
PROJECT SPECIFICATION MANUAL



Robertsville Middle School
Roof Replacement
245 Robertsville Road
Oak Ridge, TN

Prepared by

RoofConnect Inc.

45 Grant 65
Sheridan, Arkansas 72150

Pre-Bid Date: April 15, 2019 at 10:00am EDT

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1.1 EXISTING CONDITION INFORMATION

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and the attachments are not part of the Contract Documents.
- B. Selected construction drawings were provided to the Consultant and are available electronically by request.
- C. The following information represents our findings at the gypsum deck roof core, but the results are not guaranteed at other locations on the roof.
 - 1. Roof Core in Field of Gypsum Deck (Roof Profile from Top Layer to Deck)
 - a. Sprayed-in-place foam (variable thickness)
 - b. 0.50" thickness wood fiberboard insulation
 - c. EPDM membrane
 - d. 1.25" thickness expanded polystyrene insulation
 - e. Gypsum deck
- D. The following information represents our findings at the steel deck roof core, but the results are not guaranteed at other locations on the roof.
 - 1. Roof Core in Field of Gypsum Deck (Roof Profile from Top Layer to Deck)
 - a. Sprayed-in-place foam (variable thickness)
 - b. 0.50" thickness wood fiberboard insulation
 - c. EPDM membrane
 - d. 2" thickness polyisocyanurate insulation
 - e. Steel Deck
- E. No testing for the presence of asbestos fibers was performed. If suspect materials are identified during construction, notify Owner immediately.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 00 3119

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SECTION 01 1000 - 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 by Owner
 - 4. Access to Site
 - 5. Coordination with Occupants
 - 6. Work Restrictions
 - 7. Specification and Drawing Conventions

1.3 PROJECT INFORMATION

- A. Project Identification: Robertsville Middle School
 - 1. Project Location: 245 Robertsville Road, Oak Ridge, TN
- B. Owner: City of Oak Ridge
 - 1. Owner's Representative: Ms. Shira McWaters, Public Works Department Director, (W) 865-425-1847
- C. Consultant: RoofConnect Inc., PO Box 1201, Madisonville, TN 37354

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
 - 1. Remove approximately 65,600 square feet of existing spray polyurethane foam roofing and membrane roofing systems from gypsum and steel roof deck sections as identified on Contract Drawings and Section 02 4119 "Selective Demolition" and properly dispose of offsite.
 - 2. Remove approximately 8,100 square feet of existing asphalt shingle on section as identified on Contract Drawings and Section 02 4119 "Selective Demolition" and properly dispose of offsite.

3. Remove and replace deteriorated wood components scheduled to remain. Provide and install new wood nailers or blocking as shown on Contract Drawings and identified in Section 06 1053 "Miscellaneous Rough Carpentry." Replacement Work shall be performed on a Unit Price Basis.
4. Remove abandoned roof curbs and fill in deck openings with matching materials as identified on Contract Drawings and Section 02 4119 "Selective Demolition" and properly dispose of offsite.
5. Repair corroded or damaged steel decking as required to complete Work as identified in Section 05 3100 "Steel Decking". Work shall be performed on a Unit Price Basis.
6. Repair deteriorated gypsum decking with appropriate materials. Work shall be performed on a Unit Price Basis.
7. Provide and install new Isocyanurate insulation per Section 07 5419 "Polyvinyl-Chloride (PVC) Roofing" as shown on Contract Drawings, and per manufacturer's requirements.
8. Provide and install new PVC thermoplastic roof system per Section 07 5419 " Polyvinyl-Chloride (PVC) Roofing" as shown on Contract Drawings, and per manufacturer's requirements.
9. Provide and install new sheet metal flashings and counter flashings as shown on Contract Drawings and identified in Section 07 6200 "Sheet Metal Flashing and Trim."
10. Provide and install new asphalt shingle roofing per Section 07 3113 "Shingle Roofing" as shown on Contract Documents.
11. Provide Owner with PVC Roofing Manufacturers' twenty (20) year warranty and Contractor's five (5) year warranty.
12. Provide Owner with Asphalt Shingle Manufacturers' thirty (30) year warranty and Contractors' five (5) year warranty.
13. Prepare, prime and paint existing standing seam metal roof sections per Section 09 9123 "Painting" as shown on Contract Documents.

B. Type of Contract:

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

1.5 WORK BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- B. Preceding Work: None
- C. Concurrent Work: None
- D. Subsequent Work: None

1.6 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as and as indicated by requirements of this Section.

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- B. Use of Site: Limit use of Project site to work in areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limits: Confine construction operations to subject roof area and ground level around building as identified by Owner during pre-bid meeting.
 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
1. 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 approval of authorities having jurisdiction.
 2. Notify Owner not less than **72** hours in advance 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: Limit work to the following times shown below unless otherwise indicated.
1. Work Days: Work shall be performed from June 4, 2019 and complete no later than August 30, 2019. June 4th and 5th may only be used for mobilization activities and no roofing work shall be permitted.
 2. Hours for Utility Shutdowns: As agreed to by Owner with specified advanced notice
 3. Hours for Core Drilling: As agreed to by Owner with specified advanced notice

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- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Consultant and Owner not less than 3 days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
 - D. 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 Consultant and Owner not less than 3 days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
 - E. Nonsmoking Building: Smoking is not permitted within the building or within 30 feet of entrances, operable windows, or outdoor-air intakes.
 - F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
 - G. Employee Screening: Contractor shall maintain a list of onsite personnel for Owner. Contractor personnel will need to check in at the office each time they enter the building.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. 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 or in some cases specifically on the Drawings.

RoofConnect Inc.
Robertsville Middle School
Roof Replacement

SUMMARY
SECTION 01 1000

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

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SECTION 01 2100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements to address work items that may be required to complete Work without Change Orders.
- B. Types of allowances include the following:
 - 1. Quantity allowances
- C. Related Requirements:
 - 1. Section 01 2200 "Unit Prices" for procedures for using unit prices

1.3 COORDINATION

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

1.4 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Schedule of Values in the Contractor's Bid.

1.5 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment (Overage; above amount): For amounts greater than allowance amounts, prepare a Change Order proposal based on the difference between installed amount and the allowance, multiplied by final measurement of work-in-place where applicable at the Unit Rate identified in Section 01 2200 "Unit Prices".
 - 1. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.

