SECTION 07 14 13

HOT FLUID-APPLIED WATERPROOFING

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\*\* NOTE TO SPECIFIER \*\* Barrett Company ; hot fluid-applied rubberized asphalt waterproofing.  
This section is based on the products of Barrett Company , which is located at:  
2926 Chester Ave.  
Cleveland, OH 44114  
Toll Free Tel: 800-647-0100  
Tel: 908-647-0100  
Fax: 908-647-0278  
Email: [request info (info@barrettroofs.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Barrett+Company+&coid=30815&rep=&fax=908-647-0278&message=RE:%20Spec%20Question%20(07141bcr):%20%20&mf=)  
Web: <http://www.barrettroofs.com>   
 [ [Click Here](https://www.arcat.com/arcatcos/cos30/arc30815.html) ] for additional information.  
For over 10 decades the Barrett Company has had hands-on experience, professionally engineered products, and systems in the high-performance roofing and waterproofing markets.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Hot fluid-applied waterproofing for vertical application.
    2. Hot fluid-applied waterproofing for horizontal application, including:
       1. Installation at roof deck areas.
       2. Installation under concrete slabs.
    3. Drainage panel.
    4. Protection course.
    5. Plaza deck materials.
    6. Ballast.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
    2. Section 04 20 00 - Unit Masonry.
    3. Section 06 10 00 - Rough Carpentry.
    4. Section - .
    5. Section 07 18 13 - Pedestrian Traffic Coatings.
    6. Section 07 21 19 - Foamed-In-Place Insulation.
    7. Section 07 62 00 - Sheet Metal Flashing and Trim.
    8. Section 07 72 13 - Manufactured Curbs.
    9. Section 07 91 23 - Backer Rods.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
       1. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
       2. ASTM C140 - Standard Practice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing.
       3. ASTM C203 - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
       4. ASTM C272 - Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions.
       5. ASTM C293 - Standard Test Method for Flexural Strength of Concrete, Using Simple Beam with Center-Point Loading.
       6. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
       7. ASTM C542 - Standard Specification for Lock-Strip Gaskets.
       8. ASTM D5 - Standard Test Method for Penetration of Bituminous Materials.
       9. ASTM D8 - Standard Terminology Relating to Materials for Roads and Pavements.
       10. ASTM D36 - Standard Test Method for Softening Point of Bitumen, Ring-and-Ball Apparatus.
       11. ASTM D297 - Standard Test Methods for Rubber Products - Chemical Analysis.
       12. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
       13. ASTM D461 - Standard Test Methods for Felt.
       14. ASTM D471 - Standard Test Method for Rubber Property - Effect of Liquids.
       15. ASTM D573 - Standard Test Method for Rubber - Deterioration in an Air Oven.
       16. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
       17. ASTM D645 - Standard Test Method for Thickness of Paper and Paperboard.
       18. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
       19. ASTM D1149 - Standard Test Methods for Rubber Deterioration - Cracking in an Ozone Controlled Environment.
       20. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
       21. ASTM D1671 - Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials.
       22. ASTM D1777 - Standard Test Method for Thickness of Textile Materials.
       23. ASTM D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
       24. ASTM D2240 - Standard Test Method for Rubber Property - Durometer Hardness.
       25. ASTM D3617 - Standard Practice for Sampling and Analysis of Built-Up Roof Systems During Application.
       26. ASTM D3776 - Standard Test Methods for Mass Per Unit Area, Weight, of Fabric.
       27. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
       28. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus.
       29. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
       30. ASTM D4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
       31. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
       32. ASTM D4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing.
       33. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
       34. ASTM D5295 - Standard Guide for Preparation of Concrete Surfaces for Adhered, Bonded, Membrane Waterproofing Systems.
       35. ASTM D4716 - Standard Test Method for Determining the, In-plane, Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
       36. ASTM D5295 - Standard Guide for Preparation of Concrete Surfaces for Adhered, Bonded, Membrane Waterproofing Systems.
       37. ASTM D6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
       38. ASTM E96 - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
    2. American Concrete Institute (ACI):
       1. ACI 301 - Specifications for Structural Concrete.
    3. Canadian General Standards Board (CGSB):
       1. CGSB 37.50-M89 - Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing.
    4. National Roofing Contractors Association (NRCA).
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data:
        1. Manufacturer's data sheets on each product to be used.
        2. Preparation instructions and recommendations.
        3. Storage and handling requirements and recommendations.
        4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern and color.
    2. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
     2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
     3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
       1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
       2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
       3. Retain mock-up during construction as a standard for comparison with completed work.
       4. Do not alter or remove mock-up until work is completed or removal is authorized.
  1. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
     2. Protect from damage due to weather, excessive temperature, and construction operations.
  3. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  4. WARRANTY
     1. Manufacturer's standard limited Ten year warranty for labor and materials, including the membrane, membrane flashings, protection course, insulation and drainage medium.

