SECTION 07 52 16.13

SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Tear-off and properly dispose of existing roof systems and gravel, roofing accessories, metal flashings, obsolete equipment, and identified equipment on the identified section.

2. Installation of Mechanically Fasten PowerFast Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing system including but not limited to:

a. Mechanically fasten one quarter (¼") Inch Dens-Deck Board to wood deck with six fasteners and plates per board.

b. Install one ply of PowerPly Plus HT Smooth Modified Bitumen Ply Sheet to wood deck with Tremco # 15 Fasteners and Tremco 2 Inch Barbed Plates, along the side and end laps, 16 inches on center.

c. The side laps shall be four (4") inches, and the end laps shall be Six (6") Inches.

d. Seal the side laps and end laps with

e. Seal the side and end laps with Tremco LF Adhesive, a two component cartridge adhesive. Ensure all end and side laps are fully adhered and watertight.

f. Install new perimeter 24 gauge metal edge. Strip in the metal edge with two plies of 28 lb. glass membrane set into PowerPly Standard LV Adhesive.

g. Install Tremco PowerPly Standard FR GT24 Modified Bitumen White Granulated Capsheet, to base layer with PowerPly Standard LV Adhesive, at a rate on not less than Two and one half (2½) gallons per square.

h. Install TPA Flashings to all curbs, base, or penetrations. Seal edge of flashing with Rock-it Adhesive and 6" Burmesh Membrane. Embed # 11 White Granules into the "wet" adhesive.

i. Seal the metal edge with a bead of Solargard Seam Sealer.

j. Apply/embed # 11 White Granules to areas of excessive adhesive.

1.3 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Cold Process Built Up Roofing – An asbestos free formulation of asphalt, solvent, thixotrope, mineral stabilizer and reinforcing fibers used as an interply adhesive.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Fire-Test-Response Characteristics: Provide roofing systems that have a UL Class A fire rating to the slopes indicated.

D. Flashings and Fastening: Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations.

1.5 ACTION SUBMITTALS-NONE TREMCO MATERIALS

A. Product Data and MSDS Sheets: For each type of product specified.

B. Samples in the following quantities:

1. 3-by-5 inch sample of roof base sheet.
2. 3-by-5 inch sample of roof cap sheet.
3. 3-by-5 inch sample of flashing membrane.
4. 3-by-5 inch sample of stripping ply.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Qualification Data: For Installer and Roofing Inspector. Include letter from Manufacturer written for this Project indicating approval.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.

E. Warranties: Sample of special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For built-up roofing to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing similar work, and qualified by the manufacturer to furnish warranty of type specified.

1. Installer must acquire five inspection service days utilizing manufacturer's technical inspectors. Inspector must be present for roof removal, deck preparation, base sheet installation, cap sheet installation, and coating installation.

B. Manufacturer Qualifications: A qualified manufacturer that is UL listed for built-up roofing identical to that used for this Project.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

D. Source Limitations: Obtain roofing system components from or approved in writing by roofing system manufacturer.

E. Exterior Fire-Test Exposure: UL Class A; as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

F. Pre-installation Roofing Conference: Conduct conference at Project site.

1. Meet with owner, Architect, roofing installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing,

including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.

5. Review structural loading limitations of roof deck during and after roofing.

6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.

8. Review temporary protection requirements for roofing system during and after installation.

9. Review roof observation and repair procedures after roofing installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and

other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. Field measurements and material quantities:

1. Contractor shall have sole responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

C. Waste Disposal:

1. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.

D. Safety requirements:

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.

2. Comply with federal, state, local and Owner fire and safety requirements.

3. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.

4. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, fuels, solvents, torches, and open flames are being used.

1.11 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Roof System Warranty, General: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:

1. Sheet metal flashing and trim, including roof penetration flashings.
2. Roof curbs, hatches, and penetration flashings.
3. Roof and parapet expansion joint assemblies.
4. Warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover boards, walkway products, and other components of built-up roofing.
5. Manufacturer will provide, at no cost to owner, the following services in Years 2, 5, 10, and 15:
    a. Inspection by a Technical Representative and delivery of a written inspection report documenting roof conditions.
6. Warranty Period: 20 years from date of Substantial Completion.

