

TABLE OF CONTENTS

<u>DOCUMENTS</u>		<u>Pages</u>
Table of Contents		TOC-1 - 1
<u>DIVISION 01</u>	<u>GENERAL REQUIREMENTS</u>	
Sect. 011000	Summary	011000-1 - 4
012500	Substitution Procedures	012500-1 - 3
012600	Contract Modification Procedures.....	012600-1 - 2
012900	Payment Procedures	012900-1 - 4
013100	Project Management & Coordination.....	013100-1 - 5
013300	Submittal Procedures.....	013300-1 - 7
014200	References	014200-1 - 3
015000	Temporary Facilities & Controls.....	015000-1 - 3
016000	Product Requirements	016000-1 - 5
017300	Execution.....	017300-1 - 6
017419	Construction Waste Management & Disposal.....	017419-1 - 2
017700	Closeout Procedures	017700-1 - 5
017839	Project Record Documents	017839-1 - 3
<u>DIVISION 04</u>	<u>MASONRY</u>	
Sect. 040120	Masonry Repair Work	040120-1 - 5
<u>DIVISION 05</u>	<u>METALS</u>	
Sect. 055000	Metal Fabrications	055000-1 - 4
<u>DIVISION 06</u>	<u>WOOD, PLASTICS & COMPOSITES</u>	
Sect. 061000	Rough Carpentry	061000-1 - 3
<u>DIVISION 07</u>	<u>THERMAL & MOISTURE PROTECTION</u>	
Sect. 070150	Preparation for Reroofing.....	070150-1 - 4
074113	Standing Seam Metal Roofing.....	074113-1 - 7
075113	Asphalt Shingles Roofing.....	075113-1 - 6
075320	Adhered TPO Roofing.....	075320-1 - 8
076200	Sheet Metal Work.....	076200-1 - 8
077100	Roof Hatch.....	077100-1 - 3
079200	Joint Sealants	079200-1 - 3
<u>DIVISION 08</u>	<u>OPENINGS</u>	
Sect. 086200	Unit Skylights.....	086200-1 - 4

END TABLE OF CONTENTS.

SECTION 011000
SUMMARY

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:
 - 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Work under separate contracts.
 - 4. Access to site.
 - 5. Coordination with occupants.
 - 6. Work restrictions.
 - 7. Specification and drawing conventions.
 - 8. Miscellaneous provisions.
- B. Related Requirements:
 - 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: Reroofing Project at Various Schools:
 - 1. Locations:
 - a. Lewis Lemon: 1993 Mulberry Street, Rockford, IL 61101.
 - b. Ellis: 222 South Central Avenue, Rockford, IL 61102.
- B. Owner: Board of Education of Rockford School District No. 205, 501 Seventh Street, Rockford, Illinois 61104.
- C. Architect: Richard L Johnson Associates, Inc., 4703 Charles Street, Rockford, IL 61108.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of the Project is defined by the Contract Documents and consists of Reoofing Work.

- B. Contractor is responsible for construction means, methods and sequencing. Architect will not have control over, be in charge of, or be responsible for construction means, methods, techniques, sequences, procedures or safety precautions and programs in connection with the Work, as these are solely within the responsibility of the Contractor. Architect shall not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

1.5 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.
- B. Concurrent Work: Owner will award a separate contract for the following construction operations at the project site. Those operations will be conducted simultaneously with work under the contract.
 - 1. An Environmental Demolition Contractor (Asbestos Abatement) will be removing existing windows prior to new window installation. These openings will be watertight prior to window and door replacement construction phase of this project.
 - 2. The Environmental Demolition Contractor(Asbestos Abatement) will be responsible for making sure that, after they have remove any and all of the existing windows, that they are required to provide a weather-tight exterior seal as well as an interior seal, prior to the window subcontractor starting his scope of work.
 - 3. Once the Window Contractor removes any of the Demolition Contractor's weather-tight seals, it will be the Window Contractor's responsibility to provide any and all exterior and interior weather-tight seals as required to complete their scope of work.

1.6 ACCESS TO SITE

- A. General: 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.
 - 1. Driveways, Walkways and Entrances: Keep driveways loading areas, 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 storage of materials.
 - a. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. 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.

1.7 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Normal business working hours will be 7:00 a.m. to 3:30 p.m., Monday through Friday. However, Contractor can work weekends and nights with prior notification to the Owner.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.
- D. Nonsmoking Building: Smoking is not permitted within the building or anywhere on the site.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

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. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS & PART 3 – EXECUTION (Not Used)

END OF SECTION 011000

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 012500
SUBSTITUTION PROCEDURES

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 substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Provide on Contractor's letterhead.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

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 handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue through Owner supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.
- B. The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:
 - 1. For the Contractor, for Work performed by the Contractor's own forces, twelve percent of the cost.
 - 2. For the Contractor, for Work performed by the Subcontractor's, five percent of the amount due the Subcontractors.
 - 3. For each Subcontractor involved, for Work performed by the Subcontractor's own forces, five percent of the cost.
 - 4. For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five percent of the amount due the Sub-subcontractor.
 - 5. In order to facilitate checking of quotations for extras and credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Work Change Directive: Architect may issue a Construction Work Change Directive on AIA Document G714 Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

END OF SECTION 012600

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 012900
PAYMENT PROCEDURES

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 necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 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 other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of 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. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 5. 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. If required, include evidence of insurance.
 6. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
 7. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 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.
1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- 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 10th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

- 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 and/or Project Manager 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 of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect or Program Manager 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.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 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. 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. Submittal schedule (preliminary if not final).
 - 5. List of Contractor's staff assignments.
 - 6. List of Contractor's principal consultants.
 - 7. Copies of building permits.
 - 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 9. Initial progress report.
 - 10. Certificates of insurance and insurance policies.
 - 11. 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 G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707-1994, "Consent of Surety to Final Payment."

PART 2 - PRODUCTS & PART 3 – EXECUTIONM (Not Used)

END OF SECTION 012900

SECTION 013100

PROJECT MANAGEMENT & COORDINATION

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 provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination drawings.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: AIA Document G716.
 - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

1.8 PROJECT MEETINGS

- A. General Contractor: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect.
 - 1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. Progress cleaning.
 - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

- C. Progress Meetings: General Contractor to conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
 4. Minutes: The Architect will be responsible for conducting the meeting and will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS & PART 3 – EXECUTION (Not Used)

END OF SECTION 013100

DIVISION 01 – GENERAL REQUIREMENTS

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 other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 5 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- C. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
 5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Architect.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number, numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
 - 18) Signature of transmitter.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

1. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
 3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. Submit Product Data before or concurrent with Samples.
 5. Submit Product Data in the following format:
 - a. PDF electronic file.
 - b. Three paper copies of Product Data unless otherwise indicated. Architect will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
 - b. Two opaque (bond) copies of each submittal. Architect will return one copy.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Submit product schedule in the following format:
 - a. PDF electronic file.
 - b. Three paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- H. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- I. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- K. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- L. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- M. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- N. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- O. Schedule of Test and Inspections: Comply with requirements specified in Section 014000 "Quality Requirements".
- P. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Contractor's Review Stamp: review each submittal with a uniform, review stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's review stamp and will return them without action.
- B. Action Submittals: Architect's review is performed to determine general conformance with the design concept set forth in the Contract Documents. Review does not relieve Contractor of sole responsibility for means, methods, sequencing, scheduling of work, verification of quantities and dimensions or the performance of the work in a safe manner. No comments on the shop drawings will relieve the Contractor from performing the work in a manner consistent with the Contract Documents. Architect's review will indicate action mark as follows:
 - 1. Reviewed.
 - 2. Note Comments.
 - 3. Rejected.
 - 4. Not reviewed/Outside scope of Services.
 - 5. Resubmit After Required General Contractor Review.
 - 6. Revise.
 - 7. Resubmit.
- C. Subcontractors are not to use shop drawings and submittals to ask questions or request information. All questions must be asked through the RFI.
- D. Architect is not responsible for correcting errors in the shop drawings or submittals.
- E. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- F. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- G. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 014200
REFERENCES

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 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in the following list:
 - 1. AA – Aluminum Association (The).
 - 2. AIA - American Institute of Architects (The); www.aia.org.
 - 3. AISC - American Institute of Steel Construction; www.aisc.org.
 - 4. AISI - American Iron and Steel Institute; www.steel.org.
 - 5. ANSI - American National Standards Institute; www.ansi.org.
 - 6. ASTM - ASTM International; www.astm.org.
 - 7. AWPA - American Wood Protection Association; www.awpa.com.
 - 8. CSI - Construction Specifications Institute (The); www.csinet.org.
 - 9. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
 - 10. DHI - Door and Hardware Institute; www.dhi.org.
 - 11. GANA - Glass Association of North America; www.glasswebsite.com.
 - 12. ICBO - International Conference of Building Officials; (See ICC).
 - 13. ICC - International Code Council; www.iccsafe.org.
 - 14. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
 - 15. NFPA - National Fire Protection Association; www.nfpa.org.
 - 16. NFPA - NFPA International; (See NFPA).
 - 17. NFRC - National Fenestration Rating Council; www.nfrc.org.
 - 18. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
 - 19. SPIB - Southern Pine Inspection Bureau; www.spib.org.
 - 20. UL - Underwriters Laboratories Inc.; www.ul.com.
 - 21. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
 - 22. WDMA - Window & Door Manufacturers Association; www.wdma.com.
 - 23. WWPA - Western Wood Products Association; www.wwpa.org.

- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. ICC - International Code Council; www.iccsafe.org.
 2. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 2. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 3. DOE - Department of Energy; www.energy.gov.
 4. EPA - Environmental Protection Agency; www.epa.gov.
 5. FG - Federal Government Publications; www.gpo.gov.
 6. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
 7. OSHA - Occupational Safety & Health Administration; www.osha.gov.
- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. FED-STD - Federal Standard; (See FS).

PART 2 - PRODUCTS & PART 3 – EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000

TEMPORARY FACILITIES & CONTROLS

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 requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. None.

2.2 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.
- B. Portable Toilet Facilities – Contractors to provide portable toilet facilities for workers to use.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

3.2 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- C. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

- D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- E. Temporary Elevator Use if Available: Use of existing elevators is permitted.
- F. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- C. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

END OF SECTION 015000

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 016000
PRODUCT REQUIREMENTS

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 selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 014200 "References" for applicable industry standards for products specified.

1.3 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. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process 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 specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 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.

1.6 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.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.

3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 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 warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for 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 with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

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 not in conflict with 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.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
 - a. Restricted List: 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.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. 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 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 Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or 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: 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 these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 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.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300
EXECUTION

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 general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning and final cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - a. Refer to Unit Specifications.
2. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine walls for suitable conditions where products and systems are to be installed.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Proceed with patching after construction operations requiring cutting are complete.

- F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 3. Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS AND FINAL CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
 4. Contractor shall provide final cleaning of all new glass and aluminum window frames.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- K. Provide final cleaning of all disturbed areas. Clean all glass and frames.

3.7 STARTING AND ADJUSTING

- A. Confirm proper operation of components. Remove malfunctioning units, replace with new units and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

END OF SECTION 017300

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT & DISPOSAL

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 the following:
 - 1. Disposing of nonhazardous construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
 - 2. Provide plywood under the wheels of the dumpsters.

- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 017700
CLOSEOUT PROCEDURES

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 contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for progress cleaning of Project site.
 - 2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

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

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 5. Submit test/adjust/balance records.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Perform preventive maintenance on equipment used prior to Substantial Completion.
 3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 4. Participate with Owner in conducting inspection and walkthrough.
 5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 6. Complete final cleaning requirements, including touchup painting.
 7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Preliminary procedures: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect, will return annotated file.
 - b. Three paper copies. Architect will return two copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1.10 ELECTRONIC CLOSEOUT DOCUMENTATION

- A. General: Provide a complete project Closeout Documentation Package in electronic format. This package shall include:
 1. Project Record Documents.
 2. Approved submittals.
 3. Operation and Maintenance Manuals.
 4. Warranties.
 5. Project Contact Directory.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

- b. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - e. Remove debris and surface dust from limited access spaces.
 - f. Sweep concrete floors broom clean in unoccupied spaces.
 - g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - h. Clean transparent materials, including and in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish glass, taking care not to scratch surfaces.
 - i. Remove labels that are not permanent.
 - j. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
- 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 017700

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 017839
PROJECT RECORD DOCUMENTS

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 project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and one of file prints.
 - 3) Submit record digital data files and one set of plots.
 - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit three paper-copy sets of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and three sets of prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and PDF electronic files of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit one paper copy and PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file with comment function enabled.
 - 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file and paper copy.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

DIVISION 04 – MASONRY
SECTION 040120
MASONRY REPAIR WORK

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. Work Included In This Section Features.
 - 1. Repointing (tuckpointing).
 - 2. Brick Replacement.
 - 3. See drawings for all scope of work.
- B. Related Requirements:
 - 1. Section 079000: Standards for sealant work.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the standards of masonry installation described and prescribed by:
 - 1. Brick Institute of America (BIA).
 - 2. Masonry Standards Joint Committee (MSJC) Spec. (ACI 530.1/ASCE 6/TMS 602).
- B. Workers' Qualifications: Repair work shall be performed by experienced tuckpointing craftsmen.
 - 1. Submit to Architect upon request the résumés of workmen's experience.
- C. Scheduling: Schedule work to allow ample time for curing, sample approvals and inclement weather.

1.4 SUBMITTALS

- A. Process all submittals as required in Section 013300 "Submittal Requirements".

- B. Samples:
 - 1. Submit samples of mortar.
 - 2. Submit to Architect for approval of appearance 3 samples of brick proposed to replace existing brick. Submit with the sample brick, the manufacturer's notarized statement confirming brick's conformance with grade requirements specified.
- C. Sample of Installation: Prior to beginning the tuckpointing work, the tuckpointing craftsman shall complete a sample area approximately 4ft x 4ft to illustrate the workmanship and match of materials proposed for the Work.
 - 1. The location of the sample area will be selected by the Architect.
 - 2. Rework each sample area before start of tuckpointing work until the Architect's acceptance of the visual qualities of the sample is obtained. Allow sample work to completely dry out before soliciting Architect's approval.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Cement, Lime, Etc:
 - 1. Deliver in original unopened packaging, plainly marked with manufacturer's original product identification labels.
 - 2. Mortar materials in broken or water-stained packages or which have hardened shall not be incorporated into the work but shall be immediately removed from the site.
- B. Protection from Damp. Protect all masonry materials from precipitation and dampness.
 - 1. Sand and Aggregates: Store on clean hard surfaces and isolate from below-grade moisture.
 - 2. Cement and Lime: Store cement and lime isolated from below-grade moisture and away from cold concrete walls, floors and masonry.

1.6 GUARANTEE

- A. The Contractor shall provide to the Owner a written guarantee for all materials and workmanship, including sealants, for a period of 2 years from the date of final acceptance.
- B. Submit guarantee to the Architect for transmission to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Face Brick:
 - 1. Size, Shapes and Face Texture. See drawings for brick spec.
- B. Mortar:
 - 1. Mortar Materials:

- a. Portland Cement: ASTM C 150, non-staining, Type I, natural color or white as required to produce the required mortar color.
 - b. Hydrated Lime: ASTM C 207, Type S.
 - c. Sand: Natural white sand, ground white stone, ground marble, granite or other sound stone, as required to make required colors, meeting ASTM C 144; 100% passing #8 sieve; max. 15% - 30% passing #50 sieve.
 - 1) For joints less than 1/4", 100% must pass #16 sieve.
 - d. Mortar Pigments: Commercial iron oxide, manganese dioxide or carbon black, compounded for use in mortar mixes.
 - e. Water: Clean, potable, free from oil, soluble salts, acids, alkalis, organic impurities, deleterious materials.
 - f. Additives: None allowed, unless otherwise approved.
2. Mortar Mix: Type N lime cement mortar per ASTM C 270: 1 part portland cement, 6 parts damp loose sand, 1 part hydrated lime, by volume.
 - a. Compressive Strength: After 28 days' curing shall not exceed 60% of compressive strength of brick. Submit samples of mortar when so requested by Architect.
 - b. Color: Mortar mix ingredients shall be adjusted for color so that cured color of new mortar will look the same as existing mortars.
 3. Mixing: Mix materials only in a clean mechanical batch mixer.
 - a. Measurement: Measure cementitious and aggregate material in a dry condition by volume. Do not measure by shovel; use known measure.
 - b. Mixing:
 - 1) Thoroughly mix cementitious and aggregate materials together before adding any water.
 - 2) Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball.
 - 3) Maintain mortar in this dampened condition for 1 to 2 hours.
 - 4) Add remaining water in small portions until mortar of desired consistency is reached.
 - c. Temper: Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened materials.
- C. Cleaners:
1. Chemical Cleaners: Masonry cleaning agents as manufactured by Prosoco, Deidrich Chemical, Sure Klean or approved equal.
 2. Use chemical cleaners as required if power washing alone does not clean the masonry.
 3. Water: Clean potable water fresh from tap in building.
- D. Sealant: Refer to Section 079000 "Joint Sealants" for all sealant material requirements.

PART 3 - EXECUTION

3.1 PREPARATORY CLEANING

- A. Protection of Surrounding Surfaces: Provide all necessary shields, barriers and other precautions to properly protect surrounding surfaces from cleaning operations, including glass, plants, lawns, automobiles and passersby.
- B. Manufactured Cleaners:
 - 1. When using manufactured cleaners, clean in accordance with manufacturer's instructions and recommendations, product data, and container label instructions.
 - 2. Mix materials in strict accordance with manufacturer's instructions; do not dilute unless permitted by manufacturer.
- C. Brick Masonry: Clean all disturbed surfaces with high-pressure water spray and cleaners as specified so that resulting surfaces have a uniform appearance. Water pressure shall not exceed 2,700 psi. Use a zero spinning tip.

3.2 TUCKPOINTING

- A. Scope: Tuckpoint defective masonry in locations shown on the drawings.
- B. Inspect for Defective Mortar Joints: Inspect carefully. Defective joints are those with missing, building, badly deteriorated or broken mortar materials. Joints with fine hairline cracks, but which are otherwise sound, are not defective.
- C. Cut Out Defective Joints: All defective mortar joints are to be cut out as necessary to obtain solid backing but not less than 1/2" deep nor more than 1/3 the depth of the masonry unit.
- D. Cleaning of Joints: Clean the cut joints with compressed air or high-pressure water to remove all dust or dirt that could be detrimental to the installation of new mortar. Regulate pressure so as to prevent removal of sound masonry.
- E. Mortar Placement: Before placing mortar, dampen the joint and allow surrounding masonry to absorb all of the water. Place pointing mortar in joints free of visible water, laid in 1/4" thick layers. Fully compact each layer and allow to become thumbprint hard before applying next layer.
- F. Excess Mortar: Remove from edge of joint by brushing.
- G. Tooling: When final layer is thumbprint hard, tool mortar surface concave so as to make a waterproof joint.
- H. Curing: Maintain mortar in a damp condition for at least 72 hours.
- I. Required Result: Appearance of new mortar, when completely dry, shall match existing dry mortar.

3.3 MASONRY REMOVAL AND REBUILDING

- A. Brick Removal:

1. Carefully remove by hand at locations indicated any brick which are damaged, cracked or deteriorated. Cut out full units from joint to joint and in manner to permit replacement with full size units.
2. Support and protect masonry indicated to remain which surrounds removal area.
3. Clean remaining brick at edges of removal areas by removing mortar, dust, and loose debris in preparation for rebuilding.

B. Brick Rebuilding:

1. Install new brick to replace removed brick. Fit replacement units into bonding and coursing pattern of existing brick. If cutting is required use motor driven saw designed to cut masonry with clean, sharp unchipped edges.
2. Lay replacement brick with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet clay brick which have ASTM C-67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which insure that units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing.
3. Tool exposed mortar joints in repaired area to match joints of surrounding existing brickwork.
4. Repoint new mortar joints in repaired area to comply with requirements for repointing existing masonry.
5. Reuse existing brick where called for in the drawings.

3.4 FINAL TOUCH-UP AND CLEANING

- A. General: Leave repaired masonry with tuckpointed mortar and new bricks looking the same as existing masonry.
- B. As Work Progresses: Dry wipe clean all areas of repair work. At completion of work in each area, clean from top down with stiff bristle brushes as required to remove mortar from face of brick. Removal of excess mortar with solvents and cleaning agents shall only be done as approved by Architect.
- C. Construction Rubble, Debris, Equipment, Etc.: Remove from area and leave all building areas and site in clean and acceptable condition.

END OF SECTION 040120

DIVISION 05 – METALS
SECTION 055000
METAL FABRICATIONS

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. Items fabricated from iron and steel shapes, plates, bars, strips, tubes and pipes which are not part of the steel structural framing or other metal systems in other Sections of the Specifications. The items of this Section include but are not necessarily limited to the following:
 - a. Roof access steel ladders and security cover.
 - 2. Anchorages of type appropriate to the supporting structure and as required to provide a sturdy installation resistant to all reasonable loads.
 - 3. Cutting, reinforcing, drilling and tapping as required to erect the work and to fit it with work provided under other Sections of the Specifications.

1.3 COORDINATION

- A. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorage that are to be embedded in existing masonry. Deliver such items to Project site in time for installation.

1.4 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for:
 - 1. Roof access steel ladders and security cover.

1.5 QUALITY ASSURANCE

- A. Field Measurements: Take prior to preparation of Shop Drawings and fabrication, where possible. Take measurements in time, so as to avoid delaying job progress. Allow for trimming and fitting.

- B. Qualifications of Welders: Welding operators for shop fabrication shall be qualified, in accordance with AWS “Standard Qualifications Procedure.”
- C. Codes and Standards: Comply with the following unless otherwise indicated:
 - 1. AISI, Steel Products Manual, Stainless and Heat Resisting Steel.
 - 2. ANSI A58.1, Minimum Design Loads in Buildings and Other Structures.
 - 3. AWS D1.1 “Structural Welding Code.”
 - 4. OSHA: 1910.27 and 1926.1053.
 - 5. All applicable building codes having jurisdiction.
 - 6. Americans with Disabilities Architectural Guidelines.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes, including pitting, seam marks, roller marks, rolled trade names and roughness.
 - 1. Steel Plates, Shapes, and Bars: ASTM A 36.
 - 2. Steel Tubing: Hot-formed, welded or seamless, ASTM A 501.
 - 3. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
 - 4. Galvanized Carbon Steel Sheets: ASTM A 526, with ASTM A 525, G 90 zinc coating.
 - 5. Steel Sheets In Assemblies To Be Galvanized: ASTM A 569 or A 1011.
- B. Anchor Bolts: Unfinished threaded fasteners per ASTM A 307, nonheaded type unless otherwise indicated

2.2 SHOP FINISH

- A. Shop Painting: Apply manufacturer’s standard powder coat finish over the entire assembly.
 - 1. Extent: Shop paint all miscellaneous and ornamental metal work, except surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
 - 2. Surface Preparation: Remove scale, rust, grease, oils and other deleterious materials before applying shop coat of paint.

