**SECTION 07 14 16**

**COLD LIQUID-APPLIED REINFORCED WATERPROOFING**

**FOR DIRECT BONDED OVERBURDEN**

**(Specification for a fully-reinforced, ALSAN RS PMMA/PMA, waterproofing membrane for bonding concrete, asphalt, pavers or tile overburden)**

NOTE: This guide specification is provided as a guideline and must be modified, as required, by the Designer of Record for each project. This specification is prepared in general accordance with CSI format to be included under Division 7 – Thermal and Moisture Protection. Additional information is provided. [delete this paragraph]

***Optional information is presented in “blue” font below. Choose appropriate options, delete as necessary. [delete this paragraph]***

1. **GENERAL**
	1. SUMMARY
		1. The new waterproofing system shall consist of a cold liquid applied reinforced waterproofing membrane, flashings, and resin-aggregate bonding layer for direct applied overburden.
		2. Work shall include, but is not limited to, the following:
			1. Preparation of existing (new), concrete, and all flashing substrates.
			2. Liquid applied, reinforced flashings.
			3. Liquid applied, reinforced waterproofing.
			4. Liquid applied, resin-aggregate bonding layer.
			5. All related materials and labor required to complete specified waterproofing necessary to receive specified manufacturer’s warranty.
	2. RELATED SECTIONS
		1. Division 010000 – General Requirements
		2. Division 011000 – Summary of Work
	3. DEFINITIONS
		1. ASTM D 1079-Standard Terminology Relating to Roofing and Waterproofing.
		2. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.
	4. REFERENCES
		1. AMERICAN CONCRETE INSTITUTE (ACI).
			1. ACI 301 – Specifications for Structural Concrete.
			2. ACI 308-Specification for Curing Concrete.
		2. AMERICAN STANDARD OF TESTING METHODS (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 C 920 - Standard Specification for Elastomeric Joint Sealants.
			3. ASTM D 4258 – Standard Practice for Surface Cleaning Concrete for Coatings.
			4. ASTM D 4259 – Standard Practice for Abrading Concrete.
			5. ASTM D 4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
			6. ASTM E 96 – Test Methods of Water Vapor Transmission of Materials.
			7. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
			8. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
			9. ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
		3. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):
		4. FACTORY MUTUAL (FM):
		5. FLORIDA BUILDING CODE (FBC):
			1. 20XX Florida Building Code (FBC).
		6. INTERNATIONAL CODES COUNCIL (ICC):
			1. 20XX International Building Code (IBC).
		7. INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI).
		8. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA).
		9. UNDERWRITERS LABORATORIES (UL):
			1. UL 790 Standard Test Methods for Fire Tests of Roof Coverings.
			2. UL 1256 – Fire Test of Roof Deck Constructions.
		10. THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)
	5. ACTION SUBMITTALS
		1. Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.
		2. Safety Data Sheets: Submit manufacturer’s Safety Data Sheets (SDS) for each component.
		3. Sample/Specimen Warranty from the manufacturer and contractor.
		4. Shop Drawings: Provide waterproofing system detail drawings.
	6. INFORMATIONAL SUBMITTALS
		1. Contractor Certification: Submit written certification from waterproofing system manufacturer certifying that the applicator is authorized by the manufacturer to install the specified materials and system.
	7. CLOSEOUT SUBMITTALS
		1. Warranty: Provide manufacturer’s and contractor’s warranties upon substantial completion of the waterproofing system.
	8. QUALITY ASSURANCE
		1. MANUFACTURER QUALIFICATIONS:
			1. Manufacture shall have 20 years of experience manufacturing waterproofing materials.
			2. Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.
			3. Manufacturer shall provide site visit reports in a timely manner.
			4. Manufacturer shall provide specified warranty upon satisfactory project completion.
		2. CONTRACTOR QUALIFICATIONS:
			1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
			2. Applicators shall have completed projects of similar scope using the same materials as specified herein.
			3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified waterproofing system through satisfactory project completion.
			4. Applicators shall be skilled in the application methods for all materials.
			5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
			6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.
		3. SUBSTRATE EVALUATION:
			1. Contractor shall evaluate substrate moisture content and adhesion of waterproofing materials to substrate throughout the work and record with daily inspection reports or other forms of reporting acceptable to the owner or his designated representative and the waterproofing manufacturer.
				1. Moisture content: Evaluate substrate moisture content to determine acceptability for application of the specified liquid applied waterproofing materials. Moisture testing shall be performed by means suitable to the project application, or by testing substrate relative humidity (RH) in accordance with ASTM F 2170 when needed, required, or if substrate moisture content is in question.
				2. Adhesion: Evaluate soundness and surface preparation of concrete and/or masonry substrates. Prepare representative areas using specified methods complete with applied primer and waterproofing membrane. Test for minimum acceptable tensile bond strength values as required in accordance with ASTM D 4541. Evaluate all areas where concrete appears to differ in appearance or consistency, if multiple areas are involved in the scope of work, evaluate each area with a minimum of (3) tests for every 5,000 ft2 or as required by project conditions.
	9. DELIVERY, STORAGE AND HANDLING
		1. Refer to each product data sheet or other published literature for specific requirements.
		2. Refer to product Safety Data Sheets (SDS) for storage and handling related hazards, and take all necessary measures and precautions to comply with storage and handling requirements.
		3. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.
		4. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location.
		5. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in (100 mm) or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.
		6. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.
	10. SITE CONDITIONS
		1. SAFETY:
			1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
			2. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid applied or semi-solid materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
			3. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
		2. ENVIRONMENTAL CONDITIONS:
			1. Monitor substrate and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
			2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of waterproofing materials. Ensure all materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.
			3. Contractor shall implement odor control measures where required during the application of waterproofing materials adjust methods as necessary to accommodate varying project conditions.
	11. WARRANTY
		1. Manufacturer's Waterproofing No Dollar Limit (NDL) Warranty. The manufacturer shall provide the owner with the manufacturer’s warranty providing labor and materials to for 10 15 20 years from the date the warranty is issued.
		2. The contractor shall guarantee the workmanship and shall provide the owner with the contractor’s warranty covering workmanship for a period of 2 years from completion date.
2. **PRODUCTS**
	1. MANUFACTURER
		1. SINGLE SOURCE MANUFACTURER: All liquid applied membrane shall be manufactured by a single supplier with 20 years or more manufacturing history in the US.
			1. Comply with the manufacturer’s requirements as necessary to provide the specified warranty.
		2. ACCEPTABLE MANUFACTURER:
			1. SOPREMA, located at: 310 Quadral Drive, Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.
			2. Acceptable alternate manufacturers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. LIQUID APPLIED WATERPROOFING
		1. FLASHING MEMBRANE:
			1. POLYMETHACRYLATE FLASHING MEMBRANE (PMA):
				1. SOPREMA ALSAN RS 260 LO FLASH: Low odor, rapid curing, polymethacrylate (PMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing flashing membranes.

