SECTION 077100 - ROOF SPECIALTIES

1. GENERAL

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

This Section uses the term "Architect." 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.

GENERAL

* + - 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
      1. SUMMARY

Edit the following to include the premanufactured roof specialties systems and components being used on this project and illustrated in the drawings.

* + - * 1. Section Includes:

Copings.

Roof-edge specialties.

Roof-edge drainage systems.

Reglets and counterflashings.

Delete Related Requirements – Not Used any longer.

* + - 1. COORDINATION
         1. Coordinate roof specialties layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
         2. Coordinate roof specialties installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.
      2. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at **[Project site]**.

Retain subparagraphs below if additional requirements are necessary; include information about conference.

Meet with Director’s Representative, Director’s Representative's insurer if applicable, 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.

Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.

Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

* + - * 1. Sustainable Design Submittals:

Retain "Shop Drawings" paragraph below for Work that involves custom fabrication or if manufacturer's product data are inadequate.

* + - * 1. 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.

Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.

Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.

Detail termination points and assemblies, including fixed points.

Include details of special conditions.

Detail roof specialties at scale of not less than 3 inches per 12 inches (1:5).

Retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples: for each type of exposed finish

Retain subparagraph below when necessary to verify fabrication techniques in absence of a mock-up requirement.

Anodized or painted Samples: Samples to show full range to be expected for each finish and color required.

Pre-finished Metal samples: Samples to show full range to be expected for each finish and color required.

* + - * 1. Qualification Data: For manufacturer.

Retain "Product Certificates" paragraph below to require submittal of product certificates from manufacturers.

Retain "Product Certificates" and "Product Test Reports" paragraphs below for each type of roof specialty if applicable.

* + - * 1. Product Certificates: For each type of roof specialty.
        2. Product Test Reports: For **[copings] [and] [roof-edge flashings]**, for tests performed by a qualified testing agency.
        3. Sample Warranty: For manufacturer's special warranty.
        4. In accordance with Article 4.7 of the General Conditions, a re-evaluation processing fee will be levied against the Contractor for each re-evaluation required of any Submittal or Submittal Package that is returned for failure to comply with the submittal requirements relative to completeness, content or format.
      1. CLOSEOUT SUBMITTALS
         1. Maintenance Data: For roofing specialties, and its accessories, to include in maintenance manuals.
      2. QUALITY ASSURANCE
         1. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are **[FM Approvals listed for specified class] [and] [SPRI ES-1 tested to specified design pressure]**.

Retain "Source Limitations" paragraph below if required for Project. Coordinate with "Warranty" Article of this Section and requirements of Project roofing-membrane Section.

* + - * 1. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Division 7.
        2. Benchmarks: Build benchmarks to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.

Retain one of first three subparagraphs below for large-scale benchmark; insert other benchmark requirements or revise if required. Indicate portion of building represented by benchmark on Drawings, or draw benchmark as separate element. Coordinate with benchmark requirements of other Sections if applicable.

Build benchmark of typical roof edge as shown on Drawings.

Build benchmark of typical roof edge as part of Integrated Exterior Benchmark.

Build benchmark of typical roof edge, including **[fascia] [gutter] [and] [downspout] <Insert item>**, approximately **[**10 feet**] <Insert dimension>** long, including supporting construction, seams, attachments, **[underlayment,]** and accessories.

Retain first subparagraph below if mockups are not only for establishing appearance factors.

Approval of benchmark does not constitute approval of deviations from the Contract Documents contained in benchmarks unless Director’s Representative specifically approves such deviations in writing.

Retain subparagraph below if the intention is to make an exception to the default requirement for demolishing and removing benchmarks.

Subject to compliance with requirements, approved benchmarks may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. 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.
         2. Protect removable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.
      2. FIELD CONDITIONS
         1. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
         2. 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.
      3. WARRANTY

When warranties are required, verify with Director’s Representative that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

Retain "Roofing-System Warranty" paragraph below when roof specialties are required to be included in a roofing-membrane manufacturer's system warranty; coordinate with Project roofing-membrane Section.

* + - * 1. Roofing-System Warranty: Roof specialties are to be included in warranty provisions in the Roof Membrane Section.

Retain "Special Warranty on Painted Finishes" paragraph below for factory-coated metal. Delete if metal is left uncoated or field finished. Coordinate with finishes retained in Part 2.

* + - * 1. 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.

