

SECTION 07 50 01 - COLD FLUID APPLIED 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. Structural Concrete Plaza or Roof Decks (by others)
 2. Elastomeric Waterproofing Membrane
 3. Polyester Reinforcement Fabric
 4. Protection Course
 5. Drainage Composite
 6. UV Resistant Membrane
 7. Polyurethane Sealant
 8. Specified Backfill, Specified Paver, or Ballast System

1.03 Related Work

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|----|-------------|-------------------------|
| 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. ASTM C 836: High Solid Content, Cold Fluid Applied Waterproofing Membrane.

1.05 Submittals

- A. Prior to commencing the Work, submit shop drawings for the installation of the Pli-Dek CR Cold Fluid Applied Waterproofing System and accessories.
- B. Prior to commencing the Work, submit manufacturers complete set of standard details for Cold fluid applied waterproofing system.

1.06 Quality Assurance

- A. Perform Work in accordance with the printed requirements of the membrane manufacturer and this specification. Advise designer of any discrepancies prior to commencement of the Work.
- B. Maintain one copy of manufacturer's literature on site throughout the execution of the Work.
- C. At the beginning of the Work and at all times during the execution of the Work, allow access to site by the waterproofing membrane manufacturer's representative.
- D. Materials used in this Section including membranes, reemay fabric, protection course, drainage boards, and expansion joint membranes shall be fully compatible and shall be sourced and or produced by one manufacturer.
- E. Pre-construction jobsite meeting between the owner's representative, general contractor, waterproofing subcontractor, Pli-Dek representative, mechanical subcontractors; to walk the prepared surface and observe the conditions to receive the waterproofing system.

1.07 Delivery, Storage and Handling

- A. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- B. Cold fluid applied waterproofing membrane should be stored in closed containers.
- C. Store membrane at temperature of 40 degrees F and above to facilitate handling.
- D. Keep solvents away from open flame or excessive heat.



1.08 Environmental Requirements

- A. Store products in heated location until needed when temperatures fall below 40 degrees F.
- B. Minimum working temperatures shall take into consideration a factor for wind chill. Application temperature shall be considered to be the temperature minus half of the wind speed as recommended by the National Roofing Contractors Association (NRCA).

1.09 Coordination

- A. Ensure continuity of the waterproofing membrane throughout the scope of this section.
- B. Work shall be so scheduled as to provide a watertight seal at the end of each working day on the areas worked upon during the day.

1.10 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. Provide adequate protection of materials and work of this section from damage by weather backfilling operations and other causes.
 - 2. Protect work of other trades from damage resulting from work of this section. Make good such damage at own expense to satisfaction of the consultant.
 - 3. Apply protection course as soon as possible after installation of membrane.

1.11 Warranty

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

PART II: MATERIALS

2.01 Materials

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

2.02 Cold Fluid Applied Waterproofing Membrane (Basis-of-Design)

- A. Primary waterproofing membrane shall be Pli-Dek CR – Cold Fluid Applied Waterproofing Membrane manufactured by Pli-Dek, a moisture cure, solvent free elastomeric waterproofing compound having the following characteristics:
 - 1. Conforms to ASTM C 836
 - 2. Solvent content: 0%
 - 3. Non Flammable, Flash point > 450° F
 - 4. Elongation: 575%
 - 5. V.O.C < 40 grams/ Litre
 - 6. Can be applied to “green” concrete

2.03 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.

2.04 Expansion Joint Treatment

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

2.05 Exposed Membrane Flashing

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

2.06 Polyurethane Termination Sealant

- A. Termination sealant shall be; Polyurethane, a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:



1. Compatible with sheet air barrier, 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

2.07 Termination Bars

- 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.

2.08 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

2.09 Prefabricated Drain Boards

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

2.10 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. Lightweight insulating concrete is not an acceptable substrate.
- B. 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.
- C. 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 latent concrete. Remove curing compounds or any foreign matter detrimental to the adhesion of the primary waterproofing membrane or membrane flashings:
 1. All vertical walls which require repair will be treated with polyurethane sealant or sack and patch with cement as required.
 2. Insure all vertical surfaces are clean and contaminated free.
 3. All rough or damaged structural concrete surfaces shall be properly cleaned and all loose materials removed.
- B. New concrete should be cured for a minimum of 2 days and must be dry before waterproofing membranes are applied. Concrete in vented metal pan decks must be cured a minimum of 7 days.