VOC content: 0.5 g/L

Color: White, Grey, Custom Color

* + - 1. POLYMETHYL METHACRYLATE FLASHING MEMBRANE (PMMA):
				1. SOPREMA ALSAN RS 230 FLASH: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing flashing membranes.

VOC content: 4.2 g/L

Color: White, Grey, Custom Color

* + - * 1. SOPREMA ALSAN RS DETAILER: Micro-fiber enhanced, rapid curing, polymethyl methacrylate (PMMA) paste resin used for flashing difficult penetrations where a resin/fleece/resin application is not practical.

VOC content: 2.6 g/L

Color: Grey

* + 1. FIELD MEMBRANE:
			1. POLYMETHACRYLATE MEMBRANE (PMA):
				1. SOPREMA ALSAN RS 260 LO FIELD: Low odor, rapid curing, polymethacrylate (PMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing field membranes.

VOC content: 0.5 g/L.

Color: White, Grey, Custom Color.

Elongation at peak load, avg. (ASTM D412): 54%.

Peak load at 73°F, avg. (ASTM D412): 799 lbf/in2.

Tear strength (ASTM D 5147): 98 lbf.

Shore A hardness, avg. (ASTM D2240): 78

Water absorption (Method I, 24h@73°F)(ASTM D570): 0.44%.

Water absorption (Method I, 48h@122°F)(ASTM D570): 1.40%.

Low temperature flexibility (ASTM D5147): 14°F.

Dimensional stability (ASTM D5147): -0.19%.

* + - 1. POLYMETHYL METHACRYLATE MEMBRANE (PMMA):
				1. SOPREMA ALSAN RS 230 FIELD: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing field membranes.

VOC content: 2.3 g/L (summer), 2.4 g/L (winter).

Color: White, Grey, Custom Color.

