

07620 ROOF ASSEMBLY STEEL BLOCKING AND SHEET METAL

*SPECIFIER: All roof-related items above or outside the structural roof deck, including such work as blocking, insulation, membrane, sheet metal, hatches, vents, and curbs are components of the Roof Assembly.
The entire Roof Assembly carries a special warranty by the roof membrane producer, as specified in the lead section, 07500, and 07501.
Note that no wood blocking is permitted. Use only galvanized steel SRB as specified in this section.
CSI 2004 MasterFormat number: 07 62 03.
Optional keynotes to Drawings follow each major product title, for A/Es using National CAD Standard.*

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Coordinate Roof Assembly roof insulation work with work before and after. See especially:
 - 1. 07500 - Roof Assembly (RA)
 - 2. 07503 - RA Lightweight Insulating Concrete
 - 3. 07522 - RA Modified Bitumen Roofing
 - 4. 07630 - RA PVC Rainleaders and Storm Sewer
 - 5. Other Roof Assembly components such as insulation, roofing, hatches, vents, portals, and equipment curbs Div 07, 15

1.2 DEFINITIONS, REFERENCES, AND OVERALL STANDARDS Follow 07500

1.3 QUALITY ASSURANCE

- A. Installer’s Qualifications: Each installer of a shown part of the Roof Assembly shall:
 - 1. Have 5 years of successful experience in the installation of that roof component.
 - 2. Be currently listed in the M-DCPS Pre-Qualified Roofing Contractor List.
 - 3. Be currently licensed or certified by the producer of each Roof Assembly steel blocking and sheet metal component for the installing the steel blocking and sheet metal parts of the Roof Assembly.
- B. Insurer Certification: Assist M-DCPS in preparing steel blocking and roofing sheet metal acceptance certification as needed for the fire and extended coverage insurance of the Roof Assembly.
- C. Pre-Installation Meeting: At least 6 weeks before installation of Roof Assembly, the Contractor shall conduct a meeting at the worksite with installers of each part of the Roof Assembly, affected installers of other work, A/E, AHJs, and M-DCPS representatives.

1.4 SUBMITTALS

Follow 01330

- A. Special Warranties: Before making any other submittals, and at least 10 weeks before pre-installation meeting, submit and obtain approval of draft of (or form for) each specified Special Warranty.
- B. Product Data: Description of each product, including standards met, and the following:
 - 1. Miami-Dade Product Notice of Approval (NOA) number and expiration date.
 - 2. Evidence of specified FM Wind Resistance Classification.
 - 3. Producer's installation instructions.
- C. Shop Drawings: Roof plan showing slopes, expansion joints, scuppers, hatches, smoke vents, equipment supports, crickets, equipment curbs, portals, roof penetrations and how they are fitted with steel cants and penetration flashings. Show details for proper installation.
 - 1. Show negative pressures on each part of the roof where SRB and RPF occur (no less than those shown in roof wind pressure diagrams in the Construction Documents).
 - 2. Show details of interface between deck, steel blocking, metal flashings, insulation, and roofing. Show crickets and expansion joints and how they will be flashed.
 - 3. Show the number and type of fasteners in SRB, RPF and sheet metal to fasten to roof structure and vertical surfaces.
 - 4. Show location of sealants in or at edge of SRB, RPF and sheet metal to make the Roof Assembly watertight
 - 5. Show how hatches, smoke vents, equipment curbs, and portals are provided with steel cants and receivers for flashing.
 - 6. Show how any changes in roof insulation thickness will be accommodated.
 - 7. Show how water is conducted by scupper, gutter, conductor head, and stainless steel downspout from a higher roof to a lower one, and from conductor heads at lowest roof level to PVC rainleaders.
- D. Samples:
 - 1. 8 in. length of SRB for roof perimeter blocking, cant, coping, and expansion joint.
 - 2. 8 in. length of sheet metal drip edge, window head, door head.
 - 3. 8 in. length of gutter and of downspout, along with one gutter bracket, spacer bracket and downspout bracket.
 - 4. Strap support for rainleaders.
 - 5. Typical sheet metal flashing for a round roof penetration, and a conical sealant cover.
- E. Certification, before installation: Letter from the producer of steel roof blocking and roofing sheet metal, approving the proposed installer.