- C. Concrete shall have a wood float/light broom finish. Decks with a steel float finish must be sandblasted or equivalent prior to the application of the waterproofing system.
- D. All stationary penetrations shall be properly prepared to receive the CR Waterproofing Membrane.
 - 1. Metal Penetrations require wire brush cleaning, to bright metal condition, to remove all rust and contaminates. Wipe the brush surface to remove dust and contaminates. Wipe the metal surface with solvent; MEK/Acetone/Xylene/Xylol/Alcohol or Vinegar.
 - 2. Plastic Penetrations require sanding to clean the surface condition, to remove all rust and contaminates. Wipe the sanded surface to remove dust and contaminates. Wipe the plastic surface with solvent; MEK/Acetone/Xylene/Xylol/Alcohol or Vinegar.
- E. All penetration reinforcement
 - 1. Apply 45 mils of CR to the penetration a minimum of 2" above the finish deck elevation and a minimum of 6" on the structural concrete deck.
 - 2. Embed PD-2014 Reemay Fabric with finger cuts going up the penetration to the full height of the base coat and 2" onto the structural deck.
 - 3. Apply 30 mils of CR over the installed PD-2014 Reemay Fabric.
 - 4. Install clamps and hoods as required.
 - 5. Where UV stable product is required contact Pli-Dek Systems, Inc.
- F. Expansion joint assemblies should be in place prior to the application of the primary waterproofing assembly. (Contact Pli-Dek for Expansion Joint preparation).
- G. Apply Polyurethane Sealant (ASTM C 920) at all transition in plane at the surface.
 - 1. Drain Bowl – Apply sealant at the perimeter of all drain bowls to seal the bowl to the concrete deck surface.
- H. Sealing of the walls in the areas adjacent to the new waterproofing will required.
 - 1. Properly repair as required all wall areas with sealant or sack and patch method.
 - 2. Seal all vertical walls with an approved, breathable elastomeric coating.

3.03 Installation of Crack Treatment and Flashing

- A. Joint Treatment for Precast Concrete Deck:
 - 1. Reinforce joints along length of concrete deck units with a minimum 12" wide strip of fabric reinforcement embedded into an 18" wide by 45 mil thick coating of the primary membrane.
 - 2. At joints occurring along the width of the precast units reinforce with a minimum 12" wide strip of crack treatment membrane embedded into an 18" wide by 45 mil thick coating of the primary membrane.
- B. Deck to Vertical Junctures:
 - 1. Place a 3/4" x 3/4" fillet of polyurethane sealant at the juncture of the wall/deck.
 - 2. Apply a 45 mil thick coating of the primary waterproofing membrane extending 4" onto horizontal and vertical faces.
 - 3. Embed flashing sheet flat into wet membrane extending a minimum of 3" out onto the horizontal and vertical surfaces, avoid wrinkles or fish mouths.
 - 4. When height of flashing sheet exceeds 12" mechanically attach the flashing sheet to vertical surface with metal termination bar. Lap flashing sheets a minimum of 3" on end laps and bond with 45 mils thick coating of primary membrane.
- C. Crack Treatment:
 - 1. Seal cracks and joints less than 1/8" in width with a 4" wide by 45 mil thick coating of the primary membrane and a 6" wide strip of PD-2014 Reemay Fabric centered over the joint.
 - 2. Seal cracks and joints more than 1/8" in width detail crack apply approved polyurethane sealant followed by a 30 mil detailed coat of cold applied waterproofing membrane, embed a 4" wide strip of PD-2014 Reemay Fabric complete with specified system on top.
- D. Membrane Flashing at Drains:
 - 1. Metal Penetrations require wire brush cleaning, to bright metal condition, to remove all rust and contaminates. Wipe the brush surface to remove dust and contaminates. Wipe the metal surface with solvent; MEK/Acetone/Xylene/Xylol/Alcohol or Vinegar.
 - 2. Plastic Penetrations require sanding to clean the surface condition, to remove all rust and contaminates. Wipe the sanded surface to remove dust and contaminates. Wipe the plastic surface with solvent; MEK/Acetone/Xylene/Xylol/Alcohol or Vinegar.
 - 3. Coat areas around the drains with a 30 mil thick coating of primary membrane.
 - 4. Place PD-2014 Reemay Fabric sheet over the coated drain flange and extending a minimum 6" around the flange.
 - 5. Apply a second coat of 30 mil thick elastomeric membrane over the flashing sheet.
 - 6. 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.

