

SECTION 077200
ROOF ACCESSORIES

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. This Section includes the following:

1. Roof curbs.
2. Equipment supports.
3. Roof hatch or scuttle.
4. Roof supports.
5. Preformed roof penetration flashings.

- B. Related Sections include the following:

1. Division 05 Section "Metal Fabrications" for metal roof access ladders.
2. Division 05 Section "Metal Stairs" for safety railing systems not attached to roof hatch curbs.
3. Division 06 Section "Rough Carpentry" for preservative, pressure-treated wood curbs cants, and wood nailers.
4. Division 07 Section "Metal Wall Panels" for preformed metal wall panels.
5. Division 07 Section "Sheet Metal Flashing and Trim" for custom fabricated sheet metal flashings.
6. Division 07 Section "Roof Specialties" for manufactured, copings, roof edge and roof edge drainage systems.
7. Division 07 Section "Expansion Control" for expansion joint assemblies to be integrated in roofing.
8. Division 15 Sections for roof-mounted HVAC equipment supports furnished with equipment.

1.3 SUBMITTALS

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

- B. Shop Drawings: Show fabrication and installation details for roof accessories. Show layouts of roof accessories including plans and elevations. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other work.
- C. 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.
- D. Samples: For each type of exposed factory-applied color finish required and for each type of roof accessory indicated, prepared on Samples of size to adequately show color.
- E. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Pack, handle, and ship roof accessories properly labeled in heavy-duty packaging to prevent damage.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 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.
 - 1. With Architect's approval, adjust location of roof accessories that would interrupt roof drainage routes, roof expansion joints and roof access in general.

1.8 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof accessories 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 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers listed in other Part 2 articles.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers listed in other Part 2 articles.

2.2 METAL MATERIALS – AS APPLICABLE

- A. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coated and mill phosphatized for field painting.
- B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 (AZM150) coated.
- C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy and temper recommended by manufacturer for type of use and mill finish. Coil-coat finish as follows:
- D. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use, mill finished.
- E. Stainless-Steel Shapes or Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 or Type 316, No. 2D finish.
- F. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized to comply with ASTM A 123/A 123M, unless otherwise indicated.

- G. Steel Tube: ASTM A 500, round tube, baked-enamel finished.
- H. Galvanized Steel Tube: ASTM A 500, round tube, hot-dip galvanized to comply with ASTM A 123/A 123M.
- I. Galvanized Steel Pipe: ASTM A 53/A 53M.

2.3 MISCELLANEOUS MATERIALS

- A. Cellulosic-Fiber Board Insulation: ASTM C 208, Type II, Grade 1, 1 inch (25 mm) thick.
- B. Glass-Fiber Board Insulation: ASTM C 726, 1 inch (25 mm) thick.
- C. Polyisocyanurate Board Insulation: ASTM C 1289, 1 inch (25 mm) thick.
- D. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.
- 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. Polyethylene Sheet: 6-mil- (0.15-mm-) thick, polyethylene sheet complying with ASTM D 4397.
- G. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 - 1. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).
- H. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by roof accessory manufacturer. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.
- I. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.
- J. Elastomeric Sealant: ASTM C 920, polyurethane polysulfide or silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- K. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, and heavy bodied for hooked-type expansion joints with limited movement.
- L. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.4 ROOF CURBS

- A. Roof Curbs: Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Fabricate with welded or sealed mechanical corner joints, with stepped integral metal cant raised the thickness of roof insulation, and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1. Available Manufacturers:

- a. Colony Custom Curbs.
- b. Commodity Products Company, Inc.
- c. Conn-Fab Sales, Inc.
- d. Curbs Plus Inc.
- e. Custom Curb, Inc.
- f. LM Curbs.
- g. Loren Cook Company.
- h. Metallic Products Corporation.
- i. Pate Company (The).
- j. Roof Products & Systems Corporation.
- k. Roof Products, Inc.
- l. Thaler Metal Industries Ltd.
- m. ThyCurb; Div. of Thybar Corporation.
- n. Uni-Curb, Inc.
- o. Vent Products Company, Inc.

