



GUIDE SPECIFICATION

SECTION 07 14 16 COLD FLUID APPLIED WATERPROOFING

SECTION 07 55 56 FLUID APPLIED PROTECTED MEMBRANE ROOFING

SIKALASTIC® ROOFPRO (DECOTHANE®) INVERTED ROOF SYSTEM

SPEC NOTE: This specification includes materials and methods for the installation of the Sikalastic RoofPro Inverted protected membrane roofing assembly direct to structural deck, consisting of a Sikalastic RoofPro (Decothane) membrane and overburden materials such as drainage mat, extruded polystyrene insulation, precast concrete pavers, gravel ballast, and other approved topping materials. Sikalastic RoofPro is a cold applied, seamless, self-flashing roofing and waterproofing system that is fully reinforced for added tensile strength. Waterproof immediately after application, Sikalastic RoofPro membranes are guaranteed not to leak for periods up to twenty-five (25) years.

This specification serves as a guideline and should be adapted to suit the needs of each individual project by the designer. It is prepared in accordance with the CSI three-part section format and should be included as a separate section under DIVISION 07 - Thermal and Moisture Protection. Improvements and other changes to the contents may be made only with the written approval of the designer. **Upon completion of editing, we recommend you contact your local Sika representative to review for accuracy prior to issuance for bid or construction.**

PART 1 GENERAL

1.01 SUMMARY

- A. This section specifies all labor, materials, transportation, equipment and services necessary to assemble a complete protected membrane roof (PMR) assembly with a cold, liquid-applied, fully reinforced, polyurethane waterproofing membrane as shown on the drawings and described herein.
- B. Sections Included *****(Delete sections not to be used)*****
- | | | | |
|----|------------------|---|--|
| 1. | Section 07 55 56 | : | Fluid-Applied Protected Membrane Roofing |
| 2. | Section 07 22 16 | : | Roof Board Insulation |
| 3. | Section 07 76 13 | : | Roof Ballast Pavers |
| 4. | Section 07 76 16 | : | Roof Decking Pavers |
- C. Related Sections *****(Delete sections not to be used)*****
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|----|---------------------|---|--------------------------|
| 1. | Section 03 00 00 | : | Concrete |
| 2. | Section 04 21 13 | : | Brick Masonry |
| 3. | Section 04 22 00 | : | Concrete Unit Masonry |
| 4. | Section 06 15 16 | : | Wood Roof Decking |
| 5. | Section 06 16 00 | : | Sheathing |
| 6. | Section 07 60 00 | : | Flashing and Sheet Metal |
| 7. | Section 22 14 26.13 | : | Roof Drains |

1.02 REFERENCES

- A. Factory Mutual (FM Global) - *Approval Guide*
- B. American Society for Testing and Materials (ASTM) - *Annual Book of ASTM Standards*
- C. National Roofing Contractors Association (NRCA)

- D. American Society of Civil Engineers (ASCE)
- E. Steel Structures Painting Council (SSPC)
- F. International Concrete Repair Institute (ICRI)

1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) *Roofing and Waterproofing Manual* for definitions of roofing and waterproofing terms related to this section.
- B. Membrane Integrity Testing: Leak location techniques that rely on the electrical conductivity of the cover material (moist media) and electrical insulating properties of the membrane. The compatibility of this testing with a specific membrane must be established in advance by the service provider.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide an installed membrane that does not permit the passage of water and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.
- B. Membrane manufacturer shall provide all primary materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.05 SUBMITTALS

- A. Provide product data sheets for each type of product indicated in this section.
- B. Provide manufacturers standard details and approved shop drawings for the specified system.
- C. Non-standard details not approved in writing, prior to the commencement of membrane installation, will be excluded from the manufacturer's warranty.
- D. Provide samples of all system components as specified, including drainage mat, insulation, pavers, membrane materials and accessories for verification of quality.
- E. Installer shall provide written documentation from the manufacturer of their authorization to install the system, and eligibility to obtain the warranty specified in this section.
- F. Evidence that extruded polystyrene insulation is free from CFC's. *****Omit if system is not insulated*****
- G. Certification showing full time quality control of production facilities and that each batch of material is tested to ensure conformance with the manufacturer's published physical properties.
- H. Certification that the membrane meets FM Global Approval Standard 4470 for Class I roof covers, with a Class 1-990 wind uplift rating, a hail rating of SH and is ASTM E-108-00 Class A approved at a slope of 1 in 12.
- I. Manufacturer's certification that all system products meet current Volatile Organic Compound (VOC) regulations as established by the State in which they are being installed; and stating total VOC content, in grams per litre, for all system components (i.e. primers, adhesives, coatings, etc.).

