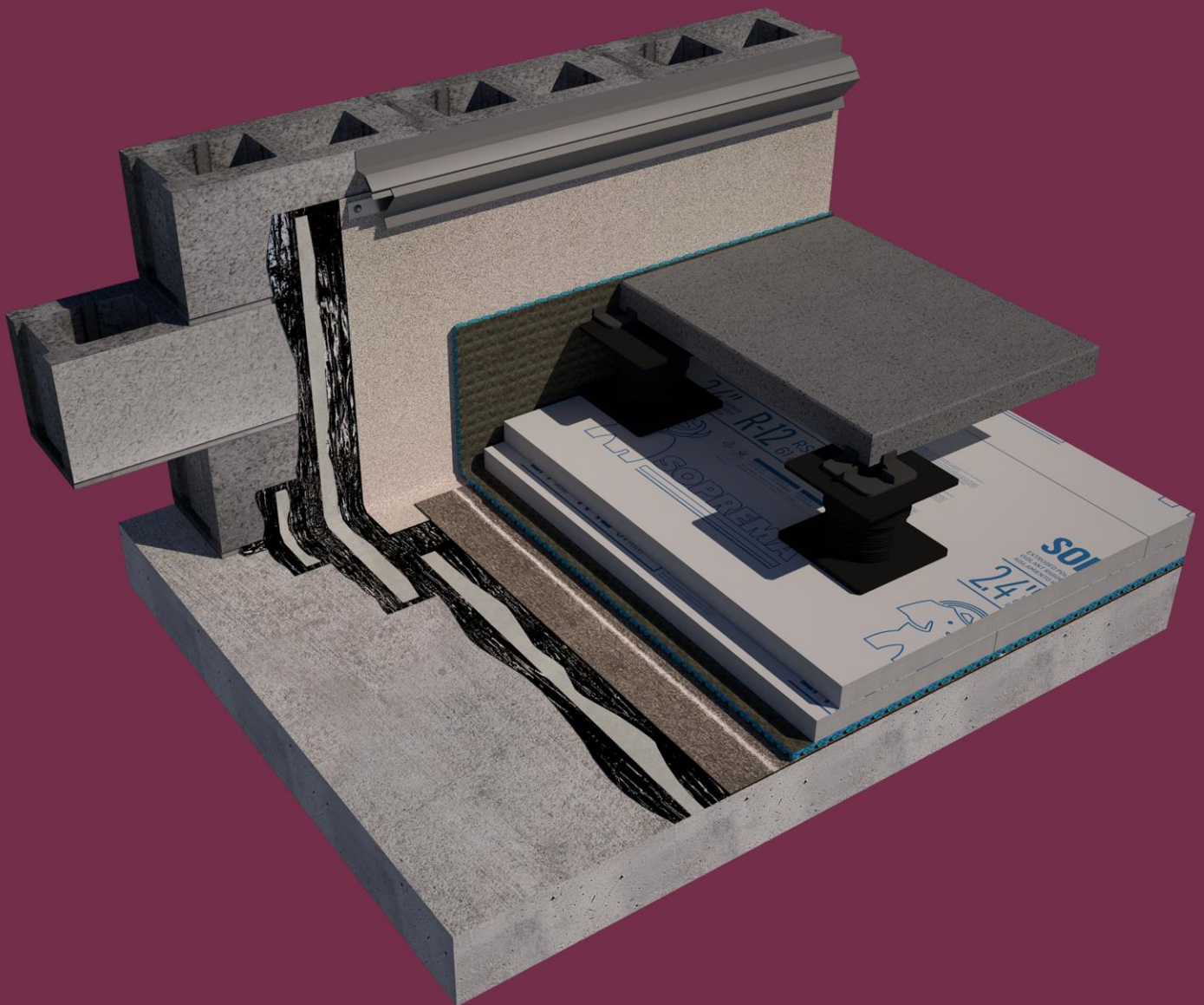




# COLPHENE® LM BARR PROTECTED MEMBRANE WATERPROOFING TECHNICAL MANUAL



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## INTRODUCTION

[SOPREMA®](#) COLPHENE® LM BARR is produced for above-grade horizontal and vertical waterproofing applications. Above-grade applications include between-slab waterproofing, plaza decks, protected roof membrane assemblies, vegetative roof systems and planter boxes.

COLPHENE® LM BARR waterproofing products consist of cold-applied, silyl terminated polyether (STPE), single-component moisture-cured, elastomeric materials. [COLPHENE® LM BARR](#) is applied using a brush, roller or squeegee. [COLPHENE® LM BARR SPRAY](#) is spray-applied, or may also be applied using a brush, roller or squeegee. [COLPHENE® LM BARR](#) and [COLPHENE® LM BARR SPRAY](#) are reinforced with [POLYFLEECE](#) or [SOPRAFLASH™-R](#) at field (horizontal) and flashing (vertical) applications. [COLPHENE® BARR FLASHING](#) is an accessory material that is tooled/trowel-applied at transitions, penetrations and terminations. Protection course sheets and other related accessories are applied over the COLPHENE® LM BARR waterproofing before applying overburden.

COLPHENE® LM BARR is produced using moisture-cured STPE technology, which is ideal for new “green” concrete containing high relative humidity (RH). COLPHENE® LM BARR is applied directly to concrete substrates, primer is not needed. COLPHENE® LM BARR waterproofing membranes are rain-proof within hours, have very low odor, and contain very low VOC’s which meet environmental restrictions and sensitive job site requirements.

The “COLPHENE® LM BARR PROTECTED MEMBRANE WATERPROOFING TECHNICAL MANUAL” is intended to offer guidance to [SOPREMA®](#) authorized contractors and design professionals. The manual provides specific instructions and details for [SOPREMA®](#) waterproofing and related accessories. Refer to applicable building codes, standards and waterproofing industry publications for additional requirements and best-practice guidelines. Refer to current [SOPREMA®](#) product data sheets and safety data sheets for specific product data and product-related requirements. For additional information refer to [www.soprema.us](http://www.soprema.us) or contact [SOPREMA®](#) at 800.356.3521.

## DISCLAIMER

This manual is intended for use by SOPREMA® authorized contractors and design professionals in order to provide instructions and details for the application of SOPREMA® waterproofing when a SOPREMA® warranty will be requested upon project completion. The contents of this manual are consistent with best industry practices, but are not specific to any particular project's needs and are not a substitute for professional design services. SOPREMA® bears no liability nor responsibility for the evaluation or design of any particular project.

The waterproofing material applicator is responsible for ensuring compliance with contract documents, project specifications, industry standards and jurisdictional codes necessary to meet the requirements for specific project applications.

## 1 SUBSTRATES FOR COLPHENE® LM BARR

### 1.1 SUBSTRATE EVALUATION, CLEANING, REPAIR AND PREPARATION

#### **General:**

- Before beginning the cleaning, repairs and preparation work, ensure project conditions are appropriate to proceed.
- Comply with all project-related health, safety and environmental requirements. Comply with all personal protective equipment (PPE) requirements.
- Review project conditions and determine when and where conditions are appropriate to utilize the specified equipment, materials and methods indicated herein. When conditions are determined to be unsafe or undesirable to proceed, take all necessary measures to prevent or eliminate all unsafe and undesirable exposures and conditions.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- 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.

