



VAPOR RETARDER TECHNICAL MANUAL, LOW-SLOPE ROOFING

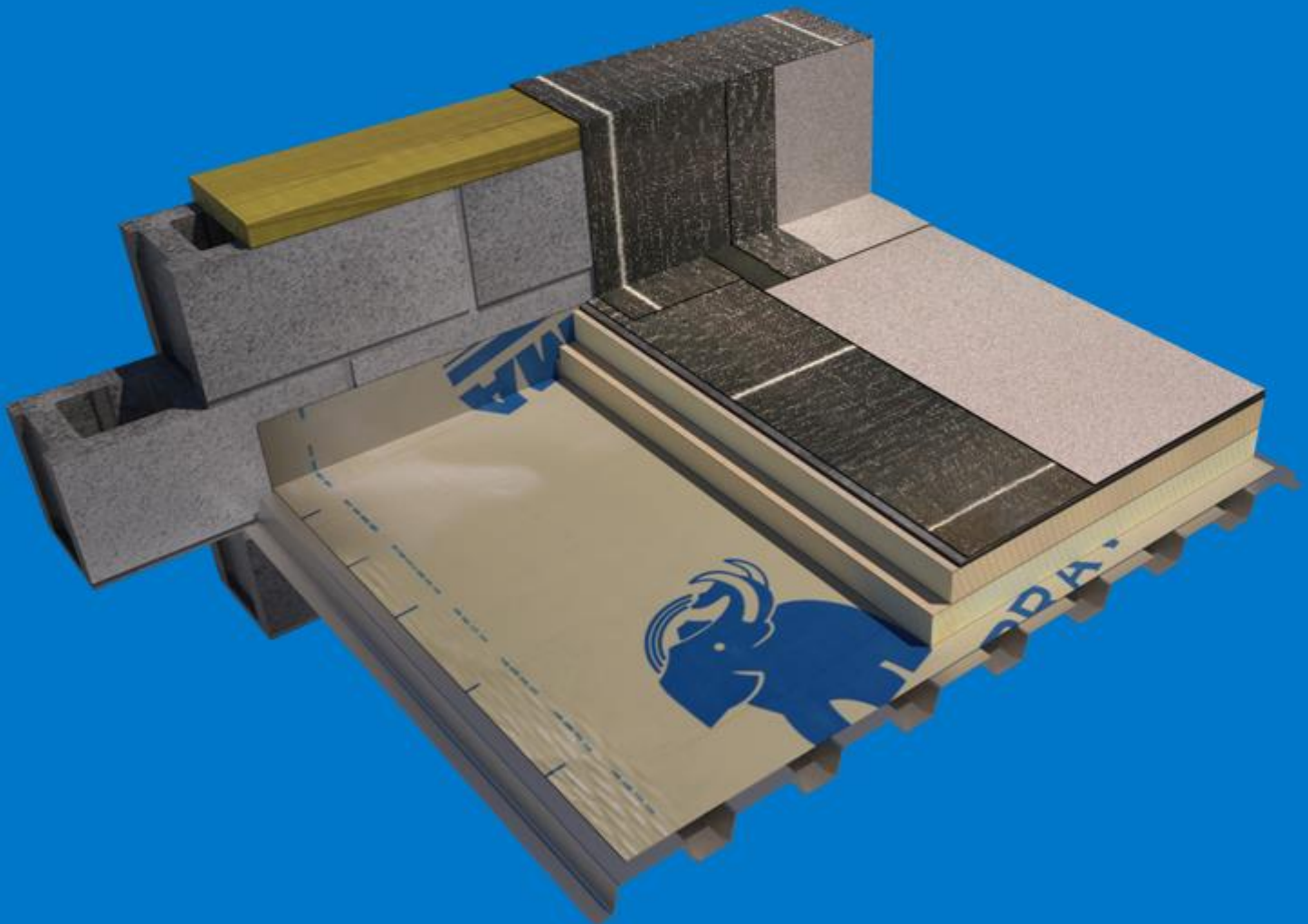


TABLE OF CONTENTS

INTRODUCTION	5
DISCLAIMER	6
1 PRIMERS.....	7
1.1 PRIMERS FOR HEAT WELDED, COLD ADHESIVE-APPLIED AND HOT ASPHALT APPLIED SBS VAPOR RETARDERS	7
1.2 PRIMERS FOR SELF-ADHESIVE SBS VAPOR RETARDERS	9
<i>Table 1.2a Primers for Self-Adhesive SBS Vapor Retarders.....</i>	<i>10</i>
1.3 PRIMERS FOR PMMA/PMA LIQUID-APPLIED FLASHINGS.....	11
<i>Table 1.3a Primers for PMMA/PMA Liquid-Applied Flashings</i>	<i>12</i>
2 BASE SHEETS/ANCHOR SHEETS	13
2.1 MECHANICALLY FASTENED BASE SHEET/ANCHOR SHEETS TO SUPPORT VAPOR RETARDERS	13
<i>Table 2.1a Mechanically Fastened Base Sheets/Anchor Sheets.....</i>	<i>14</i>
<i>Table 2.1b Base Sheet/Anchor Sheet Fasteners.....</i>	<i>15</i>
<i>Figure 2.1a Mechanically Fastened Base Sheet/Anchor Sheet 6, 6, 6 Fastening Pattern.....</i>	<i>17</i>
<i>Figure 2.1b Mechanically Fastened Base Sheet/Anchor Sheet 6, 6, 6 Fastening Pattern</i>	<i>18</i>
<i>Figure 2.1c Mechanically Fastened Base Sheet/Anchor Sheet 7, 7, 7 Fastening Pattern</i>	<i>19</i>
<i>Figure 2.1d Mechanically Fastened Base Sheet/Anchor Sheet 7.5, 7.5, 7.5 Fastening Pattern</i>	<i>20</i>
<i>Figure 2.1e Mechanically Fastened Base Sheet/Anchor Sheet 7, 10, 10 Fastening Pattern</i>	<i>21</i>
<i>Figure 2.1f Mechanically Fastened Base Sheet/Anchor Sheet 7, 14, 14 Fastening Pattern.....</i>	<i>22</i>
<i>Figure 2.1g Mechanically Fastened Base Sheet/Anchor Sheet 8, 8, 8 Fastening Pattern.....</i>	<i>23</i>
<i>Figure 2.1h Mechanically Fastened Base Sheet/Anchor Sheet 9, 9, 9 Fastening Pattern.....</i>	<i>24</i>
<i>Figure 2.1i Mechanically Fastened Base Sheet/Anchor Sheet 9, 12, 12 Fastening Pattern.....</i>	<i>25</i>
<i>Figure 2.1j Mechanically Fastened Base Sheet/Anchor Sheet 9, 18, 18 Fastening Pattern.....</i>	<i>26</i>
2.2 HOT ASPHALT-APPLIED BUILT-UP BASE SHEET/PLY SHEET VAPOR RETARDERS	27
<i>Table 2.2a Hot Asphalt-Applied Base Sheets and BUR Ply Sheets.....</i>	<i>30</i>
<i>Figure 2.2a Two (2) Ply Built Up Vapor Retarder Configuration.....</i>	<i>31</i>
<i>Figure 2.2b Three (3) Ply Built Up Vapor Retarder Configuration</i>	<i>32</i>
<i>Figure 2.2c Four (4) Ply Built Up Vapor Retarder Configuration.....</i>	<i>33</i>
3 SBS MODIFIED BITUMEN VAPOR RETARDERS	34
3.1 HEAT WELDED SBS MODIFIED BITUMEN VAPOR RETARDERS	34
3.1.1 FULLY ADHERED, HEAT WELDED VAPOR RETARDERS	34
<i>Table 3.1.1a Fully Adhered, Heat-Welded Vapor Retarders.....</i>	<i>37</i>
<i>Table 3.1.1b Substrate Preparation, Fully Adhered, Heat-Welded Vapor Retarders</i>	<i>38</i>
<i>Figure 3.1.1a Fully Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb Without Cant.....</i>	<i>39</i>
<i>Figure 3.1.1b Fully Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb Without Cant</i>	<i>39</i>
<i>Figure 3.1.1c Fully Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb With Cant.....</i>	<i>40</i>
<i>Figure 3.1.1d Fully Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb With Cant</i>	<i>40</i>
<i>Figure 3.1.1e Fully Adhered, Heat Welded Vapor Retarder at Roof Drain</i>	<i>41</i>
<i>Figure 3.1.1f Fully Adhered, Heat Welded Vapor Retarder at Penetration</i>	<i>41</i>
3.1.2 PARTIALLY ADHERED, HEAT WELDED VAPOR RETARDERS	42
<i>Table 3.1.2a Partially-Adhered, Heat-Welded Vapor Retarders</i>	<i>46</i>
<i>Table 3.1.2b Substrates For Partially-Adhered, Heat-Welded Vapor Retarders</i>	<i>46</i>

Figure 3.1.2a	Partially Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb Without Cant	47
Figure 3.1.2b	Partially Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb Without Cant	47
Figure 3.1.2c	Partially Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb With Cant	48
Figure 3.1.2d	Partially Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb Flashing With Cant...	48
Figure 3.1.2e	Partially Adhered, Heat Welded Vapor Retarder at Roof Drain	49
Figure 3.1.2f	Partially Adhered, Heat Welded Vapor Retarder at Penetration	49
3.2	COLD ADHESIVE-APPLIED SBS MODIFIED BITUMEN VAPOR RETARDERS.....	50
3.2.1	FULLY ADHERED, COLD ADHESIVE-APPLIED VAPOR RETARDERS	50
Table 3.2.1a	Fully Adhered, Cold Adhesive-Applied Vapor Retarders	54
Table 3.2.1b	Substrate Preparation, Fully Adhered, Cold Adhesive-Applied Vapor Retarders	55
Figure 3.2.1a	Fully Adhered, Cold Adhesive-Applied Vapor Retarder Termination at Wall/Curb	56
Figure 3.2.1b	Fully Adhered, Cold Adhesive-Applied Vapor Retarder Flashing at Wall/Curb	56
Figure 3.2.1c	Fully Adhered, Cold Adhesive-Applied Vapor Retarder at Roof Drain	57
Figure 3.2.1d	Fully Adhered, Cold Adhesive-Applied Vapor Retarder at Penetration	57
3.2.2	PARTIALLY ADHERED, COLD ADHESIVE-APPLIED VAPOR RETARDER FIELD PLIES	58
Table 3.2.2a	Partially-Adhered, Cold Adhesive-Applied Vapor Retarder Field Plies	61
Table 3.2.2b	Substrates for Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Plies	61
Figure 3.2.2a	Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply, 6in O.C. Fastening Pattern	62
Figure 3.2.2b	Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Wall/Curb Without Cant	63
Figure 3.2.2c	Partially Adhered, Cold Adhesive-Applied Vapor Retarder Termination at Wall/Curb With Cant	63
Figure 3.2.2d	Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Wall/Curb With Cant ..	64
Figure 3.2.2e	Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Roof Drain	64
Figure 3.2.2f	Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Penetration	65
3.3	SELF-ADHESIVE SBS MODIFIED BITUMEN VAPOR RETARDERS	66
3.3.1	FULLY ADHERED, SELF-ADHESIVE VAPOR RETARDERS	66
Table 3.3.1a	Fully Adhered, Self-Adhesive Vapor Retarders	69
Figure 3.3.1a	Fully Adhered, Self-Adhesive Vapor Retarder Termination at Wall/Curb With Cant	70
Figure 3.3.1b	Fully Adhered, Self-Adhesive Vapor Retarder Flashing at Wall/Curb With Cant	70
Figure 3.3.1c	Fully Adhered, Self-Adhesive Vapor Retarder at Roof Drain	71
Figure 3.3.1d	Fully Adhered, Self-Adhesive Vapor Retarder at Penetration	71
Figure 3.3.1e	Fully Adhered, Self-Adhesive SOPRAVAP'R Termination at Wall/Curb Without Cant	72
Figure 3.3.1f	Fully Adhered, Self-Adhesive SOPRAVAP'R Flashing at Wall/Curb Without Cant	72
Figure 3.3.1g	Fully Adhered, Self-Adhesive SOPRAVAP'R Termination at Wall/Curb With Cant	73
Figure 3.3.1h	Fully Adhered, Self-Adhesive SOPRAVAP'R Flashing at Wall/Curb With Cant	73
Figure 3.3.1i	Fully Adhered, Self-Adhesive SOPRAVAP'R at Roof Drain	74
Figure 3.3.1j	Fully Adhered, Self-Adhesive SOPRAVAP'R at Penetration	74
Figure 3.3.1k	Fully Adhered, Self-Adhesive SOPRAVAP'R End-Laps On Steel Deck	75
Figure 3.3.1l	Fully Adhered, Self-Adhesive SOPRAVAP'R Termination at Wall/Curb On Steel Deck	75
Figure 3.3.1m	Fully Adhered, Self-Adhesive SOPRAVAP'R Flashing at Wall/Curb On Steel Deck	76
Figure 3.3.1n	Fully Adhered, Self-Adhesive SOPRAVAP'R at Roof Drain On Steel Deck	76
Figure 3.3.1o	Fully Adhered, Self-Adhesive SOPRAVAP'R at Penetration On Steel Deck	77
3.3.2	PARTIALLY ADHERED, SELF-ADHESIVE VAPOR RETARDERS	78
Table 3.3.2a	Partially Adhered, Self-Adhesive Vapor Retarders	80
Figure 3.3.2a	Partially Adhered, Self-Adhesive Vapor Retarder Termination at Wall/Curb With Cant	81
Figure 3.3.2b	Partially Adhered, Self-Adhesive Vapor Retarder Flashing at Wall/Curb With Cant	81
Figure 3.3.2c	Partially Adhered, Self-Adhesive Vapor Retarder at Roof Drain	82
Figure 3.3.2d	Fully Adhered, Self-Adhesive Vapor Retarder at Penetration	82
3.4	HOT ASPHALT-APPLIED SBS MODIFIED BITUMEN VAPOR RETARDER FIELD PLIES.....	83

<i>Table 3.4a Hot Asphalt Applied Vapor Retarders</i>	<i>85</i>
<i>Figure 3.4a Hot Asphalt-Applied Vapor Retarder Termination at Wall/Curb With Cant</i>	<i>86</i>
<i>Figure 3.4b Hot Asphalt-Applied Vapor Retarder at Roof Drain</i>	<i>86</i>
<i>Figure 3.4c Hot Asphalt-Applied Vapor Retarder at Penetration</i>	<i>87</i>

4 LIQUID-APPLIED FLASHINGS 88

4.1 ALSAN RS, POLYMETHYL METHACRYLATE (PMMA)/POLYMETHACRYLATE (PMA) LIQUID-APPLIED FLASHING FOR SBS MODIFIED BITUMEN VAPOR RETARDERS..... 88

<i>Figure 4.1a ALSAN® RS Wall/Curb Flashing on Vapor Retarder</i>	<i>89</i>
<i>Figure 4.1b ALSAN® RS Roof Drain Flashing on Vapor Retarder</i>	<i>89</i>
<i>Figure 4.1c ALSAN® RS Penetration Flashing on Vapor Retarder</i>	<i>90</i>

4.2 ALSAN FLASHING, POLYURETHANE-BITUMEN, LIQUID-APPLIED FLASHING 91

<i>Table 4.2a ALSAN® FLASHING Substrates</i>	<i>92</i>
<i>Figure 4.2a ALSAN® FLASHING Wall/Curb Flashing on Vapor Retarder</i>	<i>93</i>
<i>Figure 4.2b ALSAN® FLASHING Penetration Flashing on Vapor Retarder</i>	<i>93</i>

INTRODUCTION

[SOPREMA®](#) offers a broad range of vapor retarder solutions for practically every roofing application. [SOPREMA®](#) vapor retarder products are formulated and manufactured using SBS modified bitumen, a proven technology with decades of successful service, and backed by [SOPREMA®](#) warranties. SBS modified bitumen vapor retarders may be installed using a variety of application methods to accommodate specific project requirements.

[SOPREMA®](#) vapor retarder products are tested in accordance with ASTM E 96 *Standard Test Methods for Water Vapor Transmission of Materials*, having water vapor transmission rates less than 0.1 Perm. [SOPREMA®](#) vapor retarders are considered Class I, “impermeable,” which are ideal for use in low-slope roofing assemblies. Refer to each product data sheet (PDS) for specific properties.

[SOPREMA®](#) vapor retarders are “deemed to comply” with the International Energy Conservation Code’s prescriptive requirements for use as an *air barrier*. The vapor retarder materials also meet air leakage requirements of less than 0.004 cfm/sq. ft. at 0.3 inches of water gage when tested per ASTM E 2178 *Standard Test Method for Air Permeance of Building Materials*. Refer to local building codes and agency approvals for specific requirements, and refer to the PDS for specific properties.

[SOPREMA®](#) vapor retarders are tested and listed to meet wind, fire and other specific performance requirements needed when installed within [SOPREMA®](#) roofing assemblies. Refer to published agency approvals and other related listings.

[SOPREMA®](#) vapor retarders are tough, durable and meet the challenges of a “temporary roof” when necessary to “dry-in” the roof during construction. The vapor retarder may be left exposed when phasing roof construction, and is capable of withstanding limited construction-related traffic. The exposure period varies based upon the local environment and specific project conditions.

Refer to current [SOPREMA®](#) product data sheets (PDS) and safety data sheets (SDS) for detailed information about each product discussed in this manual. For additional information refer to www.soprema.us or contact [SOPREMA®](#) at 800.356.3521.

DISCLAIMER

This manual is intended for use by [SOPREMA®](#) authorized contractors and design professionals in order to provide instructions and details for the application of [SOPREMA®](#) SBS modified bitumen products when a [SOPREMA®](#) warranty will be requested. The contents of this manual are believed to be consistent with good roofing practices, but are not specific to any particular project's needs and are not a substitute for professional design services. [SOPREMA®](#) bears no liability nor responsibility for the design of any particular project.

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

1 PRIMERS

1.1 PRIMERS FOR HEAT WELDED, COLD ADHESIVE-APPLIED AND HOT ASPHALT APPLIED SBS VAPOR RETARDERS

General:

- [SOPREMA®](#) primers are designed specifically for use with [SOPREMA®](#) SBS vapor retarder materials.
- [ELASTOCOL™ 500](#) is an bitumen-based primer used to improve adhesion between approved substrates and heat welded, cold adhesive-applied and hot asphalt applied SBS vapor retarders.
- [ELASTOCOL™ 350](#) is a low VOC, polymer emulsion primer used to improve the adhesion between approved substrates and heat welded, cold adhesive-applied and hot asphalt applied SBS vapor retarders.
- Store primers in their original unopened containers, located in dry, protected storage areas that are maintained between 40°F (4.4°C) and 105°F (40.5°C). Store primers away from direct sunlight, and away from excessive heat and open flames. Comply with requirements for flammable liquids where applicable. Ensure water-based materials are not exposed to freezing temperatures.
- Refer to current [SOPREMA®](#) product data sheets (PDS) and safety data sheets (SDS) for detailed information related to each primer.

Preparation:

- Ensure all vapor retarder substrates are clean, dry and otherwise satisfactory to apply primer.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of primer, vapor retarder and other above-deck roofing materials.
 - Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
 - Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
 - When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.
 - A relative humidity (RH) of 75% or less is considered acceptable to apply primer for [SOPREMA®](#) SBS vapor retarders.
 - For concrete decks with low RH values (less than 75%), the concrete should be primed using the applicable SOPREMA primer before applying heat welded, [COLPLY™ ADHESIVE](#), and hot asphalt-applied vapor retarder options indicated herein.
 - For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (over 75% RH), refer to vapor retarder options using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - Apply the specified primer to the clean, prepared substrate.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to cure.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.

- Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- General:
 - Apply [ELASTOCOL™ 500](#) or [ELASTOCOL™ 350](#) primer using brush, roller, or sprayer at 1 gallon per 100 square feet. Lightly prime for a uniform coverage. Do not apply heavy or thick coats of primer.
 - Allow primer to dry before applying the vapor retarder.
- Heat welded and hot asphalt-applied vapor retarders:
 - Apply [ELASTOCOL™ 500](#) or [ELASTOCOL™ 350](#) primer to clean, dry concrete, masonry, metal, wood and other compatible substrates, and allow to dry before applying hot asphalt and heat welded vapor retarders.
- Solvent-based adhesives used to apply vapor retarders:
 - [ELASTOCOL™ 350](#) or [ELASTOCOL™ 500](#) is “optional” for SBS vapor retarders adhered using [COLPLY™ ADHESIVE](#) and [COLPLY™ FLASHING CEMENT](#).
 - Apply primer to clean, dry concrete, masonry, metal, wood and other compatible substrates, and allow to dry before applying vapor retarders.
- COLPLY EF adhesive-applied vapor retarders:
 - Primer is not recommended for SBS modified bitumen vapor retarders adhered using [COLPLY™ EF ADHESIVE](#) or [COLPLY™ EF FLASHING CEMENT](#).

Inspection:

- Examine substrates before installing primers, adhesives and SBS vapor retarders.
- Ensure primer is fully dry before applying SBS vapor retarder. Primer should not transfer to the finger tips when touched.
- Apply vapor retarder within 24 hours of primer application.
- If primer becomes contaminated, examine adhesion cleaning and a second, light application of primer may be required.
- Adjust primer application methods as necessary to achieve the desired results.

1.2 PRIMERS FOR SELF-ADHESIVE SBS VAPOR RETARDERS

General:

- [ELASTOCOL™ STICK](#) is a solvent-based primer used to improve the adhesion between approved substrates and self-adhesive SBS vapor retarders.
- [ELASTOCOL™ STICK ZERO](#) is a low VOC, solvent-based primer used to improve the adhesion between approved substrates and self-adhesive SBS vapor retarders.
- [ELASTOCOL™ STICK H2O](#) is a water-based primer used to improve the adhesion between approved substrates and self-adhesive SBS vapor retarders.
- [SOPREMA®](#) self-adhesive primer is recommended for optimum adhesion to approved substrates.
- Primer may be omitted for steel decking when [SOPRAVAP'R™](#) will be adhered to the steel deck and the above-deck components will be fastened through the [SOPRAVAP'R™](#) into the steel deck.
- Store primers in their original unopened containers, located in dry, protected storage areas that are maintained between 40°F (4.4°C) and 105°F (40.5°C). Store primers away from direct sunlight, and away from excessive heat and open flames. Comply with requirements for flammable liquids where applicable. Ensure water-based materials are not exposed to freezing temperatures.
- Refer to [SOPREMA®](#) PDS and SDS for additional product information.

Preparation:

- Ensure all vapor retarder substrates are clean, dry and otherwise satisfactory to apply primer.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of primer, vapor retarder and other above-deck roofing materials.
 - Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
 - Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
 - When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.
 - A relative humidity (RH) of 75% or less is considered acceptable to apply self-primer for [SOPREMA®](#) SBS vapor retarders.
 - For concrete decks with low RH values (less than 75%), the concrete should be primed using the applicable SOPREMA self-adhesive primer before applying self-adhesive vapor retarder options indicated herein.
 - For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (over 75% RH), refer to vapor retarder options using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - Apply the specified primer to the clean, prepared substrate.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to cure.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.

- Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- Apply primer to clean, dry concrete, masonry, metal, wood and other compatible substrates in light, uniform applications. Do not apply primer in thick, heavy coats.
- Apply [ELASTOCOL™ STICK](#) and [ELASTOCOL™ STICK ZERO](#) primer using brush, roller, or sprayer at 0.66 to 1 gallons per 100 square feet.
- Apply [ELASTOCOL™ STICK H2O](#) primer using brush, roller, or sprayer at 0.5 gallons per 100 square feet.
- Install the vapor retarder the same day, soon after installing the primer.
- As the vapor retarder is installed, the primer should be “tacky” but not wet. Primer should not transfer to the finger tips when touched.
- Refer to [Section 3.3](#) for self-adhesive vapor retarders.

Inspection:

- Examine substrates before installing primers, adhesives and SBS vapor retarders.
- Ensure self-adhesive primer is tacky to-the-touch, but not wet. Primer should not transfer to the finger tips when touched. If primer becomes fully dry, dirty and loses all tack, re-prime the substrate as necessary to achieve membrane adhesion.
- Examine adhesion of self-adhesive plies during installation. Adjust primer and vapor retarder application methods as necessary to achieve the desired results.

Table 1.2a Primers for Self-Adhesive SBS Vapor Retarders	
Substrate*	Primer Required
Structural concrete and Masonry, Conditioned, un-treated wood, Approved gypsum roof boards, Approved cement roof boards, Prepared metal	ELASTOCOL™ STICK , ELASTOCOL™ STICK ZERO , ELASTOCOL™ STICK H2O
SOPRABOARD™	ELASTOCOL™ STICK , ELASTOCOL™ STICK ZERO
Steel roof decking	Primer may be omitted for SOPRAVAP'R™ when the above-deck components are fastened through the SOPRAVAP'R™ into the steel deck.

*Substrates for self-adhesive SBS vapor retarders should be dry and free of loose debris, incompatible residues, residual coatings, concrete mold release agents, waxes, oils and resins. Concrete relative humidity (RH) should be less than 75%.

1.3 PRIMERS FOR PMMA/PMA LIQUID-APPLIED FLASHINGS

General:

- ALSAN® RS liquid-applied flashing systems are recommended to flash and seal SBS modified bitumen vapor retarders at penetrations that are difficult to seal using sheet materials.
- [SOPREMA®](#) primers are designed specifically for use with [SOPREMA®](#) roofing and flashing materials and systems.
- Store primers in their original unopened containers, located in dry, protected storage areas that are maintained between 40°F (4.4°C) and 105°F (40.5°C). Store primers away from direct sunlight, and away from excessive heat and open flames. Comply with requirements for flammable liquids where applicable.
- Refer to current [SOPREMA®](#) product data sheets (PDS) and safety data sheets (SDS) for detailed information related to each primer.
- Primers:
 - [ALSAN® RS 222](#) is a rapid curing polymethyl methacrylate (PMMA) primer used to promote adhesion of ALSAN® RS flashings to concrete, masonry, wood, approved roof boards, exposed asphalt and other approved substrates. [ALSAN® RS 222](#) is recommended for most non-traffic, flashing applications. ALSAN® RS CATALYST POWDER is a reactive agent used to induce polymerization/curing of [ALSAN® RS 222](#) primer.
 - [ALSAN® RS 276](#) is a rapid curing polymethyl methacrylate (PMMA) primer used to promote adhesion of ALSAN® RS flashings to structural concrete for traffic bearing applications. ALSAN® RS CATALYST POWDER is a reactive agent used to induce polymerization/curing of the [ALSAN® RS 276](#) primer.
 - [ALSAN® RS METAL PRIMER](#) is a single component, acrylic primer used to promote adhesion of ALSAN® RS systems to clean, prepared metal substrates.
- Refer to [SOPREMA®](#) PDS and SDS for additional product information.

Preparation:

- Refer to ALSAN® RS liquid-applied flashing primer installation instructions.
- Ensure all substrates are sound, dry clean and free of dust, debris, exposed asphalt primers, adhesives, cements and mastics. Ensure substrates are properly prepared in accordance with specific installation instructions for ALSAN® RS.
- SBS modified bitumen substrates: SBS modified bitumen substrates include vapor retarders that are heat-welded, self-adhered, hot asphalt-applied or applied using [COLPLY™ EF ADHESIVE](#) or [COLPLY™ EF FLASHING CEMENT](#).
- ALSAN® RS liquid-applied flashing should not be installed above SBS vapor retarders applied with [COLPLY™ ADHESIVE](#).
- Ensure modified bitumen vapor retarders are clean, dry and free of loose sand, granules, dust and debris.
- Exposed [COLPLY™ EF ADHESIVE](#), [COLPLY™ EF FLASHING CEMENT](#) and new exposed asphalt bitumen:
 - Apply [ALSAN® RS 222](#) primer to pre-treat exposed [COLPLY™ EF ADHESIVE](#), [COLPLY™ EF FLASHING CEMENT](#) and new asphalt bitumen before applying ALSAN® RS liquid-applied flashing systems.
- Metal substrates:
 - Prepare approved metal surfaces to near-white finish by abrasion and wipe clean with [ALSAN® RS CLEANER](#) before applying ALSAN® RS liquid-applied flashing systems.
- Concrete and approved masonry substrates:
 - Substrates should be smooth and free of spalls, voids, blow holes and loose materials. Use mechanical scarifying, grinding or shot blasting methods where necessary to provide a smooth, open surface free of laitance. The surface profile should be prepared to ICRI Concrete Surface Profile CSP 3, CSP 4 or CSP 5; CSP 3 being the preferred profile. Refer to ASTM D4259 and D5295.
- Other approved substrates:

- Refer to ALSAN® RS Guide for other approved substrates and priming requirements.
- Conduct adhesion/peel tests where necessary to ensure satisfactory adhesion is achieved.

Application:

- [ALSAN® RS 222](#) and [ALSAN® RS 276](#)
 - Refer to the ALSAN® RS Guide, and published PDS and SDS.
 - Using a slow-speed mechanical agitator, thoroughly stir the entire container.
 - Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
 - Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified flashing materials. Refer to [Table 1.3a](#).
 - Apply primer using brush or roller at the rate published on the product data sheet. Do not allow heavy accumulations of primer.
 - Allow primer to fully cure before flashing application.
- [ALSAN® RS METAL PRIMER](#)
 - Refer to the ALSAN® RS Guide, and published PDS and SDS.
 - Using a slow-speed mechanical agitator, thoroughly stir the entire container.
 - Apply primer using brush or roller at the rate published on the product data sheet.
 - ALSAN® RS flashings should be installed to the primed surface within 24 hours of primer application.

Inspection:

- As project conditions vary, monitor changing conditions, Adjust primer and flashing application methods as necessary to achieve the desired results.
- Refer to ALSAN® RS Guide for additional guidance.

Table 1.3a Primers for PMMA/PMA Liquid-Applied Flashings	
Substrate	Primer Required
Prepared structural concrete	ALSAN® RS 222 or ALSAN® RS 276
Prepared masonry	ALSAN® RS 222 or ALSAN® RS 276
Conditioned, un-treated wood	ALSAN® RS 222 or ALSAN® RS 276
Approved gypsum roof boards	ALSAN® RS 222 or ALSAN® RS 276
Approved cement roof boards	ALSAN® RS 222 or ALSAN® RS 276
Prepared metal	Optional ALSAN® RS METAL PRIMER
Sand-surfaced SBS vapor retarder heat welded, self-adhesive and hot asphalt applied.	No primer required
Sand-surfaced SBS vapor retarder adhered with COLPLY™ EF	ALSAN® RS 222 on all exposed COLPLY™ EF
Sand-surfaced SBS vapor retarder adhered with COLPLY™	Not recommended for PMMA/PMA flashings. Refer to Section 4.1
Exposed, new oxidized mopping asphalt	ALSAN® RS 222

*ALSAN® RS should not be applied directly to exposed mastics, cements, solvent-based adhesives, [COLPLY™ EF ADHESIVE](#) or [COLPLY™ EF FLASHING CEMENT](#) or [SOPRAMASTIC SP1](#) sealant.

2 BASE SHEETS/ANCHOR SHEETS

2.1 MECHANICALLY FASTENED BASE SHEET/ANCHOR SHEETS TO SUPPORT VAPOR RETARDERS

General:

- [SOPREMA®](#) mechanically fastened base sheets/anchor sheets are attached to roof substrates to support SBS modified bitumen vapor retarders.
- The base sheet/anchor sheet is attached to meet wind uplift requirements, and serves to separate the vapor retarder from the roof deck and/or flashing substrates.
- Once the base sheet/anchor sheet is secure, the vapor retarder may be heat welded, cold adhesive-applied, self-adhered or applied using hot asphalt.
- Refer to [Table 2.1a](#) for fastened base sheet/anchor sheet options, and subsequent vapor retarder options.
- Storage and handling:
 - Store rolls on end and maintain in an upright position to prevent damage.
 - Store rolls in a clean dry location and cover as necessary to protect rolls from environmental damage such as extreme cold, heat, or moisture.
- Refer to [SOPREMA®](#) PDS and SDS for additional product information.

Preparation:

- Ensure all substrates are smooth, free of dust and debris, dry and acceptable for installation of base sheets/anchor sheets.
- Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.
- Remove all roll packaging tape prior to installation.



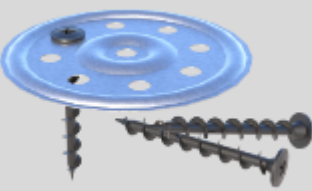
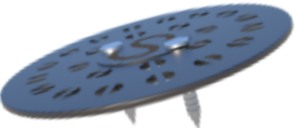
Application:


- Unroll the sheet onto the roof surface and allow time for the sheet to relax prior to installing fasteners.
- Starting at the low point of the roof, lay out the membrane to ensure all plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut sheets to working lengths and widths as required to conform to rooftop conditions.
- Align side-laps to produce the consistent overlap required for attachment to meet wind uplift approvals.
- As uniform tension is applied, start fastening at the center of the sheet and work towards the end-laps. Remove wrinkles and buckles as fastening progresses.
- Install specified fasteners along the center of side-laps. Align intermediate rows of fasteners staggered between side-laps. Fasten all end-laps. Refer to [Table 2.1b](#) for fastener types. Fasten sheet to meet specified wind uplift resistance requirements.
- Refer to [Figures 2.1a through 2.1j](#) for base sheet/anchor sheet fastening patterns. Fastening patterns and enhancements shown are for [SOPREMA®](#) warranty purposes only.