2.3 FABRICATION – GENERAL

- A. Sizes and Thicknesses: As shown, or, if not shown, as required to produce adequate strength and durability in the finished products. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

- B. Preassembly in Shop: Preassemble the 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.
- C. Dissimilar Metals: Wherever dissimilar metals come into contact, insert lead washers, spacers or gaskets between them to provide electrolytic insulation.
- D. Workmanship: Form exposed work true to line and level, with accurate angles and surfaces and straight, sharp smooth edges.
- E. Welds: Weld corners and seams continuously and in accordance with recommendations of American Welding Society. Grind exposed welds smooth and flush.

2.4 FABRICATION SPECIFICS

- A. Exterior Steel Ladder:
 1. Construction: 1'-6" wide, made from 1/2" x 2-1/2" flat steel bar side rails with eased edges. Weld on offset mounts to attach ladders to walls at distance from walls shown on Drawings.
 2. Rungs shall be anti-slip, 13 ga. steel rung Grainger #1ZDR1 or Architect approved equal, butt welded to rails:
 3. Security Cover: Lockable, Cotterman Model LG8 or architect approved equal.
 4. Finish: powder coat.

2.5 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
 5. All contacts with steel angles shall be welded.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint.

END OF SECTION 055000

DIVISION 08 – OPENINGS
SECTION 061000
ROUGH CARPENTRY

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. Materials:
 - 1. Wood blocking and nailers.
 - 2. Plywood sheathing.
 - 3. Wood treatment.
- B. Related Requirements:
 - 1. Section 075423 "Adhered TPO Roofing"
 - 2. Section 076200 "Sheet metal Work"

1.3 ACTION SUBMITTALS

- A. Product Data: Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
- B. 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.
- C. Evaluation Reports:
 - 1. For Wood-preservative-treated wood, from ICC-ES:
 - 2. Fire Retardant Treated Wood: Submit certification from treating plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS,

- A. GENERAL
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
 - 3. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

- B. Plywood Sheathing: $\frac{3}{4}$ " CDX plywood. (Treated per AWPB C9).
- C. Lumber: Worked and graded in accordance with American Lumber Standard PS 20 (U.S. Dep. Comm.), S4S, seasoned to moisture content not exceeding 19% and stamped "S-DRY."
 - 1. Headers, Rough Frames, Nailers, and Blocking, etc.: #1 Common Southern Yellow Pine, or equivalent SPF, or Douglas Fir.

2.2 WOOD BLOCKING AND NAILERS

- A. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work

2.3 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 pressure-preservative treated provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.4 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPB U1; Use Category UC2 for interior construction. Use Category UC3b for exterior construction.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- 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 all rough carpentry unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Nailers and Blocking: Execute in a manner to achieve greatest stability.
1. General: Use 2x4 wood studs spaced 16" o.c. except as indicated otherwise. Extend partition studs to the structure above.
 2. Plates: Provide single bottom plate and double top plates of matching 2x material; except single top plate may be used for non-load bearing partitions. Joints in top plates shall be lapped at least 6"; do not join over wall openings.
 3. Anchorage at Exterior Walls: Anchor the bottom plate with foundation bolts over sill sealer.
 4. Corners and Intersections: Construct with not less than 3 studs; or use "The Nailer" screw tabs to eliminate the stud traditionally provided only to back the edge of the drywall. Provide screw tabs 12" o.c. along each edge of drywall.
 5. Control Joints: Provide double studs at all gypsum board control joint locations. Place as indicated and so that no expanse of wall exceeds 30 feet, consistent with lines of building spaces, as approved by Architect.
 6. Nailers and Blocking Within Walls:
 - a. Provide wherever shown and where required for attachment of work of other trades. Cut and fit as required for true line and level of work to be attached.

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 enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label

END OF SECTION 061000

DIVISION 7 – THERMAL & MOISTURE PROTECTION

SECTION 070150
PREPARATION FOR REROOFING

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. Removal of existing roofing material, ballast, roof sheet metal work and related accessories in preparation for installation of new roof membrane systems.
2. Removal and re-installation of items as listed on drawings.
3. Protection of existing rooftop structures designated to remain.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.
2. Section 074311 "Standing Seam Metal Roofing" for new reroofing work.
3. Section 075311 "Asphalt Shingle Roofing" for new reroofing work.
4. Section 075423 "Adhered TPO Roofing" for new reroofing work.
5. Section 076200 "Sheet Metal Work" for sheet metal work related to reroofing.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.
- B. Roof Tear-Off: Removal of selected components and accessories from existing roofing system as noted on drawings under Demolition Box Notes:
 1. Existing Roofs Composition: Refer to drawings.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, sections, and details.

1.5 QUALITY ASSURANCE

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

1.6 FIELD CONDITIONS

- A. Existing Roofing Systems: See drawings
- B. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations are not disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
 - 1. Coordinate work activities daily with Owner so Owner can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. 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.
 - 1. Remove only as much roofing in one day as can be made watertight in the same day.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

- A. Sheet polyethylene or fiber reinforced plastic sheeting. Provide weights to retain sheeting in position.

2.2 INFILL AND REPLACEMENT MATERIALS

- A. Use infill materials matching existing roofing system materials unless otherwise indicated.
 - 1. Replace any wood blocking/nailers around the perimeter of roof line as required with new treated wood blocking/nailers specified in Section 061000 "Rough Carpentry."

2.3 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Shut off rooftop utilities and service piping, if any, before beginning the Work.
- B. Protect existing roofing system that is not to be reroofed.
- C. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- D. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- E. Remove existing roof mounted equipment and devices.
- F. Store and protect existing devices which are to be reinstalled.

3.2 ROOF TEAR-OFF

- A. Remove accessories from roofing as required.
- B. Roof Tear-Off: Remove existing roofing and other roofing system components as shown on the drawings.
 - 1. Inspect wood blocking, curbs, and nailers for deterioration and damage. If wood blocking, curbs, or nailers are deteriorated, replace with new treated wood blocking/nailers specified in Section 061000 – “Rough Carpentry”.
 - 2. Removal of insulation where designated on drawings.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If deck surface is unsuitable 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 BASE FLASHING REMOVAL

- A. Remove existing base flashings. 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.
- C. Inspect wood blocking, curbs, and nailers for deterioration and damage. If wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

- D. When directed by Architect, replace wood blocking, curbs, and nailers to comply with Section 061000 "Rough Carpentry."

3.5 DISPOSAL

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

END OF SECTION 070150

DIVISION 7 – THERMAL & MOISTURE PROTECTION

SECTION 074113
STANDING SEAM METAL ROOFING

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: Alternate Bid No. 1:
1. Preparation of existing roofing for covering with new metal roof system.
 2. Standing seam metal roofing systems and accessories.
 3. Nailbase insulation(non-vented).
 4. Ice and water barrier.
 5. Fasteners and adhesives.
 6. Sealants.
- B. Related Work Specified In Other Sections:
1. Section 013300 "Submittal Procedures" for submittal of required items.
 2. Section 012300 "Alternates" for alternate work related to this section.
 3. Section 061000 "Rough Carpentry" for wood blocking and nailers.
 4. Section 070150 "Preparation for Reroofing" for removal of existing roofing.
 5. Section 074311 "Standing Seam Roofing"
 6. Section 075311 "Asphalt Shingle Roofing"
 7. Section 076200 "Sheet Metal Work" Sheet metal work and roof trim.

1.3 QUALITY ASSURANCE

- A. Roofing Contractor: Illinois licensed, specializing for at least 5 years in the type of system involved, who is approved by Architect and is certified/licensed by new roofing system producer and who can furnish for this installation a foreman factory trained by the roofing system producer.
- B. Source of Supply: Metal system materials shall be obtained from a single source of supply except as authorized otherwise by membrane producer.
- C. Installation Standard: Roof system components shall be furnished and installed to meet:
1. Water Infiltration: No visible water at vertical panel joints when tested at a minimum pressure differential of 20% between 6.24 psf and 12 psf, per ASTM E 1646.
 2. Air Infiltration: No more than .09 cfm per square foot of panel when tested at 4 psf per ASTM E 1680.
 3. Wind Uplift Resistance: min. 72 mph wind.

- D. Compatible Materials: All materials and accessories furnished shall be approved and recommended by the roof panel manufacturer.
- E. Scheduling and Coordination:
 - 1. Schedule roof removal work to coincide with commencement of installation of new roofing system.
 - 2. Coordinate roofing installation with mechanical work associated with roof penetrations.
 - 3. No phased construction will be considered or approved.
- F. Wet and Damaged Materials: Shall not be installed.

1.4 SUBMITTALS

- A. Process all submittals as required in Section 013300 – Submittals.
- B. Product Data: Submit 3 copies of roofing materials producer's specifications, material characteristics and installation instructions for each product required including fasteners.
- C. Samples: Submit 2 complete sets of proposed color, using the specified finish on the same metal as will be used for the roofing panels. Final approval of color will be made by Architect.
- D. Shop Drawings: Submit for review complete Shop Drawings and erection details specific to the project. Scales shall be sufficiently large to show all components clearly.
 - 1. Show methods of erection, diagrammatic plan and elevations, sections and details, anticipated loads, flashings, roof curbs, sealants, gauges, finishes and interfaces with surrounding materials.
 - 2. Show details of every intersection. Show flashings. Use isometric and perspective drawings of non-standard conditions.
 - 3. Show how seals to reject water between components are to be made continuous.
- E. Manufacturer's Data: Submit 2 copies of metal roofing manufacturer's specifications, installation instructions and recommendations for roofing applications:
 - 1. Include performance data on the panels, anchor clips and fasteners.
 - 2. Include Product Data for underlayment.
- F. Submit manufacturer's written guarantee at completion of work.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Packaging: Deliver materials to the job site in their original containers or packages, sealed, with legible labels intact, brand name, lot number, warning labels and reference standards clearly shown.
- B. Temperatures Prior to Use: Store materials in the dry and in accordance with roofing producer's instructions.
- C. Warped or Broken Insulation Boards: Shall be removed from site.

1.6 JOB CONDITIONS

- A. Coordinate work so that the existing roofing system is not removed when weather conditions threaten the integrity of the building contents or intended continued occupancy.
- B. Maintain continuous temporary protection after removal of existing roofing, until installation of new roofing system, whenever precipitation is forecast.
- C. Ambient Conditions: Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
- D. Cold Weather: Follow membrane producer's special recommendations when cold weather retards free flow of adhesives and sealants. Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
- E. Fire Prevention: Take every precaution to prevent fire.
 - 1. Maintain at least 2 portable fire extinguishers, rated 10-B:C-20 pounds, near area where adhesives are being used and train applicators in their proper use.
 - 2. Do not use open flames to heat adhesives. Allow solvents to air-dry.
 - 3. Use only grounded spray equipment.
- F. Coordinate with Owner to shut off or block vents which may allow solvents or adhesives vapors to be drawn inside the building.