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

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

Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Verify available warranties and warranty periods for finishes with manufacturers listed in Part 2 Articles. Twenty-year or longer periods are for fluoropolymer finishes and are included with manufacturers' published data; longer periods for premium finishes may be available.

Finish Warranty Period: 30 years from date of Substantial Completion.

1. PRODUCTS
   * + 1. PERFORMANCE REQUIREMENTS
          1. General Performance: Roof specialties shall withstand wind loads, structural movement, 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.

Retain first option in "Sheet Metal Standard for Flashing and Trim" paragraph below if copings or roof edge flashings that are SPRI ES-1 tested are required, if Project is FM Global insured, or if requirements of FM Approvals set a minimum quality standard. The NRCA has a testing program and authorized fabricators for particular NRCA zinc-coated (galvanized) steel sheet, aluminum, and copper details. SMACNA does not have a testing program or authorized fabricators for its details.

* + - * 1. Sheet Metal Standard for Flashing and Trim: Comply with **[NRCA's "The NRCA Roofing Manual"] [and] [SMACNA's "Architectural Sheet Metal Manual"]** requirements for dimensions and profiles shown unless more stringent requirements are indicated.

Retain "Sheet Metal Standard for Copper" paragraph below if applicable. The NRCA has a testing program and authorized fabricators for particular NRCA copper-sheet metal details. The CDA does not have a testing program or authorized fabricators for its details.

* + - * 1. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

Retain "FM Approvals' Listing" paragraph below if Project is FM Global insured or if FM Approvals' requirements set a minimum quality standard. Coordinate requirements of FM Approvals' classification with other requirements in this Section. Verify availability of copings or roof-edge specialties with these classifications.

* + - * 1. FM Approvals' Listing: Manufacture and install [copings] [roof-edge specialties] that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, [**Class 1-90] [Class 1-120**] Identify materials with FM Approvals' markings.

Retain "SPRI Wind Design Standard" paragraph below if Project is governed by the BCNYS or if SPRI ES-1 sets a minimum quality standard. Coordinate requirements in SPRI ES-1 with other requirements in this Section. Verify availability of copings or roof-edge specialties that meet these requirements. See Evaluations for additional information on SPRI ES-1 testing programs.

* + - * 1. SPRI Wind Design Standard: Manufacture and install **[copings] [roof-edge specialties]** tested according to SPRI ES-1 and capable of resisting the following design pressures:
        2. 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.

Differential values in "Temperature Change (Range)" subparagraph below (for aluminum in particular) are suitable for most of the United States.

Temperature Change (Range): **[**120 deg F**, ambient;** 180 deg F**] <Insert temperature range>**, material surfaces.

* + - 1. COPINGS

Retain this article for metal cap copings.

* + - * 1. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding [12 feet] **<Insert dimension>**, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.

Metal-Era: Perma Tite Gold Coping.

Atas International: Rapid-Lok Ultra Coping.

W.P. Hickman / OMG: Perma Snap Plus Coping.

PAC Clad: Pac Tite Gold Coping.

Retain one of five coping caps subparagraphs below. Retain thickness of coping cap that meets performance requirements and has the rigidity to suit Project.

Metallic-Coated Steel Sheet Coping Caps: Zinc-coated **(galvanized)** steel, nominal **[**0.028-inch **thickness] [**0.034-inch **thickness] [thickness as required to meet performance requirements] <Insert thickness>**.

Surface: **[Smooth, flat] [Embossed]** finish.

Finish: **[Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] <Insert finish>**.

Color: **[As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**.

Formed Aluminum Sheet Coping Caps: Aluminum sheet, **[**0.040 inch **thick] [**0.050 inch **thick] [**0.063 inch **thick] [thickness as required to meet performance requirements] <Insert thickness>**.

Surface: **[Smooth, flat] [Embossed]** finish.

Finish: **[Mill] [Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] [Clear anodic] [Color anodic] <Insert finish>**.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Color: **[Light bronze] [Medium bronze] [Dark bronze] [Black] [As indicated by manufacturer's designations <Insert color>**. As selected by the Directors Representative from manufacturers full range.

Some manufacturers do not offer first two options in "Corners" subparagraph below; if required, verify availability with manufacturers.

Corners: Factory **mitered and and sealed watertight]**.

Splice Plates: **[Concealed] [Exposed]**, of same material, finish, and shape as coping cover.