C. Installer's Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, metal panels, and walkway products, for the following warranty period:

1. Warranty Period: Three years from date of Substantial Completion.

D. Technical Service Inspection:

1. TREMCO to provide Technical Consulting Service or Full Time Inspection for 2 days at a cost of $ 750.00 per day to the Approved Contractors or Certified Contractor by the manufacturer in the installation of the Warranty System. None approved or certified contractor to have complete full time inspection for the length of the project.

PART 2 - PRODUCTS

2.1 GENERAL

A. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. All products are also 'or equal'. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1 and performance requirements in Part 2.

B. Any materials substituted must be done 10 days prior to bid to allow for all contractors to bid the substituted product. All substitutions requested must be submitted with information required in substitution request form.

2.2 SBS-MODIFIED ASPHALT-SHEET MANUFACTURERS

A. The roofing materials specified in this Section are based upon Tremco, Inc. products named in other Part 2 articles. Subject to compliance with requirements, provide the named product or an approved comparable product.

2.3 BASE-SHEET MATERIALS

A. Base Sheet: Fire resistant, smooth surfaced modified bitumen membrane modified with SBS/SEBS elastomers and reinforced with a high-tensile, fiberglass reinforcement. ASTM D6162, Type III, Grade S.

1. Tremco PowerPly Plus HT Smooth Modified Bitumen Ply Sheet.

2.4 ROOFING MEMBRANE CAP SHEETS, SBS-MODIFIED BITUMEN

A. Tremco PowerPly Standard FR GT24 Modified Bitumen White Granulated Capsheet.

2.5 FLASHING MATERIALS

A. Base Flashing Sheet: ASTM D 4434, Type IV, internally fabric reinforced, uniform, flexible TPA sheet, CRRC listed and California Title 24 Energy Code compliant.

1. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 300 lbf/in (52 kN/m).

2. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (0.44 kN).
3. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: machine direction, 25 percent; cross machine direction, 25 percent.
4. Thickness: 45 mils, nominal.
5. Exposed Face Color: White.
6. Reflectance, ASTM C 1549: 86 percent.
7. Thermal Emittance, ASTM C 1371: .86.
8. Solar Reflectance Index (SRI), ASTM E 1980: 108

B. Stripping/Target Ply Sheet: 28-lb coated base sheet reinforced with a glass fiber mat / glass fiber scrim.

C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

1. Tremco Burmesh Membrane

D. Flashing Membrane Bonding Adhesive, Low VOC: Elastomeric, low-VOC solvent-based contact-type adhesive for bonding TPA fleece-backed single ply membranes and flashings to substrates.

1. Asbestos Content, EPA/600/R-93/116: None.
2. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1475: 7.0 lb/gal (0.84 kg/L).
3. Percent solids: 25 percent minimum.
4. VOC, maximum, ASTM D 3960: 200 g/L.
5. Tremco Sheeting Bond

E. Water-Based Asphalt Primer: Water-based, polymer modified, asphalt primer with the following physical properties:

1. Asbestos Content, EPA 600/R13/116: None.
2. Non-Volatile Content, minimum, ASTM D 2823: 30 percent.
3. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 2 g/L.
4. Tremco Tremprime WB

F. Asphalt Roofing Mastic: ASTM D 4586, Type II, Class 1, one-part, asbestos-free, cold-applied mastic specially formulated for compatibility and use with specified roofing membranes and flashings.

