

together with no joints or gaps greater than 1/4 inch. Stagger joints both horizontally and vertically if multiple layers are provided.

B. Secure insulation to the substrate with the required Carlisle fasteners and plates in accordance with manufacturers specifications.

3.3 MEMBRANE PLACEMENT AND ATTACHMENT

A. Unroll and position membrane. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.

B. Secure the membrane with the required fasteners and plates spaced a maximum of 12 inches on center depending on project conditions (centered over the pre-printed marks approximately 1-1/2 inches from the edge of the membrane sheet).

C. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's specifications.

3.4 MEMBRANE HOT AIR WELDING PROCEDURES

A. Hot air weld the Sure-Weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller immediately after welder crossed the membrane step-off to ensure a continuous hot air welded seam.

Note: When using .060-mil thick or thicker membrane, all splice intersections shall be overlaid with Sure-Weld non-reinforced flashing or IFC T-Joint covers.

B. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).

C. Repair all seam deficiencies the same day they are discovered.

D. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut edge sealant is not required on vertical splices.

3.5 FLASHING

A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane. Sure-Weld non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, scuppers, as well as inside and outside corners when the use of pre-fabricated accessories is not feasible.

B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.6 WALKWAYS

A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.

B. Hot air weld walkway material to the membrane sheet in accordance with the manufacturer's specifications.

3.7 DAILY SEAL

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.8 CLEAN UP

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

07600 - METAL FLASHING

PART 1 - GENERAL

1.01 SCOPE:

A. Provide all of the labor, materials, equipment, and services to furnish and install the flashing and sheet metal.

B. All sheet metal items are not necessarily individually described. The most important parts and those requiring detailed description are usually mentioned. Other work as indicated or necessary shall be provided unless specifically excluded from the work of this Section.

1.02 QUALITY ASSURANCE:

A. In addition to complying with all pertinent codes and standards, comply with all pertinent recommendations of:

- "Architectural Sheet Metal Manual", 5th edition. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

B. Performance requirements:

- Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

C. Perform work in accordance with SMACNA requirements:

- Downspouts:
 - Profile: Figure 1-32 (see Drawings for profile and size).
- Hanger design: Figure 1-35 (see Drawings for profile and size).
- Conductor heads: Figures 1-25C and 1-26.

D. Installers:

- For actual installation of roofing and flashing, use only competent and skilled workers completely familiar with the products and the manufacturer's current recommended methods of installation.
- Work associated with flashing including (but not limited to) membrane roofing and roof deck insulation shall be performed by and be the responsibility of a single installer. Coordinate with Section 07531.

1.03 SUBMITTALS:

A. Prior to installation, submit to the Architect for review the following:

- Complete and fully descriptive manufacturer's literature for all factory fabricated items naming all materials, dimensions, finishes and accompanying accessory items.

2. Complete shop drawings and erection drawings for each product named which shall include a material schedule, details, profiles, gauges, dimensions, layout, anchorage and joint details.

3. Physical samples - full range of finishes and coloration.

1.04 PROJECT CONDITIONS:

A. Coordinate work with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance, durability of work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.01 ALUMINUM SHEET:

A. Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength durability of alloy and temper designated below:

- Factory painted aluminum sheet:
 - Counterflashing: 0.0320".

b. Other items: ASIM B209, 3003-H14, with a minimum thickness of 0.040", unless otherwise indicated.

otherwise indicated.

B. Finish: Fluoropolymer 2-coat coating system: Manufacturer's standard 2 coat thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70% polyvinylidene fluoride resin by weight; complying with AAMA 605.2.

- Color and gloss: As selected by the Architect from the manufacturer's full range of standard and custom colors and gloss.

2.02 MISCELLANEOUS MATERIALS AND ACCESSORIES:

A. Fasteners:

1. Same metal as sheet metal flashing or other non-corrosive metal as recommended by sheet metal manufacturer.

2. Match finish of exposed heads with material being fastened.

B. Asphalt mastic: SSPC-Paint 12, solvent-type asphalt mastic, essentially free of sulfur and containing no asbestos fibers, compounded for 15 mil dry film thickness per coat.