1.5 SPECIAL WARRANTIES

Follow 01790

- A. By Membrane Producer: Provide a 20 year Special Warranty from the roof membrane producer covering correction of defects in the steel blocking and sheet metal component of the Roof Assembly.

- B. By Steel Roof Blocking and Roofing Sheet Metal Producer and Installer: Provide a 10 year Special Warranty in which the SRB producer / installer agrees to correct defective SRB work.
1. See 07500 for the full requirements of this Special Warranty that shall accompany the Roof Assembly Special Warranty.
 2. At time of project closeout, submit this signed Special Warranty to the roof membrane producer for transmittal to Contractor, A/E, and M-DCPS.

PART 2 PRODUCTS

Follow 01600

2.1 ROOF ASSEMBLY STEEL ROOF BLOCKING (SRB) [07620.srb]

- A. Description: Engineered galvanized steel brake metal, designed to replace wood blocking and, with proper fastening, to withstand positive and negative pressures in roof construction in HVHZ areas as defined in FBC. SRB fabrications include such items as stainless steel covers for use in areas exposed to view that mate with blocking profiles. SRB includes such items as blocking, cants, copings, expansion joint covers, scuppers, umbrellas, and counterflashings.
1. Structural fabrications: 16 gage galvanized steel; ASTM A653, G90.
 2. Covers: 24 gage Type 304 stainless steel; ASTM A240.
 3. Reinforcement: Add welded steel reinforcing before galvanizing where needed to withstand project-specific extreme positive and negative wind pressures at various locations as inferred from wind pressure diagrams.
 4. Accessory products: Cleats, fasteners sized and spaced to withstand specified wind pressures, compressible closed-cell elastomeric insulation, and silicone sealants
 5. Fabrications: See specified SRB fabrications for specific uses below.
- B. Product / Producer: This specification is based on the properties and performance of one Basis of Design (BOD) line of products. Provide specified BOD products or submit a detailed approval request to use another producer's line.
1. Provide SRB from a fabricator licensed by the following holder of ARBS patents, or equal approved by A/E and M-DCPS: Alternative Roof Blocking System.
 2. Equal product in quality and performance as approved after review by A/E and M-DCPS Maintenance & Operations – Roofing Division.

2.2 ROOF ASSEMBLY ROOF PENETRATION FLASHING (RPF) [07620.rpf]

- A. Description: Close-fitting stainless steel flashings for penetrating pipes, vents, conduit, coaxial cable, guys, penetration umbrellas, scuppers, structural supports, and hoods/shacks for grouped penetrating lines.
1. Material: 24 to 28 gage, as practical for various configurations, Type 304 stainless steel, ASTM A240.
 2. Accessory products: Solder, gaskets, elastomeric foam fill, backer foam, EPDM sheet, silicone sealants, hose clamps, and fastenings size and spaced to withstand specified wind pressures. Provide vandal-resisting caps for vents.
 3. Fabrications: See specified RPF fabrications for specific uses below.

B. Product / Producer: This specification is based on the properties and performance of one Basis of Design (BOD) line of products. Provide specified BOD products or submit a detailed approval request to use another producer's line.

1. SBC Industries.
2. Equal product in quality and performance as approved after review by A/E.

2.3 ROOF AND WALL SHEET METAL (SM) [07620.sm]

A. Description:

1. Sheet metal: Type 304 stainless steel; ASTM A240.
2. Accessory products: Cleats, fasteners sized and spaced to withstand specified wind pressures, compressible closed-cell elastomeric strips and fillers, and silicone sealants
3. Fabrications: See specified sheet metal fabrications for specific uses below.

B. Product / Producer: Roof membrane installer's shop or SRB fabricator's shop.

2.4 ACCESSORY PRODUCTS

A. Strap supports for Rainleaders to Storm Sewer: Hemmed, safety edge 11 ga stainless steel, suitable for bolting PVC rainleaders to walls at top, bottom and 36 to 44 in. oc between, complete with 4 screw anchor fasteners for each strap.

