Adhered and Mechanically Fastened Roofing System

Sure-Seal®/Sure-White™/Sure-Weld®/Sure-Flex™

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January 2025

Note: In addition to information listed in this section Specifiers and Authorized applicators should reference Spec Supplement and Design Reference Sections for other pertinent information.

FleeceBACK® Adhered Roofing System
Sure-Seal®/Sure-White™/Sure-Weld®/Sure-Flex™

January 2025

The information contained in this generic specification represents a part of Carlisle's requirements for obtaining a roofing systems warranty. Construction materials and practices, building siting and operation, climatic conditions, and other site-specific factors will have an impact on the performance of the roofing system. Carlisle recommends that the building owner retain a design professional to determine appropriate design measures to be taken in order to address these factors.

This section is to serve as criteria for Specifiers and Authorized Applicators regarding the design and installation of Carlisle's Adhered FleeceBACK Membrane Roofing Systems. Additional information essential for the design and installation of the roof system mentioned herein are also included in the Design Reference Section and also listed in the form of a Specification Supplement at the end of the Technical Manual. Specifiers and Authorized Applicators are advised to reference all applicable sections.

Various Warranty Tables have been included in Paragraph 1.05 citing various requirements by which specific warranty coverage can be obtained. Appropriate Warranty Table should be referenced to ensure proper warranty coverage.

PART I GENERAL

1.01 Description

Carlisle's FleeceBACK Adhered Roofing Systems utilize a Sure-Seal / Sure-White EPDM (thermoset) membrane OR a Sure-Weld TPO / Sure-Flex PVC or KEE HP PVC (thermoplastic) membrane.

A. **Thermoset Membranes**: Sure-Seal/Sure-White FleeceBACK Adhered Roofing System incorporates 10' wide, 45, 60 or 90-mil thick Sure-Seal (black) or Sure-White (white-on-black) non-reinforced EPDM membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 100, 115 or 145-mils. The membrane is fully adhered to an acceptable substrate with a spray, extrusion or splatter applied, two component, low rise, Flexible FAST™ Adhesive. Adjoining sheets of membrane are spliced together using 3" or 6" wide Factory-Applied SecurTAPE™ in conjunction with EPDM Primer.

B. **Thermoplastic Membranes**:

1. **FleeceBACK TPO Adhered Roofing System** incorporates 45-, 60- or 80-mil thick, 12' or 6' wide, scrim-reinforced, white, gray, tan or Special Color TPO (60-mil only) Sure-Weld Thermoplastic Polyolefin (TPO) membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 100, 115 or 135-mils.

2. **FleeceBACK PVC FRS Adhered Roofing System** incorporates 60- or 80-mil thick, 10' wide, fiberglass reinforced scrim, (white, gray, light gray and tan) Sure-Flex (PVC) membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 115 or 135-mils.

3. **FleeceBACK PVC Adhered Roofing System** incorporates 60- or 80-mil thick, 10' wide, polyester reinforced scrim, (white, gray, light gray, slate gray and tan) Sure-Flex (PVC) membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 115 or 135-mils.

4. **FleeceBACK KEE HP Adhered Roofing System** incorporates 50-, 60- or 80-mil thick, 10' wide, polyester reinforced scrim, (white, gray, light gray, slate gray and tan) Sure-Flex KEE HP (PVC)

membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 105, 115 or 135-mils.

NOTE: The membrane is fully adhered to an acceptable substrate with a spray, extrusion or splatter applied, two-component, low-rise, Flexible FAST Adhesive. Adjoining sheets of Sure-Weld or Sure-Flex membrane are overlapped and joined together with a minimum 1-1/2" wide hot air weld.

NOTE: FleeceBACK TPO is available with APEEL Protective Film, refer to PART II – PRODUCTS.

NOTE: FleeceBACK FR TPO membrane is also available for mechanically fastened systems over combustible decks – see 'Attachment III – FleeceBACK FR TPO Mechanically-Fastened Membrane Option' at the end of this specification.

NOTE: FleeceBACK RL (RapidLock) EPDM/TPO/PVC membrane is also available in a non-adhesive system utilizing Velcro® Brand Securable Solutions - see 'Attachment IV – FleeceBACK RL EPDM/TPO/PVC Membrane Option' at the end of this specification.

1.02 General Design Considerations

A. Projects with extended wind speed warranty coverage greater than 90 mph, projects requiring a 20-year or greater Total System Warranty and projects which have building control and/or expansion joints will require additional enhancements. Refer to Warranty Tables in Paragraph 1.05.

B. There are no maximum slope restrictions for the application of this roofing system.

C. Chemical compatibility will depend on type of membrane used. Carlisle should be contacted for verification of compatibility with specific products, chemicals or waste products that may come in contact with the roof membrane.

D. It is the responsibility of the specifier to review local, state and regional codes to determine their impact on the specified Carlisle Roofing System.

E. It is the responsibility of the building owner or his/her designated representative to verify structural load limitation. In addition, a core cut may be taken to verify weight of existing components when the roofing system is to be specified on an existing facility.

F. Coordination between various trades is essential to avoid unnecessary rooftop traffic over completed sections of the roof and to prevent possible damage to the membrane roofing system and insulation facer.

G. Concentrated loads from rooftop equipment may cause deformation of insulation/underlayment and possible damage to the membrane if protection is not provided. At protection course or sleepers must be specified.

H. Drainage

1. Drainage must be evaluated by the Specifier in accordance with all applicable codes. Slopes may be provided by tapering the structure or through the use of tapered insulation; a sufficient number of roof drains should also be specified and properly located to allow for positive drainage. Significant ponding that could remain after 48 hours should be eliminated with the addition of auxiliary drains in low areas where ponding is anticipated.

   Carlisle specifically disclaims responsibility for design of and selection of an adequate drainage system and drain accessories. Selection must be made by the building owner or owner's design professional.

2. Small incidental areas of ponded water will not impact the performance of this roofing system; however in accordance with industry standards, the roofing assembly **should be designed to prevent ponding** of water on the roof for prolonged periods (longer than 48 hours). Good roofing practice dictates proper drainage to prevent possible excessive live loads and, in the event of a roof leak, to minimize potential interior damage to the roofing assembly and to the interior of the building.

3. For roofing systems utilizing white membranes, a slope greater than 1/8" per horizontal foot is recommended to serve the long-term aesthetics.

4. Tapered edge strips, crickets or saddles are recommended where periodic ponding of water may occur.

I. On new construction projects, especially in cold climate regions, moisture generated due to the construction process could adversely impact various components within the roofing assembly if not addressed. **Refer to Design Reference DR-01 "Construction Generated Moisture" included in the Carlisle Technical Manual.**

J. On structural concrete decks, when a vapor retarder is not used, **gaps in the deck along the perimeter and around penetrations must be sealed along with vertical joints between tilt-up panels**, if present, to prevent infiltration of hot humid air and possible moisture contamination resulting from condensation. This is specifically important when adhesive is used to attach the roof insulation.

CAUTION: If left unaddressed, collected moisture could weaken insulation boards and facers resulting in a blow-off or increase the probability of mold growth.

K. Vapor Retarders

1. Carlisle does not require a vapor retarder for the protection of the membrane; however, it should be considered by the specifier for the protection of the roofing assembly (i.e. primarily insulation, underlayment and adhesives). The following criteria should be considered by the specifier:

2. Use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly, should be investigated by the specifier.

3. In the generally temperate climate of the United States, during the winter months, water vapor flows upward from a heated, more humid interior toward a colder, drier exterior. Vapor retarders are more commonly required in northern climates than in southern regions, where downward vapor pressure may be expected and the roofing membrane itself becomes the vapor retarder.

4. All Carlisle roofing membranes are tested and pass in accordance with ASTM E 2178 and shall qualify as an air barrier when following Carlisle specifications and details for roofing applications.

L. Retrofit – Recover Projects (When the existing roofing material is left in place)

1. The removal of existing wet insulation and membrane must be specified. The specifier shall select an appropriate and compatible material as a filler for voids created by removal of old insulation or membrane.

2. On existing built-up roof where partial removal is specified to remove wet or damaged insulation, priming the structural deck, with a Carlisle primer, is required where residual asphalt is present to ensure adequate adhesion of the new insulation. In lieu of priming and the use of insulation adhesion, insulation used to fill voids or to replace wet sections may be mechanically fastened.

3. Entrapment of water between old and new membrane can damage and deteriorate new insulation/underlayment between the two membranes. If a vapor retarder or air barrier is not specified, Carlisle recommends existing membrane be perforated to avoid potential moisture accumulation to allow for detection of moisture to enable the building owner to take corrective action. This can be accomplished by drilling approximately 3/4" diameter holes every 100 square feet in the existing built-up

roof or single-ply membrane (excluding PVC membrane).

4. Existing non-reinforced PVC membrane must be totally removed. If not removed it must be cut into maximum 10' by 10' sections and the new membrane underlayment must be mechanically fastened. Flashing must be totally removed.

5. When specifying this roofing system over existing gravel surfaced built-up roof, loose gravel must be removed to avoid the entrapment of moisture. In all cases, a membrane underlayment is required. Refer to Paragraph 3.02G, Insulation/Substrate Requirements, for minimum thickness of acceptable underlayment.

6. Existing Phenolic Foam insulation must be removed prior to the installation of this roofing system.

7. Refer to Section 3.02 for more information about securement of existing roof.

1.03 Quality Assurance

Building codes are above and beyond the intended purpose of this specification. The building **owner, owner's representative** or **Specifier** should verify local codes for applicable requirements and limitations. It is the responsibility of the specifier to review local, state and regional codes to determine their impact on the specified Carlisle Roofing System.
NOTE: For code approvals achieved with the Carlisle FleeceBACK Roofing Systems, refer to the Carlisle FleeceBACK Code Approval Guide, DORA (Directory of Roof Assemblies), Factory Mutual (FM) Approval Guide or Underwriters Laboratories (UL) Fire Resistance or Roofing Materials and Systems Directories.

A. When recovering or retrofitting an existing roof system, the addition of new insulation (type and thickness) may alter the fire performance characteristics of the assembly. Building owners or their designated representatives shall consult the local code enforcement agency to avoid potential code violation.

B. Carlisle recommends the use of Carlisle supplied products for use with this Carlisle Roofing System. The performance or integrity of products by others, **when selected by the specifier and accepted as compatible by Carlisle**, is not the responsibility of Carlisle and is **disclaimed** by the Carlisle Warranty.

C. The specified roofing system must be installed by a Carlisle Authorized Roofing Applicator in compliance with drawings and specifications as approved by Carlisle SynTec.

D. There must be no deviations made from Carlisle's specification or Carlisle's approved shop drawings without the **PRIOR WRITTEN APPROVAL** of Carlisle SynTec.

E. After completion of the installation, upon request, an inspection shall be conducted by a Field Service Representative of Carlisle to ascertain that the membrane roofing system has been installed according to Carlisle's published specifications and details applicable at the time of bid. This inspection is to determine whether a warranty shall be issued. It is not intended as a final inspection for the benefit of the owner.

F. Provide polyisocyanurate insulation that meets PIMA Quality Mark Certified LTTR value through third party verification meeting ASTM C 1289, Type II, Class 1, Grade 2.

G. Solar reflectance of this roofing product may decrease over time due to environmental defacement such as dirt, biological growth, ponded water, etc. The roof should be monitored at regular intervals and maintained or cleaned when necessary to assure maximum solar reflectance.

H. Refer to the **Design Reference DR-07 "CRRC/LEED Information"** for information. (i.e. solar emittance, solar reflectance and recycled content.)

1.04 Submittals

A. To ensure compliance with Carlisle's minimum warranty requirements, the following projects should be forwarded to Carlisle for review prior to installation, preferably prior to bid.

1. Air pressurized buildings, canopies, and buildings with large openings where the total wall openings exceed 10% of the total wall area on which the openings are located (such as airport hangars, warehouses and large maintenance facilities). Refer to Attachment IV at the end of this section for perimeter considerations, when a Mechanically Fastened System is Specified.

2. Cold storage buildings and freezer facilities.

3. Adhered Roofing System projects over 100' in height.

4. Mechanically Fastened Roofing System projects over 50’ in height.

5. Projects where the EPDM is expected to come in direct contact with petroleum-based products, waste products (i.e., grease, oil, animal fats, etc.) and other chemicals.

6. Projects where hot asphalt is specified for insulation attachment.

7. If a Mechanically Fastened membrane securement option is selected in lieu of the use of adhesive, projects specified with a fastener length exceeding 12 inches.

B. Shop drawings must be submitted to Carlisle by the Carlisle Authorized Roofing Applicator along with a completely executed Notice of Award (Page 1 of Carlisle's Request For Warranty form) for approval. Approved shop drawings are required for inspection of the roof and on projects where on-site technical assistance is requested.
Shop drawings must include:

1. Outline of roof and size
2. Deck type (for multiple deck types)
3. Location and type of **all** penetrations
4. Perimeter and penetration details
5. Key plan (on multiple roof areas) with roof heights indicated

C. When field conditions necessitate modifications to the originally approved drawings, a copy of the shop drawing outlining all modifications must be submitted to Carlisle for revision and approval prior to inspection and warranty issuance.

D. **As Built Projects** (roofing systems installed prior to project approval by Carlisle)

The Carlisle Authorized Applicator may supply Carlisle with an As-Built drawing for projects completed prior to Carlisle's approval. The As-Built drawings:

1. Must conform to Carlisle’s most current published specification and details applicable at the time of bid.
2. Must be submitted along with a completely executed Notice of Completion.
3. Must include the items identified in Paragraph 1.04B.

NOTE: As-Built projects are not recommended for those projects referenced in Paragraph 1.04A in order to ensure Carlisle Warranty requirements have been met.

E. **Notice of Completion** (Page 2 of the Carlisle Request for Warranty form)

After project completion, a Notice of Completion must be submitted to Carlisle to schedule the necessary inspection and acceptance of the project prior to issuance of the Carlisle warranty.

1.05 Warranty

A. Membrane System Warranty is available for roofing systems on commercial buildings within the United States and applies only to **products manufactured or marketed by Carlisle SynTec**. The membrane system is defined as membrane, flashings, adhesives, sealants and other Carlisle brand products utilized in the installation. For a complete description of these products, refer to the Part 2 “Products” Section in this Specification and **Spec Supplement “Related Products” P-01.**

B. See Tables Below for information regarding Warranted Systems and Design Criteria:

1. **TABLE I – Minimum Membrane Thickness for Various Warranty Options** Identifies minimum membrane thickness for membranes used in adhered roofing systems**.**

2. **TABLE II - Underlayment and Fastening Density for Assemblies with Warranties Up to 20 YR** Identifies required underlayments for adhered roofing systems with Warranties up to 20 year based on the various wind speed coverages available. The Table also identifies fastening density, adhesive bead spacing and required edge terminations.

3. **TABLE III – Underlayment and Fastening Density for Assemblies with Warranties - 25 to 30 YR** Identifies required underlayments for adhered roofing systems with Warranties from 25 to 30 year based on the various wind speed coverages available. The Table also identifies fastening density, adhesive bead spacing and required edge terminations.

4. **TABLE IV – Bead Spacing for FleeceBACK Membrane Adhesion** Identifies required bead spacing for field and perimeter sheets for available warranty duration and warranty wind speed coverages.

5. **TABLE V – Minimum Perimeter Width** Identifies required minimum perimeter sheet widths for various building heights.

Table I FleeceBACK Adhered Systems Warranty Options

Years	Minimum Membrane Thickness	Warranty Wind Speed			Additional Hail Coverage(4)				Accidental Puncture (6)(7) (man hours per year)
		55, 72 or 80 mph	90 or 100 mph	110 or 120 mph	1" Dia. Hail	2" Dia. Hail	3" Dia. Hail	4" Dia. Hail	
5,10, or 15 year	FleeceBACK EPDM 100-mil or FleeceBACK TPO 100-mil	√	√	√	√	√ (1)	N/A	N/A	8
	FleeceBACK PVC 115-mil (3)	√	√	√	√	√	√ (1)	N/A	16
	FleeceBACK KEE HP 105-mil	√	√	√	√	√ (1)	N/A	N/A	8
20 year	FleeceBACK EPDM 115-mil or FleeceBACK TPO 115-mil	√	√	√	√	√	√ (1)	N/A	16
	FleeceBACK PVC 115-mil (3)(5)	√	√	√	√	√	√ (1)	N/A	16
	FleeceBACK KEE HP 105-mil	√	√	√	√	√ (1)	N/A	N/A	8
25 year	FleeceBACK EPDM 115-mil	√	√	√	√	√	√ (1)	N/A	16
	FleeceBACK PVC 135-mil (3)(5)	√	√	√	√	√	√	N/A	32
	FleeceBACK TPO 135-mil	√	√	√	√	√	√	N/A	32
	FleeceBACK KEE HP 115-mil	√	√	√	√	√	√ (1)	N/A	16
30 year	FleeceBACK EPDM 145-mil	√	√	√	√	√	√	√ (2)	32
	FleeceBACK TPO 135-mil	√	√	√	√	√	√	N/A	32
	FleeceBACK KEE HP 135-mil	√	√	√	√	√	√	N/A	32

Notes: N/A = Not Acceptable √= Acceptable

General: Mechanical Fastening limited to 72 mph, refer to Attachment II, for number of fastening sheets and fasteners.

(1) Requires Flexible FAST in full coverage or beads spaced at 4” o.c.
(2) Require Flexible FAST in full coverage or beads spaced at 4” o.c. Contact Carlisle for underlayment requirements.
(3) FleeceBACK PVC with Polyester or Fiberglass Reinforced Scrim (FRS).
(4) Flexible FAST Splatter application (50% coverage or 1/2 gallon per 100 square feet) does not qualify for additional puncture or hail warranties.
(5) FleeceBACK PVC 115- or 135-mil membranes in Slate Gray are limited to Warranties Up to 20 Year.
(6) Flexible FAST in full coverage or beads spread @ 4” o.c. can receive an additional 4 hours accidental puncture coverage.
(7) Carlisle’s Accidental Puncture Warranty covers labor hours and material used during the repair. Maximum labor and material hours are dependent upon system design. Refer to the Warranty Availability Quick Reference Guide for coverage.

Table II Underlayment/Insulation & Required Attachment Assemblies Up to 20 YR Warranty

Other Requirements are Listed in Additional Design Considerations following this Table.
All Carlisle Products listed for higher wind speed coverage can also be used for Warranties with lesser speed coverage. (i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment (Carlisle Supplied Only)	Insulation/Underlayment Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' and 4' x 8' size board (11)		
			Field	Perimeter	
55 or 72 MPH	1" (20 psi) Polyisocyanurate	16	12" (4)	6" (4)	Carlisle Drip Edge, SecurEdge™ 200 or 300
	1-1/2" (20-psi) Polyisocyanurate	10			
	2" (20 -psi) Polyisocyanurate	8			
	1/2" SecurShield HD or 1/2" SecurShield HD Eco (2)	12			
	1/4" DensDeck, 1/4" Securock, 1/4" DEXCell, or 1/4" DEXCell FA	12			
80 MPH	1/2" SecurShield HD Plus (2)	8	12" (4)(6)	6" (4)(6)	Carlisle Drip Edge, SecurEdge 200 or 300 (10)
	1/2" HP Recovery Board (2)	16			
	2" SecurShield HD Composite	6			
	1/2" DensDeck Prime, 1/2" Securock, 1/2" DEXCell or 1/2" DEXCell FA (2)	8			
	1-1/2" (25-psi) Polyisocyanurate	10			
	2" (25-psi) Polyisocyanurate	8			
90 MPH	1/2" DensDeck, 1/2" Securock, 1/2" DEXCell or 1/2" DEXCell FA (2)	12	6" (8)	6" (6)(7)	Carlisle Drip Edge (3), SecurEdge 2000 or 3000.
	1/2" SecurShield HD or 1/2" SecurShield HD Eco, 1-1/2" (20-psi) SecurShield Polyiso or 1-1/2" (20-psi) SecurShield Eco (2)	16			
	1/2" SecurShield HD Plus (2)	12			
	2" (20-psi) SecurShield Polyiso or 2" (20-psi) SecurShield Eco	8			
	1-1/2" StormBase (OSB/Polyiso Composite) or 1/2" EcoStorm VSH (2)	8			
	2" SecurShield HD Composite	8	6" (4)(6)	6" (4)(6)	
	1-1/2" Insulfoam HD Composite	16			
100 MPH	2" (25-psi) SecurShield Polyiso or 2" (25-psi) SecurShield Eco (1)	16	FS	FS	Carlisle Drip Edge (3), SecurEdge 2000 or 3000.
110 MPH	1-1/2" StormBase (OSB/Polyiso Composite) or 1/2" EcoStorm VSH (2)	16	FS	FS	SecurEdge 2000 or 3000
	1/2" SecurShield HD Plus (2)				
120 MPH	5/8" DensDeck or 5/8" DensDeck StormX Prime, 5/8" Securock, 5/8" DEXCell, 5/8" DEXCell FA, 5/8" DEXCell Cement Roof Board or 5/8" DEXCell FA VSH (2)	16	FS	FS	SecurEdge 2000 or 3000
	1-1/2" StormBase (OSB/Polyiso Composite) (1) or 1/2" EcoStorm VSH (2)	17			
	1/2" SecurShield HD Plus (2)	24			
	2" SecurShield HD Composite	16			

FS = Full Spray, Equipment (Rig) Splatter or Ribbons @ 4" O.C.
(1) For Building heights between 51-100', enhance 12'-wide perimeter with 50% more fasteners and plates.
(2) Cover boards must be installed over a min. 1" thick approved Carlisle Insulation.
(3) Carlisle HP or HP-X Fasteners must be used to secure Carlisle Drip Edge or SecurEdge 200 Metal Fascia to perimeter wood nailers.
(4) Gravel Surface BUR - Field @ 6" O.C. / Perimeter @ 4" O.C
(5) Steel Decks - Field & Perimeter @ 6" O.C.
(6) Cementitious Wood Fiber - Field @ 6" O.C. / Perimeter @ 4" O.C.
(7) Smooth BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.
(8) Gravel Surface BUR – FS
(9) Reduced fastening (11 fasteners per 4 x 8 board) is acceptable on Reroof/No Tear off projects with a maximum roof height of 40'.

(10) May be fastened with ring shank nails staggered 4" on center. Carlisle HP or HP-X™ Fasteners may also be used fastened 12" on center.
(11) Maximum 4' x 4' insulation boards when the adhesive is extruded at 12" o.c. or when boards exceed 4" thickness. 4' x 8' insulation boards may be used when the adhesive is applied at Full-Spray, Equipment (Rig) Splatter, 4", or 6" beads)
(12) Gypsum decks – Bead spacing @ 12" O.C. in Field; 6" O.C. in Perimeter up to 72-MPH.

Table II - Additional Design Considerations (Up to 20 YR Warranty)
(Required in conjunction with Table II)

1 - Building height shall not exceed 100 foot*
2 - Local Wind Zone per ASCE 7 shall not exceed 130 mph*
3 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 15/32" plywood.**
4 - All "T-joints" must be overlaid with appropriate flashing material
5 - Membrane Attachment: 15 YR Warranty - Adhesive Bead Spacing 12" o.c. field, 6" o.c. perimeter up to 55 MPH; 6" o.c. field, 6" perimeter 72 MPH ; 4" o.c. Splatter, or Full Spray field and perimeter 80 MPH
6 - Membrane Attachment: 20 YR Warranty - Adhesive Bead Spacing 6" o.c. field and perimeter up to 55 MPH; 6" o.c. field, 4" o.c perimeter 72 MPH ; 4" o.c. Splatter, or Full Spray field and perimeter 80 MPH.
7 - See DR-05 for insulation fastening patterns.

* For projects where building height exceeds 100' or wind speed exceeds 130 mph, please submit to Carlisle for review.
** 16 fasteners per 4' x 8' board are required for the following decks: OSB, gypsum, cementitious, wood fiber (Tectum), lightweight insulated concrete over steel roof deck thinner than 22-gauge and steel roof deck thinner than 22-gauge. Warranties are limited to a 20-year, 72-mph wind speed.

Table III Underlayment/Insulation & Required Attachment Assemblies 25 YR or 30 YR Warranty

Other Requirements are Listed in Additional Design Considerations following this Table
All Carlisle Products listed for higher wind speed coverage can also be used for Warranties for a lower speed coverage.
(i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' and 4' x 8' size board (10)		
			Field	Perimeter	
55 or 72 MPH	1" to 2" (25 psi) Polyisocyanurate	16	6" (3)(5)	6" (5)	Carlisle Drip Edge, SecurEdge 200 or 300 (8)
	1/2" HP Recovery Board (1)(9)				
	1/4" DensDeck Prime, 1/4" Securock, 1/2" DEXCell or 1/2" DEXCell FA				
	1/2" SecurShield HD or 1/2" SecurShield HD Eco(2)(7)				
80 MPH	1-1/2" to 2" (25-psi) SecurShield Polyisocyanurate or SecurShield Eco	20	6" (3)(5)(6)	6" (5)(6)	Carlisle Drip Edge (4), SecurEdge 200 or 300(4)(5) or SecurEdge 2000 or 3000.
	1/2" DensDeck Prime, 1/2" Securock, 1/2" DEXCell or 1/2" DEXCell FA (2)	16			
	1/2" SecurShield HD Plus (2)				
	1/2" SecurShield HD or 1/2" SecurShield HD Eco (2)(7)	20			
90 MPH	1/2" SecurShield HD or 1/2" SecurShield HD Eco (2)(7)	24	FS	FS	
	1/2" SecurShield HD Plus (2)	20			
	1/2" DensDeck Prime, 1/2" Securock, 1/2" DEXCell or 1/2" DEXCell FA (2)				
100 MPH	5/8" DensDeck Prime, 5/8" DensDeck StormX Prime, 5/8" Securock, 5/8" DEXCell, 5/8" DEXCell FA, 5/8" DEXCell Cement Roof Board or 5/8" DEXCell FA VSH (2)	16	FS	FS	SecurEdge 2000 or 3000
	1-1/2" StormBase (OSB/Polyiso Composite) or 1/2" EcoStorm VSH (2)				
	2" SecurShield HD Composite (2)				
	1/2" SecurShield HD Plus (2)	24			

FS = Full Spray, Equipment (Rig) Splatter or Ribbons @ 4" O.C.
(1) For Building heights between 51-100', enhance 12'-wide perimeter with 50% more fasteners and plates.

(2) Hail coverage offered with substrate.
(3) Structural Concrete - Field @ 12" O.C. / Perimeter @ 6" O.C.
(4) 80-mph over structural concrete - Field & Perimeter @ 6" O.C.
(5) Cementitious Wood Fiber & Wood - FS
(6) 80-mph over Gypsum Decks - FS
(7) 1/2" SecurShield HD or 1/2" SecurShield HD Eco limited to 90 mph.
(8) May be fastened with ring shank nails staggered 4" on center. Carlisle HP or HP-X Fasteners may also be used fastened 12" on center.
(9) 1/2" Recovery Board limited to 55 mph.
(10) Maximum 4' x 4' insulation boards when the adhesive is extruded at 12" o.c. or when boards exceed 4" thickness. 4' x 8' insulation boards may be used when the adhesive is applied at Full-Spray, Equipment (Rig) Splatter, 4", or 6" beads)
(11) Gypsum decks – Bead spacing @ 6" O.C. up to 72-MPH.

Table III - Additional Design Considerations (25 YR or 30 YR Warranty)

1 - Minimum membrane thickness of 145-mil FleeceBACK EPDM, 135-mil FleeceBACK TPO, PVC or KEE HP PVC
2 - Building height shall not exceed 100 foot *
3 - 1/4" per horizontal foot slope is preferred; however, 1/8" slope with sufficient number of drains and crickets / saddles may be accepted.
4 - Local Wind Zone per ASCE 7 shall not exceed 130 mph*
5 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 15/32" plywood. Other decks should be submitted for Carlisle review.
6 - All "T-joints" must be overlaid with appropriate flashing material.
7 - Two layers of insulation with staggered joints, bottom layer must be a minimum 1-1/2" (20-psi) Polyisocyanurate.
8 - New construction or complete tear-off of existing roofing material.
9 - Membrane Attachment: 25/30 YR Warranty - Adhesive Bead Spacing 4" o.c., Splatter or Full Spray field and perimeter up to 100 MPH.
10 - See DR-05 for insulation fastening patterns.
* For projects where building height exceeds 100' or wind speed exceeds 100 mph, please submit to Carlisle for review.

Table IV Flexible FAST Application for FleeceBACK Membrane Adhesion Coverage

Peak Gust Wind Speed Warranty	Warranty Length in Years					
	5 to 15 years		20 years		25 years	
	Field	Perimeter*	Field	Perimeter*	Field	Perimeter*
55 MPH	12″	6″	6″	6″	FS	FS
72 MPH	6″	6″	6″	FS	FS	FS
80 to 120 MPH	FS	FS	FS	FS	FS	FS

FS = Full Spray, Equipment (Rig) Splatter, Dual Tank Splatter or Ribbons @ 4" O.C.
Note: Dual Tank Splatter is only approved for FleeceBACK Membrane Attachment
*Refer to Table V

Table V Minimum Perimeter Width For Insulation Attachment For All Warranties

Width of Perimeter	Building Height
4 feet	25 feet
8 feet	26 to 50 feet
12 feet	51 to 75 feet
16 feet	76 to 100 feet
24 feet	Greater than 100 feet

Note: This Table is for reference for Carlisle System Warranties and does not replace FM requirements for FM insured projects.

C. A warranty covering leaks caused by hail can be issued, refer to Table I – "FleeceBACK Adhered Systems Warranty Options" in this specification for further information. Contact Carlisle for additional information.

D. On projects utilizing FleeceBACK 115 membrane, a 5, 10, 15, or 20-year warranty with limited coverage for accidental punctures (up to 16 man-hours per year) is available. An additional 4 man-hours per year can be obtained when using Flexible FAST Adhesive in full coverage spray or extrusions at 4" on center.

E. On projects utilizing FleeceBACK 135 or 145 membrane, a 5, 10, 15, 20, 25 or 30-year warranty with limited coverage for accidental punctures (up to 32 man-hours per year) is available for an additional charge. An additional 4 man-hours per year can be obtained when using Flexible FAST Adhesive in full coverage spray or extrusions at 4" on center.

F. Upon review by Carlisle, projects incorporating white TPO FleeceBACK Membrane may be eligible for a 10- year Reflectivity Warranty Amendment. These projects must be submitted to Carlisle prior to installation and preferably prior to bid.

G. The formation or presence of mold or fungi in a building is dependent upon a broad range of factors including, but not limited to, the presence of spores and nutrient sources, moisture, temperatures, climatic conditions, relative humidity, and heating/ventilating systems and their maintenance and operating capabilities. These factors are beyond the control of Carlisle and Carlisle shall not be responsible for any claims, repairs, restoration or damages relating to the presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, or the like in any building or in the air, land, or water serving the building.

H. **Access for Warranty Service**

It shall be the owner's responsibility to expose the membrane in the event that warranty service is required when access is impaired. Such impairment includes, but is not limited to:

1. Design features, such as window washing systems, which require the installation of traffic surface units in excess of 80 pounds per unit.

2. Any equipment, ornamentation, building service units and other top surfacing materials which are not defined as part of this specification.

3. Photovoltaic and Mounting Systems or other Rooftop equipment that does not provide Carlisle with

reasonable access to the membrane system for purposes of warranty investigation and related repairs.

4. Severely ponding conditions.

CAUTION: Applications such as walking decks, terraces, patios or areas subjected to conditions not typically found on roofing systems are **not** covered by this specification and not eligible for system warranties as stated herein. The FleeceBACK Plaza Waterproofing specification (published separately) may be referenced for applicable installation procedures and system warranties available.

1.06 Job Conditions

A. On phased roofing, temporary closures should be provided to prevent moisture infiltration. When a temporary roof is specified, Carlisle 725TR in conjunction with CCW-702, CCW-702LV or CAV-GRIP III Low-VOC Adhesive/Primer may be used. Refer to Product Section Part II for additional product information and **Specification Supplement G-08**.

B. When possible on multiple level roofs, begin the installation on the highest level to avoid or minimize construction traffic on completed roof sections.

C. On projects at high altitudes (6,000' and above) rapid flash-off (drying) of Bonding Adhesive and Primers will occur due to low atmospheric pressure.

D. Sprayed polyurethane foam application shall not proceed during periods of inclement weather. Follow Carlisle requirements for application temperatures and humidity levels.

E. Wind barriers shall be used if conditions could affect the quality of the sprayed polyurethane adhesive and to prevent possible over spray.

F. Vapor Retarders

1. Carlisle does not require a vapor retarder for the protection of the membrane; however, it should be considered by the specifier for the protection of the roofing assembly (i.e. primarily insulation, underlayment and adhesives). The following criteria should be considered by the specifier:

   a. Use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly, should be investigated by the specifier. Consult latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.

   b. In the generally temperate climate of the United States, during the winter months, water vapor flows upward from a heated, more humid interior toward a colder, drier exterior. Vapor retarders are more commonly required in northern climates than in southern regions, where downward vapor pressure may be expected and the roofing membrane itself becomes the vapor retarder.

   c. On cold storage/freezer facilities, the perimeter and penetration details must be selected to provide an air seal and prevent outside air from infiltrating and condensing within the roofing assembly.

2. When a vapor retarder is specified, Carlisle 725TR Air and Vapor Barrier may be used. Refer to Part II “Products” for necessary information and **Spec Supplement G-08 “Application Procedures for 725TR Air and Vapor Barrier”** for product Installation.

G. Wood Nailers are required for the securement of metal edgings, scuppers, and insulated pipes. Wood Nailer shall be secured per specifier recommendation or in accordance with Factory Mutual’s Property Loss Prevention Data Sheet 1-49. Refer to **Design Reference DR-08 “Wood Nailer Securement Criteria**” in Carlisle Technical Manual shall be referenced.

H. Do not apply Flexible FAST Adhesive when surface and/or ambient temperatures are below 25° F, unless, heated spray equipment is being utilized. Heated spray equipment may include blankets, preheater and/or heated hoses.

1.07 Product Delivery, Storage and Handling

A. Deliver materials to the job site in the original, unopened containers.

B. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the specifier/owner to prevent overloading and possible disturbance to the building structure.

C. Job site storage temperatures in excess of 90°F (32°C) may affect shelf life of curable materials (i.e., Flexible FAST Adhesive - Parts A and B, uncured flashing, cleaners, sealants, primers, SecurTAPE, SPF-245 Sprayed Polyurethane Foam and Pourable Sealer.)

D. Prolonged exposure of Pressure-Sensitive Flashing and SecurTAPE to temperatures below 40°F (5°C) will cause the pre-applied adhesive to lose tack and in extreme cases, not bond to the membrane. Refer to Product Data Sheets for individual products for temperature restrictions.

E. Flexible FAST Adhesive must be a minimum of 70°F (21°C) at the time of use. Use blanket heaters and hot boxes when necessary.

F. FleeceBACK Membrane should be stored in its original plastic wrap and be covered to protect from moisture. Moisture absorbed by the fleece-backing must be removed by using a wet-vac system and allowed to dry completely, prior to membrane adhesion.

G. PVC or KEE HP PVC Membrane that has been exposed to the elements for approximately 7 days must be prepared with PVC and KEE HP Membrane Cleaner prior to hot air welding. Refer to Section 3.06, Paragraph B.2., Exposed Membrane Seam Preparation, for requirements.

H. Do not store adhesive, primer, Weathered Membrane Cleaner, PVC and KEE HP Membrane Cleaner, etc., containers with opened lids due to the loss of solvent, which will occur from flash-off.

I. When the temperature is expected to fall below 40°F (5°C), outside storage boxes should be provided on the roof for temporary storage of liquid adhesives and sealants. Adhesive and sealant containers should be rotated to maintain their temperature above 40°F (5°C).

PART II PRODUCTS

2.01 General

The components of this Carlisle Roofing System are to be products of Carlisle or accepted by Carlisle as compatible. The installation, performance or integrity of products by others, **when selected by the specifier and accepted as compatible by Carlisle**, is not the responsibility of Carlisle and is expressly disclaimed by the Carlisle Warranty.

2.02 Membranes

A. **Sure-Seal/Sure-White FleeceBACK Membrane**

Sure-Seal FleeceBACK 100, 115 or 145 membrane incorporates 45-, 60-, or 90-mil thick Sure-Seal (black) or Sure-White non-reinforced EPDM laminated to a 55-mil non-woven polyester fleece-backing resulting in a total finished sheet thickness of 100, 115 or 145-mil. A selvage edge with 3” or 6” wide Factory-Applied SecurTAPE is provided along the length of the membrane for splicing. The 100 and 115-mil membranes are

available in widths of 5’ or 10' and lengths of 40’, 50’ (black only) or 100’ depending on the product. The 145-mil membrane is available in width of 10’ and lengths of 50’ or 100’ depending on the specific product. Conforms to ASTM Standard D 4637-96, Type III (Fabric-Backed membrane) with the following physical properties:

Physical Property	Test Method	SPEC. (Pass)	Sure-Seal Typical	Sure-White Typical
Tolerance on Nominal Thickness, %	ASTM D 751	±10	±10	±10
Thickness over Fleece, min, in. (mm) 100 mil (2.54 mm) 115 mil (2.92 mm) 145 mil (3.68 mm)	ASTM D4637 Annex	 .030 (.762) .045 (1.14) .080 (2.03)	 .045 (1.143) .060 (1.524) .090 (2.28)	 .045(1.143) .060 (1.524) .090 (2.28)
Weight 1b/ft□ (kg/m□) 100 mil 115 mil 145 mil			 0.29 (1.4) 0.38 (1.9) 0.59 (2.4)	 0.33 (1.6) 0.42 (2.1) 0.63 (3.1)
Breaking Strength, min, lbf (N) 100 and 115 mil 145 mil	ASTM D751 Grab Method	90 (400)	 210 (934) 250 (1,112)	 210 (934) 210 (934)
Elongation, Ultimate, min, %	ASTM D 412	300 **	480 **	500 **
Tearing Strength, min, lbf (N) 100 and 115 mil 145 mil	ASTM D 751 B Tongue Tear	10 (45)	 45 (200) 60 (266)	 45 (200) 45 (200)
Puncture Resistance, Joules 100 mil 115 mil 145 mil	ASTM D5635		 20 27.5 35	 25 25 42.5
Puncture Resistance, lbf 100 mil 115 mil 145 mil	FTM 101C Method 2031		 328 338 355	 316 325 307
Puncture Resistance, lbf 100 mil 115 mil 145 mil	ASTM D120		 18 22 28	 17 19 22
Hail Resistance 100 mil 115 mil 145 mil	UL 2218 Over Iso HP Rec. Bd. Gypsum Bd.	Class 4 Rating 2” steel Ball at 20’	 Pass Pass Pass	 Pass Pass Pass
Brittleness point, max, °F (°C)	ASTM D 2137	-49 (-45)	-67 (-55)	-67 (-55)
Resistance to Heat Aging * Properties after 4 weeks @ 240°F (116°C) for Sure-Seal Properties after 1 week @ 240° F for Sure-White Breaking Strength, min, lbf (N) Elongation, Ultimate, min, % Linear Dimensional Change, max, %	ASTM D 573 ASTM D 751 ASTM D 412 ASTM D 1204	 80 (355) 200 ** ±1.0	 200 (890) 225 ** -0.7	 200 (890) 250 ** -0.7
Ozone Resistance * Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen wrapped around 3 inch (7.5 cm) mandrel	ASTM D 1149	No Cracks	No Cracks	No Cracks
Resistance to Water Absorption * After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471	+8, -2**	2.0 **	3.6 **
Resistance to Outdoor (Ultraviolet) Weathering * Xenon-Arc, total radiant exposure at 0.70 W/m^2 irradiance 176° F (80°C) black panel temperature	ASTM G 155	No Cracks No Crazing @ 7560 kJ/m^2	No Cracks No Crazing @ 41580 kJ/m^2	No Cracks No Crazing @ 25200 kJ/m^2

* Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting

** Specimens prepared from coating rubber compound.

B. **Sure-Weld FleeceBACK Membrane**

Sure-Weld FleeceBACK 100, 115 or 135 membrane incorporates 45, 60 or 80-mil thick Thermoplastic Polyolefin (TPO) membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 100, 115 or 135- mils. Membrane sheets are available in rolls 12' or 6' wide by 50', 75' or 100' long. Sure-Weld FleeceBACK Membrane is available in white, gray or tan in the 100-, 115- and 135-mil thicknesses and conforms to the table below:

OPTION: 115-mil Sure-Weld FleeceBACK TPO is available in 5 Special Colors (Medium Bronze, Rock Brown, Terra Cotta, Slate Gray and Patina Green) in 12' x 100' long rolls as a limited stock item, depending on stock levels product may require a lead time. Contact Carlisle for availability.

OPTION: 115-mil (white) and 135-mil (white or gray) Sure-Weld FleeceBACK TPO reinforced membrane is available with an optional APEEL Protective Film. APEEL Protective Film can be left in place for up to 90 days without affecting the integrity of the film, guarding the TPO membrane's surface from scuffs and dirt accumulation during installation. Durable and easy to remove, APEEL Protective Film improves aesthetics and long-term reflectivity. Available 6' and 12' widths by 100' long rolls for 115-mil membrane and 6' and 12' widths by 75' long rolls for 135-mil membranes. Sure-Weld 135-mil FleeceBACK APEEL TPO requires a minimum order of 200 squares and 2-3 week lead time. Also available, APEEL 6" Cover Tape, allowing 100% coverage of the TPO surface. APEEL Cover Tape rolls are 1,640 feet long.

Property	Test Method	SPEC. (min.)	Sure-Weld FB (typical)
Thickness of reinforced sheet over fleece, in. (mm) tolerance is ±10	ASTM D 751	-	0.045 (1.14) – FB 100 0.060 (1.52) – FB 115 0.080 (2.03) – FB 135
Weight, lb/sq.ft.	-	-	0.27 - FB 100 0.34 - FB 115 0.44 - FB 135
Breaking Strength, min, lbf (kN)	ASTM D 751 Grab Method	220 (1)	375 (1.6) min. FB 100 450 (2) min. FB 115 500 (2.2) min. FB 135
Elongation at break of internal fabric,%	ASTM D 751	15	25 typical
Tearing Strength, min, lbf (N) 8" by 8" specimen	ASTM D 751 B Tongue Tear	55 (245)	100 (445) typical
Puncture resistance, Joules	ASTM D5635	-	20 FB 100 25 FB 115 32.5 FB 135
Puncture resistance, lbf (N)	FTM 101C Method 2031	350(1.6) min. FB 100 400 (1.8) min. FB 115 425 (1.9) min. FB 135	450 (2.0) typical FB 100 525 (2.3) typical FB 115 600 (2.6) typical FB 135
Brittleness Point, °F (°C)	ASTM D 2137	-40 (-40) min.	-50 (-46) typical
Linear Dimensional Change (shrinkage), %	ASTM D 1204	+/- 1.0 max.	-0.2 typical
Field seam strength, lbf/in. (kN/m) Seam tested in peel	ASTM D1876	25 (4.4) FB 100 25 (4.4) FB 115 40 (7.0) FB 135	50 (8.8) typical FB 100 60 (10.5) typical FB 115 70 (12.3) typical FB 135
Water vapor permeance, Perms	ASTM E 96	-	0.10 max. 0.05 typical
Resistance to microbial surface growth, rating (1 is very poor, 10 is no growth)	ASTM D 3274	-	9 – 10 typical
Ozone Resistance, 100 pphm, 168 hours	ASTM D 1149	No Cracks	No Cracks
Resistance to Water Absorption After 7 days immersion @ 158°F (70°C) Change in mass, % (one side)	ASTM D 471	+/- 3.0	0.90
Resistance to Outdoor (Ultraviolet) Weathering Xenon-Arc, total radiant exposure at 0.70 W/m^2 irradiance, 80ºC black panel temp.	ASTM G 155	No Cracks No loss of breaking or tearing strength	No Cracks No loss of breaking or tearing strength
FB 100 FB 115 FB 135			17,640 kJ/m^2 20,160 kJ/m^2 27,720 kJ/m^2

C. **FleeceBACK PVC Membranes**

1. **FleeceBACK PVC FRS membrane** incorporates 60- or 80-mil thick, fiberglass reinforced scrim, Polyvinyl Chloride (PVC) membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 115, or 135- mils. Membrane sheets are available in rolls 10' wide by 100' long for 115-mil membrane and 10' wide by 75' log for 135-mil membranes. FleeceBACK PVC FRS Membrane is available in white, gray, light gray and tan and conforms to the following:

Property	Test Method	Requirement	FleeceBACK FRS PVC 115-mil	FleeceBACK FRS PVC 135-mil
Thickness of reinforced sheet over fleece, in. (mm)	ASTM D 4434	0.016 min. (0.40)	0.025 typ. (0.635)	0.030 typ. (0.762)
Breaking Strength (MD x CD), lbf (N)	ASTM D 751	200 min. (0.022)	450 x 400 (0.05 x 0.045)	500 x 450 (0.056 x 0.045)
Elongation break of reinforcement (MD X CD), %	ASTM D 751	15 min.	70 x 100	70 x 100
Seam Strength, min. (% of breaking strength)	ASTM D 751	>75	PASS	PASS
Tearing Strength (CD), lbf (N)	ASTM D 751	45 (200)	60	60
Low Temperature Bend	ASTM D 2136	No Cracks - 5x	PASS (-40º C)	PASS (-40º C)
Linear Dimensional Change, % (MD x CD)	ASTM D 1204	± 0.5 max.	0.36 x 0.00 typ.	0.36 x 0.00 typ.
Ozone Resistance	ASTM D 1149	No Cracks – 7x	PASS	PASS
Water Absorption Resistance, mass %	ASTM D 570	± 3.0 max.	2.0 typ.	2.0 typ.
Field Seam Strength, lbf/in. (kN/m)	ASTM D1876	No Requirement	25 (4.4) min. 60 (10.5) typ.	25 (4.4) min. 60 (10.5) typ.
Water Vapor Permeance, Perms	ASTM E 96	No Requirement	0.10 max. 0.05 typ.	0.10 max. 0.05 typ.
Puncture Resistance, Dynamic, J (ft-lbf)	ASTM D 5635	20 (14.7)	PASS	PASS
Puncture Resistance, Static, lbf (N)	ASTM D 5602	33 (145)	PASS	PASS
Xenon-Arc Resistance 12,600 kJ/m^2 total radiant exposure 10,000 hrs	ASTM G 155	No Cracks or Crazing – 10x	PASS	PASS
Properties After Heat Aging, Breaking Strength, % retained	ASTM D 3045	90 min.	90 min.	90 min.
Properties After Heat Aging, Elongation Reinf., % retained	ASTM D 3045	90 min.	90 min.	90 in.

2. **FleeceBACK PVC membrane** incorporates 60- or 80-mil thick, polyester reinforced scrim, Polyvinyl Chloride (PVC) membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 115, or 135- mils. Membrane sheets are available in rolls 10' wide by 100’ long for 115-mil membranes and 10’ wide by 75’ long for 135-mil membranes. FleeceBACK PVC Membrane is available in white, gray, light gray, slate gray and tan and conforms to the following:

Property	Test Method	Requirement	FleeceBACK PVC 115-mil	FleeceBACK PVC 135-mil
Thickness of reinforced sheet over fleece, in. (mm)	ASTM D 4434	No requirement	0.060 typ. (0.152)	0.080 typ. (0.203)
Membrane Thickness over scrim, in. (mm)	ASTM D 4434	0.016 min. (0.40)	0.027 typ. (0.686)	0.037 typ. (0.940)
Breaking Strength (MD x CD), lbf (N)	ASTM D 751	200 min. (890)	420 x 380 (73 x 66)	450 x 410 (79 x 72)
Elongation break of reinforcement (MD X CD), %	ASTM D 751	15 min.	30 x 30	30 x 30
Tearing Strength (MD x CD), lbf (N)	ASTM D 751	45 (200)	197 x 165 (876 x 734)	173 x 191 (769 x 849)
Low Temperature Bend	ASTM D 2135	No Cracks - 5x	PASS (-40º C)	PASS (-40º C)
Linear Dimensional Change, %	ASTM D 1204	± 0.5 max.	0.4 typ.	0.4 typ.
Water Absorption Resistance, mass %	ASTM D 570	± 3.0 max.	2.0	2.0
Puncture Resistance, Dynamic, J (ft-lbf)	ASTM D 5635	20 (14.7)	40 (29.5)	42.5 (31.3)
Puncture Resistance, Static, lbf (N)	ASTM D 5602	33 (145)	63.99 (284.6)	63.99 (284.6)
Federal Puncture (Max. Load in lbf)	FTM-101C	No Requirement	380	460
Xenon-Arc Resistance 12,600 kJ/m^2 total radiant exposure 10,000 hrs	ASTM G 155	No Cracks or Crazing – 10x	PASS	PASS
Properties After Heat Aging, Breaking Strength, % retained	ASTM D 3045	90 min.	90 min.	90 min.
Properties After Heat Aging, Elongation Reinf., % retained	ASTM D 3045	90 min.	90 min.	90 min.

3. **FleeceBACK KEE HP membrane** incorporates 50-, 60- or 80-mil thick Polyester Reinforced Elvaloy KEE HP PVC membrane laminated to a 55-mil non-woven fleece backing resulting in a total finished sheet thickness of 105-, 115, or 135- mils. Membrane sheets are available in rolls 10' wide by 100' long for 105- and 115-mil and 10’ wide by 75’ long for 135-mil. Sure-Flex FleeceBACK KEE HP Membrane is available in white, gray, light gray and tan and conforms to the following:

Property	Test Method	FleeceBACK KEE HP PVC 105-mil	FleeceBACK KEE HP PVC 115-mil	FleeceBACK KEE HP PVC 135-mil
Thickness of reinforced sheet over fleece, in. (mm)	ASTM D 4434	0.050 min. (1.27)	0.060 typ. (1.52)	0.080 typ. (2.03)
Thickness over scrim, in. (mm)	ASTM D 4434	0.024 min. (0.61)	0.029 typ. (0.74)	0.036 typ. (0.91)
Breaking Strength (MD x CD), lbf (kN/m)	ASTM D 751	410 x 360 (72 x 63)	450 x 410 (79 x 72)	500 x 490 (87 x 86)
Elongation break of reinforcement (MD x CD), %	ASTM D 751	35 x 30	35 x 30	35 x 30
Tearing Strength (MD x CD), lbf (N)	ASTM D 751	178 x 162 (791 x 720)	147 x 174 (653 x 774)	152 x 183 (676 x 814)
Low Temperature Bend	ASTM D 2135	PASS (-40º C)	PASS (-40º C)	PASS (-40º C)
Linear Dimensional Change, %	ASTM D 1204	0.4 typ.	0.4 typ.	0.4 typ.
Water Absorption Resistance, mass %	ASTM D 570	1.25	0.87	0.89
Puncture Resistance, Dynamic, J (ft-lbf)	ASTM D 5635	PASS	PASS	PASS
Puncture Resistance, Static, lbf (N)	ASTM D 5602	63.99 (284.6)	63.99 (284.6)	63.99 (284.6)
Federal Puncture (Max. Load in lbf)	FTM-101C	332	384	482
Xenon-Arc Resistance 12,600 kJ/m^2 total radiant exposure 10,000 hrs	ASTM G 155	PASS	PASS	PASS
Properties After Heat Aging, Breaking Strength, % retained	ASTM D 3045	90 min.	90 min.	90 min.
Properties After Heat Aging, Elongation Reinf., % retained	ASTM D 3045	90 min.	90 min.	90 min.

2.03 Insulation / Underlayments

A. General

1. Roof insulation thickness must be determined by the thermal value required for each project and may be subject to code approval limitations. On projects where a vapor retarder is used, the specifier must calculate insulation thickness to ensure the temperature at the vapor retarder will not fall below the calculated dew point.