1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
 - 1. Membrane Manufacturer must show evidence that the specified membrane has been manufactured by the same organization or direct affiliate for fifteen (15) years.
 - 2. Membrane Manufacturer shall have available an in-house technical staff to assist the contractor, when necessary, in application of the products and final inspection of the assembly.

- B. Installer's Qualifications: The Installer shall demonstrate qualifications to perform the work of this section by submitting the following documentation:
 - 1. Certification or license by the membrane manufacturer as a trained applicator of the product the installer intends to use.
- C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary membrane manufacturer.
- D. A 3'x3' mock-up of the specified membrane system shall be installed to determine the suitability of surface preparation and appropriate primers, and to evaluate surface moisture prior to installation of the specified membrane system. Tensile bond strength tests shall be conducted, as outlined, to determine suitability of surface preparation and priming requirements prior to project commencement. Mock-up shall cure for a minimum of seven (7) days prior to conducting tensile bond strength testing. Mock-ups shall remain visible and in-place for the entire project to serve as a benchmark for acceptability.
- E. Random tests to determine tensile bond strength of membrane to substrate shall be conducted by the Installer using an Elcometer Adhesion Tester or similar device. Installer shall perform tests at the beginning of the work, and at intervals as required to assure specified adhesion. Test results shall be submitted to the Owner or Owner's designated representative, the designer of record or their designated representative, and the membrane manufacturer. Contractor shall immediately notify all parties in the event test results do not meet the following requirements:
 - 1. Adequate surface preparation and adhesion shall be demonstrated when cohesive failure of the membrane system occurs at the reinforcing layer ("intercoat delamination"), or if the substrate fails cohesively prior to the occurrence of intercoat delamination.
 - 2. In the event bond strengths are less than outlined above, additional surface preparation may be required. Additional adhesion testing shall be carried out to verify the suitability of substrate preparation.

1.07 PRE-INSTALLATION CONFERENCE

- A. Prior to scheduled commencement of the membrane installation and associated work, conduct a meeting at the project site with the installer, designer of record, owner or owner's designated representative, manufacturer's representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to the membrane installation.

1.08 FIELD INSPECTION SERVICES

- A. Manufacturer's technical representative shall provide the following inspections and attend the following meetings:
 - 1. Preinstallation conference at the start of the project
 - 2. Periodic progress inspections
 - 3. Punch List inspection
 - 4. Warranty Final Inspection
- B. Manufacturer's technical representative shall provide written and photographic documentation of conversations, observations, application deficiencies, and other conditions observed during the inspection process to the owner or owner's designated representative, designer or designer's designated consultant, and the contractor/applicator.

1.09 REGULATORY REQUIREMENTS

- A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.
- B. All membrane system components shall meet current VOC regulations as established by the State in which they are being installed; and stating total VOC content, in grams per litre, for all system components (i.e. primers, adhesives, coatings, etc.).

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials to the site in original containers, with factory seals intact.
- B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
- C. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
- D. Remove manufacturer supplied plastic covers from materials provided with such. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material will be installed.
- E. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application.

1.11 PROJECT CONDITIONS

- A. Weather
 - 1. Proceed with membrane installation only when existing and forecasted weather conditions permit.
 - 2. Membrane installation can proceed when ambient temperatures are above 40°F (4.4°C), provided the substrate temperature is a minimum of 5°F above the dew point.
 - 3. It is recommended that overnight temperatures be above 40°F (4.4°C) when applying the membrane system. Consult with the manufacturer for cold weather installation procedures when ambient temperatures are expected to fall below the minimums established herein.
- B. All surfaces to receive the membrane shall be free from visible water, dew, frost, snow and ice.
- C. Application of the membrane must be conducted in well ventilated areas. Consult with the manufacturer for odor control procedures when membrane installation is being conducted in poorly ventilated areas, or in the vicinity of fresh air intakes.
- D. Over its service life, do not expose membrane to a constant temperature below -58°F (-50°C) or in excess of 176°F (80°C) (i.e., hot pipes and vents or direct steam venting, etc.).
- E. Membranes shall be non-flammable and VOC compliant. Consult container or packaging labels and Material Safety Data Sheets (MSDS) for specific safety information.
- F. Membranes shall be resistant to gasoline, paraffin, fuel oil, mineral spirits, and moderate solutions of acids and alkalis, acid rain and detergents. Any exposure to foreign materials or chemical discharges must be presented to the manufacturer for evaluation to determine any impact on the membrane performance prior to warranty issuance.

