

SECTION 077100 - ROOF SPECIALTIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following manufactured roof specialties:
 - 1. Roof edge flashings.
 - 2. Roof edge drainage systems.
 - 3. Counterflashings and reglets.
 - 4. Roof penetration flashings.
- B. Related Sections include the following:
 - 1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 075423 "Thermoplastic-Polyolefin (TPO) Roofing" for installing flashing with roofing membranes.
 - 3. Section 079200 "Joint Sealants" for field-applied sealants.
- C. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, roofing-system testing and inspecting agency representative, roofing Installer, roofing-system manufacturer's representative, Installer, structural-support Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.
 - 2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties.
 - 1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
 - 2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 - 3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 4. Detail termination points and assemblies, including fixed points.
 - 5. Include details of special conditions.
- C. Samples: For each type of roof specialty and for each color and texture specified.
- D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
- E. Samples for Verification:
 - 1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
 - 2. Include roof-edge specialties, roof-edge drainage systems, reglets and counterflashings made from 12-inch (300-mm) lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

1.4 INFORMATION SUBMITTALS

- A. Qualification Data: For manufacturer or fabricator, as applicable.
- B. Product Certificates: For each type of roof specialty.
- C. Product Test Reports: For roof-edge flashings, for tests performed by a qualified testing agency.
- D. Sample Warranty: For manufacturer's or fabricator's special warranty.

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are SPRI ES-1 tested to specified design pressure.
- B. Product Options: This specification has as its Basis-of-Design Products, products that are manufactured in accordance with the basis-of-design products indicated. At the contractor's option, shop fabricated products using the same materials, sizes, thicknesses, and appearances may be used subject to fabricator's qualifications indicated below.
- C. Fabricator Qualifications: Employs skilled workers who custom fabricate roof specialties similar to that required by this specification and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are SPR1 ES-1 tested, the fabrication shop is to be listed as able to fabricate required details as tested and approved.
- D. Source Limitations: Obtain roof specialties for project from same manufacturer or fabricator.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.
- C. Where the project consists of multiple buildings, contractor shall assume different colors for each building unless noted otherwise.

1.9 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace manufactured 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 D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Manufacture and install manufactured roof specialties to resist thermally induced movement and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Specified material thickness/gauges of products are a minimum. Material thickness shall be increased as required to meet dimensions shown on documents and as required to meet Design Pressures.
- C. Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: In accordance with the Standard Building Code (International Building Code) as adopted by the State of Georgia for the location of the project.
- D. Thermal Movements: Provide manufactured roof specialties that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing 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 engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- E. Water Infiltration: Provide manufactured roof specialties that do not allow water infiltration to building interior.

2.2 ROOF EDGE FLASHINGS

- A. Roof Edge Fascia: Manufactured, two-piece, roof edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet (365.76 cm) and a continuous formed- or extruded-aluminum anchor bar with integral drip edge cleat to engage fascia cover. Provide matching mitered and welded corner units.
 - 1. Basis-of-Design Product: Metal-Era, Inc.; Anchor-Tite or a comparable product by one of the following:
 - a. Architectural Products Co.
 - b. Hickman Edge Systems
 - c. Metal-Era, Inc.
 - d. Pac-Clad Petersen
 - 2. Fascia Cover: Fabricated from the following exposed metal:
 - a. Prepainted, Zinc-Coated Steel: minimum 0.028 (24 ga.) inch 0.03 inch (0.7 mm) thick.
 - 3. Fascia Cover Color: As selected by Architect from custom colors.
 - 4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
 - 5. Fascia Accessories: Provide fascia extenders with continuous hold down cleats where indicated on Drawings.
- B. Roof Drip Edge Flashing: Manufactured, two-piece, roof drip edge flashing consisting of TPO coated metal drip edge cover in section lengths not exceeding 12 feet (365.76 cm) and a continuous formed galvanized anchor cleat with integral edge to engage drip edge cover. Provide matching mitered and welded corner units.
 - 1. Basis-of-Design Product: Metal-Era, Inc.; One Drip Edge or a comparable product by one of the following:
 - a. Architectural Products Co.
 - b. Hickman Edge Systems
 - c. Metal-Era, Inc.
 - d. Pac-Clad Petersen
 - 2. Drip Edge Cover: Fabricated from the following exposed metal:
 - a. Zinc-Coated Steel: minimum 0.028 (24 ga.) inch 0.03 inch (0.7 mm) thick.
 - b. Surface: Smooth