Elongation at peak load, avg. (ASTM D412): 55%.

Peak load at 73°F, avg. (ASTM D412): 809 lbf/in2.

Tear strength (ASTM D 5147): 107 lbf.

Shore A hardness, avg. (ASTM D2240): 81

Water absorption (Method I, 24h@73°F)(ASTM D570): 0.41%.

Water absorption (Method I, 48h@122°F)(ASTM D570): 1.57%.

Low temperature flexibility (ASTM D5147): -13°F.

Dimensional stability (ASTM D5147): -0.063%.

* 1. ACCESSORIES
		1. PRIMERS:
			1. SOPREMA ALSAN RS 276 PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over wood, concrete and approved waterproofing board substrates.
				1. VOC content: 2.6 g/L
				2. Color: Clear
			2. SOPREMA ALSAN RS 222 PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over asphaltic substrates, wood, concrete, and approved waterproofing board substrates.
				1. VOC content: 2.5 g/L
				2. Color: Clear
			3. SOPREMA ALSAN RS LO PRIMER: Low odor, two-part, epoxy based primer for concrete and approved substrates.
				1. SOPREMA ALSAN RS LO PRIMER PART A:

VOC content: <100 g/L

Color: Ivory

* + - * 1. SOPREMA ALSAN RS LO PRIMER PART B:

VOC content: <100 g/L

Color: White

* + - 1. SOPREMA ALSAN RS METAL PRIMER: Solvent-based primer used to improve the adhesion of PMMA/PMA membranes to metal substrates.
				1. VOC content: 50 g/L
				2. Color: Off White
			2. AQUAFIN Vaportight Coat SG3 Primer: Low odor, two-part, moisture mitigation epoxy based primer for concrete and approved substrates.
				1. AQUAFIN Vaportight Coat SG3 PART A:

VOC content: 0 g/L

Color: Clear

* + - * 1. AQUAFIN Vaportight Coat SG3 PART B:

VOC content: 0 g/L

Color: Yellowish

* + 1. CATALYST:
			1. SOPREMA ALSAN RS CATALYST POWDER: Reactive agent used to cure PMMA/PMA liquid resins.
		2. REINFORCING FABRIC:
			1. SOPREMA ALSAN RS FLEECE: Woven polyester reinforcement used in PMMA/PMA liquid applied membrane and flashing applications.
				1. Thickness: 30-40 mils (0.8-1 mm)
				2. Weights: 110 g/m2
				3. Width(s): 10.3 in (26 cm), 13.8 in (35 cm), 20.7 in (53 cm), 41.3 in (105 cm). Size as required.
				4. Length: 164 ft (50 m)
			2. SOPREMA ALSAN RS PRE-CUT FLEECE: Factory pre-cut woven polyester reinforcement used for a variety of penetration flashings in PMMA/PMA liquid applied membrane and flashing applications.
				1. Thickness: 30-40 mils (0.8-1 mm)
				2. Weights: 110 g/m2
				3. Component/Size(s): Small Pipe Flashing ½ - 3 in (13 - 76 mm), Large Pipe Flashing 4 - 8 in (102 – 203 mm), Universal Corner sizes as required.
		3. PASTE AND MORTAR:
			1. SOPREMA ALSAN RS PASTE: Rapid curing, polymethyl methacrylate (PMMA) paste resin used to fill small cracks and voids on non-traffic bearing substrates prior to the application of PMMA/PMA membranes.
				1. VOC content: 4.4 g/L
				2. Color: Grey
			2. POLYMETHACRYLATE MORTAR (PMA):
				1. SOPREMA ALSAN RS 263 LO MORTAR: Rapid curing, polymethacrylate (PMA) liquid resin used as a heavy duty wearing layer in ALSAN RS pedestrian and vehicle traffic systems. Consists of ALSAN RS 223 Powder and ALSAN RS 240 LO liquid resin

SOPREMA ALSAN RS 240 LO: Low odor, rapid curing, polymethacrylate (PMA) liquid resin.

VOC content: 1.0 g/L

Color: Grey

SOPREMA ALSAN RS 223 POWDER: Filler.

* + - 1. POLYMETHYL METHACRYLATE MORTAR (PMMA):
				1. SOPREMA ALSAN RS 233 MORTAR: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used as a heavy duty wearing layer in ALSAN RS pedestrian and vehicle traffic systems. Consists of ALSAN RS 223 Powder and ALSAN RS 210 liquid resin.