1.12 WARRANTY *****(Edit to project requirements)*****

- A. **Watertightness Warranty:** Provide manufacturers standard warranty for membrane watertightness, covering defects in materials and workmanship:
 - 1. Duration: **15, 20 or 25** years

****CONTACT SIKI FOR EXACT WARRANTY TERMS AND CONDITIONS.****

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER ***** (Edit based on specified materials) *****

A. Sika Corporation

201 Polito Avenue
Lyndhurst, NJ 07071
Tel: 201-568-9300
Fax: 201-933-7326
www.sikaconstruction.com

B. DOW® or Owens Corning Brand Extruded Polystyrene Insulation

C. Hanover Architectural Products

Hanover Architectural Products
240 Bender Road
Hanover, PA 17331

Ph. 717-637-0500
Fax 717-637-7145

D. **LIST OTHER REGIONAL MANUFACTURERS OF PAVER SYSTEMS ONCE IDENTIFIED**

E. Substitutions: As approved in writing prior to submission of bid. Membrane must meet or exceed the performance requirements set forth in ASTM D7311-07.

2.02 CONCRETE REPAIR

A. A single component, rapid hardening, early strength gaining, cementitious, Patching material for concrete, **SikaQuick® 1000**, or equal approved by membrane manufacturer.

2.03 BASE SHEET

A. An asphalt coated reinforced base sheet conforming to ASTM D-4601-04, Type II.

2.04 ADHESIVES, SEALANTS and PRIMERS

A. A rapid curing, water-based primer consisting of two components for brick, concrete unit masonry (CMU), wallboard, exterior grade gypsum sheathing and previously coated surfaces, **Sika Bonding Primer**.

B. A two-component, solvent free, epoxy primer and damp proof membrane, which can be applied to damp or new concrete and screeds with high moisture drive prior to the application of the membrane system, **Sikalastic DTE Primer**.

C. A two-component, rapid curing, high solids, solvent based, dampproof primer designed for sealing cementitious substrates, **Sika Concrete Primer (Quick Cure Primer)**.

D. A two-component, cyclo-aliphatic, amine cured material with a high level of corrosion resistance for metal and modified bitumen surfaces, **Sikalastic EP Primer/Sealer (Epoxy Primer)**.

E. A single component, polyurethane based primer for the reactivation of existing polyurethane membrane resin prior to overcoating, **Sika Reactivation Primer**.

F. One part polyurethane sealant suitable for sealing reglet terminations, cracks and providing a suitable transition between the roofing system and roof penetrations prior to the installation of the membrane system. Meets or exceeds ASTM C-920-87, Type S, Grade NS, Class 25, **Sikaflex® 1a** or equal as approved by membrane manufacturer.

2.05 FLUID APPLIED MEMBRANE MATERIALS

- A. A conformable, random woven fiberglass mat for total reinforcement of the membrane system, which provides greater impact resistance and greater resistance to excessive thermal and structural movement while maintaining elasticity and membrane film integrity, **Sika Reemat Premium**.
- B. A nylon mesh for local reinforcement of the membrane at structural cracks, board joints expansion joints, and transitions between dissimilar materials, **Sika Flexitape Heavy**.
- C. A single component, cold, fluid applied, moisture triggered, aliphatic, polyurethane base coat resin meeting the following physical properties and ASTM D7311-07: Standard Specification for Liquid Applied, Single Component, Moisture-Triggered, Aliphatic Polyurethanes used in Roofing, **Sikalastic 601 BC (Decothane EC)**. *****Delete if specifying alkalinity resistant membranes or 20 & 25 year configurations as per specification note below*****
- D. A single component, cold, fluid applied, moisture triggered, aliphatic, polyurethane top coat resin meeting the following physical properties and ASTM D7311-07: Standard Specification for Liquid Applied, Single Component, Moisture-Triggered, Aliphatic Polyurethanes used in Roofing, **Sikalastic 621 TC (Decothane SP)**. *****Delete if specifying alkalinity resistant membranes per specification note below*****
- E. An alkalinity resistant, single component, cold, fluid applied, moisture triggered, aliphatic, polyurethane base and top coat resin meeting the following physical properties and ASTM D7311-07: Standard Specification for Liquid Applied, Single Component, Moisture-Triggered, Aliphatic Polyurethanes used in Roofing, **Sikalastic 624 AR (Decothane Balcons)**. *****Delete unless specifying alkalinity resistant membranes per specification note below*****

SPECIFICATION NOTE:
 Sikalastic 624 AR (Decothane Balcons) should be specified as the base, intermediate and top coats when the membrane is to be exposed to highly alkaline conditions such as the installation of topping slabs or tile setting beds atop the membrane, or where the membrane is detailed as a through-wall flashing in masonry cavity wall construction.

