

## SECTION 076200

### SHEET METAL FLASHING AND TRIM

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section Includes:

- 1. Custom Formed Products:

- a. Formed metal fascias, rakes, and beam claddings on Porte-cochere; copings on Exterior Vestibules.
    - b. Wall flashing and counter-flashings.
    - c. Built-in metal gutters and concealed downspouts.
    - d. Through-wall parapet scuppers.
    - e. Underlayment for rake copings and beam claddings.
    - f. Formed equipment support flashing not specified in either Division 07 Sections "Roof Accessories" or "Roof Specialties," or Division 15 sections or else referenced by mechanical drawings as architectural.
    - g. Formed overhead-piping safety pans.

- B. Related Sections:

- 1. Division 04 Section "Unit Masonry" for installation of through-wall flashings and for embedded flashing materials and installation.
    - 2. Division 06 Section "Miscellaneous Rough Carpentry" for preservative pressure-treated wood curbs, cants and wood nailers.
    - 3. Division 07 Sections "072726-A and B Fluid-Applied Vapor Permeable" and Vapor Retarding Air Barrier Membranes" for underlayments underlying sheet metal flashings.
    - 4. Division 07 Section "SBS Modified Bitumen Membranes Roofing" for installing sheet metal flashing and trim integral with membrane roofing.
    - 5. Division 07 Section "Metal Roof Panels" for sheet metal flashing and trim integral with metal roof panels.
    - 6. Division 07 Section "Roof Specialties" for manufactured roof edge flashings.
    - 7. Division 07 Section "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, roof penetration flashings and other manufactured roof accessory units.

8. Division 15 sections for equipment support flashing fabrications furnished with specified equipment.

### 1.3 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Fabricate and install roof edge flashings and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
  1. Wind Zone 1: For velocity pressures of 21 to 30 lbf/sq. ft. (1.00 to 1.44 kPa); 60-lbf/sq. ft. (2.87-kPa) perimeter uplift force; 90-lbf/sq. ft. (4.31-kPa) corner uplift force, and 30-lbf/sq. ft. (1.44-kPa) outward force.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing 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 sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C) material surfaces.

### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
  1. Identification of material, thickness, weight, and finish for each item and location in Project.
  2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
  3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  4. Details of termination points and assemblies, including fixed points.

5. Details of non-structured, thermal expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
  6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
  7. Details of special conditions.
  8. Details of connections to adjoining work.
  9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches (1:5).
- C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  2. Trim, Metal Closures, Non-Structural Thermal Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
  3. Accessories and Miscellaneous Materials: Full-size Sample.
- E. Qualification Data: For qualified fabricator.
- F. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.
- G. Warranty: Sample of special warranty.

## 1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

## 1.7 WARRANTY

- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel 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: fifteen (15) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
  - 2. Exposed Coil-Coated Finishes:
    - a. Two-Coat Fluoropolymer: AAMA 620. 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.
      - 1. Sheen: Low to Medium Gloss.
      - 2. Surface: Extra-smooth Matte.
      - 3. Color: As selected by Architect from manufacturer's standard pallette.

- b. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - 1. Exposed Coil-Coated Finishes:
    - a. Two-Coat Fluoropolymer: AAMA 620. 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.
      - 1. Sheen: Low to Medium Gloss.
      - 2. Surface: Extra-smooth Matte.
      - 3. Color: As selected by Architect from manufacturer's standard palette for various applications.
    - b. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- D. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.
  - 1. Finish: 2D (dull, cold rolled).
  - 2. Surface: Smooth, flat.

## 2.2 UNDERLAYMENT MATERIALS (BENEATH RAKE AND PARAPET COPINGS AND BEAM CLADDINGS)

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) 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.
  - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
  - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
  - 3. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
    - a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
    - b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.

- c. Henry Company; Blueskin PE200 HT.
- d. Metal-Fab Manufacturing, LLC; MetShield.
- e. Owens Corning; WeatherLock Metal High Temperature Underlayment.