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2. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Allowance Adjustment (Underage; less than contract amount): For amounts less than allowance amounts, adjust final application for payment based on the difference between installed amount and the allowance, multiplied by final measurement of work-in-place where applicable at the Unit Rate identified in Section 01 2200 "Unit Prices."
1. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Quantity Allowance: Include 2,100 square feet of cleaning and prime painting areas of surface corrosion of metal deck as identified in Section 05 3100 "Steel Decking."
 1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- B. Allowance No. 2: Quantity Allowance: Include 500 square feet of cleaning and prime painting areas of surface corrosion of metal deck; and overlaying area with new flat stock galvanized plating as identified in Section 05 3100 "Steel Decking."
 1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- C. Allowance No. 3: Quantity Allowance: Include 300 square feet of removal and replacement of deteriorated metal deck as identified in Section 05 3100 "Steel Decking."
 1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- D. Allowance No. 4: Quantity Allowance: Include surface repair of 1,000 square feet of deteriorated gypsum decking scheduled to remain.

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1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- E. Allowance No. 5: Quantity Allowance: Include removal and replacement of 600 square feet of deteriorated gypsum decking.
1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- F. Allowance No. 6: Quantity Allowance: Include removal and replacement of 400 square feet of deteriorated wood decking scheduled to remain as specified in Section 06 1053 "Miscellaneous Rough Carpentry. "
1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- G. Allowance No. 7: Quantity Allowance: Include removal and replacement of 1,500 board feet of deteriorated wood nailers scheduled to remain as specified in Section 06 1053 "Miscellaneous Rough Carpentry. "
1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- H. Allowance No. 8: Quantity Allowance: Include replacement of 28 cast iron drain clamping rings, strainer domes, and related hardware as specified in Section 22 4123 "Storm Drainage Piping Specialties."
1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."
- I. Allowance No. 9: Quantity Allowance: Include replacement of 10 cast iron interior roof drains and related hardware as specified in Section 22 4123 "Storm Drainage Piping Specialties."
1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 2200 "Unit Prices."

END OF SECTION 01 2100

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SECTION 01 2200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

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

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price 1: Clean and prime paint metal deck
 - 1. Description: Areas of surface corrosion of structural metal deck shall be repaired as identified per Section 05 3100 "Steel Decking".
 - 2. Unit of Measurement: Square feet of repair area
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowances."

- B. Unit Price No. 2: Overlay isolated areas of deteriorated (surface corrosion) metal decking
1. Description: Clean and prime paint isolated areas of deteriorated metal decking and install metal plating as identified per Section 05 3100 "Steel Decking".
 2. Unit of Measurement: Square feet of repair area
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowances."
- C. Unit Price No. 3: Remove and replace deteriorated metal decking
1. Description: Remove and replace areas of deteriorated metal decking as identified per Section 05 3100 "Steel Decking".
 2. Unit of Measurement: Square feet of repair area
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowance".
- D. Unit Price No. 4: Surface repair of gypsum decking
1. Description: Surface repair of deteriorated gypsum decking scheduled to remain.
 2. Unit of Measurement: Square feet of surface repair
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowance".
- E. Unit Price No. 5: Remove and replace deteriorated gypsum decking
1. Description: Remove and replace areas of deteriorated gypsum decking.
 2. Unit of Measurement: Square feet of repair area
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowance".
- F. Unit Price No. 6: Remove and replace deteriorated wood decking
1. Description: Remove and replace deteriorated wood decking scheduled to remain as identified in Section 06 1053 "Miscellaneous Rough Carpentry".
 2. Unit of Measurement: Square feet of repair area
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowance" and as noted in Bid Form.
- A. Unit Price No. 7: Replace deteriorated wood nailers
1. Description: Remove and replace deteriorated wood nailers scheduled to remain as specified in Section 06 1053 "Miscellaneous Rough Carpentry".
 2. Unit of Measurement: Board feet of replaced boards
 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 2100 "Allowance".

- B. Unit Price No. 8: Replace cracked or broken cast iron drain clamping rings and strainer domes
 - 1. Description: Replace all cracked, broken or otherwise damaged drain clamping rings with new cast iron drain clamping rings of like type and size as specified in Section 22 1423 "Storm Drain Piping Specialties." Include new strainer dome with clamping ring.
 - 2. Unit of Measurement: Each replaced

- C. Unit Price No. 9: Replace broken drain strainers with new cast iron strainers
 - 1. Description: Replace all broken or otherwise damaged cast iron interior roof drains with new cast iron interior roof drains of proper type and size as specified in Section 22 1423 "Storm Drain Piping Specialties."
 - 2. Unit of Measurement: Each replaced

END OF SECTION 01 2200

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SECTION 01 2300 - ALTERNATES

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 alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements if Owner decides to accept a corresponding change in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

- 1. No alternates shall be accepted for this Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2300

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SECTION 01 2500 - 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 01 2100 "Allowances" for products selected under an allowance.
 - 2. Section 01 2300 "Alternates" for products selected under an alternate.

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 one copy 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: Use Contractor letterhead with the specified supporting documentation and signature of authorized representative of Contractor.
 - 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.
 - 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. 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.
 - i. Cost information, including a proposal of change, if any, in the Contract Sum.
 - j. 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.
 - k. 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. Consultant's Action: If necessary, Consultant will request additional information or documentation for evaluation within three (3) working days of receipt of a request for substitution. Consultant will notify Contractor of acceptance or rejection of proposed substitution within five (5) days of receipt of request or five (5) working days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order or Consultant's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Consultant 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 (if required).

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 five (5) working days prior to time required for preparation and review of related submittals.
1. Conditions: Consultant will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Consultant 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.
- B. Substitutions for Convenience: Not allowed

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2500

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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 01 2100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 01 2200 "Unit Prices" for administrative requirements governing the use of unit prices.

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 items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Consultant at earliest possible date, but no later than ten (10) days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section as required to illustrate major work groups.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location
 - b. Owner's name
 - c. Owner's Project number
 - d. Name of Consultant
 - e. Consultant's Project number
 - f. Contractor's name and address

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- g. Date of submittal
2. Arrange schedule of values in the general format of AIA Document G703.
 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or division
 - b. Description of the Work
 - c. Name of subcontractor
 - d. Change Orders (numbers) that affect value
 - e. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
 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.
 6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 7. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as approved by Consultant and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
 1. At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to Consultant an application for payment filled out and signed by the Contractor covering the Work performed during the pay period.
 2. Application for payment shall include supporting information as the Consultant may reasonably require.
 3. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner, as will

-
- establish the Owner's title to the material and equipment and protect his interest therein, including applicable insurance.
4. The Consultant shall, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate.
 5. The Owner will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Owner shall retain an amount not exceeding ten (10) percent of each payment limited to five (5) percent of the total contract amount until final completion and acceptance of all work covered by the Contract Documents.
 6. On completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, less authorized deductions.
 7. The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.
- C. Application Preparation: Complete every entry on agreed upon form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Consultant will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- D. Transmittal: Submit two (2) signed and notarized original copies of each Application for Payment to Consultant. 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.
- E. Final Payment Application:
1. Prior to Substantial Completion, the Owner, with the approval of the Consultant and with the concurrence of the Contractor, may use any completed or substantially completed portions of the Work. Such use shall not constitute an acceptance of such portions of the Work.