LIQUID PROPERTY REQUIREMENTS

PHYSICAL PROPERTIES	ASTM	REQUIREMENTS
VISCOSITY	D2196	5 to 20 Pa.s (pascal.seconds)
VOLUME SOLIDS	D2697	76% minimum
WEIGHT SOLIDS	D1644	83% minimum
SAG RESISTANCE	D4400	No sag at 700 micrometers (0.028 in. / 28 mil)

FILM PHYSICAL PROPERTY REQUIREMENTS

PHYSICAL PROPERTIES	ASTM	REQUIREMENTS
TENSILE STRENGTH (TENSION)	D412	MIN 1.86 MPa (270lb/in ²)
ELONGATION	D412	MIN 200%
ACCELERATED WEATHERING FL/UV – 5000 HOURS	G154	NO CRACKING OR CHECKING
WATER VAPOR TRANSMISSION PERMEABILITY / PERMEANCE	E96	MAXIMUM 8.5 gms/m ² / day (0.033 perm-inches)
FLEXIBILITY – MANDREL BEND	D522	PASS NO CRACKING OR FLAKING
TEAR RESISTANCE	D624	MINIMUM 5.8 kN/m (33 lbf/in)
INDENTATION HARDNESS	D2240	82 Durometer Units (+/- 5 units)
DYNAMIC PUNCTURE RESISTANCE	D5635	MINIMUM 15 joules (357 ft.poundals)
STATIC PUNCTURE RESISTANCE	D5602	MINIMUM 20.7 kg. (45.5 lbs.)

2.06 FLASHING MATERIALS

- A. The membrane system shall be seamless and self-flashing. No special flashings should be required for system installation.

2.07 PREFABRICATED COMPOSITE DRAINAGE AND PROTECTION COURSE

- A. A composite drainage system consisting of a three-dimensional, crush-proof, drainage core and a filter fabric meeting the following physical properties. **Sika Drainage Mat 30, 32, 40, 42, 70, 100 or GRS (Deco-Drain 30, 32, 40, 42, 70, 100 or GRS).** **(consult with Sika for appropriate drainage mat as required)**

2.08 INSULATION *****(edit as required, or delete entire section if not specifying insulation)*****

- A. An extruded polystyrene rigid board insulation meeting the following physical properties.
 1. Minimum compressive strength, ASTM D-1621, **40 or 60 psi** (276 or 414 kPa) (variance by type of product).
 2. Comply with ASTM 578-95 Type VII (60 psi/2.2 lbs. cu. ft.) *****(specify where precast concrete pavers and pedestals are used over insulation)*****
 3. Comply with ASTM 578-95 Type V (100 psi/3.0 lbs. cu. ft.) *****(specify where insulation subject to significantly heavier than normal superimposed loads)*****
 4. Total insulation board thickness of **(specify total thickness of insulation)** to achieve an r value of **(specify desired R value)** at an R value of 5.0 F ft² h/Btu/in. (0.88 K m²/W) of thickness when tested at 75°F (23.9°C) mean temperature in accordance with ASTM C-518.
 5. Maximum water absorption by volume per ASTM C-272, 0.1%.
 6. Water vapor permeance for 1" product per ASTM E-96, 1.0 perm (max.) (63 ng/Pa/s/m²).
 7. Product shall be free of CFC's.

2.09 FILTER FABRIC *****(delete, unless specifying stone ballast topping)*****

- A. Non-woven polyester UV-stabilized mat, 3 oz./sq. yd. used as a separation sheet beneath membranes as a protection layer and used over membranes in ballast applied assemblies. Each roll contains thirty (30) squares (3,000 sq. ft.) of material, 10' x 300' (3.07m x 92.3m), 75 lbs. (34.1 kg), **Confil 689H from International Paper or manufacturers approved equal.**

2.10 TOPPING MATERIALS *****(Select desired paver system or ballast, delete others)*****

- A. Architectural Finish Pavers
 1. Meeting the following physical properties:

PHYSICAL PROPERTY	ASTM	REQUIREMENT
Compressive Strength	C-140	≥7,000 psi average min.
Flexural Strength	C-293	≥600 psi average min.
Water Absorption	C-140	Not greater than 5%
Freeze/Thaw	C-67	≤1% loss/dry weight (50 Cycles)
Centerload	-	Min. 1,750 lbs.

- B. A locked-down, roof paver pedestal system, which totally unitizes the entire installation for excellent wind uplift resistance.
- C. A pedestal paver system used to compensate for roof slope in order to achieve a level surface.
- D. Interlocking lightweight roof paver system, which gives superior wind uplift resistance.
- E. Roof Ballast Pavers
- F. Gravel ballast

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that the surfaces and site conditions are ready to receive work.

