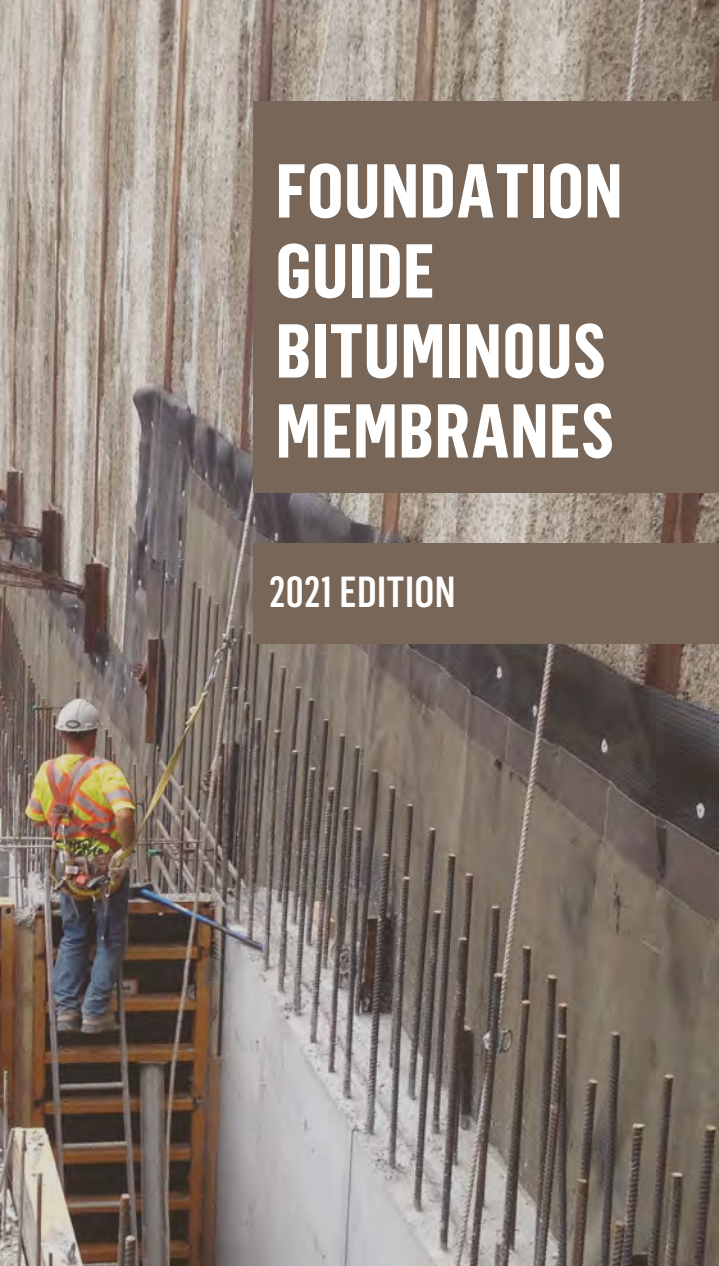


FOUNDATION GUIDE BITUMINOUS MEMBRANES

2021 EDITION



SOPREMA

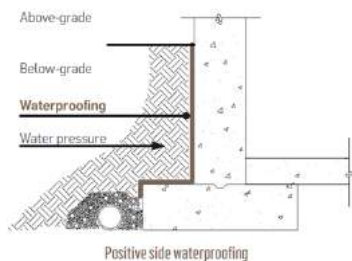
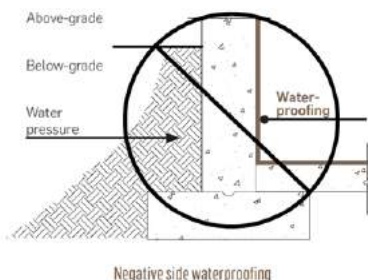
INTRODUCTION

INTRODUCTION

A foundation is an essential component of a building's architecture that ensures that building loads are supported and distributed. It's therefore critical to protect it from water infiltration to avoid cracking and other damage that would have subsequent repercussions on the structural integrity of the building.

The below ground structure must be designed to ensure continuous waterproofing throughout all the elements of the building's foundation. The waterproofing of vertical and horizontal foundation elements, as well as the waterproofing of the various details and penetrations must be addressed with the same care as the structural design of the foundation to ensure long term stability of the building.

Groundwater exerts hydrostatic pressure on foundations and, due to gravity or capillarity, an unprotected foundation can allow water to penetrate the concrete. Waterproofing must therefore be applied to the outside rather than the inside face of the foundation to keep water from carving a path into the concrete which will lead to water leakage, moisture and the appearance of mould in the building.



As such, the main purpose of this Foundation Guide is to present best practice regarding the design and the installation of SOPREMA's modified bituminous waterproofing membrane systems for below ground applications. It contains information that is relevant to all installers, designers and consultants, project managers, estimators and any other person involved in basement construction.

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GENERAL INFORMATION

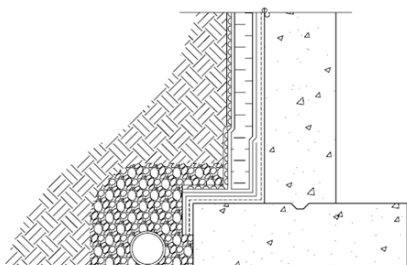
1.0. GENERAL INFORMATION

1.1. TYPE OF FOUNDATIONS

1.1.1. Waterproofing of conventional foundations

This type of waterproofing is used when products are installed directly on foundation walls. The process is used in most residential, commercial, industrial and institutional construction. Foundation waterproofing membranes are always installed on the outside of the building to create positive waterproofing, which means that the hydrostatic pressure created by the water pushes the membrane against the structure.

In this type of construction, the foundation walls can be accessed to install the membrane after the concrete is poured (post-applied application).



SOPREMA solutions

SOPREMA products that can be used for this type of foundation:

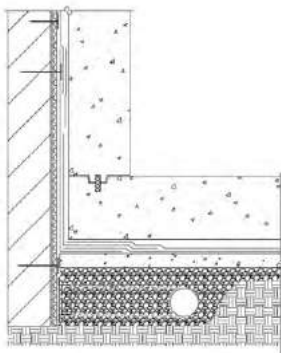
- **COLPHENE 3000** - SBS-modified self-adhered membrane
- **SOPRALENE FLAM 180** - SBS-modified torch-on membrane
- **SOPRALENE FLAM JARDIN CAP** - SBS-modified root retardant torch-on membrane
- **SOPRASUN PLUS 3** - APP-modified torch-on membrane
- **SOPRAGUM GARDEN PLUS 4** - APP-modified root retardant torch-on membrane
- **SOPRADRAIN ECO 10** - drainage board
- **SOPRAMASTIC** - bitumen based sealant
- **ELASTOCOL STICK** - primer for self-adhesive bituminous membranes

1.1.2. Waterproofing of blindside foundation walls

When the project lies within a high-density agglomeration, we need to factor in the space available for excavation, which is usually limited. Retaining walls (BSW) are often used in this type of situation.

BSW stands for blindside waterproofing, since waterproofing is done on the exterior before the concrete is poured. This type of waterproofing system is used when property lines and other site conditions make it impossible to do open trenching around the foundation's perimeter. This type of excavation can generally be found in urban areas and in case of underground parking lots.

This system involves installing waterproofing membranes against a retaining wall, or against an existing wall on an adjacent building, before concrete is poured for the new foundation (pre-applied application). This will protect the infrastructure from potential water infiltration between the concrete walls of the buildings involved.

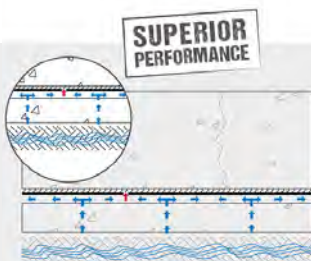


As the concrete cures, the surface of the SOPREMA membrane systems (COLPHENE BSW) bonds to the foundation, ensuring complete adhesion. This eliminates the risk of water moving laterally between the waterproofing membrane and foundation wall.

SOPREMA'S SOLUTION: COLPHENE BSW Concept

(Pre-applied membrane system that is **fully bonded** to structural concrete)

As it is natural for concrete to crack, it is important to protect it from water infiltration. The technology and concept of COLPHENE BSW ensures the full adhesion of the waterproofing membranes to the foundation.



SOPREMA solutions

SOPREMA products that can be used for this type of foundation:

- **COLPHENE BSW V** - SBS-modified self-adhered wall membrane
- **COLPHENE BSW UNI NG / COLPHENE BSW H** - SBS-modified heat welded horizontal membrane
- **SOPRALENE FLAM 180** - SBS-modified torch-on membrane
- **ALSAN FLASHING** - liquid detailing membrane
- **ALSAN EP CAP** - epoxy grout
- **ALSAN EP M** - epoxy adhesive
- **SOPRADRAIN 10** - drainage board
- **SOPRADRAIN 20** - drainage board
- **ELASTOCOL STICK** - primer for self-adhesive bituminous membranes

1.2. WATERPROOFING SYSTEM COMPOSITION

The composition of SOPREMA's pre-applied or post-applied below ground systems depends on the maximum level of hydrostatic pressure expected throughout the life of the building.

As a rule of thumb, SOPREMA generally recommends a 2-ply system when the foundation is located below the water table, as the membrane system is required to resist high hydrostatic pressure and any installation error may increase the risk of water ingress.

Where the foundation is located above the water table, a single-ply system will provide sufficient protection against water ingress.

For site specific recommendations, please contact your local SOPREMA sales representative.

1.3. STORAGE AND HANDLING

1.3.1. Basic rules

All SOPREMA products must be stored in a dry, ventilated area. They must be protected from weather and all harmful substances, and always stored away from open flames and welding sparks. Only materials that will be used that day should be taken out of the shelter.

Products stored outside must be covered by an opaque tarp after the covers provided on delivery have been removed.

1.3.2. Membranes

Materials delivered in rolls must be carefully stored upright, with the selvedge side upward.

Rolls are shipped on pallets with a plastic cover. Do not stack pallets unless plywood spacers of at least 12mm are inserted between the pallets (preferably 19mm).

Always store self-adhesive membranes out of the sun.

1.3.3. Liquids and mastics

Store liquid containers in a cool, dry place away from any flame. Store in a ventilated location, sheltered from heat and sun.

1.3.4. Welding equipment and propane gas tank

Only use certified equipment that is in perfect condition. Never modify torch-related equipment. Only use hoses suited for propane that are less than 15 m long.

Check and tighten all hook-ups before using the equipment. Ensure tank is secured to a dolly or a roller.

Do not light the torch if you smell propane. Never look for leaks using the torch. Use soapy water.

Note: Remove all packaging including cardboard inserts in membranes. Adhesive tapes used to keep membranes rolled-up must be removed from all membranes before they are installed. Otherwise, it may compromise adhesion and cause blistering. Adhesive tape also emits toxic fumes if exposed to a torch flame.



1.4. QUALITY ASSURANCE

SOPREMA's bituminous membranes are manufactured following the highest quality standards and according to the principles of sustainable construction, respecting the environment, human resources and the economy.

ISO 9001 - Quality Management Systems

ISO 14001 - Environmental Management

SOPREMA's bituminous foundation waterproofing systems are BBA certified and BRANZ appraised.



1.5. ACCREDITED INSTALLERS AND INSPECTORS

1.5.1. Accredited applicators

Installation of COLPHENE membranes shall be performed only by SOPREMA Accredited Applicators.

SOPREMA Accredited Applicators have completed SOPREMA Below Ground Waterproofing Systems' Training Program and have received a Black Accreditation Card upon the successful completion of the course. All Accredited Applicators must bring their card on-site and the card must be valid.