#### **Substrate Evaluation:**

- Examine all substrates before applying COLPLHENE® LM BARR. Ensure substrates are clean, repaired, prepared and otherwise satisfactory before installing waterproofing materials.
- Do not apply COLPHENE® LM BARR materials to wet surfaces, standing water, dew, frost or ice. Surfaces should be dry to the touch with no visible signs of moisture.
- Eliminate water discharge and condensation from substrate surfaces, and ensure substrate surfaces are free of surface moisture before and during the application of waterproofing.
- After precipitation, allow sufficient time for substrate surfaces to dry before applying COLPHENE® LM BARR waterproofing materials.
- New concrete substrates:
  - Concrete substrates should be sufficiently cured as specified by the design professional. Refer to ACI 301, *Specifications for Structural Concrete*, and ACI 308, *Specification for Curing Concrete*, for the examination and evaluation of concrete substrates.
  - Concrete should be cured sufficiently, a minimum of 3 to 7 days, and as necessary to support construction traffic in order to apply COLPHENE® LM BARR. Concrete cure time varies based on project environment. Comply with the project's concrete specifications.
  - When specified or otherwise necessary to measure the relative humidity (RH) of the concrete, complete testing in accordance with ASTM F2170, *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*. High relative humidity is acceptable for COLPHENE® LM BARR materials.
  - Examine concrete substrates to ensure substrates are flat, free of fins or planar irregularities greater than 6.4 mm in 3 m (1/4 inch in 10 ft). Verify that no excess mortar or concrete debris exists on substrates, masonry ties, shelf angle and other obstructions.
  - Examine concrete substrates to ensure surfaces have a uniform surface profile consistent with Concrete Surface Profile (CSP) 2, 3, or 4 per the International Concrete Repair Institute (ICRI).
  - Rough, pitted, porous concrete surfaces and other surface irregularities may result in pinholes in the COLPLHENE® LM BARR waterproofing. Surface irregularities must be pretreated using COLPHENE® LM BARR, [COLPHENE® BARR FLASHING](#), or [SOPRASEAL® SEALANT](#) prior to installing the COLPLHENE® LM BARR waterproofing. Refer to *Substrate repairs* below.

- Examine the adhesion of COLPLHENE® LM BARR to concrete substrates. Refer to the *Adhesion* section noted below for adhesion test guidelines.
- Notify the design professional, general contractor and/or other responsible party when concrete conditions are unacceptable to apply COLPLHENE® LM BARR. Ensure corrective action is taken, and conditions are acceptable, before applying COLPLHENE® LM BARR.
- Existing concrete substrates:
  - Refer to guidelines for *New concrete substrates* noted above.
  - Existing concrete substrates should be cleaned, repaired and prepared as necessary to install COLPHENE® LM BARR waterproofing. Refer to the *Cleaning, Preparation and Repairs* sections noted below.
  - Examine the adhesion of COLPLHENE® LM BARR to existing concrete substrates. Refer to the *Adhesion* section noted below for adhesion test guidelines.
  - Notify the design professional, general contractor and/or other responsible party when substrate conditions are found to be unacceptable. Ensure corrective action is taken, and conditions are acceptable before applying COLPLHENE® LM BARR.
- Adhesion:
  - Conduct 180 degree peel tests to examine the adhesion between COLPLHENE® LM BARR and prepared substrates. Refer to ASTM C794, *Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants*.
  - Choose 3 or more test areas that are representative of each substrate.
  - Clean and prepare the substrates as indicated herein.
  - Cut 2 inch (5.08 cm) wide x 12 inch (30.48 cm) long strips of [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcing fabric.
  - Apply COLPLHENE® LM BARR to fully encapsulate an 8 to 9 inch (20.32 to 22.86) long section of the 12 inch (30.48) strip of reinforcing fabric, allow a 3 to 4 inch (7.62 to 10.16 cm) “dry tail” to remain un-adhered.
  - Based on environmental conditions, allow sufficient time for samples to fully cure (until no longer wet and tacky) for optimum results.
  - Grip the “dry tail” end of the reinforcing fabric and pull 180 degrees, parallel with the surface. Use a small fish scale or similar scale to measure quantitative results in pounds of resistance where quantitative results are desired.
  - For concrete substrates, results should demonstrate strong resistance to peel, with cohesive failure. Most of the COLPLHENE® LM BARR should remain bonded to the substrate.
  - Record results with digital photos for reference.
  - Where quantitative measurements of peel resistance are desired, the peel resistance should exceed 2 lbf per linear inch of sample width (e.g. a 2 in wide sample should exceed 4 lbf and the sample should not peel away “clean” from the substrate).
  - Take photos or videos of the samples and the substrate to record conditions.

#### ***Substrate Cleaning:***

- Clean new concrete substrates to remove loose dirt, dust and debris as necessary to ensure satisfactory adhesion of the COLPHENE® LM BARR waterproofing materials.
- For existing concrete, refer to the *Substrate Preparation* section below.
- Refer to ASTM D4258, *Standard Practice for Surface Cleaning Concrete for Coatings*.
- Substrates should be sufficiently clean to ensure adequate adhesion of COLPHENE® LM BARR waterproofing.
- Examine adhesion when necessary to confirm substrates are sufficiently clean and ready to apply COLPLHENE® LM BARR. Refer to the *Adhesion* requirements noted above for adhesion test guidelines.

#### ***Substrate Preparation:***

- New concrete substrates:
  - Refer to the *Evaluation* section for *New concrete substrates*.
  - New, properly designed, installed and finished structural concrete should only require minimal preparation to apply COLPHENE® LM BARR.
  - Concrete should be prepared in general accordance with ASTM D5295, *Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems*.
  - Concrete should be free of spalls, voids, blow holes and free of loose materials, laitance and efflorescence.
  - Substrates should be sufficiently clean to ensure adequate adhesion of COLPHENE® LM BARR waterproofing. Refer to the *Cleaning* section noted above.
  - Examine adhesion when necessary to confirm substrates are sufficiently prepared and ready to apply COLPHENE® LM BARR. Refer to the *Adhesion* requirements noted above for adhesion test guidelines.
  - Notify the design professional, general contractor or other responsible party when new concrete has not been properly prepared for the application of COLPHENE® LM BARR. Ensure corrective action is taken, and conditions are acceptable before applying COLPHENE® LM BARR.
- Existing concrete substrates:
  - Remove all existing waterproofing materials and all other foreign materials that interfere with the adhesion of COLPHENE® LM BARR.
  - Use mechanical scarifying, grinding or shot blasting methods where necessary to remove residual waterproofing and to provide a suitable concrete surface free of incompatible materials. Refer to the *Evaluation* section noted above.
  - Concrete should be prepared in general accordance with ASTM D5295, *Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems*.
  - Concrete should be free of spalls, voids, blow holes and free of loose materials, laitance and efflorescence.
  - Examine adhesion to confirm substrates are sufficiently prepared and ready to apply COLPHENE® LM BARR. Refer to the *Adhesion* requirements noted above for adhesion test guidelines.