1. PRODUCTS
   1. MANUFACTURERS
      1. Barrett Company, which is located at: 2926 Chester Ave.; Cleveland, OH 44114; ASD Toll Free: 800-647-0100; Phone: 908-647-0100; Email: \_\_\_\_\_\_\_\_; Web: www.barrettroofs.com.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete articles not required.

* 1. WATERPROOFING MEMBRANE
     1. Basis of Design: RamTough 250 SBS Kraton; as manufactured by Barrett Company.
        1. Performance Requirements:
           1. Testing Per CGSB 37.50-M89:

Flash Point: 621 degrees F (327 degrees C).

Penetration at 77 degrees F (25 degrees C): 0.32 inches (8.3 mm).

Penetration at 122 degrees F (50 degrees C): 0.650 inches (16.5 mm).

Flow: 0.20 inches (0.5 mm).

Toughness: 11.7J.

Ratio of Toughness, J/N to Peak Load: 0.059.

Adhesion: 1.

Water Vapor Permeance: 0.39 ng/Pa.s.sm.

Water Absorption: 0.0078 ounces (0.22 g).

Crack Bridging at 77 degrees F (25 degrees C): No delamination, no loss adhesion, no cracking.

Heat Stability at 77 degrees F (25 degrees C): 80.

Heat Stability at 122 degrees F (50 degrees C): 155.

Low Temperature Flexibility at negative 13 degrees F (negative 25 degrees C): No delamination, no loss adhesion, no cracking.

* + - 1. Description: Hot polymeric waterproofing, modified bitumen with inert mineral stabilizer.
    1. Uncured Neoprene Flashing Sheet:
       1. Performance Requirements:
          1. Thickness Tolerance, ASTM D412: Plus or minus 10 percent.
          2. Specific Gravity, ASTM D297: 1.48 plus or minus 0.05.
          3. Minimum Tensile Strength, ASTM D412: 1500 psi (10.34 MPa).
          4. Minimum Ultimate Elongation, ASTM D412: 250 percent.
          5. Hardness, Durometer A, ASTM D2240: 60 plus or minus 10.
          6. Minimum Tear Resistance, ASTM D624, Die C: 120 lbs/in. (13.6 Nm).
          7. Brittleness Temperature, ASTM D746: Negative 30 degrees F (negative 34 degrees C).
          8. Flame Resistance, ASTM C542: Pass.
          9. Resistance to Aging, ASTM D573: 10 percent.
          10. Resistance to Oil Aging, ASTM D471: 80 percent.
          11. Ozone Resistance, ASTM D1149: No cracks, pass.
          12. Resistance to Water, ASTM D471: 10 percent.
          13. Water Vapor Permeance, ASTM E96: 0.07 perms.
       2. Basis of Design: RamFlash 327 HDR Sheet; as manufactured by Barrett Company.
    2. Related Materials:

\*\* NOTE TO SPECIFIER \*\* Delete material options not required.

* + - 1. Ram Primer & Surface Conditioner: Solvent based primer for preparing surface prior to hot rubberized asphalt.
      2. PolyFelt 125, Reinforcing Fabric: 16 mil lightweight thermally bonded spun laid non-woven fabric reinforcement.
      3. PolyFelt 125 VP, Reinforcing Sheet: Spun bond polyester fabric with a heat resistant resin binder.
         1. Performance Requirements:

Basis Weight, ASTM D3776: 0.20 oz./sq.ft. (60 grams/sq.m.).

Grab Tensile, ASTM D4830: 34/lb. MD 32/lb. CD.

Elongation, ASTM D4830: 37 percent MD, 42 percent CD.

Trapezoid Tear, ASTM D4830: 14 MD 12 CD.