For a list of SOPREMA Accredited Applicators, please contact info@soprema.com.au

1.5.2. Accredited inspectors

Upon request, site visits can be scheduled with SOPREMA's representatives, or an approved 3rd party inspector, to ensure that workmanship is up to the highest standards.

PREPARATION AND SUBSTRATE

2.0. PREPARATION AND SUBSTRATE

2.1. PRELIMINARY SITE MEETING

A preliminary site meeting between the applicator and the general contractor is recommended to confirm the installation methodology of the waterproofing system, to notify any high-risk areas where special care may be required and to report any possible connections to any other sealing or waterproofing system.

The following information should be noted:

- Expected hydrostatic pressure and water table level
- Required substrate condition
- List of pile caps and penetrations with their exact locations
- List of possible movements and expansion joints with their exact locations
- Connection to any other sealing or waterproofing systems

SOPREMA's team will work together with the applicator to propose details and installation methodology to waterproof penetrations and joints.

Connections to other sealing or waterproofing systems generally require complementary products. It is necessary to verify the compatibility between the selected products during the preparation phase.

2.2. CONDITION OF THE SUBSTRATE

2.2.1. Basic rules

Do not start any of the work until all surfaces are clean, dry, free of all debris and dust, and after all products pertaining to formwork and curing have been removed, along with any laitance or irregularity which may hamper membrane adhesion, in accordance with SOPREMA's instructions and recommendations.

Do not install materials directly in rainy or snowy weather.

2.2.2. Surface condition of conventional foundations

All cracks need to be filled. Any seams and cracks measuring less than 6 mm in width should be filled with **SOPRAMASTIC**. Cracks exceeding 6 mm in width should be filled with **SOPRAMASTIC**, followed by a primer and a 150mm strip of self-adhesive or heat-welded membrane.

Make sure that concrete curing is completed before installing membranes, a minimum curing period of 14 days is generally required during summer. The curing period may be longer in other seasons.

Allow at least 24 hours for the concrete substrate to dry after the substrate's curing period and after removing the formwork.

Note: Consult the contractor who poured the concrete for more details about concrete curing on a specific project.

Any curing agents must be compatible with the sealing/ waterproofing products. Check with a SOPREMA representative

prior to installation.

Concrete level shall be smooth. Any level differences along the concrete surface and at pouring joints must not exceed 5 mm.

Any holes or level differences over 5 mm must be filled with bitumen or fast-setting concrete, depending on the condition of the surface.

An adhesion test is recommended before installing the membrane.

2.2.3. Surface condition of blindside foundation walls

2.2.3.1. Dewatering

Before the installation of the COLPHENE BSW system, a general dewatering has to be done. Pumping wells are preferably located outside of the work zone.

2.2.3.2. Horizontal substrates

The horizontal substrates are usually made of lean concrete. It can be made with other materials but must have an equivalent level of flatness and low deformation under expected load.

The thickness of the blinding concrete must have a minimum of 40 mm. It must have a level of flatness satisfying the following criteria:

- 7 mm under the bar of 2 m
- 2 mm under the bar of 200 mm

Point or linear defaults of the substrate/support should be repaired. Spills must be removed and gravel nests must be patched.

The angles (internal and external) will be chamfered. Protruding, perforating or cutting elements must be removed.

When laying the membranes, the substrate or support may be moist or damp but free of dripping or stagnant water, snow and ice. The substrate or support should be thoroughly cleaned to remove all non-adhered parts.

2.2.3.3. Vertical substrates

The vertical supports can be of various types, including but not limited to wooden walls, diaphragm walls, shotcrete, formworks, etc. The substrate can be made uniform by mortar, plum concrete or shotcrete, can be covered by adding masonry, plywood, etc. or by the addition of a suitable geosynthetic drainage layer such as **SOPRADRAIN**. In any case, the substrate must be smooth and have a low deformation under load.

Vertical substrates should facilitate the installation of the membrane by:

- adhesion
- heat-welding
- allowing mechanical fixing

2.3. PRIMER COAT

2.3.1. Primer application

When necessary, apply a primer coat over the entire surface at the recommended coverage rate.

Respect required drying time, depending on the product, weather conditions and substrate temperature.

Self-adhesive membranes must be installed as soon as possible once the primer has dried, or within 2 hours after application of the primer.

Primed surfaces that are not immediately covered once the primer is dry may become contaminated (dust, loose particles, etc.) in a very short time. When this happens, the surfaces must be re-primed before installing membranes.

Primers can be applied using the following tools:

- rollers
- spray
- paint brushes
- squeegee

Note: Never dilute the primer.

Never use a torch to check if the substrate is dry. Use a bare hand to check that there is no trace of humidity or sticky film that adheres to the skin.

Drying time is dependent on the substrate's dampness, temperature and relative humidity.

2.3.2. Primers

PRIMERS	DESCRIPTION	TO USE WITH	DRYING TIME	COVERAGE*
ELASTOCOL STICK PRIMER	Solvent-based primer to prepare surfaces before the installation of self-adhesive membranes.	COLPHENE 3000 COLPHENE BSW V	15 to 60 minutes	Porous surfaces: 0.3 to 0.5 l/m ² Non-porous surfaces: 0.1 to 0.25 l/m ²
ELASTOCOL STICK H2O	Water-based primer to prepare surfaces before installing self-adhesive membranes	COLPHENE 3000 COLPHENE BSW V	1 to 3 hours	0.1 to 0.3 l/m ²
ANTIROCK PRIMER	Solvent-based primer to prepare surfaces before the installation of heat-welded membranes	SOPRALENE FLAM 180 SOPRASUN PLUS 3 SOPRAGUM GARDEN PLUS 4	Minimum 1 hour	0.15 to 0.25 l/m ²

*NOTE: Coverage varies depending on substrate porosity and surface type. It is essential that the pails be thoroughly mixed prior to installation. Drying time can vary depending on the temperature and the relative humidity.

FOUNDATION WATERPROOFING PRODUCTS

3.0. FOUNDATION WATERPROOFING PRODUCTS

3.1. MEMBRANES FOR CONVENTIONAL FOUNDATIONS (POST-APPLIED SYSTEM)

WATERPROOFING OF CONVENTIONAL FOUNDATIONS			
PRODUCTS	THICKNESS	DIMENSIONS	NET AREA*
SELF-ADHESIVE MEMBRANES			
COLPHENE 3000	1.5 mm	1 x 18.7 m	17.3 m ²
HEAT-WELDED MEMBRANES			
SOPRALENE FLAM 180	3 mm	1 x 10 m	9 m ²
SOPRASUN PLUS 3	3 mm	1 x 10 m	9 m ²
SOPRAGUM GARDEN 4 PLUS	4 mm	1 x 10 m	9 m ²
SOPRALENE FLAM JARDIN CAP	3.2 mm	1 x 8 m	7 m ²

3.1.1. Self-adhesive membranes

3.1.1.1. COLPHENE 3000

Description

COLPHENE 3000 is a self-adhesive SBS modified bitumen membrane with a trilaminated woven polyethylene facer. The self-adhesive underface is covered by silicon release film. It is designed to waterproof foundation walls and other vertical buried surfaces.

Recommended substrates

This product can be used on most construction surfaces, such as masonry, concrete, wood and dintel walls.

Limitations

Concrete must be cured for at least fourteen (14) days prior. We recommend performing an adhesion test before installing the membrane.

Complementary products

- ELASTOCOL STICK PRIMER
- SOPRAMASTIC
- ALSAN FLASHING with reinforcement (POLYFLEECE)
- SOPRADRAIN

3.1.2. Heat-welded membranes

3.1.2.1. SOPRALENE FLAM 180

Description

SOPRALENE FLAM 180 is a SBS-modified bitumen waterproofing membrane designed for roofing and below grade applications. It is reinforced with an ultra-high strength 180g/m² non-woven polyester providing excellent puncture resistance.

SOPRALENE FLAM 180 surface and underface are covered with a thermofusible plastic film.

Recommended substrates

This product can be used on most construction surfaces, such as masonry and concrete.

Limitations

Concrete must be cured for at least fourteen (14) days prior. We recommend performing an adhesion test before installing the membrane.

Complementary products

- ANTIROCK PRIMER
- SOPRAMASTIC
- ALSAN FLASHING with reinforcement (POLYFLEECE)
- SOPRADRAIN

3.1.2.2. SOPRASUN PLUS 3

Description

SOPRASUN PLUS 3 is an APP-modified bitumen waterproofing membrane designed for roofing and below grade applications. It is reinforced with non-woven polyester combined with fiberglass. The composite reinforcement conveys good mechanical characteristics, excellent dimensional stability, and elastic performance.

Recommended substrates

This product can be used on most construction surfaces, such as masonry and concrete.

Limitations

Concrete must be cured for at least fourteen (14) days prior. We recommend performing an adhesion test before installing the membrane.

Complementary products

- ANTIROCK PRIMER
- SOPRAMASTIC
- ALSAN FLASHING with reinforcement (POLYFLEECE)
- SOPRADRAIN

3.1.2.3. SOPRAGUM GARDEN PLUS 4

Description

SOPRAGUM GARDEN PLUS 4 is an APP-modified bitumen waterproofing membrane, is suitable as top layer for single-ply or multi-layer waterproofing assemblies in protected systems where root resistance is required. It is reinforced with non-woven polyester combined with fiberglass. The composite reinforcement conveys good mechanical characteristics, excellent dimensional stability, and elastic performance.

SOPRAGUM GARDEN PLUS 4 top surface is coated with anti-adhesive amorphous sand; bottom surface is covered with a thermofusible plastic film.

Recommended substrates

This product can be used on most construction surfaces, such as masonry and concrete.

Limitations

Concrete must be cured for at least fourteen (14) days prior. We recommend performing an adhesion test before installing the membrane.

Complementary products

- ANTIROCK PRIMER
- SOPRAMASTIC
- ALSAN FLASHING with reinforcement (POLYFLEECE)
- SOPRADRAIN

3.2. MEMBRANES FOR BLINDSIDE FOUNDATION WALLS (PRE-APPLIED SYSTEM)

WATERPROOFING OF BLINDSIDE FOUNDATION WALLS			
PRODUCTS	THICKNESS	DIMENSIONS	NET AREA*
SELF-ADHESIVE MEMBRANE			
COLPHENE BSW V	3 mm	1 x 10 m	9 m ²
HEAT-WELDED MEMBRANES			
COLPHENE BSW UNI NG	4 mm	1 x 8 m	7 m ²
COLPHENE BSW H	3.5 mm	1 x 10 m	9 m ²
SOPRALENE FLAM 180	3 mm	1 x 10 m	9 m ²

*NET AREA, 1 ROLL FIELD SURFACE (DUO SELVEDGE NOT INCLUDED)

3.2.1. Self-adhesive membranes

3.2.1.1. COLPHENE BSW V

Description

COLPHENE BSW V is a high-performance waterproofing membrane composed of SBS modified bitumen and composite reinforcement. The topside is covered with specially engineered carbon dioxide crystals and the underside is covered by a silicone release film. **COLPHENE BSW V** is designed for waterproofing vertical blind side walls.

Limitations

For application at temperatures above 5°C, coat the drainage board with primer before installing the vertical self-adhesive waterproofing membrane.

Accessory products

- ELASTOCOL STICK PRIMER
- ALSAN FLASHING with reinforcement (POLYFLEECE)
- SOPRADRAIN

3.2.2. Heat-welded membranes

3.2.2.1. COLPHENE BSW UNI NG

Description

COLPHENE BSW UNI NG is a waterproofing membrane composed of a select blend of high-performance flexible SBS elastomeric bitumen reinforced with a ultra high strength double reinforcement system (heavy duty non-woven polyester associated with an additional specific fleece). The topside is covered with specially engineered carbon dioxide crystals and the underside is covered by a thermofusible plastic film.