1. Tremco Polyroof.

G. Flashing Sheet Stripping Adhesive:

1. Rock-it Adhesive.

H. TF Tape: manufacturer's term bar sealant.

I. General purpose sealant: Solvent free, low odor urethane sealant.

1. Tremseal D.

2.6 ADHESIVE MATERIALS

A. General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Cap Sheet and Stripping Ply Adhesive: One-part, asbestos-free, low-volatile, cold-applied adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following physical properties:

1. Asbestos Content, EPA 600 R-93/116: None.
2. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: <250 g/L.
3. Nonvolatile Content, minimum, ASTM D 6511: 75 percent.
4. Flash Point, minimum, ASTM D 93: 100 deg. F (38 deg. C).
5. Density at 77 deg. F (25 deg. C), ASTM D 6511: 8.0 lb/gal (950 g/L).
6. Uniformity and Consistency, ASTM D 6511: Pass.
7. Asphalt Content, minimum, ASTM D 6511: 40 percent.
8. Tremco PowerPly Standard LV Adhesive.

C. Lap Adhesive:

1. Tremco LF Adhesive.

2. Black, fast curing bituminons 2 component urethane adhesive for adhereing the 4 » PowerFast base membrane over lap seam. Coverage rate Is approximately 200 linear feet per case. One week lead time.

2.7 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

B. Fasteners: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

1. Tremco # 15 Mechanical Fasteners.

2. Tremco 2” Barbed Seam Plate.

C. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

1. 24 gauge sheet metal edge.

2. 24 gauge sheet metal heater flashing.

3. New wood curbs.

4. # 11 White Granules.

5. Solargard Seam Sealer.

6. ¼ Inch Dens-Deck Board.

2.8 ROOF INSULATION

A. None.

2.9 WOOD BLOCKING AND CURBS

A. Lumber:

1. Douglas Fir free from warping and visible decay; pressure-treated with chromated copper arsenate (CCA) to meet AWPB, LP-22, 0.40 retention, and marked.

    a. Wood nailers: match insulation height x 6" minimum.

    b. Curb height: minimum 8" off finished roof surface, or as high units will allow.

B. Plywood sheathing:

1. APA C-D, Plugged and Touch Sanded, Exposure 1, PS 1-83.

2. Thickness: match existing.

C. Woodfiber cant: 4" x 4".

2.10 METAL FLASHINGS

A. Metal edge flashing:

1. Twenty-four (24) gauge minimum, Galvwash, ready to paint steel; commercial quality, Fed. Spec. QQ-S-775, Type I, Class D or ASTM A 526 or lock forming quality ASTM A 52.

    a. Rise: ¼".

    b. Fascia: extend ½" longer than existing edge metal line. Match where metal extends down the entire fascia.

B. Termination bar:

1. Aluminum bar:

    a. 1/8 x 1 inch (3.2 x 25.4 mm).

C. Work shall be in accordance with Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

2.11 MECHANICAL FASTENERS

A. Base sheet fasteners:

1. Tremco #14 Fasteners with 2" Barbed Plates:

a. Coated fasteners.

b. Sufficient length to penetrate deck per manufacturer's requirements.

B. Wood to wood:

1. Galvanized, common, annular ring nail.

2. Length: Sufficient to penetrate underlay blocking 1-1/4 inches (32 mm).

C. Wood to masonry:

1. Anchor bolts, 1/2 inch (12.7 mm) diameter with 5/8 inch (15.9 mm) washer.

D. Galvanized sheet steel to wood blocking:

1. FS FF-N-105B(3) Type II, Style 20, roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.

2. Length: Sufficient to penetrate wood blocking 1-1/4 inches (32 mm) minimum.

E. Galvanized sheet steel to galvanized sheet metal (Counterflashing extensions):

1. Self-tapping sheet metal screws of 1/2 inch length and a minimum #3 diameter, with 5/8" steel/EPDM washer under head.

F. WALKWAYS AND RUBBER BLOCKS

1. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition, slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 1/2 inch thick, minimum, with the following physical properties:

2. Rubber Blocks: 100% rubber blocks with steel channels and reflective strips designed for supporting conduit, Dura-Blok or equal.

PART 3 - EXECUTION

3.1 REMOVAL AND EXAMINATION

A. Remove and properly dispose of existing roofing, related roofing materials, flashings, abandon curbs and pipes, and any owner identified equipment to leave all portions of the building decks in a fit condition to have new roof system installed.

