

Project Manual

**ULSTER COUNTY COURTHOUSE
EXTERIOR UPGRADES
AND REPAIRS**

**ULSTER COUNTY
285 WALL STREET
KINGSTON, NEW YORK 12401**

**BID ISSUE
2/23/2023**

ARCHITECT'S PROJECT NO. 2433-00

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END OF SECTION 000003

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SECTION 010300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing Alternates.

1.3 DEFINITIONS

- A. Definition: An Alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate that Work into the Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- B. Notification: Immediately following the award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate whether alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other Work of this Contract.

1.5 SCHEDULE OF ALTERNATES

- A. Were indicated in Section 003000 state the amount to be added to or deducted from the Base Bid amount for:

ALTERNATE NO. 1: REHABILITATION OF ROOF AREA E

Provide a **DEDUCT** Alternate for all labor, materials, and equipment to rehabilitate existing single ply roof at roof area E with fluid applied roofing membrane coating as detailed by the drawings and specification section 076500.13

PART 2 - PRODUCTS Not Applicable

PART 3 - EXECUTION Not Applicable

END OF SECTION 010300

SECTION 010450 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections apply to this Section.
- B. Refer to other Sections of these Specifications for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 DESCRIPTION OF WORK

- A. All cutting required for the installation of building systems shall be performed by the parties requiring same for the installation of their work, unless otherwise specifically indicated or noted to be performed otherwise.
- B. The Construction Contract includes all patching of building materials and surfaces affected by the cutting and removals for all trades and subcontracts, except for special patching which must be performed by mechanical and electrical trades, such as patching of ductwork, piping and other mechanical and electrical systems.

1.3 CUTTING OF FINISH MATERIALS

- A. When it is necessary to have finish materials cut, drawings shall be submitted by the Contractor showing the proposed changes and indicating the finished conditions. The cutting shall not be done until the Architect has approved the drawings.
- B. Structural Work: Do not cut and patch structural elements in a manner that would reduce the load-carrying capacity or load deflection ratio. Obtain approval of the cutting and patching proposal before cutting and patching structural elements.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.
- D. Materials: Use materials identical to existing materials.
- E. Inspection: Before cutting, 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.
- F. Temporary Support: Provide temporary support of Work to be cut.

- G. Protection: Protect construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions that might be exposed during cutting and patching operations.
- H. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

1.4 PERFORMANCE

- A. Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
- B. Cut existing construction to provide for the installation of other components or the performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- C. Cutting: Cut using methods least likely to damage elements to be retained or adjoining construction. Where possible review procedures with the original installer; comply with the original installer's recommendations.
- D. Where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
- E. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
- F. Comply with requirements of applicable sections of Division 31 where cutting and patching requires excavating and backfilling.

1.5 PATCHING

- A. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
- B. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
- C. Restore exposed finishes of patched areas and extend finish into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
- D. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken plane containing the patch, after the patched area has received primer and second coat.

- E. Cleaning: Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove paint, mortar, oils, putty and similar items. Thoroughly clean piping, conduit and similar features before painting or finishing is applied.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 010450

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SECTION 010901 – HISTORIC TREATMENT PROCEDURES

PART I GENERAL

1.1 SUMMARY

- A. Section includes Procedures for work on Historic Structures.
 - 1. General: Historic Structure: The Ulster County Courthouse is listed on the National Register of Historic Places as a contributing structure of the Kingston Stockade District. It is considered to have irreplaceable cultural, material, and aesthetic value.
 - 2. Acknowledging this value and significance, the Contractor agrees to exercise special care during all phases of the work to ensure that the existing buildings, their details, materials, and finishes which are to remain, are not damaged by the work being performed

1.2 PROTECTION OF HISTORIC MATERIALS

- A. Existing Historic Materials to Remain: Protect construction elements indicated to remain against
 - 1. damage and soiling during historic treatment. When permitted by Architect, Items may be
 - 2. removed to a suitable, protected storage location during historic treatment and cleaned and
 - 3. reinstalled in their original locations after historic treatment operations are complete.
- B. Protect landscape work adjacent to or within work areas as follows:
 - 1. Provide barriers to protect tree trunks.
 - 2. Bind spreading shrubs.
 - 3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane For more than 8 hours at a time.
 - 4. Set scaffolding and ladder legs away from plants.
 - 5. Keep all construction equipment off of existing landscape features.

1.3 DEFINITIONS

- A. Preservation: Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.
- B. Rehabilitation: Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.
- C. Restoration: Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.
- D. Reconstruction: Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.
- E. Stabilize: Deteriorated portions of a historic building may need to be protected through preliminary stabilization measures until additional work can be undertaken. Stabilizing may include structural reinforcement, weatherization, or correcting unsafe conditions. Temporary stabilization should always be carried out in such a manner that it detracts as little as possible from the historic building's appearance. Although It may not be necessary in every preservation project, stabilization is nonetheless an

integral part of the treatment Preservation; it is equally applicable, if circumstances warrant, for the other treatment.

- F. Protect and Maintain: After identifying those materials and features that are important and must be retained in the process of Preservation work, then protecting and maintaining them are addressed. Protection generally involves the least degree of intervention and is preparatory to other work. For example, protection includes the maintenance of historic materials through treatments such as rust removal, caulking, limited paint removal, and re-application of protective coatings; the cyclical cleaning of roof gutter systems; or installation of fencing, alarm systems and other temporary protective measures. Although a historic building will usually require more extensive work, an overall evaluation of its physical condition should always begin at this level.
- G. Repair: when the physical condition of character-defining materials and features requires additional work, repairing by stabilizing, consolidating, and conserving is recommended. Preservation strives to retain existing materials and features while employing as little new material as possible. Consequently, guidance for repairing a historic material, such as masonry, again begins with the least degree of intervention possible such as strengthening fragile materials through consolidation, when appropriate, and repainting with mortar of an appropriate strength. Repairing masonry as well as wood and architectural metal features may also include patching, splicing, or otherwise reinforcing them using recognized preservation methods. Similarly, within the treatment Preservation, portions of a historic structural system would be reinforced using contemporary materials such as steel rods. All work should be physically and visually compatible, identifiable upon close inspection and documented for future research.
- H. Replace: If repair by stabilization, consolidation, and conservation proves inadequate, the next level of intervention involves the limited replacement in kind of extensively deteriorated or missing parts of features when there are surviving prototypes (for example, brackets, dentils, steps, plaster, or portions of slate or tile roofing). The replacement material needs to match the old both physically and visually, i.e., wood with wood, etc. Thus, with the exception of hidden structural reinforcement and new mechanical system components, substitute materials are not appropriate in the treatment Preservation. Again, it is important that all new material be identified and properly documented for future research. If prominent features are missing, such as an interior staircase, exterior cornice, or a roof dormer, then a Rehabilitation or Restoration treatment may be more appropriate.
- I. Remove: To take away or off of the existing structure. Removal procedures should include all are necessary to prevent damage to existing construction to remain.
- J. Remove and Salvage: To take away or off of the existing structure and save for reuse. Care should be taken to preserve the condition of the removed component.
- K. Remove and Reinstall: To temporarily take away and subsequently put back in same place or another place. care should be taken to prevent damage to removed component.
- L. Existing to Remain or be Retained: Existing construction to stay in place and not be impacted by the work.
- M. Material in Kind: To match in every respect including composition, design, shape, profile, color texture, strength, durability, look, finish and aesthetic.

1.4 REFERENCE STANDARDS

- A. U.S. Secretary of the Interior Standards for the Treatment of Historic Properties: web site address is as follows: <https://www.nps.gov/tps/standards.htm>
 - 1. Preservation Briefs:
 - a. (#10) Exterior Paint Problems on Historic Woodwork
- B. U.S. Secretary of the Interior Standards for the Treatment of Historic Properties: "Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings"

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION 019001

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work under Owner's separate contracts.
5. Owner-furnished/Contractor-installed (OFICI) products.
6. Contractor's use of site and premises.
7. Coordination with occupants.
8. Work restrictions.
9. Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: Ulster County Courthouse Exterior upgrades and repairs

1. Architects project Number 2433-00
2. Project Location: 285 Wall Street, Kingston, NY 12401

B. Owner: County of Ulster

1. Owner's Representative: David Gruskiewicz p. 845.340.3141

C. Architect: Lothrop Associates LLP

1. Architect's Representative: Andrew Claar p.914.234.8427

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Removal and replacement of all Asphalt shingle roofs.
2. Removal and replacement of select flat roof areas.
3. Deduct Alternate for roof restoration at roof area "E"

4. Addition of steel framed entrance canopy at South entrance.
5. Restoration of decorative metal cornice system at the annex building.
6. Restoration of wood bell tower/cupola
7. Rebuilding of the North and East stone entrance stairs
8. Masonry cleaning
9. Select Masonry repointing
10. Repainting of wood trim including eaves, rakes, soffits, and windows including lead safe work practices
11. Window restoration including sash removal and lead safe work practices.
12. Removal /abatement of asbestos containing glazing compound.
13. All other work as indicated by the contract documents.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

C. Contractor Historic renovation qualifications:

1. Contractor to provide evidence of at least five other historic renovation projects of similar project scope.
2. Contractor to have at least 10 years' experience with historic renovation projects of similar project scope.

1.4 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.5 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFICI) PRODUCTS

- A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
 2. Provide for delivery of Owner-furnished products to Project site.
 3. Upon delivery, inspect, with Contractor present, delivered items.
 - a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.

4. Obtain manufacturer's inspections, service, and warranties.
5. Inform Contractor of earliest available delivery date for Owner-furnished products.

B. Contractor's Responsibilities: The Work includes the following, as applicable:

1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
3. Receive, unload, handle, store, protect, and install Owner-furnished products.
4. Make building services connections for Owner-furnished products.
5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
6. Repair or replace Owner-furnished products damaged following receipt.

C. Owner-Furnished/Contractor-Installed (OFCI) Products:

1. As indicated in contract documents.

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limits on Use of Site: Confine construction operations to building roof and limited interior access for work associated with window restoration. Sash removal to be from exterior of building whenever possible. A portion of the parking lot will be given to the contractor for staging and storage.
 2. Driveways, Walkways, and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials except as agreed upon by owner.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1.8 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of **7a.m. to 5p.m.**, Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Architect & Owner not less than seven days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Architect & Owner not less than seven days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, vaping, electronic cigarettes, marijuana products and other controlled substances on the Project site and Owner's property is not permitted.
- F. Contractor to provide Covid-19 protocol for the safety of workers and building occupants.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

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SECTION 011530 - CHANGE ORDER PROCEDURE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as described in written Change Orders signed by the Owner, Architect and Contractor and issued after execution of the Contract, in accordance with the provisions of this Section.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 01 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing Change Order data.
- B. Change Order Form: AIA Document G-701 shall be used for all change orders.

1.3 SUBMITTALS

- A. Make submittals directly to the Architect at the address shown on the Project Directory in the Project Manual.
- B. Submit the number of copies called for under the various items listed in the Section.

1.4 PRODUCT HANDLING

- A. Maintain a "Register of Bulletins and Change Orders" at the job site, accurately reflecting current status of all pertinent data.
- B. Make the Register available to the Architect for review at his request.

1.5 PROCESSING CHANGES INITIATED BY THE OWNER

- A. Should the Owner contemplate making a change in the Work or a change in the Contract Time of Completion, the Architect will issue a "Bulletin" to the Contractor.
 - 1. Bulletins shall be dated and numbered in sequence.
 - 2. The Bulletin shall describe the contemplated changes, and carry one of the following instructions to the Contractor:
 - a. Make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion.

- b. Make the described change in the Work, credit or cost for which will be approved by the Owner and/or Architect.
 - c. Promptly advise the Architect as to credit or cost proposed for the described change. This is not an authorization to proceed with the change.
 - B. If the Contractor has been directed by the Architect to make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion, but the Contractor wishes to make a claim for one or both of such change, the Contractor shall proceed with the change and shall notify the Architect.
 - C. If the Contractor has been directed by the Architect to make the described change subject to later determination of cost or credit, the Contractor shall:
 - 1. Take such measures as needed to make the change.
 - 2. Consult with the Architect and reach agreement on the most appropriate method for determining credit or cost for the change.
 - D. If the Contractor has been directed by the Architect to promptly advise him as to credit or cost proposed for the described change, the Contractor shall:
 - 1. Analyze the described change and its impact on costs and time
 - 2. Secure the required information and forward it to the Architect for review.
 - 3. Meet with the Architect as required to explain costs and when appropriate, determine other acceptable ways to achieve the desired objective.
 - 4. Alert pertinent personnel and subcontractors as to the impending change and, to the maximum extent possible, avoid such work as would increase the Owner's cost for making the change, advising the Architect in writing when such avoidance no longer is practicable.
- 1.6 PROCESSING CHANGES INITIATED BY THE CONTRACTOR
- A. Should the Contractor required further information or explanation to interpret Contract Documents as to Architect's intent, he shall request such clarification. The Contractor's failure to do so, and subsequent work performed and rejected as a result of his misinterpretation of the Contract Documents will not be cause for a change in the Contract Sum.
 - B. Should the Contractor discover a discrepancy among the Contract Documents, a concealed condition or other cause for suggesting a change in the Work, a change in the Contract Sum, or a change in the Contract Time of Completion, he shall notify the Architect as required by pertinent provisions of the Contract Documents.
 - C. Upon agreement by the Architect that there is reasonable cause to consider the Contractor's proposed change, the Architect will issue a Bulletin in accordance with the provisions described in Article 1.05 above.

1.7 PROCESSING BULLETINS

- A. Make written reply to the Architect in response to each Bulletin.
 - 1. State proposed change in the Contract Sum, if any.
 - 2. State proposed change in the Contract Time of Completion if any.
 - 3. Clearly describe other changes in the Work required by the proposed change, or desirable therewith, if any.
 - 4. Include full backup data such as subcontractor's letter or proposal or similar information.
 - 5. Submit this response in single copy.
- B. When cost or credit for the change has been agreed upon the Owner and the Contractor, the Architect will issue a "Change Order" to the Contractor.

1.8 PROCESSING CHANGE ORDERS

- A. Change Orders shall be dated and numbered in sequence, and prepared on the forms specified.
- B. Each Change Order shall describe the change or changes, refer to the Bulletin or Bulletins involved, and shall be signed by the Owner and the Architect.
- C. The Architect will issue four copies of each Change Order to the Contractor.
 - 1. The Contractor shall sign all four copies and return three copies to the Architect.
 - 2. The Architect will retain one signed copy and forward two signed copies to the Owner.
- D. Should the Contractor disagree with the stipulated change in Contract Sum or change in Contract Time of Completion, or both:
 - 1. The Contractor promptly shall return three copies of the Change Order, unsigned by him, to the Architect with a letter signed by the Contractor and stating the reason or reasons for the Contractor's disagreement.
 - 2. The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered and to seek settlement of the dispute under applicable provisions of the Contract Documents.

PART 2- PRODUCTS - Not Applicable

PART 3- EXECUTION - Not Applicable

END OF SECTION 011530

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SECTION 012000 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussions of issues, the Architect will conduct project meetings throughout the construction period.
- B. RELATED WORK
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 01 of these Specifications.
 - 2. The Contractor's relations with subcontractor's vendors and material suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.

1.2 AUTHORITY

- A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority committing the Contractor to solutions agreed upon in the project meetings

1.3 AGENDA

- A. Agenda items: To the maximum extent practicable, advise the Architect at least 24 hours in advance of project meetings regarding items to be added to the agenda.

B. MEETING REPORT

- 1. The Architect will prepare written reports of each project meeting, and will furnish copies to the Contractor and Owner.
- 2. Recipients of copies may make and distribute copies as necessary.

1.4 MEETING SCHEDULE

- A. Except as noted below for Preconstruction Meeting, project meetings shall be held bi-weekly.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

1.5 MEETING LOCATION

- A. The Architect shall establish meeting location. Unless otherwise required or mutually agreed by all parties, meetings shall be held at the job site.

1.6 PRECONSTRUCTION MEETING

- A. Preconstruction Meeting shall be scheduled within ten (10) working days after the Owner has issued the Notice to Proceed.
 - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
 - 2. The Architect will advise other interested parties, including the Owner, and request their attendance.
- B. Minimum Agenda: Data will be distributed and discussed on at least the following items:
 - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Architect.
 - 2. Channels and procedures for communications.
 - 3. Construction schedule, including sequence of critical work.
 - 4. Contract documents, including distribution of required copies of original Documents and revisions.
 - 5. Processing of Shop Drawings and other data submitted to the Architect for review.
 - 6. Processing of Bulletins, Field Decisions, and Change Orders.
 - 7. Rules and regulations governing performance of the Work.
 - 8. Procedures for security, quality control, housekeeping, and related matters.

1.7 PROJECT MEETINGS

- A. Attendance:
 - 1. To the maximum extent possible, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
 - 2. Subcontractors, material suppliers, and others may be invited to attend those project meetings when their interests are involved.
- B. Minimum Agenda:
 - 1. Review, revise as necessary, and approve minutes of previous meetings.
 - 2. Review progress of the Work since last meeting, including status of submittals for approval.
 - 3. Identify problems, which impede planned progress.
 - 4. Develop corrective measures and procedures to regain planned schedule.
 - 5. Complete other current business.
- C. Revisions to Minutes:
 - 1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.

1.8 PROJECT CORRESPONDENCE

- A. All correspondence concerning the project, which is being submitted to the Owner or Architect, shall clearly be identified meeting the following requirements:
1. Clients Name
 3. Project Site Name
 4. Architects Project Title
 5. Architects Project # _____
 6. Owners Project # _____
- B. All correspondence not conforming to the above requirements will be discarded.

PART 2- PRODUCTS - Not Applicable

PART 3- EXECUTION - Not Applicable.

END OF SECTION 012000

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SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Quantity allowances.
 - 4. Contingency allowances.
 - 5. Testing and inspecting allowances.
- C. Related Requirements:
 - 1. Section 012200 "Unit Prices" for procedures for using unit prices, including adjustment of quantity allowances when applicable.
 - 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

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

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.10 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 1. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 SCHEDULE OF ALLOWANCES

- A. ALLOWANCE #1: Quantity allowance: include in the base bid an additional One Thousand (1000) Square foot (SF) allowance for all labor, material, and equipment to provide the removal of damaged or rust perforated decorative metal cornice panel system and replacement with new metal panel cornice panel system to match existing as detailed in the construction documents details 1,2,3,4/A502 and specification section section 057000 decorative metal restoration and fabrications
- B. ALLOWANCE #2: Quantity allowance: include in the base bid an additional four-thousand (4000) square foot allowance for all labor, material, and equipment to provide removal and replacement of damaged exterior plywood roof sheathing.
- C. ALLOWANCE #3: Quantity allowance: include in the base bid an additional four-hundred (400) square foot allowance for all labor, material, and equipment to provide masonry repointing as shown on the construction documents.
- D. ALLOWANCE #4: Quantity allowance: include in the base bid an additional four-hundred (400) linear foot allowance for all labor, material, and equipment to provide removal and replacement of rotted and damaged wood eaves, rakes, soffits, trim boards and moldings as detailed in the construction documents.
- E. ALLOWANCE #5: Quantity allowance: include in the base bid a quantity allowance for the additional removal and replacement of 2-Cupola Pilasters assemblies (including cap and plinth) including all labor, material, and equipment.
- F. ALLOWANCE #6: Quantity allowance: include in the base bid a quantity allowance for the additional removal and replacement of 2-Cupola Plinth blocks including all labor, material, and equipment.
- G. ALLOWANCE #7: Quantity allowance: include in the base bid an additional allowance for the removal and replacement of 2-cupuola Brackets including all labor, material, and equipment.

- H. ALLOWANCE #8: Quantity allowance: include in the base bid a quantity allowance for an additional One-Hundred (100) Square Feet of cupula wood board /siding removal and replacement including all labor, material, and equipment.
- I. ALLOWANCE #9: Quantity allowance: include in the base bid a quantity allowance for an additional two-hundred (200) Linear Feet of wood cornice, soffit, dentil, and trim removal and replacement including all labor, material, and equipment.
- J. ALLOWANCE #10: Quantity allowance: include in the base bid an additional allowance for a Fifty (50) Square Feet of wood ceiling removal and replacement including all labor, material, and equipment.
- K. ALLOWANCE #11: Quantity allowance: include in the base bid an additional allowance of 200 Linear foot for all labor, material, and equipment to replace rotted or damaged 2x8 wood gutter framing members.
- L. ALLOWANCE #12: Quantity allowance: include in the base bid an additional four-hundred (400) square foot allowance for all labor, material, and equipment associated with additional painting
- M. ALLOWANCE #13: Quantity allowance: include in the base bid an additional one-hundred and fifty (150) linear foot allowance for all labor, material, and equipment to provide removal and replacement of one linear foot of rotted and damaged wood gutter liner with new plywood gutter liner.
- N. ALLOWANCE #14: Quantity allowance: include in the base bid an additional allowance of two-hundred and fifty (250) linear foot for all labor, material, and equipment to provide removal and replacement of one linear foot of rotted and damaged wood 1 x 8 roof deck planks.
- O. ALLOWANCE #15: Quantity allowance: include in the base bid an additional allowance of Fifteen (15) linear feet for all labor, material, and equipment to provide removal and replacement of cast ornamental fencing.
- P. ALLOWANCE #16: Quantity allowance: include in the base bid Two Hundred (200) linear foot allowance for all labor, material, and equipment to provide removal and replacement of one linear foot of rotted and damaged wood roof framing with (2) LVL's of same depth and sistered to each side of existing framing with ½" staggered lag bolts. Assume 3-1/2" x 14" max LVL size.
 - 1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

NOTE: All UNUSED allowances will be credited back to the owner based on the unit prices included in the contract.

END OF SECTION 012100

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SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.
 - 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the Part 3 "Schedule of Unit Prices" Article contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price # 1: Removal and Replacement of damaged or rust perforated decorative metal cornice panel system.
1. Description: All labor, materials, and equipment required to provide the removal of damaged or rust perforated decorative metal cornice panel system and replacement with new metal panel cornice panel system to match existing as detailed in the construction documents refer to details 1,2,3,4/A502 and specification section section 057000 decorative metal restoration and fabrications
 2. Unit of Measurement: 1 Square foot of decorative metal panel system removal and replacement.
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- B. Unit Price #2: Removal of damaged plywood sheathing and replacement with new PLYWOOD sheathing.
1. Description: All labor, materials, and equipment required to remove and replace existing plywood roof sheathing with new exterior plywood sheathing, thickness 3/4" or as required to match existing thickness, in accordance with Section 061600 "Sheathing" not otherwise indicated in the Contract Documents.
 2. Unit of Measurement: 1 Square foot of exterior plywood roof sheathing.
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- C. Unit Price #3: provide Masonry Repointing
1. Description: All labor, materials, and equipment required to provide one square foot of masonry repointing.
 2. Unit of Measurement: One Square feet of Masonry repointing
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- D. Unit Price #4: Remove and Replace rotted and damaged wood eaves, rakes, soffits, trim boards and moldings as detailed in the construction documents.
1. Description: All labor, material, and equipment to provide removal and replacement of one linear foot of rotted and damaged wood eaves, gutter liner, rakes, soffits, trim boards and moldings as detailed in the construction documents.
 2. Unit of Measurement: one Linear Foot of eaves, gutter liner, rakes, soffits, trim boards
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

- E. Unit Price #5: Remove and Replace rotted and damaged Cupola wood pilaster, cap and plinth as detailed in the construction documents.
 - 1. Description: All labor, material, and equipment to provide removal and replacement of one rotted and damaged Cupola wood pilaster, cap and plinth as detailed in the construction documents.
 - 2. Unit of Measurement: 1 pilaster assembly
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

- F. Unit Price #6: Remove and Replace rotted and damaged Cupola wood plinth block as detailed in the construction documents.
 - 1. Description: All labor, material, and equipment to provide removal and replacement of one rotted and damaged cupola wood plinth block as detailed in the construction documents.
 - 2. Unit of Measurement: 1 plinth block
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

- G. Unit Price #7: Remove and Replace rotted and damaged Cupola wood Bracket as detailed in the construction documents.
 - 1. Description: All labor, material, and equipment to provide removal and replacement of one rotted and damaged cupola wood bracket as detailed in the construction documents.
 - 2. Unit of Measurement: 1 Cupola wood Bracket
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

- H. Unit Price #8: Remove and Replace 1 square foot of rotted and damaged Cupola wood siding/panels as detailed in the construction documents.
 - 1. Description: All labor, material, and equipment to provide removal and replacement of 1 square foot of rotted and damaged Cupola wood siding/panels as detailed in the construction documents.
 - 2. Unit of Measurement: 1 Square Foot of wood siding/panels
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

- I. Unit Price #9: Remove and Replace 1 linear foot of rotted and damaged Cupola wood cornice, soffit, dentil, and trim as detailed in the construction documents.
 - 1. Description: All labor, material, and equipment to provide removal and replacement of one linear foot of cornice, soffit, dentil, and trim as detailed in the construction documents.
 - 2. Unit of Measurement: 1 linear foot of cornice, soffit, dentil, and trim
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

- J. Unit Price #10: Remove and Replace 1 square foot of rotted and damaged Cupola wood ceiling as detailed in the construction documents.
 - 1. Description: All labor, material, and equipment to provide removal and replacement of 1 square foot of rotted and damaged Cupola wood ceiling as detailed in the construction documents.
 - 2. Unit of Measurement: 1 Square Foot of Cupola wood ceiling

3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- K. Unit Price #11: Remove and Replace rotted wood 2x8 Gutter framing
1. Description: All labor, material, and equipment to replace
 2. Unit of Measurement: replacement of one Linear foot of 2x8 wood gutter framing
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- L. Unit Price #12: Additional painting
1. Description: All labor, materials, and equipment to provide painting of items not indicated on drawings.
 2. Unit of Measurement: Square feet of painting
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- M. Unit Price #13: Remove and Replace 1 linear foot of rotted and damaged wood gutter liner with new exterior plywood sheathing, thickness 3/4" or as required to match existing thickness as detailed in the construction documents.
1. Description: All labor, material, and equipment to provide removal and replacement of 1 linear foot of rotted and damaged wood gutter liner with new exterior plywood sheathing, thickness 3/4" or as required to match existing thickness as detailed in the construction documents.
 2. Unit of Measurement: 1 Linear foot of wood gutter liner
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- N. Unit Price #14: Remove and Replace of one linear foot of rotted and damaged wood 1 x 8 roof deck planks.
1. Description: All labor, material, and equipment to provide removal and replacement of one linear foot of rotted and damaged wood 1 x 8 roof deck planks.
 2. Unit of Measurement: 1 Linear foot of wood 1 x 8 roof deck planks.
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- O. Unit Price #15: Remove and Replace of one linear foot of cast ornamental fencing.
1. Description: All labor, material, and equipment to provide removal and replacement of one linear foot of cast ornamental fencing.
 2. Unit of Measurement: 1 Linear foot of cast ornamental fencing.
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- P. Unit Price #16: removal and replacement of one linear foot of rotted and damaged wood framing with LVL of same depth sistered to each side of existing framing. Assume 14" max. depth
1. Description: all labor, material, and equipment to provide removal and replacement of one linear foot of rotted and damaged wood framing with (2)LVL's of same depth sistered to each side of existing framing with staggered 1/2" lag bolts. Assume 3-1/4" x 14" max. LVL size.

2. Unit of Measurement: 1 Linear foot of wood framing removal and replacement with (2) 3-1/2" x 14" LVLs sistered to each side of damaged member with 1/2" lag bolts.
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

END OF SECTION 012200

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SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at the earliest possible date, but no later than fourteen days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Arrange schedule of values consistent with format of AIA Document G703
 - 2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Divide each breakdown into separate line items for labor and materials
 - 3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 - 4. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 - 5. Provide separate line item for punchlist in the amount of five (5) percent of the Contract Sum and subcontract amount.
 - 6. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 - 7. Closeout Costs. Include separate line item for Project closeout requirements in an amount totaling two (2) percent of the Contract Sum.
 - 8. Punchlist Costs Include separate line item for Punchlist requirements in an amount totaling two (2) percent of the Contract Sum.

9. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the last day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit four signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application. Contractor to provide one set of Certified Payrolls with each payment application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Submittal schedule (preliminary if not final).
 6. List of Contractor's staff assignments.
 7. Copies of building permits.
 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 9. Certificates of insurance and insurance policies.
 10. Performance and payment bonds.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.

ULSTER COUNTY COURHOUSE
EXTERIOR UPGRADES AND REPAIRS
KINGSTON NY

2433-00

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013300 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies requirements for handling Submittals and scheduling. Refer to related provisions of the General Conditions.
- B. General Procedures: Coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, and other submittals and related activities. Transmit in advance of performance of related activities to avoid delays.
 - 1. Coordinate transmittal of different submittals for related elements so processing will not be delayed by the need to review concurrently for coordination. The Architect reserves the right to withhold action on a submittal requiring coordination until related submittals are received.
 - 2. Processing: Allow two weeks for initial review. Allow more time if processing must be delayed for coordination with other submittals. The Architect will advise the Contractor when a submittal must be delayed for coordination. Allow two weeks for reprocessing each submittal.
 - a. No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.
 - 3. Submittal Preparation: Place a label or title block on each submittal for identification. Provide a 4" x 10" space on the label or beside the title block on Shop Drawings to record Contractor's review and approval markings and action taken. Include the following information on the label for processing and recording action taken. (Refer to Appendix A "Shop Drawing Identification Sheet" at end of this Section).
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submission number.

- C. Contractor's Review: The Contractor will examine the submission and indicate the results of his review with a stamp with his approval representing that he has checked and verified the submission with the requirements of the work and the Contract Documents on the submission made to the Architect. He will retain one copy of all submissions for his review, and will forward the remaining copies of each shop drawing and catalog cuts, manufacturer's specifications, etc., to the Architect for review, with a copy of the transmittal to the Owner's representative. Submittals which do not bear the Contractor's review stamp will be returned with no action taken.
1. Submittal Transmittal: Package submittals appropriately for transmittal and handling.
 2. Transmit with a transmittal form. Submittals received from other than the Contractor will be returned without action. Record requests for data and deviations from Contract Documents.
 3. Include Contractor's certification that information complies with Contract Documents.

1.3 CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule: Submit a fully developed, bar-chart type construction schedule, within 10 days of the date established for Commencement of the Work. Provide a separate bar for each construction activity and a vertical line to identify the first working day of each week. Use the breakdown of units of Work as indicated in the "Schedule of Values".
1. Prepare the schedule on reproducible media, of sufficient width to show data for the entire construction period.
 2. Secure commitments for performing critical construction operations from parties involved. Coordinate each activity with other activities and show in proper sequence; include minor elements involved in the construction sequence. Indicate sequences necessary for completion of related portions.
 3. Coordinate the Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests and other schedules.
 4. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the Schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing and Area Separations: If applicable, provide a separate time bar to identify each construction phase or area for each major part of the Work. Indicate where each element must be sequenced with other activities.

1.4 CONSTRUCTION TIME

- A. Calendar Days:
1. The project includes a stipulation that the work be completed in a predetermined number of calendar days. (See Section 001001 Instructions to Bidders).

2. Calendar days are defined as a period of time beginning on a certain day and continuing consecutively on a daily basis according to the calendar year until the end. Calendar days include weekends and holidays.

B. Regular Work Days:

1. Regular Work Days are Monday through Friday within a week unless otherwise noted. Exceptions are Federal Holidays and dates the Owner is closed or has blocked out work.

C. Regular Working Hours:

1. The regular working hours are 7:00 AM to 5:00 PM on regular work days, unless otherwise stated.

1.5 SUBMITTAL SCHEDULE

- A. Submit the Submittal Schedule within 10 days of the Construction Schedule. Coordinate Schedule with the list of subcontracts, Schedule of Values and list of products as well as the Construction Schedule.

1. Prepare the Schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Name of subcontractor.
 - d. Description of the construction element covered.
 - e. Scheduled date of the Architect's final release.

- B. Distribution of Schedules: Distribute copies of the Construction and Submittal Schedules to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the temporary field office. When revisions are made, distribute to the same parties and post in the same locations.

1. Updating: Revise and issue each Schedule after each meeting or activity, where revisions have been made.

- C. Shop Drawings: Submit new information, drawn to accurate scale. Indicate deviations from Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Fax copies are unacceptable as shop drawings. Include the following information:

1. Dimensions.
2. Identification of products, materials and finishes included.
3. Notation of coordination requirements.
4. Notation of dimensions established by field measurement.
5. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 30" x 42".
6. Submittal: Submit as PDF

7. Do not use Shop Drawings without a final stamp indicating action taken in connection with construction.
- D. Product Data: Collect Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Fax copies are unacceptable.
1. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
- E. Submittals:
1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include Project Title and Architect's Project No. in email subject line and as requested by Architect.
 - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - b. Do not proceed with installation until an applicable copy of Product Data is in the installer's possession.
 - c. Do not permit use of unmarked copies of Product Data in connection with construction.
 - d. Paper and Fax copies are unacceptable.
- F. Samples: Submit four (4) full-size Samples to the Architect, cured and finished as specified and identical to the product proposed. Mount, display, or package Samples to facilitate review. Prepare Samples to match the Architect's Sample.
1. Include the following information tagged on one face, with the other face reserved for Architect's action stamp.
 - a. Project name.
 - b. Date.
 - c. Architect's name.
 - d. Contractor's name.
 - e. Generic description.
 - f. Source.
 - g. Product name or name of manufacturer.
 - h. Compliance with recognized standards.
 - i. Availability and delivery time.
 2. Submit Samples for review of kind, color, pattern, and texture, for a final check

of these characteristics, and a comparison of these characteristics between the final submittal and the component as delivered and installed. Where variations are inherent in the product, submit multiple units that show limits of the variations.

3. Preliminary submittals: Where Samples are for selection of characteristics from a range of choices, submit a full set of choices for the product. Preliminary submittals will be reviewed and returned indicating selection and other action.
 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 1 PDF. Maintain one copy at the Project site, for quality comparisons.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
 5. Distribution: Prepare additional sets for Owner, subcontractors, manufacturers, fabricators, installers, and others as required for performance. Show distribution on transmittal forms.
- G. Architect's Action: Except for submittals for record, information or similar purposes, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return.
1. The Architect will indicate the results of his review of the Contractor's shop drawings/catalog cuts by marking them as follows:

NO EXCEPTIONS TAKEN: Submittal may be released for fabrication, erection, construction and incorporation in the work without further checking, approval or submission of shop drawings, catalog cuts, etc.

MAKE CORRECTIONS NOTED: Submittal may be released for fabrication, erection, construction and incorporation in the work subject to notes, corrections shown thereon which have been made by the Architect or his Consultants.

AMEND AND RESUBMIT: Shop drawings, catalog cuts, etc., so marked must be corrected or changed, and copies sent to the Architect for record purposes, in the number and forms required by him.

REJECTED-SEE REMARKS: The items shown in the submittal are rejected for fabrication and their incorporation into the work is not permitted. Submittals so marked will be returned to the Contractor for corrections and/or the addition of more details, and resubmission will be required.
 2. The Architect's review and action taken of a separate item shall not indicate he has reviewed and acted upon the assembly in which the item functions. The Architect's review and action does not relieve the Contractor from responsibility for errors or omissions in the Shop Drawings.
 3. In the event of returns for correction and re-submissions, all alterations, changes

and additions of new information beyond the scope of the Architect's corrective notations, shall be suitably marked on the shop drawing or drawings and noted in the accompanying transmittal or resubmission.

4. Record Submittals: See other sections for requirements, if any, to submit complete set of shop drawings, product data and samples of in-place work for Owner's records.
- H. Electronic Submittals: Submit ALL Shop drawings and Submittals in electronic PDF format, subject to all requirements of this section. Procedures for electronic submittals shall be established with the Owner and Architect prior to commencement of construction.
- I. Electronic Copies of Construction Documents: The Contractor may request from the Architect electronic files (CAD files) for use in preparing shop drawings. The Contractor shall make requests in writing together with a specific list of drawings and shall execute a release form provided by the Architect.

