CONSTRUCTION STANDARD SPECIFICATION

SECTION 07600

FLASHING AND SHEET METAL

PART 1 - GENERAL

PART 2 - PRODUCTS

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CONSTRUCTION STANDARD SPECIFICATION

SECTION 07600

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: This section includes furnishing and installing flashing and sheet metal as indicated on Contract documents and by provisions of this section.

B. Section Does Not Include:

1. Flashings which are integral with membrane roofing or waterproofing systems (base flashings).

2. Flashings which are integral with prefabricated roof accessories and equipment.

3. Wood blocking, nailers, edge strips, and battens.

C. Related Sections:

1. Section 04220, “Concrete Masonry Unit”

2. Section 07900, “Joint Sealants”

3. Section 15810, “Ductwork”

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

A526 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality

A527 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality

A755 Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products

A792 Specification for Steel Sheet, Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

B32 Specification for Solder Metal

B. Factory Mutual Systems (FM)

Loss Prevention Data Sheet 1-49 Perimeter Flashing

C. Federal Specification (FS)

TT-C-494 Coating Compound, Bituminous, Solvent Type, Acid Resistant

D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

Architectural Sheet Metal Manual

1.03 SUBMITTALS

A. General: Submit the following in accordance with conditions of Contract and Section 01300, "Descriptive Submittals."

B. Product Data: Submit manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.

C. Samples for Initial Selection Purposes: Submit manufacturer's color charts and texture variations for specified sheet materials to be exposed as finished surfaces.

D. Provide written certification that all materials used are asbestos-free and lead paint-free.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed flashing, sheet metal, and trim work similar in material, design, and extent to that indicated for project that have resulted in construction with a record of successful in-service performance.

B. Quality Standard: Fabricate and install sheet metal work in accordance with Sheet Metal and Air Conditioning Contractor's National Association, Inc. (SMACNA) "Architectural Sheet Metal Manual," unless specifically indicated otherwise.

C. Wind Resistance: Fabricate and install flashings at edges of roof in accordance with FM Loss Prevention Data Sheet 1-49 for specified wind zone. Ensure that substrate construction is also in compliance.

D. 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. Temperature Change Range: 120ºF (67º C), ambient; 180ºF (100º C) material surfaces. Water Filtration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Products made by the following manufacturers will be among those considered acceptable, however, it is the Contractor's responsibility to provide only products compatible with adjacent materials in the assembly.

ATAS Aluminum Corporation
Copper Sales, Inc.
Fry Reglet Corporation
Keystone Flashing Company
MM Systems Corporation
Petersen Aluminum Corporation
Integris Metals

2.02 MATERIALS

A. General: Unless otherwise indicated on Contract documents, provide Aluminum-Zinc Alloy-Coated Steel Sheet , as standard material with a fluoropolymer "Kynar 500" or "Hylar 5000" factory finish.

B. Galvanized Steel Sheet: ASTM A526, G90, commercial quality, or ASTM A527, G90, lock-forming quality, hot-dip galvanized steel sheet with 0.20 percent copper.

1. Finish: Mill phosphatized (paint-grip).

2. Color: Selected from manufacturer's standard color selection at time of submittals.

C. Aluminum-Zinc Alloy-Coated Steel Sheet : ASTM A792, Class AZ-50 coating, grade 40, or to suit project conditions, with 55 percent aluminum, not less than 0.0336 inch (0.85 mm) thick, unless otherwise indicated.

1. Finish

a. Mill finish.

b. Coil-Coated Fluoropolymer Factory Finish “Kynar 500” or “Hylar 5000.”

2. Color: Selected from manufacturer’s standard color selection at time of submittals.

3. Provide strippable plastic protective film on prepainted surfaces.

D. Prepainted, Coil-Coated Galvanized Steel Sheet: Zinc-coated, commercial quality steel sheet conforming to ASTM A755, G90 coating designation, coil-coated with high performance flouropolymer coating.

1. Finish: Coil-coated factory finish “Kynar 500” or “Hylar 5000.”

2. Color: Selected from manufacturer’s standard color selection at time of submittals.

3. Provide strippable plastic protective film on prepainted surfaces.

2.03 REGLETS

A. General: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated.

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

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

D. Concrete Type: 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.

E. Masonry Type: Provide with offset top flange for embedment in masonry mortar joints.

F. Counterflashing Wind-Restraint Clips: Provide hold down clips with 1/2 inch (12.7 mm) kickout to be installed before counterflashing to prevent wind uplift on the counterflashing lower edge. Fabricate the clips of the following materials:

Galvanized Steel: 22 gage; 0.0336 inch (0.8534 mm) thick.

2.04 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Solder: For use with steel, furnish lead-free solder complying with ASTM B32, with rosin flux.

B. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

C. Mastic Sealants: Polyisobutylene; Nonhardening, nonskinning, nondrying, nonmigrating sealant.

D. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed; Noncorrosive; Size and thickness required for performance.

