

HOT RUBBERIZED ASPHALT

HOT APPLIED WATERPROOFING MEMBRANE



SECTION 07 14 00 - HOT APPLIED RUBBERIZED ASPHALT WATERPROOFING MEMBRANE

PART I: GENERAL

1.01 General Requirements

- A. The General Conditions, the Supplementary Conditions, the Instructions to Bidders and Division One General Requirements shall be read in conjunction with and govern this section.
- B. The Specification shall be read as a whole by all parties concerned. Sectioning of the Specification is for convenience. Each Section may contain more or less than the complete work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their work.

1.02 Description

- A. Supply labor, materials, plant, tools and equipment to complete the Work as shown on the Drawings Architectural Division as specified herein including, but not limited to the following:
 1. Deck Surfaces (by others)
 2. Two-ply (2) Hot Applied Rubberized Asphalt Waterproofing Membrane System
 3. Asphalt Primer
 4. Reinforcement Fabric
 5. Neoprene Flashing
 6. Protection Board
 7. Drainage Board
 8. Sealant
 9. Termination
 10. Separation Sheet
 11. Extruded Insulation (Optional)

1.03 Related Work

- A. Division 2 Site Work
- B. Division 3 Concrete Structural
- C. Division 4 Masonry
- D. Division 5 Structural Steel
- E. Division 6 Rough Carpentry Thermal
- F. Division 7 Sealants & Flashings
- G. Division 15 Mechanical

1.04 References

- A. The following standards are applicable to this section:
 1. ASTM D41: Asphalt Primer used in Roofing, Dampproofing, and Waterproofing
 2. ASTM D92: Standard Test Method for Flash and Fire Points by Cleveland Open Cup
 3. ASTM D5329: Standard Test Method for Concrete Joint Sealants
 4. ASTM D3407: Standard Test Method for Joint Sealants, Hot Poured, for Concrete and Asphalt Pavements
 5. ASTM E96: Water Vapor Transmission of Materials
 6. CGSB 37-GP50M: Hot Applied, Rubberized Asphalt for Roofing and Waterproofing
 7. UL Inc.: Class A Classification

1.05 Shop Drawings

- A. Prior to commencing the Work, submit references indicating that the materials proposed have been installed on projects of similar scope and nature.
- B. Prior to commencing the Work, submit manufacturers complete set of standard details for cold applied liquid waterproofing.

1.06 Delivery, Storage, and Handling

- A. Delivery of materials:
 1. Materials shall be delivered to the jobsite in undamaged and clearly marked containers indicating the name of manufacturer and product and shall have UL markings.
- B. Storage of Materials:
 1. Hot rubberized asphalt should be stored in closed containers outdoors.
 2. Store primer at temperatures of 40 degrees F and above to facilitate handling. Keep solvent away from open flame or excessive heat.
 3. Store roll materials on end.
- C. Handling of Materials:



1. Primer contains solvent and is flammable. Do not use near open flame.
2. Melting equipment shall consist of a double jacketed kettle indirectly air heated or containing a high flash point heat transfer oil and mechanical agitator.
3. Avoid overheating of hot rubberized asphalt. Recommended application temperature is 356 degrees F to 395 degrees F. Do not heat above 419 degrees F.
4. Pallets shall be shrink wrapped and secured prior to being lifted onto roof.

1.07 Project/Site Conditions

- A. Environmental Requirements :
 1. No installation work shall be performed during rainy or inclement weather and on frost or wet covered surfaces.
- B. Protection:
 1. Temporary protection of the membrane shall be provided to prevent mechanical damage or damage from spillage of oil or solvents until such time as permanent protection is provided.
 2. Do not permit traffic of any kind over unprotected waterproof membranes. Apply protection board as soon as possible after installation of membrane.
- C. Ensure all preparation work is complete prior to installing waterproofing membrane.

1.08 Submittals

- A. Submit document stating that the applicator of the primary membranes specified in this Section are recognized by the manufacturer as suitable for the execution of the Work.
- B. Copies of manufacturers' current product data: Membrane, primers, sealants, adhesives and associated auxiliary materials shall be included.
- C. Manufacturers' complete set of standard details for the roofing membrane system.
- D. Certify that waterproofing components are supplied and warranted by single source manufacturer.