PART 2 – PRODUCTS - Not Applicable

PART 3 – EXECUTION - Not Applicable

END OF SECTION 013000

SHOP DRAWING IDENTIFICATION SHEET

(This must be attached to each individual submittal copy)

Lothrop Associates ^{LLP}
333 Westchester Avenue
White Plains, NY 10604
Phone: (914) 741-1115
Fax: (914) 741-1116

Contractor: _____
Address: _____
Contact Name: _____
Phone: _____
Fax: _____

Owner: _____
Name of Project: _____
Lothrop Associates Project Number: _____

TYPE OF SUBMITTAL:

- | | | |
|---------------------------------------|--------------------------------------|---|
| <input type="checkbox"/> Shop Drawing | <input type="checkbox"/> Schedule | <input type="checkbox"/> Sample |
| <input type="checkbox"/> Product Data | <input type="checkbox"/> Certificate | <input type="checkbox"/> Color Sample |
| <input type="checkbox"/> Test Report | <input type="checkbox"/> Warranty | <input type="checkbox"/> Record Submittal |

DESCRIPTION:

Product Name: _____
Manufacturer: _____
Subcontractor/Supplier: _____

REFERENCES:

Drawing No.: _____
Spec Section No.: _____

CONTRACTOR'S REVIEW STAMP

Reviewed By: _____
Date: _____

The contractor hereby acknowledges that the attached submittal has been reviewed for compliance with contract requirement

FOR USE BY THE ARCHITECT/ENGINEER

Architect Review Stamp:

No Exceptions Taken
Make Corrections Noted
Amend and Resubmit
Reject – See Remarks

Lothrop Associates ^{LLP}		
Section	File	Submission

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF THE GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR: CONFORMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.

LOTHROP ASSOCIATES ^{LLP}

Date: _____ By: _____

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SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.

2. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as indicated in-place portions of permanent construction], consisting of multiple products, assemblies, and subassemblies, with cutaways enabling inspection of concealed portions of the Work.
 - a. Include each system, assembly, component, and part of the exterior wall to be constructed for the Project. Colors of components shall be those selected by the Architect for use in the Project.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
 4. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 5. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall have the same meaning as testing agency.
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect
- 1.3 DELEGATED-DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Statement: Submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

C. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.6 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Statement on condition of substrates and their acceptability for installation of product.
 2. Statement that products at Project site comply with requirements.
 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 5. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Statement that equipment complies with requirements.
 2. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 3. Other required items indicated in individual Specification Sections.

1.7 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as

well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329 and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - d. When testing is complete, remove test specimens and test assemblies, do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups of size indicated.
 2. Build mockups in location indicated or, if not indicated, as directed by Architect
 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 6. Obtain Architect's approval of mockups before starting corresponding work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
 8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 10. Demolish and remove mockups when directed unless otherwise indicated.
- K. Integrated Exterior Mockups: Construct integrated exterior mockup as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph.
1. Coordinate construction of the mockup to allow observation of air barrier installation, flashings, air barrier integration with fenestration systems, and other portions of the building air/moisture barrier and drainage assemblies, prior to installation of veneer, cladding elements, and other components that will obscure the work.
- L. Room Mockups: Construct room mockups as indicated on Drawings], incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Architect to evaluate quality of the Work. Comply with requirements in "Mockups" Paragraph.
- 1.8 QUALITY CONTROL
- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

- F. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

- G. **Contractor's Associated Requirements and Services:** Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 6. Security and protection for samples and for testing and inspection equipment at Project site.

- H. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. **Test and Inspection Log:** Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.

- B. **Maintain log at Project site.** Post changes and revisions as they occur. Provide access to test and inspection log for Architect's[, reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

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SECTION 014200 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Definitions: Basic contract definitions are included in the Conditions of the Contract.
1. **"Indicated"** refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as **"shown," "noted," "scheduled," and "specified"** are used to help the user locate the reference. Location is not limited.
 2. **"Directed," "requested," "authorized," "selected," "approved," "required," and "permitted"** mean directed by the Architect, requested by the Architect, and similar phrases.
 3. **"Approved,"** when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
 4. **"Regulations"** includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
 5. **"Furnish"** means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
 6. **"Install"** describes operations at the Project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
 7. **"Provide"** means to furnish and install, complete and ready for the intended use.
 8. **"Installer"** is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 9. The term **"experienced,"** when used with the term **"installer,"** means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
 10. Using a term such as **"carpentry"** does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter.
 11. **"Project site"** is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work 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 on which the Project is to be built.

12. **"Testing Agencies":** A testing agency 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.

1.2 SPECIFICATION FORMAT

- A. These Specifications are organized into Divisions and Sections based on the multiple division format and CSI/CSC's "Master Format" 2004 version numbering system.

1.3 SPECIFICATION CONTENT

- A. These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
- B. **Abbreviated Language:** Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
- C. Streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Section Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
- D. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
- E. **Applicability of Standards:** Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- F. **Publication Dates:** Comply with standards in effect as of the date of the Contract Documents.
- G. **Copies of Standards:** Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.
- H. **Abbreviations and Names:** Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

1.4 PERMITS, LICENSES, AND CERTIFICATES

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 014200

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SECTION 015000 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide temporary facilities needed for the Work including but not necessarily limited to:
 - 1. Temporary utilities such as heat, water, electricity, telephone and emergency power.
 - 2. Sanitary facilities.
 - 3. Enclosures such as tarpaulins, barricades and canopies.
 - 4. Platforms, walking surfaces, and other items required to maintain access to occupied units.
 - 5. Debris containers.
 - 6. Temporary fencing of staging areas.
 - 7. On-site storage facilities.

- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 01 of these Specifications.
 - 2. Equipment furnished by subcontractors shall comply with requirements of applicable safety regulations. Equipment normally furnished by the individual trades for execution of their own portions of the Work are not part of this Section.

1.2 PRODUCT HANDLING

- A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

PART 2 – PRODUCTS - Not Applicable.

PART 3- EXECUTION

3.1 UTILITIES

- A. Water:
 - 1. Access to water (hose bib) will be made available to contractor. Contractor responsible for providing all hoses.

- B. Electricity:
 - 1. Provide all necessary temporary wiring. Upon completion of the Work, remove temporary electrical facilities.
 - 2. Provide area distribution/outlet boxes so located that the individual trades may furnish and use 100 ft. maximum length extension cords safely to obtain power.

3. Provide and pay for electricity used in construction.

F. Fire Extinguishers: Provide and maintain fire extinguishers in sufficient quantities as required by project size.

3.2 FIELD OFFICES AND SHEDS

A. Contractor's facilities:

1. Provide a field office building/storage trailer and sheds adequate in size and accommodation for the Contractor's offices, supply, and storage.

B. Sanitary facilities:

1. Provide temporary sanitary facilities in the quantity required for use by all contractor and sub-contractor personnel.

2. Maintain in a sanitary condition at all times.

3.3 ENCLOSURES

A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

3.4 TEMPORARY FENCING

A. Provide and maintain for the duration of construction a temporary fence and/or barricade of design and type needed to prevent entry onto the Work by the public.

B. Enclose storage and staging area with temporary fencing provide key/Combination to owner's representative.

3.5 TEMPORARY ACCESS

A. Provide, install and maintain for the duration of the construction a temporary walkway and/or bridging of a design and type needed to traverse construction work area.

3.6 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Architect.

C. Repair or replace existing site elements (lawns, landscaping, shrubbery, paving, etc.) damaged by the work of this section at no additional cost to the Owner.

- D. Repair or replace existing building elements (exterior walls, walks, steps, etc.) damaged by the work of this section at no additional cost to the Owner.

END OF SECTION 01500

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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
 - 1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the

specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."

1.3 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

1.5 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.

2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
 1. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will **not** be considered
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
 2. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 013300 "Submittal Procedures."

1. Form of Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

- D. Submittal Requirements, Single-Step Process: When acceptable to Architect, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Architect of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 016300 - SUBSTITUTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

1.3 SUBSTITUTIONS

- A. Substitutions will be considered only when listed on the form provided in the Bid Documents, and when substantiated by the Contractor's submittal of required data specified herein.
- B. Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:
 - 1. Revisions to Contract Documents requested by the Owner or Architect.
 - 2. Specified options of products and construction methods included in Contract Documents.
 - 3. Compliance with governing regulations and orders issued by governing authorities.
- C. Submittal: Requests for substitution will be considered if received within 20 days after commencement of the Work. Requests received more than 20 days after commencement of the Work may be considered or rejected at the discretion of the Architect.
 - 1. Submit 3 copies of each request for substitution in the form and in accordance with procedures for Change Order proposals.
 - 2. Identify the product, or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Document compliance with requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A comparison of significant qualities of the proposed substitution with those specified.

- d. A list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and any separate Contractors, that will be necessary to accommodate the proposed substitution.
 - e. A statement indicating the substitution's effect on the Construction Schedule compared to the Schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. Certification by the Contractor that the substitution is equal to or better in every respect to that required by Contract Documents, and that it will perform adequately in application indicated. Include Contractor's waiver of rights to additional payment or time, that may be necessary because of the substitution's failure to perform adequately.
3. Architect's Action: Within one week of receipt of the request for substitution, the Architect will request additional information necessary for evaluation. Within 2 weeks of receipt of the request, or one week of receipt of additional information, whichever is later, the Architect will notify the Contractor of acceptance or rejection. If a decision on use of a substitute cannot be made within the time allocated, use the product specified. Acceptance will be in the form of a Change Order for substitutions changing the Contract Time or Contract Sum.
- D. Substitutions: The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; 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 be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, and similar considerations.

8. 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.
 9. 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.
 10. 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.
- E. The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 2- PRODUCTS - Not Applicable

PART 3- EXECUTION - Not Applicable

END OF SECTION 016310

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SECTION 016400 - PRODUCT HANDLING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 01 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures required to assure full protection of work and materials.

1.3 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.4 PACKAGING

- A. Deliver products to the job site in their manufacture's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
 - 3. Pre-finished materials shall be wrapped and suitably protected during shipment.
- B. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION

- A. Protect finished surfaces, including jambs and soffits or openings used as passageways, through which equipment and materials are handled.

- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by Owner.

1.6 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacement and repairs to the approval of the Architect and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

PART 2- PRODUCTS - Not Applicable.

PART 3- EXECUTION - Not Applicable.

END OF SECTION 016400

SECTION 017000 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included: Provide an orderly and efficient transfer of the completed work to the Owner.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 01 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Prior to requesting inspection by the Architect, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

1.3 PROCEDURES

- A. Substantial Completion:
 - 1. Prepare and submit the list required by the General Conditions of the contract for construction.
 - 2. Within a reasonable time after receipt of the list, the Architect will inspect to determine status of completion.
 - 3. Should the Architect determine that the Work is not substantially complete:
 - a. The Architect promptly will so notify the Contractor, in writing, giving the reasons therefore.
 - b. Remedy the deficiencies and notify the Architect when ready for reinspection.
 - c. The Architect will reinspect the Work.
 - 4. When the Architect concurs that the Work is substantially complete:
 - a. The Architect will prepare a **Certificate of Substantial Completion** on AIA Form G704, accompanied by the Contractor's list of items to be completed or corrected, as verified by the Architect.
 - b. The Architect will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.
- B. Final Completion:
 - 1. Prepare and submit the notice require by the General Conditions.

2. Verify that the Work is complete including, but not necessarily limited to, the General Conditions.
3. Certify that:
 - a. Contract Documents have been reviewed.
 - b. Work has been inspected for compliance with the Contract Documents.
 - c. Equipment and systems have been tested as required and are operational.
 - d. Work has been completed in accordance with the Contract Documents.
 - e. Work is completed and ready for final inspection.
 - f. Contractor shall provide a letter certifying in-house final inspection of work is complete.
4. The Architect will make an inspection to verify status of completion.
5. Should the Architect determine that the Work is incomplete or defective:
 - a. The Architect promptly will so notify the Contractor, in writing, listing the incomplete or defective work.
 - b. Remedy the deficiencies promptly, and notify the Architect when ready for reinspection.
6. For each visit the architect or consultants return to previously inspected defective work, the contractor shall be billed 2.5 times the architect/consultant rate in the form of a change order.
7. When the Architect determines that the work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.

C. Closeout Documents/Submittals:

Closeout submittals may include, but are not necessarily limited to:

1. Project record Documents described in Section 017200.
2. Operation and maintenance data for items so listed in pertinent other Sections of these Specifications, and for other items when so directed by the Architect.
3. Warranties and Bonds: Maintenance Bond providing Contractor's one year guarantee period; all manufacturers, material or supplier warranties required.
4. Keys and Keying Schedule.
5. Spare parts and materials extra stock.
6. Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
 - a. Certificates of Inspection.
 - b. Certificates of Occupancy.
7. Consent of Surety to Final Payment
8. Certificates of Insurance for products and completed operations.
9. Letter indicating that all punch list work has been completed.
10. Certificate of Completion – (see form attached).
11. Evidence of payment and release of liens;
G706A Contractor's Affidavit of Release of Liens.

12. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

D. Final adjustment of accounts:

1. Submit a final statement of accounting to the Architect, showing all adjustments to the Contract Sum.
2. If so required, the Architect will prepare a final Change Order showing adjustments to the Contract Sum, which were not made previously by Change Orders.

1.4 INSTRUCTIONS

- A. Instruct the Owner's personnel in proper operation and maintenance of system, equipment, and similar items which were provided as part of the Work, if applicable.

PART 2- PRODUCTS - Not Applicable.

PART 3- EXECUTION - Not Applicable.

END OF SECTION 017000

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SECTION 017100 - CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section establishes guidelines for cleaning in general to be performed by the Contractor on site and in buildings during the course of work.
- B. Work included: Throughout the construction period, maintain the building and site areas affected by this project in a standard of cleanliness as described in this Section.
- C. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 01 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.
- B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment, which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

- A. General:
 - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.

2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction to the Work.
3. At least once each week, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily, and more often as necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restock, tidy, or otherwise service arrangements to meet the requirements in subparagraph 3.1-A-1 above.
3. Maintain the site in a neat and orderly condition at all times.

C. Structures:

1. Daily, and more often if necessary, inspect the work area and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, sweep work area spaces clean.
 - a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

3.2 FINAL CLEANING

- A. "Clean" for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.01 above.
- C. Site:
 1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site.
 2. Completely remove resultant debris.

D. Structures

1. Exterior:

- a. Visually inspect all surfaces subject to soiling and remove all traces of soil, waste materials, smudges, and other foreign matter.
- b. Remove all traces of splashed materials from adjacent surfaces.

2. Interior:

- a. Visually inspect all surfaces subject to soiling and remove all traces of soiling, waste materials, smudges and other foreign matter.
- b. Remove all traces of splashed materials from adjacent surfaces.
- c. Remove paint droppings, spots, stains, and dirt from finished surfaces.

3. Polish Surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

E. The Contractor shall be required to clean areas, grounds, surfaces, etc., soiled by him/her, or any of their subcontractors, or suppliers during the course of the work of this contract.

F. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work.

3.3 CLEANING DURING OWNER'S OCCUPANCY

A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract.

END OF SECTION 017100

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SECTION 017200 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Article 3.1 below.
2. Upon completion of the Work, transfer the recorded changes to a set of Record Documents, as described in Article 3.2 below.

B. Related Work:

1. Documents affecting work of this Section include, but are not limited to, General Conditions, and Sections in Division 01 of these Specifications.

1.2 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Architect.

B. Accuracy of Records:

1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
2. Accuracy of records shall be such that future searches for items shown in the Contract documents may rely reasonably on information obtained from the approved Project Record Documents.

C. Make entries within 24 hours after receipt of information that the change has occurred.

1.3 SUBMITTALS

A. Comply with applicable provisions of Section 013400.

B. The Architect's approval of the current status of Project Record Documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the Contract.

- C. Prior to submitting each request for progress payment, obtain the Architect's approval of the current status of the Project Record Documents.
- D. Prior to submitting request for final payment, submit the final Project Record Documents to the Architect and secure his approval.

1.4 PRODUCT HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.
 - 1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
 - 2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

2.1 RECORD DOCUMENTS

- A. Building Department Set: Promptly following receipt of the Owner's Notice to Proceed, obtain from the Architect, which shall be chargeable to the Contractor, two (2) complete signed and sealed sets of all Documents comprising the Contract for filing with the local Building Department.
- B. Job Set: Promptly following receipt of the Owner's Notice to Proceed, obtain from the Architect, which shall be chargeable to the Contractor, one complete set of all Documents comprising the Contract.
- C. Final Record Documents: Two (2) complete hard copy sets of all Drawings in the Contract. And two electronic files.(PDF). Electronic copies to be installed on two separate thumb-drives.

PART 3 - EXECUTION

3.1 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the job set described in Paragraph 2.1-B above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".
- B. Preservation:

1. Considering the Contract Completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, provide a suitable method for protecting the job set acceptable to the Architect.
 2. Do not use the job set for any purpose except entry of new data and for review the Architect, until start of transfer of data to final Project Record Documents.
 3. Maintain the job set at the site of Work as that site is designated by the Architect.
- C. Making entries on Drawings:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
 2. Date all entries.
 3. Call attention to the entry by a “cloud” drawn around the area or areas affected.
 4. In the event of overlapping changes, use different colors for the overlapping changes.
- D. Make entries in the pertinent other Documents as approved by the Architect.
- E. Conversion of schematic layouts:
1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to show precise physical layout.
 - a. Final physical arrangement is determined and shown by the Contractor, subject to the Architect’s approval.
 - b. Design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
 2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in subparagraph 3.1-E-1 above.
 - a. Clearly identify the item by accurate note such as “cast iron drain”, “galv. water”, and the like.
 - b. Show, by symbol or note, the vertical location of the item (“under slab” “in ceiling plenum” “exposed”, and the like).
 - c. Make all identification sufficiently descriptive that it may be related reliably to the Specifications.
 3. The Architect may waive the requirements for conversion of schematic layouts where, in the Architect’s judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

3.2 FINAL PROJECT RECORD DOCUMENTS

- A. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modifications of the Work to proceed without lengthy and expansive site measurement, investigation, and examination.
- B. Approval of recorded data prior to transfer:
 - 1. Following receipt of the Final Record Drawings described in Paragraph 2.1-C above, and prior to start of transfer of recorded data thereto, obtain the Architect's approval of all recorded data.
 - 2. Make required revisions.
- C. Transfer of data to Drawings:
 - 1. Carefully transfer change data shown on the job set of Record Drawings to the corresponding Final Record Drawings, coordinating the changes as required.
 - 2. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items described in subparagraph 3.1-E.1 above.
 - 3. Call attention to each entry by drawing a "cloud" around the area or areas affected.
 - 4. Make changes neatly, consistently, and with the prior media to assure longevity and clear reproduction.
- D. Transfer of data to other Documents:
 - 1. If the Documents other than the Drawings have been kept clean during progress of the Work, and if entries thereon are acceptable to the Architect, the job set of those Documents other than Drawings will be accepted as Final Record Documents.
 - 2. If these Documents are not so approved by the Architect, obtain a new copy of that Document from the Architect at the Architect's usual charge for reproduction and handling, and carefully transfer the change data to the new copy for the approval of the Architect.
- E. Review and submittal:
 - 1. Submit the completed set of Project Record Documents to the Architect as described in Paragraph 1.3-D above.
 - 2. Participate in review meetings as required.

3. Make required changes and promptly deliver the final Project Record Documents to the Architect.

3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION 017200

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SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Product maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit by uploading to web-based project software site Enable reviewer comments on draft submittals.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. .
- D. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.3 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual

directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 2. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.4 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.5 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.

3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds, as described below.
- C. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.

3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- H. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1.7 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

1.3 DEFINITIONS

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

1.4 MATERIALS OWNERSHIP

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

1.5 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other tenants' on-site operations are not uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Coordination of tenant continuing occupancy of existing buildings.
- C. Predemolition Photographs: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Owner's tenants will occupy the buildings immediately adjacent to selective demolition area. Conduct selective demolition so tenant operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1.8 COORDINATION

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

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

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

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

3.5 DISPOSAL OF DEMOLISHED MATERIALS

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

3.6 CLEANING

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

END OF SECTION 024119

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SECTION 028213 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Contractor shall furnish all labor, materials, services, permits, insurance (specifically covering the abatement, handling, and transportation of Asbestos-Containing Material, Asbestos-Containing Construction Material and Asbestos-Containing Waste Material), and equipment which is specified, shown, or reasonably implied for Asbestos Abatement activities specified in the asbestos survey.

- B. Applicable Regulatory Agencies/Regulations. The Regulatory Agencies and regulations listed below form a part of these Specifications to the extent referenced. The regulations are referred to in the text by the basic designation only.
 - a. New York State Uniform Fire Prevention and Building Code
 - b. New York State Education Department
 - c. New York State Department of Labor
 - d. New York State Department of Environmental Conservation (DEC)
 - e. Occupational Safety and Health Administration (OSHA)
 - f. United States Environmental Protection Agency (EPA)
 - g. National Electrical Code (NEC)
 - h. OSHA Title 29 CFR Part 1910 (Specific Sections - 1001, 1101, 1200, 132, 133, & 134)
 - i. EPA Title 40 CFR, Part 61, National Emission Standard for Hazardous Air Pollutants
 - j. NYS DEC, Title 6, Part 364 (collector registration, transportation and landfill disposal)
 - k. NYS DOH, Title 10, Part 73 (Asbestos Safety Training Program, Environmental Laboratory Approval Program)
 - l. NYS DOL Code Rule 56, Asbestos Licensing and Handling.
 - m. NYS DOL Code Rule 23, Protection in Construction, Demolition and Excavation Operations.

1.2 SCOPE OF WORK

- A. Asbestos containing materials present on this project are as follows.
 - a. All asbestos work from the exterior of the building unless the approved by the Architect & Owner.

 - b. Interior and Exterior Window Glazing Compound/Putty is asbestos containing (see drawings HM210 & HM 211). Contractor shall be responsible for the abatement of all window glazing. Windows are historical and window sashes will be removed from site for restoration.

Abatement work will be completed in phases based on the window restoration schedule. It is the discretion of the abatement contractor to abate the window glazing in the most efficient and cost-effective manner.

- B. Power and Water required for the project shall be provided by the Owner if abatement occurs at the project location.
- C. Provide abatement in accordance with definitions and descriptions of NYS Industrial Code Rule 56 and all other applicable Federal, State, and local rules, regulations, and guidelines.
- D. Project Monitoring – Monitoring provided by owner consultant under separate contract. Based on the exterior abatement scope of work, a NYS Certified Project Monitor is required to complete visual inspections of the abated areas upon completion and prior to installation of temporary window infill materials.
- E. It is the Abatement Contractor's responsibility to carefully review the Contract Documents in addition to carefully examining and inspection existing conditions in area(s) indicated for abatement. Contractors must visit the site and develop their own quantity take-offs.
- F. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL QUANTITIES BEFORE SUBMITTING BID. QUANTITIES IN SURVEY ARE FOR REFERENCE ONLY AND ARE INTENDED TO ASSIST THE CONTRACTOR IN UNDERSTANDING THE APPROXIMATE SCALE OF THE PROJECT. ALL ASBESTOS ABATEMENT IS TO BE INCLUDED IN THE BASE BID UNLESS OBSURED FROM VIEW AND NOT PREVIOUSLY IDENTIFIED. The contractor is also required to perform any and all work necessary to complete the asbestos abatement work as described including the removal/relocation of building components that may rest on asbestos flooring, obstruct access to materials to be abated or other efforts necessary to accomplish the described work.
- G. The handling and disposal of all asbestos waste, except as otherwise indicated, is the sole responsibility of the Abatement Contractor and shall be removed from the premises promptly as per regulation.
- H. Contractor shall coordinate their work and schedules with Owner, Project Monitoring Firm and other contractors.
- I. To access the window interior for application of poly barriers, relocation of furnishings, equipment, etc. will be the sole responsibility.

1.3 QUALITY ASSURANCE

- A. Comply with Codes, Rules and Regulations of the State of New York (Statutory Authority: Labor Law Section 906), including Title 12 NYCRR Part 56 and 12 NYCRR Part 23 and all

applicable variances of this Code.

- B. All bids shall be based upon work described in the bid documents including work done in accordance with Code Rule 56, applicable variance and variances applied for by the Owner (if any). Any variances submitted by the contractor and approved by NYSDOL shall be executed upon approval by the Owner pursuant to review of change in scope of work and changes in contract cost resulting in a credit or cost to the Owner. Variances which include the use of a remote decontamination unit for interior abatement will not be permitted when asbestos removal includes friable material other than glove bag operations. Any additional costs including air monitoring required by the implementation of a site-specific variance requested by the Abatement Contractor shall be borne by this contractor as a credit to the owner.
- C. The Abatement Contractor performing the work of this section shall be a firm with not less than three (3) years of successful experience involving asbestos abatement.
- D. The Abatement Contractor shall comply with the most current issue of Federal, State and local regulations at the time of Execution of Contract. In the event of conflicts occurring between the Contract Documents and applicable regulations or between individual government agency regulations and codes, the most stringent requirements will be followed.

1.4 SUBMITTALS

- A. The Abatement Contractor shall submit the following information to the Owner and Environmental Consultant.
 - a. Licenses
 - b. Permits
 - c. Certifications
 - d. Site Specific Variances and Variance Requests (shall be submitted prior to signing contract)
 - e. Notifications (shall be submitted prior to commencement of work).
 - f. General Project/Contractor Information
 - g. Contractor License
 - h. Abatement Work Plan, including (per work area)
 - 1. Work shifts – times/day of week
 - 2. Proposed supervisor(s)
 - 3. Dates of start and completion
 - 4. Proposed protective respirators.
 - 5. Shop drawing plans of decontamination unit locations, set-ups and notes on specific removal procedures for each type (Actual procedures/tools/setups used)

6. Copy of daily sign in/out logs and daily progress logs, inspection sheets, etc. per work area.
7. Variances obtained (if applicable)
8. Demolition notification (if applicable)
9. OSHA N.E.A.

B. Waste Information

- a. Waste transporter permits.
- b. Asbestos waste disposal facility name, address, phone number, EPA I.D. #, and authorization to accept this project's waste.
- c. D.E.C. permits for acceptable landfill site (if in NYS).
- d. Waste manifests including chain of custody records.

C. Worker Information

- a. Worker certificates – copy of valid photo identification (both sides)
- b. Worker training records (most recent training)
- c. Worker medical surveillance records
- d. Signed copy of Certificate of Workers Acknowledgement
- e. Personal air monitoring results
- f. Respirators actually used (daily if type varies based on NEA)

D. Laboratory Information (personal air samples)

- a. Laboratory credentials for CR56- NYS DOH accreditation
- b. ELAP certificate (for min. – “Misc. Air: Fibers”)
- c. Laboratory NYS asbestos license

1.5 ADMINISTRATIVE

- A. Asbestos projects include large asbestos projects, small asbestos projects, minor asbestos projects, incidental disturbance asbestos projects and emergency projects as defined elsewhere in this Part. For purposes of licensing, certification, notification, air sampling and asbestos survey requirements, asbestos projects shall include in plant operations.
- B. Large Asbestos Project – An asbestos project involving the removal, disturbance, enclosure encapsulation, repair or handling of 160 square feet or more of ACM, PACM or asbestos material or 260 linear feet or more of ACM, PACM or asbestos material.
- C. Small Asbestos Project – An asbestos project involving the removal, encapsulation, enclosure, repair or disturbance of friable asbestos, or any handling of more than 10 and less than 160 square

feet of ACM, PACM or asbestos material or more than 25 and less than 260 linear feet of ACM, PACM or asbestos material.

- D. Minor Asbestos Project - An asbestos project involving the removal, disturbance, repair, encapsulation, enclosure, or handling of 10 square feet or less of ACM, PACM or asbestos material, or 25 linear feet or less of ACM, PACM or asbestos material. Only an isolated event necessary for repair associated with normal operation and maintenance activities shall be considered such a project.
- E. Licensing Requirements and Procedures
- a. License Required. Contractor shall have a valid asbestos handling license issued by New York State. A copy of a valid asbestos handling license or other proof of the issuance of a valid asbestos handling license shall be submitted prior to the award of contract. If the asbestos contractor is a subcontractor to a prime contractor, the proof of license must be submitted by the prime contractor prior to award. A copy of a valid asbestos handling license shall be conspicuously displayed proximate to but outside the regulated abatement work area.
 - b. Employee Certification – Any employee employed by an asbestos contractor on an asbestos project shall have an appropriate asbestos handling certificate or a copy thereof in his or her possession at all times during his or her work on the project. The only exception to the requirement of the certificate is a student copy of the Asbestos Safety Training Certificate indicating successful completion of an approved asbestos safety training program. The employee must also have a photo identification card issued by an authorized government entity. A copy of a valid certificate shall be conspicuously displayed near but outside the regulated abatement work area on an asbestos project.
- F. Record-keeping
- a. The asbestos abatement contractor shall submit, prior to close out, two Project Manuals that shall include but not be necessarily limited to the following:
 1. The name, address, and asbestos certificate number of the person who supervised the asbestos project.
 2. The location and description of the asbestos project.
 3. The amount of asbestos or asbestos material that was removed, enclosed, encapsulated, repaired, disturbed or handled.
 4. The commencement and completion dates of the asbestos project.
 5. The name, address and current NYS ELAP registration number, of the laboratory that was used for air sample analysis required for worker protection (personals)

- on the project.
6. The name and address of the deposit or waste disposal site or sites where the asbestos waste material was deposited or disposed.
 7. The name and address of any sites that were used for the interim storage of asbestos or asbestos waste materials prior to final deposit or disposal.
 8. The name and address of any transporters that were used to transport asbestos or asbestos material.
 9. The name, address and asbestos license or certificate number of all persons who were engaged on that portion of the asbestos project for which the asbestos contractor has responsibility.
 10. A copy of the asbestos abatement supervisor's daily project log.
 11. Copies of all licenses of all entities involved with the project.
 12. Copies of all supervisors and handlers' certificates.
 13. Copies of notifications and amendmentsA copy of all variances, amendments and re-openings being used for the project.
 14. A copy of the air sample log if the air sampling technician is on site. If the air sampling technician is not on site, a copy of the air sample log shall be supplied within 24 hours of the request to produce a copy thereof.
 15. A copy of all air sampling results, including method of analysis, by date for the entire asbestos project, organized by regulated abatement work area.
 16. A copy of the project monitor's daily logs during abatement (if a project monitor is used on the project).
 17. The supervisor's daily log with entry/exit logs organized by date.
 18. All bulk sample data including all asbestos inspections and surveys completed for affected portions of the building, structure, and work site.
 19. This record, along with the information listed in 1.04.4 and 1.04.6 shall be submitted (2 copies with CDs) as part of the Project Manual.
 20. Copy of any violations issued by any governmental agency referencing this project against the contractor or any sub-contractors.

G. Notification

- a. The asbestos abatement contractor who proposes to engage in an asbestos project shall notify, in writing, the New York State Asbestos Control Bureau at least ten (10) calendar days prior to commencement and the EPA 10 business days prior to commencement. A copy of the notification(s) shall be submitted to the Owner.

H. Postponement, Cancellation or Changes to Completion Dates of Projects

- a. Whenever the commencement date is postponed, or if a project for which a notification has been submitted is cancelled, or if a project completion date is changed, the asbestos abatement contractor shall notify the Asbestos Control Bureau of the postponement or

cancellation or change of completion date by written notice. A copy shall be submitted to the Owner.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 028213

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SECTION 028300 - LEAD SAFE WORK PRACTICES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Contractor shall furnish all labor, materials, services, permits, insurance and equipment which is specified, shown, or reasonably implied for Lead Safe Work Practices when disturbing painted surfaces specified in the lead-based paint testing report.
- B. Applicable Regulatory Agencies/Regulations. The Regulatory Agencies and regulations listed below form a part of these Specifications to the extent referenced. The regulations are referred to in the text by the basic designation only.
- a. OSHA Title 29 CFR Part 1929.62, Lead in Construction
 - b. New York State Uniform Fire Prevention and Building Code
 - c. New York State Department of Labor
 - d. New York State Department of Environmental Conservation (DEC)
 - e. Occupational Safety and Health Administration (OSHA)
 - f. United States Environmental Protection Agency (EPA)
 - g. National Electrical Code (NEC)
 - h. EPA Title 40 CFR, Part 61, National Emission Standard for Hazardous Air Pollutants
 - i. NYS DEC, Title 6, Part 364 (collector registration, transportation and landfill disposal)
 - j. NYS DOL Code Rule 23, Protection in Construction, Demolition and Excavation Operations.

1.2 SCOPE OF WORK

- A. **Abatement of lead containing building components is not required on this project. The Contractor may be required to remove lead containing paint from building components as part of their scope of work. If removal of lead-based paint is required, the Contractor shall follow all applicable Federal, State, and Local regulations governing the proper removal, handling, and disposal of lead containing materials as per section 1.3 of this specification.**
- B. Work to be performed in this section may include the disruption of know lead containing building components.
- The presence of lead-based paint has been assumed on the following components.
 - **Exterior facia**
 - **Window Glazing**
 - **Cornice**
 - **Soffit**
 - **All Window components (sash, stops, sills, etc.)**
 - **Cupola**

- **Lead Coated Copper Flashings**
 - **As indicated on Hazardous Materials drawings**
- C. This Section specifies requirements for working with lead containing materials (LCM), during any of the following operations:
 - a. Scraping and sanding for paint preparation activities.
 - b. Removing windows for restoration.
- D. It is the Contractor's responsibility to carefully review the Contract Documents in addition to carefully examining and inspection existing conditions in area(s) indicated. Contractors must visit the site and develop their own quantity take-offs.
- E. The handling and disposal of all lead waste, except as otherwise indicated, is the sole responsibility of the Contractor and shall be removed from the premises promptly as per regulation.
- F. All Contractors shall coordinate their work and schedules with Owner and other contractors.

1.02 DEFINITIONS

- A. The term "Lead-Based Paint" (LBP) is identified as paint or other surface coating such as varnish, sealer or stain containing lead in any detectable amount.
- B. The term "Incidental Removal or Disturbance of Lead-Based Paint" indicates one or more of the following operations:
 - i. Scraping, hand sanding, or otherwise removing loose LBP from existing surfaces scheduled to remain in place.
- C. The term "Demolition of LCM" refers to cutting, drilling, abrading, demolishing, or otherwise disturbing building elements coated with LBP or containing lead.
- D. The term "Lead-Containing Materials" (LCM) is identified as construction debris coated with lead-based paint or other materials containing lead, such as x-ray shielding.
- E. The term "Critical Barrier" indicates the perimeter of the enclosure within which lead disruption/removal work takes place. Critical Barriers may include existing floor, wall, and ceiling structures, as well as constructed partitions, closures and seals.
- F. The term "Project Site" indicates the limits of the Project Site as indicated on drawings or by provisions of this specification.
- G. The term "Work Area" indicates the area within the Critical Barrier.
- H. The term "Action Level" means exposure to an airborne concentration of lead of 30 micrograms per cubic meter of air calculated as an 8-hour time-weighted average (TWA).
- I. The term "Exposure Assessment" means a determination of employee exposures for a given task measured by air monitoring. The Assessment must meet the criteria for objective data as outlined in the OSHA Lead in Construction Standard 29 CFR 1926.62.
- J. The term "OSHA PEL" stands for the Permissible Exposure Limit established by the Occupational Safety and Health Administration for lead exposure. The OSHA PEL refers to an airborne concentration of lead of 50 micrograms per cubic meter of air calculated as an 8-hour time-weighted average (TWA).
- K. The abbreviation "TCLP" stands for Toxicity Characteristic Leaching Procedure and refers to

one of the tests to determine if waste is considered a Hazardous Waste or non-hazardous solid waste.

- L. The term “Hazardous Waste” refers to a listed waste or any solid or liquid waste with one or more of the following characteristics: toxic, corrosive, flammable, explosive, combustible, oxidizer, pyrophoric, unstable (reactive) or water - reactive.
- M. The term “Non-Hazardous Waste” refers to any solid or liquid waste not exhibiting characteristics of Hazardous Waste.

1.3 QUALITY ASSURANCE

- 1. Comply with Codes, Rules and Regulations of the State of New York (Statutory Authority: Labor Law Section 906), including Title 12 NYCRR Part 23.
- 2. Comply with all current and appropriate Federal, State and Local rules and regulations regarding work of this section, including those of the following agencies:
 - a. OSHA Title 29 CFR Part 1929.62, Lead in Construction
 - b. New York State Uniform Fire Prevention and Building Code
 - c. New York State Department of Labor
 - d. New York State Department of Environmental Conservation (DEC)
 - e. Occupational Safety and Health Administration (OSHA)
 - f. United States Environmental Protection Agency (EPA)
 - g. National Electrical Code (NEC)
 - h. EPA Title 40 CFR, Part 61, National Emission Standard for Hazardous Air Pollutants
 - i. NYS DEC, Title 6, Part 364 (collector registration, transportation and landfill disposal)
 - j. NYS DOL Code Rule 23, Protection in Construction, Demolition and Excavation Operations.