E. Installation Accessories: Provide joint tape, adhesives, sealers, and fasteners as recommended by flashing manufacturer for indicated applications.

F. Bituminous Coating: Heavy bodied, sulfur-free, asphalt-based paint; FS TT-C-494.

2.05 FABRICATION, GENERAL

A. Sheet metal fabrication standard: Fabricate sheet metal flashing and trim to comply with recommendation of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Seams: Fabricate nonmoving seams in sheet metal flat-lock seams.

E. Sealed Joints: Form nonexpansion, but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

F. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within twenty four (24) inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flange, not less than one (1) inch (25 mm) deep filled with mastic sealant concealed within joints.

G. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by SMACNA or sheet metal manufacturer.

Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

J. Form a one-half inch (12.7 mm) hem on underside of exposed edges.

2.06 SHEET METAL FABRICATIONS

A. General: As a minimum, fabricate flashings using materials in the thickness listed for each flashing application.

B. Exposed Flashings-Low Slope Roofs or Waterproofing: Formed copings, gravel stops and scuppers:

1. Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

2. Aluminum-Zinc Alloy-Coated Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

3. Prepainted Coil-Coated Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

C. Semiconcealed Flashings-Low Slope Roofs or Waterproofing: Counter flashing, reglets, equipment support flashing, roof area joint and roof expansion joint covers and pipe/conduit penetration flashing:

1. Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

2. Aluminum-Zinc Alloy-Coated Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

3. Prepainted Coil-Coated Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

D. Miscellaneous Flashings

1. Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

2. Aluminum-Zinc Alloy-Coated Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

3. Prepainted Coil-Coated Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).

E. Gutters and Downspouts

1. Fabricate from same material and finish used for adjacent exposed flashings.

2. Form sheet metal to profile dimensions indicated, free from distortions and defects detrimental to water-tight system.

3. Provide expansion joints in gutters at spacing not to exceed 30 feet (9 m). Drain each section to allow water to drain that is otherwise trapped by expansion joint ridges.

4. Provide removable debris screens for gutters, fabricated from 1/4 inch (6.35 mm) mesh wire cloth of same material used for gutters or approved compatible material. Provide formed sheet metal frame on 4 sides of each screen unit. Length of screen units not to exceed 10 feet (3 m).

5. Provide wire basket type strainers at downspouts, fabricated from wire and sheet metal of same material used for downspouts or approved compatible material.

6. Provide sheet metal baffles 6 inches (152 mm) high with legs 18 inches (457 mm) long at gutter corners below roof valleys.

7. Provide Sandia National Laboratory's Standard Drawing No. AE5013STD for precast concrete splash blocks at downspout discharge.

8. Provide formed metal splash pans fabricated from same type of sheet metal used for downspouts. Locate where downspout discharges onto lower roof.

9. Gutter supports: Brackets spaced at 30 inches (762 mm) on center.

10. Downspout supports: 20 gage, (0.0396 inch) (1.006 mm) straps at each joint and at center of section.

11. Back-paint concealed metal surfaces with bituminous coating to a minimum of 15 mils (0.38 mm) dry film thickness.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

B. Isolate dissimilar metals by means of a heavy bituminous coating, approved paint coating, adhered polyethylene sheet, or other means approved by the Sandia Delegated Representative (SDR).

3.03 INSTALLATION

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; Conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Install exposed sheet metal work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of one and one-half (1-1/2) inches (38.1 mm), except where pretinned surface would show in finished work. Do not solder prepainted, coil-coated, galvanized steel sheets.

D. Sealed Joints: Form nonexpansion, but moveable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joints with sealant and form metal to completely conceal sealant.

1. Use joint adhesive for nonmoving joints specified not to be soldered.

2. Moving Joints: When ambient temperature is moderate (40 - 70 degrees F) (4 - 21 degrees C) at time of installation, set joined members for 50 percent movement either way. Adjust setting position of joined members proportionally for temperatures above 70 degrees F (21 degrees C). Do not install sealant at temperatures below 40 degrees F (4 degrees C). Refer to section on sealants, elsewhere in Division 7, for handling and installation requirements for joint sealers.

E. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of two (2) inches (51 mm) and bed with sealant.

F. Install continuous gutter screens on gutters with noncorrosive fasteners, arranged as hinged units to swing open for cleaning gutters.

G. Roof Edge Flashings: Secure metal flashings at roof edges to comply with FM Loss Prevention Data Sheet 1-49 for Zone 2 wind exposure.

H. Surface-Mounted Reglets: Attach reglets securely to substrate, at locations indicated. Install elastomeric sealant at top edge.

3.04 CLEANING AND PROTECTION

A. Remove protective film from prefinished sheet metal immediately after installation.

B. Repair or replace work which is damaged or defective, as directed by SDR.

Refinish marred and abraded areas of prefinished sheet using finish manufacturer’s recommended methods and materials. Replace units which cannot satisfactorily be refinished in place.

C. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

D. Provide final protection and maintain conditions that ensure sheet metal flashing and trim work during construction is without damage or deterioration other than by natural weathering.

END OF SECTION