1. Install new supports and plywood decking where curbs and other penetrations are removed and replaced.

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

B. All rotted or deteriorated wood shall be removed and replaced. Deck type and attachment shall conform to local code requirements. Fastener heads shall be recessed into the wood surface.

1. Wood deck repairs:

a. Remove loose nails and pound down all high nails.

b. Reattach loose panels at 6 inches o.c. at edges; 12 inches o.c. at intermediate supports.

c. Remove deteriorated deck panels. Examine joists for rot. If unsound, contact Owner immediately for additional action.

d. Attach new decking 6 inches o.c. at edges; 12 inches o.c. at intermediate supports.

e. Provide 1/8 inch (3.2 mm) gap between panels at panel edges.

C. Substrate inspection:

1. The Applicator shall inspect the substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect the quality of work.

2. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.

3. Verify that roof openings and penetrations are in place and braced and that roof drains are securely clamped in place.
4. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that the nailers match thicknesses of insulation.
5. Use sheet metal to cover any irregularities in the wood deck.
6. Proceed with installation only after unsatisfactory conditions have been corrected.
7. All broken and disconnected conduits must be reattached and repaired by the Applicator.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Protection:

1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.
2. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
3. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each work day or before arrival of inclement weather.
4. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
5. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and

equipment movement. Move equipment and ground storage areas as work progresses.

6. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Spilled or scattered debris shall be cleaned up immediately. Removed material to be disposed from roof as it accumulates.

7. At end of each working day, seal removal areas with water stops along edges to prevent water entry.

8. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s recommendations. Have specification and product data sheets on the job site.

B. Start installation of built-up roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing built-up roofing system.

D. Coordinate installing roofing system components so insulation and roofing membrane sheets are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing mastic with joints and edges sealed.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Cold Process Asphalt Heating

1. An in-line heat exchange unit may be used to facilitate application

   a. Do not exceed maximum adhesive temperature of 100° F.

2. Heat exchange unit: Use heat transfer oil approved by heating equipment manufacturer.

3. Follow operation procedures recommended by heating equipment manufacturer.

F. Details not addressed in specification shall be in accordance with NRCA Manual Plates and recommendations, and the Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

3.4 TAPERED INSULATION INSTALLATION

A. Install tapered insulation behind curbs to achieve proper water flow.

3.5. DENS-DECK INSTALLATION:

A. Mechanically fasten ¼ inch Dens-Deck Board to wood deck with Tremco Fasteners and Plates at a rate on 6 fasteners and Plates per board. Install in all four corners and two down the center.

3.5 BASE-SHEET INSTALLATION

A. Install lapped course of base sheet starting at low point of roof system. Extend over terminations and beyond cants.

1. Unroll base ply membrane and relax for a minimum of 30 minutes.

2. Plan installation so base ply membrane lap seams will not directly align with lap seam from cap sheet.

3. Place modified base ply membrane at low point of roof and shingle upwards.

   a. Overlap side laps 4 inches and end laps 6 inches.

4. Start at one end of the sheet and install mechanical fasteners (screws and plates) along the center of the side lap.
5. Fastener/plate spacing shall be 9 inches on center for the perimeter sheets and 16 inches on center maximum for all field sheets.
6. Install fasteners to set the seam plate tight to the membrane. Do not overdrive fastener. Do not ripple or wrinkle the membrane.
7. Adhere side and end laps with the specified adhesive. Open laps can be sealed with approved heat welder. Apply pressure to laps. Ensure all side and end laps are fully adhered/welded and water tight.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
2. Install cap sheet so that cap sheet ply lap seams alternate with the base ply membrane laps.
3. Embed cap sheet in cold-applied membrane adhesive applied at a rate of 2.5 gals/100 sq. ft. minimum.
4. Immediately use 75lb. single ply roller to roll in all cap sheet. Roll towards end laps.
5. Apply seam sealer sealant in the gap between edge metal and edge of modified membrane.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Install roofing membrane sheets so side and end laps shed water. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.

