

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following sheet metal flashing and trim:**
1. Prefinished cap flashings not covered in other sections.
 2. Formed roof drainage system.
 3. Formed flashings and counterflashings.
 4. Formed wall flashing and trim.
 5. Overflow scuppers
 6. Pipe penetrations.
 7. Miscellaneous sheet metal accessories.
- B. Related Sections include:**
1. Section 04200 - Unit Masonry: Installing through-wall flashing, reglets, and other sheet metal flashing and trim.
 2. Section 06100 - Rough Carpentry: Treated Wood nailers, curbs, and blocking.
 3. Section 07272 - Vapor Permeable, Fluid-Applied Membrane Air Barriers: Weather-resistant barrier installed over sheathing.
 4. Section 07412 - Metal Wall Panels: Prefinished copings.
 5. Section 07550 - Modified Bitumen Roofing.
 6. Section 07920 - Joint Sealants : Field-applied sheet metal flashing and trim sealants.

1.2 PERFORMANCE REQUIREMENTS

- A. General:** Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Fabricate and install roof edge flashing and copings** to comply with applicable local building codes and the recommendations of FMG Loss Prevention Data Sheet 1-49.
- 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 ambient; 180 deg F material surfaces.
- D. Water Infiltration:** Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.3 SUBMITTALS

- A. **Product Data:** For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. **Shop Drawings:** Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identify 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 fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
 - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- C. **Samples for Initial Selection:** For each type of sheet metal flashing and trim indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories 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 long. Include fasteners, cleats, clips, closures, and other attachments.
 - 2. Trim: 12 inches long. Include fasteners and other exposed accessories.
 - 3. Accessories: Full-size Sample.

1.4 QUALITY ASSURANCE

- A. **Sheet Metal Flashing and Trim Standard:** Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. **Mockups:** Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof eave, gutter, copings, fascia, fascia trim, apron flashing, approximately 48 inches long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
- C. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. **Deliver sheet metal flashing materials** and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. **Unload, store, and install sheet metal flashing materials** and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. **Stack materials** on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.6 COORDINATION

- A. **Coordinate installation** of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **In other Part 2 articles** where titles below introduce lists, the following requirements apply to product selection:
 - 1. **Available Products:** Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. **Products:** Subject to compliance with requirements, provide one of the products specified.
 - 3. **Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
 - 4. **Manufacturers:** Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SHEET METALS

- A. **Aluminum Sheet:** ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:
 - 1. **High-Performance Organic Finish:** AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. **Fluoropolymer 2-Coat System:** Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.
 - b. **Color and Gloss:** Match Architect's sample.
- B. **Stainless-Steel Sheet:** ASTM A 240, Type 304.
 - 1. **Finish:** No. 2D (dull, cold rolled).
- C. **Prepainted, Metallic-Coated Steel Sheet:** Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 (Z275) coating designation; structural quality.
2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792, Class AZ50 coating designation, Grade 40 (Class AZM150 coating designation, Grade 275); structural quality.
3. Exposed Finishes: Apply the following coil coating:
 - a. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1) Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2605.
 - 2) Color: As selected by Architect from manufacturer's full range.

D. **Lead Sheet:** ASTM B 749, Type L51121, copper-bearing lead sheet.

2.3 UNDERLAYMENT MATERIALS

A. **Felts:** ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. **Slip Sheet:** Rosin-sized paper, minimum 3 lb/100 sq. ft.

2.4 FLEXIBLE SHEET MEMBRANE FLASHING

A. **Elastic Sheet Flashing/Membrane:** Nonreinforced flexible, black elastic sheet flashing of 50 to 65 mils thickness and complying with the following:

1. Shore A Hardness (ASTM D 2240): 50 to 70.
2. Tensile Strength (ASTM D 412): 1200 psi.
3. Tear Resistance (ASTM D 624, Die C): 20 lbs. per linear inch.
4. Ultimate elongation (ASTM D 412): 250 percent.
5. Low temperature brittleness (ASTM D 746): minus 30 deg. F.
6. Resistance to ozone aging (ASTM D 1149): no cracks for 10 percent elongated sample for 100 hours in 50 pphm ozone at 104 deg. F.
7. Resistance to Heat Aging (ASTM D 573): maximum hardness increase of 15 points, elongation reduction of 40 percent, and tensile strength reduction of 30 percent, for 70 hours at 212 deg. F.

