**SECTION 07 60 00 - 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 other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide all labor, equipment, and materials fabricate and install the following.
   1. Pre-manufactured metal edge, extenders and trim.
   2. Surface mounted wall counterflashings over bituminous base flashing.
   3. Metal flashings.
   4. Counterflashings over bituminous base flashing.
   5. Counterflashings at roof mounted equipment and vent stacks.
   6. Counterflashings for roof accessories.
   7. Counterflashings at walls and penetrations.
   8. Lead flashing for bituminous membranes.
   9. Other components.

B. Related Sections: The following Sections contain requirements that relate to the Section:
   1. All Provided Sections

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.
   1. Include plans, elevations, sections, and attachment details.
   2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
   3. Include identification of material, thickness, weight, and finish for each item and location in Project.
   4. Include details for forming, including profiles, shapes, seams, and dimensions.
   5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   6. Include details of termination points and assemblies.
   7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
   8. Include details of roof-penetration flashing.
   9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   10. Include details of special conditions.
   11. Include details of connections to adjoining work.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.
   1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.

ADDENDUM NO. 1

2. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.4 QUALITY ASSURANCE

A. Reference Standards
   1. Comply with details and recommendations of SMACNA Manual for workmanship methods of joining, anchorage, provisions for expansion, etc.

B. If required, fabricator/installer shall submit work experience and evidence of adequate financial Responsibility. The owner's representative reserves the right to inspect fabrication facilities in determining qualifications.

C. Successful contractor must obtain all components of roof system from a single manufacturer including any roll good materials if required. Any secondary products that are required, which cannot be supplied by the specified manufacturer, must be recommended and approved in writing by primary manufacturer prior to bid submittal.

D. Manufacturer shall have in place a documented, standardized method for maintaining quality control such as ISO-9001 approval.

E. The roof material manufacturer shall conduct daily inspections.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials which may cause discoloration or staining.

1.6 JOB CONDITIONS

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal roofing system.

B. Protection:
   1. Provide protection or avoid traffic on completed roof surfaces.
   2. Do not overload roof with stored materials.
   3. Support no roof-mounted equipment directly on the roofing system.

C. Ascertain that work of other trades which penetrates the roof or is to be made watertight by the roof, is in place and approved prior to installation of roofing.

1.7 WARRANTY / GUARANTEE

A. Material Manufacturer's Warranty
   1. Alternate: Warranty shall also include the modified bitumen roof system and pre-manufactured metal edge system and shall be a single-source Edge-to-Edge warranty provided by ONE manufacturer. Warranty will include the roof systems, pre-manufactured metal edge, and the transition between all systems.

B. Contractor's Warranty
   1. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period

ADDENDUM NO. 1

of three (3) years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Metal systems (metal coping cap system, pre-manufactured metal edge system, slip flashings, etc.), are to be comprised of 22-gauge steel, coated on both sides with an epoxy primer and on the weathering surface with a polyvinylidene fluoride (Kynar) coated finish.

B. Edge Metal reference Section 07 52 00.

C. Equipment counter flashings and slip flashings shall be 22-gauge.

D. Pitch pockets shall be either 22-gauge stainless steel or 20 oz. copper, and have all corners welded or soldiered, and a continuous deck flange at corners.

E. Flat Stock = .22 gauge

F. Miscellaneous Metals and Flashings:
1. Surface Mounted Counter Flashings: matching color, 22-gauge.
2. Copper Slip Counterflashings: ASTM B370, temper HOO (cold-rolled), 20 oz. copper
3. Equipment Slip Flashing: Matching Color, 22-gauge thick.
4. Equipment Support Flashing: Matching Color, 22-gauge thick.
5. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a non-corrosive rosin flux over tinned surfaces.
6. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
7. 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. Exposed fasteners shall have a neoprene or other suitable weatherproofing washer.
8. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.
9. Mastic Sealant: Polyisobutylene; nonhardening, non-skinning, nondrying, nonmigrating sealant.
10. Sealing Tape: Pressure sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape.
11. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
12. 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.
13. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.
14. Zinc-Coated Steel Sheet: ASTM A526, 0.20% copper, 26 gage (0.0179"); designation G90 hot-dip galvanized, mill phosphatized.
15. Stainless Steel Sheet: Type 302/304, ASTM A167, 24-gauge, annealed except dead soft where fully concealed by other work, 2D (dull) finish.
16. Copper Sheet: ASTM B370, 20 oz., temper HOO (cold-rolled).
17. Lead-Coated Copper Sheet: ASTM B101. Type I, Class A (12-15 1 lb. of lead coating per 100 sq. ft.), 17.1 oz. (0.022").
18. Zinc Alloy Sheet: Zinc with 0.6% copper and 0.14% titanium; 0.27" thick (21 gauge); standard (soft) temper, mil finish.