SOPREMA ALSAN RS 210: Rapid curing, polymethyl methacrylate (PMMA) liquid resin.

VOC content: 0.3 g/L

Color: Grey

ALSAN RS 223 Powder: Filler.

* + 1. CLEANER:
			1. SOPREMA ALSAN RS CLEANER: Clear, blended solvent used to clean and prepare plastic and metal surfaces, and used to clean existing ALSAN RS surfaces prior to the application of PMMA/PMA liquid applied membrane and flashings.
				1. VOC content: <5 g/L
				2. Color: Clear
		2. SURFACING AGGREGATE:
			1. SOPREMA ALSAN RS SURFACING AGGREGATE: Quartz aggregate used in PMMA/PMA membranes to provide a slip-resistant and mechanical bonding layer to the top coat.
				1. Size: #1.
				2. Color: Natural
1. **EXECUTION**
	1. EXAMINATION
		1. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions are satisfactory to begin, and remain satisfactory throughout the project.
		2. The contractor shall examine all waterproofing substrates including, but not limited to: decks, walls, curbs, equipment, fixtures, and wood blocking.
		3. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified waterproofing materials.
	2. PREPARATION
		1. Before commencing work each day, the contractor shall prepare all substrates to ensure conditions are satisfactory to proceed with the installation of specified materials.
		2. Preparation of substrates includes, but is not limited to, the following:

* + - 1. General:
				1. All substrates must be clean, dry and free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, release agents, lacquers, or any other condition that would be detrimental to adhesion of primer and/or resin materials to the substrate. Most surfaces will require mechanical abrasion in the form of scarifying, shot-blasting or grinding to achieve a suitable substrate.
				2. Inspect all substrates, and correct defects before application of waterproofing materials. Fill all surface voids 1/16 in (1.5 mm) or greater wide and/or deep with appropriate fill material.
			2. Concrete Substrates:
				1. Concrete shall comply with requirements of ACI 301 and ACI 308.
				2. Concrete compressive strength: 3,500 psi for all PMMA primers or 2,500 psi minimum when use of a moisture mitigation primer is required.
				3. Relative Humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
				4. Surface: Scarify, shot-blast or grind to ICRI Concrete Surface Profile CSP 3 to CSP 5; CSP 3 being the preferred profile.
				5. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
				6. Areas of spalls, voids, bug holes and other deterioration on vertical or horizontal surfaces shall be repaired as required or recommended.
			3. Masonry Substrates:
				1. Walls shall be structurally sound built of hard kiln dried brick, reinforced concrete block, or waterproof concrete block construction.
				2. Liquid applied membrane must not be applied over soft or scaling brick or block, faulty mortar joints, or walls with broken, damaged or leaking coping. Areas of spalls, voids, bug holes and other deterioration on vertical surfaces shall be repaired as required or recommended.
				3. Walls of ordinary hollow tile, or other materials which in themselves are not waterproofed, should not be accepted as suitable to receive liquid applied membrane unless properly waterproofed to prevent moisture infiltration from above or behind the new liquid applied membrane.
				4. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
				5. Surface: Scarify, shot-blast or grind to ICRI Concrete Surface Profile CSP 2 to CSP 4.
				6. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
			4. Metal Substrates:
				1. Clean and prepare metal to near-white metal in accordance with SSPC – SP3 (power tool clean) to a point maximum 1/8 in (3 mm) beyond the termination of liquid applied membrane materials and wipe with solvent cleaner to remove oils, debris or contaminants.
				2. Stainless Steel Series 300 and 400: Abrade to provide rough, open surface and wipe with solvent cleaner to remove oils, debris or contaminants.
				3. Galvanized & Zinc-Rich Metals: Galvanized and/or zinc rich metals are coated with either a layer of oil to prevent white rust or is passivated which must be completely removed prior to applying primer or liquid applied waterproofing. This can be confirmed by applying a coat of copper sulfate solution to the prepared and cleaned galvanized/zinc metal. A properly prepared surface will turn black indicating the passivator has been removed. If the surface does not turn black, additional abrasive cleaning will be required.
				4. Adhesion: Examine metal substrates by conducting adhesion testing. Prime with specified metal primer where required to achieve adequate adhesion.
			5. Rigid Plastics (PVC & ABS):
				1. Rigid plastics should be lightly abraded and wiped with solvent cleaner. Extend preparation maximum 1/8 in (3 mm) beyond the specified termination of the liquid applied membrane flashing materials.
			6. Wood Substrates:
				1. Provide sanded ¾ in (19 mm) minimum thickness APA A-C, Group 1, Exterior or Exposure 1, 48 in (1220 mm) x 96 in (2440 mm) tongue & groove sheathing panels. Install all panels with “A” side up, edges supported by blocking or structural framing, fastened using only non-corrosive screw fasteners with heads installed flush with sheathing applied at 6 in (150 mm) minimum o.c. along panel edges and 12 in (300 mm) o.c. over intermediate supports and/or additional fastening as required by jurisdictional codes. All new plywood substrates shall be structural panels performance-rated pursuant to National Institute of Standards and Technology (NIST) voluntary product standard PS-1-95; identified with American Plywood Association (APA) grade designations.
				2. Hygroscopic building materials such as wood plank, timber or plywood will normally have higher moisture content (in the range of 8% to 12%) as they adsorb or desorb moisture to reach equilibrium moisture content with the surrounding air. Cold liquid applied primer and reinforced membrane should not be applied to damp or wet sheathing materials, but may be applied to materials with higher moisture contents as indicated above, provided the exposed surface is clean and dry. Ultimately, determinations of moisture content and the resulting bond strength should be performed periodically to determine acceptability. If poor adhesion or blistering occurs, substrate will require additional drying time before proceeding.
				3. After priming plywood panels, fill joint gaps, holes and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 1 in (25 mm) wide bond breaker tape followed with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint. Cover knot holes or cracks with strips of cold liquid applied reinforced waterproofing membrane.
			7. Acceptable Rigid Insulation & Roof Cover Boards:
				1. After panels, fill joint gaps, holes and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint.
			8. Tie-In to Emulsion Coated or Smooth APP Modified Bitumen Membrane:
				1. The top surface of existing emulsion coated or smooth APP modified bitumen membrane shall be broadcast to excess with #1 (0.7 - 1.2 mm) kiln-dried quartz silica. Liquefy the top surface of the in-place membrane using a torch and broadcast silica aggregate into the liquid asphalt to excess. After the asphalt has cooled, remove all loose granules, dust, dirt or debris from the surface of the membrane by broom, blower or power vacuuming.
			9. Single Ply and Other Flashing Surfaces:
				1. Remove all contaminants and prepare substrate as needed to receive liquid applied waterproofing.
				2. Adhesion: Examine substrates by conducting adhesion testing. Prime with specified primer where required to achieve adequate adhesion.
		1. Where conditions are found to be unsatisfactory, work shall not begin until conditions are adjusted appropriately. Commencing of work shall indicate contractor’s acceptance of conditions.
	1. PRIMER APPLICATION (GENERAL)
		1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
		2. Examine all substrates and conduct adhesion peel tests as necessary, to ensure satisfactory adhesion is achieved.
	2. PMMA PRIMER APPLICATION (SOPREMA ALSAN RS 276/222)
		1. Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
		2. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
		3. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
		4. Project conditions vary throughout the day. Monitor changing conditions and the curing time of primers.
		5. Allow primer to fully cure before membrane application.
	3. EPOXY PRIMER APPLICATION (SOPREMA ALSAN RS LO PRIMER)

* + 1. Low Odor Primer Applications:
			1. Mix A and B parts using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
			2. Apply primer to compatible, clean and prepared substrate preferably with falling temperature to reduce potential for pinholes from “off-gassing” and as required to enhance adhesion of new specified waterproofing materials.
			3. Apply primer using notched squeegee and roller or brush at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
			4. When primer will be left exposed beyond recommended recoat times, broadcast to excess with #1 (0.7 – 1.2mm) kiln-dried quartz into the final coat of epoxy primer while still wet at the rate of 30 lbs/100 ft2 (1.5 kg/m2) as a mechanical bonding layer. After cure, remove loose aggregate and keep dry until subsequent system components are applied.
			5. Project conditions vary throughout the day. Monitor changing conditions and the curing time of primers.
			6. Allow primer to fully cure before proceeding. Remove excess un-adhered aggregate from surface by broom, vacuum or oil-free blower prior to apply membrane.
	1. EPOXY PRIMER APPLICATION (AQUAFIN Vaportight Coat SG3 Primer)