B. **Acceptable Materials:**

1. Butyl synthetic rubber sheet.
2. EPDM synthetic rubber sheet.

2.5 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.

B. **Fasteners:** Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.

2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
 4. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. **Solder for Stainless Steel:** ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. **Solder for Lead:** ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
- E. **Burning Rod for Lead:** Same composition as lead sheet.
- F. **Sealing Tape:** Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- G. **Elastomeric Sealant:** ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- H. **Epoxy Seam Sealer:** Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- I. **Bituminous Coating:** Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- J. **Asphalt Roofing Cement:** ASTM D 4586, asbestos free, of consistency required for application.

2.6 MANUFACTURED SHEET METAL COPING

- A. **Manufacturer/Product:** MM Systems Corp. "Snap-Lok Coping," W. P. Hickman Co. "Permasnap Coping" or C. F. Cheney "Splice Lock Coping."
1. Similar systems of other manufacturers will be acceptable subject to compliance with specifications and approval by Architect.
- B. **Description:**
1. Anchor Plates: 20 ga. galvanized steel.
 2. Splice Plates: 0.063 inch formed aluminum, with double row of butyl type sealant.
 3. Coping Member: 0.063 inch formed aluminum, prefinished as specified.
 4. Neoprene Block: Resilient spacer, 6 inches long, proper height to support coping member at intermediate anchor plate midway between splices.
- C. **Corners and end caps** shall be factory-fabricated, mitered and welded.
- D. **Dimensions:** Refer to drawings for width of parapet wall, required face height, profile and other dimensions governing coping fabrication and installation.

2.7 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, metal, and other characteristics of item indicated. Shop-fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. **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.
- C. **Fabricate 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.
 - 1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. **Sealed Joints:** Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E. **Expansion Provisions:** Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
- F. **Conceal fasteners and expansion provisions** where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G. **Fabricate cleats and attachment devices** from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application but not less than thickness of metal being secured.

2.8 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. **Hanging Gutters:** Fabricate to cross-section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
 - 1. Gutter Style: A.
 - 2. Expansion Joints: Butt type.
 - 3. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen.
 - 4. Gutters with Girth up to 15 Inches: Fabricate from the following material:
 - a. Aluminum: 0.0320 inch thick.
- B. **Downspouts:** Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Manufactured Hanger Style: Fig. C (SMACNA)
 - 2. Fabricate downspouts from the following material:

- a. Aluminum: 0.024 inch thick.

C. Parapet Overflow Scuppers and Through-Wall Drain Scuppers: Fabricate scuppers of dimensions required 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 scupper.

1. Fabricate parapet scuppers from the following material:
 - a. Stainless Steel: 0.0187 inch thick.

2.9 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop) and Fascia Caps: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Furnish with 6-inch-wide joint cover plates.

1. Joint Style: Butt, with 12-inch-wide concealed backup plate.
2. Fabricate with scuppers spaced 10 feet apart, of dimensions required with 4-inch-wide flanges and base extending 4 inches beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
3. Fabricate scuppers from the following material:
 - a. Aluminum: 0.050 inch thick.

B. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.

1. Joint Style: Butt, with 12-inch-wide concealed backup plate.
2. Fabricate copings from the following material:
 - a. Aluminum: 0.050 inch thick.

C. Roof and Roof to Wall Transition Expansion-Joint Cover: Refer to Section 05810 - Expansion Joint Assemblies for expandable (bellows-type) flashings.