3.7 FLASHING

A. General flashing requirements:
1. Elastomeric Flashing:

a. Adhere elastomeric flashing sheet completely to flashing surface, cant, and roofing with flashing adhesive. Prime surface as required. Apply adhesive in full coverage to both the substrate and to the back side of the flashing membrane. Allow adhesive to dry to the touch.

b. Apply consistent pressure to entire surface of elastomeric flashing sheet using a steel hand roller to achieve full adhesion of the sheet to the flashing substrate. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 4 inches. Fully heat weld flashing laps.

c. Elastomeric flashing sheet width: Sufficient to extend at least 6 inches beyond toe of cant onto new roof.

d. Seal horizontal edge of elastomeric flashing sheet with a five-course application of Rock-it Adhesive and fiberglass reinforcement.

e. Embed # 11 White Granules into the “wet” adhesive.

f. Seal vertical edge under counterflashings with termination bar and butyl tape secured at 8” o.c..

g. Seal vertical edge at curbs with a skirt metal with TF tape secured at 8” o.c..

h. Do not caulk cut edges of elastomeric flashing sheet until they have been inspected by manufacturer’s representative.

2. Hot air heat welding of TPA:

a. Wipe both sides of lap surfaces to be joined with solvent approved by manufacturer.

b. Adjust welding equipment air temperature prior to start. Utilize steel roller or weighted wheel on

automatic welding equipment to provide pressure on lap area during heat welding.

c. Maintain air nozzle temperature, nozzle speed, and lap pressure when joining laps together.

d. Test lap areas to assure proper bonding. Remove lap sample from the roof. When lap sample is cool, pull test lap apart. When torn, the reinforcing scrim should become exposed. Patch test areas with new TPA of the same color and style, using a minimum 2" lap area.

e. Wipe top of lap seams with approved solvent and apply silicone sealant. Tool sealant to a coved bead.

3. Base flashing height:

a. Not less than 8 inches without manufacturer's written approval. If height of base flashing exceeds 30 inches, a Termination Bar with butyl tape must be installed at the midpoint of the sheet. Heat weld a strip of elastomeric flashing sheet over the batten bar.

4. Two-Ply Stripping for metal flanges:

a. Set flange in modified mastic. Seal flange with two stripping plies embedded in specified adhesive. Extend first ply a minimum 8 inches beyond flange and the second 14 inches beyond flange. Carefully rub in the ply to insure complete adhesion.

B. Edge Detail:

1. Install nailers to match insulation as required.

2. Extend base sheet over nailers.

3. Prior to setting and nailing horizontal flanges of metal edge flashing, trowel 1/16 inch uniformly thick layer of mastic to roofing surface receiving metal flange.

4. Fabricate and install metal edge flashing with formed drip edge incorporating 3/4 inch lock.

5. Secure fascia bottom with 3/4 inch lock to continuous cleat secured with galvanized steel roofing nails or screws at 6 inches o.c. into the fascia. Insure minimum 1" penetration into nailer. Cleat shall be 1 gauge heavier than fascia and have a maximum flange width of 1 inch.

   a. Gap fascia ends 1/2 inch; overlap cleat joints - 1 inch. Cover fascia ends with cover plate profiled to fascia with a 1" longer flange. Set cover in elastomeric mastic; screw to wood blocking through gap between fascia joints.

6. Nail interior portion of flange to wood blocking or wood decking with 2" long galvanized steel roofing nails at 3 inches o.c., staggered ½".

7. Prime metal flange with asphalt primer.

8. Install stripping for metal flanges as described in general flashing requirements section.

9. Fasten termination bar with appropriate fasteners at a minimum of 8 inches on center.

C. Curb flashings:

1. Curbs must be a minimum of 18" from any other flashing detail and must be a minimum of 8" off the finished roof surface including crickets and tapered insulation.