2. The Owner shall have the right to enter the premises for the purpose of doing work not covered by the Owner. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged Work except such as may be caused by agents or employees of the Owner.
3. Upon completion and acceptance of the Work, the Consultant shall issue a certificate attached to the final payment request that the Work has been accepted by him under the conditions of the Contract Documents. The entire balance found to be due the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the Owner, shall be paid to the Contractor within thirty (30) days of completion and acceptance of the Work.
4. The Contractor will indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demands of Subcontractor's, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the Work. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so the Owner may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged where upon payment to the Contractor shall be resumed, in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor, his Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the Contract Documents by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.
5. If the Owner fails to make payment thirty (30) days after approval by the Consultant, in addition to other remedies available to the Contractor, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.

F. Acceptance of Final Payment as Release

1. The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the Owner and others relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bond.

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Roof Replacement

PAYMENT PROCEDURES
SECTION 01 2900

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

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SECTION 01 3300 - 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 01 3200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Consultant'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 Consultant'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."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit all product submittals arranged in chronological order by dates required by construction schedule. Include additional time required for making corrections or revisions to submittals noted by Consultant and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittals with list of subcontracts (if applicable), the schedule of values, and Contractor's construction schedule.

2. Initial Submittal: Submit prior to pre-construction conference. Include all submittals required to complete all roof replacement activities. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Consultant will accept either paper (color) copies or PDF files for submittal documentation. Include with each submittal package a "Letter of Transmittal" listing all products included in submission.
 - a. Paper Copies: Provide one (1) copy of each product data sheet (single-sided) for all products listed in this specification.
 - b. PDF Files; Provide one (1) filed copy of each product data sheet for all products listed in this specification. File name shall include the product name. To reduce file sizes, product data sheets should not be scanned from paper copies.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Submit all action and informational submittals for all of the products required to complete all roof replacement activities included but not limited to insulations, cover boards, fasteners, adhesives, roofing components, and miscellaneous items.
 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. Consultant reserves 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 Consultant's 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 seven (7) business days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Consultant 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 three (3) days for review of each resubmittal.

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- C. Distribution: Consultant shall furnish electronic copies of final submittals to Contractor, Owner, and others as necessary for performance of construction activities.

 - D. Use for Construction: Contractor shall retain complete copies of submittals on Project site at all times. Use only final action submittals that are marked with "Reviewed" or "Reviewed as Noted" notations from Consultant's stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Electronic Action Submittals; Submit Action Submittals electronically via email as PDF files.
 - a. Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Paper Action Submittals: Submit one (1) paper copy of each submittal unless otherwise indicated. Consultant will return PDF files.
 - 3. Paper Informational Submittals: Submit two (2) paper copies of each submittal unless otherwise indicated. Consultant will not return copies. Contractor shall maintain one (1) copy of Informational Submittals on site at all times during construction.

- B. Certificates and Certifications Submittals: Provide statements that includes signature of entity responsible for preparing certifications. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a letter from the manufacturer of the submitted roofing system stating that Contractor has been an approved applicator of their system for no less than three (3) years.
 - b. Provide a letter on Contractor's letterhead with approved signature stating that Contractor shall perform all Work per the project specification requirements, manufacturer's requirements, and applicable codes whether stated in the Contract Documents or not.
 - c. Provide a Certificate of Insurance with Contractor's insurance amounts, listing Owner as Certificate Holder, and Owner and Consultant as additional insureds.

- C. Product Data:
 - 1. Mark each copy of each submittal to show which products and options are applicable.
 - 2. 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
 3. Submit Product Data in the format discussed in this section
 - D. Shop Drawings: Provide Project-specific drawings including all information noted on the Contract Drawings. Manufacturer's standard detail drawings shall be rejected without review. Contractor shall provide Project-specific drawings in one of the following formats:
 1. Consultant Provided Contract Drawings: Contractor may submit for approval construction details (without alteration) from the Contract Documents. Contractor shall provide a letter on Contractor's letterhead stating that Contractor shall utilize construction details from Contract Documents for installation of roofing components.
 2. Contractor Generated Drawings: Contractor may submit for approval new AutoCAD generated construction details for approved. Contractor generated drawings shall include at a minimum:
 - a. Callout for each component on the drawing with same level of information as comparable drawing in Contract Documents
 - b. Dimensions as required to match information on Contract Drawings
 - c. Relationship and attachment to adjoining construction clearly indicated
 - d. Contractor's Company Logo or approved signature of Contractor
 - e. Seal and signature of professional engineer (if specified)
 3. 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)
 - E. Samples: Submit Samples as noted in each Specification Section 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. Disposition: Samples shall remain the possession of the Owner or Consultant.
 - F. Coordination Drawing Submittals: Comply with requirements specified in Section 01 3100 "Project Management and Coordination."
 - G. Contractor's Construction Schedule: Comply with requirements specified in Section 01 3200 "Construction Progress Documentation."
 - H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 2900 "Payment Procedures."
 - I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 4000 "Quality Requirements."

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- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 "Closeout Procedures."

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 Consultant.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 7700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval 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 CONSULTANT'S ACTION

- A. Action Submittals: Consultant will review each submittal, make marks to indicate corrections or revisions required, and return it. Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. "Reviewed": No Contractor action required
 2. "Reviewed as Noted": No Contractor action required
 3. "Information Only": No Contractor action required
 4. "Revise & Resubmit": Contractor shall provide additional submittal information for review
 5. "Rejected": Contractor shall provide additional submittal information for review

END OF SECTION 01 3300

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SECTION 02 4119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Removal and disposal of existing roofing components
 2. Removal of abandoned curbs and protrusions

- B. Related Requirements:

1. Section 01 1000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

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

1.5 PREINSTALLATION MEETINGS

- A. Pre-demolition Conference: Pre-construction meeting as noted in Sections 07 5419

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
1. Detailed sequence of selective demolition and removal work outlining roof area where construction shall begin and phasing through end of construction. Ensure Owner's on-site operations are uninterrupted.
 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Use of elevator and stairs.
 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.7 FIELD CONDITIONS

- A. Owner will occupy the building below selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Consultant of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials:
1. Testing for the presence of asbestos was not conducted at this facility.
 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Consultant and Owner. Removal of hazardous materials shall be performed under a separate contract with Owner.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Consultant.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 01 1000 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Contractor access to the Work area shall be by OSHA approved exterior access.
- B. Temporary Facilities: Provide temporary interior protection against dirt and debris entering interior spaces, barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide interior protection to capture and contain dirt and debris caused by roofing operations. Interior protection per Section 01 5600 "Temporary Barriers and Enclosures" as shown on the Contract Documents.

2. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
3. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
4. Protect walls and other existing finish work that are to remain or that are exposed during selective demolition operations.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated on Contract Drawings. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically from areas farthest to closest to the ground level staging access point, whenever possible.
 2. Do not use cutting torches to complete any Work.
 3. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site and immediately notify Owner.
 4. Locate demolition equipment and remove debris and materials so as not to impose excessive loads on roof deck.
 5. Properly dispose of demolished items and materials off the roofs each day.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Consultant, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.
 1. Existing insulation scheduled to remain shall be protected by a minimum of 1-inch insulation and 3/4-inch plywood. Plywood and insulation shall be sufficiently ballasted to prevent blow off. Contractor personnel shall travel to and from ground level staging access point on walkways whenever possible.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Roofing: Remove no more existing roofing than can be covered in one day by new roofing materials so that building interior remains watertight and weathertight. See Section 07 5419 "Polyvinyl Chloride (PVC) Roofing" and Section 07 3113 "Asphalt Shingle Roofing" for new roofing requirements.
 1. Remove existing roofing and roof insulation down to the existing structural roof decks.
 - a. During removal of existing roofing materials, Contractor shall take all precautions to prevent damage to structural roof decks.
 - b. Contractor shall not damage roof deck with roof cutters. Any deck damaged caused by demolition work shall be repaired by Contractor at no cost to Owner.
 2. Remove existing base and perimeter flashings down the vertical surfaces.
 3. Remove existing metal copings, penetration flashings, and perimeter flashings down to the existing vertical substrates as required to install new components.

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- B. Abandoned curbs and protrusions: remove identified items and provide temporary or permanent coverings such that the building interior remains watertight and weathertight.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by means that prevents staining of the building exterior or parking areas, and prevents debris from blowing across the property.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

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

END OF SECTION 02 4119

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SECTION 05 3100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Roof deck

B. Related Requirements:

- 1. Section 07 5419 "Polyvinyl Chloride (PVC) Roofing" for installation on new insulation and membrane over decking

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated

B. Shop Drawings:

- 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each product identified

1.5 QUALITY ASSURANCE

- A. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

- 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
- C. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 ROOF DECK

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ASC Profiles, Inc.; a Blue Scope Steel company
 - 2. Canam United States; Canam Group Inc.
 - 3. Cordeck
 - 4. Nucor Corp.; Vulcraft Group
 - 5. Roof Deck, Inc.
 - 6. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation
- B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
 - 1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 (230) minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - a. Color: Manufacturer's standard
 - 2. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230) zinc coating

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

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- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
 - D. Repair Paint: Manufacturer's standard rust-inhibitive primer

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
 - 1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Mechanical fasteners shall be used in lieu of welding. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. Fasten deck to structural supports and at side-lap and perimeter edge fastening: Fasten deck panels to structural supports in every other flute but not less than 12 inches. Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 36 inches (914 mm), and as follows:

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1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
 2. Mechanically clinch or button punch

B. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (51 mm) minimum

3.4 DECK PLATING

A. Wire brush and clean localized areas of surface corrosion where corrosion is greater than 3mils but deck is still able to provide uplift resistance required for new roof system.

B. Apply rust inhibitive primer as required by manufacturer of primer.

C. Overlay localized area with flat stock repair material and secure to existing metal deck.

1. Secure flat stock repair material with corrosion resistant hex head fasteners no more than 6 inches on center.

3.5 WIRE BRUSH AND PAINT DECKING

A. Repair Painting: Wire brush and clean areas of surface corrosion where corrosion is less than 3mils.

1. Apply rust inhibitive primer as required by manufacturer of primer.

END OF SECTION 05 3100

SECTION 06 1053 - MISCELLANEOUS 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. Section Includes:
 - 1. Rooftop equipment bases and support curbs
 - 2. Wood blocking and nailers
 - 3. Wood decking
- B. Related Requirements:
 - 1. 07 3113 "Asphalt Shingle Roofing" for installation of roofing components
 - 2. 07 5419 "Polyvinyl Chloride (PVC) Roofing" for installation of roofing components
 - 3. 07 6200 "Sheet Metal Flashing and Trim" for installation of metal components

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association
 - 2. NHLA: National Hardwood Lumber Association
 - 3. NLGA: National Lumber Grades Authority
 - 4. SPIB: The Southern Pine Inspection Bureau
 - 5. WCLIB: West Coast Lumber Inspection Bureau
 - 6. WWPA: Western Wood Products Association

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. 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.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include

physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated. Factory mark each piece of lumber with grade stamp of grading agency.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.2 MISCELLANEOUS LUMBER

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

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6. Western woods; WCLIB or WWPA
 7. Northern species; NLGA
 8. Eastern softwoods; NeLMA

- C. 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.
- D. 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 PLYWOOD PANELS

- A. Panels: DOC PS 1, Exterior, AC, in thickness indicated on Contract Drawings

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. All fasteners must be approved for use with wood-preservative-treated treated lumber.
- B. Nails, Brads, and Staples: ASTM F 1667
- C. Power-Driven Fasteners: NES NER-272
- D. Wood Screws: ASME B18.6.1
- E. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

- C. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- E. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3 2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- F. Use steel common nails approved for use with wood-preservative-treated lumber unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 PROTECTION

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

END OF SECTION 06 1053

SECTION 07 3113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 RELATED REQUIREMENTS

- 1. Section 06 1053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
- 2. Section 07 6200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings
- 3. Section 07 9200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation

1.4 DEFINITION

- A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.5 PREINSTALLATION MEETINGS

- A. Pre installation Roofing Conference: Conduct conference at Project site a minimum of seven working days prior to the first day of on-site work.
 - 1. Meet with Owner, Consultant, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 - 5. Review governing regulations and requirements for insurance and certificates if applicable.

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6. Review temporary protection requirements for roofing system during and after installation.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of asphalt shingle indicated.
 1. Include similar Samples of accessories involving color selection.
- C. Samples for Verification: For the following products, of sizes indicated:
 1. Asphalt Shingles: Full size.
 2. Ridge and Hip Cap Shingles: Full size.
 3. Ridge Vent: 12-inch long Sample.
 4. Intake Vent: 12-inch long Sample.
 5. Valley Lining Material: 12 inches square.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 1. Submit evidence of compliance with performance requirements.
- C. Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Sample Warranties: For manufacturer's special warranties.
- E. Installation Instructions.