2. Multiple layers of insulation are recommended with all joints staggered between layers.

3. For minimum recommended R-Values, previously published by American Society of Heating and Air-Conditioning Engineers (ASHRAE), consult local building code official for applicable requirements.

4. For Insulation fastening pattern and densities refer to Carlisle Applicable Details and **Design Reference DR-05 "Insulation Fastening Patterns".**

5. Carlisle Insulation/underlayment must be specified for all Total System Warranty projects or when the insulation is to be covered by the Carlisle Warranty. Any of the Carlisle Insulation/Underlayment may be specified subject to design restrictions included with each table.

B. Carlisle Polyisocyanurate

Table B1 **Polyisocyanurate** (See below for product descriptions)

Insulations*	Minimum Thickness	ASTM	Roofing System Acceptability	
			Adhered	Mechanically Fastened
Carlisle InsulBase Polyisocyanurate, Carlisle InsulBase Eco, Carlisle InsulBase HD Eco	*1.5"	C1289, Type II, Class 1, Grade 2 or 3	√	√
Carlisle InsulBase NH Polyisocyanurate	*1.5"	C1289, Type II, Class 1, Grade 2 or 3	√	√
Carlisle SecurShield Polyisocyanurate, Carlisle SecurShield Eco	*1.5"	C1289, Type II Class 2, Grade 2 or 3	√	√
Carlisle SecurShield NH Polyisocyanurate	*1.5"	C1289, Type II, Class 2, Grade 2 or 3	√	√
Carlisle SecurShield HD Composite (SS HD)	2"	C1289, Type IV, Grade 2 or 3	√	√
Carlisle StormBase Composite (OSB)	1.5"	C1289, Type V, Grade 2 or 3	√	√

Design Restrictions

- Extended Warranty, those with longer duration, higher wind speed, or puncture coverage, may require the use of a cover board over Polyiso Insulation, refer to Warranty Tables in Paragraph 1.04 for applicable requirements.
- Maximum Flute Spanability shall be limited to 2-5/8" when 1" Minimum Polyiso Insulation is to be used.
- Minimum thickness of insulation board may be restricted by wind speed coverage and warranty duration, refer to Tables II and III in Paragraph 1.05.

*1.5" minimum for adhered systems. Subject to Warranty Limitation, 1" minimum may be acceptable for adhered system, Carlisle must be contacted for fastening density.

Notes: N/A = Not Acceptable √ = Acceptable * SecurShield HD is listed in Paragraph E2 below

1. **Carlisle InsulBase Polyisocyanurate** – A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available.

2. **Carlisle InsulBase Eco** – A rigid roof insulation panel with 5% ISCC-certified bio-attributed content

composed of a closed-cell polyisocyanurate foam core bonded to glass-reinforced felt (GRF) facers, meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4’ x 8’ standard size with a thickness from 1 to 4 inches. 4’ x 4’ tapered panels are also available. UL and FM approved for direct application over steel decks, polyiso provides the highest R-value per inch of any commercially available insulation product.

3. **Carlisle InsulBase HD Eco** – A rigid-roof insulation cover board with 5% ISCC-certified bio-attributed content composed of a high-density closed-cell polyisocyanurate foam core bonded on each side to glass-reinforced felt (GRF), meeting ASTM C1289, Type II, Class 1, Grade 3. UL and FM approved for direct application over steel decks. Available in 1/2” thick, 4’ x 4’ and 4’ x 8’ panels with an R-value of 2.5. Suitable for both re-roofing and new construction applications, InsulBase HD is specifically designed for use as a cover board in mechanically-attached single-ply systems only. InsulBase HD delivers an R-value of 2.5.

4. **Carlisle InsulBase NH Polyisocyanurate -** A foam core insulation board covered on both sides with a glass-reinforced felt meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4’ x 4’ and 4’ x 8’ standard size with a thickness from ½” to 4 inches. InsulBase NH Polyisocyanurate contains zero halogenated flame retardants.

5. **Carlisle SecurShield Polyisocyanurate–** A foam core insulation board covered on both sides with a coasted glass fiber mat facer meeting ASTM C 1289, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4’ x 8’ standard size with a thickness from 1 to 4 inches. 4’ x 4’ tapered panels are also available. These flat board products feature a dark-colored coated-glass facer (CGF) on one side of the insulation board and a light-colored CGF on the other, labeled Ready Flash. Ready Flash Technology allows applicators to manage adhesive flash-off times by choosing between two different-colored facers on every board.

6. **Carlisle SecurShield Eco** – A rigid roof insulation panel with 5% ISCC-certified bio-attributed content composed of a closed-cell polyisocyanurate foam core bonded to high performance coated glass facers (CGF). ASTM C 1289, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi), available in 4’ x 8’ standard size with a thickness from 1 to 4 inches. 4’ x 4’ tapered panels are also available. Ideal for use in adhered membrane systems. Achieves a UL Class A fire rating direct to combustible deck.

7. **Carlisle SecurShield NH Polyisocyanurate -** A foam core insulation board covered on both sides with a coated glass fiber mat facer meeting ASTM C 1289, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4’ x 4’ and 4’ x 8’ standard size with a thickness from ½ inch to 4 inches. SecurShield NH contains zero halogenated flame retardants.

8. **Carlisle SecurShield HD Composite** – Composite insulation panel comprised of 1/2-inch high-density (109 psi max) Polyiso cover board laminated during the manufacturing process to SecurShield rigid Polyiso roof insulation meeting ASTM C1289 Type IV, Grade 2 (20 psi) or Grade 3 (25 psi). Available in 4’ x 8’ boards with thickness from 2” to 4.5”. 4’ x 4’ panels are also available.

9. **Carlisle StormBase Polyiso Composite (OSB)** – Polyiso insulation bonded on the bottom side with a medium weight fiber-reinforced felt face and laminated with a top surface of 7/16” or 5/8” thick Oriented Strand Board (OSB) meeting ASTM C1289, Type V, Grade 2 (20 psi) or Grade 3 (25 psi). Available in 4’ x 8’ boards with thickness from 1-1/2” to 4”.

C. **EPS: Expanded Polystyrene**

Table C1	**EPS: Expanded Polystyrene** (See below for product descriptions)			
Insulations*	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**	
			Adhered	**Mechanically Fastened**
Insulfoam I (1 lb density)	1”	C578 Type I	N/A	N/A
Insulfoam VIII (1.25 lb density)	.75”	C578 Type VIII	N/A	N/A
Insulfoam II (1.5 lb density)	.75"	C578 Type II	N/A	N/A
Insulfoam HD Composite (SecurShield HD)	1.5”	C578 Type (I, VIII, II, or IX)	√	√
InsulLam (Various Cover Boards)	1.5"	C578 Type (I, VIII, II, or IX)	√	N/A
InsulFoam SP	1"	C578 Type VIII	√	Sure-Weld/Sure-Flex
Design Restrictions				
- Local Codes must be consulted regarding the acceptance of expanded insulation directly over steel decks. When specified, minimum thickness shall be designated by the manufacturer. - Expanded polystyrene roof insulations cannot be installed directly over coal-tar pitch roof surfaces or existing PVC membranes. A separation layer of minimum 1/2” SecurShield HD, HP Recovery Board or Polyiso Insulation shall be used. - Other Insulations in other densities are available – Contact Carlisle.				
Notes: N/A = Not Acceptable √ = Acceptable * R-Tech Fanfold Recover Board is listed in Paragraph E4 below				

a. **Insulfoam I –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type I. Nominal density of 1.0 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from 1/4” to 40”. Custom lengths, widths and tapered boards are available. May be specified beneath Sure-Seal HP Recovery Board, DensDeck Prime, DensDeck StormX Prime, Securock or DEXCell.

b. **Insulfoam VIII –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type VIII. Nominal density of 1.25 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from 1/4” to 40”. Custom lengths, widths and tapered boards are available. May be specified beneath Sure-Seal HP Recovery Board, DensDeck Prime, DensDeck StormX Prime, Securock or DEXCell.

c. **Insulfoam II –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type II. Nominal density of 1.5 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from 1/4” to 40”. Custom lengths, widths and tapered boards are available. May be specified beneath Sure-Seal HP Recovery Board, DensDeck Prime, DensDeck StormX Prime, Securock or DEXCell.

d. **Insulfoam HD Composite** – A composite insulation consisting of a closed-cell, lightweight and resilient expanded polystyrene (EPS) bonded to high-density Polyisocyanurate cover board. Available in 4’ x 8’ boards with overall thickness from 1-1/2” to 7”.

e. **InsulLam –** Insulfoam expanded polystyrene (EPS) insulation laminated with a top surface of 7/16” or 5/8” thick Oriented Strand Board (OSB) or 5/8” plywood. Available in 4’ x 8’ boards with thickness from 1-1/2” to 7”.

f. **Insulfoam SP** – A closed-cell, lightweight and resilient expanded polystyrene (EPS) with a durable and stable, factory-laminated fiber glass facer. Available in 4’ x 8’ boards with overall thickness from 1” to 7”.

D. **XPS: Extruded Polystyrene –** Available through Carlisle is dimensionally stable with high thermal and low water absorption performance capability. XPS is available in varying compressive strengths thicknesses and sizes and can be specified as a base layer beneath an acceptable cover board. Refer to specific product data sheets for physical properties and additional technical information.

E. **Carlisle Vacuum Insulated Panel (VIP)**

Table E1 **Vacuum Insulated Panel (VIP)** (See below for product descriptions)				
Insulations / Underlayment	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**	
			Adhered	**Mechanically Fastened**
Carlisle Optim-R VIP	*1.6"	C1484	√	N/A
Design Restrictions				
*2.6” minimum for total installed system including an additional 2 layers of 1/2” SecurShield HD panels; 1 layer on top and 1 layer on bottom of Optim-R. For adhered systems only. Note: Optim-R VIP cannot be cut or punctured.				
Notes: N/A = Not Acceptable √ = Acceptable				

1. **Optim-R Vacuum Insulated Panel (VIP) –** a high R-Value vacuum insulated panel (VIP) used to provide a low-profile solution when height restrictions exist, such as windows, doors, equipment curbs, etc. Provides an R-38 insulating value in a 2.6” system thickness with up to 35% infill (non-VIP material). Available in 23.6” x 23.6” and 23.6” x 47.2” board sizes.

F. **Cover Boards**

Table F1	**Cover Boards** (See below for product descriptions)			
Insulations / Underlayment	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**	
			Adhered	**Mechanically Fastened**
SecurShield HD, SecurShield HD Eco	.5"	C1289, Type II, Class 4 (109 psi max)	√	√
SecurShield HD Plus	.5"	C1289, Type II, Class 4 (109 psi max)	√	√
InsulBase HD, InsulBase HD Eco	.5"	C1289, Type II, Class 1, Grade 3	N/A	√
EcoStorm VSH	.5"	Refer to Product Data Sheet	√	√
Securock Cover Board	.25"	Refer to Product Data Sheet	√	Sure-Weld/Sure-Flex Only
HP Recovery Board	.5"	C208 Grade 2	√	√
DensDeck StormX Prime	.625"	C1177	√	√ (1)
DensDeck Prime	.25"	C1177	√	√ (1)
DensDeck	.25"	C1177	√	√ (1)
R-Tech Fanfold Recovery Board	.5"	C578 Type (I, VIII, II. or IX)	N/A	√
DEXCell	.5"	C1177	√	√
DEXCell FA	.5"	C1177	√	√
DEXCell Cement Roof Board	.4375"	C1325	√	√
DEXCell FA VSH	.625"	C1177	√	√ (1)

Design Restrictions

- HP Recovery Board and R-Tech Fanfold not recommended for direct use over Type B and F steel decks.
- Securock Cover Board, HP Recovery Board, DensDeck StormX Prime, DensDeck Prime, DensDeck or DEXCell may not be used directly over New or Existing Lightweight Insulating Concrete Decks existing or Structural Concrete.
- Due to some warranty restrictions, DensDeck, DensDeck Prime, DensDeck StormX Prime and DEXCell not recommended for use directly over existing roofing membrane without prior written approval from Carlisle. Contact Carlisle for specific requirements.
- R-Tech Fanfold primarily for use in existing roof re-covers applications or directly over structural or lightweight insulating concrete.

(1) Permitted with roofs with slopes greater than 2" per foot for compliance with external fire codes, refer to UL listings or contact Carlisle.

Notes: N/A = Not Acceptable √ = Acceptable

1. **SecurShield HD** – a rigid insulation panel composed of a high-density (109 psi max), closed-cell polyisocyanurate foam core laminated to coated-glass fiber-mat facer meeting ASTM C1289, Type II, Class 4, Grade 1, for use as a cover board or recover board. Available 1/2" thick 4' x 4' (5.5 lbs) and 4' x 8' panel weight 11 lbs with an R-value of 2.5.

   Features Ready Flash, a dark-colored coated-glass facer (CGF) on one side of the insulation board and a light-colored CGF on the other. Ready Flash Technology allows applicators to manage adhesive flash-off times by choosing between two different-colored facers on every board.

2. **SecurShield HD Eco** – A rigid roof insulation panel with 5% ISCC-certified bio-attributed content composed of ½" high-density, closed-cell polyisocyanurate foam core bonded to a premium performance coated glass facer (CGF) specifically designed for use as a cover board, meeting ASTM C1289, Type II, Class 4, Grade 1. Provides 5 times the R-value at one-fifth the weight of traditional gypsum cover boards. Achieves a UL Class A fire rating direct to combustible deck. Available in 1/2" thick, 4' x 4' (5.5 lbs) and 4' x 8' (11 lbs) panels with an R-value of 2.5.

3. **SecurShield HD Plus** - a rigid insulation panel composed of a high-density (109 psi max), closed-cell polyisocyanurate foam core laminated to premium-performance coated-glass fiber-mat facer, meeting ASTM C1289, Type II, Class 4, Grade 1. for use as a cover board or recover board. Available 1/2" thick 4' x 8' panel weight 11 lbs with an R-value of 2.5. Meets an FM 1-90 using only 8 fasteners per 4' x 8' board.

4. **InsulBase HD** – a closed-cell polyisocyanurate foam core insulation board covered on both sides with

glass-reinforced felt (GRF) facer meeting ASTM C 1289, Type II, Class 1, Grade 3. The product is available in 4’ x 4’ and 4’ x 8’ standard sizes with a thickness of one half inch with an R-value of 2.5. ASTM C1289, Type II, Class 1, Grade 3.

5. **InsulBase HD Eco** – A rigid-roof insulation cover board with 5% ISCC-certified bio-attributed content composed of a high-density closed-cell polyisocyanurate foam core bonded on each side to glass-reinforced felt (GRF), meeting ASTM C1289, Type II, Class 1, Grade 3. UL and FM approved for direct application over steel decks. Available in 1/2” thick, 4’ x 4’ and 4’ x 8’ panels with an R-value of 2.5.. Suitable for both re-roofing and new construction applications, InsulBase HD is specifically designed for use as a cover board in mechanically-attached single-ply systems only. InsulBase HD delivers an R-value of 2.5.

6. **Securock Cover Board** – A uniform composition of fiber-reinforced gypsum, without a facer, for use as a cover board or a thermal barrier. Available in 1/4” to 5/8” thick and 4’ x 4’ or 4’ x 8’ size boards. Long uninterrupted runs (>200’) may require slight gapping due to thermal expansion.

7. **EcoStorm VSH Cover Board** – an engineered composite building material made from a proprietary blend of plastic and cellulose fiber sourced from post-industrial and post-consumer waste streams. EcoStorm VSH is a durable, extremely moisture and mold resistant building material with a core that does not disintegrate or delaminate in the presence of water. Available in 1/2” thick and 4’ x 8’ size board.

8. **Sure-Seal HP Recovery Board** - A 1/2” or 1” thick high-density wood fiberboard with an asphalt coated facer for use as a cover board or recover board. Available 1/2” or 1” thick and 4’ x 4’ or 4’ x 8’ size boards. When used in reroof / no tear-off projects, warranty is limited to 15-year projects.

9. **DensDeck StormX Prime** – a reinforced gypsum cover board with an enhanced, moisture-resistant core and coated glass mat facers on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for adhered membrane for use as a cover board. DensDeck StormX Prime is extremely durable and is approved for use in assemblies meeting FM’s Very Severe Hail (VSH) Classification. Available in 5/8” thickness and 4’ x 4’ or 4’ x 8’ size boards.

10. **DensDeck Prime** – gypsum core that incorporates glass-mat facings on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for adhered membrane for use as a cover board. Available in 1/4” to 5/8” and 4’ x 4’ or 4’ x 8’ size boards.

11. **DensDeck Cover Board** – gypsum core that incorporates glass-mat facings on the top and bottom side for use as a cover board. Available in 1/4” to 5/8” and 4’ x 4’ or 4’ x 8’ size boards.

12. **DEXCell** – A mold & mildew resistant, gypsum substrate board with coated fiberglass facers, used for thermal protection and acoustical enhancement of roof systems. May be used as a substrate for a vapor retarder and /or the continuous substrate for the application of commercial roofing applications. Available in 1/4”, 1/2” and 5/8” thicknesses in 4’ x 8’ boards.

13. **DEXCell FA** – A mold & mildew resistant, gypsum substrate board with heavy duty, coated fiberglass facers, used for thermal protection and acoustical enhancement of roof systems. May be used as a substrate for a vapor retarder and /or the continuous substrate for the application of commercial roofing applications. The precoated, fiberglass facers are designed to increase adhesive coverage and enhance performance of the bond strength of the system. Available in 1/4”, 1/2” and 5/8” thicknesses in 4’ x 4’ and 4’ x 8’ boards**.**

14. **DEXCell Cement Roof Board** – A mold & mildew resistant, Portland Cement, lightweight aggregate roof board with heavy-duty fiberglass mesh facers used as a substrate board, thermal barrier and cover board for commercial roofing applications. Available in 7/16” and 5/8” thicknesses in 4’ x 4’ and 4’ x 8’ boards.

15. **DEXCell FA VSH – A reinforced gypsum panel with enhanced moisture resistant gypsum core and heavy duty coated glass facers used as a substrate board, thermal barrier and cover board for commercial roofing applications, approved for use in single-ply and multi-ply assemblies meeting FM Very Severe Hail rating. Available in 5/8" thickness in 4' x 4' and 4' x 8' boards.**

G. For projects specified in conjunction with new sprayed-in-place polyurethane foam insulation, FleeceBACK membrane can be adhered directly to the new urethane foam surface with Carlisle Flexible FAST Adhesive. Refer to Carlisle's SPF Adhered Roofing System Specification for specific requirements.

2.04 Related Materials

A. **Flashings**

1. **EPDM (Sure-Seal/Sure-White) Related Products**

a. **Sure-Seal and Sure-White Pressure-Sensitive Cured Cover Strip –** a cured 60-mil non-reinforced EPDM membrane laminated to a nominal 30-mil pre-applied tape used to flash metal edgings, overlay end laps and completing general repairs to cured EPDM membrane. Available in 6", 9" and 12" widths.

b. **Sure-Seal Pressure-Sensitive Overlayment Strip:** a nominal 40-mil black, semi-cured EPDM membrane laminated to a nominal 30-mil cured, pre-applied tape. Available in 6", 9" and 12" widths and used to flash metal edgings and to overlay end laps of FleeceBACK membrane.

c. **Sure-Seal/Sure-White Uncured EPDM Elastoform® Flashing:** an easily formed uncured EPDM membrane used mainly to flash inside/outside corners, pipes, scuppers and field fabricated pourable sealer pockets when the use of Carlisle pre-fabricated flashing accessories is not feasible.

d. **Sure-Seal/Sure-White Pressure-Sensitive Uncured Elastoform Flashing:** A 6", 9" or 12" wide, 40-mil thick **uncured** EPDM Flashing laminated to a 30-mil pre-applied adhesive tape used in conjunction with Sure-Seal Primer as an alternative to Elastoform Flashing.

e. **Sure-Seal/Sure-White Pressure-Sensitive T-Joint Covers**: A factory cut 40-mil thick uncured EPDM flashing laminated to a nominal 30-mil cured pre-applied tape, used to overlay field splice intersections and to cover field splices at angle changes. Sure-Seal available in 6" and 12". Sure-White is 7" x 9".

f. **Pre-Fabricated Accessories:**

1) **Sure-Seal/Sure-White Pressure-Sensitive Pipe Flashings** with pressure-sensitive tape pre-applied to the deck flange. Fits pipes from 1" to 6" in diameter.

2) **Sure-Seal/Sure-White Pourable Sealer Pocket:** a prefabricated pourable sealer pocket which consists of a 2" wide plastic support strip with Pressure-Sensitive Uncured Elastoform Flashing. Sure-Seal available in 4", 6" and 8" diameters. Sure-White available in 6" diameter.

3) **Sure-Seal/Sure-White Inside/Outside Corner:** a 7" by 9" precut 60-mil thick Elastoform Flashing with a 30 mil pre-applied tape.

4) **Sure-Seal/Sure-White Pressure-Sensitive Curb Flashing**: a 20" wide by 50' long cured 60-mil membrane with pre-applied 6" SecurTAPE.

5) **Sure-Seal/Sure-White 20-inch Pressure-Sensitive Cured Flashing**: a 20" wide by 50' long cured flashing with pre-applied adhesive for both the vertical and deck flange surfaces.

6) **Sure-Seal/Sure-White Pressure-Sensitive Walkway Pads**: 30” x 30” pads designed to protect the EPDM membrane in those areas exposed to repetitive foot traffic or other hazards.

2. **TPO (Sure-Weld) Related Products**

a. **Sure-Weld Flashing:** Sure-Weld **non-reinforced flashing** is available in rolls **12" and 24" wide by 50' long**. Flashing is used for inside/outside corners and field fabricated pipe flashings when the use of pre-molded or pre-fabricated accessories is not feasible. In addition, **0.045 by 6" wide by 100' long**, **0.060 by 9” wide by 50’ long and 0.080 by 9” wide by 50’ long** Sure-Weld **reinforced membrane** is available for overlaying fasteners and fastening plates.

b. **Sure-Weld Pressure-Sensitive Cover Strip:** A nominal 40-mil thick non-reinforced TPO membrane laminated to nominal 35-mil thick cured synthetic rubber pressure-sensitive adhesive used in conjunction with TPO Primer or Low-VOC TPO Primer to strip in flat metal flanges (i.e., drip edges or rows of fasteners and plates). Available in rolls 6" wide by 100' long in colors of white, gray or tan. Not for use on 25-year or 30-year Warranty projects.

c. **Sure-Weld TPO Reinforced Overlayment Strip:** A heat-weldable, reinforced thermoplastic polyolefin membrane. It is available in 45-mil 6" x 100' and 60-mil 6" x 100' and 9" x 50' rolls in colors of white, gray or tan. It can be used to cover end laps on FleeceBACK and SAT TPO systems and to strip in flat metal flanges on details such as TPO coated drip edges, gravel stops, and scuppers.

d. **Sure-Weld TPO APEEL Cover Tape:** A 6"-wide, 1,640' long roll of APEEL Protective Film used to protect areas of Sure-Weld TPO membrane where APEEL Protective Film has been removed (around details) or was not factory applied (seams). APEEL Cover Tape allows contractors to keep 100 percent of the TPO surface clean during installation and is applied using the APEEL Cover Tape Applicator.

e. **Sure-Weld TPO T-Joint Covers:** A 60-mil thick injection molded TPO flashing formed into a 4.5" diameter circle used to seal step-offs at splice intersections. Installation is mandatory on all 60, 72, and 80-mil TPO systems and on 45-mil systems where step-offs have not been properly sealed. Packaged in boxes of 100. Available in white, tan or gray.

f. **Yellow Pressure-Sensitive (PS) Warning Strip:** A nominal 30-mil-thick non-reinforced TPO flashing laminated to a nominal 30-mil-thick, fully cured synthetic rubber Pressure-Sensitive adhesive and is available in 6" wide by 100' long rolls. Yellow Pressure-Sensitive Warning Strip can be applied to EPDM, TPO or Hypalon roofing systems to provide a visual warning of an impending hazard (i.e. roof edge, deep drain sump, skylight).

g. **Sure-Weld TPO Contour Rib Profile:** Used to obtain the appearance of standing seam metal roofing with the performance of a TPO single-ply membrane. The Contour Rib Profile measures 1-1/4” tall and 2-1/8” wide, including the welding flanges, while the vertical profile is a substantial 3/8” thick. The profile has a continuous 1/8” diameter alignment hole, for use with fiberglass connecting pins, as well as a 1/8” fiberglass reinforcing cord for added strength. The Contour Rib Profile is available in white, gray and tan, 10’ lengths and packaged 20 per carton.

h. **Pre-Molded Accessories:**

1) **Inside Corners**: A pre-molded corner flashing for inside corners. Available in white, gray or tan; 60-mil thick.

2) **Outside Corners**: A one-piece injection molded corner flashing used for flashing outside corners. Available in white, gray or tan; 60-mil thick.

3) **TPO Curb Wrap Corners**: Fabricated flashings are made of 60-mil thick reinforced Sure-Weld Detail membrane designed to reduce installation time to flash a curb when compared to

conventional methods. Each corner is fabricated with a 6" wide base flange and a 12" overall height. Four sizes are available to fit curbs up to 6' by 6' in size. One curb requires 4 corners for a complete installation. TPO Curb Corners are packaged in boxes containing twelve corners. Custom sizes are available as a special order product requiring lead time.

4) **TPO Universal Corners:** a pre-molded flashing for use in a variety of corner details, including inside and outside corners. Available in white, gray and tan and are 60-mil thick.

5) **Pipe Flashings**: A pre-molded white, gray or tan pipe flashing used for pipe penetrations. Available for 3/4" –8" diameter pipes with clamping rings included.

6) **Split Pipe Seals:** A prefabricated flashing consisting of 60-mil thick reinforced Sure-Weld Detail Membrane for pipes 1" – 6" in diameter. A split (cut) and overlapped tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration. Custom sizes are available as a special order product requiring lead time.

7) **TPO Square Tubing Wraps**: Fabricated flashings made of 60-mil thick reinforced Sure-Weld Detail Membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square penetration. Available for 3", 4", 5" and 6" square tubing.

8) **Molded TPO Sealant Pocket**: A pre-fabricated, interlocking, 2-piece, injection molded, flexible pocket with a rigid polypropylene vertical wall and pre-formed deck flanges. Pockets can be adjusted from 11.5" to 7.5" in length by 6" in width by following the cutting lines molded into the pocket. Used in conjunction with White One-Part Pourable Sealer for waterproofing pipe clusters or other odd shaped penetrations. Available in white, gray or tan.

9) **Pre-fabricated Sealant Pocket**: A two-piece, pre-fabricated sealant pocket that utilizes reinforced 60-mil TPO membrane and coated metal to form a rigid, oversized sealant pocket with a weldable horizontal deck flange. Available in 12" (total volume of 1.87 gallons). Packaged 2 per carton and available in white only. Refer to the applicable Product Data Sheets for dimensions and installation instructions. Custom sizes are available as special order product.

10) **Sealant Pocket Extension Legs**: Designed for use with the TPO Molded Sealant Pocket and the Pre-Fabricated Sealant Pocket to extend the length in increments of 10". Fabricated from 60-mil thick reinforced TPO membrane and TPO coated metal. Can be used full length, cut to size for customized lengths or welded to each other for extra long applications. Packaged 10 legs per carton and available in white only.

3. **PVC/KEE HP PVC (Sure-Flex) Related Products**

a. **Sure-Flex PVC non-reinforced Flashing** is 60-mil thick (white, gray, light gray, slate gray or tan) and available in rolls **12" and 24" wide by 50' long**. Flashing is used for inside/outside corners and field fabricated pipe flashings when use of pre-molded accessories is not feasible.

b. **Sure-Flex Reinforced Cover Strip:** A 8" wide, nominal 60-mil and 80-mil thick, polyester reinforced PVC membrane. Used for stripping in rows of fasteners and plates and covering the butt joints of Sure-Flex PVC membranes. Available in rolls 8" wide by 75' long in colors of white, gray or tan. Also available in 60-mil in rolls of 8" wide by 100' long in white only.

c. **Sure-Flex KEE HP Reinforced Cover Strip:** A 8" wide, nominal 60-mil and 80-mil thick, polyester reinforced KEE HP PVC membrane. Used for stripping in rows of fasteners and plates and covering the butt joints of Sure-Flex KEE HP PVC membranes. Available in rolls 8" wide by 75' long in colors of white, gray or tan, also available in 60-mil in rolls of 8" wide by 100' long in white only.

d. **Sure-Flex PVC Pressure-Sensitive Cover Strip:** A 6” wide, nominal 35-mil thick non-reinforced KEE HP flashing laminated to a nominal 35-mil, fully cured, pressure-sensitive, synthetic rubber adhesive. Used for stripping in flat metal edgings (i.e. drip edge) of Sure-Flex PVC and KEE HP PVC membranes. Available in rolls 6" wide by 100' long in colors of white, gray or tan. Used in conjunction with PVC Step 1 Activator and PVC Step 2 Primer.

e. **Sure-Flex PVC “T” Joint Cover:** A 4-1/2" diameter, 60-mil thick (white) or 40-mil (gray or tan), pre-cut non-reinforced PVC flashing used to overlay “T” joints at field splices when 80-mil Sure-Flex PVC membrane is used.

f. **Sure-Flex PVC Yellow Pressure-Sensitive Warning Strip:** a nominal 30-mil-thick, non-reinforced membrane flashing laminated to a nominal 30-mil-thick, fully cured, synthetic rubber, pressure-sensitive adhesive and is available in 6"-wide by 100'-long rolls. Pressure-Sensitive Warning Strip can be applied to Sure-Flex PVC or KEE HP systems to provide a visual warning of an impending hazard (e.g., roof edge, deep drain sump, skylight, etc.).

g. **Sure-Flex PVC Contour Rib Profile:** Used to obtain the appearance of standing seam metal roofing with the performance of a PVC single-ply membrane. The Contour Rib Profile measures 1-1/4” tall and 2-1/8” wide, including the welding flanges, while the vertical profile is a substantial 3/8” thick. The profile has a continuous 1/8” diameter alignment hole, for use with fiberglass connecting pins, as well as a 1/8” fiberglass reinforcing cord for added strength. The Contour Rib Profile is available in white, gray, light gray, slate gray and tan, 10’ lengths and packaged 20 per carton.

h. **Pre-Molded Accessories:**

1) **Sure-Flex PVC Inside Corners:** A pre-molded flashing for inside corners. Available in white, gray or tan; 60-mil thick.

2) **Sure-Flex PVC Outside Corners:** A pre-molded flashing for outside corners. Available in white, gray or tan; 60-mil thick.

3) **Sure-Flex PVC Curb Wrap Corners**: Fabricated flashings are made of 60-mil thick reinforced Sure-Flex KEE HP PVC Detail membrane designed to reduce installation time to flash a curb when compared to conventional methods. Each corner is fabricated with a 6" wide base flange and a 12" overall height. Three sizes are available to fit curbs up to 3' by 3' in size. One curb requires 4 corners for a complete installation. PVC Curb Wrap Corners are packaged in boxes containing twelve corners. Custom sizes are available as a special order product requiring lead time.

4) **PVC Universal Corners:** a pre-molded flashing for use in a variety of corner details, including inside and outside corners. Available in white tan, gray, and light gray; 60-mil thick.

5) **Sure-Flex PVC Pipe Flashings:** A pre-molded (white, gray, tan and light gray) pipe flashing used for pipe penetrations. Available for 3/4" – 8" diameter pipes with clamping rings included.

6) **Sure-Flex PVC Split Pipe Seals:** A prefabricated flashing consisting of 60-mil thick reinforced Sure-Flex Membrane for pipes 1" – 6" in diameter. A split (cut) and overlapped tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration. Available in white, gray or tan.

7) **Sure-Flex PVC Square Tubing Wraps:** Fabricated flashings made of 60-mil thick reinforced Sure-Flex membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square penetration. Available for 3", 4" and 6" diameter square tubing. Available in white and gray.

8) **Sure-Flex PVC Molded Sealant Pockets:** A pre-fabricated, interlocking, 2-piece, injection

molded, flexible pocket with a rigid PVC vertical wall and pre-formed deck flanges. Pockets can be adjusted from 11.5" to 7.5" in length by 6" in width by following the cutting lines molded into the pocket. Used in conjunction with White One-Part Pourable Sealer for waterproofing pipe clusters or other odd shaped penetrations. Available in white only.

B. **Primers, Adhesives, Sealants and Cleaners**

Refer to Product Data Sheets for material coverage rates and proper usage. Prior to the use of any of the products listed below, consult the Safety Data Sheets (SDS) for applicable cautions and warnings.

1. **General Adhesives and Sealants (For all Membranes)**

a. **Flexible FAST Adhesive:** A two-component (Part A and B), low-rise polyurethane adhesive designed for bonding FleeceBACK membrane and/or insulation to various substrates. Coverage rates can be found in Paragraph 3.05 'Membrane Placement and Securement'. Flexible FAST Adhesive is packaged in 50- and 15-gallon drums, as well as, 5-gallon Jug that can be applied in full spray, extrusion, or splatter application depending on dispensing type.

b. **Carlisle Flexible FAST Dual Tank Adhesive:** A two-component (Part A and B), low rise adhesive for bonding FleeceBACK membrane and/or insulation to various surfaces. Flexible FAST Dual Tanks utilize an HFO blowing agent. HFO (hydrofluoroolefin) blowing agents are widely recognized as the next-generation environmentally friendly blowing agent, replacing their HFC (hydrofluorocarbon) predecessor. Flexible FAST Dual Tank Adhesive can be applied in bead or spatter application. Coverage rates can be found in Paragraph 3.05 'Membrane Placement and Securement'.

c. **Flexible FAST Dual Cartridge:** A two component (Part A and B), extrusion applied, low rise adhesive for bonding insulation to various surfaces. Flexible FAST Dual Cartridge Adhesive can be applied in bead application. Coverage rates can be found in Paragraph 3.05 'Membrane Placement and Securement'.

d. **Aqua Base 120 Bonding Adhesive**: A semi-pressure-sensitive, water based adhesive used as a one-sided wet lay-in adhesive for FleeceBACK (Sure-Seal, Sure-White and Sure-Weld). Coverage rate is 100-120 square feet per gallon finished surface. Refer to **Spec Supplement G-10 "Aqua Base 120 Bonding Adhesive"** for further information.

e. **CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: bonding Sure-Weld membrane to various surfaces, priming unexposed asphalt prior to applying Flexible FAST Adhesive and for adhering Sure-Seal/Sure-Weld/Sure-Flex FleeceBACK and Sure-Seal EPDM or Sure-Weld TPO membrane to vertical walls. Coverage rate is approximately 2,000-2,500 sq. ft. per 40 lb cylinder and 4,000-5,000 sq. ft. per 85 lb cylinder as a primer, in a single-sided application; 750 sq. ft. per 40 lb cylinder and 1,500 sq. ft. per 85 lb cylinder as an adhesive for vertical walls, in a double-sided application; 1,000 sq. ft. per 40 lb cylinder and 2,000 sq. ft. per 85 lb cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided application.

f. **HydroBond Water-based Adhesive:** A wet lay-in, one sided dispersion adhesive. Compatible with all FleeceBACK membranes, this product is ideal for bonding to various porous and non-porous substrates. (The use of Hydrobond with FleeceBACK EPDM is not approved for use with Coated Glass Faced products). Coverage rates vary between 100-133 sq. ft. per gallon using roller or spray applications.

g. **Water Cut-Off Mastic:** A one-component, low viscosity, self wetting, butyl blend mastic used to prevent moisture migration at drains, compression terminations and beneath certain metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon

h. **Universal Single-Ply Sealant:** A 100% solids, solvent free, one-part, polyether sealant that provides a weather tight seal to a variety of building substrates. Can be used as a termination bar sealant or

for use in counterflashing, coping, and scupper details. Packaged 24 per carton in 10.3 ounce tubs with a coverage rate of approximately 10' per tube.

2. **Sure-Seal/Sure-White Adhesives, Sealants and Cleaners**

   a. **90-8-30A or Low-VOC Bonding Adhesive**: Yellow colored synthetic rubber adhesive that can be used for bonding FleeceBACK membrane or EPDM membrane to walls, curbs, etc.

   b. **Sure-Seal/Sure-White Lap Sealant:** A heavy-bodied material (trowel or gun consistency) used to seal the top of termination bars and exposed edges of an adhesive membrane splice (if applicable). A preformed Lap Sealant tool is included in each carton of Lap Sealant.

   c. **Sure-Seal/Sure-White SecurTAPE:** A 3" or 6" wide by 100' long splice tape used to splice adjoining sheets together. Complies with the South Coast Air Quality Management District Rule 1168.

   d. **HP-250 EPDM Primer:** A solvent-based primer used to prepare the surface of the membrane for the application of SecurTAPE, Splicing Cement (if applicable) or Pressure-Sensitive products. Available in 1 and 3 gallon pails.

   e. **Low-VOC EPDM and TPO Primer:** A Low-VOC (volatile organic compound) primer (less than 250 grams/liter) for priming of EPDM or TPO surfaces prior to application of FAT, Cover strip, SecurTAPE and all other pressure-sensitive products. Available in 1 gallon pails.

   f. **Weathered Membrane Cleaner:** A clear, solvent-based cleaner used to loosen and remove dirt and other contaminants from the surface of exposed EPDM membrane (for repairs, etc.) prior to applying Sure-Seal Splice Cleaner or Primer. Available in 1 gallon can and 5 gallon pails.

   g. **One-Part Pourable Sealer**: A black or white, single-component, moisture curing elastomeric, polyether sealant used to seal around hard-to-flash membrane penetrating objects such as clusters of pipes.

   h. **Pourable Sealer**: A black, two-component, solvent-free, polyurethane based product used for certain tie-ins.

3. **Sure-Weld Adhesives, Sealants and Cleaners**

   a. **Sure-Weld Bonding Adhesive:** A high-strength, synthetic rubber adhesive used for bonding Sure-Weld non-fleece-backed membrane to various surfaces. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both surfaces).

   b. **Sure-Weld Low-VOC Bonding Adhesive:** An alternate, high-strength, adhesive using a blend of VOC exempt and non-exempt solvent which complies with the State of California Clean Air Act of 1988 (updated in 1997).

   c. **Cut-Edge Sealant:** A clear sealant used to seal cut edges of reinforced Sure-Weld membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8"diameter bead is applied.

   d. **White One-Part Pourable Sealer**: A one-part, moisture curing, elastomeric polyether sealant used to fill Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 122 cubic inches of volume within a sealant pocket.

   e. **Weathered Membrane Cleaner:** Used to prepare membrane that has been exposed to the elements for approximately 7 days prior to hot air welding at an approximate coverage rate of 600 linear feet per gallon on a 4" wide surface.

f. **TPO and Low-VOC TPO Primer:** A primer used to prepare the surface of the membrane for the application of the Pressure-Sensitive Cover Strip.

4. **Sure-Flex Adhesives, Sealants and Cleaners**

a. **Sure-Flex Low-VOC Bonding Adhesive:** A high-strength, synthetic rubber adhesive used for bonding Sure-Flex membrane to various surfaces. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both surfaces).

b. **Hydrobond Water-Based Adhesive:** A wet lay-in, one-sided dispersion adhesive. Compatible with only Sure-Flex PVC smooth-backed and FleeceBACK membranes, this product is ideal for bonding only PVC membranes to various porous and non-porous substrates (cannot be used with any KEE or KEE HP PVC bareback membranes). Coverage rates vary between 100-133 square foot per gallon using roller or spray applications.

c. **CAV-GRIP PVC Aerosol Contact Adhesive:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: adhering PVC bareback membranes to a variety of horizontal substrates and vertical walls (cannot be used with any KEE or KEE HP bareback membranes), as well as adhering FleeceBACK membranes to vertical walls. Coverage rate is approximately 400 sq. ft. per #40 cylinder and 800 sq. ft. per #85 cylinder as an adhesive for vertical walls, in a double-sided application; 750 sq. ft. per #40 cylinder and 1,500 sq. ft. per #85 cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided applications.

d. **Sure-Flex Cut-Edge Sealant:** A clear sealant used to seal cut edges of reinforced Sure-Flex membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8"diameter bead is applied. The use of cut edge sealant to seal cut edges of Sure-Flex membrane is not required.

e. **White One-Part Pourable Sealer:** A one-part, moisture curing, elastomeric polyether sealant used to fill Molded Sealant Pockets. Packaged in four 1/2 gallon pouches per plastic bucket. One pouch will fill 122 cubic inches of volume within a molded sealant pocket.

f. **PVC and KEE HP Membrane Cleaner:** Used to prepare PVC and KEE HP PVC membrane that has been exposed to the elements for approximately 7 days prior to hot air welding or to remove general construction dirt. Approximate coverage rate of 400 square feet per gallon (one surface).

g. **Sure-Flex Low-VOC PVC Step 1 Activator:** A high-strength, solvent-based activator that allows PVC Pressure-Sensitive (PS) Cover Strip to be bonded to Sure-Flex PVC or KEE HP membranes. Low-VOC PVC Step 1 Activator meets the < 250 gpl VOC content requirements of the OTC Model Rule. It is specially formulated using a blend of VOC-exempt and non-exempt solvents and follows the state of California Clean Air Act of 1988 (updated in 1997) as further regulated by California's Air Quality Control Districts listing VOC limitations.

h. **Sure-Flex Low-VOC PVC Step 2 Primer:** A high-solids-content, polymer based splice primer. This product is applied to KEE HP and PVC membranes to improve the adhesion of PVC Pressure-Sensitive Cover Strip. Low-VOC PVC Step 2 Primer meets the < 250 gpl VOC content requirements of the OTC Model Rule.

i. **Sure-Flex PVC Step 2 Primer:** A high-solids-content, clear (translucent color), polymer-based splice primer used to prepare KEE HP and PVC membranes to be bonded to PVC Pressure-Sensitive Cover Strip.

2.05 Fastening Components

A. **Fasteners**

The following Table illustrates criteria for fastening of Carlisle Insulation with the referenced roof deck and includes minimum penetration requirements and pilot hole criteria.

Insulation Fastening Criteria

Deck Type	Carlisle Fasteners (1)	Min. Penetration	Pilot Hole Depth	Pilot Hole Diameter
Steel or Lightweight Insulating Concrete over Steel	ASAP or InsulFast™	3/4"	N/A	N/A
Structural Concrete, rated 3,000 psi or greater	CD-10	1"	Note (2)	7/32"
	HD 14-10	1"	Note (2)	3/16"
Wood Plank, min. 15/32" thick Plywood or min. 7/16" OSB	HP, ASAP or InsulFast	Min. 1" (3)	N/A	N/A
Cementitious Wood Fiber	Polymer Gyptec or Lite-Deck Fastener	1-1/2"	Note (4)	N/A
Gypsum	Polymer Gyptec or Lite-Deck Fastener	1-1/2"	Note (2)	7/16", 1/2" or 9/16" (5)

Notes: N/A = Not Applicable

(1) Only 3" diameter insulation fastening plates can be used for insulation attachment.
(2) The pilot hole must be predrilled to a sufficient depth to prevent contact between the fastener point and any accumulated dust in the predrilled hole. This will help prevent bottoming out of the fastener during installation.

(3) For wood planks only, fastener penetration shall not exceed 1-1/2".
(4) Most cementitious wood fiber decks do not require pre-drilling; however, Carlisle should be contacted prior to installation for verification of specific types that may require a pilot hole to be predrilled.

(5) Pilot hole size may be varied to maximize pullout resistance.

All Fasteners listed below can be used with Sure-Seal, Sure-Weld or Sure-Flex Roofing Systems. Refer to the applicable specification for specific requirements.

1. **HP Fastener:** A threaded E-coat square head fastener **for insulation attachment only**. Used into steel, wood plank, minimum 15/32" thick plywood or minimum 7/16" thick oriented strand board (OSB).

2. **InsulFast Fastener**: A threaded Phillips drive fastener used with Carlisle Insulation Plates for **insulation attachment** to steel or wood decks.

3. **Pre-Assembled ASAP Fasteners:** Carlisle's InsulFast Fastener pre-assembled with a 3" diameter plastic plate used for **insulation attachment only** on Adhered and Mechanically Fastened Roofing Systems. Installed using Olympic Fasteners' Fastening Tool.

4. **CD-10 Fasteners**: A hammer-driven, non-threaded E-Coat fastener for use with structural concrete decks rated 3,000 psi or greater.

5. **HD 14-10 Concrete Fasteners**: A #14 threaded fastener with a #3 Phillips drive used for minimum 3,000 psi concrete decks.

6. **Polymer Gyptec Fastener:** A non-penetrating, plastic fastener and corresponding plate used with lightweight deck substrates such as fibrous cement and gypsum.

7. **Lite-Deck Fastener**: A oversized diameter fastener and associated 3" Lite-Deck Metal Plate for use on Adhered Roofing Systems to attach insulation to gypsum decks.

8. **HP Term Bar Nail-In**: A 1-1/4" long expansion anchor with threaded drive pin used for fastening Sure-Seal Termination Bar or Seam Fastening Plates to concrete, brick or block walls. The fastener is set by hammering the drive pin into place.

B. **Insulation Fastening Plates**

1. **Insulation Fastening Plates**: A nominal 3" diameter metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener.

2.06 Vapor /Air Barrier and Primers

A. **General**

1. The use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly should be investigated by the specifier, especially on projects with high interior humidity, such as, swimming pools, breweries, pulp mills, etc.
2. If insulation is to be adhered to the vapor retarder with Flexible FAST Adhesive, the vapor retarder must be compatible and shall be fully adhered to the substrate. Available products include Carlisle's VapAir Seal 725TR and VapAir Seal MD Air and Vapor Barrier and spray or roller applied butyl coatings. Installation requirements for Carlisle's VapAir Seal 725TR Air and Vapor Barrier are identified in **Spec Supplement G-08 "Application Procedures for Carlisle's VapAir Seal 725TR Air and Vapor Barrier/Temporary Roof"** and Carlisle's VapAir Seal MD Air and Vapor Barrier are identified in **Spec Supplement G-12 "Application Procedures for Carlisle's VapAir Seal MD Air and Vapor Barrier"** in the Carlisle Technical Manual.

B. **Carlisle VapAir Seal 725TR Air and Vapor Barrier** - A 40-mil thick composite consisting of 35-mil self-adhering rubberized asphalt membrane laminated to a 5-mil UV resistant poly film with an anti-skid surface which is fully compatible with Flexible FAST Adhesive. 725TR can also function as a temporary roof for up to 120 days. Available in rolls 39" wide by 100' long (325 square feet).

C. **Carlisle VapAir Seal MD Air and Vapor Barrier** – a reinforced composite aluminum foil with self-adhesive SBS backing and removable poly release film. Used for direct application over metal decks. Available in rolls 42.5" wide by 131.23' long (460 square feet).

D. **CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: enhancing the bond between Carlisle's VapAir Seal 725TR and various substrates. Coverage rate is approximately 2,000-2,500 sq. ft. per #40 cylinder and 4,000-5,000 sq. ft. per #85 cylinder as a primer, in a single-sided application.

E. **CCW-702 Primer and 702LV Primer (Low-VOC) -** A single component, solvent based, high-tack primer used to provide maximum adhesion between Carlisle 725TR Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 300 to 350 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., DensDeck Prime gypsum board). Available in 5-gallon containers. CCW-702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

F. **CCW-702WB –** a high-tack, water-based contact adhesive for promoting adhesion of Carlisle air/vapor barrier membranes and an approved substrate (i.e., concrete, DensDeck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW-702WB Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

2.07 Edgings And Terminations

A. General

Products listed below can be used with any of the available Carlisle Roofing Systems. Refer to the applicable Carlisle details and installation instruction manuals for specific installation criteria.

B. Products

1. Fascia Products

    a. **SecurEdge CF Snap-on Fascia:** A two-part snap-on assembly including a base plate and decorative snap-on cover. Includes a 20-gauge retainer base plate with pre-slotted holes for fasteners. The fascia is available in 0.040” or .050” aluminum with mill-finish, anodized-finish or Kynar ® 500 finish or 22- or 24-gauge galvanized steel with Kynar ® 500 finish or acrylic coated galvalume finish. Available in a variety of standard colors. Custom colors are available upon request. Available in sizes from 3-1/2” to 12-1/4” face heights. ANSI/SPRI/FM-4435 ES-1 certified.

    b. **SecurEdge One Fascia:** A snap-on edge system consisting of a 20-gauge galvanized steel formed rail with pre-punched slots, a 6” stainless steel spring clip. corrosion resistant fasteners with a 24 gauge galvanized steel or 0.040”, 0.050” or 0.063” Kynar® finished aluminum fascia cover. Available in a variety of standard colors. Custom colors are available upon request. Available in 12' standard lengths with face sizes of 4”, 5”, 6” and 8”. ANSI/SPRI/FM-4435 ES-1 certified.

    c. **SecurEdge Snap-On Canted Fascia:** A snap-on edge system consisting of a 24-gauge galvanized metal water dam with pre-punched holes, a 24-gauge stainless steel spring clip and a snap-on cover. The cover is available in 0.040”, 0.050” or 0.063” thick mill-finish, anodized, or Kynar® 500 finish aluminum or 22- or 24-gauge steel with Kynar® 500 finish. The fascia is available in a variety of standard colors. Custom colors are available upon request. Available in 12' standard lengths and heights varying from 5" to 12-1/2". ANSI/SPRI/FM-4435 ES-1 certified.

    d. **SecurEdge Crimp-On Canted Fascia:** A crimp-on edge system featuring a 24-gauge, galvanized metal water dam with pre-punched holes, a 24-gauge stainless steel spring clip and a snap-on cover. The fascia cover is available in 0.040”, 0.050” or 0.063” thick mill-finish, anodized, or Kynar® 500 finish aluminum or 22- or 24-gauge steel with Kynar® 500 finish. The fascia is available in a variety of standard colors. Custom colors are available upon request. Available in 12' standard lengths and heights varying from 5-1/4" to 12-3/4". ANSI/SPRI/FM-4435 ES-1 certified.

    e. **SecurEdge EX Snap-On Fascia:** An anchor bar roof edge fascia system consisting of heavy 0.100" thick extruded aluminum bar, corrosion resistant stainless-steel fasteners and snap-on fascia cover used with Adhered, Mechanically Fastened assemblies. The fascia cover is available in 0.040”, 0.050” or 0.063” thick mill-finish, anodized, or Kynar® 500 finish aluminum or 22- or 24-gauge steel with Kynar® 500 finish. The fascia is available in a variety of standard colors. Custom colors are available upon request. Available in 12' standard lengths and 4”, 5-1/2”, 7” and 8-1/2” heights. ANSI/SPRI/FM-4435 ES-1 certified.

2. Coping Products

    a. **SecurEdge Snap-on Coping:** A snap-on coping system that incorporates 20-gauge anchor cleats with pre-slotted holes, a concealed joint cover and 10' or 12' continuous sections of coping cap consisting of 40, 50 or 63-mil thick clear and colored anodized, and Kynar 500 finish or 24-

gauge steel with Kynar® 500 finish. The coping cap is available in a variety of standard colors. Custom colors are available upon request. Also available in a variety of widths including custom pieces such as tees, crosses, radius copings, etc. ANSI/SPRI/FM-4435 ES-1 certified.

b. **SecurEdge Snap-on Gold Coping:** A snap-on coping system that incorporates 20-gauge, galvanized steel anchor clips and 12”, 20-gauge, factory-applied stainless-steel springs. Available with 22- and 24-gauge steel with Kynar® 500 finish or 0.040”, 0.050” and 0.063” mill-finish, anodized or Kynar® 500 coated aluminum. A variety of standard colors are available. Custom colors are available upon request. ANSI/SPRI/FM-4435 ES-1 Certified.

c. **SecurEdge CF Snap-on Coping:** A snap-on coping system that incorporates 20-gauge, galvanized steel anchor cleats with pre-slotted holes, a concealed joint cover and 0.040”, 0.050” and 0.063” thick mill-finish, anodized or Kynar® 500 finish or 22- or 24-gauge Kynar 500® coated steel. The coping cap is available in a variety of colors and widths, including custom pieces such as tees, crosses, and radius copings. Custom colors are available upon request. Available in standard 12’ lengths with 6” to 16” wall heights. ANSI/SPRI/FM-4435 ES-1 certified.