1. Confirm quantities needed, fabricate, supply fasteners, and supply to PVC rainleader installer.

B. Priming and Protective Coatings: Bituminous paint or zinc-rich primer such as zinc molybdate in an alkyd vehicle.

C. Elastomeric Coating (sometimes referred to as "paint") for drip edges, scuppers, gutters, collection boxes, downspouts, rainleaders, and window and door head flashings: As specified in elastomeric coating section (Div 09).

1. Time of coating: Before installation of each sheet metal item, preferably at shop.
2. Texture: Smooth, without granules.
3. Color: Match each wall color directly in background of each sheet metal fabrication.

D. SBS-modified Bitumen: As specified in roofing assembly modified bitumen roofing section.

E. Roofing Cement: Asphalt or SBS-modified asphalt, asbestos-free; ASTM D4586.

F. Flashing Cement: Asphalt or SBS-modified asphalt, fibered, asbestos free, non-sag; ASTM D4586, Type I.

G. Primer for stainless steel, copper, and other sheet metal that is to be embedded in roofing or base flashing plies: Asphalt or SBS-modified asphalt, asbestos-free, such as Elastocol 500, by Soprema: ASTM D2027.

- H. Alsan flashing: Alsan flashing, by Soprema, or equal product approved by A/E. Do not use this flashing unless approved by A/E for each condition where no other flashing detail or product is suitable.
- I. Fasteners:
 - 1. Screw anchors (for use in concrete and masonry): Case hardened steel screws with baked-on rust-inhibitive coating, for use in drilled holes, such as GrabCon by Grabber, Tapcon by ITW Buildex, or Tapper by Powers.
 - a. For products having Miami-Dade County Product Approval or FBC product acceptance, use only the specific brand of fasteners used in testing the product, and in the same diameter, length, and structural penetration.
 - 2. Screws (for attaching to metal): Stainless steel machine screws in tapped holes or self-drilling screws.
 - 3. Solder: Tin alloy, lead-free.

2.5 STEEL ROOF BLOCKING (SRB) AND SHEET METAL (SM) FABRICATIONS

A. Drip Edge Assembly:

- 1. Design: As shown on the Plans and as reviewed and approved by A/E and M-DCPS Maintenance – Roofing Division. Where the thickness of insulation varies, provide blocking sections of varying height to match profile of insulated roof edge.
- 2. Standard: Follow FBC RAS 111 – Table 2.
- 3. SRB blocking and closers: 16 ga galvanized steel.
- 4. Drip edge cover: 22 ga stainless steel in sections no more than 10 ft long.
- 5. Cover cleat with 22 ga stainless steel edge profile.
- 6. Roof flange: At least 4 in. wide.
- 7. Bottom drip: Not less than 1 in. below bottom of wood roof sheathing, with kick to shed water 3/4 in. from finish wall.
- 8. Elastomeric coat surfaces at any elevation that will be visible from ground.
- 9. At roof edges, in existing wood blocking assemblies only, such as tile or shingle roofs: Provide a continuous 20 ga. stainless steel cleat with punched holes 6 in. o.c., without SRB. If cleat extends more than 6 ft, punch holes 12 in. oc.

B. Surface-Mounted Counterflashing (one-piece):

- 1. Design: As shown on the Plans and as reviewed and approved by A/E and M-DCPS Maintenance & Operations – Roofing Division.
- 2. Stainless steel sheet, fabricated in approximately 10 ft sections.
- 3. Provide flashing with 1-1/2 in. wall flange with 1/4 in. kick at top to receive sealant, a 1/2 in. 135° face sloping to flange, and a 4 in. bottom flange formed inward 3/4 in. towards wall with a hemmed 1/2 in. kick at bottom.
- 4. Shop punch wall flange 12 in. oc for fastening.
- 5. Provide shop fabricated corner splices 4 in. wide.
- 6. Elastomeric coat surfaces below 60 ft elevation that will be visible from ground.