- B. Verify that the deck is supported and secured.
- C. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.
- D. Verify that the deck surfaces are dry and free of ice or snow.
- E. Verify that all openings and penetrations through the deck are solidly set.

3.02 SUBSTRATE PREPARATION *****(Select deck type(s), delete others)*****

A. Structural Concrete Deck

1. Minimum deck thickness for structural concrete is 4" (10.2 cm).
2. Only poured in place concrete decks that provide bottom side drying are acceptable. Composite decks installed over non-vented metal pans that remain in place may trap moisture and may not be acceptable. Contact membrane manufacturer for approval.
3. Structural Weight Concrete: Recommend 28 days, minimum 14 days cure, dependent upon substrate moisture (less than 20% WME on a protimeter is acceptable), prior to application of the membrane.
4. Lightweight Structural Concrete: Recommend 28 days, minimum 14 days dependent upon substrate moisture (less than 20% WME on a protimeter is acceptable), prior to application of membrane. Venting of the deck from the underside is recommended to facilitate drying.
5. The above minimum cure/dry times are recommended based upon basic concrete fundamentals and experience. Membrane can be applied to any cementitious substrate with a moisture content of less than the maximum 20% wood moisture equivalent (WME) as measured by a Protimeter.
6. Light broom, heavy broom, or steel trowel finish equivalent.
7. Curing agents must be checked for compatibility with waterproofing materials.
8. In all retrofit roof applications, it is required that deck be inspected for defects.
9. Using most effective means, prepare structural concrete deck to minimum CSP 3-5 standards, as required by manufacturer based upon actual field conditions, as outlined in ICRI Guideline No. 03732: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
10. Patch all unsound or defective concrete with repair mortar acceptable to membrane manufacturer.

B. Plywood Deck

1. Plywood sheathing must be exterior grade, minimum 4 ply, and not less than 15/32" (12 mm) thick.
2. Preservatives or fire retardants used to treat the decking must be compatible with membrane materials.
3. The deck must be installed over joists that are spaced 24" (61 cm) o.c. or less.
4. The deck must be installed so that all four sides of each panel bear on and are secured with screws to joist and cross blocking. "H" clips are not acceptable.
5. Panels must be installed with a 1/8" to 1/4" (3mm – 6mm) gap between panels and must match vertically at joints to within 1/8" (3mm).
6. Decking should be kept dry and protected promptly after installation.

C. Brick and Concrete Unit Masonry (CMU)

1. Brick and CMU surfaces to which the membrane shall be applied must be sound and well pointed.

D. All Others

1. Check with manufacturer on a project by project basis.

3.03 INSTALLATION - GENERAL

- A. Install membrane in accordance with all currently published data sheets and application guidelines, in addition to those listed in this section.

3.04 TEMPORARY PROTECTION

SPECIFICATION NOTE:

When temporary protection is required, always specify liquid applied membrane when protecting plywood or other combustible decks. Both liquid applied membrane and base sheet temporary protection may be specified for non-combustible decks.

A. Liquid Applied Membrane

1. Polyurethane resin may be applied to properly prepared and primed surfaces, at a wet film thickness of 15-20 mils, for use as a temporary roof/waterproofing.
2. Resin applied as a temporary roof/waterproofing should not have to be removed prior to installation of the specified membrane system.
3. Resin used for temporary roofing/waterproofing should be cleaned and primed, if it has been exposed for >7 days, prior to installation of the specified membrane system.

B. Base Sheet

1. Follow base sheet manufacturer's recommended application procedures.
2. When using a base sheet for temporary protection, all temporary flashings must be removed back to the structural deck prior to the installation of the specified membrane system to allow for the proper flashing of the membrane system.

3.05 LIQUID APPLIED MEMBRANE APPLICATION

A. Surface Preparation: *****(Delete Substrates That Do Not Apply)*****

1. Plywood
 - a) All surfaces should be blown clean using an air compressor to remove any remaining loose debris, and to facilitate the drying process.
 - b) All cracks and voids >0.040" should be routed and caulked with a polyurethane sealant. Allow to cure per manufacturer's instructions prior to overcoating with the membrane system.
 - c) At all inside corners and any gaps or voids at the juncture of the deck and penetrations, apply a minimum ½" bead of polyurethane sealant, and allow to cure per manufacturer's instructions prior to installing the membrane system.
 - d) Install minimum 1" bond break, centered over all board joints, cracks, inside corners, and at all transitions between dissimilar materials.
 - e) Membrane terminations should be finalized prior to project start-up and documented in shop drawings, but in general, terminations should occur in raked out mortar joints, saw cut terminations, and where feasible, under installed counter-flashing materials.
 - f) Tape lines should always be used to achieve a straight and professional looking edge detail.
2. Concrete and Masonry
 - a) All previously prepared concrete and masonry surfaces to receive the membrane should be low-pressure (5,000 psi or less) power-washed, in accordance with ICRI Guideline No. 03732: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays to remove all dirt, debris, or surface contamination that would compromise bonding of the waterproofing membrane system. Remove oil or grease with solvent or detergent and water. Rinse surface clean of all cleaning agent remains.
 - b) All surfaces should be blown clean using an air compressor to remove any remaining loose debris, and to facilitate the drying process.
 - c) All cracks and voids >0.040" should be routed and caulked with a polyurethane sealant. Allow to cure per manufacturer's instructions prior to installing the membrane system.