   Also available in SecurEdge CF Gold Coping with 16-gauge anchor cleats for added performance.

d. **SecurEdge One Coping:** A mechanically fastened coping system consisting of a 22-gauge retainer bar (face side only), corrosion resistant fasteners and a .040”, .050” or .063” mill-finish, anodized or Kynar® 500 coated aluminum and 22- or 24-gauge, Kynar® 500 coated steel coping cover. A variety of standard colors are available. Custom colors are available upon request. Available for wall thicknesses up to 12”. ANSI/SPRI/FM-4435 ES-1 Certified.

e. **SecurEdge Continuous Cleat Coping:** An engineered coping system, featuring continuous, 20-gauge galvanized steel cleats on both the inside and outside face of the parapet. Available with 0.040”, 0.050” and 0.063” mill-finish, anodized or Kynar® 500 coated aluminum and 22- and 24-gauge Kynar® 500 coated steel. A variety of standard colors are available. Custom colors are available upon request. Custom fabricated for specific project requirements. Cleat available in standard 12’ lengths. ANSI/SPRI/FM 4435/ES-1 Certified. Miami-Dade approved.

3. **Water Control Products**

a. **SecurEdge Gravel Stop**: A two-piece assembly that consists of a continuous 22-gauge steel cleat with pre-punched holes and snap-on gravel stop cover. The gravel cover is available in 0.040”, 0.050”, and 0.063” mill-finish, anodized or Kynar® 500 coated aluminum or 22- and 24-gauge steel with galvanized Kynar® 500 coated or acrylic coated galvalume finish. Available in a variety of standard colors. Custom colors are available upon request. Available in 12' standard lengths with 3” to 10” heights and 1” and 3” flange widths. ANSI/SPRI/FM-4435 ES-1 Certified.

b. **SecurEdge Drip Edge**: Designed for use on Adhered and Mechanically Fastened Roofing Systems. Includes a 22-gauge continuous 12' pre-punched, 90-degree angle cleat and 10’ or 12' long fascia sections, including concealed joint covers. Available in 0.032” or 0.040” mill-finish, anodized or Kynar® 500 coated aluminum or 24-gauge Kynar 500 coated steel. A variety of standard colors are available. Custom colors are available upon request. ANSI/SPRI/FM-4435 ES-1 Certified.

c. **SecurEdge EX Drip Edge:** Featuring an extruded aluminum anchor bar with pre-punched holes for roof membrane securement. The cover is manufactured from 0.040” aluminum with mill-finish, anodized or Kynar® 500 finish or 24-gauge steel with Kynar® 500 finish. Available in standard 12’ lengths with sizes ranging from 3” to 7.5” face heights. A variety of standard colors are available. Custom colors are available upon request. ANSI/SPRI/FM 4435/ES-1 Certified. Miami-Dade approved.

d. **SecurWeld TPO Coated Drip Edge:** Prefabricated, non-reinforced, TPO-coated metal

edging featuring a 22-gauge, 90-degree, angle cleat with pre-slotted holes and TPO-coated, and a 24-gauge metal cover used to heat-weld the roofing membrane directly to the metal edge. Available in standard TPO colors of white, gray or tan or special colors (Rock Brown, Slate Gray, Terra Cotta, Patina Green and Medium Bronze) Available in 12' standard lengths with a variety of sizes up to 8" fascia height. ANSI/SPRI/FM 4435/ES-1 Certified.

e. **SecurWeld PVC Coated Drip Edge:** Prefabricated, non-reinforced, PVC-coated metal edging featuring a 22-gauge, 90-degree, angle cleat with pre-slotted holes and PVC-coated, and a 24-gauge metal cover used to heat-weld the roofing membrane directly to the metal edge. Available in standard PVC colors including white, gray, tan, light gray and slate gray. Available in sizes up to 8" fascia height. Available in standard 10' lengths with a variety of sizes up to 8" fascia height. ANSI/SPRI/FM 4435/ES-1 Certified.

f. **SecurWeld TPO Skirted Drip Edge:** Prefabricated TPO-coated metal edging, featuring a 22-gauge 90 degree, angle cleat with pre-slotted holes, a TPO coated, and a 24-gauge metal cover used to heat-weld the roofing membrane directly to the metal edge. Available in standard TPO colors of white, gray or tan or special colors (Rock Brown, Slate Gray, Terra Cotta, Patina Green and Medium Bronze) Available in 12' standard lengths with a variety of sizes up to 8" fascia height. ANSI/SPRI/FM 4435/ES-1 Certified.

g. **SecurWeld PVC Skirted Drip Edge:** Prefabricated PVC-coated metal edging, featuring a 22-gauge, 90-degree, angle cleat with pre-slotted holes, a PVC coated, and a 24-gauge metal cover used to heat-weld the roofing membrane directly to the metal edge. Available in standard PVC colors of white, gray, tan, light gray, and slate gray. Available in 10' standard lengths with a variety of sizes up to 8" fascia height. ANSI/SPRI/FM 4435/ES-1 Certified.

h. **SecurEdge WR Gutter:** system incorporates 1" wide extruded internal gutter brackets and aluminum or galvanized steel gutter. Available in 0.040", 0.050 or 0.063" aluminum, and 22-gauge or 24-gauge with Kynar® 500 finish. Gutter support brackets are extruded aluminum. Available in box style, chamfer style, and offset profiles. ANSI/SPRI/FM 4435/ES-1 Certified.

i. **Sure-Seal Ballast Retaining Bar**: A ballast retaining perimeter securement system comprised of a slotted (4" on center) extruded mil aluminum retention bar with an integrated compression fastening strip. 1-1/2" stainless steel fasteners with Neoprene washers are provided for stable securement.

j. **Termination Bar**: A 1" wide and 98-mil thick extruded aluminum bar pre-punched 6" on center which incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

k. **SureTite Snap-On Fascia Cleat:** Prefabricated, 22-gauge, Galvalume steel, continuous, snap-on cleat with pre-punched holes. Used for use on single ply roofing applications when Carlisle metal flat sheets are used to shop fabricate the fascia or coping cover. Available in 12' standard lengths and 4-1/4" to 8-1/4" face heights. ES-1 certified.

l. **SureTite Drip Edge Cleat:** Prefabricated, 22-gauge, Galvalume steel, continuous, cleat with pre-punched holes. Used for use on single ply roofing applications when Carlisle metal flat sheets are used to shop fabricate the drip edge, gravel stop or flat coping cover. Available in 12' standard lengths and 3", 5" 6" and 7" heights. ES-1 certified.

4. Other Carlisle Metal Edgings / Copings suitable for use with roofing system included in the section, can be found in the Specification Supplement G-11 Metal Edging.

2.08 Roof Walkways

Walkways are to be specified at all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders, etc.), and if regular maintenance (once a month or more) is necessary to service rooftop equipment.

A. **Walkway Types**

1. **Sure-Seal/Sure-White Pressure-Sensitive Walkway Pads**: Sure-Seal (black) or Sure-White (white) molded walkway pads with Factory-Applied TAPE used to provide protection for areas of EPDM membrane that are exposed to regular rooftop maintenance.

2. **Sure-Weld Heat Weldable Walkway Rolls:** Designed to protect Sure-Weld membrane in those areas exposed to repetitive foot traffic or other hazards. Walkway material may be heat welded to Sure-Weld membrane using an automated heat welder or hand held heat welder. The diamond plate tread pattern offers superior slip resistance. The walk edges are trimmed in safety yellow to better define the designated traffic flow. Walkway Rolls are 34” wide by 50' long and are nominal 180 mils thick. Available in white, tan or gray.

   NOTE: As an option, Sure-Weld walkway pads may be adhered to the membrane surface with SecurTAPE/TPO Primer

3. **Sure-Flex PVC Heat Weldable Walkway Rolls:** Manufactured from specially compounded PVC, offering superior tear, puncture and weather resistance. Designed to protect Sure-Flex (PVC/KEE HP) membrane in those areas exposed to repetitive foot traffic or other hazards. Walkway material may be heat welded to Sure-Flex (PVC/KEE HP) membrane using an automated heat welder or hand held heat welder. Walkway Rolls are 36" wide by 60' long and are nominal 80-mils and 110-mils thick. Available in gray only.

4. **Sure-Weld TPO Crossgrip Walkway Rolls:** Manufactured from TPO and may be used in lieu of standard Sure-Weld TPO Walkway Rolls when a walkway is to be loose-laid and not secured to the membrane. Loose-laid Crossgrip TPO Walkway Rolls are effective for winds up to 55 mph. Rolls are 36” wide by 33’ long, available in white, gray and yellow.

5. **Sure-Flex PVC Crossgrip Walkway Rolls:** Manufactured from PVC and may be used in lieu of standard Sure-Flex PVC Walkway Rolls when a walkway is to be loose-laid and not secured to the membrane. Loose-laid Crossgrip PVC Walkway Rolls are effective for winds up to 55 mph. Rolls are 36” wide by 33’ long, available in white, gray and yellow.

6. **Other Walkways (For use with all membranes)**

   a. **Carlisle’s Interlocking™ Rubber Pavers:** 24" X 24" X 2" thick rubber paver weighing approximately 24 pounds per unit, 6 pounds per square foot manufactured from recycled rubber, which provides a resilient, shock absorbing, weather resistant surface. Designed primarily for use as a walkway or on terrace areas offering a unique, environmentally sound advantage over concrete pavers. Features include freeze/thaw stability, bi-directional drainage and no breakage concerns. Available in black and terra cotta.

   b. **Smooth concrete pavers**, when specified in conjunction with insulation that is mechanically fastened, must be loose laid over a slip sheet of membrane or 2 layers of HP Protective Mat. When insulation is attached with Flexible FAST Adhesive, concrete pavers may be placed over one layer of HP Protective Mat. Pavers cannot weigh more than 80 pounds per paver for ease of removal.

   c. **Hanover Pedestal Paver** – Used for light traffic areas associated with rooftop or garden roof applications. 23-1/2” x 23-1/2” x 2” thick precast concrete pavers weighing 25 psf with an elevated clearance of 1/2” from incorporated footing. Available in 8 standard colors, with special order colors available. The pedestal paver can either be installed in conjunction with a separation layer of HP Protective Mat or using Hanover Pedestal and shims.

   d. **Hanover Ballast and Lightweight Ballast Pavers:** The standard, 24” x 24” x 1-13/16” thick, Ballast Paver comes in a natural color and a non-slip Diamond finish and weighs 22 lbs/sq. ft. The Lightweight, 23-1/2” x 23-1/2” x 1-1/4” thick, Ballast Paver comes in a natural color and a non-slip diamond finish and weighs 15 lbs/sq. ft. Both pavers can be used as ballast or

walkways.

2.09 Other Carlisle Accessories

Refer to **Spec Supplement P-01 “Related Products”** for additional accessories.

PART III EXECUTION

Prior to commencing with the installation of any of the FleeceBACK Membrane Systems refer to Paragraph 1.05 "Warranty Tables" for applicable components and proper securement method suitable for the appropriate warranty coverage.

Requirements listed in this specification are considered minimum and are intended for the sole purpose of obtaining a Carlisle Warranty. Additional requirements dictated by Regulatory Agencies, Building Insurance or Specifiers must be complied with and are considered to be beyond the scope of this specification.

3.01 General

A. Safety Data Sheets (SDS) must be on location at all times during transportation, storage and application of materials. The applicator shall follow all safety regulations as recommended by OSHA and other agencies having jurisdiction.

B. To ensure most current installation requirements are met and techniques are followed, Product Data Sheets should be available on site.

C. Subject to project conditions, it is recommended to begin the application of this roofing system at the highest point of the project area and work to the lowest point to prevent water infiltration. This will include completion of all flashings, terminations and daily seals.

D. A proper substrate shall be provided by the building owner. The structure shall be sufficient to withstand normal construction loads and live loads.

E. Protect areas of high construction traffic using plywood sheets.

3.02 Roof Deck/Substrate Criteria

A. Proper decking shall be provided by the building owner. The building owner or its designated representative must ensure that the building structure is investigated by a registered engineer to assure its ability to withstand the total weight of the specified roofing system as well as construction and live loads in accordance with all applicable codes. The specifier must also designate the maximum allowable weight and location for material loading and storage on the roof.

B. When insulation/membrane underlayments are to be mechanically fastened, withdrawal resistance tests are strongly suggested to determine the suitability of a roof deck. Refer to **Design Reference DR-06 "Withdrawal Resistance Criteria" in** the Carlisle Technical Manual proper procedures for conducting pullout tests.

C. Defects in the substrate must be reported and documented to the specifier, general contractor and building owner for assessment. The Carlisle Authorized Applicator shall not proceed with installation unless defects are corrected

D. On structural concrete decks, when a vapor retarder is not used, gaps in the deck along the perimeter and around penetrations must be sealed along with vertical joints between tilt-up panels, if present, to prevent infiltration of hot humid air and possible moisture contamination resulting from condensation. This is specifically important when adhesive is used to attach the roof insulation.

E. **For all projects** (new or retrofit), the substrate must be relatively even without noticeable high spots or depressions. Accumulated water, ice or snow must be removed to prevent the absorption of moisture in the new roofing components and roofing system.

F. **Substrate Preparation**

1. Prior to the placement of membrane underlayment, clear the substrate of debris and foreign material that may be harmful to the roofing system. Gaps greater than 1/4" must be filled with an appropriate material.

2. For direct application over an acceptable roof deck/substrate, the substrate must be smooth, steel trowel finished (structural concrete), free of debris, protrusions, sharp edges and loose and foreign material. Cracks or voids in the substrate, greater than 1/4", must be filled with an appropriate material.

3. **On retrofit - recover projects**, cut and remove wet insulation, as identified by the specifier, and fill all voids with new insulation of type specified so it is relatively flush (+/- 1/4") with the existing surface.

    a. Entrapment of water between the old and new membrane can damage and deteriorate new insulation/underlayment between the two membranes. **If a vapor retarder or air barrier is not specified**, Carlisle recommends the existing membrane be perforated to avoid potential moisture accumulation and to allow the detection of moisture to enable the building owner to take corrective action.

    b. **For existing PVC membranes**, when insulation/membrane underlayment are to be mechanically fastened, in lieu of total removal, the membrane may be cut into maximum 10' by 10' sections. All PVC flashings at the perimeter, roof drains and roof penetrations must be removed.

    c. When installing this roofing system over existing **gravel surfaced built-up roof**, **loose gravel must be removed**. Power Brooming or Hydro Vacuuming is recommended by Carlisle to remove the loose gravel or dirt, which may trap moisture. Any uneven areas of the substrate must be leveled to prevent new insulation from bridging.

    d. When installing this roofing system over existing TPO Membranes less than 2 years old or EPDM Membrane, use X-Tenda Coat Membrane Cleaner or X-Tenda Coat EPDM Activator. Dilute the product per the instruction label., Spray the surface and let stand for 15 minutes, prior to power washing.

        1) On retrofit projects, all existing phenolic insulation must be removed.
        2) Refer to table below for other Recover/Retro-fit considerations.

    NOTE: When FleeceBACK membrane is installed directly over an existing single-ply roof, the existing single-ply roof must be secured with HP or HP-X Fasteners and 2” diameter Seam Plates at 12” O.C. at all deck to wall junctions, angle changes greater than 2:12 and around curbs/skylights, regardless of warranty duration or warranty wind speed. Fasten directly through FleeceBACK membrane and existing single-ply roof to the deck OR fasten through the existing single-ply roof to the deck, prior to application of FleeceBACK. Additional fastening of the existing roof may be utilized to enhance the wind uplift resistance of the existing roof, Contact Carlisle for further information.

G. The following table identifies the acceptable roof decks/substrates and the minimum underlayment requirements:

Roof Deck & Substrate Criteria for Adhered Roofing Systems

Acceptable Roof Deck/Substrate	FleeceBACK EPDM Membrane	FleeceBACK TPO Membrane	FleeceBACK PVC / KEE HP PVC Membrane
NEW CONSTRUCTION			
Steel (min. 22 gauge) (1)(2)	Insulation	Insulation	Insulation
Structural Concrete (min. 3000 psi) or Gypsum	Direct Application	Direct Application	Direct Application
Plywood (min. 15/32" thick) or Oriented Strand Board (min. 7/16" thick)	Direct Application	Direct Application	Direct Application
Wood Planks (minimum 3/4" thick)	Direct Application	Direct Application	Direct Application
Fibrous Cement	Insulation	Insulation	Insulation
Lightweight Insulating Concrete	Direct Application (3)	Direct Application (3)	Direct Application (3)
RETROFIT / NO TEAR-OFF			
Existing Smooth Surface BUR (9) or Mineral Surface Cap Sheet	Direct Application (4)(10)	Direct Application (10)	Direct Application (10)
Gravel Surfaced Asphaltic BUR (5)	Insulation	Insulation	Insulation
Coal Tar Pitch (5)(6)	Insulation	Insulation	Insulation
Modified Bitumen	Direct Application (8)(10)	Direct Application (8)(10)	Direct Application (8)(10)
Existing Single-Ply	Direct Application (7)	Direct Application (7)	Direct Application (7)
Existing SPF	Direct Application (11)	Insulation	Insulation
RETROFIT / TEAR-OFF			
Existing roof material removed (regardless of deck type)	Insulation	Insulation	Insulation

Notes:

(1) Local codes must be consulted regarding thermal barrier requirements.

(2) Mechanically Fastened Systems cannot be specified on steel decks less than 22 gauge or for corrugated steel decks, regardless of gauge (Refer to attachment 2).

(3) FleeceBACK Adhered Roofing System may be specified directly over a new approved cellular or perlite lightweight insulating concrete substrate, refer to Attachment I for additional information.

(4) FleeceBACK EPDM Adhered Systems (Sure-Seal black membrane) may be applied directly to the substrate providing asphalt on existing smooth surfaced built-up roof has a softening point above 185°F (85°C).

(5) Loose gravel must be removed to avoid moisture entrapment.

(6) Existing coal tar could drip back into the building, especially when new insulation does not provide sufficient thermal value to prevent the surface of the coal tar from softening.

(7) An approved mechanically fastened insulation/underlayment is required over existing ballasted single-ply systems and PVC roofing systems of any type. For Direct Application Carlisle may be contacted for required substrate preparation.

(8) Direct application permitted over smooth or granular surfaced modified bitumen. Membrane shall be positioned with length of sheets parallel to modified bitumen field seams. Effort should be made to ensure seams of the FleeceBACK system are parallel to existing seams, when new splices run perpendicular the field seam must be carefully inspected especially at intersections.

(9) Existing Type III or IV smooth asphalt BUR Only

(10) Possible staining/discoloration of the white membrane may result when installing this system directly over existing smooth surfaced BUR or modified bitumen, especially along the selvage edge where fleece backing is not present. If aesthetics are critical, an approved insulation should be specified beneath the membrane

(11) Silicone-coated substrates must be scarified (coating removed) prior to the application of Flexible FAST Adhesive.

3.03 Insulation/Underlayment

A. General

1. Roof insulation thickness must be determined by the thermal value required for each project and may be subject to code approval limitations. On projects where a vapor retarder is used, the specifier must calculate insulation thickness to ensure the temperature at the vapor retarder will not fall below the dew point.

2. On projects where coal tar pitch is used, sufficient insulation must be used to prevent softening of the coal tar and possible dripping into the building, especially when the insulation is mechanically fastened.

4. Multiple layers of insulation are recommended with all joints staggered between layers.

5. Do not install more insulation/underlayment than can be covered by membrane in the same day.

6. All insulation boards must be butted together with no gaps greater than 1/4". Gaps greater than 1/4" are not acceptable.

7. Insulation should be protected from repetitive foot or construction traffic during or after installation of the roofing system.

8. Adhered or “Peel and Stick” Vapor Retarders, when used, may pull away from angle changes due to inadequate adhesion or poor substrate preparation. When insulation is to be adhered to the Vapor Retarder, mechanical securement is required along the perimeter. Insulation shall be mechanically fastened with plates and fasteners at 12” o.c. (within 6” of the angle change).

   NOTE: Projects utilizing Carlisle’s “Peel and Stick” Vapor Barrier must comply with Carlisle’s installation requirement outlined in Spec Supplement G-08 “Application Procedures for Carlisle 725TR Air and Vapor Barrier”. Applicable Details should also be referenced for Vapor Retarder terminations along angle changes.

9. Restrictions:

   a. Carlisle Roofing Systems cannot be specified in conjunction with existing or new Phenolic Insulation.

   b. Fiberglass insulation cannot be specified even if overlaid with additional insulation or membrane underlayment.

c. The direct application of Sure-Flex Membrane over expanded or extruded polystyrene insulation is not permitted.

3.04 Insulation Attachment

A. **General**

1. Prior to proceeding with insulation securement refer to Warranty Tables, Paragraph 1.05, for attachment method and appropriate fastening density required for the specific Carlisle Warranty.

B. **Adhered Roofing Systems**

1. **Mechanical Attachment**, insulation fastening density will vary based on insulation type, thickness, and required warranty. Warranty Tables in Paragraph 1.05 should be referenced for fastening density and the appropriate Carlisle detail may be consulted to identify acceptable fastening pattern.

   a. For code compliance, increased fastening density may be required depending upon project wind speed and wind uplift requirement. Refer to **Design Reference DR-05 "Insulation Fastening Patterns"** for fastening pattern reference.

   b. When insulation securement is to comply with Factory Mutual (FM) approvals, follow the requirements of the specifier concerning additional securement at the roof perimeter and corners. Also refer to **Design Reference DR-05 "Insulation Fastening Patterns"** for various fastening patterns.

   c. On Reroof/No Tear off projects with a maximum roof height of 40', any Carlisle Insulation (i.e., 1/2" SecurShield HD, HP Recovery Board, Polyisocyanurate less than 1-1/2" thick) may be secured at the minimum rate of 11 Fasteners per 4' x 8' board (5 Fasteners per 4' x 4' board).

   d. Oriented strand board (OSB) when specified as the membrane underlayment, must be mechanically fastened to the deck at the rate 17 fasteners for 4 x 8 board in accordance with Carlisle Details. If OSB is to be used in conjunction with Carlisle urethane based adhesive, an OSB/Polyisocyanurate composite board is recommended. When positioning OSB it shall not be butted allow 1/8" gaps between boards to prevent cupping.

2. **Adhesive attachment**, Carlisle Urethane Adhesive Full Spray (Flexible FAST), Bead (Flexible FAST or Olybond) or Equipment (Rig) Splatter (Flexible FAST) may be used. When bead adhesive is specified, bead spacing will vary based on Warranty coverage, refer to Warranty Tables, Paragraph 1.05 and appropriate Carlisle Details.

   a. **CAUTION:** Ensure the bead of adhesive is 2" from edge of board for 4" o.c. bead spacing and 3" from edge of board for 6" and 12" o.c. bead spacing. Refer to **Detail A-27G** in **Spec Supplement G-09**.

   b. **CAUTION:** For application of urethane adhesives directly to un-weathered asphalt, (new or residual), refer to **Spec Supplement G-03 "FleeceBACK and Insulation Attachment and Coverage Rates with Flexible FAST Adhesive".**

   c. **CAUTION:** Gaps between horizontal and vertical surfaces of the roof area as well as gaps around penetrations must be sealed to prevent interior warm air from infiltrating and condensing within the roofing assembly. Condensing moisture could weaken bottom insulation facer and eventually result in dislodgement or loose boards when adhesive is used.

   d. Flexible FAST may be used in an Equipment (Rig) splatter application method, in lieu of, full spray or bead attachment for adhering Insulation or FleeceBACK Membranes to a smooth, flat surface. Flexible FAST may be dispensed by using a HULK Spray Rig with a HULK Dispensing Gun or Patriot Spray Rig with a VEE-AIR Spray Gun to achieve 50% coverage of the substrate at a rate of 1/2 gallon per 100 square feet. To achieve proper coverage, spray in a horizontal, sweeping motion, from a minimum of 24" height, overlapping each new pass with the previous pass by 50%.

e. Refer to **Spec Supplement G-02 "Flexible FAST Adhesive Equipment and Set-Up Requirements for Full Spray, Bead and Splatter Applications"** and **G-03-20 "FleeceBACK and Insulation Attachment and Coverage Rates with Flexible FAST Adhesive"** for equipment settings, application procedures and coverage rates.

f. On FM Global insured projects, consult FM Global's local representative concerning the use of adhesive to attach insulation to steel decks.

g. Check to ensure the substrate is dry. Adhesive cannot be applied to a wet or damp surface.

h. Allow the adhesive to rise up approximately 1/8" to 3/4", depending on dispensing method, and develop strings prior to setting insulation boards into adhesive.

Note: String-time is measured by touching the adhesive with a splice wipe and looking for development of "strings" of adhesive as you pull the splice wipe out of the adhesive. With Flexible FAST Adhesive, string time is generally around 1-1/2 – 2 minutes after application at room temperature.

i. **Walk the boards into the adhesive and roll using a 30" wide, 150 pound segmented steel roller** to ensure full embedment. Optimal set up time should be approximately 5 to 7 minutes.

CAUTION: Walking on the boards immediately after placement in adhesive can cause slippage/movement until the adhesive has started to set up.

CAUTION: If the boards easily slide, string time has not been achieved.

On roofs with a slope greater than 1/2" in 12", begin adhering insulation at the low point and work upward to avoid slippage.

One person should be designated to walk and roll in all boards. Relief cuts may be necessary to allow lifted board to lay flat, or constant weight (a minimum 10 lbs for 5-15 minutes per lifted area) may be necessary to achieve adequate adhesion.

j. **NOTE: Projects utilizing Carlisle's "Peel and Stick" Vapor Barrier must comply with Carlisle's installation requirement outlined in Spec Supplement G-08 "Application Procedures for Carlisle 725 Air and Vapor Barrier". Applicable Details should also be referenced for Vapor Retarder terminations along angle changes.**

3.05 Membrane Placement and Securement

A. **General**

1. Do not apply Flexible FAST Adhesive when surface and/or ambient temperatures are below 25°F (-4°C). The temperature of Flexible FAST Adhesive must be between 70°F (21°C) and 90°F (32°C), at the time of use. Use blanket heaters and/or hot boxes when necessary.

2. Flexible FAST Adhesive may be applied when surface and/or ambient temperatures are below 25°F (-4°C) when heated equipment is used that includes the following: heated blankets, preheater, and heated hose.

3. When using Flexible FAST Adhesive in non-heated spray equipment, substrate and/or ambient temperatures must be between 25° F (-4° C) and 120° F (49° C).

4. The coverage rate of Flexible FAST Adhesive below:

Flexible FAST Adhesive Coverage Rates					
Approximate Coverage Rate (Sq. Ft.)					
Package Type	**Full Spray**	**Splatter**	**4” o.c.**	**6” o.c.**	**12” o.c.**
Dual Cartridges	N/A	N/A	100-200	200-300	400-600
Dual Tanks	N/A	2,600-2,800	1,100-1,300	1,700-1,900	3,500-3,700
5-Gallon Jugs	600-1,000	1,800-2,000	670-900	1,000-1,250	2,000-2,500
15-Gallon Drums	1,800-3,000	5,400-6,000	2,110-2,700	3,000-3,750	6,000-7,500
50-Gallon Drums	5,000-10,000	18,000-20,000	6,700-9,000	10,000-12,500	20,000-25,000

5. **Sweep** all loose debris from the substrate.

6. **Verify** all sections are dry prior to proceeding with the application of Flexible FAST Adhesive/FleeceBACK membrane.

CAUTION: Ensure that water does not flow beneath any completed sections of the membrane system by completing all flashings, terminations and daily seals by the end of each work day.

7. At angle changes along walls, curbs, skylights, etc., for warranties up to 20 years, FleeceBACK membrane must be adhered in Flexible FAST Adhesive beads placed directly at the angle change and an additional bead spaced a maximum of 3” away from the first bead (at the angle change). For warranties over 20 years, mechanical securement of the membrane is required.

B. **EPDM Membrane Installation - Option #1**

1. Position and unroll successive sheets and align to provide the minimum 3" or 6” wide splice. At end laps (along the width of the sheet), membrane shall be butted together.

2. Fold adjacent sheets in half lengthwise (end to end) to expose approximately 10' wide (width of the sheet) by half the length of the sheet substrate area.

   Notes: Fold selvage sheet edges (along the length of the sheets), if pre-applied tape is not present, under the membrane to prevent overspray onto the splice area.

   Membrane which has the adjacent sheet spliced over it should be adhered to the substrate first. This will prevent the selvage edge splice area from being contaminated by setting splice edge into urethane adhesive.

3. Apply Flexible FAST Adhesive onto the substrate and allow to rise approximately 1/8" to 3/4" and develop **strings when touched with an HP Splice Wipe**. Roll the membrane with a 30" wide, 150 lb weighted segmented steel roller, to set the membrane into the adhesive. **For Non-Dual Tank extruded applications, apply adhesive at 4", 6" or 12" on center with a minimum 1/2" wide, wet bead**. **For Dual Tank extruded applications apply adhesive with a minimum of 1.5" wide, wet bead.**

4. Apply Flexible FAST Adhesive to the substrate and continue the process described above until all sheets are fully adhered, allowing for the necessary splice overlaps at selvage edges. At end laps (along the width of the sheet), membrane shall be butted together and overlay with 6" wide Pressure-Sensitive Cured Cover Strip or Pressure-Sensitive Overlayment Strip. See Paragraph 3.05-F for additional splicing requirements.

C. **TPO/PVC Membrane Installation –Option #1**

1. Position and unroll successive sheets and align to provide a minimum 2" overlap (use pre-marked overlap line) along the selvage edge. At end laps (along the width of the sheet), membrane shall be butted together.

2. Fold adjacent sheets in half lengthwise (end to end) to expose approximately 10' wide (width of the sheet) by half the length of the sheet substrate area.

   Notes: Fold selvage sheet edges (along the length of the sheets) under the membrane to prevent overspray onto the splice area.

   Membrane which has the adjacent sheet spliced over it should be adhered to the substrate first. This will prevent the selvage edge splice area from being contaminated by setting splice edge into urethane adhesive.

3. Apply Flexible FAST Adhesive onto the substrate and allow to rise approximately 1/8" to 3/4"and develop strings when touched with an HP Splice Wipe. Roll the membrane with a 30" wide, 150 lb weighted segmented steel roller, to set the membrane into the adhesive. **For Non-Dual Tank extruded applications, apply adhesive at 4", 6" or 12" on center with a minimum 1/2" wide, wet bead**. **For Dual Tank extruded applications apply adhesive with a minimum of 1.5" wide, wet bead.**

   Note: Exercise care to prevent overspray onto membrane. If Flexible FAST Adhesive should contaminate the splice area, immediately (while adhesive is still in liquid form) clean with TPO, PVC and KEE HP Membrane Cleaner or allow Flexible FAST Adhesive to cure and remove with a paint remover as referenced in Paragraph 3.05-E.

4. Apply Flexible FAST Adhesive to the substrate and continue process described above until all sheets are fully bonded, allowing for the necessary splice overlaps. At end laps (along the width of the sheet), membrane shall be butted together and to be overlaid with minimum 6" wide Sure-Weld/Sure-Flex Reinforced Membrane hot air welded on all edges.

D. **EPDM, TPO and PVC Membrane Installation – Option #2**

1. **Position** first roll of FleeceBACK membrane at the designated starting point on the roof.

2. **Chalk** a line to ensure proper positioning of the FleeceBACK membrane.

3. **Unroll** 10' to 15' of membrane to ensure it is properly aligned and fold unrolled section back over roll.

4. **Apply** Flexible FAST Adhesive over the substrate area to be covered by the membrane that is folded back. **For Non-Dual Tank extruded applications, apply adhesive at 4", 6" or 12" on center with a minimum 1/2" wide, wet bead**. **For Dual Tank extruded applications apply adhesive with a minimum of 1.5" wide, wet bead.**

5. Once the Flexible FAST Adhesive is applied in place and has begun to rise approximately 1/8" in height and **develop strings when touched with an HP Splice Wipe**, slide the membrane back into the adhesive.

6. **Roll** the membrane using a 30” wide, 150 lb weighted segmented steel roller, to set the membrane into the adhesive.

7. Proceed to the front of the roll and continue to apply Flexible FAST Adhesive and roll the FleeceBACK membrane into the adhesive.

8. Once the first sheet is positioned, measure to allow for a minimum (Refer to Option #1) overlap along the length of the sheet.

9. Position the next roll and repeat the process as described above.

10. At end laps, membrane shall be butted together and overlaid with 6" wide Pressure-Sensitive Cured Cover Strip or Pressure-Sensitive Overlayment Strip with EPDM Primer, for EPDM, and overlaid with a minimum 6” wide Sure-Weld/Sure-Flex Reinforced Membrane hot air welded on all edges. (Cut edges of Sure-Weld membrane shall be sealed with Cut Edge Sealant.)

E. **Do not apply Flexible FAST Adhesive to splice areas.** If Flexible FAST Adhesive should contaminate the splice area, immediately (while the adhesive is still in liquid form) clean with Weathered Membrane Cleaner (EPDM or TPO) or PVC and KEE HP Membrane Cleaner (PVC or KEE HP PVC Only). Cured Adhesive which has dried may be removed with paint remover as referenced in Paragraph 3.06 B.3.

F. **EPDM MEMBRANE SPLICING (Sure-Seal/Sure-White)**

FleeceBACK membrane has selvage edges (fleece-backing is discontinued) and **Factory-Applied SecurTAPE** along the length of the sheet for membrane splicing in accordance with the following procedures.

Selvage edges are not provided along the width of the membrane (roll ends); adjoining membrane sheets shall be butted together and overlaid with 6” wide Pressure-Sensitive Cured Cover Strip in accordance with appropriate Carlisle Detail. As an option, sheets can be rotated 90° to form a cap sheet to eliminate flashing overlay. For additional installation procedures, refer to **Spec Supplement E-02 “EPDM Membrane Splicing and Splice Repairs”.**

1. **General**

a. **Projects with 10, 15 and 20 year Warranties – Detail FB-2A**

Side Laps: Tape splices must be a minimum of 2-1/2" wide using **3" wide field-applied Pressure Sensitive SecurTAPE OR 3” Factory-Applied TAPE (FAT)**. (**Detail FB-2A**).

End Laps: A minimum of 6” wide Pressure-Sensitive Cured Cover strip or Pressure-Sensitive Overlayment Strip shall be used at all end laps and shall be centered over the leading edge (butt edge) of the splice. (**Detail FB-2A**).

Splice Intersections: All intersections between the Pressure-Sensitive Cover strip and side laps shall be overlaid by a 6”x6” minimum (black) or 7”x9” (white) Pressure-Sensitive ‘T’-Joint cover with a bead of Lap Sealant. (**Detail FB-2A**).

Note: In lieu of the 7”x9” Sure-White Pressure Sensitive ‘T’-Joint cover, a 6”x6” section of white Pressure-Sensitive Elastoform flashing may be used. White Pressure-Sensitive Elastoform flashing is available in rolls of 6”, 9” and 12”.

b. **Projects with 25 and 30 year Warranties - Detail FB-2A.1**

Side Laps: Must be a minimum of 5-1/2” wide using **6” wide Field-Applied or Factory-Applied Tape (FAT)** OR if **3” wide Factory-Applied Tape (FAT)** SecurTAPE is used, the 3” Tape must be overlaid with **6” Pressure-Sensitive Cured Cover Strip**. (**Detail FB-2A.1**).

End Laps: Use two layers of Pressure-Sensitive Flashing as an overlay for the end laps. The first layer shall be 6” wide Pressure-Sensitive Overlayment Strip or Pressure-Sensitive Cured Cover Strip and the top layer shall be 12” wide Pressure-Sensitive Elastoform Flashing. Both layers shall be centered over the butt edges of the sheet.

Splice Intersections: ’T’-Joints are to be flashed with a bead of lap sealant and 6”x6” (black) or 7”x9” (white) Pressure-Sensitive ‘T’-Joint Cover. Apply a second layer of 12”x12” Pressure-Sensitive ‘T’-Joint Cover centered over 6” x 6” ‘T’-Joint Cover. (**Detail FB-2A.1**).

Note: In lieu of the 7”x9” Sure-White Pressure-Sensitive ‘T’-Joint cover, a 6”x6” section of white Pressure-Sensitive uncured Elastoform flashing may be used. White Pressure-Sensitive Elastoform flashing is available in rolls of 6”, 9” and 12”.

c. Field splices located in areas where ponding water occurs or those that resist water flow, must be overlaid with 6" wide Pressure-Sensitive Overlayment Strip or 6" wide Pressure-Sensitive Cured Cover Strip.

d. Tape shall extend 1/8" minimum to 1/2" maximum beyond the splice edge. Factory-Applied tape can be flush with sheet edge.

e. **Prior to SecurTAPE application, the splice area must be primed with Sure-Seal EPDM or Low-VOC EPDM Primer.**

f. Field splices at roof drains must be located outside the drain sump.

2. If the splice area is contaminated with field dirt, adhesive or other residue, scrub with Sure-Seal Weathered Membrane Cleaner prior to application of Sure-Seal Primer.

3. Position membrane sheets to allow for an appropriate overlaps depending on SecurTAPE width. Where Factory-Applied tape is not present, mark the bottom sheets with an indelible marker approximately 1/4" from the top sheet edge. The pre-marked line on the membrane edge can also be used as a guide for positioning splice tape.

4. **Apply EPDM or Low-VOC EPDM Primer** with a 1/2” medium nap roller to achieve a **thin, even coat** on both membrane surfaces. Splice area must be uniform in color, streak free and free of globs or puddles.

   Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended when cleaners or primers are being used.

5. **Allow** Primer to dry until tacky but does not transfer to a dry finger touch.

   Note: Due to solvent flash-off, condensation may form on freshly applied EPDM Primer when the ambient temperature is near the dew point. If condensation develops, the application of Primer and SecurTAPE must be discontinued since proper adhesion will not be achieved. Allow the primer surface to dry and apply a thin freshener coat of EPDM Primer to the previously coated surface and apply SecurTAPE when conditions allow.

6. Where Factory-Applied SecurTAPE is not present (i.e., base flashing details, cap sheet locations, etc.) unroll approximately 3' of SecurTAPE. Align release film with marked line and press tape down to bottom sheet using firm even hand pressure. Continue for the length of the splice. Tape roll ends must be overlapped 1". Allow top sheet to rest on release film on back side of the tape.

7. **Pull** release film from SecurTAPE beneath top sheet and allow top sheet to fall freely onto exposed tape.

8. **Press** the top sheet onto the tape using firm even hand pressure across the splice towards the splice edge.

9. **Immediately roll** the splice using positive pressure. When using a 2" wide steel roller, roll across the splice edge, not parallel to it. When using Carlisle's Stand-Up Seam Roller, splices may be rolled lengthwise along the splice.

   Note: When temperatures are below 40°F (4°C), prior to rolling the splice, apply heat to the top side of the splice area with a hot air gun.

10. **Install** a "T" Joint Covers as required. Refer to **Spec Supplement E-02 "EPDM Membrane Splicing and Splice Repair"** for specific requirements dictated by membrane thickness and warranty duration

11. **Cold Weather Restrictions** - When temperatures are below 40°F (4°C)

    1) Splice tape must be stored in a warm, dry area. Hot boxes must be provided for temporary storage to maintain the temperature of the tape above 40°F (4°C).

    2) After Primer has been applied and allowed to properly dry, **heat the primed area of the bottom membrane sheet** with a hot air gun as the tape is applied and pressed into place.

    3) When temperatures fall below 40°F (4°C), use a steel roller to apply pressure to the tape prior to removing the release film.

    4) Position the top sheet and remove the release film. Prior to rolling the splice with the 2" steel roller, apply heat to the top side of the splice area with a hot air gun. The heated surface should be very hot to the touch of bare skin (approximately the temperature of hot tap water). Take care not to burn or blister the membrane.

G. Lap Sealant Application

1. **General**

   a. The use of Lap Sealant with tape splices is optional except at tape overlaps, where Lap Sealant must be utilized.

   b. Lap Sealant is optional on straight runs of Pressure-Sensitive Flashing and around Pressure-Sensitive Pipe Flashings.

   c. Lap Sealant is required at the following locations:

      a. Splices between adjoining sections of uncured and semi-cured Pressure-Sensitive Flashing.

      b. Intersections between Pressure-Sensitive Flashing and joints in metal edgings.

2. Where applicable, additional cleaning of the splice edge prior to applying Lap Sealant is not required unless contaminated with dirt or other contaminants.

3. Apply a **5/16" (minimum 1/4") diameter bead** of Lap Sealant to completely cover the splice edge. When a 5/16" diameter bead of Lap Sealant is applied, approximately 22 linear feet of coverage per tube can be achieved.

4. **Feather** the Lap Sealant with the specially preformed tool or nozzle (included in the Lap Sealant cartons) so the high point or the crown of the Lap Sealant is located over the edge of the splice.

   Clean the feathering tool occasionally for consistent crowning of the Lap Sealant.

5. **APPLICATION OF LAP SEALANT SHOULD BE COMPLETED BY THE END OF THE DAY.** Delayed Lap Sealant application (not within the same day) will require scrubbing of accumulated dirt and dust along the splice edge, rinsing with clean water and cleaning with Weathered Membrane Cleaner or Primer.

3.06 Heat Welding Procedures (Sure-Weld/Sure-Flex)

A. **General**

1. Hot air weld the Sure-Weld or Sure-Flex FleeceBACK membrane sheets using the Automatic Hot Air Welding Machine or Hot Air Hand Welder and silicone roller. For description of heat welding equipment and generator/electrical requirements, refer to **Spec Supplement T-01 "Heat Welding Equipment".**

2. When roof slope exceeds 5 inches per horizontal foot, use of the Automatic Hot Air Welding Machine may become more difficult working parallel with the slope it may be necessary to run the sheets perpendicular to avoid the use of Hand Held Hot Air Welder.

3. Membrane has a selvage edge (fleece-backing is discontinued) along the length of the sheet for membrane welding.

   Selvage edges are not provided along the width of the membrane. Adjoining membrane sheets shall be butted together, overlaid with a minimum 6" wide Sure-Weld/ Sure-Flex Reinforced Membrane and hot air welded on all edges. Seal all Sure-Weld membrane edges (where scrim reinforcement is exposed) with Cut-Edge Sealant. Cut-Edge Sealant not required for Sure-Flex Membrane, however it is recommended.

   Note: When using Sure-Weld FleeceBACK 115- or 135-mil membrane or Sure-Flex FleeceBACK 135-mil membrane, a surface splice of non-reinforced flashing or "T-Joint" Cover must be applied over all "T" joint splice intersections.

B. Check the surfaces of the membrane to be hot air welded to ensure they are properly prepared as outlined below:

1. Membrane Cleaning - The surfaces to be hot air welded must be clean. Membrane overlaps that become contaminated with field dirt must be cleaned with Weathered Membrane Cleaner (Sure-Weld) or PVC and KEE HP Membrane Cleaner (Sure-Flex) and wiped dry with a clean HP Splice Wipe. No residual dirt or contaminants should be evident.

2. Exposed Membrane Seam Preparation - Surface oxidation of membrane will occur upon exposure to heat and sunlight. After exposure to the elements, membrane must be cleaned with Weathered or PVC and KEE HP Membrane Cleaner prior to hot air welding as follows:

   a. Apply Weathered Membrane Cleaner (Sure-Weld) or PVC and KEE HP Membrane Cleaner (Sure-Flex) to the surface of the membrane which has been exposed using a clean HP Splice Wipe or other white natural fiber (cotton) rag or "Scotch Brite" type pad and wipe along the direction of the seam.

      If natural fiber rags are used, they must be white to prevent fabric dye from discoloring the membrane.

      Prior to hot air welding, wipe the surface where Weathered Membrane Cleaner (Sure-Weld) or PVC or KEE HP Membrane Cleaner (Sure-Flex) has been applied with a clean, dry HP Splice Wipe or other white rag to remove cleaner residue.

   b. Weathered Membrane Cleaner (Sure-Weld) will achieve approximately 600 linear feet (one surface) of coverage per gallon for a standard hot air welded splice area. PVC or KEE HP Membrane Cleaner (Sure-Flex) will achieve approximately 400 square feet (one surface) of coverage per gallon for a standard heat welded splice area.

   c. The membrane can typically be repaired up to 6 months to a year with the standard cleaning method referenced above. In cases where the standard cleaning method is not sufficient, additional scrubbing

and cleaning will be required. Refer to Paragraph 3.07-B.

3. Check surfaces of the FleeceBACK membrane around details (i.e., walls, curbs, vents, etc.) for evidence of Flexible FAST Adhesive overspray since proper heat welding of flashing will not be accomplished if overspray is present. Overspray shall be removed as follow:

   a. Apply a paint remover such as Tal-Strip® Extra Strength manufactured by Mar-Hyde® Corporation (can be purchased at most automotive centers) to the overspray area and allow to remain on the membrane surface approximately 5 minutes.

   b. Remove residue with a Splice Wipe or clean cloth. Wipe cleaned area with Weathered Membrane Cleaner (EPDM or TPO) or PVC and KEE HP Membrane Cleaner (PVC and KEE HP Only) prior to heat welding (Acetone may be used in lieu of PVC and KEE HP Membrane Cleaner where VOC requirements are in effect.

C. **Automatic and/or Hand Held Hot Air Welder Equipment**

1. Refer to **Spec Supplement T-01 – "Heat Welding Equipment"** for:

   a. Temperature Settings.
   b. Equipment Set-up.
   c. Additional Information.

D. **Membrane Welding**

1. Prepare the Automatic Hot Air Welding Machine and allow it to warm for approximately 5 to 10 minutes to reach operating temperature.

2. Perform test trials before welding to ensure proper welding is achieved.

3. Position the Automatic Hot Air Welding Machine properly prior to seaming with the guide handle pointing in the same direction the machine will move along the seam.

4. Lift the overlapping membrane sheet and insert the blower nozzle of the Automatic Hot Air Welding Machine between the overlap. Immediately begin moving the machine along the seam to prevent burning the membrane.

5. Weight plates provided on Automatic Welders must be utilized.

6. Proceed along the seam ensuring that the small guide wheel in front of the machine aligns with the edge of the top membrane sheet. Guide the machine from the front only.

   CAUTION: Ensure the power cord has plenty of slack to prevent dragging the machine off course (which could result from a tightly stretched cord).

7. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam (the membrane should be creased into any membrane step-off with the edge of the silicone roller). A false weld may result due to surface irregularities created by multiple thicknesses of Sure-Weld membrane sheets.

   Note: When using Sure-Weld FleeceBACK 115- or 135-mil membrane or Sure-Flex FleeceBACK 135-mil membrane, a surface splice of Non-Reinforced Flashing or T-Joint Cover must be applied over all "T" joint splice intersections. T-joint covers are also required along the end-lap overlays regardless of membrane thickness

8. To remove the Automatic Hot Air Welding Machine from the finished splice, stop the movement of the machine and immediately remove the nozzle from the seam area. Mark the end of the hot air welded

seam with a water-soluble marker for easy identification. A Hand Held Welder will be necessary to complete the weld in the area between where the Automatic Hot Air Welding Machine is stopped and restarted.

E. **Preventing Membrane Creeping During Welding**

The operator of automatic welding equipment must apply foot pressure to the membrane, keeping the membrane tight under the welder. Refer to **Spec Supplement T-01 – "Heat Welding Equipment**" for additional information.

F. **Test Cuts**

Perform a test weld at least at the start of work each morning and afternoon. Refer to **Spec Supplement T-01 – "Heat Welding Equipment"** for additional information.

G. **Seam Probing**

A blunt or dull cotter pin puller is recommended to probe all heat-welded seams. Probing seams must be done once heat welds have thoroughly cooled. Refer to **Spec Supplement T-01 – "Heat Welding Equipment"** for additional information.

3.07 Welding Problems/Repairs

A. A Hand Held Hot Air Welder and a 2 inch wide silicone roller must be used when repairing the Sure-Weld or Sure-Flex FleeceBACK membrane. When the entire hot air welded seam is to be overlaid, an Automatic Hot Air Welding Machine may be used.

B. Prior to proceeding with any repair procedure, the area to be repaired must be cleaned and any material which has been exposed approximately 7 days must be prepared with Carlisle Weathered Membrane Cleaner (Sure-Weld) or PVC and KEE HP Membrane Cleaner (Sure-Flex) as outlined in **Spec Supplement T-01 "Heat Welding Equipment Use and Procedures Thermoplastic Membranes",** Exposed Membrane Seam Preparation. The membrane can typically be repaired up to 6 months to a year with a standard cleaning method. In cases where the standard cleaning method is not sufficient, the following procedures must be used:

1. Scrub the area to be welded with a "Scotch Brite" pad and appropriate Membrane Cleaner. The cleaner will become discolored during this procedure.

2. Clean all residue from the area to be welded with a Splice Wipe or clean rag.

3. Weld the new membrane to the cleaned area using standard welding procedures.

C. Voids in welded seams can be repaired using a Hand Held Hot Air Welder and a silicone roller.

D. Position the Hand Held welder facing into void so hot air is forced between overlapping membranes. Roll the top membrane surface using positive pressure toward the outer edge until the heated membrane surfaces are fused.

E. Exposed scrim-reinforcement (resulting from scorching surface of membrane) and test cut areas must be repaired by overlaying the damaged area with a separate piece of membrane with rounded corners. The overlay must extend a minimum of 2 inches past the area to be repaired.

F. Probe all edges of the overlay once cooled to ensure a proper weld has been achieved.

G. Seal all cut edges of Sure-Weld reinforced membrane with TPO Cut-Edge Sealant. PVC Cut-Edge Sealant is not required for Sure-Flex Membrane.

Note: The same overlay repair procedures may be used for punctures in the Sure-Flex membrane.

3.08 Flashings

For other requirements which must be complied with in order for Carlisle warranty to be issued, refer to Spec Supplement G-05 "Flashing Consideration/Metal Work".

A. General Considerations

1. All existing loose flashing must be removed prior to the application of new flashing. New membrane flashing must extend above all existing intact flashing but must not conceal weep holes or cover existing through wall counterflashing.

2. Deck to wall joints, vertical joints between tilt up panels, and any gaps in metal walls must be sealed to prevent any infiltration and possible condensation beneath the membrane. Refer to appropriate Carlisle Details for recommendation.

3. Install surface mounted reglets and compression bar terminations directly to the wall surface.

4. In areas where metal counterflashing is used as the vertical termination, the counterflashing must be sealed with a rubber grade caulking to prevent moisture migration behind the new wall flashing.

5. **At roof drains and compression seal terminations** such as terminations bars and coping stones, the **fleece-backing must be removed** from the back of the membrane so Water Cut-Off Mastic can be applied directly to the membrane surface.

    a. To remove fleece-backing utilize a Hand Held Hot Air Welder and apply heat in a back and forth motion over the area of where the fleece is to be removed. Fleece will melt and the bottom of the membrane will be exposed.

6. Cut-edges of Sure-Weld FleeceBACK membrane, where scrim reinforcement is exposed, must be sealed with TPO Cut-Edge Sealant (not required on vertical surfaces). The use of PVC Cut-Edge Sealant on cut edges of Sure-Flex FleeceBACK membrane is not required.

7. Care must be taken when setting the flashing to avoid bridging greater than 3/4 inch at angle changes (i.e., where a parapet or roof penetration meets the roof deck). This can be accomplished by creasing the membrane into the angle change.