C. Cants With Counterflashing Above:

1. Design: As shown on the Plans and as reviewed and approved by A/E and M-DCPS Maintenance & Operations – Roofing Division.
2. SRB edge blocking / cant fabrication: 16 ga galvanized steel, fastened 12 in. oc with #14 steel roof fasteners or 1-1/2 in. screw anchors, with, each over 3/4 in. steel washers.
3. Counterflashing: As specified for surface-mounted counterflashing.

D. Stucco Stop with Counterflashing (two-piece):

1. Design: As shown the Plans and as reviewed and approved by the A/E and M-DCPS Maintenance & Operations – Roofing Division.
2. Stainless steel sheet, 22 ga. fabricated in approximately 10 ft sections.
3. Receiver: 1-1/2 in. wall flange, 3/4 in. sloping stucco stop, 3/4 in. flange bent downward with 1/2 in. hem.
4. Shop punch wall flange 12 in. oc for fastening.
5. Corner splices: Shop-fabricated, extending 4 in. each way.
6. Counterflashing: 1-1/2 in. 45° top flange with 1/4 in. kickback at top and a 4 in. bottom flange formed inward 3/4 in. towards wall with a hemmed 1/2 in. kick at bottom.
7. Storm cleats: 1-1/2 in. x 4 in.
8. Elastomeric coat surfaces below 60 ft elevation that will be visible from ground.

E. Scuppers:

1. Design: As shown on Plans and as reviewed and approved by A/E and M-DCPS Maintenance & Operations – Roofing Division.
2. Standard: Follow FBC RAS 111 – Table 2.
3. SRB blocking and cants: 16 ga galvanized steel.
4. Stainless steel sheet, 22 ga.
5. Lock seam corners, solder watertight and hem outer exposed edges.
6. Wall flanges: At least 4 in. wide, formed to fit cants, decks and vertical wall surface. Shop punch 6 in. oc for fastenings.
7. Where a scupper discharges to the ground, extend lip 3 - 4 in. beyond the wall plane to reduce drippage against wall. Over collector boxes, extend lip 2 in.
8. Elastomeric coat side, soffit and drip surfaces at any elevation above grade.

F. Copings:

1. Design: As shown on Plans and as reviewed and approved by A/E and M-DCPS Maintenance & Operations – Roofing Division.
2. Standard: Follow FBC RAS 111 – Table 2.
3. Stainless steel sheet, 22 ga, fabricated with upper finish exposed to weather in approximately 10 ft sections.
4. Provide at least 8 in. wide covers at each joint, crossing or termination in coping.
5. Elastomeric coat outside surfaces, front, top and back, at any elevation above grade.
6. Solder all miter joints.

G. Expansion Joints, Insulated, at level roofs and at roofs of differing elevations:

1. Design: As shown on Plans and as reviewed and approved by A/E and M-DCPS Maintenance & Operations – Roofing Division.
2. Standard: Follow FBC RAS 111 – Table 2.
3. SRB blocking and cants: 16 ga galvanized steel.

4. Steel galvanized body 16 ga, with stainless steel cap, 26 ga, fabricated with upper finish exposed to weather in approximately 10 ft sections.
5. Provide at least 8 in. wide covers at each joint, crossing or termination in coping.
6. Elastomeric coat outside surfaces visible from ground.

H. Duct Portals, Insulated:

1. Design: As shown on the Plans, rising straight for 12 in. to receive counterflashing, and as reviewed and approved by A/E and M-DCPS Maintenance & Operations – Roofing Division.
2. Standard: Follow FBC RAS 111 – Table 2.
3. SRB blocking and field-applied cants: 16 ga galvanized steel.
4. Stainless steel sheet, 22 ga, fabricated with upper finish exposed to weather in approximately 10 ft sections.

2.6 ROOF PENETRATION FLASHING (RPF) FABRICATIONS

A. Roof Penetration Fabrications: Fabricate in two pieces where needed to install around penetrations, with provision for interlocking seams filled with sealant in field. Fabricate and install to drain water away from sealant joints, and protect sealant in joints from sunlight and standing water.

