SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roof curbs.
   2. Equipment supports.
   3. Roof hatches.
   4. Hatch-type heat and smoke vents.
   5. Dropout-type heat and smoke vents.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory indicated.

B. Shop Drawings: For roof accessories.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items.

B. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 10 years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
   1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
   2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
   3. Exposed Coil-Coated Finish: Two-coat fluoropolymer finish; AAMA 621; system consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
   4. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat.

B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 coated.
   1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
   2. Exposed Coil-Coated Finish: Two-coat fluoropolymer finish; AAMA 621; system consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
   3. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat.

C. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
   1. Mill Finish: As manufactured.
   2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
   3. Clear Anodic Finish: AAMA 611, Class II, 0.010 mm or thicker.
   4. Color Anodic Finish: AAMA 611, Class II, 0.010 mm or thicker.
   5. Exposed Coil-Coated Finish: Two-coat fluoropolymer finish; AAMA 620; system consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
   6. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils.

D. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.

E. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.
F. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.

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. Acrylic Glazing: ASTM D 4802, thermoformable, monolithic sheet, manufacturer's standard, Type UVA (formulated with UV absorber), Finish 1 (smooth or polished).

C. Polycarbonate Glazing: Thermoformable, monolithic polycarbonate sheets manufactured by extrusion process, burglar-resistance rated according to UL 972 with an average impact strength of 12 to 16 ft-lbf/in. of width when tested according to ASTM D 256, Method A (Izod).

D. 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.

E. Security Grilles: 3/4-inch diameter, ASTM A 1011/A 1011M steel bars spaced 6 inches o.c. in one direction and 12 inches o.c. in the other; factory finished with manufacturer's or fabricator's standard, universal shop primer compatible with substrate and field-applied finish paint system indicated.

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.

G. Sealants: As recommended by roof accessory manufacturer for installation indicated.

2.3 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; with welded or mechanically fastened and sealed corner joints 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

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

   a. AES Industries, Inc.
b. Curbs Plus, Inc.
c. Custom Solution Roof and Metal Products.
d. Greenheck Fan Corporation.
e. LM Curbs.
f. Metallic Products Corp.
g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
h. Pate Company (The).
i. Roof Products, Inc.
j. Safe Air of Illinois.
k. Thybar Corporation.
l. Vent Products Co., Inc.
m. <Insert manufacturer's name>.

B. Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, 0.052 inch thick.
   1. Finish: Mill phosphatized or baked enamel or powder coat.
   2. Color: As selected by Architect from manufacturer's full range of color.

C. Material: Stainless-steel sheet, 0.078 inch thick.
   1. Finish: Manufacturer's standard.

D. Construction:
   1. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
   2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
   3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.
   4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
   5. Fabricate curbs to minimum height of 12 inches unless otherwise indicated.
   6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
   7. 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.
2.4 EQUIPMENT SUPPORTS

A. Equipment Supports: Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, 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. AES Industries, Inc.
      b. Curbs Plus, Inc.
      c. Custom Solution Roof and Metal Products.
      d. Greenheck Fan Corporation.
      e. LM Curbs.
      f. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
      g. Pate Company (The).
      h. Roof Products, Inc.
      i. Thybar Corporation.
      j. Vent Products Co., Inc.
      k. <Insert manufacturer's name>.

B. Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, 0.052 inch thick.

   1. Finish: Mill phosphatized, Baked enamel, or powder coat.
   2. Color: As selected by Architect from manufacturer's full range of color.

C. Material: Stainless-steel sheet, 0.078 inch thick.

   1. Finish: Manufacturer's standard or No. 2D, directional polish finish >.

D. Construction:

   1. Insulation: Factory insulated with 1-1/2-inch thick glass-fiber board insulation.
   2. Liner: Same material as equipment support, of manufacturer's standard thickness and finish.
   3. Factory-installed continuous wood nailers 5-1/2 inches wide at tops of equipment supports.
4. Metal Counterflashing: Manufacturer’s standard, removable, fabricated of same metal and finish as equipment support.
5. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
6. Fabricate equipment supports to minimum height of 12 inches unless otherwise indicated.
7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate each support with height to accommodate roof slope so that tops of supports are level with each other. Equip supports with water diverters or crickets on sides that obstruct water flow.

2.5 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and insulated single or double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing 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:

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. AES Industries, Inc.
   b. Babcock-Davis.
   c. Bilco Company (The).
   d. Bristolite Skylights.
   e. Custom Solution Roof and Metal Products.
   f. Dur-Red Products.
   g. Hi Pro International, Inc.
   h. J. L. Industries, Inc.
   i. Metallic Products Corp.
   j. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
   k. Naturalite Skylight Systems; Vistawall Group (The).
   l. Nystrom.
m. O'Keeffe's Inc.

n. Pate Company (The).

o. Precision Ladders, LLC.

p. <Insert manufacturer's name>.

B. Type and Size: Single-leaf lid, 30 by 54 inches.

C. Type and Size: Double-leaf lid, 72 by 96 inches.

D. Loads: Minimum 40-lbf/sq. ft external live load and 20-lbf/sq. ft. internal uplift load.

E. Hatch Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, 0.079 inch thick.
   1. Finish: Mill phosphatized, baked enamel, or powder coat.
   2. Color: As selected by Architect.