Accessory products

- ALSAN FLASHING with reinforcement (POLYFLEECE)

3.2.2.2. COLPHENE BSW H

Description

COLPHENE BSW H is a high-performance waterproofing membrane composed of SBS modified bitumen and non-woven polyester reinforcement. The topside is covered with specially engineered carbon dioxide crystals and the underface is covered with thermofusible plastic film.

COLPHENE BSW H is designed for horizontal waterproofing applications under concrete slabs.


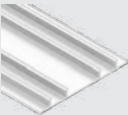



Accessory products

- ALSAN FLASHING with reinforcement (POLYFLEECE)


3.2.2.3. SOPRALENE FLAM 180

Please refer to section 3.1.2.1.


3.3. OTHER FOUNDATION PRODUCTS

WATERSTOPS		
SOPRAWELL NG	SOPRASWELL NG is a hydrophilic rubber strip used for sealing of static construction joints for both horizontal and vertical applications. SOPRASWELL can be fastened with nails or glued with an adhesive. In contact with water and in confined conditions, SOPRASWELL NG will swell and stop the water infiltration.	
SOPRAJOINT TPE	SOPRAJOINT TPE is a transparent TPE waterstop, extruded from high-quality raw materials. SOPRAJOINT TPE is used at construction joints, around the piles, at termination or to prevent the risk of increased water through the structure at critical areas.	
INJECTION HOSE		
SOPRAHOSE 13	<p>SOPRAHOSE 13 is a re-injectable hose system, used to seal construction joints in concrete structures against water ingress.</p> <p>SOPRAHOSE 13 is used to carry injection grout along the length of the hose and disperse it into the concrete joint via micro-ports along the hose. SOPRAHOSE 13 can be flushed, which allows the system to be re-injectable for the lifetime of the structure. This is a great advantage if movement or shrinkage occurs between concrete joint faces of the structure.</p>	
LIQUID MEMBRANES		
ALSAN FLASHING/ ALSAN FLASHING JARDIN	ALSAN FLASHING and ALSAN FLASHING JARDIN are a single-component polyurethane- and bitumen-based resin. It is used to waterproof hard-to-access upstands and other details where it is difficult to apply sheet waterproofing membranes. ALSAN FLASHING JARDIN has anti-root properties.	
ALSAN FLASHING QUADRO	ALSAN FLASHING QUADRO is a high-performance single-component polyurethane resin. This new generation resin is recommended for higher risk areas of water ingress.	


DRAINAGE BOARD

SOPRADRAIN	<p>SOPRADRAIN is a high-strength drainage board consisting of a high-density polyethylene (HDPE) core with a factory-laminated geotextile for installation over waterproofing membranes in most vertical and horizontal drainage applications. It provides protection to the waterproofing system against build-up of water pressure and humidity.</p> <p>SOPRADRAIN is available in 10mm or 20mm thick board and is mechanically fastened to the substrate.</p>	
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HYBRID WATERPROOF TAPE

FLAG JOINT BR 500	<p>FLAG JOINT BR 500 is made of PVC-P with a central fiberglass reinforcement. A geotextile fleece is attached to one end. On the other end, the surface is light grey and the underface is black.</p> <p>FLAG JOINT BR 500 is a waterproof, flexible joint tape used to join SOPREMA bituminous and PVC waterproofing membranes, as well as PVC and PMMA resin waterproofing membranes.</p>	
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MOVEMENT JOINT

SOPRAJOINT	<p>SOPRAJOINT is a SBS-modified bitumen waterproofing strip with a polyester reinforcement. The underface is covered with a thermofusible plastic film. The top face has an aluminium foil adhered to the centre of the membrane and is covered by a protective silicone paper to be removed during application. SOPRAJOINT is specifically designed for waterproofing expansion joints where the maximum multidirectional movement is 20 mm.</p>	
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PRIMERS

ELASTOCOL STICK	<p>ELASTOCOL STICK is a primer composed of SBS synthetic rubbers, adhesive enhancing resins and volatile solvents, designed to enhance the adhesion of COLPHENE self-adhesive membranes on porous and non-porous substrates.</p>	
ELASTOCOL STICK H2O	<p>ELASTOCOL STICK H2O is a polymer emulsion-based primer designed to improve the adhesion of self-adhesive waterproofing membranes on most substrates. It is an excellent choice when the use of solvent-based primer is not recommended.</p>	
ANTIROCK PRIMER	<p>ANTIROCK PRIMER is a blend of SBS-modified bitumen, fast-evaporating solvents and adhesive enhancing additives. ANTIROCK PRIMER is designed to improve the adhesion of SOPREMA bituminous torch-on membranes on concrete and metal surfaces.</p>	

SEPARATION LAYER

GEOLAND PP FR

GEOLAND PP FR is a geotextile fabric made of 100% highly needled polypropylene staple filament used for a wide range of geotechnical applications, including separation, protection, filtration and drainage procedures.



EPOXY ADHESIVE & GROUT

ALSAN EP M

ALSAN EP M is a two component, non sag, high strength epoxy adhesive, used to bond SOPREMA bituminous and PVC waterproofing membranes to a variety of common building materials on vertical and horizontal surfaces.



ALSAN EP CAP

ALSAN EP CAP is a two-component, high performance, pre filled epoxy grout designed for general heavy duty civil engineering applications and for encapsulating pile tops.



MASTIC

SOPRAMASTIC

SOPRAMASTIC is a black multi-purpose solvent-based mastic containing SBS-modified bitumen, fibres and mineral fillers that has been formulated with a high level of polymer.

SOPRAMASTIC is an ideal complement for bituminous waterproofing membranes and is used as jointing mastic, caulking material and joint filler.



CEMENTITIOUS GEOMEMBRANE

TILTEX

TILTEX is a geocomposite made of cement-sand mix, embedded and fixed between two layers of geotextile. Delivered in rolls and hydrated on site, TILTEX makes possible to obtain a fiber reinforced concrete slab with a smooth and regular surface.

Tiltex can be used for various type of applications such as erosion control, temporary protection, blinding concrete or reinforcement support.



PROTECTION BOARD

SOPRABOARD

SOPRABOARD is a protection board composed of two asphalt-saturated glass mat reinforcement covering the installed waterproofing membrane.



INSTALLATION METHODS FOR FOUNDATION MEMBRANES

4.0. INSTALLATION METHODS FOR FOUNDATION MEMBRANES

4.1. TORCHING TECHNIQUE

4.1.1. Flame distance

Maintain the appropriate distance between the end of the torch head and the roll. This distance varies from approx. 150 mm to 300 mm, depending on surrounding conditions. The appropriate distance must be maintained to obtain maximum heat and proper diffusion of the flame. The hottest part of the flame is located from approx. 100 mm to 250 mm.

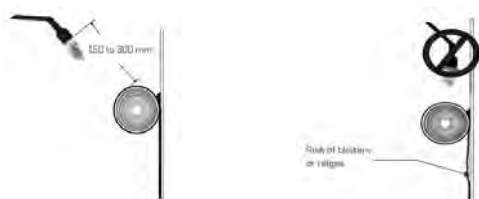
4.1.2. Torching vertically and horizontally

Before starting to weld, you must know the product you are welding and know the type of material to which you are welding this product.

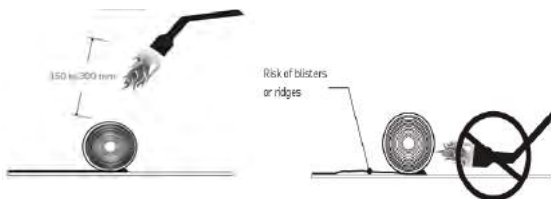
The membrane can be applied vertically or horizontally. When vertically applied, start from the bottom of the foundation and work your way up. When horizontally applied, start at one end of the surface and work your way in the opposite direction from there.

Never direct the flame between the roll and the substrate. This could trap air under the membrane and cause blisters or ridges.

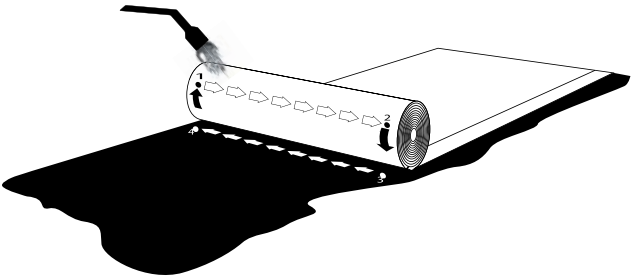
VERTICAL WELDING



HORIZONTAL WELDING

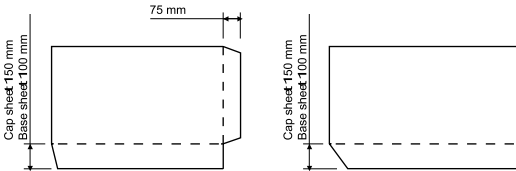


The flame should be directed at the top surface of the roll in order to heat it just enough to soften the bitumen to obtain a small bead of melted bitumen in front of the membrane as it is unrolled onto the substrate. The weld will be more effective if the movement of the torch, and hence its flame, is continuous and even, in a rectangular pattern.

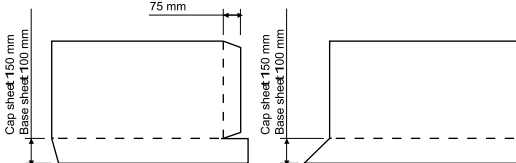


4.1.3. Membrane Cutting

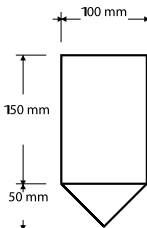
Inside corners



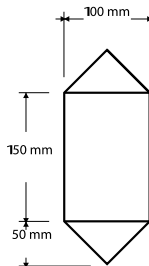
Outside corners



Gussets without cant strip



Gussets with cant strip



Gussets are mandatory at every angle, whether interior or exterior, at the transition of the field surface.

4.2. WATERPROOFING OF BOTTOM SLAB



COLPHENE BSW UNI NG / COLPHENE BSW H installation of bottom slab applies for both, conventional foundations (post-applied system) and blindside wall systems (pre-applied system).

4.2.1. COLPHENE BSW UNI NG / COLPHENE BSW H

Single ply

- STEP 1:** Apply COLPHENE BSW UNI NG/COLPHENE BSW H loose laid on blinding concrete (or prepared and well compacted substrate with GEOLAND PP FR on top).
- Ensure minimum 100/120 mm side overlap and minimum 150 mm end lap between each strip.
- Stagger laps in order to avoid excessive layering. End laps will be staggered by at least 300 mm.
- During installation, the self-adhesive part of DUO SELVEDGE allows to maintain its position and allows slight modification.
- STEP 2:** Seal all side laps and end laps by heat-welding the selvedge with a propane torch or using an electrical hot air welder or automated electrical hot air welder.

Double ply: COLPHENE BSW UNI NG/COLPHENE BSW H + SOPRALENE FLAM 180

- STEP 1:** Apply SOPRALENE FLAM 180 as per *STEP 1* and *STEP 2* above.
- STEP 2:** Apply COLPHENE BSW UNI NG/COLPHENE BSW H loose laid over SOPRALENE FLAM 180. Heat-weld the laps using a propane torch.
- For minimum overlaps and staggering of laps refer to single ply *STEP 1*.

4.3. WATERPROOFING OF FOUNDATION WALLS

4.3.1. Conventional Foundations

4.3.1.1. COLPHENE 3000

Single ply

- STEP 1:** Prime the substrate using ELASTOCOL STICK or ELASTOCOL STICK H₂O primer. The substrate must be smooth and clean.
- STEP 2:** After the primer is completely dry, begin installation of a 300 mm reinforcement strip membrane centered on the corner of all interior and exterior foundation angles. This

strip must be applied directly on the surface, with no gaps between the surface and the membrane. Outside corners should be double lapped.