- d) At all inside corners and any gaps or voids at the juncture of the deck and penetrations, apply a minimum ½" bead of polyurethane sealant, and allow to cure per manufacturer's instructions prior to installing the membrane system.
 - e) Membrane terminations should be finalized prior to project start-up and documented in shop drawings, but in general, terminations should occur in raked out mortar joints, saw cut terminations, and where feasible, under installed counter-flashing materials.
 - f) Tape lines should always be used to achieve a straight and professional looking edge detail.
3. Metal
- a) All exposed metal surfaces and drain bowls to receive the membrane must be power tool cleaned (SSPC SP-3) to remove all corrosion deposits back to a clean, bright metal, followed by a solvent wipe prior to application of specified primer.
 - b) Fill any gaps or voids at the juncture of the deck and penetrations with a polyurethane sealant, and allow to cure per manufacturer's instructions prior to installing the membrane system.
4. Temporary Protections
- a) Liquid Applied Membrane
 - (a) *Using most effective means, clean existing liquid membrane to remove all chalking, dirt, and any other physical or chemical contaminant that may compromise adhesion of the membrane system.*
 - (b) *Prime previously prepared liquid membrane surfaces per manufacturer's instructions and allow to cure prior to installing the specified membrane system.*
 - b) Base Sheet
 - (a) *Using most effective means, clean existing base sheet to remove all dirt, and any other physical or chemical contaminant that may compromise adhesion of the membrane system.*
- B. Priming
- 1. Concrete, Plywood and Masonry
 - a) Mix and apply primer to concrete/roof board/masonry/wood surfaces by brush, roller or airless spray at a rate not to exceed 320 sf/gallon (porous, rough or absorbent surfaces will decrease coverage rate, always refer to specific primer data sheets). Allow to cure and dry in accordance with manufacturer's instructions.
 - 2. Metal
 - a) Apply primer to previously prepared metal and drain bowls by brush, roller or airless spray at a rate of 200-250 sf/gallon, to achieve an overall wet film thickness of 6-8 mils. High porosity and roughness of the substrate will decrease coverage rates.
 - b) Allow to cure and dry in accordance with manufacturer's instructions.
 - 3. Previously Applied Liquid Membrane
 - a) Prime all previously applied membrane resin that has been in place longer than seven (7) days, by roller at a maximum coverage rate of 250 sf/gallon. Allow to cure prior to applying subsequent layers of membrane resin.

- 4. Base Sheet
 - a) No priming is required for base sheets used as temporary protection.
- 5. All Other Surfaces
 - a) Check with manufacturer for specific priming instructions.

C. Local Reinforcement (Cracks, Plywood Board Joints, and Dissimilar Material Transitions)

- 1. Apply a minimum 1" bond break at repaired cracks in concrete decks, joints between plywood sheets, and transitions between dissimilar materials, prior to applying the specified membrane system. Bond break should be installed centered over each joint or crack.
- 2. Follow by applying a local stripe coat of polyurethane resin at a width a minimum of 1" wider than the reinforcement, and while wet, insert nylon tape reinforcement into the wet membrane and backroll to fully embedment adding additional material as needed.
- 3. Ensure that local reinforcing mesh is not in tension during embedment.

D. Membrane Application

The following **Sikalastic RoofPro (Decothane)** membrane system is specified for this project.

SPECIFICATION NOTE:

Choose one of the tables below for a 15, 20 or 25 year warranted system; or more than one table if providing a base bid and an alternate system warranted for a longer period. Select only "AR" membranes when the membrane is to be exposed to highly alkaline conditions such as the installation of topping slabs or tile setting beds atop the membrane, or where the membrane is detailed as a through-wall flashing in masonry cavity wall construction.