1.7 WARRANTIES

- A. Provide panel manufacturers' standard 20-year warranty against defects in product workmanship and materials, including chalking, fading, visible checking, crazing or peeling of factory-applied panel finish.
- B. The metal roofing manufacturer shall also furnish the Owner a warranty to maintain the metal panel roofing system in a watertight condition, including repair of all damages resulting from ordinary wear and tear by the elements to the system's components, for a period of 5 years. Liability shall be limited to, as a minimum, equal the cost of the original cost of material plus labor.

PART 2 - PRODUCTS

2.1 SYSTEM TYPE AND MANUFACTURER

- A. Roof Panel Type: Standing wide-rib seam striated panel profile having 16" wide panels with approximately 2" high ribs, anchored with low floating clip system, and other concealed fasteners. System shall bear UL 90 rating.
- B. Acceptable Product and Manufacturers: "Snap-Clad" by Peterson Aluminum Corp. (PAC) or comparable product of other manufacturer as approved by Architect.

2.2 MATERIALS

- A. Base Material For Roof Panels: 24-gauge galvalume sheet steel having minimum yield strength of 50,000 psi and conforming to ASTM A 792, AZ50 with 0.5 ounce per square foot coating, auto corrective leveled..
- B. Trim Items: Factory formed from the same material, gauge and finish as the roofing panels except that temper may be reduced to facilitate forming.
- C. Flashings: Factory formed or field formed from the same material, gauge and finish as the roofing panels except that temper may be reduced to facilitate forming.
- D. Roofing & Trim Finish: Fluoropolymer coating made from a minimum of 70% Kynar 500 or Hylar 5000 resin. Back side of panels shall be primed with manufacturer's standard prime finish.
 - 1. Roof Color: As selected by Architect from manufacturer's extended line of options.
- E. Fasteners: Ring-shank or screw-shank hot-dip galvanized nails or carbon steel screws coated with anti-corrosion coating, sized as required to meet wind uplift resistance minimum of 72 mph.
- F. Roof Insulation:
 - 1. Acceptable Type & Manufacturer.: "H-Shield-NB" panels by Hunter Panels or comparable products of other manufacturers as approved by Architect and panel composition as follows:
 - a. Top layer of ADA exterior grade (PS2) fire treated plywood laminated off-line to black fiber reinforced polyisocyanurate foam insulation (grade 3, 25 psi min.).
 - b. Size: 5/8" plywood rabbited, 47-1/2" x 95-1/2" with an overall thickness of 3.5"
 - c. R Value: 18.0.
 - d. Flute Spanability: 4-3/8"

2.3 ACCESSORIES

- A. General: Furnish the roof panel manufacturer's low floating clip system, standard fasteners, brackets, anchoring devices, spacers, flashings, closures, adhesives, joint sealers, expansion joints and other components needed for a complete, permanently weatherproof installation. Use materials that are non-corrosive, non-deteriorating, and compatible with panel faces.
- B. Roof Panel Attachment Clips: UL-rated, not less than 18-gauge steel with zinc-dichromate or other approved corrosion resistant coating, with at least 2 fasteners for attachment to structure.
- C. Closures: Cross-linked polyethylene foam of 2-pcf density, factory molded to the roof panel profile selected and having end keys for positive seal between lengths of closure.

- D. Ice and Water Shield: Self-adhering membrane .040" thick, consisting of a 4 mil slip-resistant finished polyethylene sheet laminated to high heat resistant rubberized asphalt, all conforming to ASTM D 1970. Use "Vycor Ultra" by W.R. Grace & Co. or comparable products of other manufacturers as approved by Architect.
- E. Panel And Trim Sealants:
 - 1. Tapes: Butyl based, not less than 3/4" wide where penetrated by screws.
 - 2. Liquid Sealants: High modulus, non-corrosive sealants bearing sealant manufacturer's 20-year guarantee.
 - 3. Foam-In-Place Sealants: NOT allowed except to form back-up for liquid sealants and to fill voids at roof penetrations to inhibit thermal leakage.

2.4 FABRICATION

- A. Panels shall be fabricated from either pre-finished coiled stock in the factory or in the field or from sheet stock formed and finished in the factory.
- B. Furnish roof panels in lengths extending from ridge to eave without joints.
- C. Form and fabricate strips, cleats, ridges, edge treatments, integral flashings and other components of the system to the profiles, patterns and drainage arrangements shown and as required for permanent leakproof construction.
 - 1. Shop-fabricate the materials to the greatest extent possible.
 - 2. Provide concealed, noiseless means to accommodate thermal expansion and contraction, located so as to minimize the possibility of leakage.
 - 3. Form exposed faces flat and free of buckles, excessive waves and avoidable tool marks, considering the temper and reflectivity of the metal.
 - 4. Except as otherwise shown, fold back the sheet metal to form an open (non-compressed) hem on the concealed side of exposed edges.
 - 5. Except as approved otherwise, fabricate joints so that fasteners will be concealed from the weather. Fabricate items so that fasteners pass only through predrilled holes.

3 EXECUTION

3.1 PREPARATION

- A. The installer shall examine the substrate and the conditions under which metal roofing will be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Except as otherwise shown or specified, comply with recommendations and instructions of metal panel manufacturer.
- C. Coordinate metal roofing with adjoining work to provide a permanently leakproof, secure and noncorrosive installation.
- D. Remove any strippable plastic protection before beginning installation.

3.2 TEMPORARY PROTECTION

- A. Temporary Protective Sheeting: Provide over uncovered deck surfaces whenever precipitation is forecast.
 - 1. Retain sheeting in position with weights or temporary fasteners.
 - 2. Provide for surface drainage from sheeting to existing drainage facilities.
- B. Traffic: Do not permit traffic over unprotected or repaired deck surface.

3.3 INSPECTION FOR NEW ROOFING

- A. Acceptance of Conditions Affecting Application: Proceeding with roof system application shall designate acceptance of conditions.

3.4 INSTALLATION

- A. Insulation:
 - 1. Mechanically attach the nailbase insulation panels to the existing nailbase insulation surface using manufacturers recommended fasteners in accordance with written instructions.
- B. Ice and Water Barrier: Install 1 layer of self-adhering ice barrier membrane over the entire surface of the roof sheathing where metal roofing is to be installed.
 - 1. Start the membrane at the eave and lay, free of wrinkles. Overlap ends of rolls 4".
 - 2. When temperatures are too high or too low to allow membrane to adhere to steep substrates, backnail the high end of membrane.
 - 3. Ice and water membrane shall be installed without stretching. Lapped joints shall be back-rolled.
 - 4. Apply second layer of ice and water barrier up 3 feet from the eaves.
- C. Roof Panels: Fasten to roof sheathing as recommended by roof panel manufacturer to achieve a minimum wind uplift resistance of 72 mph. Install work with ribs parallel. Conceal fasteners at all panel attachment locations.
 - 1. Fix Point: Fix the panels at tops of slopes so that thermal loads will cause panels to uniformly expand and contract to and away from that line.
 - 2. Top of Slopes: Fold up the ends of each panel to form a water-resistant dam without cutting panels to make the dams. Cover the panel ends with a ridge/cap flashing secured by hidden clips and fasteners, providing at least 8" of cover past the ends of the panels. Include vent flashings, as detailed with "Cor-A-Vent" filler.
 - 3. Ridge Line: Seal between the standing seams with a molded foam gasket set, top and bottom, in sealant. Shield the foam from sunlight with a metal baffle under the ridge/cap flashing, recessed at least 1" from the edge of the flashing.
 - 4. Bottom of Slopes: Seal the end of each standing seam as recommended by manufacturer to prevent wind blown water intrusion. Close off ends of pencil ribs/mesas as well.
 - 5. Trim Conditions: Seal all joints using methods recommended by panel manufacturer and as designated on Shop Drawings. Make seals continuous for leakproof construction, paying particular attention to where metal touches metal

and where metals bend. Cover and seal fasteners and anchors as required for a tight, weatherproof installation. Remove excess sealant as the work progresses.

3.5 INSTALLATION OF SHEET METAL WORK

- A. Coordinate membrane installation with Section 076200 – Sheet Metal Work Contractor.

3.6 DAMAGED MATERIALS

- A. Repair or replace any panels as well as trim that have been damaged.
- B. Minor damage to finish may be repaired in accordance with panel manufacturer's recommendations.

3.7 PROTECTION

- A. The Installer shall advise the Contractor of provisions required for protection of the completed metal roofing during the remainder of the construction period.
- B. Strippable plastic films furnished for protection during shipment shall not be used for protection after installation.

3.8 CLEAN UP

- A. Smears and Droppings: Clean from all non-roofing surfaces.
- B. Rubble, Debris, and Excess Materials: Remove roof construction rubble, debris, and excess roofing materials and containers.

END OF SECTION 074113

DIVISION 7 – THERMAL & MOISTURE PROTECTION

SECTION 075311

ASPHALT SHINGLES ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Nailbase insulation (vented).
 - 3. Ice and water shield.
- B. Related Requirements:
 - 1. Section 070150 "Preparation for Re-roofing" for wood blocking/nailers.
 - 2. Section 074113 "Standing Seam Metal Roofing" for roof area to receive metal roofing.
 - 3. Section 075423 "Adhered TPO Roofing" for roof area to receive TPO roofing.
 - 4. Section 076123 "Sheet Metal Work: for metal fascia, edge trim, gutters and downspouts.

1.3 QUALITY ASSURANCE

- A. Roofing Contractor: Illinois licensed, specializing for at least 5 years in the type of membrane system involved, who is approved by Architect and is certified/licensed by new roofing membrane system producer and who can furnish for this installation a foreman factory trained by the roof membrane system producer.
- B. Source of Supply: Membrane system materials shall be obtained from a single source of supply except as authorized otherwise by membrane producer.
- C. Standards of Installation: All components of roof system shall be furnished and installed to meet the wind 72 mph wind warranty.
- D. Scheduling and Coordination:
 - 1. Schedule roof removal work to coincide with commencement of installation of new roofing system.
 - 2. Coordinate roofing installation with mechanical and electrical work associated with roof penetrations.
 - 3. No phased construction will be considered or approved.
- E. Wet and Damaged Materials: Shall not be installed.

1.4 SUBMITTALS.

- A. Product Data: Submit 3 copies of roofing materials producer's specifications, material characteristics and installation instructions for each product required including fasteners.
- B. Manufacturer's Installation Instructions:
 - 1. Provide published instructions that indicate preparation required and installation procedures.
 - 2. Indicate shingle manufacturer's recommendations for underlayment and flashing membranes.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Receive and handle materials to avoid damage. Store materials out of the sun, off of the ground, under well ventilated waterproof cover and away from hot radiators or other sources of heat. Avoid rough handling at 40°F and below.
- B. Store rolled materials upright and protect ends against damage.
- C. Do not store shingles in stacks greater than 4 feet high.
- D. Do not pile shingle bundles on top of one another on roof deck, but rather, distribute the load of bundles

1.6 JOB CONDITIONS

- A. Coordinate work so that the existing roofing system is not removed when weather conditions threaten the integrity of the building contents or intended continued occupancy.
- B. Maintain continuous temporary protection after removal of existing roofing, until installation of new roofing system, whenever precipitation is forecast.
- C. Ambient Conditions: Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
- D. Cold Weather: Follow membrane producer's special recommendations when cold weather retards free flow of adhesives and sealants. Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.