B. Flashings for Pipes, Conduits, and Equipment Supports That Penetrate or Rest on Roof:

1. Form tubular stainless steel base flashing sleeves at least 8 in. high to fit pipe, conduit, and round equipment support and with 4 in. wide roof flanges soldered watertight.
2. Form split tubular stainless steel counterflashing to minimum loose edge lap, of 5-1/2 in. minimum height and lapping 4 in. over base flashings.
3. Conical sealant cover: Slope outward and downward at 30° to 45° from the horizontal plane with ID equal to the vent stack diameter and with OD 1 to 2 in. larger.

C. Curb-to-Duct Flashing and Counter Flashing:

1. Coordinate curb sizing so that their roof deck metal flanges can be fastened to the structural deck to achieve height at least of 8 in. above the finish roof surface. Provide greater height when required by code.
2. Fabricate flashings from stainless steel to fit duct curbs and ducts projecting from curbs.
3. Provide 4 in. vertical flange to cover top edge of bituminous base flashings. Form flange bottom towards curb, with 1/4 in. bottom edge bent 1/4 in. out and hemmed.
4. At top of curbs bend metal 90° and extend horizontally over to duct, then bend upward and extend vertically not less than 3 in. from top edge of flashing out 3/8 in. to receive sealant.
5. Provide for field soldered lap joints at corners and 1 in. lap joints at horizontal miter splices.
6. Provide roof crickets at the highest side of roof curbs, roof hatches, smoke vents, fan bases, and goosenecks.

2.7 SHEET METAL (SM) FABRICATIONS

- A. Roof drain flashings: 16 oz copper at least 0.200 in. thick, 30 x 30 in. overall; ASTM B272, Temper 00 or 01. Do not use lead.
- B. Gutters: Stainless steel, 22 ga. For gutters with a girth (length of a cord encircling gutter) that exceed 30 in., fabricate from 18 ga or heavier stainless steel. Hold front edge of the gutter at least 1 in. below the back edge. Provide continuous cleats at the back edge of the gutter. Elastomeric coat outside surfaces:
 - 1. Gutter expansion joints: Provide no more than 50 ft oc (or 25 ft from a corner).
 - a. Locate downspouts and attach gutter anchors and supports to accommodate, not constrain, thermal movement.
 - b. Lap joints in gutter at least 2 in. in direction of flow, and solder. Use only solder at lap and conductor head joints; no liquid gutter seal.
 - 2. Gutter brackets: Stainless steel, spaced no more than 30 in. oc.
 - a. Brackets: At least 1/8 in. thick (11 ga) by 1 in. wide for gutter girths up to 20 in., and 2 in. wide for girths exceeding 20 in.
 - b. Attach to the face of the gutter, in addition to the building structure at the back of the gutter.
 - 3. Spacer straps: Stainless steel, 1/16 in. thick (16 ga) x 1 in. wide, in gutters 5 in. or wider, halfway between all gutter brackets. Fasten only to front and back of gutter.
- C. Conductor Heads and Downspouts (Downspouts convey water from conductor heads to PVC rainleaders or to splash blocks on a lower roof or at grade:
 - 1. Conductor heads and downspouts: Stainless steel, 22 ga, soldered watertight.
 - 2. Make top of the conductor head at least 2 in. wider than and 1 in. below the scupper. Proportion following SMACNA Architectural Sheet Metal Manual.
 - 3. For conductor heads and s/s downspouts feeding rainleaders. Provide a tailpiece at least 3 in. long that will mate with the PVC rainleader pipe that is to be used in such a way that an airtight seal (using gasket or sealant) can be made.
 - 4. For conductor heads feeding s/s downspouts: Provide a tailpiece 2 to 4 in. long that will mate with the downspout to form a screwed and soldered, airtight joint.
 - 5. Strap supports: Hemmed safety edge 11 ga stainless steel, suitable for bolting downspouts to walls at top, bottom and 36 to 44 in. o.c. between, complete with 4 screw anchor fasteners for each strap.
 - 6. Prepare outside surfaces of conductor heads, downspouts and straps to receive field application of elastomeric wall coating.
- D. Window Head Flashings:
 - 1. Stainless steel sheet, fabricated to extend flashing 3 in. past window on each side
 - 2. Hem bottom drop edge and punch wall flange for fastenings in shop.
 - 3. Elastomeric coat surfaces.
- E. Door Hoods / Flashings: Stainless steel with closed ends, lock seamed top and side joints.