2. Load Requirements: 40 lbf/sq. ft. (1.9-kPa) external.

3. Material: Stainless-steel sheet, 0.078 inch (1.98 mm) thick.

- a. Finish: Mill.

4. Liner: Same material as curb, of manufacturer's standard thickness and finish.

5. Factory install wood nailers at tops of curbs.

6. Factory insulate curbs with 1-1/2-inch- (38-mm-) thick, cellulosic or glass-fiber board insulation.

7. Curb height may be determined by adding thickness of roof insulation and minimum base flashing height recommended by roofing membrane manufacturer. Fabricate units to minimum height of 12 inches (300 mm) unless otherwise indicated.

2.5 EQUIPMENT SUPPORTS

- A. Equipment Supports: Provide metal equipment supports, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Fabricate with welded or sealed mechanical corner joints, with integral metal cant, stepped integral metal cant raised the thickness

of roof insulation and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1. Available Manufacturers:

- a. Colony Custom Curbs.
- b. Commodity Products Company, Inc.
- c. Conn-Fab Sales, Inc.
- d. Curbs Plus Inc.
- e. Custom Curb, Inc.
- f. LM Curbs.
- g. Loren Cook Company.
- h. Metallic Products Corporation.
- i. Pate Company (The).
- j. Roof Products & Systems Corporation.
- k. Roof Products, Inc.
- l. Thaler Metal Industries Ltd.
- m. ThyCurb; Div. of Thybar Corporation.
- n. Uni-Curb, Inc.
- o. Vent Products Company, Inc.

2. Load Requirements: 40 lbf/sq. ft. (1.9-kPa) external.

3. Material: Stainless-steel sheet, 0.078 inch (1.98 mm) thick.

a. Finish: Mill.

4. Factory-install continuous wood nailers 5-1/2 inches (140 mm) wide at tops of equipment supports.

5. Metal Counterflashing: Manufacturer's standard removable counterflashing, fabricated of same metal and finish as equipment support.

6. Fabricate units to minimum height of 12 inches (300 mm), unless otherwise indicated.

2.6 ROOF HATCHES

A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated double-wall curb frame with integral deck mounting flange and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product specified below or a comparable product submitted for review and approval by the Architect.

a. Single-leaf roof scuttle: Type 11B by The Bilco Co.

2. Available Manufactures:
 - a. Babcock-Davis; A Ciera Products Inc. Company.
 - b. Bristolite Skylights.
 - c. Custom Curb, Inc.
 - d. Dur-Red Products.
 - e. Hi Pro International, Inc.
 - f. J. L. Industries, Inc.
 - g. Metallic Products Corporation.
 - h. Milcor, Inc.; a Gibraltar Company.
 - i. Nystrom, Inc.
 - j. O’Keeffe’s, Inc.
 - k. Precision ladders, LLC.
 - l. Roof Products & Systems Corporation.
 - m. ThyCurb; div of Thybar Corporation.
 - n. Wasco Products, Inc.
 - o. Western Canwell.
3. Loads: Fabricate roof hatches to withstand 40-lbf/sq. ft. (1.9-kPa) external and 20-lbf/sq. ft. (0.95-kPa) internal loads.
4. Type and Size: Single-leaf lid nominal 36 by 72 inches (900 by 1800 mm).
5. Curb and Lid Material: Stainless-steel sheet, 0.078 inches (1.98 mm) thick.
 - a. Finish: Mill.
6. Insulation: Cellolosic-fiber, Glass-fiber or Polyisocyanurate board.
7. Interior Lid Liner: Manufacturer’s standard metal liner of same material and finish as outer metal lid.
8. Exterior Curb Liner: manufacturer’s standard metal liner of same material and finish as metal curb.
9. Fabricate units to minimum height of 12 inches (300 mm), unless otherwise indicated.
10. Hardware: Stainless-steel spring latch with turn handles, butt- or pintle- type hinge system, and padlock hasps inside and outside.

2.7 ROOF SUPPORTS

- A. Pipe Roof Supports: Adjustable height, extruded-aluminum tube, urethane insulation filled, 2 inches (50 mm) in diameter, with aluminum base plates and manufacturer’s recommended hardware for mounting to structural roof deck, and extruded-aluminum carrier assemblies, suitable for quantity of pipe runs and sizes, with EPDM end caps.