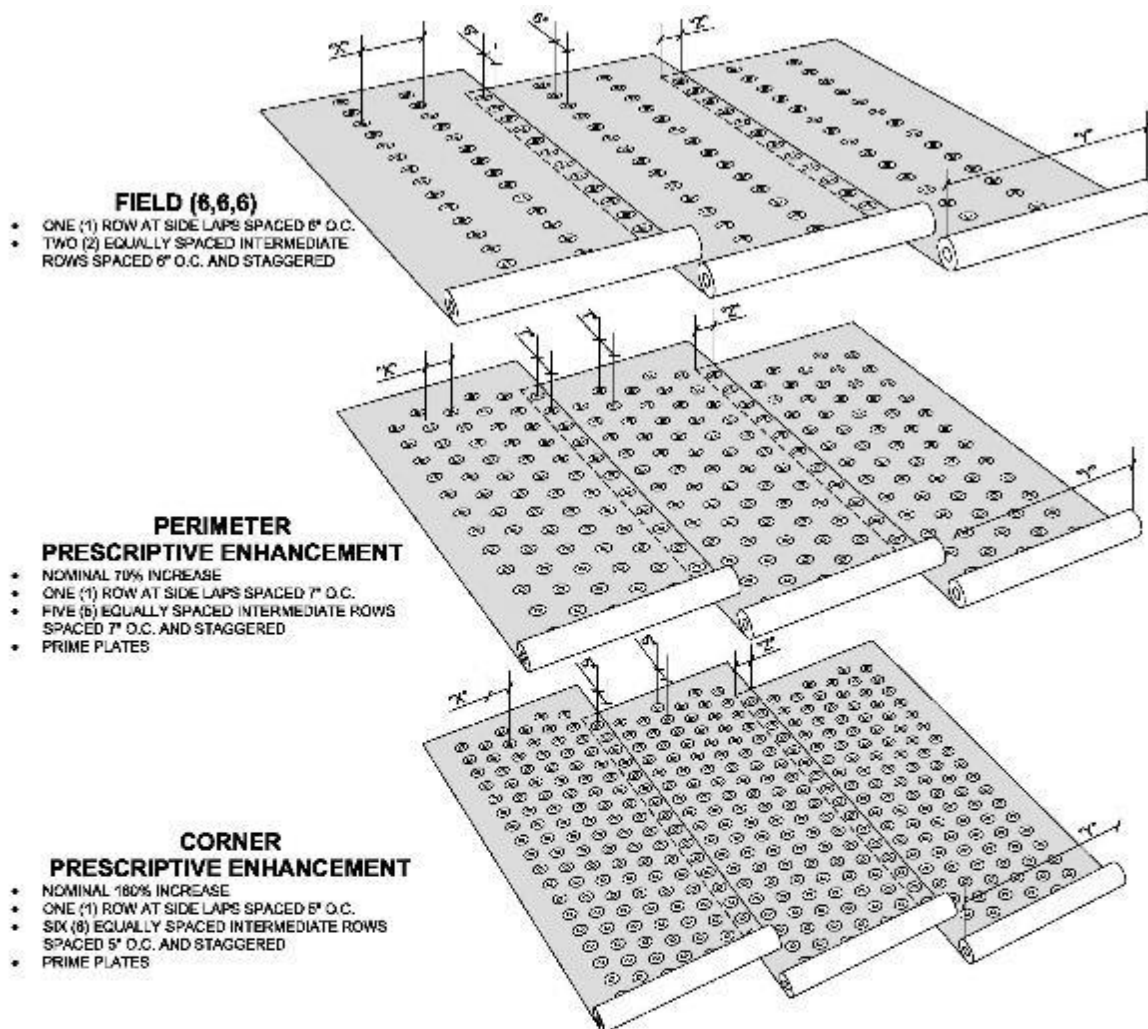
Inspection:

- Examine fasteners during installation. Replace all damaged and improperly installed fasteners.
- Repair base sheet/anchor sheet wrinkles, buckles and all other installation deficiencies.

Table 2.1a Mechanically Fastened Base Sheets/Anchor Sheets			
Name	Reinforcement	Top Surfacing	Overlying SBS Vapor Retarder Options
MODIFIED SOPRA G™ , SOPRA G	Glass fiber	Sanded	All fully adhered, heat welded SBS vapor retarders. Refer to Table 3.1.1a .
			All fully adhered, cold adhesive-applied vapor retarders (Refer to Table 3.2.1a .) applied with COLPLY™ ADHESIVE .
			All fully adhered, self-adhesive vapor retarders. Refer to Table 3.3.1a .
			All hot asphalt-applied vapor retarders. Refer to Table 3.4a .
SOPRABASE S	Non-woven polyester	Sanded	All fully adhered, cold adhesive-applied vapor retarders (Refer to Table 3.2.1a .) applied with COLPLY™ ADHESIVE .
			All fully adhered, self-adhesive vapor retarders. Refer to Table 3.3.1a .
			All hot asphalt-applied vapor retarders. Refer to Table 3.4a .
SOPRABASE TG	Non-woven polyester	Plastic burn-off film	All fully adhered, heat welded SBS vapor retarders. Refer to Table 3.1.1a .
SOPRA 4897	Glass fiber	Sanded	All fully adhered, heat welded SBS vapor retarders. Refer to Table 3.1.1a .
			All fully adhered, cold adhesive-applied vapor retarders (Refer to Table 3.2.1a .) applied with COLPLY™ ADHESIVE .
			All fully adhered, self-adhesive vapor retarders. Refer to Table 3.3.1a .
			All hot asphalt-applied vapor retarders. Refer to Table 3.4a .

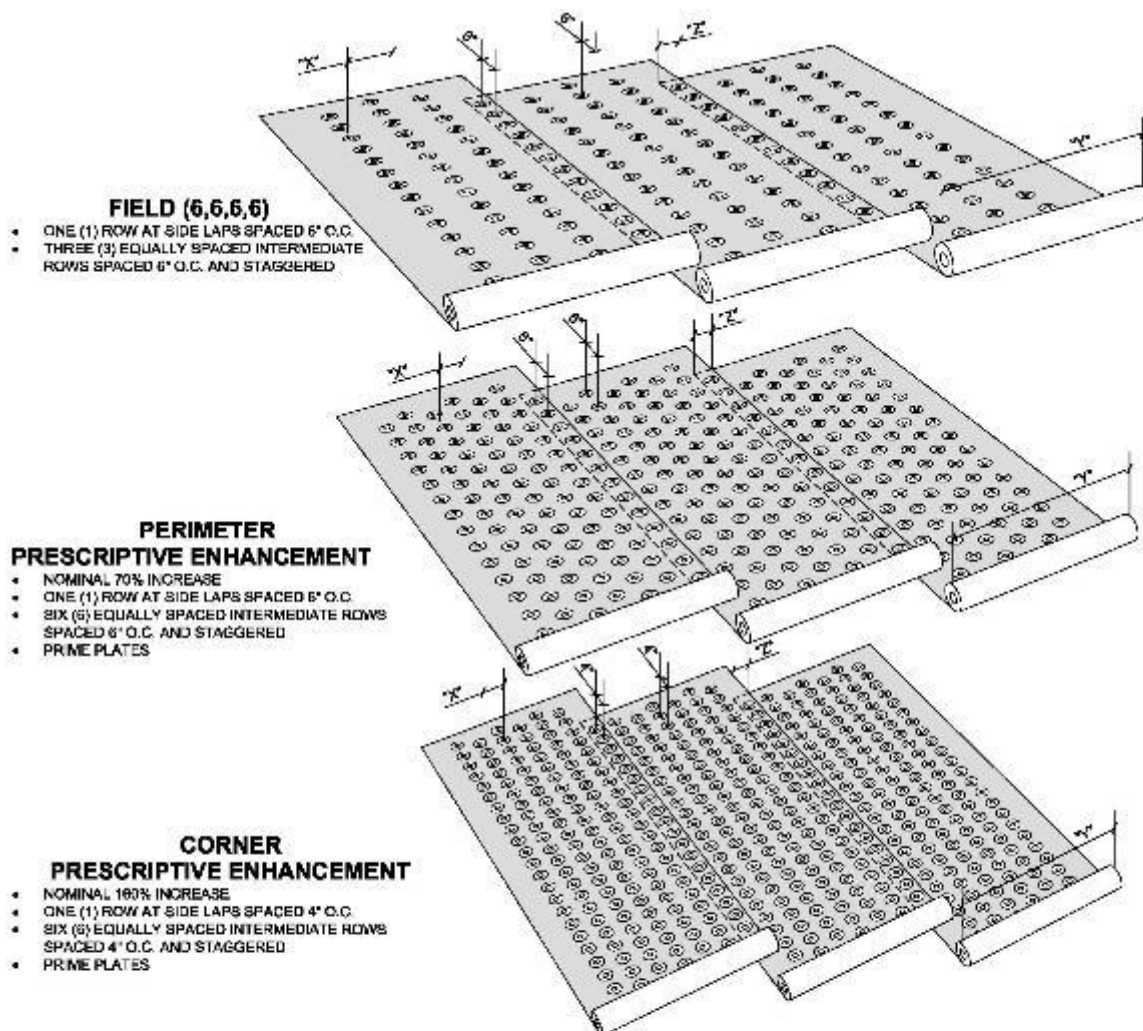
Table 2.1b Base Sheet/Anchor Sheet Fasteners			
Name	Graphic	Base Sheet/Anchor Sheet	Substrate
BASE SHEET FASTENER		MODIFIED SOPRA G™ , SOPRA G, SOPRABASE S , SOPRABASE TG , SOPRA 4897	Cellular lightweight insulating concrete, Aggregate lightweight insulating concrete, Poured gypsum
TWIN LOC-NAIL		MODIFIED SOPRA G™ , SOPRA G, SOPRABASE S , SOPRABASE TG , SOPRA 4897	Cementitious wood fiber, Aggregate lightweight insulating concrete, Cellular lightweight insulating concrete, Poured gypsum
TRUFAST® VERSA-FAST fastener and plate		MODIFIED SOPRA G™ , SOPRA G, SOPRABASE S , SOPRABASE TG , SOPRA 4897	Aggregate lightweight insulating concrete, Cellular lightweight insulating concrete, Poured gypsum, Gypsum Plank
Simplex® MAXX Cap		MODIFIED SOPRA G™ , SOPRA G, SOPRABASE S , SOPRABASE TG , SOPRA 4897	Wood

Name	Graphic	Base Sheet/Anchor Sheet	Substrate
Metal cap nail		MODIFIED SOPRA G™ , SOPRA G, SOPRABASE S , SOPRABASE TG , SOPRA 4897	Wood



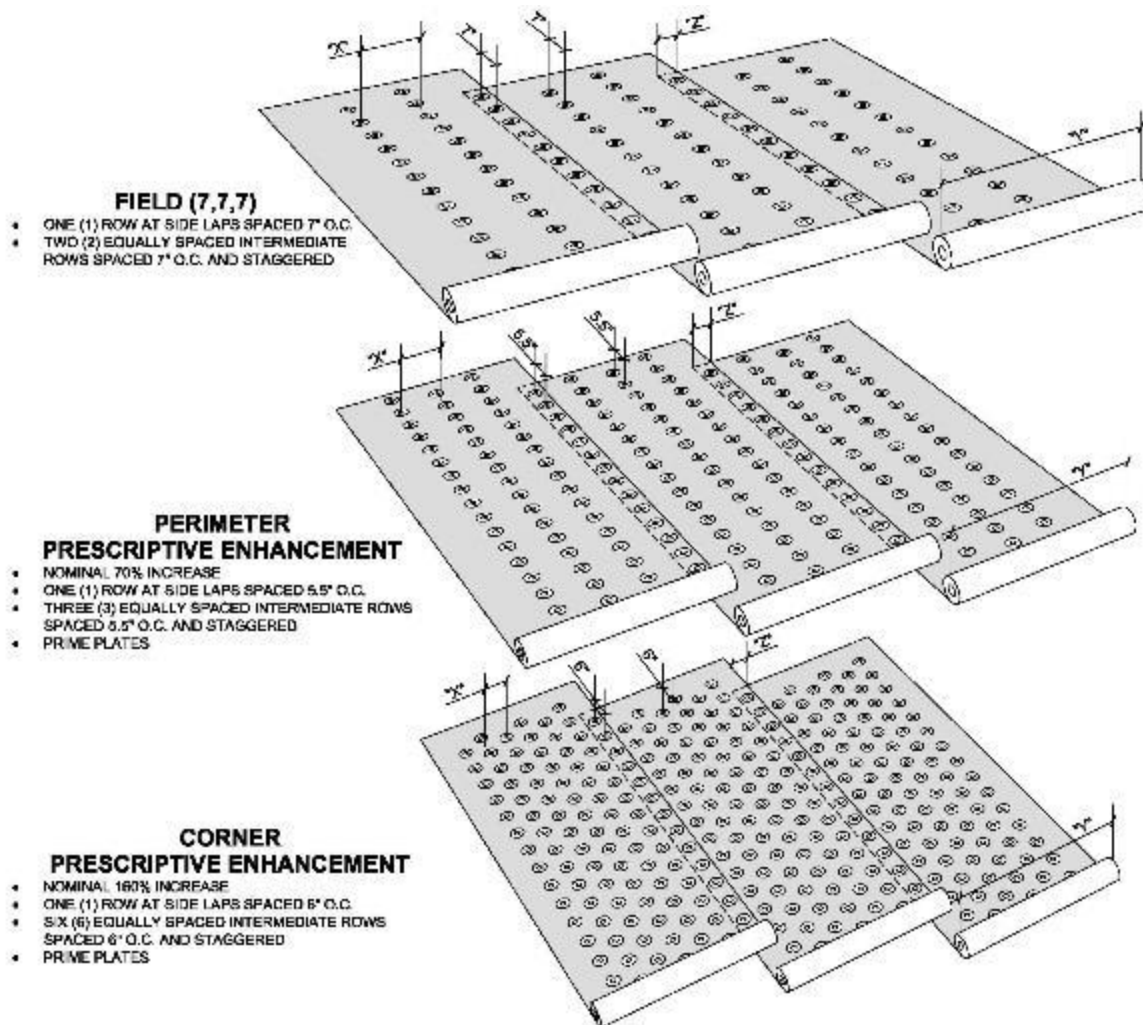
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	6,6,6	11.33in	212
		Perimeter	7,7,7,7,7,7	5.67in	363
		Corner	5,5,5,5,5,5,5	4.86in	593
36in (0.9m)	3in	Field	6,6,6	11in	218
		Perimeter	7,7,7,7,7,7	5.5in	374
		Corner	5,5,5,5,5,5,5	4.71in	611
36in (0.9m)	4in	Field	6,6,6	10.67in	225
		Perimeter	7,7,7,7,7,7	5.33in	386
		Corner	5,5,5,5,5,5,5	4.57in	630
39in (1m)	3in	Field	6,6,6	12in	200
		Perimeter	7,7,7,7,7,7	6in	343
		Corner	5,5,5,5,5,5,5	5.14in	560
39in (1m)	4in	Field	6,6,6	11.67in	206
		Perimeter	7,7,7,7,7,7	5.83in	353
		Corner	5,5,5,5,5,5,5	5in	576

Figure 2.1a Mechanically Fastened Base Sheet/Anchor Sheet 6, 6, 6 Fastening Pattern



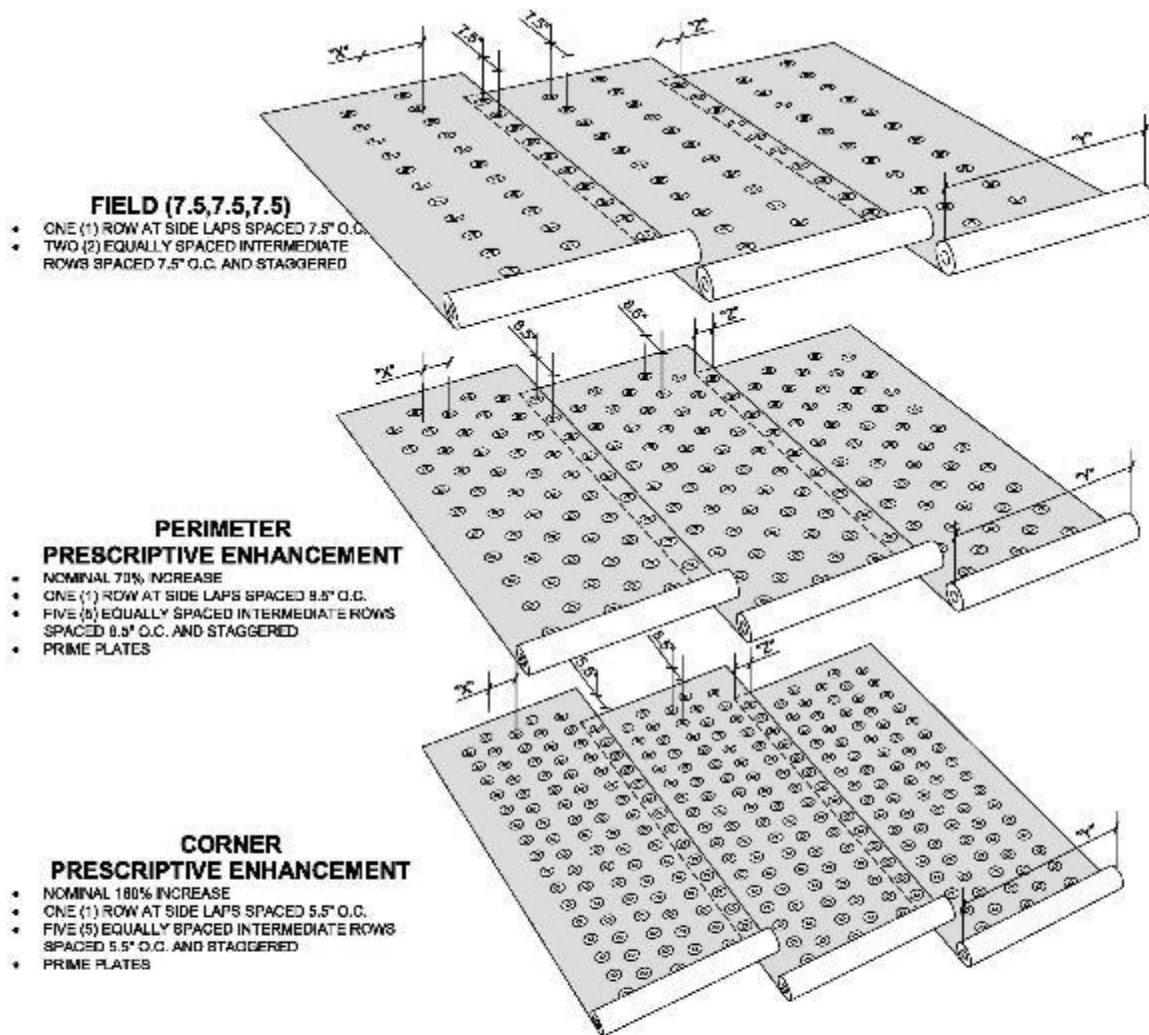
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	6,6,6,6	8.5in	262
		Perimeter	6,6,6,6,6,6	4.86in	494
		Corner	4,4,4,4,4,4	4.86in	741
36in (0.9m)	3in	Field	6,6,6,6	8.25in	291
		Perimeter	6,6,6,6,6,6	4.71in	509
		Corner	4,4,4,4,4,4	4.71in	763
36in (0.9m)	4in	Field	6,6,6,6	8in	300
		Perimeter	6,6,6,6,6,6	4.57in	525
		Corner	4,4,4,4,4,4	4.57in	788
39in (1m)	3in	Field	6,6,6,6	9in	267
		Perimeter	6,6,6,6,6,6	5.14in	467
		Corner	4,4,4,4,4,4	5.14in	700
39in (1m)	4in	Field	6,6,6,6	8.75in	274
		Perimeter	6,6,6,6,6,6	5in	480
		Corner	4,4,4,4,4,4	5in	720

Figure 2.1b Mechanically Fastened Base Sheet/Anchor Sheet 6, 6, 6, 6 Fastening Pattern



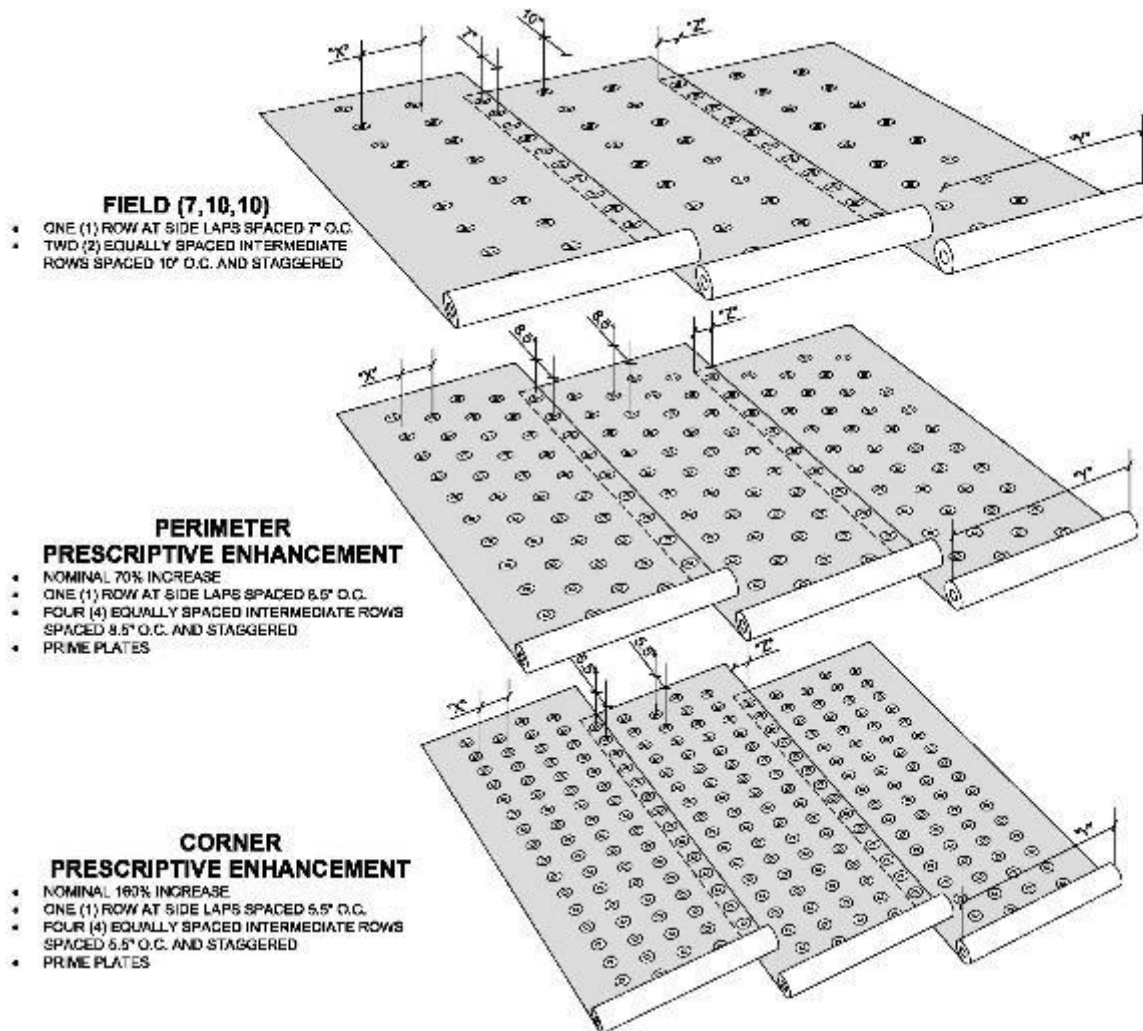
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	7,7,7	11.33in	182
		Perimeter	5,5,5,5,5,5,5	8.5in	308
		Corner	6,6,6,6,6,6,6	4.86in	494
36in (0.9m)	3in	Field	7,7,7	11in	187
		Perimeter	5,5,5,5,5,5,5	9.25in	317
		Corner	6,6,6,6,6,6,6	4.71in	509
36in (0.9m)	4in	Field	7,7,7	10.67in	193
		Perimeter	5,5,5,5,5,5,5	9in	327
		Corner	6,6,6,6,6,6,6	4.57in	525
39in (1m)	3in	Field	7,7,7	12in	171
		Perimeter	5,5,5,5,5,5,5	9in	291
		Corner	6,6,6,6,6,6,6	5.14in	467
39in (1m)	4in	Field	7,7,7	11.67in	176
		Perimeter	5,5,5,5,5,5,5	9.75in	299
		Corner	6,6,6,6,6,6,6	5in	490

Figure 2.1c Mechanically Fastened Base Sheet/Anchor Sheet 7, 7, 7 Fastening Pattern



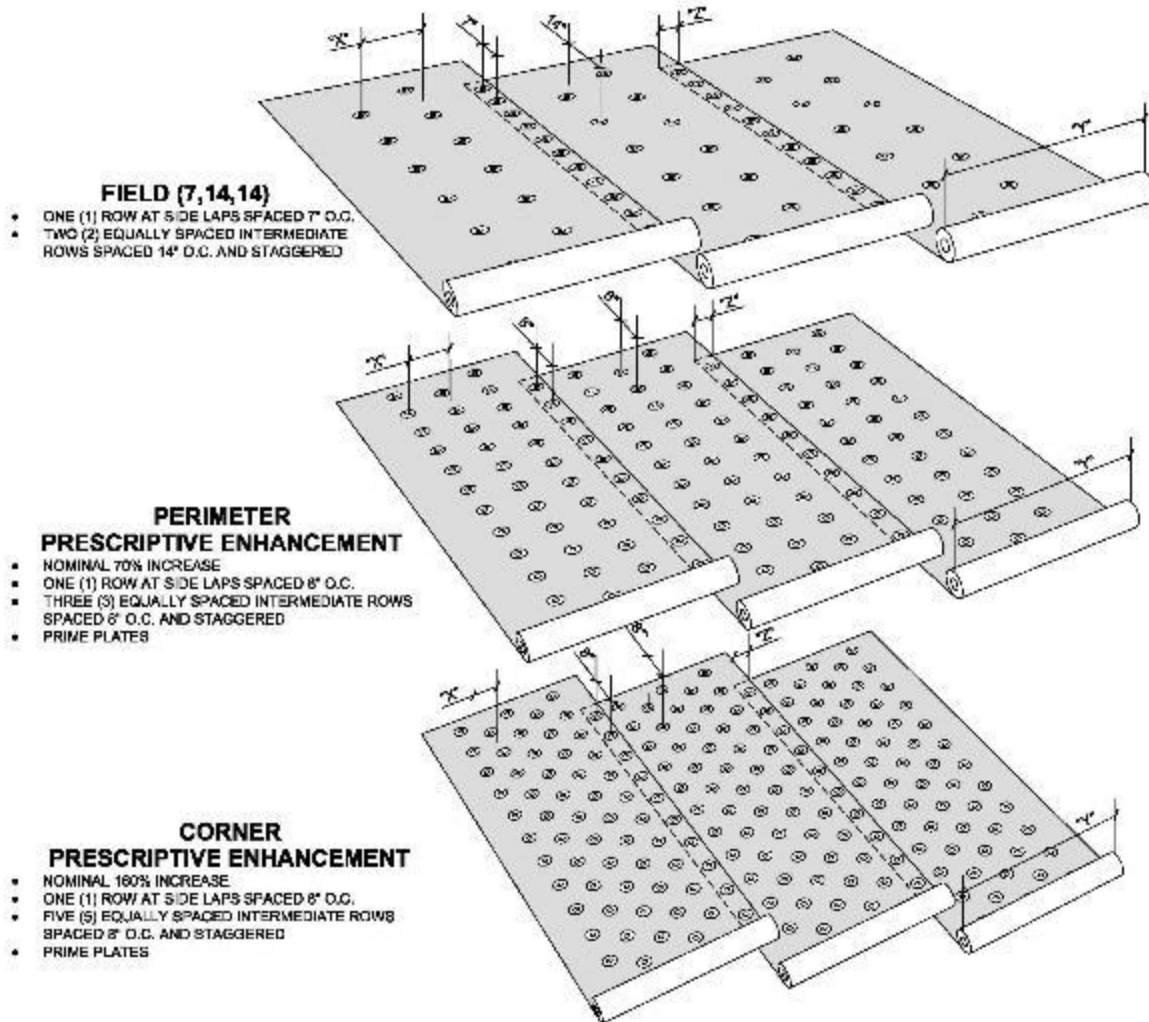
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	7.5, 7.5, 7.5	11.33in	199
		Perimeter	8.5, 8.5, 8.5, 8.5, 8.5, 8.5	5.67in	298
		Corner	5.5, 5.5, 5.5, 5.5, 5.5, 5.5	5.67in	462
36in (0.9m)	3in	Field	7.5, 7.5, 7.5	11in	175
		Perimeter	8.5, 8.5, 8.5, 8.5, 8.5, 8.5	5.5in	308
		Corner	5.5, 5.5, 5.5, 5.5, 5.5, 5.5	5.5in	478
36in (0.9m)	4in	Field	7.5, 7.5, 7.5	10.67in	180
		Perimeter	8.5, 8.5, 8.5, 8.5, 8.5, 8.5	5.33in	318
		Corner	5.5, 5.5, 5.5, 5.5, 5.5, 5.5	5.33in	481
39in (1m)	3in	Field	7.5, 7.5, 7.5	12in	160
		Perimeter	8.5, 8.5, 8.5, 8.5, 8.5, 8.5	6in	282
		Corner	5.5, 5.5, 5.5, 5.5, 5.5, 5.5	6in	436
39in (1m)	4in	Field	7.5, 7.5, 7.5	11.67in	185
		Perimeter	8.5, 8.5, 8.5, 8.5, 8.5, 8.5	5.83in	290
		Corner	5.5, 5.5, 5.5, 5.5, 5.5, 5.5	5.83in	449

Figure 2.1d Mechanically Fastened Base Sheet/Anchor Sheet 7.5, 7.5, 7.5 Fastening Pattern



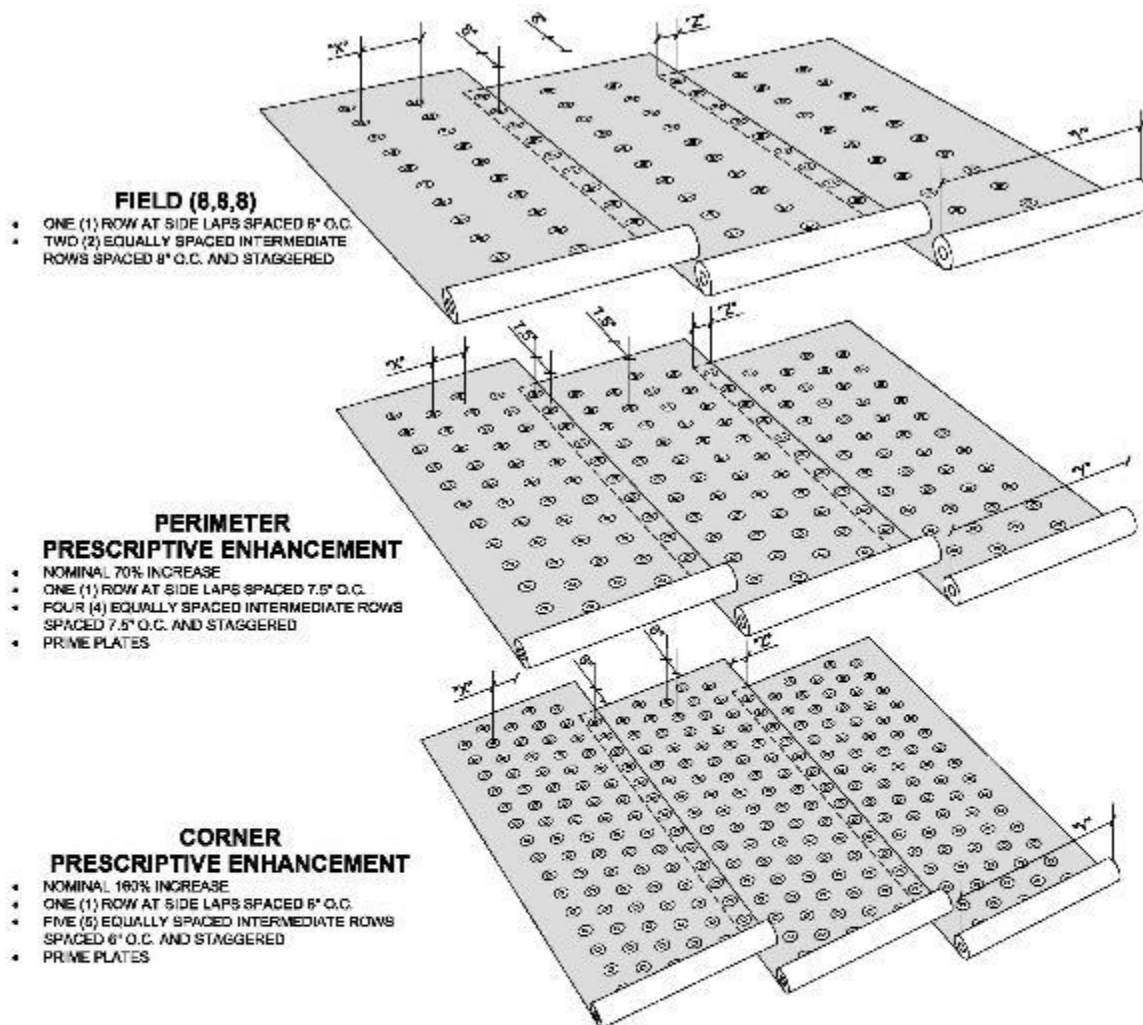
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	7,10,10	11.33in	145
		Perimeter	8.5,8.5,8.5,8.5	6.8in	249
		Corner	5.5,5.5,5.5,5.5	6.8in	385
36in (0.9m)	3in	Field	7,10,10	11in	150
		Perimeter	8.5,8.5,8.5,8.5	6.6in	257
		Corner	5.5,5.5,5.5,5.5	6.6in	397
36in (0.9m)	4in	Field	7,10,10	10.67in	154
		Perimeter	8.5,8.5,8.5,8.5	6.4in	265
		Corner	5.5,5.5,5.5,5.5	6.4in	409
35in (1m)	3in	Field	7,10,10	12in	137
		Perimeter	8.5,8.5,8.5,8.5	7.2in	235
		Corner	5.5,5.5,5.5,5.5	7.2in	361
35in (1m)	4in	Field	7,10,10	11.67in	141
		Perimeter	8.5,8.5,8.5,8.5	7in	242
		Corner	5.5,5.5,5.5,5.5	7in	374

