

University of Houston Master Specification

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SECTION 07 7200 - ROOF ACCESSORIES

Maintain Section format, including the UH master spec designation and version date in the center columns of the header and footer. Complete the header and footer with Project information.

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect" or "Engineer." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

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. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
 - 2. The University of Houston's *Supplemental General Conditions and Special Conditions for Construction*.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof curbs.
 - 2. Roof hatches.

1.3 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.

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1.4 ACTION SUBMITTALS

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

Retain paragraph and associated subparagraphs below if Project is to be LEED v4 certified.

- B. LEED Action Submittals (Projects authorized for LEED certification only):

1. Building Product Disclosure and Optimization:

a. Leadership Extraction Practices

- 1) Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
- 2) Wood Products: Certified by Forest Stewardship Council or USGBC approved equivalent.
 - a) Chain-of-Custody Certificates: For certified wood products. Include statement of costs.
 - b) Chain-of-Custody Qualification Data: For manufacturer and vendor.
- 3) Provide details of biobased material per Sustainable Agriculture Network's Sustainable Agriculture Standard or USDA certified biobased product. Indicate cost, location of extraction, manufacture, and purchase of material.
- 4) Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.
 - a) Include statement indicating costs for each product having recycled content.

- b. Sourcing of Raw 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) Product Certificates: For materials manufactured within 100 miles of Project, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each raw material.

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, using the applicable exposure scenario.

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- a. Paints, and Coatings: For wet applied on site products, include printed statement of VOC content, showing compliance with the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3,-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.
 - 1) Product Data: For installation adhesives, indicating VOC content.
 - 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.
 - f. Provide General Emissions Evaluation certificates for adhesives, sealants showing compliance with California Department of Public Health v1.1 emissions testing or equivalent.
3. Laboratory Test Reports: For installation adhesives indicating compliance with requirements for low-emitting materials.
- C. Manufacturer Compliance Letter: Signed by roof accessory manufacturer, stating that materials and units supplied comply with requirements.
- D. Shop Drawings: For roof accessories. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
- E. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.5 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

[Retain paragraph and associated subparagraphs below if Project is to be LEED v4 certified.](#)

- B. LEED Informational Submittals:

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1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:
 - a. Raw Material Sources and Extraction Reporting: Submit Raw materials supplier corporate Sustainability Reports (CSRs); documenting responsible extraction; including extraction locations, long term ecologically responsible land use, commitment to reducing environmental harms from extraction and manufacturing processes, and a commitment to meeting applicable standards or programs that address responsible sourcing criteria
 - 1) Submit manufacturers' self-declared reports
 - 2) Submit third party verified corporate sustainability reports (CSR) using one of the following frameworks"
 - a) Global Reporting Initiative (GRI) Sustainability Report
 - b) Organization for Economic Co-operation and Development (OECD)
 - c) Guidelines for Multinational Enterprises
 - d) UN Global Compact
 - e) ISO 26000
 - f) USGBC approved program.
2. Building Product Disclosure and Optimization - Material Ingredients
 - a. Material Ingredient Optimization: Submit manufacturer's Environmental Product Declaration (EPD) or at least one of the following:
 - 1) GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
 - 2) Cradle to Cradle: Manufacturer's published literature for the product bearing the Cradle to Cradle logo.
 - 3) International Alternative Compliance Path - REACH Optimization
 - 4) Declare: Manufacturer's completed Product Declaration Form
 - 5) Other programs approved by USGBC
 - b. Product Manufacturer Supply Chain Optimization: Submit documentation from manufacturers for products that go beyond material ingredient optimization as follows:
 - 1) Are sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs that at a minimum document at least 99 percent (by weight) of the ingredients used to make the building product or building material, and
 - 2) Are sourced from product manufacturers with independent third party verification of their supply chain that at a minimum verifies:
 - a) Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation

- b) Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
- c) Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
- d) Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
- e) Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
- f) Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain.

1.6 CLOSEOUT SUBMITTALS

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

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical conditions at either a standalone mockup or on the building that, once accepted, can be included in the construction of the project.
- B. Manufacturer: Specialized in manufacturing the type of roof accessories specified in this section with a minimum of five years documented successful experience and with facilities capable of meeting requirements of the Contract Documents as a single-source responsibility and warranty.
- C. Preinstallation Conference: Conduct conference at Project site.
 - 1. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 2. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.8 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.

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1.9 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 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 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units with integral spring-type vibration isolators and 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, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.
 - 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. AES Industries, Inc.
 - b. Pate Company.
 - c. Roof Products, Inc.
 - d. Substitutions: See Section 01 2500 "Substitution Procedures."
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Material: Zinc-coated (galvanized) steel sheet, 18 gage 0.048 inch (1.21 mm) thick, complying with ASTM A 653/A 653M, SS Grade 33 (230).
 - 1. Finish: G60 (Z180) coating designation.
 - 2. Color: As selected by Architect from manufacturer's full range.
- D. Construction:

1. Insulation: Factory insulated with 1-1/2-inch-(38-mm-) thick glass-fiber board insulation.
2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
3. Preservative treated 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. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck.
6. Fabricate curbs to minimum height of 14 inches (356 mm) above roof deck, 6 inches (152 mm) minimum above finished roof surface, unless otherwise indicated.
7. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
8. 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.
9. Security Grille: Provide where indicated.
10. On curbs adjacent to roof openings, provide curb on all sides of opening, with top of curb horizontal for equipment mounting.
11. Provide layouts and configurations as shown on the drawings.