Sikalastic RoofPro Inverted 15	Film Thickness (wet mils)	*Est. Coverage Rate (sf/gal)
Sikalastic 601 BC (Decothane EC)	45	28-32
Sikalastic 621 TC (Decothane SP)	30	45-50
<i>*Note: Coverage rates include a reasonable amount of wastage. Rough and textured substrates can significantly affect coverage rates.</i>		

Sikalastic RoofPro Inverted 15 (AR)	Film Thickness (wet mils)	*Est. Coverage Rate (sf/gal)
Sikalastic 624 AR (Decothane Balcons)	45	28-32
Sikalastic 624 AR (Decothane Balcons)	30	45-50
<i>*Note: Coverage rates include a reasonable amount of wastage. Rough and textured substrates can significantly affect coverage rates.</i>		

Sikalastic RoofPro Inverted 20	Film Thickness (wet mils)	*Est. Coverage Rate (sf/gal)
Sikalastic 621 TC (Decothane SP)	45	28-32
Sikalastic 621 TC (Decothane SP)	30	45-50
<i>*Note: Coverage rates include a reasonable amount of wastage. Rough and textured substrates can significantly affect coverage rates.</i>		

Sikalastic RoofPro Inverted 20 (AR)	Film Thickness (wet mils)	*Est. Coverage Rate (sf/gal)
Sikalastic 624 AR (Decothane Balcons)	45	28-32
Sikalastic 624 AR (Decothane Balcons)	40	34-38
<i>*Note: Coverage rates include a reasonable amount of wastage. Rough and textured substrates can significantly affect coverage rates.</i>		

Sikalastic RoofPro Inverted 25	Film Thickness (wet mils)	*Est. Coverage Rate (sf/gal)
Sikalastic 621 TC (Decothane SP)	45	28-32
Sikalastic 621 TC (Decothane SP)	30	45-50
Sikalastic 621 TC (Decothane SP)	30	45-50
<i>*Note: Coverage rates include a reasonable amount of wastage. Rough and textured substrates can significantly affect coverage rates.</i>		

Sikalastic RoofPro Inverted 25 (AR)	Film Thickness (wet mils)	*Est. Coverage Rate (sf/gal)
Sikalastic 624 AR (Decothane Balcons)	45	28-32
Sikalastic 624 AR (Decothane Balcons)	30	45-50
Sikalastic 624 AR (Decothane Balcons)	30	45-50
<i>*Note: Coverage rates include a reasonable amount of wastage. Rough and textured substrates can significantly affect coverage rates.</i>		

1. Apply base coat to all horizontal and vertical surfaces by $1/2'' - 3/4''$ nap roller, brush or airless spray to achieve minimum wet film thicknesses as specified above.
 2. While the base coat is still wet, immediately lay precut lengths of reinforcing scrim into the wet base coat, and using a short nap roller with the appropriate roller frame and handle, roll the scrim to force the wet coating up through the scrim to achieve full saturation and embedment. Add additional material, if necessary, to ensure that the mesh is fully saturated and fully conformed to the substrate without any visible pinholes.
 3. Minimum overlap of the reinforcing scrim shall be 2" in all directions. Reinforcement shall turn up all adjacent wall surfaces, etc. until the termination point is accomplished according to the project details and specifications. Membrane terminations should be finalized prior to project start-up and documented in shop drawings, but in general, terminations should occur in raked out mortar joints, saw cut terminations, and where feasible, under installed counter-flashing materials. Tape lines should always be used to achieve a straight and professional looking edge detail.
 4. Allow the base coat to cure and dry prior to the next application procedure. If the base coat remains exposed for > seven (7) days or becomes heavily soiled as a result of trafficking, it must be primed per the manufacturer's instructions prior to application of additional coats.
 5. Apply intermediate coat by $1/2'' - 3/4''$ nap roller, brush or airless spray to achieve minimum wet film thicknesses, as specified in table above.
 6. Allow the intermediate coat to cure and dry prior to the next application procedure. If the intermediate coat remains exposed for > seven (7) days or becomes heavily soiled as a result of trafficking, it must be primed per the manufacturer's instructions prior to application of additional coats.
- **Delete 5 and 6 above when specifying Sikalastic RoofPro Inverted 15 and 20 membranes****
7. Apply top coat by $1/2'' - 3/4''$ nap roller, brush or airless spray to achieve minimum wet film thicknesses, as specified in table above.
 8. Allow top coat to dry overnight prior to exposing to foot traffic.

3.06 FLASHINGS

A. Parapet and Building Walls:

1. Terminate the membrane at a tape-line to ensure a clean edge.
2. Where possible, terminate the membrane within a sawcut reglet and finish the reglet with a polyurethane sealant.
3. Metal counterflashings are optional, but recommended.
4. Flash wall scuppers with a coated metal insert that is mechanically attached to the wall and integrated as part of the membrane system.

