SOPREMA REPAIR AND RE-COVER ROOFING GUIDE





Preface

This technical guide is intended for specifiers and installers of SOPREMA roofing materials solely for information purposes, in an effort to help them in the design and partial reconstruction of existing roofs.

SOPREMA believes that the owner or the professional representing the owner is responsible for deciding on whether or not to repair a roof's waterproofing system. This decision must be informed, as the Canadian Roofing Contractors' Association (CRCA) recommends in volume 43 of its technical bulletin: "The decision to repair a modified bitumen roof should, as with every type of roofing system, be made only after careful thought and should be based primarily on performance consequences. Open seams, fishmouths at laps, large unbonded areas of the membrane and areas where overheating has resulted in distortion to the reinforcing should be corrected as soon as possible. Trivial anomalies, on the other hand, such as minor wrinkling and ridging are to be expected as a function of the physical characteristics of these materials and their required application methods. Patching a minor blister or a small wrinkle because of visual impact alone is not justified and, in most cases, the repairs will look far worse than the blemish they were intended to correct."

Sustainability

The long term objective in designing a durable roof is to have the roofing system in place for as long as possible as well as to avoid having materials hauled off to burial sites or using new materials.

Energy conservation, sustainability and a reduction of raw material consumption and waste minimization must be the guiding principles behind any roof design and specifications. Specifically, sustainable design must involve materials and details that extend and exceed the expected useful life of a roof, and be backed by a long-term roof re-cover plan. Manufacturers, designers and installers must now join forces and work together to contribute to the protection of the environment, while prioritizing sustainable development.

To limit environmental impacts and save time and money, SOPREMA offers many roof re-cover solutions not requiring the removal of the existing waterproofing system. These environmentally friendly re-cover solutions can be covered under a 10- or 15-year PLATINUM GENERATIONS warranty. Please see SOPREMA's GENERAL CONDITIONS FOR ROOF WARRANTIES for the warranty eligibility requirements.

Policy Statements

- **1.0.1** The information and specifications contained in this manual are intended to assist in selecting appropriate roofing systems. SOPREMA Inc. believes the design and construction of the buildings which receive these products are best left to the owner, architect and/or contractor. We stress that to obtain a roofing system that will perform properly, workmanship is equally as important as the use of quality materials properly designed into a good roofing specification. The most perfectly manufactured product cannot perform its function if it is not properly installed. The recommendations which are contained in this manual cannot substitute for the knowledge, skill, experience and integrity expected of a qualified professional roofing contractor or the technical expertise of trained architects and engineers. It is recommended that the user become familiar with all the relevant material included in this manual before selecting or installing a particular roof specification.
- **1.1.3** No manual can explicitly cover every detail of a particular roofing system nor anticipate all new products, roof decks, or building designs. If an unusual condition is encountered that is not explained in this manual, contact SOPREMA Inc.



Table of Contents

1.0 EV/	ALUATI	ON OF THE CONDITION OF THE ROOFING SYSTEM	4		
1.1	1.1 Visual inspection				
1.2	Therm	ographic or hygrometric analysis	5		
1.3	Types	of defects	5		
2.0 REC	CONSTI	RUCTION OF SBS MODIFIED BITUMEN MEMBRANES	6		
2.1	Granu	le loss	6		
	2.1.1	Membrane regranulation with liquid coatings and bulk granules	6		
2.2	Partial	reconstruction of components other than membranes	7		
2.3	Conne	ction of new membranes to existing membranes	7		
	2.3.1	Addition of a mechanical unit curb to existing membranes (heat welded)	7		
	2.3.2	Addition of a mechanical unit curb to existing membranes (self-adhesive)	8		
2.4	Wrink	le repair	9		
	2.4.1	Repair by heat welding	10		
	2.4.2	Repair with cold adhesive	11		
2.5	Partial	resurfacing	11		
	2.5.1	Partial resurfacing (heat welded)	11		
	2.5.2	Partial resurfacing (adhesive applied)	12		
2.6	Comp	lete resurfacing (heat welded)	13		
3.0 RE	PAIR OF	OTHER TYPES OF MEMBRANES	14		
3.1	BUR w	vith flood coat and gravel	14		
	3.1.1	Partial repair over BUR with flood coat and gravel (surface preparation)	14		
	3.1.2	Partial repair over BUR with flood coat and gravel (heat welded)	14		
	3.1.3	Partial repair over BUR with flood coat and gravel (adhesive applied)	15		
	3.1.4	Addition of a mechanical unit curb to existing membranes (heat welded)	16		
	3.1.5	Addition of a mechanical unit base to existing membranes (self-adhesive)	16		
3.2	Comp	lete re-cover over BUR	17		
	3.2.1	XPRESS BOARD panels	17		
	3.2.2	Other re-cover panels	18		

- 3.2.2.1 SOPRABOARD panels and SOPRAROCK DD PLUS insulation 3.3 Non-bituminous single-ply roofing membrane (PVC/TPO/EPDM)
- 4.0 DETAILS

19

18

1.0 EVALUATION OF THE CONDITION OF THE ROOFING SYSTEM

Before carrying out a partial or complete reconstruction of a roofing system, it is important to know the state of its components. Thus a roof that is over 20 years old, but for which only the membranes are showing signs of fatigue can be restored by installing a new waterproofing membrane over the existing one (resurfacing), which produces significant cost savings for owners. Depending on the type of materials used, the type of deck, the presence or absence of partitioning or roof area divider joints, it may also be possible to partially replace the components (insulation and re-cover panels) in specific areas and to then go on to the partial or complete resurfacing of membranes.