### 2.3 EPDM MEMBRANE LINER (FOR GUTTER OF PORTE COCHERE)

- A. EPDM Rubber Sheet: ASTM D 6134, Type I, 60-mil- (1.5-mm-) thick flexible sheet, unreinforced, formed from EPDM.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Carlisle Coatings & Waterproofing Inc.; Sure-Seal EPDM.
- B. Auxiliary Materials:
  - 1. Bonding Adhesives: Adhesive for bonding EPDM to substrates and projections.
  - 2. Splicing Cement and Cleaner: Single-component butyl splicing cement and solvent-based splice cleaner.
  - 3. Lap Sealant: Single-component sealant.
  - 4. In-Seam Sealant: Single-component sealant.
  - 5. Other materials as recommended by EPDM membrane manufacturer.

### 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal[ or manufactured item] unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal[ or manufactured item].
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
  - 2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

- C. Solder:
  - 1. For Stainless-Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide, or silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

## 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
  - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 2. Obtain field measurements for accurate fit before shop fabrication.
  - 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual"[ and by FMG Loss Prevention Data Sheet 1-49] for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. [ Rivet joints where necessary for strength.]

## 2.6 ROOF EDGE SHEET METAL FABRICATIONS

- A. Interfacing Parapet Copings: Fabricate to profiles indicated, with soldered joints, complete with outside corner pieces and other special accessories as required. Fabricate in minimum 96 inch (2400 mm) long sections. Miter corners, seal, and solder or weld watertight. Fabricate joint plates of same thickness as cornices and copings unless otherwise indicated. Furnish with continuous cleats to support edges of external legs of cornices and copings and drill elongated holes for fasteners on interior leg of coping. Miter corners, seal, and solder or weld watertight.
  - 1. Fabricate from the following material:
    - a. PVDF-coated Galvanized Steel: 0.050 inches (1.3 mm) thick.
- B. Fascia, Rake Copings and Beam Claddings: Fabricate to cross sections shown, complete with corner and other transitions as required. Fabricate in minimum 96-inch-(2400-mm-) long sections. Fabricate control joints and accessories from same metal as cladding unless otherwise indicated.
  - 1. Fabricate from following material:
    - a. PVDF-coated Galvanized Steel: 0.050 inches (1.3 mm) thick.

## 2.7 WALL SHEET METAL FABRICATIONS

- A. Base Flashing: Fabricate from the following materials:
  - 1. Stainless Steel: 0.019 inch (0.48 mm) thick.
- B. Counterflashing: Fabricate from the following materials:
  - 1. Stainless Steel: 0.019 inch (0.48 mm) thick.
- C. Flashing Receivers: Fabricate from the following materials:
  - 1. Stainless Steel: 0.016 inch (0.40 mm) thick.

## 2.8 WALL SHEET METAL FLASHING ACCESSORIES

- A. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
  - 1. Stainless Steel: 0.019 inch (0.48 mm) thick; mill finish
  - 2. Corners: Factory mitered and continuously welded or mechanically clinched and sealed watertight.
  - 3. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
  - 4. 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.
  - 5. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Cheney Flashing Company.
    - b. Fry Reglet Corporation
    - c. Heckman Building Products, Inc.
    - d. Hickman, W. P. Company.
    - e. Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
    - f. Keystone Flashing Company, Inc.
    - g. National Sheet Metal Systems, Inc.
    - h. Sandell Manufacturing Company, Inc.

## 2.9 ROOF DRAINAGE SHEET METAL FABRICATIONS, DOWNSPOUT FABRICATIONS; GUTTER LINER ACCESSORIES

- A. Built-in Gutters: Fabricate to cross section indicated, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required.

Fabricate in minimum 96-inch- (2400-mm-) long sections. Fabricate to extend onto structural steel roof deck along rear side a minimum of 6 inches (16 cm) and to sheathed edge of light gauge steel cradle forming profile of built-in gutter.

1. Fabricate from the following materials:

a. Hot-dipped Galvanized Steel: 0.040 inch (1.0 mm) thick.

2. Accessories: Aluminum wire ball downspout strainer.

B. Concealed Downspouts: Fabricate downspouts and fittings of same Schedule 40 PVC DWV specified in Section 15050 for underground storm water drainage.

C. Gutter Liner Accessories: Fabricated spigot type fittings of EPDM membrane of size to suit sheet metal outlet tube and specified downspout piping.

## 2.10 TROUGH WALL PENETRATION SHEET METAL FLASHING FABRICATIONS

A. Fabricate through-wall scuppers of dimensions shown on drawings with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Fluoropolymer Coated and Uncoated Aluminum: 0.063 inch (1.6 mm) thick.