Ames Thickness, ASTM D1777: 9.5 mils.

Fatigue Life, ASTM D8B: Minimum 10,000 cycles.

* + - 1. Ram 306, Cap Ply: Complying with ASTM D6164, Type I, Grade G.
      2. RamFlash 327, Flashing Membrane: elastomeric sheet comprised of uncured neoprene sheet 60 mils(1.52mm)
      3. RamFlash PMMA System, Cold-Applied Flashing System: Comprised of a two-component polymethyl methacrylate primer, reinforcing fleece and membrane system.
      4. Pitch Pockets and Umbrella Covers: Fabricated from 16 ounce cold rolled copper with stainless steel drawband and sealant cove.
      5. Roof Drains: Slightly depressed or flush with concrete slab.
      6. Fasteners: As specified by fastener Manufacturer and approved by membrane Manufacturer for specific application.
      7. KeeneSeal 100, Joint Sealant: Single component silyl-terminated polyether elastomeric sealant that meets ASTM C920.
  1. DRAINAGE PANELS
     1. Description: Drainage materials with a drainage core and filter fabric recommended by waterproofing manufacture.

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: Ram DD 025; as manufactured by Barrett Company.
       1. Material: Polymeric 1/4 inch (6.4 mm) cuspate core with a nonwoven filter fabric.
       2. Flow rate 9 gpm per foot (112 lpm per m).
    2. Basis of Design: Ram DD 050; as manufactured by Barrett Company.
       1. Material: Polymeric 7/16 inch (11 mm) cuspate core with a nonwoven spunbonded filter fabric with a high flow rate.
       2. Flow rate 18 gpm per foot (224 lpm per m).
    3. Basis of Design: Ram EN 36 013; as manufactured by Barrett Company.
       1. Material: Polymeric entangled net prefabricated composite drain 0.13 inches (3.3 mm) thick, zig- zag geometric patterned core, drainage mat with a layer of non-woven geotextile.
    4. Basis of Design: Ram EN 36 025; as manufactured by Barrett Company.
       1. Material: Polymeric entangled net prefabricated composite drain 0.25 inches (6.4 mm) thick, zig- zag geometric patterned core, drainage mat with a layer of non-woven geotextile.
    5. Basis of Design: Ram EN 36 045; as manufactured by Barrett Company.
       1. Material: Polymeric entangled net prefabricated composite drain 0.45 inches (11 mm) thick, zig- zag geometric patterned core, drainage mat with a layer of non-woven geotextile.
  1. PROTECTION COURSE
     1. Description: Manufacture protection course materials recommended by application.

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: Ram 200; as manufactured by Barrett Company.
       1. Material: Fiberglass sheet, smooth surfaced 3.0 mm (118 mil) heavy-duty fiberglass reinforced rubberize sheet.
    2. Basis of Design: Ram 203; as manufactured by Barrett Company.
       1. Material: Fiberglass sheet, smooth surfaced 2.2 mm (86 mil) medium-duty fiberglass reinforced rubberize sheet.
  1. PLAZA DECK MATERlALS

\*\* NOTE TO SPECIFIER \*\* Delete material options not required.

* + 1. Insulation: Dense, rigid, extruded polystyrene insulation, designed for plaza applications.
       1. Performance Requirements:
          1. Thermal Conductivity at 75 degrees F (24 degrees C), ASTM C518: 0.20K.
          2. Compressive Strength, ASTM D1621: Minimum 60 psi (414 kPa).
          3. Flexural Strength, ASTM C203: Minimum 75 lbs/in (8.5 Nm).
          4. Water Absorption, ASTM C272 : 0.1 percent.
          5. Water Vapor Permeance, ASTM E96: 0.3 to 0.8 perms.
          6. Dimensional Stability, ASTM D2126: Maximum 2 percent.
       2. Basis of Design: Foamular; as manufactured by Owens-Corning.

\*\* NOTE TO SPECIFIER \*\* Delete thickness option not required.

* + - 1. Thickness: As indicated on Drawings.
      2. Thickness: \_\_\_\_\_.
    1. Paver Units: Exposed aggregate precast concrete units.
       1. Performance Requirements:
          1. Compressive Strength, ASTM C140: Minimum 8000 psi (55,160 kPa).
          2. Water Absorption, ASTM C140: Maximum 5 percent.
          3. Freeze and Thaw Resistance, ASTM C67: Maximum 1 percent loss.
          4. Flexural Strength, ASTM C293: 600 psi (4140 kPa).
       2. Pedestals: Westile Pavers.
       3. Size: 24 x 24 x 2 inches (610 x 610 x 51 mm).