- c. Finish: Two-coat fluoropolymer
- d. Color: As selected by architect from custom colors.
- 3. TPO Roofing Membrane: Where drip edge is used with TPO roofing membrane, cover shall be 24 ga. galvanized steel with applicable TPO coating required by TPO manufacturer.

2.3 ROOF EDGE DRAINAGE SYSTEMS

- A. Gutters and Downspouts: Manufactured formed gutter in uniform section lengths not exceeding 12 feet (365.76 cm), with mitered and welded or soldered corner units, end caps, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25.4 mm) above front gutter rim. Furnish with flat-stock gutter straps and gutter support brackets. Gutter straps and gutter brackets shall be 3/16" x 1 1/2". Furnish expansion joints and expansion-joint covers fabricated from same metal as gutters. Provide a flange that extends minimum 2" back onto roof.
 - 1. Basis-of-Design Product: Metal-Era, Inc.; Seal-Tite Gutter Systems or a comparable product by one of the following:
 - a. Architectural Products Co.
 - b. Hickman Edge Systems
 - c. Metal-Era, Inc.
 - d. Pac-Clad Petersen
 - 2. Fabricate gutter from the following exposed metal:
 - a. Prepainted, Zinc-Coated Steel: As recommended by manufacturer for girth indicated but not less than 0.028 (24 ga.) inch 0.03 inch (0.7 mm) thick.
 - 3. Gutter Style: Box as indicated on Drawings.
 - 4. Downspouts: Rectangular closed-face with mitered elbows, manufactured from the following exposed metal. Furnish 1/16" x 1 1/2" metal hangers, from same material and finish as downspouts, with anchors.
 - a. Prepainted, Zinc-Coated Steel: 0.03 inch (0.7 mm) minimum 0.028 inch (0.71 mm) thick.
 - 5. Color: As selected by Architect from custom colors.
- B. Splash Pans: Fabricate splash pans from the following material:
 - 1. Stainless Steel: 0.0250 inch (0.64 mm) thick (24 ga.).

2.4 COUNTERFLASHINGS AND REGLETS

- A. Basis-of-Design Product: Metal-Era, Inc.; Two-piece counterflashing or a comparable product by one of the following:
 - 1. Architectural Products Co.
 - 2. Fry Reglet Corporation.
 - 3. Hickman Edge Systems
 - 4. Metal-Era, Inc.
 - 5. Pac-Clad Petersen
- B. Counterflashings: Manufactured units in lengths not exceeding 12 feet (365.76 cm) designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal in thickness indicated:
 - 1. Prepainted, Zinc-Coated Steel: minimum 0.028 inch (0.71 mm) (24 ga.) thick.
- C. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashings indicated with factory-mitered and -welded corners and junctions, from the following exposed metal in thickness indicated:
 - 1. Prepainted, Zinc-Coated Steel: minimum 0.028 inch (0.71 mm) (24 ga.) thick.
 - 2. Type: Surface-mounted with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 - 3. Type: For masonry application, with offset top flange for embedment in masonry mortar joint.

- D. Color: As selected by Architect from custom colors.
- E. Equipment Curb Support Flashing: Pre-painted metallic coated steel: 0.0259 inch (0.66 mm).