8. All vertical EPDM field splices at the base of a wall or curb must be overlaid with a Pressure-Sensitive "T" Joint Cover, 6" wide section (with rounded corners) of Sure-Seal Pressure-Sensitive Flashing or Sure-White uncured Elastoform Flashing centered over the field splice in accordance with the applicable Carlisle Details. When 60-mil or greater Reinforced Sure-Weld or 80-mil Sure-Flex Non-Fleece Membrane is used for wall/curb flashing resulting splice intersection must be overlaid with appropriate "T"-Joint cover.

9. Terminate the edges of the installed membrane in accordance with Carlisle's applicable Termination Details.

10. On all Total System Warranty projects, Carlisle's Termination Bar, in conjunction with Water Cut-Off Mastic, must be installed under all metal counterflashings used for vertical wall terminations.

11. The height of the new wall flashing and termination must extend above the anticipated water level (due to heavy rain) or slush line (due to water under accumulated snow).

12. The Specifier must examine structural supports for rooftop equipment to determine if reasonable access to the membrane beneath the equipment is provided.

13. Bitumen based roof cement must be removed or concealed with an acceptable underlayment.

14. When sleepers are used for mounting rooftop equipment, they must be designed to provide adequate support. An appropriate detail must be selected to prevent depression of the insulation and possible damage to the membrane.

    NOTE: When sleeper mounted pipe and gas lines running perpendicular to roof slope should be elevated to reduce forces caused by melting/sliding snow. Designer may consider the utilization of a support system secured to roof structure and properly flashed.

15. **Existing Roof Tie-Ins**, depending on the type of the existing roofing system, the tie-in method will vary. Total isolation between the two roofing systems or weep holes may be required to address moisture migration from one roofing system to the other. Refer to appropriate U-13 Detail, contact Carlisle for further information. If constant compression is required, ensure fleece is removed from the bottom of the membrane.

16. **Flashing of other Penetrations**, refer to **Spec Supplement G-05 for "Flashing Considerations / Metal Work"** and the applicable Carlisle detail for specific requirements.

17. **Flashing of Difficult Penetrations,** refer to **Spec Supplement G-13 for "LIQUISEAL Liquid Flashing"** for additional information and specific requirements.

B. **Walls, Parapets, Curbs, Skylights, etc.**

1. Use continuous deck membrane where feasible as outlined in appropriate Carlisle Detail.

2. When the use of continuous deck membrane for wall flashing is not feasible, a separate piece of Non-Fleece Cured Membrane may be used in accordance with appropriate Carlisle Detail.

   When a separate piece of Non-Fleece Cured membrane is used, adhere membrane to the wall or curb with appropriate Bonding Adhesive. Terminate in accordance to the applicable Carlisle Termination Details.

3. When using a separate piece of Non-Fleece membrane for wall flashing should comply with minimum membrane thickness as outlined in Warranty Tables in the appropriate EPDM and Thermoplastic specifications.

4. As an alternative to the use of a separate piece of Non-Fleece Cured Membrane, a separate piece of FleeceBACK membrane can be used for wall/curb flashings if a selvage edge is provided.

5. At angle changes along walls, curbs, skylights, etc., for warranties up to 20 years, FleeceBACK membrane must be adhered in Flexible FAST Adhesive beads placed directly at the angle change and an additional bead spaced a maximum of 3" away from the first bead (at the angle change) see Detail FB-12A.1 and FB -12B.1. For warranties over 20 years, mechanical securement of the membrane is required.

6. Adhere **FleeceBACK** membrane to the wall with **Flexible FAST Adhesive with full spray.** Allow extra time for Flexible FAST Adhesive to gain green strength prior to setting membrane in vertical surface.

   NOTE: Splatter Application is not approved for vertical wall attachment.

   a. FleeceBACK membrane may be adhered with appropriate Bonding Adhesive, however, a coat of bonding adhesive must first be applied to the fleece backing and allowed to dry. Then apply a standard coat of Bonding Adhesive on the wall and a second layer over the dried coat of Bonding Adhesive on the fleece membrane, then and allow to properly dry.

   b. FleeceBACK membrane may be adhered to vertical surfaces with CAV-GRIP III Low-VOC aerosol adhesive. Spray wall and back of the membrane utilizing 50% overlap and 100% coverage.

7. When FleeceBACK membrane is used as wall/curb flashing, the **fleece-backing must be removed along the top edge of the membrane prior to completing compression seal terminations** so Water Cut-Off Mastic can be applied directly to the membrane surface. This can be accomplished by applying heat to the fleece until the bottom of the membrane is exposed.

8. For **corner flashing** requirements, refer to the applicable Carlisle Details included at the end of this section.

9. For re-roofing projects where residual asphalt may be present separation must be provided between the asphalt and White Membranes to avoid possible discoloration and permanent staining. Refer to applicable Carlisle Detail or Carlisle may be contacted for other recommendations.

C. **Metal Edge Terminations**

1. The width of the perimeter wood nailer to which the metal edge is to be secured must extend beyond the width of the metal edge deck flange.

2. All shop fabricated metal must incorporate a continuous cleat (min. 22 ga.) and must be secured at least 6 inches on center. Or as approved by the Specifier, whichever is greater.

3. Pre-Manufactured metal edging must be secured to the wood nailer as specified by the respective manufacturer.

4. Refer to the appropriate Carlisle Detail for flashing options and requirements and **Design Reference DR-12 "Metal Edgings"** for applicable wind uplift achieved using the various Carlisle supplied metal.

D. **Expansion Joints**

At expansion joints, a separate section of FleeceBACK membrane installed with the fleece-backing side facing up beneath the field membrane may be required. Refer to the applicable Carlisle Details for installation requirements.

E. **Roof Drains**

When the FleeceBACK membrane extends into the drain sump/clamping ring, **Fleece-backing must be removed** from the underside of the membrane so Water Cut-Off Mastic can be applied directly to the membrane surface. Apply heat to fleece material until the bottom of the membrane is exposed. As an option, a separate section of Non-Fleece Membrane can be extended into the drain sump. Refer to applicable Carlisle Details for various flashing options.

Only drain strainers that have been approved by the specifier in accordance with all applicable codes may be used.

F. **Sure-Weld/Sure-Flex Contour Rib Profiles**

1. The Contour Rib Profile is recommended for use with FleeceBACK® TPO and PVC adhered roofing systems.

2. The Sure-Weld/Sure-Flex Contour Rib Profiles should be positioned parallel to the laps of the installed TPO/PVC roofing system and parallel with the roof slope where possible.

3. Ensure that all welding surfaces are clean and dry. Inspect all seam areas for proper weld prior to installing Sure-Weld/Sure Flex Contour Rib Profile.

4. Contour Rib Profile spacing can be individually determined to achieve the desired appearance.

5. Connecting multiple ribs is achieved by using fiberglass pins. Insert a pin half-way into the end of one

profile. Connect the adjoining rib by inserting the exposed end of the pin into the alignment hole. Repeat previous steps for additional TPO/PVC Contour Rib profiles.

6. Consult the Sure-Weld or Sure Flex Contour Rib Profile installation guides for instructions on proper installation techniques.

G. **Other Penetrations**

1. Thermoplastic FleeceBACK Membrane (TPO/PVC/KEE HP PVC) with Warranties of 20 Year or greater must incorporate Carlisle supplied pre-fabricated accessories to seal pipes, corners, sealant pockets, etc.

2. Carlisle's pre-fabricated accessories are available in thickness of 60 mil. For projects with 20 year or greater Warranties only pre-fabricated accessories with minimum of 60-mil may be used.

3. For EPDM FleeceBACK installations, use Pressure-Sensitive Pipe Seals, when feasible, to flash pipes and round penetrations in accordance with appropriate Carlisle Detail.

   When Pressure-Sensitive Pipe Seals cannot be used, install field fabricated pipe seals using Pressure Sensitive uncured Elastoform Flashing around pipe, round supports and structural steel tubing with a corner radius greater than 1/4".

4. For either Thermoplastic or EPDM FleeceBACK Membrane, Flexible Penetrations (braided cables, conduits, wires, etc.) must be enclosed in a stable "goose neck".

   Apply a field fabricated pipe flashing using Sure-Weld (TPO) or Sure-Flex (PVC) non-reinforced flashing to flash the goose neck.

   For EPDM FleeceBACK Membrane systems use Sure-Seal/Sure-White Pressure-Sensitive Flashing refer to appropriate Carlisle Detail

5. For pipe clusters or unusually shaped penetrations, a Molded or Pourable Sealant Pocket must be utilized.

6. Hot pipes which exceed 140°F (60°C) (PVC/KEE HP PVC), 160°F (71°C) (TPO) or 180°F (82°C) (EPDM) must be insulated with metal collars and rain hoods and flashed in accordance with appropriate Carlisle Detail.

7. Applicable Carlisle details shall be utilized. For FleeceBACK Adhered Roofing Systems, additional membrane securement around pipes or pourable sealer pockets is not required regardless of size.

3.09 Roof Walkways

Walkways are to be specified at all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders, etc.), and if regular maintenance (once a month or more) is necessary to service rooftop equipment. Refer to **Spec Supplement G-06 "Roof Walkway Installation".**

3.10 Daily Seal

On phased roofing, when the completion of flashings and terminations is not possible by the end of each workday, provisions must be taken to temporarily close the membrane to prevent water infiltration. Refer to **Spec Supplement G-07 "Daily Seal / Clean Up**".

This specification represents the applicable information available at the time of its publication. Owners, specifiers and Carlisle authorized roofing applicators should consult Carlisle or their Carlisle Manufacturers Representative for any information, which has subsequently been made available.

Review the appropriate Carlisle warranty for specific warranty coverage, terms, conditions and limitations.

SPECIFICATION
ATTACHMENT
FLEECEBACK ROOFING SYSTEMS

Adhered Roofing System
Sure-Seal®/Sure-White™/Sure Weld®/Sure-Flex™
"Attachment I"

Direct Application Over Lightweight Insulating Concrete

January 2025

When specified, the Sure-Seal/Sure-White or Sure-Weld or Sure-Flex FleeceBACK membrane may be adhered with **Flexible FAST Adhesive** directly over a new **approved cellular or perlite lightweight insulating concrete** substrate with a **minimum compressive strength of 225 psi.**

Note: When the use of vermiculite lightweight insulating concrete is specified, Carlisle must be contacted to determine applicable requirements pertaining to priming, venting and warranty wind speed coverage. Projects where the FleeceBACK membrane has been approved over vermiculite will be limited to a wind speed coverage of 55 mph peak gust wind speed unless otherwise approved by Carlisle.

Note: Except when the lightweight insulating concrete is poured over slotted steel decks, pressure relief vents must be specified at a minimum rate of 1 every 2000 square feet and shall be installed with each completed section, to provide immediate relief and prevent pressure build-up. Direct Application is not permitted where the lightweight concrete is poured over an existing roofing material.

The Authorized Applicator must provide Carlisle with a copy of a certification letter from the lightweight insulating concrete manufacturer (on new construction projects), which references the project name and location and contains the manufacturer's brand name, minimum compressive strength, average wet and air dry densities.

The substrate must be dry, free of debris, fins, frost, loose and foreign materials. Fill any gaps in the substrate greater than 1/4" with Flexible FAST Adhesive or other appropriate material.

FleeceBACK Membrane - Adhesive Attachment – Up to 20 YR Warranty			
Warranty Duration	**Wind Speed Coverage**	**Adhesive Ribbon Spacing**	
		Field	**Perimeter**
15 YR Warranty	55 MPH	12” O.C.	6” O.C.
	72 MPH	6” O.C.	6” O.C.
	80 MPH	FS	FS
20 YR Warranty	55 MPH	6” O.C.	6” O.C.
	72 MPH	6” O.C.	4” O.C.
	80 MPH	FS	FS
FS = Full Spray, Equipment (Rig) Splatter, Dual Tank Splatter or Ribbons @ 4” O.C.			

Application Cautions

1. Do not proceed with membrane installation until the lightweight insulating concrete has cured a minimum of 48 hours. If necessary, consult with the lightweight insulating concrete manufacturer concerning additional drying time.

2. After rain or other precipitation, follow the manufacturer's requirements concerning proper visual inspection and additional drying time prior to adhering the membrane.

3. Prior to membrane installation, darker areas, especially along hairline cracks in the concrete, may serve as an indication of moisture entrapment and possible standing water beneath the surface. If this condition is found, consult with the lightweight insulating concrete manufacturer for proper corrective measures.

4. Except when lightweight insulating concrete is poured over slotted steel decks, the roofing applicator must conduct core cuts at the minimum rate of 1 every 2,000 square feet. The core cuts should be located around hairline cracks (if present) where darker areas are visible. After core cuts have been taken, the substrate must be examined for evidence of moisture above the structural deck and, if found, a wet/dry vacuum system, as recommended by the lightweight insulating concrete manufacturer, must be utilized to remove standing water from beneath the surface of the concrete.

    a. To ensure the efficient operation of the vacuum system, a tight seal must be provided between the nozzle of the vacuum and the lightweight concrete substrate.

    b. A one-way pressure relief vent, approved by Carlisle, must be installed over each core cut in accordance with applicable Carlisle Detail. Contact Carlisle for approved pressure relief vents.

END OF ATTACHMENT

SPECIFICATION ATTACHMENT
FLEECEBACK ROOFING SYSTEMS

Mechanically Fastened Roofing System
Sure-Seal®/Sure-White™/Sure Weld®/Sure-Flex™
"Attachment II"

Mechanically Fastened Membrane Option

January 2025

General Considerations

A. As an option to fully adhering the FleeceBACK Membrane with Flexible FAST Adhesive, the membrane may be loose laid and mechanically fastened over an approved substrate to an acceptable deck (minimum 22 ga. steel deck or wood decks as described in Table I (below) using Carlisle Fasteners and Plates.

1. For EPDM Membrane use HP Fasteners with HP Polymer Plates.
2. For TPO and PVC Membranes use HP-X Fasteners and Pirahna Plates.

B. **Any Carlisle approved insulation or cover board** included in the Thermoplastic or EPDM Specifications, approved for Mechanically Fastened Assemblies, may be used as part of the roofing assembly.

C. The approved insulation/cover board shall be mechanically fastened to the roof deck at the minimum rate of **1 fastener and plate per every 8 square feet** (4 fasteners in a 4 x 8 board) for warranties up to 15 year. Projects with 20 year or greater warranties require the use of 6 fasteners and plates in a 4' x 8' board (1 per 5.333 square feet).

CAUTION: Carlisle Polyisocyanurate Insulation with a thickness less than 1.5" installed over an existing roofing membrane without a tear-off must be mechanically fastened to the roof deck with a minimum of **1 fastener and plate for every 4 square feet** or less of insulation. Refer to appropriate EPDM/Thermoplastic Mechanically Fastened Specification for Specific Cautions, Warnings and other membrane/insulation fastening options.

D. Use of DensDeck, DensDeck Prime and DensDeck StormX Prime should be limited to assemblies with slopes greater than 2" per foot to ensure compliance with external fire codes, care shall be exercised to ensure polymer plates are fully seated. DensDeck, DensDeck Prime or DensDeck StormX Prime are not approved in re-roofing applications for use directly over existing roofing membranes. Not for use directly over lightweight insulating concrete substrates in either new construction or re-roofing applications/tear-off.

Submittals

A. In addition to the Submittal requirements outlined in Paragraph 1.04 of the main specification, for mechanically fastened systems shop drawings must include:

1. Sheet width and number of perimeter sheets
2. Carlisle Fastener type, length and maximum spacing (for membrane securement).

B. **Along with project submittals** (shop drawing and Request for Warranty), the roofing contractor must include **pullout test** results when the results are below the requirements identified in the Table included in **Design Reference DR-06 "Withdrawal Resistance Criteria".**

Warranty

A. Projects meeting the conditions below can be eligible for a maximum 20 year System Warranty with wind speed coverage up to 72 mph peak gusts. Projects requiring extended wind speed coverage must be submitted to Carlisle for review prior to installation.

Table I — **FleeceBACK Membrane Fastening Criteria for Mechanically Fastened Roofing Systems 22 GA. Steel Deck Only – Maximum 60' Building Height**

Peak Gust Wind Speed Warranty	Membrane Type	Min. Number of Perimeter Sheets			Field Membrane Width	Perimeter Sheet Width	Fastening Density* (Field & Perimeter Sheets)
		Building Distance from Coastline					
		Greater than 7 miles	3 to 7 miles	Less than 3 miles			
55 MPH	TPO	1	2	3	12'	6'	12" O.C.
	EPDM	1	2	3	10'	5'	
	KEE HP PVC	1	2	3	10'	5'	
72 MPH	TPO	2	2	3	12'	6'	12" O.C.
	EPDM	2	2	3	10'	5'	
	KEE HP PVC	2	2	3	10'	5'	

* TPO or KEE HP PVC Using HP-X Fasteners and Piranha™ Plates. EPDM using HP Fasteners and Polymer Fastening Plates.

Table II — **FleeceBACK Membrane Fastening Criteria for Mechanically Fastened Roofing Systems Wood (Plywood and OSB) Decks Maximum 60' Building Height**

Peak Gust Wind Speed Warranty	Deck Type	Projected Pull-Out Values	Membrane Type	Min. Number of Perimeter Sheets			Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
				Building Distance from Coastline					
				Greater than 7 miles	3 to 7 miles	Less than 3 miles			
55 MPH	7/16" OSB* or 15/32" 3-Ply Plywood or 5/8" OSB	210 lbs* (OSB) or 240 lbs (3-Ply) or 310lbs (OSB)	TPO	2	3	3	12'	6'	12" O.C. *
			EPDM	2	3	3	10'	5'	
			KEE HP (1) PVC	2	3	3	10'	5'	
	15/32" 5-Ply Plywood	530 lbs	TPO	1	1	1	12'	6'	12" O.C.
			EPDM	1	1	1	10'	5'	
			KEE HP (1) PVC	1	1	1	10'	5'	
72 MPH	15/32" 5-Ply Plywood	530 lbs	TPO	1	1	1	12'	6'	12" O.C.
			EPDM	1	1	1	10'	5'	
			KEE HP (1) PVC	1	1	1	10'	5'	

*Fastening Density for Field and Perimeter Sheets is 9" o.c. when fastening to 7/16" OSB with minimum pullout of 210lbs.

1. FleeceBACK PVC polyester reinforced can be used.

Roof Deck and Substrate Criteria

A. The following table identifies the acceptable roof decks/substrates and the minimum underlayment requirements:

Roof Deck & Substrate Criteria for Mechanically Fastened Roofing Systems

Acceptable Roof Deck/Substrate	FleeceBACK EPDM Membrane	FleeceBACK TPO Membrane	FleeceBACK PVC / KEE HP PVC Membrane
NEW CONSTRUCTION			
Steel (min. 22 gauge) (1)(2)	Insulation	Insulation	Insulation
Plywood (min. 15/32" thick) or Oriented Strand Board (min. 7/16" thick)	Direct Application	Direct Application	Direct Application
Wood Planks (minimum 3/4" thick)	Direct Application	Direct Application	Direct Application
Lightweight Insulating Concrete	Direct Application	Direct Application	Direct Application
RETROFIT / NO TEAR-OFF			
Existing Smooth Surface BUR (4)(8) or Mineral Surface Cap Sheet	Direct Application (3)(8)	Direct Application (8)	Direct Application (8)(9)
Gravel Surfaced BUR (4)(5)	Insulation	Insulation	Insulation
Coal Tar Pitch (4)(5)	Insulation (5)	Insulation (5)	Insulation (5)
Modified Bitumen	Direct Application	Direct Application (7)	Direct Application (7)
Existing Single-Ply	Direct Application (6)	Direct Application (6)	Direct Application (6)
RETROFIT / TEAR-OFF			
Existing roof material removed (steel or wood decks)	Insulation	Insulation	Insulation

Notes:

(1) Local codes must be consulted regarding thermal barrier requirements.

(2) Mechanically Fastened Systems cannot be specified on steel decks less than 22 gauge or for corrugated steel decks, regardless of gauge.

(3) Mechanically Fastened Systems (Sure-Seal (black)) may be applied directly to the substrate providing asphalt on existing smooth surfaced built-up roof has a softening point above 185°F (85°C).

(4) Loose gravel or granules must be removed to avoid moisture entrapment.

(5) Existing coal tar could drip back into the building, especially when new insulation does not provide sufficient thermal value to prevent the surface of the coal tar from softening.

(6) An approved Insulation/underlayment is required over existing ballasted single-ply systems and PVC roofing systems of any type.

(7) Direct application permitted over smooth surfaced modified bitumen. Membrane shall be positioned with length of sheets parallel to modified bitumen field seams. At end laps or other locations where splices intersect modified bitumen field seams. Refer to FleeceBACK specification for end laps. For side laps refer to appropriate Mechanically Fastened Specification and applicable Carlisle Details.

(8) Existing Type III or IV smooth asphalt BUR Only.

(9) Direct Application for FleeceBACK KEE HP Only. FleeceBACK PVC requires Insulation.

END OF ATTACHMENT

SPECIFICATION ATTACHMENT
FLEECEBACK ROOFING SYSTEMS

FleeceBACK FR TPO
Mechanically Fastened Roofing System

"Attachment III"

January 2025

General Considerations

A. A UL Class A roof assembly can be achieved without the use of a coverboard over combustible decks by utilizing the FleeceBACK FR TPO, 115-mil white, membrane, available in 5’ or 10’ wide by 50’ or 100’ long rolls. This roof assembly is loose laid and mechanically fastened over a combustible deck with Carlisle HP-X Fasteners and Pirahna Plates positioned along the sheets as follows:

1. Adjoining sheets of FleeceBACK FR TPO are overlapped approximately 51/2" along the length of the membrane (at the selvage edge) where fastening plates will be located.

   Note: To qualify for Carlisle’s 2" hail coverage warranty, adjoin the two FleeceBACK FR TPO sheets by overlapping approximately 9" to ensure the fastening plates are covered by the FR fleece. The fleece portion of the membrane must extend a minimum of 3/4" past the edge of the plate.

2. At end laps (along the width of the sheet), membranes shall be butted together which will be overlaid with minimum 6"-wide Sure-Weld reinforced membrane hot-air welded on all edges. Cut edges of TPO membrane shall be sealed with TPO cut edge sealant.

B. The membrane shall be secured around the building perimeter using either 5’ wide sheets of FleeceBACK FR TPO or additional rows of HP-X Fasteners and Pirahna Plates positioned along the centerline of the 10'-wide sheets as follows:

1. Sure-Weld Pressure-Sensitive Cover strip (in conjunction with TPO Primer) or a minimum 6"-wide Sure-Weld Reinforced membrane (hot-air welded) used to overlay the fasteners and plates. Cut edges of TPO membrane shall be sealed with TPO cut edge sealant.

2. **Note:** Projects, where a 20-year Warranty is specified, must utilize a minimum 6"-wide Sure-Weld Reinforced membrane (hot-air welded) used to overlay the fasteners and plates.

Submittals

A. In addition to the Submittal requirements outlined in Paragraph 1.04 of the main specification, for mechanically fastened systems shop drawings must include the number of perimeter.

B. **Along with project submittals** (shop drawing and Request for Warranty), the roofing contractor must include **pullout test** results when the results are below the requirements identified in Table I.

Warranty

Projects meeting the conditions outlined in Table I can be eligible for a maximum 20 year System Warranty with wind speed coverage up to 72 mph peak gusts. Projects requiring extended wind speed coverage or a 20-year System warranty must be submitted to Carlisle for review prior to installation.

Table I	FleeceBACK FR TPO Membrane Fastening Criteria for Wood (Plywood / OSB) Decks							
Peak Gust Wind Speed Warranty	Deck Type	Projected Pull-Out Values	Membrane Type	Min. Number of Perimeter Sheets		Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
				Building Distance form Coastline				
				Greater than 7 miles	Less than or equal to 7 miles			
55 MPH	7/16" OSB* or 15/32" 3-Ply Plywood or 5/8" OSB	210 lbs* (OSB) or 240 lbs (3-Ply) or 310lbs (OSB)	**FR TPO**	2	3	10'	5'	12" O.C. *
	15/32" 5-Ply Plywood	530 lbs	**FR TPO**	1	2	10'	5'	12" O.C.
72 MPH	15/32" 5-Ply Plywood	530 lbs	**FR TPO**	2	3	10'	5'	12" O.C.

*Fastening Density for Field and Perimeter Sheets is 9" o.c. when fastening to 7/16" OSB with minimum pullout of 210lbs.

Roof Deck and Substrate Criteria

The following table identifies the acceptable roof decks/substrates and the minimum underlayment requirements:

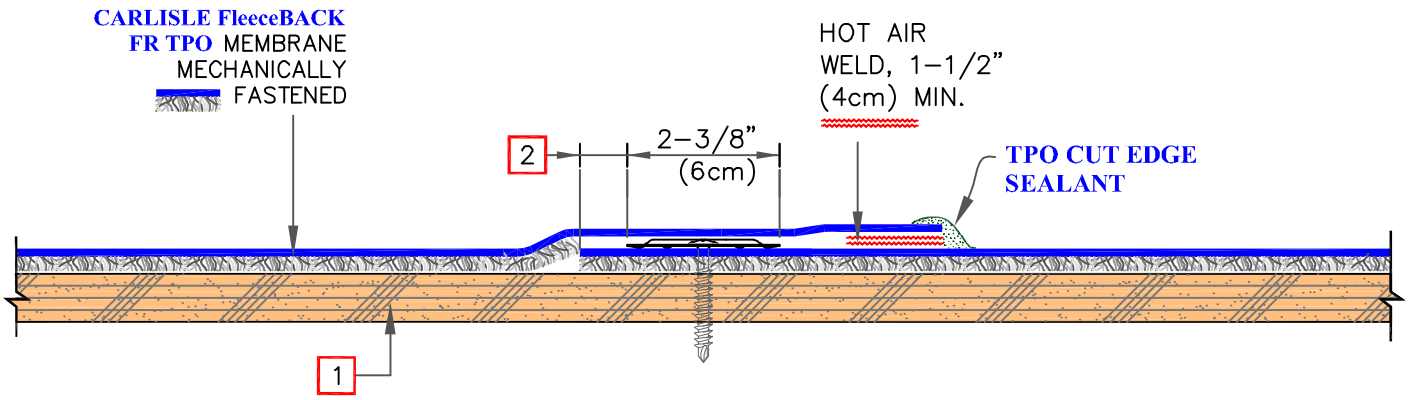
Roof Deck & Substrate Criteria for Mechanically Fastened Roofing Systems

Acceptable Roof Deck/Substrate	FleeceBACK FR TPO Membrane
NEW CONSTRUCTION	
Plywood (min. 15/32" thick) or Oriented Strand Board (min. 7/16" thick)	Direct Application
Wood Planks (minimum 3/4" thick)	Direct Application
RETROFIT / TEAR-OFF	
Existing roof material removed (wood decks)	Direct Application with some limitations*

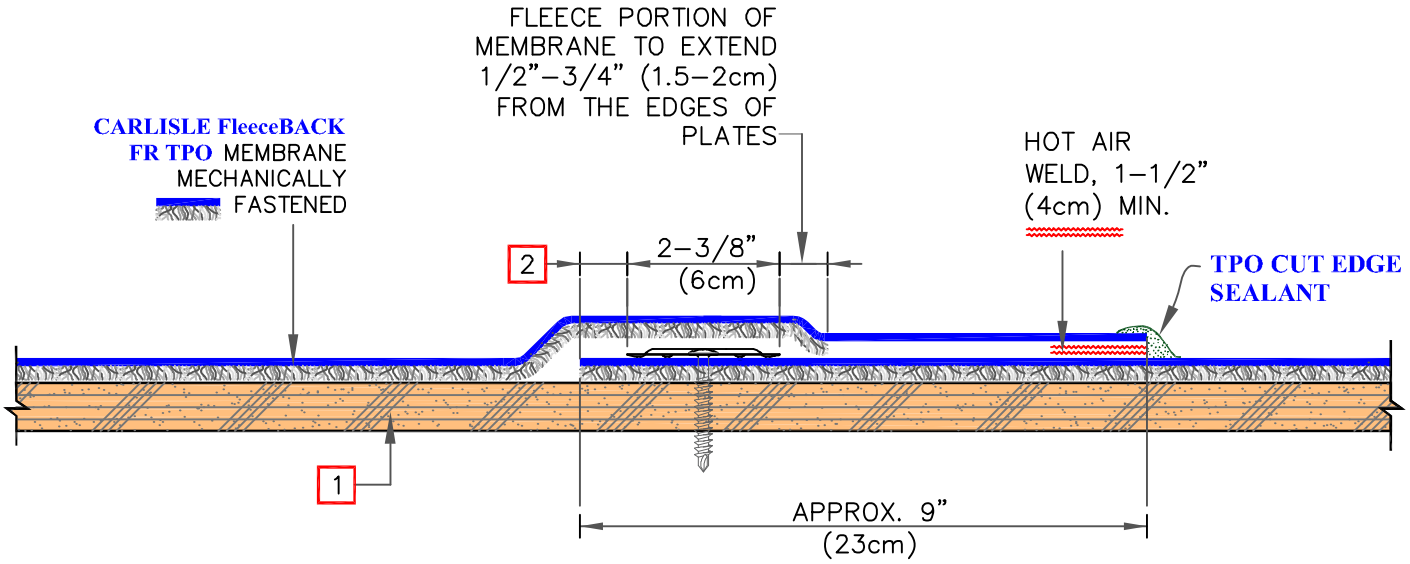
* For direct application over an acceptable roof deck/substrate, the substrate must be smooth, free of debris, protrusions, sharp edges and loose and foreign material. Cracks or voids in the substrate, greater than 1/4", must be filled with an appropriate material. Protruding nails or screws shall be removed and replaced with threaded screw-type fasteners.

Associated Installation Details

END OF ATTACHMENT



DETAIL A (TYPICAL SEAM)



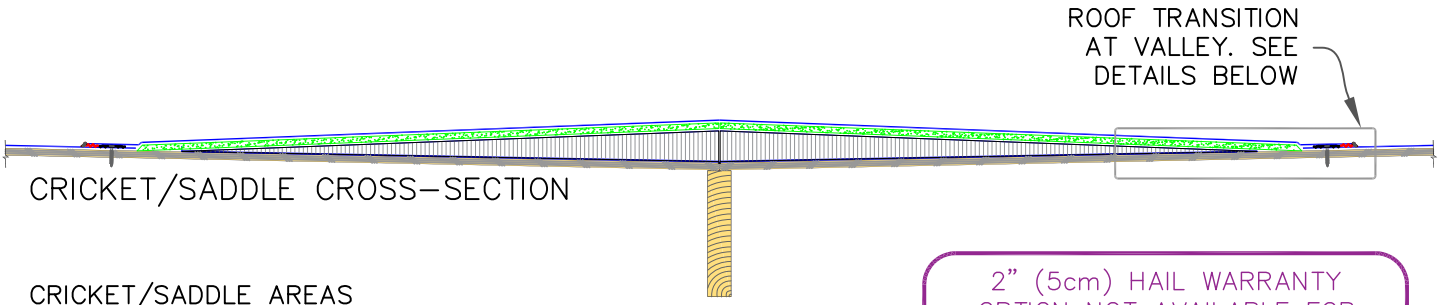
DETAIL B (SEAM FOR OBTAINING HAIL WARRANTY COVERAGE)

NOTES:

1. COMBUSTIBLE DECK, MAX. SLOPE 1/4" PER FOOT – PLYWOOD SHOWN. ON EXISTING DECKS, REMOVE PROTRUDING NAILS/FASTENERS AND REPLACE WITH NEW THREADED FASTENERS.

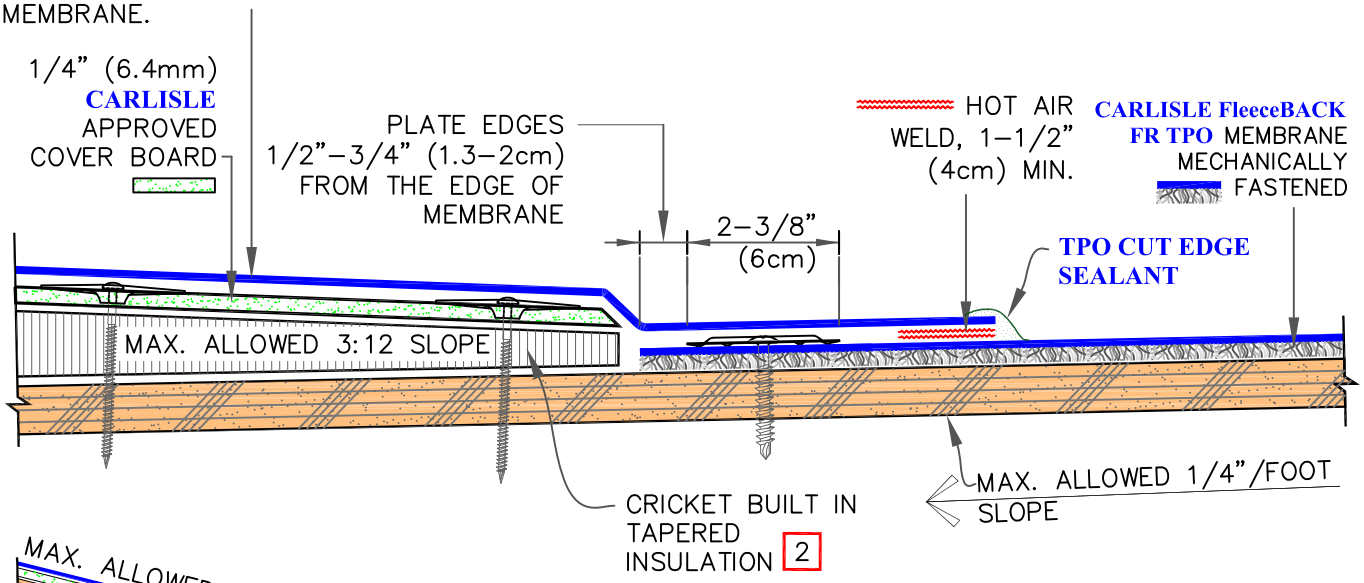
2. PLATE EDGES 1/2"–3/4" (1.5–2cm) FROM THE EDGE OF MEMBRANE.

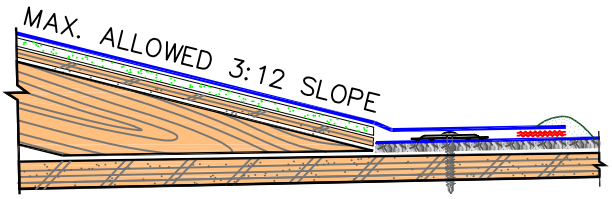
DIRECT APPLICATION OVER WOOD DECK		DETAIL NO. FR–2.1
For additional information, refer to Specifications		FR (FIRE RATED)



CRICKET/SADDLE CROSS-SECTION

2" (5cm) HAIL WARRANTY OPTION NOT AVAILABLE FOR AREAS USING NON-FLEECE MEMBRANE.



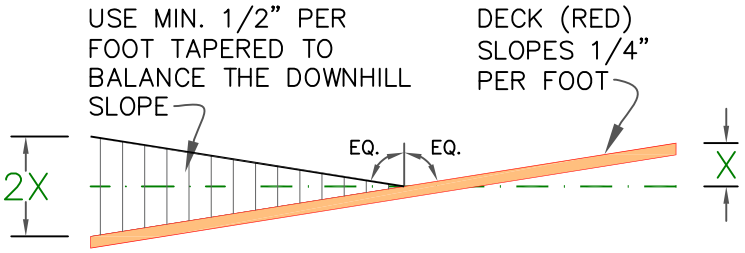


CRICKET BUILT IN WOOD CARPENTRY

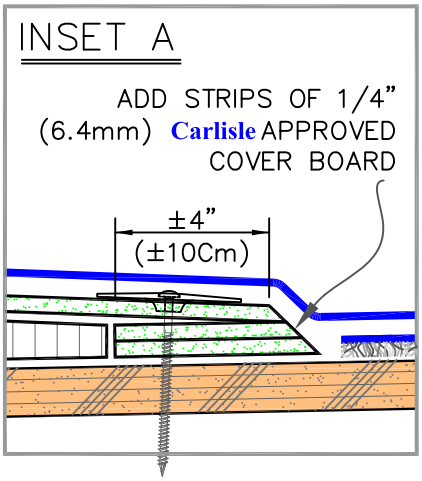
1/4"/FOOT	1.2°	1 METER : 2Cm	2%
3" : 12"	14°	1 METER : 25Cm	25%

NOTES:

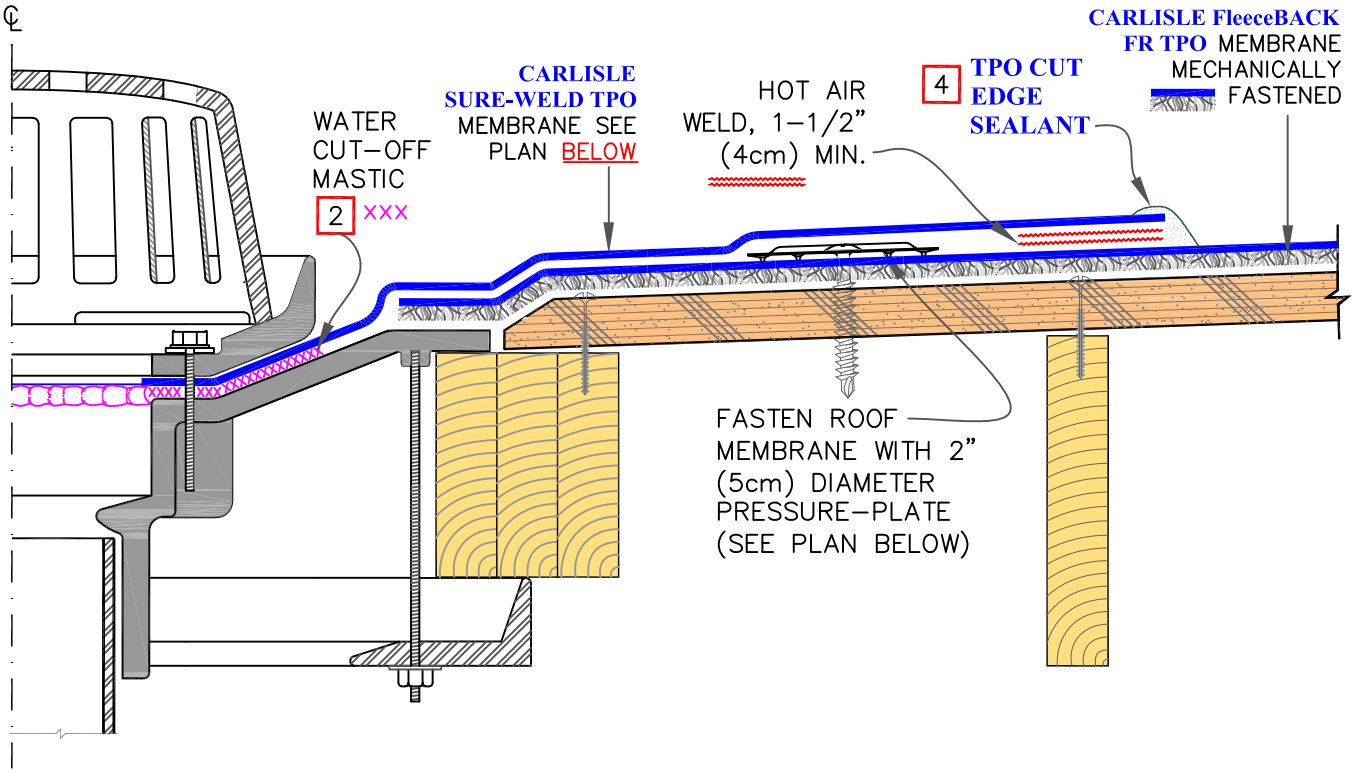
1. SEE INSET A TO FURTHER ENHANCE THE FIRE PROTECTION, (OPTIONAL).
2. POLYISOCYANURATE OR EXPANDED POLYSTYRENE BOARDS. SEE GRAPHIC EXAMPLE BELOW FOR SLOPE RATIO.



INSET A

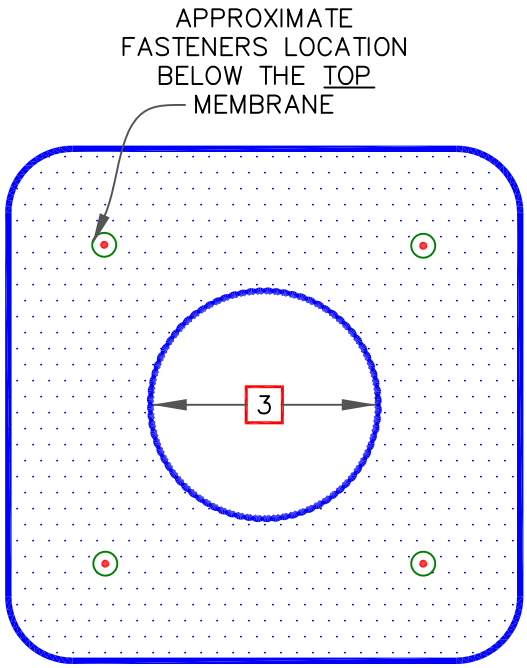


CRICKET OR SADDLE COVERED WITH STANDARD TPO MEMBRANE	FD	DETAIL NO. FR-2.2
For additional information, refer to Specifications		FR (FIRE RATED)



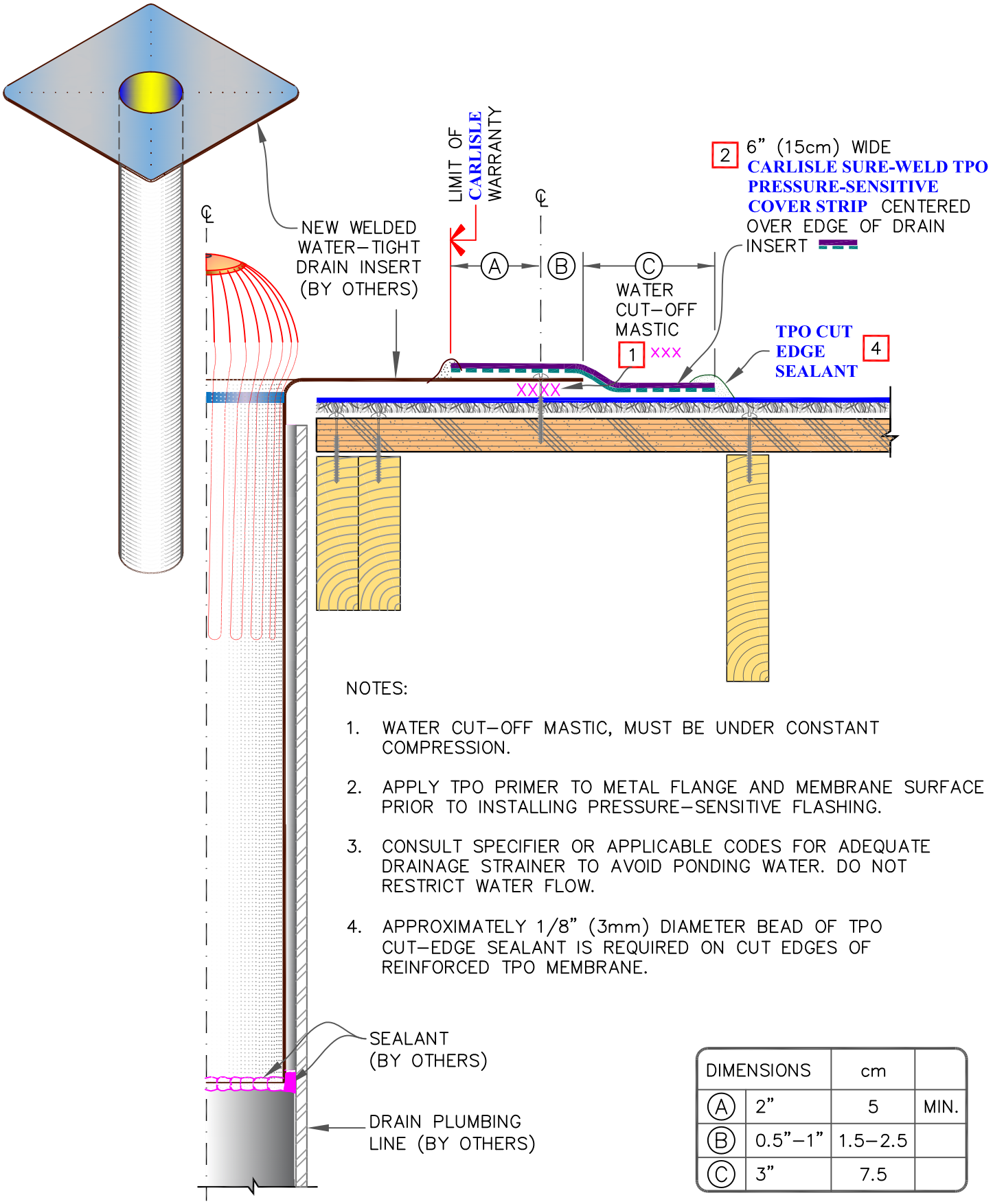
NOTES:

1. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
2. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT–OFF MASTIC.
3. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
4. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.



36"X36" (91X91cm) CARLISLE SURE-WELD TPO MEMBRANE WITH ROUNDED CORNERS

ROOF DRAIN	DETAIL NO. FR–6.1
For additional information, refer to Specifications	FR (FIRE RATED)



NOTES:

1. WATER CUT-OFF MASTIC, MUST BE UNDER CONSTANT COMPRESSION.
2. APPLY TPO PRIMER TO METAL FLANGE AND MEMBRANE SURFACE PRIOR TO INSTALLING PRESSURE-SENSITIVE FLASHING.
3. CONSULT SPECIFIER OR APPLICABLE CODES FOR ADEQUATE DRAINAGE STRAINER TO AVOID PONDING WATER. DO NOT RESTRICT WATER FLOW.
4. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF TPO CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

DIMENSIONS		cm	
A	2"	5	MIN.
B	0.5"–1"	1.5–2.5	
C	3"	7.5	

INSERT DRAIN THROUGH DECK

DETAIL NO. FR–6.2

For additional information, refer to Specifications

FR (FIRE RATED)

SPECIFICATION ATTACHMENT
FLEECEBACK ROOFING SYSTEMS

FleeceBACK RL EPDM/TPO/PVC/KEE HP RapidLock Roofing System

"Attachment IV"

January 2025

General Considerations

This system utilizes FleeceBACK RL EPDM, TPO or PVC membrane attached with Velcro® Brand Securable Solutions to either InsulBase RL Polyiso, SecurShield RL Polyiso or SecurShield HD RL Cover Board resulting in a fully adhered membrane without the use of adhesives.

A. Thermoset Membranes

1. Sure-Seal/Sure-White FleeceBACK Rapidlock EPDM Roofing Systems incorporates 10' wide, 60 or 90-mil thick Sure-Seal (black), or Sure-White (white) non-reinforced EPDM membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 115 or 145-mil. The membrane is fully attached to an acceptable substrate with a hook and loop attachment method. Adjoining sheets of the membrane are spliced together using 3” (115-mil) or 6” (145-mil) wide Factory-Applied SecurTAPE™ in conjunction with EPDM Primer.

B. Thermoplastic Membranes

1. Sure-Weld FleeceBACK RL TPO Adhered Roofing System incorporates a 10’ wide, 60 or 80-mil thick, scrim-reinforced, white, gray, tan or Special Color TPO (60-mil only) Sure-Weld Thermoplastic Polyolefin (TPO) membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 115 or 135-mils. The FleeceBACK RL TPO 115- or 135-mil membrane is available with APEEL Protective film in white, tan or gray and 10’ wide by 75’ long rolls.

2. Sure-Flex FleeceBACK RL PVC Adhered Roofing System incorporates a 10’ wide, 60 or 80-mil thick, polyester reinforced scrim, (white, gray, light gray, slate gray and tan) Sure-Flex (PVC) membrane laminated to a 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 115 or 135-mils.

Warranty

Membrane System Warranty is available for roofing systems on commercial buildings within the Unites States and applies only to products manufactured or marketed by Carlisle SynTec. The membrane system is defined as membrane, flashings, adhesives, sealants and other Carlisle brand products utilized in the installation. Projects requiring extended wind speed coverage warranty must be submitted to Carlisle for review prior to installation.

NOTE: See Tables Below for information regarding Warranted Systems and Design Criteria

Table I **FleeceBACK RL Adhered Systems Warranty Options**

Years	Minimum Membrane Thickness	Warranty Wind Speed			Additional Hail Coverage(4)			Accidental Puncture (3) (man hours per year)
		55, 72 or 80 mph	90 or 100 mph	110 or 120 mph	1" Dia. Hail	2" Dia. Hail	3" Dia. Hail	
5,10, or 15 year	FleeceBACK RL EPDM 115-mil (1) or FleeceBACK RL TPO 115-mil or FleeceBACK RL PVC 115-mil	√	√	√	√	√	N/A	16
20 year	FleeceBACK RL EPDM 115-mil (1) or FleeceBACK RL TPO 115-mil or FleeceBACK RL PVC 115-mil	√	√	√	√	√	N/A	16
25 year	FleeceBACK RL EPDM 115-mil (2)	√	√	√	√	√	N/A	16
	FleeceBACK RL EPDM 145-mil (2)	√	√	√	√	√	√	32
	FleeceBACK RL TPO 135-mil	√	√	√	√	√	√	32
	FleeceBACK RL PVC 135-mil	√	√	√	√	√	√	32
30 year	FleeceBACK RL EPDM 145-mil (2)	√	√	√	√	√	√	32
	FleeceBACK RL PVC 135-mil	√	√	√	√	√	√	32
	FleeceBACK RL TPO 135-mil	√	√	√	√	√	√	32

Notes: N/A = Not Acceptable √= Acceptable

(1) Using 3” Factory-Applied Tape (FAT)
(2) Using 6” Factory-Applied Tape (FAT)
(3) Carlisle’s Accidental Puncture Warranty covers labor hours and material used during the repair. Maximum labor and material hours are dependent upon system design. Refer to the Warranty Availability Quick Reference Guide for coverage.

Table II Underlayment/Insulation & Required Attachment Assemblies Up to 20 YR Warranty

Other Requirements are Listed in Additional Design Considerations following this Table
All Carlisle Products listed for higher wind speed coverage can also be used for Warranties with lesser speed coverage.
(i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment (Carlisle Supplied Only)	Insulation/Underlayment Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' and 4' x 8' size board (9)		
			Field	Perimeter	
55 or 72 MPH	1/2 SecurShield HD RL (2)	12	6" (4)	6" (4)	Carlisle Drip Edge, SecurEdge™ 200 or 300
	2" InsulBase RL	8			
	2.6" InsulBase RL				
	2" SecurShield Polyiso RL				
	2.6" SecurShield Polyiso RL				
80 MPH	1/2 SecurShield HD RL (2)	16	6" (4)	6" (4)	Carlisle Drip Edge, SecurEdge 200 or 300 (8)
	2" SecurShield Polyiso RL	8			
	2.6" SecurShield Polyiso RL				
90 MPH	1/2" SecurShield HD RL (2)	16	6" (7)	6" (7)	Carlisle Drip Edge (3), SecurEdge 2000 or 3000.
	2" SecurShield Polyiso RL	8			
	2.6" SecurShield Polyiso RL				
100 MPH	2" SecurShield Polyiso RL	16	FS	FS	Carlisle Drip Edge (3), SecurEdge 2000 or 3000.
	2.6" SecurShield Polyiso RL				
110 or 120 MPH	1/2" SecurShield HD RL (2)	Not Acceptable	FS	FS	SecurEdge 2000 or 3000

FS = Full Spray, Equipment (Rig) Splatter or Ribbons @ 4" O.C.
(1) For Building heights between 51-100', enhance 12'-wide perimeter with 50% more fasteners and plates. Cannot exceed 24 fasteners per board.
(2) Cover boards must be installed over a min. 1" thick approved Carlisle Insulation.
(3) Carlisle HP or HP-X Fasteners must be used to secure Carlisle Drip Edge or SecurEdge 200 Metal Fascia to perimeter wood nailers.
(4) Gravel Surface BUR - Field @ 6" O.C. / Perimeter @ 4" O.C
(5) Steel Decks - Field & Perimeter @ 6" O.C.
(6) Smooth BUR - Field @ 6" O.C. / Perimeter @ 4" O.C
(7) Gravel Surface BUR – FS
(8) May be fastened with ring shank nails staggered 4" on center. Carlisle HP or HP-X™ Fasteners may also be used fastened 12" on center.
(9) Maximum 4' x 4' insulation boards when the adhesive is extruded at 12" o.c. or when boards exceed 4" thickness. 4' x 8' insulation boards may be used when the adhesive is applied at Full-Spray, Equipment (Rig) Splatter, 4", or 6" beads).