1.4 SUBMITTALS

- A. The Contractor shall submit the following information, as applicable, to the Owner and Environmental Consultant.
 - a. Exposure Assessment Documentation
 - b. All information used to document previous employee exposure assessments, if available. If not available, conduct an initial exposure assessment at the start of the project.
 - c. Written Compliance Plan: Submit to the Owner and Environmental Consultant a written compliance plan incorporating all requirements in the OSHA Lead in Construction Standard.
 - d. Health and Safety Requirements: Submit to the Owner and Environmental Consultant:
 - i. Respiratory Protection Program

- ii. Proof of current fit test for the respirator that will be worn on the project site.
 - iii. Proof of medical surveillance for respirator usage and lead work.
- B. Waste Information (for hazardous waste)
- a. Waste transporter permits.
 - b. Waste disposal facility name, address, phone number, EPA I.D. #, and authorization to accept this project's waste.
 - c. D.E.C. permits for acceptable landfill site (if in NYS)
 - d. Waste manifests including chain of custody records.
- C. Worker Information
- a. Worker certificates – copy of valid photo identification (both sides)
 - b. Worker training records (most recent training)
 - c. Worker medical surveillance records (if applicable)
 - d. Signed copy of Certificate of Workers Acknowledgement
 - e. Personal air monitoring results
 - f. Respirators used (daily if type varies)
- D. Laboratory Information (personal air samples for NEA)
- a. Laboratory credentials for accreditation
 - b. Respirators used (daily if type varies)

ADMINISTRATIVE

- A. Personnel involved in the disturbance of LCM shall be trained in accordance with the requirement of OSHA Title 29 CFR Part 1929.62 including:
- a. The content of the standard.
 - b. The specific nature of the operations on the project which could result in exposure to lead above the action level.
 - c. The purpose, proper selection, fitting, use, and limitations of respirators. The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant).
 - d. The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices.

1.5 LEAD SAFE WORK PRACTICES

A. General

- a. Restrict access to Work Area to essential personnel.
- b. Use moist-removal methods and/or HEPA vacuuming where applicable. Do not over-saturate the Work Area.
- c. Any debris generated must be cleaned up immediately before it can be tracked into other areas.
- d. Remove contaminated clothing and personal protective equipment before leaving the Work Area, or Work Area enclosure, as applicable.
- e. If the Action Level is exceeded outside the Work Area, discontinue work and modify Critical Barrier, or perform other modifications of methods or materials as required to reduce the lead contamination below the Action Level.
- f. Prohibit eating, drinking, and smoking in the Work Area.

B. Incidental Removal of Lead Paint

- a. Remove paint from building surface by wet hand scrapping or sanding.
- b. Wet methods (including power-washing) that use amounts of water that can drip, spill, or leak onto the ground, or onto or into other adjacent surfaces are prohibited.
- c. Dry removal methods (including sand blasting, power sanding, and other methods relying on high velocity mechanical abrasion) that create airborne fine particulate waste materials are prohibited.
- d. Fluid applied chemical strippers designed to dry into a solid polymeric sheet and peel off in paint encapsulated are prohibited.
- e. Prior to torch-cutting building elements containing LBP, remove paint within four inches of centerline of cut.

- C. Thorough cleaning followed by a cleaning verification procedure to minimize exposure to lead-based paint hazards is required.

1.6 DISPOSAL

- A. All building materials and debris, including paint chips, shall be removed from the work area and properly disposed of.
- B. Prior to removal of waste from the site, the contractor shall perform a Toxicity Characteristic Leaching Procedure (TCLP) to determine waste characterization and proper disposal.
- C. Removal of Waste from the Site - All waste generated as part of the lead project shall be removed from the site within ten (10) calendar days after waste characterization. All waste

generated during the project shall be legally disposed of at an approved landfill facility. All generated waste removed from the site must be documented, accounted for and disposed of in compliance with Local, State, & Federal Regulations & Requirements.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 028300

Section 03 01 00 PRECAST CONCRETE REPAIR

Part 1 - General

1.1 General requirements

This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their Work and coordinate overlapping Work.

1.2 System description

The Work of this section shall include furnishing all labor, materials, equipment, and supervision to prepare the surface of the structural concrete members and to install the material as indicated.

1.03 Submittals

- A. Substitutions: Requests for substitution must be received by Architect at least 14 days prior to bid opening and shall be accepted only from prime bidders. Request shall include:
 - a. Documentation from an approved independent testing laboratory showing compliance with this specification.
 - b. Record of past performance, list of similar installations.
 - c. Detailed comparison of the qualities of the proposed substitute with the specified product, statement of product costs showing all savings passed to owner if approved.
 - d. Certification by the contractor that the proposed substitute is in every significant way equal to or better than the specified product.
- B. Submit two copies of manufacturer's actual literature including: Product Data Sheets and appropriate Safety Data Sheets (SDS).

1.4 Quality assurance

Comply with the following unless modified by this specification.

- a. ASTM C109/C109M-02 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch. Cube Specimens)
- b. ASTM C191-04 Standard Test Method for Time of Setting of Hydraulic Cement by Vicat Needle

1.5 Delivery, Storage And Handling

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material or unsealed pails must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Store and handle the specified product as recommended by the manufacturer.

1.6 Job Conditions

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to

be imminent. Minimum application temperature 45°F (7°C) and rising.

- B. Protection: Precautions should be taken to avoid damage to packaging

1.7 Warranty

Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

Part 2 - Products

2.1 Manufacturer

SikaQuick Smooth Finish, as proposed by Sika Corporation, is considered to conform to the requirements of this specification.

2.2 Materials

SikaQuick Smooth Finish is a fast setting, one component, durable mortar for repairing and re-profiling vertical and overhead concrete surfaces to achieve a smooth finish.

2.3 Performance Criteria

Typical Properties of SikaQuick Smooth Finish:

1. Aspect	Light weight mortar
2. Color	Concrete gray
3. Mixing Ratio	8 - 9 quarts of water per 50 lb. bag
4. Application Thickness	Min: Feather Edge Max: 1/2"
5. Finishing Time	1 hour
6. Compressive Strength (ASTM C-109)	
	1 day @ 73°F (23°C) 1,000 psi
	28 days @ 73°F (23°C) >2,000 psi
7. Shall not re-emulsify when wet.	
8. Shall be non-metallic with no added chlorides and shall be pre-blended	

Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55%relative humidity.

Part 3 – Execution

3.1 Surface Preparation

Concrete - Concrete/Mortar: Remove all deteriorated concrete, dirt, oil, grease, and all bond-inhibiting materials from surface. After preparation, substrate strength should be verified prior to patch placement.

Substrate should be dry or saturated surface dry (SSD) with no standing water during application.

3.2 Mixing and Application

- A. Wet down all tools and mixer to be used. Mix mechanically with a low-speed drill (400 - 600 rpm) and mixing paddle or by hand.
- B. Mix to a uniform consistency, maximum 3 minutes. Manual mixing can be tolerated only for less than a full unit. Thorough mixing and proper proportioning of the powder and liquid is necessary. Inaccurate proportioning of the powder to liquid will result in a finished product that may not conform with stated properties.
- C. Start mixing with 8 - 9 quarts of water per 50 lb. bag. DO NOT EXCEED 9 qts. Adjust the water dosage, if necessary, to achieve the desired consistency. DO NOT OVER WATER. Over-watering may result in difficulty handling and/or not meeting stated property values. Do not retemper. Clean bucket and mixing equipment in between batches.

3.2 Application

- A. SikaQuick Smooth Finish should be applied in one pass in thicknesses ranging from a true feather edge to 1/2" in depth. Typical working time of the product is 30 minutes at 73°F. Working time will vary depending on application temperature. In high temperature work environments, cold water should be used to increase working time.
- B. Painting: Can be overcoated same day.
- C. Once material is in place, as the material hardens, use a trowel to shave or cut the excess material to the desired shape. Material can be sanded and painted the same day.

3.3 Cleaning

- A. Clean all tools immediately after use.
- B. Clean excess material from surrounding areas immediately.

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SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.

1.3 QUALITY CONTROL

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- C. Special Inspections: Owner will engage a special inspection program to perform the special inspections and prepare reports:

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. 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.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
 - 1. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I or Type II. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, graded.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating with minimum 18 percent solids content.
- F. Penetrating Exterior Anti-Spalling Sealer for Slab: "Euco-Guard 100" by Euclid Chemical Co. (mixed to 17.5 percent concentration); "MasterProtect H400" by Master Builders; "Aquapel Plus" by L&M Construction Chemicals; or accepted equivalent.

2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Trench Drains-Zurn Z883-SVF with Zurn P6-BZ decorative bronze grate
 1. Provide all required piping and accessories for a complete installation.
 2. Follow all of manufactures installation directions and specifications.
 3. Encase trench drain in concrete per manufactures recommendations and specifications.
 4. Install pitched at 1/4" per foot to provide positive drainage.
 5. Connect to existing underground storm system with piping like or compatible with existing system materials and sizes.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing or high-range water-reducing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped with a water-cementitious materials ratio below 0.50.
- D. Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength at 28 days: 4000 psi for piers and foundation walls, 3000 psi for mat foundation, 4500 psi for exterior slab on grade and stairs on grade.
 2. Maximum Water-Cementitious Materials Ratio: 0.50 for piers and foundation walls, 0.55 for footings, 0.45 for exterior slabs on grade including stair on grade.
 3. Slump Limit: 4 inches to 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture, plus or minus 1 inch. 6 inches max slump for exterior slab on grade concrete.
 4. Air Content: 4.5 percent, plus or minus 1.5 percent at point of delivery for foundation walls, piers and mat foundation, 6.0 percent plus or minus 1.5 percent for exterior slab on grade and stairs on grade.

2.8 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.9 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

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

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one inch of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.5 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. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Comply with ACI 306.1.
- D. Hot-Weather Placement: Comply with ACI 301.

3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 1. Apply to concrete surfaces exposed to public view.
- C. 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.
- D. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive mortar setting beds and as otherwise indicated. After placing slabs, plane surface to tolerances for floor flatness (FF) of 15 and floor levelness (FL) of 13. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

3.7 CONCRETE PROTECTING AND CURING

- A. Protect freshly placed slabs from premature drying and excessive cold or hot temperature. Maintain without drying at a relatively constant temperature for time period necessary for cement hydration and proper hardening.
- B. Cure exterior slabs completely by moist-curing using burlap absorptive cover, soaker hoses, and ponding for at least 7 days. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers. Avoid rapid drying at end of curing period. Allow absorptive cover to remain an additional 3 days.
- C. Do not allow foot or other traffic over slabs during 7-day curing period.
- D. Apply penetrating exterior anti-spalling sealer to exterior concrete slab and stair according to manufacturer's direction

3.8 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a special inspection program to perform field tests and inspections and prepare test reports.

END OF SECTION 033000

SECTION 040110 - MASONRY CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cleaning the following:
 - 1. Unit masonry surfaces.
 - 2. Stone surfaces.

1.2 DEFINITIONS

- A. Low-Pressure Spray: **100 to 400 psi; 4 to 6 gpm**

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

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

1.5 QUALITY ASSURANCE

- A. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Cleaning: Clean an area **approximately 25 sq. ft.** for each type of masonry and surface condition.
 - a. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.

PART 2 - PRODUCTS

2.1 PAINT REMOVERS

- A. Low-Odor, Solvent-Type Paste Paint Remover: Manufacturer's standard low-odor, water-rinsable, solvent-type paste, gel, or foamed emulsion formulation, for removing paint coatings from masonry; containing no methanol or methylene chloride.
 - 1. Prosoco Sure Klean Heavy Duty Paint Stripper

2.2 CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

PART 3 - EXECUTION

3.1 PROTECTION

- A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent paint removers and chemical cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
 - 1. Cover adjacent surfaces with materials that are proven to resist paint removers and chemical cleaners used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents according to manufacturer's written instructions. Do not apply liquid strippable masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.

3.2 CLEANING MASONRY, GENERAL

- A. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from **20 feet** away by Architect.
- B. Proceed with cleaning in an orderly manner; work from **top to bottom** of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces.
- C. Use only those cleaning methods indicated for each masonry material and location.
 - 1. Brushes: Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
 - 2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage surfaces, including joints.
 - a. Equip units with pressure gages.
 - b. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
 - c. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.
- D. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without

streaking or damaging masonry surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.

- E. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to the "Cleaning Appearance Standard" Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.
- F. Water-Spray Application Method: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from masonry surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.

3.3 PRELIMINARY CLEANING

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing remaining growth to dry as long as possible before removal. Remove loose soil and plant debris from open joints to whatever depth they occur.
- B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to planned cleaning methods. Extraneous substances include paint, calking, asphalt, and tar.
 - 1. Carefully remove heavy accumulations of rigid materials from masonry surface with sharp chisel. Do not scratch or chip masonry surface.
 - 2. Remove paint and calking with **alkaline paint remover**
 - a. Comply with requirements in "Paint Removal" Article.
 - b. Repeat application up to two times if needed.
 - 3. Remove asphalt and tar with **solvent-type paste paint remover**
 - a. Comply with requirements in "Paint Removal" Article.
 - b. Apply paint remover only to asphalt and tar by brush without prewetting.
 - c. Allow paint remover to remain on surface for 10 to 30 minutes.
 - d. Repeat application if needed.

3.4 PAINT REMOVAL

- A. Paint-Remover Application, General: Apply paint removers according to paint-remover manufacturer's written instructions. Do not allow paint removers to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.
- B. Paint Removal with Solvent-Type Paste Paint Remover:
 - 1. Remove loose and peeling paint using **low** pressure water spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.

2. Apply thick coating of paint remover to painted surface with natural-fiber cleaning brush, deep-nap roller, or large paint brush. Apply in one or two coats according to manufacturer's written instructions.
3. Allow paint remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing.
4. Rinse with **cold** water applied by **low** pressure spray to remove chemicals and paint residue.

3.5 CLEANING MASONRY

A. Cleaning:

1. Wet surface with **hot** water applied by low-pressure spray.
2. Scrub surface with medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet.
3. Rinse with **hot** water applied by **low** pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

END OF SECTION 040110

SECTION 040140.62 - STONE REPOINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes repointing joints with mortar.

1.2 PREINSTALLATION MEETINGS

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Quality-control program.

1.5 QUALITY ASSURANCE

- A. Stone Repointing Specialist Qualifications: Engage an experienced stone repointing firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing standard unit masonry or new stone masonry is insufficient experience for stone repointing work.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging stonework. Include provisions for supervising performance and preventing damage.
- C. Mockups: Prepare mockups of stone repointing to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Repointing: Rake out joints in two separate areas each approximately 36 inches (900 mm) high by 48 inches (1200 mm) wide unless otherwise indicated for each type of repointing required, and repoint one of the areas.

2.1 MORTAR MATERIALS

- A. Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; white **or gray** where required for color matching of mortar.
 - 1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Mortar Sand: ASTM C144.
 - 1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
 - 2. Color: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.
- D. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in stone mortars.
 - 1. Davis Colors
 - 2. Solomon Colors
- E. Water: Potable.

2.2 MORTAR MIXES

- A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
 - 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again, adding only enough water to produce a damp, unworkable mix that retains its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
 - 1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black which is limited to 2 percent.
- C. Do not use admixtures in mortar unless otherwise indicated.

- D. Mixes: Mix mortar materials in the following proportions:
1. Pointing Mortar by Property: ASTM C270, Property Specification, **Type N Type**> unless otherwise indicated; with cementitious material limited to **portland cement and lime**

PART 3 - EXECUTION

3.1 PROTECTION

Retain this article if applicable.

- A. Remove **gutters and** downspouts and associated hardware adjacent to stone and store during stone repointing. Reinstall when repointing is complete.
1. Provide temporary rain drainage during work to direct water away from building.

3.2 REPOINTING

- A. Rake out and repoint joints to the following extent:
1. Joints indicated as sealant-filled joints. Seal joints according to Section 079200 "Joint Sealants."
 2. Joints at locations of the following defects:
 - a. Holes and missing mortar.
 - b. Cracks that can be penetrated 1/4 inch (6 mm) or more by a knife blade 0.027 inch (0.7 mm) thick.
 - c. Cracks **1/8 inch** or more in width and of any depth.
 - d. Hollow-sounding joints when tapped by metal object.
 - e. Eroded surfaces 1/4 inch (6 mm) or more deep.
 - f. Deterioration to point that mortar can be easily removed by hand, without tools.
 - g. Joints filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
1. Remove mortar from joints to depth of **2 times joint width 2-1/2 times joint width but not less than 3/4 inch and [not less than that required to expose sound, unweathered mortar** Do not remove unsound mortar more than **2 inches (50 mm)** deep; consult Architect for direction.
 2. Remove mortar from stone surfaces within raked-out joints to provide reveals with square backs and to expose stone for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 3. Do not spall edges of stone units or widen joints. Replace or patch damaged stone units as directed by Architect.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose stone, rotted wood, rusted metal, and other deteriorated items.

E. Pointing with Mortar:

1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than **3/8 inch (9 mm)** a uniform depth is formed. Fully compact each layer, and allow it to become thumbprint hard before applying next layer.
3. After deep areas have been filled to same depth as remaining joints, point joints by placing mortar in layers not greater than **3/8 inch (9 mm)** Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing stone has worn or rounded edges, slightly recess finished mortar surface below face of stone to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed stone surfaces or to featheredge the mortar.
4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
6. Hairline cracking within mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

- F. Where repointing work precedes cleaning of existing stone, allow mortar to harden at least 30 days before beginning cleaning work.

3.3 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
1. Do not use metal scrapers or brushes.
 2. Do not use acidic or alkaline cleaners.

END OF SECTION 040140.62

SECTION 044313.13 - ANCHORED STONE MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stone masonry anchored to concrete backup.

1.2 ACTION SUBMITTALS

A. Product Data: For each variety of stone, stone accessory, and manufactured product.

B. Samples:

1. For each stone type indicated.
2. For each color of mortar required.

1.3 FIELD CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 BLUESTONE

A. Material Standards:

1. Maximum Absorption per ASTM C97/C97M: 3 percent.
2. Minimum Compressive Strength per ASTM C170/C170M: 4000 psi
3. Match existing color size thickness, finish and patterns

2.2 NORTH STAIR

1. Maximum Absorption per ASTM C97/C97M: 3 percent.
2. Minimum Compressive Strength per ASTM C170/C170M: 4000 psi
3. Match existing color size thickness, finish and patterns

2.3 EAST STAIR

1. Maximum Absorption per ASTM C97/C97M: 3 percent.
2. Minimum Compressive Strength per ASTM C170/C170M: 4000 psi
3. Match existing color size thickness, finish and patterns.

2.4 SOUTH ENTRANCE CANOPY

1. Maximum Absorption per ASTM C97/C97M: 3 percent.
2. Minimum Compressive Strength per ASTM C170/C170M: 4000 psi
3. Match existing color size thickness, finish and patterns.

2.5 MORTAR MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; natural color or white cement may be used as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Colored Portland Cement-Lime Mix: Packaged blend of portland cement, hydrated lime, and mortar pigments. Mix shall produce color indicated or, if not indicated, as selected from manufacturer's standard colors. Pigments shall not exceed 10 percent of portland cement by weigh
 1. Design Mix
 2. Work Rite
 3. Spec Mix
- D. Aggregate: ASTM C144 and as follows:
 1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.
 2. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
- E. Water: Potable.

2.6 VENEER ANCHORS

- A. Materials:
 1. Stainless Steel Wire: ASTM A580/A580M, **Type 304**.
 2. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, **Type 304**.
- B. Size: Sufficient to extend at least halfway, but not less than 1-1/2 inches (38 mm), through stone masonry and with at least a 5/8-inch (16-mm) cover on exterior face.

- C. Wire Veneer Anchors for reconstruction work: Wire ties formed from 3/16" diameter, **stainless steel** wire.
 - 1. Hohmann & Barnard 345 BT
 - 2. Heckman 103C

- D. Adjustable Masonry-Veneer Anchors for new construction:
 - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).
 - 2. Fabricate sheet metal anchor sections, dovetail slots and other sheet metal parts from **[0.078-inch- (1.98-mm-) thick, stainless steel**
 - 3. Fabricate wire ties from 3/16" **stainless steel** wire unless otherwise indicated.
 - 4. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.
 - a. Hohmann & Barnard 315 with 305 dovetail slot
 - b. Heckman 103C with 100 dovetail slot

2.7 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
 - 1. Zinc tin coated Copper: ASTM B370, Temper H00 or H01, cold-rolled copper sheet, 10-oz./sq. ft. (3-kg/sq. m) weight or 0.0135 inch (0.34 mm) thick for fully concealed flashing; 16-oz./sq. ft. (5-kg/sq. m) weight or 0.0216 inch (0.55 mm) thick elsewhere.
 - 2. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from **neoprene urethane or PVC**.

- B. Cementitious Damp proofing: Cementitious formulation recommended by ILI and nonstaining to stone, compatible with joint sealants, and noncorrosive to veneer anchors and attachments.

- C. Weep/Vent Products: Use the following unless otherwise indicated:
 - 1. Mesh Weep Holes/Vents: Free-draining mesh; made from polyethylene strands, full width of head joint and 2 inches (50 mm) high by thickness of stone masonry; in color selected from manufacturer's standard.

2.9 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry

surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.

1. Prosoco 600
2. Diedrich 202

2.10 FABRICATION

- A. **Cut** stone to produce pieces of thickness, size, and shape to match existing, including details on Drawings and pattern specified in "Setting Stone Masonry" Article.
 1. Shape stone specified to be laid in pattern to match existing.
- B. Thickness of Stone: Provide thickness indicated, but not less than the following:
 1. Thickness: 4 inches (100 mm) plus or minus [**1/4 inch (6 mm)**] [**1/2 inch (13 mm)**]. **Thickness does not include projection of pitched faces.**
- C. Finish exposed stone faces and edges to comply with requirements indicated for finish and to match approved samples.
 1. Finish: Match Existing
 2. Finish for Copings: Match existing
 - a. Finish exposed ends of copings same as front and back faces.

2.11 MORTAR MIXES

- A. General: Do not use admixtures unless otherwise indicated.
 1. Do not use calcium chloride.
 2. Use **portland cement-lime** mortar unless otherwise indicated.
 3. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in small portions until mortar reaches required consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.
- B. Mortar for Stone Masonry: Comply with ASTM C270, Proportion Specification.
 1. Mortar for Setting Stone: **Type S**
 2. Mortar for Pointing Stone: **Type N**
- C. Pigmented Mortar: Use colored cement product [**or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products**].
 1. Pigments shall not exceed 10 percent of portland cement by weight.
 2. Pigments shall not exceed 5 percent of masonry cement by weight.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coat concrete and unit masonry backup with asphalt dampproofing.

3.2 INSTALLATION OF STONE MASONRY

- A. Perform necessary field cutting and trimming as stone is set.
 - 1. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.
 - 2. Use hammer and chisel to split stone that is fabricated with split surfaces. Make edges straight and true, matching similar surfaces that were shop or quarry fabricated.
 - 3. Pitch face at field-split edges as needed to match stones that are not field split.
- B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.
- C. Arrange stones in random ashlar pattern match existing adjacent masonry course heights, random lengths, and uniform joint widths.
- D. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance. Match existing color range and variation.
- E. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment if any. Lay walls with joints not less than **3/8 inch** at narrowest points or more than **5/8 inch** at widest points.
- F. Provide sealant joints of widths and at locations indicated.
 - 1. Keep sealant joints free of mortar and other rigid materials.
 - 2. Sealant joints are specified in Section 079200 "Joint Sealants."
- G. Install embedded flashing[**and weep holes** at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
 - 1. At concrete backing, extend flashing through stone masonry, turned up a minimum of **4 inches** and insert in reglet.
 - 2. Extend sheet metal flashing 1/2 inch (13 mm) beyond masonry face at exterior, and turn flashing down to form a drip.
- H. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing.
 - 1. Use **mesh weep holes/vents**] [or] [**open head joints**] to form weep holes.
 - 2. Use wicking material to form weep holes above flashing in stone sills. Turn wicking down at lip of sill to be as inconspicuous as possible.

3. Space weep holes [**24 inches (600 mm)**] o.c.

I. Coat limestone with cementitious dampproofing as follows:

1. Stone at Grade: Beds, joints, and back surfaces to at least 12 inches (300 mm) above finish-grade elevations.
2. Stone Extending below Grade: Beds, joints, back surfaces, and face surfaces below grade.

3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces, do not exceed 3/8 inch in 20 feet more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or more.
- B. Variation from Level: For[**bed joints and**] lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet
- C. Variation of Linear Building Line: For position shown in plan, do not exceed 1/2 inch in 20 feet (13 mm in 6 m) or 3/4 inch in 40 feet (19 mm in 12 m) or more.

3.4 INSTALLATION OF ANCHORED STONE MASONRY

- A. Anchor stone masonry to concrete with corrugated-metal veneer anchors unless otherwise indicated. Secure anchors by inserting dovetailed ends into dovetail slots in concrete.
- B. Anchor stone masonry to unit masonry with **individual wire** veneer anchors unless otherwise indicated. Embed anchors in unit masonry mortar joints or grouted cells at a distance of at least one-half of unit masonry thickness.
- C. Anchor stone masonry to unit masonry with wire anchors unless otherwise indicated. Connect anchors to masonry joint reinforcement by inserting pintles into eyes of masonry joint reinforcement projecting from unit masonry.
- D. Anchor stone masonry to unit masonry with wire anchors unless otherwise indicated. Connect anchors to masonry joint reinforcement with vertical rods inserted through anchors and through eyes of masonry joint reinforcement projecting from unit masonry.
- E. Embed veneer anchors in mortar joints of stone masonry at least halfway, but not less than 1-1/2 inches (38 mm), through stone masonry and with at least a 5/8-inch (16-mm) cover on exterior face.
- F. Space anchors to provide not less than one anchor per 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (300 mm) of openings, sealant joints, and perimeter at intervals not exceeding 12 inches (300 mm).
- G. Set stone in full bed of mortar with full head joints unless otherwise indicated. Build anchors into mortar joints as stone is set.
 1. Do not attempt to trowel or remove mortar fins protruding into cavity.

- H. Rake out joints for pointing with mortar to depth of not less than **1/2 inch** before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.

3.5 POINTING

- A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch (10 mm) deep until a uniform depth is formed.
- B. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch (10 mm) deep. Compact each layer thoroughly and allow to it become thumbprint hard before applying next layer.
- C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
 - 1. Joint Profile: **Concave**

3.6 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Technical Note No. 20, Revised II, using job-mixed detergent solution.

3.7 EXCESS MATERIALS AND WASTE

- A. Excess Stone: Stack excess stone where directed by Owner for Owner's use.
 - 1. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

END OF SECTION 044313.13

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SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Grout.

1.2 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer fabricator.
- B. Welding certificates.
- C. Mill test reports for structural steel, including chemical and physical properties.
- D. Source quality-control reports.
- E. Field quality-control and special inspection reports.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 360.
3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. Angles: ASTM A 36/A 36M.
- B. Plate and Bar: ASTM A 36/A 36M.
- C. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B or Grade C, structural tubing.
- D. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
- E. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
 1. Finish: Plain.
- C. Headed Anchor Rods: ASTM F 1554, Grade 36 or ASTM F 1554, Grade 55, weldable, straight.
 1. Finish: Plain.

2.4 GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

2.6 SOURCE QUALITY CONTROL

- A. Special Inspections: Owner will engage a Special Inspector to perform shop tests and inspections.
 - 1. Provide Special Inspector with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
- D. Prepare Special Inspection Reports and submit to Architect and Engineer for review.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete bearing surfaces and locations of anchor rods for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Leveling Plates: Clean concrete bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspection program to perform the following special inspections and prepare reports:

1. Verify structural-steel materials and inspect steel frame joint details.
 2. Verify weld materials and inspect welds.
 3. Verify connection materials and inspect high-strength bolted connections and welds.
- B. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E 164.

END OF SECTION 051200

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**SECTION 05 70 00
DECORATIVE METAL
RESTORATION AND
FABRICATIONS**

PART ONE: GENERAL

1.1 Summary

- 1.1.1** Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
1. Restoration of ornamental metal Architectural components
 2. Engineering and fabrication of ornamental metal Architectural components
 3. Restoration of Weathervane and globe assembly

1.2 Reference Standards

- 1.2.1** American National Standards Institute (ANSI)
- 1.2.2** American Society for Testing and Materials (ASTM)
- 1.2.3** National Ornamental and Miscellaneous Metals Association (NOMMA)
- 1.2.4** American Welding Society (AWS)

1.3 Submittals

- 1.3.1** All submittals shall be made in accordance to section 01 33 00 and as specified herein. Contractor is to submit the following to Owner and/or Consultant for approval prior to construction and fabrication:
- 1.4.1.1** Product Literature: The Contractor shall submit copies of the manufacturer's technical data for each product including their recommendations for installation and use and Safety Data Sheets (SDS). The Contractor shall include test reports and certificates that verify the products' compliance with the specification's requirements.

Shop Drawings indicating fabrication and installation methods, to include plans, elevations, component details and attachments to other

work. Indicate required field dimensions, materials, finishes, substructure, profiles of each decorative metal member, fittings, joinery, fasteners, anchorages and additional accessory items.

1.4.1.2 Submit three samples for each exposed finish as follows

1. Section of linear shapes.
2. Samples of welded joints showing quality of workmanship.

1.4.1.3 Welding Certificates

1.5 Mock-ups:

1.5.1 Prior to executing work, the Contractor shall provide in-place mockups for approval. Panels shall be resubmitted until approved. Mock-ups shall be prepared using the same workmen, methods, and materials that will be employed for the remainder of the work. Upon approval, the mock-ups will remain the standard throughout the job. The approved mock-ups shall be retained, undisturbed and suitably marked, throughout construction. Mock-ups may be incorporated into the finished work when so approved. Mock-ups shall not be made until the methods and locations are approved. The Engineer or his/her representative will be present during the creation of all mock-ups. The Contractor shall notify the Engineer not less than seven (7) days in advance of mock-ups.

1.6 Quality Assurance

1.6.1 Fabricator Qualifications: A firm with at least 10 years' experience in producing decorative metal similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.6.2 Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

1.6.3 Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.6.4 Weathervane and globe restoration: to be carried out by firm with at least 10 years' experience in repair and restoration of weathervanes.

1.7 Coordination

1.7.1 Coordinate installation of anchorages for decorative metal items. 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.

PART TWO: PRODUCTS

2.1 General

2.1.1 Acceptable manufacturer/supplier of replacement panels:

2.1.1.1 Gotham Metalworks

87 Bowne St.
Brooklyn, NY 11231
717-786-1774

2.1.1.2 B&B Sheetmetal

2540 50th Ave.
Long Island City, New York 11101-442
Voice: (718) 433-2501

2.1.2 Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. Provide materials without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

2.2 Materials:

GALVANIZED STEEL:

18 gauge zinc galvanized sheet steel.

COATINGS:

Hardware shall be cleaned of all dirt, grime, oil, grease or other contamination using appropriate solvents that do not harm the galvanized coating. If the galvanized hardware comes with a dye, such dye must be removed prior to painting. The contractor shall notify the Engineer of the product to be used for this purpose and demonstrate its effectiveness. To ensure that such product does not interact with the primer paint, all remnants of the product shall be washed off as recommended by the product's technical data sheet.

Primer for Galvanized Components: The Contractor shall use a primer suitable for use on galvanized and non-ferrous surfaces to coat all exposed galvanized surfaces, including but not limited to galvanized fastener heads. Refer to section 099113 exterior painting

Second and Finish Coats: The Contractor shall use a DTM Alkyd enamel as specified section 099113 exterior painting-suitable for use on ferrous metals.

Color and Sheen: Finish coat paint color and sheen will be selected by the Architect from the manufacturer's full range of colors. Primer coats shall each have a slight variation of color to distinguish them from the preceding coat.

Single Source: All coatings, primer and finish coats, applied in the shop or field shall be obtained from a single manufacturer.

Weathervane and globe finish: refer to specification section 099113-Exterior painting. Colors as scheduled.

MISCELLANEOUS:

Filler Compounds: Filler compounds shall be epoxy resin binder with metallic (iron or steel) filler particles.

Sealant: The sealant shall be architectural grade polyurethane sealant.

Welding Rods and Electrodes: The Contractor shall provide the appropriate type and alloy of filler metal and electrodes as recommended by the manufacturer of metal to be welded, and as required for color match, strength and compatibility in the fabricated items. Cast Iron: Conform to ASME/BPVC SEC II-C.

DELIVERY, STORAGE, AND HANDLING:

The Contractor shall deliver materials to project site in manufacturer's original and unopened packaging, labeled with manufacturer's name and type of products.

The Contractor shall store ironwork above the ground on a clean dry surface with air circulation; do not store directly on the ground. Deliver, store, and handle materials to prevent cracks, dents, scratched coatings, or other physical damage. Protect materials from moisture, tampering, acts of vandalism, and possible injury to workers and the public in general.

2.3 Fasteners

2.3.1 Bolts, nuts, washers, screws, rivets, and other connection devices shall be zinc galvanized

2.3.2 Fasteners for Anchoring to Other Construction: Unless otherwise indicated, select fasteners of type, grade, and class required to produce connections suitable for anchoring indicated items to other types of construction indicated.

2.3.3 Provide concealed fasteners for interconnecting components and for attaching decorative metal items to other work unless exposed fasteners are unavoidable.

2.3.4 Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

2.4 Miscellaneous Materials

- 2.4.1** Provide any additional materials what may be required for a complete installation as specified but not limited to the Architect's specifications. All additional materials shall also be of a quality equal to or better than industry standards for the project conditions.

2.5 Fabrication

- 2.5.1** Assemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- 2.5.2** Form decorative metal to required shapes and sizes, true to line and level with true curves and accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.
- 2.5.3** Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- 2.5.4** Form simple and compound curves in bars by bending members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces.
- 2.5.5** Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- 2.5.6** Mill joints to a tight, hairline fit.
- 2.5.7** Grind smooth and polish exposed metal edges and corners.
- 2.5.8** Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap as needed to receive finish hardware, screws, and similar items unless otherwise indicated.
- 2.5.9** Comply with AWS for recommended practices in shop welding. Weld behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded joints of flux, and dress exposed and contact surfaces.
 - 2.5.9.1** Where welding cannot be concealed behind finished surfaces, finish joints to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 Welds: no evidence of a welded joint.

PART THREE: EXECUTION

3.1 Examination

- 3.1.1** Do not begin installation until substrates have been properly prepared.
- 3.1.2** Verify openings and substrates are prepared to receive products of this section.
- 3.1.3** If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of decorative metal.
- 3.1.4** Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation

3.2.1 COATING AND CORROSION REMOVAL:

The Contractor shall clean all metal surfaces free of coatings and corrosion and prepare for re-coating according to the requirements of the Society for Protective Coatings (SSPC):

- 3.2.2** SSPC-SP 6 - Joint Surface Preparation Standard, Commercial Blast Cleaning Surfaces shall be primed immediately following cleaning to prevent additional corrosion. All foreign materials such as dirt, dust, rust scale, sand, bird droppings, and all materials loosened by abrasive blasting operations shall be completely removed from the area of work before any painting operations are begun.

3.3 INSTALLATION:

- 3.3.1** Replace all damaged, missing, and poor previous replacement ornamental metalwork with new material that matches the existing and adjacent work in size, shape, profile, and surface finish. The Contractor shall install metalwork plumb, level, and true to existing adjacent work and firmly secure all work and secure components from tampering or theft.
- 3.3.2** Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- 3.3.3** Clean surfaces thoroughly prior to installation.

3.4 Installation

- 3.4.1** Install in accordance with the manufacturers recommendations and the approved shop drawings and in proper relationship with adjacent construction.
- 3.4.2** Where appropriate, supply products of this section for installation by installers of

products of other sections.

- 3.4.3** Provide anchorage devices and fasteners where needed to secure decorative metal to in-place construction.
 - 3.4.4** Perform cutting, drilling, and fitting required to install decorative metal. Set products accurately in location, alignment, and elevation, measured from established lines and levels.
 - 3.4.5** Fit exposed connections accurately together to form tight, hairline joints or, where indicated, uniform reveals. Where cutting, welding, and grinding are required for proper shop fitting and jointing of decorative metal, restore finishes to eliminate evidence of such corrective work.
 - 3.4.6** Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.
- 3.5** CONNECTIONS:
- 3.5.1** The Contractor shall mill joints to a tight, hairline fit. Joints exposed to weather shall be formed to exclude water penetration. Surfaces shall be dressed smooth and free from mill marks or imperfections. Excessive use of epoxy and other filler materials will not be permitted.
 - 3.5.2** Bolts and Screws: The Contractor shall make threaded connections tight with threads entirely concealed and use lock washers and nuts. Screw heads exposed to view shall be vandal resistant. The Contractor shall cut off projecting threaded ends of exposed bolts and screws flush with nuts or adjacent metal.
 - 3.5.3** Welding shall be in accordance with Standard Code for Welding in Building Construction, D1.1: Structural Welding of the American Welding Society (AWS) and shall be done with electrodes and methods as recommended by the manufacturers of the metals being welded. Weld shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth to match finish of adjoining surfaces; undercut metal edges behind surfaces which will be exposed to view to prevent distortion of finished surface. Remove weld splatter and welding oxides from all welded surfaces.
 - 3.5.4** Restore protective coverings that have been damaged during shipment or installation. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at same location.
 - 3.3.7.1** Retain protective coverings intact; remove coverings simultaneously from similarly finished items to preclude non-uniform oxidation and discoloration.

