

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

Section Includes:

Copings.

- a. Roof-edge specialties.
- b. Roof-edge drainage systems.

Related Requirements:

Section 042000 "Unit Masonry" for reglets installed as work of Section 042000 but furnished by Section 077100.

- c. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
- d. Section 076200 "Sheet Metal Flashing and Trim"
- e. Section 077200 "Roof Accessories" for roof hatches, and other manufactured roof accessory units.
- f. Section 079200 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

Preinstallation Conference: Conduct conference at Project site.

Meet with Unit Masonry installer to coordinate locations and requirements of reglets for roofing system interface.

- g. Examine substrate conditions for compliance with performance requirements.

1.3 ACTION SUBMITTALS

Shop Drawings: For roof specialties.

Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.

- a. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
- b. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.

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- c. Detail termination points and assemblies, including fixed points.
- d. Include details of special conditions.
- e. Material description, product details, finish data, and test reports.

B. Samples for Verification:

Include Samples of each type of roof specialty on final application material to verify finish and color selection, in manufacturer's standard sizes.

1.4 CLOSEOUT SUBMITTALS

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

1.5 QUALITY ASSURANCE

Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are ANSI/SPRI/FM 4435/ES-1 tested to specified design pressure.

Products (units) shall be manufactured in specified manufacturer's facilities. Products (units) fabricated by installer or other fabricator will not be acceptable unless fabricator can demonstrate to Architect's satisfaction that products (units) have been tested and passed ANSI/SPRI/FM 4435/ES-1 Wind Design Standard.

A. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section .

Provide coping, fascia, gravel stops, and edge metal from one manufacturer and single source for Project. Mixing of items and components from different manufacturers or shop-formed components is not acceptable.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.

Build mockup of typical roof edge as directed by Architect.

- a. Build mockup of typical roof edge, including fascia gutter and downspout, approximately 10 feet long, including supporting construction, seams, attachments, and accessories.
- b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- c. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

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1.6 DELIVERY, STORAGE, AND HANDLING

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.

- A. 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.

1.7 FIELD CONDITIONS

Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication and indicate measurements on Shop Drawings.

- A. 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.

1.8 WARRANTY

Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

Color fading more than 5 Hunter units when tested according to ASTM D 2244.

- a. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
- b. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Finish Warranty Period: 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

- 2.1 BASIS OF DESIGN PRODUCTS: Basis for Design for all below products shall be by Applied Fabricators, Inc. (AFAB) 7185 N200 West, Greenfield, IN 46140. (317) 284-0685. Email: orders@appliedfabricators.com. Web: www.appliedfabricators.com

2.2 PERFORMANCE REQUIREMENTS

General Performance: Roof specialties 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.

- A. Wind Design Standard: Manufacture and install roof-edge specialties tested according to ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressures:

Design Pressure: As indicated on Structural Drawings.

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.

Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.3 COPINGS

Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.

All components of coping, caps, corners, and system shall be manufactured by same manufacturer. Fabricated (by installer in shop or in field) components are not acceptable.

- a. All fasteners shall be concealed, unless approved by Architect prior to installation. Exposed rivets, screws, and tek screws are not acceptable. Unless attachment is intended by manufacturer to be movable. Open or lapped seams are not acceptable unless indicated on Shop Drawings and reviewed by Architect.
- b. Basis-of-Design Product: Subject to compliance with requirements, provide "Snap-On Coping" as manufactured by Applied Fabricators, Inc. or comparable product by one of the following:
 - a. Metal Era, Inc.
 - b. Hickman Company, W. P.
- c. Basis of Design Product: Subject to compliance with requirements, provide "Coping with Continuous Cleat" as manufactured by Applied Fabricators, Inc. or a comparable product by one of the following:
 - a. Metal Era, Inc.
 - b. Hickman Company, W.P.
- d. Formed Aluminum Sheet Coping Caps: Formed aluminum of thickness determined by width of covered wall: Up to 16 inches - 0.040 inch; 16+ inches to 24 inches - 0.050 inch; 24+ inches to 36 inches - 0.063 inch.

Surface: Smooth, flat finish.

 - a. Finish: Two-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.

Corners: Factory mitered.

Corner units shall have minimum 18 inches length legs measured on inside of each leg.

e. Coping-Cap Attachment Method: Snap-on, fabricated from coping-cap material.

Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.

2.4 ROOF-EDGE SPECIALTIES

General: All roof edge flashings, including components, shall be manufactured by same manufacturer at manufacturer's facility. Fabricated components, whether in installer's shop or in field are not acceptable.

A. Canted Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of metal fascia cover in section lengths not exceeding 12 feet Insert dimension and a continuous formed galvanized-steel sheet cant, 0.032 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.