* + 1. Moisture Mitigation Primer Applications:
			1. Mix A and B parts using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
			2. Apply primer to compatible, clean and prepared substrate preferably with falling temperature to reduce potential for pinholes from “off-gassing” and as required to enhance adhesion of new specified waterproofing materials.
			3. Apply primer using a notched squeegee and roller or brush at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
			4. Allow primer to fully cure and inspect for bubbles, blisters, voids or pinholes.
			5. Repair bubbles, blisters, voids and pinholes as recommended by manufacturer.
			6. For steep slope, vertical and flashing applications, minimum two coats of primer are required.
			7. When primer will be left exposed beyond recommended recoat times, following any required primer repairs, apply a second coat of primer over the in-place primer and broadcast to excess with #1 (0.7 – 1.2mm) kiln-dried quartz into the final coat of epoxy primer while still wet at the rate of 30 lbs/100 ft2 (1.5 kg/m2) as a mechanical bonding layer. After cure, remove loose aggregate and keep dry until subsequent system components are applied.
			8. Project conditions vary throughout the day. Monitor changing conditions and the curing time of primers.
			9. Allow primer to fully cure before proceeding. Remove excess un-adhered aggregate from surface by broom, vacuum or oil-free blower prior to apply membrane.
	1. METAL PRIMER APPLICATION (SOPREMA ALSAN RS METAL PRIMER)
		1. Mix primer resin approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
		2. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
		3. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
		4. Project conditions vary throughout the day. Monitor changing conditions and the curing time of primers.
		5. Allow primer to fully cure before membrane application.
	2. SUBSTRATE PATCHING, LEVELING & REPAIR (SOPREMA ALSAN RS PASTE OR ALSAN RS 233/RS 263 MORTAR)
		1. GENERAL:
			1. After priming and before commencing with application of liquid applied waterproofing, the contractor shall patch, level or repair all substrates as required to eliminate bug holes, voids, cavities, low spots, repair cracks or any other condition that may be detrimental to proper application of the liquid applied waterproofing.
		2. PATCHING, LEVELING & REPAIRS:
			1. Contractor shall use proprietary paste or resin-mortar for all patching, leveling or repairs wherever possible. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
			2. Traffic bearing substrates: Use only resin-mortar for all substrate leveling, patching and repairs.
			3. Non-traffic bearing horizontal or vertical substrates: Use paste or resin-mortar for all substrate leveling, patching and repairs.
			4. Application:
				1. Install paste or resin-mortar over a fully cured primer.
				2. The substrate should be dry and free of any dust or loose particles.
				3. Mix paste resin and/or resin-mortar using a slow speed agitator prior to pouring into a larger container.
				4. When required, combine the paste or resin-mortar with #1 (0.7 – 1.2mm) kiln-dried quartz aggregate as recommended for deep voids or large areas.
				5. Mix paste and/or resin-mortar and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
				6. Apply the catalyzed paste and/or resin-mortar onto the substrate using a smoothing trowel, working the material into the surface for complete coverage and full adhesion.
				7. Paste and/or resin-mortar should be placed in lifts no greater than the maximum thicknesses recommended.
				8. If additional lifts will be required, broadcast top surface of the placed paste or resin-mortar with clean dry #1 (0.7 - 1.2 mm) kiln-dried quartz aggregate at approximately 25% coverage while the paste and/or resin-mortar is wet. Place next lift once the paste and/or resin-mortar has cured.
		3. NON-MOVING (STATIC) CRACKS – 1mm or less:
			1. Determine that crack is non-moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin mortar or paste as required.
		4. MOVING (DYNAMIC) CRACKS – 1 mm or less:
			1. Determine that crack is moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin-mortar or paste as required. After the resin-mortar or paste has cured, apply minimum 4 in (100 mm) wide strip of reinforced cold liquid applied membrane centered over crack.
		5. MOVING (DYNAMIC) CRACKS – 3 mm or less:
			1. Determine that crack is moving. Remove any existing filler and clean out crack by brushing and oil-free compressed air. Fill crack with resin-mortar or paste as required. After the resin-mortar or paste has cured, apply bond breaker tape 5 times in width greater than the maximum anticipated expansion. Then cover with a strip of reinforced cold liquid applied membrane centered over crack sized to provided 2 in (50 mm) minimum cover beyond all side of the bond breaker tape but no less than 6 in (150 mm) minimum width.
		6. MOVING (DYNAMIC) CRACKS – Greater than 3 mm:
			1. Moving cracks greater than 3 mm must be treated as an expansion joint.
	3. INSTALLATION & STAGING