Manufacturers offer a variety of special fabrications and face-leg profiles.

Special Fabrications: **[Radiussed sections] [Arched sections] [Bullnose-face leg] [Two-way sloped coping cap] <Insert description>**.

Coping-Cap Attachment Method: **[Snap-on] [or]** fabricated from coping-cap material.

Retain "Snap-on Coping Anchor Plates" or "Face-Leg Cleats" subparagraph below and coordinate with coping-cap attachment method selected.

Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches (300 mm) wide, with integral cleats.

Retain first option in "Face-Leg Cleats" subparagraph below for anchoring aluminum and galvanized-steel coping caps; retain second for anchoring copper coping caps.

Face-Leg Cleats: Concealed, continuous **[galvanized-steel sheet] [stainless steel].**

* + - 1. ROOF-EDGE SPECIALTIES

Retain this article for roof-edge specialties, sometimes called "roof edging" or "roof-edge fascia."

Retain first paragraph below for a two-piece, canted, roof-edge fascia or gravel-stop fascia consisting of a snap-on or compression-clamped metal fascia cover over a metal cant or water dam. Product configurations vary considerably; revise to suit Project. Indicate the edge profile and height on Drawings. See Evaluations.

Copy first paragraph below and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Roof-Edge [Fascia] Manufactured, two-piece, roof-edge fascia consisting of [snap-on] metal fascia cover in section lengths not exceeding [12 feet] and a continuous formed galvanized-steel sheet cant, 0.028 inch) thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.

Metal-Era: Perma Tite Fascia.

Atas International: Edge-Lok 2 Fascia.

PAC Clad: Pac Loc Fascia 2000.

Retain one of three fascia covers subparagraphs below. Retain thickness of fascia cover that meets performance requirements and has the rigidity to suit Project.

Metallic-Coated Steel Sheet Fascia Covers: Zinc-coated **(galvanized)** steel, nominal **[**0.028-inch **thickness] [**0.034-inch **thickness] [thickness as required to meet performance requirements] <Insert thickness>**.

Surface: **[Smooth, flat] [Embossed]** finish.

Finish: **[Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] <Insert finish>**.

Color: **[As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**.

Formed Aluminum Sheet Fascia Covers: Aluminum sheet, **[**0.040 inch **thick] [**0.050 inch **thick] [**0.063 inch **thick] [thickness as required to meet performance requirements] <Insert thickness>**.

Surface: **[Smooth, flat] [Embossed]** finish.

Finish: **[Mill] [Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] [Clear anodic] [Color anodic] <Insert finish>**.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Color: **[Light bronze] [Medium bronze] [Dark bronze] [Black] [As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**. As selected by the Directors Representative from manufacturers full range.

Architectural Products and perhaps other manufacturers offer extruded-aluminum fascia covers. In "Extruded-Aluminum Fascia Covers" subparagraph below, retain one of last two thickness options for extruded aluminum.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Some manufacturers do not offer first two options in "Corners" subparagraph below; if required, verify availability with manufacturers.

Corners: Factory mitered and **[sealed watertight]**.

Splice Plates: **[Concealed] [Exposed]**, of same material, finish, and shape as fascia cover.

Manufacturers offer a variety of special fabrications and fascia-cover profiles.

Special Fabrications: **[Radiussed sections] [Arched sections] [Bullnose fascia cover] [Cornice fascia cover] [Cove fascia cover] <Insert description>**.

Scuppers separate from roof-edge specialties are specified in "Roof-Edge Drainage Systems" Article.

Fascia Accessories: **[Fascia extenders with continuous hold-down cleats] [Wall cap] [Soffit trim] [Overflow scuppers] [Overflow scuppers with perforated screens] [Spillout scuppers] [Downspout scuppers with integral conductor head and downspout adapters] [Downspout scuppers with integral conductor head and downspout adapters and perforated screens] <Insert description>**.

Retain "Roof-Edge Fascia" paragraph below for a two-piece, roof-edge fascia consisting of a snap-on fascia cover over a continuous anchor bar; revise to suit Project.. Receiver typically secures a downturned single-ply roofing membrane and is capable of developing substantial uplift resistance.

Retain "Metallic-Coated Steel Sheet Fascia Covers" or "Formed Aluminum Sheet Fascia Covers" subparagraph below. Retain thickness of fascia cover that meets performance requirements and has the rigidity to suit Project.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Some manufacturers do not offer first two options in "Corners" subparagraph below; if required, verify availability with manufacturers.