C. Mastic sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

D. Elastomeric sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants.

E. Epoxy seam sealer: 2 part, non-corrosive, aluminum seam cementing compound, recommended by aluminum manufacturer for exterior and interior non-moving joints, including riveted joints.

F. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

G. Paper slip sheet: 5 lb./square red rosin, sized building paper conforming to FS UU-B-790, Type I, style 1b.

H. Polyethylene underlayment: ASIM D4397, minimum 6 mil thick black polyethylene film, resistant to decay when tested according to ASIM E154.

I. 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; non-corrosive; size and thickness required for performance.

2.03 FABRICATION:

A. 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.

B. 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.

C. Seams: Fabricate non-moving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

D. Expansion: Space movement joints at maximum of 10" with no joints allowed within 24" 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 flanges, not less than 1" deep, filled with mastic sealant (concealed with joints).

E. Sealed joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

F. Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by the manufacturer.

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

H. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, non-corrosive metal recommended by sheet metal manufacturer.

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

2.04 CAULKING (SEALANT):

A. Product:

- One part polysulfide.
- An approved equal.

2.05 OTHER MATERIALS:

A. All other materials, not specifically described but required for a complete and proper installation of flashing and sheet metal, shall be new, first quality of their respective kinds, and subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 MEASUREMENTS:

A. Verify all dimensions shown on the Drawings by taking field measurements, proper fit and attachment of all part is required.

3.02 WORKMANSHIP - GENERAL:

A. Unless specifically detailed or specified otherwise, all work shall be in accordance with the recommendations of the SMACNA Manual.

B. Form all sheet metal accurately to the dimensions and shapes required, finishing all milled and broken surfaces with true, sharp, and straight lines and angles and where intercepting other members, coping to an accurate fit and soldering securely.

C. Reinforcement, fasteners and expansion provisions shall be wholly concealed within the finished assembly.

D. Turn exposed edges back 2".

E. General:

1. 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 substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

F. Seams/Waterproofing:

- Finish watertight and weather tight.
- Make all lock seam work tight and true to line.
- Make all flat and lock seams in direction of flow.
- Form hems and seal with epoxy seam sealer. Rivet joints for additional strength.

G. Joints:

- Join all parts with clips or sheet metal screws where necessary for strength or stiffness.
- Provide suitable watertight expansion joints for all runs of more than 40 feet, except where closer spacing is indicated on the Drawing or required for proper installation.

Joints and corners shall be accurately machined, filed and fitted, and rigidly framed together and connected. All components shall be matched to produce perfect continuity with the design. Joints and connections in exterior face metal shall be made watertight.

Face of metal shall have hairline joints.

4. Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

5. Use joint adhesive for non-moving joints specified not to be soldered.

H. Nailing:

- Whenever possible, secure metal by means of clips or cleats without nailing through the metal.
- In general, space all nails, rivets, and screws not more than 8" apart and, when exposed to the weather, use lead washers.

I. Expansion: Provide for thermal expansion of exposed sheet metal work. Space movement joints at maximum of 10" with no joints allowed within 24" 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 flanges, not less than 1" deep, filled with mastic sealant (concealed with joints).

J. Separations: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

1. Underlayment: Where installing aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.

2. Bed flangings of work in a thick coat of roofing cement where required for waterproof performance.

K. Embed all metal in connection with roofs in a solid bed of caulking.

L. Finishes shall be factory applied. Shapes shall be formed in the field. Do not break or crack the finishes during field forming and installation.

3.03 COUNTER OR CAP FLASHING:

A. Flashing shall be provided with all base flashings. The flashing shall be formed of sheets not longer than 10'-0" and shall be built into the masonry approximately 4" with the inner edge terminating in a 1/4" hook dam or alternate, turning up 1" behind the first masonry course. The apron shall be of sufficient width to overlap the base flashing not less than 3". Ends of

adjacent lengths of flashing shall overlap not less than 3" and the built-in horizontal portion of the joint shall be set in elastic cement. The flashing shall have a layer of mortar above and below the horizontal flange in the wall.

3.04 SCUPPERS, CONDUCTOR HEADS AND DOWNSPOUTS:

A. Scupper and conductor head:

1. Attach conductor head to wall with masonry fasteners. Overflow openings in conductor head shall be provided.

2. A closure flange shall be locked to the scupper and soldered at the top. The juncture between the top of the closure flange and masonry wall shall be sealed.