Figure 2.1e Mechanically Fastened Base Sheet/Anchor Sheet 7, 10, 10 Fastening Pattern



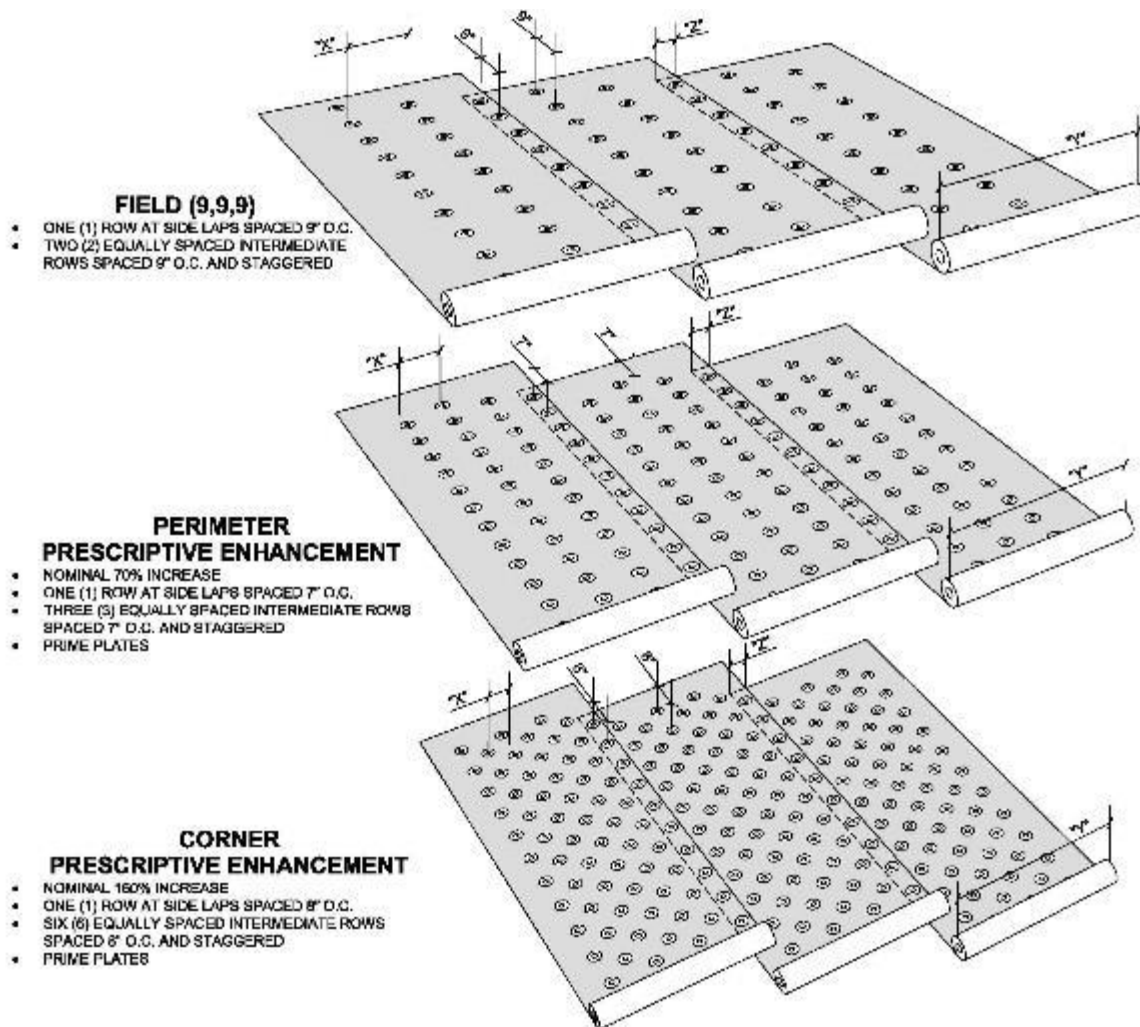
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	7,14,14	11.33in	121
		Perimeter	8,8,8,8	8.5in	212
		Corner	8,8,8,8,8,8	5.67in	318
36in (0.9m)	3in	Field	7,14,14	11in	125
		Perimeter	8,8,8,8	8.25in	219
		Corner	8,8,8,8,8,8	5.5in	328
36in (0.9m)	4in	Field	7,14,14	10.67in	129
		Perimeter	8,8,8,8	8in	225
		Corner	8,8,8,8,8,8	5.33in	338
39in (1m)	3in	Field	7,14,14	12in	115
		Perimeter	8,8,8,8	9in	200
		Corner	8,8,8,8,8,8	6in	300
39in (1m)	4in	Field	7,14,14	11.67in	118
		Perimeter	8,8,8,8	8.75in	206
		Corner	8,8,8,8,8,8	5.83in	309

Figure 2.1f Mechanically Fastened Base Sheet/Anchor Sheet 7, 14, 14 Fastening Pattern



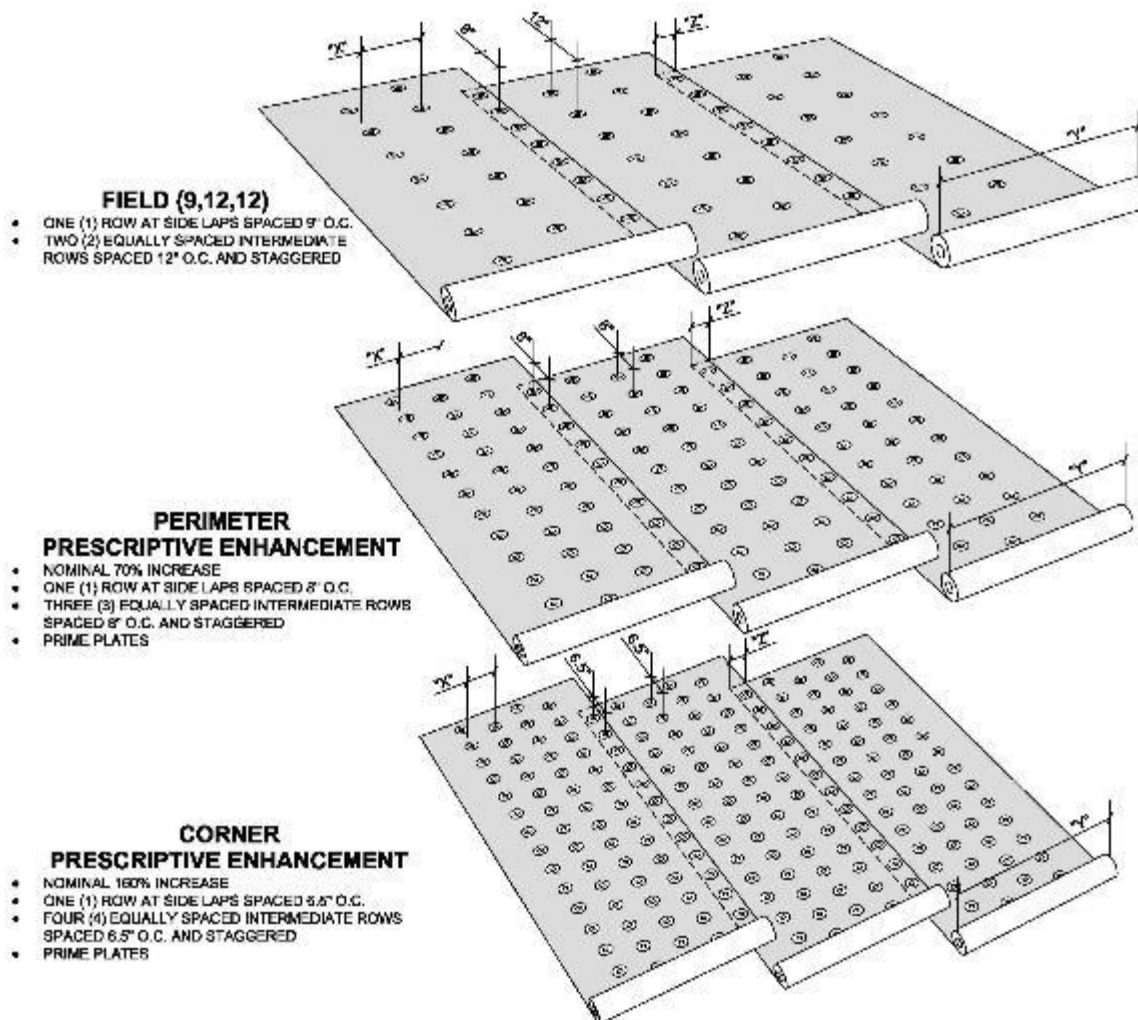
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	8,8,8	11.33in	159
		Perimeter	7.5,7.5,7.5,7.5,7.5	6.8in	282
		Corner	6,6,6,6,6	5.67in	424
36in (0.9m)	3in	Field	8,8,8	11in	154
		Perimeter	7.5,7.5,7.5,7.5,7.5	6.6in	281
		Corner	6,6,6,6,6	5.5in	436
36in (0.9m)	4in	Field	8,8,8	10.67in	159
		Perimeter	7.5,7.5,7.5,7.5,7.5	6.4in	300
		Corner	6,6,6,6,6	5.33in	450
39in (1m)	3in	Field	8,8,8	12in	150
		Perimeter	7.5,7.5,7.5,7.5,7.5	7.2in	267
		Corner	6,6,6,6,6	6in	400
39in (1m)	4in	Field	8,8,8	11.67in	154
		Perimeter	7.5,7.5,7.5,7.5,7.5	7in	274
		Corner	6,6,6,6,6	5.83in	411

Figure 2.1g Mechanically Fastened Base Sheet/Anchor Sheet 8, 8, 8 Fastening Pattern



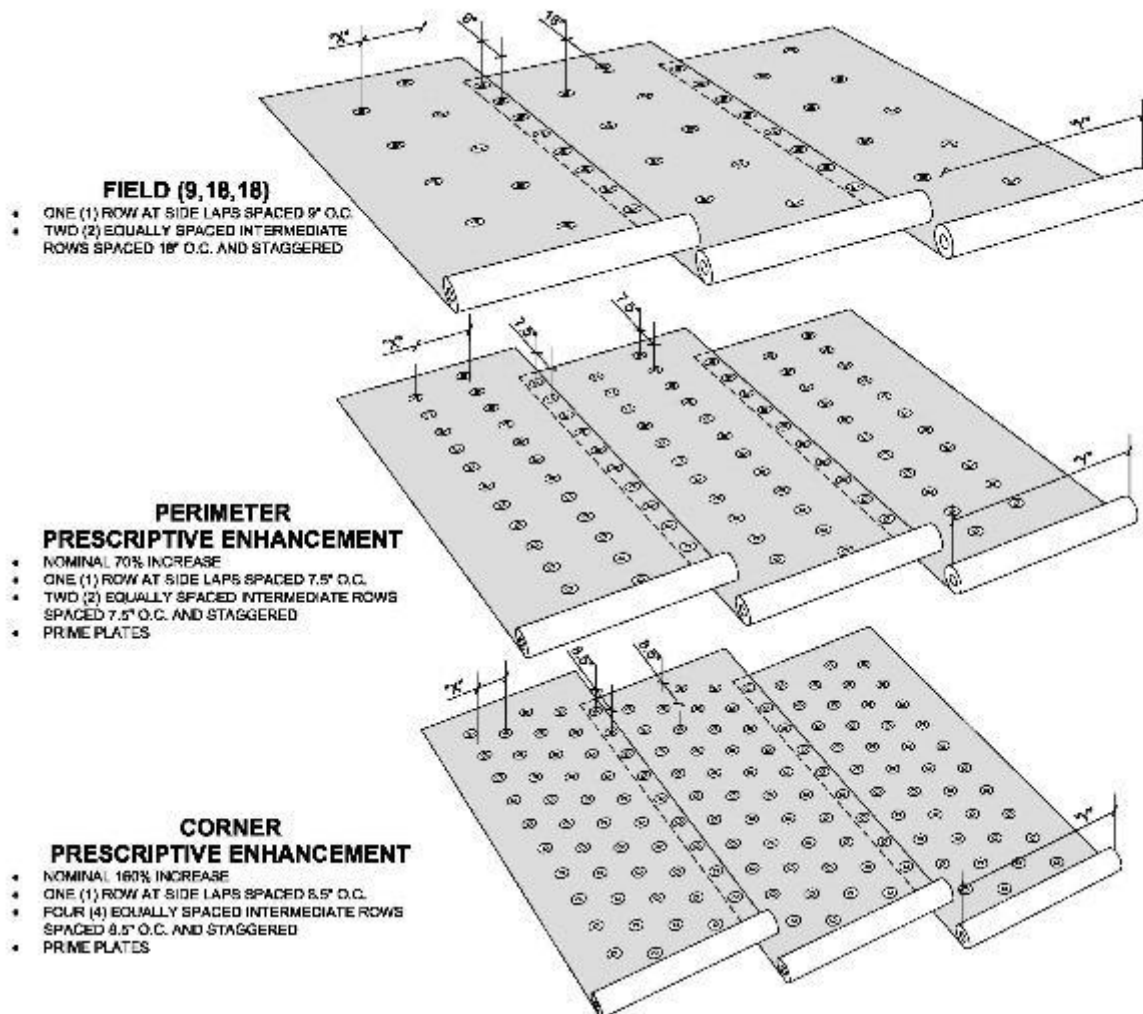
Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	9,9,9	11.33in	141
		Perimeter	7,7,7,7	8.5in	242
		Corner	8,8,8,8,8,8	4.86in	371
36in (0.9m)	3in	Field	9,9,9	11in	145
		Perimeter	7,7,7,7	8.25in	249
		Corner	8,8,8,8,8,8	4.71in	382
36in (0.9m)	4in	Field	9,9,9	10.67in	150
		Perimeter	7,7,7,7	8in	258
		Corner	8,8,8,8,8,8	4.57in	394
39in (1m)	3in	Field	9,9,9	12in	133
		Perimeter	7,7,7,7	9in	229
		Corner	8,8,8,8,8,8	5.14in	350
39in (1m)	4in	Field	9,9,9	11.6in	137
		Perimeter	7,7,7,7	8.75in	235
		Corner	8,8,8,8,8,8	5in	360

Figure 2.1h Mechanically Fastened Base Sheet/Anchor Sheet 9, 9, 9 Fastening Pattern



Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	9,12,12	11.33in	118
		Perimeter	8,8,8,8	8.5in	212
		Corner	6.5,6.5,6.5,6.5,6.5,6.5	6.9in	326
36in (0.9m)	3in	Field	9,12,12	11in	121
		Perimeter	8,8,8,8	8.25in	218
		Corner	6.5,6.5,6.5,6.5,6.5,6.5	6.6in	336
36in (0.9m)	4in	Field	9,12,12	10.67in	125
		Perimeter	8,8,8,8	8in	225
		Corner	6.5,6.5,6.5,6.5,6.5,6.5	6.4in	346
36in (1m)	3in	Field	9,12,12	12in	111
		Perimeter	8,8,8,8	9in	200
		Corner	6.5,6.5,6.5,6.5,6.5,6.5	7.2in	308
36in (1m)	4in	Field	9,12,12	11.67in	114
		Perimeter	8,8,8,8	8.75in	208
		Corner	6.5,6.5,6.5,6.5,6.5,6.5	7in	316

Figure 2.1i Mechanically Fastened Base Sheet/Anchor Sheet 9, 12, 12 Fastening Pattern



Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Fasteners Per Square
36in (0.9m)	2in	Field	9,18,18	11.33in	94
		Perimeter	7.5,7.5,7.5	11.33in	169
		Corner	8.5,8.5,8.5,8.5,8.5	6.6in	249
36in (0.9m)	3in	Field	9,18,18	11in	97
		Perimeter	7.5,7.5,7.5	11in	175
		Corner	8.5,8.5,8.5,8.5,8.5	6.6in	257
36in (0.9m)	4in	Field	9,18,18	10.67in	100
		Perimeter	7.5,7.5,7.5	10.67in	180
		Corner	8.5,8.5,8.5,8.5,8.5	6.4in	265
39in (1m)	3in	Field	9,18,18	12in	89
		Perimeter	7.5,7.5,7.5	12in	180
		Corner	8.5,8.5,8.5,8.5,8.5	7.2in	235
39in (1m)	4in	Field	9,18,18	11.67in	91
		Perimeter	7.5,7.5,7.5	11.67in	185
		Corner	8.5,8.5,8.5,8.5,8.5	7in	242

Figure 2.1j Mechanically Fastened Base Sheet/Anchor Sheet 9, 18, 18 Fastening Pattern

2.2 HOT ASPHALT-APPLIED BUILT-UP BASE SHEET/PLY SHEET VAPOR RETARDERS

General:

- [SOPREMA®](#) base sheets and/or ASTM D2178 ply felts may be applied using hot asphalt to produce multi-ply built-up-roofing vapor retarders. Refer to [Table 2.2a](#).
- Contact [SOPREMA®](#) for pre-approval of ASTM D312 Type III or Type IV mopping asphalt used for multi-ply built-up vapor retarder membranes.
- ASTM D312 Type IV mopping asphalt is required for SBS modified bitumen. Refer to [Section 3.4](#).
- Storage and handling:
 - Store rolls on end and maintain in an upright position to prevent damage.
 - Store rolls in a clean dry location and cover as necessary to protect rolls from environmental damage such as extreme cold, heat, or moisture.
- Refer to [SOPREMA®](#) PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on hot asphalt-applied vapor retarders.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during vapor retarder application.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply hot asphalt and vapor retarder plies.
 - Take all necessary measures and monitor all conditions, to ensure the specified asphalt temperature is no less than the equiviscous temperature (EVT) at the point of contact with the specified vapor retarder as it is unrolled into the hot asphalt.
 - Store rolls in a heated area to maintain the rolls at 70°F (21°C) during cold weather.
- Ensure all substrates are smooth, free of dust and debris, dry and acceptable for installation of the vapor retarder.
- Ensure substrates are even at all substrate transitions to prevent voids in the vapor retarder. Ensure substrates are primed where required using [ELASTOCOL™ 350](#) or [ELASTOCOL™ 500](#) primer. Refer to [Section 1.1](#).
- Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.
- Refer to mopping asphalt supplier's published values for softening point, flash point (FP), finished blowing temperature (FBT) and equiviscous temperature (EVT).
- Refer to the softening point for maximum slope applications. The maximum recommended roof slope for asphalt-applied built-up vapor retarders is 3/4:12.
- Remove all roll packaging tape and properly dispose prior to installation of asphalt-applied vapor retarders.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of primer, asphalt-applied vapor retarder and other above-deck roofing materials.
 - Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
 - Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
 - When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.

- A relative humidity (RH) of 75% or less is considered acceptable to apply primer for [SOPREMA®](#) SBS vapor retarders.
- For concrete decks with low RH values (less than 75%), the concrete should be primed using the applicable SOPREMA primer before applying hot asphalt vapor retarder options indicated herein.
- For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (over 75% RH), refer to vapor retarder options using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - Apply the specified primer to the clean, prepared substrate. Ensure primer is fully dry.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to sufficiently cool.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
 - Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- Starting at the low point of the roof, lay out the vapor retarder to ensure the plies are installed perpendicular to the slope, shingled to prevent back-water laps.
- Apply mopping asphalt within +/- 25°F (14°C) of the published EVT and as required to obtain a nominal 23 to 25 pounds per square interply coverage rate. Refer to the EVT provided by the asphalt supplier.
- The Type III asphalt application temperature should be within 365 to 435°F (185 to 224°C), and Type IV asphalt should be within 400 to 475°F (204 to 246°C) at the point of contact with the ply as the ply is rolled into the hot asphalt.
- The asphalt application temperature should be monitored and recorded during application to ensure application temperature remains as published herein.
- TWO (2) PLY BUILT-UP VAPOR RETARDER APPLICATION (Refer to [Figure 2.2a](#)):
 - First, start at the low point of the roof by installing a ply cut 18 inches wide.
 - Second, install a full 36 inch wide ply, installed along the same low point of the roof.
 - Next install a full 36 inch wide ply, installed 19 inches over the second ply (17 inches from the low point of the roof).
 - Each of the following plies should also be installed 19 inches over the preceding ply, producing the same 17 inch exposure.
 - Follow the lay-lines on the plies or snap chalk lines as required to maintain consistent 2-ply membrane coverage, with 2 inch side laps and 4 inch end laps.
- THREE (3) PLY BUILT-UP VAPOR RETARDER APPLICATION (Refer to [Figure 2.2b](#)):
 - First, start at the low point of the roof by installing a ply cut 12 inches wide.
 - Second, install a ply cut 24 inches wide, installed along the same point of the roof.
 - Third, install a full 36 inch wide ply, installed along the same low point of the roof.

- Next install a full 36 inch wide ply, installed 24-2/3 inches over the third ply (11-1/8 inches from the low point of the roof).
- Each of the following plies should be installed 24-2/3 inches over the preceding ply, producing the same 11-1/8 inch exposure.
- Follow the lay-lines on the plies or snap chalk lines as required to maintain consistent 3-ply membrane coverage, with 2 inch side laps and 4 inch end laps.
- **FOUR (4) PLY BUILT-UP VAPOR RETARDER APPLICATION (Refer to [Figure 2.2c](#)):**
 - First, start at the low point of the roof by installing a ply cut 9 inches wide.
 - Second, install a ply cut 18 inches wide, installed along the same low point of the roof.
 - Third, install a ply cut 27 inches wide, installed along the same low point of the roof.
 - Fourth, install a full 36 inch wide ply installed along the same low point of the roof.
 - Next install a full 36 inch wide ply, installed 27-1/2 inches over the fourth ply (8-1/2 inches from the low point of the roof).
 - Each of the following ply should be installed 27-1/2 inches over the preceding ply, producing the same 8-1/2 inch exposure.
 - Follow the lay-lines on the plies or snap chalk lines as required to maintain consistent 4-ply membrane coverage, with 2 inch side laps and 4 inch end laps.
- Carefully squeegee the plies in place, working forward to the end of the roll as necessary to remove wrinkles and voids to ensure full adhesion.
- Avoid walking over the vapor retarder during application to prevent displacing asphalt between plies. Allow the asphalt to cool sufficiently before walking over the new vapor retarder.
- Where completed built-up vapor retarder is to be left exposed during construction, apply a thin squeegee coat of hot asphalt over the membrane surface to seal the surface watertight.

Inspection:

- Inspect the installation each day to ensure the plies are fully adhered. Repair all voids, wrinkles, open laps and all other deficiencies each day.
- Do not leave built-up vapor retarder plies exposed overnight. Before the end of each work day, squeegee a thin glaze coating of asphalt over the built-up vapor retarder plies to protect the vapor retarder from exposure to moisture.
- Do not phase built-up vapor retarder felt applications. Install the total number of specified built-up vapor retarder plies each day.
- Temporary night seals are required to seal vapor retarder terminations and transitions watertight. Remove temporary night seals before resuming the vapor retarder installation.

Table 2.2a Hot Asphalt-Applied Base Sheets and BUR Ply Sheets

Name	Reinforcement	Bottom Surfacing	Top Surfacing	Overlying Insulation Options
MODIFIED SOPRA G™ , SOPRA G	Glass fiber	Sanded	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete
SOPRABASE S	Non-woven polyester	Sanded	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
SOPRA IV , SOPRA VI	Glass fiber	None	None	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete

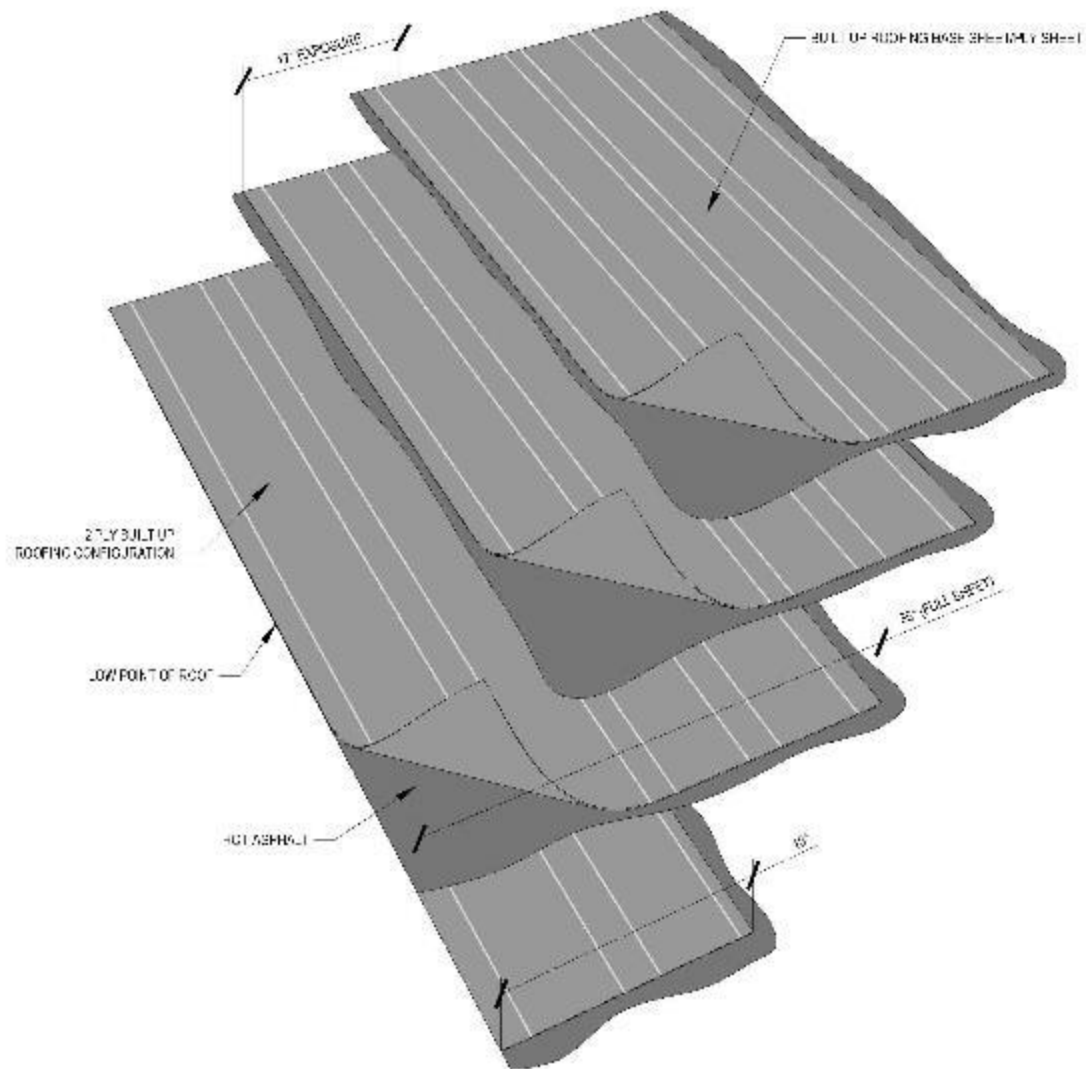


Figure 2.2a Two (2) Ply Built Up Vapor Retarder Configuration

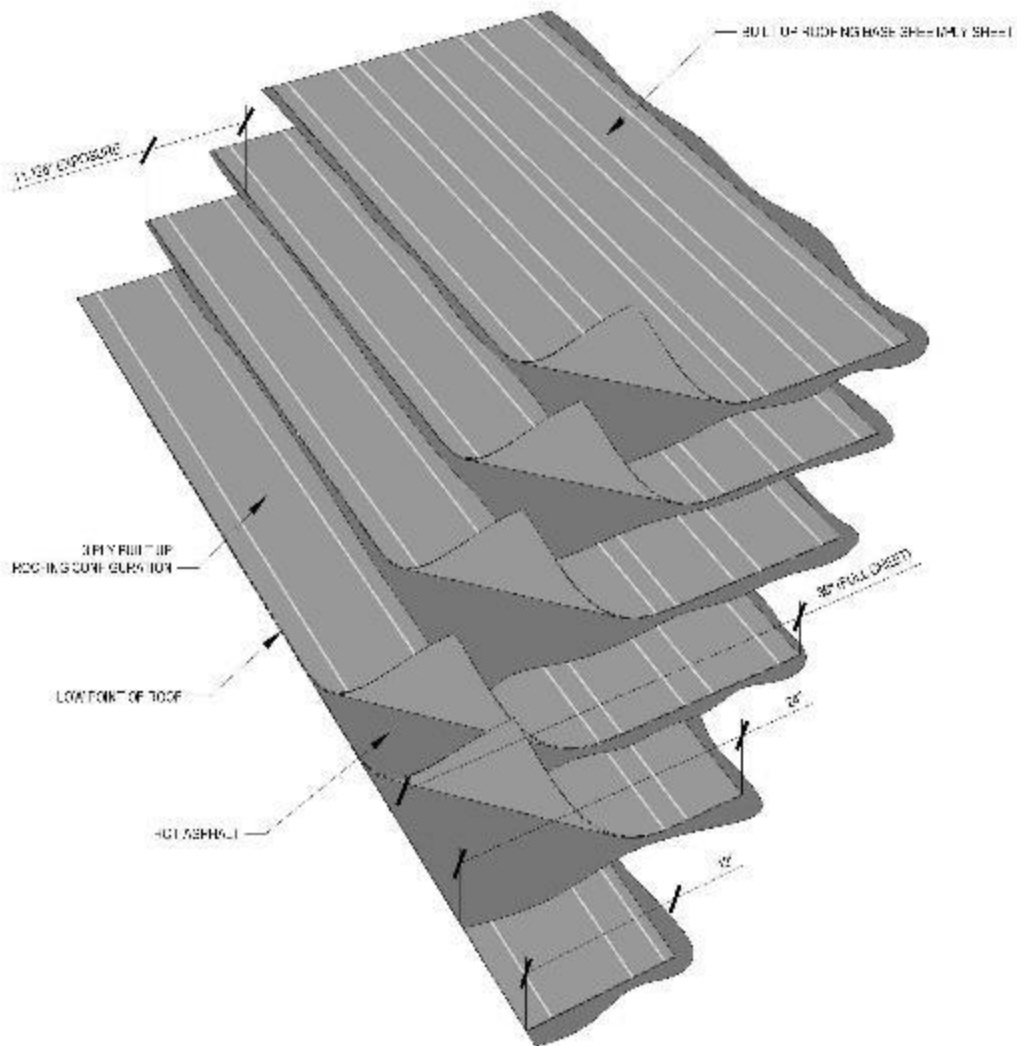


Figure 2.2b Three (3) Ply Built Up Vapor Retarder Configuration

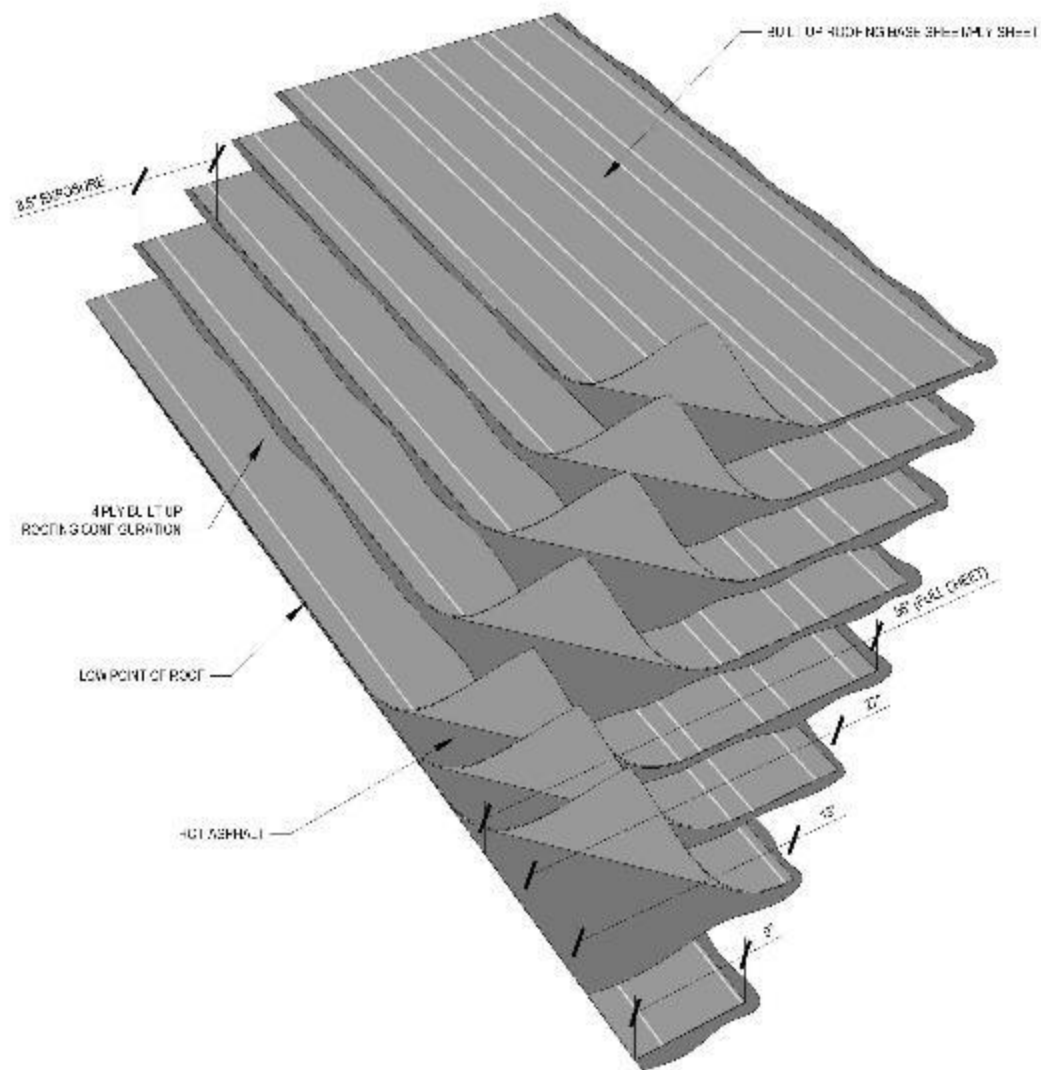


Figure 2.2c Four (4) Ply Built Up Vapor Retarder Configuration

3 SBS MODIFIED BITUMEN VAPOR RETARDERS

3.1 HEAT WELDED SBS MODIFIED BITUMEN VAPOR RETARDERS

3.1.1 FULLY ADHERED, HEAT WELDED VAPOR RETARDERS

General:

- [SOPREMA®](#) heat welded SBS modified bitumen vapor retarders may be installed over structural concrete roof decks, steel roof decks with thermal barriers, mechanically fastened base sheets/anchor sheets, and other substrates. Refer to [Table 3.1.1b](#).
- The underside of heat welded SBS vapor retarders consists of a plastic burn-off film to optimize heat welding operations. The top surfacing of the plies are sanded for adhering insulation or lightweight insulating concrete above the vapor retarder. Refer to [Table 3.1.1a](#). Refer to the PDS and SDS for additional product information.
- Heat welding equipment:
 - Single or multi-nozzle, hand-held propane roof torches should be used to install heat welded SBS field plies.
 - Multi-nozzle carts “dragon wagons” may also be utilized to install field plies. Seven (7) nozzle carts are recommended for uniform heat application rather than five (5) nozzle carts.
 - Single-nozzle, hand-held, propane detail torches should be used to install heat welded SBS flashing plies.
 - Hot-air welders may be used where required for small, detail work, side-laps and end-laps.
 - [SOPREMA® Mini MACADEN® 1000](#) is recommended to optimize the efficiency of heat welded SBS field plies for vapor retarder projects. Contact [SOPREMA®](#) for more information.
- Storage and handling:
 - Store rolls on end and maintain in an upright position to prevent damage.
 - Store rolls in a clean dry location and cover as necessary to protect rolls from environmental damage such as extreme cold, heat, or moisture.
- Refer to [SOPREMA®](#) PDS and SDS for additional product information.

Preparation:

- Prior to beginning work, refer to NRCA CERTA, local codes and the building owner’s hot work inspection, permitting and monitoring requirements.
- Where the applicator deems conditions are unsafe to use open flames, [SOPREMA®](#) alternate application methods should be used to install SBS modified bitumen vapor retarders. Acceptable alternate methods include cold adhesive-applied, hot asphalt-applied, self-adhered, hot-air welding or a combination of appropriate SBS modified bitumen materials and methods may be used.
- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and vapor retarder application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during application.
- Ensure all substrates are prepared and acceptable to receive the heat-welded vapor retarder.
- Where required, ensure substrates are primed using [ELASTOCOL™ 350](#) or [ELASTOCOL™ 500](#) primer. Ensure primer is fully dry before beginning heat-welding operations. Refer to [Section 1.1](#).
- Remove all roll packaging tape and properly dispose prior to installation of the vapor retarder.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of primer, vapor retarder and other above-deck roofing materials.

- Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
- Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
- When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.
- A relative humidity (RH) of 75% or less is considered acceptable to apply primer for [SOPREMA®](#) SBS vapor retarders.
- For concrete decks with low RH values (less than 75%), the concrete should be primed using the applicable SOPREMA primer before applying heat welded vapor retarder options indicated herein.
- For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (over 75% RH), refer to vapor retarder options using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - Apply the specified primer to the clean, prepared substrate. Ensure primer is fully dry.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to cool.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
 - Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- Field Ply :
 - Unroll plies onto the roof surface and allow time to relax prior to heat welding.
 - Starting at the low point of the roof, lay out the field plies to ensure they installed perpendicular to the roof slope, shingled to prevent back-water laps.
 - Cut sheet to working lengths and widths to conform to rooftop conditions, and lay out to always work to a selva edge.
 - Ensure specified side-laps and end-laps are maintained. End-laps should be staggered 3 ft apart.
 - As the vapor retarder is unrolled, apply heat to the underside of the ply until plastic burn-off film melts away sufficiently for full adhesion to the substrate, and full adhesion between plies.
 - For hand-held roof torches, continuously move the torch side-to-side across the underside of the roll to melt the bitumen while continuously unrolling sheet.
 - For multi-nozzle carts, apply uniform heat to the underside of the roll to melt the bitumen while continuously unrolling the sheet.
 - While unrolling and heating the sheet, ensure approximately ¼ to 1/2 in of hot bitumen flows ahead of the roll, and there is 1/8 to 1/4 in bleed out at all laps. Ensure all side-laps are fully adhered and sealed watertight.

- Adjust application methods to accommodate varying environmental conditions as necessary to achieve the desired results.
- For gypsum thermal barriers subject to potential heat damage, apply the heat high on the roll to prevent overheating or damaging the gypsum thermal barrier.
- At the 6 in end-laps ensure a fully adhered watertight seal. Melt the plastic burn-off film using a torch or hot-air welder.
- At end-laps where T-Joints exist, cut a 45 degree dog-ear away from the selvage edge, or otherwise ensure the vapor retarder is fully heat-welded watertight at the T-joints.
- Flashing Ply:
 - Seal the vapor retarder watertight at all roof penetrations, transitions and terminations.
 - When vapor retarder are to remain exposed for extended periods of time, install vapor retarder flashings capable of withstanding all weather and environmental exposures. Refer to the SBS Membrane Roofing Technical Manual.
 - Unroll flashing sheets onto the roof surface and allow time to relax prior to heat welding.
 - Unroll the flashing ply onto the roof surface to their complete length. Once relaxed, cut the flashing ply to the required working lengths to accommodate the flashing height, cants and the required over-lap onto the horizontal roof surface.
 - Cut the flashing ply from the end of the roll in order to always install flashings to the side-lap line or selvage edge line.
 - Install non-combustible cant strips at transitions where required. Cants may be omitted where specified and where [SOPREMA®](#) flashing plies meet the following requirements:
 - Flashing ply: Heat welded, polyester reinforced. Refer to [Figure 3.1.1b](#).
 - Before installing flashings, extend the sheet up from the horizontal field of the roof to the top of the cant (if used), at all vertical roof terminations, transitions and penetrations.
 - Install the flashing ply starting at the top leading edge of the vertical flashing substrate, down over the cant and onto the horizontal surface of the roof a minimum of 3 in beyond the wall/curb or base of the cant (if used) onto the horizontal roof surface. Ensure a minimum 3 in side-lap is maintained.
 - Install gussets to seal inside and outside corner transitions.
 - During the flashing installation, ensure all plies are completely adhered in place, with no bridging, voids or openings.
 - Ensure bitumen bleed-out is present at all flashing side-laps and end-laps. Where sufficient bitumen bleed-out is not present, apply hot bitumen or [SOPRAMASTIC SP1](#) sealant to seal the vapor retarder termination along all roof terminations, transitions and penetrations.
 - Seal the vapor retarder at all pipe penetrations, along the top edge of curb and wall flashing, and all other flashing terminations where necessary to seal vapor retarder flashings watertight.
 - When necessary to achieve full adhesion and conform to transitions, press-in the flashing plies using a damp sponge float or damp cloth.
 - Fasten the top leading edge of vertical flashings 8 in on-centers with appropriate 1 in metal cap nails.
 - Seal flashing fastener penetrations watertight using [SOPRAMASTIC SP1](#) sealant.
 - [ALSAN® RS 230 FLASH](#), [ALSAN® RS 260 LO FLASH](#) and [ALSAN® FLASHING](#) liquid-applied, reinforced flashing systems may be installed as an alternate to SBS flashing plies. Refer to [Section 4, LIQUID-APPLIED FLASHINGS](#) and the ALSAN RS Guide.
 - Contact [SOPREMA®](#) for other flashing options.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.

- Temporary night seals are required to seal vapor retarder terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Vapor retarder exposure and phased applications:
 - Due to the wide range of environmental conditions and project related exposures, the effects from exposures vary.
 - When the vapor retarder is left exposed for an extended period to UV, dust, debris, traffic and other extreme conditions, thoroughly examine the vapor retarder to ensure conditions are satisfactory to install subsequent roofing materials.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.1.1a Fully Adhered, Heat-Welded Vapor Retarders					
Name	Application	Reinforcement	Bottom Surfacing	Top Surfacing	Overlying Insulation Options
ELASTOPHENE® SP 2.2 , ELASTOPHENE® SP 3.0	Field Ply	Glass fiber	Plastic burn-off film	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete.
SOPRALENE® 180 SP 3.0 , SOPRALENE® 180 SP 3.5	Field Ply, Flashing Ply	Non-woven polyester	Plastic burn-off film	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete.

Table 3.1.1b Substrate Preparation, Fully Adhered, Heat-Welded Vapor Retarders	
Substrate ***	Preparation
Concrete/Concrete Deck	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Metal	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Masonry	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Approved gypsum roof boards**	Optional prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Approved cement roof boards	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Wood	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
SOPRABOARD™	None
Base sheets/anchor sheets. Refer to Section 2.1 .	None

*Refer to [Section 1.1](#) for priming.

**Primer is optional, primer is recommended for optimum performance. Contact [SOPREMA®](#).

***Refer to NRCA CERTA recommendations for heat welding application methods and protection of substrates.



Figure 3.1.1a Fully Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb Without Cant

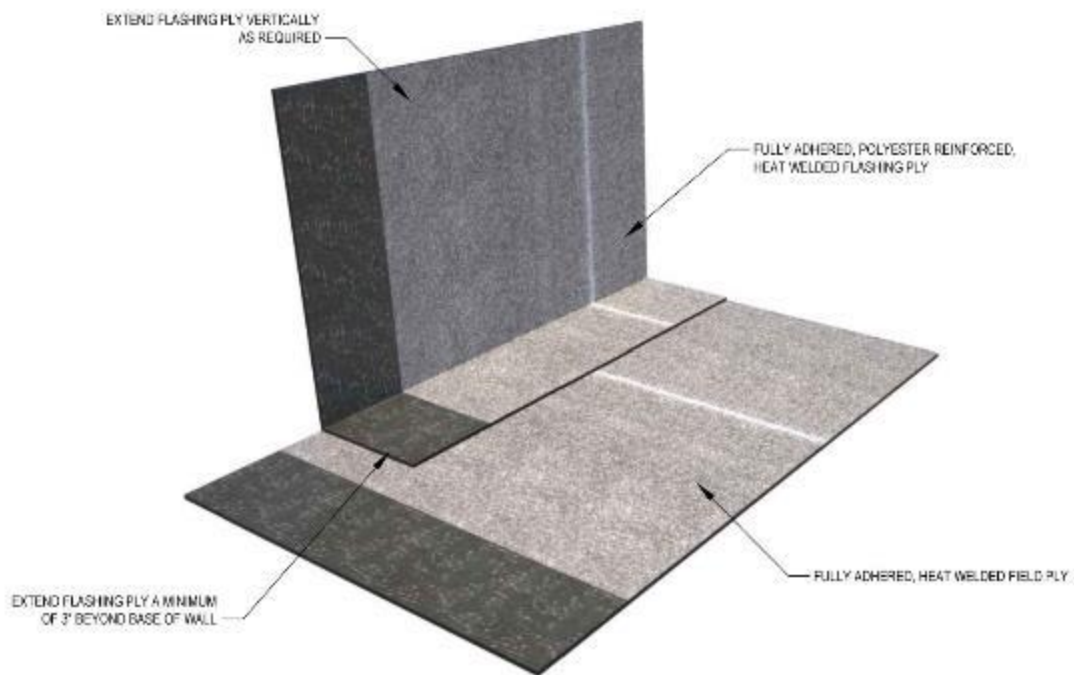


Figure 3.1.1b Fully Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb Without Cant

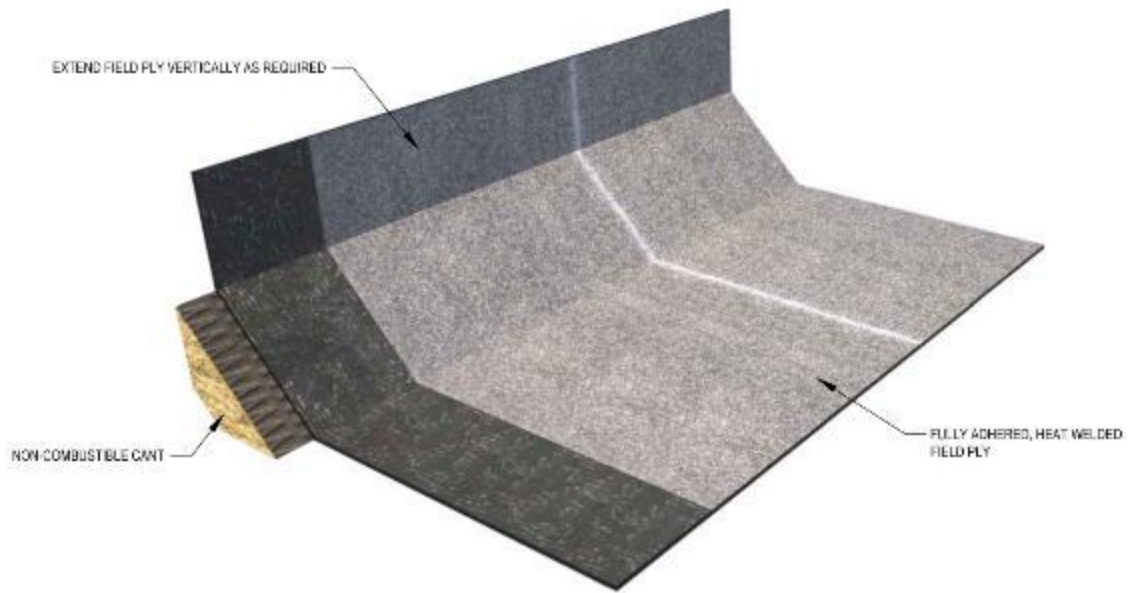


Figure 3.1.1c Fully Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb With Cant

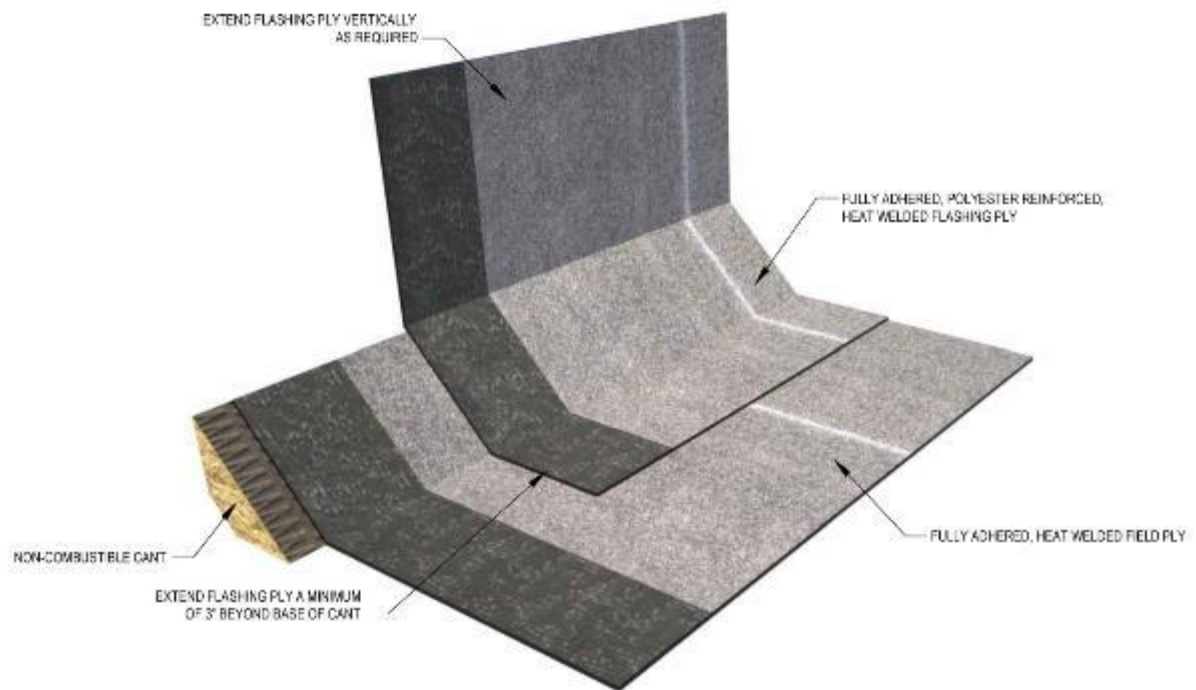


Figure 3.1.1d Fully Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb With Cant

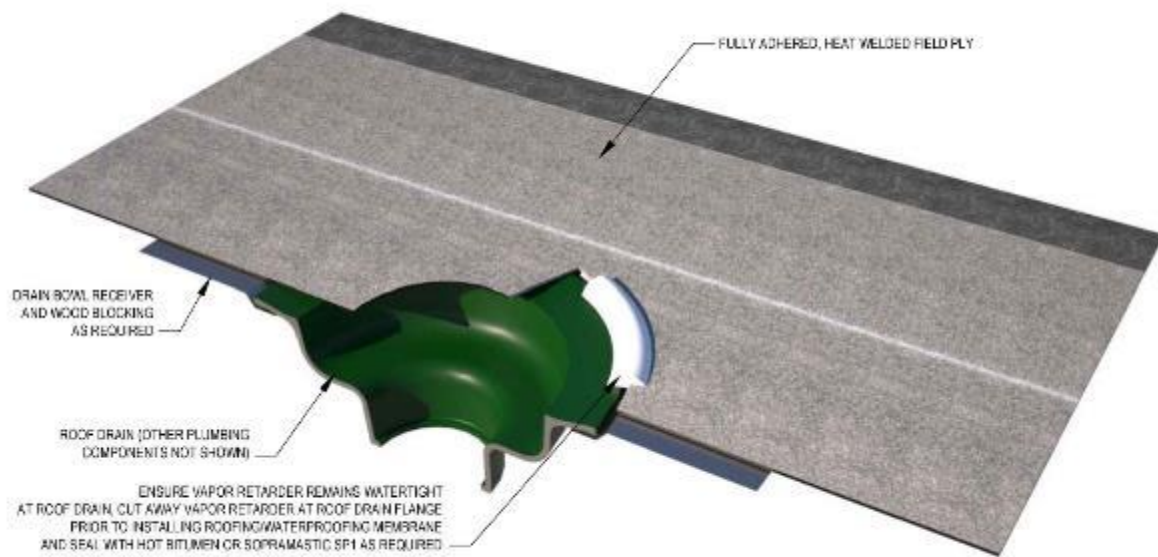


Figure 3.1.1e Fully Adhered, Heat Welded Vapor Retarder at Roof Drain

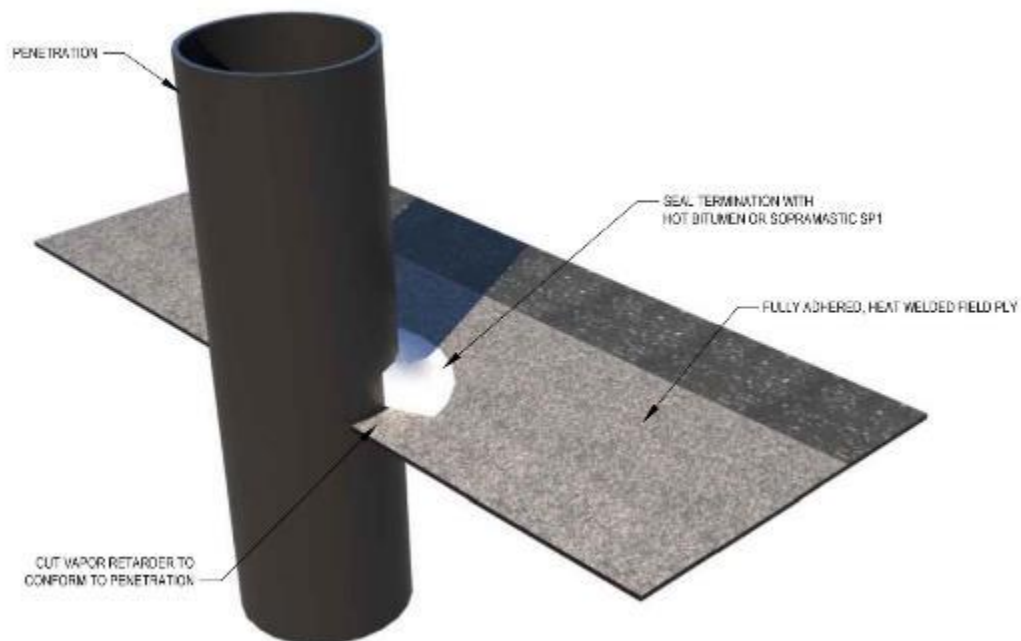


Figure 3.1.1f Fully Adhered, Heat Welded Vapor Retarder at Penetration

3.1.2 PARTIALLY ADHERED, HEAT WELDED VAPOR RETARDERS

General:

- [SOPREMA®](#) COLVENT™ partially adhered heat welded SBS modified bitumen vapor retarders may be installed over structural concrete roof decks and other appropriate substrates. Refer to [Table 3.1.2b](#).
- [SOPREMA®](#) COLVENT™ partially adhered, heat welded SBS modified bitumen vapor retarders are manufactured with ribbons of SBS modified bitumen adhesive separated by sanded venting channels on the underside of the sheet. The sanded venting channels prevent adhesion to the substrate. The un-adhered sanded venting pattern allows vapor pressure to dissipate to the atmosphere where venting channels are open at flashing terminations.
- Heat welding equipment:
 - Single or multi-nozzle, hand-held propane roof torches should be used to install heat welded SBS field plies.
 - Single-nozzle, hand-held, propane detail torches should be used to install heat welded SBS flashing plies.
 - Hot-air welders may be used where required for small, detail work, side-laps and end-laps.
- Storage and handling:
 - Store rolls on end and maintain in an upright position to prevent damage.
 - Store rolls in a clean dry location and cover as necessary to protect rolls from environmental damage such as extreme cold, heat, or moisture.
 - Refer to the PDS and SDS for additional information.

Preparation:

- Prior to beginning work, refer to NRCA CERTA, local codes and the building owner's hot work inspection, permitting and monitoring requirements.
- Where the applicator deems conditions are unsafe to use open flames, [SOPREMA®](#) alternate application methods should be used to install SBS modified bitumen vapor retarders. Acceptable alternate methods include cold adhesive-applied, hot asphalt-applied, self-adhered, hot-air welding or a combination of appropriate SBS modified bitumen materials and methods may be used.
- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and vapor retarder application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during application.
- Ensure all substrates are prepared and acceptable to receive the heat-welded vapor retarder.
- Where required, ensure substrates are primed using [ELASTOCOL™ 350](#) or [ELASTOCOL™ 500](#) primer. Ensure primer is fully dry before beginning heat-welding operations. Refer to [Section 1.1](#).
- Remove all roll packaging tape and properly dispose prior to installation of the vapor retarder.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of primer, vapor retarder and other above-deck roofing materials.
 - Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
 - Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
 - When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.
 - A relative humidity (RH) of 75% or less is considered acceptable to apply primer for [SOPREMA®](#) SBS vapor retarders.

- For concrete decks with low RH values (less than 75%), the concrete should be primed using the applicable SOPREMA primer before applying heat welded vapor retarder options indicated herein.
- For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (over 75% RH), refer to vapor retarder options using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - Apply the specified primer to the clean, prepared substrate. Ensure primer is fully dry.
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the samples to cool.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
 - Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- Field Ply:
 - Unroll field plies onto the roof surface and allow time to relax prior to heat welding.
 - Starting at the low point of the roof, lay out the field plies to ensure they are installed perpendicular to the roof slope, shingled to prevent back-water laps.
 - Cut field ply to working lengths and widths to conform to rooftop conditions, and lay out to always work to a selvage edge.
 - Cut rolls to working lengths to conform to roof conditions, and lay out to always work to a selvage edge. In order to maintain the venting pattern on the underside of the sheet, the sheet may be butted at each end. Strip-in the butted end laps using a fully-adhered heat-welded strip-in ply. If end-laps are over-lapped, the venting channels must be maintained and all T-joints sealed watertight.
 - As the sheet is un-rolled, apply heat to the underside of the sheet until the plastic burn-off film melts away from the ribbons of bitumen. Direct the torch high on the roll as required to prevent lifting the sheet.
 - Continuously move the roof torch side-to-side across the underside of the roll as required to melt the bitumen ribbons on the underside of the sheet while not melting the sanded bitumen between ribbons.
 - While unrolling and heating the sheet, ensure the melted bitumen ribbons maintain contact with the substrate as necessary to adequately adhere the ribbons to the substrate.
 - Adjust the application of heat as required for varying substrates and environmental conditions.
 - At sheet terminations, ensure the venting pattern is maintained as required to continue the venting pattern to adjacent flashing details.
 - At all side-laps, ensure side-laps are heat-welded across the full width, and there is approximately 1/8 to 1/4 in bleed-out.

- For lightweight insulating concrete substrates, and where specified, install one-way spun aluminum roof vents evenly spaced to cover 1,000 sq ft per vent.
- Flashing Ply:
 - Unroll flashing plies onto the roof surface and allow time to relax prior to installing the ply.
 - Ensure all flashing substrates are prepared and acceptable to receive the heat-welded flashing ply.
 - Cut rolls to working lengths to conform to flashing conditions, and lay out to always work to a selvage edge.
 - Install non-combustible cant strips at transitions where required. Cants may be omitted where specified and where [SOPREMA®](#) flashing plies meet the following requirements:
 - Flashing ply: Heat welded, polyester reinforced. Refer to [Figure 3.1.2b](#).
 - Before installing flashings, extend the sheet up from the horizontal field of the roof to the top of the cant (if used), at all vertical roof terminations, transitions and penetrations.
 - Install the flashing ply starting at the top leading edge of the vertical flashing substrate, down over the cant and onto the horizontal surface of the roof a minimum of 3 in beyond the wall/curb or base of the cant (if used) onto the horizontal roof surface. Ensure a minimum 3 in side-lap is maintained.
 - As the flashing ply is un-rolled, apply heat to the underside of the flashing ply until the plastic burn-off film melts away from the ribbons of bitumen. Direct the torch high on the roll as required to prevent lifting the sheet. Continuously move the torch side-to-side across the underside of the roll as required melt the bitumen ribbons on the underside of the sheet while not melting the sanded bitumen between ribbons.
 - While unrolling and heating the flashing ply, ensure the melted bitumen ribbons maintain contact with the substrate as necessary to adequately adhere the ribbons to the substrate.
 - Install gussets to seal inside and outside corner transitions.
 - Ensure approximately 1/8 to 1/4 in bitumen bleed-out is present at all flashing side-laps and end-laps. Where sufficient bitumen bleed-out is not present, apply hot bitumen or [SOPRAMASTIC SP1](#) sealant to seal the vapor retarder termination along all roof terminations, transitions and penetrations. These include pipe penetrations, along the top edge of curb and wall flashing, and all other flashing terminations where necessary to seal flashings watertight.
 - Use a damp sponge float or damp cloth to press-in the heat-welded flashing plies during installation.
 - Fasten the top leading edge of the flashings 8 in on-centers with appropriate 1 in metal cap nails where required.
 - Seal flashing fastener penetrations watertight using [SOPRAMASTIC SP1](#) sealant.
 - Adjust the application of heat as required for varying substrates and environmental conditions.
 - Ensure the venting pattern is maintained as required to continue the venting pattern at the flashing termination.
 - Where specified, ensure partially-adhered flashings that are designed to vent pressure to the atmosphere are adhered at all adhesive ribbons on the underside of the flashing base ply. The sanded vent channels should remain un-adhered to the substrate.
 - Partially adhered, heat welded flashing plies are limited to vertical flashing applications such as walls and curbs.
 - The flashing ply at all horizontal details should be fully adhered by heat welding, cold adhesive-applied using the specified COLPLY™ flashing cement or self-adhesive applied. Refer to [Sections 3.1.1](#) for fully adhered heat welded flashing plies, [Section 3.2.1](#) for fully adhered cold adhesive-applied flashing plies or [Section 3.3.1](#) for fully adhered self-adhesive applied flashing plies.
 - Other partial attachment methods for vertical flashings may include the following:
 - Mechanically fastened base sheets. Refer to [Section 2.1](#).
 - Mechanically fastened [SOPRABOARD™](#) or approved cement roof board.
 - Partially adhered, self-adhesive flashing plies. Refer to [Section 3.3.2](#).

- Counterflashing, or other flashing must be installed along the top leading edge of partially adhered flashing details as required to prevent moisture infiltration into the opened venting channels.
- Refer to flashing application guidelines indicated herein.
- Contact [SOPREMA®](#) for additional flashing options.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the heat-welded ribbons are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding
- Temporary night seals are required to seal vapor retarder terminations and transitions watertight. Remove temporary night seals before resuming the vapor retarder installation.
- Temporary night seals must be removed upon resuming the installation to ensure venting channels are maintained as specified.
- Each day, ensure all vented flashing details are flashed and sealed watertight to prevent moisture infiltration into the venting channels.
- Vapor retarder exposure and phased applications:
 - Ensure conditions are satisfactory to install subsequent insulation when the vapor retarder is installed and left exposed to UV, dust, debris, traffic and other extreme conditions for an extended period of time. Due to the wide range of environmental conditions and project related exposures, the effects from these exposures vary.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.1.2a Partially-Adhered, Heat-Welded Vapor Retarders					
Name	Application	Reinforcement	Bottom Surfacing	Top Surfacing	Overlying Insulation Options
COLVENT™ TG	Field ply	Glass fiber	Ribbons of polyfilm and sand	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete
COLVENT™ 180 TG	Field ply, Flashing ply	Non-woven polyester	Ribbons of polyfilm and sand	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete

Table 3.1.2b Substrates For Partially-Adhered, Heat-Welded Vapor Retarders	
Substrate***	Preparation
Wood	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Concrete/Concrete deck	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Masonry	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Approved gypsum roof boards**	Optional prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Approved cement roof boards**	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
Approved cellular lightweight insulating concrete over vented steel form deck**	Prime with ELASTOCOL™ 500* or ELASTOCOL™ 350*
	No primer required pending satisfactory peel results

*Refer to [Section 1.1](#) for primer application.