B. Fabricate of two pieces consisting of interlocking through-wall scupper liner and exterior closure flange based upon NRCA Detail BUR-24S "Mop- or Cold-applied Base Flashing at Through-wall Scupper" with exception that closure flange is of uniform dimension that surrounds scupper line protrusion on all four sides and scupper liner does not engage a conductor head.

1. Fabricate each piece with all joints soldered or welded. No lapped seams are to be visible.

2. Form perimeter edge of exterior closure flange with lip to receive sealant.

3. Bend interlocking bottom leading edges of exterior closure flange and scupper liner flange to form waterfall.

## 2.11 ROOF PENETRATION METAL FABRICATIONS

A. Equipment Support Flashings not specified in Division 15 Sections. Fabricate from the following materials:

1. Stainless Steel: 0.019 inch (0.48 mm) thick.

## 2.12 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Overhead-Piping Safety Pans: Fabricate from the following materials:

1. Galvanized Steel: 0.040 inch (1.02 mm) thick.

## 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.
  1. Verify compliance with requirements for installation tolerances of substrates.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  5. Install sealant tape where indicated.
  6. Torch cutting of sheet metal flashing and trim is not permitted.
  7. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
  1. Coat back side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of specified underlayment. Refer to paragraph 3.4 "Underlayment Installation."
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood working not less than 3/4 inch (19 mm) for wood screws and metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints as shown and as required for watertight construction.
  1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
- F. 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 (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
  1. Do not solder metallic-coated steel and aluminum sheet.
  2. 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.
  3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
- G. Rivets: Rivet joints in uncoated aluminum and where necessary for strength.

### 3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

- B. Roof Edge Flashings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.
1. Install self-adhering sheet underlayment coursing in accordance with paragraph 3.5 below.
  2. Interlock exterior bottom edges of rake and cornice copings with continuous cleats anchored to substrate at 16-inch (400-mm) centers.
  3. Anchor interior leg of coping with screw fasteners and washers at 24-inch (600-mm), 20-inch (500-mm) centers.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner by means of snap-in installation and sealant and sealant interlocking folded seam.
- D. Reglets: Install reglets with stainless steel fasteners through bed joints of new and masonry veneer construction. Use manufactured termination bars with foam strip backing where necessary to avoid deformation of reglet.
- E. Built-in Gutters: Join sections with riveted and soldered or lapped joints sealed with sealant. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.
1. Anchor back of gutter that extends onto roof deck and front edge that rests in cradle of created with light gauge steel work with fasteners not more than 24 inches (600 mm) apart.
- F. Downspouts: Install downspouts in accordance with piping installation protocol described in Division 05 Section "Plumbing" for Interior Drainage Systems.
1. Provide hangers with fasteners designed to hold downspouts securely to structure. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
  2. Connect downspouts to underground drainage system indicated.
- G. Through-wall Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
1. Anchor exterior closure flange to scupper liner by lock-seaming onto protruding edges of scupper liner.
  2. Seal perimeter of exterior closure flange to face of brick along edges formed to accept sealant with elastomeric sealant.

### 3.4 EPDM GUTTER INSTALLATION

- A. Install sheets to be fully adhered over entire gutter pan area to receive waterproofing according to manufacturer's written instructions and recommendations in ASTM D 5843.
- B. Apply bonding adhesive to substrates at required rate and allow to partially dry.
- C. Apply bonding adhesive to sheets and firmly adhere sheets to substrate. Do not apply bonding adhesive to splice area of sheet.
- D. Clean splice areas, apply splicing cement and in-seam sealant, and firmly roll side and end laps of overlapping sheets according to manufacturer's written instructions to produce a splice not less than 6 inches (150 mm) wide and to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet terminations.
- E. Spread adhesive bed over drain tube outlet flanges at ends of gutter and securely seal fabricated spigot type EPDM membrane fittings in place.

### 3.5 UNDERLAYMENT INSTALLATION (BENEATH RAKE COPINGS AND BEAM CLADDINGS)

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

### 3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. Overhead-Piping Safety Pans: Suspend pans independent from structure above as indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.
- B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

### 3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in SMACNA's "Architectural Sheet Metal Manual."

### 3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturers written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200