



SIKAPLAN[®] MEMBRANE - STANDARD POST APPLIED SYSTEM – SPECIFICATION

SUGGESTED MASTER SPECIFICATION

SECTION 07 13 54 THERMOPLASTIC SHEET WATERPROOFING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. PVC sheet waterproofing for below ground structures.
- B. Related Sections include the following:
 - 1. Division 7 Section "Joint Sealants" for joint-sealant materials and installation.

1.03 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
- B. Shop Drawings: Show locations and extent of waterproofing. Include joints detail, pile head detail, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
 - 1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal supported concrete pavers.
- C. Samples: For the following products:
 - 1. 300-by-300-mm square of waterproofing.
 - 2. Geotextile.
 - 3. Ancillary Accessories as recommended.
- D. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.
- E. Qualification Data: For Installer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for waterproofing (to include accelerated aging tests).

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that is approved by waterproofing manufacturer for installation of waterproofing required for this Project.
- B. Source Limitations: Obtain waterproofing materials and protection through one source from a single manufacturer to ensure compatibility. The source of each system component shall be confirmed.
- C. Pre-installation Conference: Conduct conference at Project site.



1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and installation procedures, testing and inspection procedures, protection and repairs.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.
- C. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- D. Store rolls according to manufacturer's written instructions.
- E. Protect stored materials from direct sunlight.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

PART 2 PRODUCTS

2.01 SHEET WATERPROOFING

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide the following or similar as approved by the Engineer: [select one of the following in accordance with project conditions]
 1. SIKAPLAN WP 1130-15C
 2. SIKAPLAN WP 1130-20C
 3. SIKAPLAN WP 1130-25C
- C. PVC Sheet shall be 1 layer of loose laid [1.5, 2.0, 2.5]mm thick synthetic PVC twin color geo-membrane. The membrane shall be twin color with signal layer for visual indication when damage occurs as approved by Engineer. The PVC membrane should meet the following physical properties: [values based on 1.5mm membrane]

Property	Test Method	Required Limits
Thickness	ASTM D751	0.059 (1.5mm)
Tensile Strength	ASTM D638	1,600 psi min. (11.1 MPa)
Elongation at Break	ASTM D638	240% min.
Tensile Strength (after heat aging)	ASTM D638/D3045	1,500 psi min. (10.5 MPa)
Elongation at Break (after heat aging)	ASTM D638/D3045	225% min.
Dynamic Puncture Resistance	ASTM D5635	Pass @ 117.7 ft-pd (5 J)
Tearing Resistance	ASTM D1004	21.3 lbf min. (94.7 N)
Static Puncture Resistance	ASTM D5602	Pass @ 56 lbf (250 N)
Water Absorption	ASTM D570	2.0 % (7days @ 70°C)
Seam Strength (% tensile strength)	ASTM D638	90



2.02 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
 - 1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. PVC Anchor Strip: PVC Tape for anchoring PVC membrane at designated locations.
- C. PVC fixing disc: Rondels for providing support of the PVC membrane for vertical installation.
- D. Separation Layer: Manufacturer's standard non-woven needle-punched polypropylene geotextile minimum 500g/m² for vertical applications.
- E. Metal Termination Bars: Manufacturer's standard stainless-steel or aluminum bars pre-punched, or PVC coated sheet.
- F. Protection Layer: Manufacturer's standard non-woven needle-punched polypropylene geotextile minimum 500g/m² for vertical applications.
- G. Drainage Layer: Manufacturer's recommended three-dimensional, high-impact resistant polymeric grid with woven monofilament drainage fabric bonded to the grid.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
 - 1. Verify that substrates to receive waterproofing are clean, sound, smooth, free of fins and sharp edges, loose and foreign matter, oil and grease and anything detrimental to waterproofing membrane. Pitted surfaces must be repaired before membrane installation.
 - 2. Notify the Engineer in writing of anticipated problems using waterproofing over substrate.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

- A. Before commencing Works of this Section and as Works of this Section proceeds, sweep surfaces clean and remove debris, irregularities, standing water and any adhering materials which would impair works.
- B. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- C. Prepare, fill and treat joints in substrates in accordance with manufacturer's recommendations.
- D. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions in accordance with manufacturer's recommendations.

3.03 ANCHOR STRIP INSTALLATION

- A. Install manufacturer's recommended PVC anchor strip in accordance with the layout shown on the design drawings and approved shop drawings.



- B. Fully adhere PVC anchor strip to the substrate using the manufacturer's recommended epoxy resin in accordance with the manufacturer's written instructions.
- C. Allow the epoxy to fully cure prior to hot-air welding to the PVC anchor strip.

3.04 LEVELING LAYER INSTALLATION

- A. Carefully inspect the substrate prior to installation of the leveling layer. The surface shall be clean and smooth with no excessive surface roughness, contaminated surfaces or unsound substrates.
- B. Install manufacturer's recommended leveling layer over acceptable substrate, lapping all edges a minimum of 4 inches (10.2 cm).
- C. Install only as much leveling layer as can be made weathertight in one day.
- D. Fasten leveling layer to concrete wall using PVC fixing discs at a rate of one disc every 3 square feet (0.3 sq. meter).
- E. The leveling layer felt is to be cut with either scissors or utility blades. The use of hot air welding equipment to cut the product is not allowed.