1.7 WARRANTIES

- A. New Roofing: Shall be provided with a non-prorated, No-Dollar-Limit, full system warranty to Owner, including tapered insulation saddles, against leaks or defects of any kind due to faulty materials or workmanship, and to sustain a 72 mph maximum wind speed as follows:
 - 1. Roofing membrane system producer's "Lifetime Protection" warranty for materials and workmanship.
 - 2. Roofing Contractor's 2 year warranty for workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphalt Shingles: Basis of Design: Timberline “HD” by GAF or comparable products of Tamko, Elk, Owens Corning. Color as selected by Architect.
 - 1. Ridge Vent: “Cobra Ridge Vent 3” premium exhaust vent for roof ridge by GAF or approved equal during bidding.
 - 2. Eave Vent: “Deck-Air DA-4 Vent System” by Lomanco” or approved during bidding.
- B. Fasteners: Hot-dip galvanized barbed or deformed roofing nails, 10 to 12 gauge shank with minimum 3/8" diameter head, Lengths shall be sufficient to achieve 3/4" penetration into plywood wall sheathing or types recommended by roof system manufacturer.
- C. Ice and Water Barrier: Self-adhering membrane .040" thick, consisting of a slip-resist finished polyethylene sheet laminated to rubberized to ASTM D 1970 asphalt Use any of the following that meet OSHA criteria for slip resistance: “Grace Ice & Water Shield” by W.R. Grace & Co or approved equal during bidding.
- D. Roof Insulation:
 - 1. Acceptable Types & Manufacturer.: “Cool-Vent” vented nailable panels by Hunter Panels or approved equal during the bidding phase.
 - a. Description of System: Factory assembled panel consisting of one layer of 5/8” fire rated plywood top surface, a built-in ventilation space maintained by 1” wood spacer blocks and polyisocyanurate insulation with a minimum R Value of 15.
 - b. Thickness to be 4.1”.
- E. Eave/Rake Starter Strip: “Pro-Start” by GAF comparable products of Tamco, Elk, Owens Corning.
- F. Cements:
 - 1. Lap Cement: Fibrated cutback asphaltic type recommended for use as an adhesive In the cold application of asphalt roofing or underlayment; free of toxic solvents.
 - 2. Plastic Flashing Cement: A non-asbestos fibrated asphalt plastic cement complying with ASTM D 2822 or ASTM D 4586 or Fed. Spec. SSC-153, Type 1, and designed for trowel application.
 - 3. Tab Cement: Quick-setting asphalt cement recommended by shingle manufacturer for fixing down loose tab.
- G. Temporary Protection: Sheet polyethylene or fiber reinforced plastic. Provide weights to retain sheeting in position.
- H. Auxiliary Materials: Prefabricated flashing units, bonding adhesives, sealants, splicing cements, mastics and other accessory materials shall be recommended by producer of roof membrane for the system installed.-

PART 3 - EXECUTION

3.1 GENERAL:

- A. Install roofing membrane and flashing system in accordance with details, specifications and best practices recommended by membrane manufacturer.
 - 1. Follow all recommendations and adhere to all precautions specified by roofing manufacturer except that where conflict occurs between manufacturer's recommendations and these specifications, the more stringent requirement shall prevail.
 - 2. No wet or damaged materials shall be installed.

3.2 REMOVAL AND PREPARATION OF EXISTING ROOFING

- A. Refer to Section 070150 "Preparation for Reroofing" for remove of existing roofing material and accessories down to the existing structural roof substrate.

3.3 TEMPORARY PROTECTION

- A. Temporary Protective Sheeting: Provide over uncovered deck surfaces whenever precipitation is forecast.
 - 1. Retain sheeting in position with weights or temporary fasteners.
 - 2. Provide for surface drainage from sheeting to existing drainage facilities.
- B. Traffic: Do not permit traffic over unprotected or repaired deck surface.

3.4 INSPECTION FOR NEW ROOFING

- A. Acceptance of Conditions Affecting Application: Proceeding with roof system application shall designate acceptance of conditions.

3.5 NAILABLE INSULATION

- A. Mechanically attach the nailbase insulation panels to the existing nailable insulation deck surface using manufacturers recommended fasteners in accordance with written instructions.

3.7 UNDERLAYMENT INSTALLATION

- A. Ice and water shield: Install 1 layer of underlayment over the entire surface of the nailable insulation where shingle roofing is to be installed in accordance with manufacturer's written instructions. Install second layer up 3 feet at the eaves.

3.8 SHINGLES INSTALLATION

- A. Inspection: Do not apply shingles to underlayments which are wet, wrinkled or buckled or will otherwise not allow shingles to lay flat.

- B. Install shingles according to manufacturer's recommendations on shingle wrappers. Apply in parallel courses, straight and true. Use vertical chalk lines to keep tabs properly aligned. Finished result shall have an even appearance in color and texture, and shall be free of ridges, wavy patterns, warps and voids.
- C. Ridge Caps and Eave Ventilation: Install eave vents and ridge vent as detailed on drawings.
- D. Starter Strip: Start shingles with manufacturer's starter strip or a course of tab-less shingles. Do NOT invert starter strips. Place starter strips so that seal strips will align with subsequent shingle tabs while keeping cutouts from aligning with joints and fasteners. Extend shingles approximately 3/8" beyond edge of roof trim.
- E. Coursing: Lay shingles with exposure to match existing as recommended by manufacturer. Lay shingle strips with the ends barely touching each other. Begin shingle application at center of eaves, just lapping starter strip.
 - 1. "Racking" or application straight up the slope is not permitted.
 - 2. Apply shingles across and diagonally up the slope, using a "multi-course, stepped-off diagonal method" recommended by the manufacturer, offsetting each course 6" with respect to previous course, including starter strip. After every fifth or sixth course verify with a chalk line that courses are straight and are parallel to the eaves.
 - 3. Fastening: Secure each shingle strip with 6 fasteners, puncturing the shingle 5/8" above and 1/2" each side of the heads of the cutouts, and 1" from ends. Drive fasteners straight and true, perpendicular to the shingle face, tight to the shingle but not over-tight.
 - 4. Accurately adjust nail guns for correct penetration.
 - 5. Architect reserves right to require replacement of shingles that have been fastened with over-driven fasteners.
 - 6. Exposed nails will be permissible only where unavoidable, and then shall be covered with plastic cement.
- F. Sealing Down Tabs: Strictly follow manufacturer's recommendations. Should there be any question of tabs sealing before storms with high winds may appear, ensure sealing of tabs by walking on tabs after roof is hot from sun. In cold weather, provide protection as specified near the end of this Section.
- G. Place edges of shingles at rakes in full bed of plastic cement.
- H. Do not cut shingles when laid on roof.
- I. As work progresses, inspect for any improperly placed fasteners and repair carefully.

3.9 PROTECTION

- A. Should wind gusts greater than 35 mph be predicted before shingle tabs have had a complete chance to seal, protect shingles from wind by covering with heavy canvas, sail cloth or other suitable materials nailed down to roof deck under lengths of lumber.
- B. After storm subsides, remove protection and replace shingles damaged by wind and/or by anchors used to secure protection.

3.10 CLEAN UP AND INSPECTION

- A. Remove extra fasteners, shingles and all debris from the roof. Sweep all around the building with a magnetic broom to pick up stray nails.
- B. Inspect all areas where asphalt cements have been applied for freedom of bubbles and proper adhesion. Repair as required. Remove any excess plastic cement, using solvent that will not damage shingles.
- C. 30 days after installation, inspect all tabs for adhesion. Where tabs are not adhered, secure tab with 2 dabs of plastic cement the size of a quarter applied to dry shingles after removing dust and other contaminates.
- D. Leave roof clean and watertight.

END OF SECTION 075311

DIVISION 7 – THERMAL & MOISTURE PROTECTION

SECTION 075320
ADHERED TPO ROOFING

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. Fully adhered TPO sheet roofing systems.
2. Board insulation.
3. Membrane roof flashings, base flashings and parapet flashings.
4. Elastomeric flashing boots at pipe penetrations.
5. Fasteners and adhesives.
6. Sealants.
7. Walkway pads.
8. Expansion joints.
9. Cover board.

B. Related Work Specified In Other Sections:

1. Section 013300 “Submittal Procedures” for submittal of required items.
2. Section 070150 “Preparation for Re-Roofing” for preparation of existing roofing for installation of new roofing.
3. Section 074311 “Standing Seam Roofing”
4. Section 075311 “Asphalt Shingle Roofing”
5. Section 076200 “Sheet Metal Work” Sheet metal work and roof trim.

1.3 QUALITY ASSURANCE

- A. Roofing Contractor: Illinois licensed, specializing for at least 5 years in the type of membrane system involved, who is approved by Architect and is certified/licensed by new roofing membrane system producer and who can furnish for this installation a foreman factory trained by the roof membrane system producer.
- B. Source of Supply: Membrane system materials shall be obtained from a single source of supply except as authorized otherwise by membrane producer.
- C. Standards of Installation: All components of roof system shall be furnished and installed to meet the wind 72 mph wind warranty.
- D. Scheduling and Coordination:
 1. Coordinate roofing installation with mechanical and electrical work associated with roof penetrations.
 2. No phased construction will be considered or approved.

- E. Wet and Damaged Materials: Shall not be installed.
- 1.4 SUBMITTALS
- A. Process all submittals as required in Section 01300 – Submittals.
 - B. Product Data: Submit 3 copies of roofing materials producer's specifications, material characteristics and installation instructions for each product required including fasteners.
 - C. Shop Drawings: Indicate:
 - 1. Outline of roof and dimensions.
 - 2. Typical and special details for flashings, roof curbs, penetrations, perimeter conditions, termination details, etc. Reference the locations of details on the roof outline.
 - 3. Number and mark of each factory prepared roofing sheet and flashing.
 - 4. Layout of tapered insulation saddle areas.
 - 5. Provide fastener locations and spacing for insulation installation.
- 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING
- A. Packaging: Deliver materials to the job site in their original containers or packages, sealed, with legible labels intact, brand name, lot number, warning labels and reference standards clearly shown.
 - B. Temperatures Prior to Use: Store materials in the dry and in accordance with membrane producer's instructions. Other than roof membrane, all materials furnished by membrane producer shall be stored between 60°F and 80°F. If exposed to lower temperatures, restore to 60 - 80°F prior to use.
 - C. Warped or Broken Insulation Boards: Shall be removed from site.
- 1.6 JOB CONDITIONS
- A. Ambient Conditions: Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
 - B. Cold Weather: Follow membrane producer's special recommendations when cold weather retards free flow of adhesives and sealants. Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
 - C. Electrical Power: Furnish power for heat welders by way of portable generator(s) producing at least 30 amps per welder supplied or furnish power to 220V heat welders by way of #10 x 3 or greater power cords and boost the power with a step-up transformer when cord length exceeds 150 feet.
 - D. Fire Prevention: Take every precaution to prevent fire.
 - 1. Maintain at least 2 portable fire extinguishers, rated 10-B:C-20 pounds, near area where adhesives are being used and train applicators in their proper use.
 - 2. Do not use open flames to heat adhesives. Allow solvents to air-dry.
 - 3. Use only grounded spray equipment.
 - E. Coordinate with Owner to shut off or block vents which may allow solvents or adhesives vapors to be drawn inside the building.