3.6 Protection, Cleaning and Repairs

- 3.6.1** Unless otherwise indicated, clean metals by washing thoroughly with clean water and soap, rinsing with clean water, and drying with soft cloths.
- 3.6.2** Protect finishes of decorative metal from damage during construction period with temporary protective coverings approved by decorative metal fabricator. Remove protective covering at time of Substantial Completion.
- 3.6.3** Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

SECTION 05 70 01 -ORNAMENTAL IRONWORK RESTORATION

DESCRIPTION

This work shall consist of restoring ornamental ironwork as indicated in the contract documents

Restoring is defined as repairing, replicating and replacing in-kind damaged, missing and poor previous replacement ornamental ironwork. Restoration includes, but is not limited to, the following:

1. Removal of coatings and corrosion from all existing ironwork to remain
2. Disassembly and removal of poor previous replacement fencing and repair work
3. Replication of new wrought and cast-iron fence sections and decorative elements – including pier finials - to match existing originals
4. Field repair of existing ironwork to remain
5. Assembly and installation of replicated components
6. Shop and field coating of all ironwork

DEFINITIONS:

Poor Previous Replacement: Previous replacement or repair work that does not match the original work, including material, size, shape, profile, surface finish, decoration, etc., as represented in historic existing work, photographs, or original plans.

Replicate: Provide new components that match the original components in material, size, shape, profile, surface finish, decoration, etc., as represented in historic existing work, photographs, or original plans.

MATERIALS

Galvanized Coatings and Repair Methods

NYS DOT standard specifications Volume 4 section 719-01

The following ASTM standards shall apply:

Standard Specification for Carbon Structural Steel
Standard Specification for Gray Iron Castings

A36
A48

The following other specifications shall apply:

Section II-C Specifications for Welding Rods, Electrodes, and Filler Metals – Materials
Structural Welding Code – Steel – 23rd Edition 2nd Printing
Shield Expansion (Lag, Machine and Externally Threaded Wedge Bolt Anchors)
Shop, Field and Maintenance Painting of Steel

ASME/BPVC SEC II-C
AWS D1.1
A-A-1923A
SSPC PA 1

Guide to Zinc-Rich Coating Systems
Commercial Blast Cleaning
Steel Structure Painting Manual

SSPC PS Guide 12.00
SSPC SP6/NACE No. 3
Volume II

Except as otherwise shown on the approved shop drawings, the Contractor shall use materials of size, thickness and type required to produce reasonable strength and durability on the work.

CAST IRON:

The Contractor shall provide replacement iron castings that meet the requirements of ASTM A48, Class 35 or similar class to match the hardness and strength of the existing alloy. No mill cinder iron, white or burnt iron or inferior scrap of any kind will be permitted in the composition. All castings shall be custom fabricated, as required, to match the appearance of existing original castings including size, shape, profile, and surface finish. The Contractor shall match original method of assembly and attachment unless otherwise approved.

WROUGHT IRON:

The Contractor shall provide steel bar for repair and replacement of wrought iron pickets, rails, or other components that meets the requirements of ASTM A36. All steel bar shall be cut, milled, and fabricated, as required, to match the appearance of existing original wrought iron element including size, shape, profile, and surface finish. The original method of assembly and attachment shall be matched unless otherwise approved.

FASTENERS:

Bolts, nuts, washers, screws, rivets, and other connection devices contacting the cast or wrought iron shall be galvanized in accordance with the requirements of §719-01, Type II. Stainless steel or other metals that are incompatible with cast iron shall not be used. Incompatible metals will cause galvanic corrosion of iron elements to occur.

Masonry Anchors: Expansion shield type shall conform to Federal Specification A-A-1923A, Type 3.

COATINGS:

Hardware shall be cleaned of all dirt, grime, oil, grease or other contamination using appropriate solvents that do not harm the galvanized coating. If the galvanized hardware comes with a dye, such dye must be removed prior to painting. The contractor shall notify the Engineer of the product to be used for this purpose and demonstrate its effectiveness. To ensure that such product does not interact with the primer paint, all remnants of the product shall be washed off as recommended by the product's technical data sheet.

Primer for Blast Cleaned Components: The Contractor shall use an ethyl silicate zinc-rich (zinc content no less than 80% by weight in dried film) primer that is suitable for use on steel and ductile iron and meets or exceeds the requirements of Society for Protective Coatings (SSPC) PS 12.00.

Primer for Galvanized Components: The Contractor shall use a waterborne epoxy primer suitable for use on galvanized and non-ferrous surfaces to coat all exposed galvanized surfaces, including but not limited to galvanized fastener heads.

Second and Finish Coats: The Contractor shall use a waterborne acrylic epoxy suitable for use on ferrous metals.

Color and Sheen: Finish coat paint color and sheen will be selected by the Architect from the manufacturer's full range of colors. Primer coats shall each have a slight variation of color to distinguish them from the preceding coat.

Single Source: All coatings, primer and finish coats, applied in the shop or field shall be obtained from a single manufacturer.

MISCELLANEOUS:

Filler Compounds: Filler compounds shall be epoxy resin binder with metallic (iron or steel) filler particles.

Lead Caulking: Lead caulking shall be antimonial lead.

Sealant: The sealant shall be architectural grade polyurethane sealant.

Welding Rods and Electrodes: The Contractor shall provide the appropriate type and alloy of filler metal and electrodes as recommended by the manufacturer of metal to be welded, and as required for color match, strength and compatibility in the fabricated items. Cast Iron: Conform to ASME/BPVC SEC II-C.

DELIVERY, STORAGE, AND HANDLING:

The Contractor shall deliver materials to project site in manufacturer's original and unopened packaging, labeled with manufacturer's name and type of products.

The Contractor shall store ironwork above the ground on a clean dry surface with air circulation; do not store directly on the ground. Deliver, store, and handle materials to prevent cracks, dents, scratched coatings, or other physical damage. Protect materials from moisture, tampering, acts of vandalism, and possible injury to workers and the public in general.

SUBMITTALS:

Qualification Data: Qualification data and references shall be submitted for firms and persons specified above in "Special Experience Requirements" to demonstrate their capabilities and experience.

Product Literature: The Contractor shall submit copies of the manufacturer's technical data for each product including their recommendations for installation and use and Safety Data Sheets (SDS). The Contractor shall include test reports and certificates that verify the products' compliance with the specification's requirements. One complete set of product literature and SDS shall be placed in a 3-ring, loose-leaf binder and shall be present on the job site always.

Program of Work: The Contractor shall prepare and submit a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of the work including protection of surrounding materials and project site. Provide drawings illustrating means and methods of protection. If materials and methods other than those specified herein are proposed for any phase of restoration work, include a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this project and worker's ability to use such materials and methods properly.

Shop Drawings: The Contractor shall prepare and submit shop drawings, including plans, elevations,

sections and details of castings and other metal fabrications and their connections that are required. No casting or other fabrication shall proceed until the shop drawings for that part of the work have been approve

Samples: The Contractor shall clearly label all samples to include the project name and contract number, the product name, manufacturer name, and any other information relevant to identification of and differentiation between samples including production codes, batch numbers, and color or formula numbers. The Contractor shall submit the following for approval prior to erecting mock-ups:

1. One (1) full-size sample for each cast or fabricated ironwork component.
2. Three (3) samples for each type of fastener.
3. One (1) sample for each type of coating system, including primer and finish coats, prepared on a wrought or cast-iron metal plate measuring no less than sixteen (16) square inches.

Mock-ups: Prior to executing work, the Contractor shall provide in-place mockups for approval. Panels shall be resubmitted until approved. Mock-ups shall be prepared using the same workmen, methods, and materials that will be employed for the remainder of the work. Upon approval, the mock-ups will remain the standard throughout the job. The approved mock-ups shall be retained, undisturbed and suitably marked, throughout construction. Mock-ups may be incorporated into the finished work when so approved. Mock-ups shall not be made until the methods and locations are approved. The Engineer or his/her representative will be present during the creation of all mock-ups. The Contractor shall notify the Engineer not less than seven (7) days in advance of mock-ups.

The Contractor shall provide protection for adjacent surfaces during the mock-up phase. Submit the following mock-ups for approval:

1. One (1) existing coating and corrosion removal, minimum of one (1) square foot for each type of material (cast and wrought iron), performed on site at a selected location.
2. One (1) field repair of existing ironwork for each type of repair, including welding repairs on cast and wrought iron, in select locations.
3. One (1) linear foot of fence field coating in selected locations.

CONSTRUCTION DETAILS

SPECIAL EXPERIENCE REQUIREMENTS:

Contractor: All ornamental ironwork restoration shall be done by a Contractor with a minimum of five (5) years of experience working with historic ironwork. Contractor shall demonstrate three (3) projects similar in scope and type to the required work in the New York metropolitan region involving facilities designated as Landmarks by local governments, or buildings listed on the National or State Register of Historic Places.

Mechanics: The Contractor shall maintain a steady work crew consisting of mechanics who are experienced with the materials and methods specified, and are familiar with the design requirements. Contractor shall maintain a full-time Foreperson who fluently speaks, reads, and writes English. Contractor shall confirm that all workers understand the job's requirements. Mechanics shall be fully supervised to ensure that the work is accomplished to meet or exceed the highest standards of the trades. The Contractor shall provide one crew of mechanics for the duration of the project. Substitutions and additions of work force shall be permitted with consent only and if there is no adverse effect on quality or performance of work

Fabricator: All ornamental ironwork fabrication and casting shall be done by a qualified Fabricator with
ORNAMENTAL IRONWORK RESTORATION 057001-4

experience replicating historic ironwork. Fabricator shall demonstrate three (3) projects similar in scope and type to the required work involving facilities designated as Landmarks by local governments, or buildings listed on the National or State Register of Historic Places.

QUALITY ASSURANCE:

Continuous Work: Work shall be performed daily, without interruption unless directed otherwise.

Skill: In acceptance or rejection of the work of this specification, no allowances shall be made for lack of skill on the part of the mechanics.

Personnel Substitutions: The Contractor shall provide one crew of mechanics for the duration of the project. Substitutions and additions of work force shall be permitted with consent, so long as there is no adverse effect on quality or performance of work.

Damage: The Contractor shall replace, at no additional cost to the owner, all broken, lost, or damaged materials resulting from work.

Access: Regular access shall be given to the Contractor's scaffolding, swing stage, or work site so that he/she may inspect work being performed.

Protection: All adjacent surfaces shall be protected from weld splatter and paint drippings or other damage. The Contractor shall immediately remove misplaced coatings.

Repair Appearance Standard: Repaired surfaces shall have a uniform appearance as viewed from ten (10) feet away. The samples can be viewed at any angle from the ground or scaffold. If direct line of sight is not possible due to scaffold or obstructions, other means including, but not limited to distance viewing through the use of field glass or binoculars to simulate approximate same distances, will be utilized as determined.

COORDINATION:

Masonry Cleaning and Repair: The work of historic stone masonry cleaning and historic stone masonry repair shall be completed prior to the work of this section being performed.

Preconstruction Conference: Prior to beginning the work, the Contractor shall convene a meeting with all relevant parties to review the requirements of the Program of Work, installation procedures, locations of required mock-up areas, and all job conditions and processes. Representatives of all subcontracting firms involved with this work shall participate in this meeting.

General Public: The Contractor shall coordinate ornamental ironwork restoration with public circulation patterns at project site. The work is near public circulation patterns. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. The Contractor shall plan and execute the work accordingly.

Other Trades: The Contractor shall coordinate the work of all other trades related to the successful completion of this work.

PROTECTION:

Surrounding areas shall be protected from contact with the surface preparation, cleaning operations, and abrasive media. Surrounding areas shall include, but shall not be limited to, adjacent surfaces and structures, private property including automobiles, vegetation, and all other surfaces that would be

adversely affected if placed in contact with the cleaning materials or abrasive media. The Contractor shall make full restitution for damages caused at no additional cost to the State. Contractor vehicle parking and deliveries shall be coordinated accordingly, and the Contractor shall provide, erect, and maintain barricades, danger signals and warning signs as needed.

The Contractor shall not allow spent media or debris from the coating and corrosion removal process to enter storm sewer system, contaminate water supplies or to enter natural bodies of water. Spent media and debris shall be collected and disposed of as outlined in the approved Program of Work.

PRE-WORK SITE INSPECTION:

Before starting any work, the Contractor shall make a complete inspection of all surfaces and associated elements to confirm all repairs and any existing conditions of concern. The Contractor shall perform inspection in the presence of the Engineer, examine all adjoining work on which this work is in anyway dependent for proper installation and workmanship, and report any conditions which prevent the performance of this work. The Contractor shall not proceed with the work until all discrepancies are resolved.

The Contractor shall bring to the attention of the Engineer any items not indicated in the contract documents that require repair work, such as displaced masonry or other substrates affecting the work of this specification, or serious deterioration of ironwork components exposed during coating removal or repairs.

FABRICATION:

General:

The Contractor shall be responsible for collecting all field measurements and removing samples required for preparation of shop drawings and accurate replication of ornamental ironwork components. Molds for castings shall be based on existing pieces as approved.

Fastenings shall be concealed or of the same or similar arrangement as in existing work.

The Contractor shall cut metal by sawing, shearing, or blanking. Flame cutting will not be permitted. The Contractor shall make cuts accurate, clean, sharp and free of burrs without deforming adjacent surfaces or metals.

The Contractor shall provide materials that have been selected for their surface flatness, smoothness and freedom from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces, which exhibit pitting, seam marks, roller marks, stains, discolorations or other imperfections on the finished units will not be acceptable.

The Contractor shall finish exposed surfaces to smooth, sharp, well-defined lines and arises.

All components shall be shop primed before shipment to the job site using specified primer paint according to the Steel Structures Painting Manual Vol. 2, SSPC PA-1, "Paint Application Specification No. 1, Shop, Field and Maintenance Painting." Remove loose rust, mill scale and existing paint by air abrasive cleaning as specified in Steel Structures Painting Manual Vol. 2, SSPC SP-6, "Commercial Blast Cleaning."

Cast Iron:

Cast iron components shall be designed and fabricated to allow for expansion and contraction for a minimum ambient temperature range of 120°F, without causing buckling, excessive opening of joints or

overstressing of fasteners, anchors, or welds.

Castings shall be sharp, sound, true to pattern and free from excessive shrinkage. They shall be free from cracks, cold shuts, blowholes and other flaws, and have smooth clean surfaces. They shall be neatly chiseled, ground and cleaned before leaving the foundry. Base castings shall be machined to insure an even bearing. Runners, risers, fins and other cast-on pieces shall be removed. Plugging and filling will not be permitted. The Contractor shall provide necessary rabbets, lugs, and brackets for assembly of units.

Castings shall have all joints cut and filed to a close fit; all bolt and screw holes shall be drilled (not cored).

Patterns shall allow for shrinkage in the castings. Approved patterns shall be used to make the sand molds for castings.

COATING AND CORROSION REMOVAL:

The Contractor shall clean all ironwork surfaces free of coatings and corrosion and prepare for re-coating according to the requirements of the Society for Protective Coatings (SSPC):

SSPC-SP 6 - Joint Surface Preparation Standard, Commercial Blast Cleaning Surfaces shall be primed immediately following cleaning to prevent additional corrosion. All foreign materials such as dirt, dust, rust scale, sand, bird droppings, and all materials loosened by abrasive blasting operations shall be completely removed from the area of work before any painting operations are begun.

INSTALLATION:

Replace all damaged, missing, and poor previous replacement ornamental ironwork with new material that matches the existing and adjacent work in size, shape, profile, and surface finish. The Contractor shall install ironwork plumb, level, and true to existing adjacent work and firmly secure all work and secure components from tampering or theft.

CONNECTIONS:

The Contractor shall mill joints to a tight, hairline fit. Joints exposed to weather shall be formed to exclude water penetration. Surfaces shall be dressed smooth and free from mill marks or imperfections. Excessive use of epoxy and other filler materials will not be permitted.

Bolts and Screws: The Contractor shall make threaded connections tight with threads entirely concealed and use lock washers and nuts. Screw heads exposed to view shall be vandal resistant. The Contractor shall cut off projecting threaded ends of exposed bolts and screws flush with nuts or adjacent metal.

Welding shall be in accordance with Standard Code for Welding in Building Construction, D1.1: Structural Welding of the American Welding Society (AWS) and shall be done with electrodes and methods as recommended by the manufacturers of the metals being welded. Weld shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth to match finish of adjoining surfaces; undercut metal edges behind surfaces which will be exposed to view to prevent distortion of finished surface. Remove weld splatter and welding oxides from all welded surfaces.

Lead Setting: Fence posts or other wrought ironwork shall be set in hot pourable lead caulking. Surfaces embedded in lead shall not be coated; remove coating as required. The Contractor shall re-use existing setting holes in stonework. Molten lead shall not be poured into stone setting holes if stone is wet; stone may crack or spall due to heat. The Contractor shall shore and support fencing until lead has cooled.

COATING:

All ironwork surfaces, including surfaces that will be concealed in final constructed condition, shall be coated using the specified coating system applied according to the requirements of SSPC-PA 1 - Shop, Field and Maintenance Painting, Steel Structure Painting Manual, vol. 2.

All work shall be done in a workmanlike manner and by skilled mechanics. All paint shall be evenly spread, smoothly flowed on, and shall be free from defects. No coat shall be applied until the previous coat has reached its "dry to handle" (for the finish coat) or "dry to recoat" (for the primer) time as established by the paint manufacturer in the product data sheet. Finish surfaces shall be uniform. Coatings shall be brush or spray applied; rollers shall not be used.

The Contractor shall confirm surface temperature of metal surfaces prior to painting or installation of filler compounds and not paint or use filler compounds if surface temperature falls below or rises above that recommended by the coating manufacturer.

Each primer coat applied shall produce a dry film thickness of 2.0 to 2.5 mils.

Each finish coat shall produce a minimum dry film thickness of 2.0 to 3.5 mils.

Marred or otherwise damaged coatings shall be touched-up with the specified coating system (primer and finish coats) as required.

Primer Coats: Two (2) coats shall be applied to provide a minimum 5-mil dry film thickness.

Finish Coats: The Contractor shall provide 4 - 9 mil dry film thickness by applying one or more coats as necessary to achieve specified film thickness.

COMPLETION / SITE CLEAN-UP:

Upon completion of work, the Contractor shall clean all surfaces of any debris, paint drips, construction materials, etc. protect the new work against damage from subsequent restoration work. Any defective or failed work shall be repaired or replaced at the Contractor's expense using approved procedures.

End of Section

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Rooftop equipment bases and support curbs.
 2. Wood blocking cants and nailers.
 3. Wood furring
 4. Plywood backing panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.
 2. Fire-retardant-treated wood.
 3. Engineered wood products.
 4. Shear panels.
 5. Power-driven fasteners.
 6. Post-installed anchors.
 7. Metal framing anchors.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Dress lumber, S4S, unless otherwise indicated.

- B. Maximum Moisture Content of Lumber: 19 percent15 percent for 2-inch nominal thickness or less; unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
 - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat [items indicated on Drawings, and the following:]
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, [furring,] [stripping,] and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 - 4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
 - 5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame

front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat [items indicated on Drawings, and the following:
1. Framing for raised platforms.
 2. Framing for stages.
 3. Concealed blocking.
 4. Framing for non-load-bearing partitions.
 5. Framing for non-load-bearing exterior walls.
 6. Roof construction.
 7. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Cants.
 5. Furring.
 6. Grounds.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.
- C. Concealed Boards: [15] percent maximum moisture content and [any of]the following species and grades:
1. Mixed southern pine or southern pine; No. 2 grade; SPIB.
 2. Eastern softwoods; No. 2 Common grade; NeLMA.
 3. Northern species; No. 2 Common grade; NLGA.
 4. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

2.5 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners[with hot-dip zinc coating complying with ASTM A153/A153M] [of Type 304 stainless steel].
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on [ICC-ES AC01] [ICC-ES AC58] [ICC-ES AC193] [or] [ICC-ES AC308] as appropriate for the substrate.

2.6 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Phoenix Metal Products, Inc.
 - 2. Simpson Strong-Tie Co., Inc.
 - 3. USP Structural Connectors.
- B. Allowable design loads, as published by manufacturer, shall meet or exceed those [indicated] [of basis-of-design products] [of products of manufacturers listed]. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
 - 1. Use for interior locations unless otherwise indicated.
- D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
 - 1. Use for wood-preservative-treated lumber and where indicated.

2.7 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.

- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- D. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate [furring,]nailers, blocking, [grounds,]and similar supports to comply with requirements for attaching other construction.
- D. Install shear wall panels to comply with manufacturer's written instructions.
- E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.

3.2 PROTECTION

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

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof sheathing.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 ROOF SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exterior sheathing.
 - 1. Span Rating: Not less than 16/0.
 - 2. Nominal Thickness: Not less than 3/4 inch or (match existing)

2.2 FASTENERS

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

1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
 2. ICC-ES evaluation report for fastener.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

END OF SECTION 061600

SECTION 04103 - EXTERIOR ARCHITECTURAL QUALITY WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Exterior wall cladding.
2. Exterior wall painting.
3. Quality workmanship and materials including but not limited to:
 - ' nns' nvh dcf a ibpi pvc l ni tnl t epus ' dbd nibevt nl aivdt ianl .
4. Sbn, , w f d q nycr icv nvpvt b a c t idvpu' nns' nvh.
- j. Sbn, yd a b d q nycr icv nvpvt b a c t idvpu' nns' nvh.

1.2 PREINSTALLATION MEETINGS

A. Provide preliminary meeting with contractor at **Project site**

1.3 ACTION SUBMITTALS

A. Provide the following, as required:

1. Quality Workmanship Test of cladding

- p. The test shall be performed by a qualified person in accordance with the manufacturer's instructions.
- g. The test shall be performed by a qualified person in accordance with the manufacturer's instructions.
- t. The test shall be performed by a qualified person in accordance with the manufacturer's instructions.

F. Sbn, Dv p' d qam

1. The test shall be performed by a qualified person in accordance with the manufacturer's instructions.
2. Sbn' **large-scale full-size** scipaa.
3. Sbn' unt p ianl a pl s a q ca ny ydwd qwgunt hd qwpl s bpl qd q aiw a wd t uds d q gunt hd q pl s v d ynt cf cl i tnl t epus g: tnl aivdt ianl pl s a, ct o a s d nibev Sct ianl a.
4. A, , u **AWI Quality Certification** Pvnqvpf upguin Sbn, Dv p' d qa.

C. Spf , w a n x n v c p t b c r , n a c s , v n s d t i p l s y n v c p t b t n u n v p l s y d a b a , c t o a s .

1.4 INFORMATIONAL SUBMITTALS

A. Provide the following information:

F. xœus " dpui: -t nl imuvc, nvia.

1.j CLOSEOUT SUFe ITTALS

A. k dpui: Sipl spvs Cnf , upl t c Cevioxt picam **AWI Quality Certification Program** t cvioxt pica.

1.M k UALITY ASSURANCE

A. e pl dypt idvevæ Cevioxt picnl nLd cl acs , pvict q pl i d **AWI's Quality Certification Program**

F. Il aipuevk dpuyt picnl an **Licensed participant in AWI's Quality Certification Program**

C. e nt hd, amF das f nt hd, a in Wvø: acwt icnl a f psc dl scv Spf , u adgf di puwin scf nl aivpic pcaibcid cyxt iawpl s in aci " dpui: aipl spvs a ynvf picvøua pl s cr ct di ml .

1. Fdas f nt hd, a ny **typical exterior architectural woodwork as shown on Drawings**
2. A , nWø ny f nt hd, a snca l ni tnl aicidic p , nWø ny scWø picnl a ynf ibc Cnl i vpt i Dnt df cl ia tnl ipd cs d f nt hd, a dl waa O' l cva, ct øt pur p , nWø a adt b scWø picnl a g: Cbpl qc Ovs cv.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL Q OODQ ORKwGENERAL

A. k dpui: Sipl spvs mUl waa nibev' œc d st pics wtnf , u ' ðb ibc Avt bæct idvpu Q nns' nvh Sipl spvs a ynv qvps ca ny cr icvøv pt bæct idvpu ' nns' nvh d st pics ynv tnl aivdt icnl wyd œbcaw d aipupicnl wpl s nibevv" dœcf cl ia.

1. PvnWøc **labels pnd certificates** ynf **AWI** t cvioxt picnl , nqvøf d st pid q ibpi ' nns' nvh **and installation** tnf , wæa ' ðb v" dœcf cl ia ny qvps ca a, ct øœs .

2.2 EXTERIOR STANDING AND RUNNING TRIe xOR OPAk UE xINISH

A. Avt bæct idvpu Q nns' nvh Sipl spvs a Gvps cn **Custom**.

F. Fpt hndi nv qvnnWø gpt ha ny ypi ivf f cf gevawpl s hcvy gpt ha ny nibev' œcwyøi f cf gevaw crtc, i ynvf cf gevæ ' ðb cl sa cr , nacs d yd œbes ' nvh.

C. Q nns S, ct œanQ caicvl ves t espwQ bic nphwS, pl œb t espwLnt daiwC: , vdwapl s Cbcail di.

1. Q nns e nœidvc Cnl icl in **9 to 15** , cvt cl i.

2.3 EXTERIOR xRAe ES AND /Ae FS xOR OPAk UE xINISH

A. Avt bæct idvpu Q nns' nvh Sipl spvs a Gvps cn **Custom**

- F. Q nns S, ct æanQ caicvl ves t espwQ bic nphwS, pl æb t espwLnt daiwC: , vdawpl s Cbcail di.
1. Q nns e naidve Cnl icl in **9 to 15**, cvt cl i.

2.4 Q OOD e ATERIALS

- A. Hps gnpvs mANSI A13j .4.
F. Snyl' nns Pu ' nns mDOC PS lwer icvnxv

2.j PRESER(ATI(E-TREATED-Q OOD e ATERIALS

- A. PvcacwPioW-Tvcpics-Q nns e picvpuam PvnWsc ' dib ' picv-vc, cucl i , vcaacwPioW icvpif cl i tnf , u d q ' dib AQ PA N1)sq wa, v: wunns wnv Wt ddf -, vcaadv icvpif cl i].
1. PvcacwPioW Cbcf t puam3-ans n-2-, vn, : l : u gdi: ut pvpgf pic)IPFC]5, **combined with a compatible EPA-registered insecticide**.
2. Uac tbcf tpu ynv dupicla ibpi sn lni gues ibvndqb nv nibcv' æc ps Wvacu pyyeti yd æbca. Dn lni dac t nuypl ia d anudicnl in soid qdæb icvpics f picvpu ynv dl icvpics f picvpu
F. Erieli ny PvcacwPioW-Tvcpics Q nns e picvpuam Tvcpi ' nns f picvpu **unless otherwise indicated on Drawings**
1. Iicf a ypgvt pics ynf ibc ynun' d q ' nns a, ct æa l ces lni ge icvpics m
p. **All-heart redwood.**
g. **Western red cedar**
t. Q bic nph.

2.M xASTENERS

- A. Gcl cvpum PvnWsc ypaicl eva ny aq c pls i: , c d s t pics wpttc, ipgu in pdibnvicæa bpWd q Bivas d icnl wpls ibpi tnf , u ' dib ve"doef elia a, ct æes d ibæ pvicæ ynv f picvpu pls f pl dypt idv. PvnWsc l paa nvat v' awd adyyt æl i ucl qibwin , cl civpic lni wæa ibpl 1-172 d t bca)3Vf f] d in ' nns adgai pic.
1. Uac **stainless steel** dl wæa nibcv' æc d s t pics.
2. xnv, vcaadv-, vcaacwPioW-icvpics ' nns wdac aipd wæa aiccuypaicl eva.
3. xnv ves' nns wdac **stainless steel** ypaicl eva.
F. NpaamASTE x1MM.
C. Pn' cv-DvoWl xpaicl evan ICC-ES ACJ0.
D. Q nns St w' a pls Lpq St w' amASe E F 1V.2.1wASe E F 1V.Ml wnv ICC-ES AC233.
E. Cpvgnl -Siccu FniamASTE A30J ' dib ASTe Aj M)ASTE Aj M e] bcr l dia pl sw' bev d s t pics wypi ' pabcva pubni-s q ; d t t npics.

- x. Sipd waa SiccuFniamASTE xj 63wAun: Gvnd, 1 nv28' dib ASTE xj 64wAun: Gvnd, 1 nv2)ASTE xV3M wGvpsc A1 nvGvpsc A4] bcr l dia pl s w' bevc d s t pics wyupi ' pabcva.
- G. Pnaid aipucs Al tbnvamSipd waa aiccu **torque-controlled expansion** pl tbnva ' dib t p, p g a i : in adaipd w' dibndi ypadvcwp unps c" dpuin Midf ca ibc unps df , nacs ' bel d aipucs d dl d f panl v: paacf guca pl s c" dpuin 4 idf ca ibc unps df , nacs ' bel d aipucs d tnl tvcic pa scicvf d es g: icaid q pt t nwsd q in ASTE E4WÆ4Wæ tnl sdtics g: p " d p u æ s d s c , c l s c l i icaid q pl s d a , c t i d q p q c l t : .
- 1. Sipd waa aiccu gnua pl s l dia tnf , u d q ' dib ASTE xj 63 pl s ASTE xj 64wAun: Gvnd, 1 nv2)ASTE xV3M wGvpsc A1 nvGvpsc A4].

2.J e ISCELLANEOUS e ATERIALS

- A. Funt hd qwSbcf awpl s NpævanSnyi' nns nvbpws' nns ulf gcw h a l -s w æ s in waa ibpl l j , c v t c l i f n a i d v e t n l i c l i .
- 1. Q nns -PwacvWioW Tvcpif cl i n f : , w a a d v e , v n t c a a w A Q P A U 1 8 U a c C p i c q n v : U C 3 g .
 - p. K a l -s v : u l f g e v p y i c v i v e p i f c l i i n p f p r d f d f n a i d v e t n l i c l i n y 1 6 , c v t c l i .
 - g. PwacvWioW Cbcf t p u a m A t t c , i p g u e i n p d i b n v i c æ a b p W d q **It was d i a l and containing no arsenic or chromium.**
 - t. e p v h u l f g e v ' d i b i v e p i f c l i " d p u i : f p v h n y p l d a , c t i a n l p q c l t : p , , v n W æ s g : i b c A f c v t p l L d f g e v S i p l s p v s a C n f f d i c c æ) A L S C] F n p w s n y R e W æ ' .

2.V xAFRICATION

- A. x p g v t p i c e r i e v n v p t b a e t i d v p u ' n n s ' n v h i n s d f c l a n l a w v n y æ a w p l s s c i p a a d s t p i c s .
- 1. E p a c e s q e a i n v p s a d a d s t p i c s y n v i b e y n u n ' d q m
 - p. E s q e a n y S n u s - Q n n s) L d f g e v] e c f g e v a m l 7 l M d t b) 1 . j f f] d l w a a n i b e v ' æ c d s t p i c s .
 - g. E s q e a n y R p a a p l s S d f a p v e c f g e v a e n v e T b p l 3 7 l l t b) 1 6 f f] T b t h m l 7 d t b) 3 f f] .
- F. C n f , w i c y p g v t p i a n l w d t u d s d q p a a c f g u w i n f p r d f d c r i c l i , n a a g u e g e y n v e a b q f c l i i n P v n B t i a i c .
- 1. D a p a a c f g u e t n f , n l c l i a n l u p a l c t c a a p v : y n v a b q f c l i p l s d a i p u p i a n l .
- 2. Q b e v e l c t c a a p v : y n v y i i d q p i a d e w v n W æ s c p u n ' p l t e y n v a t v g d q w i v d f d d q w p l s y i i d q .
- 3. T v p u y i p a a c f g u a p i y p g v t p i a n l a b n , i b p i t p l l n i g e a b q , e s t n f , w i c u p a a c f g u s .
 - p. I l a i p u s n ' c u a w a t v e ' a w g n i c s t n l l c t i n v a w p l s n i b e v y p a i e l d q s c W æ c a i b p i t p l g e v e f n W æ s p y i c v i v p u y i i d q .
 - g. (c v y : i b p i , p v i a y i p a d i e l s e s w p l s t b e t h f e p a d v e f c l i a n y p a a c f g u a p q p d a i y æ u s f e p a d v e f c l i a d s t p i c s n l p , , v n W æ s S b n , D v p ' d q a g e y n v e s æ p a a c f g u l q y n v a b q f c l i .

2.6 SHOP PRIME FINISHING

- A. Prime, prepare and sand substrate, and apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
- F. Finish, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry. **Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.**
- C. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry. [Refer to Section 066113 for details.]

2.10 SHOP FINISHING

- A. Prime, prepare and sand substrate, and apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
 - 1. Finish, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry. A, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
- F. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry. [Refer to Section 066113 for details.]

PART 3 - EXECUTION

3.1 PREPARATION

- A. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
- F. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.

3.2 INSTALLATION

- A. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
- F. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
- C. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.
 - 1. For areas in contact with concrete or masonry, use a roller to apply two coats of primer to all surfaces to be finished, including areas in contact with concrete or masonry.

2. Il aipuuWupl s , udf g in p inuwp l t c ny l 7 d t b d 6 M d t b c a) 3 f f d 2400 f f] .

D. Sipl s d q pl s Rdl l d q Twf m

1. Il aipuu' ab f d d f l df gcv ny B d ia , naagucwdad q ydu-uel qib , aet ca) ynf f pr d f d f uel qib ny udf gcv p Wapgu] in qvpciai er icl i , naaguc .
2. Dn l ni dac , aet ca uaa ibpl **560 inches (1500 mm)** 9 unl qwer t c , i ' bcw abnvicv ad qu-uel qib , aet ca pvc l ct caapv .
3. St pyvdl l d q B d ia pl s aipqqcvd ps B t cl i pl s vcpics f cf gcv a .

E. St vgc pl s t di er icv n v pvt baet idvpu' nns' nvh in yi ps B d d q ' nvhwcyd ab t di advpt cawpl s w , pvs pf pqes yd ab pi t dia .

x. Pwacv WioW - Twcpics Q nns e pievpuan Q bcw ycus t di nvs vaes wivepi t di cl sa pl s s vaes bnua pt t nvs d q in AQ PA e 4 .

G. xoc - Rcipv pl i - Twcpics Q nns e pievpuan l aipuu yoc - vcpv pl i - ivcpics f pievpu in tnf , u ' ab t bcf t puivcpif cl i f pl dypt idvva ' vaicl d aivdt icnl a .

H. Al t bnv er icv n v pvt baet idvpu' nns' nvh in pl t bnva nv gunt hd q gdai d nvs aet iu piipt bes in adgai v pica .

1. Set dvc ' ab t ndl icvadl hwt nl t cpus ypaicl cva pl s gud s l pad q .
2. Uac yd c yd ab d q l paa **5 or finishing screws** 9 ynv cr , nacs ypaicl d qwt ndl icvadl h pl s yucs ydab ' ab er icv n v pvt baet idvpu' nns' nvh .
3. xnv cr , nacs ' nvhw p wpl qc ypaicl cva d aivpaqbi vn' a , pypucu' ab csqca ny f cf gcvaw ' ab ypaicl cva c W l u a , pt es pl s ' ab ps B t cl i vn' a aipqqcvcs .
4. xnv abn , - yd abcs acf awdac yucv f pit bd q yd ab ny acf a ged q d aipucs .

3.3 xIELD k UALITY CONTROL

A. Il a , ct icnl am Pvn Wsc d a , ct icnl ny d aipucs Q nvh ibvndqb **AWI's Quality Certification Program** t cvio: d q ibpi ' nns' nvhw d tuls d q d aipupianl wt nf , uca ' ab w " d aef cl ia ny ibc At baet idvpu Q nns' nvh Sipl spvs a ynv ibc a , ct oacs qvps c .