1. Form 1-1/2 in. wall flanges at sides and top; shop-punch 6 in. oc for fastenings.
2. Form 1-1/2 in. horizontal inward stiffener flanges with hemmed edges, at top and bottom of hood.
3. Elastomeric coat all surfaces.
4. Lap bottom hood lips at corners, solder, and fasten with 2 stainless steel rivets in each corner.

F. Base Flashing at Covers over Canopies:

1. Scope: This applies to the flashing of the joint between the walls of school buildings and the metal canopy covers that adjoin them. Also, a free-standing walkway cover will often have such a joint at its end(s). These covers are not roofed, but a sheet metal flashing is installed at the joint before the canopy is waterproofed.
2. Fabricate using sheet stainless steel to detail shown, in not over 10 ft sections.
3. Provide 4 in. minimum upturned wall flange behind counterflashing.
4. Where flutes of metal cover are parallel to abutting wall, provide horizontal roof flange extending as far as the nearest flute-top on the walkway cover, plus 2 in.
5. Where flutes of metal cover are oriented 90° away from the abutting wall, provide a horizontal roof flange that extends 4 in. out over the walkway cover.
6. Seal roof flange to metal walkway cover with silicone. Where flutes are oriented 90° away from the abutting wall, fill space between bottom of flutes and bottom of 4 in. flashing flange with carefully cut and fitted sponge neoprene seals, 4 in deep, compressed at least 25% into each void.

PART 3 EXECUTION

Follow 01700

3.1 EXAMINATION AND PREPARATION

- A. Check and prepare surfaces that will receive steel roof blocking and roofing sheet metal.
 1. Concrete condition: Dry, smooth, and free of shrinkage cracks, laitance, bond-breaking substances, loose material, pits, honeycomb, ridges and roughness.
 2. Metal condition: Clean and smooth. Verify that dissimilar metals are coated with bituminous paint or zinc-rich primer.
- B. Check openings for other work on or passing through roof deck, such as for roof drains, hatches, smoke vents, equipment curbs and portals, to confirm that they are complete, framed or reinforced, and trimmed straight and clean.
- C. Delivery, Storage and Weather: Deliver and store products in sealed protective packaging. Install products dry, in dry weather.
- D. Do not start the installation of this work until conditions detrimental to its proper completion have been corrected.

3.2 PRIMING AND COATING

- A. Priming: Before setting in place, prime topsides and undersides of flashings that are to be placed over the roof membrane.