** Contact [SOPREMA®](#) for additional information.

***Refer to NRCA CERTA recommendations for heat welding application methods and protection of substrates.

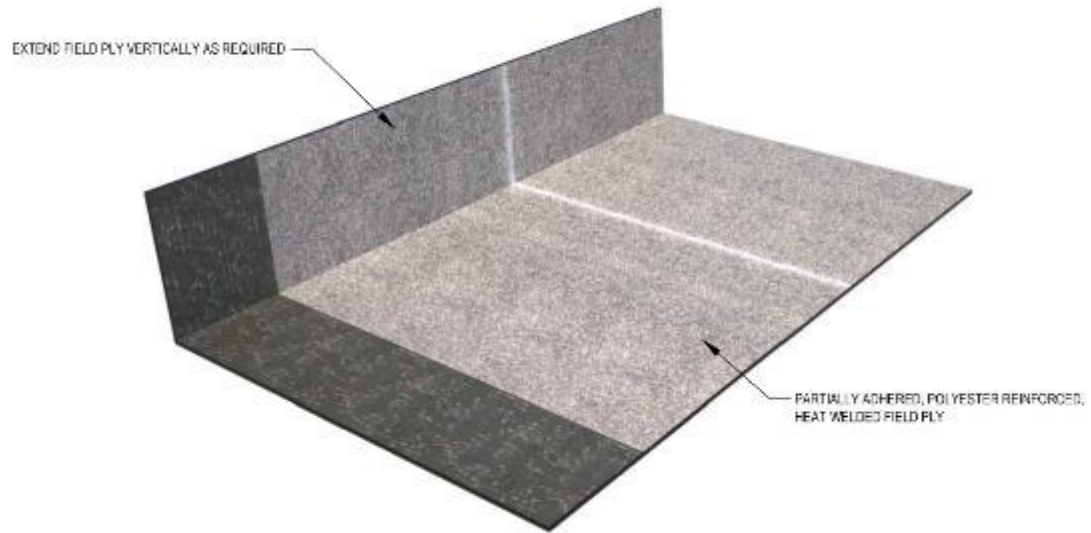


Figure 3.1.2a Partially Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb Without Cant

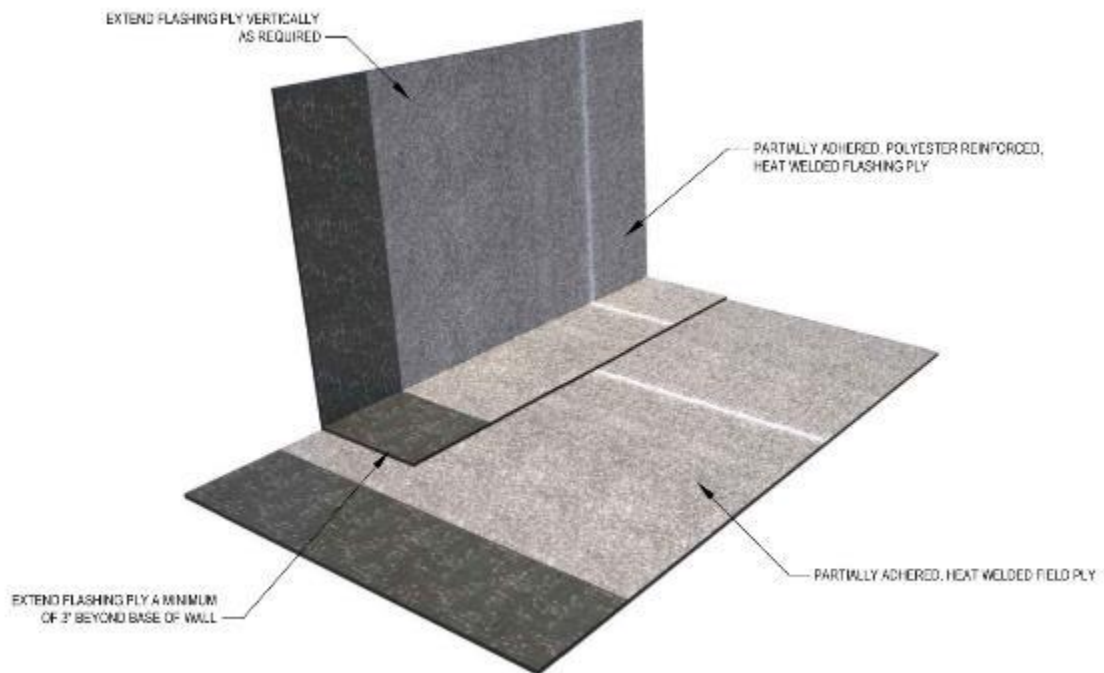


Figure 3.1.2b Partially Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb Without Cant



Figure 3.1.2c Partially Adhered, Heat Welded Vapor Retarder Termination at Wall/Curb With Cant

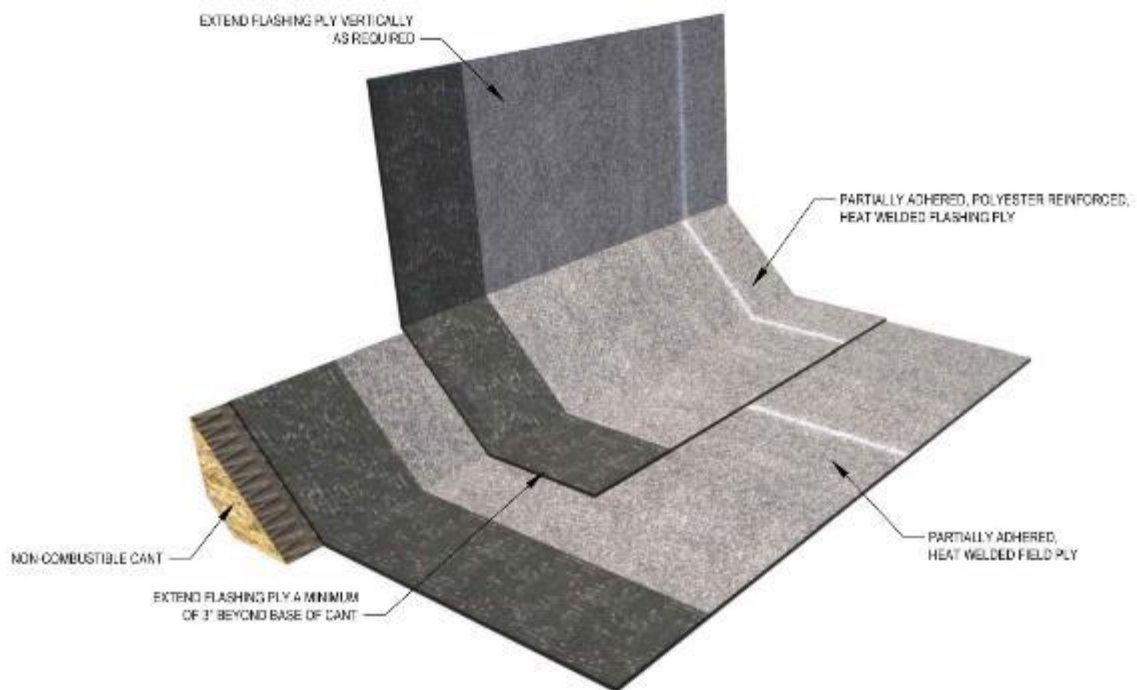


Figure 3.1.2d Partially Adhered, Heat Welded Vapor Retarder Flashing at Wall/Curb Flashing With Cant

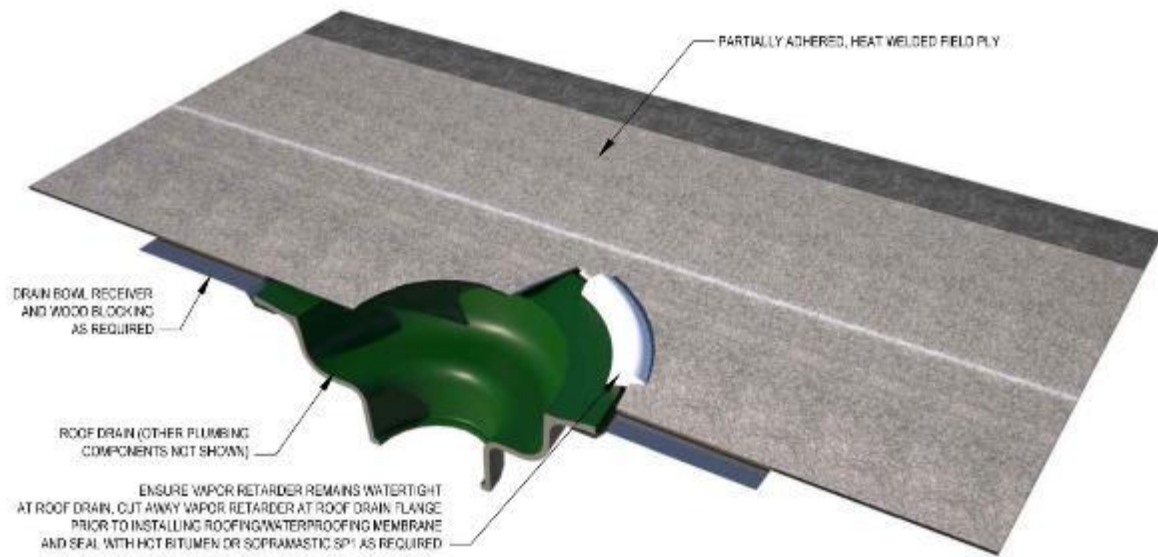


Figure 3.1.2e Partially Adhered, Heat Welded Vapor Retarder at Roof Drain

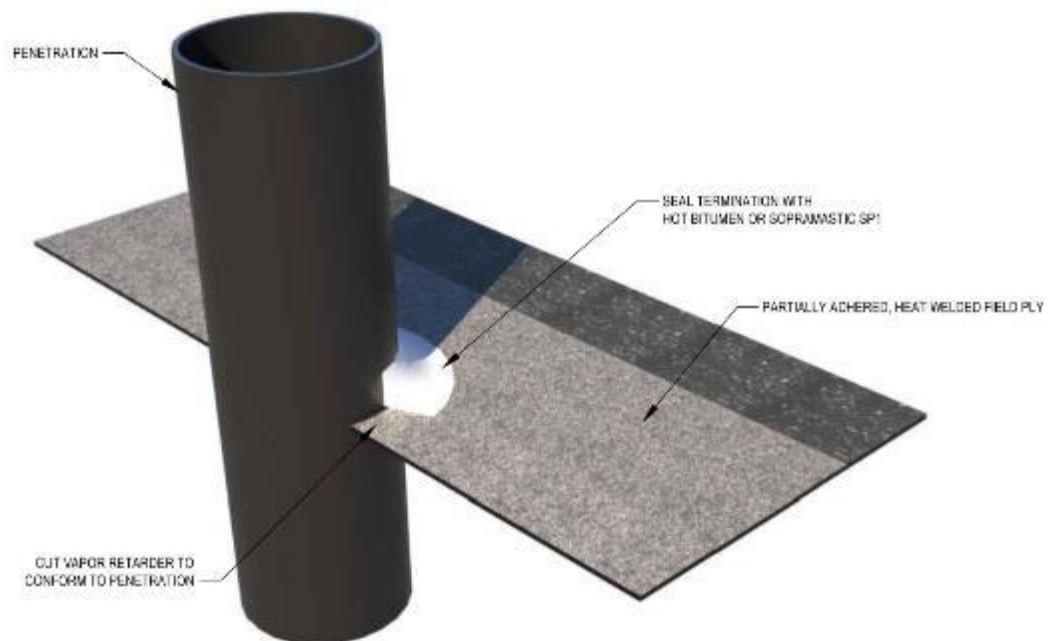


Figure 3.1.2f Partially Adhered, Heat Welded Vapor Retarder at Penetration

3.2 COLD ADHESIVE-APPLIED SBS MODIFIED BITUMEN VAPOR RETARDERS

3.2.1 FULLY ADHERED, COLD ADHESIVE-APPLIED VAPOR RETARDERS

General:

- [SOPREMA®](#) cold adhesive-applied SBS modified bitumen vapor retarders may be installed over concrete roof decks, structural lightweight concrete roof decks, thermal barriers, mechanically fastened base sheets, and other appropriate roof substrates. Refer to [Table 3.2.1b](#). Contact [SOPREMA®](#) for additional information.
- The underside of the SBS modified bitumen vapor retarders are sanded for cold adhesive-application, and the top surface is also sanded to allow for insulation or lightweight insulating concrete application above the vapor retarder. Refer to [Table 3.2.1a](#).
- [SOPREMA®](#) cold adhesives:
 - [COLPLY™ ADHESIVE](#): Low VOC (< 250 g/L) polymer-modified membrane adhesive.
 - [COLPLY™ EF ADHESIVE](#): Moisture-cured, polyether, low-odor, polymeric membrane adhesive
- [SOPREMA®](#) flashing cements:
 - [COLPLY™ FLASHING CEMENT](#): Low VOC (< 250 g/L) polymer-modified flashing adhesive.
 - [COLPLY™ EF FLASHING CEMENT](#): Non-toxic, low-odor, solvent free, polymeric flashing adhesive
- Storage and handling:
 - Store rolls on end and maintain in an upright position to prevent damage.
 - Store rolls in a clean dry location and cover as necessary to protect rolls from environmental damage such as extreme cold, heat, or moisture.
- Refer to [SOPREMA®](#) PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on the adhesives, flashing cements and vapor retarders plies.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during application.
- The following precautions are recommended during extended periods of cold weather:
 - During extended periods of cold weather, store drums, 5 gallon pails and related vapor retarder materials in heated areas to ensure materials are 70°F (21°C) at the time of application.
 - During extended periods of cold weather, maintain materials in heated storage areas until the materials are needed on the rooftop.
 - Provide drum and pail heaters when necessary to maintain materials 70°F (21°C) on the rooftop when materials are exposed to cold weather during application.
 - The ambient temperature should be at least 40°F (4.4°C), and rising to help ensure conditions are acceptable to apply materials. Wind, cloud cover and sun may also have an effect on material application during cold weather.
- The following are recommended for [COLPLY™ EF ADHESIVE](#) during periods of hot, humid weather:
 - When conditions are hot and humid, [COLPLY™ EF ADHESIVE](#) cures and skins-over quickly. Store pails in cool, dry storage areas, away from direct sun.
 - Once opened, maintain lids on drums and pails to prevent skinning.
- Primer: Refer to [Section 1.1](#).
 - Primer is optional when using [COLPLY™ ADHESIVE](#) and [COLPLY™ FLASHING CEMENT](#). Primer may be applied to reduce adhesive consumption rates for some absorptive substrates.
 - Primer is not recommended for [COLPLY™ EF ADHESIVE](#) or [COLPLY™ EF FLASHING CEMENT](#).

- Ensure all substrates are clean, dry and prepared to receive the specified adhesive or flashing cement and vapor retarder.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of primer, adhesives, vapor retarder and other above-deck roofing materials.
 - Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
 - Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
 - When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.
 - A relative humidity (RH) of 75% or less is considered acceptable to prime concrete and apply [COLPLY™ ADHESIVE](#) and [COLPLY™ FLASHING CEMENT](#).
 - For concrete decks with low RH values (less than 75%), it is acceptable to prime the concrete and apply [COLPLY™ ADHESIVE](#) and [COLPLY™ FLASHING CEMENT](#).
 - For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (RH over 75%), [SOPREMA®](#) recommends using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive to apply the [SOPREMA®](#) SBS modified bitumen vapor retarder.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - For [COLPLY™ ADHESIVE](#) and [COLPLY™ FLASHING CEMENT](#), apply the specified primer to the clean, prepared substrate. Ensure primer is fully dry.
 - Primer is not recommended for concrete when using [COLPLY™ EF ADHESIVE](#) or [COLPLY™ EF FLASHING CEMENT](#).
 - Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Allow sufficient time for the adhesive to dry/cure.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
 - Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- Field ply:
 - Before beginning the installation, unroll the sheet onto the roof surface and allow the ply to relax prior to installing.
 - Re-roll the sheet in order for the plies to be unrolled into the adhesive while ensuring the specified side and end-laps are maintained.
 - Adhesive application:
 - [COLPLY™ ADHESIVE](#) may be applied using a 3/16 – 3/8 in notched squeegee, brush or spray-applied using approved spray equipment.

- [COLPLY™ EF ADHESIVE](#) may be applied using a 3/16 – 3/8 in notched squeegee or brush. [COLPLY™ EF ADHESIVE](#) may not be applied using spray equipment.
 - Apply adhesive to low-slope roofing substrates at 1-1/2 to 2 gallons per square.
 - Apply adhesive at 2 to 2.5 gallons per square or more for unprimed, absorptive and/or rough substrates.
 - Adjust the application rates based upon conditions as required to achieve full coverage.
- Starting at the low point of the roof, lay out the sheet to ensure they are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut rolls to working lengths and widths to conform to roof conditions, and lay out to always work to a selvage edge.
- Install the specified sheet adhesive ahead of the sheet application. Do not allow the adhesive to skin-over before the sheet is applied into the adhesive. The sheet will not adhere where adhesive has skinned over.
- Use a follow tool, weighted roller or broom the leading edge of the sheet to the substrate, working forward and outward as necessary to remove wrinkles. Avoid walking over the sheet and prevent adhesive displacement or damage during application.
- Side and end laps:
 - Apply sufficient adhesive coverage to ensure 1/8 to 1/4 in of adhesive bleed-out at all laps.
 - At end-laps, cut a 45 degree dog-ear away from the selvage edge for all T-joints.
 - For low-slope areas where the slope falls below 1/4 in per foot, and where otherwise specified, leave all side and end-laps “dry,” and hot-air weld or torch all laps watertight.
 - [COLPLY™ EF ADHESIVE](#) moisture-cured adhesive may be used to seal side and end-laps where the roof slope is less than 1/4 in per foot, unless otherwise specified.
- Flashing ply:
 - Unroll flashing plies onto the roof surface and allow time to relax prior to installation.
 - Unroll the flashing ply onto the roof surface to their complete length. Once relaxed, cut the flashing ply to the required working lengths to accommodate the flashing height, cants and the required over-lap onto the horizontal roof surface.
 - Cut the flashing ply from the end of the roll in order to always install flashings to the side-lap line or selvage edge line.
 - Install cants at all vertical roof transitions.
 - Ensure correct field and flashing sequencing to achieve watertight flashings.
 - Before installing flashings, install the sheet in the horizontal field of the roof, then extend the sheet up to the top of the cant at vertical terminations, transitions and penetrations.
 - Install the flashing ply starting at the top leading edge of the vertical substrate, then down over the cant and onto the horizontal surface of the roof a minimum of 3 in beyond the of base of the cant. Cut the flashing ply at corners to form 3 inch side-laps. Install gussets to seal corner transitions.
 - Apply flashing cement at 2.0 – 2.5 gallons per square using a ¼ inch notched trowel. Apply flashing cement to the flashing substrate, and apply flashing cement to the underside of the flashing ply as required to ensure full adhesion. Application rates vary based on substrate and environmental conditions.
 - During the flashing installation, ensure all plies are completely adhered into place with no bridging, voids or openings. Ensure bleed-out is present at all flashing side-laps and end-laps.
 - Use a roller and press-in the flashing plies during installation to ensure plies are in full contact with the substrate below.
 - Where sufficient bleed-out is not present, apply hot bitumen or [SOPRAMASTIC SP1](#) sealant to seal the membrane termination along all roof terminations, transitions and penetrations. These include gravel stop edge metal, pipe penetrations, along the top edge of curb and wall flashing, and all other flashing terminations where necessary to seal the edge of flashing plies watertight.

- Fasten the top leading edge of vertical flashings 8 in on-centers with appropriate 1 in metal cap nails or other specified fasteners as required. Seal fastener penetrations watertight using [SOPRAMASTIC SP1](#) sealant or [SOPRAMASTIC SBS ELASTIC CEMENT](#) mastic.
- ALSAN® RS and [ALSAN® FLASHING](#) liquid-applied, reinforced flashing systems may be installed as an alternate to SBS flashing membranes. Refer to [Section 4, LIQUID APPLIED FLASHINGS](#).
- Contact [SOPREMA®](#) for other flashing options.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered and watertight.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.
- Temporary night seals are required to seal vapor retarder terminations and transitions watertight. Remove temporary night seals before resuming the vapor retarder installation.
- Ensure adhesive is sufficiently dry and cured to prevent damage from construction-related traffic or the application of subsequent materials.
- Vapor retarder exposure and phased applications:
 - Due to the wide range of environmental conditions and project related exposures, the effects from exposures vary.
 - When the vapor retarder is left exposed for an extended period to UV, dust, debris, traffic and other extreme conditions, thoroughly examine the vapor retarder to ensure conditions are satisfactory to install subsequent roofing materials.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.2.1a Fully Adhered, Cold Adhesive-Applied Vapor Retarders

Name	Application	Reinforcement	Bottom Surfacing	Top Surfacing	Overlying Insulation Options
ELASTOPHENE® SANDED 2.2, ELASTOPHENE® SANDED 3.0, ELASTOPHENE® HR SANDED 2.2, ELASTOPHENE® HR SANDED 3.0	Field Ply	Glass fiber	Sanded	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete.
SOPRALENE® 180 SANDED 2.2, SOPRALENE® 180 SANDED, SOPRALENE® 250 SANDED	Field ply, Flashing ply	Non-woven polyester	Sanded	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete.

Table 3.2.1b Substrate Preparation, Fully Adhered, Cold Adhesive-Applied Vapor Retarders

Ply	Adhesive	Substrate	Primer
All fully adhered, cold adhesive-applied SBS vapor retarder field plies. Refer to Table 3.2.1a .	COLPLY™ ADHESIVE	Concrete/Concrete deck	Optional prime with ELASTOCOL™ 500 * or ELASTOCOL™ 350 *
		Metal	
		Masonry	
		Approved gypsum roof boards	
		Approved cement roof boards	
		Wood	
		SOPRABOARD™	
	COLPLY™ EF ADHESIVE	All mechanically fastened base sheets with a sanded top surfacing. Refer to Table 2.1a .	None
		Concrete/Concrete deck	None
		Metal	
		Masonry	
		Approved gypsum roof boards	
		Approved cement roof boards	
		Wood	
All fully adhered, cold adhesive-applied SBS vapor retarder flashing plies. Refer to Table 3.2.1a .	COLPLY™ FLASHING CEMENT	SOPRABOARD™	Optional prime with ELASTOCOL™ 500 * or ELASTOCOL™ 350 *
		Concrete	
		Metal	
		Masonry	
		Approved gypsum roof boards	
		Approved cement roof boards	
		Wood	
	COLPLY™ EF FLASHING CEMENT	All mechanically fastened base sheets with a sanded top surfacing. Refer to Table 2.1a .	None
		Concrete	None
		Metal	
		Masonry	
		Approved gypsum roof boards	
		Approved cement roof boards	
		Wood	
		SOPRABOARD™	
		All mechanically fastened base sheets with a sanded top surfacing. Refer to Table 2.1a .	

* Refer to [Section 1.1](#) for primer application.

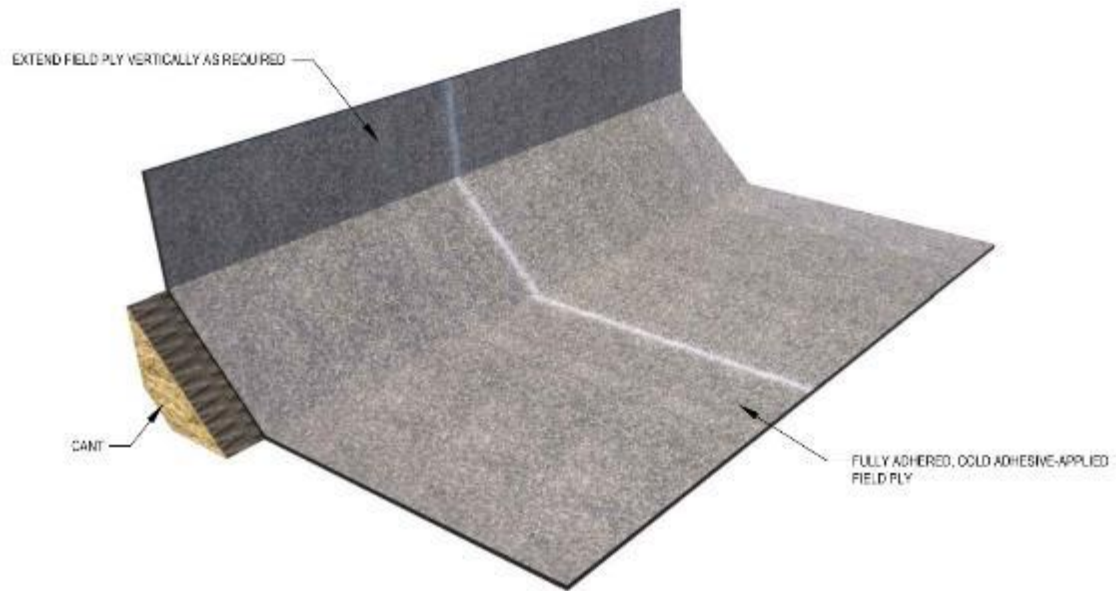


Figure 3.2.1a Fully Adhered, Cold Adhesive-Applied Vapor Retarder Termination at Wall/Curb

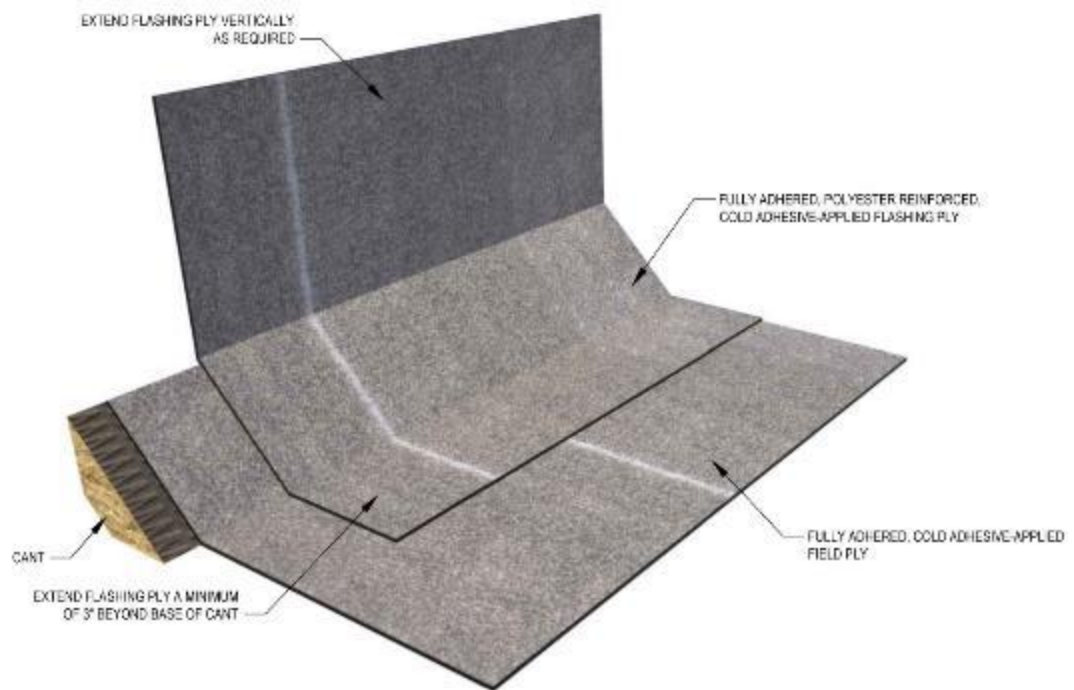


Figure 3.2.1b Fully Adhered, Cold Adhesive-Applied Vapor Retarder Flashing at Wall/Curb

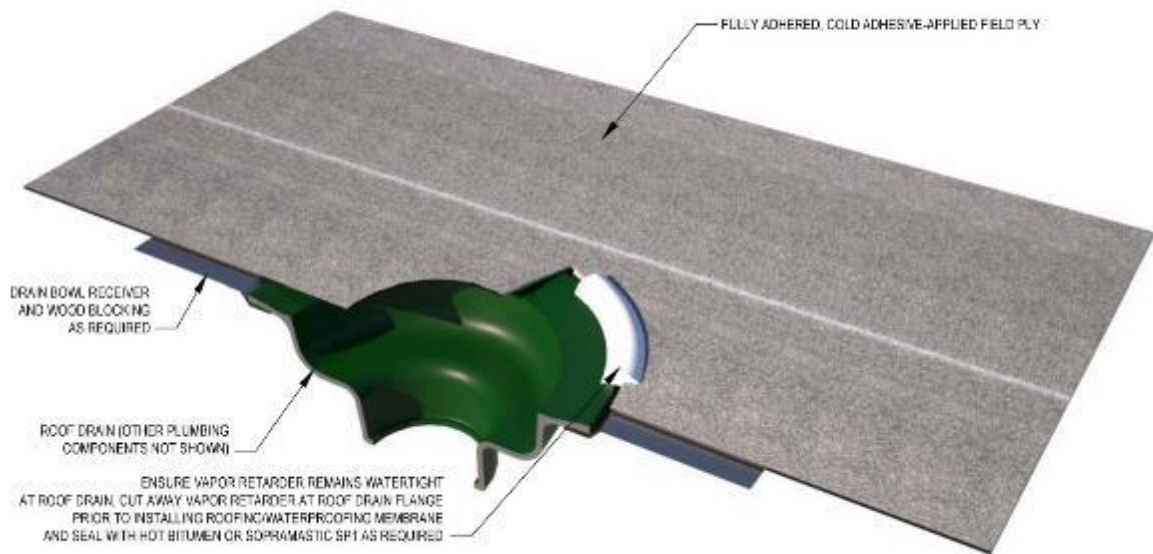


Figure 3.2.1c Fully Adhered, Cold Adhesive-Applied Vapor Retarder at Roof Drain

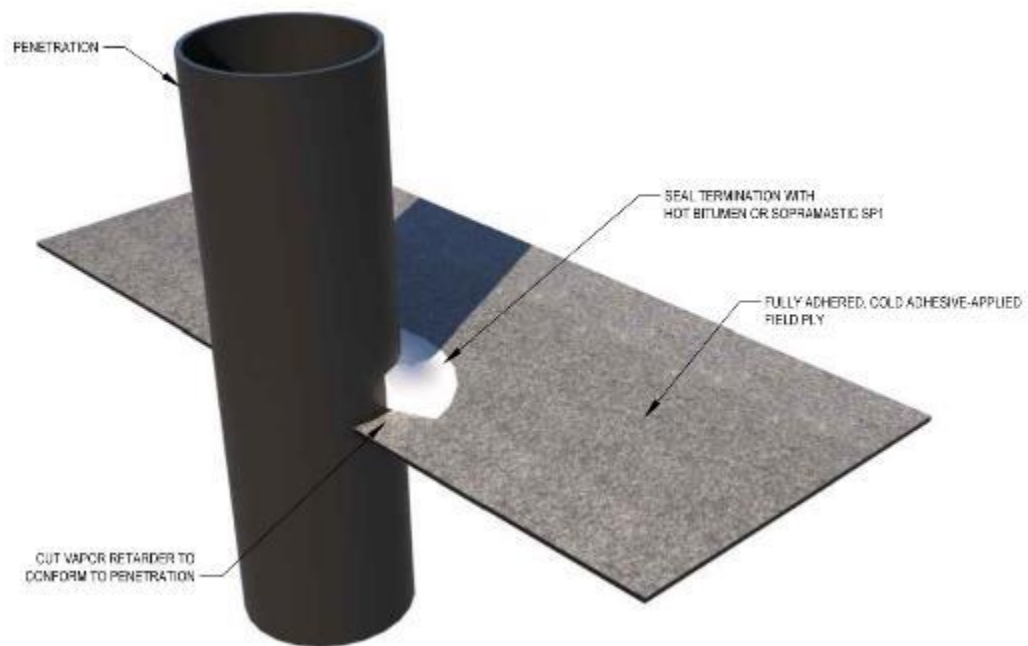


Figure 3.2.1d Fully Adhered, Cold Adhesive-Applied Vapor Retarder at Penetration

3.2.2 PARTIALLY ADHERED, COLD ADHESIVE-APPLIED VAPOR RETARDER FIELD PLIES

General:

- [SOPREMA®](#) partially-adhered, vapor retarders are installed using ribbons of [SOPREMA® COLPLY™ EF ADHESIVE](#) over approved structural concrete, structural lightweight concrete, gypsum, lightweight insulating concrete and other roof deck substrates.
- [COLPLY™ EF ADHESIVE](#) ribbon-applied vapor retarders allow vapor pressure to disperse and/or dissipate between the un-adhered channels between ribbons of adhesive.
- The underside of the SBS modified bitumen vapor retarders are sanded for cold adhesive-application, and the top surface is also sanded to allow for insulation or lightweight insulating concrete application above the vapor retarder. Refer to [Table 3.2.2a](#).
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and vapor retarder application.
- The following precautions are recommended during extended periods of cold weather:
 - During extended periods of cold weather, store drums, 5 gallon pails and related vapor retarder materials in heated areas to ensure materials are 70°F (21°C) at the time of application.
 - During extended periods of cold weather, maintain materials in heated storage areas until the materials are needed on the rooftop.
 - Provide drum and pail heaters when necessary to maintain materials 70°F (21°C) on the rooftop when materials are exposed to cold weather during application.
 - The ambient temperature should be at least 40°F (4.4°C), and rising to help ensure conditions are acceptable to apply materials. Wind, cloud cover and sun may also have an effect on material application during cold weather.
- The following are recommended for [COLPLY™ EF ADHESIVE](#) during periods of hot, humid weather:
 - When conditions are hot and humid, [COLPLY™ EF ADHESIVE](#) cures and skins-over quickly. Store pails in cool, dry storage areas, away from direct sun.
 - Once opened, maintain lids on drums and pails to prevent skinning.
- Ensure all substrates are clean, dry and prepared to receive the specified adhesive or flashing cement and vapor retarder.
- Structural Concrete and Structural Lightweight Concrete roof decks:
 - Ensure concrete roof decks are uniform, and free of damage and loose materials that may prevent adhesion of vapor retarder and other above-deck roofing materials.
 - Exposure to precipitation, dew point temperatures and other environmental conditions may prolong the drying time needed for concrete roof decks.
 - Consideration should be given to the fact that concrete RH may vary as project conditions vary from day-to-day.
 - When necessary to quantify the concrete roof deck RH, refer to ASTM F2170 *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*.
 - For structural lightweight concrete and new concrete roof decks where high relative humidity (RH) is present (RH over 75%), [SOPREMA®](#) recommends using [COLPLY™ EF ADHESIVE](#) moisture-cured, polyether adhesive to apply the [SOPREMA®](#) SBS modified bitumen vapor retarder.
- Adhesion/peel tests are recommended for concrete and other substrates where surface conditions vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.

