

SUGGESTED MASTER SPECIFICATION

SECTION 07 13 26(54) PRE-APPLIED SHEET MEMBRANE WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. The work of this section includes, but is not limited to, blindside pre-applied sheet membrane waterproofing that forms an adhesive and mechanical bond to poured concrete for the following applications:
 - 1. Horizontal Applications: Membrane applied on prepared subbase prior to placement of concrete slabs.
 - 2. Vertical Applications: Membrane applied against formwork, or soil retention system prior to placement of concrete foundation walls.
 - 3. Waterstops for sealing concrete construction joints, pipe penetrations, and knock-outs.

1.02 RELATED SECTIONS

- A. Section 03 10 00 - Concrete Forming and Accessories
- B. Section 03 15 13 - Waterstops
- C. Section 03 20 00 - Concrete Reinforcing
- D. Section 03 30 00 - Cast-In-Place Concrete
- E. Section 31 20 00 - Earth Moving
- F. Section 31 62 00 - Driven Piles
- G. Section 31 64 00 - Caissons

1.03 REFERENCES

- A. American Society for Testing and Materials International (ASTM)
 - 1. ASTM C 836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
 - 2. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
 - 3. ASTM D570 Standard Test Method for Water Absorption of Plastics
 - 4. ASTM D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
 - 5. ASTM D 1876 Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)
 - 6. ASTM D1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
 - 7. ASTM D3767 Standard Practice for Rubber - Measurement of Dimensions
 - 8. ASTM D5385 Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
 - 9. ASTM E96 Standard Test Method for Water Vapor Transmission of Materials
 - 10. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

1.04 SUBMITTALS

- A. Manufacturer's Product Data, installation instructions for waterproofing membrane system, and representative membrane samples for approval.

- B. LEED Submittals – Provide LEED submittal information as required.
- C. Shop Drawings: Manufacturer to provide shop drawings of the entire sub-grade waterproofing system showing locations and extent of all waterproofing materials, waterstops, and accessories including details of substrate joints, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, integration with air barrier system, and other termination conditions.
- D. Mock-up Panels: Mock-up panels as specified herein shall be constructed by the Contractor at locations selected by the Architect, to test all products specified in this Section and arrive at acceptable methods of installation.

1.05 QUALITY ASSURANCE

- A. Manufacturer’s Qualifications: Sheet membrane waterproofing system manufacturer shall be ISO 9001 certified and demonstrate a minimum of fifteen (15) years continuous, successful experience in production of waterproofing membranes.
- B. Installer Qualifications: Sheet membrane waterproofing system installation shall be performed by one Contractor, approved by the waterproofing manufacturer, and shall have at least three (3) years of experience in work of the type required by this section.
- C. Manufacturer Technical Representatives: Membrane manufacturer shall provide trained direct company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conduct a final inspection upon successful completion of the installation.
- D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions, to coordinate this work with related and adjacent work, and to review special details.
- E. Give a minimum of five (5) days’ notice to the owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
- F. Contractor shall attend necessary job meetings and furnish competent and full-time supervision, experienced mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the membrane installation in accordance with this specification.
- G. Materials: Obtain primary sheet membrane waterproofing and all joint sealing and waterstop materials of each type required from a single manufacturer. Manufacturer to provide waterproofing shop drawings.
- H. Backup Preparation: The Contractor shall prepare the backup surfaces to accept the approved waterproofing system in the manner necessary to comply with all requirements of the membrane manufacturer and architect. Backup preparation shall be guided by the following:
 - 1. Mock-up areas shall be used to determine required methods and tools to obtain degree of backup preparation required by the membrane manufacturer. Prepare and clean a three (3) foot by three (3) foot areas of each substrate material type.
 - 1. Schedule Coordination: Schedule work such that the membrane will not be left exposed to jobsite conditions for longer than that recommended by the manufacturer. Manufacturer or manufacturer’s representative to be on site during waterproofing installation.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer’s original and unopened labeled packages. Store and handle in strict compliance with manufacturer’s instructions. Protect from damage from weather, excessive temperature, and construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

1.07 CODE REQUIREMENTS

- A. Work shall be performed in accordance with the more stringent requirements of these specifications, the Local Building Code, OSHA, or other governmental authorities including Federal, State, and Local, having jurisdiction.

