

SECTION 07 60 00

SHEET METAL FLASHINGS

PART 1 - GENERAL**1.1 SCOPE OF STANDARD**

- A. This standard provides general guidance concerning the specific preferences of Texas State University for Standing Sheet Metal Roofing.
- B. Texas State University recognizes that project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification, it is expected that these guidelines will govern the design and specifications for Texas State University projects.
- C. Roof systems shall be designed by, and with plans and specifications sealed by, a Licensed Architect or Engineer in accordance with ASCE 7, the International Building Code, and the International Plumbing Code.
- D. Roof edge assemblies and attachment shall be provided in compliance with the most recent edition or version of the SPRI/ANSI ES-1 Standard.
- E. Scope of Work - The scope of Work covered under this Section is as follows:
 - 1. Water Conveyance Sheet Metal
 - 2. Water Shedding Sheet Metal
 - 3. Imbedded Sheet Metal

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Rough Carpentry
- B. Roof Deck
- C. Roof Insulation
- D. Modified Bitumen Roofing
- E. Roof Specialty and Accessory Items
- F. Lightning Protection
- G. Metal Roofing

1.3 PROJECT / SITE CONDITIONS

- A. Dimensions Approximate - Dimensions as contained in these Specifications or as scaled from Detail Drawings shall be presumed to be approximate. In the event that site conditions uncovered during the Work require modification to, or alteration of those specifications, the Contractor shall make adjustments as required to comply with that intent.
- B. Coordination with Other Trades - The Work of this Section shall be coordinated with and properly integrated into related Work covered by other Sections.

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1.4 CONTRACTOR REQUIREMENTS

- A. The roofing contractor shall be experienced in commercial, institutional, and industrial metal roofing systems with a minimum of five (5) years experience and who is certified by the metal roofing system manufacturer as qualified to install the manufacturer's systems.
- B. Contractor must be certified by manufacturer specified as supplier of structural standing seam system and obtain written certification from manufacturer that installer is approved for installation of specified system. If requested, contractor must supply owner with a copy of this certification.
- C. The Contractor shall have demonstrated its proficiency by having a satisfactory record of performance in the following areas:
 - 1. On-time completion of previous work of a similar size and scope.
 - 2. No history of litigation, claims, or lawsuits relating to past or ongoing performance that may affect current performance.
 - 3. Proven safety record as demonstrated by company documentation and workers compensation insurance Experience Modifier.
 - 4. Positive record of post-completion warranty service to clients.
- D. The roofing contractor shall maintain a full-time, non-working, non-changing, English-speaking Supervisor/Foreman on the job site during all phases of roofing and sheet metal work and at any time roofing work is in progress. A copy of the construction documents shall be in the possession of the Supervisor/Foremen and on the roof at all times.

1.5 SUBMITTALS

- A. Submittals shall be provided in accordance with the General Conditions of the Contract. Provide a submittal cover sheet identifying the project by name and number and listing the following columns for review by the design professional with a separate sheet for each roof section.
 - 1. Specification section
 - 2. Description of brand and product
 - 3. "Accepted"
 - 4. "Rejected"
 - 5. "Resubmit"
 - 6. "Comments"
- B. Provide a place for the design professional's signature.
- C. Submit Samples - Prior to mass fabrication, submit to the Architect/Engineer physical samples of each of the following:
 - 1. All fasteners to anchor metal work

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2. Color sample for prefinished metal

D. Product Data Sheets - Submit product data sheets on all the following items:

1. Prefinished metal
2. Elastomeric flashing cement
3. Sealant tape
4. Elastomeric sealant
5. Sealant primer
6. Backer rod
7. Paint
8. Paint primer.

E. Submit Proposed Changes - If Contractor proposes changes to flashing assemblies, he shall submit detailed shop drawings as necessary to illustrate the changes, and shall obtain Architect/Engineer's written approval prior to fabrication.