3. From the roof side a flange shall be formed and soldered to the scupper prior to its insertion into the wall.

B. Downspouts:

1. Form to size and shape indicated. Longitudinal joints shall be locked. End joints shall telescope 1-1/2".

2. Support leaders in position clear of wall by 1/8" x 3" red brass or copper straps no more than 10' apart. Prongs 1/2" high by 3/4" long shall be punched from the strap to hold leader 3/4" from wall, or a red brass rod 1/4" dia. shall extend through the strap back of the leader. Extend straps on wall surface 2" on each side of leader and secure to masonry with bronze expansion shields and bronze machine bolts of the cinch bolt type. Attachment to wood shall be with bronze lag screws. Provide a shoulder of solder on each side of leader above each strap to carry weight of leader.

3. Provide elbows at bottom where leaders empty onto splash blocks.

07622 - ALUMINUM SILL PANS

PART 1 - GENERAL

1.01 SCOPE:

A. Provide all of the labor, materials, equipment, and services required to furnish and install the aluminum sill pans and end dams at all windows, storefront and curtain wall installations.

1.02 SUBMITTALS:

A. Prior to installation, submit to the Architect for review the following:

- Shop drawings indicating materials, shapes and profiles, connections and installation details.

PART 2 - PRODUCTS

2.01 ALUMINUM SILL PANS AND END DAMS:

A. Materials:

- Aluminum sheet 5050 alloy with finish to match windows.
- Break and fabricate shapes before finishing.
- Thickness: .073"

B. Fasteners: Stainless steel screws of proper size for the application.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install in accordance with approved shop drawings. Take care not to scratch or abrade surfaces.

07651 - LAMINATED SHEET FLASHING

PART 1 - GENERAL

1.01 SCOPE:

A. Provide all of the labor, materials, equipment, and services required to furnish and install the wall flashing.

B. The purpose of this flashing is to prevent penetration of water through the exterior shell of the building.

1.02 QUALITY ASSURANCE:

Qualification of installers:

- Provide at least one person who shall be present at all times during execution of the work of this Section and who shall be thoroughly trained and experienced in the materials and methods required and who shall direct the entire flashing installation.

2. Provide the Architect with the name of responsible person and his job title.

1.03 SUBMITTALS:

A. Prior to installation, submit to the Architect for review the following:

- Complete and fully descriptive manufacturer's literature which shall include installation instructions as applicable for this Project.

2. A schedule of all locations where the Contractor proposes use of this product.

3. Physical sample of the product intended to be installed.

1.04 PRODUCT HANDLING:

A. Protection: Use all means necessary to protect flashing materials before, during and after installation and to protect the installed work and materials of all other Trades.

B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 LAMINATED SHEET FLASHING:

A. Product/manufacturer:

- Cap-R-Tex Duplex as manufactured by York.
- Or comparable products as manufactured by:
 - Advanced Building Products.
 - Sandell Manufacturing Co.

B. Metal: 5 oz. copper bonded on both sides with kraft paper.

2.02 ACCEPTABLE EQUAL PRODUCT:

A. Product/manufacturer:

- Perm-A-Barrier Wall Flashing as manufactured by W. R. Grace.
- Or an approved equal.

B. Description:

- 32 mils, self-adhesive rubberized asphalt integrally bonded to 8 mils of cross-laminated, high-density polyethylene film to provide a minimum of 40 mil thick membrane.
- Membrane shall be interleaved with disposable silicone-coated release paper until installed.

2.03 OTHER MATERIALS:

A. All other materials, not specifically described but required for a complete and proper installation of flashing, shall be new, first quality of their respective kinds, and subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 GENERAL:

A. Install flashing in all locations where the flashing shall be totally concealed.

B. After installation, cut wall flashing flush with exterior faces of joints.

C. Under sills, over exterior openings, and as otherwise indicated, extend flashing into outside of frame or next higher joint of back-up.

D. Provide concealed flashings in masonry work at or above all shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on bed of mortar and cover with mortar. Seal penetrations, laps, and edges (vertically and horizontally) in flashing with mastic before covering the mortar.