1.09 Quality Assurance

- A. Installer:
 1. Submit copies of manufacturers' current product data: Membrane, primers, sealants, and adhesives.
 2. Perform work in accordance with the printed requirements of the waterproofing membrane manufacturer and this specification.
 3. Maintain one copy of manufacturer's instructions on site.
 4. At the beginning of the work and at all times during the execution of the work, allow access to work site by the waterproofing membrane manufacturer's representative.
 5. Mock-Up: Where directed, construct typical assembly incorporating substrate, primer and waterproofing membrane. Allow 24 hours for inspection of mock-up before proceeding. Mock-up may remain as part of the work.
- B. All components used in this section shall be furnished by one manufacturer, including primary membrane, liquid sealants, primers, mastics, and adhesives. Primary membrane shall meet CGSB 37-GP-50-M89.
- C. The rubberized asphalt membrane product shall be resistant to acids (fertilizers, building washes and acid rain).
- D. Pre-Construction Conference:
 1. With prior notice, manufacturers of the waterproofing/roofing membrane will meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the waterproofing assembly.

1.09 Warranty

- A. Contact Pli-Dek Systems, Inc. for warranty information.

PART II: MATERIALS

2.01 Materials

- A. Components and membrane materials must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.
 1. Acceptable Manufacturer: Pli-Dek Systems, Inc.
 41610 Date Street # 104
 Murrieta, CA 92562
 800-364-0287
 Web Site: www.plidek.com



2.02 Waterproofing Membrane (Basis-of-Design)

- A. Primary waterproofing membrane shall be PD-HR manufactured by Pli-Dek, hot-applied rubberized asphalt composed of a specially selected blend of refined asphalts, synthetic rubber and mineral stabilizers, and having the following physical properties:
1. Solids Content: 100%
 2. Low Temperature Flexibility and Adhesion: No cracking, delamination or loss of adhesion @ 13 degrees F in accordance with CGSB 37-GP-50-M89
 3. Flow (1/8inch film on 75% angle for 5 hours @ 140 degrees F): No flow in accordance with ASTM D5329
 4. Cone Penetration: More than 10 @ 32 degrees F, less than 110 @ 77 degrees F, less than 200 @ 122 degrees F in accordance with ASTM D5329
 5. Water Absorption: Gain of 0.09g in accordance with CGSB 37-GP-50-M89
 6. Flash Point (Open Cup): 545 degrees F in accordance with ASTM D92
 7. Water Vapor Permeance (3mm Film): 0.01 perms in accordance with ASTM E96 Procedure A and 0.02 perms in accordance with ASTM E96 Procedure E
 8. Ratio of Toughness to Peak Load: 0.04 min. in accordance with CGSB 37-GP-50-M89
 9. Toughness: 9.2J in accordance with CGSB 37-GP-50-M89
 10. Crack Bridging Capability: No cracking, splitting or loss of adhesion in accordance with CGSB 37-GP-50-M89
 11. Heat Stability (5 hours @ 390 degrees F): Meets flow, penetration and low temperature flexibility in accordance with CGSB 37-GP-50-M89.1
 12. Recycled content: 11% for standard membrane

2.03 Primer:

- A. Asphalt Primer:
1. Asphalt Primer conforming to ASTM D41-85 shall be asphalt penetrating primer as manufactured by Pli-Dek.
 2. Applied at 200 square feet per gallon.

2.04 Flashing, Expansion and Transition Joints

- A. Exposed flashings and expansion joint membrane shall be Neoprene Flashing having a minimum thickness of 60 mils, manufactured by Pli-Dek Systems, Inc.

2.05 Separation Sheet:

- A. Granulated separation sheet membrane shall be an asphalt impregnated protection sheet having a ceramic granule top surface, reinforced with a non-woven polyester reinforcement, designed specifically for hot mop applications, and having the following physical properties in accordance with ASTM D6164 Type 1, Grade G.
1. Thickness: 0.140 inches 140 mils
 2. Tensile strength @ 0 degrees F: 113 lbf/inch (md), 100 lbf/inch (xd)
 3. Elongation @ 0 degrees F: 40% (md & xd)
 4. Low temperature flexibility: -15 degrees F

2.06 Joint Treatment and Fabric Reinforcement Mesh

- A. Joint Treatment and Reinforcement Mesh, open weave glass fabric yarn saturated with synthetic resins complying with ASTM D1668, Type I, shall be Pli-Dek PD-2014 Reemay Fabric manufactured by Pli-Dek Systems, Inc.

2.07 Protection Board:

- A. Waterproofing accessories must be obtained from an acceptable manufacturer to ensure total system compatibility and integrity.
1. Acceptable Manufacturers:
 - a. APOC 5520 Protection Panels
West Coast – 813.248.2101
East Coast – 562.432.6471
 - b. PB4 Board – 800.241.4402

2.08 Polyurethane Termination Sealant:

- A. Termination Sealant shall be a polyurethane sealant; moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
1. Compatible with roofing and waterproofing membranes and substrate,

2. Complies with Fed. Spec. TT-S-00230C, Type II, Class A
3. Complies with ASTM C 920, Type S, Grade NS, Class 25
4. Remains flexible with aging.

