SECTION 07 71 00 - ROOF 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.

B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
   1. *Uniform General Conditions for Construction Contracts*, State of Texas, 2010 (UGC).
   2. The University of Houston's *Supplemental General Conditions and Special Conditions for Construction.*

1.2 SUMMARY

A. Section Includes:

   1. Copings.
   2. Roof-edge flashings.
   3. Roof-edge drainage systems.

B. Related Sections:

   1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
   2. Section 07 41 13.16 "Standing-Seam Metal Roof Panels" for roof-edge drainage-system components provided by metal-roof-panel manufacturer.
   3. Section 07 72 00 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. SPRI Wind Design Standard: Manufacture and install copings tested according to SPRI ES-1 and capable of resisting the following design pressures:

   1. Design Pressure: As indicated on Drawings .

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F , material surfaces.

1.4 ACTION SUBMITTALS

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

B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work. Include the following:

1. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
2. Pattern of seams and layout of fasteners, cleats, clips, and other attachments.
3. Details of termination points and assemblies, including fixed points.
4. Details of special conditions.

C. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for copings and roof-edge flashings.

B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

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

1.7 QUALITY ASSURANCE

1.8 DELIVERY, STORAGE, AND HANDLING

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

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof specialties installation.

1.9 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.

b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXPOSED METALS

A. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:

1. Exposed High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
a. Three-Coat Fluoropolymer: AAMA 2605. System consisting of primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent PVDF resin by weight.

2. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
2. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

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

E. Bituminous Coating: ASTM D-312, Type IV extra steep asphalt.

F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 COPINGS

A. Copings: Formed aluminum, 0.063 inch thick, shaped as indicated, including special supports spaced at 24 inches on center. Include cover plates to conceal and weather seal joints and attachment flanges.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Architectural Products Company.
    b. Petersen Aluminum Corporation.
    c. Substitutions: See Section 01 25 00 – Substitution Procedures.

3. Coping-Cap Material: Formed aluminum, 0.063 inch thick thickness as required to meet performance requirements .

    a. Finish: Three-coat fluoropolymer.
    b. Color: As selected by Architect from manufacturer's full range .

B. One-Piece Gravel Stops: Manufactured, one-piece, metal gravel stop in section lengths not exceeding 12 feet , with a horizontal flange and vertical leg, drain-through fascia terminating in a drip edge, and concealed splice plates of same material, finish, and shape as gravel stop. Provide matching corner units.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Architectural Products Company.
    b. Petersen Aluminum Corporation.
    c. Substitutions: See Section 01 25 00 – Substitution Procedures.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

B. Self-Adhering Sheet Underlayment: Install wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water. Overlap edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties 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 roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of self-adhering, high-temperature sheet underlayment .

3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of [**12 feet**] Insert dimension with no joints within of corners or intersections unless otherwise shown on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance .

E. Seal joints with [**elastomeric**] [**butyl**] sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches except reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 COPING INSTALLATION

A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor copings to meet performance requirements.

1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements .
2. Interlock face leg drip edge into continuous cleat anchored to substrate at manufacturer's required spacing that meets performance requirements . Anchor back leg of coping with screw fasteners and elastomeric washers at manufacturer's required spacing that meets performance requirements .

3.5 ROOF-EDGE FLASHING INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.6 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.
2. Install continuous leaf guards on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.
1. Connect downspouts to underground drainage system indicated.

D. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
2. Loosely lock front edge of scupper with conductor head.
3. Seal or solder exterior wall scupper flanges into back of conductor head.

E. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper discharge.

3.7 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder and sealants.

B. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 71 00