1.6 QUALITY ASSURANCE

A. Skilled Workmen - All sheet metal work shall be fabricated and installed by fully trained, qualified sheet metal mechanics properly skilled to perform the Work in accordance with the standards set forth in these Specifications. Substandard Work will be rejected.

B. Accepted Flashing Details - In the event field conditions make installation of a flashing detail in accordance with SMACNA or NRCA Details impractical, the Contractor shall submit a shop drawing design to the Owner for approval to fit the particular conditions present.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Storage Compliance - Deliver, store, and handle all sheet metal work in accordance with the provisions of the General Conditions of the contract.

B. Fabricator's responsibility:

1. Deliver products to the site with seals and labels intact in manufacturer's original containers, dry and undamaged.
2. Protect components during fabrication and packing from mechanical abuse, stains, discoloration, and corrosion.
3. Provide protective interleaving between contact areas of exposed surfaces to prevent abrasion during shipment, storage, and handling.

C. Installer's responsibility:

1. Store materials off ground providing for drainage; under cover providing for air circulation; and protected from wind movement, foreign material contamination, mechanical damage, cement, lime or other corrosive substances.
2. Handle materials to prevent damage to surfaces, edges and ends of roofing sheets and sheet metal items. Damaged material shall be rejected and removed from the site.
3. Protect materials from wind-related damages.

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4. Inspect materials upon delivery. Reject and remove physically damaged or marred material from project site.

1.8 PRODUCTS WARRANTIES

- A. Sheet metal flashings shall be included in the Manufacturer's 20 Year No Dollar Limit Total System Warranty without exclusions.

PART 2 -**2.1 SHEET METAL**

- A. It is the intent of this section that all exposed sheet metal shall be made of 20 oz. copper unless specifically specified or noted otherwise.
- B. The following materials may be used in appropriate locations as detailed:
 1. Copper Sheet Metal - Flashing material shall be 20 oz. per square foot copper, H01 or H02 temper, smooth as per ASTM B370-92.
 2. Galvalume Sheet Metal - 24 Ga. Galvalume coated steel, (aluminum-zinc alloy coated steel) sheet coated on both sides with a layer of aluminum-zinc alloy by continuously hot dip method (approximately 55% aluminum, 45% zinc). Triple spot minimum 0.55 oz. per square foot as determined by ASTM A-792.
 3. Galvanized Sheet Metal - 22 Gauge with G-90 Coating, unless otherwise shown in Detail Drawings shall be used for all cleats and continuous wind clips in accordance with Factory Mutual requirements.
 4. Galvanized Sheet Metal - 24 Gauge with G-90 Coating, unless otherwise shown in Detail Drawings shall be used for all metal flashings and at equipment curbs unless otherwise specified to be prefinished or a different gauge. All materials to be soldered shall be 24 Ga., G-90 G.I.
 5. Prefinished Sheet Metal - 24 Gauge with G-90 galvanized coating and Kynar 500 finish in the color of the Owner's choosing for exposed details where color matching is desirable. Unless otherwise specified, the color selected will be a standard manufacturer's color.
 6. Prefinished Galvalume Sheet Metal - 24 ga. Galvalume coated steel, (aluminum-zinc alloy coated steel) sheet coated on both sides with a layer of aluminum-zinc alloy by continuously hot dip method (approximately 55% aluminum, 45% zinc). Triple spot minimum 0.55 oz. Per square foot as determined by ASTM A-792 and Kynar 500 finish.
 7. Stainless Steel Sheet Metal: ASTM A 240/A 240M, Type 304; No. 2B finish; 24 gauge.

2.2 RELATED MATERIALS – SOLDERING

- A. Solder - 50% Tin, 50% lead - (ASTM D 32), for galvanized sheet metal, and ASTM Specification B-32, composition 50% tin and 50% lead for copper sheet metal.
- B. Flux - Rosin, Muriatic acid filled with zinc or non-acid type paste.