However, no resurfacing should be performed at a roofing area having components that have been altered.

To determine the state of the roofing, the following steps should be followed:

1.1 Visual inspection

To determine the types of corrective action to be taken on a roof, the entire surface concerned must first undergo a visual inspection. The person performing this task will look for signs of membrane deterioration as well as the presence of defects capable of compromising the integrity of the waterproofing system.

Other infiltration sources:

Even though membranes may not show any sign of deterioration and all components, including flashings, may appear to be in perfect condition, it may nevertheless be possible to detect infiltrations inside the building. Therefore, during visual inspections, attention must also be paid to components that can have an impact on waterproofing, such as mechanical units, flashing, bumps on walls or any potential source of infiltration.

During a visual inspection, particular attention must be paid to the following areas:

- 1- flashing membranes at transition (90 °) with the existing surface;
- 2- horizontal overlaps of existing field surface membranes;
- 3- condition of drains;
- 4- metal flashings;
- 5- drains and vents;
- 6- roof to wall junctions;
- 7- junctions with mechanical units.









1.1 c

1.2 Thermographic or hygrometric analysis

Should potential infiltration sources be observed during a visual inspection, or should an infiltration be detected inside the building, a firm specializing in roof inspections must be called in to determine the scope and type of deficiencies involved. Depending on each case, such professionals can carry out a thermographic inspection of the roofing system or use a hygrometer to locate zones that may have been damaged by moisture ingress.

Should the roofing system type and weather conditions permit it, opt for thermography, which is the more reliable and efficient of the two methods. Thermography makes it possible to locate areas of the roofing system with variable temperatures, which indicates the possible presence of moisture in the system. However, whatever the method used, only a cut test will make it possible to determine whether or not traces of moisture are present in the system.

Once the analysis and the test have been completed, a layout plan demonstrating the observations should be prepared in order to allow roofers to carry out the repairs needed.





1.2 b

1.3 Types of defects

As earlier mentioned, repairs are not recommended if they are purely for aesthetic reasons. The presence of wrinkles is often attributable to the materials or installation methods used, and in most cases, does not have a negative impact on the longevity of the roofing system. However, corrective action should be taken in cases where wrinkles that appear progressively and worsen may eventually grow to become a source of problems. Conversely, new roof membranes may initially manifest minor wrinkles, but these generally disappear during the course of the year following the exposure of the new membrane assembly.

The following table shows some types of defects that can be observed on an SBS modified bitumen roof and the degree of importance they should be assigned.

DEFECT	IMPORTANCE	
Minor wrinkles (1.3 a)	Insignificant	None
Major wrinkles (1.3 b)	Medium	Recommended
Fishmouths (1.3 c)	High	Mandatory
Delamination / Blisters (1.3 d)	High	Recommended
Granule loss (1.3 e)	Medium	Optional
Cracks (membranes) (1.3 f)	High	Mandatory
Cracks (sealant and pitch pans) (1.3 g)	High	Mandatory
Tenting (1.3 h)	High	Recommended









1.3 e



1.3 d









1.3 h

2.0 RECONSTRUCTION OF SBS MODIFIED BITUMEN MEMBRANES

2.1 Granule loss

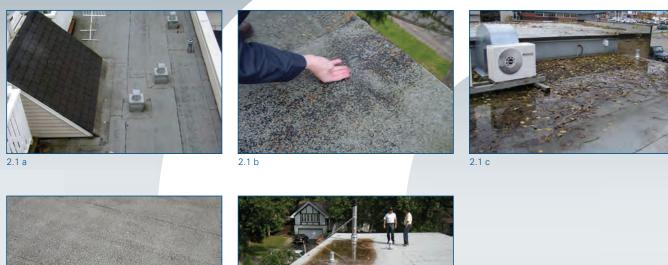
Some particular conditions often lead to partial granule loss and to the appearance of cracks on the surface of the cap sheet. This may be caused by several factors, foremost among which are excess foot traffic on the roof, excessive maintenance, accumulations of bird droppings and ponding leaving sediments (commonly called mud curling).