#### ***Substrate Repairs:***

- Notify the design professional, general contractor or other responsible party upon discovery of significant damages and concrete deficiencies that cannot be properly addressed by cleaning and preparation measures indicated above.
- Ensure corrective action is taken, and repairs are acceptable, before applying COLPHENE® LM BARR waterproofing.
- Minor repairs:
  - Minor concrete irregularities that are 1/8 to 1/4 in include small spalls, pitting, voids, holes, static cracks and other minor irregularities.
  - Clean and remove dust and debris from the irregularities.
  - Pretreat concrete irregularities using COLPHENE® LM BARR, COLPHENE® BARR FLASHING, or SOPRASEAL® SEALANT. Use spray equipment, brush, roller, or trowel to work-in the material, and bond the waterproofing material to the irregularity.
  - Ensure substrates are pretreated to provide uniform surfaces before applying the reinforced COLPHENE® LM BARR waterproofing.



## 2 COLPHENE® LM BARR MEMBRANE

### 2.1 FLASHING MEMBRANE

#### *General:*

- [COLPHENE® LM BARR](#) (brush, roller or squeegee-grade) or [COLPHENE® LM BARR SPRAY](#) (spray grade) may be used to apply waterproofing for the field and for flashings.
- Before applying COLPHENE® LM BARR, ensure conditions are acceptable to proceed. Refer to [Section 1.1 SUBSTRATE EVALUATION, CLEANING, REPAIR AND PREPARATION](#).
- The fully reinforced COLPHENE® LM BARR flashings are generally installed first at penetrations, termination and transitions before installing the COLPHENE® LM BARR field membrane. It is also acceptable to install flashings after the field membrane has been completed. Refer to the flashing details noted below.
- Install subsequent coats of COLPHENE® LM BARR within 72 hours of the initial application. For additional coats, and at tie-ins, ensure the surface is clean and free of foreign materials that may interfere with adhesion.
- Weather and environmental conditions:
  - COLPHENE® LM BARR STPE/polyether materials are moisture cured. Materials cure faster and skin over quickly when exposed to high temperatures.
  - COLPHENE LM BARR materials should be stored at or above room temperature (70°F (21°C)) for optimum application.
  - The ambient application temperature should be between 35°F (1.7°C) and 95°F (35°C).
  - The substrate temperature should be between 35°F (1.7°C) and 120°F (48.9°C). Monitor substrate and material temperatures to ensure conditions remain satisfactory while applying COLPHENE® LM BARR.
  - COLPHENE® LM BARR materials are not subject to freezing; however, materials may become viscous and difficult to apply when the material is cold. During periods of cold weather, materials should be stored in a heated area and maintained at or above 70°F (21°C). Provide band-type drum and pail heaters designed to heat containers as necessary when applying COLPHENE® LM BARR during cold weather.
  - Ice and frost will prevent adhesion of COLPHENE LM BARR and may be difficult to detect on concrete substrates. During extended periods of cold weather when the substrate is exposed to freezing conditions, the substrate should be heated as necessary to eliminate ice crystals that may be present. Examine adhesion closely when conditions are below freezing.
  - During hot weather, COLPHENE® LM BARR may cure and skin-over quickly. During hot, sunny conditions store materials in cool or shaded areas away from direct sunlight.
  - Environmental conditions such as sun, cloud cover, wind, humidity, and shade impact the application and cure time. Monitor the application of COLPHENE® LM BARR and adjust application methods as necessary to accommodate changing weather conditions.
  - Surfaces should be dry to the touch with no visible signs of moisture. Do not apply COLPHENE® LM BARR materials to wet surfaces, standing water, dew, frost or ice.
  - Ensure all materials and substrates remain above the dew point temperature to prevent condensation. The ambient temperature should be well above the dew point temperature, with no dew, fog or condensation present.
  - COLPHENE® LM BARR generally cures within one day, ready for foot traffic in 24 hours. The cure time is 3 hours for each 30 mils applied at 70°F (21°C) and 50 percent relative humidity. Cure time varies based upon project conditions.
  - Examine the COLPHENE® LM BARR waterproofing to ensure it is cured sufficiently (not wet nor tacky) to support construction traffic before walking over the waterproofing and before applying subsequent materials.
  - COLPHENE® LM BARR should be fully protected from UV exposure within 90 days of application.



- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE), administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.
- 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.

#### ***Flashing Preparation:***

- Ensure pipes, drains, equipment, etc. to be flashed are clean, prepared and secured to prevent movement, and all gaps and breaks between substrates are properly sealed before applying the COLPHENE® LM BARR materials.
- Before applying the COLPHENE® LM BARR, pre-cut the [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcing fabric to conform to flashings. Cut reinforcing to ensure the COLPHENE® LM BARR is fully reinforced and overlapped at finger-cuts, side-laps and end-laps to eliminate skips or breaks in the reinforcement.
- Ensure sufficient application tools and equipment are ready and available before beginning work. Refer to the equipment manufacturer's instructions, safety, care and maintenance requirements.
- Spray equipment:
  - Pump Model:
    - Graco King XL70 Heavy Fluid Spray
    - Graco GH933
    - Graco 675DI
  - Gun: XTR7
  - Pump Pressure: 6,750psi – 7,250psi
  - Pump Volume: 1.5gpm – 4.6gpm
  - Tip: XHD
  - Tip Orifice: 0.031in – 0.041in
  - Tip Guard: XHD RAC Guard
  - Fan Width (12in from surface): 10in – 24in
  - Hose Length: 50ft
  - Hose Pressure Rating: 7,250psi
  - Hose ID: 1/2in min
  - Whip Hose Length: 15ft
  - Whip ID: 3/8in min
  - Whip Pressure Rating: 7,250psi
- Manual/hand held application tools and equipment:
  - Stiff bristle brushes.
  - ½ to ¾ in naps, rollers and handles.
  - ¼ in notched squeegees and handles.
  - Trowel, flat-blade putty knife, joint sealant tools.
- Ensure sufficient COLPHENE® LM BARR and reinforcing fabric materials are available and ready for application. Refer to *Weather and environmental conditions* noted above.
- Stir [COLPHENE® LM BARR](#) pails using a paddle mixer and low speed drill prior to use.
- [COLPHENE® LM BARR SPRAY](#) supplied in drums and totes may be applied directly from the drum or tote without stirring.

#### ***Flashing Application:***

- [COLPHENE® LM BARR](#) (brush, roller or squeegee-grade) or [COLPHENE® LM BARR SPRAY](#) (spray grade) may be used to apply COLPHENE® LM BARR waterproofing for flashing details.