2.09 Termination Bar

- A. Termination bars shall be continuous aluminum, stainless steel or galvanized metal, 1/8" x 1" in size and shall be pre-drilled for non-corrosive screw attachment on a maximum of 8" o.c.

2.10 Prefabricated Drain Boards

1. Contact Pli-Dek Systems, Inc. for job specific requirements.

2.11 Gravel Ballast or Concrete Pavers

- A. Plaza Deck Pavers: Heavyweight, hydraulically pressed, concrete units, square edged, factory cast for use as roof pavers; absorption not greater than 5 percent, ASTM C140; no breakage and maximum 1 percent mass loss when tested for freeze-thaw resistance, ASTM C78 and as follows:
 1. Size: 24 x 24 x 2"
 2. Compressive Strength: 7500 psi, minimum ASTM C 140
 3. Colors and Textures as selected by architect
 4. Available Manufacturers:
 - a. Hanover Architectural Products, Inc.
 - b. Wausau Tile, Inc. Terra-Paving Div.
 - c. Westile
 - d. Stepstone
- B. Pedestal Supports: For pavers shall be in accordance with the paver manufacturers' recommendations.
- C. Stone Ballast: Well screened and washed stone gravel meeting ASTM D-448-80, gradations #57, 2, 4 or 5.
- D. Concrete Pour Topping.

PART III: EXECUTION

3.01 Examination

- A. Acceptable substrates are cast-in-place concrete, concrete block (CMU), gypsum deck/wall sheathing and plywood. Metal pan decks to which concrete is poured must be venting type.
- B. Lightweight concrete is an acceptable substrate provided:
 1. The compressive strength of the concrete topping is minimum 2500 psi at 28 days.
 2. The density of the concrete topping is minimum 115 pcf.
 3. The deck is vented from the underside to facilitate drying. For composite steel deck construction, allow concrete to cure sixty (60) days.
 4. For cast-in-place concrete decks, a cure period of minimum twenty-eight (28) days is required prior to application of the membrane system, except as described above for composite decks. For cure times less than the stated minimum, contact Pli-Dek representative.
- C. Verify that surfaces and conditions are ready to accept the work of this section. Commencement of the work or any parts thereof shall mean acceptance of the substrate.
- D. Lightweight Insulating Concrete is not an acceptable substrate.
- E. Confirm the horizontal deck(s) are properly sloped to drain as required.

3.02 Preparation

- A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, frost or other contaminants. Fill spalled areas in substrate to provide an even plane and remove scaling or laitant concrete. Remove any foreign matter detrimental to the adhesion of the primary waterproofing membrane or membrane flashings.
- B. New concrete should be cured for a minimum of 28 days and must be dry before waterproofing membranes are applied. Concrete in vented metal pan decks must be cured a minimum of 28 days.
- C. Concrete shall have a broom finish. Steel float finishes are too smooth and compromise the adhesion of the waterproofing system. Decks with a steel float finish must be sandblasted or equivalent prior to the application of the waterproofing system.
- D. Prefabricated expansion joint assemblies should be in place prior to the application of the primary waterproofing assembly.
- E. Substrate Preparation for Sheathing over Metal Deck or Wood Blocking:
 1. Mechanically secure sheathing with type and sufficient quantity as recommended by the sheathing manufacturer and to meet maintain structure integrity and applicable code.



1. Lay sheathing with butted joints at right angles to flute direction. Joints occurring along the widths of the sheathing to continuously supported on a top flange of the metal deck.
2. Install sheathing such that all edge and end joints are supported by metal deck ribs and/or appropriate blocking. Stagger end joints of adjacent boards.
3. Prepare joints with minimum 12" wide PD-2014 Reemay Fabric placed in 90 mils of HR.
4. The contractor shall review all surfaces to receive the membrane and report any discrepancies prior to installing the waterproofing system.