1. Il a , ct icnl cl ia: abpu , vc , pvc pl s adgf a vc , nvi ny d a , ct icnl .

END OX SECTION 0M4013

SECTION 070150 - PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof tear-off.
 - 2. Roof re-cover preparation.
 - 3. Removal of base flashings.

1.2 ACTION SUBMITTALS

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

1.3 INFORMATIONAL SUBMITTALS

- A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Installer of new membrane roofing system.
- B. Reroofing Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
 - 1. Coordinate work activities with the Owner so Contractor can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below the work area.
 - 2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated before proceeding with work over the impaired deck area.
- B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

- C. Limit construction loads on roof to 30 psf for uniformly distributed loads.
- D. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

PART 2 - PRODUCTS

2.1 AUXILIARY REROOFING MATERIALS

- A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of [existing and]new membrane roofing system.
- B. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approval's "Approval Guide."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect existing roofing system that is indicated not to be reroofed that day.
- B. Maintain roof drainage system in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering and conductors.

3.2 ROOF TEAR-OFF

- A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Roof Tear-Off: Remove existing roofing systems and other roofing system components down to the deck, including but not limited to the following:
 - 1. roofing shingles, roofing felt paper.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.

- C. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

3.4 EXISTING BASE FLASHINGS

- A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
 - 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.

3.5 DISPOSAL

- A. Collect and place demolished materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150

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SECTION 070150.74 - REHABILITATION OF SINGLE PLY ROOFING- ALTERNATE#1

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Roof membrane coating preparation.
2. Application of reinforced fluid-applied roof membrane and flashings over existing fully adhered EPDM membrane roof.

1.2 ROOFING CONFERENCES

A. Roofing Rehabilitation Preinstallation Conference: Conduct conference at Project site to review methods and procedures related to roofing system.

1. Meet with Owner; Architect; roofing coating materials manufacturer's representative; roofing rehabilitation Installer including project manager and foreman; and installers whose work interfaces with or affects rehabilitation including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
2. Review temporary protection requirements for existing roofing system that is to remain uncoated, during and after installation.
3. Review methods and procedures related to re-coating preparation, including coating manufacturer's written instructions.
4. Review roof drainage during each stage of coating and review roof drain plugging and plug removal procedures.
5. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
6. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect coating.
7. Review HVAC shutdown and sealing of air intakes.
8. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
9. Review governing regulations and requirements for insurance and certificates if applicable.
10. Review existing conditions that may require notification of Owner before proceeding.

1.3 MATERIALS OWNERSHIP

- A. Demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.
- B. Roofing Coating Preparation: Existing roofing that is to remain and be prepared to accept restorative coating application.
- C. Patching: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system and replacement with similar materials.
- D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
- E. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.5 ACTION SUBMITTALS

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

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
 - 1. Provide manufacturer's UL listing certificate for roofing system.
- B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
 - 1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.
- C. Warranties: Unexecuted sample copies of special warranties.
- D. Roof Moisture Survey
 - 1. Submit completed roof moisture survey to manufacturer for approval of existing roofing system to be restored.

- E. Photographs or Video Recordings: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by rehabilitation operations. Submit before Work begins.
- F. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, and for dust control. Indicate proposed locations and construction of barriers.
- G. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.
 - 1. Submit report within 48 hours after inspection.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: To include in maintenance manuals.
- B. Warranties: Executed copies of approved warranty forms.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of three years' experience installing products similar to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:
 - 1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
- B. Manufacturer Qualifications: Primary product manufacturer that is UL listed for roofing system identical to that specified for this Project with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.
- C. If Contractor chooses to bid a substitute system, Contractor must bid specified system and submit separate bid for the substitute system. Substitute system must be identified publicly during the pre-bid conference to give all bidders equal opportunity. Bidding contractors proposing substitutes shall submit the following to Architect a minimum of 10 (ten) business days prior to bid date:
 - 1. Written explanation of why the substitute system should be considered.
 - 2. Sample Warranty.
 - 3. Accredited third-party testing certifications showing that the physical and performance characteristics of the substitute system's products will meet or exceed those of the specified materials.

4. Printout of current UL assembly approval, meeting or exceeding specified wind uplift and fire rating requirements, showing exact proposed substitute materials.
5. A written summary sheet showing a comparison of physical properties all of the specified products against the proposed substitute products; including printed versions of all manufacturers' current product data sheets for all products being proposed or compared in the required summary.
6. List minimum five (5) roofing projects, installed within 50 miles of Kingston, NY project site, using the exact combination of proposed substitute materials. Include all project contact information including project size, names, addresses and contact phone numbers of Owners and Architects involved. Include copies of current warranties for verification.
7. Smallest standard package of, and product data sheets for, all proposed substitute adhesives, mastics, sealants, ply sheets and flashings.
8. Any proposed substitute system that the Architect deems as qualified to compete for the project will be acknowledged by written addendum before the bid date.
9. Voluntary alternate roofing systems submitted by the low bid Contractor, without pre-approval acknowledged by the Architect through the published addendum process, may be rejected without cause by the Owner's Representative.

D. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.
2. An independent party certified as a Registered Roof Observer by the International Institute of Building Enclosure Consultants (formerly the Roof Consultants Institute) retained by the Contractor or the Manufacturer and approved by the Manufacturer.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with rehabilitation work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

1. Store all materials prior to application at temperatures recommended by manufacturer.
2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer.
3. Do not apply roofing in snow, rain, fog, or mist.

- B. Protect building to be rehabilitated, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from rehabilitation operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
- E. Owner will occupy portions of building immediately below re-coating area. Conduct re-coating so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1.10 WARRANTY

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
 - 1. Form of Warranty: Manufacturer's standard warranty form.
 - 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
 - 3. Warranty Period: 20 years from date of completion.
- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
 - 1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
 - 1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
 - 2. Scope of Warranty: Work of this Section.
 - 3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco CPG Inc, Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.
 - 1. Garland Co.

2. Pacific Polymers.

- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Rehabilitated roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.
1. Accelerated Weathering: Roofing system shall withstand 5000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Exterior Fire-Test Exposure: Roofing system exterior fire-test exposure performance following application of rehabilitation coating shall be not be less than that of the prerehabilitated roof performance when tested in accordance with ASTM E108, based upon manufacturer's tests of identical applications.

2.3 MATERIALS, GENERAL

- A. General: Rehabilitation materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.
- B. Infill Materials: Where required to replace test cores and to patch existing roofing, use infill materials matching existing membrane roofing system materials, unless otherwise indicated.
- C. Temporary Roof Drainage: Design and selection of materials for temporary roof drainage are responsibilities of the Contractor.

2.4 FLUID-APPLIED ROOFING MEMBRANE COATING

- A. Polyurethane Elastomeric Fluid-Applied System: Two-coat fluid-applied roofing membrane formulated for application over prepared existing roofing substrate.
1. Polyurethane-modified methyl methacrylate reinforced roof coating system base coat, two-part moisture-curing for use with a compatible top coat.
- a. Basis of design product: Tremco, AlphaGuard PUMA Base Coat.
- b. Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system .
- c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
- d. Tensile Strength, ASTM D5147: 175 lbf/in (31 N/mm).

- e. Elongation, Reinforced, ASTM D5147: 40 percent.
 - f. Crack Bridging, ASTM D5147: Pass - 2 mm.
 - g. Hardness, Shore A, minimum, ASTM D2240: 93.
 - h. Minimum Thickness, Reinforced Base Coat: 80 mils (2.0 mm) wet total: Apply 40 mils (1.0 mm) wet, plus 40 mils (1.0 mm) wet over reinforcing fabric.
2. Polyurethane-modified methyl methacrylate roof coating system top coat, two-component 0 VOC, UV resistant, for application over compatible base coat.
- a. Basis of design product: Tremco, AlphaGuard PUMA Top Coat.
 - b. Combustion Characteristics, UL 790: Maintains combustion characteristics of existing roof system.
 - c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - d. Tensile Strength, ASTM D5147: 175 lbf/in (30 N/mm).
 - e. Elongation, Reinforced, ASTM D5147: 40 percent.
 - f. Crack Bridging, ASTM D5147: Pass, 2 mm.
 - g. Hardness, Shore A, minimum, ASTM D2240: 93.
 - h. Solar Reflectance Index (SRI), minimum, ASTM E1980: 95.
 - i. Minimum Thickness: 20 mils (0.51 mm) wet over cured base coat.
- B. Primers:
- 1. Primer, Methyl Methacrylate: Two-component primer for concrete and metal substrates for application of PUMA coatings.
 - a. Basis of design product: Tremco, AlphaGuard PUMA Primer - 107.
 - b. Coverage Rate: 1 gal/100 sq. ft (16 mils) (0.40 mm) wet.
- C. Fluid-Applied Roofing Reinforcing Fabric:
- 1. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.
 - a. Basis of design product: Tremco, Permafab.
 - b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..

- c. Elongation, Minimum, ASTM D1682: 60 percent.
- d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
- e. Weight: 3 oz./sq. yd (102 g/sq. m).

2.5 AUXILIARY ROOFING REHABILITATION MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system and roofing coating system.
- B. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine existing roofing substrates, with Installer present, for compliance with requirements and for other conditions affecting application and performance of roof coatings
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify compatibility with and suitability of substrates.
 - 3. Verify that substrates are visibly dry and free of moisture.
 - 4. Verify that roofing membrane surfaces have adequately aged to enable proper bond with base coat.
 - 5. Verify that roofing membrane is free of blisters, splits, open laps, indications of shrinkage, and puncture damage or other indications of impending roof system failure.
 - 6. Commencing application of coatings indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Protect existing roofing system that is indicated not to be rehabilitated, and adjacent portions of building and building equipment.
 - 1. Mask surfaces to be protected. Seal joints subject to infiltration by coating materials.
 - 2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
 - 3. Maintain temporary protection and leave in place until replacement roofing has been completed.

- B. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with coating work that could affect indoor air quality or activate smoke detectors in the ductwork.
 - 1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.
- C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 1. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

3.3 ROOFING COATING PREPARATION

- A. Removal of Wet Insulation: Remove portions of roofing membrane with underlying wet insulation. Remove wet insulation, fill in tear-off areas to match existing insulation and membrane, and prepare patched membrane for application of roof coating as specified below.
- B. Repair of Ponding Areas: Repair areas indicated as ponding areas or areas of inadequate drainage by removing roof membrane, adding additional insulation as required to provide minimum slopes to drain required by roofing rehabilitation coating manufacturer, and replace membrane with material matching existing. Submit photographic report indicating compliance.
- C. Membrane Surface Preparation:
 - 1. Remove walkway pads and pavers from roofing membrane. Discard damaged pavers.
 - 2. Remove blisters, ridges, buckles, roofing membrane fastener buttons projecting above the membrane, and other substrate irregularities from existing roofing membrane that would inhibit application of uniform, waterproof coating.
 - 3. Broom clean existing substrate.
 - 4. Substrate Cleaning: Clean substrate of contaminants such as dirt, debris, oil, and grease that can affect adhesion of coating by power washing at minimum 2,000 psi (13,800 kPa).
 - a. Dispose of waste water in accordance with requirements of authorities having jurisdiction.
 - 5. Verify that existing substrate is dry before proceeding with application of coating. Spot check substrates with an electrical capacitance moisture-detection meter.
 - 6. Verify adhesion of new products.

- D. Existing Flashing and Detail Preparation: Repair flashings, gravel stops, copings, and other roof-related sheet metal and trim elements. Reseal joints, replace loose or missing fasteners, and replace components where required to leave in a watertight condition.
 - 1. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.
 - 2. Roof Drains: Remove drain strainer and clamping ring. Grind metal surfaces down to clean, bare, metal.
- E. Surface Priming: Prime surfaces to receive fluid-applied coating using coating manufacturer's recommended product for surface material. Apply at application rate recommended by manufacturer.
 - 1. Ensure primer does not puddle and substrate has complete coverage.
 - 2. Allow to cure completely prior to application of coating.
- F. Membrane Repair: Repair membrane at locations with irregularities using seam sealer mastic and reinforcing fabric.
- G. Membrane Seam Reinforcement: Reinforce membrane seams using seam sealer mastic and reinforcing fabric overlapping onto field of existing membrane not less than width required by roof coating manufacturer.

3.4 FLUID-APPLIED FLASHING APPLICATION

- A. Fluid-Applied Flashing and Detail Base Coat Application: Complete base coat and fabric reinforcement at parapets, curbs, penetrations, and drains prior to application of field of fluid-applied membrane. Apply base coat in accordance with manufacturer's written instructions.
 - 1. Apply base coat on prepared and primed surfaces and spread coating evenly. Extend coating minimum of 8 inches (200 mm) up vertical surfaces and 4 inches (100 mm) onto horizontal surfaces.
 - 2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
 - 3. Reinforcing Fabric: Place fabric reinforcement onto wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
 - a. Apply second base coat over installed fabric reinforcement and back roll to achieve not less than minimum coating thickness indicated in Part 2 product listing, unless greater thickness is recommended by manufacturer. Verify application thickness as work progresses.

4. Roof Drains: Install base coat onto surrounding membrane surface and metal drain bowl flange. Install target piece of fabric reinforcement immediately into wet base coat and roll to fully embed and saturate fabric. Reinstall clamping ring and strainer following application of top coat. Replace broken drain ring clamping bolts.

3.5 FLUID-APPLIED MEMBRANE APPLICATION

- A. Fluid-Applied Membrane Base Coat: Apply base coat to field of membrane in accordance with manufacturer's written instructions.
 1. Apply base coat on prepared and primed surfaces and spread coating evenly.
 2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
- B. Fabric Reinforcement: Place fabric reinforcement onto wet base coat. Lap adjacent pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
 1. Apply second base coat over installed fabric reinforcement and back roll to achieve not less than minimum coating thickness indicated in Part 2 product listing, unless greater thickness is recommended by manufacturer. Verify application thickness as work progresses.
- C. Fluid-Applied Membrane Top Coat: Apply top coat to field of membrane and flashings uniformly in a complete, continuous installation.
 1. Allow base coat to cure prior to application of top coat.
 2. Following curing of base coat and prior to application of top coat, sand raised or exposed edges of fabric reinforcement.
 3. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.
 4. Apply top coat extending coating up vertical surfaces and out onto horizontal surfaces. Install top coat over field base coat and spread coating evenly.
 5. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
 6. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

3.6 FIELD QUALITY CONTROL

- A. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 2 full-time days on site, to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria

established in Quality Control and Quality-assurance Guidelines for the Application of Membrane Roof Systems."

- B. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation, and submit report. Notify Architect 48 hours in advance of dates and times of inspections. Inspect work as follows:
 - 1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
 - 2. Following application of re-coating to flashings and application of base coat to field of roof.
 - 3. Upon completion of re-coating but prior to re-installation of other roofing components.
- C. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.
- D. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

3.7 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 070150.74

SECTION 073113 - ASPHALT SHINGLES

PART I GENERAL

1.01 SECTION INCLUDES

- A Asphalt roofing shingles.
- B Leak barrier and roof deck protection.
- C Metal flashing associated with shingle roofing.
- D Attic ventilation.

1.02 RELATED SECTIONS

- A Section 06100 - Rough Carpentry: Framing, wood decking, and roof sheathing.
- B Section 07620 - Flashing and Sheet Metal: Sheet metal flashing not associated with shingle roofing; gutters and downspouts.
- C Section 08630 - Unit Skylights: Skylights

1.03 REFERENCES American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards

- 1. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 3. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
 - 4. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
 - 5. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
 - 6. ASTM D 3462 – Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules.
 - 7. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
 - 8. ASTM D 7158 - Standard Test Method for Wind-Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method).
 - 9. AC438-1011-R1 – New Acceptance Criteria for Alternative Asphalt Roofing Shingles
- B Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TFWZ.R21)
 - 1. UL 790 - Tests for Fire Resistance of Roof Covering Materials.
 - 2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.
 - C Asphalt Roofing Manufacturers Association (ARMA)
 - D Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.
 - E National Roofing Contractors Association (NRCA)

- F American Society of Civil Engineers (ASCE).
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- G U.S. Green Building Council (USGBC)
- H Leadership in Energy and Environmental Design (LEED)
- I ENERGY STAR
- J Cool Roof Rating Council (CRRC)
- K Miami Dade County

1.04 DEFINITIONS

- A Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

1.05 SUBMITTALS

- A Submit copies of GAF® product data sheets, detail drawings and samples for each type of roofing product.

1.06 QUALITY ASSURANCE

- A Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
- B Installer Qualifications: Installer must be approved for installation of all roofing products to be installed under this section.

1.07 REGULATORY REQUIREMENTS

- A Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
- B . Install all roofing products in accordance with all federal, state and local building codes.
- D All work shall be performed in a manner consistent with current OSHA guidelines.

1.08 PREINSTALLATION MEETING

- A General: For all projects in excess of 250 squares of roofing, a pre-installation meeting is strongly recommended.
- B Timing: The meeting shall take place at the start of the roofing installation, no more than 2 weeks into the roofing project.
- C Attendees: Meeting to be called for by manufacturer's certified contractor. Meeting's mandatory attendees shall include the certified contractor and the manufacturer's representative. Non-mandatory attendees shall include the owner's representative, architect or engineer's representative, and the general contractor's representative.
- D Topics: Certified contractor and manufacturer's representative shall review all pertinent requirements for the project, including but not limited to, scheduling, weather considerations, project duration, and requirements for the specified warranty.

1.09 DELIVERY, STORAGE, AND HANDLING

- A Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
- B Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.

- C Store bundles on a flat, properly drained surface. Maximum stacking height shall not exceed GAF®'s recommendations. Store all rolls on end.
- D Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

1.10 WEATHER CONDITIONS

- A Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with GAF®'s recommendations

1.11 WARRANTY Provide to the owner a **GAF® Shingle & Accessory Ltd. Warranty** for:

- B Provide to the owner a **GAF® All American Pledge™ Guarantee**
 - 1. Provide to the owner a GAF® WeatherStopper® Golden Pledge® Ltd Warranty for the Steep Slope System covering:
 - a Roofs installed by a Certified GAF® Master Elite™ Contractor only.
 - b Manufacturing defects: 100% coverage for materials and labor for:
 - i. Single family detached homes owned by individuals the first
 - 50 years non-prorated, then 20% thereafter for all GAF lifetime shingles.
 - 20 years non-prorated, then 20% thereafter for GAF Marquis Weathermax and GAF Royal Sovereign Shingles.
 - ii. Any other type of owner or building – 40 years with the first 20 years non-prorated. (excludes Marquis WeatherMax and Royal Sovereign)
 - c Workmanship errors: 100% coverage for workmanship errors for:
 - i. Single family detached homes owned by individuals - the first 25 years for after installation. (20 years for Marquis WeatherMax and Royal Sovereign)
 - ii. Any other type of owner or building - 20 years.
 - 2. Roof system NOT installed over an existing roof, all existing roof materials must be removed to the deck.
 - 3. Warranted against algae discoloration for 10 years

PART I PRODUCTS

1.01 MANUFACTURER

- A Basis of Design Manufacturer: GAF®, 1 Campus Drive, Parsippany, NJ 07054. Tel: 1-973-628-3000.

1.02 SHINGLES

- A Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules. Dovetail cut tabs and bold shadow lines provide a slate appearance with a 7 1/2 in. exposure. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval. **Slateline®** Lifetime Designer Shingles, by GAF®.
 - 1. Color: As selected from manufacturers' full range standard and premium colors

1.03 HIP AND RIDGE SHINGLES

- A High profile self sealing hip and ridge cap shingle matching the color of selected roof shingle. Each bundle covers approx. 20 lineal feet (6.10m). **Timbertex®** Premium Ridge Cap Shingles, by GAF®.

1.04 STARTER STRIP

- A Self sealing starter shingle designed for premium roof shingles. Each bundle covers approx. 100 lineal feet (30.48m) for English and metric shingles or 50 lineal feet (15.24m) for oversized shingles. **WeatherBlocker™** Eave/Rake Starter Strip by GAF®.

1.05 LEAK BARRIER

- A Self-adhering, self-sealing, bituminous leak barrier surfaced with fine, skid-resistant granules. Approved by UL, Dade County, ICC, State of Florida and Texas Department of Insurance. Each roll contains approx. 150 sq ft (13.9 sq.m.), 36" X 50' (0.9m x 20.3m) or 200 sq ft (18.6 sq.m.), 36" X 66.7' (0.9m x 20.3m). **WeatherWatch®** Leak Barrier, by GAF®.

1.06 SHINGLE UNDERLAYMENT

- A Premium, water repellant, breather type non-asphaltic underlayment. UV stabilized polypropylene construction. Meets or exceeds ASTM D226 and D4869. Approved by Dade County, Florida Building Code, and ICC. Each roll contains approximately 10 squares (1003 sq. ft.) of material and is 54 in. x 223 ft. **Deck-Armor™** Premium Breathable Roof Deck Protection, by GAF®.

1.07 ROOFING CEMENT

- A Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II.

1.08 ROOF ACCESSORIES

- A Exterior acrylic rust resistant aerosol roof accessory paint. Each 6 oz can is available in boxes of 6 and in a wide variety of colors to compliment the roof. **Shingle-Match™** Roof Accessory Paint by GAF®.
- B UV stable solid molded PVC compression collar, Kynar PVDF coated 24 gauge galvanized flange, **Ultimate Pipe Flashing** by Lifetime Tool.

1.09 ATTIC VENTILATION

A Ridge Vents

1. Flexible rigid plastic ridge ventilator designed to allow the passage of hot air from attics, while resisting snow infiltration. For use in conjunction with eave/soffit ventilation products. Provides 12.5 sq inches Net Free Ventilation Area per lineal foot (26460 sq.mm/m). Each package contains 20 lineal feet (6.10m) of vent. **Cobra® Ridge Runner™** Ridge Vent by GAF®.

B Fascia and Soffit/Under Eave Vents

1. Flexible rigid plastic ridge ventilator designed to allow the passage of hot air out of attics at the roof top along the eaves. For use in conjunction with ridge ventilation products. Provides 9.0 sq inches (11613 sq.mm/m) in NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent, **Cobra® IntakePro™** Rooftop Intake Vent (includes 1-3/4" (44.5 mm) coil nails), by GAF®

C Hip Vents

1. Flexible low profile rigid plastic ridge ventilator designed to allow the passage of hot air from attics, while resisting rain and snow infiltration. For use in conjunction with eave/soffit ventilation products. Provides 9 sq inches Net Free Ventilation Area per

lineal foot (19,046 sq.m/m). Each package contains 40 lineal feet (12.19m) of vent.
Cobra® Hip Vent Exhaust Vent by GAF®.

D Roof Louvers

1. Rooftop mounted, slant-back designed, high-impact resin exhaust ventilator designed to evacuate hot air from attics. Each vent provides 65 sq in NFVA. **MasterFlow™ IR65** Passive Roof Louver, by GAF®.

1.10 NAILS

- A Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

1.11 METAL FLASHING

- A 16-oz/sq ft (0.56mm) zinc coated copper sheet, complying with ASTM B 370.

PART III EXECUTION

3.01 EXAMINATION

- A Do not begin installation until the roof deck has been properly prepared.
- B If roof deck preparation is the responsibility of another installer, notify the architect or building owner of unsatisfactory preparation before proceeding.

3.02 PREPARATION Remove all existing roofing down to the roof deck.

- B Verify that the deck is dry, sound, clean and smooth. It shall be free of any depressions, waves, and projections.
- C Cover with sheet metal, all holes over 1 inch (25mm) in diameter, cracks over 1/2 inch (12mm) in width, loose knots and excessively resinous areas.
- D Replace damaged deck with new materials.
- E Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

3.03 PREPARATION OF SUBSTRATE Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

- B At areas that receive eaves protection membrane, fill knotholes and cracks with latex filler.
- C Install crickets on the upslope side of all chimneys in the north, any chimney wider than 24" (610mm), and on all roofs steeper than 6/12.

3.04 PREPARATION Verify that the deck is structurally sound and free of deteriorated decking. All deteriorated decking shall be removed and replaced with new materials.

- B Verify that the existing shingles are dry, sound, clean and smooth. All curled, buckled or loose tabs shall be nailed down or removed.
- C Clean shingle surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

3.05 SUBSTRATE INSTALLATION

- A The structural roof deck shown in the plans shall be smooth and level and free of water or debris before the nail base insulation is installed. Apply vapor retarder if required.

NOTE: GAF recommends that the designer carefully considers the need for a vapor/air retarder.

- B Installation shall follow the GAF written installation instructions.
- C Fasten with ThermaCal® Fasteners to the supporting roof deck shown in the plans.
- D Protect nail base insulation work from exposure to moisture damage and deterioration, primarily by prompt installation of the roofing, sheet metal and waterproofing work.

3.06 INSTALLATION OF UNDERLAYMENTS General:

- 1. Install using methods recommended by GAF®, in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

B Eaves:

- 1. Install eaves edge metal flashing tight with fascia boards; lap joints 2 inches (51mm) and seal with plastic cement or high quality urethane sealant; nail at the top of the flange.
- 2. In the north, and on all roofs between 2/12 and 4/12 (low slopes) install GAF® leak barrier up the slope from eaves edge a full 36 inches (914mm) or to at least 24 inches (610 mm) beyond the interior "warm wall". Lap ends 6 inches (152mm) and bond.

C Valleys:

- 1. Install eaves protection membrane at least 36 (914mm) inches wide and centered on the valley. Lap ends 6 inches (152mm) and seal.
- 2. All valleys to be "open valleys", install metal flashing over GAF® leak barrier before GAF® roof deck protection is installed; DO NOT nail through the flashing. Secure the flashing by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down the edge.

D Hips and Ridges:

- 1. Install GAF® leak barrier along entire lengths. If ridge vents are to be installed, position the GAF® leak barrier so that the ridge slots will not be covered.

E Roof Deck Protection:

- 1. Install one layer of GAF® roof deck protection over the entire area not protected by GAF® leak barrier at the eaves or valley. Install sheets horizontally so water sheds and nail in place.
- 2. On roofs sloped at more than 4:12, lap horizontal edges at least 2 inches (51mm) and at least 2 inches (51mm) over eaves protection membrane.
- 3. On roofs sloped between 2:12 and 4:12, lap horizontal edges at least 19 inches (482 mm) and at least 19 inches (482mm) over eaves protection membrane.
- 4. Lap ends at least 4 inches (102 mm). Stagger end laps of each layer at least 36 inches (914 mm).
- 5. Lap GAF® roof deck protection over GAF® leak barrier in valley at least 6 inches (152mm).

F Deck-Armor™ Application

- 1. Deck-Armor shall be installed over a clean, dry deck.
- 2. Install Weather Watch® or StormGuard® Leak Barrier at eaves, valleys, rakes, skylights, dormers and other vulnerable leak areas.

3. Lay Deck-Armor™ over deck and overlap 3" (76mm) at side laps and 6" (152mm) at end laps.
4. For exposure to rain or snow, overlap 12" (305mm) at end laps.
5. For side and end laps: fasten Deck-Armor 12" (305mm) o.c. (6" (152mm)o.c. for high wind areas).
6. For middle of the roll: fasten Deck-Armor 24" (610mm) o.c. (12" (305mm) o.c. for high wind areas).
7. For exposure to rain or snow, completely cover all side laps, end laps and fasteners with tape.
8. For long term exposure see complete Deck-Armor installation instructions for side lap detail.
9. If roof may be exposed to high winds, apply tape over all fasteners at the center of the roll to prevent rain or snow from entering at the fasteners.
10. For slopes less than 2:12, a double application of Deck-Armor™ is required. See complete Deck-Armor installation instructions for more information.

G Penetrations:

1. Vent pipes: Install a 24 inch (610 mm) square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.
2. Vertical walls: Install eaves protection membrane extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
3. Skylights and roof hatches: Install eaves protection membrane from under the built-in counterflashing and 12 inches (305mm) on to the roof surface lapping over roof deck underlayment.
4. Chimneys: Install eaves protection membrane around entire chimney extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
5. Rake Edges: Install metal edge flashing over eaves protection membrane and roof deck underlayment; set tight to rake boards; lap joints at least 2 inches (51mm) and seal with plastic cement; secure with nails.

3.07 INSTALLATION OF STARTER SHINGLES

A General:

1. Install in accordance with GAF®'s instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
2. Refer to application instructions for the selected starter strip shingles.

B Placement and Nailing:

1. For maximum wind resistance along rakes & eaves, install any GAF® starter strip containing sealant or cement shingles to underlayment and each other in a 4" (102mm) width of asphalt plastic roof cement.
2. Place starter strip shingles 1/4" – 3/4" (6 – 19mm) over eave and rake edges to provide drip edge.
3. Nail approximately 1-1/2" – 3" (38 – 76mm) above the butt edge of the shingle.
4. Rake starter course should overlap eave edge starter strip at least 3" (76mm).

3.08 INSTALLATION OF SHINGLES

A General:

1. Install in accordance with GAF®'s instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
2. Minimize breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
3. Handle carefully in hot weather to avoid scuffing the surfacing, or damaging the shingle edges.

B Placement and Nailing: Secure with 4, 5, or 6 nails per shingle per GAF®'s application instructions or local codes.

2. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
3. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
4. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.

C Placement and Nailing: Beginning with the starter strip, trim shingles so that they "nest" within the shingle located beneath it. This procedure will yield a first course that is typically 3 inch (76mm) to 4 inch (102mm) rather than a fully exposed shingle.

2. Laterally, offset the new shingles from the existing keyways, to avoid waves or depressions caused by excessive dips in the roofing materials.
3. Using the bottom of the tab on existing shingles, align subsequent courses.
4. *Note: DO NOT install standard sized shingles (5inch exposure) over metric (5 5/8 inch exposure) shingles, as it will overexpose the shingles and reveal the nails. Use standard alignment methods to assure proper shingle placement.
5. Secure with 4, 5, or 6 nails per shingle per GAF®'s instructions or local codes.
6. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
7. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
8. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.

D Valleys Install valleys using the "open valley" method:

- a Snap diverging chalk lines on the metal flashing, starting at 3 inches (76mm) each side of top of valley, spreading at 1/8 inch per foot (9mm per meter) to the eaves.
- b Run shingles to chalk line.
- c Trim last shingle in each course to match the chalk line; do not trim shingles to less than 12 inches (305mm) wide.
- d Apply a 2 inch (51mm) wide strip of plastic cement under ends of shingles, sealing them to the metal flashing.

E Penetrations

1. All Penetrations are to be flashed according to GAF®, ARMA and NRCA application instructions and construction details.

F Skylights and Roof Hatches

1. Consult the manufacturer of the skylight or roof hatch for specific installation recommendations.
2. Skylights and roof hatches shall be installed with pre-fabricated metal flashings specifically designed for the application of the unit.
3. Instal step flashings at existing roof vets and hatches

3.09 INSTALLATION OF ATTIC VENTILATION

A General

1. Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

B Roof and Gable Louvers:

1. Cut vent hole through sheathing as specified by the manufacturer for the type of vent to be installed.
2. Install a 24 inches (610mm) square of leak barrier, centered around the hole for roof louvers
3. Install according to manufacturers instructions for flashing vent penetrations
4. Install eave vents in sufficient quantity to equal or exceed the exhaust vent area, calculated as specified by manufacturer.

C Hip Vents and Rooftop Vents

1. Install according to manufacturer's instructions.
2. Install vents in sufficient quantity to equal or exceed the exhaust vent area, calculated as specified by manufacturer.

3.10 INSTALLATION OF VENTILATION ACCESSORIES

A Chimney Caps

1. Install chimney caps to manufacturer recommendations

B Foundation Vents

1. Install foundation vents per manufacturer recommendations and applications.

3.11 PROTECTION

A Protect installed products from foot traffic until completion of the project.

B Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.

END OF SECTION

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SECTION 07 41 13-Metal Roof Panels

Part 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Factory-formed sheet metal roofing, including flashings and trim.

- B. Related Sections: Section(s) related to this section include:
 - 1. Sealants: Division 7 Joint Sealants Section.
 - 2. 076200 Sheet Metal Flashing

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A653/A653M Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A792/A792M Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot Dip Process.
 - 3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 4. ASTM D2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - 5. ASTM E1680 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
 - 6. ASTM E1646 Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
 - 7. ASTM G90 Standard Practice for Performing Accelerated Outdoor Weathering of Non-Metallic Materials Using Concentrated Natural Sunlight.
 - 8. ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
 - 9. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
 - 10. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials
 - 11. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
 - 12. ASTM E 2140 - Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head.

- B. Underwriters Laboratories (UL):

1. UL 263 - Fire Tests of Building Construction and Materials.
2. 580 - Tests for Uplift Resistance of Roof Assemblies.
3. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
4. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.

- C. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA); "Architectural Sheet Metal Manual"
- D. Miami-Dade County
- E. Florida Building Code
- F. Texas Windstorm Approval

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings:

1. Schedule meeting to discuss roof project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements before start of work onsite. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.
2. Required attendees: Contractor, metal deck & roof installer, and any other subcontractors who have equipment penetrating the roof or work that requires roof access or traffic.

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Provide sheet metal roofing which has been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure or infiltration of water.

1. Air infiltration: Maximum 0.06 cfm per lineal foot (0.33 m³/hr per linear meter) of seam at static pressure of 6.24 psf (3.0 kPa) when tested per ASTM E1680.
2. Water penetration:
 - a. No uncontrolled water penetration through the joints at a static pressure of 6.24 psf (3.0 kPa) when tested in accordance with ASTM E1646.
3. Fire rating: Class A
4. Uplift Tests:
 - a. UL 580 Class 90
 - b. FM 4471 (2" only I-90)
 - c. ASTM E 1592 (1.5", 2" & 3")
5. Miami Dade: 2" x 16" only
6. Class 4 Impact Resistance: UL 2218
7. Fire Resistance: UL 263
8. Florida State Approval

9. ICC-ES: ESL 1082

B. Finish Performance Requirements:

1. Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating consisting of a nominal 0.25 mil dry film thickness primer, and a nominal dry film thickness of 0.7 -0.8 mil color coat for a total 0.9 to 1.1 mil total system dry film thickness.
2. Color change and fade resistance: No cracking, peeling, blistering or loss of adhesion when tested in accordance with ASTM G23; color change, after removal of surface deposits such as dirt or chalk, maximum 5 NBS units.
3. Humidity resistance: No blistering, peeling or loss of adhesion after 1000 hours testing, in accordance with ASTM D2247.

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturer's product data for specified products.

C. LEED Submittal Documentation:

1. Product Test Reports for applicable sustainable sites credits: For roof panels, indicating that panels comply with solar reflectance index requirement.

D. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.

1. Indicate layout of roofing panels and roof panel sizes, including custom-fabricated roofing panels if indicated; indicate each item of trim and accessories.
2. Indicate in detailed drawings profile and gauge of interior and exterior sheets, and locations and types of fasteners; indicate locations, gauges, shapes and methods of attachment of roofing panels, trim and accessory items.
3. Include Sealant location and denote those that are factory and field applied.
4. Indicate products/materials required for construction activities and field worked conditions of this section not supplied by manufacturer of products of this section.
5. Delegated Design- Signed and sealed shop drawings by New York State professional engineer for design of all roof panels, details, fasteners and fastener spacing to meet New York state building code and project requirements, including load and wind uplift.

E. Samples: Submit selection and verification samples for finishes, colors and textures.

1. Selection Samples: For each product requiring color selection, 2 sets of manufacturer's sample chips representing full range of standard, premium and deluxe colors and finishes available.

2. Verification Samples: For each color and finish selected, 2 chips indicating match to selected color and finish.

F. Warranties:

1. Substrate Warranty
2. Finish Warranty
3. Weather Tightness Warranty (if applicable)

G. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

H. Quality Assurance Submittals: Submit the following:

1. Contractor Certificates: Contractor's certification that:
 - a. Manufacturer of products of this section meets specified qualifications.
 - b. Installer of products of this section meets specified qualifications.
2. Manufacturer Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
3. Manufacturer's Instructions: Manufacturer's installation instructions.
4. Manufacturer's Field Reports: Manufacturer's field reports if required.

I. Closeout Submittals: Submit the following:

1. Warranty: Warranty documents specified herein.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Provider of "hands on" installer training at manufacturer or customer facility.
2. Minimum of ten years' experience in manufacturing metal roof systems.
3. Provider of product produced in a permanent factory environment with fixed roll-forming equipment and also possesses the capability to roll form continuous panels on jobsites with a factory technician for jobs with panel lengths in excess of 50'

B. Installer Qualifications:

1. At least five years' experience in the installation of structural standing seam metal roof panels.
2. Experience on at least five projects of similar size, type and complexity as this project that have been in service for a minimum of two years with satisfactory performance of the roof system.
3. Employer of workers for this project who are competent in techniques required by manufacturer for installation indicated and who shall be supervised at all times when material is being installed.
4. Certificate: When requested, submit certificate indicating qualification.