1.08 FIELD CONDITIONS

- A. Perform work only when weather conditions as well as ambient and substrate temperatures are within the limits established by the manufacturer of the sheet membrane waterproofing system. Do not apply waterproofing in snow, rain, or mist.
- B. Proceed with installation only when the substrate construction and preparation work is complete and is suitable to support sheet membrane waterproofing.

PART 2 PART

2.01 MANUFACTURER

- A. **Sika Corporation**, 201 Polito Ave. Lyndhurst, NJ 07071; Phone: 201-933-8800; usa.sika.com
- B. Source Limitations for Waterproofing System: Obtain primary sheet membrane waterproofing and all joint sealing and waterstop materials of each type required from a single manufacturer.

2.02 MATERIALS

- A. Basis of Design: Pre-applied and Post-Applied Integrally Bonded Sheet Waterproofing Membrane: **SikaProof® A+** by **Sika Corporation**, a flexible sheet membrane consisting of a flexible polyolefin membrane and a hybrid bonding layer with a cement modified polymer. The membrane shall form a continuous and permanent dual bond (mechanical and adhesive) to poured concrete or existing concrete to prevent lateral water migration between the membrane and structural concrete
 - 1. Pre-Applied Applications:
 - a. Horizontal Applications (Underslab)
 - A. Sika; SikaProof® A+12
 - b. Vertical Applications (Pre-Applied in formwork or blindside)
 - A. Sika; SikaProof® A+12
 - 2. Post-Applied Applications:
 - a. Horizontal Applications (Post Applied – Top of Exposed Slab/Footing)
 - A. Sika; SikaProof® A+12 with SikaProof® Adhesive-22
 - b. Vertical Applications (Post Applied on walls)
 - A. Sika; SikaProof® A+12 with SikaProof® Adhesive-22
- B. Provide membrane with the following physical properties:

Property	Test Method	Result
Color		Yellow
Thickness (nominal)	ASTM D 3767	1.70mm (0.07in.)
Lateral Water Migration Resistance	ASTM D 5385 modified	Pass at 71m (231 ft.) of hydrostatic head pressure head pressure
Resistance to Hydrostatic Head	ASTM D 5385 modified	71m (231 ft.) min.
Low Temperature Flexibility	ASTM D 1970	Pass at -29°C (-20°F)
Tensile Strength ¹	ASTM D 412	830 psi (5.7 MPa) min.
Elongation ¹	ASTM D 412	1400% min.
Crack Cycling	ASTM C 836	Pass at -26°C (-15°F)
Peel Adhesion to Concrete	ASTM D 903	20 lbs/in. min.
Lap Peel Adhesion	ASTM D 1876	30 lbs/in. min.
Permeance	ASTM E 96 Method B	3.45ng/Pa x s x m ² (0.06 perms)
Puncture Resistance	ASTM E 154	200 lbs (670 N) min.
Radon Permeability (SPA-12)	Certificate E-214/2011	(5.3 +/- 0.7) x 10 ⁻¹² m ² /s

2.03 ACCESSORIES

- A. SikaProof® Tape A+N: Self-Adhesive tape for pre-applied internal jointing, detailing, and transitions.
- B. SikaProof® ExTape-100: Self-Adhesive tape for post-applied SikaProof® A+ membrane seams
- C. SikaProof® Adhesive-22: Cementitious adhesive for application of SikaProof® A+ membrane to concrete
- D. Sikagard 7600: 2 Component Liquid Applied Membrane for detailing on submerged applications.
- E. Sikalastic HLM5000GC: 1 Component Liquid Applied Membrane for detailing on non-submerged applications.
- D. Sika Drainage Mat 420/720/1000: Consists of a polypropylene dimpled drainage core bonded with a non-woven geocomposite fabric on the top side, and a membrane protective film bonded to the bottom side.
- E. Sika Sarnafelt NWP HD: Non-Woven Polypropylene geotextile fabric for use to absorb the inconsistencies of a rough or uneven substrate
- F. Sikaswell S-2: Single Component urethane water-swelling sealant used for detailing and penetrations
- G. Waterstop: Sika waterstops as required by Section 03 15 13
- H. Sika Fuko Hose: Re-injectable waterproofing grout injection hose
- I. Sika Tieback Covers: 4" and 9" rigid plastic Tieback cover for soil nail heads
- J. Miscellaneous Accessories: Accessories specified or acceptable to manufacturer of pre-applied waterproofing membrane system.