B. Roof Drains:

1. Remove the strainer basket and clamping ring from the drain bowl prior to membrane application.
2. Replace the drain bowl bolts prior to application
3. Extend the membrane directly into the throat of the prepared drain.
4. Remove drain bowl bolts, replace clamping ring and trainer, and resecure.

3.01 MEMBRANE INTEGRITY TESTING

- A. Upon completion of membrane installation a visual inspection/acceptance shall be conducted by manufacturer's technical representative.
- B. No overburden shall be installed until all visual inspection and electric field vector testing by third party is completed and accepted by engineer, owners representative and manufacturer.

3.02 WATER TEST

- A. It is strongly recommended that the deck area or portions thereof be water tested by means of ponded water to a minimum depth of 2" for a recommended minimum period of 24 hours to check the integrity of the membrane installation.
- B. Verify that the structure can support the live load weight of a water test before testing.
- C. If leaks should occur, the water must be drained completely and the membrane installation repaired. The repaired area should then be retested.

3.03 PREFABRICATED COMPOSITE DRAINAGE AND PROTECTION COURSE

- A. Do not apply composite drainage and protection course until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. Before the application of the insulation layer, any damage or deterioration to the installed membrane must be repaired.
- B. Install drainage course on horizontal and vertical surfaces in accordance with the manufacturer's recommendations.
- C. Layout and position drainage course. Allow to lay flat. Cut and fit drainage course to perimeter and penetrations.
- D. Bond all geotextile overlap edges to adjacent drainage course geotextile with an acceptable adhesive to insure geotextile integrity.
- E. Place subsequent topping materials.

3.04 INSULATION – GENERAL *****(*Delete if not specifying insulation*)*****

- A. Do not apply insulation until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. Before the application of the insulation layer, any damage or deterioration to the composite drainage and protection course must be repaired.
- B. Loose lay (horizontal applications), in a staggered manner, and tightly butt together all insulation boards. Insulation must be installed within ¼" of all projections, penetrations, etc
- C. When multi-layer insulation applications are involved the bottom layer of insulation must be the thickest layer and must be a minimum of 2" thick. All layers shall be installed un-adhered to each other and all joints in relation to underlying layers staggered.
- D. For vertical, multi-layer applications, second layer of insulation board may be spot adhered to the protection layer with appropriate adhesive.
- E. Do not install wet, damaged or warped insulation boards.
- F. Install insulation boards with staggered board joints from layer below.

3.05 FILTER FABRIC *****(*Required over insulation when installing gravel/stone ballast*)*****

- A. Install filter fabric on horizontal and vertical surfaces in accordance with the manufacturer's recommendations.
- B. Layout and position filter fabric course. Allow to lay flat. Cut and fit filter fabric to perimeter and penetrations.
- C. Bond all geotextile overlap edges to adjacent filter fabric with an acceptable adhesive to insure geotextile integrity.
- D. Place subsequent topping materials.

3.06 STONE BALLAST *****(*Delete if not required*)*****

- A. Install stone ballast in accordance with requirements determined by the most current revision of ANSI RP-4.
 - 1. Minimum ballast application rate for #4 nominal 1-1/2" ballast is 10 lbs. per sq.ft.
 - 2. Minimum ballast application rate for #2 nominal 2-1/2" ballast is 13 lbs. per sq.ft.
- B. If existing ballast is to be reused, a minimum 3 oz. filter fabric sheet shall be installed prior to ballast application.

3.07 ARCHITECTURAL PAVER PLACEMENT *****(*Select desired paver system or delete if not required*)*****

- A. Furnish and install Architectural Finish Pavers, as outlined in 07 76 16.
- B. Furnish and install a locked-down, roof paver pedestal system, which totally unitizes the entire installation for excellent wind uplift resistance as outlined in 07 76 16.
- C. Furnish and install a pedestal paver system used to compensate for roof slope in order to achieve a level surface, as outlined in 07 76 16.
- D. Furnish and install an interlocking lightweight roof paver system, which gives superior wind uplift resistance, as outlined in 07 76 13.
- E. Furnish and install Roof Ballast Pavers, as outlined in 07 76 13

3.08 PROTECTION

- A. Protect all partially and fully completed work from other trades until completion.
- B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed areas.
- C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed areas from traffic and point loading during the application process.

3.09 CLEAN-UP

- A. All work areas are to be kept clean, clear and free of debris at all times.
- B. Do not allow trash, waste, or debris to collect. These items shall be removed from the work area on a daily basis.
- C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished membrane surfaces and protected from exposure to the elements.
- D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.
- E. Properly clean the finished membrane surface after completion, and make sure the drains and gutters are not clogged.
- F. Clean and restore all damaged surfaces to their original condition.

END OF SECTION

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