- C. Mock-Ups: Establish standards by which work will be judged. Mock-Ups: Install in place mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color, texture and pattern and workmanship standard
1. Include eave, ridge, valley, gable and hip conditions.
 2. Mock-Up Size: 12"x12".
 3. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
 4. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

1.7 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
1. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 label where appropriate.
- C. Delivery and Acceptance Requirements: Ensure all panels are received in good condition. In cases where damage is visible, note all paperwork; inform architect and project superintendent.
- D. Packing, Shipping, Handling and Unloading:
1. Roofing panels to be crated to protect panels from shipping damage.
 2. Package trim and accessories in waterproof wrapping paper.
- E. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above-ground location.
1. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture runoff.
 2. Store products of this section in manufacturer's unopened packaging until installation of products
 3. Maintain dry, heated storage area for products of this section until installation of products.
 4. Remove strippable plastic film before storage under high-heat conditions.

1.8 PROJECT CONDITIONS

- A. 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.

- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed in accordance with manufacturers' written instructions and warranty requirements..

1.9 WARRANTY

A. Project Warranty:

1. Panel Material: Furnish manufacturers 25 year warranty covering the panel against rupture, structural failure, or perforation.
2. Panel Coating: Furnish manufacturer's 40-year warranty covering cracking, checking, and peeling, and 30 year warranty covering fade and chalk on the Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating.
 - a. Manufacturer's warranty may exclude surface deterioration due to physical damage and corrosive environments.

B. Weather Tightness Warranty

1. Weathertightness Warranty: Manufacturers [Joint][Single Source] weathertightness warranty.
2. Warranty Term: [5][10][15][20][25] commencing on Date of Substantial Completion.
3. Total Manufacturers Liability: [\$0.20 (Joint Only)] [\$7.00] [\$14.00][NRL (No Repair Limit)] /sq. ft.
4. Warranty must cover winds up to 120 mph
 - a. (If Penetrations are chosen) Pipes must be centered in the panel or a pipe curb must be used, Curbs must be all welded (0.0630 minimum) aluminum or 18ga. Stainless Steel.
 - b. If Wind Rider is chosen Manufacturer must supply engineered installation shop drawings, signed and sealed by an Engineer registered in the state in which the project is located.

- C. Special Warranty: Installer's standard form in which installer agrees to repair or replace panels that fail due to poor workmanship or faulty installation within the specified warranty period.

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

PART 2 PRODUCTS

2.1 Metal Roof Panels

A. Manufacturer: Basis of Design McElroy Metal, Inc.

1. Contact: 1500 Hamilton Rd., Bossier City, LA 71111; Telephone: (800) 950-6531; Fax: (318) 747-8099; E-mail: info@mcelroymetal.com; website: www.mcelroymetal.com.
2. Proprietary Products: McElroy Metal Preformed Sheet Metal Roofing Panels.

B. Substitutions:

1. Basis of Design Product: Subject to compliance with requirements provide McElroy Metal Maxima
2. Substitution Limitations
 - a. Requests for approval must be submitted in writing at least ten (10) days prior to bid date, and are accompanied by all related test reports and design calculations listed in section 1.4 and Design and Performance criteria Section 2.2.
 - b. Substitute manufacturers will be approved by written addendum to all bidders. Voluntary alternates will not be considered. Substitutions will not be permitted after the bid date of this project.
 - c. Roof panels proposed for substitution shall fully comply with specified requirements in appearance, assembly, and performance.

- C. Forming: Use continuous end rolling method. No end laps are permitted on panels without architect approval. It is the intent of the Architect to provide factory-manufactured panel systems or systems manufactured on-site by factory personnel only for this project.

2.2 MANUFACTURED UNITS

A. McElroy Metal Maxima Panels:

1. Profile: Vertical leg standing seam panel with male/female seam to be mechanically interlocked at jobsite with mechanical seamer specifically designed for Maxima profile.
2. Size: 2" high seam by 16" width Length as indicated on drawings.
3. Panel Surface: 2": pencil ribs
4. Material: Galvalume steel sheet conforming to ASTM A792, AZ50 coating for bare; AZ50 coating for painted; 22 gauge sheet thickness.
5. Panels should be factory formed for lengths below 50'. To avoid lap conditions for panels greater than 50', panels should be produced on site but production must be completed by factory technicians.

2.3 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, in manufacturer's standard profiles Provide required fasteners, closure strips, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, finish and color of metal panel face sheet.
- C. Panel Clips: ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.

- D. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
 - 1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
 - 2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
 - 3. Concealed Joint Sealant: Non-curing butyl, AAMA 809.2.
- F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.
- G. Roof Accessories:
 - 1. Gutters-Arch flanged gutter supplied by McElroy Metal. Color to be selected from full range of manufacturer's standard, premium, architectural, metallic, and deluxe colors.
 - a. Provide all straps, clips, brackets, accessories, trim, and end caps in same color as gutter.
 - b. Provide all hardware, clips, brackets and accessories for a complete installation
 - 2. Downspouts-Lock seam 4"x 3-1/2" downspout. Color to be selected from full range of manufacturer's standard, premium, architectural, metallic, and deluxe colors.
 - a. Provide all straps, clips, brackets, accessories, trim, and end caps in same color as downspout.
 - b. Provide all hardware, clips, brackets and accessories for a complete installation
- H. Snow Guards: provide snowguards. Spacing and layout as recommended by manufacturer.
 - 1. Manufacturer: S-5 Snow Retention Systems 1-888-485-6577 www.s-5.com
 - 2. Style: Color Guard system with strip of actual roof material inserted into extruded crossmember. Color to match roof color.
 - 3. Provide all hardware, clips, trim and brackets for complete installation.
- I.

2.4 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.
- C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.

- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate.

2.5 FINISHES

- A. Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating consisting of a nominal 0.25 mil dry film thickness primer, and a nominal dry film thickness of 0.7 -0.8 mil color coat for a total 0.9 to 1.1 mil total system dry film thickness. Finish to be selected from manufacturer's standard color selection. The back side of the material should be 0.25 mil primer and a 0.25 mil polyester wash coat.

- 1. Roof Panel Color:
 - a. Selected from full range of manufacturer's standard, premium, architectural, metallic and deluxe colors.
- 2. Roof Related Trim/Accessories Color:
 - b. Selected from full range of manufacturer's standard, premium architectural, metallic and deluxe colors.

2.6 RELATED MATERIALS

- A. General: Coordinate use of related materials:
 - 1. Underlayment: Refer to Division 7 Roofing Section
 - 2. Plywood Deck: Refer to Division 6 Rough Carpentry Section
 - 3. Sealants: Refer to Division 7 Joint Sealants Section

2.7 SOURCE QUALITY

- A. Source Quality: Obtain metal panel products from a single manufacturer.
- B. Quality Control: Obtain structural standing seam metal roof panels, trim and other accessories from a manufacturer capable of providing on-site technical support and installation assistance.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, recommendations and installation instructions for substrate verification, preparation requirements and installation.
 - 1. Strippable Film: Remove manufacturer's protective film, if any, from surfaces of roofing panels.

- B. 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.
1. Verification of Conditions:
 - a. Panel support systems are ready for construction activities of this section and within specified tolerances.
 - b. Rough-in utilities are in correct locations.
 2. Installer's Examination:
 - a. Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
 - b. Transmit 2 copies of installer's report to Architect within 24 hours of receipt.
 - c. Delay construction activities of this section until unacceptable conditions have been corrected.
 - d. Beginning construction activities of this section indicates installer's acceptance of conditions.

3.2 PREPARATION

- A. Coordination: Coordinate metal roofing with other work to provide a noncorrosive and leak-proof installation.
1. Install substrate boards, hat channels, purlins, or furring channels in accordance with manufacturer's recommendations.
 2. Coordinate work, with installation of other associated Work, to ensure quality application.
 3. Coordinate work with installation of associated metal flashings and building walls.
 4. Coordinate work to minimize foot traffic and construction activity on installed finished surfaces.
 5. Coordinate location of pipe penetrations to allow centering of pipe in panel.
 6. Coordinate location of roof curbs, to allow proper integration with roof panel.
 7. Coordinate work to minimize foot traffic and construction activity on installed finished. surfaces.
 8. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

3.3 INSTALLATION

- A. General: Install metal roofing panels to profiles, patterns and drainage indicated and required for leak-proof installation. Provide for structural and thermal movement of work. Seal joints for leak-proof installation.
1. Shim or otherwise plumb substrates receiving metal panels.
 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws.
 3. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 4. Install screw fasteners in predrilled holes for clip installation.
 5. Locate and space fasteners in uniform vertical and horizontal alignment.
 6. Install flashing and trim as metal panel work proceeds.
 7. Install continuous length panels if at all possible. If splices are required, locate panel splices over, but not attached to, structural supports.
 8. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws.
 9. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 10. Provide weathertight EPDM Flashing for pipe- and conduit-penetrating panels.
 11. Seams: Provide uniform, neat seams.
 12. Fix panels at location depicted on reviewed shop drawings.

13. Allow for required panel clearance at penetrations for thermal movement.
14. Align pipe penetrations to occur at center of roof panel. Report and have corrected improperly placed penetrations before proceeding with panel installation. Remove and replace roof panels which have improperly placed penetration flashings.
15. Allow for required panel clearance at penetrations for thermal movement.
16. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leak-proof installation.
17. Sealant-Type Joints: Provide sealant-type joint where indicated. Form joints to conceal sealant. Comply with Division 7 Joint Sealants Section for sealant installation.

B. Roofing Installation:

1. Install roofing plumb, true and in correct alignment with structural framing, in accordance with shop drawings and manufacturer's printed installation instructions.
2. Install roofing using manufacturer's concealed fastening system or non-corroding fasteners color-matched to panel.
3. Install trim using concealed fasteners where possible; sight-exposed non-corroding fasteners color-matched to trim are permitted on vertical surfaces only.

C. Installation Tolerances:

1. Variation from Plumb: Maximum 1/8" (3.2 mm) in 20 feet (6.096 m).
2. Variation from Level: Maximum 1/8" (3.2 mm) in 20 feet (6.096 m).
3. Variation from True Plane: Maximum 1/4" (3.2 mm) in 20 feet (6.096 m).

D. Underlayment Installation

1. Underlayment to be supplied by metal roof panel manufacturer.
2. Self-adhered High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 40 mils thick adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
3. Thermal Stability: Stable after testing at 240 degree F; ASTM D1970.
4. Low-Temperature Flexibility: Passes after testing at minus 20 degree F; ASTM D1970.
5. Supplied by metal roof panel manufacturer.
6. Apply over the entire roof surface.

E. Accessory Installation: Install accessories using techniques recommended by manufacturer and which will assure positive anchorage to building and weathertight mounting. Provide for thermal movement. Coordinate installation with flashings and other components

F. Flashing and Trim Installation: Comply with performance requirements, manufacturer's written installation instructions, and the SMACNA "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units to true level. Install work with laps, joints, and seams that will be permanently watertight.

G. Metal Roof Curbs: .063 minimum thickness welded aluminum, or 18 gauge minimum welded stainless steel, factory-insulated, with integral cricket, and designed to fit roof panel module, sized to meet specification.

3.4 FIELD QUALITY REQUIREMENTS

- A. Site Tests: (Post-Installation Testing): Owner reserves right to perform post-installation testing of installed metal panel installation.
- B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.5 CLEANING

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas.
- B. Repair or replace damaged installed products.
- C. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
- D. Remove construction debris from project site and legally dispose of debris.
- E. Remove strippable coating and perform dry wipe-down cleaning of panels as erected.

3.6 PROTECTION

- A. Protection: Protect installed product's finish surfaces from damage during construction:
 - 1. Protect installed products from damage by subsequent construction activities.
 - 2. Replace products having damage other than minor finish damage.
 - 3. Repair products having minor damage to finish in accordance with panel Manufacturer's recommendation
 - 4. Architect shall be sole judge of acceptability of repair to damaged finishes; replace products having rejected repairs

END OF SECTION

SECTION 07 42 93 – SOFFIT PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Flush-profile, concealed fastener, lap-seam metal panels, with related metal trim and accessories.

1.2 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel Framing" for steel framing supporting metal panels.
- B. Division 07 Section "Metal Roof Panels" for metal roof panels installed with metal soffit and liner panels.
- C. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing items in addition to items specified in this Section.

1.3 REFERENCES

- 1. ASTM A755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- 2. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- 3. ASTM C920 - Specification for Elastomeric Joint Sealants.
- 4. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- 5. ASTM D4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
- 6. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

1.4 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer accredited under IAS AC472, Part B.
- B. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years' experience with successfully completed projects of a similar nature and scope.
 - 1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.
- C. **Buy American Compliance:** Materials provided under work of this Section shall comply with the following requirements:
 - 1. Buy American Act of 1933 BAA-41 U.S.C §§ 10a – 10d.
 - 2. Buy American provisions of Section 1605 of the American Recovery and Reinvestment Act of 2009 (ARRA).

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, metal panel installer, metal panel manufacturer's technical representative, inspection agency and related trade contractors.
 - 1. Coordinate building framing in relation to metal panel system.
 - 2. Coordinate openings and penetrations of metal panel system.
 - 3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.6 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products. Include data indicating compliance with performance requirements.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, and special details. Make distinctions between factory and field assembled work.
 - 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
 - 2. Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide up to 10 color chips for color selection and verifying color selection.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC472 Part B.
- D. **Buy American Certification:** Manufacturers' letters of compliance acceptable to authorities having jurisdiction, indicating that products comply with requirements.
- E. Manufacturer's warranty: Unexecuted sample copy of manufacturer's warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
 - 1. Deliver, unload, store, and erect metal panels and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
 - 2. Store in accordance with Manufacturer's written instruction. Provide wood collars for stacking and handling in the field.
 - 3. Shield foam insulated metal panels from direct sunlight until installation.

1.10 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.
- B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:

1. **Fluoropolymer** Two-Coat System:

- a. Basis of Design System: **MBCI, Signature 300.**
- b. Color fading in excess of 5 Hunter units per ASTM D2244.
- c. Chalking in excess of No. 8 rating per ASTM D4214.
- d. Failure of adhesion, peeling, checking, or cracking.
- e. Warranty Period: 40] years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer: **MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.**; Houston TX. Tel: (877)713-6224; Email: info@ecoficientseries.com; Web: www.mbcicom.com.

- 1. Provide basis of design product, or comparable product approved by Architect prior to bid.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, as determined by ASTM E1592:
 - 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.

SOFFIT PANELS

- a. Wind Negative Pressure: Certify capacity of metal panels by actual testing of proposed assembly.
 2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/120 of the span with no evidence of failure.
 3. Seismic Performance: Comply with ASCE 7 Sections 9, "Earthquake Loads."
- C. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

2.3 FORMED METAL SOFFIT PANELS

- A. Flush-Profile L12 with beads, Concealed Fastener Metal Panels: Metal panels consisting of formed metal sheet with vertical panel edges, with flush joints between panels, field assembled with nested lapped edges, and attached to supports using concealed fasteners.
 1. Basis of Design: **MBCI, Artisan Panel.**
 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, Coating Class AZ50
 - a. Nominal Thickness: 22 gage coated thickness, with smooth surface.
 - 1) Exterior Finish: Fluoropolymer two-coat system
 - 2) Color: As selected by Architect from manufacturer's full range of standard deluxe and premium colors]
 3. Panel Width: 12 inches (305 mm).
 4. Panel Thickness: 1 inch (25 mm).

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide complete metal panel assemblies incorporating trim, fasciae, and miscellaneous flashings. Provide required fasteners, closure strips, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panels.
- C. Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal panels by means of factory-applied coating, with weathertight resilient washers.

2.5 FABRICATION

- A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

2.6 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621[, meeting solar reflectance index requirements].
 - 1. Basis of Design: **MBCI, Signature 300.**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.
 - 1. Inspect framing that will support insulated metal panels to determine if support components are installed as indicated on approved shop drawings and are within tolerances acceptable to metal panel manufacturer and installer. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal panels.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

3.2 METAL PANEL INSTALLATION

- A. Concealed-Fastener Formed Metal Soffit Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, project drawings, and referenced publications. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer. Fasten panel to support structure through leading panel flange. Fit back flange of subsequent panel into secured flange of previous panel.
 - 1. Cut panels in field where required using manufacturer's recommended methods.
 - 2. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.
- C. Attach panel flashing trim pieces to supports using recommended fasteners.

3.3 ACCESSORY INSTALLATION

- A. General: Install metal panel accessories with positive anchorage to building and weather tight mounting; provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel assembly, including trim, flashings, sealants, closure strips, and similar items.

SOFFIT PANELS

2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

3.4 CLEANING AND PROTECTION

- A. Clean finished surfaces as recommended by metal panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets **with counterflashing**.
2. Formed roof-drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.
4. Formed steep-slope roof sheet metal fabrications.
5. Formed wall sheet metal fabrications.

1.2 PREINSTALLATION MEETINGS

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

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following

1. Underlayment materials.
2. Elastomeric sealant.
3. Butyl sealant.
4. Epoxy seam sealer.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.

- C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long by actual width.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of coping and roof edge flashing that is **ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved.**
- B. Evaluation Reports: For copings and roof edge flashing, from **ICC-ES** showing compliance with ANSI/SPRI/FM 4435/ES-1.
- C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Special warranty.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested [**and**] [**FM Approvals approved**], shop shall be listed as able to fabricate required details as tested and approved.

1.7 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: **20**years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces] <Insert temperature change.

2.2 SHEET METALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Tin/zinc Coated Copper Sheet (freedom Gray): ASTM B370, cold-rolled copper sheet, H00 or H01 temper.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Riverside Sheet Metal
 - b. Revere Copper Products, Inc.
 - 2. Nonpatinated, Exposed Finish: Mill.
- C. Lead Sheet: ASTM B749 lead sheet.

2.3 UNDERLAYMENT MATERIALS

- A. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.
- B. Refer to section 073113 asphalt shingles

2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, **solder**, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal[**or manufactured item**] unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal **or manufactured item**.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
- C. Solder:
 - 1. For Copper: ASTM B32, Grade Sn5050 percent tin and 50 percent lead
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

- H. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- I. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.
- J. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated **with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.**
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corporation.
 - b. Hohmann & Barnard, Inc.
 - c. Keystone Flashing Company, Inc.
 - 2. Material: Stainless steel, 0.0188 inch (0.477 mm) thick, and Copper (chapel building), 16 oz./sq. ft.
 - 3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 - 4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
 - 5. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
 - 6. Finish: **Mill With manufacturer's standard color coating**

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch) offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard **and by FM Global Property Loss Prevention Data Sheet 1-49** for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.[**Rivet joints where necessary for strength.**]
3. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.[**Rivet joints where necessary for strength.**]

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Gutters(all except for Entrance canopy standing seam roof):

1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
2. Fabricate in minimum 96-inch- (2400-mm-) long sections.
3. Furnish flat-stock gutter brackets and **flat-stock** gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than **twice the gutter thickness**
4. Fabricate expansion joints, expansion-joint covers,**gutter bead reinforcing bars**, and gutter accessories from same metal as gutters.**Shop fabricate interior and exterior corners.**

5. Accessories: [**Continuous, removable leaf screen with sheet metal frame and hardware cloth screen**] [**Wire-ball downspout strainer**] [**Valley baffles**].
 6. Gutters with Girth up to 25 Inches Fabricate from the following materials:
 - a. Tin/zinc Coated: [**20 oz./sq. ft.**]
 7. Gutters with Girth 26 to 30 Inches Fabricate from the following materials:
 - a. Tin/zinc Coated Copper: [**24 oz./sq. ft.**]
 8. Gutters with Girth 31 to 35 Inches Fabricate from the following materials:
 - a. Tin/zinc Coated Copper [**24 oz./sq. ft.**]
 - B. Downspouts: Fabricate **round** downspouts to match existing dimensions complete with mitered elbows. Furnish with metal hangers from **same material as downspouts and anchors**
 1. Hanger Style: strap
 2. Fabricate from the following materials:
 - a. Tin/zinc Coated Copper **16 oz./sq. ft.**
 - C. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof.[**Fasten gravel guard angles to base of scupper.**] Fabricate from the following materials:
 1. Tin/zinc Coated Copper: [**16 oz./sq. ft. (0.55 mm thick)**]
 - D. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes[, **exterior flange trim,**] [**and**] [**built-in overflows**]. Fabricate from the following materials:
 1. Tin/zinc Coated Copper: [**16 oz./sq. ft. (0.55 mm thick)**]
 - E. Splash Pans: Fabricate to dimensions and shape required and from the following materials:
 1. Tin/zinc Coated Copper: [**16 oz./sq. ft. thick**]
- 2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS
- A. Base Flashing: **Shop fabricate interior and exterior corners.** Fabricate from the following materials:
 1. Tin/zinc Coated Copper: [**20 oz./sq. ft. (0.68 mm thick)**]
 - B. Counterflashing: **Shop fabricate interior and exterior corners.** Fabricate from the following materials:

1. Tin/zinc Coated Copper: Copper: [16 oz./sq. ft. (0.55 mm thick)]

- C. Roof-Penetration Flashing: Fabricate from the following materials:
 1. Tin/zinc Coated Copper [16 oz./sq. ft. (0.55 mm thick)]

- D. Roof-Drain Flashing: Fabricate from the following materials:
 1. Copper: [12 oz./sq. ft. (0.41 mm thick)]

- E. Drip Edges: Fabricate from the following materials:
 1. Tin/zinc Coated Copper Copper: [16 oz./sq. ft. (0.55 mm thick)]

- F. Ledge Flashing: Fabricate from the following materials:
 1. Tin/zinc Coated Copper: Copper: 16 oz./sq. ft. (0.55 mm thick)]

PART 3 - EXECUTION

3.1 INSTALLATION OF UNDERLAYMENT

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.
 1. Install in shingle fashion to shed water.
 2. Lap joints not less than 2 inches (50 mm).

- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, in accordance with manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
 1. Lap horizontal joints not less than 4 inches (100 mm).
 2. Lap end joints not less than 12 inches (300 mm).

- C. Self-Adhering, High-Temperature Sheet Underlayment:
 1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
 2. Prime substrate if recommended by underlayment manufacturer.
 3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
 4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses.
 5. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller.
 6. Roll laps and edges with roller.
 7. Cover underlayment within 14 days.

- D. Install slip sheet, wrinkle free, **directly on substrate** before installing sheet metal flashing and trim.
 - 1. Install in shingle fashion to shed water.
 - 2. Lapp joints not less than 4 inches (100 mm).

3.2 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder welds and sealant.
 - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 - 5. Install continuous cleats with fasteners spaced not more than 12 inches (300 mm) o.c.
 - 6. Space individual cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
 - 8. Do not field cut sheet metal flashing and trim by torch.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Coat concealed side of **uncoated-aluminum and stainless steel** sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
 - 1. Space movement joints at maximum of [10 feet (3 m)] with no joints within 24 inches (600 mm) of corner or intersection.
 - 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 - 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate [wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws and not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
 - 1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant.
 - b. Form joints to completely conceal sealant.
 - c. 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.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.
 - 1. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 2. Do not solder [**metallic-coated steel**] [**and**] [**aluminum**] sheet.
 - 3. Do not pre-tin zinc-tin alloy-coated copper.
 - 4. Do not use torches for soldering.
 - 5. Heat surfaces to receive solder, and flow solder into joint.
 - a. Fill joint completely.
 - b. Completely remove flux and spatter from exposed surfaces.
 - 6. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.
- H. Rivets: Rivet joints where necessary for strength.

3.3 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters:
 - 1. Join sections with **riveted and soldered joints**
 - 2. Provide for thermal expansion.
 - 3. Attach gutters at eave or fascia to firmly anchor them in position.
 - 4. Provide end closures and seal watertight with sealant.
 - 5. Slope to downspouts.
 - 6. Install gutter with expansion joints at locations indicated on Drawings, but not exceeding, **50 feet** apart. Install expansion-joint caps.

7. Install continuous gutter screens on gutters with noncorrosive fasteners, **removable or hinged to swing open** for cleaning gutters.

C. Downspouts:

1. Join sections with 1-1/2-inch (38-mm) telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
4. Provide elbows at base of downspout to direct water away from building.
5. Connect downspouts to underground drainage system.

D. Splash Pans:

1. Install where downspouts discharge on **low-slope roofs**
2. Set in [**asphalt roofing cement**] [**or**] [**elastomeric sealant**] compatible with the substrate.

E. Parapet Scuppers:

1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
2. Anchor scupper closure trim flange to exterior wall and [**solder**] [**or**] [**seal with elastomeric sealant**] to scupper.
3. Loosely lock front edge of scupper with conductor head.
4. [**Solder**] [**or**] [**seal with elastomeric sealant**] exterior wall scupper flanges into back of conductor head.

- F. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch (25 mm) below **scupper or gutter** discharge.

3.4 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements[, **sheet metal manufacturer's written installation instructions,**] and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at [**staggered 3-inch (75-mm)**] **<Insert spacing>** centers.
3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.
 - 1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
 - 2. Extend counterflashing 4 inches (100 mm) over base flashing.
 - 3. Lap counterflashing joints minimum of 4 inches (100 mm).
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with [elastomeric] [butyl] sealant and clamp flashing to pipes that penetrate roof.

3.5 INSTALLATION OF WALL FLASHINGS

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill,[jamb,] and similar flashings to extend [4 inches (100 mm)] beyond wall openings.

3.6 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

3.8 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

ULSTER COUNTY COURHOUSE
EXTERIOR UPGRADES AND REPAIRS
KINGSTON NY

2433-00

END OF SECTION 076200

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SECTION 075600.13 - FLUID-APPLIED MEMBRANE ROOFING, INSULATED

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes fluid-applied roof membrane system on insulated metal deck and wood deck, consisting of the following:
 - 1. Roof insulation and cover board.
 - 2. Base-ply sheet.
 - 3. Application of reinforced fluid-applied polyurethane roof membrane and membrane flashings.

1.2 ROOFING CONFERENCES

- A. Roofing Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative if applicable, roofing materials manufacturer's representative, roofing Installer including project manager and foreman, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
 - 2. Review methods and procedures related to preparation, including membrane roofing system manufacturer's written instructions.
 - 3. Review drawings and specifications.
 - 4. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.
 - 5. Review roof drainage during each stage of roofing and review roof drain plugging and plug removal procedures.
 - 6. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 7. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect re-coating.
 - 8. Review HVAC shutdown and sealing of air intakes.
 - 9. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.

10. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.
11. Review governing regulations and requirements for insurance and certificates if applicable.
12. Review existing conditions that may require notification of Owner before proceeding.

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened components.
 1. Base flashings and terminations.
 - a. Indicate details meet requirements of NRCA and FMG required by this Section.
 2. Tapered insulation, including slopes.
 3. Crickets, saddles, and tapered edge strips, including slopes.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
 1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.
- C. Warranties: Unexecuted sample copies of special warranties.
- D. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by re-coating operations. Submit before Work begins.

- E. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.

- 1. Submit report within 48 hours after inspection.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: To include in maintenance manuals.
- B. Warranties: Executed copies of approved warranty forms.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:

- 1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

- B. If Contractor chooses to bid a substitute system, Contractor must bid specified system and submit separate bid for the substitute system. Substitute system must be identified publicly during the pre-bid conference to give all bidders equal opportunity. Bidding contractors proposing substitutes shall submit the following to Architect a minimum of 10 (ten) business days prior to bid date:

- 1. Written explanation of why the substitute system should be considered.
 - 2. Sample Warranty.
 - 3. Accredited third-party testing certifications showing that the physical and performance characteristics of the substitute system's products will meet or exceed those of the specified materials.
 - 4. Printout of current UL assembly approval, meeting or exceeding specified wind uplift and fire rating requirements, showing exact proposed substitute materials.
 - 5. A written summary sheet showing a comparison of physical properties all of the specified products against the proposed substitute products; including printed versions of all manufacturers' current product data sheets for all products being proposed or compared in the required summary.
 - 6. List minimum five (5) roofing projects, installed within 50 miles of Kingston, NY project site, using the exact combination of proposed substitute materials. Include all project contact information including project size, names, addresses and contact phone numbers of Owners and Architects involved. Include copies of current warranties for verification.

7. Smallest standard package of, and product data sheets for, all proposed substitute adhesives, mastics, sealants, ply sheets and flashings.
 8. Any proposed substitute system that the Architect deems as qualified to compete for the project will be acknowledged by written addendum before the bid date.
 9. Voluntary alternate roofing systems submitted by the low bid Contractor, without pre-approval acknowledged by the Architect through the published addendum process, may be rejected without cause by the Owner's Representative.
- C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.
 2. An independent party certified as a Registered Roof Observer by the International Institute of Building Enclosure Consultants (formerly the Roof Consultants Institute) retained by the Contractor or the Manufacturer and approved by the Manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Handle and store roofing materials, and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
- C. Protect materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting.

1.9 PROJECT / FIELD CONDITIONS

- A. Protect building, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from roofing operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- C. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.
 1. Store all materials prior to application at temperatures between 60 and 90 deg. F (16 and 32 deg C).

2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer. Do not apply materials when air temperature is below 50 or above 110 deg. F (10 or above 43 deg C).
 3. Do not apply roofing in snow, rain, fog, or mist.
- D. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
- E. Owner will occupy portions of building immediately below roofing area. Conduct roofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1.10 WARRANTY

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
1. Form of Warranty: Manufacturer's standard warranty form.
 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
 3. Warranty Period: 30 years from date of completion.
- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
1. Inspections to occur in following years: 2, 5, 10, 15, 20 and 25 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
 2. Scope of Warranty: Work of this Section.
 3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco CPG Inc, Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.

1. Garland Co.
2. Pacific Polymers.

B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Provide roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures.

D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to ANSI/SPRI ES-1.

E. Flashings: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Manufactured Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations of the following:

1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.

F. Exterior Fire-Test Exposure: ASTM E108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

G. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
2. Identify products with appropriate markings of applicable testing agency.

2.3 MATERIALS

- A. General: Roofing materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.
- B. Temporary Roofing Materials: Selection of materials and design of temporary roofing is responsibility of Contractor.

2.4 SHEET MATERIALS

A. Base-Ply Sheet:

- 1. SBS-modified asphalt coated composite polyester / fiberglass/fiberglass mat reinforced high tensile strength base sheet, ASTM D4601 Type II.
 - a. Basis of design product: Tremco, BURmastic Composite Ply HT.
 - b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 165 lbf/in (725 N); Cross machine direction, 150 lbf/in (660 N).
 - c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 260 lbf (1150 N); Cross machine direction, 230 lbf (1120 N).
 - d. Thickness, minimum, ASTM D5147: 0.060 inch (1.5 mm).

B. Flashing Base-Ply Sheet: Same product as base-ply sheet.

2.5 FLUID-APPLIED ROOFING MEMBRANE

A. Polyurethane Elastomeric Fluid-Applied System: Two-coat reinforced fluid-applied roofing membrane formulated for application over prepared existing roofing substrate.

1. Base Coat:

- a. Polyurethane-modified methyl methacrylate reinforced roof coating system base coat, two-part moisture-curing for use with a compatible top coat.
 - 1) Basis of design product: Tremco, AlphaGuard PUMA Base Coat.
 - 2) Combustion Characteristics, UL790: Maintains combustion characteristics of existing roof system .
 - 3) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - 4) Tensile Strength, ASTM D5147: 175 lbf/in (31 N/mm).
 - 5) Elongation, Reinforced, ASTM D5147: 40 percent.
 - 6) Crack Bridging, ASTM D5147: Pass - 2 mm.

- 7) Hardness, Shore A, minimum, ASTM D2240: 93.
 - 8) Minimum Thickness, Reinforced Base Coat: 80 mils (2.0 mm) wet total: Apply 40 mils (1.0 mm) wet, plus 40 mils (1.0 mm) wet over reinforcing fabric.
2. Top Coat:
- a. Polyurethane-modified methyl methacrylate roof coating system top coat, two-component 0 VOC, UV resistant, for application over compatible base coat.
 - 1) Basis of design product: Tremco, AlphaGuard PUMA Top Coat.
 - 2) Combustion Characteristics, UL 790: Maintains combustion characteristics of existing roof system.
 - 3) Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - 4) Tensile Strength, ASTM D5147: 175 lbf/in (30 N/mm).
 - 5) Elongation, Reinforced, ASTM D5147: 40 percent.
 - 6) Crack Bridging, ASTM D5147: Pass, 2 mm.
 - 7) Hardness, Shore A, minimum, ASTM D2240: 93.
 - 8) Solar Reflectance Index (SRI), minimum, ASTM E1980: 95.
 - 9) Minimum Thickness: 36 mils (0.91 mm) wet over cured base coat.
3. Reinforcing Fabric:
- a. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.
 - 1) Basis of design product: Tremco, Permafab.
 - 2) Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..
 - 3) Elongation, Minimum, ASTM D1682: 60 percent.
 - 4) Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
 - 5) Weight: 3 oz./sq. yd (102 g/sq. m).
4. Primers:

- a. Primer, Methyl Methacrylate: Two-component primer for concrete and metal substrates for application of PUMA coatings.

- 1) Basis of design product: Tremco, AlphaGuard PUMA Primer - 107.

- 2) Coverage Rate: 1 gal/100 sq. ft (16 mils) (0.40 mm) wet.

2.6 ADHESIVE MATERIALS

A. Base-Ply Sheet Adhesive:

- 1. Cold-applied bio-based low odor urethane roofing adhesive, two-part, USDA BioPreferred, formulated for compatibility and use with specified roofing membranes and flashings.

- a. Basis of design product: Tremco, POWERply Endure BIO Adhesive TF.

- b. Volatile Organic Compounds (VOC), maximum, ASTM D3690: 0 g/L.

- c. Low Temperature Flexibility, ASTM D2240: Pass at -30 deg F (-34 deg C).

- d. Solids, by Volume, ASTM D2697: 100 percent.

- e. Biobase Content, Minimum, ASTM D6866: 70 percent.

B. Flashing Base-Ply Sheet Adhesive: Same product as base-ply sheet adhesive.

2.7 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system and fluid-applied roofing system.

- B. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.8 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

- 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated, not less than two times the roof slope.

B. Roof Insulation:

- 1. Board Insulation, Polyisocyanurate: CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces, ASTM C1289 Type II Class 1.

- a. Basis of design product: Tremco, Trisotech Insulation.

- b. Compressive Strength, ASTM D1621: Grade 2: 20 psi (138 kPa).
- c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.

2.9 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with built-up roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate and acceptable to roofing manufacturer.
- C. Roof Insulation Adhesive:
 - 1. Urethane adhesive, bead-applied, low-rise two-component solvent-free low odor, formulated to adhere roof insulation to substrate.
 - a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.
 - b. Flame Spread Index, ASTM E84: 10.
 - c. Smoke Developed Index, ASTM E84: 30.
 - d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - e. Tensile Strength, minimum, ASTM D412: 250 psi (1720 kPa).
 - f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.50 kN/m).
 - g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.
- D. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.
- E. Tapered Edge Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.
- F. Cover Board:
 - 1. Gypsum panel, glass-mat-faced, primed, ASTM C1177/C1177M.
 - a. Basis of design product: Tremco/GP Gypsum DensDeck Prime.
 - b. Thickness: 1/2 inch (12 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation. wood cants
 - 3. Metal Deck:
 - a. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
- B. Proceed with installation once unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.
- B. Protect existing roofing system that is indicated to remain, and adjacent portions of building and building equipment.
 - 1. Comply with warranty requirements of existing roof membrane manufacturer.
 - 2. Mask surfaces to be protected. Seal joints subject to infiltration by coating materials.
 - 3. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
 - 4. Maintain temporary protection and leave in place until replacement roofing has been completed.
- C. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with re-coating work that could affect indoor air quality or activate smoke detectors in the ductwork.
 - 1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

3.3 MEMBRANE ROOFING INSTALLATION, GENERAL

- A. Install roofing membrane according to roofing manufacturer's written instructions.
 1. Commence installation of roofing in presence of manufacturer's technical personnel.
- B. Coordinate installation of roofing so insulation and other components of roofing not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement with joints and edges sealed.
 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Substrate-Joint Penetrations: Prevent fluid-applied materials and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.