STEP 3: Install a 300 mm reinforcement strip membrane on the footings, making sure that 150 mm is installed on the foundation wall and 150 mm is installed on the footing. Peel off the top of the silicone release film and stick the membrane on, making sure it is carefully aligned. Slowly remove the silicon release film while making sure the membrane is fully adhered. Longitudinal overlaps must measure at least 75 mm, while transversal overlaps must be at least 150 mm. Use a 300 mm membrane roller to apply pressure over the entire surface of the membrane, to ensure sufficient adhesion and to prevent membrane movement during the installation of concrete.

NOTE: The uppermost edge of each strip must be (temporary) mechanically fastened to the substrate using ≥ 40 mm diameter round plates and appropriate fasteners spaced at every 250 mm on centre. Alternatively, you may use a wooden batten.

The top end must be mechanically attached using a non-corrosive metal pressure seal and sealed with **SOPRAMASTIC** or **SOPRAMASTIC ALU** if exposed. Use **SOPRAMASTIC** to seal details and critical areas.

STEP 4: Install the XPS insulation panel or **SOPRADRAIN** board directly on the membrane with adhesive or fasteners while avoiding the perforation of the membrane. Any waterproofing membrane that can be seen after filling must be protected from UV rays and mechanical damage.

Double ply: COLPHENE 3000 + COLPHENE 3000

Apply the first layer as per previous section. For the second layer, repeat **STEPS 2 to 4**. STEP 1 is only needed if more than 24 hours have passed between the application of the first and second layer.



4.3.1.2. Heat-welded membranes

SOPREMA solutions: SOPRALENE FLAM 180 /
SOPRALENE FLAM JARDIN CAP /
SOPRASUN PLUS 3 /
SOPRAGUM GARDEN 4 PLUS

Single ply

- STEP 1:** Prime the substrate using **ANTIROCK PRIMER**. The substrate must be smooth and clean.
- STEP 2:** After the primer is completely dry, begin installation of a 300 mm wide reinforcement strip membrane centered on the corner of all interior and exterior foundation angles using a propane torch. This strip must be applied directly on the surface, with no gaps between the surface and membrane. Outside corners should be double lapped.
- Install a 300 mm reinforcement strip membrane on the footings, making sure that 150 mm is installed on the foundation wall and 150 mm is installed on the footing.
- STEP 3:** Continue to heat weld the membrane onto the entire foundation wall, ensuring it is aligned with the previous roll. Longitudinal overlaps must measure at least 75 mm, while transversal overlaps must be at least 100 mm.
- STEP 4:** Seal the top end and all overlaps using a trowel and torch. The top end must be mechanically attached using metal edging and sealed with **SOPRAMASTIC**. Use **SOPRAMASTIC** to seal details and critical areas.
- Tears and holes must be repaired using the same membrane. The strip must be 100 mm wider than the perforated or torn surface, and welded into place with a propane torch.
- STEP 5:** After backfilling, we recommend covering the waterproofing membrane with a **SOPRADRAIN** drainage board, mechanically fastened above the top edge of the membrane, or a XPS insulation panel directly on the membrane with adhesive or fasteners while avoiding the perforation of the membrane. Backfilling should be done immediately after the panels are installed.
- Any waterproofing membrane that can be seen after filling must be protected from UV rays and mechanical damage.



Double ply: SBS-modified bitumen heat welded membrane + SOPRALENE FLAM 180 or SOPRALENE FLAM JARDIN CAP

APP-modified bitumen heat welded membrane + SOPRASUN PLUS 3 or SOPRASUN GARDEN 4 PLUS

STEP 1:

Apply the first layer as per **STEPS 1-5** from previous section.

STEP 2:

Install a 300 mm reinforcement strip membrane on the footings, making sure that 150 mm is installed on the foundation wall and 150 mm is installed on the footing.

STEP 3:

To install **SOPRALENE FLAM 180/SOPRALENE FLAM JARDIN CAP** or **SOPRASUN PLUS 3/SOPRASUN GARDEN 4 PLUS**, heat weld the membrane onto the entire foundation wall, ensuring it is aligned with the previous roll.

STEP 4:

Longitudinal overlaps must measure at least 75 mm, while transversal overlaps must be at least 100 mm.

Seal the top end and all overlaps using a trowel and torch.

The top end must be mechanically attached using metal edging and sealed with **SOPRAMASTIC** or **SOPRAMASTIC ALU** if exposed. Use **SOPRAMASTIC** to seal details and critical areas.

Tears and holes must be repaired using the same membrane. The strip must be 100 mm wider than the perforated or torn surface, and welded into place with a propane torch.

* SOPRALENE FLAM JARDIN may require additional lead time for production and a minimum order.

4.3.2. Blindsided Foundation Walls

4.3.2.1. COLPHENE BSW V

Single ply

- STEP 1:** Coat the drainage board with **ELASTOCOL STICK** primer before installing the vertical self-adhesive waterproofing membrane.
- STEP 2:** Install the **COLPHENE BSW V** waterproofing membrane vertically by removing the silicon release film.

Mechanically fasten the top of the membrane to the substrate using ≥ 40 mm diameter round plates and appropriate anchors every 300 mm from centre to centre.

Use a 300 mm membrane roller to apply pressure over the entire surface of the membrane to ensure sufficient adhesion and to prevent membrane movement during installation of concrete.

The uppermost edge of each strip must be (temporary) mechanically fastened to the substrate using ≥ 40 mm diameter round plates and appropriate fasteners spaced at every 250 mm on center. These fasteners are installed temporary.

Ensure a minimum of 100 mm side overlap between each strip with 55 mm self-adhesive bitumen and 45 mm sealed by heat-welding using a propane torch and a round nosed trowel or electrical hot air welder with a 125 mm membrane roller.

Horizontal joints shall be aligned and overlapped by minimum 150 mm covering all temporary fasteners.

Note: After pouring of the concrete of the 1st level, it is recommended to remove the temporary fastening in order to avoid possible tears in case of major settlement in subsequent phases.

- STEP 3:** All angle changes, inside and outside corners, as well as cold joints must be reinforced by installing an additional 300 mm reinforcement strip membrane either fully heat-welded with a torch (**COLPHENE BSW UNI NG/ COLPHENE BSW H**) or self-adhered (**COLPHENE BSW V**) over primed surface centered in the angle or on the joint. All membrane terminations must be sealed by heat-welding.

Double ply: COLPHENE BSW V + COLPHENE BSW UNI NG/ COLPHENE BSW H

- STEP 1:** Apply the first layer as per **STEPS 1-3** from previous section.
- STEP 2:** Install by heat-welding a 300mm reinforcement strip membrane using a propane torch. The strips should be centered and cover all horizontal joints.

STEP 3: Apply **COLPHENE BSW UNI NG/COLPHENE BSW H** on vertical blind side walls, heat-weld with a propane torch.

The uppermost edge of each strip must be (temporary) mechanically fastened to the substrate using ≥ 40 mm diameter round plates and appropriate fasteners spaced at every 250 mm on center. These fasteners are installed temporary.

STEP 4: Ensure a minimum of 100 mm side overlap between each strip with 55 mm self-adhesive bitumen and 45 mm sealed by heat-welding using a propane torch and a round nosed trowel or electrical hot air welder with a 125 mm membrane roller.

Horizontal joints shall be aligned and overlapped by minimum 150 mm covering all temporary fasteners.

STEP 5: Reinforce all angle changes, inside and outside corners as well as cold joints, by installing an additional 300 mm reinforcement strip membrane fully heat-welded with a torch centered in the angle or on the joint. All membrane terminations must be sealed by heat-welding.

Install a 300 mm reinforcement strip membrane either fully heat-welded with a torch over primed surface centered on all horizontal joints. All membrane terminations must be sealed by heat-welding.

4.4. MEMBRANE TERMINATION

The membrane's termination shall be done at least 150 mm above the finished ground level. The membrane is mechanically fixed at the top using 4 fasteners per meter (fasteners adapted to the support + distribution elements consisting of washers or continuous profiles).

The upper part of the waterproofing will be treated:

- either by a non-corrosive metal strip (pressure seal) with **SOPRAMASTIC** or **SOPRAMASTIC ALU** if exposed.
- either by a reglet detail, a K-profile or a pressure seal with **ALSAN FLASHING JARDIN** covered with granules or by a hard protection.

INSTALLATION METHODS FOR JUNCTIONS AND DETAILING

5.0. INSTALLATION METHODS FOR JUNCTIONS AND DETAILING

5.1. CONVENTIONAL FOUNDATIONS

5.1.1. Horizontal junctions (between bottom slab and wall)

As the pre-applied membranes are already installed, the vertical post applied system (single or double ply) is welded directly on the pre-applied membrane without additional primer.

5.1.2. Vertical junctions (between walls)

A chamfer edge (cant strip) will be installed along the vertical junctions. The vertical junction will be reinforced by adding a 500 mm strip of **COLPHENE 3000** or the torch-applied membrane used.

Stagger all side from the vertical junction by at least 150 mm.

5.2. BLINDSIDE WALL FOUNDATIONS

5.2.1. Horizontal junctions (between bottom slab and wall)

5.2.1.1. Single ply

- Install **COLPHENE BSW V** as per section 4.3.2.1. The first ply should start at a minimum of 500 mm above the reinforcement bars of the bottom slab, and should extend by at least 200 mm into the bottom slab (horizontally).
- Follow steps on section 4.2.1 to install **COLPHENE BSW UNI NG/COLPHENE BSW H**. Torch the membrane onto the 200 mm **COLPHENE BSW V** overlap.
- The angle joint will be reinforced by heat-welding an additional **COLPHENE BSW UNI NG/COLPHENE BSW H** strip of 500 mm (250 mm horizontal and 250 mm vertical, as shown in the 3D build up in section 9.3).



NOTE: The angle will be prepared by a chamfer edge.
The use of prefabricated chamfer edge is possible.

5.2.1.2. Double ply

- Install the first vertical ply of **COLPHENE BSW V** as per section 4.3.2.1. This first ply should start at a minimum of 500 mm above the reinforcement bars of the bottom slab, and should extend by at least 200 mm into the bottom slab (horizontally).
- Follow steps on section 4.2.1 to install the first horizontal ply (**SOPRALENE FLAM 180**). Torch the membrane onto the 200 mm **COLPHENE BSW V** overlap.
- The second vertical ply (**COLPHENE BSW UNI NG/COLPHENE BSW H**) is installed as per section 4.3.2.1. on the first layer already in place. The end of the membrane should extend by at least 200 mm into the bottom slab (horizontally).
- Before installing the last ply (horizontal), reinforce the angle joint by heat-welding an additional **COLPHENE BSW UNI**

NG/COLPHENE BSW H strip of 500 mm (250 mm horizontal and 250 mm vertical, as shown in the 3D build up in section 9.6).

- Finally, install the second horizontal ply (**COLPHENE BSW UNI NG/COLPHENE BSW H**) to the bottom slab (section 4.3.2.1).

5.2.2. Vertical junctions (between walls)

A chamfer edge (cant strip) will be installed along the vertical junctions.

The vertical junction will be reinforced by adding a 500 mm strip of **COLPHENE BSW V** or **COLPHENE BSW UNI NG/COLPHENE BSW H**.

Stagger all sides from the vertical junction by at least 150 mm.

5.3. SPECIFIC DETAILS TREATMENTS

5.3.1. Pipe penetrations and anchorage

Please see details 9.16 and 9.17.

5.3.2. Vertical bars fixing

Fixing of vertical bars are, when possible, to be avoided.

In the special case it has to be done, hot melted bitumen will be used to seal the fixings.

5.3.3. Piles

The treatment of pile heads will be the subject of a specific study for each project and will be validated by SOPREMA's Technical Team (contact info@soprema.com.au). Please see detail in sections 9.18 to 9.20.