ADDENDUM NO. 1

2.2 RELATED MATERIALS

A. Metal Primer: Zinc chromate type.

B. Plastic Cement: ASTM D 4586

C. Sealant: As required by material manufacturer.

D. Lead: Meets Federal Specification QQ-L-201, Grade B, four pounds per square foot.

E. Solder: ANSI/ASTM B32; 95/05 type.

F. Flux: FS O-F-506.

G. Underlayment: Ply of specified base flashing modified membrane or approved equal.

H. Fasteners:
1. Nails and Fasteners: Non-ferrous metal or hot dipped galvanized fasteners complying with ASTM A153 and connectors complying with ASTM A653, Class G185; Type 304 or Type 316 stainless steel fasteners and connectors shall be used with new generation of pressure-treated wood; except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the wood blocking/nailer material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.
2. Fastening shall conform to ANSI/SPRI ES-1 and/or Factory Mutual 1-90 requirements or as stated on section details, whichever is more stringent and per the manufacturer's requirements.

I. Metal Termination Bars:
1. Shall be heavy flat bar aluminum unless otherwise recommended by membrane manufacturers.
2. Material shall be .125" x 1" (minimum) aluminum conforming to ASTM B-221, mill finish. Bars shall have holes for fasteners at 6" o.c. maximum.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Examine substrates, areas, and conditions with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
2. Verify that air or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PROTECTION

A. Isolate contact areas of dissimilar metals with heavy asphalt or other approved coating, specifically made to stop electrolytic action.

ADDENDUM NO. 1

3.3 INSTALLATION GENERAL

A. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction.

B. Fastening of metal to walls and wood blocking shall comply with ANSI-SPRI ES-1, SMACNA Architectural Sheet Metal Manual, Factory Mutual 1-100 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.

C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.

3.4 INSPECTION

A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.

B. Verify membrane termination and base flashings are in place, sealed, and secure.

C. Beginning of installation means acceptance of existing conditions.

D. Field measure site conditions prior to fabricating work.

3.4 SHOP FABRICATED SHEET METAL

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.

B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

C. Hem exposed edges.

D. Angle bottom edges of exposed vertical surfaces to form drip.

E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.

F. Install sheet metal to comply with ANSI/SPRI, SMACNA and NRCA standards, and per the manufacturer’s instructions.

3.5 INSTALLATION

A. ROOF DRAIN
1. Prime lead at a rate of 100 square feet per gallon and allow to dry.
2. Set lead flashing (30" square minimum) in a 1/4" bed of mastic.
3. Install specified roof flashing system.
4. Install metal clamping ring and strainer. Stop all plies short of the clamping ring and seal edge with a three course application of the specified liquid applied flashing system and reinforcing mesh.

B. PLUMBING STACK
1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.
2. Install properly sized sleeves in a 1/4" bed of roof cement.
3. Turn sleeve a minimum of 1" down inside of stack or lead caps on pipes 2” or less in diameter.
4. Caulk intersection of the membrane and flange with asphalt roof cement.

ADDENDUM NO. 1

C. EQUIPMENT SUPPORTS/EXHAUST VENTS
1. Mill finished aluminum counterflashing and/or slip flashing extender shall be provided with watertight accessories such as miters, transitions, end caps, etc. and finished to match.
2. Accessories: Joint covers, corners, fasteners, strip flashing at joinings, fastening, and other accessories shall be included.
3. On small units, install an 0.040 mill finished aluminum extender will be installed under the existing counterflashing or curb lip to cover the newly installed roof flashing system by at least 4 inches. The new extender will be secured with fasteners and neoprene washers every 8 inches on center.

D. PITCH POCKET
1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.
2. Install properly sized and prefabricated stainless steel or copper pitch pockets with welded watertight joints in a 1/4" bed of roof mastic.
3. Install specified two-ply roof flashing system.
4. Caulk intersection of the flashing membrane and flange with asphalt roof cement.
5. In accordance with project the details, fill pitch pocket with non-shrink grout and pourable sealer.

E. CURB DETAIL/AIR HANDLING STATION
1. Mill finish aluminum slip flashing extender shall be provided with watertight accessories such as miters, transitions, end caps, etc. and finished to match.
1. Accessories: Joint covers, corners, fasteners, strip flashing at joinings, fastening, and other accessories shall be included.
2. Over the termination bar, and 0.040 mill finished aluminum extender will be installed under the existing counterflashing or curb lip to cover the newly installed roof flashing system by at least 4 inches. New counterflashing will be secured with fasteners and neoprene washers every 8 inches on center.

**END OF SECTION 07 62 00**

ADDENDUM NO. 1