1.8 CLOSEOUT SUBMITTALS

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

1.9 MAINTENANCE MATERIAL SUBMITTALS

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

1.10 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayments and ventilation products, by a single manufacturer.

1.11 DELIVERY, STORAGE, AND HANDLING

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

1.12 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Protection: Schedule installation sequence to limit access and utilization of the newly installed roofing surfaces for material storage, construction staging, mechanical and/or excessive foot traffic.

1.13 WARRANTY

- A. Manufacturer's Standard Limited Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.
 - 2. Material Warranty Period: Thirty (30) years from date of Substantial Completion.
- B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D3462/D3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
1. Manufacturers: Subject to compliance with requirements, provide following products by one of the manufacturers offering products that may be incorporated into the Work:
 - a. Certainteed
 2. Exposure: Manufacturer's standard exposure.
 3. Strip Size: Manufacturer's standard size.
 4. Algae Resistance: Granules resist algae discoloration.
 5. Impact Resistance: UL 2218, Class 4.
 6. UL 790 Class A rated.
 7. Color and Blends: As selected by Owner from manufacturer's full range.
- B. Intake and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.
- C. Starter Strips: Self-sealing starter shingle designed for use with all roof shingles.

2.3 UNDERLAYMENT MATERIALS

- A. Synthetic Underlayment: UV-resistant polypropylene, polyolefin, or polyethylene polymer fabric with surface coatings or treatments to improve traction underfoot and abrasion resistance; evaluated and documented to be suitable for use as a roof underlayment under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction. Meets or exceeds ASTM D226 and D4869.
- B. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D1970/D1970M, minimum of 40-mil thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.
- C. Self-Adhering Valley Lining, Polyethylene Faced: ASTM D1970/D1970M, minimum of 40-mil thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment; minimum 36 inches wide.

2.4 HIP AND RIDGE VENTS

- A. Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic vent for use under hip and ridge shingles.
 - 1. Minimum Net Free Area: 18.0 square inches NFVA per lineal foot.
 - 2. Features: Designed to allow the passage of hot air out of attics while prohibiting snow infiltration.
 - a. Hand nailed

- B. Intake Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic vent for use under hip and ridge shingles.
 - 1. Minimum Net Free Area: 9.0 square inches NFVA per lineal foot.
 - 2. Features: Designed to allow the passage of hot air out of attics while prohibiting snow infiltration.
 - a. Hand nailed

2.5 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D4586, Type II, asbestos free.

- B. Roofing Nails: ASTM F1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch diameter, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
 - 1. Shank: Barbed or deformed shank
 - 2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

- C. Synthetic-Underlayment Fasteners: As recommended in writing by synthetic-underlayment manufacturer for application indicated.

2.6 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Sheet Metal: Aluminum, mill finished, minimum thickness of .032-inch, complying with ASTM B 209.

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- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
1. Apron Flashings: Fabricate with lower flange a minimum of four (4) inches beyond each side of downslope asphalt shingles and six (6) inches up the vertical surface.
 2. Step Flashings: Fabricate with a headlap of two (2) inches and a minimum extension of four (4) inches over the underlying asphalt shingle and up the vertical surface.
 3. Cricket or Backer Flashings: Fabricate with concealed flange extending a minimum of eighteen (18) inches beneath upslope asphalt shingles and six (6) inches beyond each side of protrusion and six (6) inches above the roof plane.
 4. Drip Edges: Fabricate in lengths not exceeding ten (10) feet with two (2) inch roof-deck flange and one and one-half (1-1/2) inch fascia flange with three-eighth (3/) inch drip at lower edge.
- C. Vent Pipe Flashings: ASTM B749, Type L51121, at least one-sixteenth (1/16) inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least four (4) inches from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated. When local codes and application are in conflict, the more stringent requirements shall take precedence.
- B. Synthetic Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides and ends and treat laps as recommended in writing by manufacturer. Stagger end laps

between succeeding courses at interval recommended in writing by manufacturer. Fasten according to manufacturer's written instructions. Cover underlayment within period recommended in writing by manufacturer.

1. Install in single layer on roofs sloped at 4:12 and greater. Minimum two (2) inch side laps and four (4) inch end laps.
2. Install in double layer on roofs sloped at less than 4:12. Minimum nineteen (19) inch side laps and four (4) inch end laps.

C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than three and one half (3-1/2) inches. Lap ends not less than six (6) inches staggered twenty-four (24) inches between courses. For use as eave ice and snow barrier or valley liner lap ends not less than twelve (12) inches. Roll laps with roller. Cover underlayment within seven days.

1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.
2. Eaves: Extend from edges of eaves thirty-six (36 inches) beyond interior face of exterior wall.
3. Valleys: Extend from lowest to highest point eighteen (18 inches) on each side on roofs sloped at 4:12 and greater. Extend from lowest to highest point thirty-six (36 inches) on each side on roofs sloped at less than 4:12.
4. Sidewalls: Extend beyond sidewall eighteen (18) inches and return vertically against sidewall not less than six (6) inches.
5. Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Extend beyond penetrating element eighteen (18) inches and return vertically against penetrating element not less than six (6) inches.
6. Roof Slope Transitions: Extend eighteen (18) inches on each roof slope.
7. Vent Pipes: Install a twenty-four (24) inch square piece of self-adhering sheet underlayment lapping over roof deck protection; seal tightly to pipe.

D. Concealed Valley Lining: For (closed-cut) valleys. Comply with NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems." Install underlayment centered in valley and fastened to roof deck.

1. Lap roof-deck underlayment over valley underlayment at least six (6) inches.
2. Install self-adhering sheet underlayment centered in valley. Install per requirements shown in 3.2 C 4 of this section. Fasten to roof deck only at outside edges of sheet.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

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- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
 - C. Step Flashings: Install with a headlap of two (2) inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
 - D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.
 - E. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
 - F. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
 - G. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.
 - H. Counterflashing: Extend counterflashing components a minimum four (4) inches over apron flashings, step flashings or other flashing components. At masonry surfaces insert counterflashing into a mortar or a cut reglet joint and seal top with appropriate sealant.

3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems." When local codes and application are in conflict, the more stringent requirements shall take precedence.
- B. Install self-sealing starter shingle along lowest roof edge with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles one-half (1/2) inch overhanging fasciae at eaves and rakes.
 - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Fasten asphalt-shingle strips with a minimum of four to six roofing nails per shingle according to manufacturer's requirements and located according to manufacturer's written instructions.
 - 1. Where roof slope exceeds 21:12, seal asphalt shingles with asphalt roofing cement spots.
 - 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 - 3. When ambient temperature during installation is below 40 degrees F, seal asphalt shingles with asphalt roofing cement spots.