Mud curling occurs when stagnant water and dirt accumulates in the lower parts of the roof. When water evaporates, soil, leaves or other debris in these areas form a film of sediments causing granule loss on drying. In most cases, this phenomenon occurs on roofs with poor drainage or on those that are inadequately maintained. To reduce the incidence of mud curling and prevent sediment accumulation, it is generally enough to perform maintenance twice a year. This includes ensuring that drains are not obstructed, thereby allowing water to drain normally.

2.1.1 Membrane regranulation with liquid coatings and bulk granules

Mark off and cover areas to be regranulated with ALSAN FLASHING coating. With the coating still wet, spread bulk granules at a rate of about 1.2 kg/m². When the coating is dry, a blower or brush can be used to remove excess granules.

Note: Since ALSAN FLASHING is resistant to ultraviolet rays, it does not require any additional protection. Bulk granules are therefore used solely for aesthetic reasons, at the owner's discretion.





2.1 d



2.2 Partial reconstruction of components other than membranes

When it becomes necessary to replace altered components, new materials should be isolated from existing ones in order to prevent the possible deterioration of new materials. To that end, a partitioning joint should be installed in accordance with the SOP 21 detail.

2.3 Connection of new membranes to existing membranes

When new membranes need to be connected to existing ones or when a mechanical unit curb is added to an existing roof, membrane sequencing is impossible where base and cap sheet membranes overlap. To ensure full waterproofing, base sheet membranes must overlap existing membranes by at least 150 mm (6 in.) and cap sheet membranes by at least 300 mm (12 in.) (see detail SOP 33 and 39).

2.3.1 Addition of a mechanical unit curb to existing membranes (heat welded)

- 1- Before cutting the field surface membranes, degranulate the surface of existing membranes over a width of 300 mm (12 in.) around the zone where the curb of the new mechanical unit is to be installed.
- 2- Once the new curb is installed, prime it with ELASTOCOL STICK for self-adhesive membranes.
- **3-** Install the self-adhesive base sheet using the usual method. This membrane should overlap the field surface by 150 mm (6 in.).
- 4- Install a heat-welded cap sheet using the usual method. This membrane should overlap the field surface by 300 mm (12 in.).

Note: See detail SOP 39











2.3.1 d

2.3.1 e



2.3.1 f





2.3.2 Addition of a mechanical unit curb to existing membranes (self-adhesive)

- 1- Cut the field surface membranes and install the curb of the new mechanical unit.
- 2- Once the new curb is installed, prime it with ELASTOCOL STICK for self-adhesive membranes.
- 3- Install the self-adhesive base sheet using the usual method. This membrane should overlap the field surface by 150 mm (6 in.).
- 4- Lift up the part of the self-adhesive base sheet membrane that overlaps the granulated zone and seal it with TROWEL GRADE COLPLY adhesive.
- 5- Prime the surface of the newly installed base sheet.
- 6- Install a self-adhesive cap sheet using the usual method. This membrane should overlap the field surface by 300 mm (12 in.).
- 7- Lift up the part of the self-adhesive cap sheet membrane that overlaps the granulated zone using a trowel with a 5 mm notches (3/16 in.) and seal it with TROWEL GRADE COLPLY adhesive on the first 125 mm (5 in.).
- 8- After positioning the membrane, apply pressure to the entire surface with a roller for complete and uniform embedment. Finish the application by welding the last 25 mm (1 in.) of the overlap to the field surface with an electric hot-air gun and a roller.

Note: See detail SOP 33











2.3.2 c



2.3.2 d



2.3.2 e



2.3.2 f





2.3.2 h

2.4 Wrinkle repair

Wrinkles may form on membrane surfaces for various reasons. In most cases, these wrinkles either originate from the installation methods used or the instability of components under waterproofing membranes. The most common installation related problems include a lack of heat or the use of a poor technique during welding, low temperature for hot bitumen and the installation of self-adhesive membranes without the proper use of rollers to apply pressure to assure contact.

When wrinkles are caused by installation techniques, simply doing repair on membranes is all that is required. However, more extensive measures such as mechanical fastening of the entire roofing system or complete reconstruction should be considered when wrinkles are caused by the instability of components under the membranes

Areas needing repairs (e.g.: excessive wrinkles, blisters, membrane detachment and infiltrations at overlaps) must be corrected prior to the installation of the resurfacing membrane, according to the methods described below.

2.4.1 Repair by heat welding

- 1- Degranulate the membrane around the wrinkle in all directions within a 150 mm (6 in.) radius.
- 2- Cut and remove the wrinkled area of the membrane.
- 3- Apply an F/F type base sheet membrane to the entire degranulated area.





2.4.1 b







2.4.1 d



2.4.1 e



2.4.1 f



2.4.1 g

2.4.2 Repair with cold adhesive

Cut and remove the wrinkled area of the membrane. Cut a piece of the membrane whose with the dimensions to exceed the opening by at least 150 mm (6 in.) in all directions. Using a steel trowel with 5 mm notches (3/16 in.), coat the area to be covered with a base sheet membrane with COLPLY TROWEL GRADE. Place an S/S type base sheet membrane on the entire adhesive -coated area. After placing the membrane on the adhesive, apply pressure over the entire area using a roller to achieve total and uniform adhesion.