Manufacturers offer a variety of special fabrications and fascia-cover profiles.

Scuppers separate from roof-edge specialties are specified in "Roof-Edge Drainage Systems" Article.

Retain "One-Piece Gravel Stops" paragraph below for a one-piece gravel stop; revise to suit Project. Product configurations vary considerably; revise to suit Project.

Retain one of five metal gravel stops subparagraphs below. Retain thickness of gravel stop that meets performance requirements and has the rigidity to suit Project.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Verify that manufacturers offer extruded-aluminum gravel stops if retaining. In "Extruded-Aluminum Gravel Stops" subparagraph below, retain one of last two thickness options for extruded aluminum.

Retain "Color" subparagraph below for painted and color anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Stainless-steel finishes are often not indicated in manufacturers' catalogs; verify availability with manufacturers before retaining a numbered finish.

Some manufacturers do not offer first two options in "Corners" subparagraph below; if required, verify availability with manufacturers.

* + - 1. ROOF-EDGE DRAINAGE SYSTEMS
         1. Gutters: Manufactured in uniform section lengths not exceeding [12 feet] <Insert dimension>, 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.

Zinc-Coated Steel: Nominal **[**0.028-inch**] [**0.034-inch **] <Insert value>** thickness.

Aluminum Sheet: **[**0.032 inch **] [**0.040 inch **] [**0.050 inch**] [**0.063 inch **] <Insert value>** thick.

Copper Sheet: **[**16 oz./sq. ft. **] [**20 oz./sq. ft. **] <Insert value>**.

Retain "Gutter Profile" subparagraph below if Drawings do not show cross section or profile in sufficient detail. Most manufactured gutter profiles are rectangular with variations. See SMACNA's "Architectural Sheet Metal Manual" to identify commonly used gutter profiles. See the Evaluations for discussion of highback gutters; verify availability with manufacturers. CopperCraft and perhaps other manufacturers offer the "quarter-round" option.

Gutter Profile: **[Style A] [Style B] [Style F] [Style G] [Style H] [Style I] [Style K] [Style K highback] [Half-round single bead] [Half-round highback] [Quarter round] [Ogee] [As indicated] <Insert style>** according to SMACNA's "Architectural Sheet Metal Manual."

Retain "Embossed Surface" subparagraph below for gutters with embossed design on the front surface, available from Berger and perhaps other manufacturers.

Embossed Surface: Embossed with design **[as indicated by manufacturer's designations] [As selected by Architect from manufacturer's full range] <Insert description>**.

Retain "Applied Fascia Cover (Concealed Gutter)" subparagraph below if special decorative fascia or cornice is applied to conceal the gutter. See Evaluations. Detail profile on Drawings and verify availability with manufacturers.

Applied Fascia Cover **(Concealed Gutter)**: Exposed, formed **[copper,** 16 oz./sq. ft**.] [aluminum,** 0.040 inch**] <Insert material and weight or thickness>**, with factory-mitered corners, ends, and concealed splice joints.

Some manufacturers do not offer first two options in "Corners" subparagraph below; if required, verify availability with manufacturers.

Corners: Factory mitered and **[soldered] [continuously welded] [mechanically clinched and sealed watertight]**.

See SMACNA's "Architectural Sheet Metal Manual" for discussion of gutter brackets, straps, and spikes and ferrules for supporting gutters; see manufacturers' written instructions.

Gutter Supports: **[Gutter brackets] [Straps] [Spikes and ferrules] [Manufacturer's standard supports as selected by Architect] <Insert description>** with finish matching the gutters.

Manufacturers offer a variety of special fabrications and fascia-cover profiles.

Special Fabrications: **[Radiussed sections] <Insert description>**.

Gutter Accessories: **[Continuous screened leaf guard with sheet metal frame] [Continuous hinged leaf guard of solid metal designed to shed leaves] [Continuous snap-in plastic leaf guard] [Bronze wire ball downspout strainer] [Wire ball downspout strainer] [Flat ends] [Bullnose ends for half-round gutter] <Insert description>**.

Revise "Downspouts" paragraph below if chain downspouts are required. See Evaluations.