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- E. Closed-Cut Valleys: Extend asphalt-shingle strips from one side of valley twelve (12) inches beyond center of valley. Use one-piece shingle strips without joints in valley. Fasten with extra nail in upper end of shingle. Install asphalt-shingle courses from other side of valley and cut back to a straight line two (2) inches short of valley centerline. Trim upper concealed corners of cut-back shingle strips.
1. Do not nail asphalt shingles within six (6) inches of valley center.
 2. Set trimmed, concealed-corner asphalt shingles in a three (3) inch wide bed of asphalt roofing cement.
- F. Hip and Ridge Vents: Install continuous ridge or hip vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing. Hand nail only.
- G. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Lap hip shingles at hips to shed water away downslope. Fasten with roofing nails of sufficient length to penetrate sheathing. Hand nail when installed over hip and ridge vents.
1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.
- H. Intake Vents: Install continuous intake vents along eave edge under asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing. Hand nail only.

3.5 ROOFING INSTALLER'S WARRANTY

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

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

1. Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Peak gust wind speed exceeding 77mph;
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
4. During Warranty Period, if Owner allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

RoofConnect Inc.
Robertsville Middle School
Roof Replacement

ASPHALT SHINGLE ROOFING
SECTION 07 3113

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

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

END OF SECTION 07 3113

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SECTION 07 5419 - POLYVINYL-CHLORIDE (PVC) 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. Adhered 60 mil polyvinyl-chloride (PVC) roofing system
 - 2. Roof insulation
- B. Related Requirements:
 - 1. Section 06 1053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
 - 2. Section 07 6200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings
 - 3. Section 07 9200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation
 - 4. Section 22 1423 "Storm Drainage Piping Specialties" for roof drains

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

- A. Pre installation Roofing Conference: Conduct conference at Project site a minimum of seven working days prior to the first day of on-site work.
 - 1. Meet with Owner, Consultant, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 - 5. Review governing regulations and requirements for insurance and certificates if applicable.
 - 6. Review temporary protection requirements for roofing system during and after installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product
- B. Shop Drawings: For roofing system; Include plans, details, and attachments to other work including:
 - 1. Base flashings and membrane terminations
 - 2. Crickets, saddles, and tapered edge strips, including slopes
 - 3. Insulation fastening pattern for corner, perimeter, and field-of-roof
- C. Samples for Verification: For the following products:
 - 1. Walkway pads or rolls, of color required

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
- C. Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Sample Warranties: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM Global approved for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

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- B. Handle all materials in such a manner as to prevent damage and contamination with moisture or foreign matter. Handle rolled goods in a manner to prevent damage to edges or ends.
 - C. Do not expose materials to moisture in any form, before, during or after delivery to work site. Reject delivery of materials that show evidence of contact with moisture.
 - D. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
 - E. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location.
 - F. Slice manufacturer supplied plastic covers from materials to allow moisture movement. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture.
 - G. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material is to be installed.
 - H. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.
 - I. Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, and will require removal and replacement at Contractor's expense.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Protection: Schedule installation sequence to limit access and utilization of the newly installed roofing surfaces for material storage, construction staging, mechanical and/or excessive foot traffic.
- C. Safety: Take all necessary precautions regarding worker and general public health and safety when using solvents, adhesives or bitumens. Store flammable liquids away from open sparks or flames. Take necessary precautions when using solvents, adhesives or bitumens near fresh air intakes.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

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1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
 2. Warranty Period: **Twenty (20) years** from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
1. Warranty Period: **Five (5) years** from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain components including roof insulation, fasteners, pre-fabricated corners and boot flashings, and all other miscellaneous products for roofing system from same manufacturer as membrane roofing whenever available. All products shall be approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a built-up roofing system, and shall be listed in **FM Global's "RoofNav" for Class 1** or noncombustible construction, as applicable. Identify materials with FM Global markings.
1. Fire/Windstorm Classification: Class 1A-90
 2. Hail-Resistance Rating: SH
 3. Provide FM Global RoofNav Numbers for systems utilized
- D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

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- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 PVC ROOFING

- A. PVC Sheet: ASTM D 4434/D 4434M, Type II, fiberglass reinforced or Type III, polyester fabric reinforced, with a minimum membrane thickness over scrim of 23mils for 60 mil membranes.
 - 1. Manufacturers: Subject to compliance with requirements, provide following products by one of the manufacturers offering products that may be incorporated into the Work:
 - a. Sarnafil; Sika Plan
 - b. Johns Manville; JM PVC SD Plus
 - c. Carlisle; Sure-Flex PVC
 - 2. Thickness: 60 mils
 - 3. Exposed Face Color: White

2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Asphalt resistant sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet.
- C. Bonding Adhesive: Manufacturers's approved water based PVC adhesive.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.
- F. Base Sheet: Manufacturer approved base sheet complying with specific FM Global RoofNav for use over gypsum decking.
- G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.5 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Atlas Roofing Corporation
 - b. Sarnafil
 - c. Hunter Panels
 - d. Johns Manville
 - 2. Thickness: As shown on Contract Drawings

2.6 TAPERED INSULATION

- A. Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2, provide factory-tapered insulation boards fabricated to slope as indicated on Contract Drawings.

2.7 COVER BOARD

- A. Cover Board: ASTM C 1278/C 1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate
 - 1. Manufacturers: Subject to compliance with requirements, provide products by:
 - a. USG Corporation; Securock Gypsum-Fiber Roof Board, 1/2" thickness
 - b. Approved Equal

2.8 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer.

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- D. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation and cover board to substrate or to another insulation layer as follows:
1. Bead-applied, low-rise, one-component or multi-component urethane adhesive.

2.9 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
1. Verify that the surfaces and site conditions are ready to receive work.
 2. Verify that structural deck is anchored and secure.
 3. Verify that roof openings and penetrations are in place, curbs are set and braced and roof drain bodies are securely clamped in place.
 4. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 5. Verify that the deck surfaces are dry.
 6. Verify that surface plane of the roof deck is clean and smooth, free of depressions, waves or projections and properly sloped to drains, valleys, eaves, scuppers or gutters.
 7. Verify that the surface plane of the deck is suitable to allow for adhesion of base layer of insulation when adhesives are used.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Daily production schedules of new roofing shall be limited to that which can be made 100% watertight at the end of each day.

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- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
 - D. Install roofing and auxiliary materials to tie in to existing roofing to maintain weather tightness of transition.