2.4.2 d







2.4.2 f

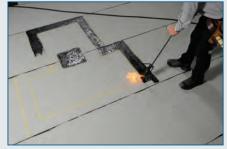
2.5 Partial resurfacing

After carrying out the needed repairs, clean the existing membrane surface with a head and a blower to rid it of any granules or of any unbonded particles. Resurfacing membranes must then be installed using appropriate methods described below.

2.5.1 Partial resurfacing (heat welded)

- 1- Degranulate the existing membrane within 150 mm (6 in.) radius around the area where the new membrane will be installed.
- 2- Coat the remaining granulated surface with ELASTOCOL 500 primer at a rate of 0.25 l/m².
- 3- Heat apply a cap sheet membrane to the surface to be covered following the usual procedure.

N. B. Make sure the end of the cap sheets and the end laps of the field surface are staggered by a minimum of 300 mm (12 in.). When repairs are less than 150 mm (6 in.) from the side laps of the field surface, a reinforcing band must also be applied to the adjacent membrane using the same application procedure.



2.5.1 a



2.5.1 b





2.5.2 Partial resurfacing (adhesive applied)

- 1- After carrying out the needed repairs, clean the existing membrane surface with a broom and a blower to rid it of any granules or of any unbonded particles.
- 2- Coat the existing membrane with COLPLY TROWEL GRADE adhesive covering the entire area to be resurfaced.
- 3- Place a cap sheet membrane with a sanded bottom surface excedding 25 mm (1 in.) the adhesive-coated area. After placing the membrane on the adhesive, apply pressure on the entire area using a roller to achieve total and uniform adhesion. Finish the application by welding the last 25 mm (1 in.) of the overlap to the field surface with an electric hot-air gun and a roller.

N. B. Make sure the end of the cap sheets and the end laps of the field surface are staggered by a minimum of 300 mm (12 in.). When repairs are less than 150 mm (6 in.) from the side laps of the field surface, a reinforcing band must also be applied to the adjacent membrane using the same application procedure.





2.5.2 b











2.5.2 e



2.6 Complete resurfacing (heat welded)

After carrying out the needed repairs, clean the existing membrane surface with a broom head and a blower to rid it of any granules or of any unbonded particles. Resurfacing membranes must then be installed using the following method:

- 1- Degranulate the existing membrane within a 150 mm (6 in.) radius around all areas of the roof perimeter as well as at the perimeter of raised components, such as vents and mechanical units.
- 2- Degranulate the existing membrane within a 500 mm (20 in.) radius around the drains.
- 3- Coat the existing granulated surface with ELASTOCOL 500 primer at a rate of 0.25 l/m². A 19-liter container will cover approximately 76 m² (815 ft²).
- 4- Apply a cap sheet membrane to the surface to be covered following the usual procedure.













2.6 d







261



2.6 g



2.6 h

3.0 REPAIR OF OTHER TYPES OF MEMBRANES

Compatibility of products

There are various types of waterproofing membranes. While some are compatible, others are completely incompatible with one another. It is therefore important to first ascertane the feasibility of reconstructing a particular system by using SBS modified bitumen membranes. However, even when two materials (e.g.: SBS modified bitumen and PVC) are incompatible, other solutions may be used (see page 19).

3.1 BUR with flood coat and gravel

SBS modified bitumen membranes are compatible with multi-ply roofs made of organic felt paper or of glass fibre mat installed with oxidised bitumen. Old multi-ply roofs are often partially restored by using SBS modified bitumen membranes to reconstruct flashings or repair cracks on existing surfaces. However, large modified bitumen membrane surfaces should not be adhered directly to this type of coating. When adhesion is carried out on small surfaces, moisture can easily evaporate through the sides of membranes, thus significantly reducing the risk of blistering.

3.1.1 Partial repair over BUR with flood coat and gravel (surface preparation)

- 1- When the roof is covered in gravel, remove all unbonded gravel within a 500 mm (20 in.) radius of the area to be repaired.
- 2- While taking care not to delaminate organic paper folds, proceed to remove bonded gravel by spudding clean within a 300 mm (12 in.) radius of the area to be repaired.
- 3- Where wrinkles or blisters are present, cut them and remove the unbonded area of the membrane.
- 4- Use ELASTOCOL 500 primer to coat surfaces to be covered.
- 5- Install SBS modified bitumen membranes as shown in 3.1.2 and 3.1.3.



3.1.1 b





3.1.1 c

14

3.1.2 Partial repair over BUR with flood coat and gravel (heat welded)

- 1- Apply an F/F type base sheet membrane exceeding the area to be covered by 150 mm (6 in.).
- 2- Apply a cap sheet membrane exceeding the previously installed base sheet by 150 mm (6 in.).
- 3- Using a trowel, generously apply adhesive so it overlaps the newly installed membrane and the existing waterproofing.
- 4- Cover the adhesive string with gravel.