- Pretreat concrete irregularities using COLPHENE® LM BARR, [COLPHENE® BARR FLASHING](#) or [SOPRASEAL® SEALANT](#). Use a brush, roller or trowel to fill imperfections and provide a smooth, uniform surface before applying the reinforced COLPHENE® LM BARR waterproofing. Refer to [Section 1.1](#) SUBSTRATE EVALUATION, CLEANING, REPAIR AND PREPARATION
- Horizontal-to-vertical transitions at walls and curbs:
  - Refer to [Figure 2.1a](#) below.
  - Apply a bead of [COLPHENE® BARR FLASHING](#) along the joint, tool-in the material to create a 45 degree cant with a ¾ in face.
  - At the angle transition, apply 60 mils (3.7 gal/square) of COLPHENE® LM BARR waterproofing 3 to 4 in onto the horizontal and vertical surfaces. Immediately set [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcement into the wet COLPHENE® LM BARR. Work the fleece into the COLPHENE® LM BARR waterproofing to prevent wrinkles. Ensure the reinforcing fabric is cut to conform to conditions so that the COLPHENE® LM BARR is fully reinforced and overlapped at cuts, side-laps and end-laps. Overlap reinforcing fabric side-laps a minimum of 2 in. Apply COLPHENE® LM BARR between reinforcing fabric laps.
  - Apply an additional 60 mils (3.7 gal/square) of COLPHENE® LM BARR.
  - Use a brush, roller or squeegee to work the COLPHENE® LM BARR into the reinforcement as needed to eliminate “dry” reinforcement, voids, air pockets and wrinkles.
  - For the horizontal and vertical substrates, apply a minimum 60 mils (3.7 gal/square) base layer of COLPHENE® LM BARR waterproofing. Immediately set reinforcement into the wet COLPHENE® LM BARR. Work the fleece into the COLPHENE® LM BARR waterproofing to prevent wrinkles. Ensure the reinforcing fabric is cut to conform to conditions so that the COLPHENE® LM BARR is fully reinforced and overlapped at cuts, side-laps and end-laps. Overlap reinforcement side-laps a minimum of 2 in. Apply COLPHENE® LM BARR between reinforcing fabric laps.
  - Apply a minimum 60 mils (3.7 gal/square) top coat of COLPHENE® LM BARR.
  - Use a brush, roller or squeegee to work the COLPHENE® LM BARR into the reinforcement as needed to eliminate “dry” reinforcement, voids, air pockets and wrinkles.
  - Ensure the COLPHENE® LM BARR waterproofing is fully reinforced.
  - COLPHENE® LM BARR vertical flashings should extend 8 in above the horizontal surface of the exposed overburden.
  - These fundamentals apply to other similar waterproofing transition details.
- Waterproofing penetrations and drains:
  - Refer to [Figures 2.1b and 2.1c](#) below.
  - Apply 60 mils (3.7 gal/square) COLPHENE® LM BARR waterproofing 3 to 4 in onto the horizontal and vertical surfaces.
  - Immediately set [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcement into the wet COLPHENE® LM BARR waterproofing. Work the fleece into the COLPHENE® LM BARR waterproofing to prevent wrinkles. Ensure the reinforcing fabric is cut to conform to conditions so that the COLPHENE® LM BARR waterproofing is fully reinforced and overlapped at cuts, side-laps and end-laps.
  - Immediately apply 60 mils (3.7 gal/square) of COLPHENE® LM BARR waterproofing, and work the COLPHENE® LM BARR into the reinforcing fabric to ensure the reinforcement is fully encapsulated.
  - Ensure the COLPHENE® LM BARR waterproofing is fully reinforced.
  - These fundamentals apply to other similar waterproofing penetration details.
- COLPHENE® LM BARR tie-ins between field and flashings:
  - At flashing tie-ins where COLPHENE® LM BARR materials have cured, apply new COLPHENE® LM BARR overlapped onto the cured COLPHENE® LM BARR a minimum of 4 in.
- COLPHENE® LM BARR daily tie-ins:
  - Where COLPHENE® LM BARR has been exposed for an extended period (72 hours or more), or has become dirty, clean the COLPHENE® LM BARR surface using a clean cloth and xylene solvent. Apply new COLPHENE® LM BARR overlapped 6 in onto the clean, dry waterproofing surface.
- Flashing protection course:

- COLPHENE® LM BARR waterproofing requires a protection course to eliminate exposure from UV. Protection is also required to protect the waterproofing from potential damages resulting from overburden materials, construction traffic and environmental exposures.
- Ensure waterproofing is cured sufficiently (not wet or tacky) for 24 hours or more before applying the protection course over the COLPHENE® LM BARR waterproofing. Waterproofing should not be left exposed for more than 90 days after applying the COLPHENE® LM BARR.
- Ensure the COLPHENE® LM BARR has been thoroughly inspected and all deficiencies corrected before applying the protection course. Refer to the *Flashing inspection* section below.
- SBS modified bitumen flashing cap sheet protection course:
  - Where COLPHENE® LM BARR flashing details are exposed to UV, install [COLPHENE® 180 FR GR](#), or other approved SOPREMA SBS modified bitumen flashing cap sheet to protect the waterproofing from UV exposure. Refer to [Figure 2.1a](#) below.
  - Unroll the flashing cap sheet and allow it to relax.
  - Once relaxed, cut the [COLPHENE® 180 FR GR](#) cap sheet to the required working lengths to accommodate the flashing height and the required over-lap onto the horizontal surface.
  - Cut [COLPHENE® 180 FR GR](#) from the end of the roll in order to always install flashings to the selvage edge line.
  - Install [COLPHENE® 180 FR GR](#) starting at the top leading edge on the vertical substrate, down the wall, and onto the horizontal surface 4 in or more from the base of the wall/curb.
  - Eliminate all bridging and voids at the vertical-to-horizontal transition.
  - Extend [COLPHENE® 180 FR GR](#) onto the horizontal surface as required to protect the COLPHENE® LM BARR waterproofing from exposure to UV.
  - Apply [COLPHENE® BARR FLASHING](#) or [COLPLY™ EF FLASHING CEMENT](#) to the underside of [COLPHENE® 180 FR GR](#) using a ¼ inch notched trowel. Apply 2.0 – 2.5 gallons per square to the sheet. Application rates vary based on substrate conditions.
  - Ensure the flashing cap sheet is completely adhered in place, with no bridging, voids or openings.
  - Roll-in or press-in the flashing cap sheet during installation to ensure they are in full contact with the substrate below.
  - Fasten the top leading edge of the flashing cap sheet 8 in on-centers using appropriate anchors or fasteners and plates. Seal fastener penetrations watertight using [SOPRASEAL® SEALANT](#).
  - Ensure protection course is in place before the installation of overburden materials.

#### ***Flashing Inspection:***

- Each day, physically inspect all COLPHENE® LM BARR flashings before concealing the waterproofing with the protection course and overburden.
- Closely examine the COLPHENE® LM BARR to ensure there are no pin holes.
  - Each day, repair all areas where pin holes exist by applying an additional 60 mils (3.7 gal/square) of COLPHENE® LM BARR waterproofing to seal all pinholes.
- Inspect the COLPHENE® LM BARR for voids, wrinkles, open laps, blisters or other deficiencies that involve the [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcement.
  - Cut out and replace all damaged and deficient areas of waterproofing with COLPHENE® LM BARR and reinforcement.
- Inspect the protection course, and ensure the protection course conceals and protects all COLPHENE® LM BARR waterproofing surfaces before the placement of overburden.