E. Extend flashings the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from a line 1" beyond from exterior face of outer wythe of masonry (rim and seal after installation), through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2".

Seal joints with cold setting cement or mastic.

07661 - PREFABRICATED ALUMINUM COPING AND FASCIA

PART 1 - GENERAL

1.01 SCOPE:

A. Provide all of the labor, materials, equipment, and services required to furnish and install the prefabricated aluminum coping and fascia.

1.02 QUALITY ASSURANCE:

A. High performance gravel stop shall be certified by the fascia manufacturer to comply with ANSI/SPRI Standard ES-1-98. Fascia shall meet performance design criteria according to the following test standards:

1. ANSI/SPRI ES-1-98 Test Method RE-1 Test for Roof Edge Termination of Single-ply Roofing Membranes: The fascia system shall be tested to secure the membrane to minimum 100 lbs./ft. in accord with the ANSI/SPRI ES-1-98 Test Method RE-1. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

2. ANSI/SPRI ES-1-98 Test Method RE-2 Pull-Off Test for Fascia: The fascia system shall be tested in accord with the ANSI/SPRI ES-1-98 Test Method RE-2. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

3. FMRC Loss Prevention Data Sheet 1-49 APerimeter Flashing: The fascia product shall be listed in current Factory Mutual Research Corporation Approval Guide approved for the zone in which the work is being accomplished.

B. High performance coping shall be certified by the coping manufacturer to meet performance design criteria according to the following test standards:

1. ANSI/SPRI ES-1-98 Test Method for Coping and Design Guide for Edge Systems Used with Low Slope Roofing Systems (current edition). The coping system shall be tested simultaneously on horizontal and vertical surfaces and shall exceed horizontal and vertical design wind pressure as indicated in accord with the ANSI/SPRI ES-1-98 Test RE-3. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

2. FMRC Loss Prevention Data Sheet 1-49 APerimeter Flashing: The coping product shall be listed in current Factory Mutual Research Corporation Approval Guide approved for the zone in which the work is being accomplished.

3. Physical sample indicating the finish and color to be provided.

PART 2 - PRODUCTS

2.01 COPING:

A. Product/manufacturer:

- Permasnap Coping (.050" aluminum) as manufactured by Hickman Company.
- Or a comparable product as manufactured by:
 - Metal-Era Roof Edge Systems.
 - MM Systems.

B. Finish: Kynar 500. Refer to Architectural drawings for color.

2.02 FASCIA/DRIP EDGES:

A. Types:

- Drain-Through Gravel Stop (.050" aluminum) as manufactured by Hickman Company
- Or a comparable product as manufactured by:
 - Metal-Era Roof Edge Systems.
 - MM Systems.

B. Finish: Kynar 500. Refer to Architectural drawings for color.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Coping and fascia shall be formed and installed straight and true to line.

B. Splice joints to have 6" wide concealed splice plates. Caulking shall be of a type and installed in a manner as approved by the manufacturer. Provide 12" wide field formed aluminum flashing at all splice joints. Provide shop welded, prefabricated corners. Provide continuous hold-down strips. Provide all fasteners in a finish and color to match the coping and fascia.

C. Provide the Architect with the name of responsible person and his job title.

D. Provide the Architect with the name of responsible person and his job title.

E. Provide the Architect with the name of responsible person and his job title.

F. Provide the Architect with the name of responsible person and his job title.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Coping and fascia shall be formed and installed straight and true to line.

B. Splice joints to have 6" wide concealed splice plates. Caulking shall be of a type and installed in a manner as approved by the manufacturer. Provide 12" wide field formed aluminum flashing at all splice joints. Provide shop welded, prefabricated corners. Provide continuous hold-down strips. Provide all fasteners in a finish and color to match the coping and fascia.

C. Provide the Architect with the name of responsible person and his job title.

D. Provide the Architect with the name of responsible person and his job title.

E. Provide the Architect with the name of responsible person and his job title.

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G. Provide the Architect with the name of responsible person and his job title.

H. Provide the Architect with the name of responsible person and his job title.

I. Provide the Architect with the name of responsible person and his job title.

J. Provide the Architect with the name of responsible person and his job title.

K. Provide the Architect with the name of responsible person and his job title.