3.1.2 e

3.1.3 Partial repair over BUR with flood coat and gravel (adhesive applied)

- 1- Coat with adhesive a surface exceeding the area to be repaired by 150 mm (6 in.).
- 2- Place an S/S type base sheet membrane on the entire adhesive-coated area. After placing the membrane on the adhesive, apply pressure on the entire area using a roller to achieve total and uniform adhesion.
- 3- Use the adhesive to coat the base sheet and overlap it by 125 mm (5 in.).
- 4- Place a cap sheet membrane with a sanded bottom surface excedding 25 mm (1 in.) the adhesivecoated area. After placing the membrane on the adhesive, apply pressure on the entire area using a roller to achieve total and uniform adhesion. Finish the application by welding the last 25 mm (1 in.) of the overlap to the field surface with an electric hot-air gun and a roller.
- 5- Using a trowel, generously apply adhesive so it overlaps the newly installed membrane and the existing waterproofing.
- 6- Cover the adhesive with gravel.













3.1.3 d



3.1.3 e







3.1.3 g

3.1.3 i

3.1.4 Addition of a mechanical unit curb to existing membranes (heat welded)

Surfaces must be prepared as indicated in Section 3.1.1. Install membranes using the same methods as those indicated in Section 2.3.1.

Note: See detail SOP 40



3.1.4 a





3.1.4 c

16



3.1.4 d



3.1.4 e

3.1.5 Addition of a mechanical unit base to existing membranes (self-adhesive)

Surfaces must be prepared as indicated in Section 3.1.1. Install membranes using the same methods as those indicated in Section 2.3.2

Note: See detail SOP 32

3.2 Complete re-cover over BUR

Multi-ply roofing membranes are either covered with asphalt flood coat and gravel, or protective coating resistant to ultraviolet rays. These two substrate types are not appropriate substrates for modified bitumen membranes. Even when a larger part of ultraviolet protection is removed, organic and glass fiber mat felts papers may still contain moisture, which could eventually generate vapour blisters under modified bitumen membranes. In both cases, it is necessary to install a support panel (mechanically fastened or glued) on the existing waterproofing in order to facilitate the installation of a new two-ply system of SBS modified bitumen membranes. SOPREMA recommends moisture resistant panels, such as XPRESS BOARD, SOPRAROCK DD PLUS and/or SOPRABOARD panels.

When panels are adhered using hot bitumen, a double layer of asphalt may be required to smooth the uneven surface caused by the bonded gravel of the existing waterproofing. While the first bitumen coating will make the surface consistent, the second will fasten the panels.

3.2.1 XPRESS BOARD panels

- 1- Use a power broom or any other effective method such as industrial vaccuming to remove all unbonded gravel on the existing surface.
- 2- Use a torch to dry the surface.

Note: Retain the following article where panels must be mechanically fastened to the substrate.

3- Use SOPRAFIX screws and plates to attach XPRESS BOARD panels in accordance with CSA A 123.21-04 Standard Test Method for Dynamic Wind Uplift Resistance of Mechanically Attached Membrane Roofing Systems.

Note: Retain the following article where panels must be fastened to the substrate using hot asphalt.

- 4- Where necessary, install a layer of bitumen to smooth the surface.
- 5- Place XPRESS BOARD panels where they will be adhered.
- 6- Fold half the panel onto the other half.
- 7- Apply a layer of hot asphalt, at a rate ranging between 1 to 1.5 kg/m², on the surface of the multi-ply roofing membrane which corresponds to the folded half of the panel to be installed.
- 8- While the asphalt is at the recommended temperature, fold the panel into the hot asphalt.
- 9- Apply the same procedure to the second half of the panel.
- **10-** All panels must be perfectly butted, free of any significant level differences between them and must be perfectly adhered to the surface.
- 11- Once the panel is fully adhered, seal the first 75 mm (3 in.) of self-adhesive side lap joints with a roller, then adhere the remaining 25 mm (1 in.) with a torch or hot air gun.

Note: Retain the following article where panels with sanded surfaces are used.

12- Sealandlapjoints with a self-adhered membrane strips with a 300 mm (12 in.) sanded surface, placed on the joint. The surface to be covered should have been previously coated with ELASTOCOL STICK primer. Note: Retain the following article where recovery panels covered with a plastic film are used.

- 13- Seal end lap transversal joints by torch-welding a 300 mm (12 in.) protection tape, centered on them.
- 14- Install cap sheet membranes selected according to the appropriate method.

3.2.2 Other re-cover panels

Several types of support panels can be used to cover the existing multi-ply roofing surface on which Soprema membranes will be installed. Please refer to manufacturer recommendations for panel installation methods where such panels were not produced by Soprema.