<i>Table 2.1a COLPHENE® LM BARR Flashing Protection Course</i>	
Protection Course	Installation
<u>COLPHENE® 180 FR GR</u>	Fully adhered with <u>COLPHENE® BARR FLASHING</u> or <u>COLPLY™ EF FLASHING CEMENT</u>

<i>Table 2.1b COLPHENE® LM BARR Warranty Term &amp; Flashing Membrane Thickness</i>		
Warranty Term	Minimum Thickness	Approximate Coverage Rate
20 years	60 mil base layer/reinforcement /60 mil top coat totaling 120 mils	2 layers @ 3.7 gals/100 ft <sup>2</sup> totaling 7.4 gals/100 ft <sup>2</sup>
30 years	90 mil base layer/reinforcement/90 mil top coat totaling 180 mils	2 layers @ 5.5 gals/100 ft <sup>2</sup> totaling 11.0 gals/100 ft <sup>2</sup>

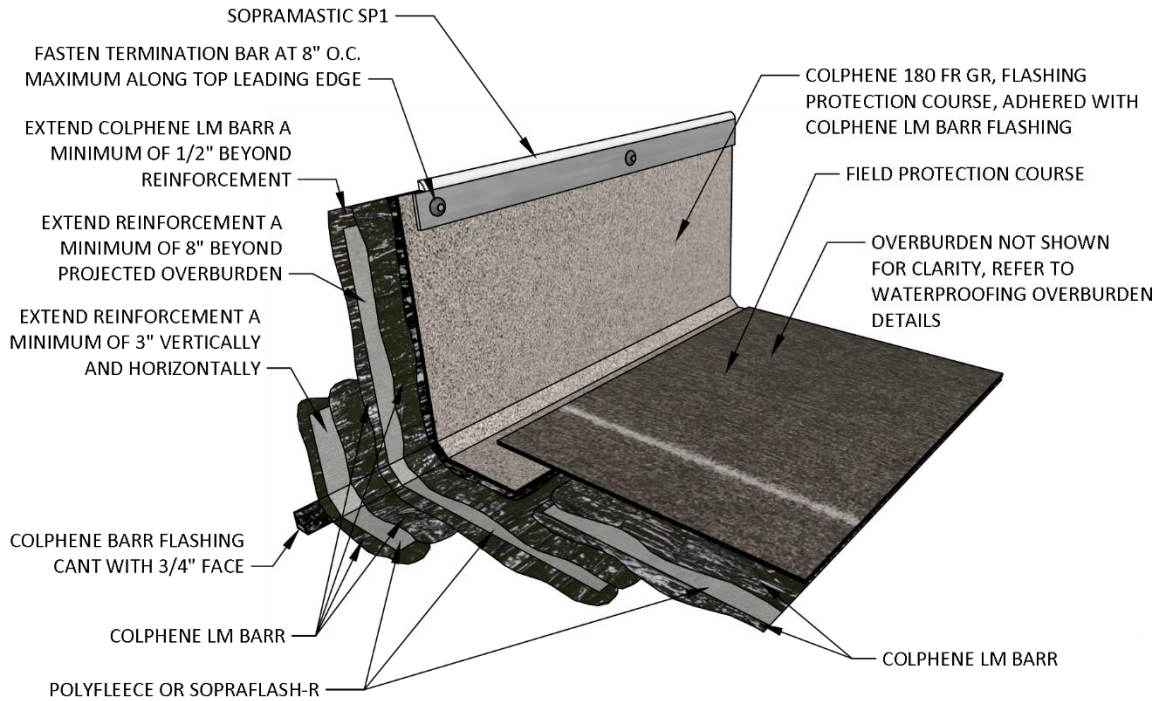


Figure 2.1a COLPHENE® LM BARR At Wall/Curb

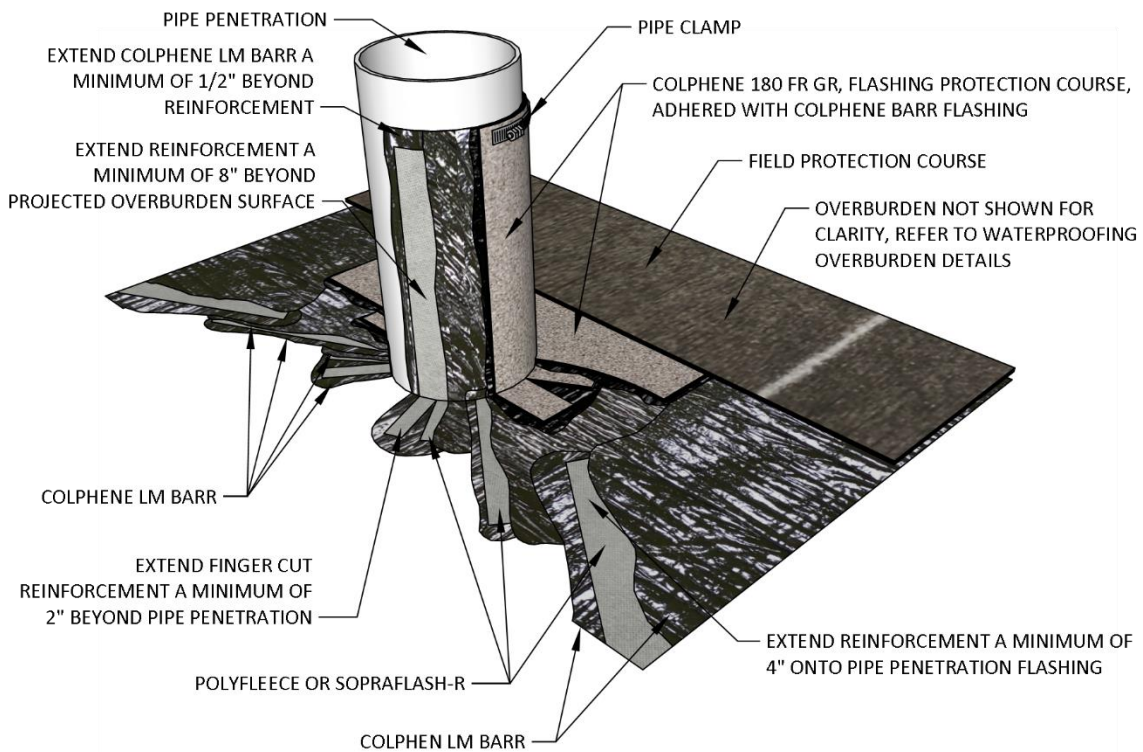


Figure 2.1b COLPHENE® LM BARR At Penetration

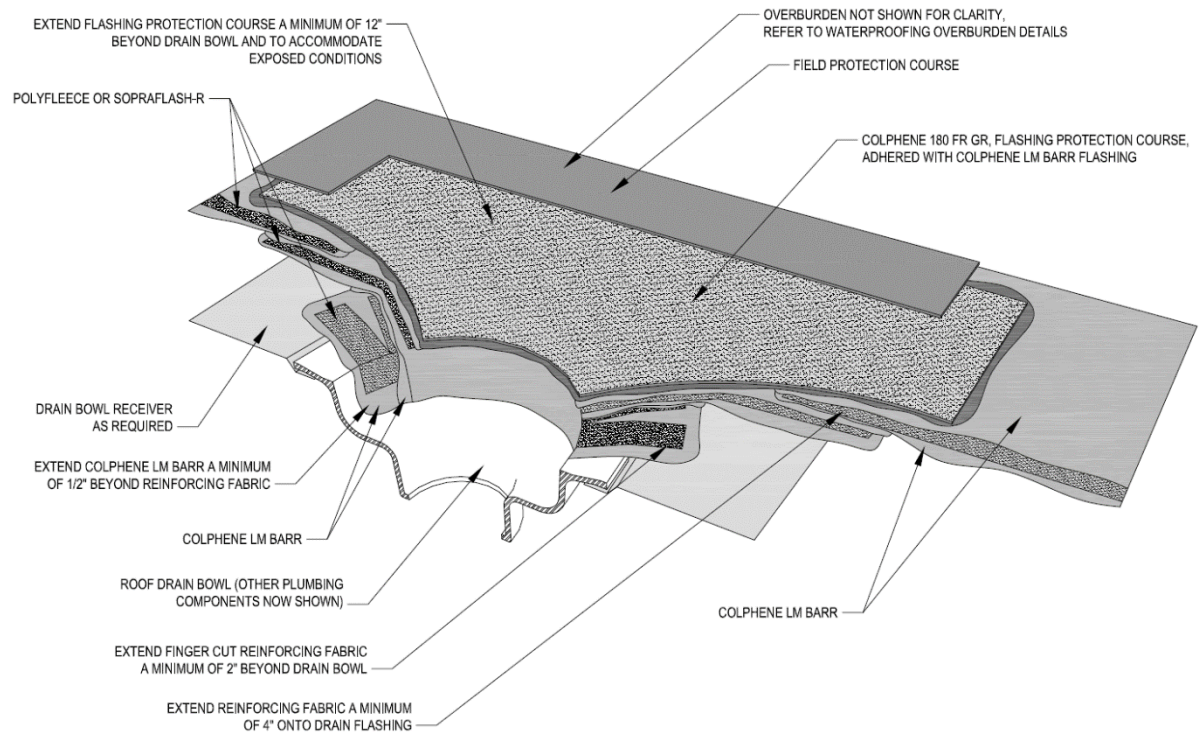


Figure 2.1c COLPHENE® LM BARR At Roof Drain



## 2.2 FIELD MEMBRANE

### **General:**

- [COLPHENE® LM BARR](#) (brush, roller or squeegee-grade) or [COLPHENE® LM BARR SPRAY](#) (spray grade) may be used to apply COLPHENE® LM BARR waterproofing for the field (horizontal) and flashings (vertical).
- Before applying COLPHENE® LM BARR, ensure conditions are acceptable to proceed. Refer to [Section 1.1](#) *SUBSTRATE EVALUATION, CLEANING, REPAIR AND PREPARATION*.
- The fully reinforced COLPHENE® LM BARR flashings are generally installed first at penetrations, termination and transitions before installing the COLPHENE® LM BARR field membrane. It is also acceptable to install flashings after the field membrane has been completed. Refer to the flashing details noted in [Section 2.1](#) Flashing Membrane.
- Install subsequent coats of COLPHENE® LM BARR within 72 hours of the initial application. For additional coats, and at tie-ins, ensure the surface is clean and free of foreign materials that may interfere with adhesion.
- Weather and environmental conditions:
  - COLPHENE® LM BARR STPE/polyether materials are moisture cured. Materials cure faster and skin over quickly when exposed to high temperatures.
  - COLPHENE® LM BARR materials should be stored at or above room temperature (70°F (21°C)) for optimum application.
  - The ambient application temperature should be between 35°F (1.7°C) and 95°F (35°C).
  - The substrate temperature should be between 35°F (1.7°C) and 120°F (48.9°C). Monitor substrate and material temperatures to ensure conditions remain satisfactory while applying COLPHENE® LM BARR.
  - COLPHENE® LM BARR materials are not subject to freezing; however, materials may become viscous and difficult to apply when the material is cold. During periods of cold weather, materials should be stored in a heated area and maintained at or above 70°F (21°C). Provide band-type drum and pail heaters designed to heat containers as necessary when applying COLPHENE® LM BARR during cold weather.
  - Ice and frost will prevent adhesion of COLPHENE LM BARR and may be difficult to detect on concrete substates. During extended periods of cold weather when the substrate is exposed to freezing conditions, the substrate should be heated as necessary to eliminate ice crystals that may be present. Examine adhesion closely when conditions are below freezing.