* + - * 1. Downspouts: **[Plain round] [Corrugated round] [Plain rectangular] [Corrugated rectangular] [Open-face rectangular] <Insert shape>** complete with **[machine-crimped] [mitered] [smooth-curve]** elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

Zinc-Coated Steel: Nominal **[**0.028-inch**] [**0.034-inch **] <Insert value>** thickness.

Formed Aluminum: **[**0.032 inch **] [**0.040 inch **] [**0.050 inch **] [**0.063 inch **] <Insert value>** thick.

Architectural Products and perhaps other manufacturers offer extruded-aluminum downspouts.

Extruded Aluminum: **[**0.125 inch **] <Insert value>** thick.

Copper: **[**16 oz./sq. ft. **] <Insert value>**.

Manufacturers offer a variety of scupper configurations. Parapet scuppers, which are installed in parapet wall, discharge into conductor heads or, as overflow scuppers, merely project through the parapet. Scuppers combined with roof-edge specialties and discharging into gutters or conductor heads are specified in "Roof-Edge Specialties" Article.

* + - * 1. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. **[Fasten gravel guard angles to base of scuppers.]**

Zinc-Coated Steel: Nominal **[**0.028-inch**] <Insert value>** thickness.

Formed Aluminum: **[**0.032 inch **] <Insert value>** thick.

Stainless Steel: **[**0.019 inch **] <Insert value>** thick.

Copper: **[**16 oz./sq. ft. **] <Insert** weight **(thickness)>**.

Manufacturers offer a variety of conductor-head designs. If a highly ornamental conductor head is required, show details on Drawings or insert manufacturer's name and model number as a basis of design.

* + - * 1. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout **[exterior flange trim,] [and] [built-in overflow]**.

Zinc-Coated Steel: Nominal **[**0.028-inch **] <Insert value>** thickness.

Formed Aluminum: **[**0.032 inch **] <Insert value>** thick.

Stainless Steel: **[**0.016 inch **] <Insert value>** thick.

Copper: **[**16 oz./sq. ft. **] <Insert** weight **(thickness)>**.

Manufacturers generally do not show metal splash pans in catalogs; other materials are often used. Retain "Splash Pans" paragraph below if required, and detail splash pans on Drawings unless included in Section 076200 "Sheet Metal Flashing and Trim."

* + - * 1. Splash Pans: Fabricate from the following exposed metal:

Zinc-Coated Steel: Nominal **[**0.028-inch **] <Insert value>** thickness.

Formed Aluminum: **[**0.040 inch **] <Insert value>** thick.

Stainless Steel: **[**0.019 inch **] <Insert value>** thick.

Copper: **[**16 oz./sq. ft. **] <Insert** weight **(thickness)>**.

Manufacturers offer a variety of other roof-edge drainage-system components; insert components to suit Project.

Retain required finish selection from options in paragraphs below. If retaining more than one finish and color, indicate locations of each on Drawings or by inserting descriptive text.

* + - * 1. Zinc-Coated Steel Finish: **[Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] <Insert finish>**.

Color: **[As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**.

* + - * 1. Aluminum Finish: **[Mill] [Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] [Clear anodic] [Color anodic] <Insert finish>**.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Color: **[Light bronze] [Medium bronze] [Dark bronze] [Black] [As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**.

Stainless-steel finishes are often not indicated in manufacturers' catalogs; verify availability with manufacturers before retaining a numbered finish.

* + - * 1. Stainless-Steel Finish: **[No. 2B (bright, cold rolled, unpolished)] [No. 3 (coarse, polished directional satin)] [No. 4 (bright, polished directional satin)] <Insert finish>**.
        2. Copper Finish: **[Non-patinated, mill] [Pre-patinated dark brown] [Pre-patinated verdigris] <Insert finish>**.
      1. REGLETS AND COUNTERFLASHINGS
         1. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:

Zinc-Coated Steel: Nominal **[**0.022-inch**] [**0.028-inch**] <Insert value>** thickness.

Formed Aluminum: **[**0.024 inch**] [**0.050 inch **] <Insert value>** thick.

Stainless Steel: **[**0.019 inch **] [**0.025 inch**] <Insert value>** thick.

Copper: **[**16 oz./sq. ft.**] <Insert** weight **(thickness)>**.

Some manufacturers do not offer first two options in "Corners" subparagraph below; if required, verify availability with manufacturers.

Corners: Factory mitered and **[soldered] [continuously welded] [mechanically clinched and sealed watertight]**.

Retain one of or more reglet types in five subparagraphs below.

Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.