3.2.2.1 SOPRABOARD panels and SOPRAROCK DD PLUS insulation

- 1- Use a power broom or any other effective method such as industrial vaccuming to remove all unbonded gravel on the existing surface.
- 2- Use a torch to dry the surface.
- 3- Where necessary, install a layer of bitumen to smooth the surface.
- 4- Apply a layer of hot asphalt, at a rate ranging between 1 to 1.5 kg/m², on the surface of the multi-ply roofing membrane which corresponds to the folded half of the panel to be installed.
- 5- While the asphalt is at the recommended temperature, fold the panel into the hot asphalt.
- 6- All panels must be perfectly butted, free of any significant level differences between them and must perfectly adhere to the surface.
- 7- Install cap sheet membranes selected according to the appropriate method.

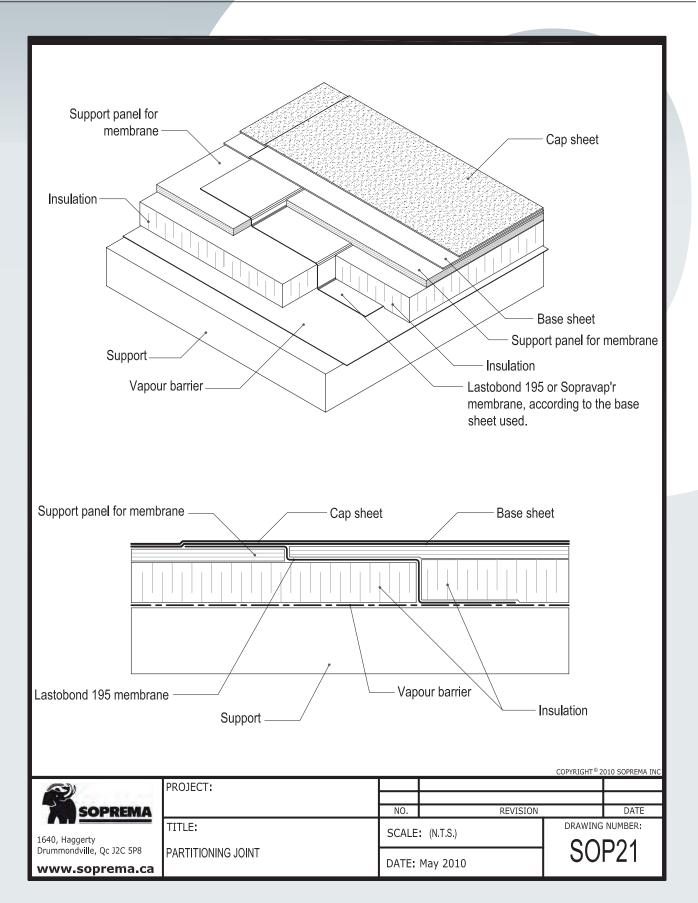
3.3 Non-bituminous single-ply roofing membrane (PVC/TPO/EPDM)

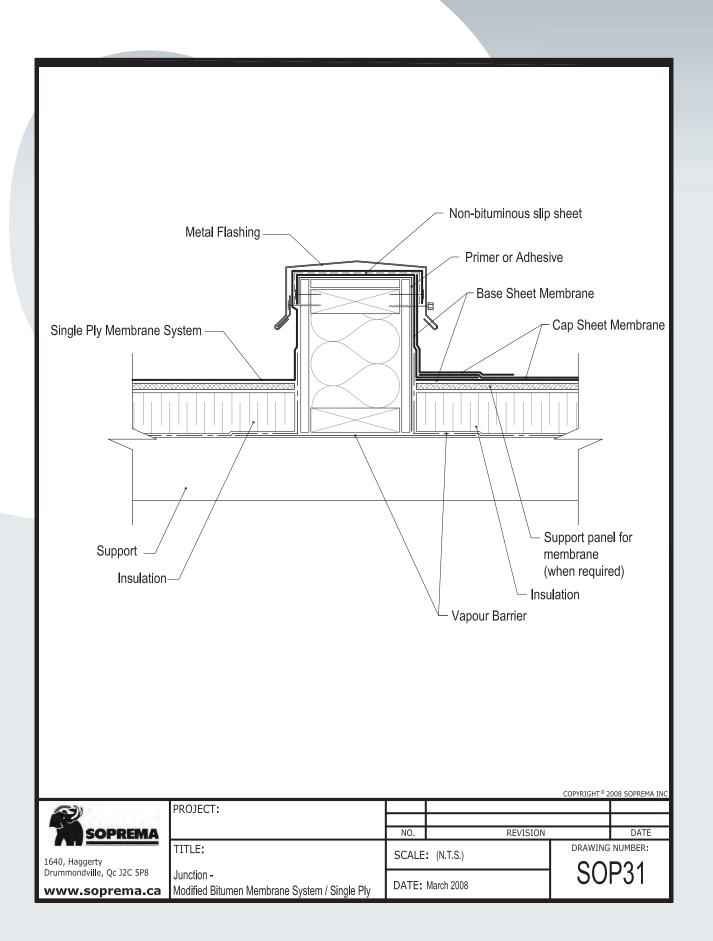
Single-ply roofing membranes are not normally compatible with SBS modified bitumen membranes. For this reason, no connection should be made on the existing surface (field surface) between these membranes types. The only acceptable way to ensure a connection is waterproof involves separating the two membrane types using a parapet on which the membranes overlap. This parapet should always be covered with a metal flashing.