PART 3 EXECUTION

3.01 GENERAL

- A. The Installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.
- B. Membrane Placement: Thickness of the sub-grade membrane shall be determined by the following factors and approved by the membrane manufacturer's technical representative and the architect.
 - 1. SikaProof® A+ 12: Use on all horizontal surfaces and where rebar cages are placed next to vertical surfaces. Run SikaProof® A+ 12 up vertical wall to a height above the rebar concentration and marry to the SikaProof® A+ 12 membrane. Use for post-applied horizontal applications with SikaProof® Adhesive-22
 - 2. SikaProof® A+12: Use on all vertical surfaces where membrane will be pre-applied or for post applied applications with SikaProof® Adhesive-22.

3.02 SUBSTRATE PREPARATION

- A. Pre-Applied Applications
 - 1. The substrate shall be of sufficient stability to prevent movement during the concrete placement. Substrates must be regular and smooth with no gaps or voids larger than 0.5 in. Acceptable substrates include concrete, permanent or removable formwork, plywood, fleece, rigid protection board, or drainage composite.
 - a. Horizontal Surfaces: The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over crushed stone or earth, ensure substrate is well compacted to prevent displacement of the substrate due to traffic or concrete placement. Substrate may be damp but standing water must be removed.
 - b. Vertical Surfaces: Use a suitable substrate such as permanent or temporary formwork, plywood, rigid protection board, or drainage composite to provide membrane support.
- B. Post-Applied Applications
 - 1. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.
 - a. Cast In Place Concrete Substrates:
 - 1. Concrete must be cured for minimum 48 hours
 - 2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
 - 3. Repair bug holes over 0.5 in in length and 0.25 in depth and finish flush with surrounding surfaces.
 - 4. Remove scaling to sound, unaffected concrete and repair exposed area
 - 5. Grind irregular construction joints to suitable flush surface

3.03 INSTALLATION

- A. General: Strictly comply with installation instructions in manufacturer's published literature, including but not limited to the following:
- B. Horizontal Pre-Applied Applications:
 - 1. Install a separation/protection or leveling layer based on existing jobsite conditions.

2. Form the corners with the same SikaProof® A+12 sheet adhering internally with SikaProof® Tape-A+.
 3. Install the SikaProof® A+ membrane grey side up, adhering the joints with the SikaProof® Tape A+ or the SikaProof® Sandwich Tape.
 4. Accurately position succeeding sheets to overlap the previous sheet by a minimum of 50 mm (2 in.).
 5. Apply SikaProof® Tape A+ or SikaProof® Sandwich Tape at overlap of sheets. Roll with a hand roller to ensure a continuous bond is achieved.
 6. Install detail areas, such as pipe penetrations, pits, connections, expansion joints, and any other special details using the appropriate accessory products and in strict accordance with the manufacturer's installation instructions.
- C. Vertical Pre-Applied Applications:
1. Install leveling layer or protection based on existing jobsite conditions.
 2. Mechanically fasten the membrane using fasteners appropriate to the substrate with the grey side facing towards the concrete placement. The membrane may be installed in either horizontal or vertical orientation in any convenient length.
 3. Accurately position succeeding sheets to overlap by a minimum of 50mm (2 in.).
 4. Apply SikaProof® Tape A+ at overlap of sheets. Roll with hand roller to ensure a continuous bond is achieved.
- D. Dual Vertical Formwork Pre-Applied Applications:
1. Mechanically fasten the membrane using fasteners appropriate to the substrate with the grey side facing towards the concrete placement. The membrane may be installed in either horizontal or vertical orientation in any convenient length.
 2. Accurately position succeeding sheets to overlap by a minimum of 50mm (2 in.). Ensure the underside of the succeeding sheet is clean, dry, and free from contamination before removing the protective release liner.
 3. Apply SikaProof® Sandwich Tape between overlapping sheets and roll with hand roller to ensure a continuous bond is achieved.
 4. After removing the formwork penetrations, such as form ties, any membrane damage and construction joints can be sealed on the external side of the membrane with SikaProof® Patch-200 or the Sika Dilatec system.
 5. Protect membrane in accordance with the manufacturer's published literature prior to backfilling operations.
- E. Post Applied Applications (Vertical and Horizontal)
1. Apply SikaProof® Adhesive-22 at rate recommended by manufacturer using a 1/4in x 3/16in V-notch trowel for vertical and horizontal.
 2. Apply membrane directly into adhesive bed during workability time of adhesive.
 3. Tape Seams after adhesive has cured and apply protection board and related materials in accordance with manufacturer's recommendations.

END OF SECTION

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