Stucco Type, Embedded: Provide reglets with upturned fastening flange and extension leg of length to match thickness of applied finish materials.

Concrete Type, Embedded: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.

Masonry Type, Embedded: Provide reglets with offset top flange for embedment in masonry mortar joint.

Multiuse Type, Embedded: For multiuse embedment in **[cast-in-place concrete] [masonry mortar joints]**.

Coordinate "Counterflashings" paragraph below with sheet metal through-wall flashing (with snaplock receiver to receive counterflashing), specified in either Section 042000 "Unit Masonry" or Section 076200 "Sheet Metal Flashing and Trim." Revise paragraph if one-piece counterflashings are required; see Evaluations.

* + - * 1. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding **[**12 feet**] <Insert dimension>** designed to snap into **[reglets] [or] [through-wall-flashing receiver]** and compress against base flashings with joints lapped, from the following exposed metal:

Zinc-Coated Steel: Nominal **[**0.022-inch**] [**0.028-inch **] <Insert value>** thickness.

Formed Aluminum: **[**0.024 inch**] [**0.032 inch**]** **<Insert value>** thick.

Stainless Steel: **[**0.019 inch**] [**0.025 inch**] <Insert value>** thick.

Copper**: [**16 oz./sq. ft. **] <Insert** weight **(thickness)>**.

* + - * 1. Accessories:

Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.

Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

Retain required finish selection from options in paragraphs below. If retaining more than one finish and color, indicate locations of each on Drawings or by inserting descriptive text.

* + - * 1. Zinc-Coated Steel Finish: **[Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] <Insert finish>**.

Color: **[As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**.

* + - * 1. Aluminum Finish: **[Mill] [Two-coat fluoropolymer] [Three-coat fluoropolymer] [Two-coat mica fluoropolymer] [Three-coat metallic fluoropolymer] [Clear anodic] [Color anodic] <Insert finish>**.

Delete "Color" subparagraph below for mill and clear anodic finishes. First four options are examples of color anodic finishes and may vary in color range and availability among manufacturers.

Color: **[Light bronze] [Medium bronze] [Dark bronze] [Black] [As indicated by manufacturer's designations] [Match Director’s Representative sample] [As selected by Director’s Representative from manufacturer's full range] <Insert color>**.

Stainless-steel finishes are often not indicated in manufacturers' catalogs; verify availability with manufacturers before retaining a numbered finish.

* + - * 1. Stainless-Steel Finish: **[No. 2B (bright, cold rolled, unpolished)] [No. 3 (coarse, polished directional satin)] [No. 4 (bright, polished directional satin)] <Insert finish>**.
        2. Copper Finish: **[Non-patinated, mill] [Pre-patinated verdigris] <Insert finish>**.
      1. MATERIALS
         1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation.
         2. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

Type 304 stainless steel is standard in manufacturers' literature. Revise "Stainless-Steel Sheet" paragraph below if Type 316 stainless steel is required; verify availability with manufacturers.

* + - * 1. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.
      1. UNDERLAYMENT MATERIALS

Retain applicable paragraphs in this article for roof specialties applied directly over dissimilar metal or corrosive substrates. These underlayments are also used to resist leaks and to provide continuity of building water, air, and vapor barriers.

Self-adhering underlayment in "Self-Adhering, High-Temperature Sheet" paragraph below is manufactured for high temperatures associated with exposed metals used in roofing applications. Revise if high-temperature underlayment is not required.

* + - * 1. Self-Adhering, High-Temperature Sheet: Minimum 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.

Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.

Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.

Type II (No. 30) felt or self-adhering sheet underlayment is generally used over wood blocking or sheathing when air- and moisture-tight construction is not required; verify need with roof-specialty manufacturer.

Slip sheet in "Slip Sheet" paragraph below is often used over other types of underlayment materials and may be required over a felt underlayment; verify need with roof-specialty manufacturer.

* + - 1. MISCELLANEOUS MATERIALS
         1. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.

Fasteners for Aluminum: Aluminum or Series 300 stainless steel.

Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153 or ASTM F 2329.

Retain applicable subparagraphs below and revise to suit Project.

Revise "Elastomeric Sealant" paragraph below if sealant of specific type, grade, class, and use is required.

* + - * 1. Elastomeric Sealant: ASTM C 920, elastomeric [silicone] polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

Retain "Butyl Sealant" paragraph below for concealed sealant use in metal joints with limited movement.