2.3 RELATED MATERIALS – FASTENERS

- A. Fastener Compatibility – Fasteners shall be made of a material compatible with the underlying sheet metal to be fastened.

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- B. Copper Nails – Nails for wood and concrete shall be flathead, barbed nails, not less than No. 12 gauge, 1” LONG AND MADE OF EITHER COPPER OR BRASS. Expansion shields shall be lead sleeves. Copper or brass fasteners shall be used wherever copper flashings are used.
- C. Copper Screws – Screws shall be of hard copper or brass and shall have round heads. A lead washer shall be placed between the copper and screw head. Expansion shields used with copper flashings shall have lead sleeves.
- D. Roofing Nails - Minimum 1-1/2", hot-dipped galvanized, ring shank, with minimum 3/8" head - for nailing concealed cleats to wood substrates, and sheet metal flanges built into membrane.
- E. Flashing Nails - Flashing nails shall be of sufficient length to penetrate a minimum of 1" into receiving member, *hot dipped galvanized*, ring shank, with minimum 15/16" head, as manufactured by Simplex Nail Company, Americus, GA, for top-nailing plies, base flashings, and membrane flashing at "L" nailers and curbs.
- F. Hex-Head Wood Screws - 1-1/2", stainless steel, prefinished using coating to match the color and finish of the sheet metal to which it is attached, with neoprene washers, to fasten square-to-round counter flashings at curbed penetrations, new expansion joint covers, and copings.
- G. Pop Rivets - Pop rivets shall be #44 stainless steel with stainless steel shafts. Pop rivets shall be prefinished using coating to match the color and finish of the sheet metal to which it is attached.
- H. Sheet Metal Screws - All exposed screws used in sheet metal applications shall be stainless steel and be prefinished using coating to match the color and finish of the sheet metal to which it is attached.

2.4 RELATED MATERIALS - BITUMINOUS

- A. Paint Primer - (ASTM D 41) - for priming metal flanges
- B. Secondary Waterproofing Membrane
 1. Grace Ultra membrane as made by W.R. Grace.
 2. GAF StormGuard Film Surfaced Leak Barrier as made by GAF Materials Corporation.
- C. Flashing Cement - Asphalt Built-Up Roofs - Industrial roof flashing cement, as manufactured by Johns Manville Corp., to embed all flanges of metal flashings in all areas; to embed backer plate/cover plate assemblies in gravel guard; and to provide seal as shown in Detail Drawings.
- D. Flashing Cement - Modified Bitumen Roofs - MBR Utility Cement as made by Johns Manville Corporation, or approved equal.

2.5 RELATED MATERIALS - NON BITUMINOUS

- A. Manufactured Expansion Joint Covers - Factory manufactured EJ covers shall not be used in lieu of shop fabricated 20 Oz. Copper or 24 Ga. sheet metal covers unless specifically detailed.
- B. Elastomeric Sealant - one part polyurethane Sonolastic 150 with VLM, as manufactured by Sonneborn shall be used at all flashings including, but not limited to, hips, ridges, vents, collars, counterflashing, and lap joints.