  - During hot weather, COLPHENE® LM BARR may cure and skin-over quickly. During hot, sunny conditions store materials in cool or shaded areas away from direct sunlight.
  - Environmental conditions such as sun, cloud cover, wind, humidity, and shade impact the application and cure time. Monitor the application of COLPHENE® LM BARR and adjust application methods as necessary to accommodate changing weather conditions.
  - Surfaces should be dry to the touch with no visible signs of moisture. Do not apply COLPHENE® LM BARR materials to wet surfaces, standing water, dew, frost or ice.
  - Ensure all materials and substrates remain above the dew point temperature to prevent condensation. The ambient temperature should be well above the dew point temperature, with no dew, fog or condensation present.
  - COLPHENE® LM BARR generally cures within one day, ready for foot traffic in 24 hours. The cure time is 3 hours for each 30 mils applied at 70°F (21°C) and 50 percent relative humidity. Cure time varies based upon project conditions.
  - Examine the COLPHENE® LM BARR waterproofing to ensure it is cured sufficiently (not wet nor tacky) to support construction traffic before walking over the waterproofing and before applying subsequent materials.
  - COLPHENE® LM BARR should be fully protected from UV exposure within 90 days of application.
- The contractor and/or applicator is responsible for managing and controlling all exposures related to chemical hazards, toxic substances and odors. This includes personal protective equipment (PPE),



administrative and work practice controls, and engineering controls. The contractor is responsible for the elimination or substitution of products as necessary to manage and control exposures related to chemical hazards, toxic substances and odors.

- 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.

#### **Field Membrane Preparation:**

- Ensure sufficient application tools and equipment are ready and available before beginning work. Refer to the equipment manufacturer's instructions, safety, care and maintenance requirements.
- Spray equipment for applying COLPHENE® LM BARR SPRAY (spray grade):
  - Pump Model:
    - Graco GH933
    - Graco 675DI
  - Gun: XTR7
  - Pump Pressure: 6,750psi – 7,250psi
  - Pump Volume: 1.5gpm – 2.5gpm
  - Tip: XHD
  - Tip Orifice: 0.031in – 0.041in
  - Tip Flow Rate:
    - Graco GH933: 1.03gpm – 1.98gpm
    - Graco 675DI: 1.3gpm
  - Tip Guard: XHD RAC Guard
  - Fan Width (12in from surface): 10in – 24in
  - Hose Length: 50ft
  - Hose Pressure Rating: 7,250psi
  - Hose ID: 3/8in max
  - Whip Hose Length: 15ft
  - Whip ID: 3/8in
  - Whip Pressure Rating: 7,250psi
- Manual/hand held application tools and equipment for applying both COLPHENE® LM BARR (brush, roller or squeegee-grade) or COLPHENE® LM BARR SPRAY (spray grade):
  - Stiff bristle brushes
  - ½ to ¾ in naps, rollers and handles.
  - ¾ in notched squeegees and handles.
  - Trowel, flat-blade putty knife, joint sealant tools.
- Ensure sufficient COLPHENE® LM BARR and POLYFLEECE or SOPRAFLASH™-R materials are available and ready for application. Refer to *Weather and environmental conditions* noted above.
- Stir COLPHENE® LM BARR pails using a paddle mixer and low speed drill prior to use.
- COLPHENE® LM BARR SPRAY supplied in drums and totes may be applied directly from the drum or tote without stirring.