2.5 EXPOSED MATERIALS

- A. Prepainted, Zinc-Coated Steel Sheet: ASTM A653/A653M, G90 (Z275) coating designation, structural quality, and prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - 1. Surface: Smooth, flat finish.
 - 2. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A755/A755M and coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer: AAMA 621. 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. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.0127 mm).

2.6 CONCEALED METALS

- A. Aluminum Extrusions: ASTM B221 (((ASTM B221M))) (((ASTM B221M))), alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.
- B. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 (Z275) (Z275) coating designation; structural quality.

2.7 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, separators, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to withstand design loads.
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
- C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- D. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.
- G. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- H. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

2.8 SPECIAL FABRICATIONS

- A. Where any roof specialties are shown to fit a radius, building component, the roof specialty product shall be manufactured to fit the designed radius.

2.9 FINISHES

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

- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other 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 work.
 - 1. Examine walls and roof edges for suitable conditions for manufactured roof specialties.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install manufactured roof specialties according to manufacturer's written instructions. Anchor manufactured roof specialties securely in place and capable of resisting forces specified in performance requirements. Use fasteners, separators, sealants, and other miscellaneous items as required to complete manufactured roof specialty systems.
 - 1. Install manufactured roof specialties with provisions for thermal and structural movement.
 - 2. Torch cutting of manufactured roof specialties is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Underlayment: Where installing exposed-to-view components of manufactured roof specialties directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Install manufactured roof specialties level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil-canning, buckling, or tool marks.
- D. Install manufactured roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
- E. Expansion Provisions: Provide for thermal expansion of exposed manufactured roof specialties. Space movement joints at a maximum of 12 feet (365.76 cm) with no unplanned joints within 18 inches (457.2 mm) of corners or intersections.
- F. Fasteners: Use fasteners of type and size recommended by manufacturer but of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19.05 mm) for wood screws.
- G. Seal joints with butyl sealant as required by manufacturer of roofing specialties.

3.3 ROOF EDGE FLASHING INSTALLATION

- A. Install cleats, cant dams, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings to resist uplift and outward forces according to performance requirements.

3.4 ROOF EDGE DRAINAGE SYSTEM INSTALLATION

- A. General: Install gutters and downspouts to produce a complete roof drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Gutters: Join and seal gutter lengths. Attach gutters to firmly anchored gutter brackets and straps spaced not more than 30 inches (762 mm) apart. Slope gutters to downspouts.
 - 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (1524 cm) apart. Install expansion joint caps.
- C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers designed to hold downspouts securely 1 inch (25.4 mm) away from walls. Downspouts shall be manufactured to follow contour of wall. Locate hangers at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.
 - 1. Connect downspouts to underground drainage system indicated. If not indicated, provide elbows at base of downspout to direct water away from building. Provide concrete splash blocks at grade for all downspout locations not connected to underground drainage systems. Concrete splash blocks shall be of [4000] psi ([27579.04] kPa) concrete 12" x 18" long.
- D. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in asphalt roofing cement compatible with roofing membrane.

3.5 COUNTERFLASHING AND REGLET INSTALLATION

- A. Counterflashings: Coordinate installation of counterflashings with installation of base flashings. Insert counterflashings in reglets or receivers and fit tightly to base flashings. Extend counterflashings 4 inches (101.6 mm) over base flashings. Lap counterflashing joints a minimum of 4 inches (101.6 mm) and bed with butyl sealant.
- B. Reglets: Installation of reglets is specified in Division 4 Section "Unit Masonry Assemblies."

3.6 ROOF/PENETRATION FLASHINGS

- A. Install roof penetration flashings in accordance with manufacturer's recommendations for a weather-tight seal.
- B. At roof drains, provide 48" square sheet set in mastic over roofing membrane. Prime top surface and strip flash in accordance with roofing manufacturer's recommendations.
- C. At equipment support curbs, install flashing full perimeter of curb as shown on Drawings.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as manufactured 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 in a clean condition during construction.
- D. Replace manufactured roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

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