1.7 WARRANTIES

- A. New Roofing: Shall be provided with a non-prorated, No-Dollar-Limit, full system warranty to Owner, including tapered insulation saddles, against leaks or defects of any kind due to faulty materials or workmanship, and to sustain a 72 mph maximum wind speed as follows:
 - 1. Roofing membrane system producer's 20 year warranty for materials and workmanship.
 - 2. Roofing Contractor's 2 year warranty for workmanship.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. System Fire Rating: Provide a fire-resistant membrane and insulation assembly which has been tested and listed by Underwriter's Laboratories, Inc. (UL) as Class A, for the roof deck and slopes to be used on this project.
- B. System Wind Rating:
 - 1. Roof to be warranted for a 72 mph maximum wind speed.
- C. System Types:
 - 1. Reinforced TPO membrane fully adhered to the top cover board.
- D. Membrane Joint System: Membrane system producer's splice tape system.
- E. Approved Products: Use one of the following systems:
 - 1. TPO Membrane System:
 - a. Carlisle "Sure-Weld"
 - b. Firestone "Ultra Ply TPO".
 - c. Versico "VersiWeld."
- F. Membrane Joint System: Membrane system producer's splice tape system.

2.2 MATERIALS

- A. Membrane: TPO Roof Membrane: Gray or Tan as selected by owner, Thermoplastic Polyolefin, .060" (60 mil) thick, reinforced.
 - 1. Roof Insulation: High Density Rigid board insulation of foamed isocyanurate core with manufacturer's standard glass fiber reinforced mat facers or organic/inorganic facers integrally laminated to both sides; minimum R=5.7 per 1" of thickness: All insulation to be 20psi: Insulation furnished shall be as approved by membrane manufacturer.
 - a. Thickness: As shown on the drawings.
 - b. Tapered Insulation for Field: Isocyanurate units by same manufacturer as typical roof insulation; taper as required to achieve slopes indicated.

- c. Tapered Insulation for Saddle & and Crickets: Isocyanurate units by same manufacturer as typical roof insulation; taper as required to achieve slopes indicated, or, if not indicated, not less than 1/4" per foot after roof deflection under full design load.
 - d. Tapered Insulation for Sump: Basis of Design "Hinged Target Sump" by Versico or equal, isocyanurate units by same manufacturer as typical roof insulation; with a 2" start and taper as required to achieve slopes indicated, or, if not indicated, not less than 1/4" per foot after roof deflection under full design load.
- B. Cover Board: ½" water-resistant gypsum substrate, 1/2 inch thick, DensDeck StormX or approved equal during bidding.
- C. Mechanical Anchors: Types recommended by roof system manufacturer including compression plates, for the kind of deck indicated and for wood nailers, featuring anti-corrosive materials and anti-blackout design. Anti-corrosion coating shall pass 30 cycles in Kesternich Cabinet DIN #50018 - 2 liter.
- D. Base and Parapet Flashing: Same material as used for roof membrane.
- E. Flashing To Cover Corners In Substrates: Same material as roof membrane; or roof membrane producer's unreinforced ethylene propylene-based flashing strips, .055" (55 mil) thick, of matching color.
- F. Pipe Flashings: Premolded rubber boots approved by system producer for the membrane system, complete with stainless steel, screw tightened, pipe clamps.
- G. Temporary Protection: Sheet polyethylene or fiber reinforced plastic. Provide weights to retain sheeting in position.
- H. Auxiliary Materials: Prefabricated flashing units, bonding adhesives, sealants, splicing cements, mastics and other accessory materials shall be recommended by producer of roof membrane for the system installed.
- I. Roof Expansion Joints: Closed cell foam tube, laid over the expansion joint opening. Verify diameter in the field. In addition, the joint shall be filled with one of the following:
 - 1. Non-rigid closed cell plastic foam batts or tubes to a depth of 10".
 - 2. 3–1/2" thick glass fiber batts cut to nominal 10" width and suspended on a 10 mil polyethylene sheet, all covered with roof membrane.
- J. Walkway Pads:
 - 1. Carlisle "Sure-Seal Roof Walkway Pads" 30" wide x 30" long, 3/8" thick.
 - 2. Firestone "Walkway Pad", 30" wide x 30" long, .54" thick.
 - 3. Or approved equal during bidding.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Install roofing membrane and flashing system in accordance with details, specifications and best practices recommended by membrane manufacturer.

1. Follow all recommendations and adhere to all precautions specified by roofing manufacturer except that where conflict occurs between manufacturer's recommendations and these specifications, the more stringent requirement shall prevail.
2. No wet or damaged materials shall be installed.

3.3 TEMPORARY PROTECTION

- A. Temporary Protective Sheeting: Provide over uncovered deck surfaces whenever precipitation is forecast.
 1. Retain sheeting in position with weights or temporary fasteners.
 2. Provide for surface drainage from sheeting to existing drainage facilities.
- B. Traffic: Do not permit traffic over unprotected or repaired deck surface.

3.4 PREPARATION

- A. Surfaces to Receive Roofing System: Prepare so that they will be clean, dry, and free of fins, sharp edges, loose, damaged and foreign materials, oil and grease.
- B. Cleaning: Sweep roof surface clean of loose matter.

3.5 INSPECTION FOR ROOFING

- A. Acceptance of Conditions Affecting Application: Proceeding with roof system application shall designate acceptance of conditions.

3.6 ROOF SYSTEM INSTALLATION

- A. TPO Membrane System Over Existing Insulation on Metal Decking:
 1. Mechanically fasten one layer of rigid roof insulation thru the existing rigid insulation thru to the existing metal deck.
 2. Adhere one layer of ½" cover board to the rigid roof insulation.
 3. Fully adhere one layer of TPO roofing to the cover board.
 4. See drawings for thicknesses of rigid insulation.
- B. TPO Membrane System Over Existing Wood Decks:
 1. Mechanically fasten one layer of ½" cover board to the existing wood deck.
 2. Adhere one layer of rigid roof insulation to the cover board.
 2. Adhere one second layer of rigid roof insulation to the first layer of rigid insulation board.
 4. Adhere ½" cover board over the top layer of rigid roof insulation.
 5. Fully adhere one layer of TPO roofing to the cover board.
 6. See drawings for thicknesses of rigid insulation.
- C. Crickets and Saddles: Slopes shall be of 1/2 per foot. Assure positive drainage flow by installing crickets and saddles wherever flow to roof drain is obstructed, is inadequate or must be positively encouraged during storms to counter the forces of excessive runoff speeds or high winds. Take special care to correct flow patterns at rooftop equipment and where roofs have been modified. Fully adhere to insulation using adhesive as recommended by manufacturer.

3.8 ROOF MEMBRANE INSTALLATION

- A. General: Install roofing membrane and flashings in accordance with details, specifications and best practices recommended by membrane producer. Follow all recommendations and comply with all precautions specified by roofing producer except that where conflict occurs between producer's recommendations and these specifications, the more stringent requirement shall prevail.
 - 1. Direction of Membrane Placement: Orient the membrane so that rainwater runs over rather than along lap joints.
 - 2. Whole Sheets: Use whole, single sheets to the extent practicable.
- B. Membrane Installation: Lay membrane in full bed of contact adhesive for 100% adhesion.
 - 1. Relaxing: Roof membrane shall be set in place over substrate without stretching and allowed to relax 30 minutes before bonding.
 - 2. Placement: Set sheets in final position, free of wrinkles and folds, overlapping adjacent sheets, with up-hill sheet on top of joint. Make overlap 5" on EPDM membranes. Then roll sheet back evenly onto itself. Sweep away bonding contaminants from mating surfaces using a stiff bristled broom.
 - 3. Bonding Adhesive Application: Apply evenly to underside of sheet and to insulation at about the same time so as to allow matching drying times. Smooth out adhesive with nap roller. Hold bonding adhesive well back from edges to be spliced over other membrane.
 - 4. Bonding to Insulation: When bonding adhesive is tacky and does not stick or string to touch of a dry finger, roll membrane into the coated substrate slowly and evenly so as not to cause wrinkles. Compress the bond with an approved roller. Do not bond surfaces before adhesive becomes tacky. Should adhesive lose its tackiness, reapply adhesive. Set the pace of work accordingly. When first half of a sheet is fully adhered, complete other half in same manner.
 - 5. Contaminated Adhesive: Should adhesive become contaminated by dust, moisture, walking etc., re-apply adhesive, but only after contaminated adhesive is thoroughly dry, even if redoing entire field of adhesive is required. Remove contaminated adhesives when so recommended by membrane producer.
- C. Lap Splices:
 - 1. Cleaning: Sweep away excess talc and other bonding contaminants from mating surfaces using a stiff bristled broom.
 - 2. Adhesive Application: Scrub on bonding adhesive to each surface to be mated, extending adhesive 1/2" to 3/4" beyond edge of the sheet that will be layed on top. Scrub harder where there is excess dusting agent or contamination. Time the application of adhesive to each surface so as to allow matching drying times when each side of splice tape is pressed into the adhesive.
 - 3. Rolling: Roll the splice tape into the adhesive applied onto bottom sheet, leaving no edge of tape un-wet by the adhesive.
 - 4. Trimming: Trim the top sheet as required to allow splice tape to be exposed 1/8" to 1/2" after top sheet is fixed.
 - 5. Bonding: Fix the top sheet in place by allowing the sheet to carefully fall on to the freshly exposed top surface of the splice tape, making a joint free of wrinkles and fishmouths. Broom the entire length of the splice as the splice is made and then roll

- the splice tight with a silicone wheeled hand roller, working across the joint and then along its length.
6. Splices between Lengths of Splice Tape: Lap the splices at least 1" and cover such joints with a 6" x 6" patch of uncured membrane, sealed all around with lap edge sealant.
 7. Sealing Exposed Scrim: Wherever the membrane reinforcement scrim is exposed, cover with continuous bead of lap edge sealant.
 8. Sealant Application: Prime the surfaces before applying sealant and tool the sealant bead, as required by membrane manufacturer. Take caution to not disturb fresh lap sealant.
- D. Edge Attachment: Mechanically attach edges of membrane all around roof edges and roof openings, anchoring into parapets and edge blocking, according to membrane producer's recommendations and approved details.
- E. Flashing: Bond only to clean surfaces. Contour the membrane to fit substrate to which it is bonded so as not to allow bridging or gapping effect.
1. Roof Interruptions, Curbs and Edges: Flash with longest pieces practicable. Include intersections with other roofs. Terminate flashings a minimum of 8" above adjacent roof surface unless indicated otherwise.
 2. Pipe Penetrations: Flash with prefabricated rubber boots. Seal the top of boots with stainless steel strap clamps and continuous bed of mastic sealant. Form all surfaces so as to provide positive drainage.
 3. Pipe Penetrations: Seal according to Architect's approval using sealant pockets having proper metal flashings all around.
 4. Base Flashings: Membrane flashings applied over upright surfaces shall be fully adhered to substrate, all across contact area, using techniques similar to those used to bond main roof membrane.
 5. Joints In Membrane Flashings: Provide a minimum lap of 3" at joints and compress the bond with an approved roller. Round off membrane corners. Apply additional patches of flashing membrane over joints and seal all around edges, according to roof membrane system producer's recommendations.
 6. Flashing Over Fasteners: Cover the fasteners with flashing membrane, providing a minimum lap of 3" beyond washers.
- F. Expansion Joints:
1. Fill expansion voids with expansion joint insulation down to the level of the roof deck. Fill voids completely. Do not use any rigid materials.
 - a. Wrap a vapor barrier membrane around fibrous insulations and seal joints between vapor membrane sections with vapor resistant construction tape and then seal the joint between vapor barrier and curb with approved mastic.
 2. Top the expansion joint with an approved foam tube and secure the tube against dislodgement with strips of flashing membrane or as otherwise approved.
- G. Temporary Closures: Install as needed to prevent water from flowing beneath roof system during inclement weather.
1. Extent: The roof membrane shall be extended at least 2 feet past edge of roof insulation and a continuous layer of sealer applied onto substrate 12" wide along the membrane edge.