- Primer is not recommended for concrete when using [COLPLY™ EF ADHESIVE](#) or [COLPLY™ EF FLASHING CEMENT](#).
- Adhere an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) vapor retarder, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
- Allow sufficient time for the adhesive to dry/cure.
- Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
- Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

Application:

- Before beginning the installation, unroll vapor retarder onto the roof surface and allow the membrane to relax prior to installing.
- Re-roll the vapor retarder in order for the plies to be unrolled into the adhesive while ensuring the specified side and end-laps are maintained
- Adhesive application:
 - Apply parallel rows of [COLPLY™ EF ADHESIVE](#) ribbons (beads) using a spreader cart, or dispense [COLPLY™ EF ADHESIVE](#) from cartridges using guns.
 - Provide a “skip” in the rows of adhesive ribbons in order to “break” the rows and allow for cross-venting between ribbons. Provide one “skip” per roll of vapor retarder, spaced 33 to 45 ft apart, and as necessary to accommodate rooftop and roof perimeter conditions. Refer to [Figure 3.2.2a](#).
 - Fill spreader carts using 5 gallons of [COLPLY™ EF ADHESIVE](#) at a time to help ensure large amounts of adhesive do not cure in the cart during application.
 - Apply ribbons of adhesive ½ to ¾ in wide at the point of application. The ribbons should spread 2-1/2 to 3 in wide when the vapor retarder is rolled-in.
 - Seal side-laps and end-laps watertight using beads of [COLPLY™ EF ADHESIVE](#) dispensed from cartridges and guns, or seal laps using a hot air welder or roof torch.
 - One gallon of [COLPLY™ EF ADHESIVE](#) applied in ½ to ¾ in wide ribbons covers approximately 100 to 75 linear feet.
 - For concrete and lightweight insulating concrete substrates, the average coverage rate of [COLPLY™ EF ADHESIVE](#) is two gallons per square when the ribbons are applied at 6 in on centers.
 - Adhesive coverage rates may vary, adjust the application rate based upon project conditions.
- Starting at the low point of the roof, lay out the sheet to ensure they are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut rolls to working lengths and widths to conform to roof conditions, and lay out to always work to a selva edge.
- Install the specified vapor retarder adhesive ahead of the vapor retarder sheet application. Do not allow the adhesive to skin-over before the sheet is applied into the adhesive. The sheet will not adhere where adhesive has skinned over.
- Unroll the vapor retarder sheet into the ribbons of adhesive. The vapor retarder may also be installed by “flying-in” the sheet.
- Use a weighted roller to roll-in the sheet, working forward and outward as necessary to remove wrinkles.
- Roll-in the sheet as necessary to spread the ribbons of adhesive and ensure the sheet is fully bonded to the ribbons of adhesive.
- Side and End-Laps:

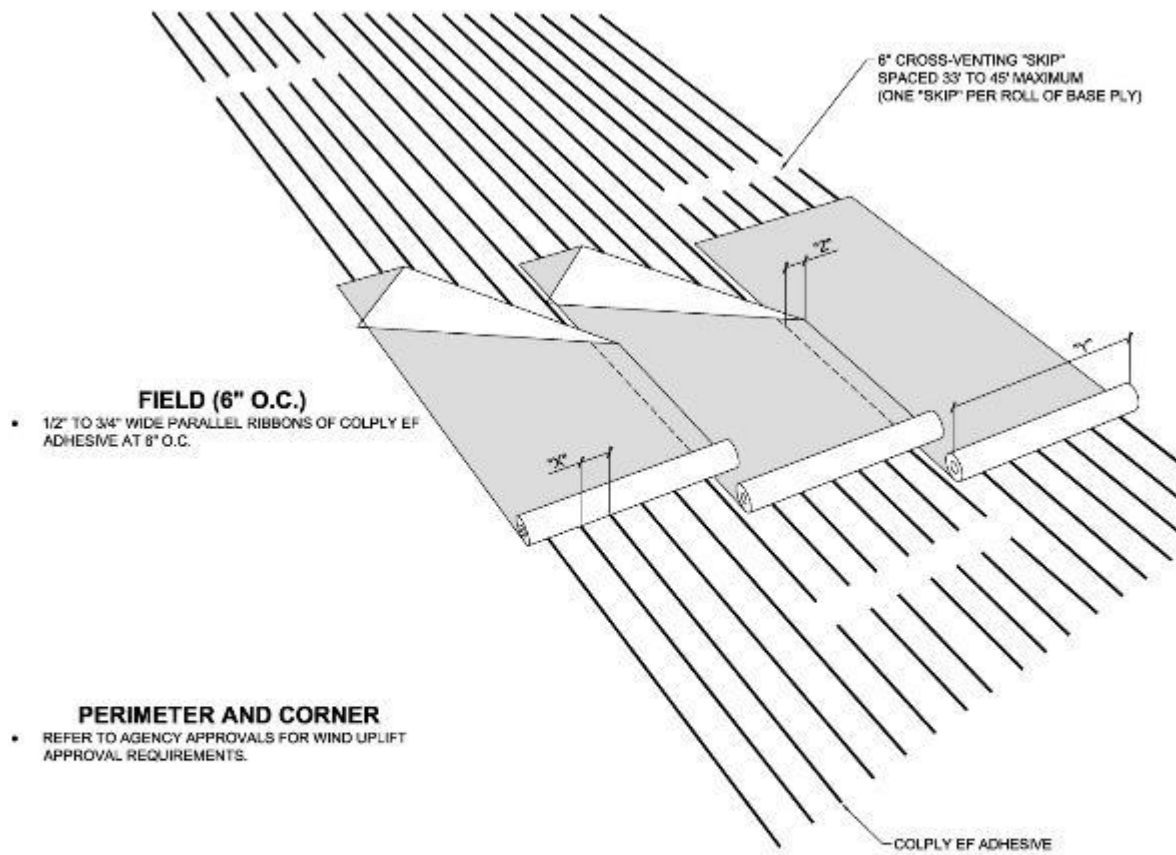
- [COLPLY™ EF ADHESIVE](#): Apply ½ to ¾ in wide beads in side laps using cartridges and guns as necessary to fully seal laps watertight and ensure 1/8 to 1/4 in of adhesive bleed-out.
- Heat Welding: Seal side and end-laps using roof torch or hot air welder to fully seal laps watertight.
- At end-laps, cut a 45 degree dog-ear away from the selvage edge for all T-joints.
- Venting Details:
 - Where specified or otherwise required, perimeter details may be partially attached to accommodate venting:
 - Partial attachment of vertical flashings include the following:
 - Mechanically fastened base sheets. Refer to [Table 2.1a](#).
 - Mechanically fastened [SOPRABOARD™](#) or approved cement roof board.
 - Partially adhered, heat welded flashing plies. Refer to [Section 3.1.2](#).
 - Partially adhered, self-adhesive flashing plies. Refer to [Section 3.3.2](#).
 - For lightweight insulating concrete substrates, and where specified, install one-way spun aluminum roof vents evenly spaced to cover 1,000 sq ft per vent.
 - Where conditions do not require venting, perimeter details may be fully adhered. Refer to the following details:
 - Fully adhered, heat welded flashing plies. Refer to [Section 3.1.1](#).
 - Fully adhered, cold adhesive-applied flashing plies. Refer to [Section 3.2.1](#).
 - Fully adhered, self-adhesive flashing plies. Refer to [Section 3.3.1](#).
 - Refer to flashing application guidelines indicated herein. Contact [SOPREMA®](#) for additional flashing options.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are adhered.
- Each day, repair all wrinkles, open laps, and all other deficiencies before proceeding
- Temporary night seals are required to seal flashing end terminations watertight. Temporary night seals must be removed upon resuming the installation to ensure venting channels are maintained as specified.
- Each day, ensure all vented flashing details are flashed watertight to prevent moisture infiltration into the venting channels between ribbons of adhesive.
- Vapor retarder exposure and phased applications:
 - Due to the wide range of environmental conditions and project related exposures, the effects from exposures vary.
 - When the vapor retarder is left exposed for an extended period to UV, dust, debris, traffic and other extreme conditions, thoroughly examine the vapor retarder to ensure conditions are satisfactory to install subsequent roofing materials.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.2.2a Partially-Adhered, Cold Adhesive-Applied Vapor Retarder Field Plies				
Name	Reinforcement	Bottom Surfacing	Top Surfacing	Overlying Insulation Options
SOPRALENE® 180 SANDED 2.2, SOPRALENE® 180 SANDED, SOPRALENE® 250 SANDED	Non-woven polyester	Sanded	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete

Table 3.2.2b Substrates for Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Plies		
Ply	Adhesive	Substrate
All partially adhered, cold adhesive-applied vapor retarder field plies. Refer to Table 3.2.2a .	COLPLY™ EF ADHESIVE	Concrete deck
		Poured gypsum deck
		Gypsum plank deck
		Cellular lightweight insulating concrete
		Wood deck



Roll Width (Y)	Lap Width (Z)	Zone	Pattern	Row Spacing (X)	Gallons Per Square ^A
39in (1m)	3in	Field	6in o.c.	6in	2

^ADOES NOT INCLUDE SIDE LAPS AND END LAPS. LAPS MAY BE SEALED USING COLPLY EF OR HEAT WELDED WATER TIGHT.

Figure 3.2.2a Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply, 6in O.C. Fastening Pattern



Figure 3.2.2b Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Wall/Curb Without Cant



Figure 3.2.3c Partially Adhered, Cold Adhesive-Applied Vapor Retarder Termination at Wall/Curb With Cant

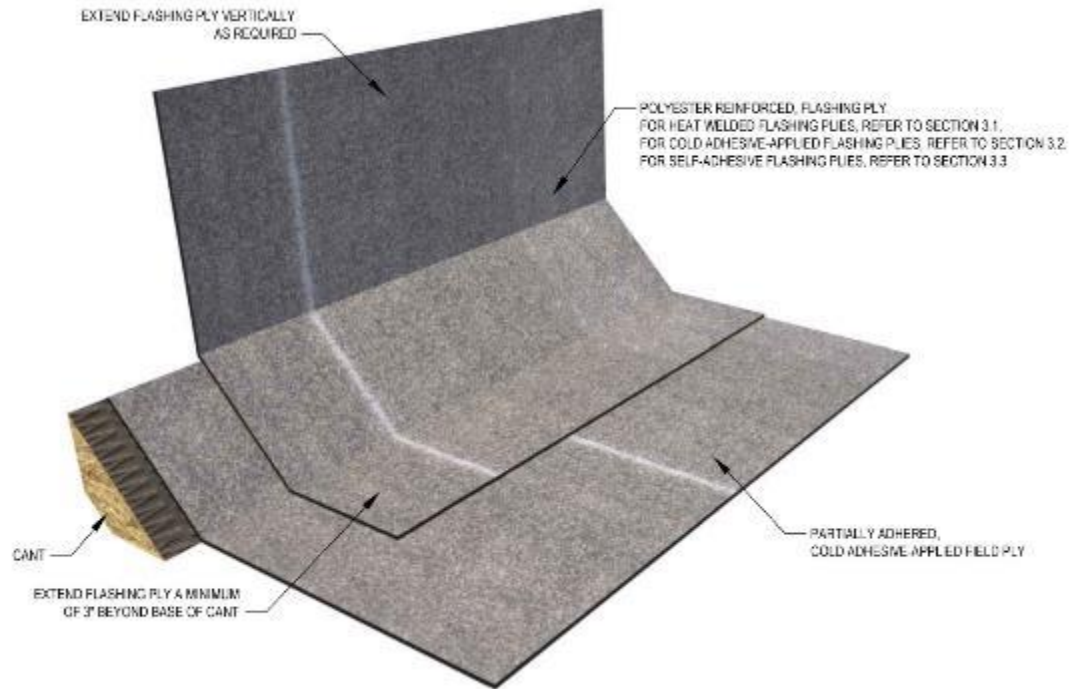


Figure 3.2.3d Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Wall/Curb With Cant

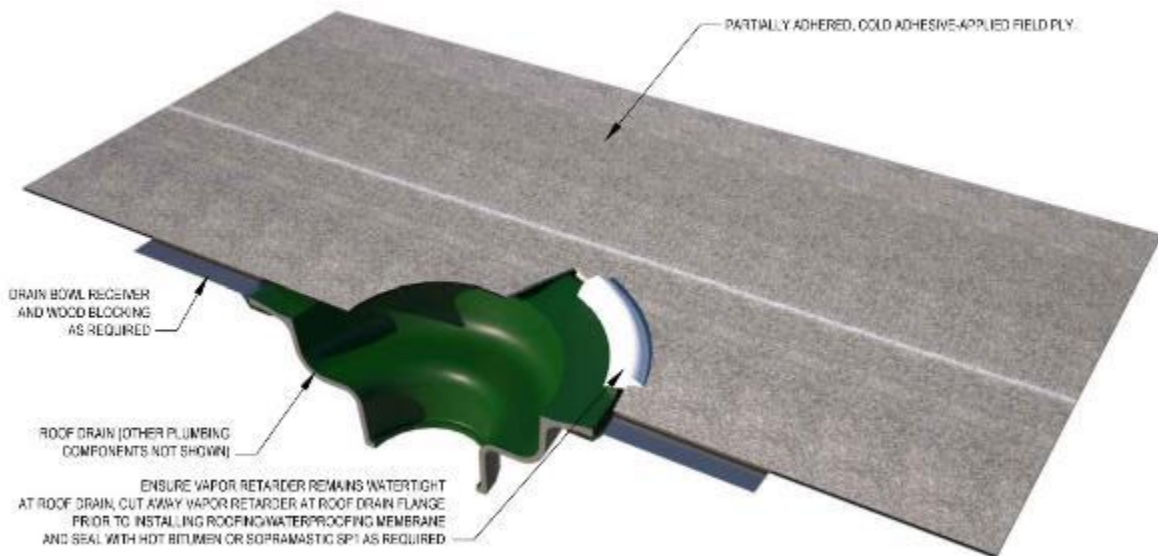


Figure 3.2.3e Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Roof Drain

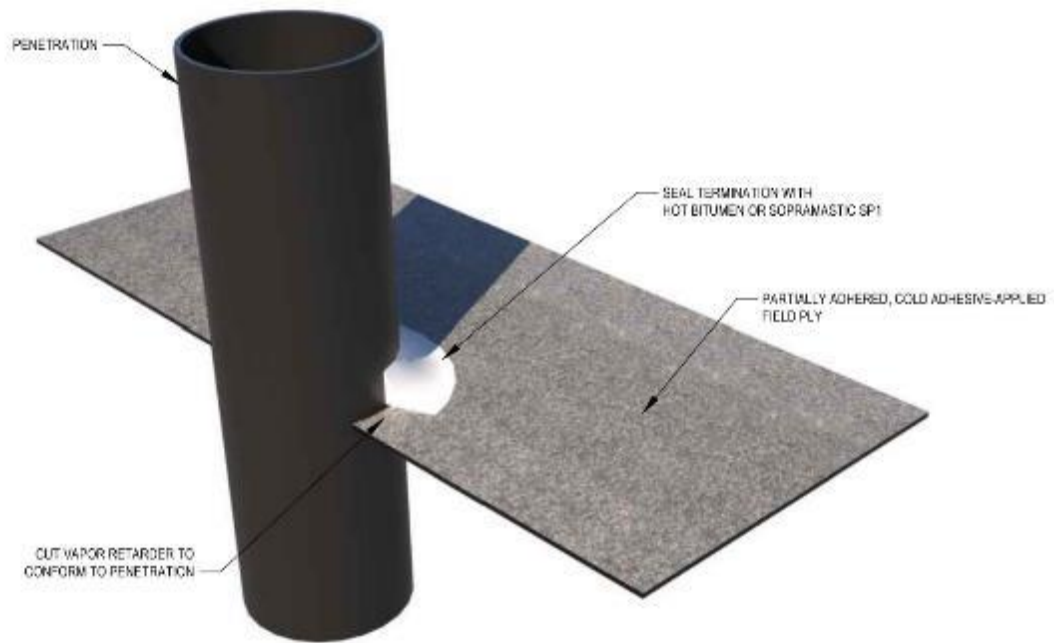


Figure 3.2.3f Partially Adhered, Cold Adhesive-Applied Vapor Retarder Field Ply at Penetration

3.3 SELF-ADHESIVE SBS MODIFIED BITUMEN VAPOR RETARDERS

3.3.1 FULLY ADHERED, SELF-ADHESIVE VAPOR RETARDERS

General:

- [SOPREMA®](#) self-adhesive vapor retarders may be installed over concrete roof decks, thermal barriers, mechanically fastened base sheets, and other appropriate roof substrates.
- Self-adhesive vapor retarders are composed of elastomeric SBS modified bitumen in combination with a high tack self-adhesive layer.
- [SOPREMA®](#) self-adhesive primer is recommended for optimum adhesion to approved substrates. Refer to [Table 1.2a](#) for primer options.
- [ELASTOPHENE® STICK](#) and [SOPRALENE® STICK](#) consist of protective polyolefin release film on the underside that is removed during application. The top surface is sanded to allow insulation or lightweight insulating concrete application above the vapor retarder. Components may be fastened through the vapor retarder into the structural deck. Refer to [Table 3.3.1.a](#).
- [SOPRAVAP'R™](#) consist of protective polyolefin release film on the underside that is removed during application. The top surface consists of a tri-laminate polyethylene film which allows insulation to be adhered above using DUOTACK 365. Components may be fastened through the vapor retarder into the structural deck. Refer to [Table 3.3.1.a](#).
- Primer may be omitted for steel decking when [SOPRAVAP'R™](#) will be adhered to the steel deck and the above-deck components will be fastened through the [SOPRAVAP'R™](#) into the steel deck.
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and vapor retarder application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during roofing application.
- Ensure all substrates are clean, dry and prepared to receive the specified self-adhesive primer and vapor retarder.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply self-adhesive primer and sheet.
 - The self-adhesive primer and sheet temperature should be 70°F (21°C) or more at the point of membrane application.
 - To ensure the primer is applied at 70°F (21°C) during cold weather, drums and 5 gallon pails should be stored in heated areas. Drums and 5 gallon pails exposed to cold temperature on the roof should be provided with heaters when necessary to ensure the minimum application temperature is maintained.
 - Water-based materials must not be stored below 40°F (4.4°C) to prevent damage from freezing.
 - Store rolls in a heated area to maintain the rolls above 70°F (21°C) during cold weather.
- Ensure all substrates are primed using self-adhesive vapor retarder primer. Primer is optional where subsequent roofing materials above the vapor retarder will be fastened through the vapor retarder and into the deck. Refer to [Section 1.2](#).
- Adhesion/peel tests are encouraged for concrete, masonry and other substrates where surface conditions may vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.

- Apply the specified primer to the clean, prepared substrate.
- Apply an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
- Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
- Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
- Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
- Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.
- Vapor retarder exposure:
 - Ensure conditions are satisfactory to install materials above the vapor retarder when the vapor retarder has been left exposed to UV, dust, debris, traffic and other extreme conditions for an extended period of time. Due to the wide range of environmental conditions and project related exposures the effects from these exposures will vary.
 - Adhesion/peel tests are encouraged to examine adhesion when conditions vary.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.
- Remove all roll packaging tape prior to installation.

Application:

- Field ply:
 - Unroll self-adhesive field plies onto the roof surface and allow time to relax prior to installing.
 - Starting at the low point of the roof, lay out the field plies to ensure they are installed perpendicular to the roof slope, shingled to prevent back-water laps.
 - Ensure all substrates are prepared and acceptable to receive the self-adhesive primer and vapor retarder.
 - Ensure self-adhesive primer is tacky to-the-touch, but not wet. Primer should not transfer to the finger tips when touched. Do not proceed if primer is wet or becomes fully dry or dirty. If primer becomes fully dry, dirty and loses all tack, re-prime the substrate as necessary to achieve sheet adhesion. [Refer to Section 1.2.](#)
 - Cut rolls to working lengths and widths to conform to rooftop conditions, and lay sheets onto the roof surface, always working to a selva edge.
 - Ensure the side-laps and the 6 in end-laps are maintained.
 - Peel the release film from the underside of the sheet. Press and adhere the leading edge of the sheet to the substrate.
 - As the release film is removed, use a weighted roller to firmly set the sheet in place. Ensure full contact is made between the self-adhesive ply and the primed substrate for full adhesion. Use a hand-roller to roll-in confined areas, and to ensure full contact.
 - Stagger self-adhered end-laps 3 ft apart.
 - End-laps and T-joints:
 - At all 6 in end-laps, cut a 45 degree dog-ear away from the 3 in selva edge.
 - [ELASTOPHENE® STICK](#) and [SOPRALENE® STICK](#) end-laps must be heat welded or sealed using a COLPLY™ adhesive. Seal all T-joints watertight using a hot-air welder, SOPRAMASTIC, or COLPLY™ cold adhesive.
 - [SOPRAVAP'R™](#) end-laps are self-adhered to the film surface without the need of primer nor adhesives. Use a hand-roller to roll-in T-joints.

- Flashing ply:
 - Unroll the self-adhesive vapor retarder flashing plies onto the roof surface to their complete length. Once relaxed, cut the flashing ply to the required working lengths to accommodate the flashing height, cants and the required over-lap onto the horizontal roof surface.
 - Cut the flashing ply from the end of the roll in order to always install flashings to the side-lap line or selva edge line.
 - Lay out the flashing ply to offset the field and flashing side-laps 12 inches so that the field and flashing side-laps are not aligned. Shingle the flashing ply laps to prevent back-water laps.
 - Install 45 degree cant strips at 90 degree transitions where required.
 - Ensure correct field and flashing sequencing to achieve watertight vapor retarder flashings.
 - Before installing flashings, install the sheet in the horizontal field of the roof, then extend the sheet up to the top of the cant at vertical terminations, transitions and penetrations.
 - Install the flashing ply starting at the top leading edge of the vertical substrate, then down over the cant and onto the horizontal surface of the roof a minimum of 3 in beyond the of base of the cant. Cut the flashing ply at corners to form 3 inch side-laps. Install gussets to seal corner transitions.
 - T joints and end-laps:
 - [ELASTOPHENE® STICK](#) and [SOPRALENE® STICK](#) end-laps must be heat welded or sealed using a COLPLY™ flashing cement or adhesive. Seal all T-joints watertight using a hot-air welder, SOPRAMASTIC, or COLPLY™ flashing cement or adhesive.
 - [SOPRAVAP'R™](#) end-laps are self-adhered to the film surface without the need of primer nor adhesives. Use a hand-roller to roll-in T-joints.
 - Apply [SOPRAMASTIC SP1](#) sealant to seal the vapor retarder termination watertight at all roof terminations, transitions and penetrations.
 - Fasten the top leading edge of the vapor retarder flashing 8 in on-centers with appropriate 1 in metal cap nails or other specified fasteners and plates where required. Seal fastener penetrations watertight using [SOPRAMASTIC SP1](#) sealant.
 - ALSAN® RS and [ALSAN® FLASHING](#) Liquid-applied, reinforced flashing systems may be installed as an alternate to SBS flashing membranes. Refer to [Section 4, LIQUID-APPLIED FLASHINGS](#).
 - Contact [SOPREMA®](#) for other vapor retarder flashing options.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.
- Temporary night seals are required to seal membrane and flashing terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Vapor retarder exposure and phased applications:
 - Due to the wide range of environmental conditions and project related exposures, the effects from exposures vary.
 - When the vapor retarder is left exposed for an extended period to UV, dust, debris, traffic and other extreme conditions, thoroughly examine the vapor retarder to ensure conditions are satisfactory to install subsequent roofing materials.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.3.1a Fully Adhered, Self-Adhesive Vapor Retarders					
Vapor Retarder	Application	Reinforcement	Bottom Surfacing	Top Surfacing	Overlying Insulation Options
ELASTOPHENE® STICK	Field ply	Glass fiber	Polyolefin release film	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete.
SOPRALENE® STICK	Field ply, Flashing ply	Non-woven polyester	Polyolefin release film	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.
					Rigid insulation boards adhered with hot asphalt.
					Lightweight concrete.
SOPRAVAP'R™	Field ply, Flashing ply	None	Polyolefin release film	Tri-laminate polyethylene	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
					Rigid insulation boards mechanically fastened through to deck.

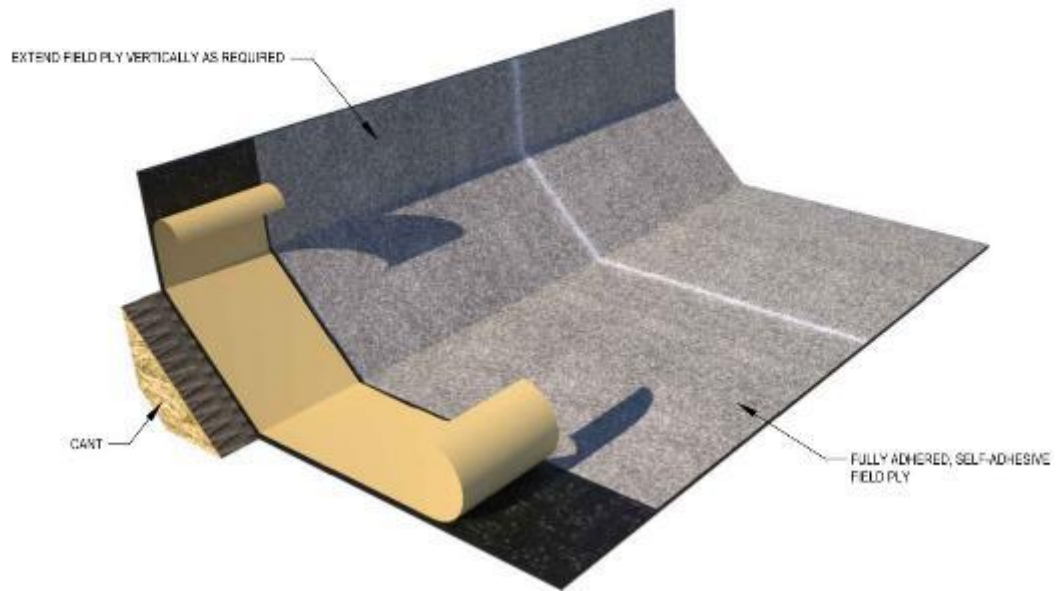


Figure 3.3.1a Fully Adhered, Self-Adhesive Vapor Retarder Termination at Wall/Curb With Cant

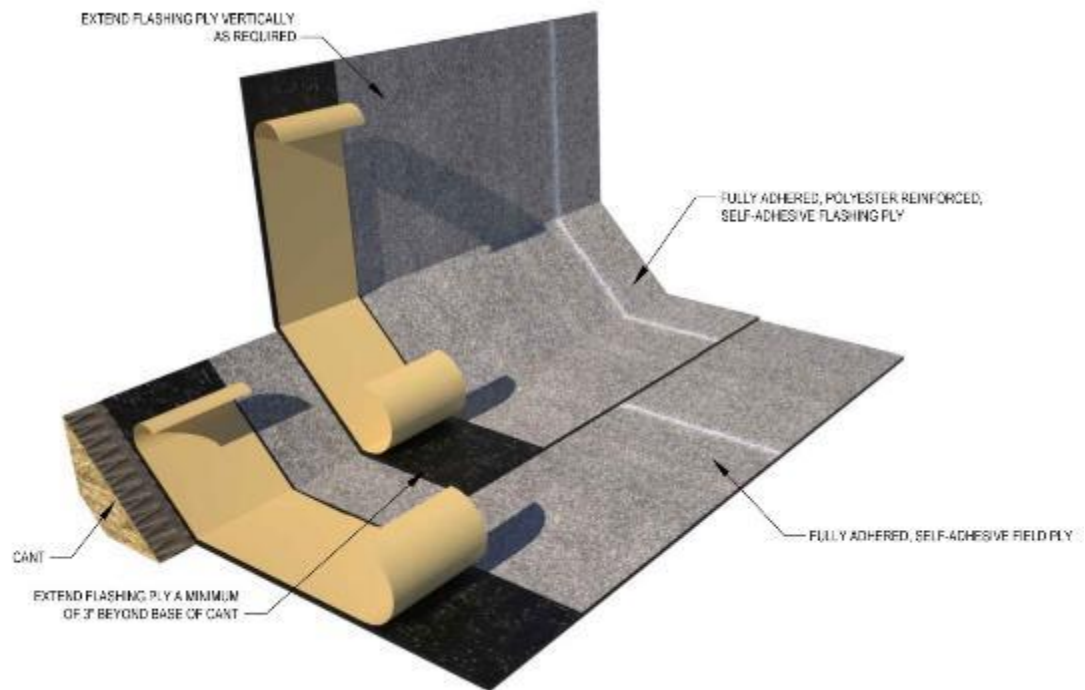


Figure 3.3.1b Fully Adhered, Self-Adhesive Vapor Retarder Flashing at Wall/Curb With Cant