3.4 INSULATION INSTALLATION

- A. Comply with roofing manufacturer's written instructions for installing roof insulation.
- B. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- C. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (70 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
 1. Flat Insulation System on Sloped Steel Roof Deck: Install insulation at minimum thickness as follows:
 - a. Minimum total thickness of Continuous Insulation: 2 inches.
 2. Tapered Insulation System for Flat Wood Roof Deck: Install insulation as follows:

- a. Minimum total thickness of Continuous Insulation: 2 inches.
3. Insulation Drain Sumps: Tapered insulation sumps, not less than 2 by 2 ft (600 by 600 mm), sloped to roof drain; sump to maximum depth of not more than 1 inch (25 mm) less than the Project-stipulated continuous insulation thickness based upon code requirements.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 - F. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
 - G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
 - H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.
 1. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover in place.

3.5 BASE-PLY SHEET INSTALLATION

- A. Install base sheet starting at low point of roofing. Align base sheet without stretching. Shingle side laps of base a minimum of 4 inches (100 mm). Shingle in direction to shed water. Extend base sheets over edges and terminate above cants.
 1. Embed base sheet in cold-applied membrane adhesive applied at rate required by roofing manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing and 6 inches (150 mm) onto field of roofing.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 1. Seal top termination of base flashing with specified sealant.
 2. Seal top termination of base flashing with a metal termination bar.
- D. Install stripping according to roofing manufacturer's written instructions where metal flanges and edgings are set on roofing.
 1. Flashing Sheet Stripping: Install flashing sheet stripping in specified cold adhesive and extend onto roofing membrane.

- E. Roof Drains: Install base-ply sheet in cold adhesive around drain bowl. Base sheet must be installed so that it will be under compression from the clamping ring. Install base coat, fabric reinforcement, and top coat over base sheet. Install drain clamping ring and strainer.

3.6 FLUID-APPLIED FLASHING APPLICATION

- A. Fluid-Applied Flashing and Detail Base Coat Application: Complete base coat and fabric reinforcement at parapets, curbs, penetrations, and drains prior to application of field of fluid-applied membrane. Apply base coat in accordance with manufacturer's written instructions.
 - 1. Extend coating minimum of 8 inches (200 mm) up vertical surfaces and 4 inches onto horizontal surfaces.
 - 2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
 - 3. Reinforcing Fabric: Place fabric reinforcement onto wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
 - a. Apply second base coat over installed fabric reinforcement and back roll to achieve not less than minimum coating thickness indicated in Part 2 product listing, unless greater thickness is recommended by manufacturer. Verify application thickness as work progresses.
 - 4. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
 - 5. Roof Drains: Set 30 by 30 inch (760 by 760 mm) square metal flashing in bed of compatible mastic/adhesive sealer on roofing base-ply sheet. Cover metal flashing with stripping ply and extend a minimum of 6 inches (150 mm) beyond edge of metal flashing. Allow to cure.
 - a. Apply base coat and immediately install target piece of fabric reinforcement into wet base coat, extend into drain bowl and roll to fully embed and saturate fabric. Apply top coat after base coat has cured.
 - b. Following application and curing of fluid-applied roofing membrane, install clamping ring and strainer. Replace broken drain ring clamping bolts.
 - 6. Allow base coat to cure prior to application of top coat.

3.7 FLUID-APPLIED MEMBRANE APPLICATION

- A. Base Coat: Apply base coat to field of membrane in accordance with manufacturer's written instructions.
 - 1. Apply base coat on prepared and primed surfaces and spread coating evenly.

2. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
 3. Reinforcing Fabric: Place fabric reinforcement onto wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
 - a. Apply second base coat over installed fabric reinforcement and back roll to achieve not less than minimum coating thickness indicated in Part 2 product listing, unless greater thickness is recommended by manufacturer. Verify application thickness as work progresses.
 4. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
 5. Allow base coat to cure prior to application of top coat.
- B. Top Coat: Apply top coat to field of membrane and flashings uniformly in a complete, continuous installation.
1. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.
 2. Apply top coat extending coating up vertical surfaces and out onto horizontal surfaces. Install top coat over field base coat and spread coating evenly.
 3. Back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
 4. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

3.8 FIELD QUALITY CONTROL

- A. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 2 full-time days on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in Quality Control and Quality-assurance Guidelines for the Application of Membrane Roof Systems."
- B. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation, and submit report to the Architect. Notify Architect 48 hours in advance of dates and times of inspections. Inspect work as follows:
 1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
 2. Following application of re-coating to flashings and application of base coat to field of roof.

3. Upon completion of re-coating but prior to re-installation of other roofing components.

- C. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.
- D. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075600.13

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Nonstaining silicone joint sealants.
3. Urethane joint sealants.
4. Immersible joint sealants.
5. Mildew-resistant joint sealants.
6. Latex joint sealants.

1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at [Project site] <Insert location>.

1.3 ACTION SUBMITTALS

- ##### A. Product Data: For each joint-sealant product.
- ##### B. Samples: For each kind and color of joint sealant required.
- ##### C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
 2. Joint-sealant manufacturer and product name.
 3. Joint-sealant formulation.
 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- ##### A. Product test reports.
- ##### B. Preconstruction laboratory test reports.
- ##### C. Preconstruction field-adhesion-test reports.
- ##### D. Field-adhesion-test reports.
- ##### E. Sample warranties.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 - 3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with [stone] [masonry] <Insert substrate> substrates.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: [Two] <Insert number> years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: [Five] <Insert number> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

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

2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C1248.

- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. Pecora Corporation.
 - c. Tremco Incorporated.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, M, P, 50, T, NT: Multicomponent, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 50, Uses T and NT.

- 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. BASF.
 - b. LymTal International Inc.
 - c. Sika.

- B. Urethane, Immersible, S, P, 25, T, NT, I: Immersible, single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T, NT, and I.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Sika Corporation; Joint Sealants.
 - b. Tremco Incorporated.
 - c. W.R. Meadows, Inc.

2.4 Butyl rubber sealants

- 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Tremco
 - b. Pecora
 - c. Sika.

2.5 JOINT-SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C1330, Type C closed-cell material with a surface skin and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.7 PREFORMED WALL EXPANSION JOINTS

- A. Precompressed primary plus secondary seal composed of modified-acrylic foam sealant and with factory silicone coating.
 - 1. Manufacturers: Subject to compliance with requirements, [provide products by the following]
 - a. Emseal- colorseal
 - 2. Color as selected by architect from manufacturer's full range of colors

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 1. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10]tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
 - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other

requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces

1. Joint Locations:

- a. Control and expansion joints in brick pavers.
- b. Isolation and contraction joints in cast-in-place concrete slabs.
- c. Joints between plant-precast architectural concrete paving units.
- d. Joints in stone paving units[, including steps].
- e. Tile control and expansion joints.
- f. Joints between different materials listed above.

- g. Other joints as indicated on Drawings.

2. Joint Sealant: [Urethane, M, P, 50, T, NT]

3. Joint-Sealant Color: [As selected by Architect from manufacturer's full range of colors]

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces

1. Joint Locations:

- a. Construction joints in cast-in-place concrete.
- b. Joints between plant-precast architectural concrete units.
- c. Control and expansion joints in unit masonry.
- d. Joints in dimension stone cladding.
- e. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

C. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces subject to water immersion

1. Joint Locations:

- a. Joints in pedestrian plazas.
- b. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, immersible, S, P, 25, T, NT, I

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

D. Joint-Sealant Application: Concealed mastics

1. Joint Locations:
 - a. Aluminum thresholds.
 - b. Sill plates.
 - c. Other joints as indicated on Drawings.
2. Joint Sealant: Butyl-rubber based
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

END OF SECTION 079200

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SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior hollow metal doors and frames.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include elevations, door edge details, metal thicknesses, preparations for hardware, and other details.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required.
- E. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Ceco door
 - 2. Galaxy metal Products
 - 3. Republic Doors and Frames,
 - 4. An approved equal.

2.2 MATERIALS

- A. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B; with minimum A40 metallic coating.
- B. 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 hot-dip galvanized according to ASTM A 153 Class B.
- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153.
- D. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Comply with ANSI/SDI A250.8.
 1. Core Construction: Core-Polystyrene Core - Doors shall be reinforced by laminating face skins to a foam core slab of expanded polystyrene. Core shall have 1 lb to 1.25 lb per cubic foot density.
 2. Vertical Edges for Single-Acting Doors: Beveled edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 3. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
 4. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
 5. Design: Embossed 6 panels. Thickness - 1-3/4".
 6. Actual Door Size - Door undersized from nominal by 1/4" in width and 7/8" in height. Standard undercut is 3/4".
 7. Hinge Rail & Reinforcement - Hinge edge is non-beveled and reinforced with a continuous or segmented 16 gauge steel channel projection welded at a maximum 5" on center. Additional reinforcement plates are provided at the hinge locations to give a total of 3/16" reinforcement. (Backset 1/4") .
 - 4-1/2"x4-1/2" ball bearing hinges
 8. Lock Rail - Lock edge is non-beveled and reinforced with a continuous 16 gauge channel. 16 gauge reinforcements for mortise or cylindrical locks are of an integral type in accordance with ANSI A115 Standards. .
 9. Edge Seams - Overlapping. Continuously welded.
 10. Top Channel - Flush, 16 gauge channel, projection welded at a maximum 2-1/2" on center.
 11. Bottom Channel - Inverted 16 gauge channel, projection welded at a maximum 2-1/2" on center. .
 12. Insulation - Polystyrene Core (R value of 2.18 per ASTM C1363) (Optional- Sound Transmission Control (STC) 40- 6-panel only).
 13. Face Skins - 14 gauge

14. Closer Reinforcement - 12 gage (18" x 6").
15. Sizes: as shown on drawings
16. Thermal performance: Maximum U value of .60 Btu/ (hr) (ft²)

B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Comply with ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless).
 - a. Width: 1-3/4 inches.

C. Hardware Reinforcement: ANSI/SDI A250.6.

2.4 STANDARD HOLLOW METAL FRAMES

A. Hollow Metal Frames: Fabricated from 12 gauge metallic-coated steel. Full profile Welded frames with mitered corners.

B. Hardware Reinforcement: ANSI/SDI A250.6.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

2.6 STOPS AND MOLDINGS

A. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

2.7 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. Top of door needs Flush Closure Cap.
- C. Hardware Preparation: Factory prepare hollow metal work to receive templated hardware according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
 - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 - 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.

2.8 STEEL FINISHES

- A. Preparation: Clean and phosphatize surfaces of steel door and frames.
- B. Primer: Apply one coat of a gray, alkyd acrylic enamel primer..
- C. Finish: paint with alkyd acrylic enamel using a two-coat process, with each coat being force cured after each coating.
- D. Factory-Applied Paint Finish: ANSI/SDI A250.3.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.9 WARRANTY

- A. 10 Year limited warranty.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. 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 Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
- c. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
- d. Grout frames solid. Drill holes in frame to install grout and weld holes closed. Grind flush and field touch up with Zinc-Rich paint that contains 65% to 69% metallic zinc by weight.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. 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.

END OF SECTION 081113

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085201 -WOOD WINDOW AND LOUVER RESTORATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Restoration of Wood windows including:
 - a. Paint removal from window and louver sash and frames
 - b. Sash and frame component repairs and replacement
 - c. Rot remediation and prevention
 - d. Glass and glazing of wood windows
 - e. Window hardware cleaning, maintenance and installation
 - f. Weatherstripping
 - g. Removal/reinstallation of storm windows
- B. Related Sections include the following:
 - 1. Sheet metal flashing
 - 2. Joint Sealants
 - 3. Exterior Painting
- C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 REFERENCES

- A. Abbreviations and Acronyms
- B. DH = Double Hung Windows Definitions
 - 1. Window System Component Descriptions: Window component terminology shall be as identified in AWI's "Architectural Woodwork Quality Standards", Section 1000.
 - 2. Glazing includes glass, glazing points and glazing compounds.
 - 3. Adjacent components include transoms, mullions and side lights.
- C. Reference Standards
 - 1. AWI Quality Standard: Comply with applicable requirements in AWI's "Architectural Woodwork Quality Standards" for construction, finishes, grades of wood windows, and other requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination
 - 1. This contractor shall coordinate all work with Architect regarding phasing, staging, storage of materials and schedule.

B. Pre-installation meetings

1. This contractor shall attend on site construction meetings as necessary to coordinate his schedule with the job progress and as necessary according to the Owner.

1.4 SUBMITTALS

A. Action Submittals

1. Product Data
 - a. Submit product data for each type of product indicated.
2. Shop Drawings
 - a. Provide shop drawings for any proposed deviation from methods of joinery observed in the existing conditions on the project.
 - b. Provide shop drawings for proposed moldings if recreations must be made identifying their exact match to original profiles.
 - c. Asbestos abatement submittals
3. Samples
 - a. Provide owner with samples of replacement materials including:
 1. historic or restoration glass
 2. 12" sample of each type of weatherstripping to be used.
 3. Representative sample of each type of replacement hardware.

B. Informational Submittals

1. Qualification Statements
 - a. Submit qualification data for historic treatment specialists including list of projects similar in scope, age, and type including contact information for owner's representatives sufficient to illustrate 5 years of full time involvement in projects of this type.
2. Field Quality Control Reports
 - a. Provide wood moisture content measurements before painting and at other points as directed by the owner.
3. Special Procedure Submittals
 - a. Provide a detailed, written description of the materials, methods, equipment, and sequence of operations to be used in the window restoration process including specific dry and cure time requirements.
 - b. Provide a window / openings schedule integrating specific notes or deviations from standard process as described above for any openings.
 - c. Provide schedule of window refinishing. Window refinishing and sash removals and reinstallation to be staged and completed in groups of 30 windows maximum. No more than 30 windows to be refinished at one time.

C. Closeout Submittals

1. Operation and Maintenance Data
 - a. Provide a written maintenance schedule for the owner's future

maintenance requirements.

b. Perform instruction for owner's maintenance personnel with regard to rope/chain replacement, hardware operation and finish touch-up if requested.

2. Warranty Documentation

a. Provide written warranty as described in section 1.9.

3. Record Documentation

a. Provide certification of restoration per applicable standards and regulations.

b. Provide details of restoration steps undertaken as required by all authorities having jurisdiction and as may be required by the owner for historic record.

D. Maintenance Material Submittals

1. Parts and Paints

a. Provide the owner with documentation of all transparent finishes types, paint colors and types.

1.5 Provide owner with 1 quart of touch up paint / transparent finish for QUALITY ASSURANCE

A. Regulatory Requirements

1. Comply with all local, state and federal authorities having jurisdiction with regard to preservation regulations and hazardous materials and disposal regulations.

2. Contractor must provide evidence of EPA Lead Based Paint Renovators Certification or an equivalent federally recognized state license.

B. Qualifications

1. Historic Treatment Specialist Qualifications: A firm or individual experienced in historic treatment of windows similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

2. Contractor must be engaged full time in restoration of windows (replacement does not qualify) for a period of 5 years prior to the date of this project bid.

3. Contractor must be able to provide examples of job specific architectural/engineering drawings of profiles, joinery and weatherstrip design that they've performed for previous projects.

C. Preconstruction Testing

1. Preconstruction testing for hazardous materials has been performed. Information is available section 028313 Lead Abatement and 028213 Asbestos Abatement.

D. Field Samples

E. Mockups

1. Prepare 1 existing window to serve as mockups to demonstrate historic treatment methods and procedures for aesthetic effects and qualities of materials and execution. Use materials and methods proposed for completed Work and prepare mockups under same weather conditions to be expected during remainder of Work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements
 1. Coordinate all deliveries with Owner
 2. This contractor must have personnel available to receive deliveries on site if necessary.
 3. Deliver patching and repair compounds to Project site in manufacturer's original containers, labeled with description of contents and name of manufacturer.
 4. Storage and Handling Requirements Comply with all manufacturers' instructions with regard to storage and handling requirements.
- B. Packaging Waste Management
 1. This contractor is responsible for legal offsite disposal of any hazardous waste. Refer to specification section 028313 Lead Abatement and 028213 Asbestos Abatement.

1.7 FIELD CONDITIONS

- A. This contractor is responsible to schedule work in a manner necessary to work within optimum temperatures and humidity levels and protect partially complete work from inclement weather.
- B. Window refinishing and sash removals and reinstallation to be staged and completed in groups of 30 windows maximum. No more than 30 windows to be refinished at one time.
- C. Contractor to provide temporary weather protection at all windows from time sash is removed until sash is reinstalled and windows are weathertight. Contractor to provide temporary construction barriers to isolate area of interior window paint removal and refinishing for duration of window/ sash refinishing.
- D. All courtroom windows and sashes to be removed and refinished on second shift and weekends.

1.8 WARRANTY

- A. All work is to be warranted against defects in material or workmanship for a period of 5 year(s).

PART 2 – PRODUCTS

2.1 EXISTING PRODUCTS

- A. Products being remanufactured, rebuilt and restored are existing elements of the

owners building. Owner gives no representation as to their condition or that of the substrate. Contractor is to provide reasonable assumptions as to the conditions of the substrates based on their observations and experience with similar projects. Contractor is to include an assumption of rot and UV deterioration in the wood of the sash and visible members of the frame.

- B. Existing materials shall be reused whenever possible in the repair and rehabilitation of historic wood windows. This includes all wood elements, hardware and glazing that are determined to be of historic significance. Replacement of window elements with new material shall be done only when originals are so deteriorated as to prohibit their useful function.

2.2 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the manufacturers specified in section 2.3.

2.3 MATERIALS

A. Adhesives

- 1. Exterior grade wood Glue
 - a. Acceptable products/manufacturers include:
 - (a) Titebond III

B. Paint Removal

- 1. Refer to Lead Abatement section 028213
- 2. Chemical Paint removers are to comply with all local, state, and federal authorities having jurisdiction. Dichloromethane / Methylene Chloride may not be used on any component of the project on or off site. Acceptable product/Manufacturer:
 - a. Prosoco -SafStrip
- 3. The use of infrared stripping on site will be allowed.
- 4. Mechanical stripping methods will be allowed if performed in compliance with EPA and OSHA regulations.
- 5. No heat guns will be used on existing paint.

C. Replacement wood materials

- 1. Any wood replaced shall be done so with the same species as original making every effort to match the age, grain direction and growth rate of the piece it is replacing.

D. Glass

- 1. Existing intact original glass shall be reused. Any removed lights shall be reused in their original frames and positions.
- 2. Glass Removal: All glass will be removed to accommodate sash restoration.
 - a. Existing glazing compound is asbestos containing refer to section 028213 -

ASBESTOS ABATEMENT

b. Label each pane of glass with location and orientation within the sash so that the historic glass can be returned to its original location and orientation. Use painters tape to label glass and consistently label on either interior or exterior to avoid confusion at reinstallation

3. Replacement glass

a. Missing or broken glass shall be replaced with new glass matching the same degree of waviness as the existing or as appropriate for the time period of the original construction.

E. Glazing Compound

1. Existing glazing compound is asbestos containing refer to section 028213 - ASBESTOS ABATEMENT

2. Glazing compound for single pane glass shall be linseed oil-based, non-staining and non-bleeding.

3. Acceptable manufacturers

a. Sarco Glaze Putty

F. Glazing Points

1. Glazing points shall be stainless steel or galvanized steel.

G. Epoxies – liquid consolidants

1. Liquid wood consolidants shall consist of a two-part, low-viscosity liquid epoxy designed for wood restoration. Design criteria standards and evaluations of acceptable alternates will be based on Abatron LiquidWood.

2. Acceptable Manufacturers:

a. Abatron, Inc

b. Advanced Repair Technology

c. Gougeon Brothers, Inc

H. Epoxies – Paste

1. Epoxy paste shall consist of a two-part, thixotropic paste epoxy designed for wood restoration. Design criteria standards and evaluations of acceptable alternates will be based on Abatron WoodEpoxy.

2. Acceptable Manufacturers:

a. Abatron, Inc

b. Advanced Repair Technology

c. Gougeon Brothers, Inc

I. Wood Preservative

1. Acceptable manufacturers and products include:

a. Nisus Corporation; Bora-care

J. Hardware

1. Replacement hardware shall match original in design, material, and finish. Acceptable Manufacturers include:

a. Bronze Craft Corporation, The

b. Phelps Company Architectural Specialties

- K. Weather Stripping
 - 1. Acceptable manufacturers include:
 - a. Accurate Metal Weather Stripping
 - b. Pemko Manufacturing CO., Inc
 - c. Reese Enterprises, Inc
 - d. Schlegel

- L. Sash Cord
 - 1. ¼” or 5/16” sash cord, solid braid 100% cotton.

- M. Louver Screen/Mesh:
 - 1. Match existing material, size and finish.

2.4 FINISHES

- A. Refer to section 099113 Exterior Painting

2.5 SOURCE QUALITY CONTROL

- A. Tests

1. Document testing of all sash and wood materials before finishing confirming moisture content maximums.

PART 3 – EXECUTION

3.1 CONTRACTOR / INSTALLER

- A. The Contractor shall repair wood windows as indicated on drawings, and shall return them to proper operation and sound condition.

3.2 REPAIRS

- A. Sash Removal – All sashes to be removed for repair, reconditioning and refinishing. The interior stops shall be removed first in a method so as to not scar the wood. Connecting hardware and operating mechanisms shall then be detached and the sash shall be removed from the frame. Removed sashes and frames shall be identified as to location to assure reinstallation in their original positions. Windows with counter-weight systems shall have the sash cords detached from the sides of the sash and their ends pinned with a nail or tied in a knot to prevent them from falling into the weight pocket; the lower sash can then be removed. The parting bead shall be removed so as to not scar the wood. Plastic covering or plywood shall be installed to cover the window opening during repairs. Refer to sections 028300 and LEAD SAFE WORK PRACTICES 028213 Asbestos Abatement for additional requirements.
- B. Storm Windows:
1. Remove and salvage storm windows for window restoration/renovation.
 2. Mark each storm window with location to assure reinstallation in original location.
 3. Repair damaged storm windows prior to reinstallation.
 4. Reinstall storm windows after window restoration/ refinishing. Replace all damaged hardware with new hardware to match existing type and finish.
- C. Sash Repair:
1. All glazing to be removed for sash repair. Glazing Compound is asbestos containing refer to section 028213 ASBESTOS ABATEMENT.
 2. Repair all damaged wood sections refer to wood repair section below.
 3. Square and tighten sash corners and joints.
- D. Sash replacement: Fabricate new sash if existing sash is beyond repair.
1. Coordinate dimensions with actual measurements of window openings and adjacent construction to match in kind.
 2. Fabricate components to match originals in kind.
 3. Join moldings to match construction of original sash exactly.
 4. Machine sash elements to receive glazing panels. Machine sash elements of

movable sash to receive weatherstripping, if appropriate, and hardware.

- E. Wood Louvers Repair:
1. wood louvers be removed for repair, reconditioning and refinishing. Frames shall be identified as to location to assure reinstallation in their original positions.
 2. Metal screen/ mesh to be removed. Replace screen mesh with new screen to match existing.
 3. Repair all damaged wood sections refer to wood repair section below.
 4. Square and tighten corners and joints.
- F. Wood Louver replacement: Fabricate new louver if existing louver is beyond repair.
1. Coordinate dimensions with actual measurements of openings and adjacent construction to match in kind.
 2. Fabricate components to match originals in kind.
 3. Join moldings to match construction of original sash exactly.
 4. Machine louver elements to receive hardware and screen/ mesh
 5. Provide new screen mesh to match existing.
- G. Paint Removal – All paint is to be removed from each sash using non-destructive means such as steam, chemical stripper or heat gun. If chemical strippers are used, wood shall be neutralized after stripping to a litmus pH of 5 to 8.5. Wood shall be allowed to dry to a moisture content of 8 to 12 percent before repainting. If heat methods are used for paint removal, glass shall be protected from sudden temperature change to avoid breakage. Coordinate with section 028300 - LEAD SAFE WORK PRACTICES
- H. Wood Repair - Badly decayed areas (with more than 30 percent wood decayed) shall be removed from wood sash, sill, frame, and trim assemblies. Moderately decayed areas (less than 30 percent decayed), weathered, or gouged wood shall be patched with approved patching compounds, and shall be sanded smooth. Intact sash rails and stiles that are loose shall be repaired with new dowels to make joints tight.
- I. Epoxy Wood Repair/Consolidation - Epoxy wood repair materials shall be applied in accordance with manufacturer's written instructions. Health and safety instructions shall be followed in accordance with the manufacturer's instructions. The source or cause of wood decay shall be identified and corrected prior to application of patching materials. Wet wood shall be completely dried to a moisture content of 8 to 12 percent to its full depth before patching. Wood that is to be patched shall be clean of dust, grease, and loose paint. Clean mixing equipment shall be used to avoid contamination. Mix and proportions shall be as directed by the manufacturer. Batches shall be only large enough to complete the specific job intended. Patching materials shall be completely cured before painting or reinstallation of patched pieces.
- J. Epoxy Liquid Wood Consolidant - Epoxy liquid wood consolidants shall be used to

penetrate and impregnate deteriorated wood sections to reinforce wood fibers that have become softened or absorbent.

- K. Epoxy Paste - Epoxy paste shall be used to fill areas where portions of wood are missing such as holes, cracks, gaps, gouges, and other voids. Areas to receive epoxy paste patching material shall be primed with compatible epoxy liquid wood consolidants or a primer recommended by the manufacturer.
- L. Wood Replacement – Extensively decayed wood shall be replaced with new pieces that match originals in all respects. Joinery shall match that of existing. Muntins shall have coped mortise and tenon joints. Molded members shall have mitered or coped joints.
- M. Hardware - Existing hardware which is in good condition shall be reused unless otherwise noted. Reused existing hardware shall be stripped of paint down to bare metal. New hardware shall be furnished and installed where original is missing, damaged, or unsuitable for new operation, per manufacturer's directions to provide a secure and smoothly operating window assembly.
- N. Glazing - Lights to be reused shall be reinstalled in their original frames and positions. Rabbeted integral glazing recesses shall be brushed with boiled linseed oil or primed prior to the application of bed glazing compound. Broken glass shall be replaced to match existing.
 - 1. All glass will be removed to accommodate sash restoration.
 - 2. Label each pane of glass with location and orientation within the sash so that the historic glass can be returned to its original location and orientation. Use painters tape to label glass and consistently label on either interior or exterior to avoid confusion at reinstallation.
 - 3. Existing glazing compound is asbestos containing refer to section 028213 - ASBESTOS ABATEMENT
- O. Operating System - Windows with counter-weight systems shall be repaired to original operating function. Original sash weights (and sash chains, if applicable) shall be reused wherever possible. Missing weights and sash cords or chains shall be replaced. Missing or deteriorated sash cords shall be replaced with new cotton-polypropylene cord rated for sash weight. When new weights are required, they shall match the originals in weight. Replacement weights shall be cast iron or square milled steel bar stock or weights salvaged from similar projects
- P. Weatherstripping and Moldings - Weatherstripping shall be installed on all operable sash. Weatherstripping shall consist of compression weather strips designed for permanent sealing under bumper or wiper action. Weatherstripping shall be provided at the perimeter of each sash including meeting rails and shall be installed per manufacturer's instructions. Weatherstripping shall be concealed when sash is closed.

- Q. Louver mesh/screens-existing mesh which is in good condition shall be reused. Damaged mesh/screen shall be replaced with new to match existing.

3.3 PAINTING PREPARATION

A. Areas where paint was removed or where existing paint shows crazing, wrinkling, and inter-coat peeling shall be scraped, sanded, and shall have edges feathered. Paint shall be removed to bare wood or first sound paint layer. All parts shall be cleaned by brush using bleach and/or tri sodium phosphate (TSP) solution, and let dry. Existing finish shall be de-glossed. Open joints and cracks shall be filled with epoxy repair materials. Perimeter of fixed sash shall be caulked.

3.4 PAINTING

A. Wood elements shall be primed and painted in accordance with Section 099123.02 Exterior Painting

3.5 REASSEMBLY

A. After repairs are completed, the window or louver shall be reassembled with all parts tight, true and functioning properly. Wood surfaces shall be free of blemishes.

3.6 ADJUSTMENTS

A. Final adjustment for proper operation of ventilating unit shall be made after reassembly. Adjustments shall be made to operating sash or ventilators to assure smooth operation and weather-tight performance when locked closed.

3.7 CLEANING

A. Windows shall be cleaned on both exterior and interior.

END OF SECTION

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SECTION 087110 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Door Hardware

1.2 SUBMITTALS

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

B. Samples: For each exposed finish.

C. Schedules:

1. Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as procedures and diagrams.

a. Format: Use same scheduling sequence and format as in the Contract Documents.

b. Content: Include the following information:

- 1) Fully coordinated with door schedule.
- 2) Identification number, location, hand, fire rating, and material of each door and frame.
- 3) Type, style, function, size, quantity, and finish of each door hardware item.
- 4) Complete designations of every item required for each door or opening including name and manufacturer.

2. Existing Deadbolt and Keying will be reinstalled on new doors.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by lock manufacturer.

1. Installer's responsibilities include supplying and installing door hardware and providing a qualified Architectural Hardware Consultant available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

B. Architectural Hardware Consultant Qualifications: A person or firm who is currently certified by DHI as an Architectural Hardware Consultant and who is experienced in providing services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

1.4 COORDINATION

- A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section and door hardware sets indicated on the drawings.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Sets" Article. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements.
 - 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- C. Finishes: As indicated herein.

2.2 HINGES, GENERAL

- A. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - 1. Exterior Hinges: Stainless steel, with stainless-steel pin
- C. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head; machine screws (drilled and tapped holes) for metal doors and wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.3 HINGES

- A. Continues Hinge: BHMA A156.1, finish: satin stainless, Heavy duty, full mortise
- B. Template Hinge Dimensions: BHMA A156.7.
- C. Provide electric through wire
- D. Manufacturers:
 1. Pemco; an ASSA ABLOY: FM-HD
 2. Best:661-HD.

2.4 LOCKS AND LATCHES, GENERAL

- A. Accessibility Requirements: Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).
- B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lbf (67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.
- C. Lock Trim:
 1. L Lever
- D. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors.
- E. Backset: 2-3/4 inches, unless otherwise indicated.
- F. Strikes: Manufacturer's standard strike with strike box for each latch bolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set.
- G. Finish: US 26 D

2.5 EXIT DEVICES

- A. Precision apex 2000 series rim exit device
- B. Vandal resistant Trim V4908A
 1. 4900A "A" lever Trim
 2. Best 7 pin cylinder with IC core

3. 03 function with delayed egress

2.6 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:
 1. Best 9K
 - a. #15C lever design
 - b. L rose design

2.7 KEYING

- A. Coordinate all keying with Owner.

2.8 DOOR CLOSERS

All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt and security type fasteners as required for proper installation.
8. Provide aluminum closer cover

Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully

operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

9. Acceptable Manufacturers:

- a. Best series HD8000
- b. Norton Door Controls (NO) - 7500 Series.
- c. LCN -4030 Series

2.9 STOPS AND HOLDERS

A. Stops, Holders and Bumpers: BHMA A156.16 Grade 1, US26D finish.

1. Provide floor stops for doors unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.

B. Manufacturers:

1. Trimco (TBM).
2. Glynn-Johnson; an Ingersoll-Rand Company (GJ).
3. Rockwood (ASSA Abloy)
 - a. Floor stop Rockwood 441 CU
 - b. Wall stop Rockwood 405

2.10 DOOR GASKETING

A. Standard: BHMA A156.22.

B. General: Provide continuous weather-strip gasketing on exterior doors. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

D. Gasketing Materials: ASTM D 2000 and AAMA 701/702, Gray finish.

E. Manufacturers:

1. Zero International (ZRO).
2. National Guard Products (NGP).
3. Pemko Manufacturing Co. (PEM).
4. Reese Enterprises (RE).

2.11 THRESHOLDS

- A. Standard: BHMA A156.21.
- B. Accessibility Requirements: Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
- C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch (13 mm) high.
- D. Manufacturers:
 - 1. Zero International (ZRO).
 - 2. National Guard Products (NGP).
 - 3. Pemko Manufacturing Co. (PEM).

2.12 FABRICATION

- A. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- B. Fasteners: Provide screws according to commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - 1. Comply with NFPA 80 for fasteners of door hardware in fire-rated applications.
- C. Finishes: BHMA A156.18, as indicated in door hardware sets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: Comply with DHI A115 Series. Drill and tap doors and frames for surface-applied door hardware according to ANSI A250.6.
- B. Mounting Heights: Mount door hardware units at heights indicated on Drawings unless otherwise indicated or required to comply with governing regulations.
- C. Install each door hardware item to comply with manufacturer's 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 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

- D. 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

3.2 DOOR HARDWARE SETS

Hardware Schedule

Set: 1

Holding entrance door

<u>ITEM</u>	<u>MODEL NO.</u>	<u>MANUFACTURER</u>	<u>FINISH</u>
Panic Device	Series 2103	Precision/Apex	US 26D Satin Chrome
Power Supply	PS161-6	Precision/Apex	
Cylinder (2)	IC CORE	Precision	US 26D Satin Chrome
Hinges (1)	661-HD	BEST	Clear Anodized Aluminum
* Provide Electric through wires with Easy Access Panel			
Door Stop	441CU	ROCKWOOD	US 26D Satin Chrome
Weather strip	S773BL	PEMKO	Black
Threshold	566	ZERO	US 26D Satin Chrome
Closer	HD8000	Best	US 26D Satin Chrome

END OF SECTION 087100

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SECTION 096340 - STONE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Dimension stone exterior flooring.

1.2 ACTION SUBMITTALS

- A. Product Data: For each variety of stone, stone accessory, and manufactured product.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work.
- C. Samples:
 - 1. For each stone type indicated. Include at least four or more Samples in each set and show the full range of color and other visual characteristics in completed Work.
 - 2. For each color of grout required.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For stone flooring to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
 - 1. Build mockup of typical exterior pavement area about 96 inches square
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 FIELD CONDITIONS

- A. Maintain air and material temperatures to comply with requirements of installation material manufacturers, but not less than 50 deg F (10 deg C) during installation and for seven days after completion.
- B. Cold-Weather Requirements for Exterior Stone Flooring: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

- C. Hot-Weather Requirements for Stone Flooring: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 and with the following:
 - 1. Maintain temperature of materials below 100 deg F (38 deg C).
 - 2. When the ambient temperature exceeds 90 deg F (32 deg C), fog spray installed stone flooring until damp at least three times a day until flooring is three days old.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Varieties and Sources: Subject to compliance with requirements, provide stone of varieties and sizes as indicated

2.2 BLUE STONE PAVERS AND TREADS

- A. Material Standard: Classification I Exterior
 - 1. Stone Abrasion Resistance: Minimum value of [8] based on testing according to ASTM C241/C241M
- B. Description: Blue stone paver match existing paver thickness, color size, finish, and pattern.
- C. Description: Bluestone tread match existing thickness, color size, finish.
- D. Description: Bluestone capstone match existing thickness, color size, finish, or as indicated on drawings.

2.3 STONE TREADS

- A. Match existing thickness, color size, finish.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II.[Provide natural color or white cement as required to produce mortar color indicated.]
 - 1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.

- C. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in stone masonry mortar.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bayer, Industrial Chemicals Division.
 - b. Euclid Chemical Company (The); an RPM company.
 - c. Solomon Colors, Inc.
- D. Aggregate: ASTM C144; except for [joints narrower than 1/4 inch (6 mm)] [and] [pointing mortar], use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.
1. White Aggregates: Natural white sand or ground white stone.
 2. Colored Aggregates: Natural-colored sand or ground marble, granite, or other durable stone; of color necessary to produce required mortar color.
- E. Latex Additive: acrylic-resinwater emulsion, serving as replacement for part of or all gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement mortar bed, and not containing a retarder.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. LATICRETE SUPERCAP, LLC.
 - c. MAPEI Corporation.
- F. Water: Potable.

2.5 GROUT

- A. Grout Colors: As selected by Architect from manufacturer's full range.
- B. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate to produce required color.
- C. Standard Cement Grout: ANSI A118.6, packaged.
1. Unsanded grout mixture for joints 1/8 inch (3 mm) and narrower.
 2. Sanded grout mixture for joints wider than 1/8 inch (3 mm).
- D. High-Performance Cement Grout: ANSI A118.7, packaged.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. LATICRETE SUPERCAP, LLC.

c. MAPEI Corporation.

2. Unsanded grout mix for joints 1/8 inch (3 mm) and narrower.
3. Sanded grout mix for joints wider than 1/8 inch (3 mm).

2.6 ACCESSORIES

A. Water-Cleanable Epoxy Adhesive: ANSI A118.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Bostik, Inc.
- b. LATICRETE SUPERCAP, LLC.
- c. MAPEI Corporation.

B. Cleavage Membrane: Polyethylene sheeting, ASTM D4397, 4.0 mils (0.1 mm) thick[; or unperforated asphalt felt, ASTM D226/D226M, Type I (No. 15)].