Retain "Solder for Copper" paragraph below if required for copper components; verify availability with manufacturers. If required, retain tin-lead solder option where permitted by authorities having jurisdiction, or insert another specific solder grade (alloy). Insert solders for other metals to suit Project. See "Seaming and Fastening" Article in the Evaluations.

* + - * 1. Solder for Copper: ASTM B 32, **[lead-free solder] [Grade Sn50, 50 percent tin and 50 percent lead] <Insert solder grade>**.
      1. FINISHES
         1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
         2. Protect mechanical and painted finishes on exposed surfaces from damage by applying a removable, temporary protective covering before shipping.
         3. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. 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.

Retain one of or more finish descriptions from four finishes paragraphs below corresponding to finish selections indicated under product descriptions above or on Drawings.

* + - * 1. Coil-Coated Galvanized-Steel Sheet Finishes:

High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A 755 and coating and resin manufacturers' written instructions.

Revise or insert additional testing requirements in subparagraphs below if performance levels indicated in AAMA 621 are insufficient.

Insert other specialty finishes if required.

"Two-Coat Fluoropolymer" subparagraph below is standard fluoropolymer for most manufacturers; other finishes may vary in availability among manufacturers.

Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Two-Coat Mica Fluoropolymer: AAMA 621. Fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Three-Coat Metallic Fluoropolymer: AAMA 621. Fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Finish in "Concealed Surface Finish" subparagraph below is frequently retained for nonexposed surfaces of coil-coated sheet.

Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil .

* + - * 1. Coil-Coated Aluminum Sheet Finishes:

High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Retain one of or more of four fluoropolymer subparagraphs below if a painted finish is required. Revise or insert additional testing requirements if performance levels indicated in AAMA 2605 are insufficient. Note that AAMA 2605-11 now includes requirements formerly published under AAMA 620.

Insert other specialty finishes if required.

"Two-Coat Fluoropolymer" subparagraph is standard fluoropolymer for most manufacturers; other finishes may vary in availability among manufacturers.

Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Two-Coat Mica Fluoropolymer: AAMA 2605. Fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Three-Coat Metallic Fluoropolymer: AAMA 2605. Fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Finish in "Concealed Surface Finish" subparagraph below is frequently retained for nonexposed surfaces of organic-finished coil-coated sheet.

Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

Retain one of or both anodic finish subparagraphs below if anodic finish is required.

Retain one of two options in "Clear Anodic Finish" subparagraph below. Class I finish is heavy anodized. Verify availability with manufacturers.

Clear Anodic Finish: AAMA 611, **[AA-M12C22A41, Class I,] [AA-M12C22A31, Class II,]** or thicker.

Retain one of two options in "Color Anodic Finish" subparagraph below. Class I finish is heavy anodized. Verify availability with manufacturers.

Color Anodic Finish: AAMA 611, **[AA-M12C22A42/A44, Class I,] [AA-M12C22A32/A34, Class II,]** or thicker.

Retain one of or more of four fluoropolymer subparagraphs below if a painted finish is required.

AAMA 2604 provides a five-year high-performance finish, and AAMA 2605 provides a 10-year superior-performance finish on extrusions and panels. Revise if specific products are required.

Revise or insert additional testing requirements if performance levels indicated in AAMA 2605 are insufficient.

Insert other specialty finishes if required.

"Two-Coat Fluoropolymer" subparagraph is standard fluoropolymer for most manufacturers; other finishes may vary in availability among manufacturers.

Finish in "Concealed Surface Finish" subparagraph below is frequently retained for nonexposed surfaces of organic-finished coil-coated sheet.

Retain one of or both anodic finish subparagraphs below if anodic finish is required.

Retain one of two options in "Clear Anodic Finish" subparagraph below. Class I finish is heavy anodized. Verify availability with manufacturers.

Retain one of two options in "Color Anodic Finish" subparagraph below. Class I finish is heavy anodized. Verify availability with manufacturers.

* + - * 1. Copper Sheet Finishes:

Retain one of or both finish subparagraphs below. Retain "Non-Patinated Finish" subparagraph for natural-color copper finish that weathers and changes color naturally over time. If retaining more than one finish, indicate locations of each on Drawings or by inserts.

Non-Patinated Finish: Mill finish.

Retain "Pre-Patinated Finish" subparagraph below for pre-patinated finishes, offered by some manufacturers, which reduce nonuniform weathering of exposed copper sheet. Verdigris is the ultimate, light-green color of aged copper.