		1. In a normal cold liquid applied membrane application the substrate is prepared and primed, flashings are installed, followed by the application of the waterproofing membrane, mortar, surfacing and finish. When applying broadcast aggregate, the aggregate should not be left subject to the elements, and therefore must be top-coated with finish the same day of application whenever possible.
		2. If work is interrupted for more than 12 hours, use manufacturer’s proprietary cleaner to clean and reactivate applied primer, resin mortar, flashing or field membrane transition areas. Cleaner should be allowed a minimum of 20 minutes evaporation time after application and covered within 60 minutes of application or as recommended by the manufacturer.
	4. FLASHING MEMBRANE APPLICATION (SOPREMA ALSAN RS 230 FLASH AND SOPREMA ALSAN RS 260 LO FLASH)
		1. General:
			1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
			2. Provide a minimum vertical height of 8 in (200 mm) for all flashing terminations wherever possible. Flashing height shall be at least as high as the potential water level that could be reached as a result of a deluging rain and/or poor slope.
			3. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.
			4. All flashing shall be terminated as required by the manufacturer. Cap flashings or counter flashings may be constructed of metal, stone, tile or other materials properly installed in accordance with industry-accepted practice.
			5. Install all flashing membranes before installing field membranes.
			6. The primed substrate shall be dry and free of any dust, loose particles or contaminants.
			7. Precut reinforcing fleece to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side laps and extend flashing 4 in (100 mm) minimum horizontally onto deck unless otherwise specified. Ensure the completed liquid applied flashing membrane is fully reinforced.
			8. Wherever possible factory pre-cut fleece pipe penetration and universal corners shall be used.
			9. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of waterproofing resin that can be used within the application time.
			10. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
			11. Immediately apply the reinforcing fleece into the wet base coat of resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
			12. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.
		2. Penetrations
			1. Pipes, Conduits, Posts, Supports and Unusual Shaped Penetrations:
				1. Pipes, conduits and other items to be flashed must be separated with ½ in (13 mm) minimum clearance or as recommended by manufacturer to adequately waterproof each individual penetration.
				2. All penetrations must be flashed individually. Two or more items ganged together in a flashing will NOT be permitted.
				3. Flash penetrations using cold liquid applied reinforced membrane or proprietary fibrated flashing resin as recommended. Flashing shall be applied using factory pre-cut fleece wherever possible consisting of a reinforced deck skirt/target flashing applied over a reinforced vertical wrap finger flashing.
			2. Drains:
				1. Follow manufacturer’s specific drain flashing details for use on traffic bearing waterproofing systems.
				2. Flash drains using cold liquid applied membrane. Flashing shall consist of a membrane target extending minimum 12 in (300 mm) horizontally onto the substrate applied over a finger flashing extended into the prepared drain bowl a minimum of 3 in (75 mm) or terminated on exterior of trench drains where applicable.
				3. At no time should the cold liquid applied membrane be installed to restrict or reduce the drain inlet in size.
				4. For new drains, contractor shall include cost of all plumbing work, piping and connection to existing storm sewer system.
			3. Hot Pipes:
				1. Protect cold liquid applied membrane components from direct contact with steam or heat sources when the in-service temperature exceeds 150°F (65.5°C). In all such cases flash to an intermediate "cool" sleeve.
				2. Fabricate "cool" sleeve in the form of a metal cone using galvanized metal in accordance with manufacturer details.
				3. Flash sleeve using cold liquid applied reinforced membrane similar to a standard pipe flashing. Flashing shall consist of a reinforced target applied over a reinforced vertical wrap finger flashing.
			4. Flexible Penetrations:
				1. Provide a weather-tight gooseneck set in manufacturers resin paste and secured to the deck.
				2. Flash gooseneck penetrations using cold liquid applied reinforced membrane as recommended. Flashing shall consist of a reinforced target and reinforced vertical wrap finger flashing.
			5. Walls, Curbs and Bases:
				1. Flash all walls, curbs and bases using cold liquid applied reinforced membrane. Wherever possible extend flashing up and over tops of walls, curbs and bases so the membrane terminates on the opposite face of the vertical element.
			6. Expansion Joints:
				1. Flash all expansion joints with minimum two layers of manufacturers cold liquid applied reinforced membrane applied over an expansion joint compressible filler, expansion tube, backer rod and/or bond breaker tape as recommended by manufacturer.