#### **Field Membrane Application:**

- Pretreat concrete irregularities using COLPHENE® LM BARR, COLPHENE® BARR FLASHING or SOPRASEAL® SEALANT. Use a brush, roller or trowel to fill imperfections and provide a smooth, uniform surface before applying the reinforced COLPHENE® LM BARR waterproofing. Refer to Section 1.1 SUBSTRATE EVALUATION, CLEANING, REPAIR AND PREPARATION
- Field Membrane:
  - COLPHENE® LM BARR (brush, roller or squeegee-grade) or COLPHENE® LM BARR SPRAY (spray grade) may be used to apply COLPHENE® LM BARR waterproofing for the field.

- Apply uniform applications of COLPHENE® LM BARR waterproofing using the appropriate application tools and equipment.
- Apply a minimum 60 mils (3.7 gal/square) base layer of COLPHENE® LM BARR to the substrate.
- Immediately set [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcement into the wet COLPHENE® LM BARR. Overlap reinforcing fabric side-laps a minimum of 2 in. and end-laps a minimum of 4 in. Apply COLPHENE® LM BARR between reinforcing fabric laps.
- Work the fleece into the COLPHENE® LM BARR to prevent wrinkles. Ensure the reinforcing fabric is cut to conform to conditions so that the COLPHENE® LM BARR is fully reinforced and overlapped at cuts, side-laps and end-laps.
- Apply a minimum 60 mils (3.7 gal/square) top coat of COLPHENE® LM BARR.
- Use a brush, roller or squeegee to work the COLPHENE® LM BARR into the reinforcement as needed to eliminate “dry” reinforcement, voids, air pockets and wrinkles.
- Where substrate conditions are uneven, apply additional COLPHENE® LM BARR as needed to ensure the reinforcement is fully encapsulated and covered by COLPHENE® LM BARR .
- COLPHENE® LM BARR tie-ins between field and flashings:
  - At flashing tie-ins where COLPHENE® LM BARR materials have cured, apply new COLPHENE® LM BARR overlapped onto the cured COLPHENE® LM BARR a minimum of 4 in.
- COLPHENE® LM BARR daily tie-ins:
  - Where COLPHENE® LM BARR has been exposed for an extended period (72 hours or more), or has become dirty, clean the COLPHENE® LM BARR surface using a clean cloth and xylene solvent. Apply new COLPHENE® LM BARR overlapped 6 in onto the clean, dry waterproofing surface.
- Protection course:
  - COLPHENE® LM BARR waterproofing requires a protection course to eliminate exposure from UV. Protection is also required to protect the waterproofing from potential damages resulting from overburden materials, construction traffic and environmental exposures.
  - Many protection course options are available. Refer to [Table 2.2a](#) below.
  - Ensure the COLPHENE® LM BARR waterproofing is cured sufficiently (not wet or tacky) for 24 hours or more before applying the protection course. The COLPHENE® LM BARR should not be left exposed for more than 90 days.
  - Ensure the COLPHENE® LM BARR has been thoroughly inspected and all deficiencies corrected before applying the protection course. Refer to the *Field membrane inspection* section below.
  - SBS modified bitumen field protection course:
    - Refer to [Table 2.2a](#) for SOPREMA SBS modified bitumen ply sheet options for the field protection course.
    - Unroll the sheet onto the substrate and allow time to relax.
    - Cut the sheet to working lengths and widths to conform to conditions, and lay out the sheets to work to the side-lap.
    - Ensure side-laps and end-laps are maintained, and ensure the sheet is installed to cover and protect all COLPHENE® LM BARR surfaces.
    - The sheet may be loose laid, partially adhered or fully adhered to the COLPHENE® LM BARR waterproofing surface. Refer to options in [Table 2.2a](#).
    - Overlap the sheet onto the flashing protection course to ensure the COLPHENE® LM BARR waterproofing is not exposed to UV nor in direct contact with the overburden. Refer to [Figures 2.1a through 2.1c](#).
    - When adhering the sheet in place, use a broom or weighted roller to firmly set the sheet and bond it in place.
  - [SOPRABOARD™](#) field protection course:
    - Refer to [Table 2.2a](#) for [SOPRABOARD™](#) options for the field protection course.
    - Cut the [SOPRABOARD™](#) so that joints are tightly butted together.
    - Ensure the [SOPRABOARD™](#) is installed to ensure the boards cover and protect all COLPHENE® LM BARR surfaces.

- [SOPRABOARD™](#) may be loose laid, partially adhered or fully adhered to the COLPHENE® LM BARR waterproofing. Refer to [Table 2.2a](#).
- Overlap [SOPRABOARD™](#) onto the flashing protection course to ensure the COLPHENE® LM BARR waterproofing is not exposed. Refer to [Figures 2.1a through 2.1c](#).
- When adhering [SOPRABOARD™](#), use a roller or walk-in the boards.

**Field membrane inspection:**

- Before allowing foot traffic and construction activities over the COLPHENE® LM BARR, closely examine the application to ensure the waterproofing has cured sufficiently to allow foot traffic. Generally, 24 hours is sufficient time to allow foot traffic; however, the cure time may be longer during cold weather.
- Each day, physically inspect all COLPHENE® LM BARR flashings before concealing the waterproofing with the protection course and overburden.
- Closely examine the COLPHENE® LM BARR to ensure there are no pin holes.
  - Each day, repair all areas where pin holes exist by applying an additional 60 mils (3.7 gal/square) of COLPHENE® LM BARR waterproofing to seal all pinholes.
- Inspect the COLPHENE® LM BARR for voids, wrinkles, open laps, blisters or other deficiencies that involve the [POLYFLEECE](#) or [SOPRAFLASH™-R](#) reinforcement.
  - Cut out and replace all damaged and deficient areas of waterproofing with COLPHENE® LM BARR and reinforcement.
- Inspect the protection course, and ensure the protection course conceals and protects all COLPHENE® LM BARR waterproofing surfaces before the placement of overburden.