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- C. Elastomeric Sealant Primer - Prime all surfaces to receive elastomeric sealant using compatible material approved by the manufacturer of the sealant such as Sonneborn Primer No. 733, or approved equal.
- D. Sealant Tape - polyisobutylene butyl elastic tape, such as Tremco 440 tape, minimum thickness of 1/8" with a 3/4" minimum width, unless otherwise instructed for use between metal connections, behind flashing termination bars, lap joints in metal flashings, and at coping seams.
- E. Paint Primer - Pittsburgh Paint Galvanized Primer No. 6-209 or approved equal for priming all metal surfaces to be field painted. Color to be chosen by the Owner.
- F. Paint - Pittsburgh Paint Industrial Metal Enamel No. 54-352 or approved equal for field painting of exposed visible face of all metal flashings constructed of paint grip metal. Color to be selected by Owner.
- G. Instant Cold Galvanize Compound - Aerosol spray instant cold galvanizing compound as manufactured by LPS Inc., or approved equal.
- H. Through-Wall Flashing - Cop-R-Tex Plus Lead 5 Oz. per sq. ft.. The material shall have a creped kraft paper reinforced with fiberglass adhered to one side of the bimetallic sheet.
- I. Cast Iron Downspout Boots - Cast Iron Downspout Boots as manufactured by McKinley Iron Works, Inc. 901 Throckmorton, Fort Worth, TX 76106, (817) 429-0791, or approved equal. Rectangular boots, Types DS1, DS2, DS4, or DS8, whichever are shown, shall be provided. Aluminum downspout boots are not acceptable with G.I. sheet metal. Prime and paint cast iron downspouts boots color selected by Owner.

PART 3 - EXECUTION**3.1 GENERAL**

- A. Precision Fabrication - Fabricate all flashings to exact, uniform, and consistent dimensions and ensure that same are properly fitted and well seated, particularly backer plates and cover plates.
- B. Mock-ups – Construct an in-place mockup of each sheet metal flashing detail and receive the Architect's approval in writing before proceeding with installation of additional sections or components. Sheet metal installed without a mock-up or the Architect's prior approval may be required to be removed at the Architect's request.
- C. Minimize Joints - Install all continuous flashings of the longest practical length.
- D. Terminations and Intersections - Where flashings terminate or intersect, utilize and comply with methods and procedures as outlined in the latest edition of the "Architectural Sheet Metal Manual" as distributed by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), the NRCA Roofing and Waterproofing Manual, latest edition, or "The Copper/Brass/Bronze Design Handbook" published by the Copper Development Association, Inc. Construct terminations and intersections as separate, fixed components independent from intersecting, continuous flashings in such a manner as to absorb thermal movement of adjacent components without stress on mitered joints of terminations and intersections. Each corner leg shall be approximately 18" long on each leg.

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- E. Conflict Resolution and Authority - In the event any metal flashing component of any flashing is not specifically covered by the Specifications, or Drawings, each shall comply with the theory and intent of "NRCA Construction Details" and those of the "Architectural Sheet Metal Manual", Fifth Edition, 1989, as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
- F. No Dissimilar Metals - In no case, shall dissimilar metals come into contact with each other, nor shall a flashing be constructed in such a way as to permit water from running off one type metal onto another where chemical reaction or corrosion may occur.
- G. Treated Lumber - Sheet metal components, other than nails or screws, shall not come into direct contact with treated lumber. Wherever treated lumber is used, a bituminous barrier such as Ice and Water Shield, or a #30 asphalt saturated roofing felt shall be used as a permanent separator.
- H. Use of Sealants - Sealants shall be used to provide secondary moisture protection, not primary. Wherever elastomeric sealant is used, it shall be applied beneath the component to be sealed, and both surfaces shall be primed with the primer recommended by the manufacturer. Failure to prime the surfaces of components to be sealed will be considered grounds for removal. Sealant shall match the color of the material to which it is being applied. Non-matching color sealant shall be completely removed, the substrate material cleaned, and new matching sealant applied. Where the sealant cannot be removed or the surface cleaned, the substrate material, or sheet metal shall be removed and replaced with clean material.