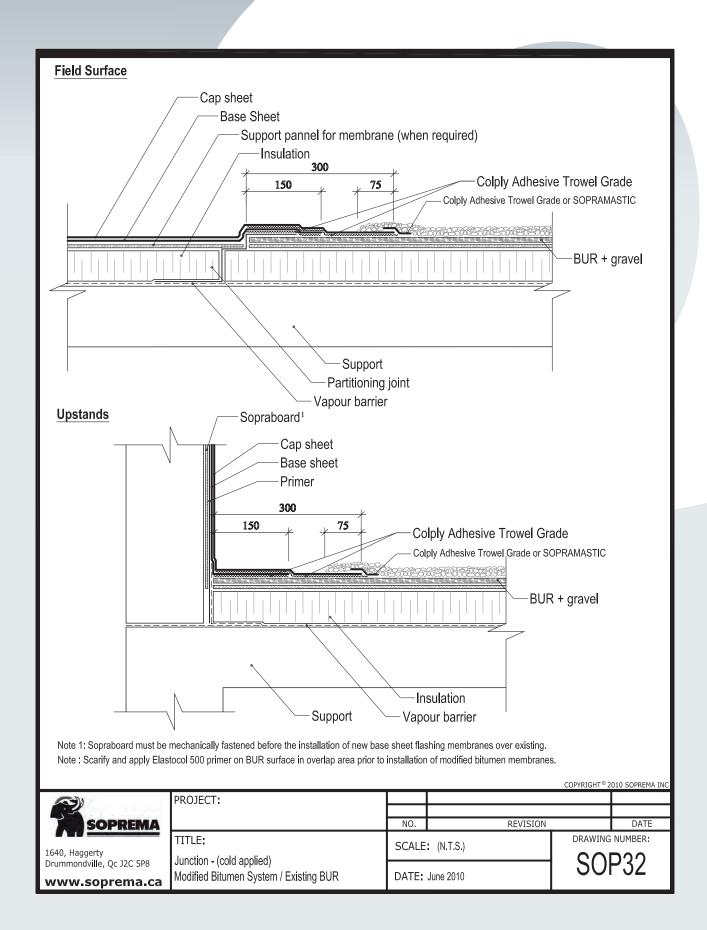
Note: See detail SOP 31

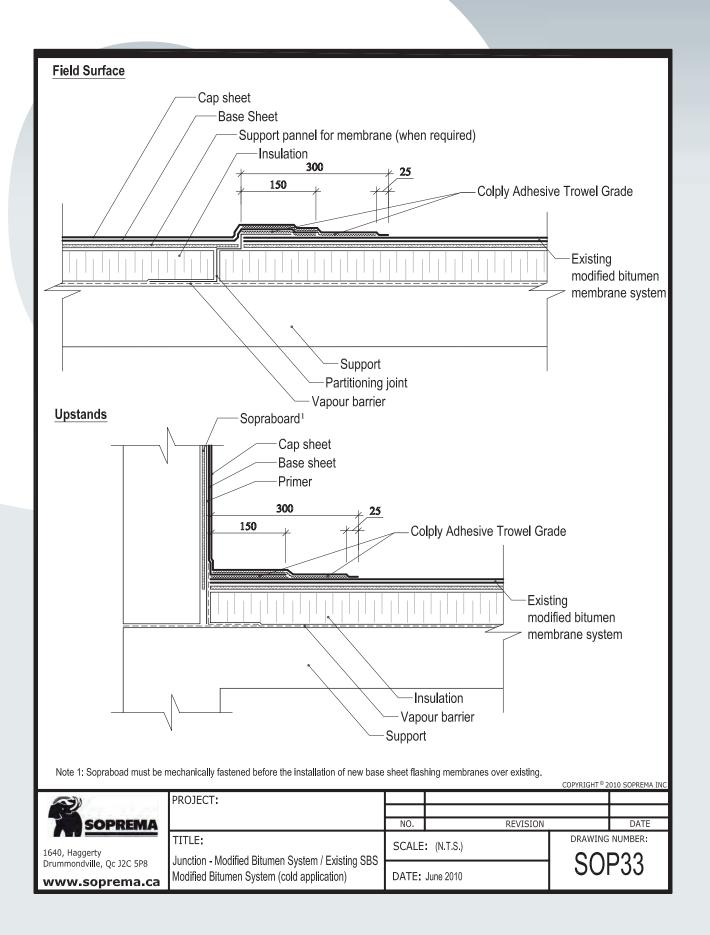
Warning: Regarding PVC roofing membranes, a separating sheet is required to avoid any contact between the PVC and bituminous membranes. In fact, when exposed to heat, some PVC roofs release plasticizers that may damage bitumen integrity.