C. Reinforcing Wire: Galvanized, welded, 0.062-inch- diameter wire; 2-by-2-inch (50-by-50-mm) mesh; comply with ASTM A1064/A1064M, except for minimum wire size.

D. Cleaner: Stone cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer]. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

2.7 MORTAR AND GROUT MIXES

A. Mortar: Comply with referenced standards and with manufacturers' written instructions to produce mortar of uniform quality and with optimum performance characteristics.

1. Do not use admixtures unless otherwise indicated. Do not use calcium chloride.
2. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Add only enough water to produce a damp, unworkable mix that retains its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Portland Cement-Lime Setting Mortar: ASTM C270, Proportion Specification, [Type S]

C. Latex-Modified Portland Cement Setting Mortar: Proportion and mix portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions and to produce a stiff mixture with a moist surface when bed is ready to receive stone.

D. Mortar-Bed Bond Coat: Mix neat cement and [water] to a creamy consistency.

E. Cement-Paste Bond Coat: Mix either neat cement or cement and sand with water to a consistency similar to that of thick cream.

- F. Latex-Modified Portland Cement Bond Coat: Proportion and mix portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions.
- G. Pointing Mortar: Comply with requirements indicated above for setting mortar, including type and the following:
 - 1. Pigmented Pointing Mortar: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1:10, by weight.
 - 2. Colored-Aggregate Pointing Mortar: Produce color required by combining colored aggregates with portland cement of selected color.
- H. Joint Grout: Comply with mixing requirements in referenced ANSI standards and with manufacturer's written instructions.

2.8 FABRICATION OF STONE

- A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
- B. Cut stone to produce pieces of thickness, size, and shape indicated.
 - 1. Stone Thickness: match existing.
 - 2. Stone Edges: Square cut with top corner slightly eased to prevent snipping
 - 3. Joint Width: match existing
 - 4. Stone size match existing
- C. Pattern Arrangement: Fabricate and arrange stone units with veining and other natural markings to comply with the following requirements:
 - 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
 - 2. Arrange units in blend pattern.

PART 3 - EXECUTION

3.1 PREPARATION

- A. [Vacuum] [Sweep] substrates to remove dirt, dust, debris, and loose particles.
- B. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.
- C. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- D. Before setting stone, clean dirty or stained stone surfaces by removing soil, stains, and foreign materials.

3.2 INSTALLATION, GENERAL

- A. Do necessary field cutting as stone is set. Cut lines straight and true, and finish field-cut edges to match shop-cut edges.
 - 1. Use power saws with diamond blades to cut stone
- B. Scribe and field cut stone as necessary to fit at obstructions. Produce neat joints of size specified or indicated.
- C. Provide control and expansion joints of widths and at locations indicated. Keep control and expansion joints free of mortar, grout, and other rigid materials.

3.3 INSTALLATION TOLERANCES

- A. Variation in Joint Width: Do not vary from average joint width more than plus or minus 1/16 inch (1.5 mm) or one-fourth of nominal joint width, whichever is less.
- B. Variation in Surface Plane: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 3/8 inch (10 mm) maximum from level or slope indicated.
- C. Variation in Plane between Adjacent Units (Lipping): Do not exceed 1/32-inch (0.8-mm) difference between planes of adjacent units.

3.4 INSTALLATION OF STONE OVER [WATERPROOFING]

- A. Place cleavage membrane over substrates indicated to receive stone, lapped at least 4 inches (100 mm) at joints.
- B. See waterproofing Section for installation of waterproofing[and protection board].
 - 1. Provide cork joint filler, where indicated, at waterproofing that is turned up on vertical surfaces.
- C. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions.
- D. Place reinforcing wire fabric over [protection board], lapped at least one full mesh at joints and supported so mesh becomes embedded in middle of mortar bed. Hold edges back from vertical surfaces and control and expansion joints about 1/2 inch (13 mm).
- E. Place mortar bed over [protection board] with reinforcing wire fabric fully embedded in middle of mortar bed. Spread, tamp, and screed to uniform thickness at elevations required for setting stone to finished elevations indicated.
- F. Mix and place only that amount of mortar bed that can be covered with stone before initial set. Cut back, bevel edge, and discard material that has reached initial set before stone can be placed.

- G. Place stone before initial set of mortar occurs. Immediately before placing stone on setting bed, apply uniform 1/16-inch- (1.5-mm-) thick bond coat to mortar bed or to back of each stone unit.
- H. Tamp and beat stone with a wooden block or rubber mallet to obtain full contact with mortar bed and to bring finished surfaces within indicated tolerances. Set each unit in a single operation before initial set of mortar; do not return to areas already set and disturb stone for purposes of realigning finished surfaces or adjusting joints.
- I. Rake out joints to depth required to receive [grout] as units are set.
- J. Point joints after setting. Fill full with mortar type and color indicated. Tool joints flat, uniform, and smooth, without visible voids.

3.5 GROUTING

- A. Grout stone joints to comply with ANSI A108.10 and with manufacturer's written instructions.
 - 1. Do not use sanded grout for polished stone.
 - 2. Grout joints as soon as possible after initial set of setting bed. Force grout into joints, taking care not to smear grout on adjoining stone and other surfaces. After initial set of grout, finish joints by tooling to produce a slightly concave polished joint, free of drying cracks.

3.6 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean stonework as work progresses. Remove [mortar fins and smears] [grout smears] before tooling joints.
- B. Clean stonework after setting and [pointing] [grouting] are complete. Use procedures recommended by stone fabricator for application types.
- C. Apply sealer to cleaned stonework according to sealer manufacturer's written instructions.

3.7 PROTECTION

- A. Prohibit traffic from installed stone for a minimum of 72 hours.
- B. Protect installed stonework during construction with nonstaining kraft paper. Where adjoining areas require construction work access, cover stonework with a minimum of 3/4-inch (20-mm) untreated plywood over nonstaining kraft paper.

END OF SECTION 096340

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Section 098300 - ELASTOMERIC COATINGS

Part 1 - General

1.1 Summary

- A. This specification describes the coating of substrates with an elastomeric, crack bridging, anti-carbonation, protective coating.

1.2 Quality Assurance

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 certified and have in existence a recognized ongoing quality assurance independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.3 Delivery, Storage, and Handling

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

1.4 Job Conditions

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45°F (7°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.5 Submittals

- A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.6 Warranty

- A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project

Part 2 - Products

2.1 Basis of Design Manufacturer

- A. **Sikagard 550W Elastocolor**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.
- B. **Sikagard Elastic Base Coat (Smooth & Textured)**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.
- C. **Sikagard 552W Primer or SikaLatex R**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

2.2 Materials

- A. Elastomeric Acrylic Coating:
1. Product shall be 100% Acrylic Emulsion with the following properties:
 - a. Water vapor permeable
 - b. Can bridge dynamically moving cracks
 - c. Crack bridging properties maintained at low temperatures
 - d. The material shall be resistant to dirt pick-up and mildew
- B. Elastomeric Acrylic Smooth & Textured Base Coating:
1. Product shall be 100% Acrylic Emulsion with the following properties:
 - a. Water vapor permeable
 - b. Can bridge dynamically moving cracks
 - c. Crack bridging properties maintained at low temperatures
- C. Adhesion Promoter / Surface Conditioner
1. Product shall be a water-based, acrylic primer with the following properties:
 - a. Solids content 12.5% -20% by volume
 - b. Recoat time 4 – 24 hours
- D. Color-As selected by architect from full range of manufacturer's standard, premium and deluxe colors.

2.3 Performance Criteria

- A. Properties of the elastomeric Sikagard 550W Elastocolor acrylic coating:
1. Pot Life: indefinite
 2. Tack Free Time 6 Hours @ 73°F, 50% Relative Humidity. Final Cure < 24 Hours
 3. Carbon Dioxide Diffusion: μCO_2 214,000 Carbon Dioxide Diffusion Resistance at 16 mils (400 microns) $\text{SdCO}_2 = 299$ ft. (equivalent air thickness) i.e. Approx. 9-in. of standard concrete cover.
 4. Water Vapor Diffusion: $\mu\text{H}_2\text{O}$ 2,146 Water Vapor Diffusion Resistance at 16 mils $\text{SdH}_2\text{O} = 2.6$ ft. (0.8m) (equivalent air thickness)
 5. Moisture Vapor permeability (ASTM E96) 14.5 perms
 6. Tensile Properties (ASTM D-412 Modified)
7 day-Tensile strength 190 psi (1.3 MPa) - Elongation at break 820% - 340% @ 0°F (-18°C)
 7. Crack Bridging(at 16 mils = 400 microns DFT)
 - a. Static (at -4°F/-20°C) 30 mils (0.75mm)
 - b. Dynamic >1000 cycles(at -4°F/-20°C) 12 mils (0.30mm)
 8. Resistance to wind driven rain (TT-C-555B): No passage of water through coating
 9. Weathering (ASTM G-23) 10,000 hours excellent, no chalking or cracking.
 10. Solids Content: by weight – 62% by volume – 55%
 11. Flame Spread and Smoke Development (ASTM E-84-94)

Flame Spread 5 Smoke Development 5 Class Rating A

Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.

Part 3 – Execution

3.1 Surface Preparation

- A. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for coatings and fall within CSP1 to CSP3.

3.2 Mixing and Application

- A. Mixing: Stir materials to ensure uniformity using a low speed (400-600 rpm) drill and paddle. To minimize color variation, blend two batches of material.(boxing)
- B. Crack detail: Recommended application temperatures 40° - 100°F (4⁰-38⁰)
Small defects and cracks (non-structural): Cracks 10 – 20 mils. Apply Surface Filler “Brush Grade” generously over the center of the cracks. Feather material to zero over a two-inch wide area. Allow a minimum 24 hours to cure before overcoating.
Large defects and cracks (non-structural): Cracks >20mils. Rout to 1/4-in wide by 1/4-in. deep. Blow out cut with oil-free compressed air. Fill slot with Surface Filler “Knife Grade” allowing for a small crest to remain. This will compensate for any shrinkage that might occur. **NOTE: Sikaflex-1a,-2c, or -15LM, polyurethane sealant may be used in place of Knife Grade Surface Filler.** Allow 24 hours-minimum cure before over coating.
- C. Coating Application: Apply by brush, roller, or spray over entire area moving in one direction. A minimum of two coats are required. Each coat should be applied at a rate not to exceed 100 sq. ft. per gallon. Total dry film thickness shall be a minimum 8 - 10 dry mils per coat. Allow a minimum of 2 hours prior to re-coating.
- D. When applying the coating, never stop the application until the entire surface has been coated. Always stop application at an edge, corner, or joint. Never let a previously coated film dry; always coat into a wet film. Always apply the coating at a 45° angle to an edge, corner, or joint.
- E. If substrate has been previously coated and presents a “chalky” condition, apply 1 coat of Sikagard 552W or SikaLatex R, primer/surface conditioner by brush, roller, or spray at a rate not to exceed 300 sq. ft. per gallon.
- F. Adhere to all limitations and cautions for the elastomeric acrylic coating in the manufacturers printed literature.

3.3 Cleaning

- A. The uncured elastomeric acrylic coating can be cleaned from tools with water. The cured elastomeric acrylic coating can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

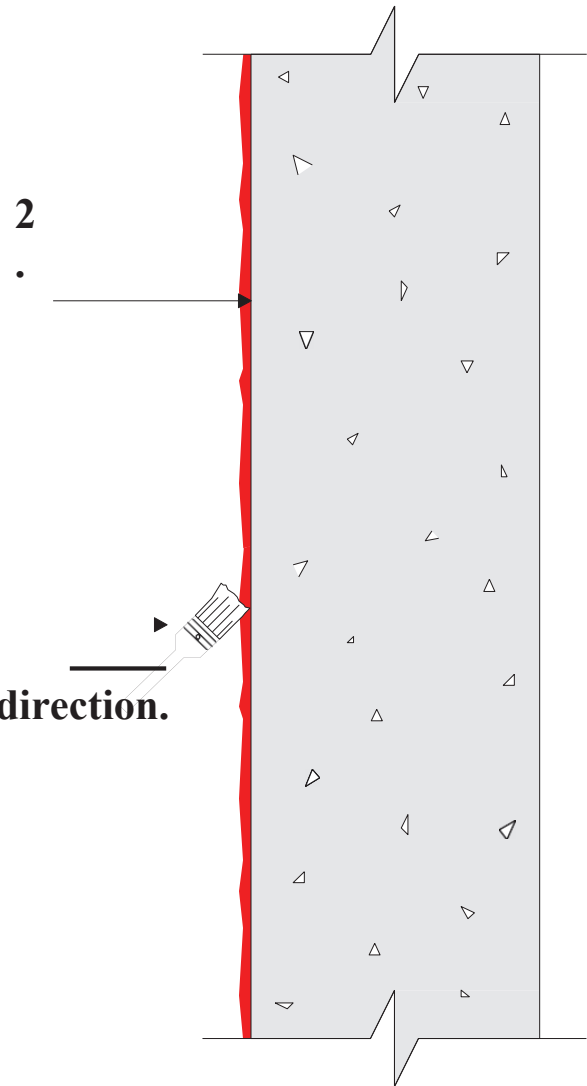
SC-058 Sikagard® 550W Elastocolor, Anti- Carbonation Crack- bridging Coating

**1. Substrate must be dry,
clean and sound.**

**2. Condition surface with Sikagard
552W or SikaLatex R(as needed)**

3. Apply base coating as needed

**4. Apply Sikagard 550W Elastocolor by brush,
roller or spray over entire area moving in one direction.
3 &4.**



SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Primers.
 - 2. Finish coatings.
 - 3. Floor sealers and paints.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of topcoat product.

1.3 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Sherwin Williams
- B. Benjamin Moore
- C. Pittsburgh Paint
- D. Keim

2.2 PAINT PRODUCTS, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range or as indicated on drawings

2.3 PRIMERS

A. Exterior, Alkyd/Oil Wood Primer: Alkyd/oil-based primer that is resistant to extractive bleeding when applied to wood substrates with less than 15 percent moisture content; formulated for sag, mold, and microbial resistance; for hiding stains; and for use on exterior wood subject to extractive bleeding.

1. Sherwin Williams oil-based exterior wood primer

B. Alkyd Metal Primer: Corrosion-resistant, solvent-based, alkyd primer formulated for use on prepared ferrous metals subject to industrial and light marine environments.

1. Sherwin Williams Direct-To-Metal Alkyd Enamel
2. Benjamin Moore Super Spec HP D.T.M. Alkyd

C. Galvanized-Metal and Aluminum Primer: Corrosion-resistant, pigmented, acrylic primer; formulated for use on cleaned/etched, exterior, galvanized and aluminum metal to prepare it for subsequent coatings.

1. Sherwin Williams Pro-Cryl Primer
2. Benjamin Moore Ultra Spec HP acrylic metal primer

2.4 FINISH COATINGS

A. EXTERIOR OIL-BASED PAINT, GLOSS: Oil-based, pigmented emulsion coating formulated for alkali, mold, microbial, and water resistance and for use on exterior surfaces, such as, portland cement plaster, and primed wood.

1. Sherwin Williams SWP
2. Gloss Level: **Manufacturer's standard gloss finish**

B. DTM Paint Solvent-based, pigmented, alkyd enamel formulated for mold, microbial, and water resistance and for use on exterior, metal surfaces.

1. Sherwin Williams Direct-Direct-To Metal Alkyd Enamel
2. Benjamin Moore Super Spec HP
3. Gloss Level: **Manufacturer's standard semigloss finish**

C. Exterior Masonry: Mineral Sol-Silicate Paint

1. Keim Soldalit

- D. Gold leaf:
 - 1. 23kt gold leaf
 - 2. 20 to 23 grams per 1000 leaves

2.5 EXAMINATION

- A. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.
- B. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

2.6 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
 - 2. Scrape and sand wood and metal surface to remove loose paint. Do not use chemical strippers or sand blasting on wood substrates. Coordinate work with section 028300 LEAD SAFE WORK PRACTICES

2.7 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

2.8 CLEANING AND PROTECTION

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

2.9 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates:

- 1. Direct to metal Alkyd Enamel System:
 - a. Prime Coat: **Alkyd metal primer**
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior alkyd enamel, **semigloss**.

B. Galvanized-Metal Substrates:

- 1. Alkyd System:
 - a. Pretreatment Coat: Vinyl wash primer.
 - b. Prime Coat: Quick-drying aluminum primer.
 - c. Intermediate Coat: Matching topcoat.
 - d. Topcoat: Exterior alkyd enamel, **semigloss**.

C. Aluminum Substrates:

- 1. Alkyd System:
 - a. Pretreatment Coat: Vinyl wash primer.
 - b. Prime Coat: Quick-drying aluminum primer.
 - c. Intermediate Coat: Matching topcoat.
 - d. Topcoat: Exterior alkyd enamel, **semigloss**.

D. Dressed-Lumber Substrates: **Trim, Architectural woodwork, Doors and Windows**

- 1. Oil-based over oil-based Primer System
 - a. Prime Coat: Exterior, oil base wood primer.
 - b. Intermediate Coat: oil base topcoat.
 - c. Topcoat: Exterior oil base paint, **semigloss or gloss**

E. Wood-Based Panel Substrates:

- 1. Oil based over Oil based Primer System:

- a. Prime Coat: Exterior, oil base wood primer.
- b. Intermediate Coat: Oil based topcoat.
- c. Topcoat: Exterior Oil based paint, **semigloss** or **gloss**.

F. Exterior Masonry

- 1. Silicate paint over silicate primer
 - a. Prime coat: Silicate prime coat
 - b. Topcoat: Silicate finish coat

END OF SECTION 099113

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SECTION 10 14 00 - CAST METAL PLAQUES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Signage of the following types:
 - 1. Cast or precision tooled metal plaques.

1.2 REFERENCES

- A. NAVY G 88-0-4 (C90300) - Alloy Specification for Tin Bronze.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's illustrated product literature and specifications to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Submit detailed drawings of products and assemblies.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer to have a minimum of 20 year experience in manufacturing cast plaques.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.
- C. Sourcing: All signage shall be manufactured by one manufacturer.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is approved by Architect.
 - 3. Rework mock-up area as required to produce acceptable work.

1.5 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

- B. Handle materials to avoid damage.

1.7 PROJECT 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 recommended limits.

1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty against defects in materials and workmanship. Letters shall be guaranteed for the life of the business against defects.

PART 2 PRODUCTS

2.1 CAST OR PRECISION TOOLED METAL PLAQUES

- A. Plaques: material to be owners' choice
 1. Material: Bronze (220 Commercial)
 2. Material: Aluminum (#5052).
- B. Design:
 1. Plaque shall be 26" diameter, multi color plaque custom design NY Court seal as included this section
- C. Fabrication:
 1. Size: 26" Diameter.
 2. Material Thickness: 5/16 inch (8 mm) to 1 inch (25 mm).
 3. Edges: Single Line
 4. Background Colors:
 - a. Color Custom: Blue to match "State of New York United Court System" Seal.
 - b. Color Custom: Yellow to match "State of New York United Court System" Seal.
 5. Surface Finish: Painted.
 - a. Multiple colors to match State of "New York United Court System" (Seal included this section.)
 6. Coating: Semi-Gloss.
- D. Mounting:
 1. Hardware and instructions are provided for selected mounting methods.
 2. Mounting Method: Blind Stud Mount.

2.2 CAST METAL LETTERS

- A. Cast Metal Letters Aluminum or bronze as selected by Architect:
 1. Material: Aluminum.
 2. Material: Bronze - no lead base metal.
- B. Design: As indicated on the drawings.
 1. Letter Style: All Capital letters, "CENTURY" font.
 2. Text "ULSTER COUNTY COURTHOUSE"
 3. Size: 6" High

4. Mounting: A mounting template designating stud locations shall be provided. Stud size and type shall be as required by manufacturer for application and design intent.
- C. Aluminum Finish: Architect to choose from any of the following finishes:
 1. Natural Satin faces, bead-blasted returns, clear acrylic polyurethane powder-coated, baked.
 2. Baked Enamel, bead-blasted returns, baked.
 3. Clear Anodized, bead-blasted returns, #514 Alloy.
 4. Gold anodized, bead-blasted returns, #514 Alloy.
 5. Medium bronze anodized, sanded return, #514 Alloy.
 6. Dark bronze anodized, sanded return, #514 Alloy.
 7. Black anodized, sanded return, #514 Alloy.
- D. Bronze Finish: Architect to choose from any of the following finishes:
 1. Natural satin faces, bead-blasted returns, sprayed with 2-part hardened acrylic polyurethane clear coat, NAVY G 88-0-4 lead- and mercury-free bronze alloy, baked.
 2. Polished, US9 Finish, hand-polished face, bead-blasted return, 2-part hardened acrylic polyurethane clear coat, NAVY G 88-0-4 lead- and mercury-free bronze alloy, baked.
 3. Oxidized, NAVY G 88-0-4 lead- and mercury-free bronze alloy, 2-part hardened acrylic polyurethane clear coat, US10B finish, baked.
 4. Green Patina, varies from letter to letter, not uniform.
- E. Mounting:
 1. Cast metal letters shall have threaded stud bosses or drilled and tapped for stud insertion.
 2. Aluminum letters under 18 inches (457 mm) shall use aluminum studs, type based on stroke and thickness.
 3. Other letter material and sizes shall use stainless steel studs.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper relationship to adjacent construction.

3.4 PROTECTION

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

END OF SECTION



State of New York Unified Court System seal for Plaque Design

SECTION 107423 CUPOLAS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide cupola work shown on the drawings, as specified herein, and as needed for a complete and proper installation.
- B. Coordinate steeple/cupola work of this section with General Conditions and Supplementary Conditions.

1.02 SUBMITTALS

- A. Submit shop drawings designed in accordance with local building code requirements. Proved shop drawings signed and sealed by NY state professional engineer that cupola and installation meet all NY State code and windload requirements. Shop drawings to include fastening and installation details. Upon approval, general contractor shall send to field or job-site superintendent copy of final approved shop drawing.
- B. Submit color samples of exterior covering, and window glazing.
- C. Submit certificates of insurance.
- D. Submit close-out documents, warranties, and manuals.

1.03 QUALITY ASSURANCE

- A. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts, and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use materials which shall be free from defects impairing strength, durability, and appearance; shall be of best commercial quality for purpose required; and shall comply with approved drawings.
- C. Use manufacturer who has had ten (10) years of experience in the manufacture of specified product.

1.04 WARRANTY

- A. Warrant the product for one year after date of completed installation by manufacturer of product.
- B. Warrant the product for one year after date of delivery of product installed by others.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Basis of design manufacturer is Campbellville Industries, Inc., P.O. Box 278, 440 Taylor Blvd., Campbellville, KY 42718, Phone: 800/467-8135, Fax: 270/465-6839. Website: <http://cvilleindustries.com>. E-mail: steeple@cvilleindustries.com.

- B. Cupola design as shown on drawings. Custom cupola to match all dimensions and details of existing metal cupola.

2.02 MATERIALS

- A. Use structural aluminum products according to the Construction Manual of the Aluminum Association, Inc., and shall be alloy 6061-T6.
- B. Use .032" aluminum cladding, 3003-H14 alloy, with available stock finishes.

2.03 ACCESSORIES

- A. Fabricate finial, weathervane and/or topping ornament true to dimensions, with welded or soldered joints, ground smooth.
- B. Form louver blades and firmly secure and rivet to frames, and back with 18 x 18 aluminum or copper screen.
- C. Form cornices, mouldings, and ornaments in accordance with approved drawings.
- D. Cast, stamp, form, and/or spin special ornaments in accordance with good and acceptable practices, and in accordance with approved drawings.

2.04 FABRICATION

- A. Fabricate structural aluminum framing with cold driven aluminum rivets, limiting welding to secondary architectural members.
- B. Form all exterior cladding with good and acceptable sheet metal practices, and lock form all seams inasmuch as possible.
- C. Conceal all exterior fasteners to maximum possibility.
- D. Use cadmium plated bolts, nuts, and washers for anchoring, unless anchoring materials are provided and installed by others.

2.05 FINISHES

- A. Use aluminum skin with Kynar 500 finishes, color to be custom color match existing metal cupola.
- B. Shop finish all aluminum castings, stampings, spinings, and accessories. Units shall be caustic etched, primed with 2 heavy coats of primer, and finished with 2 heavy coats minimum of industrial vinyl or enamel finish electrostatically applied and air dried.
- C. Paint all aluminum surfaces in contact with steel with one heavy coat of zinc primer, and paint all steel surfaces with 2 heavy coats red lead or zinc chromate, followed by one coat of aluminized bituminous paint.

2.06 CAULKING

- A. Clean and dry all surfaces to be caulked.
- B. Apply with caulking gun, using nozzle of proper size to fit the joint width.
- C. Use silicone caulking by Dow Corning, or approved equal.

PART 3 - EXECUTION

3.01 PROJECT SITE CONDITIONS

- A. Verify that site conditions are suitable and accessible for delivery and installation.
- B. Confirm that all preparatory work is in place in accordance with approved shop drawings before delivery and installation.

3.02 INSTALLATION

- A. Coordinate as required to assure proper and adequate installation.
- B. Clean all soiled and dirty areas and touch up any scratches or abrasions to finish before lifting into position.
- C. Install work with skilled workmen who are familiar with such work in accordance with approved shop drawings.
- D. Provide crane to for unloading and hoisting product into position for as long as required.
- E. Installation to include all required fastens, blocking and framing for a complete installation.

3.03 CLEAN-UP

- A. Clean up all debris caused by work of this section
- B. Keep the premises clean and neat at all times.

END OF SECTION

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SECTION 31 23 01 - EXCAVATION, BACKFILL, AND COMPACTION (BUILDING AREA)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including general and supplementary conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. This section pertains to an area bounded by 20-feet-minimum outside of and parallel to the exterior walls of the building, including canopies, loading docks, and other structures attached to the building.
- B. This work includes the following:
 - 1. Preparing subgrade for building slabs, walks, and pavements.
 - 2. Preparing subbase for support of building slabs.
 - 3. Excavating and backfilling for building structure.
 - 4. Excavating and backfilling of trenches within building lines.
 - 5. Excavating and backfilling for underground mechanical and electrical utilities and buried mechanical and electrical appurtenances.
 - 6. Excavating and backfilling for Mechanical/Electrical Work. Refer to mechanical and electrical sections for excavation and backfill required in conjunction with underground mechanical and electrical utilities and buried mechanical and electrical appurtenances.

1.3 QUALITY ASSURANCE

- A. Comply with: New York State Department of Transportation (NYSDOT) "Standard Specifications for Construction and Materials."
- B. Routine testing of existing soils and compacted material for compliance with these specifications will be performed as part of Special Inspections.
 - 1. Compacted material not meeting density requirements shall be removed or recompacted and retested at Contractor's expense.

1.5 MATERIAL EVALUATION/QUALITY CONTROL

- A. Preconstruction Testing: Contractor shall employ a special inspection program to perform the following services:
 - 1. Test materials proposed for use by Contractor to verify specified requirements.
 - a. Determine optimum moisture at which maximum density can be obtained in accordance with ASTM D 1557, Modified Proctor.
 - b. Perform particle size analysis in accordance with ASTM D 422.
 - 1. Identify soils requiring undercutting and replacement while observing proof rolling and when subgrade is exposed.
 - 2. Verify footing bearing strata.

3. Review and accept materials proposed by Contractor for use as compacted fill based on test data and information submitted by preconstruction Testing Agency. Architect shall coordinate review of submittals.
 4. Observe and accept filling and compaction procedures.
 5. Review and approve preparation of slab-on-grade subgrade and subbase.
- B. Geotechnical Engineer shall submit copies of reports to Special Inspector, Engineer, Architect, Construction Manager, and Contractor. Include date of site visit, description of work observed, and summary of observations and recommendations.

1.6 SUBMITTALS

- A. Submit to RDP for Geotechnical Engineering:
1. Product data, specifications, and installation instructions for proprietary materials.
 2. Material certifications for products specified to conform with NYS DOT references and ASTM references.
- B. Prior to placement of slab on grade, submit to Special Inspector and RDP for Structural Engineering a written protection program for vapor retarder, slab subbase, and slab on grade for record only.

1.7 DEFINITIONS

- A. Excavation: Removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.
- B. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect. Unauthorized excavation and remedial work directed by Architect shall be at Contractor's expense.
1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to Architect.
 2. In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification unless otherwise directed by Architect.
- C. Additional Excavation: If RDP for Geotechnical Engineering determines bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered. Replace excavated material as directed by Geotechnical Engineer.
1. Removal of unsuitable material and replacement as directed will be paid on basis of conditions of contract relative to changes in work.
- D. Subgrade: Undisturbed earth or compacted soil layer immediately below granular subbase, base of structure, or topsoil materials.

1.8 PROJECT CONDITIONS

- A. Site Information: Subsurface investigation reports were used for basis of design and are available to Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
 - 1. Additional test borings and other exploratory operations may be performed by Contractor at Contractor's option; however, no change in contract sum will be authorized for additional exploration.
- B. Existing Utilities: Locate existing underground utilities in work area before starting earthwork operations. Where utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 1. If uncharted or incorrectly charted piping or other utilities are encountered during excavation, consult with utility owner and Architect immediately for directions. Cooperate with Owner and public and private utility companies to keep services and facilities in operation. Repair damaged utilities as required by utility owner.
 - 2. Do not interrupt existing utilities serving facilities occupied by Owner or others during occupied hours except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided.
 - a. Provide minimum 48-hours notice to Architect and receive written notice to proceed before interrupting utilities.
 - 3. Demolish and remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.
- C. Use of Explosives: Do not bring explosives onto site or use in work.
- D. Protection of Property: Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - 1. Perform excavation by hand within drip line of large trees to remain. Protect root systems from damage and from drying out to greatest extent possible. Maintain moist condition for root system, and cover exposed roots with moistened burlap.

1.9 PRODUCT HANDLING

- A. Store materials so as to preserve their quality and fitness for work.

1.10 WORKMANSHIP

- A. Contractor shall be responsible for correction of work not conforming to specified requirements. Correct deficient work as directed by Architect.
- B. Remove work found to be defective. Replace with new acceptable work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General Fill Material: Soil materials free of clay, rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

- B. Structural Fill: Sound and durable sand and gravel, free of deleterious materials such as pyritic shale, organics, or contaminants of a chemical, mineral, or biological nature and conforming to the following limits of gradation:

Percent Passing by Weight	Sieve Size
100	3 inch
90 – 100	2 inch
75 – 90	3/4 inch
35 – 65	1/4 inch
5 – 40	No. 40
0 – 8	No. 200

- C. Subbase Material: Sound and durable gravel, free of organic and other deleterious materials, conforming to New York State Department of Transportation, paragraph 304-03, Type 2.
- D. Drainage Fill: Washed crushed stone or crushed or uncrushed gravel conforming to NYSDOT Section 703-02, size 2.
- G. Filter Fabric: "Geotex 351" by Propex Geosynthetics; "Mirafi 140N" by Mirafi, Inc.; or accepted equivalent.
- H. Excavated Materials: Do not use as structural fill or subbase material. Do not use as general fill material unless accepted by Geotechnical Engineer.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

- A. Examine substrates and conditions under which work shall be performed. Do not proceed with work until unsatisfactory conditions are corrected.
- B. Maintain drainage and restrict traffic within building area during construction to maintain integrity of subgrade. Failure to observe these precautions will require Contractor to remove disturbed areas and correct at his expense.

3.2 COLD-WEATHER PROTECTION

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.3 REMOVALS

- A. Clear, grub, and strip site of vegetation, topsoil, and other organic materials.
- B. Remove brick fragments and other construction debris. Plow-strip or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material can bond with existing surface.
1. When existing ground surface has a density less than that specified for a particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- C. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash, and debris. Legally dispose off Owner's property.

3.4 PROOF ROLLING

- A. Following stripping and removing miscellaneous fill, grade and compact exposed subgrade. Proof roll subgrade by making five passes across building area in each direction using smooth-drum vibrating roller having static weight of 10 tons minimum.
- B. Undercut soft spots that develop during proof rolling and replace with compacted structural fill. Contractor shall be paid for this work on unit cost basis.
- C. Do not perform proof rolling during or immediately after periods of inclement weather.

3.5 EXCAVATION

- A. Excavation shall be considered unclassified and understood to mean all materials encountered during excavation.
- B. Excavations shall be laid back or sheeted and braced to prevent sloughing in of sides. Maintain sides and slopes of excavations in stable condition until completion of backfill. Incline cut slopes no steeper than permitted by OSHA standards for excavations in soil type(s) encountered.
- C. Hand trim foundation excavations to remove loose soil or ridges of materials left by equipment.
- D. Keep loose material and debris out of excavations.
- E. Shoring and Bracing: Provide materials for shoring and bracing, including sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.
 - 1. Provide permanent steel sheet piling or pressure-cresotated timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops minimum 2 feet 6 inches below final grade, and leave permanently in place.

3.6 DEWATERING

- A. Dewatering activities shall conform to Stormwater Pollution Prevention Plan (SWPPP) implemented by site operator if required as a condition of construction permit.
- B. Perform excavation and filling in manner and sequence to provide proper drainage at all times.
- C. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.
 - 1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting of footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
 - 2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

3.7 STORAGE OF EXCAVATED MATERIALS

- A. On-site storage of excavated materials shall conform to Stormwater Pollution Prevention Plan (SWPPP)

implemented by site operator if required as condition of construction permit.

- B. Stockpile excavated materials acceptable for reuse. Place, grade, and shape stockpiles for proper drainage.
 - 1. Locate and retain soil materials away from edges of excavations. Do not store within drip lines of trees indicated to remain.
 - 2. Dispose of excess excavated soil material and materials not acceptable for use as general fill.

3.8 TRENCH EXCAVATION FOR PIPES AND CONDUIT

- A. Excavate trenches to uniform width sufficiently wide to provide ample working room and minimum of 6 to 9 inches of clearance on both sides of pipe or conduit.
- B. Do not locate trenches that are deeper than adjacent footings closer horizontally to footing than vertical distance separating bottom of trench and bottom of footing.
- C. Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
 - 1. For pipes or conduit less than 6 inches in nominal size and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 - 2. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90 degrees (bottom 1/4 of the circumference). Fill depressions with bedding or tamped cushion sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads to ensure continuous bearing of pipe barrel on bearing surface.

3.10 FILLING, BACKFILLING, AND COMPACTION

- A. Do not place fill material on surfaces that are muddy, frozen, or contain frost or ice.
- B. Use structural fill to increase grades within building areas, as interior backfill against foundations and in trenches, as exterior backfill against walls with footing drains and as exterior backfill where pavement or walkways abut building.
- D. Use general fill material to increase grades outside building area except as otherwise specified.
- F. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and are carried below bottom of such footings or pass under wall footings. Place concrete to level of bottom of adjacent footing.
- G. Backfill foundation excavations as soon as possible following construction of foundations and foundation walls.
- H. Backfill and fill against foundation walls evenly on both sides to prevent displacement of construction. For walls with fill on one side only, do not backfill until concrete has achieved 70 percent of its design strength and walls have been braced.
- I. Begin filling in lowest section of area.
- J. Place fill materials in layers not more than 8 inches in loose depth for material compacted by heavy

compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

- K. Lifts or portions thereof not compacted in accordance with specifications shall be recompacted or removed and replaced to meet compaction requirements.
- L. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density in accordance with ASTM D 1557, Modified Proctor:
 - 1. Under structures, footings, foundations, building slabs, and steps: Compact top 12 inches of subgrade and each layer of fill material to 95 percent.
 - 2. Under pavements: Compact top 12 inches of subgrade and each layer of fill material to 95 percent.
 - 3. Subbase Material: Compact to 95 percent with moisture content no greater than 2 percent wet of optimum.
 - 4. Under walkways: Compact top 6 inches of subgrade and each layer of fill material to 95 percent.
 - 5. Under lawn or unpaved areas: Compact top 6 inches of subgrade and each layer of fill material to 90 percent.
 - 6. Cushion sand: Compact to 100 percent.
- M. Where a power roller is used for compaction, do not approach nearer than 10 feet from walls of new or existing construction.
- N. Moisture Control: Where subgrade or layer of soil material must be moisture- conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
 - 1. Remove and replace or scarify and air dry soil material too wet to permit compaction to specified density.
 - 2. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to satisfactory value.

3.11 TOLERANCES

- A. Excavation for structures shall conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot except to facilitate drainage during construction stage.
- B. Surface of subbase under building slabs shall be graded smooth and even, free of voids, and rolled to required elevation. Provide final grades within tolerance of 1/2 inch when tested with 10-foot straightedge.

END OF SECTION

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