Basis-of-Design Product: Subject to compliance with requirements, provide "Gravel Stop Fascia" or "Canted Snap Edge" as manufactured by Applied Fabricators, Inc. or comparable product by one of the following:

- a. Metal Era, Inc
- b. Hickman Company, W. P.

b. Formed Aluminum Sheet Fascia Covers: Aluminum sheet of thickness as determined by fascia height indicated on Drawings: Up to 4 inches - 0.040 inch; 4+ inches to 8 inches - 0.040 inch; 8+ inches to 13 inches - 0.050 inch; 14+ inches to 16 inches - 0.063 inch.

Surface: Smooth, flat finish.

- a. Finish: Two-coat fluoropolymer.
- b. Color: As selected by Architect from manufacturer's full range.

Corners: Factory mitered.

c. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.

Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and "with a continuous formed 20 gauge galvanized-steel cleat" or "an extruded aluminum anchor bar" to engage fascia cover and secure single-ply roof membrane. Provide matching corner units.

Basis-of-Design Product: Subject to compliance with requirements, provide "Snap-Edge Fascia" or "Bar Edge Guard" as manufactured by Applied Fabricators, Inc. or comparable product by one of the following:

- a. Metal Era, Inc

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- b. Hickman Company, W. P.

- d. Formed Aluminum Sheet Fascia Cover: Aluminum sheet of following thickness as determined by fascia face height indicated on Drawings: Up to 4 inches - 0.040 inch; 4+ inches to 8 inches - 0.040 inch; 8+ inches to 13 inches Above 8'-12' use cleat with stiffener and V bend.

Surface: Smooth, flat finish.
 - a. Finish: Two-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
Corners: Factory mitered.
 - e. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
 - f. Receiver: Manufacturer's standard material and thickness.

2.5 ROOF-EDGE DRAINAGE SYSTEMS

General: All roof edge drainage systems, including components shall be manufactured by manufacturer at manufacturer's facility. Fabricated (at installer's shop or in field) components are not acceptable.

- A. Design Manufacturer: Subject to compliance with requirements, provide products specified as manufactured Applied Fabricators, Inc or comparable product by one of the following:
 - a. Metal Era, INC
 - b. Hickman Company, W. P.

Gutters: Basis of Design-"AFAB Gutter"; Manufactured in uniform section lengths not exceeding 12 feet, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.

Gutters must meet ANSI/SPRI GT-1 Structural Design for Gutter Systems with Low Slope Roof

- Formed Aluminum: Provide thickness based on overall girth of gutter as follows: Up to 15 inches - 0.032 inch; 15+ inches to 20 inches - 0.040 inch; 20+ inches to 25 inches - 0.050 inch; 25+ inches to 30 inches - 0.063 inch.
 - c. Gutter Profile: As indicated according to SMACNA's "Architectural Sheet Metal Manual."
 - d. Corners: Factory mitered.
 - e. See SMACNA's "Architectural Sheet Metal Manual" for discussion of gutter brackets, straps, and spikes and ferrules for supporting gutters; see manufacturers' written instructions.
 - f. Gutter Supports: Gutter brackets and straps with finish matching the gutters.

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Downspouts: Basis of Design-"AFAB Downspout"; Plain rectangular complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors. Join sections with 1-1/2" telescoping joints.

Formed Aluminum: 0.040 inch thick.

Aluminum Finish: Two-coat fluoropolymer.

Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

- A. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.

- a. Provide uniform, neat seams with minimum exposure of solder and sealant.
- b. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
- c. Torch cutting of roof specialties is not permitted.
- d. Do not use graphite pencils to mark metal surfaces.

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.

Do not allow coatings to touch roofing membrane or other substrates not indicated below.

- e. Coat concealed side of uncoated aluminum and stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
- f. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.

- g. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

- B. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
- C. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.3 COPING INSTALLATION

Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

- A. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturers required spacing that meets performance requirements.

- a. Interlock face-leg drip edge into continuous cleat anchored to substrate at manufacturers required spacing that meets performance requirements. Anchor back leg of coping with screw fasteners and elastomeric washers at manufacturers required spacing that meets performance requirements.

3.4 ROOF-EDGE SPECIALITIES INSTALLATION

Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

- A. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements as indicated in manufacturer's written instructions.

3.5 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

- A. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.

Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.

Connect downspouts to underground drainage system indicated.

3.6 CLEANING AND PROTECTION

Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

- A. Clean and neutralize flux materials. Clean off excess solder and sealants.
- B. Remove temporary protective coverings and strippable films as 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 roof specialties in a clean condition during construction.
- C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100