1. Set primed copper roof drain flashings in full bed of flashing cement (torch application) or SBS-modified bitumen (hot mopped application) over the intermediate ply of the roof membrane assembly and cement or hot mop cap sheet in place.
 2. Set other primed sheet metal items over cap ply.
 3. After priming the flanges, strip in the flanges of all roof-set sheet metal items with 2 roofing plies, torched in place (set in solid coats of hot bitumen if hot mopping)..
- B. Elastomeric Coating: Do not install sheet metal over previously applied elastomeric-coated walls until sheet metal items (including straps) have been coated by provider of elastomeric coating to match wall color (but in smooth un-textured formulation).
- 3.3 INSTALLATION OF ROOF BLOCKING AND STAINLESS STEEL COVERS (SRB).
- A. Install SRB following approved shop drawings and producers current published instructions, except as more stringently specified herein.
1. Fasteners not covered by insulation or roofing membrane shall be removable
 2. Install steel blocking to even, smooth, sound, thoroughly clean and dry surfaces that are free from defects that might affect performance.
 3. Lap, weld, bolt, rivet, lock, or seal joints and provide sufficient fasteners to ensure complete and weathertight assemblies. Fasten to building structure.
 4. Isolate dissimilar metals with isolation sheets or heavy isolation coatings.
 5. Install blocking and sheet metal to drain water away from sealant joints. Protect sealant in joints from sunlight and standing water.
- B. Edge Drips:
1. Install a continuous 20 ga stainless steel cleat.
 2. Set 22 ga stainless steel edge drip roof flanges in full bed of roofing cement over completed roofing.
 3. Lap splices 4 in. minimum and seal top horizontal surface laps with cold SBS bitumen.
 4. Stagger-nail the 4 in. flange to roof deck 4 in. oc and cover with 2 plies of felt stripping set in full bed of roofing cement.
 5. Locate drip bottom not less than 3/4 in. away from finished vertical surfaces
- C. Stucco Stop with Counterflashing (2- piece)
1. Set receiver on exterior walls where shown, but in no case less than 11 in. above level of roofing. Lap splices at least 4 in. and seal laps with silicone sealant.
 2. Fasten receiver to wall with #10 x 1-1/4 in. or larger screw anchors 12 in. oc.
 3. Check for watertight membrane/bitumen seal at top of base flashing before installing counterflashing.
 4. Attach storm cleats 30 in. oc, with one cleat at each joint. Insert counterflashing into receiver, and fasten tightly with storm cleats.
- D. Surface Mounted Flashing (1-piece):
1. Set on exterior walls over base flashing where shown. Lap splices at least 4 in. and seal laps with silicone. Fasten to wall with #10 x 1-1/4 in or larger pan head concrete screw anchors 12 in. oc. Provide neoprene sealing discs over stainless steel washers at each fastener.

2. Over corrugated metal walls, place premolded neoprene filler strip on wall immediately above top of metal base flashing. Set filler strip in silicone and seal abutting edges of filler strip likewise. Set counterflashing in silicone sealant over filler strip and fasten flashing to metal wall through filler strip with #10 stainless steel sheet metal screws of appropriate length, 6 in. oc, centered on wall flutes.
3. Provide EPDM or neoprene discs and stainless steel washers under screw heads.
4. Check for watertight membrane/bitumen seal at top of base flashing before installing counterflashing.

E. Copings:

1. Fasten wall-top receiver or cleats to SRB 6 in. oc using #12 screws or larger.
2. Install coping over receiver or cleats with 1/8 in. space between each coping section.
3. Fasten inside face of coping with removable grommet type fasteners.
4. Slope coping 1-in-12 to inner or down-slope side of parapet or other wall-top.
5. Install covers at each joint, crossing and terminations in full bed of silicone sealant.
6. Solder all miter joints.

F. Scuppers:

1. Set scuppers in full bed of roofing cement over completed base flashing and roof membrane.
2. Fasten to structure with stainless sheet metal fasteners and anchors 6 in. oc.
3. Seal against both sides of wall at scupper perimeter.

G. Cants: Provide and fasten SRB cants to hatches, smoke vents, portals, and equipment curbs that have not been fabricated with integral cants.

H. Crickets: Provide sheet metal crickets upstream of roof curbs to ensure that the rainwater course is divided to flow around obstructions.

3.4 INSTALLATION OF ROOF PENETRATION FLASHING (RPF)

A. Install RPF following approved shop drawings and producers current published instructions, except as more stringently specified herein.

1. Slip stainless steel flashing over each vent stack and other roof penetration, lock 2-piece units with sealant in joints, and set roof flanges in full bed of roofing cement.
2. Mate shop fabricated half-sections around the penetrating item and solder vertical and horizontal seams watertight.
3. Set flashing roof flanges in full bed of roofing cement.
4. Cover flashing flanges with 2 layers of roofing felt stripping set in solid coats of hot SBS-modified bitumen or roofing cement.
5. Wrap pipe, conduit, and round equipment supports with one or more layers of 3/8 x 1 in. wide neoprene foam tape, with tight fitting butt joints.
6. Install counterflashing over base flashing and solder the vertical seam.
7. Wrap oversize backer rod around vent stack and insert it 3/8 in. below top of flashing.
8. Seal watertight at top edges with a one part silicone sealant and tool to shed water.
9. Install conical sealant covers directly above sealant.
10. Install vandal-resistant vent stack caps at vent stacks unless otherwise shown.