3.2 WOOD BLOCKING AND NAILERS

- A. Materials and installation of wood blocking and nailers are specified elsewhere. Contractor providing Work under this Section shall, however, comply with the following procedures.
- B. Securement - All wood blocking and nailers of any type intended to receive sheet metal attachment are to be securely anchored to the building in accordance with FM 1-90 requirements or the Texas Windstorm Act, whichever is the prevailing authority for the geographical area. The Contractor shall notify the Architect/Engineer of any securement deficiency prior to installation of any metal components. Any metal attached to improperly secured wood blocking or nailers shall be removed at the Contractor's expense and reinstalled after the securement has been corrected.
- C. Level and Continuous Nailers - The Contractor is cautioned to ensure that during the installation of all wood blocking a continuously level and smooth elevation is provided to insure a simplicity of installation.
- D. Copings and Parapet Caps - All copings and metal parapet wall caps shall be installed over tapered or beveled wood blocking securely anchored to the structure. The slope or bevel shall be installed in a manner to drain the water to the roof side of the building, not the outside face.
- E. Flange Supports - All metal flanges in imbedded metal details shall bear over wood nailers, not roof insulation, and shall be fully supported by such wood nailers with no gaps.
- F. Expansion Joint Curbs - Expansion joint curbs shall be sloped to drain.

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3.3 SOLDERING

- A. Solder Using Irons - All soldering is to be done using soldering irons heated conventionally in a pot. The use of propane or other types of torches will not be permitted.
- B. Corners and Intersections - Solder only those fixed components such as corners, intersections, terminations, skirts, collars, and covers. Do not solder joints between adjacent 10' lengths of flashings.
- C. Cleaning Joints - When forming soldered joints, apply flux to surface and lift overlapping sheet to apply between sheets to minimum 1/2" depth. Thoroughly sweat joint drawing solder between sheets to minimum 1/2" depth and apply uniform surface without excess build-up.
- D. No Exposed Nails - Do not nail metal components in place and solder over nail heads. If necessary to join components prior to soldering, use only stainless steel pop rivets. Cut, notch, miter, and provide tabs as necessary to properly join and interlock individual components for soldering.
- E. Surface Treatment - Immediately neutralize all flux from surfaces after soldering, using cloth saturated with 10% solution of washing soda and water, and wipe again using separate cloth and water. Upon completion of pop riveting and soldering spray soldered joint and pop rivet heads with "Instant Cold Galvanizing Compound" to prevent rusting.

3.4 WATER CONVEYANCE SHEET METAL

- A. Gutters and Downspouts
 1. Gutters shall be fabricated from prefinished 20 Oz. Copper. Downspouts shall be made of the same material, except interior downspouts, which shall be PVC, or cast iron as may be required by local codes or specified differently elsewhere.
 2. All detailing shall be in accordance with SMACNA unless otherwise indicated in the Contract Documents to the contrary.
 3. Gutters shall be formed in such a manner as to provide positive slope to downspouts. Standing water in gutters is not acceptable.
 4. Support spacers shall be 1/8" thick brass or copper and attached with stainless steel screws, not pop rivets.
 5. Gutter support brackets consisting of 1/8" brass or copper. shall be installed every 3'- 0" in accordance with Factory Mutual 1-90 requirements. Support brackets shall be covered with prefinished metal of a matching color to the gutter to provided continuity of appearance. Field painting is not acceptable.
 6. Downspouts shall be supported with a minimum of two straps per downspout regardless of length and shall have additional straps as required by SMACNA for greater lengths. Straps shall be in the same finish as the downspout and shall be fastened behind the downspout to conceal the flanges.
 7. Gutters shall have expansion joints at a maximum spacing of 50' O.C. or as specified by SMACNA, whichever is the more stringent.
 8. Unless otherwise detailed on the Drawings, the maximum downspout spacing permitted is 30' O.C.
 9. Gutters shall be formed and joined in such a manner as not to leak at the joints. Leaking gutter joints are a defect and will not be accepted.
 10. Downspouts shall not be located at or near corners which require water to turn a corner to drain.