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
          2. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
          3. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
          4. Proceed with installation only after unsatisfactory conditions have been corrected.
       2. UNDERLAYMENT INSTALLATION

Retain "Self-Adhering Sheet Underlayment" or "Felt Underlayment" paragraph below as required. Revise paragraphs below to suit Project.

* + - * 1. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

Retain one of or both subparagraphs below.

Apply continuously under **[copings] [roof-edge specialties] [and] [reglets and counterflashings]**.

Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

* + - 1. INSTALLATION, GENERAL
         1. 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.

Provide uniform, neat seams with minimum exposure of solder and sealant.

Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.

Torch cutting of roof specialties is not permitted.

Retain subparagraph below if required to prevent galvanic corrosion between graphite and aluminum. See discussion on galvanic scale in the Evaluations.

Do not use graphite pencils to mark metal surfaces.

* + - * 1. 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.

Coat concealed side of **[uncoated aluminum] [and] [stainless-steel]** roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

* + - * 1. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

Space movement joints at a maximum of **[**12 feet**] <Insert dimension>** with no joints within **[**18 inches**] <Insert dimension>** of corners or intersections unless otherwise indicated on Drawings.

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.

* + - * 1. Fastener Sizes: Use fasteners of sizes that penetrate **[wood blocking or sheathing not less than** 1-1/4 inches **for nails and not less than** 3/4 inch **for wood screws] [substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance] <Insert size requirement>**.
        2. 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**.

Retain "Soldered Joints" paragraph below if required for copper components; verify with manufacturers. Insert soldering for other metals to suit Project. See "Seaming and Fastening" Article in the Evaluations.

* + - * 1. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
      1. COPING INSTALLATION
         1. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
         2. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

Retain first subparagraph below for snap-on-type copings mounted on cleated anchor plates.

Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at

Retain subparagraph below for copings with back leg fasteners exposed.

* + - 1. ROOF-EDGE SPECIALITIES INSTALLATION

Coordinate installation of roof-edge specialties with applicable low-slope roofing Section.

* + - * 1. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
        2. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
      1. ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION
         1. 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.

Retain last option in "Gutters" paragraph below if soldering the joints and ends of copper gutters.

* + - * 1. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than **[**12 inches**] [**24 inches **] [**30 inches **] <Insert dimension>** apart. Attach ends with rivets and **[seal with sealant] [solder]** to make watertight. Slope to downspouts.

Retain subparagraphs below if required. See manufacturers' written instructions.

Install gutter with expansion joints at locations indicated but not exceeding **[**50 feet **] <Insert dimension>** apart. Install expansion-joint caps.

Install continuous leaf guards on gutters with noncorrosive fasteners, **[removable] [hinged to swing open]** for cleaning gutters.

Revise "Downspouts" paragraph below if chain downspouts are required.

* + - * 1. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately **[**60 inches **] <Insert dimension>** o.c.

Retain one of two subparagraphs below.

Provide elbows at base of downspouts at grade to direct water away from building.

Connect downspouts to underground drainage system indicated.

* + - * 1. Splash Pans: Install where downspouts discharge on **[low-slope roofs] <Insert surface>**. Set in **[asphalt roofing cement] [elastomeric sealant]**.
        2. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

Retain first subparagraph below if scupper terminates at exterior wall. Retain both first and second subparagraphs below if scupper discharges into conductor head set immediately below base elevation of scupper. Retain third subparagraph below if scupper discharges directly into back of conductor head. See manufacturers' written instructions.

Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.

Loosely lock front edge of scupper with conductor head.

Seal or solder exterior wall scupper flanges into back of conductor head.

* + - * 1. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below **[scupper] [gutter]** discharge.
      1. REGLET AND COUNTERFLASHING INSTALLATION
         1. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
         2. Embedded Reglets: See **[Section 033000 "Cast-in-Place Concrete"] [and] [Section 042000 "Unit Masonry"]** for installation of reglets.
         3. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
         4. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.
      2. CLEANING AND PROTECTION

Retain paragraphs below that apply to roof specialties specified for Project. First paragraph below is not applicable to stainless steel or to painted or coated steel and aluminum.

* + - * 1. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
        2. Clean and neutralize flux materials. Clean off excess solder and sealants.
        3. 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.
        4. 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