D. Base Flashing: Fabricate from the following material:

1. Stainless Steel: 0.0187 inch thick.

E. Counterflashing: Fabricate from the following material:

1. Stainless Steel: 0.0187 inch thick.

F. Flashing Receivers: Fabricate from the following material:

1. Stainless Steel: 0.0156 inch thick.

G. Roof-Penetration Flashing: Fabricate from the following material:

1. Lead: 4.0 lb/sq. ft., hard tempered.

H. Splash Pans: Fabricate from the following material:

1. Stainless Steel: 0.0187 inch thick.

I. Roof-Drain Flashing: Fabricate from the following material:

1. Lead: 4.0 lb/sq. ft., hard tempered.

2.10 WALL SHEET METAL FABRICATIONS

- A. **Through-Wall Flashing:** Refer to Section 04200 - Unit Masonry for asphalt-coated copper flashing.
- B. **Openings Flashing in Frame or Existing Construction:** Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high end dams. Fabricate from the following material:
 - 1. Stainless Steel: 0.0156 inch thick.
- C. **Wall Expansion-Joint Cover:** Refer to Section 05810 - Expansion Joint Assemblies for expandable (bellows-type) flashing.

2.11 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. **Equipment Support Flashing:** Fabricate from the following material:
 - 1. Stainless Steel: 0.0187 inch thick.
- B. **Overhead-Piping Safety Pans:** Fabricate from the following material:
 - 1. Galvanized Steel: 0.0396 inch thick.

2.12 FINISHES

- A. **Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products"** for recommendations for applying and designating finishes.
- B. **Protect mechanical and painted finishes** on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. **Appearance of Finished Work:** Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Examine substrates**, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 2. 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. Torch cutting of sheet metal flashing and trim is not permitted.

- 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 fabricator or manufacturers of dissimilar metals.
 - 1. Coat side of 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 felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C. **Install exposed sheet metal flashing and trim** without excessive oil canning, buckling, and tool marks.
- D. **Install sheet metal flashing and trim** true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.
- E. **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.
 - 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
- F. **Expansion Provisions:** Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
- G. **Fasteners:** Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
 - 1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
 - 2. Aluminum: Use aluminum or stainless-steel fasteners.
 - 3. Stainless Steel: Use stainless-steel fasteners.
- H. **Seal joints** with elastomeric sealant as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- I. **Soldered Joints:** Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.
 - 1. Do not solder prepainted, and aluminum sheet.
 - 2. Pretinning is not required for lead.

3. **Stainless-Steel Soldering:** Pre-tin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
4. Where surfaces to be soldered are lead coated, do not tin edges, but wire brush lead coating before soldering.
5. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

- J. **Aluminum Flashing:** Rivet or weld joints in uncoated aluminum where necessary for strength.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. **General:** Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. **Hanging Gutters:** Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Fasten gutter spacers to front and back of gutter.
 2. Loosely lock straps to front gutter bead and anchor to roof deck.
 3. Anchor and loosely lock back edge of gutter to continuous cleat.
 4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
 5. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.
 6. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.
- C. **Downspouts:** Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
1. Provide elbows at base of downspout to direct water away from building.
- D. **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 scupper closure trim flange to exterior wall and seal or solder to scupper.
- E. **Expansion-Joint Covers:** Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.
- F. **Splash Pans:** Install where downspouts discharge on low-sloped roofs. Set in asphalt roofing cement compatible with roofing membrane.

3.4 ROOF FLASHING INSTALLATION

- A. **General:** Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, 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.

- B. **Roof Edge Flashing:** 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. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 16-inch centers.
- C. **Copings:** 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. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 16-inch centers.
- D. **Pipe or Post Counterflashing:** Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- E. **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 over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.
 - 1. Secure in a waterproof manner by means of anchor and washer at 36-inch centers.
- F. **Roof-Penetration Flashing:** Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
 - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
 - 2. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.5 WALL FLASHING INSTALLATION

- A. **General:** Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. **Through-Wall Flashing:** Installation of manufactured through-wall flashing is specified in Division 4 Section "Unit Masonry Assemblies."
- C. **Reglets:** Installation of reglets is specified in Division 3 Section "Concrete, Formwork, and Reinforcing" and Division 4 Section "Unit Masonry."
- D. **Openings Flashing in Frame Construction:** Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. **Overhead-Piping Safety Pans:** Suspend pans from pipe and install drain line to plumbing waste or drain line.
- 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 CLEANING AND PROTECTION

- A. Clean and neutralize flux materials.** Clean off excess solder and sealants.
- B. Remove temporary protective coverings** and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- C. 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