Additional Design Considerations (Up to 20 YR Warranty)
(Required in conjunction with Table II)

A - Building height shall not exceed 100 foot*
B - Local Wind Zone per ASCE 7 shall not exceed 130 mph*
C - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 15/32" plywood.
D - All "T-joints" must be overlaid with appropriate flashing material
* For projects where building height exceeds 100' or wind speed exceeds 130 mph, please submit to Carlisle for review.

Table III Underlayment/Insulation & Required Attachment Assemblies 25 YR or 30 YR Warranty

Other Requirements are Listed in Additional Design Considerations following this Table.
All Carlisle Products listed for higher wind speed coverage can also be used for Warranties for a lower speed coverage.
(i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 8' size board		
			Field	Perimeter	
55 or 72 MPH	2" SecurShield Polyiso RL	20	6" (3)	6"	Carlisle Drip Edge, SecurEdge 200 or 300 (5)
	2.6" SecurShield Polyiso RL				
	1/2" SecurShield HD RL (1) (2)(7)	16			
80 MPH	2" SecurShield Polyiso RL	20	6"	6"	Carlisle Drip Edge (4), SecurEdge 200 or 300(4) or SecurEdge 2000 or 3000.
	2.6" SecurShield Polyiso RL				
	1/2" SecurShield HD RL (2)(7)				
90 MPH	1/2" SecurShield HD RL (1) (2)(7)	24	FS	FS	SecurEdge 2000 or 3000
100, 110 or 120 MPH	1/2" SecurShield HD RL (2)	Not Acceptable	FS	FS	SecurEdge 2000 or 3000

FS = Full Spray, Equipment (Rig) Splatter or Ribbons @ 4" O.C.
(1) For Building heights between 51-100', enhance 12'-wide perimeter with 50% more fasteners and plates. Cannot exceed 24 fasteners per board.
(2) Hail coverage offered with substrate.
(3) Structural Concrete - Field @ 12" O.C. / Perimeter @ 6" O.C.
(4) 80-mph over structural concrete - Field & Perimeter @ 6" O.C.
(5) May be fastened with ring shank nails staggered 4" on center. Carlisle HP or HP-X Fasteners may also be used fastened 12" on center.
(6) Gravel Surface BUR – Field @ 6" O.C. / Perimeter @ 4" O.C.
(7) 1/2" SecurShield HD limited to 90 mph.

Additional Design Considerations (25 YR or 30 YR Warranty)

(Required in conjunction with Table III)

A - Minimum membrane thickness of 145-mil FleeceBACK RL EPDM, 135-mil FleeceBACK RLTPO or RL PVC, Maximum 25-year warranty for FleeceBACK RL PVC
B - Building height shall not exceed 100 foot *
C - 1/4" per horizontal foot slope is preferred; however, 1/8" slope with sufficient number of drains and crickets / saddles may be accepted.
D - Local Wind Zone per ASCE 7 shall not exceed 130 mph*
E - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 15/32" plywood.
F - All "T-joints" must be overlaid with appropriate flashing material.
G - Two layers of insulation with staggered joints, bottom layer must be a minimum 1-1/2" (20-psi) Polyisocyanurate.
H - New construction or complete tear-off of existing roofing material.
* For projects where building height exceeds 100' or wind speed exceeds 100 mph, please submit to Carlisle for review.

Table IV Minimum Perimeter Width For Adhered Insulation Attachment

Width of Perimeter	Building Height
4 feet	25 feet
8 feet	26 to 50 feet
12 feet	51 to 75 feet
16 feet	76 to 100 feet
24 feet	Greater than 100 feet

Note: This Table is for reference for Carlisle System Warranties and does not replace FM requirements for FM insured projects.

Insulation/Underlayments

A. Carlisle InsulBase RL (RapidLock) Polyisocyanurate – A foam core insulation board covered on both sides with a glass fiber-reinforced felt facer (GRF) meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi). The product is available in 4' x 8' standard size with a thickness of 2.0 inch and 2.6 inch. InsulBase RL has an additional "hook" facer to be used with the "loop" fleece of the FleeceBACK RL membrane.

B. Carlisle SecurShield RL (RapidLock) Polyisocyanurate – A foam core insulation board covered on both sides with a premium coated glass facer (CGF) meeting ASTM C 1289, Type II, Class 2, Grade 2 (20 psi). The product is available in 4' x 8' standard size with a thickness of 2.0 inch and 2.6 inch. InsulBase RL has an additional "hook" facer to be used with the "loop" fleece of the FleeceBACK RL membrane.

C. Carlisle SecurShield HD RL Cover Board– a rigid insulation panel composed of a high-density, closed-cell polyisocyanurate foam core laminated to moisture resistant coated-glass fiber-mat facer for use as a cover board or recover board meeting ASTM 1289, Type II, Class 4, Grade 1 (80 psi). Available 1/2" thick 4' x 8' panel weight 11 lbs with an R-value of 2.5. SecurShield HD RL has an additional "hook" facer to be used with the "loop" fleece of the FleeceBACK RL membrane.

D. Carlisle SecurShield HD Composite RL Polyiso – a rigid roof insulation panel composed of a top layer of high-density, closed cell foam, and a bottom layer of 20 psi closed cell foam. Both layers are laminated to a coated glass facer. SecurShield HD Composite RL has an additional "hook" facer to be used with the "loop" fleece of the FleeceBACK RL membrane; May be used as a cover board in compliance with ASTM C1289 Type II, Class 4, Grade 1 (109 psi max.) or as base insulation meeting ASTM C1289 Type II, Class 2, Grade 2 (20 psi). The product is available in 47.5" x 95.5" (1206 mm x 2425 mm) and 47.5" x 47.5" (1206 mm x 1206 mm) in 2" to 4.0" thickness in .5" increments.

Insulation Installation

A. Insulation Attachment (Mechanically Fastened) –
RapidLock insulation is mechanically fastened to the roof deck per Paragraph 3.04 of this FleeceBACK specification.

B. Insulation Attachment (Adhered) –
RapidLock insulation is adhered with Flexible FAST Adhesive to the roof deck. When adhering insulation with Flexible FAST, the adhesive is spray-applied, bead-applied or Equipment (Rig) Splatter, onto the substrate and allowed to rise and foam. Once the adhesive develops string/body/gel (approximately 2 minutes depending on climate), place insulation into the adhesive and walk board into place. Roll the insulation with 30" wide, 150 lb weighted segmented steel roller, to ensure full embedment.

NOTE: Assemblies with multiple layers of insulation may incorporate both methods by fastening the bottom layer(s) and adhering the top layer.

Membrane Installation

A. Membrane Attachment –
Prior to membrane placement, the surface of the RapidLock insulation must be cleaned of dust and other foreign matter using a fine push broom or a blower.

B. Option 1

1. Remove the RapidLock fleece release film on one half of the sheet starting from the split in the liner at the middle of the sheet. The liner should be removed at an angle to reduce splitting or tearing.
2. Roll the membrane onto the substrate at an angle while avoiding wrinkles. When applying the FleeceBACK RL EPDM, TPO or PVC membrane, it is recommended to maintain a large curve (radius) on the leading edge of the membrane. This will help eliminate creases and bubbles that cannot be removed after the sheet is in place.
3. Broom the sheet and then roll the membrane in place starting using a 30” wide, 150 lb weighted segmented steel roller from the middle of the 10'-0” wide sheet and working towards the outer edge.
4. Fold back the remaining half of the sheet and repeat the above process.

C. Option 2

1. Pull both release liners off simultaneously from underneath the membrane at a low angle.
2. Broom the sheet and then roll the membrane in place starting using a 30” wide, 150 lb weighted segmented steel roller from the middle of the 10'-0” wide sheet and working towards the outer edge.

D. Membrane Splicing – FleeceBACK RL EPDM

1. To complete seams between two adjoining membrane panels, apply primer to the splice area in conjunction with Carlisle’s Factory-Applied Tape.
2. Roller-apply HP-250 Primer or Low-VOC EPDM Primer to the splice area of the bottom sheet with a short-nap-length paint roller. The primed area shall be free of globs and puddles. Allow primer to dry until it does not transfer to a dry finger.
3. Allow the taped edge of the top sheet to fall freely onto the primed sheet below.
4. Pull the poly backing from the Factory-Applied Tape beneath the top sheet and allow the top sheet to fall freely onto the exposed primed surface.
5. Press top sheet onto bottom sheet using firm, even hand pressure across the splice and toward the splice edge.
6. Immediately roll the splice with a 2"-wide (50 mm) steel roller or Carlisle’s Stand-Up Seam Roller, using positive pressure. Roll across the splice edge when using a 2" roller, not parallel to it. When using the Stand-Up Seam Roller, roll parallel to direction of the splice.
7. For cold-weather splicing below 40°F (4°C), these steps must be followed:

    a. Heat the primed area of the bottom membrane with a hot-air gun as the top sheet with Factory-Applied Tape is applied and pressed into place.

    b. Prior to rolling the splice area with a 2"-wide steel hand roller, apply heat to the top side of the membrane with a hot-air gun. The heated surface should be hot to the touch. Be careful not to burn or blister the membrane.

8. Install Pressure-Sensitive Elastoform Flashing or Pressure- Sensitive T-Joint Covers over all field splice intersections. Apply Lap Sealant according to appropriate detail.
9. Strip-in end laps with 6" Pressure-Sensitive Overlayment Strip or Pressure-Sensitive Cured Cover Strip.

E. TPO Membrane Splicing using Heat-Welding – FleeceBACK RL TPO

1. Refer to the paragraph 3.06 of this FleeceBACK specification for typical heat welding procedures.
2. The membrane has an uncoated edge on one side along the length of the sheet for membrane welding. Adjoining membrane sheets are overlapped lengthwise a minimum of 2" to provide for a minimum 1-1/2" wide heat weld. It is recommended that all splices be shingled to avoid bucking of water.
3. An uncoated edge is not provided at the ends of the rolls. Adjoining membrane sheets must be butted together and overlaid with 6"- wide TPO Reinforced Membrane, hot-air welded along all edges. Seal all

membrane edges (where scrim reinforcement is exposed) with TPO Cut-Edge Sealant.

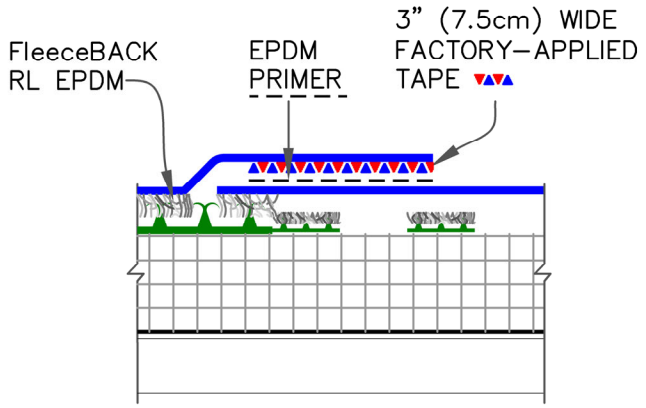
F. PVC Membrane Splicing using Heat-Welding – FleeceBACK RL PVC

1. Refer to the paragraph 3.06 of this FleeceBACK specification for typical heat welding procedures.
2. The membrane has an uncoated edge on one side along the length of the sheet for membrane welding. Adjoining membrane sheets are overlapped lengthwise a minimum of 2" to provide for a minimum 1-1/2" wide heat weld. It is recommended that all splices be shingled to avoid bucking of water.
3. An uncoated edge is not provided at the ends of the rolls. Adjoining membrane sheets must be butted together and overlaid with 6"- wide PVC Reinforced Membrane, and hot-air welded along all edges. PVC Cut-Edge Sealant is not required on cut edges of Sure-Flex membrane.

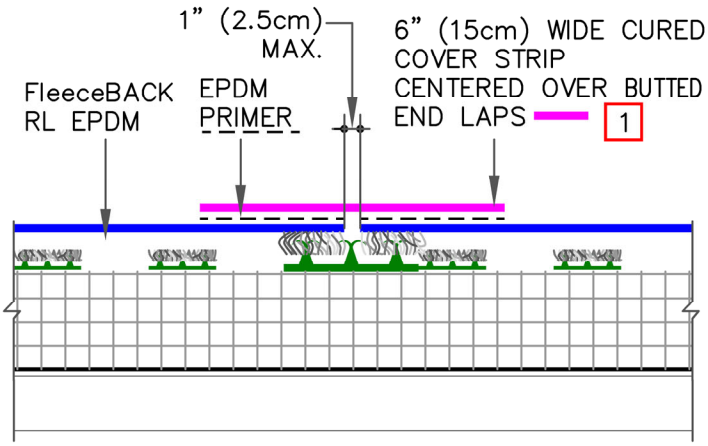
Associated Installation Details

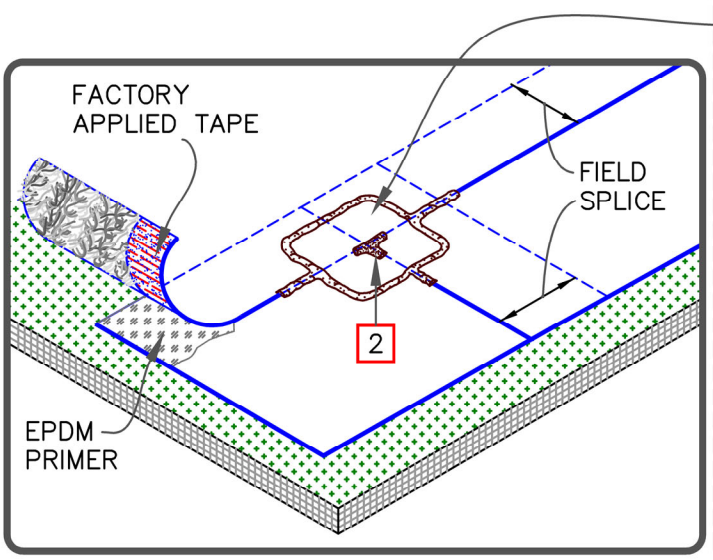
END OF ATTACHMENT

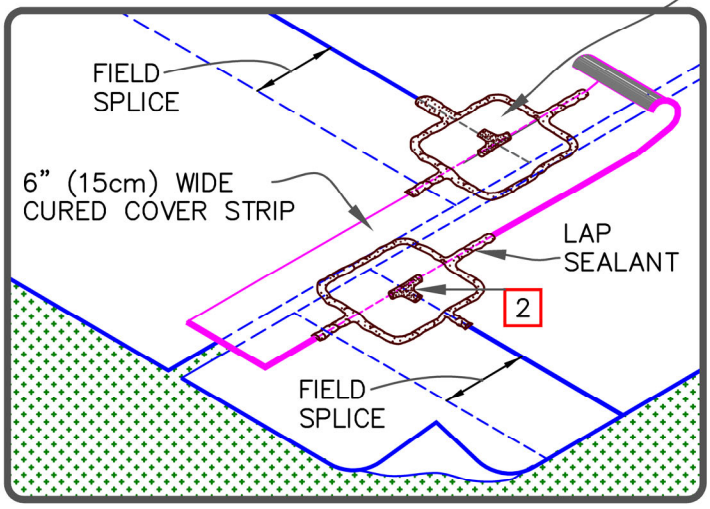
MEMBRANE SPLICE



END LAP SPLICE







NOTES:

1. APPLY EPDM PRIMER TO MEMBRANE SURFACES PRIOR TO INSTALLING PRESSURE–SENSITIVE FLASHING AND/OR FACTORY APPLIED SecurTAPE.

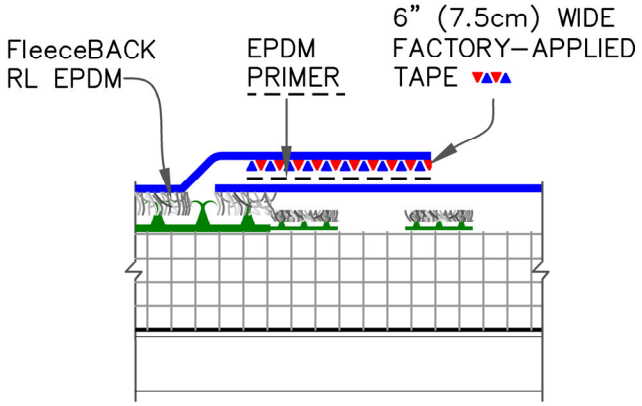
2. APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE (UNDER THE 6"x6" (15cm X 15cm) T–JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.

3. 6" (15cm) WIDE PRESSURE–SENSITIVE ELASTOFORM FLASHING MAY ALSO BE CENTERED OVER THE FIELD SPLICE INTERSECTION.

*RAPID LOCK TECHNOLOGY IS MAGNIFIED ON SCALE

FleeceBACK RL MEMBRANE *INSULATION BOARD WITH RAPID LOCK TECHNOLOGY 0 → SEE NOTE(S)	RL™ EPDM (RAPID LOCK) MEMBRANE SPLICE– PROJECTS WITH 10, 15 AND 20 YEAR WARRANTIES MAXIMUM WARRANTY: 20 YEARS	DETAIL NO. RL – 2A RAPID LOCK

MEMBRANE SPLICE



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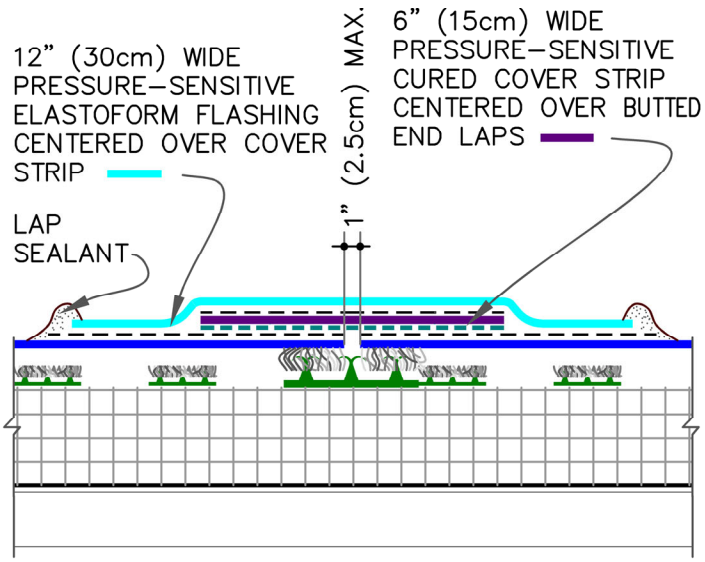
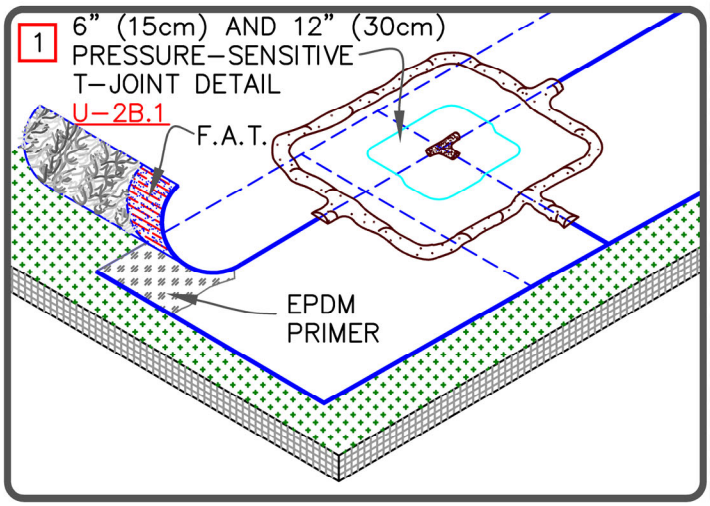
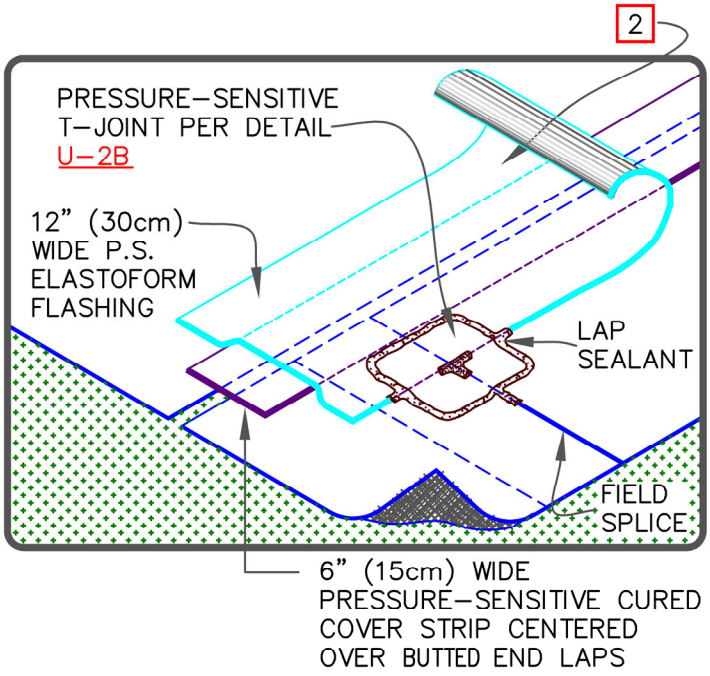






NOTES:

1. APPLY EPDM PRIMER TO MEMBRANE SURFACES PRIOR TO INSTALLING PRESSURE–SENSITIVE FLASHING AND/OR FACTORY APPLIED SecurTAPE.

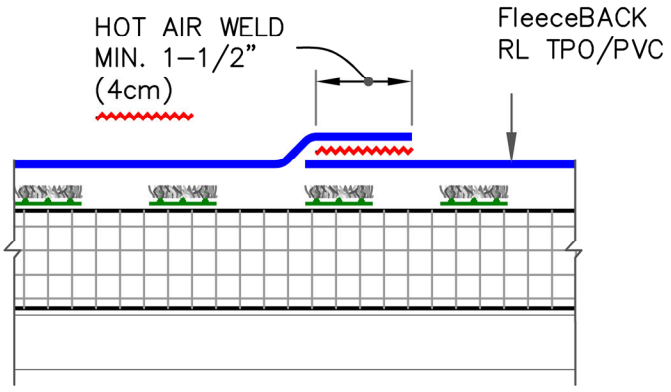
2. APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE (UNDER THE 6"x6" (15cm X 15cm) T–JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.

3. ALL EPDM SPLICE INTERSECTIONS MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6"X6" (15cm X 15cm) COVERED WITH A 12"X12" (30cm X 30cm) TOP LAYER. BOTH LAYERS SHALL BE CENTERED OVER THE SPLICE INTERSECTION AND SEALED WITH CONTINUOUS LAP SEALANT, AS SHOWN.

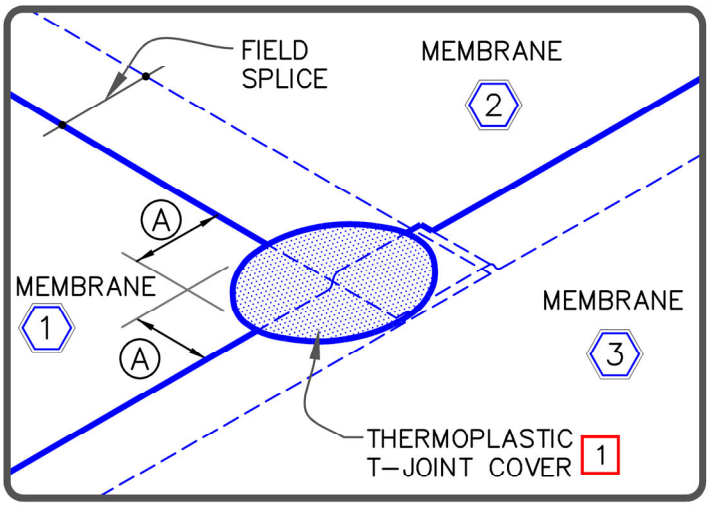
*RAPID LOCK TECHNOLOGY IS MAGNIFIED ON SCALE

FleeceBACK RL MEMBRANE *INSULATION BOARD WITH RAPID LOCK TECHNOLOGY 0 SEE NOTE(S)	RL™ EPDM (RAPID LOCK) MEMBRANE SPLICE– PROJECTS WITH 145–MIL MEMBRANE OR 25 AND 30–YEAR WARRANTIES MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. RL–2A.1 RAPID LOCK

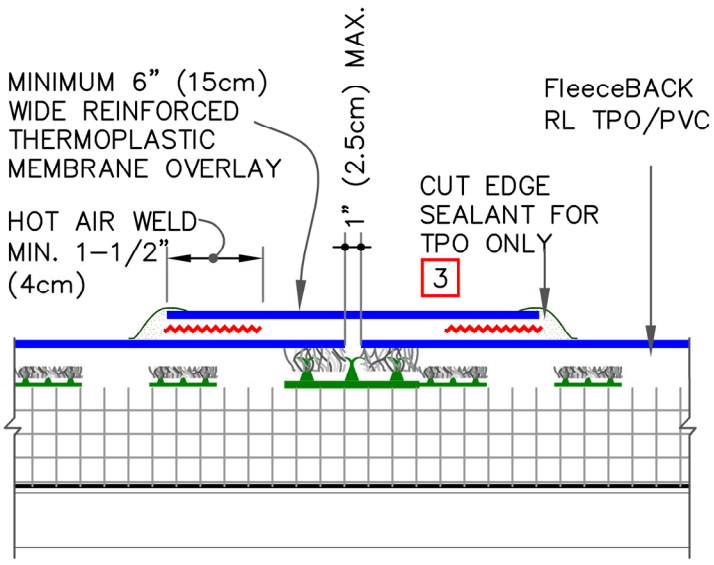
MEMBRANE SPLICE

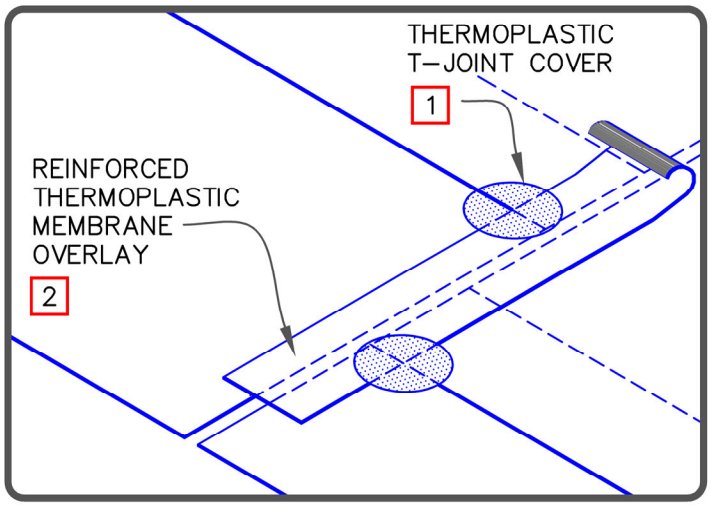


DIMENSION		cm
A	2–1/4"	6



END LAP SPLICE

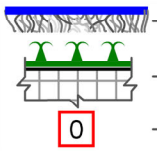




NOTES:

1. WHEN USING 115–MIL OR 135–MIL FLEECEBACK RL TPO OR PVC MEMBRANE, APPLY A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
2. WHEN USING 60–MIL OR 80–MIL THERMOPLASTIC REINFORCED MEMBRANE OVERLAY, INTERSECTIONS BETWEEN SPLICES MUST BE OVERLAID WITH A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER.
3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
4. WHEN USING 115–MIL FLEECEBACK RL TPO OR PVC MEMBRANES, MAXIMUM WARRANTY IS 20 YEARS.

*RAPID LOCK HOOKS ARE MAGNIFIED AND THOSE ARE NOT TO SCALE



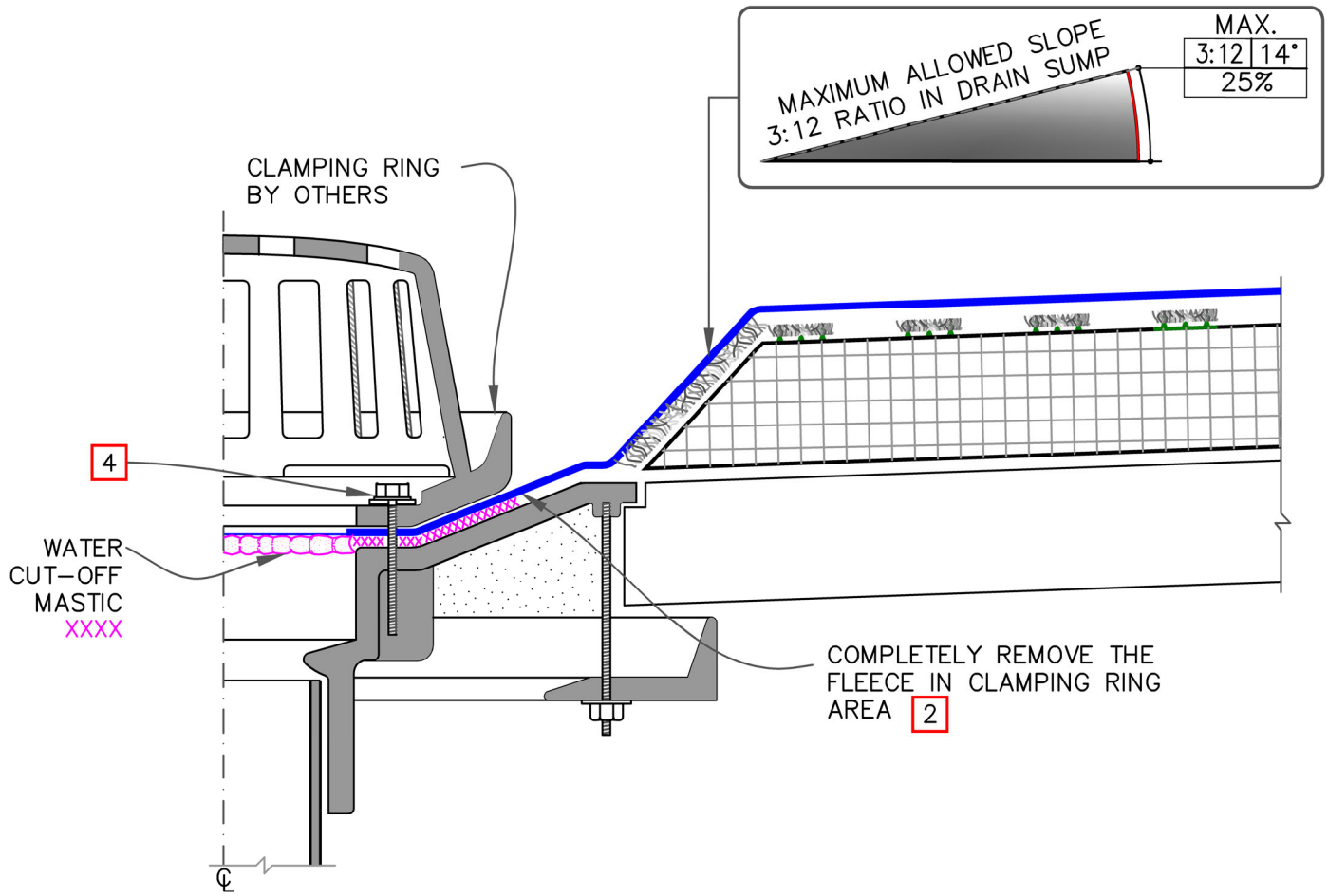
TPO/PVC RL™ (RAPID LOCK) – MEMBRANE SPLICES

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.

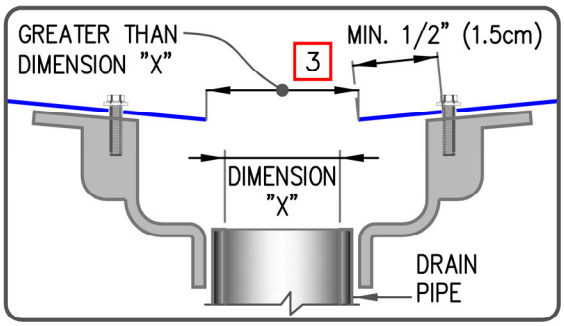
RL–2B.1

RAPID LOCK



NOTES:

1. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
2. FLEECE RL BACKING MUST BE REMOVED FROM THE MEMBRANE SO THAT WATER CUT OFF MASTIC IS IN DIRECT CONTACT.
3. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
4. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT–OFF MASTIC.
5. FIELD SPLICES MUST BE LOCATED AT LEAST 6 INCHES (15cm) OUTSIDE THE DRAIN SUMP.
6. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.

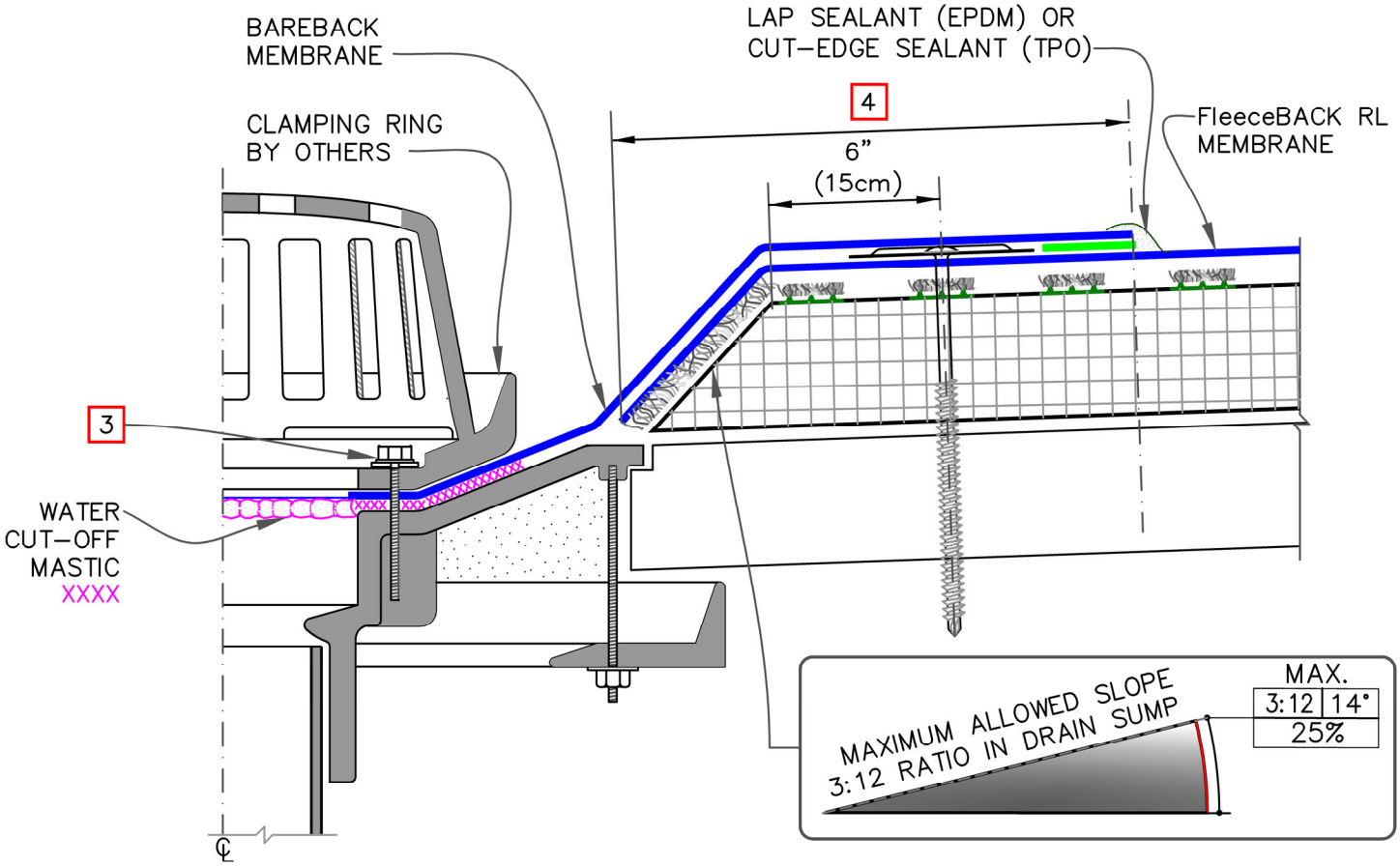


*RAPID LOCK TECHNOLOGY IS MAGNIFIED ON SCALE

FleeceBACK RL MEMBRANE *INSULATION BOARD WITH RAPID LOCK TECHNOLOGY 0 SEE NOTE(S)	ROOF DRAIN WITH CONTINUOUS MEMBRANE MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. RL–6A.1 RAPID LOCK

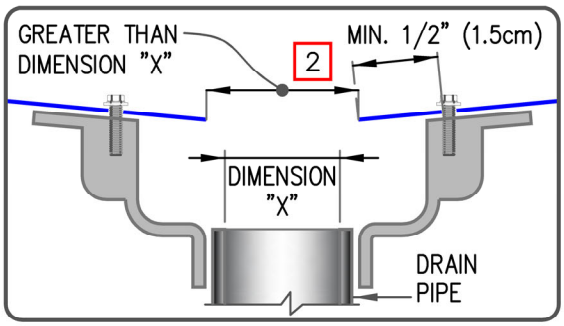
CAUTION

EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (15cm) WIDE FIELD APPLIED SecurTAPE FOR PROJECTS WITH 20, 25 & 30-YEAR WARRANTIES.



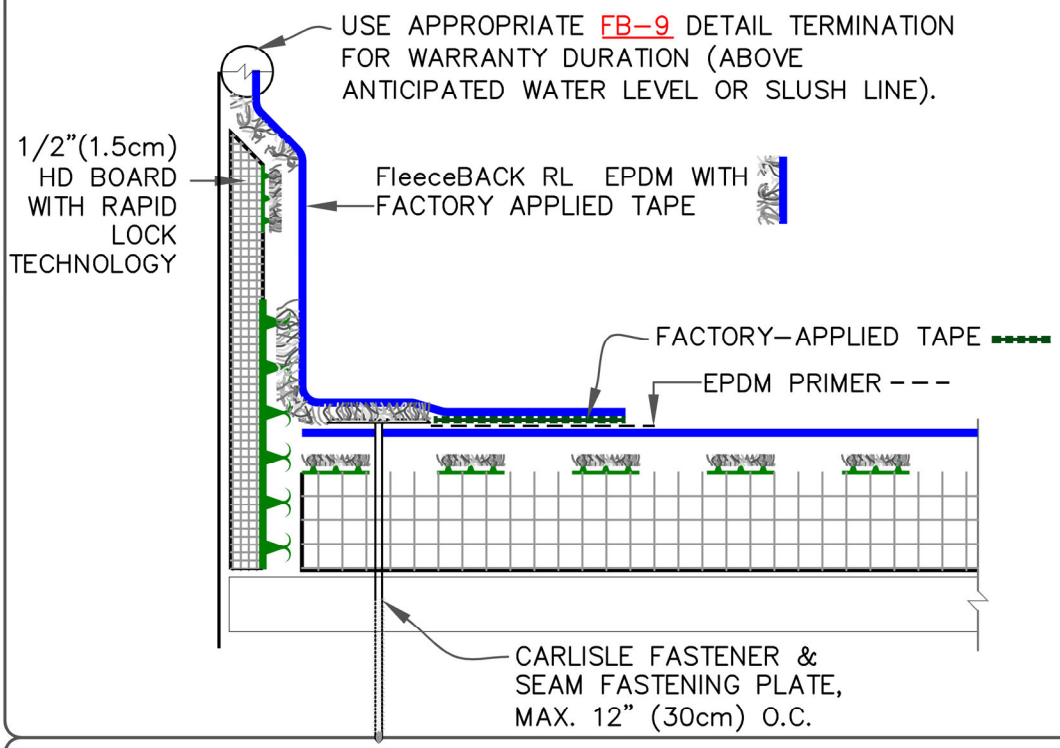
NOTES:

1. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
4. SPLICES SHALL BE COMPLETED USING MIN. 3" (7.5CM) WIDE SecurTAPE/PRIMER WITH EPDM MEMBRANE AND MIN. 1-1/2" (4cm) HOT AIR WELD WITH TPO/PVC MEMBRANES
5. FIELD SPLICES MUST BE LOCATED AT LEAST 6 INCHES (15cm) OUTSIDE THE DRAIN SUMP.
6. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
7. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.

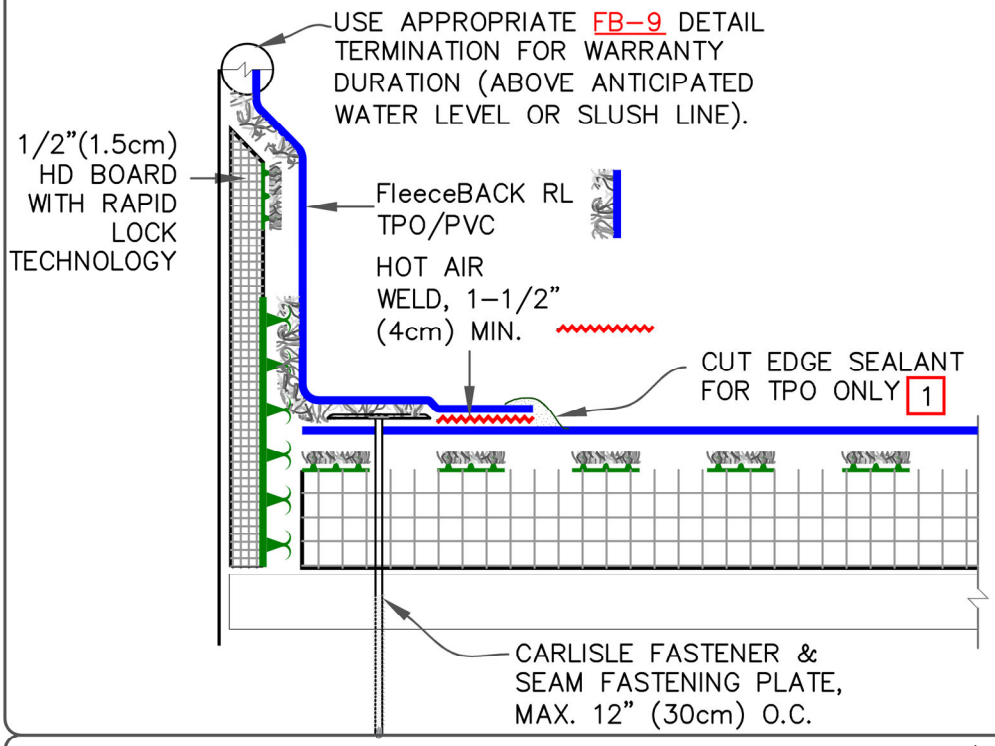


*RAPID LOCK TECHNOLOGY IS MAGNIFIED ON SCALE

FleeceBACK RL MEMBRANE *INSULATION BOARD WITH RAPID LOCK TECHNOLOGY 0 SEE NOTE(S)	ROOF DRAIN WITH SEPARATE TARGET SPLICE MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. RL-6B.1 RAPID LOCK



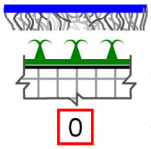
FleeceBACK RL EPDM



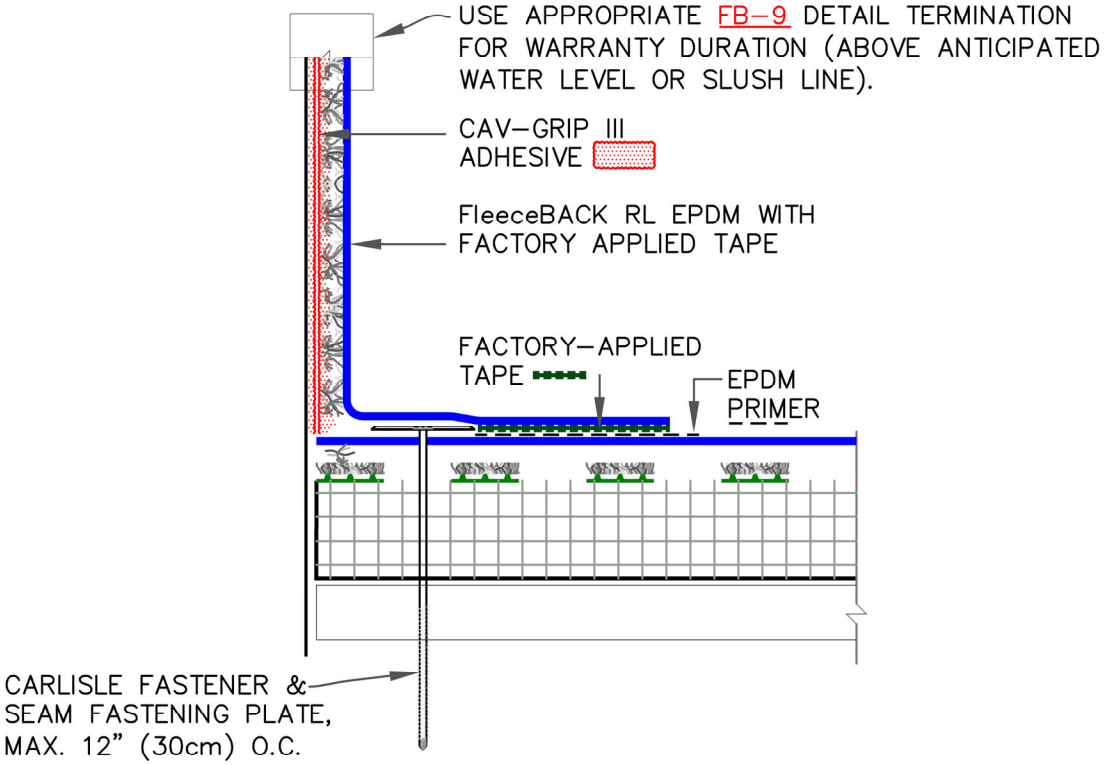
NOTE:

1. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE ONLY.

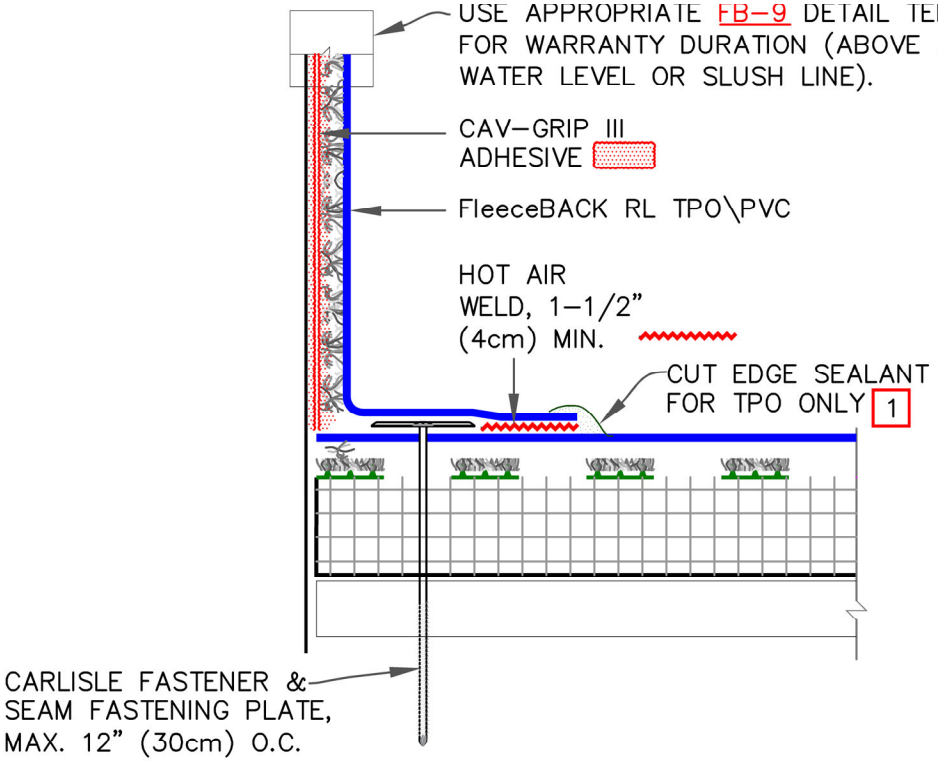
FleeceBACK RL TPO/PVC



PARAPET/CURB WITH SEPARATE MEMBRANE: NO ADHESIVE	DETAIL NO.
	RL–12A.1A
MAXIMUM WARRANTY: 30 YEARS	RAPID LOCK



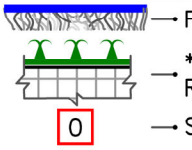
FleeceBACK RL EPDM



NOTES:

1. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE ONLY.