Include manufacturer's standard hardware for mounting to structure or structural roof deck.

1. Available Manufacturers:
 - a. Thaler Metal Industries Ltd.
2. Pipe Support Height: As indicated on drawings.
3. Pipe Roller Assembly: Stainless-steel roller assembly sized for supported pipes with extruded aluminum.
4. Pipe Support Flashing: Insulated sleeve flashings with integral base flange, and EPDM grommetted top seal and base seals.
 - a. Metal: Type 304 stainless-steel, .031 inch (0.79 mm) thick.

B. Light-Duty Pipe Roof Supports: Extruded-aluminum base assembly and Type 304 stainless-steel roller assembly for pipe sizes indicated, including manufacturer's standard hardware for mounting to structure or structural roof deck.

1. Available Manufacturers:
 - a. Thaler Metal Industries Ltd.

C. Narrow Duct Roof Supports: 2-inch- (50-mm-) diameter, extruded-aluminum, urethane-insulated supports, including manufacturer's standard Type 304 stainless-steel flashing and hardware for mounting to structure or structural roof deck.

1. Available Manufacturers:
 - a. Thaler Metal Industries Ltd.

2.8 PREFORMED ROOF PENETRATION FLASHINGS

A. Exhaust Vent Flashings: Double-wall metal flashing sleeve, urethane insulation filled, with integral deck flange, 12 inches (300 mm) high, with removable metal hood and slotted or perforated metal collar, and as follows:

1. Available Manufacturers:
 - a. Thaler Metal Industries Ltd.
2. Metal: Type 304 stainless-steel, .031 inch (.079mm) thick.
3. Diameter: As required .

B. Vent Stack Flashing: Metal flashing sleeve, with integral deck flange, uninsulated, and as follows:

1. Available Manufacturers:

- a. Thaler Metal Industries Ltd.
 2. Metal: Type 304 stainless-steel, .031 inch (.079mm) thick.
 3. Height: 13 inches (330 mm) minimum, unless otherwise indicated.
 4. Diameter: As required.
- C. H-Beam, Round and Rectangular Tubular Steel, and Angle Flashings: Two piece divided and single piece slip-on types with integral deck flanges and prefabricated sealant covers allowing precision fitting in the field.
1. Available Manufacturers:
 - a. SBC Industries, Inc.
 2. Metal: Stainless-steel, 26 GA., Types 304, 2B, ASTM A-240.
 3. Solder: ASTM 96.5 TS Tin-Silver.
 4. Backer Rod: Open cell foam, 7/8", ASTM 1564.
 5. Sealant: Single part urethane, ASTM C920-79.

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. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored and is ready to receive roof accessories.
 2. Verify dimensions of roof openings for roof accessories.
 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Install roof accessories to fit substrates and to result in watertight performance.

- C. 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. Coat concealed side of uncoated aluminum or stainless-steel roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing exposed-to-view components of roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene underlayment.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by roof accessory manufacturers for waterproof performance.
 - D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 - E. Roof Curb Installation:
 - 1. Set roof curb so top surface of roof curb is level.
 - F. Equipment Support Installation:
 - 1. Set equipment support so top surface of equipment support is level.
 - G. Roof Hatch Installation:
 - 1. Check roof hatch for proper operation. Adjust operating mechanism as required. Clean and lubricate joints and hardware.
 - 2. Attach safety railing system to roof hatch curb.
 - 3. Attach ladder safety post according to manufacturer's written instructions.
 - H. Preformed Roof Penetration Flashing Installation:
 - 1. Secure to roof membrane according to vent and stack flashing manufacturer's written instructions.
 - I. Seal joints with Elastomeric or butyl sealant as required by manufacturer of roof accessories.
- 3.3 TOUCH UP
- A. Touch up factory-primed surfaces with compatible primer ready for field painting in accordance with Division 09 painting Sections.
 - B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.4 CLEANING

- A. Clean exposed surfaces according to manufacturer's written instructions.

END OF SECTION 077200