

## **SECTION 07 72 00 - ROOF ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Roof curbs (including equipment curbs).
  - 2. Pipe and duct supports.
  - 3. Pipe portals.
  - 4. Premanufactured coping system.
  - 5. Premanufactured roof edge specialties.
- B. Related Work:
  - 1. Division 07, Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, and miscellaneous sheet metal trim and accessories.
  - 2. Division 23, Section 23 34 23 "HVAC Power Ventilators" for power roof-mounted ventilators.

#### **1.2 COORDINATION**

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

#### **1.3 PREINSTALLATION MEETING**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, 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.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of roof accessory.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories.
  - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

2. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.
  3. Wind-Restraint Details: Detail fabrication and attachment of wind restraints. Show anchorage details and indicate quantity, diameter, and depth of penetration of anchors.
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.
- D. Fabrication Engineering and Design Data Submittal: For roof curbs, premanufactured assemblies, and equipment supports indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.
  2. Wind-Restraint Details: Detail fabrication and attachment of wind restraints. Show anchorage details and indicate quantity, diameter, and depth of penetration of anchors. For premanufactured copings, fabrication engineering submittal calculations shall demonstrate that fasteners provide uplift resistance equal to or greater than that required to meet ANSI/SPRI ES-1. And that fasteners comply with manufacturer recommendations and tested engineering.
- E. Sustainable Design Submittals:
1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:
    - a. Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
    - b. Bio-based Materials: For bio-based products and materials other than wood, submit documentation of product data and testing results in compliance with LEED requirements.
    - c. Wood Products: Submit documentation of Forest Stewardship Council or USGBC equivalent certification.
    - d. Materials Reuse: For products that are salvaged, refurbished, or reused, include a statement indicating costs for each product.
    - e. Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.
      - 1) Include statement indicating costs for each product having recycled content.
    - f. Regional Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.
      - 1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.
  2. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010 or v1.2 2017, using the applicable exposure scenario.
    - a. For paints, and coatings, wet applied, include printed statement of VOC content, showing compliance with the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure for Architectural Coatings or the South Coast Air Quality Management District (SCAQMD) Rule 1113-2011.
    - b. Adhesives and Sealants: For wet applied on-site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005, and rule amendment date of January 7, 2005.
    - c. Alternative tests for VOC above include ASTM D2369-10; ISO 11890 part 1; ASTM D6886-03; or ISO 11890-2.
    - d. Methylene Chloride and perchloroethylene may not be added to paints, coating, adhesive or sealants

- e. Composite Wood: Submit documentation showing that wood used in the project has low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low emitting formaldehyde (ULEF) resins or no added formaldehyde resins.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
  - 1. Size and location of roof accessories specified in this Section.
  - 2. Method of attaching roof accessories to roof or building structure.
  - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
  - 4. Required clearances.
- B. Sample Warranties: For manufacturer's special warranties.
- C. Sustainable Design Submittals:
  - 1. Building Product Disclosure and Optimization - Environmental Product Declarations
    - a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.
  - 2. Building Product Disclosure and Optimization - Material Ingredients
    - a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000ppm) with at least one of the following:
      - 1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
      - 2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
      - 3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
      - 4) Living Product Challenge
      - 5) Product Lens Certification
      - 6) USGBC approved program.
    - b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100ppm) and/or that has a compliant material ingredient optimization report with at least one of the following:
      - 1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
      - 2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
      - 3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
      - 4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
      - 5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
      - 6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

## 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

## **1.7 WARRANTY**

- A. **Installer's Warranty:** Furnish installer's written warranty signed by an authorized representative using installer's standard form agreeing to repair or replace components of all prefabricated and premanufactured metal flashing products and assemblies that exhibit defects in materials or workmanship within specified warranty period. "Defects" is defined to include, but not limited to, deterioration or failure to perform as required.
  - 1. **Warranty Period:** 5 years from date of Substantial Completion.
- B. **Special Finish Warranty, Factory-Applied Painted Finishes:** Manufacturer's standard form in which manufacturer agrees to repair finishes or replace metal that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. **Deterioration includes, but is not limited to, the following:**
    - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. **Warranty Period:** 10 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. **General Performance:** Roof accessories 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. **Fabrication Engineering and Design Data:** Engage a qualified structural engineer licensed in the state of Texas to design roof curbs and equipment curbs to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. **Wind-Restraint Performance:** As indicated on Drawings.
- D. **FM Approvals' Listing:** Manufacture and install roof and parapet flashing that are listed in FM Approvals' "RoofNav" in accordance with Division 07 "Modified Bituminous Membrane Roofing" and meet wind uplift requirements.
  - 1. **SPRI Window Design Standard:** Manufacturer and install copings tested to SPRI ES-1 and capable of resisting design pressures.
- E. **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.
- F. **Temperature Change (Range):** 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- G. **Low-Emitting Materials:**
  - 1. Architectural paints and coatings wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.