3.03 Installation of Waterproofing Membrane

- A. Primer:
 1. Apply Asphalt Primer as recommended by manufacturer and allow to dry prior to the application of the primary waterproofing membrane or membrane flashings.
- B. Joint Treatment For Precast Concrete Deck:
 1. Reinforce joints along length and width of units with a strip of 12" wide PD-2014 Reemay Fabric placed in 90 mils of HR.
- C. Deck to Vertical Junctures:
 1. Apply HR membrane to provide a thickness of approximately 90 mils to the vertical faces and a minimum of 4" out onto the horizontal surface and 6" on the vertical face.
 2. Embed PD Neoprene Flashing placed in 90 mils of HR, avoiding any wrinkles or fishmouths, extending a minimum of 3" out onto the horizontal surface.
 3. Mechanically attach the flashing sheet to vertical surfaces with metal termination bar where height of flashing exceeds 12". Lap flashing sheet minimum 3" on ends.
 4. At monolithic pour, use PD Neoprene Flashing fabric reinforcement as option to flashing sheet.
- D. Expansion Joints (Neoprene):
 1. Expansion joint membrane can be applied in a bed of primary waterproofing membrane or adhered to substrate with expansion joint adhesive. Place PD Neoprene Flashing elastomeric sheet expansion joint membrane into expansion joint adhesive as recommended by manufacturers' written instructions.
 2. Loop PD Neoprene Flashing elastomeric sheet expansion joint membrane down into expansion joint, embedded into a 90 mils thick layer of HR membrane. Ensure that the depth of loop is a minimum 1½".
 3. Extend PD Neoprene Flashing elastomeric sheet expansion joint membrane minimum of 3" on each side of joint. Seal end joints a minimum of 6" and seal with a 90 mil coat of HR membrane. Fill loop with membrane as required.
 4. Secure top of expansion joint membrane with continuous fixing termination bar at vertical wall locations.
- E. Crack Treatment:
 1. Seal cracks and joints over 1/16" but less than ¼" in width with a 12" wide, Neoprene Flashing placed in 90 mils of HR membrane and a 6" wide strip of PD Neoprene Flashing, centered over joint.
 2. Seal cracks and joints 1/8" to ¼" in width and 12" wide, PD Neoprene Flashing placed in 90 mils of HR membrane and a 6" wide strip of crack treatment or expansion joint membrane, centered over joint.
- F. Membrane Flashing at Drains:
 1. Coat areas around the drains with 90 mils of HR.
 2. Place PD Neoprene Flashing sheet over the coated drain flange and extending a minimum 6" around the flange.
 3. Apply a second coat of HR membrane over the flashing sheet at a thickness of 90 mils.
 4. Apply clamping ring exerting sufficient pressure to affect a seal between clamping ring and membrane. Temporarily block all drains during the application of ballast, or other materials that might block the drains. Remove blocking when work is not in progress and upon completion.
- G. Membrane Flashing at Protrusions:
 1. At mechanical vent, protrusions and pipe penetrations provide flashing sheet set into 1/8" layer of HR membrane. Overcoat and seal with membrane. Install clamps as required.
 2. At pitch pockets, place pan on top of a 90 mil layer of membrane and attach into roof deck. Set flashing sheet into 90 mils of HR membrane over top of flange. Fill pitch pocket with rubberized asphalt or rubber asphalt sealer in order to shed water.
- H. Non-Exposed Membrane Flashing at Vertical Junctures:
 1. Apply self-adhering waterproofing membrane to prepared substrate in lengths of 6 feet or less.



2. Horizontal to vertical inside corner transition areas are to be pre-treated with a fillet bead of polyurethane termination sealant extending ¾" vertically and horizontally from the corner. Apply a minimum 10" wide strip of 90 mils of waterproofing membrane and PD Neoprene Flashing centered at the joint.
 3. All outside corners are to be pre-treated with a minimum 10" strip of waterproofing membrane centered at the joint. Apply a minimum 10" wide strip of 90 mils of waterproofing membrane and PD Neoprene Flashing centered at the joint.
 4. Where three or more planes come into contact reinforce with cut sections of waterproofing membrane reinforcing sheet as per manufacturer's instructions.
 5. Provide 2-1/2" laps at both sides and ends. Position for alignment and remove protective film. Press firmly into place. Promptly roll all laps with a counter top roller to affect seal. If more than one length is required on a vertical surface, apply in a shingle fashion.
 6. Terminate membrane using polyurethane termination sealant and counter flashing as indicated.
 7. All laps within 12" of a 90 degree change in plane are to be sealed with polyurethane termination sealant.
- I. Application of HR Membrane:
1. Ensure deck is ready to receive HR membrane.
 2. Apply Asphalt Primer to the surfaces at a rate of 400 – 500 per square foot with roller or spray.
 3. Apply first layer of HR membrane evenly to a minimum thickness of 90 mils to form a continuous monolithic coating over horizontal and vertical surfaces including previously reinforced areas.
 4. Apply fabric reinforcing sheet and firmly press into first layer of HR. Overlap fabric approximately ¼" ensuring that a layer of membrane is present between overlaps. Apply second layer of HR over the fabric to a minimum thickness of 1/8" (125 mils) providing a total thickness of 215 mils.
- J. Installation of Separation Sheet:
1. Separation Sheet shall be rolled onto HR membrane while still warm and tacky.
 2. Lap protection course 2" on side laps and 6" on end laps.
 3. Starting at the low points or drains lay the protection course membrane in full continuous sheets in a shingle pattern. Stager all end laps.
- K. Flood Test:
1. Upon the completion of the Primary Waterproofing Membrane, Protection Board and all associated terminations the contractor shall flood test the system. (ASTM D 5957)
 2. Provide temporary stops and plugs for the roof drains within the test area.
 3. Flood test with minimum 2" of water for no less than 24 hours.
 4. Repair and retest the system for no less than 24 hours, report all deficiencies to the Consultant.
 5. Remove temporary stops and plugs.
 6. No other Work is to proceed without prior direction from the Consultant.