2. Sealing Edge: Firmly embed roof membrane into sealer and provide continuous pressure over the length of the cut-off, using lumber and other ballast, so as to prevent blow-off.

H. Repairs:

1. Wrinkles: When within 18" of a splice or running towards a splice or positioned to interrupt proper drainage, cut out the wrinkle and repair with unspliced roof membrane to at least 3" beyond the wrinkle.
2. Cuts and Punctures: Patch over with roof membrane to at least 3" beyond the break.

3.9 INSTALLATION OF SHEET METAL WORK

- A. Coordinate membrane installation with Section 076200 – Sheet Metal Work Contractor.

3.10 CLEAN UP

- A. Smears and Droppings: Clean from all non-roofing surfaces.
- B. Rubble, Debris, and Excess Materials: Remove roof construction rubble, debris, and excess roofing materials and containers.

END OF SECTION 075323

DIVISION 7 – THERMAL & MOISTURE PROTECTION

SECTION 076200
SHEET METAL WORK

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. Flashings and sheet metal work.
- 2. Metal copings, edges and fascias.
- 3. Metal gutters and downspouts.
- 4. Overflow Scuppers.
- 5. Joint sealants.

B. Related Requirements:

- 1. Section 070150 "Preparation for Re-roofing" for removal of existing sheet metal work
- 2. Section 061000 "Rough Carpentry" for treated blocking and nailers.
- 3. Section 074113 "Standing Seam Metal Roofing" for materials and installation of new roofing.
- 4. Section 075113 "Asphalt Shingles Roofing" for materials and installation of new roofing.
- 5. Section 075423 "Adhered TPO Roofing Roofing" for materials and installation of new roofing.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

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 special conditions.
 9. Include details of connections to adjoining work.
 10. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- D. Samples for Verification: For each type of exposed finish.
1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
- E. Certifications: Submit roof membrane producer's certification that metal items to be furnished for roofing are acceptable for inclusion in roof system producer's warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing panels and trim, and its accessories, to include in maintenance manuals.

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.
- B. Applicator: A company specializing in sheet metal flashing work and approved by membrane roofing subcontractor; having 10 years' minimum experience.
- C. Provide water and weather-tight work, with surfaces free from waves and buckles, and seams avoided as much as possible.
- D. Comply with applicable recommendations and details of the latest editions of the SMACNA Architectural Sheet Metal Manual and the NRCA Roofing & Waterproofing Manual, including workmanship and installation.

E. Coordination:

1. Coordinate fabrication and installation of metal roof flashings with roof membrane system installers so as to meet requirements of roof warranty (specified in roofing specifications Section).
2. Coordinate metal flashings work with adjoining work for proper sequencing of each installation to ensure the best possible weather resistance and the protection of materials and finishes from damage.

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 WARRANTY

- A. Sheet metal flashings incorporated into membrane roofing shall be compatible with the requirements of the roof system producer for inclusion into the roofing warranty.
- B. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing, panels and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing, coping and trim assemblies 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, Coping and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

2.2 FABRICATED SHEET METAL COMPONENTS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Counterflashings: Made from 0.050" aluminum, with 3" end laps. Corners to be mitered and solder sealed. Fabricate with punched nail hole slots 12" o.c. to allow for expansion.
- C. Coping: .050" thick mill finished aluminum strips, formed to profiles indicated, with corners formed by butting adjacent fascia pieces over backer splice unit that has been mitered and welded.
- D. Fascia: Made from 0.050" aluminum, with corners formed by butting adjacent fascia pieces over backer splice unit that has been mitered and welded.
- E. Roof Edge Trim: .050" thick mill finished aluminum strips, formed to profiles indicated. to provide 1-1/2" nailing flange and 1-1/2" downturn terminated by a 1/2" 45° drip.
- F. Gutters: .050" thick, factory-finished 5005-H134 aluminum alloy, in sizes to match existing except as otherwise noted or as shown on the drawings. Furnish in 10 ft or 12 ft lengths.
 - 1. Corners: Welded or spliced over a welded corner unit. Exposed welds shall be factory painted to remove all welding blemishes.
 - 2. Hanger Straps: Provide heavy duty anchors every 24" o.c.
- G. Downspouts: 0.050" aluminum, having smooth surface and rectangular or round profile (see drawings), sizes shown on the drawings, 45 deg. exit elbow where noted on drawings. Finish to match gutters.
- H. Finish (All Fabricated Sheet Metal Components except as otherwise noted): Factory applied fluoropolymer coating containing a minimum of 70%, by weight, Kynar 500, Kynar 500 VLD or Hylar 5000 resin; color as selected by Architect from manufacturer's full range of standard options to match existing.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, 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. Flashing Cement: Asphalt mastic cement formulated for weathering and flow resistance, meeting requirements of Fed. Spec. SS-C-153.
- C. Adhesives for sheet metal flashings in contact with EPDM roofing shall be type recommended by flashing sheet manufacturer and approved by roofing system manufacturer to provide a waterproof/weather-resistant seaming and adhesive application compatible with roofing system materials.
- D. Dissimilar Metal Protection: Bituminous coating conforming to Fed. Spec. TT-C-494 or SSPC-Paint 12, or plastic separators, or insulating tape, subject to Architect's approval.
 - 1. For metal flashing in contact with roofing, use separation materials or methods compatible with roofing system materials as approved by roofing system manufacturer.
- E. Sealant Tape for Surface Mounted Flashings: Protective Treatments, Inc., "Product #606 Architectural Sealant Tape," 3/16" x 3/4" minimum size.
- F. Sealant for Metal Flashing Joints: Use one of the following, color as best blends with color of flashing material:
 - 1. Dap, Inc. "Butyl - Flex" .
 - 2. Pecora Corp. "BC 158" .
 - 3. Protective Treatments, Inc. (PTI) "757 Butyl Sealant" .
 - 4. Tremco "Butyl Sealant" .
 - 5. Sonneborn Bldg. Products "Butakauk" .
- G. Fasteners: Fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. For Fastening Aluminum Flashings: Aluminum or stainless steel nails with annular threads, of sufficient length to penetrate wood blocking at least 7/8".
 - 2. For Cleats to Nailers: Use ring-shank or screw-shank nails long enough to penetrate the wood nailer at least 1-3/4" or use #8 screws long enough to penetrate the wood nailer 3/4".
 - 3. For Exposed Fastening: Fasteners as recommended by panel manufacturer or as specified above or screws, with soft neoprene washers.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim 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.
 - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

- B. 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.
- C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Drip Edges: All exposed edges of flashing shall have 1/2" projecting hemmed edge.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing fascia panels and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of welds, and sealant.
 - 2. Install sheet metal flashing and fascia panels and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 - 5. Torch cutting of sheet metal flashing and trim is not permitted.

- 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 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. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- D. Fasteners: Use fastener sizes that penetrate substrate 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. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 INSTALLATION

- A. General:
 - 1. Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of other wall components.
 - 2. Secure flashings in place using concealed fasteners. Use no exposed fasteners except as detailed. Install work watertight, making allowances for expansion and contraction. Install fasteners snug; do not over-tighten. Finished work shall be free of waves, warps, buckles, fastening stress, and distortions.
- B. Roof Edgings: Install in coordination with roofing, as required to maintain roofing warranties. Engage drip hem around the anchor cleat to the full depth of the drip hem. Metal flanges under roof membranes shall be attached to blocking at 4" o.c., with nails placed 1" from back edge of roof flange.

- C. Gutters: Install in accordance with manufacturer's instructions:
 - 1. Support every separate section. Keep gutters separated from walls to avoid staining and corrosion.
 - 2. Use hangers adequate in size and spacing to support gutters filled with ice.
 - 3. Construct gutters with positive slopes, to prevent accumulation of standing water. Lap joints to match drainage flow.
 - 4. Provide at least one movement joint midway between each gutter downspout to allow for expansion and contraction of gutters.
- D. Downspouts: Install in accordance with manufacturer's instructions.
 - 1. Keep metal downspouts separated from walls to avoid staining and corrosion.
 - 2. Install downspouts visually plumb and anchor to building at top and bottom and at 4 ft (maximum) intervals in between. Protect building surfaces from damage from hanger and strap connectors.

3.4 CLEANING AND PROTECTION

- A. Clean off excess sealants.
- B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- C. 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.

END OF SECTION 076200

DIVISION 07 – THERMAL & MOISTURE PROTECTION

SECTION 077100
ROOF HATCH

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

- B. Section includes roof hatch:
 - 1. Roof access hatch with guard rail.
- C. Related Requirements:
 - 1. Section 070150 "Preparation for Re-Roofing" for removal of existing roof hatch.
 - 2. Section 061000 "Rough Carpentry" for wood framing.
 - 3. Section 075320 "Adhered Elastomeric Roofing" for roof flashings.

1.3 SUBMITTALS

- D. Shop Drawings: Coordinate with Roof Installer as required. Indicate details for flashings, roof curbs, penetrations, perimeter conditions, etc. Shop Drawings for prefabricated roof hatch shall show exact dimensions, anchorages and relationships to other materials.
- E. Product Data: Submit manufacturer's specifications, material descriptions and installation instructions for each product required, including fasteners.
- F. Warranties.

1.4 WARRANTY

- G. Roof hatch manufacturer shall warrant that units will be free of defects in materials and workmanship for 5 years.

PART 2 - PRODUCTS

2.1 ROOF ACCESS HATCH

- A. Type and Size: 2'-6" x 3'-0" (Verify Size in Field) ladder access type, with hatch cover lid controlled hydraulically or by counterbalancing spring, such as "Model GSS"

manufactured by Bilco Co. as Basis-of-Design, or comparable products of Milcor or Babcock-Davis. Contractor to verify exact size needed in the field.

- B. Cover Lid: Aluminum extrusion with built-in condensation drainage channel and clear polycarbonate dome or double domes. Dome(s) is coated for UV-resistance.
- C. Curb: Minimum 14-gauge steel galvanized with G-90 coating. Curb shall be at least 8" higher than adjacent roof surface with an attachment flange at least 3" wide. Joints shall be welded continuously. Joints in galvanized steel shall be coated with zinc-rich galvanizing repair paint.
- D. Insulation For Cover Lid and Curb: Glass fiber or mineral fiber insulation or rigid foamed plastic insulation, 1" thick, covered on the inside with 22-gauge steel, factory primed.
- E. Counterflashings and Seals: Unit shall provide positive exclusion of wind blown moisture and cold air using neoprene or EPDM gaskets and counterflashing flanges of metal. Metal shall be same type as it is attached to, at least 22-gauge steel galvanized with G-90 coating.
- F. Lock: Furnish with provisions for padlock on interior side.

2.2 HATCH RAILING SYSTEM

- G. Type: Model "RL-E" manufactured by Bilco Co., or comparable products of other listed acceptable manufacturers which conforms to requirements of OSHA 29 CFR 1910.23 and meets OSHA strength requirements with a safety factor of two.