E. Equipment Rails: Two-sided curbs in straight lengths, with top horizontal for equipment mounting.

1. Provide preservative treated wood nailers along top of rails.
2. Height Above Finished Roof Surface: 6 inches (152 mm), minimum.
3. Height Above Roof Deck: 14 inches (356 mm), minimum.

F. Pipe, Duct, and Conduit Mounting Pedestals: Vertical posts, minimum 8 inches (400mm) square unless otherwise indicated.

1. Provide sliding channel welded along top edge with adjustable height steel bracket, manufactured to fit item supported.
2. Height Above Finished Roof Surface: 8 inches (203 mm), minimum.
3. Height Above Roof Deck: 14 inches (356 mm), minimum.

2.2 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and insulated single -walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.

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. Bilco Company.

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- b. Dur-Red Products.
 - c. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - d. Substitutions: See Section 01 2500 "Substitution Procedures."
- B. Roof Hatches: Factory-assembled steel frame and cover, complete with operating and release hardware.
- 1. Style: Provide flat metal covers unless otherwise indicated.
 - 2. Mounting: Provide frames and curbs suitable for mounting on flat roof deck.
 - 3. Size(s): As indicated on drawings; single-leaf style unless otherwise indicated as double-leaf.
 - 4. For Ladder Access: Single leaf; 30 by 36 inches (762 by 914 mm).
 - 5. For Ships Ladder Access: Single leaf; 30 by 54 inches (762 by 1372 mm).
 - 6. For Stair Access: Single leaf; 30 by 96 inches (762 by 2438 mm).
- C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
- 1. Material: Galvanized steel, 14 gage, 0.0747 inch (1.90 mm) thick.
 - 2. Finish: Factory prime paint.
 - 3. Insulation: 1 inch (25 mm) rigid glass fiber, located on outside face of curb.
 - 4. Curb Height: 12 inches (305 mm) from finished surface of roof, minimum.
- D. Metal Covers: Flush, insulated, hollow metal construction.
- 1. Capable of supporting 40 psf (1.92 kPa) live load.
 - 2. Material: Galvanized steel; outer cover 14 gage, 0.0747 inch (1.90 mm) thick, liner 22 gage, 0.03 inch (0.76 mm) thick.
 - 3. Finish: Factory prime paint.
 - 4. Insulation: 1 inch (25 mm) rigid glass fiber.
 - 5. Gasket: Neoprene, continuous around cover perimeter.
- E. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
- 1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf (475 kPa) load.
 - 2. Hinges: Heavy duty pintle type.
 - 3. Hold open arm with vinyl-coated handle for manual release.
 - 4. Latch: Upon closing, engage latch automatically and reset manual release.
 - 5. Manual Release: Pull handle on interior.
 - 6. Locking: Padlock hasp on interior.

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2.3 GENERAL FINISH REQUIREMENTS

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

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3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof Curb Installation: Install each roof curb so top surface is level and is high enough to provide 8 inches minimum clear height for vertical leg of flashing.
- D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other and are high enough to provide 8 inches minimum clear height for vertical leg of flashing
- E. Roof-Hatch Installation:
1. Install roof hatch so top surface of hatch curb is level and is high enough to provide 8 inches minimum clear height for vertical leg of flashing
 2. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
 3. Attach safety railing system to roof-hatch curb in full compliance with OSHA standards and manufacturer's written instructions.
 4. Attach ladder-assist post according to OSHA standards, and manufacturer's written instructions.
 5. Project Specific: Place roof system assembly letter and roof warranty in durable laminated sheets and wire-tie to the roof hatch.
- F. Heat and Smoke Vent Installation:
1. Install heat and smoke vent so top perimeter surfaces are level.
 2. Install and test heat and smoke vents and their components for proper operation according to NFPA 204.
- G. Gravity Ventilator Installation: Verify that gravity ventilators operate properly and have unrestricted airflow. Clean, lubricate, and adjust operating mechanisms.
- H. Pipe Support Installation: Install pipe supports so top surfaces are in contact with and provide equally distributed support along length of supported item.
- I. Security Grilles: Weld bar intersections and, using tamper-resistant bolts, attach the ends of bars to structural frame or primary curb walls.
- J. Roof Walkway Installation:
1. Verify that locations of access and servicing points for roof-mounted equipment are served by locations of roof walkways.
 2. Remove ballast from top surface of low-slope roofing at locations of contact with roof-walkway supports.
 3. Install roof walkway support pads prior to placement of roof walkway support stands onto low-slope roofing.

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4. Redistribute removed ballast after installation of support pads.

- K. Preformed Flashing-Sleeve Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions.
- L. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.3 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 09 9113 "Exterior Painting" and Section 09 9123 "Interior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 7200