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- B. Scuppers - All scuppers, either through-wall or spill-out, shall be constructed of 20 Oz. Copper, unless otherwise detailed.
 - 1. Scuppers shall have a minimum 1” drip edge turned down 45° on the outside with a 1/2” hem.
 - 2. All scuppers shall have an escutcheon plate on the outside attached to the exterior wall with concealed fasteners. The escutcheon shall fully cover the rough opening and be sealed with an approved elastomeric sealant to prevent moisture entry.
 - 3. All scuppers shall be fully supported by wood blocking extending to the deck and a minimum of 1” beyond the scupper flange in all directions.
- C. Conductor Heads - Where shown, conductor heads shall be fabricated in accordance with SMACNA procedures.
 - 1. Conductor heads shall be securely attached to the structure without permitting leakage around the conductor head.
 - 2. Conductor heads shall either be installed a minimum of 1” below the level of the scupper or shall have overflow scallops in accordance with SMACNA details.
- D. Downspout Boots
 - 1. All downspouts extending to the ground shall have cast iron downspout boots or heavy gauge protective covers as detailed.

3.5 WATER SHEDDING SHEET METAL

- A. Copings And Cap Flashings
 - 1. Secondary waterproofing consisting of a self-adhering modified bitumen membrane shall be installed over the wood blocking and extending down to 1” below the bottom of the nailer and over the top of the base flashing material or other wall moisture protection a minimum of 1”.
 - 2. A continuous metal clip shall be attached to the outside of the nailer made one full gauge heavier than the metal coping itself. The clip shall extend 1 1/2” below the wood blocking and shall be nailed at 6” O.C.
 - 3. The metal cap shall be fabricated and installed precisely and large enough not to cause a curving, bowing and “bellying” on the top. Coping that is not flat on top when a straight edge is laid across the top may be considered grounds for rejection.
 - 4. Joints shall be secured by means of a single lock, button punched standing seam. Cover plates are not acceptable.
 - 5. Coping terminating into a higher wall shall be turned up the wall 6”, have a complete through-wall flashing above with a two-piece receiver/counterflashing imbedded in the wall.
 - 6. The coping shall be secured on the outside by means of crimping the outside flange tightly over the continuous clip and on the reverse side with screws through a slotted hole with neoprene washers at 24 “ O.C.
 - 7. Where fascias are required with face width or height greater than 7-1/2 inches, such fascia shall be fabricated and installed in multiple pieces of equal face width. That is to say that if a fascia height of 10 inches is required, such fascia shall be fabricated with two 5 inch faces rather than a 7 inch and 3 inch face. Each fascia piece shall have a continuous cleat. The contractor shall discuss with the Architect in advance of construction whether the Architect wishes the fascia pieces to be aligned or staggered.
- B. Expansion Joints