<b>Table 2.2a COLPHENE® LM BARR Field Protection Course</b>	
<b>Protection Course</b>	<b>Installation</b>
<a href="#">COLPHENE® 180 SANDED</a> , <a href="#">COLPHENE® SANDED</a> , <a href="#">COLPHENE® 180 FR GR</a>	Loose Laid
	Partially adhered using ribbons or spots of <a href="#">COLPHENE® LM BARR</a> or <a href="#">COLPHENE® LM BARR SPRAY</a>
	*Fully adhered with <a href="#">COLPHENE® LM BARR</a> or <a href="#">COLPHENE® LM BARR SPRAY</a> at 1.5 to 2 gallons per square
<a href="#">SOPRABOARD™</a> 1/8", <a href="#">SOPRABOARD™</a> 1/4"	Loose Laid
	Partially adhered with ribbons or spots of <a href="#">COLPHENE® LM BARR</a> or <a href="#">COLPHENE® LM BARR SPRAY</a>
	Fully adhered with <a href="#">COLPHENE® LM BARR</a> or <a href="#">COLPHENE® LM BARR SPRAY</a> at 1.5 to 2 gallons per square

\*Fully adhered protection course may be required for wind uplift approvals. Contact the SOPERMA Technical Support Department for additional information.

<b>Table 2.2b COLPHENE® LM BARR Warranty Term &amp; Field Membrane Thickness</b>		
<b>Warranty Term</b>	<b>Minimum Thickness</b>	<b>Approximate Coverage Rate</b>
20 years	60 mil base layer/reinforcement/60 mil top coat Totaling 120 mils	2 layers @ 3.7 gals/100 ft <sup>2</sup> totaling 7.4 gals/100 ft <sup>2</sup>
*30 years	90 mil base layer/reinforcement/90 mil top coat Totaling 180 mils	2 layers @ 5.5 gals/100 ft <sup>2</sup> totaling 11.0 gals/100 ft <sup>2</sup>

\*Contact the SOPREMA Warranty Department or Technical Support Department for additional information and warranty terms and conditions.

### 3 MISCELLANEOUS

#### 3.1 COLPHENE® LM BARR MATERIALS AND ACCESSORIES

General:

- Refer to [Table 3.1a](#) for COLPHENE® LM BARR materials and accessories.
- Refer to the Product Data Sheets and Safety Data Sheets for additional product information.

<b>Table 3.1a COLPHENE® LM BARR Materials and Accessories</b>	
<b>Product*</b>	<b>Product description**</b>
<a href="#"><u>COLPHENE® LM BARR</u></a>	Brush, roller, squeegee-grade. Cold-applied, 98% solids, silyl terminated polyether (STPE), single-component moisture-cured, elastomeric waterproofing. Rain-proof within hours, low odor, and very low VOC. May be used for the field and flashing waterproofing for both horizontal and vertical substrates. May be used to adhere horizontal field protection course. Applied using brushes, rollers or squeegees. Packaged in 5 gallon (19 L) pails.
<a href="#"><u>COLPHENE® LM BARR SPRAY</u></a>	Spray-grade. Cold-applied, 95% solids, silyl terminated polyether (STPE), single-component moisture-cured, elastomeric waterproofing. Rain-proof within hours, low odor, and low VOC. May be used for the field and flashing waterproofing for both horizontal and vertical substrates. May be used to adhere horizontal field protection course. Applied using hydraulic airless spray equipment, and may also be applied using brushes, rollers or squeegees. Packaged in 5 gallon (19 L) pails and 50 gallon (189 L) drums.
<a href="#"><u>POLYFLEECE</u></a>	Non-woven polyester fleece reinforcement used to reinforce COLPHENE LM BARR waterproofing in the horizontal field and all flashings. Rolls are 50 ft (15.2 m) long. Roll widths are 39 in (99 cm), 8 in (20 cm), 6 in (15 cm) and 4 in (10 cm).
<a href="#"><u>SOPRAFLASH™-R</u></a>	Thermally bonded spun laid polyester/nylon composit mat used to reinforce COLPHENE LM BARR waterproofing in the horizontal field and all flashings. Rolls are 180 ft (15.2 m) long. Roll width is 36 in (99 cm).
<a href="#"><u>COLPHENE® BARR FLASHING</u></a>	Trowel-grade. Cold-applied, 100% solids, silyl terminated polyether (STPE), single-component moisture-cured, elastomeric waterproofing. Rain-proof within hours, low odor, and low VOC. A waterproofing accessory material that is tooled or trowel-applied at transitions, penetrations and terminations. May be used to adhere exposed flashing protection course for horizontal and vertical flashings. Packaged in 3.5 gallon (13 L) pails.
<a href="#"><u>SOPRASEAL® SEALANT</u></a>	Gun-grade. Fast-setting, moisture cured, low VOC, polyether adhesive-sealant. A waterproofing accessory that is tooled or trowel-applied to address irregular concrete surfaces, seal small voids and cracks in waterproofing substrates. Packaged in 10.1 oz tubes.
<a href="#"><u>COLPLY™ EF FLASHING CEMENT</u></a>	Trowel-grade. Silyl terminated polyether (STPE) flashing cement. An alternative to <a href="#"><u>COLPHENE® BARR FLASHING</u></a> for applying exposed flashing protection course for field and vertical flashings. Applied using a notched trowel. Packaged in 3.5 gallon (13 L) pails.
<a href="#"><u>COLPHENE® SANDED</u></a>	SBS modified bitumen, smooth-surfaced, glass fiber reinforced protection course ply sheet with sanded top and bottom surfaces. May be loose-laid, partially adhered or fully adhered to the cured COLPHENE® LM BARR waterproofing. Not for exposed applications. To be covered by overburden. Packaged in 49.2 ft (15 m) long x 39.4 (1 m) wide rolls.

Product*	Product description**
<u>COLPHENE® 180 SANDED</u>	SBS modified bitumen, smooth-surfaced, polyester reinforced protection course ply sheet with sanded top and bottom surfaces. May be loose-laid, partially adhered or fully adhered to the cured COLPHENE® LM BARR waterproofing. Not for exposed applications. To be covered by overburden. Packaged in 49.2 ft (15 m) long x 39.4 (1 m) wide rolls.
<u>COLPHENE® 180 FR GR</u>	SBS modified bitumen, granule-surfaced, polyester reinforced protection course ply sheet with sanded bottom surface. Fully adhered to cured COLPHENE® LM BARR waterproofing when used in exposed flashing applications. May be loose laid, partially adhered or fully adhered when covered by overburden. Packaged in 32.8 ft (10 m) long x 39.4 (1 m) wide rolls.
<u>SOPRABOARD™</u>	Protection board consisting of a mineral-fortified asphalt core between two fiberglass reinforcing plies. May be loose-laid, partially adhered or fully adhered to the cured COLPHENE® LM BARR waterproofing. Boards dimensions are 4x8 ft 1.2x2.4 m) , 4x5 ft (1.2x1.5 m) and 4x4 ft (1.2x1.2 m). The board thickness is 1/8 in (3.2 mm) and 1/4 in (6.4 mm).

\*Refer to [www.SOPREMA.us](http://www.SOPREMA.us) for product data sheets (PDS) or safety data sheets (SDS).

\*\*Refer to additional preparation and application guidelines, and detail drawings included herein. Contact [SOPREMA®](http://www.SOPREMA.us) at 800.356.3521 for more information.