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

* + - 1. Color: To be selected by Architect.
      2. Color: As indicated on Drawings.
      3. Color: \_\_\_\_\_\_.
  1. BALLAST
     1. Stone Ballast: Clean graded rock ballast:
        1. Size: 3/8 to 1 inch (9.5 to 25 mm) diameter.
        2. Weight: 15 pounds (6.8 kg) per square foot (0.09 square meters) for 2 inches (51 mm) of insulation.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Additional Weight: 5 pounds (2.3 kg) per square foot (0.09 square meters) for each additional inch (25 mm) of insulation.
      2. Minimum Weight at Roof Perimeter: 20 pounds (9.1 kg) per square foot (0.09 square meters) for 20 foot (7300 mm) width.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Remove all dirt, trash, debris, grease, oil, water, moisture and other contaminates from the footings and walls which may affect the bond of the membrane to application surface.
      2. Condition of Surface: Any new concrete surfaces shall be wood float finish ACI 301-11.7.3 and comply with ASTM D5295 requirements. All concrete shall have cured for a minimum of 28 days or, alternatively, pass the ASTM D4263 and the NRCA deck dryness tests. All surfaces shall be dry, clean, firm and free from laitance, frost, dust, dirt, oil, unapproved curing compounds or other foreign matter detrimental to the performance of the waterproofing membrane. Contractor shall certify no wax base curing compounds have been used.
      3. Before commencing work, examine all areas and report in writing to Architect any conditions that will adversely affect successful installation. Do not begin work until the conditions have been addressed and corrected. Voids, cracks, holes and other damaged surfaces shall be repaired with materials compatible with waterproofing membrane.
      4. Expansion Joints: Expansion joints shall be sharply formed and free of broken edges, loose aggregate and completely free of preformed joint fillers, sealants or back-up materials to a depth that is at least twice the width of the joint. Chamfer edges of the joint.
      5. Contractor shall verify concrete surfaces are properly cured, dry, and reasonably smooth and in conformance with ASTM D5295 standard guide for concrete surface preparation. Prepare other surfaces according to respective Manufacturer's published instructions. Use cleaning materials and methods necessary to render an acceptable dust- free surface, including oil-free filtered compressed air or high speed power blowers. Protect adjacent areas from damage with tarpaulins or other durable materials.
      6. Temporary protection to installed membrane is required to prevent damage by mechanical gouging, scraping, spilling of oil and solvents or excessive heat.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
      2. Surface Conditioner: Each day, prior to application of waterproofing membrane, apply surface conditioner, as a fine spray at a rate of approximately 1 gallon (3.8 L) per 300 to 600 square feet (27.9 to 37.2 square meters). Allow to dry completely tack free. Do not allow primed surface to be contaminated with construction debris or dust barrier. Re-prime and allow to dry as may be required by job conditions.
      3. Application: Units of waterproofing membrane shall be melted in an approved double-jacketed melter under continuous agitation until the material can be drawn free-flowing and lump- free at a temperature of approximately 350 to 400 degrees F (177 to 204 degrees C). Flash foundation footing before application of vertical wall waterproofing. The waterproofing membrane shall be applied at a rate to provide a continuous coating with a minimum thickness of 90 mils (2.3 mm) and averaging 125 mils (3.12 mm) over all wall surfaces.

\*\* NOTE TO SPECIFIER \*\* Delete application options not required.