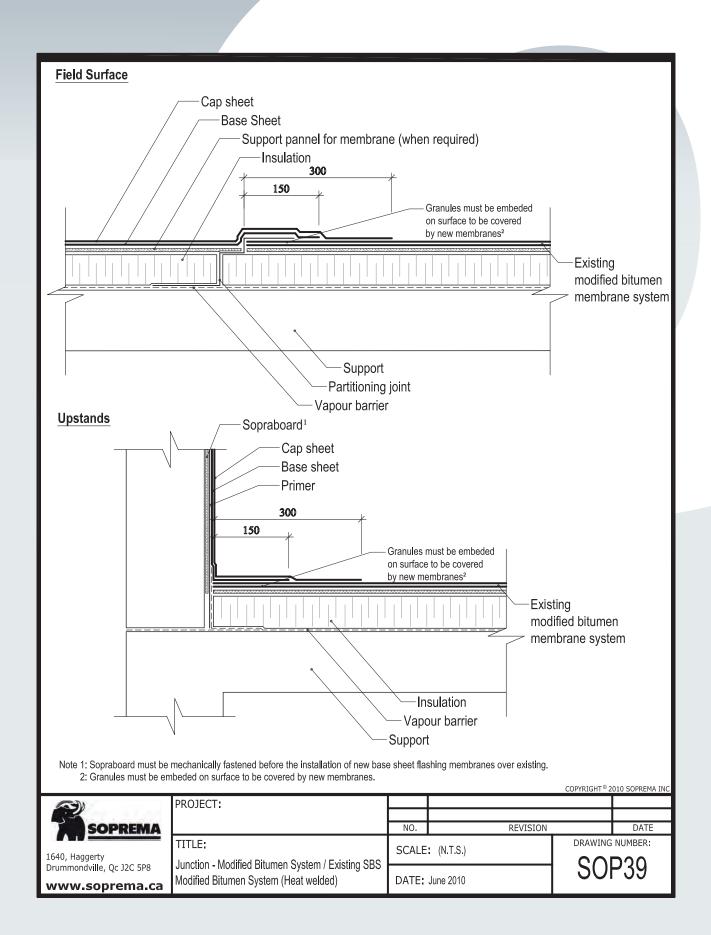
4.0 DETAILS

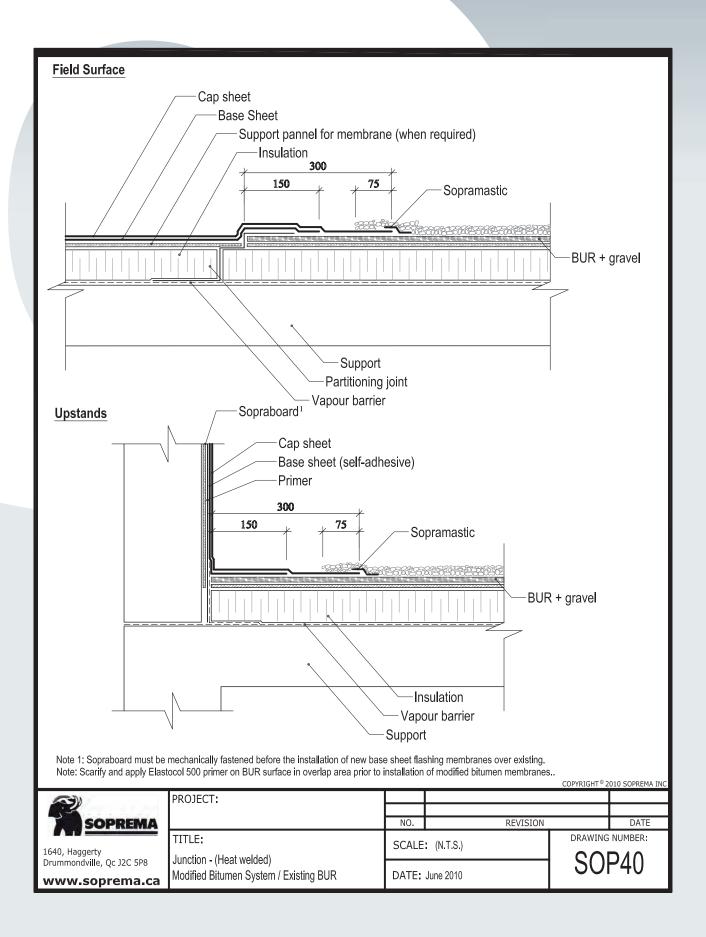
















1.877.MAMMOUTH www.soprema.ca