2. All paints and coatings wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01 Section 01 81 13 "Sustainable Design Requirements - LEED v4 BD+C."
3. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
4. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01 Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C."

## 2.2 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Adaptable Air Products.
    - b. AES Industries, Inc.
    - c. Air Balance; a division of MESTEK, Inc.
    - d. Conn-Fab Sales, Inc.
    - e. Curbs Plus, Inc.
    - f. Custom Solution Roof and Metal Products.
    - g. Greenheck Fan Corporation.
    - h. KCC International Inc.
    - i. Kingspan Light + Air, North America.
    - j. Lloyd Industries, Inc.
    - k. LMCurbs.
    - l. Louvers & Dampers, Inc.; a division of Mestek, Inc.
    - m. Metallic Products Corp.
    - n. Milcor; a division of Hart & Cooley, Inc.
    - o. Pate Company (The).
    - p. Plenums Incorporated.
    - q. Roof Curb Systems.
    - r. Roof Products and Systems (RPS); a division of Hart & Cooley, Inc.
    - s. Roof Products, Inc.
    - t. Thybar Corporation.
    - u. Vent Products Co., Inc.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Supported Load Capacity: Coordinate load capacity with information on Shop Drawings of equipment to be supported.
- D. Material: Zinc-coated (galvanized) steel sheet, 0.079 inch thick.
1. Finish: Baked enamel, powder coat, or fluoropolymer finish.
  2. Color: As selected by Architect from manufacturer's full range.
- E. Construction:
1. Curb Profile: Manufacturer's standard compatible with roofing system.
  2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
  3. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.

4. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
5. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
6. Insulation: Factory insulated with 1-1/2-inch-thick glass-fiber board insulation.
7. Liner: Same material as curb, of manufacturer's standard thickness and finish.
8. Nailer: Factory-installed wood nailer along top flange of curb, continuous around curb perimeter.
9. Wind Restraint Straps and Base Flange Attachment: Provide wind restraint straps, welded strap connectors, and base flange attachment to roof structure at perimeter of curb, of size and spacing required to meet wind uplift requirements.
10. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch-thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
11. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.
12. Damper Tray: Provide damper tray or shelf with opening 3 inches.

## 2.3 PIPE AND DUCT SUPPORTS

- A. Fixed-Height Cradle-Type Pipe Supports: Polycarbonate pipe stand accommodating up to 1-1/2-inch-diameter pipe or conduit; with provision for pipe retainer and with manufacturer's support pad or deck plate as recommended for penetration-free installation over roof membrane type; as required for quantity of pipe runs and sizes.
- B. Fixed-Height Roller-Bearing Pipe Supports: Polycarbonate pipe stand with polycarbonate roller carrying assembly accommodating up to 7-inch-diameter pipe or conduit; with provision for pipe retainer and with manufacturer's support pad or deck plate as recommended for penetration-free installation over roof membrane type as required for quantity of pipe runs and sizes.
- C. Adjustable-Height Roller-Bearing Pipe Supports: Polycarbonate pipe stand base, pipe support, and roller housing, with stainless steel threaded rod designed for adjusting support height, accommodating up to 18 inch diameter pipe or conduit; with provision for pipe retainer and with manufacturer's support pad or deck plate as recommended for penetration-free installation over roof membrane type; as required for quantity of pipe runs and sizes.
- D. Adjustable-Height Structure-Mounted Pipe Supports: Extruded-aluminum tube, filled with urethane insulation; 2 inches in diameter; accommodating up to 7-inch-diameter pipe or conduit, with provision for pipe retainer; with aluminum baseplate, EPDM base seal, manufacturer's recommended hardware for mounting to structure or structural roof deck as indicated, stainless steel roller and retainer, and extruded-aluminum carrier assemblies as required for quantity of pipe runs and sizes.

## 2.4 PIPE PORTALS

- A. Curb-Mounted Pipe Portal: Insulated roof-curb units with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom; with weathertight curb cover with single or multiple collared openings and pressure-sealed conically shaped EPDM protective rubber caps sized for piping indicated, with stainless steel snaplock swivel clamps.
  1. Basis-of-Design Product: Subject to compliance with requirements, provide RPH (roof Penetration Housings); AWI Vault Series or a comparable product by one of the following:

- a. Portals Plus; Duravent Group.
- b. Roof Products and Systems (RPS); Duravent Group.