3.04 Electric Field Vector Mapping (EFVM) (Alternative to Flood Test)

- A. EFVM to be completed in conjunction with the completion of waterproofing and prior to placement of root barrier or any other overburden.
- B. International Leak Detection, or pre-approved test provider will need to be contacted several weeks in advance to coordinate schedule.
- C. In the event of a breach of the membrane, repair and retest the system for no less than 24 hours,
- D. Report results of testing to the Consultant and Pli-Dek Technical Representative. Remove temporary stops and plugs.
- E. No other Work is to proceed without prior direction from the Consultant.

3.05 Insulation Application (Optional)

- A. Install insulation loose over the separation sheet, firmly butting each insulation board to surrounding board.
- B. The end joints of the insulation shall be staggered.
- C. The insulation shall be cut to fit closely to all cants, protrusions and obstructions.
- D. When installing multiple layers of insulation, the thickest layer is to be installed first. Install the second layer with joints staggered with the layer below.

3.06 Installation of Drain Board (Horizontal)

- A. Install Specified PD Drain Board as indicated on the drawings.



1. Clean horizontal surfaces of loose debris and unroll PD Drain Board fabric side up in the direction of maximum slope.
2. Attach PD Drain Board with double sided tape or adhesive that is compatible with waterproofing.
3. At overlaps, place adjacent panels so that cores abut.
4. Secure the fabric overlap at 5' intervals with glue or tape. All core joints must be covered by fabric overlay.
5. Place end panels so that cores abut, then glue or tape overlap.

3.07 Installation of Filter Fabric (Optional)

- A. Install filter fabric over the insulation as indicated on drawings. Overlap all edges a minimum 6". Do not use lengths of less than 6 feet.
- B. At all penetrations and roof drains cut and fit sections of filter fabric to surround the penetration or drain, extend up vertically and secure. Slit fabric to fit tightly over penetrations, cut out around roof drains and other openings.
- C. Extend fabric up perimeter and vertical surfaces where required or as indicated on drawings.
- D. Provide temporary ballasting over Filter Fabric as required preventing displacement until permanent covering material installed.

3.08 Field Quality Control

- A. Final Inspection and Approval:
 1. Final inspection of completed work shall be carried out by the owner's representative, the contractor and Pli-Dek Systems, Inc.

3.09 Installation of Gravel Ballast or Concrete Pavers

- A. Installation of gravel ballast or concrete pavers to be completed after placement of curbs details as indicated on drawings.
- B. Spread gravel ballast uniformly over the installed filter fabric according to insulation manufacturer's recommendations.
- C. Place concrete pavers, where indicated, on pedestals, accurately aligned, and leveled with upper surface of pavers in plane with adjacent units. Cut pavers to fit irregularly shaped areas and around protrusions. Install according to manufacturer's instructions.

3.10 Clean Up

- A. Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.
- B. Clean to the consultant's approval, soiled surfaces, spatters, and damage caused by work of this Section.
- C. Check area drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from the site.

END THIS SECTION

Disclaimer

Information contained in this specification conforms to standard detail and product recommendations for the installation of the Pli-Dek products as of the date of publication of this document and is presented in good faith. Pli-Dek Systems, Inc. assumes no liability, expressed or implied, as to the architecture, engineering or workmanship of any project. To insure that you are using the latest, most complete information, contact Pli-Dek Systems, Inc. at:

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* The Trained Applicator indicates certain employees of the company have been instructed in the proper application of Pli-Dek products and have received copies of the Pli-Dek Application Instructions and Specifications. The Trained Contractor Program is not an apprenticeship. Each trained contractor is an independent company and bears responsibility for its own workmanship. Pli-Dek Systems Inc. assumes no liability for the workmanship of a trained contractor