* + 1. Horizontal Application:
       1. Hot fluid applied membrane shall be applied in a width exceeding the reinforcement fabric roll width and spread with a non-serrated smooth squeegee. While membrane is hot and tacky, install specified reinforcement, brooming in place from the side of the fabric. Side laps shall be a minimum of 2 inches (51 mm) with lap placement so that the water flows over them and not against them. All laps shall be sealed with hot membrane under lap. In no place shall fabric reinforcement touch fabric reinforcement. End laps shall be 6 inches (152 mm). Carry fabric reinforcement up all vertical wall surfaces a minimum of 8 inches (203 mm). Conduct adhesion and thickness checks every hour with a pull tab and thickness gauge.
       2. After reinforcement fabric has been placed and broomed in, install second layer of membrane, a minimum of 125 mils (3.12 mm) thick, at all points of the deck and walls. Carry slab applications up vertical wall surfaces a minimum of 8 inches (203 mm) completely covering fabric. Do not leave any reinforcement fabric uncovered at the end of day's work or in inclement weather. Complete installation of all plies each day including cap sheet.
       3. Embed protection course into hot membrane simultaneously with the 125 mil (3.12 mm) application. End laps shall be minimum 6 inches (152 mm). End laps and selvage laps shall be fully embedded in hot membrane. Spot touch-up work may be done with hot air guns. Bleed out of hot membrane at all side laps shall be evident.
       4. After protection course is installed, install granular flashing sheet at all exposed base flashing conditions, followed by installation of the termination bar, sealant and counterflashing.
    2. Vertical Application:
       1. Precut sheet membrane to desired lengths. Apply membrane vertically in lengths up to 8 feet. Apply the sheet membrane to the hot or still warm waterproofing membrane substrate, removing release paper. Press and roll firmly in place with hand roller as material is placed in position. On higher walls apply membrane in multiple lifts of two or more sections with the upper sheets overlapping the lower sheets by a minimum of 3 inches (76 mm). Roll all membrane with a steel hand roller. Install termination bar at top of lower sheets prior to installation of higher sheets.
       2. At the top terminations, press the membrane firmly to the wall with steel roller and secure with a termination bar. Seal all laps and termination bars with a toweling of hot waterproofing membrane before the end of each work day. Deck membrane shall overlap vertical wall membrane by 12 inches (305 mm).
    3. Crack Treatment: At all cracks and construction joints, apply waterproofing membrane with a 6 inch (152 mm) wide strip of flashing over the joint or crack and embed into the warm membrane. Avoid air pockets. Allow assembly to cool. Flashing should be installed before the continuous, unbroken thick film of bitumen and reinforcement felt is applied over the entire application surface and flashing areas in accordance with Part 3 of this Specification.
    4. Expansion Joints: Over expansion joints, up to 2 inches (51 mm) in width with a designed total movement of 50 percent or less, neoprene flashing shall be placed over the joint as shown on the drawings and embedded into a 125 mil (3.12 mm) thick coating of waterproofing membrane. The sheet shall be looped into the joint 1-1/2 times the joint width at maximum opening and extend 8 inches onto the substrate on each side of the joint. The sheet shall be covered and the loop coated with waterproofing membrane. Install 1-1/2 inch (38 mm) foam rod and second sheet of neoprene flashing looped over the foam rod. Extend sheet 12 inches (305 mm) onto the wall on each side of the joint. Overcoat flange on each side.
  1. FLASHING
     1. Base Flashing Base Ply:
        1. Complete base flashing base ply work before doing flat field application. Carry hot applied membrane and reinforcement up all junctions of horizontal deck and vertical surfaces, all changes of plane, all cold joints and cracks as indicated on the drawings. At all parapets, walls, curbs, penetrations, drains, edges, and other changes of plane, install neoprene flashing with hot fluid applied membrane as shown on the drawings, extending to top of the flashing over the base of membrane coat and polyester reinforcement.
        2. Apply the neoprene flashing tight to all substrates starting the installation on the flat and working the sheet into place in upward direction. Finished sheet shall be completely adhered with no unsupported bridging at the change of plane. Over-coat sheet with another 125 mil (3.12 mm) coat of the fluid applied membrane. Application width of neoprene flashing sheet shall be a minimum 3 inches (76 mm) in any single direction or more as required by field conditions.
     2. Base Flashing Cap Ply: Do not install the base flashing cap ply until the flat field of the roof is completed. Precut sheet across the roll to install in 36 inch (914 mm) wide sheets. Embed SBS granular cap sheet membrane into hot fluid applied membrane extending flashings out onto the field of the roof 3 inches (76 mm) minimum and up vertical surfaces 8 inches (203 mm) minimum and 24 inches (610 mm) maximum. Overlap shall be 3 inches (76 mm) minimum. Mechanically fasten top to the substrate with 1/8 inch (3.2 mm) thick flat bar stock termination bar and mechanically fasten 8 inches (203 mm) on centers. Counterflashing is required.
  2. PROTECTION COURSE
     1. Install specified protection course over the membrane, rolling in place with steel hand roller. Provide 3 inch (76 mm) side laps and 6 inch (152 mm) end laps. Seal all laps with mastic or fluid-applied membrane.
  3. DRAINAGE MAT
     1. Install specified drain mat over the waterproofing protection course starting drain panels so that the fabric lap is facing the perimeter conditions. Seal the lap to the perimeter. Place adjacent panels so that the cores are butted together. Place successive fabric laps over adjacent panels and secure at 3 inch (76 mm) intervals with adhesive or duct tape. Join roll ends by peeling back the fabric and cutting off 4 inches (102 mm) of the drain core. Place drain panel ends so that the cores are butted together and then glue or tape the 4 inch (102 mm) fabric overlap 3 inches (76 mm) on centers.
     2. On vertical applications measure full height, add 4 feet (1219 mm), and cut from roll. At the top of the wall, glue 2 feet (610 mm) of fabric on the flat deck. Gently drape the balance of the mat down the wall allowing an extra 2 feet (610 mm) to fall over the drain at the bottom. Backfill, by hand, as soon as possible.
  4. INSULATION AND BALLAST
     1. Insulation: Ensure that membrane, flashing and other associated work is completed and tested. Upon acceptance of the waterproofing application, install extruded polystyrene insulation directly on the protection course with open channel sides down in accordance with manufacturer's requirements and recommendations.
        1. Stagger end joints.
        2. Tightly abut all boards.
        3. The maximum acceptable opening between boards is 1/4 inch (6.4 mm).
        4. Provide temporary ballast and filter fabric as required to prevent wind damage.
        5. In multiple layer applications, all joints shall be staggered.
     2. Pavers: Specified paver units shall be set on specified pedestals in areas indicated to line and grade as shown, with uniform joint width.
        1. Adjust pedestal elements so that precast paver has bearing on all four corners.
        2. Where cutting is required, it shall be done with a high-speed masonry saw producing clean sharp edges.
        3. Precast paver units shall fit to within 1/4 inch (6.4 mm) of all projections and walls or as shown on drawings.
        4. Protect units in place from soiling or damage during the construction process.
        5. Replace any units damaged prior to Owner acceptance.
        6. Provide shims as required to align paver surface with existing elements and other pavers.
     3. Stone Ballast: Install in accordance with insulation manufacturer requirements.
  5. FIELD QUALITY CONTROL