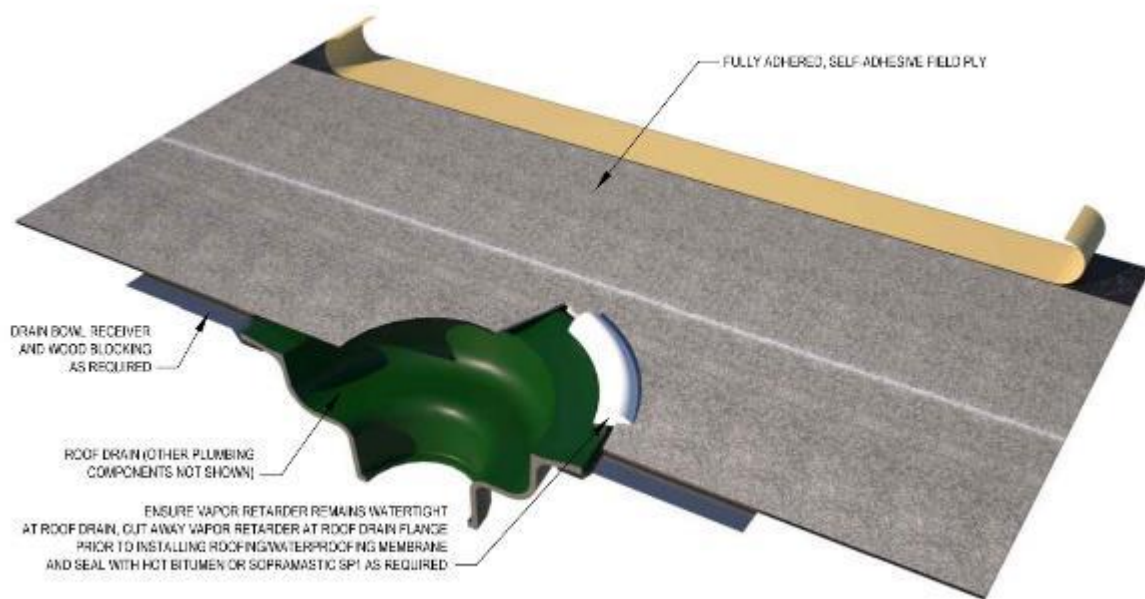


Figure 3.3.1c Fully Adhered, Self-Adhesive Vapor Retarder at Roof Drain

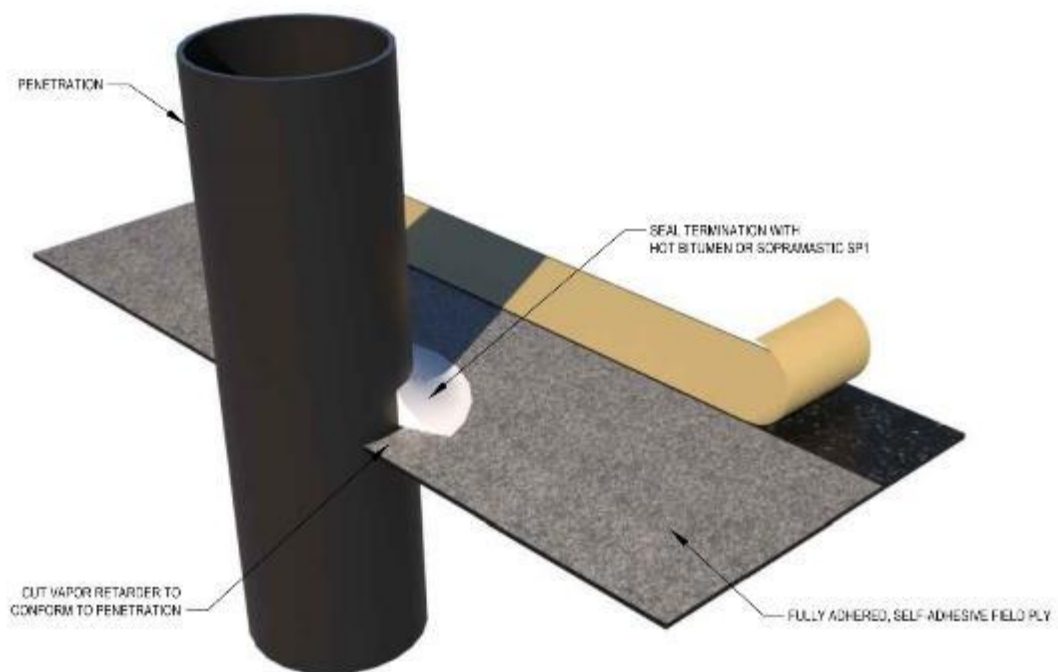


Figure 3.3.1d Fully Adhered, Self-Adhesive Vapor Retarder at Penetration

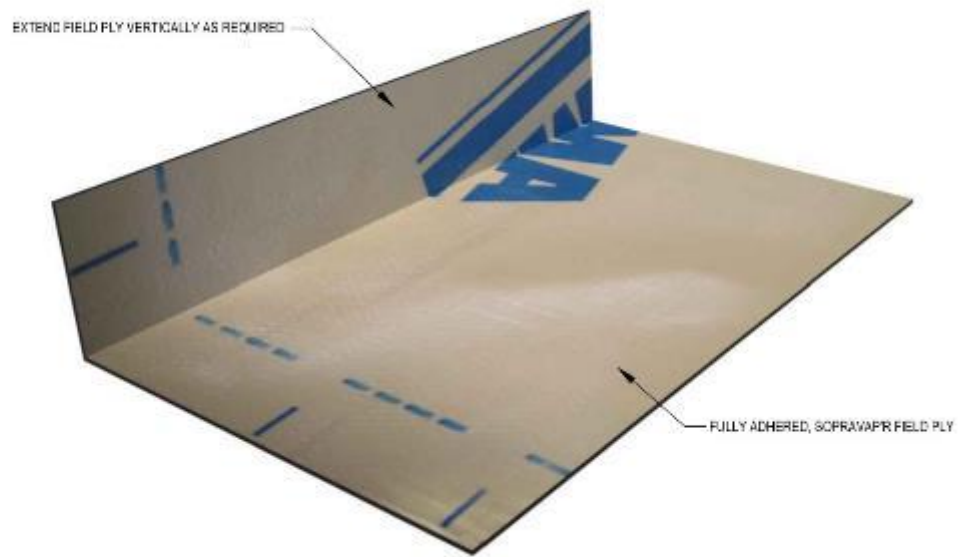


Figure 3.3.1e Fully Adhered, Self-Adhesive SOPRAVAP'R Termination at Wall/Curb Without Cant



Figure 3.3.1f Fully Adhered, Self-Adhesive SOPRAVAP'R Flashing at Wall/Curb Without Cant

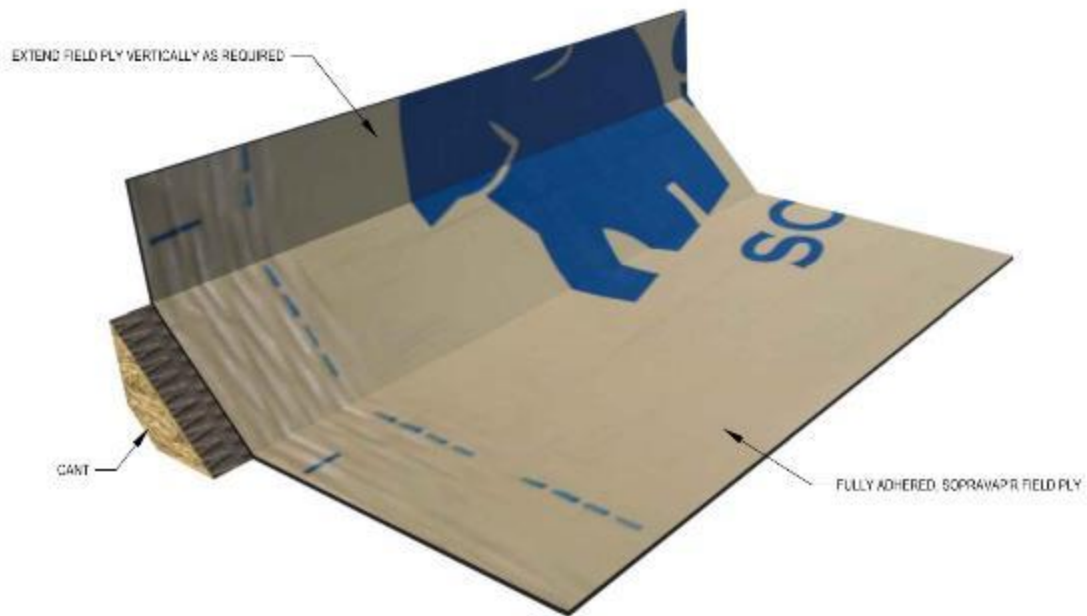


Figure 3.3.1g Fully Adhered, Self-Adhesive SOPRAVAP'R Termination at Wall/Curb With Cant

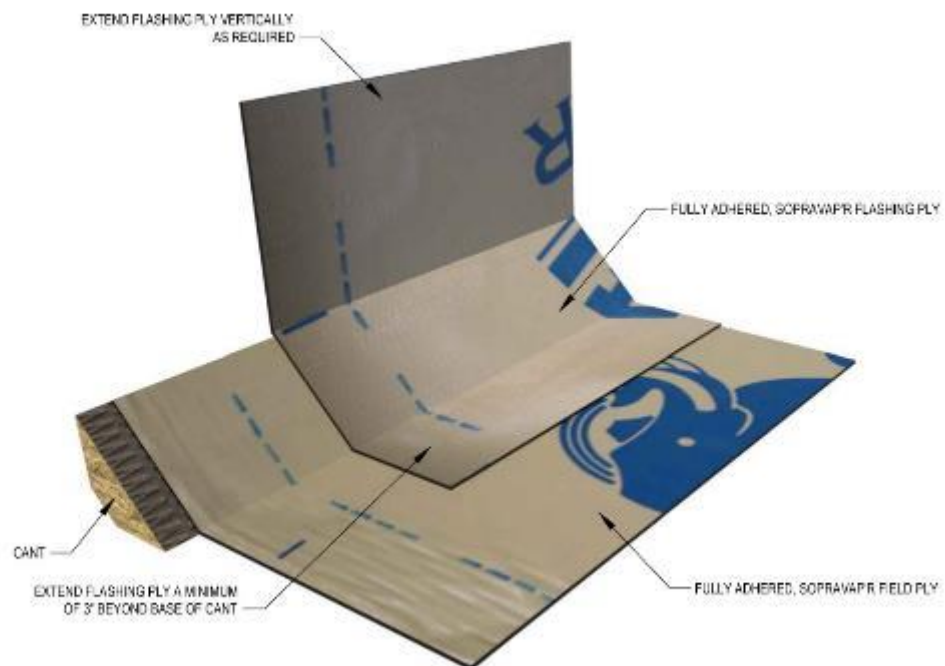


Figure 3.3.1h Fully Adhered, Self-Adhesive SOPRAVAP'R Flashing at Wall/Curb With Cant



Figure 3.3.1i Fully Adhered, Self-Adhesive SOPRAVAP'R at Roof Drain

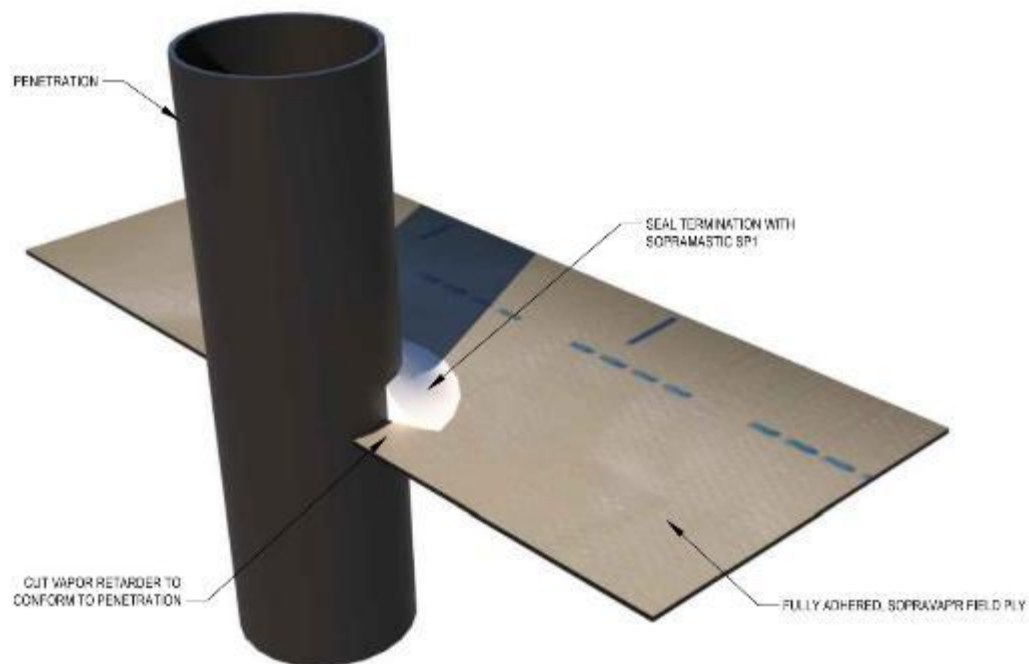


Figure 3.3.1j Fully Adhered, Self-Adhesive SOPRAVAP'R at Penetration

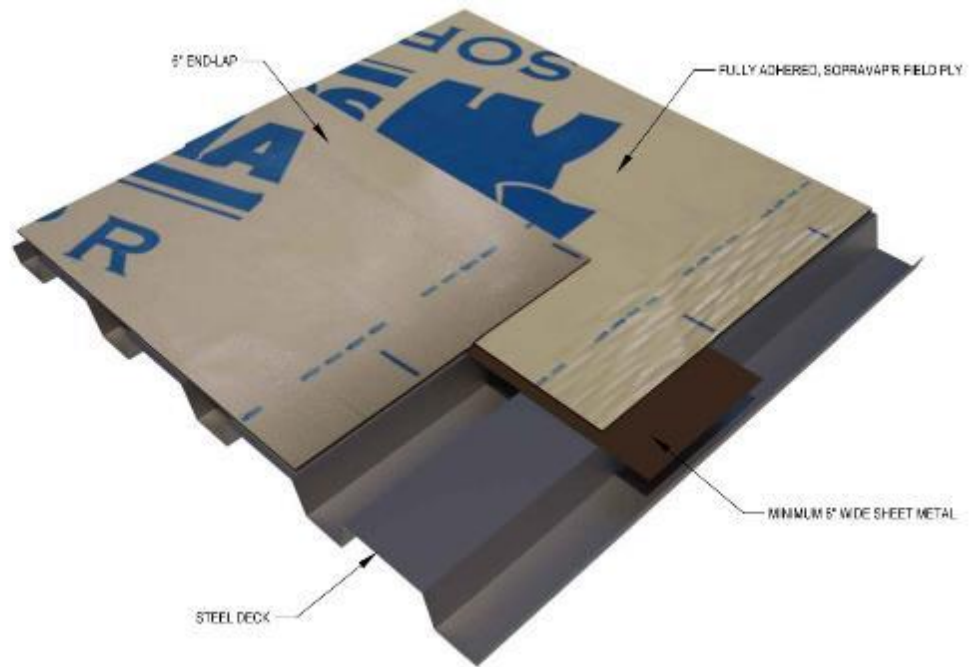


Figure 3.3.1k Fully Adhered, Self-Adhesive SOPRAVAP'R End-Laps On Steel Deck

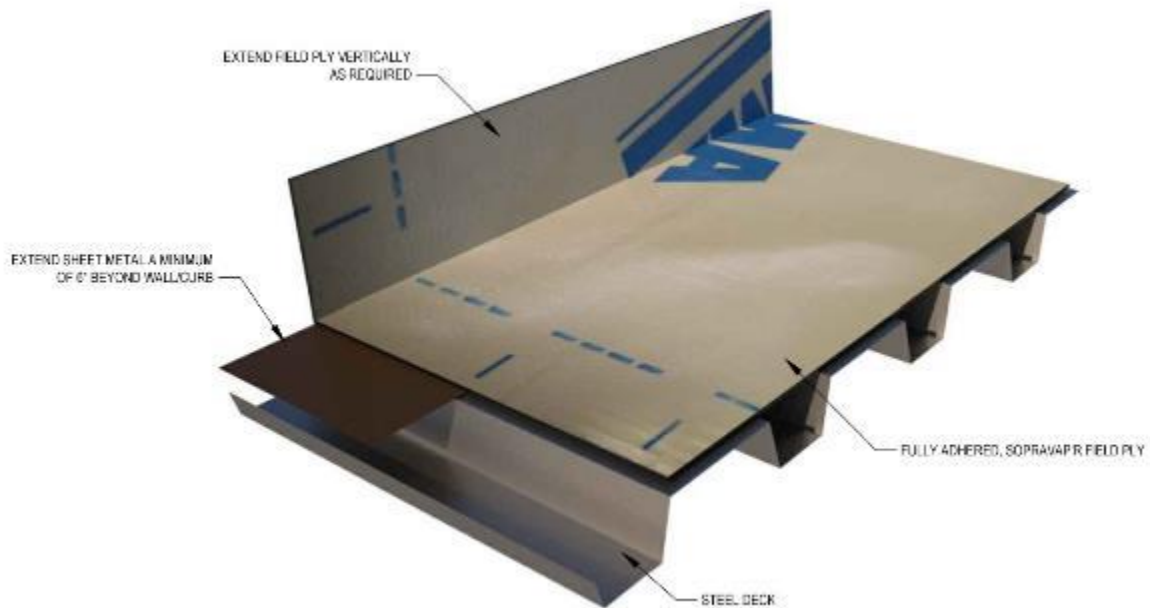


Figure 3.3.1l Fully Adhered, Self-Adhesive SOPRAVAP'R Termination at Wall/Curb On Steel Deck

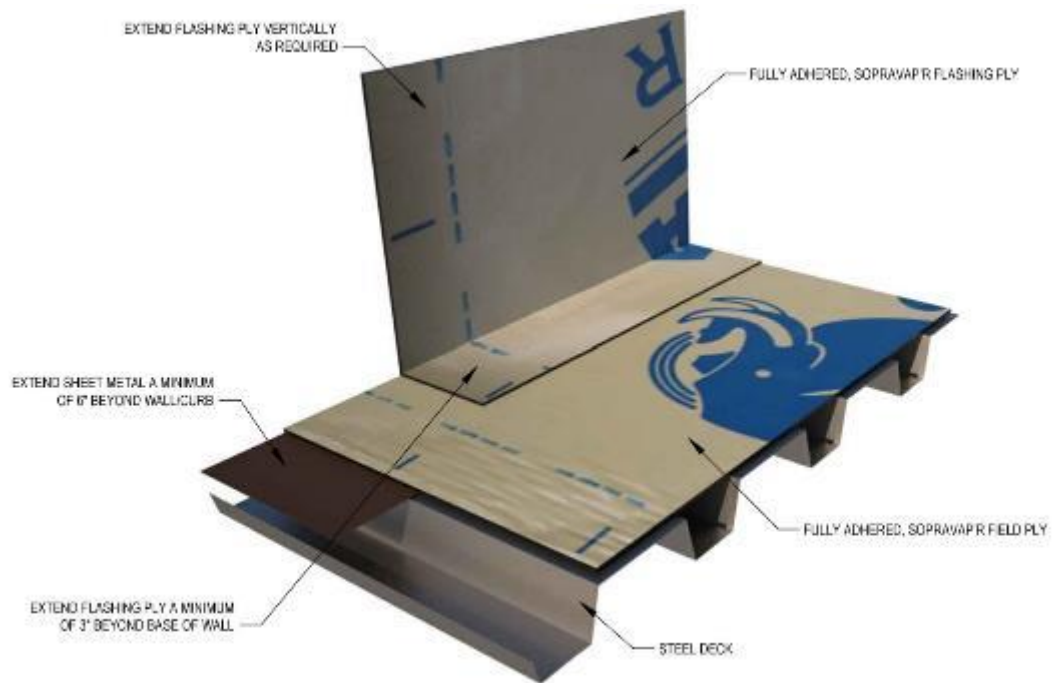


Figure 3.3.1m Fully Adhered, Self-Adhesive SOPRAVAP'R Flashing at Wall/Curb On Steel Deck

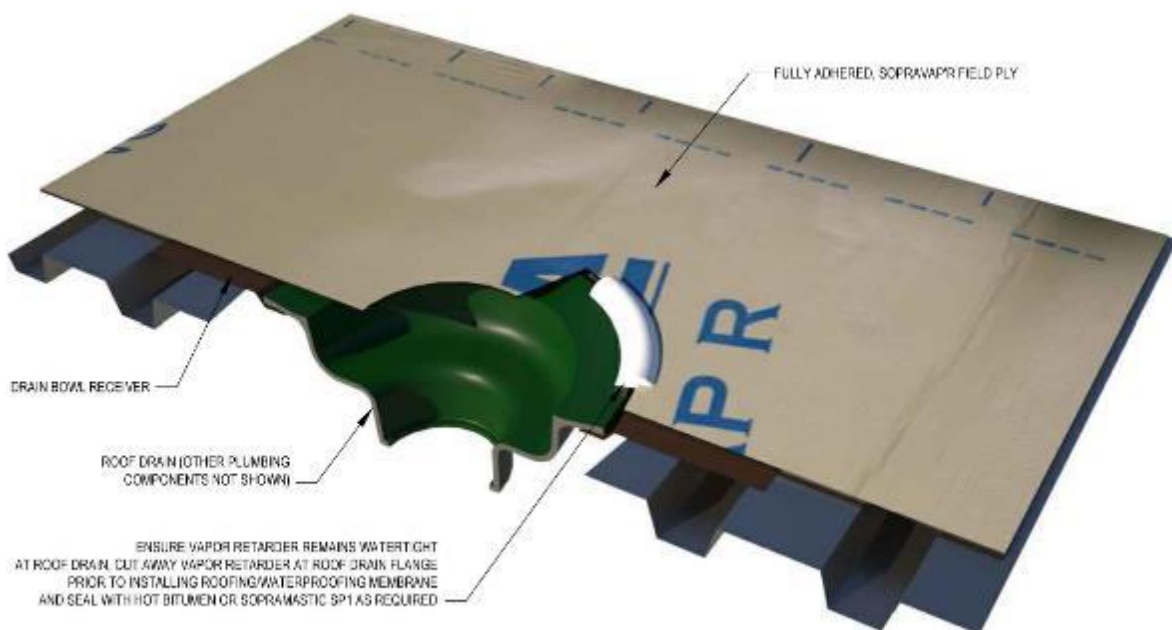


Figure 3.3.1n Fully Adhered, Self-Adhesive SOPRAVAP'R at Roof Drain On Steel Deck

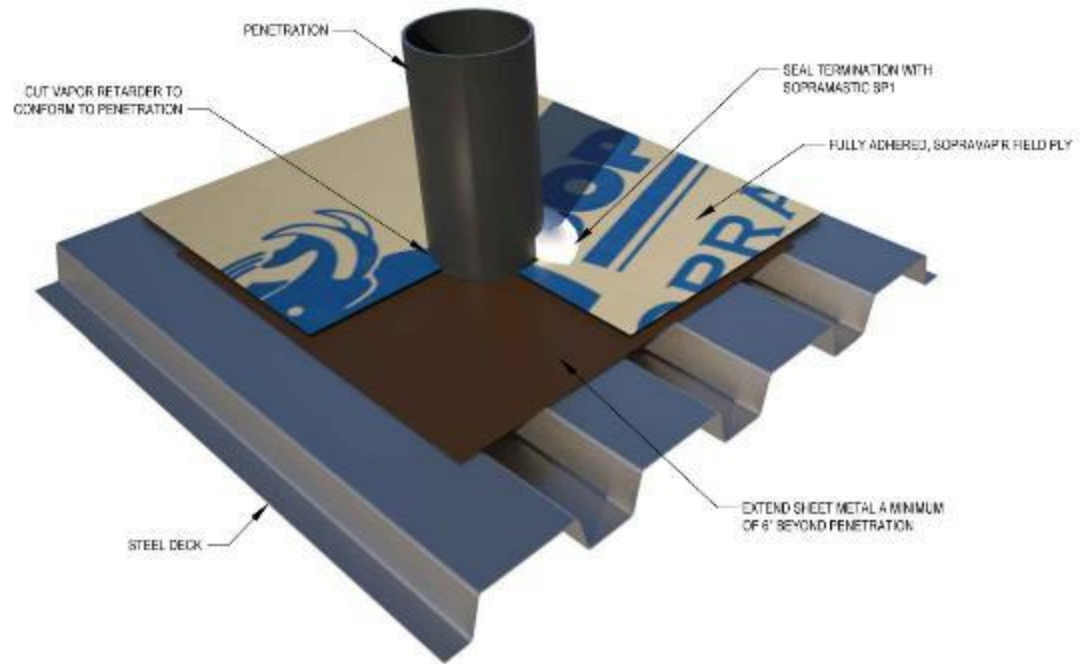


Figure 3.3.1o Fully Adhered, Self-Adhesive SOPRAVAP'R at Penetration On Steel Deck

3.3.2 PARTIALLY ADHERED, SELF-ADHESIVE VAPOR RETARDERS

General:

- [SOPREMA®](#) COLVENT™ partially-adhered, self-adhesive vapor retarders consist of ribbons of SBS self-adhesive on the underside of the sheet that bonds the sheet to primed substrates. Refer to [Table 3.3.2a](#).
- The underside of the self-adhesive base ply is surfaced with protective polyolefin release film that is removed during application. The ribbons of SBS modified bitumen self-adhesive are separated by sanded venting channels. The sanded venting channels prevent adhesion to the substrate. The un-adhered sanded venting channels allow vapor pressure to dissipate to the atmosphere where venting channels are open to flashing terminations.
- Partially adhered, self-adhesive base plies are installed over approved substrates using a self-adhesive primer. Refer to [Table 1.2a](#).
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and application of the vapor retarder.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during application of the vapor retarder.
- Ensure all substrates are clean, dry and prepared to receive the specified self-adhesive primer and vapor retarder.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply self-adhesive primers and vapor retarder.
 - The self-adhesive primer and vapor retarder temperature should be 70°F (21°C) or more at the point of vapor retarder application.
 - To ensure the primer is applied at 70°F (21°C) during cold weather, drums and 5 gallon pails should be stored in heated areas. Drums and 5 gallon pails exposed to cold temperature on the roof should be provided with heaters when necessary to ensure the minimum application temperature is maintained.
 - Store rolls in a heated area to maintain the rolls at 70°F (21°C) during cold weather.
- Ensure all substrates are primed using self-adhesive primer. Refer to [Section 1.2](#).
- Adhesion/peel tests are encouraged for concrete, masonry and other substrates where surface conditions may vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder. Use larger samples of COLVENT as deemed necessary.
 - Apply the specified primer to the clean, prepared substrate.
 - Apply an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.

- Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.
- Remove all roll packaging tape prior to installation.
- Contact [SOPREMA®](#) for additional information.

Application:

- Unroll the vapor retarder onto the roof surface and allow to relax prior to installation.
- Starting at the low point of the roof, lay out the vapor retarder to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Ensure all substrates are prepared and acceptable to receive the self-adhesive vapor retarder.
- Ensure primer is tacky to-the-touch, but not wet. Primer should not transfer to the finger tips when touched. Do not proceed if primer is wet or becomes fully dry. If primer becomes fully dry and loses tack, re-prime the substrate as necessary to achieve vapor retarder adhesion. Refer to [Section 1.2](#).
- Cut rolls to working lengths and widths to conform to rooftop conditions, and lay out to always work to a selva edge. In order to maintain the venting pattern on the underside of the membrane, the membrane may be butted at each end. Strip-in the butted end laps using a fully-adhered heat-welded, self-adhesive or cold-adhesive-applied strip-in ply. If end-laps are over-lapped, the venting channels must be maintained and all T-joints sealed watertight.
- Peel the release film from the underside of the vapor retarder. Press the leading edge of the vapor retarder to the substrate.
- As the release film is peeled away, use a weighted roller to firmly set the sheet in place. Ensure full contact is made between the ply and the substrate for full adhesion of ribbon strips. Use a hand-roller to roll-in vertical flashings and confined areas to firmly apply pressure.
- At the butted ends, melt the plastic burn-off film from the surface where present, using a torch or hot-air welder. Adhere all base ply end-laps using torch or hot-air welder or specified COLPLY™ adhesive.
- Counterflashing, or other flashing must be installed along the top leading edge of partially adhered flashing details as required to prevent moisture infiltration into the opened venting channels.
- Contact [SOPREMA®](#) for additional flashing options.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the ribbons of self-adhesive are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding
- Temporary night seals are required to seal flashing end terminations watertight. Temporary night seals must be removed upon resuming the installation to ensure venting channels are maintained as specified.
- Each day, ensure all vented flashing details are flashed watertight to prevent moisture infiltration into the venting channels.
- Vapor retarder exposure and phased applications:
 - Due to the wide range of environmental conditions and project related exposures, the effects from exposures vary.
 - When the vapor retarder is left exposed for an extended period to UV, dust, debris, traffic and other extreme conditions, thoroughly examine the vapor retarder to ensure conditions are satisfactory to install subsequent roofing materials.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.3.2a Partially Adhered, Self-Adhesive Vapor Retarders				
Name	Application	Reinforcement	Top Surfacing	Overlying SBS Field Base Ply Options
COLVENT™ SA	Field ply	Glass fiber	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete.
COLVENT™ 180 SA	Field ply, Flashing Ply	Non-woven polyester	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete.

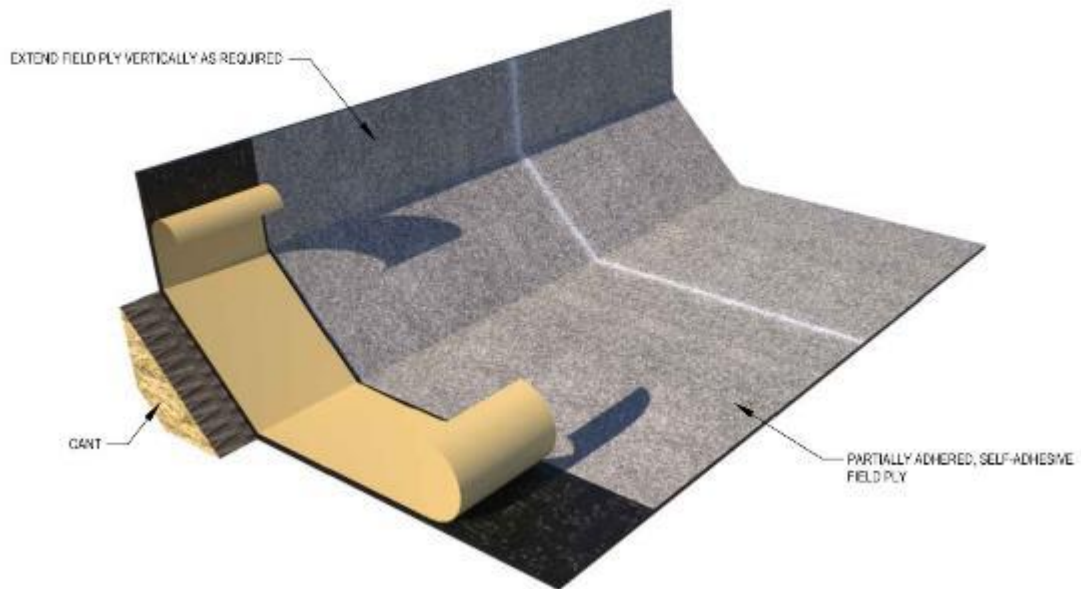


Figure 3.3.2a Partially Adhered, Self-Adhesive Vapor Retarder Termination at Wall/Curb With Cant

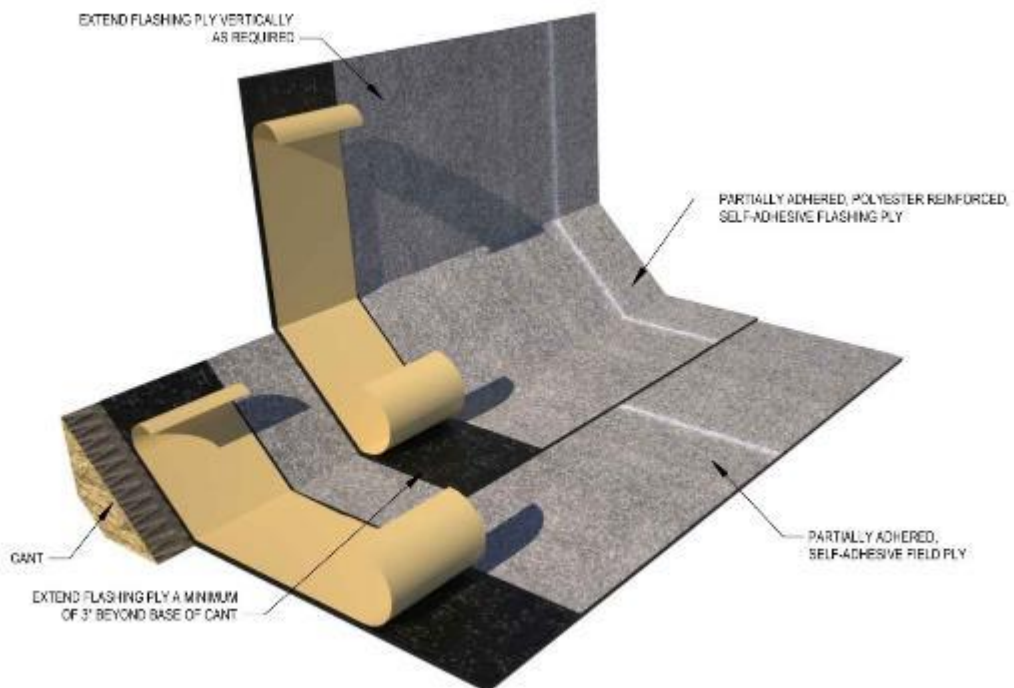


Figure 3.3.2b Partially Adhered, Self-Adhesive Vapor Retarder Flashing at Wall/Curb With Cant