3.05 FIELD QUALITY CONTROL

- A. Comply with manufacturer's most recent printed specifications and their specific recommendations for this project, except as modified in this section.
- B. At no time shall asphaltic materials or polystyrene be in contact with any PVC material of permanent installation. Equipment shall have no sharp edges and shall be clean and free of any asphaltic or coal tar products. Promptly remove any portion of PVC waterproofing contaminated by bituminous products.
- C. Workmen and all others that walk on waterproofing shall wear clean, soft-soled shoes so as not to damage materials. Heed all manufacturer's cautions and warning in regard to product use. Membrane is slippery when wet or covered with frost, snow and ice. Take proper precautions.
- D. Welding equipment shall be approved by the membrane manufacturer. All mechanics intending to use the equipment shall be trained and qualified and shall have successfully completed a course of instruction provided by Sika prior to welding.
- E. All surfaces to be welded shall be clean and dry, no contaminants shall be present within lap areas.
- F. Use standard size sheets to reduce the number of three-way overlaps. Obtain owner's approval of sheet sizes shown on shop drawings before ordering materials. Lay out work to minimize traffic over installed areas.
- G. Extend membrane full height of basement walls. Installation to be as shown on drawings. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.
- H. Vertical: Apply membrane onto surfaces as directed by manufacturer. Install a minimum 500 g/m² non woven needle punched polypropylene geotextile protection layer against vertical concrete as previously instructed. Loose lay membrane over geotextile spotwise anchoring with PVC fixing disks. Install a minimum 500 g/m² non woven needle punched polypropylene geotextile separation layer over membrane.



- I. All lap joints of sheets, to be double seam welded utilizing automatic dual seam welding equipment, and pressure tested. Thoroughly inspect the completed membrane at the end of each day's work as well as before the installation of protection layer.
- J. Have manufacturer's technical representative randomly check seams. Repair faulty seams.
- K. For all details of corners, membrane termination, pipe penetration, pile head treatment and the like, refer to the technical documents and approved shop drawings and provide, collars, metal clamps, sealant, etc.
- L. Make watertight seals to all items passing through the membrane such as ties, anchors, pipes, etc. to overcome any water penetration, sealing details to be as manufacturer's recommendations.
- M. Drainage Layer: Install composite drainage material over geotextile protection layer.
- N. Apply full coverage and overlap geotextile where necessary.
- O. Spot-adhere the separation layer geotextile to the membrane utilizing a "basket-weave" system of strips of PVC membrane spot welded to the membrane and woven through the geotextile.

3.06 SEPARATION LAYER INSTALLATION

- A. The manufacturer's recommended separation layer shall be applied over the completed waterproofing membrane and overlapped a minimum of 4 inches (10.2 cm). Spot adhere the separation layer geotextile to the membrane utilizing a "basket-weave" system of strips of PVC membrane spot welded to the membrane and woven through the geotextile.
- B. The separation layer is to be cut with either scissors or utility blades. The use of hot air welding equipment to cut the product is not allowed.

3.07 INSTALLATION OF DRAINAGE PANELS

- A. Install drainage panels directly over the separation layer. Drainage panels can be supported from the top of wall or spot adhered with adhesive or double stick tape.
- B. Splice panels together by butting longitudinal edges of adjacent sheets and peeling back fabric to expose the cores of the panels. Overlap the core dimples of each panel and reattach fabric over the panel joint overlapping any excess fabric to the adjacent sheet.
- C. Neatly trim drainage panels to fit closely around the base of all projections. Trim panel edge to ensure that water will flow freely from panels into drain openings. Cut the core around penetrations, and cut and "X" in the filter fabric and tape the fabric to the sides of the penetration.
- D. Cover all cut edges of the drainage composite with an integral fabric flap by tucking the fabric around the edge of the core and adhering the fabric to the bottom of the core.
- E. Proceed with installation of insulation (if specified), or backfill, promptly; do not leave filter fabric or panel exposed to direct sunlight for more than one week.

3.08 MONITORING OF INSTALLATION OF FINISHING LAYERS AND BACKFILL

- A. The waterproofing Applicator shall monitor finishing layer installation and backfill operations to assure no damage is done to the waterproofing membrane. The type of backfill is to be approved by the designer and owner.



- B. Backfill materials shall be satisfactory soil material, free of all foreign matter, clay, rock, gravel larger than 1 inch (25.4 mm) in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
- C. Backfill materials must be placed carefully and evenly adjacent to structures, piping or conduit to required elevations. Prevent wedging action of backfill against structures. Backfill is to be placed uniformly in lifts around the structure.
- D. No large rocks are to be allowed against the waterproofing system.
- E. Alert all parties concerned of any activities that might adversely affect the long-term performance of the waterproofing.

3.09 FIELD QUALITY CONTROL

- A. Visual inspection of the membrane should be made prior to covering with protection layer to check for damage indicated by breaches in light colored signal layer.
- B. Air pressure tests will be carried out on all double seam welds, acceptable pressure drop in the channel between the two welds with starting pressure of 2 bar after minimum 300 seconds is less than or equal to 20%.
- C. The applicator must be approved by the manufacturer and be able to demonstrate his participation in the manufacturer's training.

3.10 PROTECTION AND CLEANING

- A. Do not permit excessive foot traffic or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

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