- E. Membrane Flashing at Protrusions and Penetrations:
1. Metal Penetrations require wire brush cleaning, to bright metal condition, to remove all rust and contaminates. Wipe the brush surface to remove dust and contaminates. Wipe the metal surface with solvent; MEK/Acetone/Xylene/Xylol/Alcohol or Vinegar.
 2. Plastic Penetrations require sanding to clean the surface condition, to remove all rust and contaminates. Wipe the sanded surface to remove dust and contaminates. Wipe the plastic surface with solvent; MEK/Acetone/Xylene/Xylol/Alcohol or Vinegar.
 3. At mechanical vent protrusions and pipe penetrations provide PD-2014 Reemay Fabric set into a 45 mil thick coating of CR waterproofing membrane.
 4. Embed PD-2014 Reemay Fabric with finger cuts going up the penetration to the full height of the base coat and 2" onto the structural deck.
 5. Apply 45 mils of CR to the penetration a minimum of 2" above the finish deck elevation and a minimum of 6" on the structural concrete deck.
 6. Overcoat and seal with membrane. Apply a minimum of 45 mils of CR over the treated area.
 7. Install clamps and hoods as required.
 8. Where PMA-UV is to be applied to extend above the finish surface, extend the base layer of CR and PD-2014 Reemay Fabric above the finish slab elevation a minimum of 2". Allow the CR to fully cure.
 9. Apply 2 layers of PMA-UV at 55 mils and allow the 1st coat to fully cure prior to application of the 2nd coat of 55 mils.
 10. Extend the PMA-UV over the CR with a minimum 3" overlap.
- F. Expansion Joints: Expansion joint assemblies should be in place prior to the application of the primary waterproofing assembly:
1. Properly prepare and installed required sealant and backer rod in the Expansion Joint prior to the installation of the waterproofing membrane. Elastomeric sheet membrane can be applied in a 60 mil bed of primary waterproofing membrane. Place elastomeric sheet membrane into primary liquid membrane. Coat the elastomeric sheet with 60 mils of the primary waterproofing membrane and extend the membrane a minimum of 6" beyond the elastomeric sheet on the adjacent concrete surface.
 2. Loop PD Neoprene Flashing elastomeric sheet membrane down into expansion joint, embedded into a 60 mil thick layer of primary waterproofing membrane. Ensure that the depth of loop is a minimum 1½".
 3. Extend PD Neoprene Flashing elastomeric sheet membrane minimum of 3" on each side of joint. Seal end joints a minimum of 6" and seal with a 60 mil thick coat of membrane. Fill loop with membrane as required.
 4. Secure top of expansion joint membrane with continuous fixing bar at vertical wall locations.
- G. Membrane Flashing at Protrusions:
1. Wall Juncture – ¾" fillet of sealant at the juncture of the wall.
 2. Penetrations – ¾" fillet of sealant at the intersection of the concrete deck and leg of the penetration.
 3. Drain Bowl – Apply sealant at the perimeter of all drain bowls to seal the bowl to the concrete deck surface.
- H. Plywood Seams and Metal Flashing:
1. At plywood seams, metal flashing transitions and dissimilar transitions (excluding expansion joints) apply a detail strip 4-6" wide at 45 mils. Embed 4-6" strips of PD-2014 Reemay Fabric into membrane. Once detailing has been completed allow to cure and apply specified system over the detail areas.