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1. Factory-Made Components - All terminations, tees, crossovers, and other necessary assemblies shall be as manufactured for that purpose, and installed in accordance with the manufacturer's printed instruction, SMACNA or NRCA, whichever is the more stringent.
 2. Shop Fabricated Sheet Metal Type - Where shown in the Drawings, expansion joint covers shall be constructed of 24 Ga. G.I., G-90. Such expansion joint covers shall have vertical standing seam ribs at all end laps or joints.
 3. Roof to Wall Expansion Joints - Where shown on the Drawings, roof to wall expansion joints shall have secondary waterproofing beneath the metal cover.
- C. Counterflashings
1. Walls and Elevation Changes - Fabricate counterflashings, using sheet metal of the approximate dimensions and configurations shown on the Detail Drawings, or as necessary to overlap base flashings a minimum of 4". Materials shall be compatible and shall match the material already present on the building in similar details.
 2. Equipment Cannot Be Its Own Counterflashing - Equipment flanges cannot be a substitute for separate two-piece counterflashing. All equipment must have a separate receiver and counterflashing beneath the equipment flange.
 3. Vents and Plumbing and HVAC Equipment - At power exhaust units, fabricate counterflashing of 20 Oz. copper or 24 Ga. galvalume as detailed with reverse open hem (approximately 1") on the vertical face extending under unit housing. Fasten 16" O.C. with approved fasteners with a minimum of two fasteners per side. All vent and plumbing and HVAC flashings shall have soldered and pop riveted seams. Seams and joints are not to be sealed with sealant as primary waterproofing.
 4. Expansion Provisions - Fabricate all counterflashings in such a manner that each may be removed and reinstalled if necessary. Provide for differential movement between base flashing and counterflashing assemblies at all locations.
 5. Wind Clips - All counterflashings at walls shall have 2" wide wind clips at 24" O.C. in accordance with SMACNA provisions.
- D. Mechanical Equipment Flashings
1. Seal and Fill Flashing Openings - Where existing pitch pans and metal penetration flashings are replaced with curbed assemblies, stuff opening with non-combustible fill insulation. All "gooseneck" or "T" flashings shall be filled with expanding foamed in place polyurethane foam.
 2. Mechanical Fastening of Flanges - All flanges of metal flashings larger than 24" in diameter, except lead, shall be securely fastened to wood or concrete substrates.
 3. Vent Covers - All vent pipes with covers shall have new covers made of like materials.
 4. Fit and Finish - All curb flanges and counterflashings shall be fabricated and installed so as not to cut or gouge the base flashings. Curb flanges that are cut at corners or elsewhere to fit over base flashings shall be replaced.
- E. Umbrella Flashings
1. Umbrella flashings shall be used for round vertical pipes, and shall be securely welded at the top with a continuous weld bead. Umbrella flashings shall cover the top of the underlying flashing by a minimum of 1".
- F. Through-Wall Flashings - Where through-wall flashings are installed in masonry walls, the procedure shall be the following:
1. The through wall flashing shall be constructed of 20 Oz. Copper or 24 Ga. Stainless Steel, as detailed, and shall lapped a minimum of 2" at the joints and sealed at the joints by sealant tape.

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2. Over the Stainless Steel through-wall flashing shall be a secondary layer of moisture protection consisting of York Cop-R-Tex Plus Lead flashing or approved equivalent.

3.6 IMBEDDED SHEET METAL

- A. General - The following instructions apply to all imbedded metal details and conditions.
 1. Prime Flanges - Flanges of all sheet metal shall be primed on both sides with an approved primer prior to installation. Lead flanges shall be wire brushed to rough the surface prior to priming.
- B. Gravel Guard - All gravel guard shall be installed in the following manner.
 1. Imbed Flange Edges - The edge of all metal flanges to be built into or covered by roof membranes or strip-in plies shall be turned down or "kicked-down" slightly to prevent cut edge from wearing through the roof membrane. The "kick-down" shall not exceed 1/2" wide or be more than a 5-degree break. Prime the top side and bottom side of all flanges and build into the roof membrane within 24 hours or re-prime.
 2. Secondary Waterproofing - All gravel guard shall have secondary waterproofing made of self-adhering modified bitumen material beneath the base sheet and extending over the edge of the blocking and into the gutter, where applicable, and to a distance of 1" below the bottom of the wood nailer otherwise.
 3. Back-Up and Cover Plates - All gravel guard shall have both backup and cover plates in accordance with SMACNA requirements.
 4. Continuous Clips - Unless otherwise stipulated elsewhere, all gravel guard shall be attached to a continuous clip made one full gauge heavier with the clip nailed at 6" O.C. The clip or cleat shall be nailed no more than 1-3/4 inches from the bottom of the cleat or clip.
- C. Pitch Pans - Pitch pans are not permitted. Alternative hooded flashings shall be used in lieu of pitch pans.
- D. "T" Tops - "T" Tops shall be used only where shown and otherwise such flashings shall consist of a wood curb with a metal hood.
- E. Equipment Curbs - Light gauge equipment flashings are not permitted, and wherever such conditions occur, a wood curb of the proper height shall be provided. Heavier gauge curbs such as air conditioning curbs shall have a counterflashing added as specified elsewhere.
- F. Roof Drain Gravel Guard - All roof drains shall have gravel guard installed around the perimeter and stripped in as provided by standard NRCA details.

END OF SECTION 07 60 00