F. Hatch Material: Aluminum sheet, 0.090 inch thick.
   1. Finish: Mill, Clear anodic, baked enamel or powder coat.
   2. Color: As selected by Architect.

G. Hatch Material: Stainless-steel sheet, 0.078 inch thick.
   1. Finish: Manufacturer's standard or No. 2D, directional polish finish.

H. Construction:
   1. Insulation: Glass-fiber or Polyisocyanurate board.
   2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
   3. Hatch Lid: Glazed, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
   4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
   5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
   6. Fabricate curbs to minimum height of 12 inches unless otherwise indicated.
   7. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.

I. Hardware: Galvanized-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
   1. Provide two-point latch on lids larger than 84 inches.
   2. Provide remote-control operation.
J. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.

K. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder. Post locks in place on full extension; release mechanism returns post to closed position.

2.6 HEAT AND SMOKE VENTS

A. Hatch-Type Heat and Smoke Vents: Manufacturer's standard, with single-walled insulated curbs, welded or mechanically fastened and sealed corner joints, integral condensation gutter, and cap flashing. Fabricate with insulated double-walled lid and continuous weathertight perimeter lid gaskets, and equip with automatic self-lifting mechanisms and UL-listed fusible links rated at 165 deg F.

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:

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

   a. Babcock-Davis.
   b. Bilco Company (The).
   c. Bristolite Skylights.
   d. Dur-Red Products.
   e. Hi Pro International, Inc.
   f. J. L. Industries, Inc.
   g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
   h. Naturalite Skylight Systems; Vistawall Group (The).
   i. Nystrom.
   j. O'Keeffe's Inc.
   k. Pate Company (The).
   l. Western Canwell.
   m. <Insert manufacturer's name>.
3. **Type and Size:** Single-leaf lid, 30 by 54 inches.
4. **Type and Size:** Double-leaf lid, 72 by 96 inches.
5. **Loads:** Minimum 40-lbf/sq. ft external live load and 30-lbf/sq. ft internal uplift load.
   a. When release is actuated, lid shall open against 10-lbf/sq. ft wind load and lock in position.
6. **Heat and Smoke Vent Standard:** Provide units that have been tested and listed to comply with UL 793.
7. **Curb, Framing, and Lid Material:** Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, 0.079 inch thick.
   a. **Finish:** Mill phosphatized, baked enamel or powder coat.
   b. **Color:** As selected by Architect.
8. **Curb, Framing, and Lid Material:** Aluminum sheet, 0.090 inch thick.
   a. **Finish:** Mill phosphatized, baked enamel or powder coat.
   a. **Color:** As selected by Architect.
9. **Curb, Framing, and Lid Material:** Stainless-steel sheet, 0.078 inch thick.
   a. **Finish:** Manufacturer's standard or No. 2D, directional polish finish.
10. **Construction:**
    a. **Insulation:** Glass-fiber or Polyisocyanurate board.
    b. **Hatch Lid:** Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
    c. **Hatch Lid:** Glazed, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
    d. **Exterior Curb Liner:** Manufacturer's standard, of same material and finish as metal curb.
    e. **Fabricate curbs to minimum height of 12 inches unless otherwise indicated.**
    f. **Sloping Roofs:** Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.
    g. **Security Grille:** Provide where indicated.
11. **Hardware:** Manufacturer's standard, corrosion resistant or hot-dip galvanized; with hinges, hold-open devices, and independent manual-release devices for inside and outside operation of lids.

B. **Dropout-Type Heat and Smoke Vents:** Manufacturer's standard, gravity operated and automatic; with single-walled insulated curbs and frame, welded or mechanically fastened and sealed corner joints, integral condensation gutter, cap flashing, and heat-sensitive dome glazing that will deform and drop out of vent opening according to heat and smoke vent standard indicated.
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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. Construction Specialties, Inc.
   b. Naturalite Skylight Systems; Vistawall Group (The).
   c. Pate Company (The).
   d. Plasteco, Inc.
   e. <Insert manufacturer's name>.
4. Heat and Smoke Vent Standard: Provide units that have been tested and listed to comply with UL 793 and are FM Approved.
5. Curb and Framing Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, 0.079 inch thick.
   a. Finish: Mill phosphatized, baked enamel or powder coat.
   b. Color: As selected by Architect.
6. Curb and Framing Material: Aluminum sheet, 0.090 inch thick.
   a. Finish: Mill, Clear anodic, baked enamel or powder coat.
   b. Color: As selected by Architect from manufacturer's full range.
7. Curb and Framing Material: Stainless-steel sheet, 0.078 inch thick.
   a. Finish: Manufacturer's standard or No. 2D, directional polish finish.
8. Construction:
   a. Insulation: Glass-fiber or Polyisocyanurate board.
   b. Exterior Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
   c. Fabricate curbs to minimum height of 12 inches unless otherwise indicated.
   d. Sloping Roofs: Where slope of roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip unit with water diverter or cricket on side that obstructs water flow.
9. Hardware: Manufacturer's standard, corrosion resistant or hot-dip galvanized; with hinges, hold-open devices, and independent manual-release devices for inside and outside operation of lids.
PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Verify dimensions of roof openings for roof accessories. 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, excessive oil canning, 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. Coat concealed side of uncoated aluminum and stainless-steel roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing 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 sheet.

C. Security Grilles: Weld bar intersections and, using tamper-resistant bolts, attach the ends of bars to structural frame or primary curb walls.

D. Seal joints with sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

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 077200