3.4 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Do not install wet or warped insulation boards. Warped insulation boards shall be considered damaged and shall be promptly removed from site at Contractor's expense.
- C. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- D. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or crushing of the insulation at the corners.
- E. Damaged insulation board corners shall be cut out and replaced with an insulation piece a minimum 12" x 12". Pieces that are cut from larger panels that are smaller than one (1) square foot are not acceptable.
- F. Install insulation on area of roofing to achieve required thickness. Stagger joints of each succeeding layer staggered from joints of previous layer a minimum of 12 inches in each direction.
- G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- H. Taper roof insulation to create drain sumps. All taper boards or pieces must be securely adhered or mechanically fastened with a minimum of two (2) fasteners per piece.
- I. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- J. Fasteners and adhesives shall be installed in accordance with manufacturer's recommendations, fasteners shall comply with minimum fastener penetration for specific deck types when applicable.
- K. Additional adhesive and fasteners shall be installed in accordance with manufacturer specifications and/or specified uplift requirements to provide perimeter and corner wind uplift enhancements.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 12 inches in each direction. Adhere insulation with manufacturer's approved adhesive per installation requirements.
 - 1. Fasten cover boards according to requirements in FM Global's "RoofNav" for specified Windstorm resistance Classification.

3.6 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before installing.
- B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- A. Membrane Adhesive: Apply to substrates according to roofing system manufacturer's written instructions.
- B. Do not apply to splice area of roofing.
- C. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing according to roofing system manufacturer's written instructions.
- D. Apply roofing with side laps shingled with slope of roof deck where possible.
- E. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity.
 - 2. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- F. Drains: Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.7 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.

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- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
 - D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
 - E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Owner.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Consultant and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

3.11 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <Insert name of Owner>.
2. Address: <Insert address>.

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3. Building Name/Type: **<Insert information>**.
 4. Address: **<Insert address>**.
 5. Area of Work: **<Insert information>**.
 6. Acceptance Date: _____.
 7. Warranty Period: **<Insert time>**.
 8. Expiration Date: _____.

- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding 72mph;
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or

deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

END OF SECTION 07 5419

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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. Formed low-slope roof sheet metal fabrications

- B. Related Requirements:

- 1. Section 06 1053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking
 - 2. Section 07 3113 "Asphalt Shingle Roofing" for installation of sheet metal flashing and trim integral with roofing
 - 3. Section 07 5419 "Polyvinyl Chloride (PVC) Roofing" for installation of sheet metal flashing and trim integral with 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 roofing and wall materials, joints, and seams to provide leak proof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: As noted in Section 07 5419 "Polyvinyl Chloride (PVC) Roofing"

1.5 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. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.

2. Include identification of material, thickness, weight, and finish for each item and location in Project.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. High performance roof edge system shall be CERTIFIED by the manufacturer to comply with ANSI/SPRI/FM 4435 ES-1 Standard. Roof edge shall meet performance design criteria according to the following test standards: 1. ANSI/SPRI/FM 4435/ES-1 Test Method RE-2 Pull-Off Test for Fascia: The fascia system shall be tested in accord with the ANSI/SPRI ES-1 Test Method RE-2. Use the current edition of ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

C. Handle all materials in such a manner as to prevent damage and contamination with moisture or foreign matter. Handle rolled goods in a manner to prevent damage to edges or ends.

D. Do not expose materials to moisture in any form, before, during or after delivery to work site. Reject delivery of materials that show evidence of contact with moisture.

E. Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, and will require removal and replacement at Contractor's expense.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing 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.

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- B. SPRI Wind Design Standard: Pursuant to 1504.5 Edge securement for low-slope roofs. Low-slope built-up, modified bitumen and single-ply roof system metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except Vult wind speed shall be determined from Figure 1609A, 1609B, or 1609C as applicable.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- A. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance with ASTM A653/A653M, G90 (Z275) coating designation; pre-painted by coil-coating process to comply with ASTM A755/A755M.
1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - B. Aluminum Sheet: ASTM B209 alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

2.3 ENGINEERED EDGE SYSTEMS

- A. Fascia: Manufactured, two-piece, fascia consisting of snap-on metal fascia cover section lengths not exceeding 12 feet (3.6 m) and a engineered cleat system as shown on Contract Drawing.
1. Manufacturers: Provide the following:
 - a. Metal-Era, Inc. as manufactured for specified manufacturers
 2. Fascia: Fabricated from the following exposed metal:
 - a. Kynar Finish Galvanized Steel: 24 gauge
 - b. Color: match existing as approved by Owner
 3. Splice Plates: Concealed, of same material, finish, and shape as fascia cover

2.4 GUTTERS AND DOWNSPOUTS

- A. Gutter: Seamless 5" aluminum gutter with painted finish, site formed from .032" aluminum painted coil to provide a continuous length without seams from end to end

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- B. Downspout: Pre-fabricated 3" x 4" sized aluminum downspout with painted finish formed from .032"
 - C. Gutter Hangers: Approved aluminum hangers utilizing screw fasteners (spikes and ferrules not permitted)

2.5 COUNTERFLASHING COMPONENTS

- A. General: Provide shop fabricated components formed to fit into existing receivers

2.6 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 unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal. Fasteners installed in wood-preservative-treated lumber shall be coated appropriate coatings to resist corrosion from wood-preservative treatment.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened
 - 2. Fasteners for Steel Sheet: Series 300 stainless steel
 - 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel
- C. Solder:
 - 1. For Stainless Steel: ASTM B 32, Grade Sn60 or Grade Sn96, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.7 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. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. 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.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- H. Do not use graphite pencils to mark metal surfaces.

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.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks
4. Torch cutting of sheet metal flashing and trim is not permitted
5. Do not use graphite pencils to mark metal surfaces

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.

C. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inch for nails and not less than 3/4 inch for wood screws but not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

D. 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.

E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder aluminum sheet.
2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering.

Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate as shown on Drawings.
- C. Roof Edge Flashing: Ensure all fascia extend a minimum of 2" lower than the bottom of the wood nailers.
- D. Roof Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of 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.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 6200

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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. Section Includes:

1. Silicone joint sealants
2. Urethane joint sealants
3. Polysulfide joint sealants
4. Latex joint sealants
5. Solvent-release-curing joint sealants
6. Preformed joint sealants
7. Acoustical joint sealants

B. Related Sections:

1. Section 07 3113 "Asphalt Shingle Roofing" for roofing components
2. Section 07 5419 "Polyvinyl Chloride (PVC) Roofing" for roofing components
3. Section 07 6200 "Sheet Metal Flashing and Trim " for sheet metal flashing and trim

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated

1.4 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 degrees F
2. When joint substrates are wet
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates

1.5 WARRANTY

When warranties are required, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 2 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L

2.2 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT
 - 1. Products: Subject to compliance with requirements, provide the following provide one of the following available products that may be incorporated into the Work:
 - a. Sika Corporation, Construction Products Division; Sikaflex - 1a

2.3 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

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

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces

3.4 CLEANING

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

3.5 PROTECTION

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

END OF SECTION 07 9200

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SECTION 09 9123 – EXTERIOR PAINTING

PART ONE – GENERAL

1.01 DESCRIPTION

- A. General: Provide all labor, materials, equipment and tools as required to prepare and coat existing standing seam metal roof area with new materials as specified.