3.04 Cold Fluid Applied Elastomeric Membrane Application

- A. Vertical Standard Application
1. Ensure substrates are ready to receive primary waterproofing membrane.
 2. Apply membrane by squeegee or trowel ensuring full bond of membrane to substrate.
 3. Apply base coat layer of primary membrane evenly to a minimum thickness of 60 mils up to 120 mils based on job specific requirements, to form a continuous monolithic coating over horizontal and vertical surfaces including previously reinforced areas.
 4. Contact Pli-Dek Systems, Inc. for recommendation of the use of filter fabric as a walk able separation sheet.
- B. Horizontal Standard Application
1. Single Coat Application: Apply a full and continuous coat of primary waterproofing membrane with a trowel, long handled squeegee, roofing brush or spray. Apply membrane

at a rate of 5 gal. U.S./100ft.² to provide a minimum wet thickness of 60 mils ensuring no pinholes or blisters. Allow membrane to fully cure/dry prior to subsequent application coatings.

2. 90 mil Two Coat Application: Apply a full and continuous coat of primary waterproofing membrane with a trowel, long handled squeegee, roofing brush or spray. Apply first coat of membrane to provide a minimum wet thickness of 45 mils ensuring no pinholes or blisters. Allow membrane to cure/dry prior to second coat application of membrane to provide a minimum wet thickness of 45 mils ensuring no pinholes of blisters.
- C. High Build Application:
1. Apply first coat of Pli-Dek Waterproofing Membrane – CR shall be installed by squeegee, or trowel application at a rate of 90 mil (18 square feet per gallon) wet film thickness (WFT).
 2. Application of the PD-2014 Reemay Fabric into the wet CR shall have overlaps of 2” minimum and end laps of 4”. Stagger all end overlaps. Allow the first coat and Reemay to set a minimum of 24 hours prior to the installation of additional coats of CR.
 3. Application of the second coat of Pli-Dek Waterproofing Membrane – CR shall be installed by smooth squeegee application at a rate of 90 mil (18 square feet per gallon) for a total thickness of 120 mil minimum wet film thickness (WFT).
 4. Contact Pli-Dek Systems, Inc for recommendation of the use of a filter fabric as a walk able separation sheet.
 5. (Basis-of-Design) Embed a filter fabric material into the top of the specified coating system. This course is used to protect the membrane during the curing process from trade debris.

3.05 Curing and Protection

- A. Allow membrane to dry thoroughly. Protect from rain until fully cured. Allow membrane to fully cure prior to installing drainage composite, covering material or backfilling. Patch or repair damaged areas using same material as original coating.
- B. Protect cured membrane from damage caused by backfilling with drain boards prior to commencing backfill.

3.06 Flood Test

- A. Contractor shall flood test the system upon the completion of the horizontal waterproofing membrane applications.
- B. Provide temporary stops and plugs for the roof drains within the test area.
- C. Flood test with minimum 2” of water for 24 hours. (ASTM D 5957).
- D. Repair and retest the system for no less than 24 hours, report all deficiencies to the owners representative.
- E. Remove temporary stops and plugs.
- F. No other Work is to proceed without prior direction from the Consultant.

3.07 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.

3.08 Installation of Protection Course (Basis-of-Design)

- 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

3.09 Installation of Drain Board (Horizontal)

- A. Install specified PD Drain Board over cured membrane as indicated on the drawings.
 1. Clean horizontal surfaces of loose debris and unroll the 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.

3.10 Installation of Drain Board (Vertical)

- A. Align and hang drainage up to foundation wall. Position the bottom edge of PD Drain Board to be in moderate contact with weeping tile system.
- B. Secure PD Drain Board to foundation wall with nails and washers spaced 16" o.c. horizontally. Install minimum of 2 rows staggered and spaced 6" apart and min 6" from top edge.
- C. Align and install termination strip along top edge with nails spaced 12" o.c. and seal with termination sealant.
- D. Align and install moulding strip over completed top edge detail.
- E. Overlap end laps; pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.
- F. Bend PD Drain Board to create inside corners and cut board to create outside corners, provide 3" of extra fabric to wrap corner.
- G. Stagger or offset joints of PD Drain Board sheets.
- H. Place all subsequent sheets in an overlapping single fashion.
- I. Backfill bottom edge in conjunction with weeping tile system.

3.11 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 representative.

3.12 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.

3.13 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