FleeceBACK RL TPO/PVC



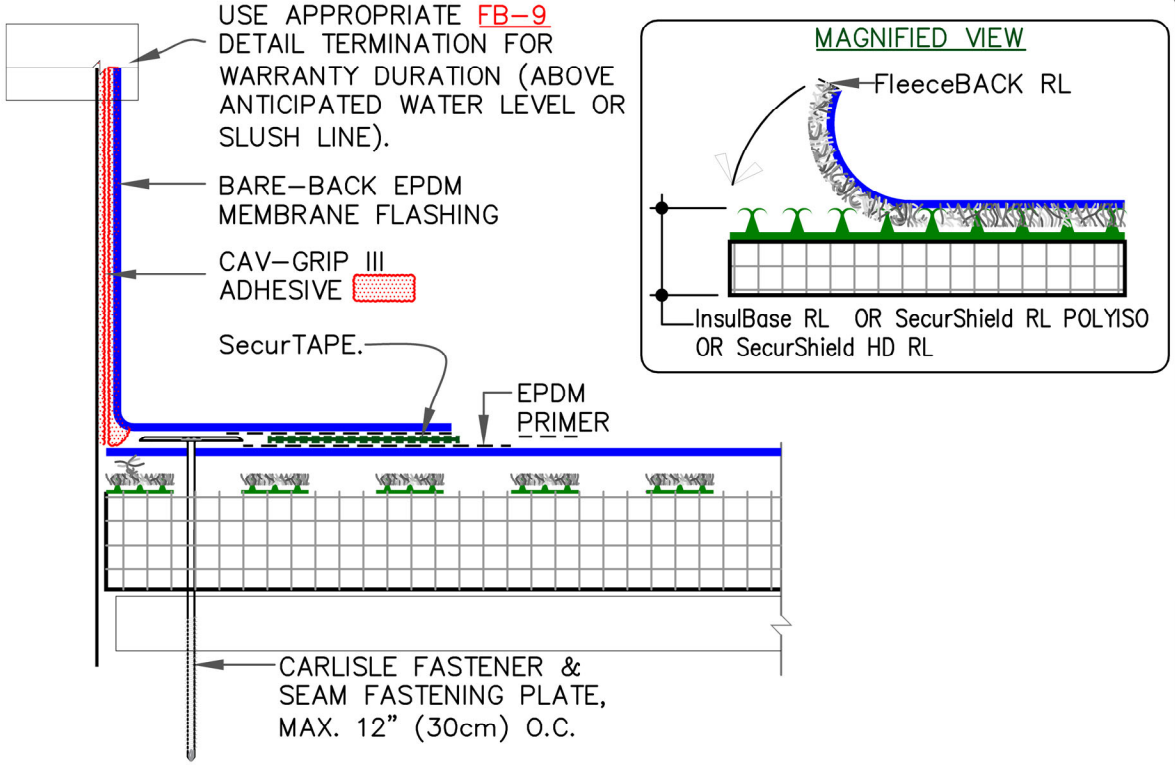
PARAPET/CURB WITH SEPARATE MEMBRANE: RL MEMBRANE ADHERED WITH CAV-GRIP III

MAXIMUM WARRANTY: 30 YEARS

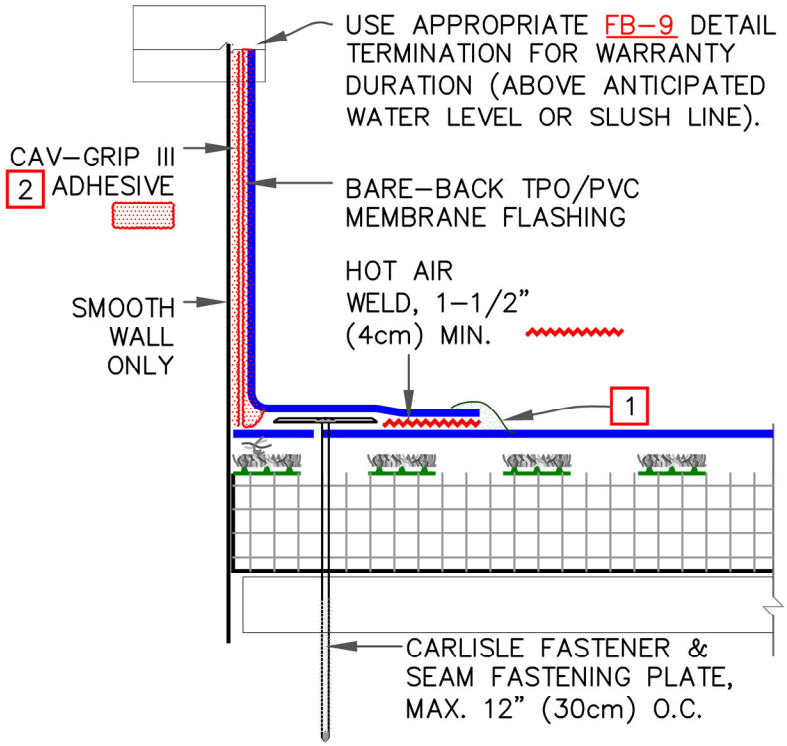
DETAIL NO.

RL-12A.1B

RAPID LOCK



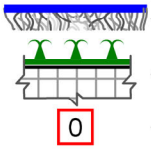
FleeceBACK RL EPDM



NOTES:

1. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE ONLY.
2. FOR PVC USE CAV-GRIP PVC IN PLACE OF CAV-GRIP III.

FleeceBACK RL TPO/PVC



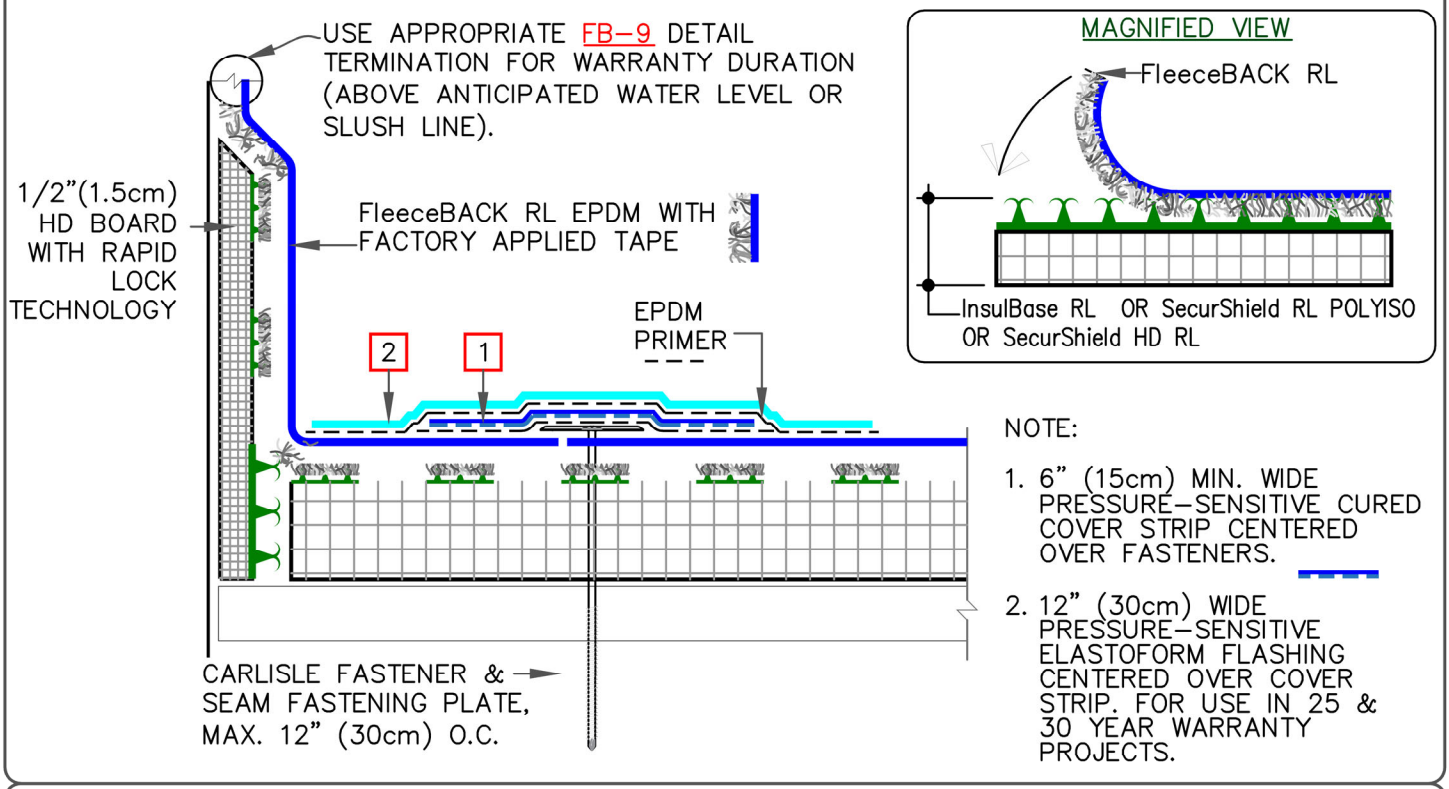
PARAPET/CURB WITH SEPARATE MEMBRANE: BARE-BACK MEMBRANE ADHERED WITH CAV-GRIP III/CAV-GRIP PVC

MAXIMUM WARRANTY: 30 YEARS

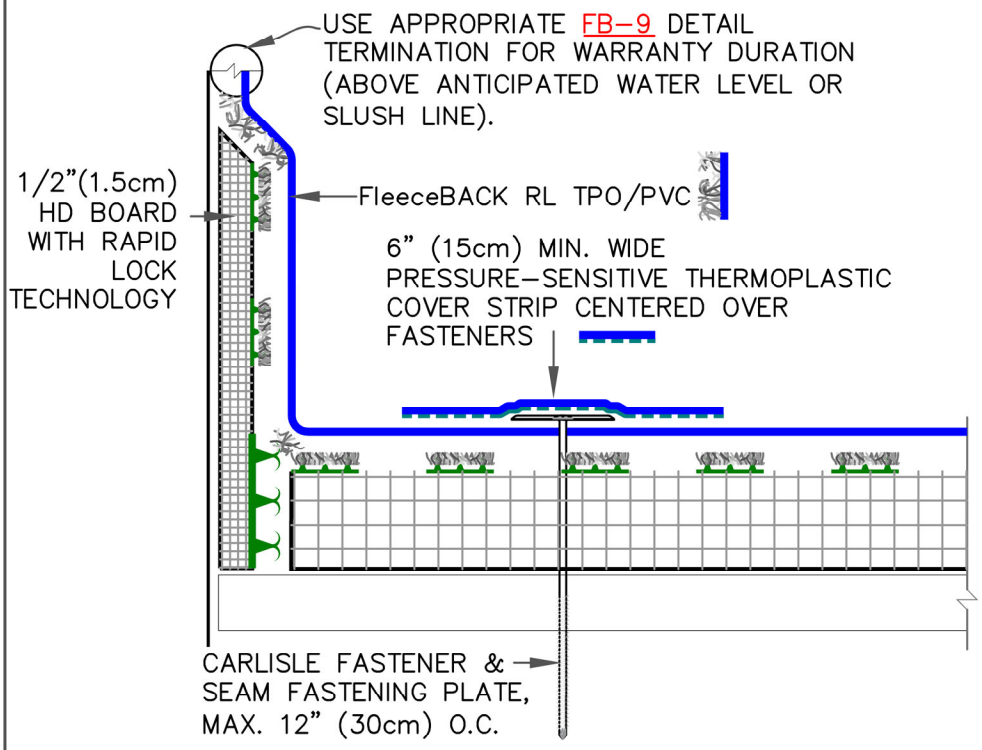
DETAIL NO.

RL-12A.1C

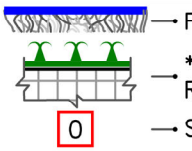
RAPID LOCK



FleeceBACK RL EPDM – MAXIMUM 30 YEAR WARRANTY



FleeceBACK RL TPO/PVC – MAXIMUM 20 YEAR WARRANTY



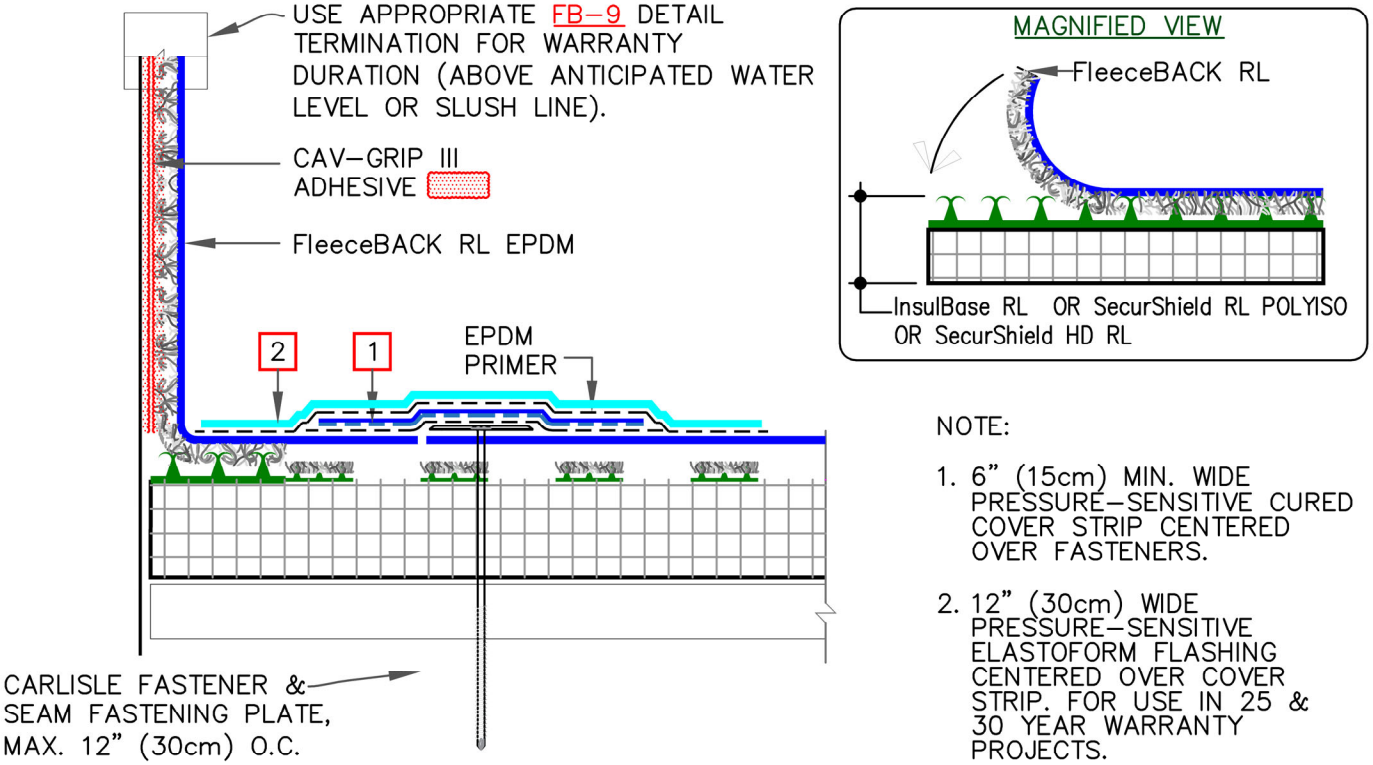
PARAPET/CURB WITH CONTINUOUS MEMBRANE–NO ADHESIVE

MAXIMUM WARRANTY: 20/30 YEARS

DETAIL NO.

RL–12B.1A

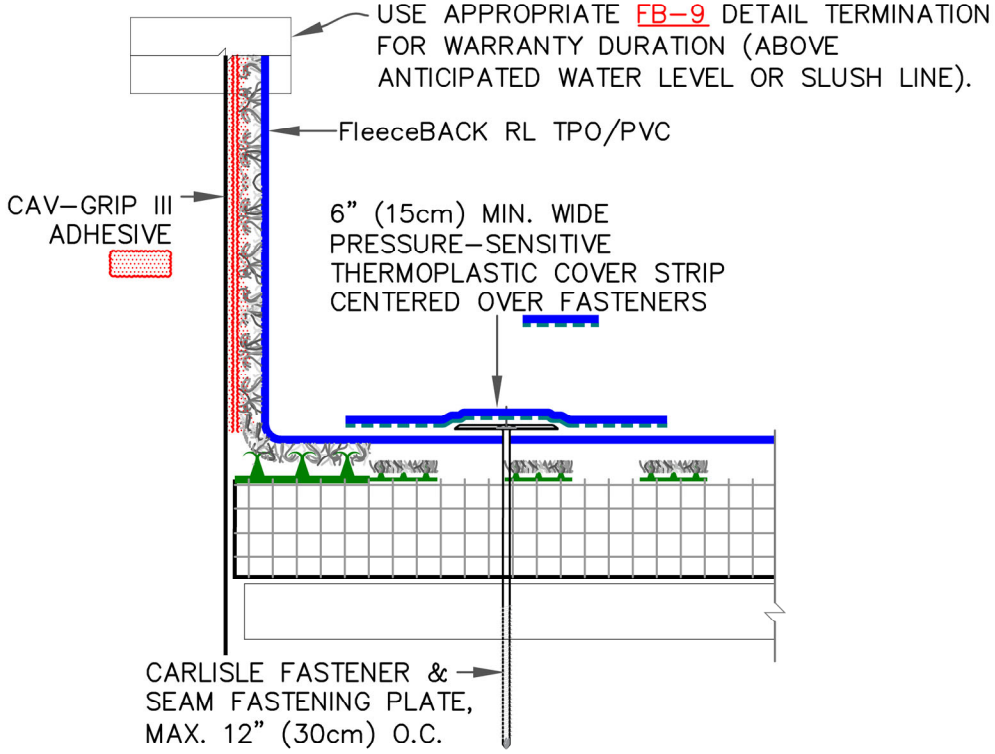
RAPID LOCK



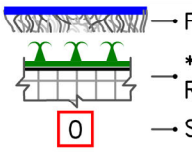
NOTE:

1. 6" (15cm) MIN. WIDE PRESSURE-SENSITIVE CURED COVER STRIP CENTERED OVER FASTENERS.
2. 12" (30cm) WIDE PRESSURE-SENSITIVE ELASTOFORM FLASHING CENTERED OVER COVER STRIP. FOR USE IN 25 & 30 YEAR WARRANTY PROJECTS.

FleeceBACK RL EPDM – MAXIMUM 30 YEAR WARRANTY



FleeceBACK RL TPO/PVC – MAXIMUM 20 YEAR WARRANTY



PARAPET/CURB WITH CONTINUOUS MEMBRANE-RL MEMBRANE ADHERED WITH CAV-GRIP III

MAXIMUM WARRANTY: 20/30 YEARS

DETAIL NO.

RL-12B.1B

RAPID LOCK

CARLISLE'S FLEECEBACK ROOFING SYSTEMS

Adhered Roofing System

Sure-Seal®/Sure-White™/Sure Weld®/Sure-Flex™

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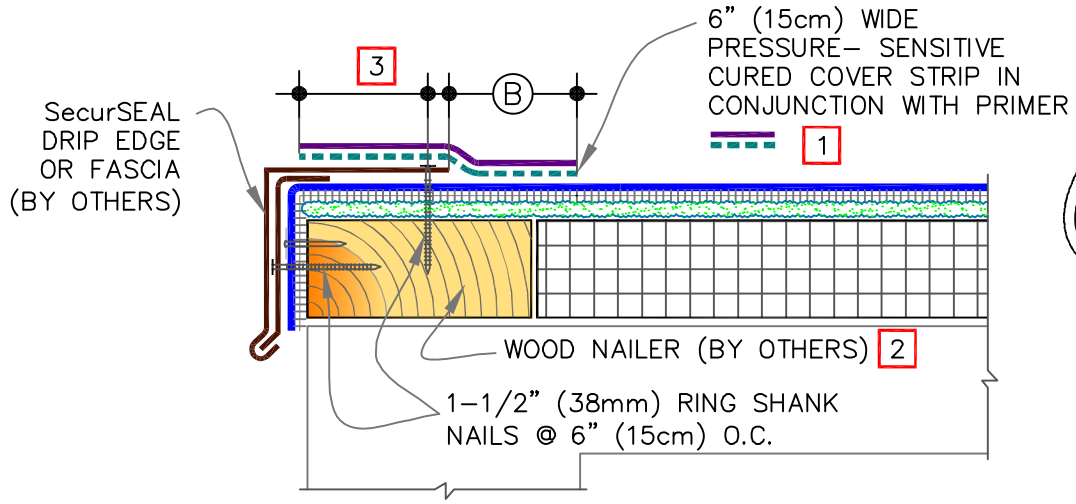
January 2025

Through-Wall Scupper

Accessory

CAUTION

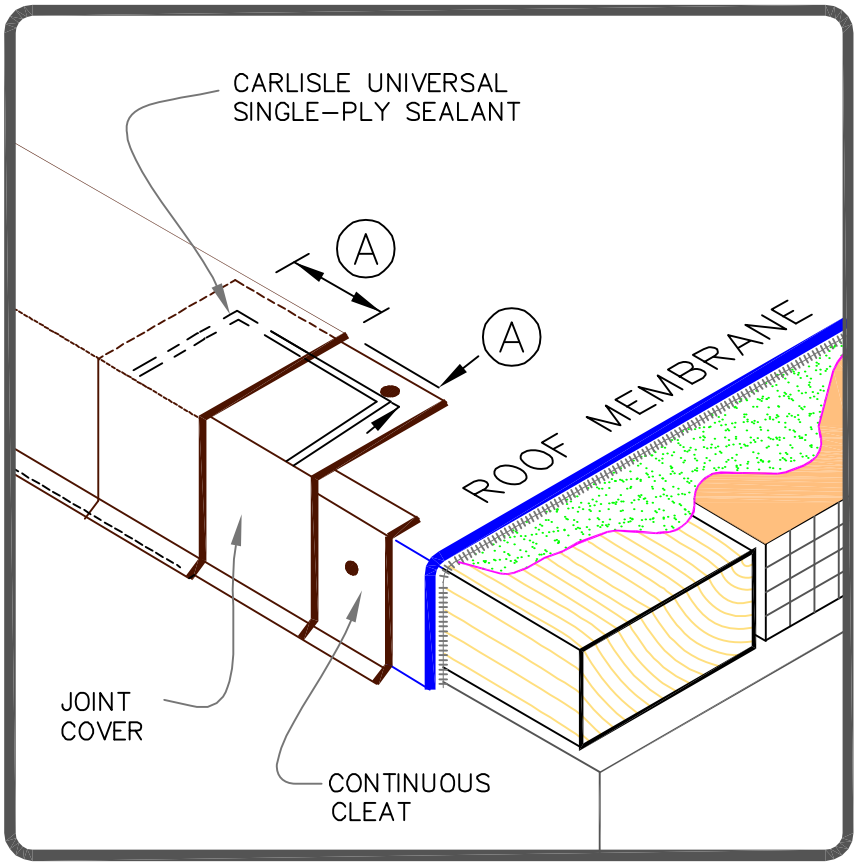
DETAIL NOT FOR USE ON 25 & 30-YEAR WARRANTY PROJECTS. ACCEPTABLE EDGING SHALL CONFORM WITH THERMOSET DETAIL U-1A.1 WHEN USING EPDM MEMBRANE OR FB-1B WITH TPO MEMBRANE.



DIMENSIONS		cm	
A	1/2"	1.5	TO
	1"	2.5	
B	2"	5	MIN.

NOTES:

1. USE APPROPRIATE COVER STRIP & PRIMER BASED UPON MEMBRANE TYPE. FOR EPDM, REFER TO THERMOSET U-1A. FOR TPO, REFER TO THERMOPLASTIC U-1A.
2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
3. METAL FASCIA DECK FLANGE MUST BE TOTALLY COVERED BY PRESSURE-SENSITIVE COVER STRIP WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS.
4. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
5. APPLY PRIMER TO METAL FLANGE AND MEMBRANE SURFACE PRIOR TO INSTALLING PRESSURE-SENSITIVE FLASHING.
6. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.

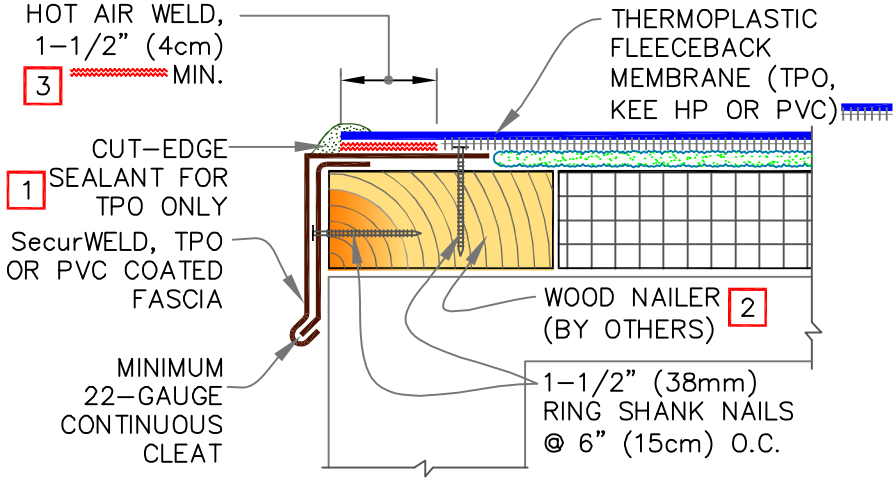


FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

SecurSEAL DRIP EDGE FASCIA

MAXIMUM WARRANTY: 20 YEARS

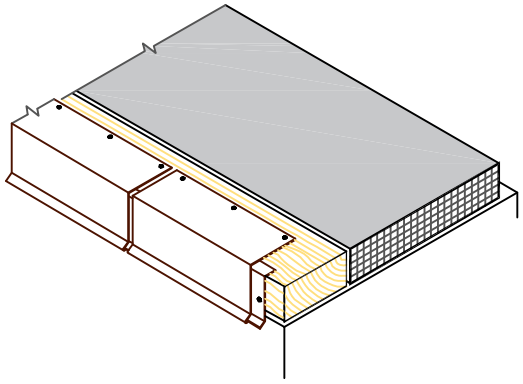
DETAIL NO.
FB-1A
FLEECEBACK ADHERED



NOTES:

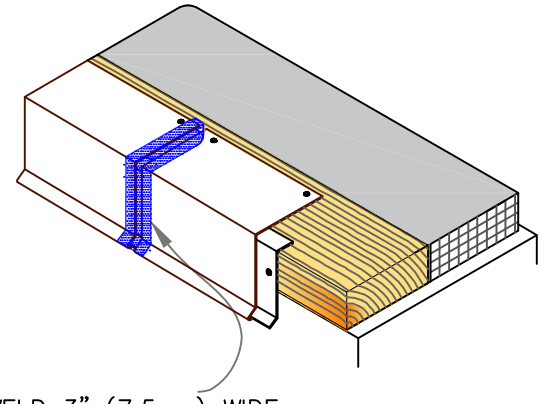
1. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
3. POSITION MEMBRANE WITH SELVAGE EDGE TO AVOID REMOVAL OF FLEECE BACKING.

1



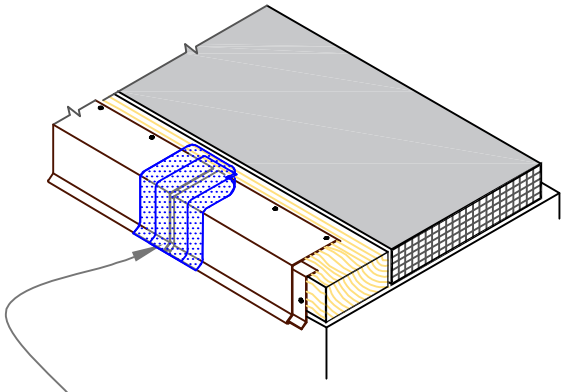
INSTALL CONTINUOUS CLEAT AND COATED METAL WITH 1/8"–1/4" (0.5–1cm) JOINTS BETWEEN ADJOINING SECTIONS.

2



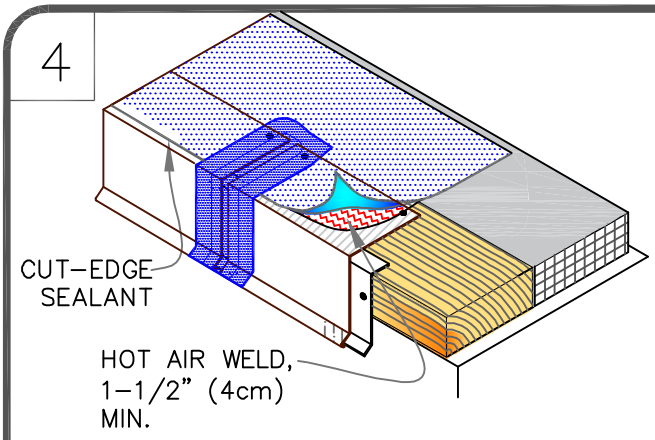
HEAT WELD 3" (7.5cm) WIDE PIECE OF NON–REINFORCED THERMOPLASTIC MEMBRANE OVER JOINT

3



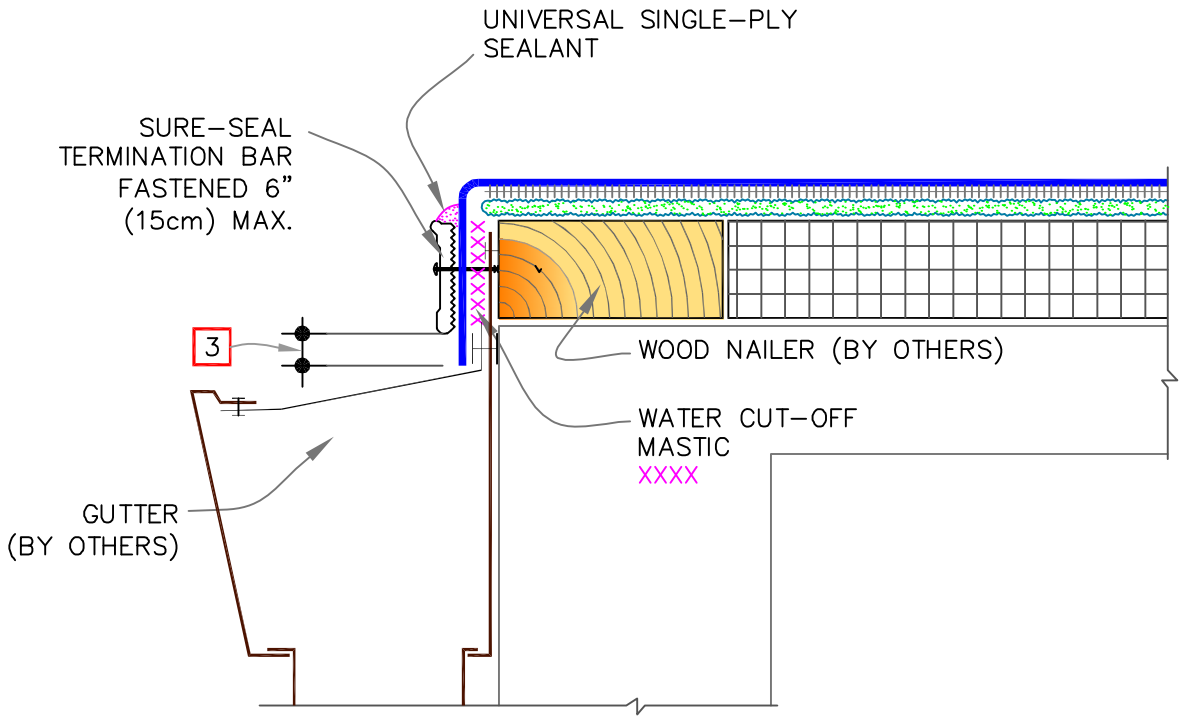
HEAT WELD 6" (15cm) WIDE PIECE OF NON–REINFORCED THERMOPLASTIC MEMBRANE OVER JOINT

4



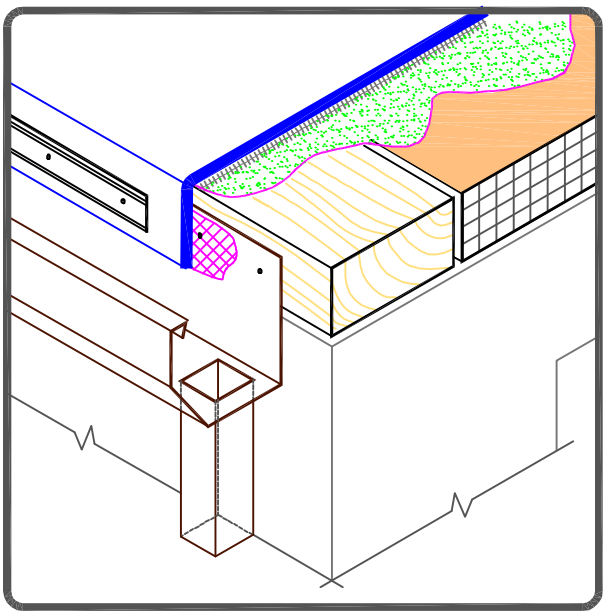
POSITION FIELD MEMBRANE AND HEAT WELD TO COATED METAL A MINIMUM OF 1–1/2" (4cm) AS SHOWN.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	COATED DRIP EDGE FASCIA – TPO, PVC OR KEE HP MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB–1B.1 FLEECEBACK ADHERED



NOTES:

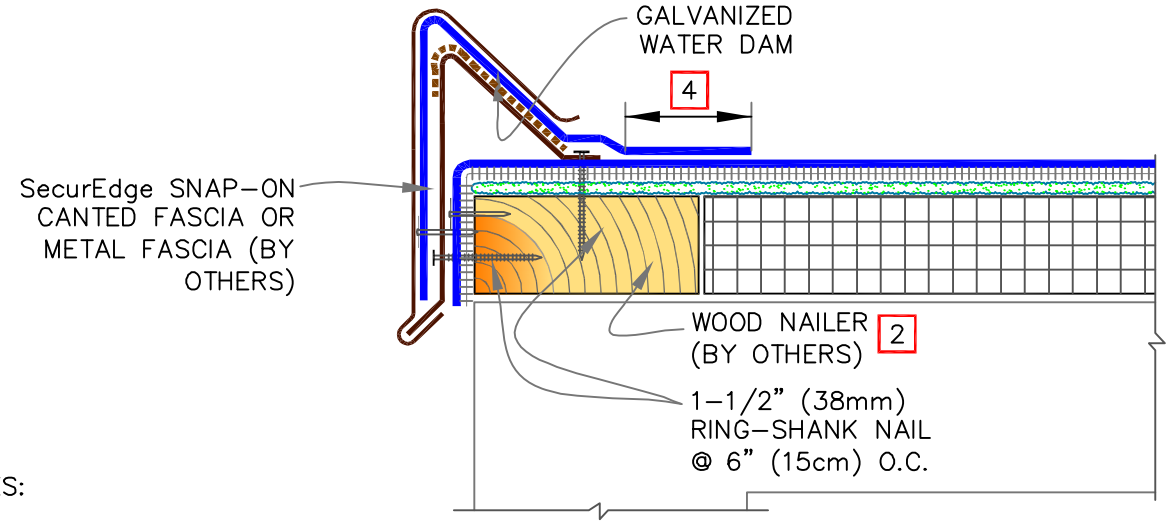
1. POSITION MEMBRANE WITH SELVAGE EDGE AT TERMINATION BAR LOCATION TO AVOID REMOVAL OF FLEECE BACKING.
2. FASTENING OF METAL TERMINATION BAR MUST PROVIDE CONSTANT COMPRESSION ON WATER CUT–OFF MASTIC.
3. ALLOW MEMBRANE SHEET TO EXTEND 1/2" (1.5cm) MINIMUM BELOW THE METAL TERMINATION BAR.



FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	METAL BAR EDGE TERMINATION MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB–1C.1 FLEECEBACK ADHERED

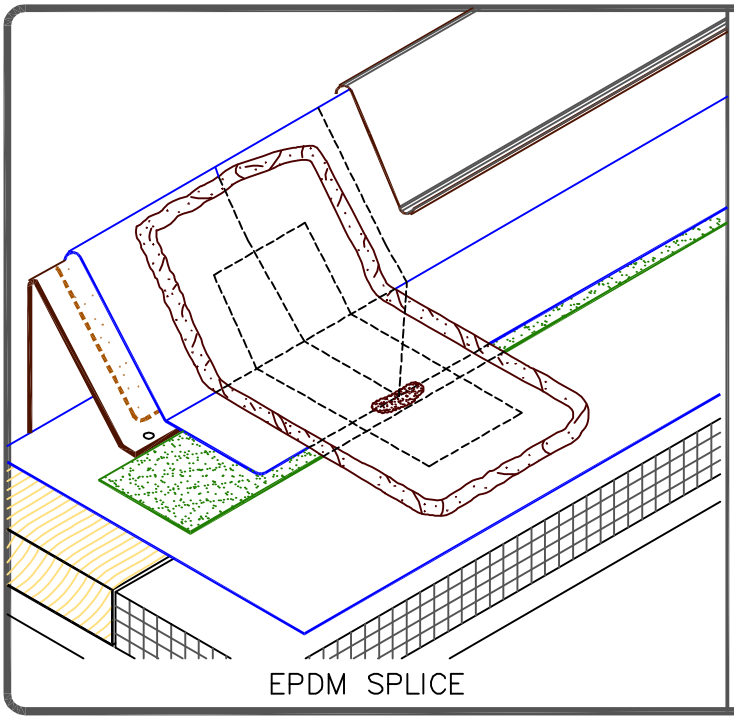
CAUTION

FOR PROJECTS WITH 25 & 30–YEAR WARRANTIES, ALL EPDM SPLICE INTERSECTIONS MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6"X6" (15cm X 15cm) COVERED WITH A 12"X12" TOP LAYER (30cm X 30cm). BOTH LAYERS SHALL BE CENTERED OVER THE SPLICE INTERSECTION AND SEALED WITH CONTINUOUS LAP SEALANT.



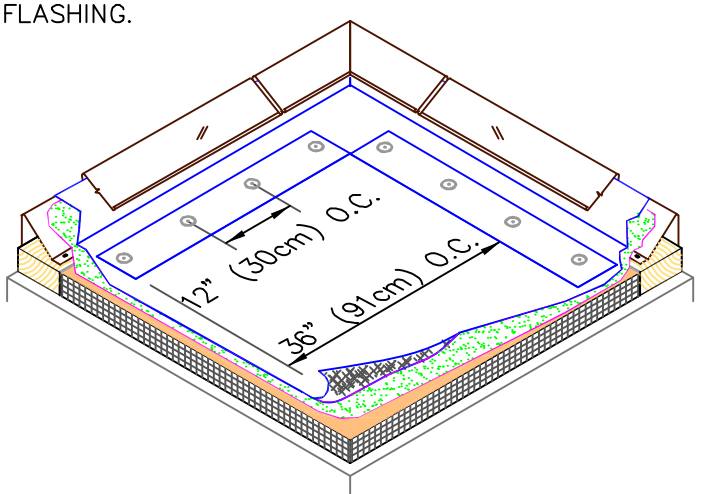
NOTES:

1. REFER TO SecurEdge SNAP–ON CANTED FASCIA INSTALLATION INSTRUCTION MANUAL FOR STEP–BY–STEP INSTALLATION PROCEDURES.
2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF GRAVEL STOP DECK FLANGE.
3. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.
4. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC.



EPDM SPLICE

AT CORNERS, SEAM FASTENING PLATES MUST BE INSTALLED 12" (30cm) MAX. FROM THE BASE OF THE WATER–DAM AND SHALL EXTEND 36" (91cm) MINIMUM IN EACH DIRECTION. STRIP IN WITH CURED MEMBRANE FLASHING.



CORNER REINFORCEMENT

FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

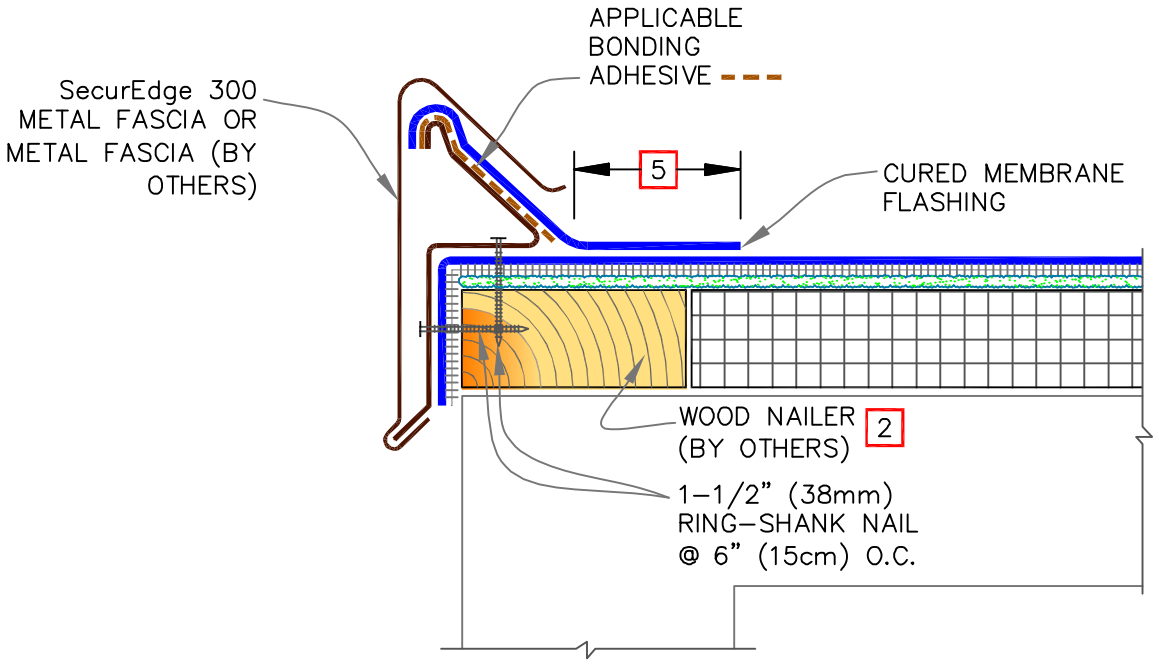
CARLISLE SecurEdge SNAP–ON CANTED FASCIA

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–1D.1
FLEECEBACK ADHERED

CAUTION

FOR PROJECTS WITH 25 AND 30–YEAR WARRANTIES OR WHEN USING 145–MIL FLEECEBACK MEMBRANE, REFER TO DETAIL FB–2A.1.



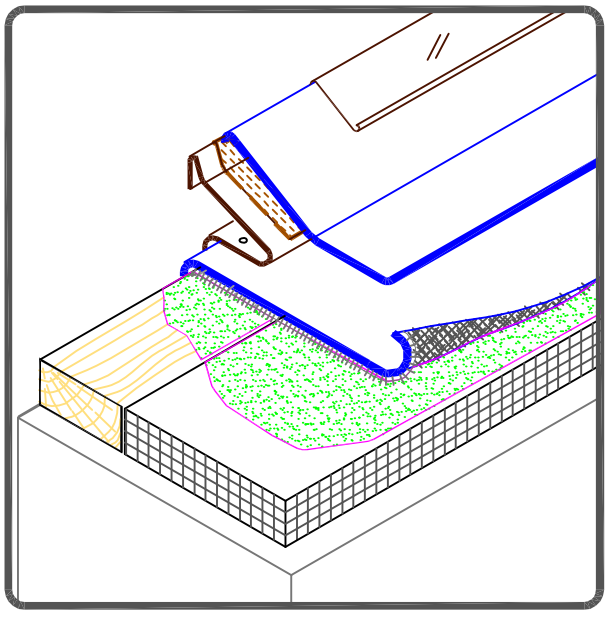
NOTES:

1. REFER TO SecurEdge 300 INSTALLATION INSTRUCTION MANUAL FOR STEP–BY–STEP INSTALLATION PROCEDURES.

2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF GRAVEL STOP DECK FLANGE.

3. PRESSURE–SENSITIVE T–JOINT COVER OR 6" (15cm) WIDE PRESSURE–SENSITIVE FLASHING, IN CONJUNCTION WITH EPDM PRIMER, MUST BE CENTERED OVER EPDM FIELD SPLICES AT THE ANGLE CHANGE. PROJECTS WITH 25 OR 30–YEAR WARRANTIES OR WHEN USING 145–MIL MEMBRANE, FIELD SPLICES SHALL BE OVERLAID WITH TWO LAYERS OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6" (15cm) WIDE COVERED WITH A 12" WIDE TOP LAYER (30cm). BOTH LAYERS SHALL BE CENTERED AND SEALED WITH CONTINUOUS LAP SEALANT.

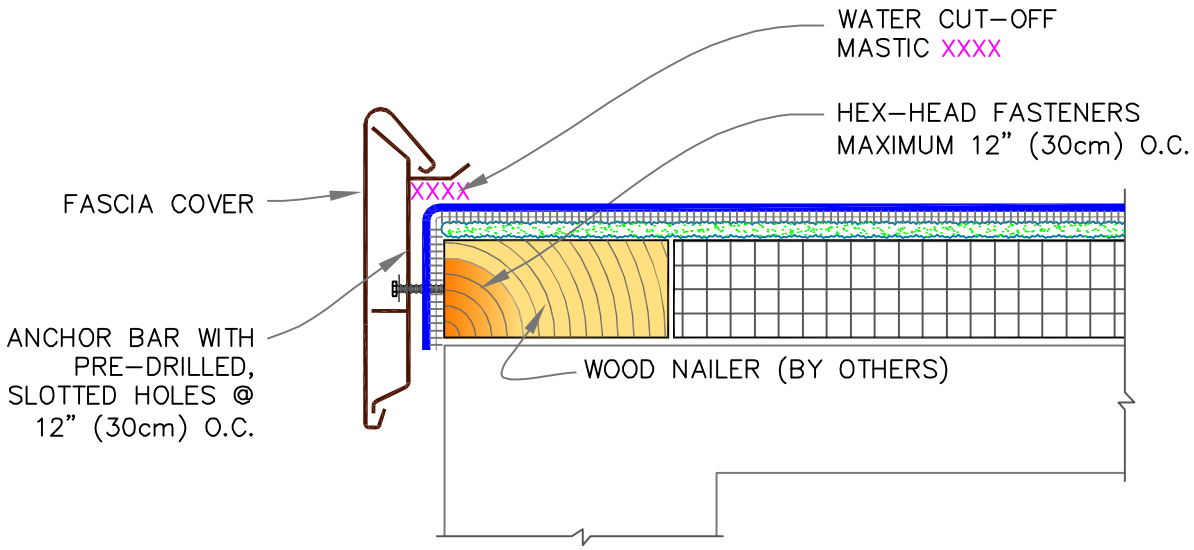
4. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.



5. MEMBRANE SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/EPDM PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC.

6. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

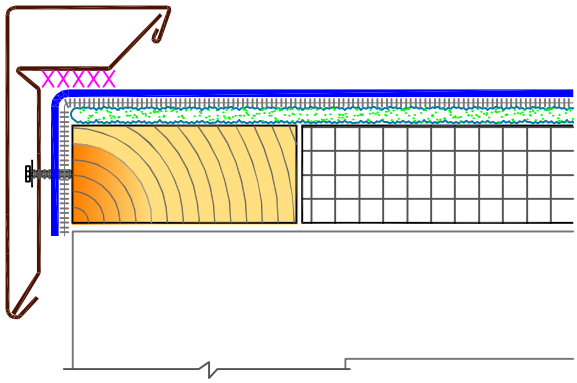
FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	CARLISLE SecurEdge 300 MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB–1E.1 FLEECEBACK ADHERED



SecurEdge EX SNAP-ON FASCIA

NOTES:

1. REFER TO SecurEdge EX SNAP-ON FASCIA OR SNAP-ON FASCIA INSTRUCTION MANUALS FOR THE STEP BY STEP INSTALLATION PROCEDURES.
2. IF INCIDENTAL/TEMPORARY PONDED WATER IS EXPECTED, THE SecurEdge MUST BE ELEVATED AND SCUPPERS PROVIDED FOR DRAINAGE.
3. ENSURE ROOF SLOPES AWAY FROM SecurEdge.



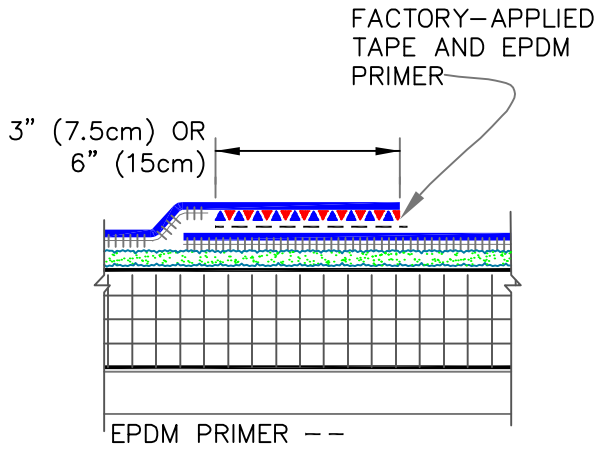
SecurEdge SNAP-ON FASCIA

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	CARLISLE SecurEdge EX SNAP-ON FASCIA & SecurEdge SNAP-ON FASCIA MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB-1F.1 FLEECEBACK ADHERED

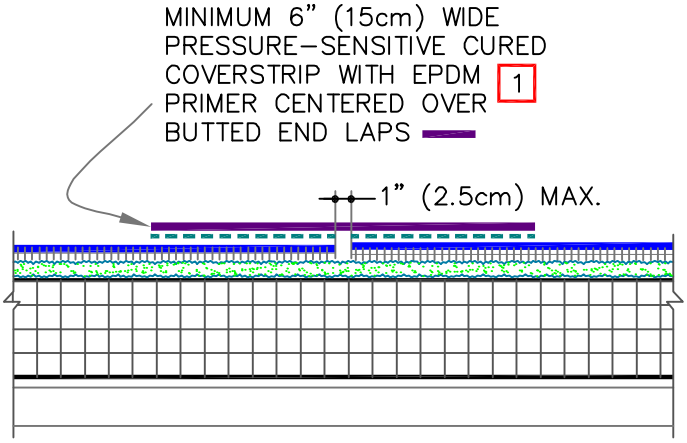
CAUTION

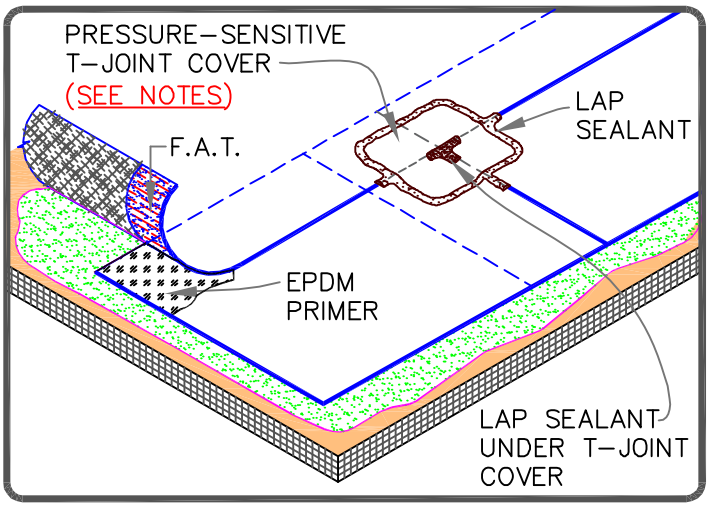
EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (15cm) WIDE FIELD APPLIED SecurTAPE FOR PROJECTS WITH 20, 25 & 30-YEAR WARRANTIES.

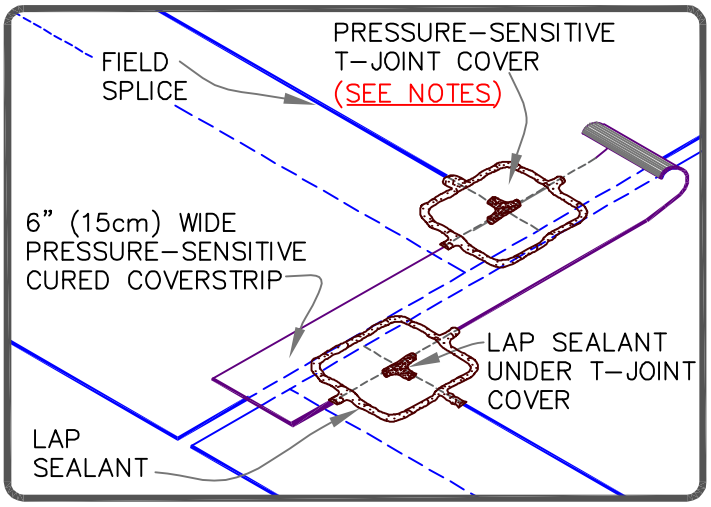
MEMBRANE SPLICE



END LAP SPLICE





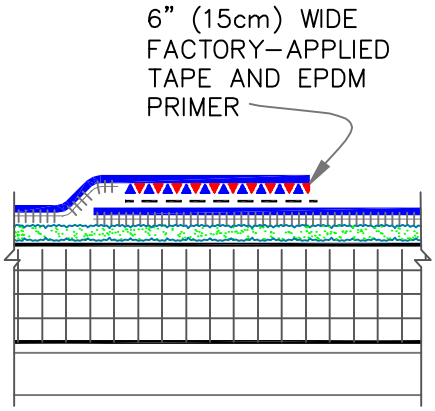


NOTES:

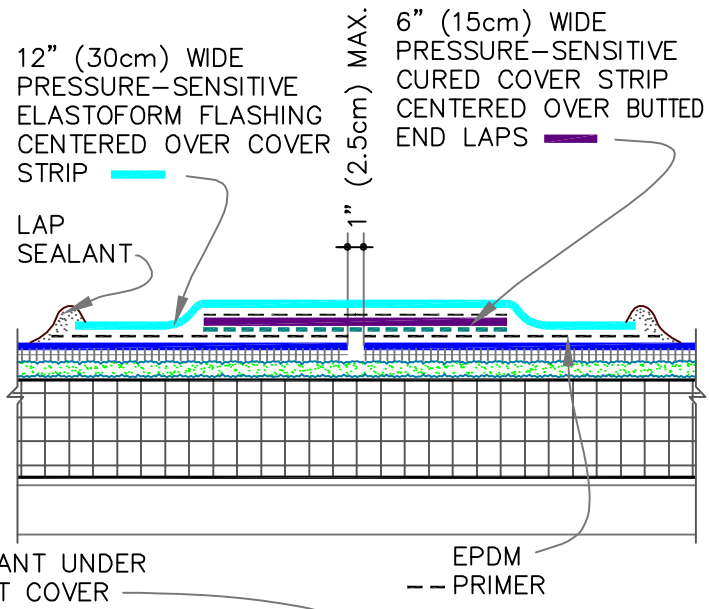
1. APPLY EPDM PRIMER TO MEMBRANE SURFACES PRIOR TO INSTALLING PRESSURE-SENSITIVE FLASHING AND/OR FACTORY APPLIED SecurTAPE.
2. APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE (UNDER THE 6"x6" (15cm x15cm)T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.
3. 6" (15cm) WIDE PRESSURE-SENSITIVE ELASTOFORM FLASHING MAY ALSO BE CENTERED OVER THE FIELD SPLICE INTERSECTION.