1. Components:

- a. Posts & Rails: Pultruded from a fire retardant, fiberglass-reinforced polymer (FRP) which has a molded-in, high visibility, safety yellow color and is treated with a UV inhibitor.
- b. Mounting Brackets: Fabricated from 1/4" thick hot dip galvanized steel.
- c. Gate Hinges & Post Guides: Constructed of 6063-T5 aluminum and torsion rod is type 302 stainless steel.
- d. Fasteners: Type 316 stainless steel. Hatch rail system satisfies the requirements of OSHA 29 CFR 1910.23 and meets OSHA strength requirements with a safety factor of two.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Verify that surfaces to receive roof accessories roof hatches are suitable for application of the materials and that wood nailers have been properly installed.
- B. Proceeding with installation of roof accessories, roof hatch shall designate acceptance of conditions.
- C. Flash in existing roofing system watertight.

3.2 INSTALLATION

- D. Install unit in accordance with manufacturer's instructions according to the type of roof deck provided. Locate units accurately. Install roof curbs furnished under this Section.
- E. Set flange in a continuous bed of roofing cement. Anchor only to the top of solid, treated wood blocking or through to structural framing members as detailed. Ensure that flange lays flat all around.
- F. Securely fasten unit curbs to roof deck so as to resist all stresses induced by temperature changes in the roof system and induced through icing.

3.3 PROTECTION

- G. Provide temporary coverings as necessary to protect against roofing operations.

END OF SECTION 077100

SECTION 079200
JOINT SEALANTS

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. Sealant work in association with masonry repair work.
- B. Related Requirements:
 - 1. Section 040120 "Masonry Repair Work" for sealants for masonry repair of walls.
 - 2. Section 076200 "Sheet Metal Work" for sealants for sheet metal work.

1.3 QUALITY ASSURANCE

- A. Compatibility: Before purchasing any sealant specified, investigate its compatibility with the joint surfaces, joint fillers and other materials in joint systems. Provide only materials known to be fully compatible with actual installation condition, as affirmed by manufacturer's published data or certification.
- B. Packaging: Deliver materials to job site in sealed containers with manufacturer's original label attached, one brand for each type of sealant.
- C. Manufacturer's Instructions: Sealant applications shall be in accordance with manufacturer's instructions.
- D. Applicators: Skilled and trained in accordance with Sealant, Waterproofing, and Restoration Institute's (SWRI) "Applicator Training Manual." Submit applicators' certificates of SWRI approved training, upon Architect's request.

1.4 SUBMITTALS

- A. Process all submittals per requirements in Section 013300 "Submittal Procedures"
- B. Samples: Submit samples or color charts of each sealant color for Architect's selection.
- C. Manufacturer's Literature: Submit 4 copies of manufacturer's specifications, recommendations and installation instructions for each type of sealant and associated miscellaneous material required.

PART 2 - PRODUCTS

2.1 MAUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of, the products listed herein.

2.2 JOINT SEALANTS

- A. Sealant for Repair of Exterior Masonry, Windows, Louvers, Control Joints: Single component, moisture cure, ultra low modulus, non-staining; non-bleeding silicone sealant:
 - 1. Tremco "Spectrum 2" silicone sealant or approved equal during bidding
- B. Sealant Colors: As selected by Architect from manufacturer's extended line of colors.
- C. Backer Rod: Compressible rod stock of closed-cell polyethylene foam, polyethylene jacketed polyurethane foam, extruded polyolefin foam with non-absorptive skin, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material recommended by the sealant manufacturer.
 - 1. Provide size of rod that will form optimum shape of sealant at bottom of joint and will minimize possibility of sealant extrusion when joint is compressed.
 - 2. Use adhesive backed 1/4" triangular or quarter-round backer rod for all fillet joints subject to movement from temperature or humidity changes.
- D. Joint Cleaners: Type recommended by sealant manufacturer for the joint surfaces to be sealed.
- E. Joint Primer/Sealer: Type recommended by sealant manufacturer for the joint surfaces involved.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Surfaces to Receive Sealant Work. Examine prior to application for suitability to receive sealant work.
- B. Detrimental Conditions: Notify Architect of any conditions detrimental to a satisfactory application that cannot be corrected by ordinary cleaning and priming.

3.2 PREPARATION

- A. Clean joint surfaces free of dirt, oil, grease, moisture, loose mortar and/or other foreign matter immediately before installation of sealant.
- B. Metal Surfaces: Wipe with joint cleaner using "two cloth" method and then dry.
- C. Masonry Surfaces: Clean with a wire brush and then blow or brush clean.

- D. Test for Necessity of Primer: Test each proposed combination of sealant and substrate to determine whether or not a primer is required to achieve the sealant manufacturer's advertised bond strength.
- E. Masking: When applying primers or sealants that may bleed or stain, mask the adjacent surfaces.

3.3 APPLICATION

- A. General: Comply with sealant manufacturer's printed instructions except where more stringent requirements are shown or specified. Do not apply to damp surfaces.
- B. Priming and Sealing: Prime or seal the joint surfaces wherever recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- C. Backer Rod: Install sealant backer rod except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown. Install backer rod with approved tool designed to achieve the following uniform depths of sealant (at the thinnest point), unless recommended otherwise by sealant manufacturer.
 - 1. Joints 1/4" Wide: Sealant shall be approximately but not less than 1/8" thick.
 - 2. Joints 3/8" to 1/2" Wide: Sealant shall be not less than 3/16" thick but no thicker than half the width of the joint.
 - 3. Joints Larger than 1/2" Wide: Sealant shall be not less than 1/4" thick but no thicker than half the width of the joint.
- D. Sealant Application:
 - 1. Employ only proven application techniques which will ensure that sealant will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bonding surfaces equally on opposite sides, solid to the backing material.
 - 2. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces.
 - 3. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove so that joint will not trap moisture and dirt.
- E. Tooling: All joints shall be tooled immediately after application and left free of ridges, wrinkles, sags, air pockets and embedded impurities. Use dry tooling techniques.

3.4 CLEANING AND PROTECTION

- A. Excess Material and Smears: Remove all excess material and smears adjacent to joints as work progresses.
- B. Protection: Protect finished sealant installation until cured.
- C. Contaminated Sealants: Cutout and remove, clean the joint and apply fresh sealant.

END OF SECTION 079200

DIVISION 8 – OPENINGS
SECTION 086200
UNIT SKYLIGHTS

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. Unit skylights fall protection rated.
- B. Related Requirements:
 - 1. Section 070150 "Preparation for Reroofing" for removal of existing skylight.
 - 2. Section 061000 "Rough Carpentry" for wood nailers.
- C. Product Data: For each type of unit skylight.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for unit skylights.
- D. Shop Drawings: For unit skylight work.
 - 1. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.
- E. Aluminum Finish Samples: For each type of exposed finish required, in a representative section of each unit skylight in manufacturer's standard size.
- F. Glazing Samples: For each color and finish of glazing indicated, 12 inches square and of same thickness indicated for the final Work.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Data Sheet: For each type of skylight specified, include details of construction and installation, relative to applicable roofing materials.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For unit skylights to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** A manufacturer capable of fabricating unit skylights that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.
- B. **Installer Qualifications:** An installer acceptable to unit skylight manufacturer for installation of units required for this Project.
- C. **Fire-Test-Response Characteristics:** Provide Thermoformed domes fabricated from sheets identical to those tested for the following fire-test-response characteristics, per ASTM test method indicated below, by UL or other testing and inspecting agencies acceptable to authorities having jurisdiction. Identify plastic sheets with appropriate markings of applicable testing and inspecting organization.
 - 1. **Self-Ignition Temperature:** 651 deg F (343 deg C) or greater when tested per ASTM D 1929 on plastic sheets in the thickness intended for use.
 - 2. **Smoke density** of 75 or less when tested per ASTM D 2843 on plastic sheets in the thickness intended for use.
 - 3. **Relative- Burning Characteristics:** As follows, when tested per ASTM D 635:
 - a. **Co-Polyester:** Burning extent of 1 inch (25mm) or less when tested on plastic glazing indicated below with a nominal thickness of 0.060 inch (1.5 mm) or the thickness intended for use

1.6 WARRANTY

- A. **General:** Warranties specified in this section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B. **Skylight Warranty:** Provide written warranty signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship and guaranteeing weather-tight and leak-free performance. “Defects” is defined as uncontrolled leakage of water and abnormal aging or deterioration
 - 1. **Warranty Period:** 5 years from date of Substantial Completion.
- C. **Plastic Warranty:** Provide written warranty signed by manufacturer agreeing to repair or replace work that has or develops defects in the plastic. “Defects” is defined as abnormal aging or deterioration
 - 1. **Warranty Period for Co-Polyester:** 5 years from date of Substantial Completion against yellowing or breakage
- D. **Finish Warranty:** Provide written warranty signed by manufacturer agreeing to repair or replace work with finish defects. “Defects” is defined as peeling, chipping, chalking, fading, abnormal aging or deterioration, and failure to perform as required.
 - 1. **Warranty Period for Anodized Finish:** 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE TYPE & MANUFACTURERS

- A. Square Skylights - "TSF-12-FG" by American Skylights or comparable products of other manufacturers as approved by Architect during bidding.

2.2 UNIT SKYLIGHTS

- A. General: Provide factory-assembled unit skylights that include glazing, extruded-aluminum glazing retainers, gaskets, and inner frames and that are capable of withstanding performance requirements indicated.
- B. Polycarbonate white dome over inner clear polycarbonate dome, Curb Mounted consisting of the following:
 - 1. Unit Shape and Size: Size to be field verified to match size of existing opening.
 - 2. Retainer Frame: Extruded aluminum alloy 6063-T5 (min). ASTM B 221 (ASTM B 221 M) with minimum effective thickness of 0.60 inch.
 - 3. U-Factor: .64 BTU/HR-FT²-DegF
 - 4. Solar Gain: 47.
 - 5. Visual Light Transmission: 61%.
 - 6. Condensation Control: Fabricate unit skylights with integral internal gutters and nonclogging weeps to collect and drain condensation to the exterior.
 - 7. Thermal Break: Fabricate unit skylights with thermal barrier separating exterior and interior metal framing.
- C. Accessories:
 - 1. Fasteners: Same metal as metal being fastened, nonmagnetic stainless steel, or other noncorrosive metal as recommended by manufacturer. Finish exposed fasteners to match material being fastened.
 - a. Where removal of exterior exposed fasteners might allow access to building, provide nonremovable fastener heads.
 - 2. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

2.3 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

2.4 FABRICATION

- A. Framing Components: As follows:
 - 1. Factory fit and assemble components.
 - 2. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
 - 3. Fabricate components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.

4. Fabricate components to accommodate expansion, contraction, and field adjustment, and to provide for minimum clearance and shimming at skylight perimeter.
5. Fabricate components to ensure that glazing is thermally and physically isolated from framing members.
6. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
7. Fit and secure joints by heliarc welding.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Coordinate installation of unit skylight with installation of substrates, vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight.
- B. Comply with recommendations in AAMA 1607 and with manufacturer's written instructions for installing unit skylights.
- C. Install unit skylights level, plumb, and true to line, without distortion.
- D. Anchor unit skylights securely to supporting substrates.
- E. Where aluminum surfaces of unit skylights will contact another metal or corrosive substrates, such as preservative-treated wood, apply bituminous coating on concealed metal surfaces or provide other approved permanent separation recommended in writing by unit skylight manufacturer.

3.3 CLEANING

- A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes.
- B. Remove and replace glazing that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF SECTION 086200