5.3.4. Expansion joint

Expansion joint (up to 50 mm gap) will be performed using **SOPRAJOINT** membranes.

NOTE: For seismic joints, a specific study will have to be done (minimum and maximum structural gap movements).

INSTALLATION METHODS FOR DRAINAGE BOARDS

6.0. INSTALLATION METHODS FOR DRAINAGE BOARDS

6.1. ROLES OF DRAINAGE BOARDS

- Allow the installation of waterproofing membranes on a smooth and dry substrate
- Spread eventual excess of hydrostatic pressure
- Limit the hydrostatic pressure acting on retaining walls



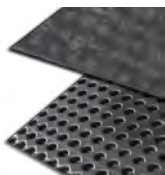
Note: In the case of aggressive water (Riznar index less than 4), the use of the drainage panels may only be considered as a short-term protection.

6.2. CONVENTIONAL FOUNDATIONS

It is necessary to protect the waterproofing layer(s) from puncture before backfilling operations and eventual settlement.

Different kinds of protection can be used depending on the height of the backfill and of the particle size of the filler materials used.

SOPRADRAIN or EPS or XPS insulation boards (adapted for this use)



EPS and XPS insulation boards are glued to the vertical membrane with **SOPRACOLLE 300N** dots and bads of approx. 200 g/m². A **SOPRADRAIN** board should then be mechanically fixed at 100 mm higher than the insulation board termination.

Other solutions may be used if they provide full protection of the waterproofed surface.

6.3. BLINDSIDE FOUNDATION WALLS

Install the drainage board with the geotextile facing the soil retention system. The drainage board can cover cracks and holes from 25 to 50 mm in width and depth. Cracks or holes in the substrate exceeding these measurements should be repaired with mortar, shotcrete or plywood (mechanically fastened to the substrate) prior to installing the drainage board.

Fasten the board using mechanical anchors adapted to the substrate and washers with a minimum diameter of 25 mm. Install an anchor at a minimum of every 600 mm at the top end with a ratio of one anchor per square metre on the board.

Note: The number of anchors required may increase depending on site and substrate conditions.

Use additional anchors as needed around the edges of the solid substrate supporting the board.

CONCRETE AND BACKFILLING

7.0. CONCRETE AND BACKFILLING

7.1. CONCRETE

7.1.1. Steel reinforcement installation

Before installing the reinforcement, a visual inspection of installed membranes shall be done to check for any damages. Any defects must be repaired. The reinforcement must be laid in such a way as not to damage the membranes.

NOTE: Do not install any concrete layers between the structural slab and the membrane.

7.1.1.1. Horizontal sections

For horizontal sections, special attention will be paid to avoid punching membranes. Thus, the presence of spacers is required. Plastic or wooden holds are not allowed. Linear concrete spacers will be preferred. Punctual spacers are permitted provided that the bearing surface is flat and sufficient (minimum dimension 50 mm x 50 mm). The distance between two spacers will be 60 cm maximum.

In all cases, and in particular when the reinforcement is heavy, it will be ensured that the distribution of spacers can limit the static punching to a value less than 50% of that indicated on the data sheets of the products used.

7.1.1.2. Vertical sections

For vertical sections, plastic spacers are allowed.

Fixing through the membranes will be treated as presented in 4.7.3.

7.1.2. Concrete installation

7.1.2.1. Minimum RCC Characteristic

To prevent migration of water between membrane and the structure, the concrete must have minimum strength (> 20 MPa) and minimum cohesion (> 1.5 MPa).

Concrete composition and properties according to EN 206-1 minimum requirements.

The minimum thickness of reinforced cement concrete shall be 100 mm in order to have the necessary heat input for bonding between the membrane. Bars must be surrounded of minimum 30 mm of concrete when in contact with membrane. Spacers must ensure compliance with this recommendation.

A minimum concrete compressive strength of 10 MPa is recommended prior to stripping formwork supporting COLPHENE BSW membranes (7 days minimum period for curing concrete). Premature stripping may result in loss of adhesion between the membrane and concrete.

The COLPHENE BSW system does not impact the concrete's class of exposure to external aggressions.

7.1.2.2. Precautions for concrete pouring

When pouring the structural concrete, the membranes must be clean and shall have no stagnant water.

Concrete will be poured directly onto the membranes, being careful not to damage them (especially in vertical areas of great height). The concrete will be vibrated on the entire surface.

In order to limit the risk of degradation of the membrane surface, it is advised to pour the concrete within 60 days of membrane installation.

7.2. BACKFILLING

In the case of post-applied installation structures, the installation of the backfill by the trade concerned must be done with all the precautions to avoid any damages on the membrane and/or its protection, taking into account the performance of the chosen protection.

NOTE: Structures not subject to hydrostatic pressure should be drained. The water drained must be gathered by a collector placed at the bottom of the wall and then evacuated through a suitable network.

SAFETY MEASURES

8.0. SAFETY MEASURES

8.1. IMPORTANT PRELIMINARY INSTRUCTIONS



SOPREMA products must be applied by qualified workers who have received appropriate safety training (such as proper use of fire extinguishers) to deal with accidents caused by the use of combustible or flammable materials, liquefied propane gas, open flames and installation equipment.

Before commencing work on site, it is imperative that all employees are made aware of the following guidelines.

Before using flammable liquids and mastics, consult the appropriate use instructions (labels, technical data sheets, material safety data sheets, etc.).

Before using products that may be hazardous, including products containing volatile solvents, consult the appropriate Material Safety Data Sheets. Only use these products in well-ventilated areas and only use primers that do not contain volatile solvents in areas with poor or no ventilation.

Shut off fans and blowers near the torching area.

Identify the construction and composition of the wall systems before torching.

Ensure the site is clean and free of waste material.

Notify building occupants of any torching activities, as appropriate, including the following persons:

- Person in charge of security
- Person in charge of the department
- Person in charge of maintenance

At the end of each day, the contractor must meticulously inspect the membrane and ensure it is correctly installed.

8.2. TORCHING SPECIAL PRECAUTIONS

Follow the specifications, notices, documents, and guidelines of Workers Safety Standards.

Wear proper clothing: gloves, long sleeve shirts, trousers, security footwear, eye protection and a helmet. Do not wear clothing made from synthetic fabrics. Remove all clothing that comes into contact with solvents.

The torch dedicated to the torching of waterproofing membranes can produce temperatures above 1,100°C. Avoid contact with materials sensitive to these temperatures, such as lead and plastic.

Do not work in an enclosed area where gas can accumulate.

Follow manufacturer's recommendations for torching-welding of membranes. Never torch a membrane to a readily flammable surface such as wood or any other surface for which this installation technique is not approved.

Never use a torch on substrates that have been recently covered by a solvent-based product (wait until the product is dry), near combustible materials, near full or partly filled containers containing flammable materials (keep open flame at least 3 m away), or directly on substrates considered combustible.

Avoid placing combustible materials near open flames.

Do not direct the flame through open penetrations.

Keep in mind that the flame can travel over long distances (several meters), through and beyond small openings. Take proper preventive safety measures.

Attach the torch to the fuel tank using a pressure regulator calibrated to the manufacturer's design pressure. The regulator should be equipped with a certified rupture check valve.

Shut off the torch when not in use. Never leave a lighted torch unattended. When the torch is not in use, always place it on its support, with the head pointing upwards. Make sure that it will stay in this position.

At all times, and especially before leaving job site, check for smouldering or concealed fires. In case of fire, follow the appropriate safety procedures. The site manager must make sure that workers remain on site for at least one hour after any welding activity.

To shut off the torch, close the valve on the propane tank first, then let the gas remaining in the hose burn off before closing the valve on the torch itself.

8.3. SPECIAL PRECAUTIONS FOR PROPANE GAS TANKS



Secure and fasten propane gas tanks in an upright position at least 3 m from open flames and in an easily accessible location to permit rapid shutoff.

Never attempt to defrost a gas tank with a flame. In cold weather, use specially designed heating blankets.

Handle gas tanks with care. Avoid shocks and protect their valves.

After each use, tightly close the gas tank valve, even if the tank is empty.

Propane is heavier than air. Check low areas for gas accumulation.

Ensure good air exchange on job sites. Never work in unventilated enclosed areas.

Do not store tanks in sunlight for long periods or at temperatures exceeding 40°C. Use only in well-ventilated areas.

Never puncture, throw away, or incinerate empty tanks.

Maintain strict compliance with local fire codes.

Smoking is forbidden while flammable material is being installed, and near storage areas.

8.4. SPECIAL PRECAUTIONS FOR PRIMER APPLICATION

Avoid all eye and skin contact; primers are toxic if inhaled.

Use a respiratory protection device approved by the local Work Health and Safety Regulations.

Wear chemical-resistant gloves (natural rubber, polyvinyl alcohol reinforced, neoprene, nitrile), safety goggles and clean protective garments that cover the arms and legs, to keep exposure to a minimum.

Contain spills using an absorbent product (e.g. vermiculite, clay or sand).

Use non-sparking tools to sweep or collect spills into containers. Cover without sealing hermetically and store in a well-ventilated waste storage area.

Carefully rinse the spill area with water. Do not dispose of undiluted products in sewers.

Highly flammable. Keep out of sun and away from flames.

Never use ignition sources or smoke during application/use of products.

After application, wait until the solvent has evaporated before using the torch.

Keep enclosed spaces well-ventilated. Use forced ventilation if necessary.

8.5. MONITORING AFTER THE COMPLETION OF WELDING WORK

At the end of each workday, make sure there are no smouldering fires. A watchman must remain at the worksite for at least one hour after the completion of welding work. (The monitoring period may be longer in certain places. Requirements should be verified with local authorities.)

The watchman must have an infrared thermometer to take readings in high-risk areas. The readings must be taken every fifteen to twenty minutes. The temperature on the membrane surface should decrease between each reading.

The watchman must have an operational ABC fire extinguisher in his or her possession.

A telephone must be close by with the number of the local fire department. If a fire is suspected, the fire department must be called and the building evacuated.

At the end of the monitoring period, inspect the interior of the building with the owner's representative before leaving the worksite.

8.6. FIRE PRECAUTIONS



Strict compliance with local fire codes must be maintained.

Verify whether the owner has put in place an emergency measures program; if so, take it into account.

Always have an ABC fire extinguisher on hand, filled and in perfect working order during all installation operations on the construction site. There must be one easily accessible extinguisher near each torch. If possible, hook up a water hose on the roof.

When laying down the torch, make sure that the area is free of flammable or combustible materials.

Smoking is forbidden while flammable materials are being installed and close to where such materials are stored.

8.7. PRIMER AND LIQUID PRODUCTS

Smoking is forbidden near storage areas, while handling empty or full packaging, and during the installation of products.

Always have one minimum 6 kg multi-purpose dry chemical extinguisher in the liquid products application area.

Never puncture containers.

The type of application must be chosen and the substrate must be prepared so that no accumulation of the product is possible in any area.

Full and empty containers must be protected from sudden heat increases, especially in summer. They must be stored at least 10 m from any flame or ignition point.

Before using a torch on the job site, it is **IMPERATIVE** to retrieve all containers, full or empty, and put them in the storage area as described above.

The application of liquid products containing flammable solvents must be undertaken only after having verified the following: there are no flames nearby, there is no heating device nearby, there are no propane tanks in service or stored nearby and there is no gas channelling hooked up to an instrument in service within a 10 m radius of the application area.

After application, the product must be given enough time to dry before starting any work that involves torching. Never use a torch to accelerate the drying process.

8.8. FIRST AID MEASURES



Flush burns with cold water and seek immediate medical attention.