1.02 QUALITY ASSURANCE

A. Qualifications of Manufacturer

1. Provide primary roof coating product from a single manufacturer which has successfully marketed and supplied the products for not less than 15 years. Provide secondary accessory materials only as recommended and approved by manufacturer of primary materials.
2. Primary products shall include spray, brush, and trowel grade coatings, polyester membrane, and rust conditioning materials.

B. Qualifications of Contractor

1. The Contractor shall use adequate numbers of qualified workers who are thoroughly trained in the crafts and techniques required to properly install the type of roof coating proposed for use and other work required to complete the work specified.
2. A single installer will perform the work. The installer must be trained and certified by product manufacturer, and show written evidence of his authorized status.
3. The installer will own or have access to the equipment necessary, and shall meet all safety, insurance, and technical requirements of the building owner.

1.03 INSTALLATION PARAMETERS:

- A. Emergency spot repairs can be made in the winter or during inclement weather. However, extensive repairs or system installations should not be considered unless the following conditions are met:
1. Surface must be clean and dry prior to application of coatings.
 2. Do not begin work if surface temperature is above 140 degrees Fahrenheit or below 40 degrees Fahrenheit, or when the dew point is less than 5 degrees Fahrenheit above the surface temperature.

3. All previous non-factory applied coatings must be tested for acceptable adhesion and must be removed if the adhesion is found to be inadequate. For questionable substrates, contact manufacturer's technical department.

4. Do not begin spray work if wind velocity is above 15 m.p.h.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Deliver only approved materials to the job site. Deliver materials in original sealed containers with seals unbroken and labels legible and intact.
- B. Materials shall be delivered in sufficient quantities so as not to cause delays in work.
- C. Store and handle materials in a manner which will ensure that there is no possibility of contamination. Store in a dry, well-ventilated, weather-tight place, at temperatures between 50 degrees and 80 degrees F. Do not stack pallets more than two (2) high. Do not subject existing roofing to unnecessary loading. In all cases, the storage and handling of materials shall conform to the requirements of the manufacturer and all applicable safety regulatory agencies.
- D. Material containers shall not be removed from the job site until final completion and/or until so authorized by the owner. All waste materials and debris shall be cleaned up daily.
- E. Any damaged materials or materials not conforming to the specified requirements shall be rejected by the owner. Rejected materials shall be immediately removed from the job site and replaced at no additional cost to the owner.

PART TWO – PRODUCTS

2.01 ROOF COATING

- A. Acrylic Coating: Sherwin Williams Sher-Cryl HPA
 - 1. One component acrylic coating, gloss finish
 - 2. Comply with ASTM D4541 Adhesion and ASTM D2246 Thermal Cycling testing
- B. Primer for Painted Surfaces: Sherwin Williams DTM Bonding Primer
 - 1. Waterborne acrylic emulsion adhesion-promoting bonding primer
 - 2. Comply with ASTM D522 Flexibility and ASTM D4400 Sag testing
- C. Rust Inhibiting Primer: Sherwin Williams Pro Industrial Pro-Cryl Universal Acrylic Primer
 - 1. Self-crosslinking acrylic primer
 - 2. Comply with ASTM D4541 Adhesion and ASTM D4585 Moisture Condensation Resistance testing

2.04 MANUFACTURER

- A. The following roof coating manufacturers have been approved for this project. No substitutions by secondary, indirect manufacturers will be allowed.

1. Sherwin Williams
101 West Prospect Avenue
Cleveland, OH 44115
(216) 566-2000

PART THREE - EXECUTION

- 1.1 PAINTING OF EXISTING METAL COPING
 - D. Existing rusted surfaces: Wire brush or scrape rusted areas to bare metal
 - E. Abrase existing surfaces with small grit sand paper to promote adhesion
 - F. Clean existing surfaces to be painted to comply with Society for Protective Coatings Standard SP-1 Solvent Cleaning
 - G. Spot apply Sherwin Williams Pro-Cryl Universal Acrylic rust inhibitive Primer over all prepared existing rusted surfaces. Apply at an approximate coverage rate of 160-320 square feet per gallon. Allow to dry before installing subsequent primer applications.
 - H. Apply Sherwin Williams DTM Bonding Primer over all surfaces to be painted. Apply at an approximate coverage rate of 135-328 square feet per gallon. Allow to dry before installing subsequent primer applications. Allow sufficient drying time before painting.
- 1.2 Apply two (2) coats of Sherwin Williams Sher-Cryl HPA acrylic coating over all surfaces to be coated. Apply at an approximate coverage rate of 160-270 square feet per gallon (6.0 – 10.0 wet mils) each coat in accordance with Sherwin William requirements. Allow sufficient drying time between coats. CLEANING AND PROTECTION
 - A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
 - B. Provide masking tape and other protective coverings to protect adjacent surfaces during all painting work.
 - C. Clean off excess sealants.
 - D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of 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.
 - E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 09 9123

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SECTION 22 1423 - STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof drains
 - 2. Miscellaneous storm drainage piping specialties
 - 3. Flashing materials

1.3 ACTION SUBMITTALS

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

1.4 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 METAL ROOF DRAINS

- A. Cast-Iron, Large-Sump, General-Purpose Roof Drains:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company
 - b. Smith, Jay R. Mfg. Co.
 - c. Zurn Plumbing Products Group; Specification Drainage Operation
 - d. Wade Company
 - 2. Standard: ASME A112.6.4, for general-purpose roof drains
 - 3. Body Material: Cast iron
 - 4. Dimension of Body: Match existing
 - 5. Outlet: Bottom
 - 6. Underdeck Clamp: Required
 - 7. Dome Material: Cast iron
 - 8. Description: Manufactured, gray-iron casting, for attaching to existing piping
 - 9. Outlet Size to match existing piping

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.
 - 1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
 - 2. Position roof drains for easy access and maintenance

3.2 CONNECTIONS

- A. Comply with requirements for piping specified in Section 22 1413 "Facility Storm Drainage Piping."

3.3 PROTECTION

- A. Protect drains during construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 1423