3.5 INSTALLATION OF SHEET METAL (SRB, SM AND RPF)

- A. Install sheet metal items following approved shop drawings and producers current published instructions, except as more stringently specified herein.
1. Fasteners not covered by roofing membrane shall be removable.
 2. Extend each downspout or conductor head tailpiece that feeds a PVC rainleader from 2 to 4 in. into the rainleader, Seal the joint airtight with silicone or EPDM gasket.
 3. Screw and solder s/s downspouts to s/s conductor head tailpieces.
 4. Install roofing sheet metal items to even, smooth, sound, thoroughly clean and dry surfaces that are free from defects that might affect performance.
 5. Lap, screw, lock, and seal joints as field conditions require. Fasten to steel blocking and building structure wherever possible.
 6. Provide sufficient fasteners and hardware to ensure a complete, weathertight system.
 7. Isolate dissimilar metals with isolation sheets or heavy isolation coatings.
 8. Perform soldering work slowly, with properly heated coppers to thoroughly heat seam material and sweat solder through full width of seam that shall show not less than 1 in. of evenly flowed solder. Start soldering immediately after application of flux. Solder flat locked seams.
 9. Make flashing and sheet metal work water and weathertight, with lines, arises and angles sharp and true and plane surfaces free from waves and buckles.
- B. Installation of Downspouts:
1. Extend each downspout to terminate within 1 in. above a splash block's high end.
 2. Downspout straps: Place close to each downspout top, bottom, and in-between so that straps are not more than 44 in. apart.
 3. Fasten each end of straps to walls using stainless steel sheet metal screws in shields, or screw anchors, 4 fasteners in each strap.
 4. Fasten each section of downspout to top strap with at least 2 stainless steel sheet metal screws. Do not fasten bottom end of each downspout section to strap – to allow for thermal movement.
- C. Window Head Flashings:
1. Set wall flange in full bed of silicone sealant over each window and window wall.
 2. Fasten head flashings to prefinished wall panels or other metal substrate with #10 x 3/4 in. pan head stainless steel sheet metal screws 10 in. oc.
 3. Provide EPDM or neoprene discs and stainless steel washers under screw heads.
- D. Door Hoods:
1. Set hoods level, over doors, with wall flanges fully bedded in silicone sealant.
 2. Fasten hood wall flanges to prefinished wall panels or other metal substrate with #10 x 3/4" stainless steel sheet metal screws 6 in. oc
 3. Provide EPDM or neoprene discs and stainless steel washers under screw heads.

3.6 PITCH PANS / SEALANT PANS PROHIBITED EXCEPT BY M-DCPS APPROVAL

- A. Do not use any sealant pans, whether filled with asphalt, coal tar pitch, roof cement, or urethane, to flash oddly shaped or sized items that penetrate or rest on the roof membrane. Instead, provide penetration flashings of a design similar to those specified above.
 - 1. When a “hard-to-flash” situation arises, propose to A/E a flashing solution and obtain approval of A/E and M-DCPS Maintenance & Operations – Roofing Division before building.
- B. If A/E and M-DCPS determine that it is not be practical to use anything other than a sealant pan, submit details that follow this procedure to A/E and M-DCPS Maintenance & Operations – Roofing Division for approval in each case.
 - 1. Fabricate and locate the sheet metal sealant pan frame (which shall be at least 3 in. high, so that it’s out-side roof flange can be set in a full bed of plastic roofing cement.
 - 2. Cover pan flanges with 2 layers of roofing felt stripping set in solid coats of hot SBS-modified bitumen or roofing cement.
 - 3. Fill sealant pan to a level 3/4 in. from rim with a flexible mixture of plastic roofing cement stiffened with Portland cement.
 - 4. Top out the sealant pan, fully to the rim, with 3/4 in. of hot SBS-modified bitumen or self-leveling urethane sealant
 - 5. Do not nip top edge of hem to allow for drainage of water. To shed water, use SBS-modified bitumen or self-leveling urethane to form a cone that slopes 1/2 in./ft from the penetration to the edge of the pan.

END OF SECTION