\*\* NOTE TO SPECIFIER \*\* Delete testing options not required.

* + 1. Flood Test: Each contiguous area shall be water tested with 2 inches (51 mm) of standing water for a 48 hour period.
       1. Provide for overflow in the event of rain.
       2. Flood tests shall be witnessed and approved by Architect and Manufacturer.
       3. An electric field vector mapping may be used in lieu of the flood test.
    2. Electric Field Vector Mapping (EFVM):
       1. After installation of the waterproofing membrane and protection board and prior to the placement of the remaining system components or overburden. An EFVM is required, conducted by a surveyor approved by the Architect and waterproofing manufacturer.
       2. The EFVM wires shall remain in place with lead wires located in an area accessible after placement of the overburden and approved by the Owner and Architect.
       3. A detailed CAD drawing and report of the EFVM survey shall be furnished to the Owner, Manufacturer, and Architect prior to proceeding with the placement of the remaining system components or overburden.
    3. Adhesion Tests and Thickness Tests shall be monitored by Applicator every hour throughout the application process.
    4. Test Cuts shall be made at locations requested by Architect or Manufacturer:
       1. Remove one 12 x 12 inch (305 x 305 mm) un-surfaced cut per 100 squares of waterproofing area.
       2. Follow field audit criteria outlined by ASTM D3617 practice.
       3. Laboratory results shall be submitted by the laboratory directly to the Architect.
       4. Repair sampled areas in accordance with Manufacturer's recommendations.
    5. Correct any deficiencies in the membrane, if any, as prescribed by material Manufacturer and approved by the Architect.
  1. CLEANING AND PROTECTION
     1. Remove equipment, trash, debris and any excess material from the jobsite.
     2. Repair damage and remove any stains caused by work of this Section.
     3. Protect finished waterproofed areas from damage during subsequent construction.

END OF SECTION