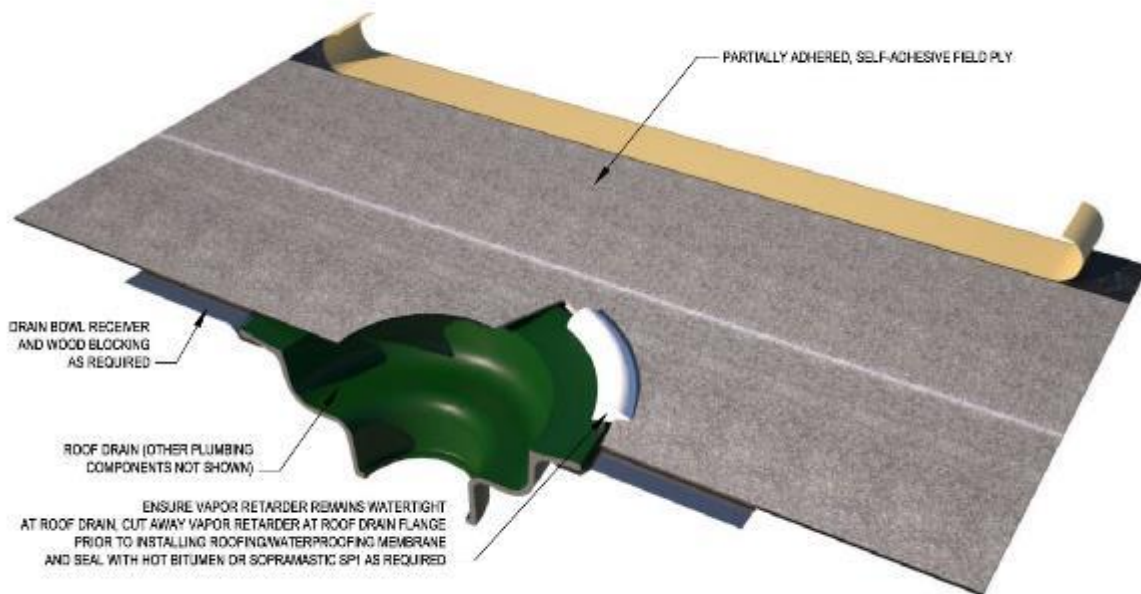


Figure 3.3.2c Partially Adhered, Self-Adhesive Vapor Retarder at Roof Drain

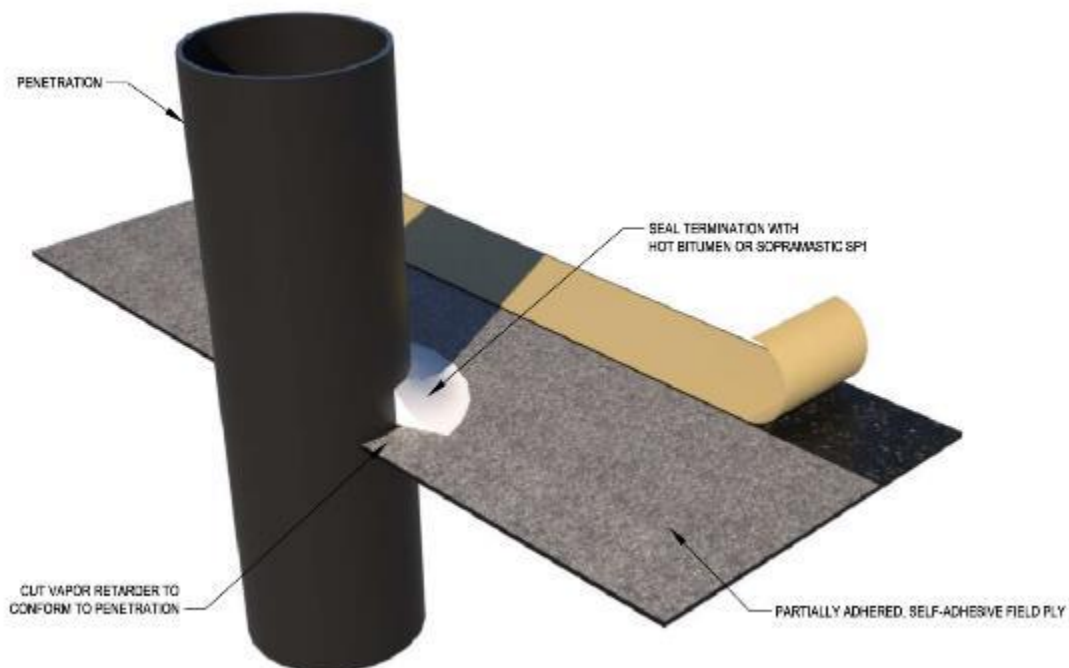


Figure 3.3.2d Fully Adhered, Self-Adhesive Vapor Retarder at Penetration

3.4 HOT ASPHALT-APPLIED SBS MODIFIED BITUMEN VAPOR RETARDER FIELD PLIES

General:

- [SOPREMA®](#) hot asphalt-applied SBS modified bitumen vapor retarders may be installed over [SOPRABOARD™](#), approved roof barrier boards and other approved roofing substrates.
- Hot asphalt-applied SBS modified bitumen vapor retarders are limited to horizontal applications. Heat welded, cold adhesive-applied, or self-adhesive vapor retarders should be considered for vapor retarder flashings.
- The underside and topside of hot asphalt-applied SBS plies are sand surfaced. Refer to [Table 3.4a](#).
- Contact [SOPREMA®](#) for review of ASTM D312 Type IV mopping asphalt used for [SOPREMA®](#) SBS modified bitumen vapor retarders.
- Refer to the PDS and SDS for additional product information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and vapor retarder application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during vapor retarder application.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply hot asphalt and vapor retarder.
 - Take all necessary measures, and monitor all conditions, to ensure the specified asphalt temperature is no less than the equiviscous temperature (EVT) at the point of contact with the vapor retarder as it is unrolled into the hot asphalt.
 - Store rolls in a heated area to maintain the rolls at 70°F (21°C) during cold weather.
- Ensure all substrates are smooth, free of dust and debris, dry and acceptable for installation of asphalt-applied sheets. Ensure substrates are even at all substrate transitions to prevent membrane voids. Ensure substrates are primed where required using [ELASTOCOL™ 350](#) or [ELASTOCOL™ 500](#) primer. Refer to [Section 1.1](#).
- Adhesion/peel tests are encouraged for concrete, masonry and other substrates where surface conditions may vary. Conduct 180 degree peel tests as follows:
 - Choose three (3) or more representative substrate areas to examine.
 - Clean and prepare the substrate as specified, allow to dry.
 - Cut 1 in (2.54 cm) wide by 12 in (30.48 cm) long strips of the specified vapor retarder.
 - Apply the specified primer to the clean, prepared substrate.
 - Apply an 8 to 9 in (20.32 to 22.86 cm) long section of the 12 in (30.48 cm) strip, and allow a 3 to 4 in (7.62 to 10.16 cm) long portion to remain un-adhered in order to grip and pull.
 - Grip the un-adhered portion of the sample and pull 180 degrees and parallel with the surface. Use a small scale to measure results in pounds of resistance where quantitative results are desired.
 - Results should demonstrate strong resistance to peel. A strong bond will result in significant residual materials remaining adhered to the substrate, or part of the substrate itself may be removed along with the sample.
 - Samples that peel away easily from the substrate may indicate further preparation is needed, or alternate materials and/or application methods may be necessary.
 - Where quantitative measurements of peel resistance are desired, peel resistance of 1 in wide samples should exceed 2lb/in (0.35 N/mm) when tested.

- Refer to mopping asphalt supplier's published values for softening point, flash point (FP), finished blowing temperature (FBT) and equiviscous temperature (EVT).
- Refer to the softening point for maximum roof slope applications. The maximum recommended roof slope for asphalt-applied vapor retarders is 3/4:12.
- Remove all roll packaging tape prior to installation.

Application:

- Before beginning the installation, unroll the vapor retarder onto the roof surface and allow the ply to relax prior to installing the vapor retarder.
- Re-roll the vapor retarder in order for the plies to be unrolled into the adhesive while ensuring the specified side and end-laps are maintained.
- Starting at the low point of the roof, lay out the vapor retarder to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- Cut rolls to working lengths and widths as required to conform to rooftop conditions. Cut vapor retarder plies as necessary to always work to a selva edge.
- Ensure all roofing and flashing substrates are prepared and primed as necessary, and all substrates are acceptable to receive the specified asphalt and vapor retarder.
- Re-roll the vapor retarder in order for the plies to be unrolled into the hot asphalt while ensuring the specified side and end-laps are maintained.
- Apply Type IV asphalt within 400 to 475°F (204 to 246°C) at the point of contact with the ply as the ply is unrolled into the hot asphalt. The mopping asphalt should be within +/- 25°F (14°C) of the published EVT and as required to obtain a nominal 23 to 25 pounds per square interply coverage rate. Refer to the EVT provided by the asphalt supplier.
- The asphalt application temperature should be monitored and recorded during application to ensure application temperature remains as published herein.
- Apply sufficient asphalt coverage to ensure 1/8 to 1/4 inch bleed-out is present beyond all laps. Prevent excessive asphalt bleed-out on the SBS ply surface.
- At 6 in end-laps, cut a 45 degree dog-ear away from the 3 in selva edge at all T-joints.
- Broom the vapor retarder to the substrate, working forward to the end of the roll as necessary to remove wrinkles and voids to ensure full adhesion. Avoid walking over the vapor retarder during application.

Inspection:

- Each day, physically inspect all side and end-laps, and ensure the vapor retarder is sealed watertight.
- Where necessary, use a torch, hot-air welder or SBS mastic to ensure all laps are fully sealed.
- Inspect the installation each day to ensure the plies are fully adhered.
- Each day, repair all voids, wrinkles, open laps, blisters and all other deficiencies before proceeding.
- Temporary night seals are required to seal flashing end terminations watertight. Temporary night seals must be removed upon resuming the installation.
- Vapor retarder exposure and phased applications:
 - Due to the wide range of environmental conditions and project related exposures, the effects from exposures vary.
 - When the vapor retarder is left exposed for an extended period to UV, dust, debris, traffic and other extreme conditions, thoroughly examine the vapor retarder to ensure conditions are satisfactory to install subsequent roofing materials.
 - Refer to product data sheets and contact [SOPREMA®](#) technical services for review of project conditions.

Table 3.4a Hot Asphalt Applied Vapor Retarders

Name	Application	Reinforcement	Top Surfacing	Overlying Insulation Options
ELASTOPHENE® SANDED 2.2 , ELASTOPHENE® SANDED 3.0	Base ply	Glass fiber	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete
ELASTOPHENE® HR SANDED 2.2 , ELASTOPHENE® HR SANDED 3.0	Base ply	Glass grid	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete
SOPRALENE® 180 SANDED , SOPRALENE® 250 SANDED	Base ply	Non-woven polyester	Sanded	Rigid insulation boards adhered with DUOTACK® 365 or ribbons of DUOTACK SPF .
				Rigid insulation boards mechanically fastened through to deck.
				Rigid insulation boards adhered with hot asphalt.
				Lightweight concrete



Figure 3.4a Hot Asphalt-Applied Vapor Retarder Termination at Wall/Curb With Cant

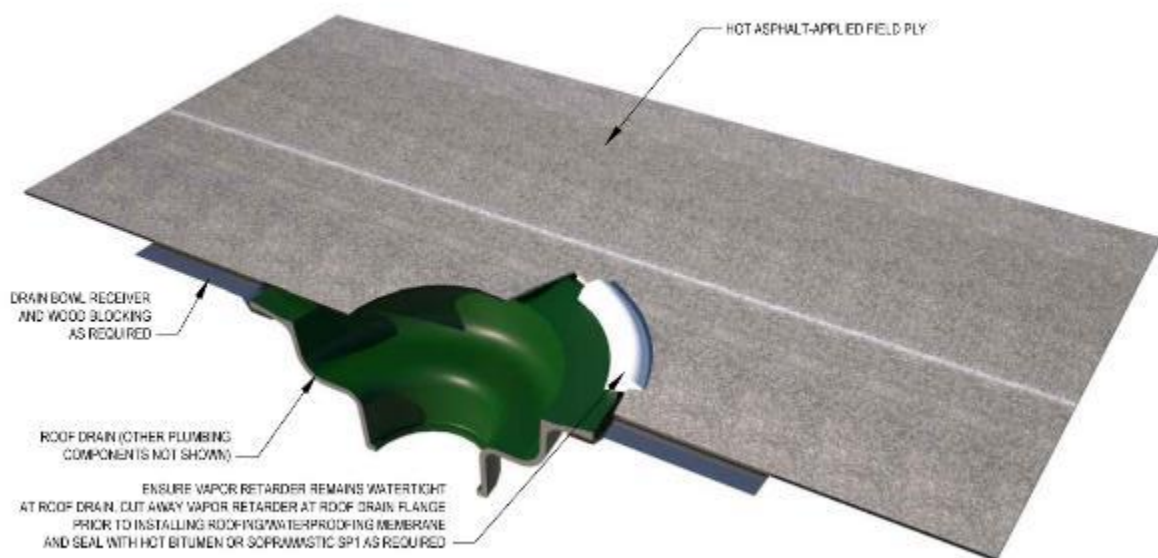


Figure 3.4b Hot Asphalt-Applied Vapor Retarder at Roof Drain

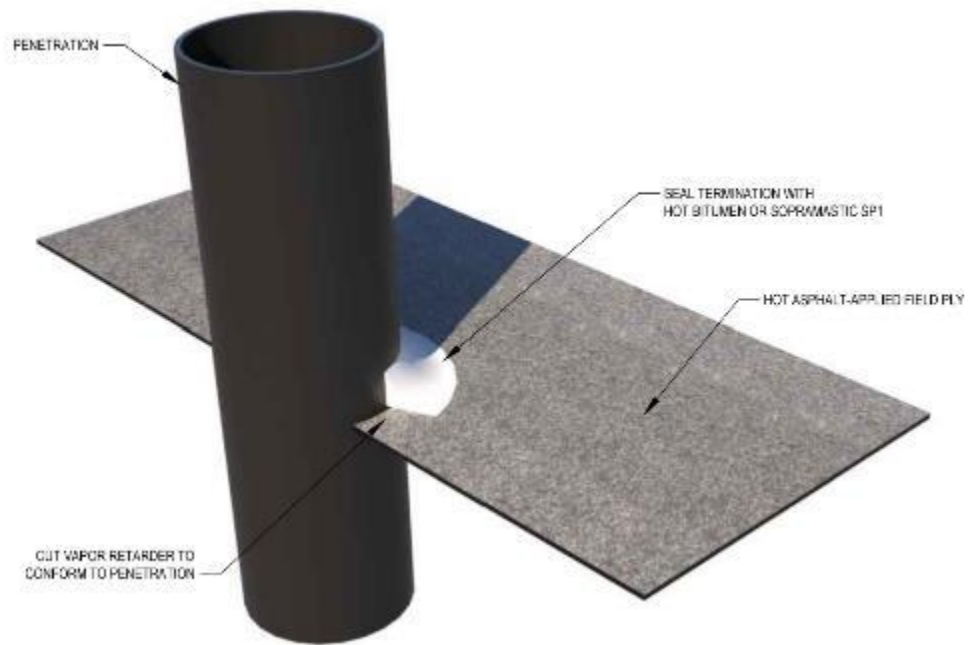


Figure 3.4c Hot Asphalt-Applied Vapor Retarder at Penetration

4 LIQUID-APPLIED FLASHINGS

4.1 ALSAN® RS, POLYMETHYL METHACRYLATE (PMMA)/POLYMETHACRYLATE (PMA) LIQUID-APPLIED FLASHING FOR SBS MODIFIED BITUMEN VAPOR RETARDERS

General:

- [SOPREMA®](#) offers [ALSAN® RS 230 FLASH](#) or [ALSAN® RS 260 LO FLASH](#) liquid-applied, reinforced flashing systems to flash SBS modified bitumen vapor retarders at roof transitions, terminations and penetrations. Refer to [Figures 4.1a through 4.1c](#).
- ALSAN® RS liquid-applied flashings are suitable to flash heat-welded, self-adhesive-applied and hot asphalt-applied SBS modified bitumen vapor retarders. ALSAN® RS liquid-applied flashings are suitable to flash SBS modified bitumen vapor retarders applied using [COLPLY™ EF ADHESIVE](#) and [COLPLY™ EF FLASHING CEMENT](#). Refer to [Table 4.1a](#).
- Refer to The ALSAN® RS Guide, detail drawings, product data sheets and published guidelines for additional installation requirements.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and flashing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during flashing application.
- Refer to ALSAN® RS product data sheets and published guidelines for application temperatures.
- Ensure all substrates are clean, dry and prepared to receive ALSAN® RS. Adhesion/peel tests are encouraged for concrete, masonry and for other substrates where surface conditions may vary. Prime substrates where required. Refer to [Table 1.3a](#).

Application:

- Pre-cut [ALSAN® RS FLEECE](#) polyester reinforcement to conform to roof terminations, transitions and penetrations. Cut reinforcement to ensure a minimum 2 in overlap of fleece at side-laps and end-laps. Ensure the liquid-applied flashing membrane is fully reinforced.
- Prime substrates where required. Refer to [Section 1.3](#).
- Apply the base coat of catalyzed ALSAN® RS flash resin onto the substrate using a brush or roller, working the liquid resin into the surface for complete coverage and full adhesion.
- Immediately apply the [ALSAN® RS FLEECE](#) reinforcing into the wet base coat of resin. Using a brush or roller, work the [ALSAN® RS FLEECE](#) reinforcement into the wet resin while applying the second coat of catalyzed ALSAN® RS flash resin to fully encapsulate the fleece. Extend the ALSAN® RS flash resin a maximum of 1/4 in beyond the [ALSAN® RS FLEECE](#).

Inspection:

- Each day examine completed liquid-applied flashing and repair all deficiencies.

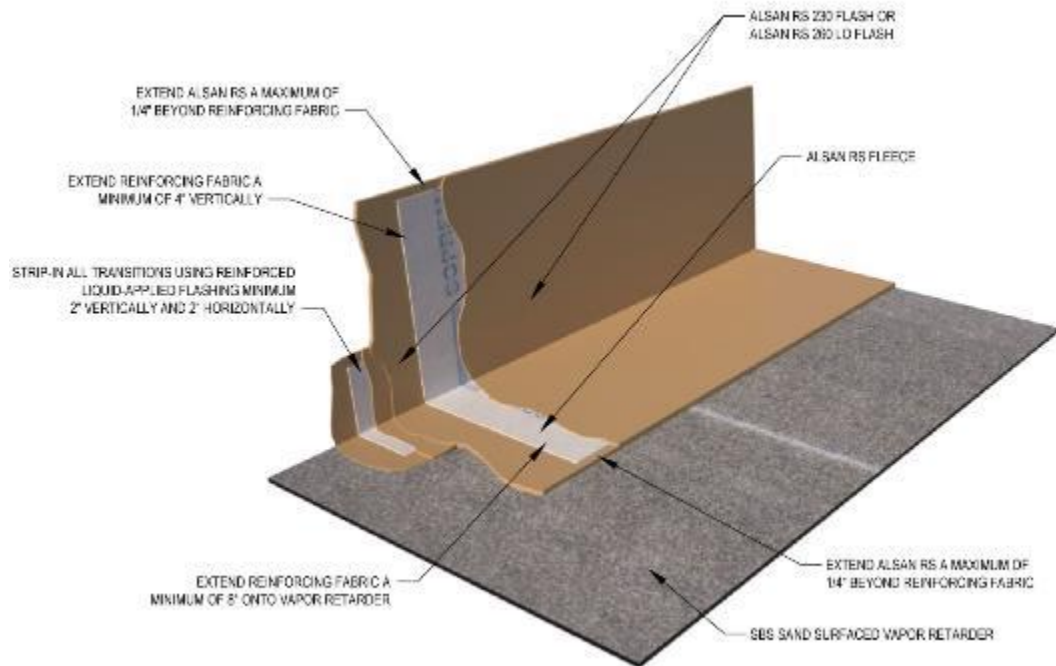


Figure 4.1a ALSAN® RS Wall/Curb Flashing on Vapor Retarder

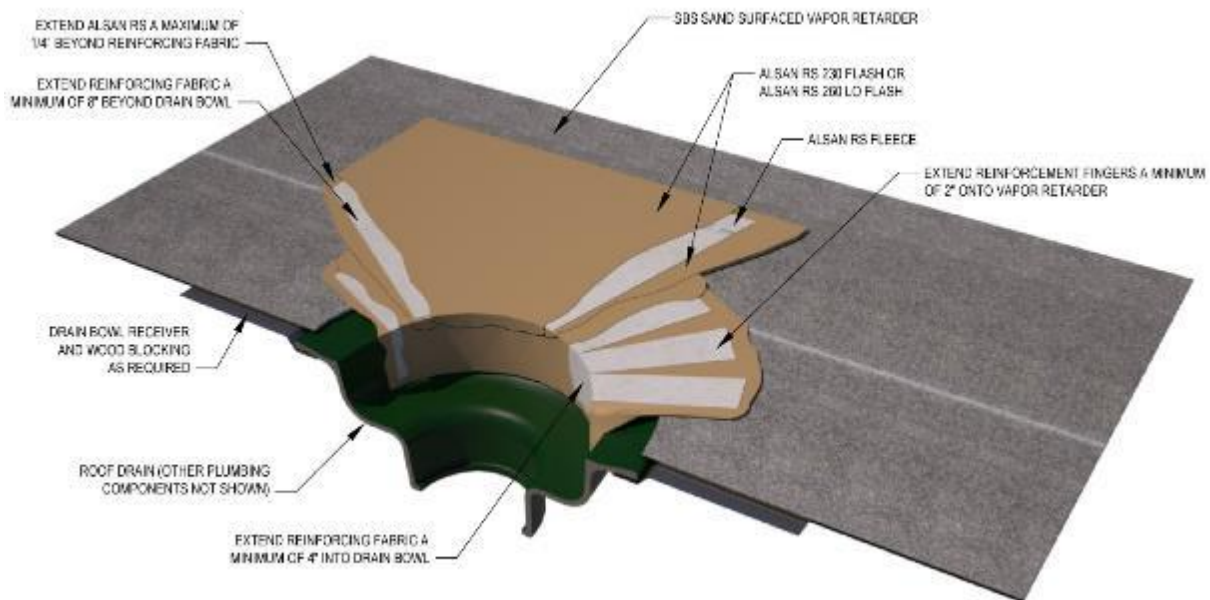


Figure 4.1b ALSAN® RS Roof Drain Flashing on Vapor Retarder

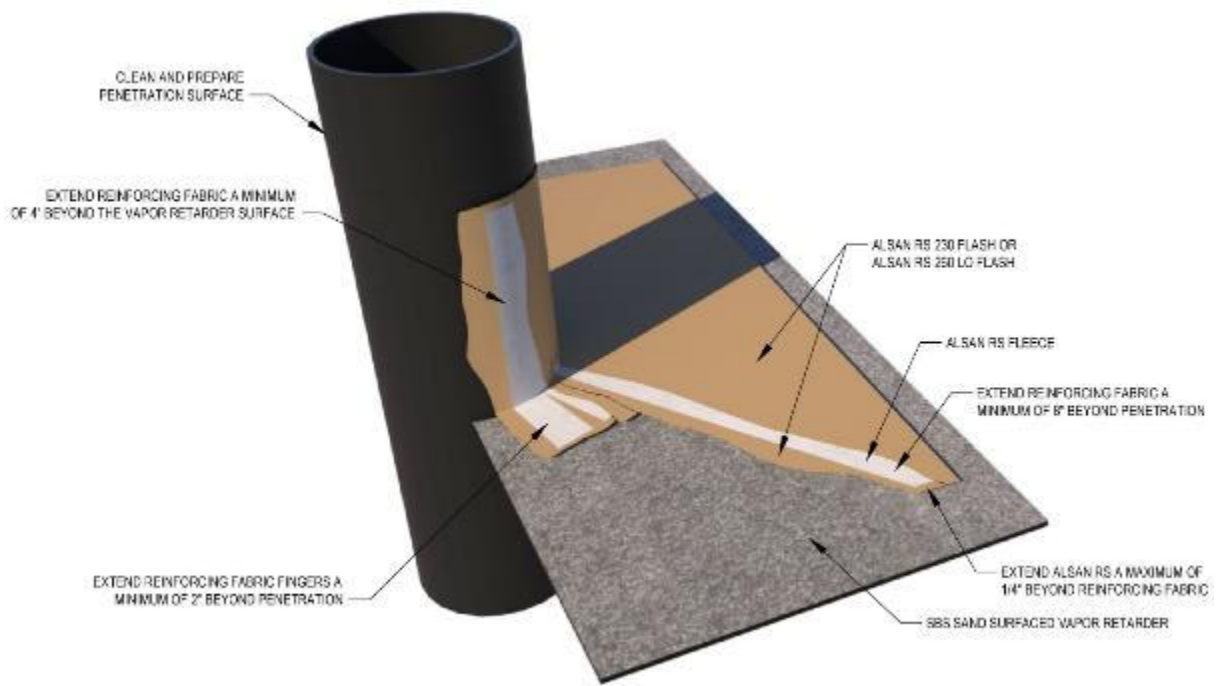


Figure 4.1c ALSAN® RS Penetration Flashing on Vapor Retarder

4.2 ALSAN FLASHING, POLYURETHANE-BITUMEN, LIQUID-APPLIED FLASHING

General:

- [SOPREMA® ALSAN® FLASHING](#) liquid-applied, reinforced flashing is recommended for SBS modified bitumen vapor retarders to seal roof transitions, terminations and penetrations. Refer to [Figures 4.2a through 4.2b](#).
- [ALSAN® FLASHING](#) is a single component, polyurethane-bitumen resin, reinforced with [ALSAN® POLYFLEECE](#) fabric.
- Refer to [ALSAN® FLASHING](#) detail drawings, product data sheets and published guidelines for additional information.

Preparation:

- Ensure environmental conditions are acceptable to proceed. Monitor precipitation, temperature, humidity, wind, cloud cover and sun that may have an effect on materials and flashing application.
- Conditions should remain dry, and the ambient temperature should be well above the dew point at all times during flashing application.
- The following are recommended during cold weather:
 - The ambient temperature should be at least 40°F (4.4°C), and rising to ensure conditions remain acceptable to apply [ALSAN® FLASHING](#).
 - The [ALSAN® FLASHING](#) temperature should be 70°F (21°C) or more at the point of application.
 - To ensure [ALSAN® FLASHING](#) is applied at 70°F (21°C) during cold weather, pails should be stored in heated areas.
 - Store pails in a heated area to maintain the pails at 70°F (21°C) during cold weather.
- Primer is not required for [ALSAN® FLASHING](#). Ensure all substrates are clean, dry and prepared to receive [ALSAN® FLASHING](#). Refer to [Table 4.2a](#). Adhesion/peel tests are encouraged for concrete, masonry and for other substrates where surface conditions may vary.

Application:

- Pre-cut the [ALSAN® POLYFLEECE](#) reinforcement to conform to roof terminations, transitions and penetrations. Cut reinforcement to ensure a minimum 2 in overlap of fleece at side-laps and end-laps. Ensure the liquid-applied flashing membrane is fully reinforced.
- Ensure [ALSAN® POLYFLEECE](#) extends a minimum of 4 in vertically and 8 in horizontally at roof terminations, transitions and penetrations. Refer to [Figures 4.2a through 4.2b](#).
- Use a paint stir stick to thoroughly stir the pail [ALSAN® FLASHING](#) prior to application.
- Apply the base coat of [ALSAN® FLASHING](#) resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion. Apply the base coat at 2.0 gallons per square.
- Immediately apply [ALSAN® POLYFLEECE](#) reinforcing fabric into the wet base coat of resin. Using a brush or roller, work the [ALSAN® POLYFLEECE](#) into the wet resin while applying the second coat of [ALSAN® FLASHING](#) resin also at 2.0 gallons per square to completely encapsulate the fleece. Extend the [ALSAN® FLASHING](#) resin a minimum of 1 in beyond the [ALSAN® POLYFLEECE](#).
- Allow the liquid membrane to sufficiently cure for 24 to 48 hours then apply the finish coat of [ALSAN® FLASHING](#) resin at 2.0 gallons per square.
- The total application rate of [ALSAN® FLASHING](#) resin is approximately 6 gallons per square.
- When applying lightweight insulating concrete over SBS modified bitumen vapor retarders, refer to [Section 4.1](#) for liquid-applied flashings.

Inspection:

- Each day examine completed liquid-applied flashing and repair all deficiencies.

Table 4.2a ALSAN® FLASHING Substrates	
Substrate	Preparation
Concrete	Clean, dry and free of loose debris or laitance
Masonry	Clean, dry and free of loose debris or laitance
Metal	Grind metal surfaces down to bare “white” metal
Wood	Clean and dry
PVC pipe	Roughen substrate by sanding
Sanded surfaced SBS base plies	Clean, dry and free of loose debris

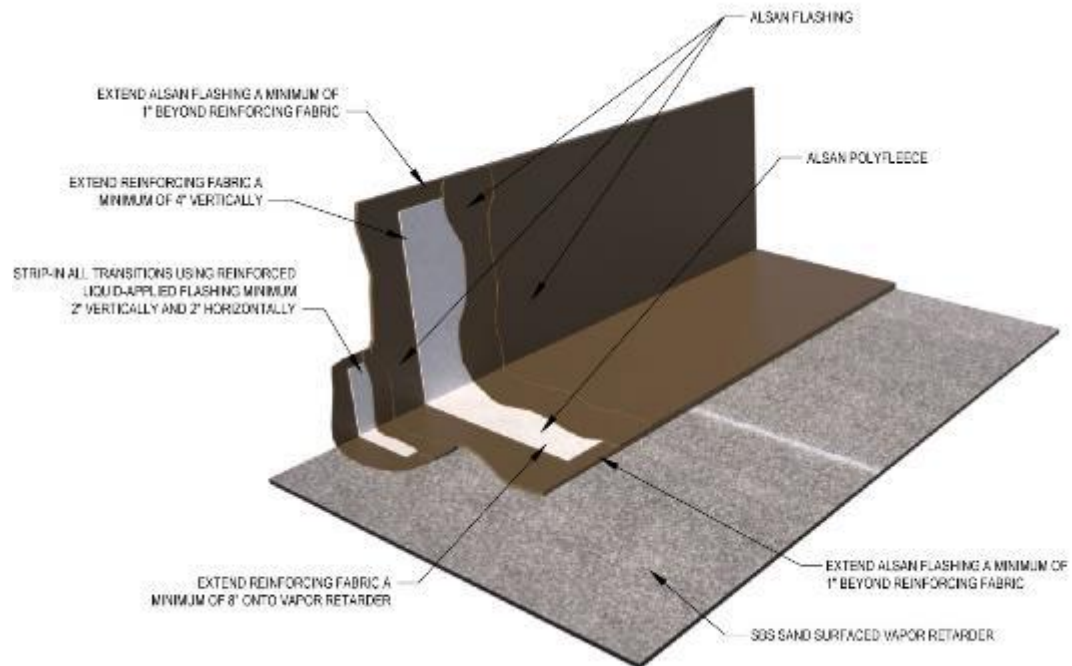


Figure 4.2a ALSAN® FLASHING Wall/Curb Flashing on Vapor Retarder

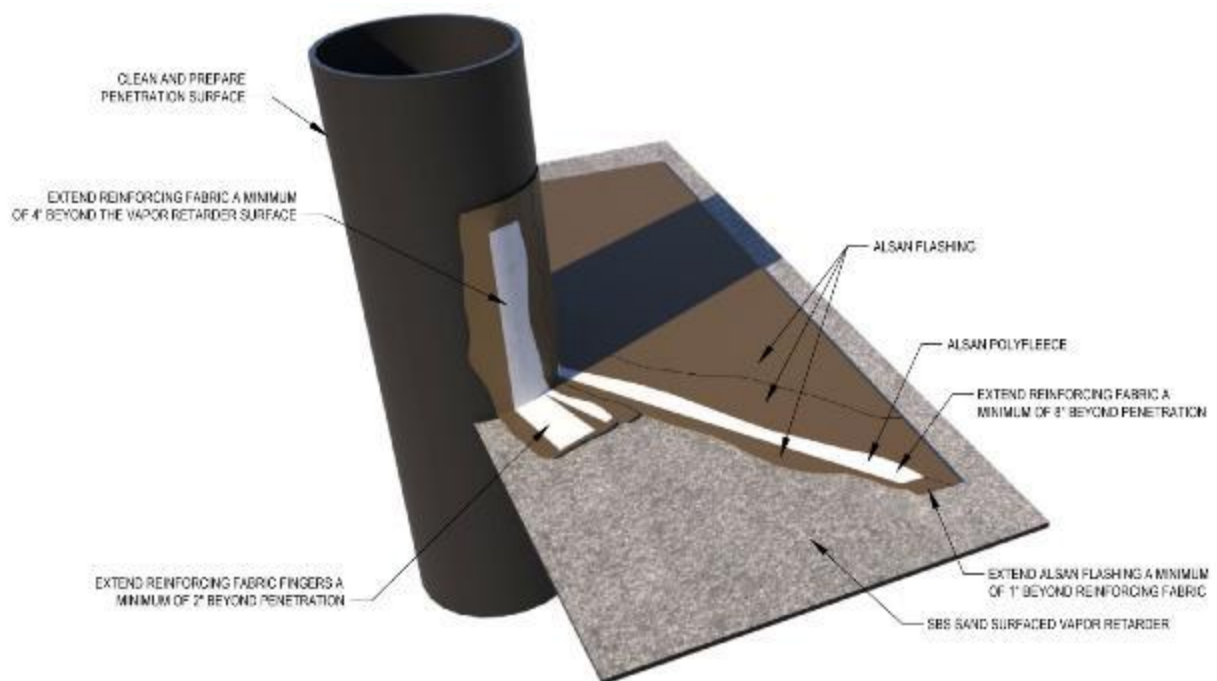


Figure 4.2b ALSAN® FLASHING Penetration Flashing on Vapor Retarder