Should molten bitumen come into contact with eyes or skin, flush with cold water and seek immediate medical attention. Do not attempt to remove molten bitumen from skin or

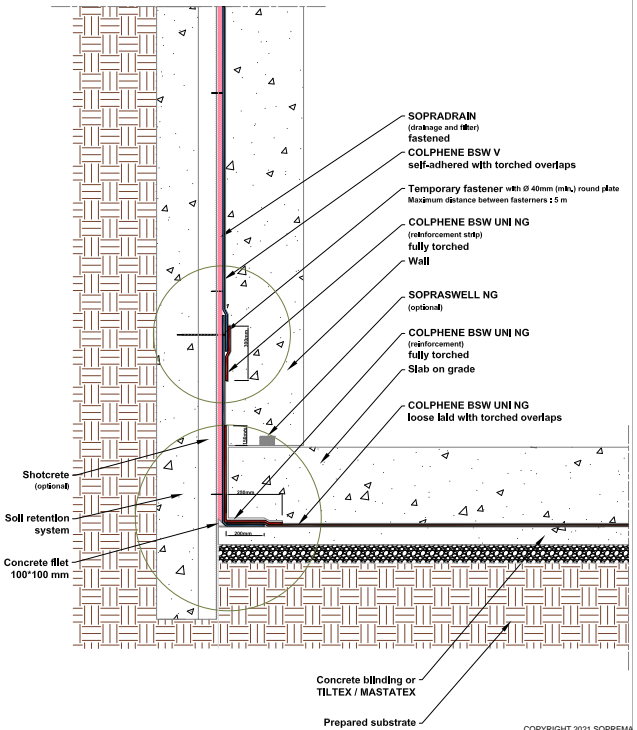
clean with a solvent. Should molten bitumen come into contact with clothing, flush with cold water.

DETAILS

9.0. DETAILS

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9.1. JUNCTION DETAIL: SINGLE PLY



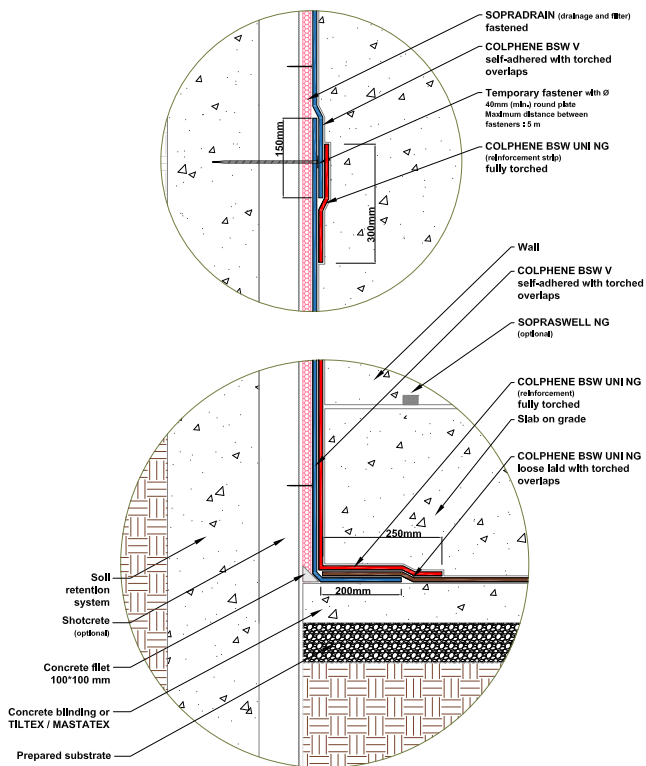
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* COLPHENE BSW UNI NG can be substituted for COLPHENE BSW H

NOTE:

This detail is only indicative and should be verified by the designer and/or the applicator according to real job site conditions.

9.2. JUNCTION DETAIL: SINGLE PLY - ZOOM VIEW



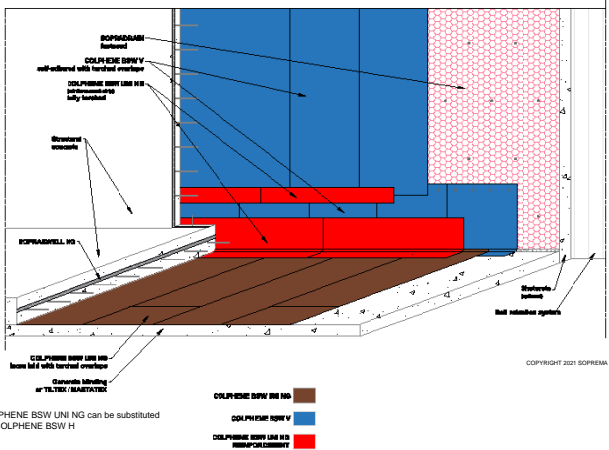
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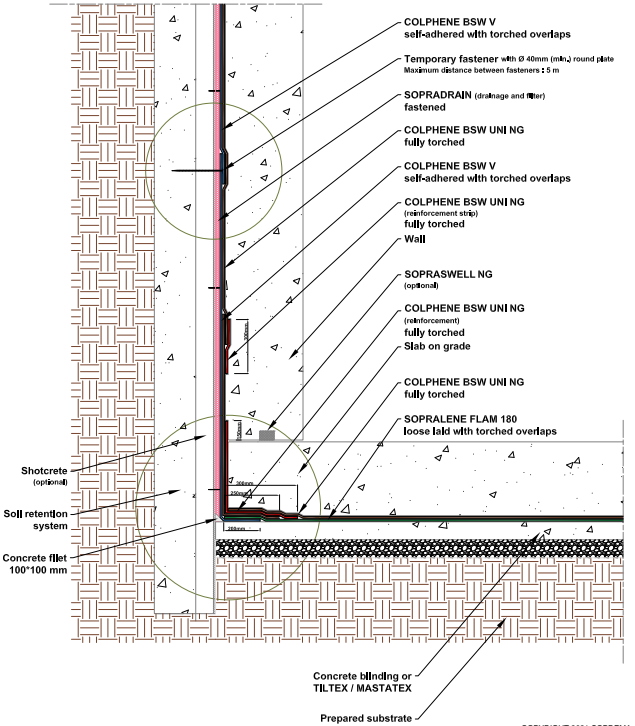
This detail is only indicative and should be verified by the designer and/or the applicator according to real job site conditions.

9.3. JUNCTION DETAIL: SINGLE PLY - 3D

**NOTE:**

This detail is only indicative and should be verified by the designer and/or the applicator according to real job site conditions.

9.4. JUNCTION DETAIL: DOUBLE PLY



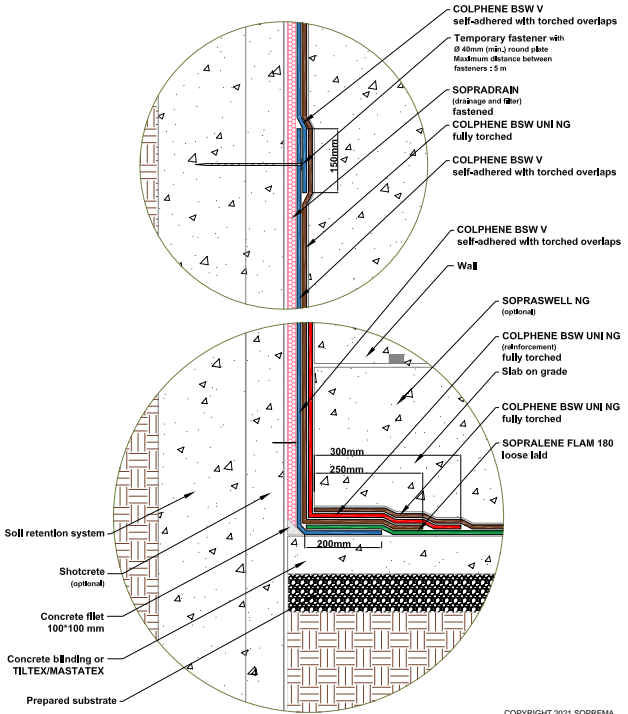
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9.5. JUNCTION DETAIL: DOUBLE PLY - ZOOM VIEW



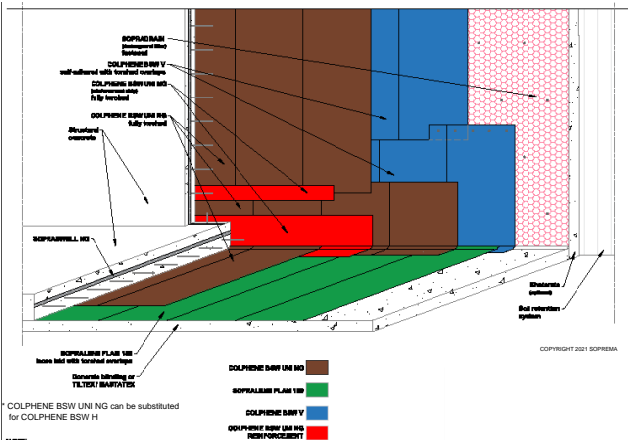
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NOTE:

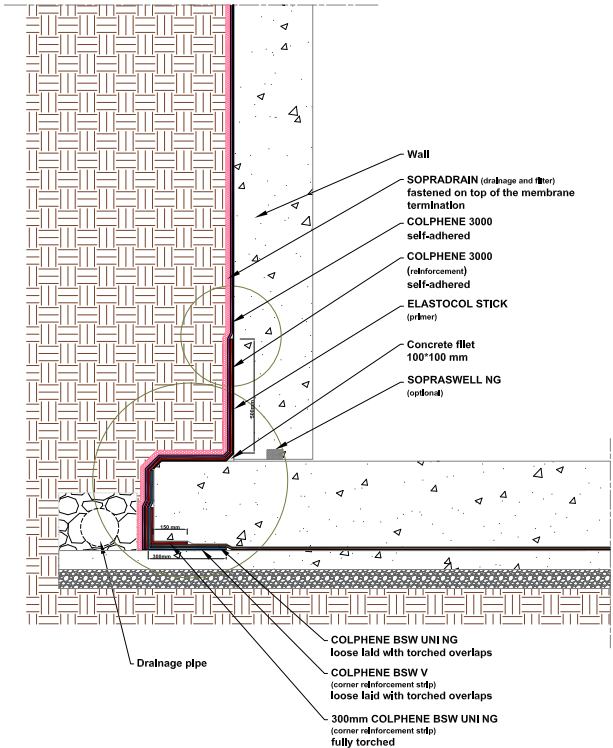
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9.6. JUNCTION DETAIL: DOUBLE PLY - 3D



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9.7. JUNCTION DETAIL COLPHENE 3000 - COLPHENE BSW UNI NG/H: SINGLE PLY



Without chamfer on all angles, a corner reinforcement must be previously applied

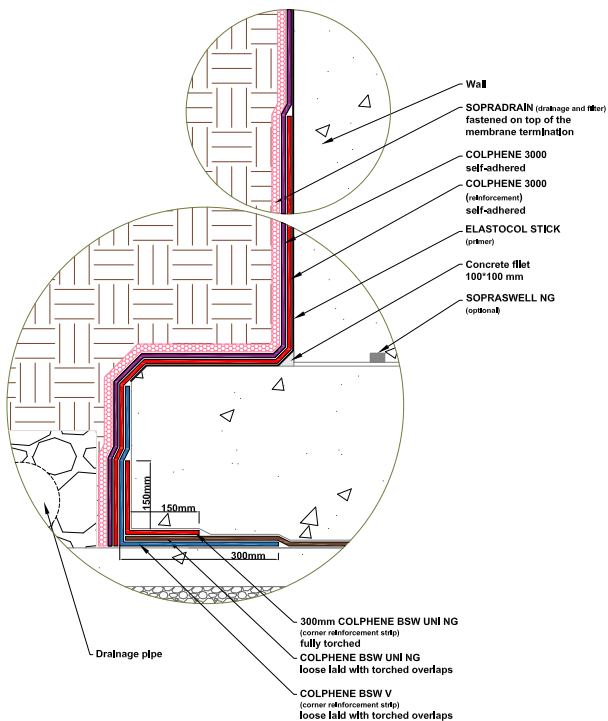
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NOTE:

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9.8. JUNCTION DETAIL COLPHENE 3000 - COLPHENE BSW UNI NG/H: SINGLE PLY - ZOOM VIEW



Without chamfer on all angles, a corner reinforcement must be previously applied

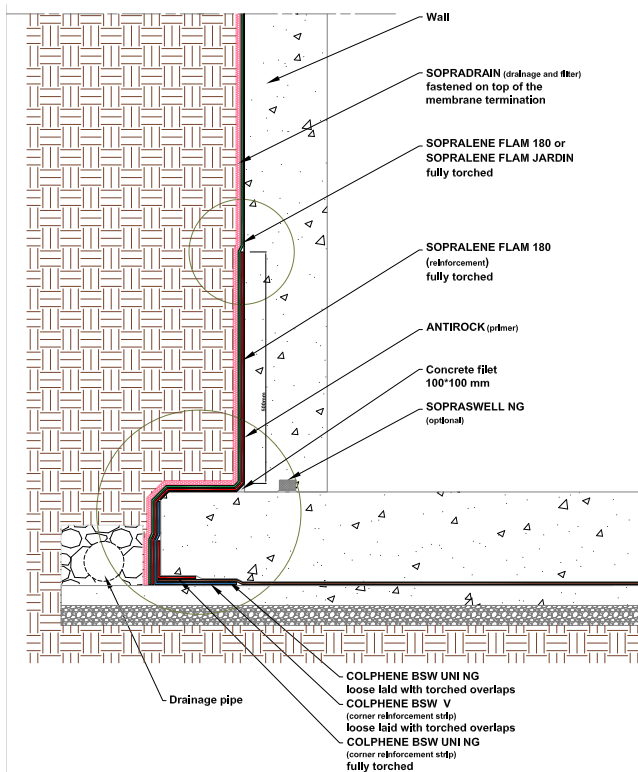
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NOTE:

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9.10. JUNCTION DETAIL POST-APPLIED TORCH-ON - COLPHENE BSW UNI NG/H: SINGLE PLY



Without chamfer on all angles, a corner reinforcement must be previously applied

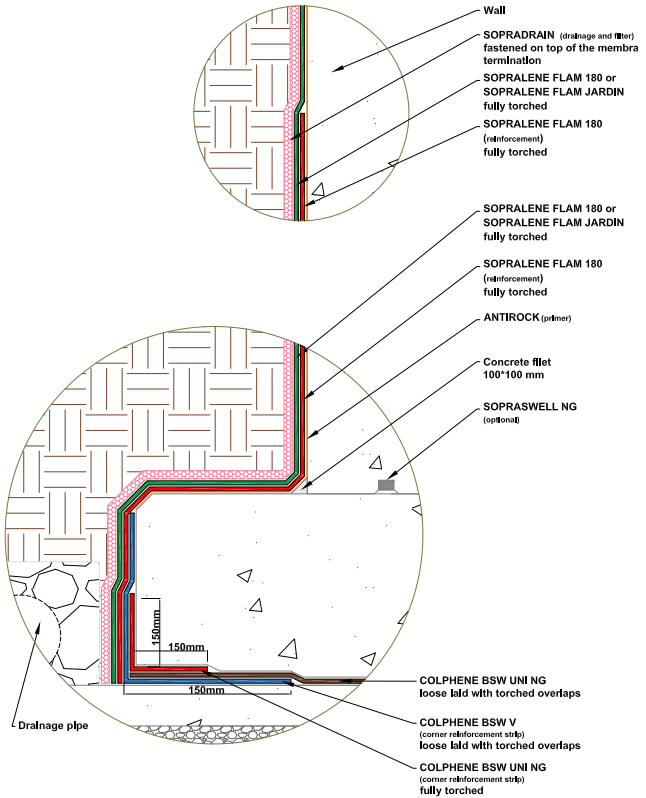
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NOTE:

This detail is only indicative and should be verified by the designer and/or the applicator according to real job site conditions.

9.11. JUNCTION DETAIL POST-APPLIED TORCH-ON - COLPHENE BSW UNI NG/H: SINGLE PLY - ZOOM VIEW



Without chamfer on all angles, a corner reinforcement must be previously applied

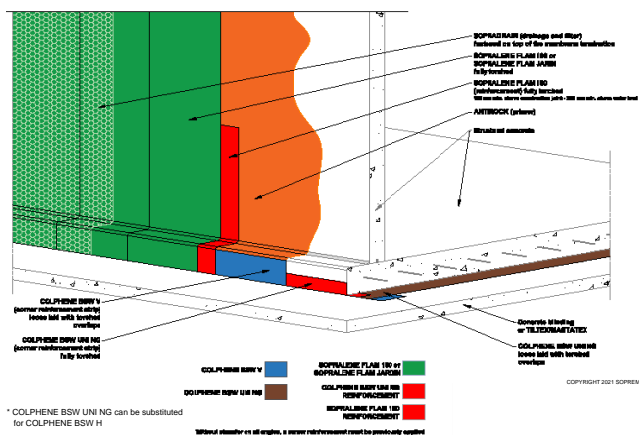
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* COLPHENE BSW UNI NG can be substituted for COLPHENE BSW H

NOTE:

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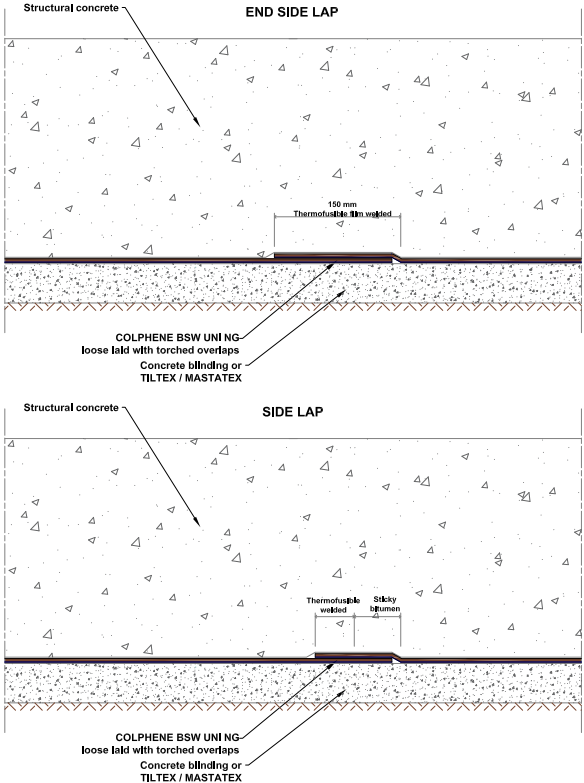
9.12. JUNCTION DETAIL POST-APPLIED TORCH-ON - COLPHENE BSW UNI NG/H: SINGLE PLY - 3D



* COLPHENE BSW UNI NG can be substituted for COLPHENE BSW H

NOTE
This detail is only indicative and should be verified by the designer and/or the applicator according to real job site conditions.

9.13. HORIZONTAL OVERLAP DETAIL: SINGLE PLY



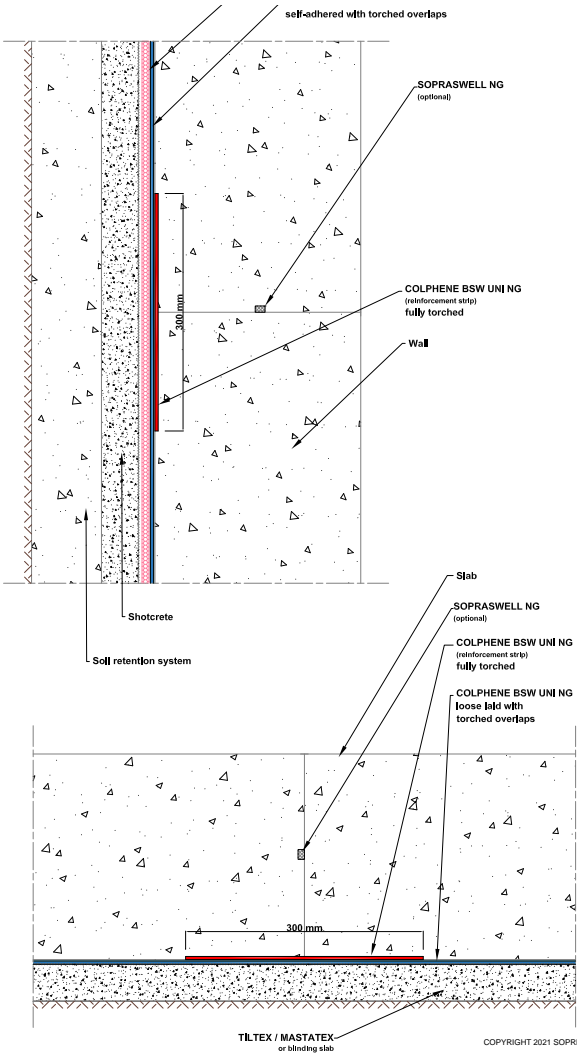
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NOTE:

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9.14. VERTICAL AND HORIZONTAL CONSTRUCTION JOINT DETAIL: SINGLE PLY

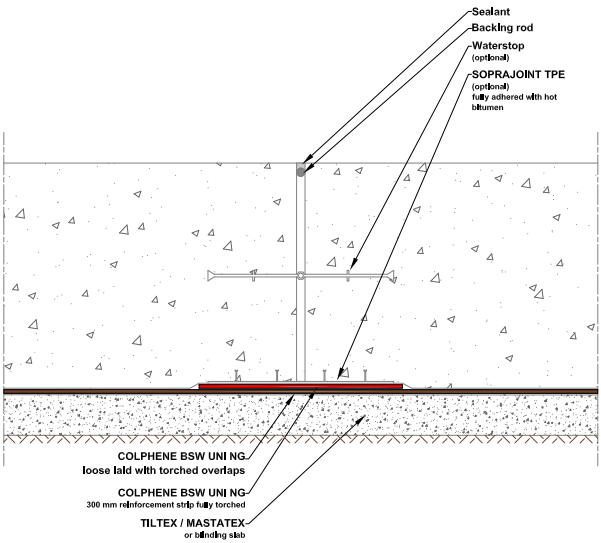


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9.15. HORIZONTAL MOVEMENT JOINT DETAIL: SINGLE PLY



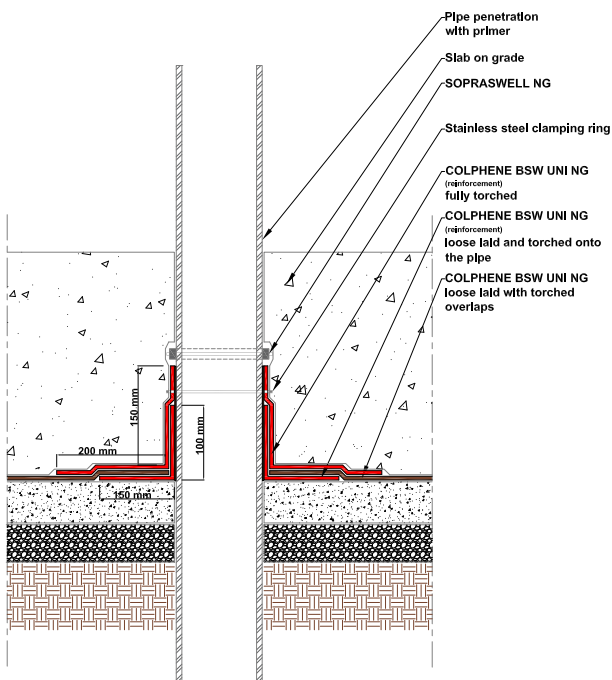
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NOTE:

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9.16. PIPE PENETRATION DETAIL: SINGLE PLY



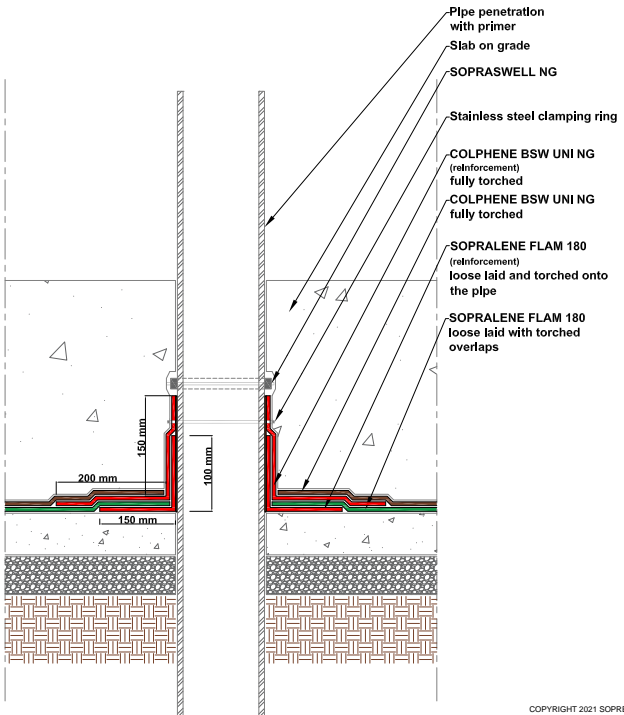
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NOTE:

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9.17. PIPE PENETRATION DETAIL: DOUBLE PLY



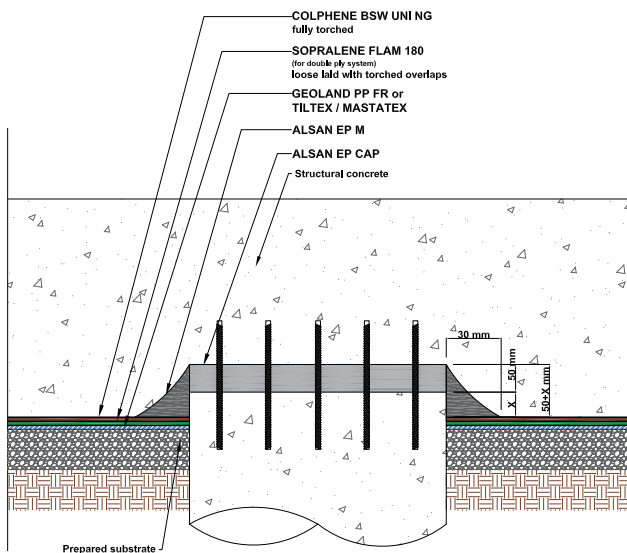
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NOTE:

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9.18. PILE CAP DETAIL



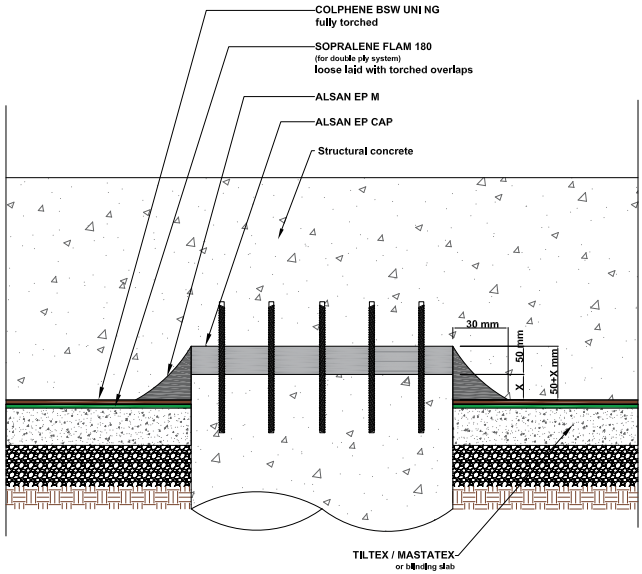
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NOTE:

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9.19. PILE CAP DETAIL WITH TILTEX OR MASTATEX



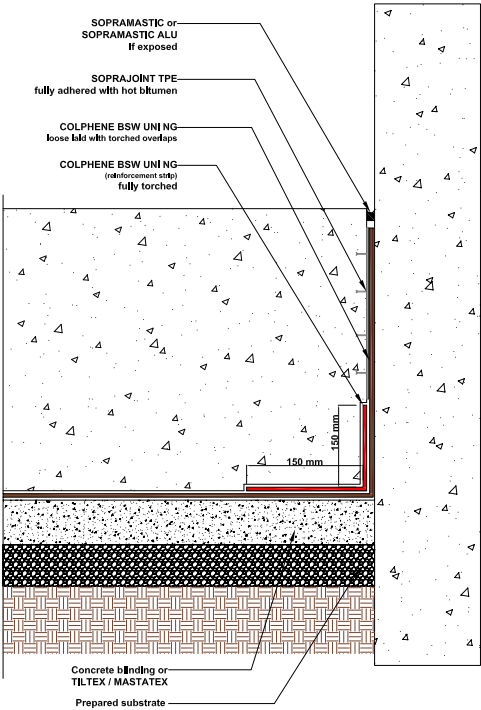
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* COLPHENE BSW UNI NG can be substituted for COLPHENE BSW H

NOTE:

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9.20. SLAB TERMINATION DETAIL WITH SOPRAJOINT TPE

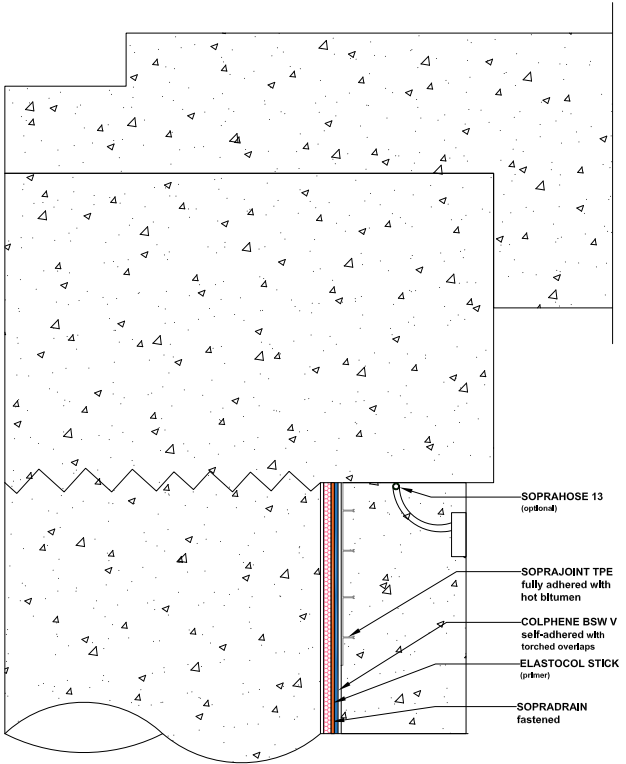


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NOTE:
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9.21. TERMINATION DETAIL AT PILE HEAD WITH SOPRAJOINT TPE

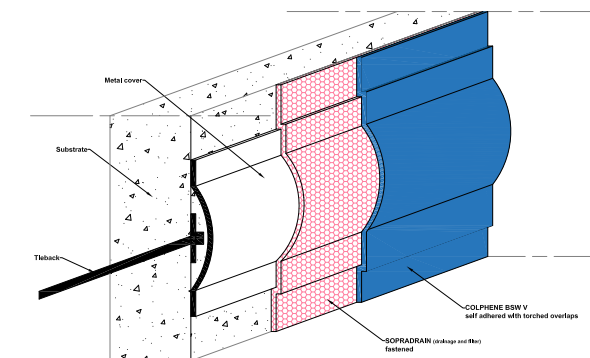


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9.22. TIED BACK DETAIL

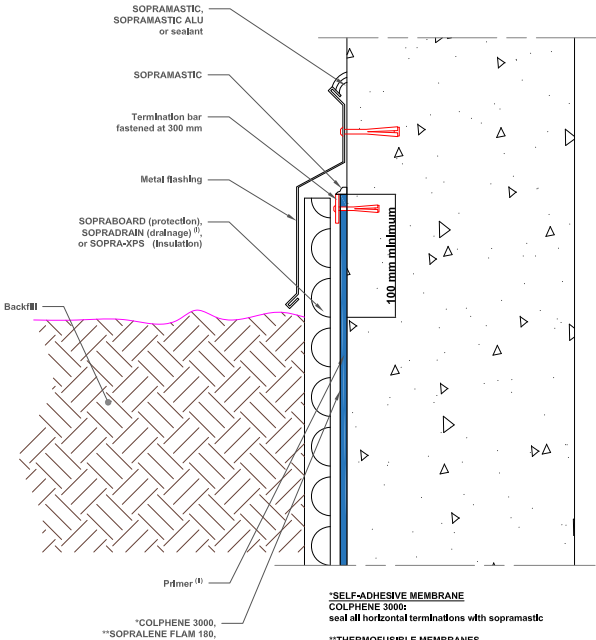


NOTE:

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9.23. TERMINATION WITH METAL FLASHING



***SELF-ADHESIVE MEMBRANE**
COLPHENE 3000:
 seal all horizontal terminations with sopramastic

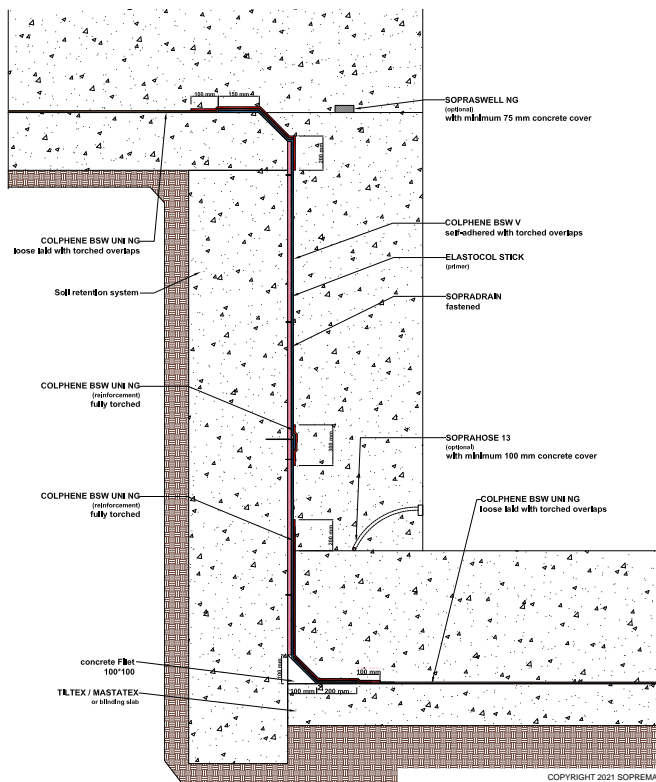
****THERMOFUSIBLE MEMBRANES**
SOPRALENE FLAM 180:
 seal all terminations (horizontal and vertical) with trowel with a round end.

(I): Always install Sopradrain filter fabric towards backfill.
(II): Use ELASTOCOL STCK PRIMER with self-adhesive membrane and ANTIROCK PRIMER with thermofusible membrane.

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NOTE:
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9.24. LIFT PIT DETAIL: SINGLE PLY SYSTEM



* COLPHENE BSW UNI NG can be substituted for COLPHENE BSW H

NOTE:
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NOTE:
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