2. Install elastomeric flashing sheet as described in general flashing requirements section.

3. Extend flashing sheet to completely cover solid topped curbs.

4. Secure top edge of flashing membrane to vertical substrate with skirt metal and one layer of butyl tape secured 8 inches o.c. maximum.

5. Wipe top of bar clean with metal cleaner. Prime metal surface to receive sealant with metal primer. Allow to dry.

6. Caulk top of bar with polyurethane sealant. Provide watershed. Tool neatly.

7. Seal all holes, screws, and penetrations on equipment with polyurethane sealant.

D. Wall flashings:

1. Minimum height of base flashing 8”.

2. Adhere cant strip to flashing base in a continuous application of adhesive.

3. Fully adhere flashing sheet to approved substrate.

4. Secure at 8” oc with base sheet nails.

5. Three-course vertical edge of flashing sheet with fibrated mastic and fiberglass reinforcement.

E. Plumbing vents, pipe penetrations, and supports:

1. Penetrations must be a minimum of 18” from any other flashing detail and must be a minimum of 8” off the finished roof surface including crickets and tapered insulation.

2. Wedge plumbing vent and pipe penetrations tight against deck.

3. Seal base of penetrations with polyurethane mastic within 24 hours of cap installation.

4. Install field fabricated TPA flashing boot tight to penetration.

   a. Adhere to field of roof with flashing adhesive.

   b. Seal top of flashing with polyurethane sealant.

   c. Strip in with a five-course application of Rock-It and Burmesh.

5. Install TPA umbrellas to counterflash. Install butyl tape between umbrella and penetration. Clamp with stainless steel pipe clamp. Prime and caulk top of clamp with polyurethane sealant. Umbrellas must extend a minimum of 3” down the vertical edge of the penetration flashing.

6. Install pelican hood, NRCA MB-15, for multiple pipes and insulated pipes coming through the deck in the same location.

F. T-Tops and other galvanized flashings:

1. Prime top and bottom of base and set in a bed of mastic.

2. Secure with screws at 4" o.c..

3. Install two (2) ply stripping for metal flanges as described in general flashing requirements section.

G. Roof Drains:

1. Install ply system as specified.

2. Install zinc flashing sheet primed and set in a bed of mastic through drain sump.

3. Install two stripping plies extending a minimum 12" and 24" past flashing sheet.

4. Complete cap installation.

5. Clamp roofing system and drain flashing with clamping ring. Insure bolts and washers are tight.

6. Test all drains for proper flow and water tightness. Correct defects.

H. Scupper drains:

1. Inspect nailers to assure proper attachment and configuration.

2. Install base and ply sheets as specified.

3. Install new 22 gauge galvanized scuppers set in a ¼" bed of fibrated mastic. Assure all box seams are closed and soldered.

4. Fasten flange of scupper every 3 inches o.c. staggered.

5. Prime at a rate of 200 sq. ft. per gallon.

6. Install two (2) ply stripping for metal flanges as described in general flashing requirements section.

7. Install base flashing as described in general flashing requirements extending through the scupper.

8. Install a face plate and seal the outside of the scupper with polyurethane sealant. Use colored sealant matching the color of the wall.

I. Overflow Scuppers:

1. Inspect nailers to assure proper attachment and configuration.

2. Install roof system and base flashing as specified.

3. Install new clad metal scupper. Assure all box seams sealed.

4. Fasten flange of scupper every 3 inches o.c. staggered.

5. Strip in and seal with elastomeric membrane.

6. Install a face plate and seal the outside of the scupper with polyurethane sealant. Use colored sealant matching the color of the wall.

J. Pipe/conduits sitting on roofs shall be set on and clamped to new rubber blocks with steel channels.

1. Support lines every 10 feet on pipe runs along with support on each side of every union, junction, and direction change.

3.8 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads from roof access to and surrounding all serviceable equipment.

1. Set pads in a spot application of solvent free mastic.

2. Do not coat walkway pads.

3.9 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Owner.

B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.