## **2.5 PREMANUFACTURED COPING SYSTEM**

- A. Manufactured Coping System:
  - 1. Subject to compliance with requirements, provide one of the following:
    - a. ATAS International, Inc.
    - b. Architectural Products Company.
    - c. Castle Metal Products.
    - d. Cheney Flashing Company.
    - e. Drexel Metals.
    - f. EXCEPTIONAL Metals; Canted Coping.
    - g. Merchant & Evans Inc.
- B. Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet (3.6 m), concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
- C. Basis of Design: ATAS International, Inc.; Continuous Cleat Coping.
- D. Formed Aluminum Sheet Coping Caps: Aluminum sheet, 0.040 inch (1.02 mm) thick.
  - 1. Surface: Smooth, flat finish.
  - 2. Finish: Fluoropolymer finish.
- E. Corners: Factory mitered and continuously welded mechanically clinched and sealed watertight.
- F. Coping-Cap Attachment Method: Snap-on, fabricated from coping-cap material.
  - 1. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches (300 mm) wide, with integral cleats.
  - 2. Face-Leg Cleats: Concealed, continuous stainless steel.

## **2.6 PREMANUFACTURED ROOF EDGE SPECIALTIES**

- A. Manufactured Canted Roof Edge Specialties:
  - 1. Subject to compliance with requirements, provide one of the following:
    - a. ATAS International, Inc.
    - b. Architectural Products Company.
    - c. Drexel Metals.
    - d. Hickman Edge Systems LLC (an MTL Company).
    - e. Merchant & Evans Inc.
    - f. Metal-Era, Inc.; Anchor-Tite Canted Roof Edge Fascia.
    - g. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle company.
  - 2. Basis of Design: ATAS International, Inc. Edge Lock 2 Fascia.
  - 3. Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet (3.6 m) and a continuous formed galvanized-steel sheet cant, 0.028 inch (0.71 mm) thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.
    - a. Formed Aluminum Sheet Coping Caps: Aluminum sheet, 0.040 inch (1.02 mm) thick.
      - 1) Surface: Smooth, flat finish.
      - 2) Finish: Fluoropolymer finish.
    - b. Corners: Factory mitered and soldered.
    - c. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
    - d. Special Fabrications: Radiused sections.

- e. Fascia Accessories: Fascia extenders with continuous hold-down cleats.
- B. Manufactured Drip Roof Edge Specialties:
  - 1. Subject to compliance with requirements, provide one of the following:
    - a. ATAS International, Inc.
    - b. Architectural Products Company.
    - c. Drexel Metals.
    - d. Hickman Edge Systems LLC (an MTL Company).
    - e. Merchant & Evans Inc.
    - f. Metal-Era, Inc.; Anchor-Tite Canted Roof Edge Fascia.
    - g. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle company.
  - 2. Basis of Design: ATAS International, Inc. Drip Edge
  - 3. Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet (3.6 m) and a continuous metal receiver with integral drip-edge cleat to engage fascia cover. Provide matching corner units.
    - a. Metallic-Coated Steel Sheet Fascia Covers: Zinc-coated (galvanized) steel, nominal 0.028-inch (0.71-mm) thickness.
      - 1) Surface: Smooth, flat finish.
      - 2) Finish: Fluoropolymer finish.

## 2.7 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation.
- B. Stainless Steel Sheet and Shapes: ASTM A240/A240M or ASTM A666, Type 304.
- C. Steel Shapes: ASTM A36/A36M, hot-dip galvanized according to ASTM A123/A123M unless otherwise indicated.
- D. Steel Tube: ASTM A500/A500M, round tube.
- E. Galvanized-Steel Tube: ASTM A500/A500M, round tube, hot-dip galvanized according to ASTM A123/A123M.
- F. Steel Pipe: ASTM A53/A53M, galvanized.

## 2.8 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Glass-Fiber Board Insulation: ASTM C726, nominal density of 3 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F, thickness as indicated.
- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches thick.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Self-Adhering, High-Temperature Underlayment Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.



- F. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
  - 1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.
  - 2. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
- G. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- H. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- I. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

## 2.9 GENERAL FINISH REQUIREMENTS

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- 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.
- D. Baked-Enamel Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range of solid and mica colors.
- E. Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils (0.04 mm). Prepare, treat, and coat metal to comply with resin manufacturer's written instructions.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range of solid and mica colors.
- F. Fluoropolymer Finish:
  - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. Two-coat fluoropolymer finish system consisting of corrosion inhibitive primer and fluoropolymer color coat complying with AAMA 621 or AAMA 2604, containing not less than 50 percent PVDF resin by weight in color coat in not less than 1.2 mils dry thickness.
  - 2. Color and Gloss: As selected by Architect from manufacturer's full range of solid and mica colors.

## 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. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Install roof accessories according to manufacturer's written instructions.
  - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- 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. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.
- E. Pipe Support Installation: Comply with MSS SP-58 and MSS SP-89. Install supports and attachments as required to properly support piping. Arrange for grouping of parallel runs of horizontal piping, and support together.
  - 1. Pipes of Various Sizes: Space supports for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
- F. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

### **3.3 REPAIR AND CLEANING**

- A. Clean exposed surfaces according to manufacturer's written instructions.
- B. Clean off excess sealants.
- C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

### **END OF SECTION**