			7. Non-standard Flashing Details:
				1. When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations or protrusions.
			8. Traffic Curbs and Flashings Subject to Vehicle Impact:
				1. Liquid applied flashings applied on curbs, walls and penetrations are subject to mechanical damage from vehicles. When required, especially at vehicular curbs, flashings should be protected using metal bollards, stand-offs, steel plate or other means as necessary.
		3. Mud-set Masonry, Tile & Poured-In-Place Concrete (Bonding Layer):
			1. For all areas to receive new direct applied cement, concrete, or mortar setting bed, apply a supplementary wearing coat of the membrane manufacturer’s cold liquid applied resin.
				1. Using a lambswool roller, apply an even layer of cold liquid applied resin at the minimum consumption of 30 lbs/100 ft2 (1.5 kg/m2) or as recommended by the membrane manufacturer and broadcast #1 (0.7 - 1.2mm) kiln-dried quartz aggregate into the wet resin to excess for full coverage.
				2. Allow resin bonding layer to cure as recommended by the membrane manufacturer prior to continuing application or applying loads. Remove excess unadhered aggregate from surface by broom, vacuum or oil-free blower prior to apply overburden.
				3. When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations or protrusions.
	5. FIELD MEMBRANE APPLICATION (SOPREMA ALSAN RS 230 AND SOPREMA ALSAN RS 260 LO)
		1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
		2. Install all flashing membranes before installing field membranes.
		3. The primed substrate shall be dry and free of any dust, loose particles or contaminants.
		4. Precut reinforcing fleece to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side and 4 in (100 mm) at end-laps. Ensure the completed liquid applied membrane is fully reinforced.
		5. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
		6. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
		7. Immediately apply the reinforcing fleece into the wet base coat of waterproofing resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
		8. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.
	6. WATERPROOFING CONTINUITY TESTING & QC EVALUATION
		1. Prior to applying bonding layer or overburden, contractor shall conduct a complete evaluation of the installed liquid applied waterproofing membrane and flashings which shall include visual inspection as well as an acceptable method for (low voltage, high voltage or water-flood) continuity testing.
		2. Immediately following evaluation and continuity testing, repair all deficiencies identified in liquid applied waterproofing membrane and flashings.
		3. Upon satisfactory completion of all required repairs, proceed with application of bonding layer installation.
	7. BONDING LAYER: (SOPREMA ALSAN RS 230 OR SOPREMA ALSAN RS 260 LO)
		1. For all areas that are going to receive new direct contact cement, poured concrete, paving asphalt or mortar setting bed, apply a supplementary wearing coat of membrane manufacturer’s cold liquid applied resin.
			1. Using a lambswool roller, apply an even layer of cold liquid applied resin at the minimum consumption of 30 lbs/100 ft2 (1.5 kg/m2) or as recommended by the membrane manufacturer and broadcast to excess with #1 (0.7 - 1.2mm) kiln-dried quartz aggregate into the wet resin to excess for full coverage.
			2. Allow resin bonding layer to cure as recommended by the membrane manufacturer prior to continuing application or applying loads. Remove excess unadhered aggregate from surface by broom, vacuum or oil-free blower prior to apply overburden.
	8. overburden placement:
		1. Overburden shall be placed as soon as possible after installation of the waterproofing system to reduce the risk of damage to the waterproofing membrane.
		2. For concrete overburden, when placing reinforcing steel over waterproofing membrane, use concrete bar supports (dobbies) or chairs with plastic tips or rolled feet to prevent damage from sharp edges. Take special care when using wire mesh, especially if the mesh is curled.
		3. For asphalt overburden, do not use any protection course between the waterproofing membrane and thin-layer asphalt overlays. Following rain, paving must be delayed until the bonding aggregate layer is dry.
		4. Use only pneumatic tire paving equipment for placement of concrete or asphalt onto waterproofing membrane. Equipment should be inspected prior to use for burrs, stones, or sharp projections on tires which could damage the membrane. Note: Flat tracked paving equipment is NOT allowed and should not be used for any applications over new waterproofing membrane.
	9. CLEAN UP
		1. Uncured resin is considered a hazardous material. Unused resin must be catalyzed and cured prior to disposal.
		2. Clean up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.
	10. PROTECTION
		1. Upon completion of new work (including all associated work), institute appropriate procedures for surveillance and protection of finished work during remainder of construction period. Protect all areas where waterproofing membrane, wearing layer, surfacing and finish have been installed.

END OF SECTION