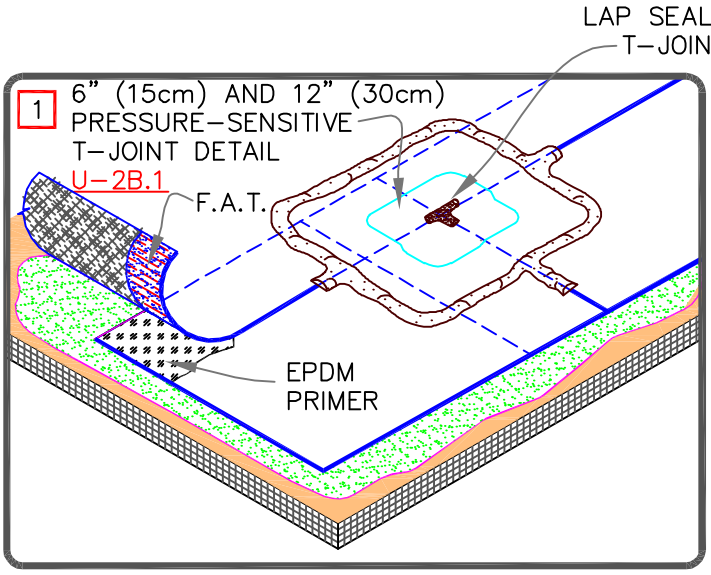
FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	EPDM MEMBRANE SPLICES – PROJECTS WITH 10, 15, 20 AND 25 YEAR WARRANTIES MAXIMUM WARRANTY: 25 YEARS	DETAIL NO. FB-2A FLEECEBACK ADHERED

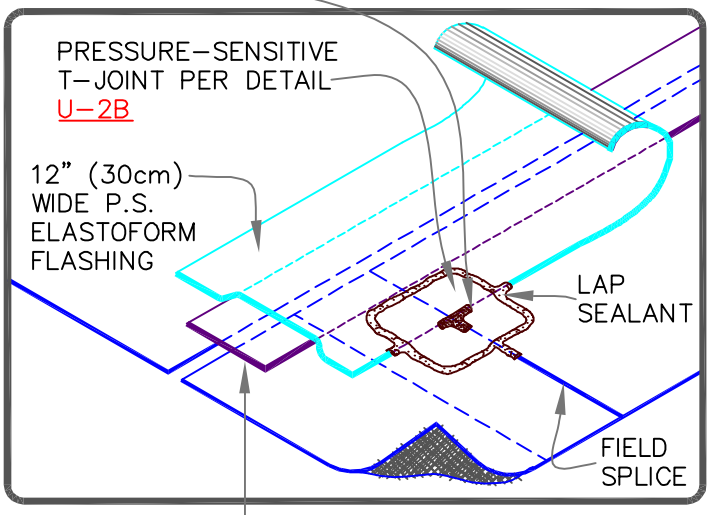
MEMBRANE SPLICE



END LAP SPLICE







NOTES:

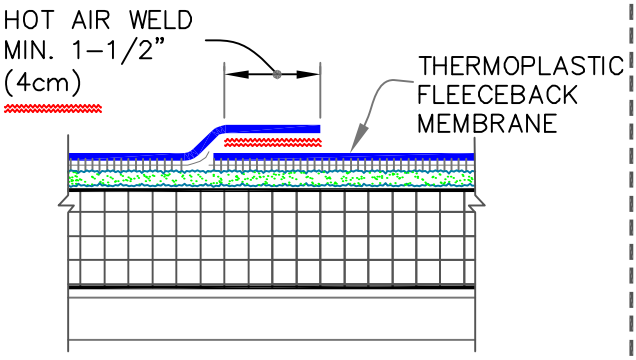
1. APPLY EPDM PRIMER TO MEMBRANE SURFACES PRIOR TO INSTALLING PRESSURE-SENSITIVE FLASHING AND/OR FACTORY APPLIED SecurTAPE.

2. APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE (UNDER THE 6"x6" (15cm X 15cm) T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.

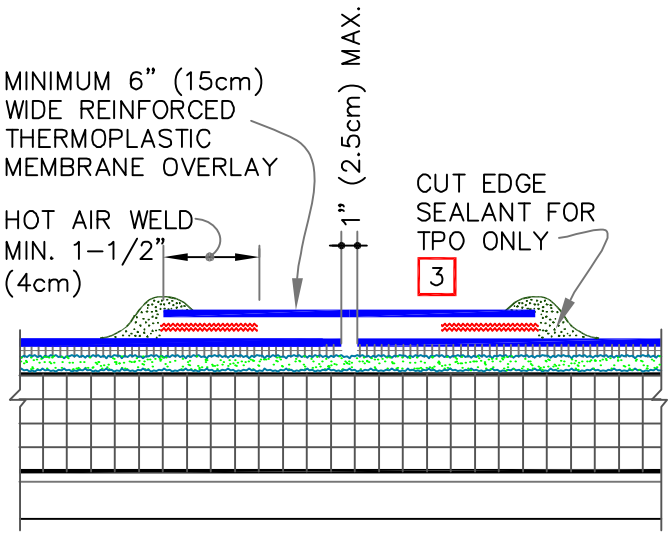
3. ALL EPDM SPLICE INTERSECTIONS MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6"X6" (15cm X 15cm) COVERED WITH A 12"X12" (30cm X 30cm) TOP LAYER. BOTH LAYERS SHALL BE CENTERED OVER THE SPLICE INTERSECTION AND SEALED WITH CONTINUOUS LAP SEALANT, AS SHOWN.

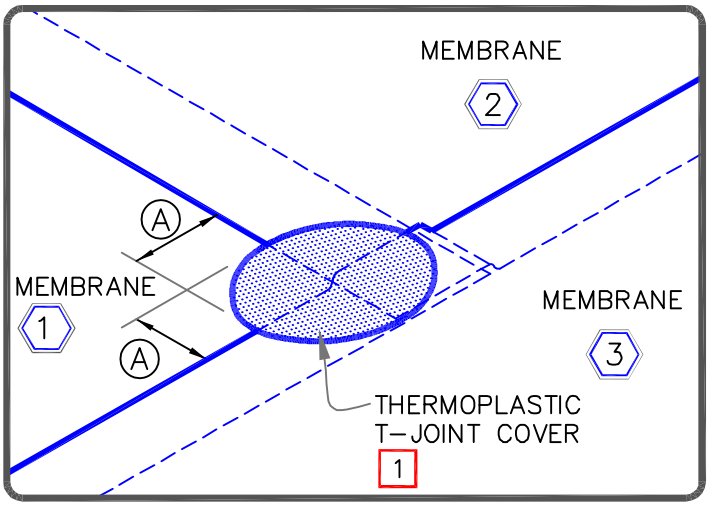
FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	EPDM MEMBRANE SPLICES- PROJECTS WITH 145-MIL MEMBRANE and 30-YEAR WARRANTIES MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB-2A.1 FLEECEBACK ADHERED

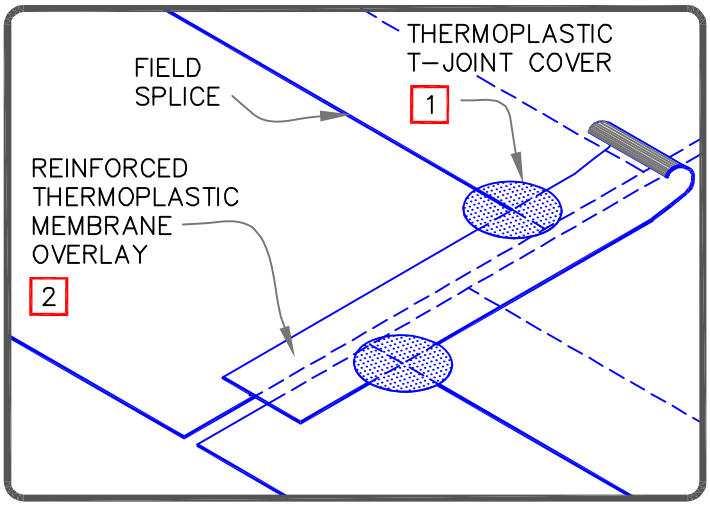
MEMBRANE SPLICE



END LAP SPLICE







DIMENSION		cm
Ⓐ	2–1/4"	6

NOTES:

1. WHEN USING 115–MIL TPO OR 135–MIL TPO, 135–MIL PVC OR KEE HP FLEECEBACK MEMBRANE, APPLY A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

2. WHEN USING 60 OR 80 MIL THERMOPLASTIC REINFORCED MEMBRANE OVERLAY, INTERSECTIONS BETWEEN SPLICES MUST BE OVERLAID WITH A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER.

3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

4. WHEN USING 115–MIL FLEECEBACK TPO, MAXIMUM WARRANTY IS 20 YEARS

FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

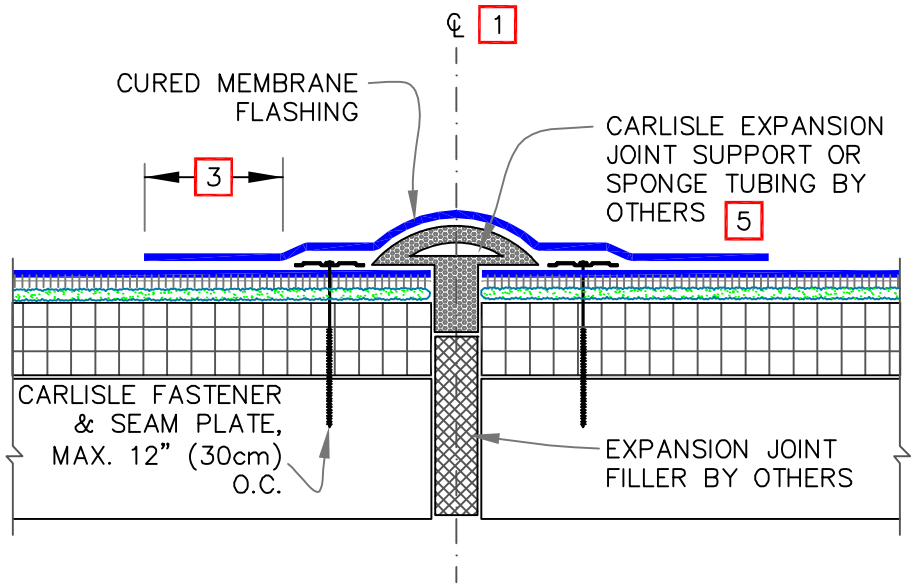
THERMOPLASTIC MEMBRANE SPLICES

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–2B.1
FLEECEBACK ADHERED

CAUTION

EPDM MEMBRANE SPLICES SHALL INCORPORATE 3"(7.5cm) WIDE FIELD APPLIED SecurTape FOR 20 & 25 YEAR WARRANTIES AND 6" (15cm) WIDE FIELD APPLIED SecurTAPE FOR PROJECTS WITH 30-YEAR WARRANTIES.



NOTES:

1. WHEN CARLISLE EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (2cm) AND SHALL NOT EXCEED 3" (7.5cm).

2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

3. MEMBRANE SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE & PRIMER WITH EPDM MEMBRANE AND MINIMUM 1-1/2" (4cm) HOT AIR WELD WITH TPO/PVC.

4. WHEN USING 60 OR 80-MIL TPO AND 80-MIL PVC/KEE HP REINFORCED THERMOPLASTIC MEMBRANE FLASHING, APPLY A 4-1/2" (11cm) DIAMETER THERMOPLASTIC "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

5. ALL EPDM SPLICE INTERSECTIONS MUST BE OVERLAID WITH A PRESSURE-SENSITIVE T-JOINT COVER. PRIOR TO DOING SO, APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE (UNDER THE 6"x6" (15cm X 15CM) T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 2" (5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION. PROJECTS WITH 30-YEAR WARRANTIES OR WHEN USING 145-MIL MEMBRANE, INTERSECTIONS MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6"X6" (15cm X 15cm) COVERED WITH A 12"X12" TOP LAYER (30cm X 30cm). BOTH LAYERS SHALL BE CENTERED OVER THE SPLICE INTERSECTION AND SEALED WITH CONTINUOUS LAP SEALANT, REFER TO FB-2 DETAILS.

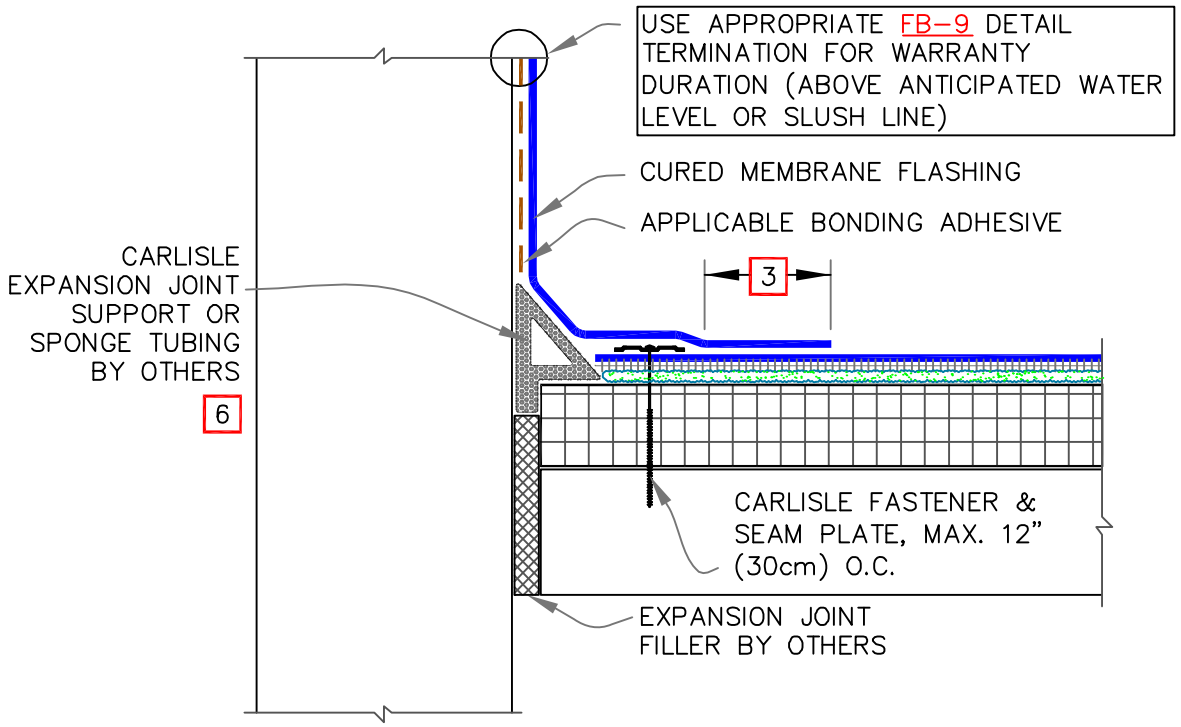
6. ROOF MEMBRANE SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT OR SPONGE TUBING.

7. FOR EPDM APPLICATIONS, USE TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING WITH EACH LAYER 3" (7.5cm) LARGER THAN THE PREVIOUS LAYER IN ALL DIRECTIONS FOR EXPANSION JOINT INTERSECTIONS BETWEEN EXPANSION JOINTS TO WALL OR EDGING.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	DECK-TO-DECK EXPANSION JOINT MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB-3A.1 FLEECEBACK ADHERED

CAUTION

EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (15cm) WIDE FIELD APPLIED SecurTAPE FOR PROJECTS WITH 30-YEAR WARRANTIES.



NOTES:

1. WHEN CARLISLE EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (2cm) AND SHALL NOT EXCEED 2" (5cm).

2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

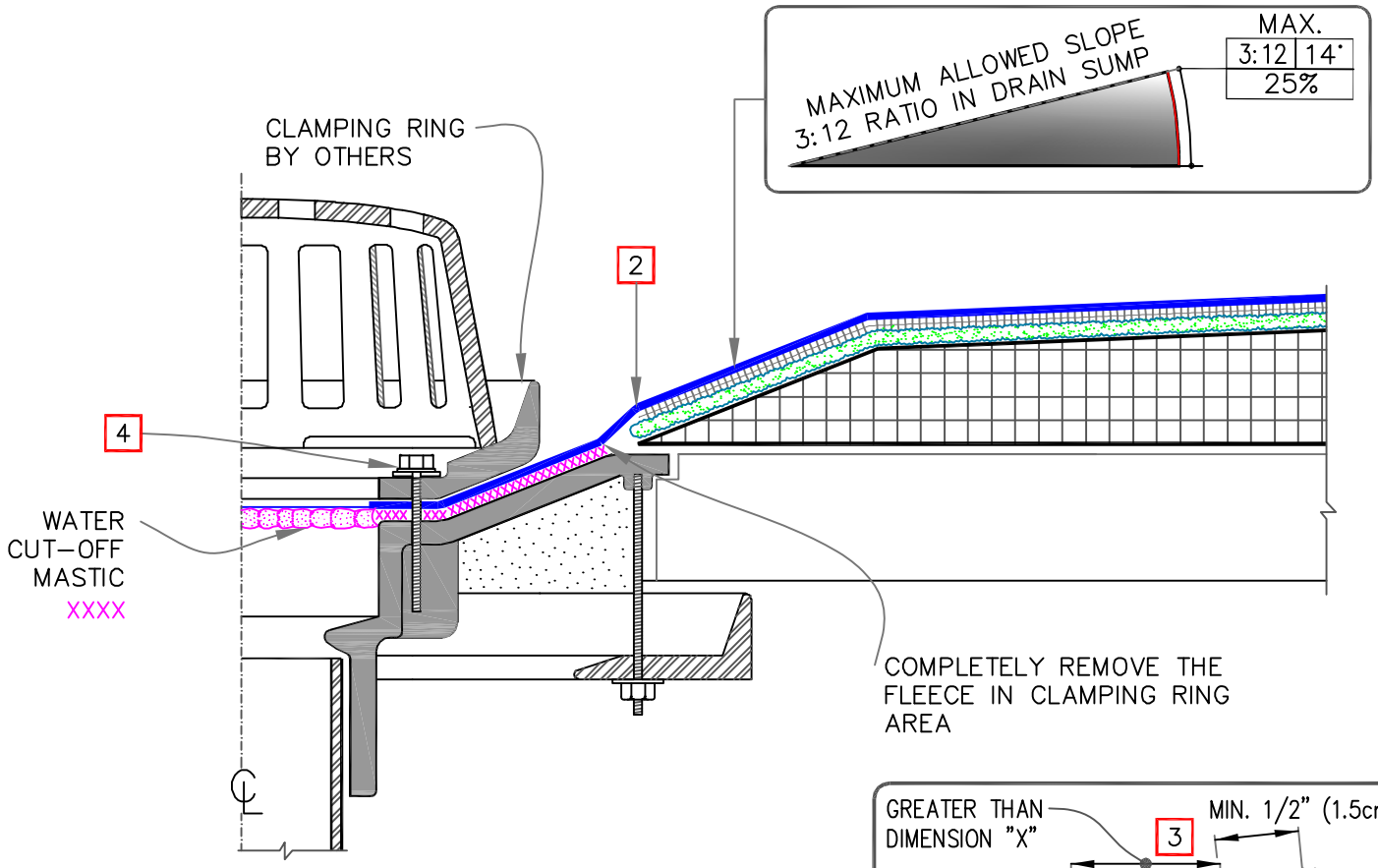
3. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1-1/2" (4cm) HOT AIR WELD WITH TPO/PVC.

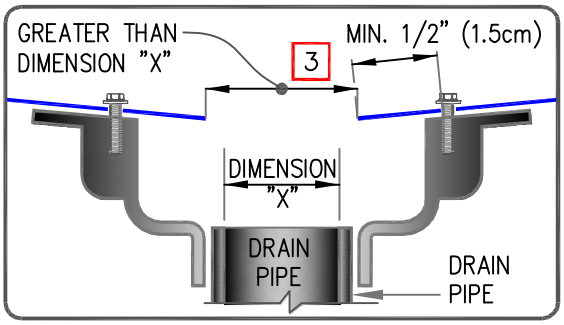
4. WHEN USING 60 OR 80-MIL TPO AND 80-MIL PVC/KEE HP REINFORCED THERMOPLASTIC MEMBRANE FLASHING, APPLY A 4-1/2" (11cm) DIAMETER THERMOPLASTIC "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

5. ALL EPDM SPLICE INTERSECTIONS MUST BE OVERLAID WITH A PRESSURE-SENSITIVE T-JOINT COVER. PRIOR TO DOING SO, APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE (UNDER THE 6"x6" (15cm X 15cm)T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 2" (5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION. PROJECTS WITH 25 & 30-YEAR WARRANTIES OR WHEN USING 90-MIL EPDM FLASHING, INTERSECTIONS MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6"X6" (15cm X 15cm) COVERED WITH A 12"X12" TOP LAYER (30cm X 30cm). BOTH LAYERS SHALL BE CENTERED OVER THE SPLICE INTERSECTION AND SEALED WITH CONTINUOUS LAP SEALANT, REFER TO FB-2 DETAILS.

6. ROOF MEMBRANE SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT OR SPONGE TUBING.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	DECK-TO-WALL EXPANSION JOINT MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB-3B.1 FLEECEBACK ADHERED





NOTES:

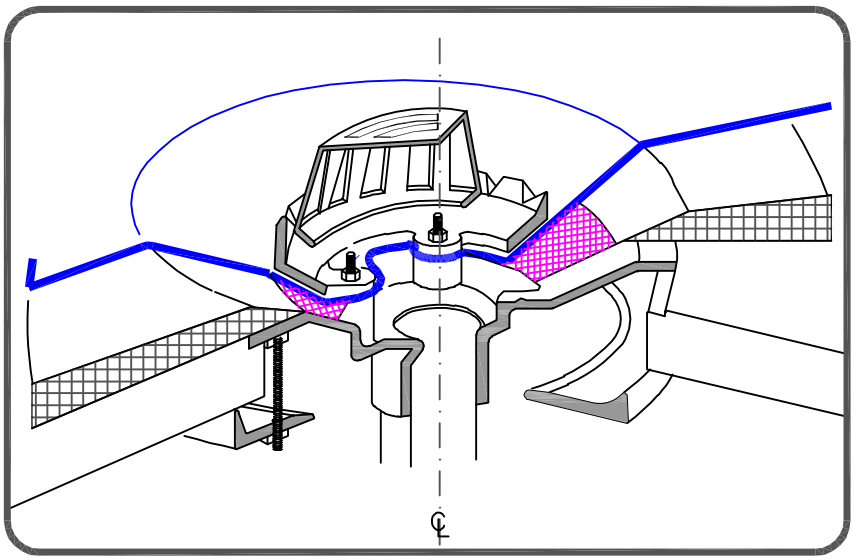
1. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.

2. FLEECE–BACKING MUST BE REMOVED FROM THE MEMBRANE SO THAT WATER CUT–OFF MASTIC IS IN DIRECT CONTACT.

3. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.

4. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT–OFF MASTIC.

5. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.



FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

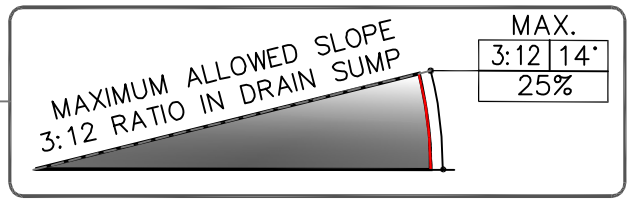
ROOF DRAIN WITH CONTINUOUS MEMBRANE

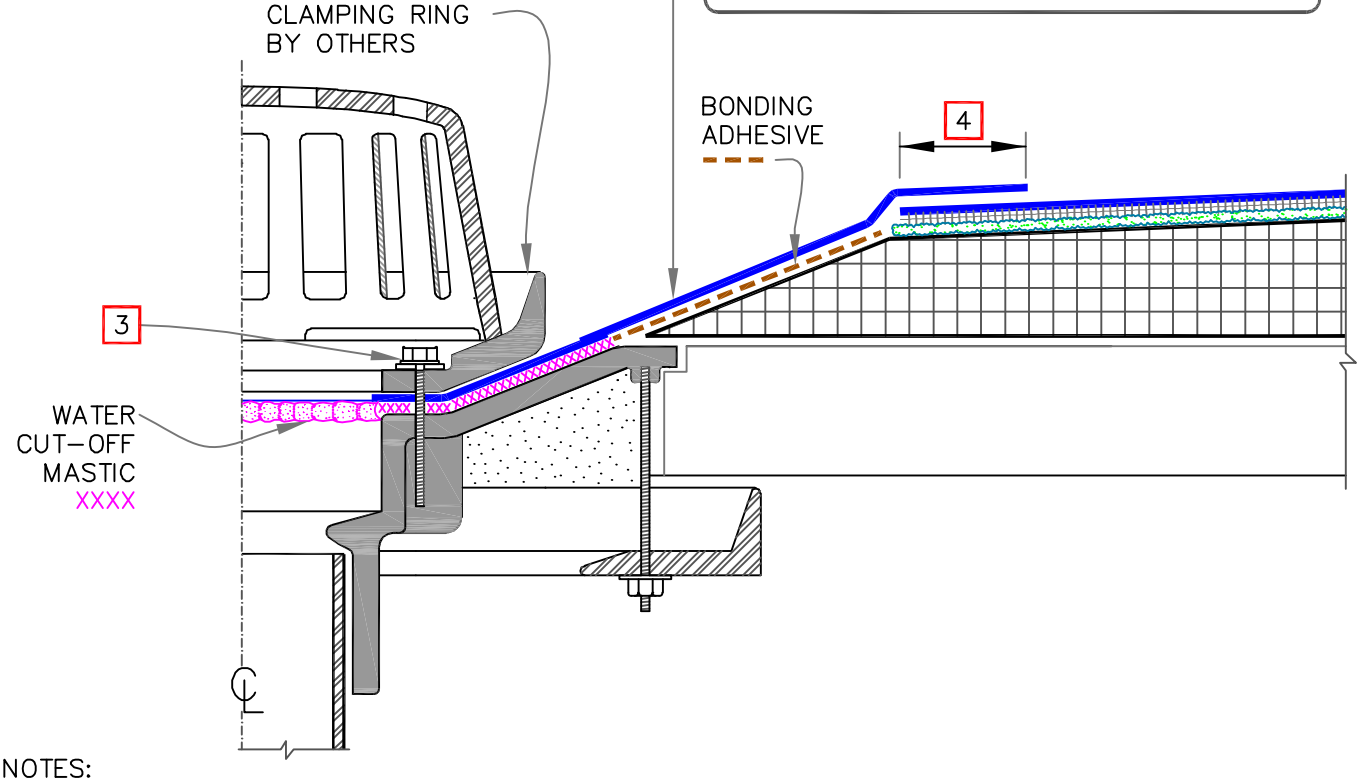
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–6A.1
FLEECEBACK ADHERED

CAUTION

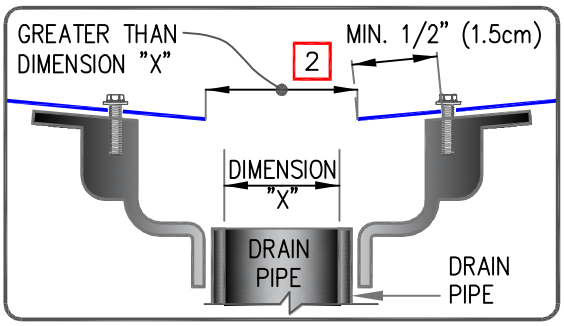
EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (15cm) WIDE FIELD APPLIED SecurTAPE FOR PROJECTS WITH 20, 25 & 30–YEAR WARRANTIES.





NOTES:

1. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT–OFF MASTIC.
4. SPLICES SHALL BE COMPLETED USING MIN. 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC/KEE HP.
5. FIELD SPLICES MUST BE LOCATED AT LEAST 6 INCHES (15cm) OUTSIDE THE DRAIN SUMP.
6. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
7. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.



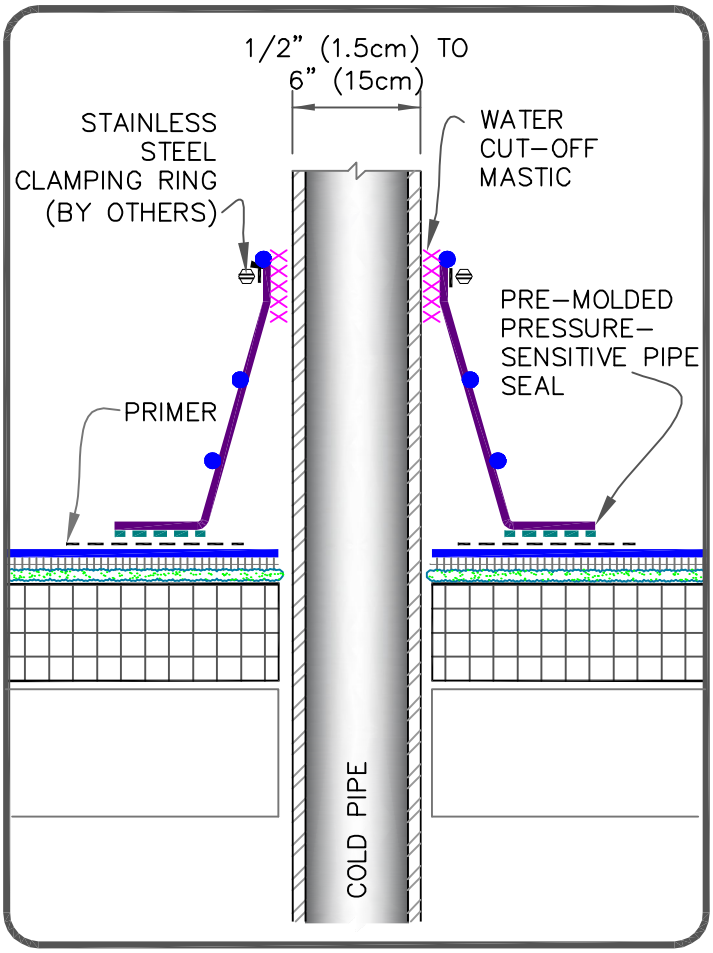
FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

ROOF DRAIN WITH SEPARATE TARGET SPLICE

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–6B.1
FLEECEBACK ADHERED

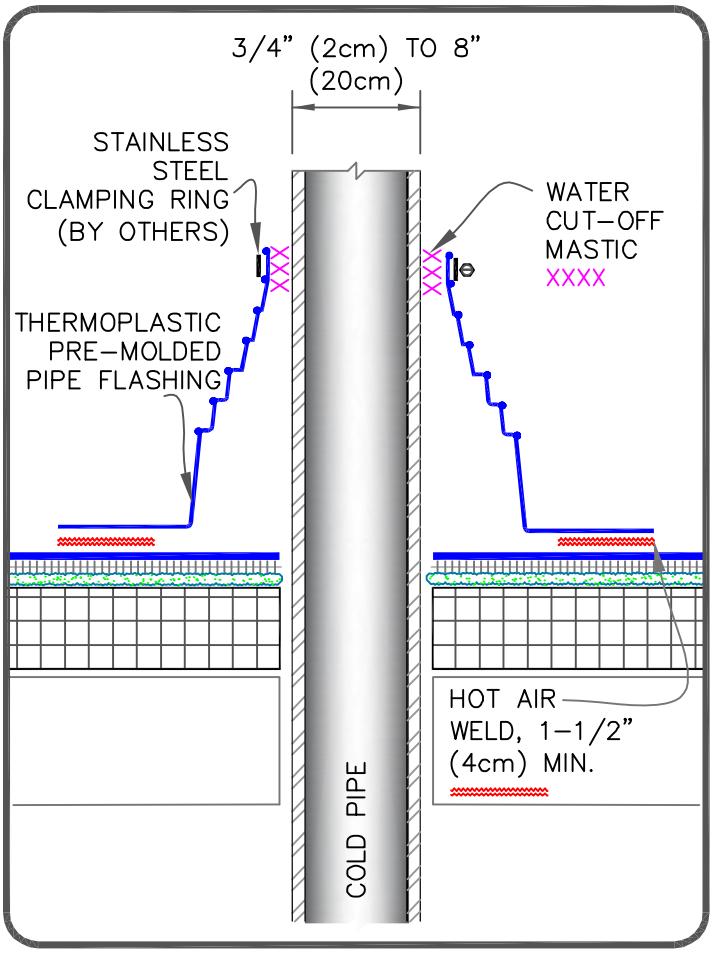
EPDM



NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD FABRICATED PIPE SEAL.
2. TEMPERATURE OF PIPE MUST NOT EXCEED 180°F (82°C).
3. APPLY EPDM PRIMER TO SPLICE AREA.
4. PRE–MOLDED PIPE FLASHING MUST HAVE INTACT RIB AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
5. DECK FLANGES OF THE PRE–MOLDED PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.
6. WHEN A FIELD SPLICE INTERSECTS A PIPE SEAL, APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE COVERING THE EXPOSED SPLICE TAPE 2" (5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION & OVERLAY WITH A 6"X6" (15 X 15cm) T–JOINT COVER.

TPO/PVC/KEE HP



NOTES:

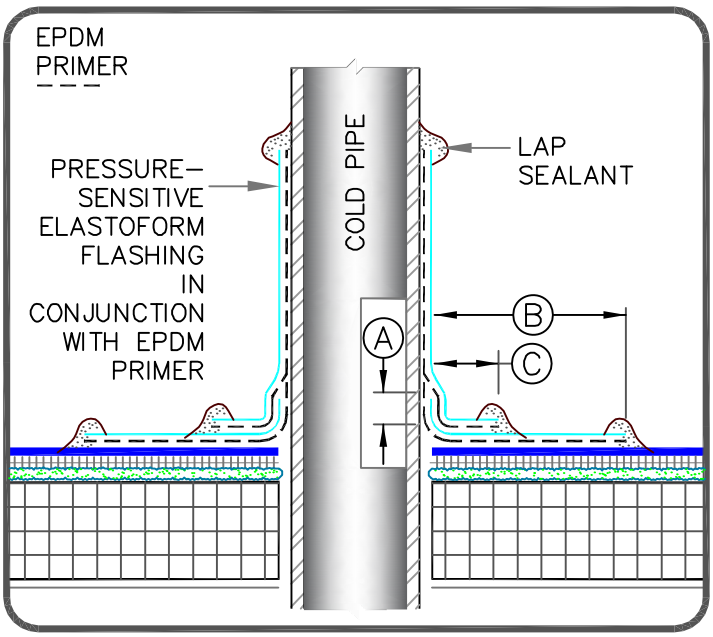
1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD FABRICATED PIPE SEAL.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC OR KEE HP AND 160°F (71°C) WHEN USING TPO FLASHING.
3. PRE–MOLDED PIPE FLASHING MUST HAVE INTACT RIB AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
4. DECK FLANGES OF THE PRE–MOLDED PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PRE–MOLDED PIPE SEALS MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB–8A.1 FLEECEBACK ADHERED

CAUTION

DETAIL NOT FOR USE ON 25 & 30–YEAR WARRANTY PROJECTS. ACCEPTABLE PIPE FLASHINGS SHALL CONFORM WITH FB–8A DETAIL OR REFER TO THERMOSET/THERMOPLASTIC UNIVERSAL DETAILS.

EPDM

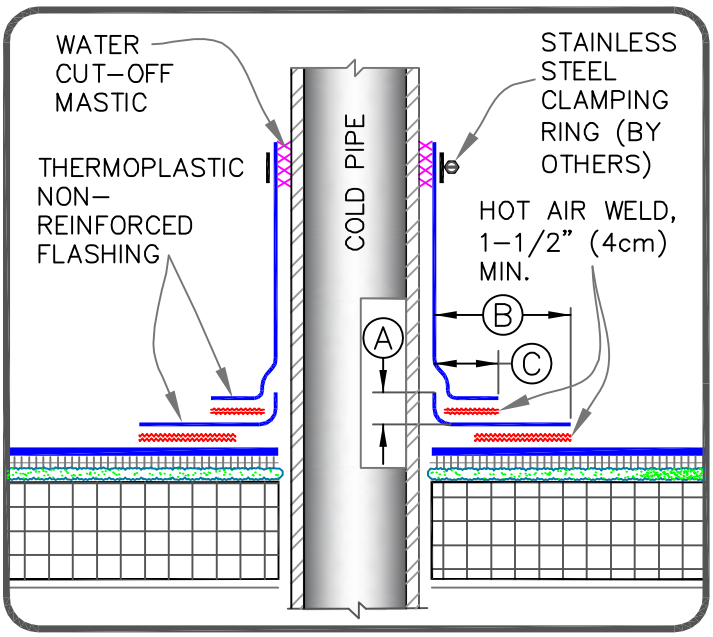


DIMENSIONS		cm	
A	1/2"	1.5	MIN.
B	3"	7.5	MIN.
C	1"	2.5	MIN.

NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD–FABRICATED PIPE SEAL.
2. TEMPERATURE OF PIPE MUST NOT EXCEED 180°F (82°C).
3. PRIOR TO APPLYING PRESSURE–SENSITIVE ELASTOFORM FLASHING, APPLY EPDM PRIMER TO SPLICE AREAS.
4. MECHANICAL SECUREMENT IS REQUIRED AROUND ALL PIPES GREATER THAN 18" (46cm) IN DIAMETER.
5. IN COLDER TEMPERATURES A HEAT GUN MUST BE USED WHEN FORMING PRESSURE–SENSITIVE ELASTOFORM FLASHING.
6. REFER TO EPDM UNIVERSAL DETAILS FOR HOT STACK, STEEL TUBING & FLEXIBLE PIPE PENETRATIONS.

TPO/PVC/KEE HP



DIMENSIONS		cm	
A	1/2"	1.5	MIN.
B	1–1/2"	4	TO
	2"	5	
C	1"	2.5	MIN.

NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD FABRICATED PIPE SEAL.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC OR KEE HP AND 160°F (71°C) WHEN USING TPO FLASHING.
3. APPLY HEAT TO FLASHING AND FORM BY HAND PRIOR TO HOT AIR WELDING
4. MECHANICAL SECUREMENT IS REQUIRED AROUND ALL PIPES GREATER THAN 18" (46cm) IN DIAMETER.
5. REFER TO THERMOPLASTIC UNIVERSAL DETAILS FOR HOT STACK, STEEL TUBING & FLEXIBLE PENETRATIONS.

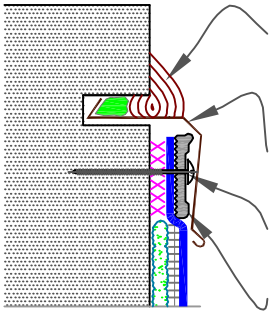
FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

FIELD FABRICATED PIPE FLASHING

MAXIMUM WARRANTY: 20 YEARS

DETAIL NO.
FB–8B
FLEECEBACK ADHERED

9A MECHANICAL TERMINATION WITH COUNTER FLASHING



CARLISLE UNIVERSAL SINGLE–PLY SEALANT OR SEALANT (BY OTHERS)

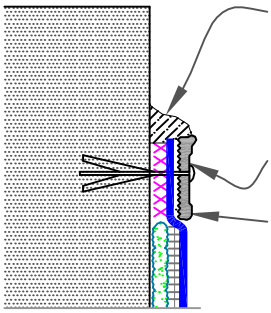
METAL COUNTER–FLASHING WITH LEAD WEDGES, AS REQUIRED (BY OTHERS).

THREADED FASTENERS OR CARLISLE HP TERM BAR NAIL–IN

CARLISLE TERMINATION BAR

WARRANTY UP TO 30 YEARS | **SEE INSET A**

9B MECHANICAL TERMINATION



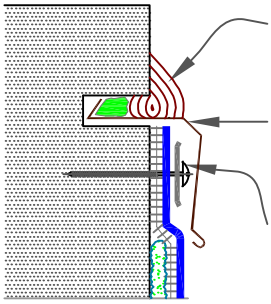
CARLISLE UNIVERSAL SINGLE–PLY SEALANT OR SEALANT (BY OTHERS)

CARLISLE HP TERM BAR NAIL–IN

CARLISLE TERMINATION BAR

WARRANTY UP TO 20 YEARS | **SEE INSET A**

9C COUNTER FLASHING TERMINATION



CARLISLE UNIVERSAL SINGLE–PLY SEALANT OR SEALANT (BY OTHERS)

METAL COUNTER–FLASHING WITH LEAD WEDGES, AS REQUIRED (BY OTHERS).

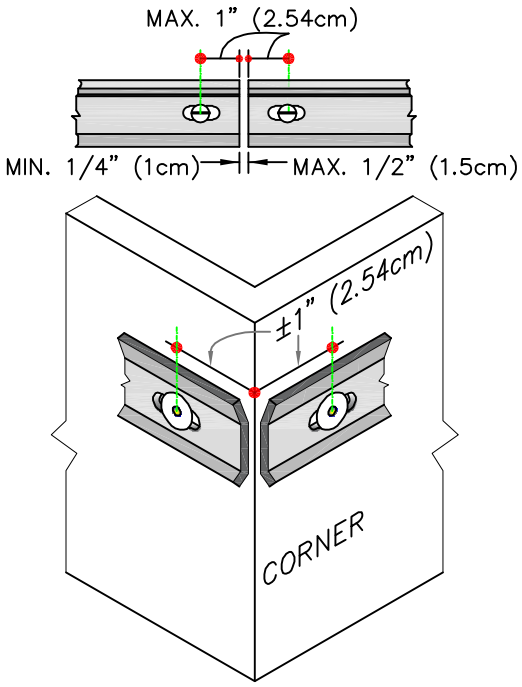
FASTEN MEMBRANE @ 12" (30cm) O.C. MAX. USE GALVANIZED WASHERS, MIN. 1", (2.54cm) DIAMETER

NOTE:

1. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER–FLASHING, USE EPDM WASHERS, APPLY WATER CUT–OFF MASTIC UNDER THE COUNTER–FLASHING OR CAULK THE FASTENER HEADS.

WARRANTY UP TO 10 YEARS

INSET A



NOTES:

1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. DO NOT WRAP TERMINATION BAR AROUND CORNERS.
3. DETAIL 9D ON PAGE 2 OF 3 MUST BE USED AT VERTICAL JOINTS IN PANEL WALLS.

XXX WATER CUT–OFF MASTIC– MUST BE HELD UNDER CONSTANT COMPRESSION.

FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

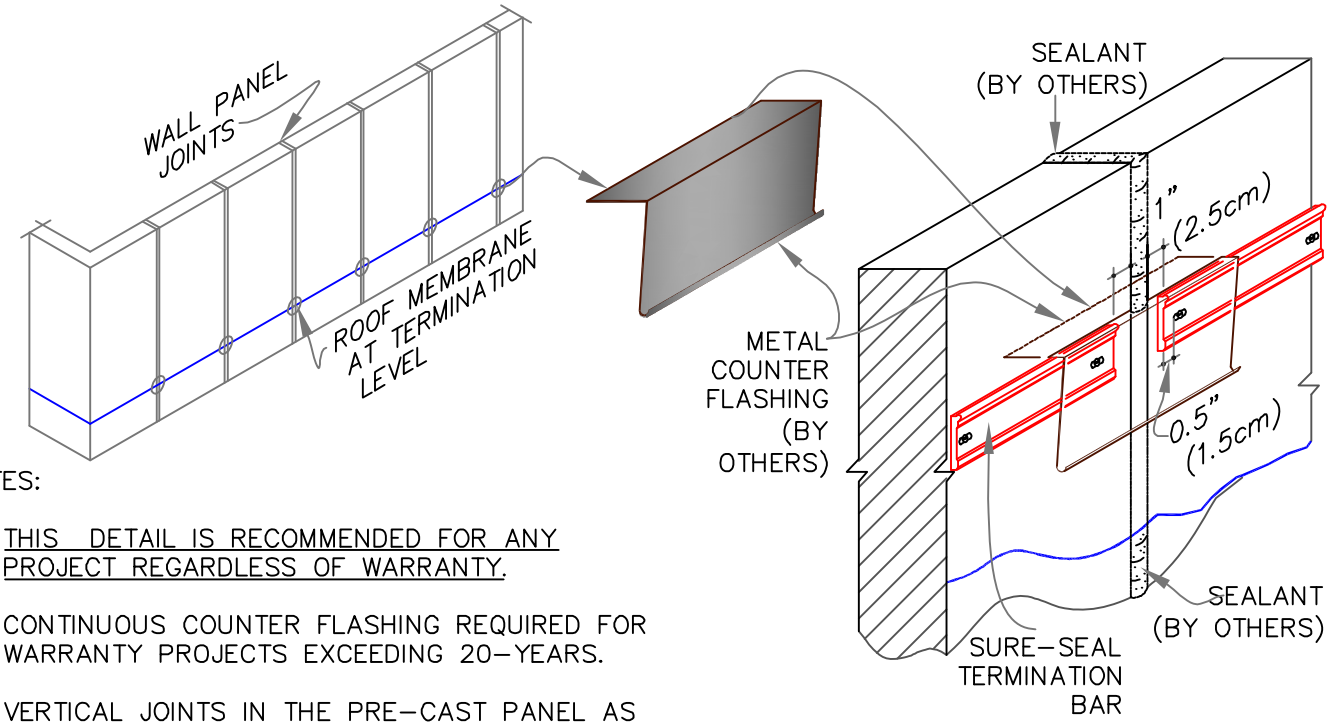
MEMBRANE TERMINATIONS (PAGE 1 OF 3)

WARRANTY AS NOTES FOR EACH DETAIL

DETAIL NO. FB–9

FLEECEBACK ADHERED

9D MECHANICAL TERMINATION AT VERTICAL JOINTS



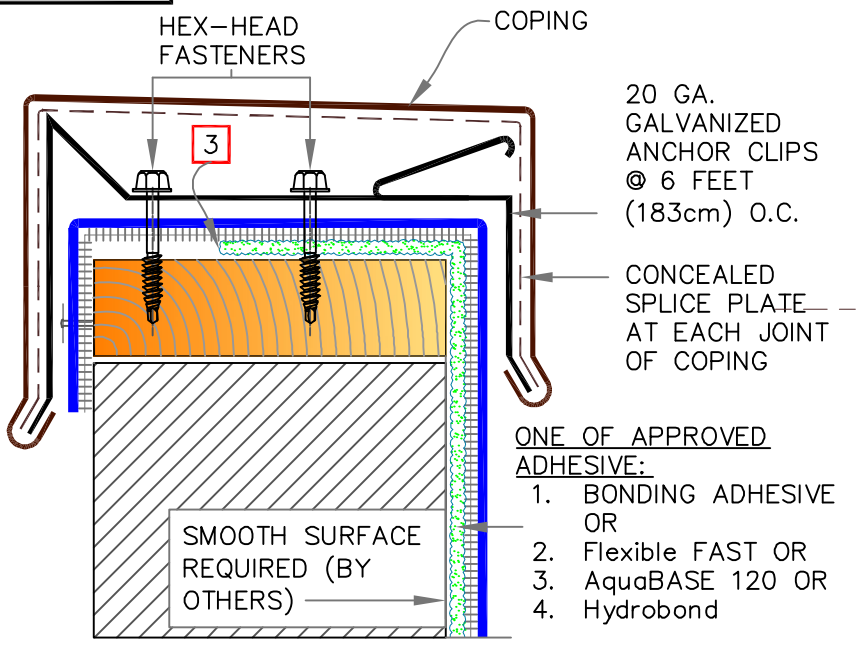
NOTES:

1. THIS DETAIL IS RECOMMENDED FOR ANY PROJECT REGARDLESS OF WARRANTY.
2. CONTINUOUS COUNTER FLASHING REQUIRED FOR WARRANTY PROJECTS EXCEEDING 20-YEARS.
3. VERTICAL JOINTS IN THE PRE-CAST PANEL AS WELL AS ALL GAPS AT THE JUNCTION OF THE TILT-UP PANEL AND ROOF DECK MUST BE FULLY SEALED TO PREVENT AIR INFILTRATION.
4. APPLY ON HARD SMOOTH SURFACE ONLY.

9E SecurEdge & SecurEdge 300 COPINGS

NOTES:

1. MEMBRANE MUST BE EXTENDED AT CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE. SEE 3D DETAIL 9F ON PAGE 3 OF 3.
2. REFER TO SecurEdge COPING INSTALLATION INSTRUCTION MANUAL FOR STEP-BY-STEP INSTRUCTION PROCEDURES.
3. STOP ADHESIVE AT APPROPRIATE DISTANCE TO AVOID STAINING ON EXTERIOR FACE OF WALL. EXTEND THE MEMBRANE DOWN & TEMPORARILY SECURE WITH CAPPED NAILS AT 12" (30.5cm) O.C. ENSURE SEAMS ARE SEALED.



FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

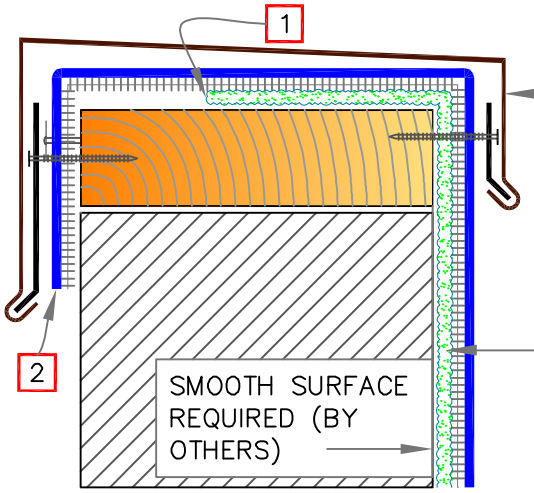
MEMBRANE TERMINATIONS (PAGE 2 OF 3)

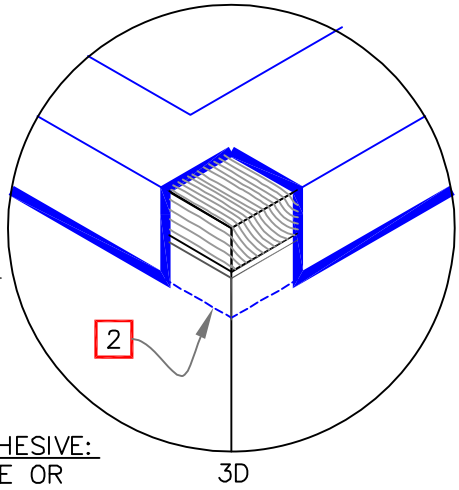
WARRANTY AS NOTES FOR EACH DETAIL

DETAIL NO. FB-9

FLEECEBACK ADHERED

9F SHEET METAL COPING (BY OTHERS)



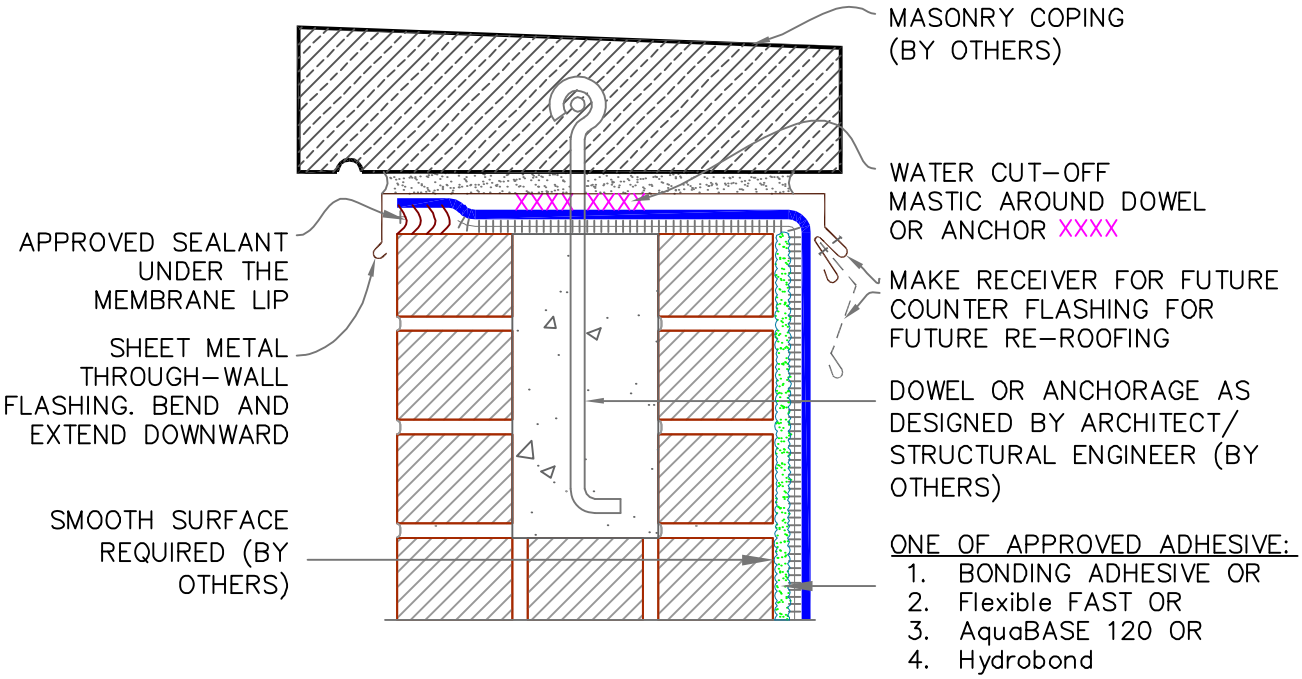


NOTES:

1. STOP ADHESIVE AT APPROPRIATE DISTANCE TO AVOID STAINING ON EXTERIOR FACE OF WALL. EXTEND THE MEMBRANE DOWN & SECURE WITH CAPPED NAILS AT 12" (30.5cm) O.C. ENSURE SEAMS ARE SEALED.

2. EXTEND THE MEMBRANE BELOW THE JOINT. AT CORNERS, MEMBRANE MUST BE EXTENDED TO PROVIDE COMPLETE COVERAGE OF WALL SURFACE.

9G MASONRY COPINGS (BY OTHERS)



XXX WATER CUT-OFF MASTIC- MUST BE HELD UNDER CONSTANT COMPRESSION.

FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

MEMBRANE TERMINATIONS (PAGE 3 OF 3)

MAXIMUM WARRANTY: 30 YEARS

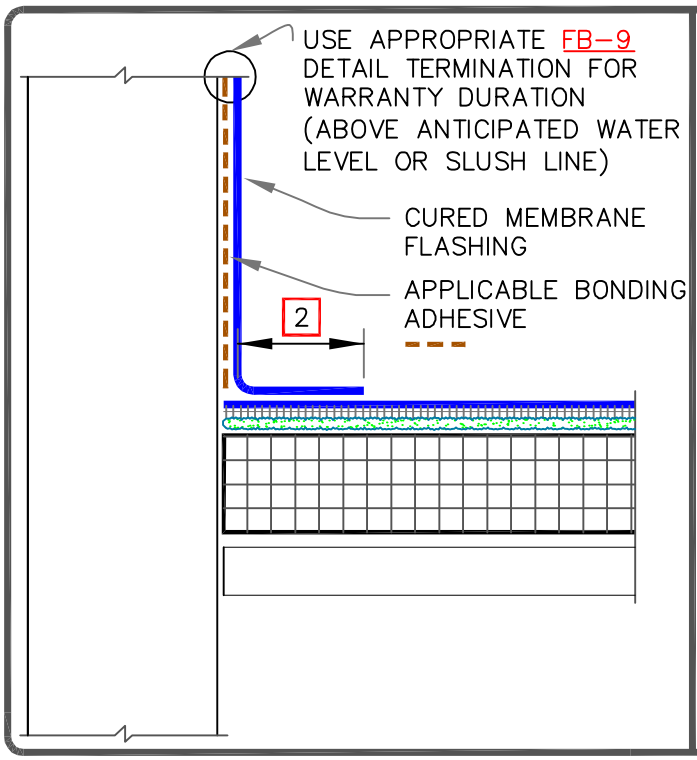
DETAIL NO. FB-9

FLEECEBACK ADHERED

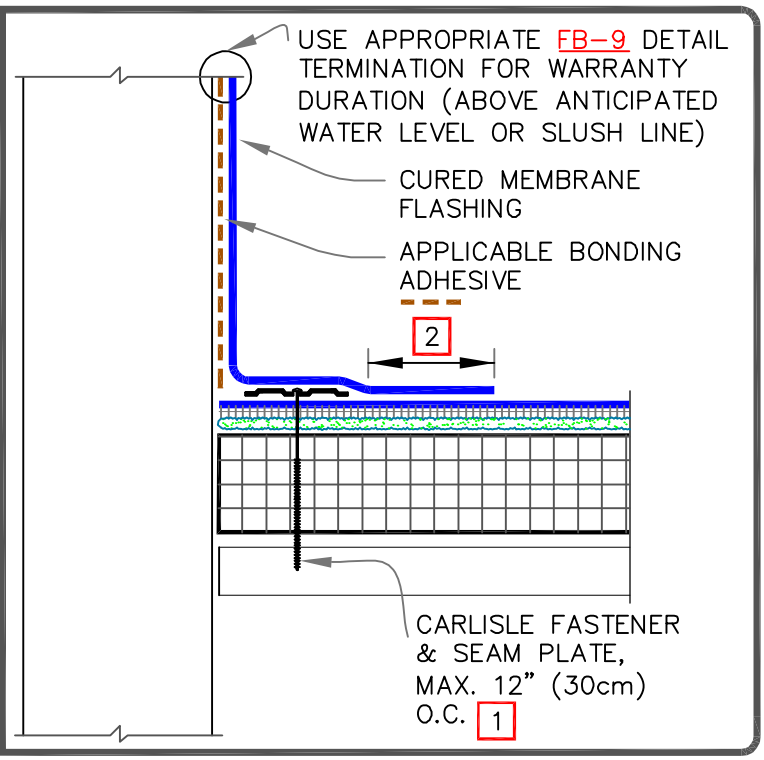
CAUTION

REFER TO DETAIL FB–12C WHEN USING AQUA BASE 120 ADHESIVE OR HYDROBOND.

WARRANTY UP TO 20 YEARS



WARRANTY UP TO 25/30 YEARS



NOTES:

1. MECHANICALLY FASTENED BASE SECUREMENT IS REQUIRED WHEN ANY ONE OF THE FOLLOWING MAY OCCUR:
   - 1.1. SPECIFIED WARRANTIES GREATER THAN 20–YEARS.
   - 1.2. WARRANTY WIND SPEEDS GREATER THAN 90MPH.
   - 1.3. PROJECTS WITH CONTROL OR EXPANSION JOINTS OR ANTICIPATED BUILDING MOVEMENT.
   - 1.4. WHEN FLEECEBACK MEMBRANE IS INSTALLED DIRECTLY OVER AN EXISTING SINGLE–PLY ROOF.

2. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC/KEE HP. EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (15cm) WIDE SECURTAPE FOR PROJECTS WITH 25 AND 30–YEAR WARRANTIES.

3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

4. WHEN USING 60 OR 80–MIL REINFORCED THERMOPLASTIC MEMBRANE FLASHING, APPLY A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

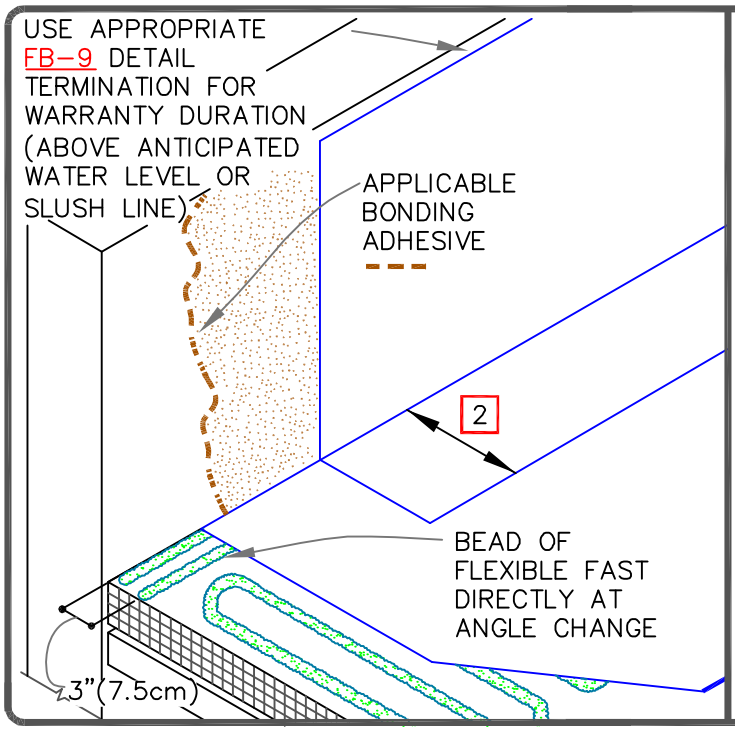
5. ALL EPDM SPLICE INTERSECTIONS REFER TO FB–2 DETAILS.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PARAPET/CURB WITH SEPARATE MEMBRANE – FULL COVERAGE / SPLATTER MAXIMUM WARRANTY: SEE EACH DETAIL	DETAIL NO. FB–12A.1A FLEECEBACK ADHERED

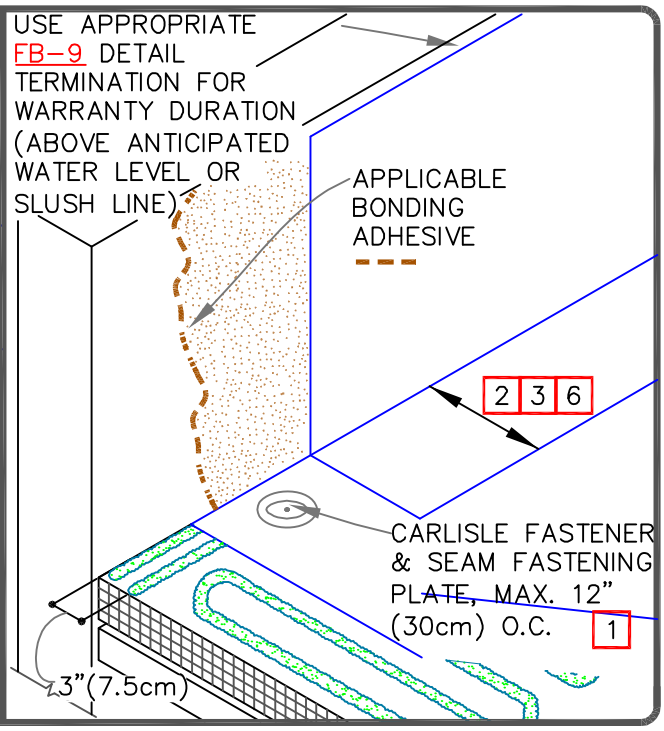
CAUTION

REFER TO DETAIL FB–12C WHEN USING AQUA BASE 120 ADHESIVE OR HYDROBOND.

WARRANTY UP TO 20 YEARS



WARRANTY UP TO 25/30 YEARS



NOTES:

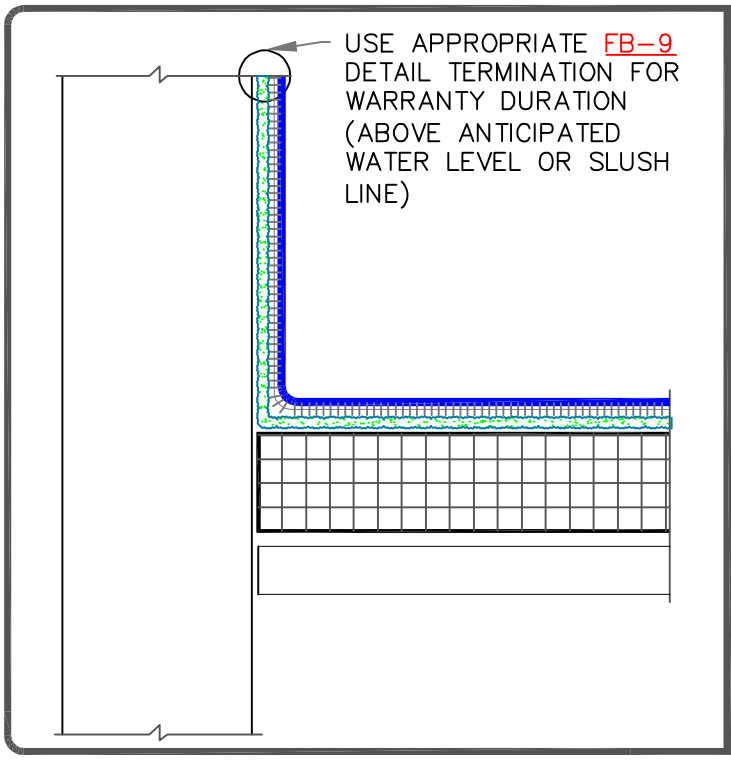
1. MECHANICALLY FASTENED BASE SECUREMENT IS REQUIRED WHEN ANY ONE OF THE FOLLOWING MAY OCCUR:
   - 1.1. SPECIFIED WARRANTIES GREATER THAN 20–YEARS.
   - 1.2. WARRANTY WIND SPEEDS GREATER THAN 90MPH.
   - 1.3. PROJECTS WITH CONTROL OR EXPANSION JOINTS OR ANTICIPATED BUILDING MOVEMENT.
   - 1.4. WHEN FLEECEBACK MEMBRANE IS INSTALLED DIRECTLY OVER AN EXISTING SINGLE–PLY ROOF.
2. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC/KEE HP.
3. EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (15cm) WIDE SECURTAPE FOR PROJECTS WITH 25 AND 30–YEAR WARRANTIES.
4. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
5. WHEN USING 60 OR 80–MIL REINFORCED THERMOPLASTIC MEMBRANE FLASHING, APPLY A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
6. 3" AND 6" FIELD APPLIED TAPE MUST BE OUTSIDE PLATES.
7. ALL EPDM SPLICE INTERSECTIONS REFER TO FB–2 DETAILS.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PARAPET/CURB WITH SEPARATE MEMBRANE – BEAD APPLIED MAXIMUM WARRANTY: SEE EACH DETAIL	DETAIL NO. FB–12A.1B FLEECEBACK ADHERED

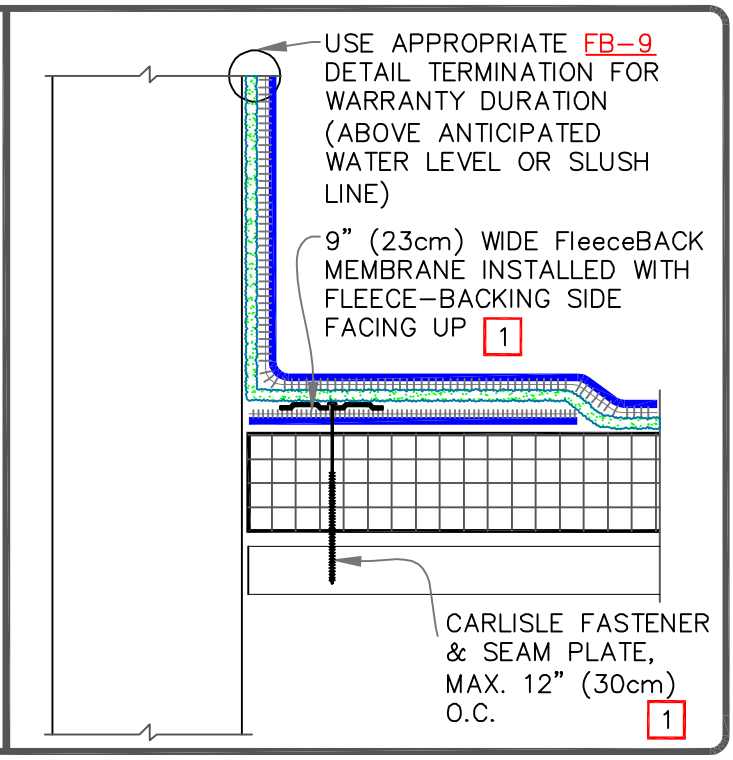
CAUTION

REFER TO DETAIL FB–12C WHEN USING AQUA BASE 120 ADHESIVE OR HYDROBOND.

WARRANTY UP TO 20 YEARS



WARRANTY UP TO 25/30 YEARS



NOTES:

1. MECHANICALLY FASTENED BASE SECUREMENT IS REQUIRED WHEN ANY ONE OF THE FOLLOWING MAY OCCUR:
   - 1.1. SPECIFIED WARRANTIES GREATER THAN 20–YEARS.
   - 1.2. WARRANTY WIND SPEEDS GREATER THAN 90MPH.
   - 1.3. PROJECTS WITH CONTROL OR EXPANSION JOINTS OR ANTICIPATED BUILDING MOVEMENT.
   - 1.4. WHEN FLEECEBACK MEMBRANE IS INSTALLED DIRECTLY OVER AN EXISTING SINGLE–PLY ROOF.

2. PRESSURE–SENSITIVE EPDM T–JOINT COVER OR 6" (15cm) WIDE PRESSURE–SENSITIVE FLASHING, IN CONJUNCTION WITH EPDM PRIMER, MUST BE CENTERED OVER EPDM FIELD SPLICES AT THE ANGLE CHANGE. PROJECTS WITH 25 OR 30–YEAR WARRANTIES OR WHEN USING 145–MIL MEMBRANE, FIELD SPLICES SHALL BE OVERLAID WITH TWO LAYERS OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6" (15cm) WIDE COVERED WITH A 12" WIDE TOP LAYER (30cm). BOTH LAYERS SHALL BE CENTERED AND TOP LAYER SEALED WITH CONTINUOUS LAP SEALANT.

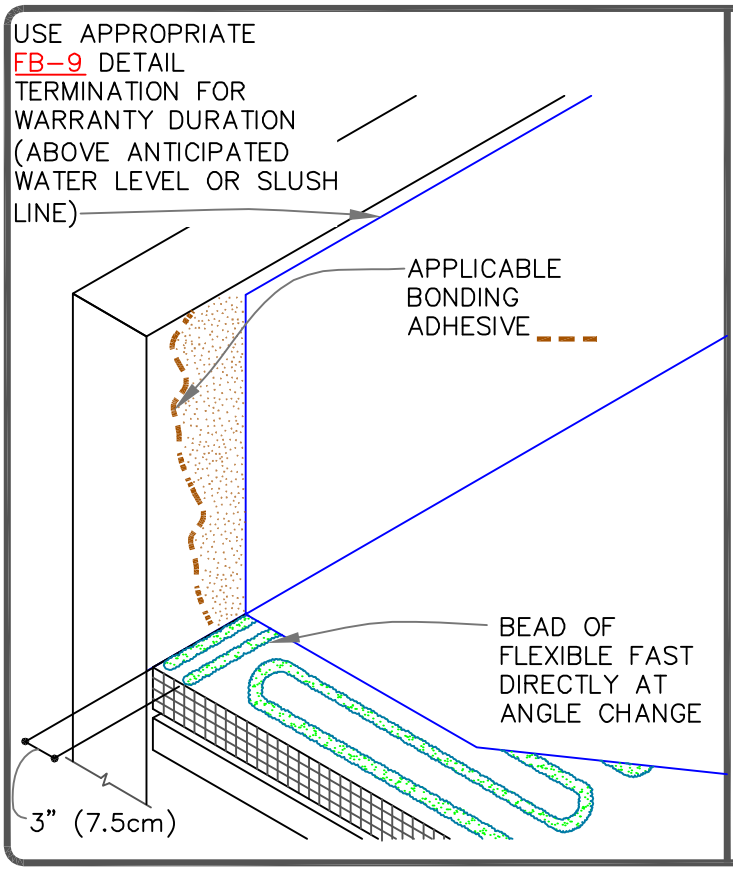
3. WHEN THE USE OF FLEXIBLE FAST ADHESIVE (FULL SPRAY) IS NOT FEASIBLE ON THE VERTICAL SUBSTRATE. SEE APPROPRIATE PDS FOR INSTALLATION INSTRUCTIONS FOR BONDING ADHESIVE.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PARAPET/CURB WITH CONTINUOUS MEMBRANE – FULL COVERAGE / SPLATTER MAXIMUM WARRANTY: SEE EACH DETAIL	DETAIL NO. FB–12B.1A FLEECEBACK ADHERED

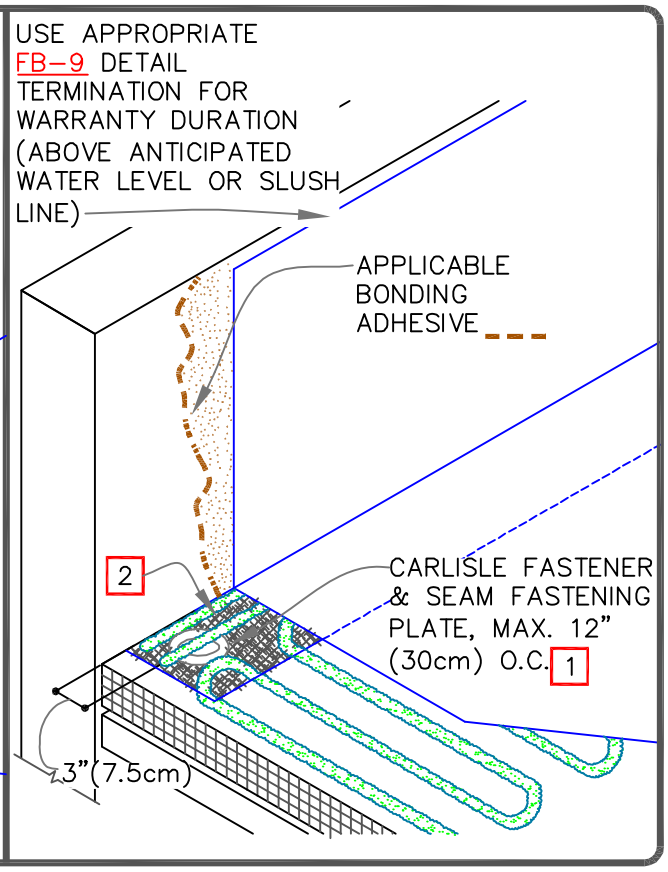
CAUTION

REFER TO DETAIL FB–12C WHEN USING AQUA BASE 120 ADHESIVE OR HYDROBOND.

WARRANTY UP TO 20 YEARS



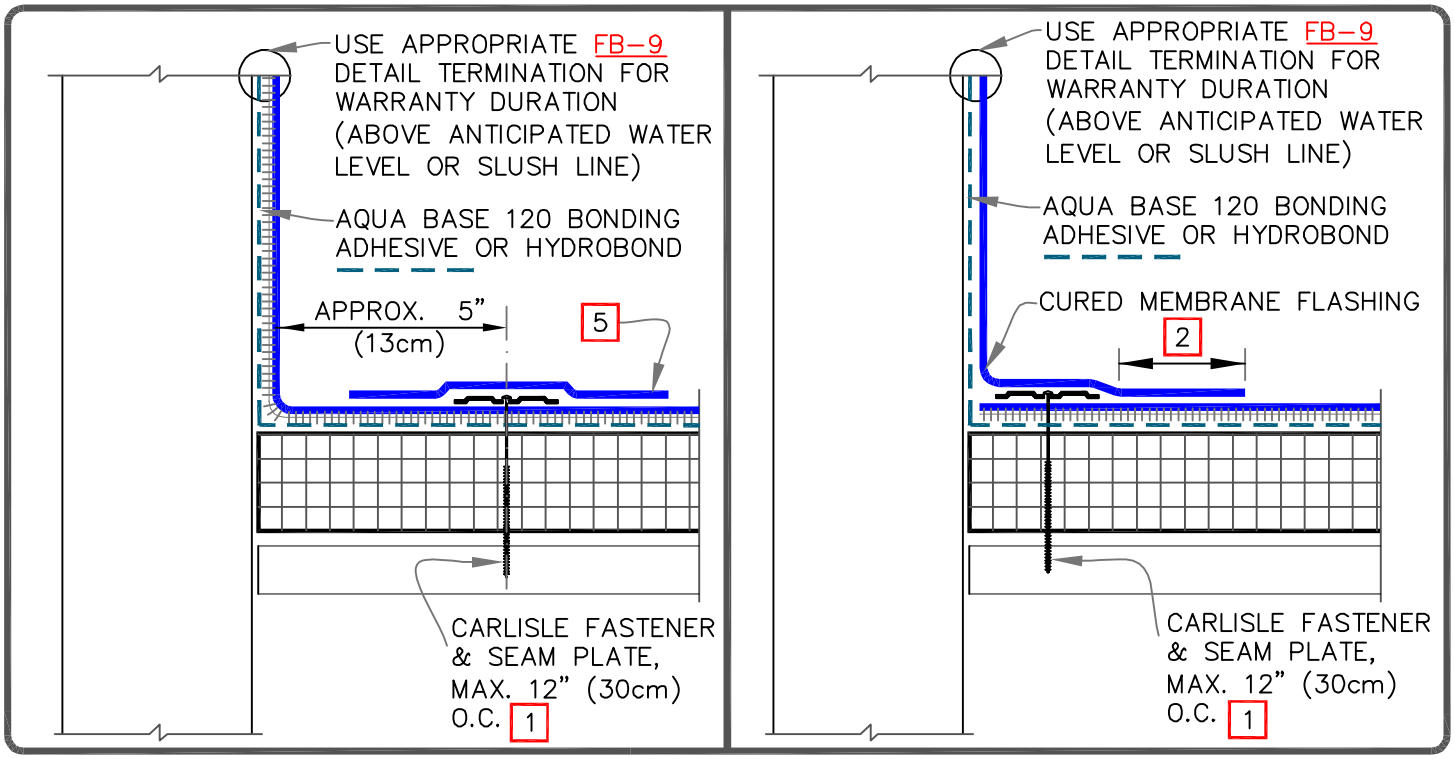
WARRANTY UP TO 25/30 YEARS



NOTES:

1. MECHANICALLY FASTENED BASE SECUREMENT IS REQUIRED WHEN ANY ONE OF THE FOLLOWING MAY OCCUR:
   - 1.1. SPECIFIED WARRANTIES GREATER THAN 20–YEARS.
   - 1.2. WARRANTY WIND SPEEDS GREATER THAN 90MPH.
   - 1.3. PROJECTS WITH CONTROL OR EXPANSION JOINTS OR ANTICIPATED BUILDING MOVEMENT.
   - 1.4. WHEN FLEECEBACK MEMBRANE IS INSTALLED DIRECTLY OVER AN EXISTING SINGLE–PLY ROOF.
2. 9" (23cm) WIDE FleeceBACK MEMBRANE INSTALLED WITH FLEECE–BACKING SIDE FACING UP.
3. WHEN USING 60 OR 80–MIL REINFORCED THERMOPLASTIC MEMBRANE FLASHING, APPLY A 4–1/2" (11cm) DIAMETER THERMOPLASTIC "T–JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
4. ALL EPDM SPLICE INTERSECTIONS REFER TO FB–2 DETAILS.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PARAPET/CURB WITH CONTINUOUS MEMBRANE – BEAD APPLIED MAXIMUM WARRANTY: SEE EACH DETAIL	DETAIL NO. FB–12B.1B FLEECEBACK ADHERED



NOTES:

1. REGARDLESS OF WARRANTY/ WARRANTY WIND SPEEDS, MECHANICAL SECUREMENT MUST BE PROVIDED AT THE PERIMETER OF EACH ROOF LEVEL, ROOF SECTION, EXPANSION JOINT, CURB FLASHING, SKYLIGHT, INTERIOR WALL, PENTHOUSE, ETC., AT ANY INSIDE ANGLE CHANGE WHERE SLOPE EXCEEDS 2" IN ONE HORIZONTAL FOOT.

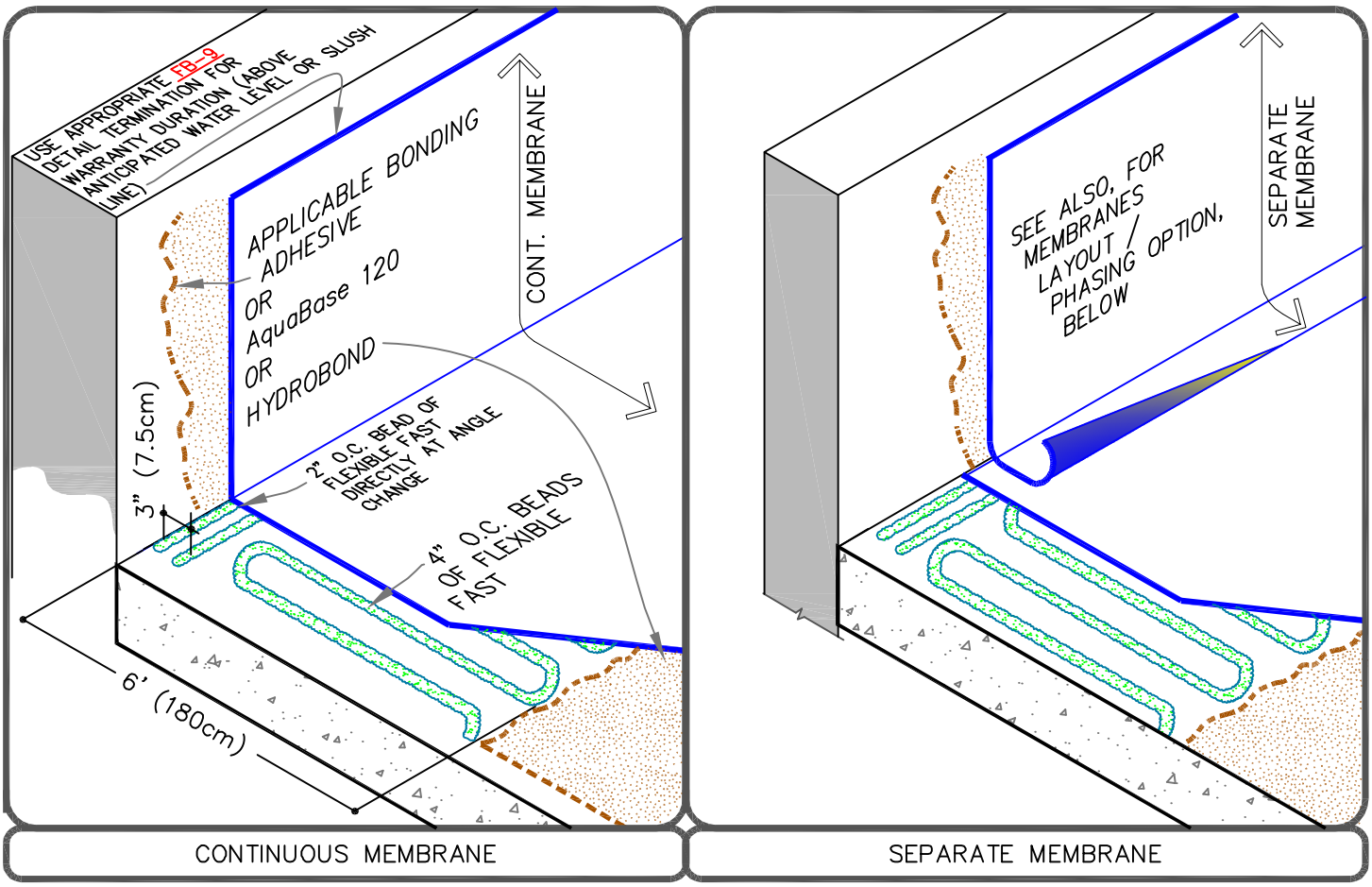
2. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1-1/2" (4cm) HOT AIR WELD WITH TPO/PVC.

3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

4. WHEN APPLYING AQUA BASE 120 BONDING ADHESIVE TO FLEECEBACK MEMBRANE ON THE VERTICAL WALL SUBSTRATE, APPLY A COAT OF AQUA BASE 120 ADHESIVE OR HYDROBOND TO THE FLEECE SIDE OF THE MEMBRANE AND ALLOW TO DRY. ONCE THE ADHESIVE ON THE FLEECE IS DRY, APPLY BONDING ADHESIVE AT THE COVERAGE RATE OF 60 S.F./GALLON FOR AQUA BASE 120 AND 100 S.F./GALLON FOR HYDROBOND TO THE WALL SUBSTRATE AND A SECOND COAT TO THE FLEECEBACK MEMBRANE.

5. WHEN USING EPDM FB MEMBRANE, MINIMUM 6" (15cm) WIDE PRESSURE-SENSITIVE CURED COVER STRIP MUST BE CENTERED OVER THE MECHANICAL FASTENERS AND PLATES. WHEN USING TPO OR PVC FLEECEBACK MEMBRANE, MINIMUM 6" (15cm) WIDE REINFORCED THERMOPLASTIC MEMBRANE FLASHING SHALL BE CENTERED OVER THE MECHANICAL FASTENERS AND PLATES AND HEAT WELDED ON ALL SIDES AND TPO CAN USE PRESSURE-SENSITIVE SUREWHITE.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PARAPET/CURB WITH WATER BASED ADHESIVE MAXIMUM WARRANTY: 20 YEARS	DETAIL NO. FB-12C FLEECEBACK ADHERED



NOTES:

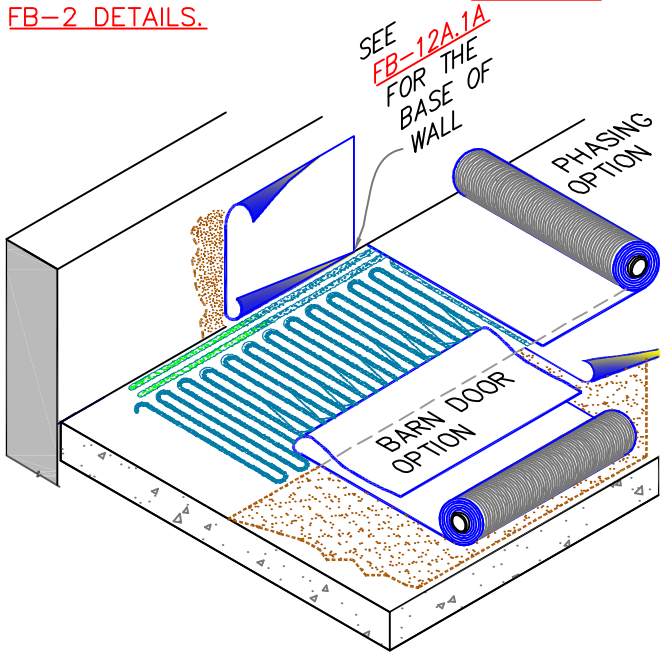
1. REGARDLESS OF WARRANTY/ WARRANTY WIND SPEEDS, SECUREMENT MUST BE PROVIDED AT THE PERIMETER OF EACH ROOF LEVEL, ROOF SECTION, EXPANSION JOINT, CURB FLASHING, SKYLIGHT, INTERIOR WALL, PENTHOUSE, ETC., AT ANY INSIDE ANGLE CHANGE WHERE SLOPE EXCEEDS 2" IN ONE HORIZONTAL FOOT.

2. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC.

3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

4. WHEN APPLYING AQUA BASE 120 BONDING ADHESIVE TO FLEECEBACK MEMBRANE ON THE VERTICAL WALL SUBSTRATE, APPLY A COAT OF AQUA BASE 120 ADHESIVE OR HYDROBOND TO THE FLEECE SIDE OF THE MEMBRANE AND ALLOW TO DRY. ONCE THE ADHESIVE ON THE FLEECE IS DRY, APPLY BONDING ADHESIVE AT THE COVERAGE RATE OF 60 S.F./GALLON FOR AQUA BASE 120 AND 100 S.F./GALLON FOR HYDROBOND TO THE WALL SUBSTRATE AND A SECOND COAT TO THE FLEECEBACK MEMBRANE.

5. ALL EPDM SPLICE INTERSECTIONS REFER TO FB–2 DETAILS.



FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

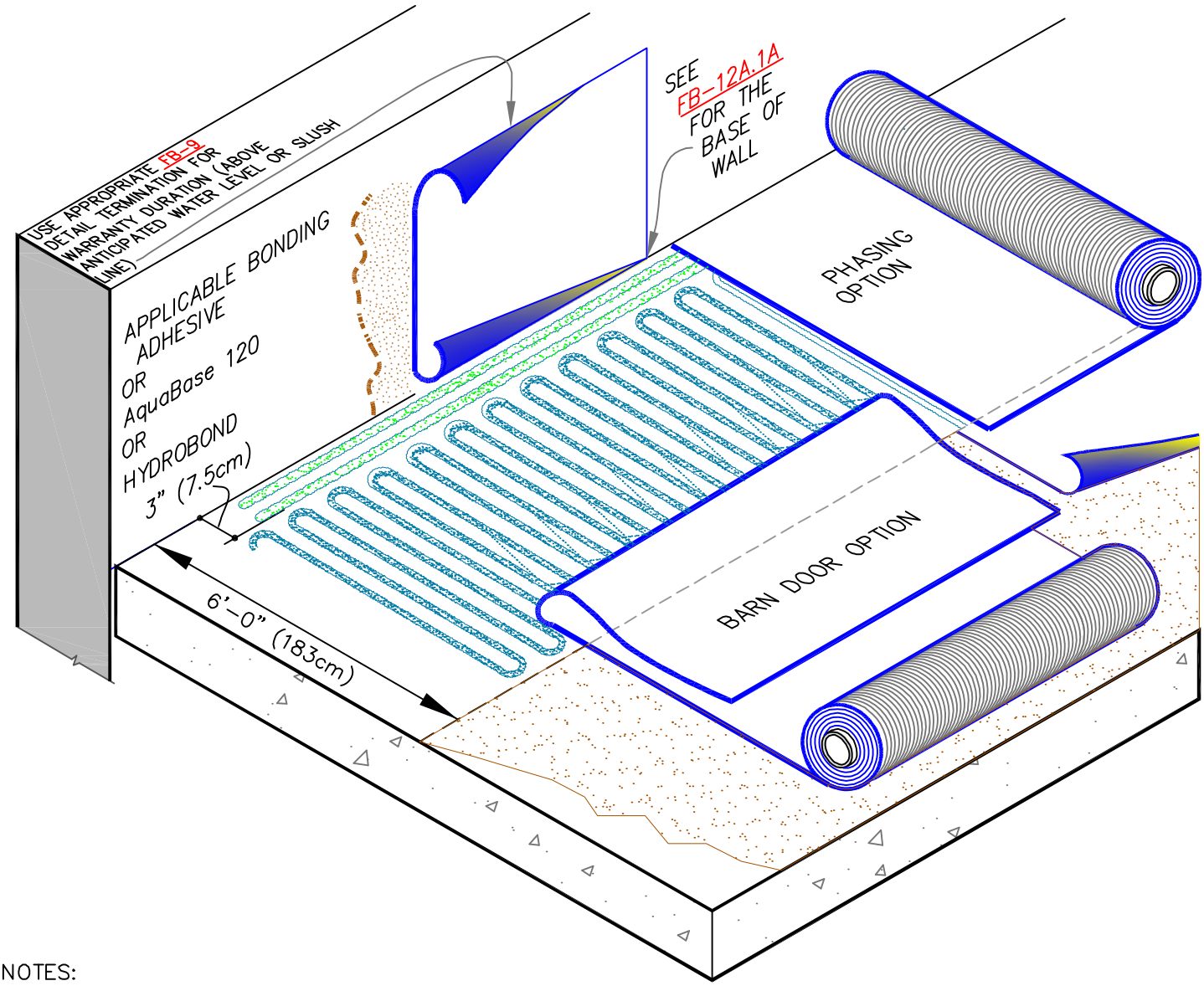
PARAPET/CURB–WATER BASED ADHESIVES W/ BEAD APPLIED FLEXIBLE FAST AT PERIMETERS– OVER CONCRETE. PAGE 1 OF 2

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–12C.1
FLEECEBACK ADHERED

CAUTION

REFER TO DETAIL FB–12C WHEN USING AQUA BASE 120 ADHESIVE OR HYDROBOND.

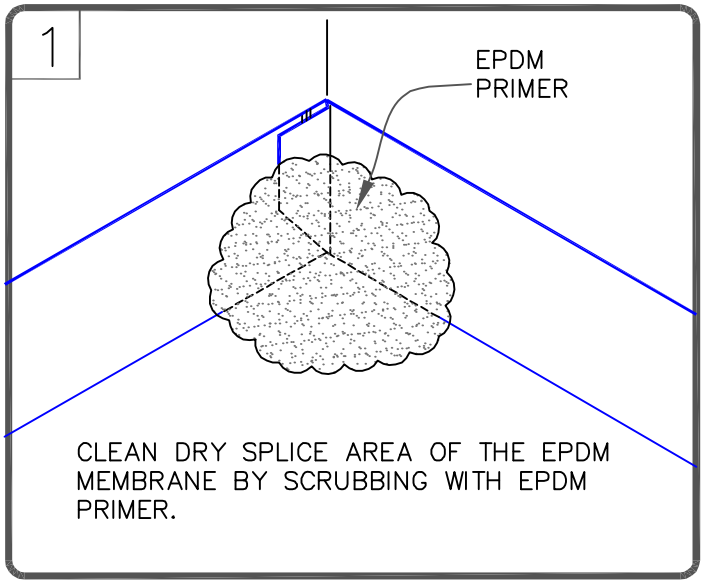


NOTES:

1. ADDITIONAL SECUREMENT IS REQUIRED FOR ANY ISNIDE ANGLE CHANGE WHEN SLOPE EXCEEDS 2" IN ONE HORIZONTAL FOOT.
2. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (7.5cm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1–1/2" (4cm) HOT AIR WELD WITH TPO/PVC.
3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT–EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
4. WHEN APPLYING AQUA BASE 120 BONDING ADHESIVE TO FLEECEBACK MEMBRANE ON THE VERTICAL WALL SUBSTRATE, APPLY A COAT OF AQUA BASE 120 ADHESIVE OR HYDROBOND TO THE FLEECE SIDE OF THE MEMBRANE AND ALLOW TO DRY. ONCE THE ADHESIVE ON THE FLEECE IS DRY, APPLY BONDING ADHESIVE AT THE COVERAGE RATE OF 60 S.F./GALLON FOR AQUA BASE 120 AND 100 S.F./GALLON FOR HYDROBOND TO THE WALL SUBSTRATE AND A SECOND COAT TO THE FLEECEBACK MEMBRANE.
5. FOR ALL EPDM SPLICE INTERSECTIONS, REFER TO FB–2 DETAILS.

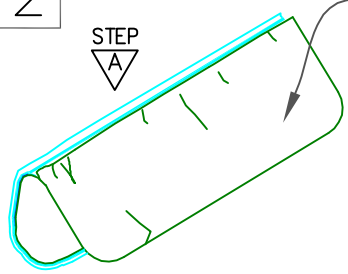
FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	PARAPET/CURB–WATER BASED ADHESIVES W/ BEAD APPLIED FLEXIBLE FAST AT PERIMETERS– OVER CONCRETE. PAGE 2 OF 2 MAXIMUM WARRANTY: 20 YEARS (90MPH)	DETAIL NO. FB–12C.1 FLEECEBACK ADHERED

1



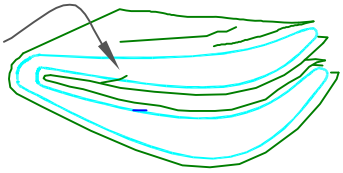
CLEAN DRY SPLICE AREA OF THE EPDM MEMBRANE BY SCRUBBING WITH EPDM PRIMER.

2



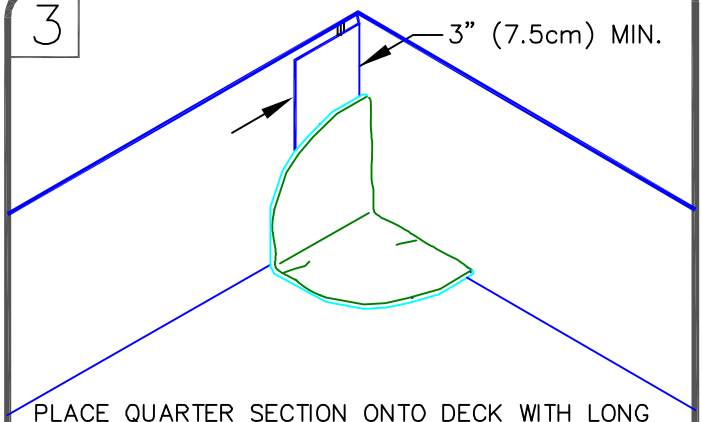
CLEAR POLY RELEASE FILM REMOVE POLY RELEASE FILM AND PLACE ON FLASHING SIDE TO PREVENT STOCKING

STEP
B



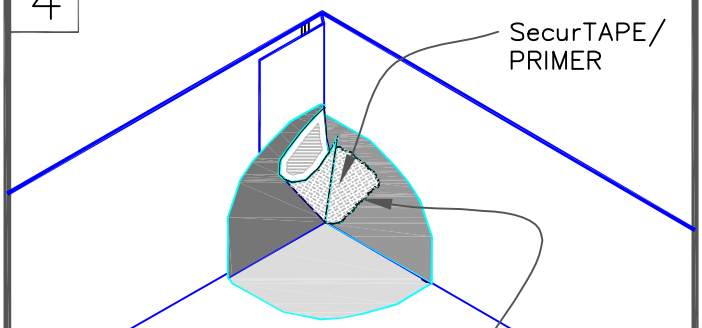
FOLD PRESSURE-SENSITIVE CORNER LENGTHWISE AND PROCEED TO FOLD QUARTERLY AS SHOWN IN STEP B

3



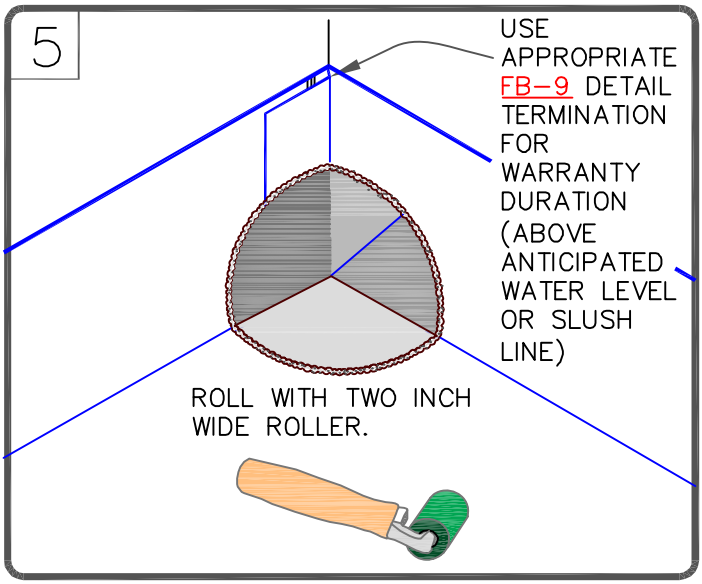
PLACE QUARTER SECTION ONTO DECK WITH LONG FOLDED SIDE FACING THE WALL. REMOVE REMAINING RELEASE PAPER. PRESS FIRMLY AND PROCEED WITH SECOND QUARTER GOING UP THE VERTICAL WALL BY PRESSING FIRMLY INTO CORNER.

4



FORM A PIG EAR. APPLY PRIMER/SecurTAPE TO THE PIG EAR AND ADHERE TO THE WALL.

5



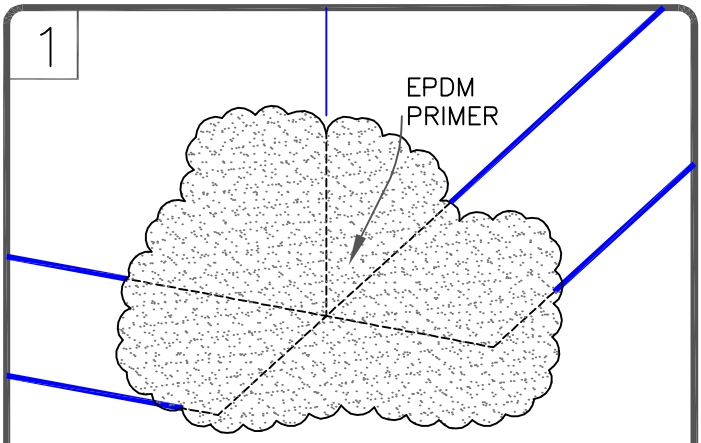
ROLL WITH TWO INCH WIDE ROLLER.

NOTES:

1. FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES OR WHEN USING 145-MIL MEMBRANE, ALL INSIDE CORNERS MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE-SENSITIVE FLASHING. THE BOTTOM LAYER SHALL BE A 7"X9" (17.5cm X 23cm) PRESSURE-SENSITIVE PRE-CUT INSIDE/OUTSIDE CORNER OR A 6'X6" (15cm X 15cm) PRESSURE-SENSITIVE ELASTOFORM FLASHING PIECE COVERED WITH A 12"X12" (30cm X 30cm) TOP LAYER OF PRESSURE-SENSITIVE ELASTOFORM FLASHING. BOTH LAYERS SHALL BE CENTERED AND SEALED WITH CONTINUOUS LAP SEALANT.
2. EPDM PRIMER MUST BE APPLIED TO ALL SPLICE AREAS AND FOR EACH LAYER OF PRESSURE-SENSITIVE FLASHING.
3. IF USING FLEECE MEMBRANE ON THE VERTICAL, STRIP-IN SPLICE WITH ELASTOFORM PRIOR TO INSTALLING OUTSIDE CORNER.

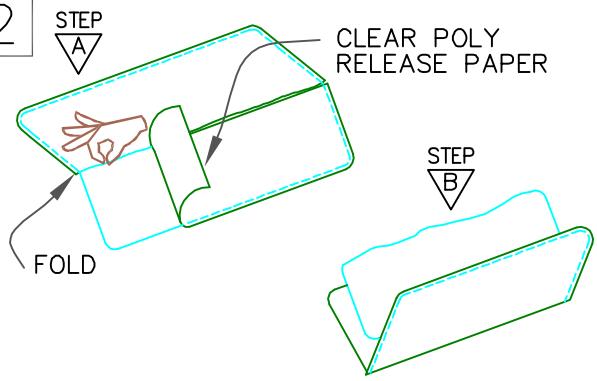
FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	EPDM PRESSURE-SENSITIVE INSIDE CORNER MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB-15A.1 FLEECEBACK ADHERED

1



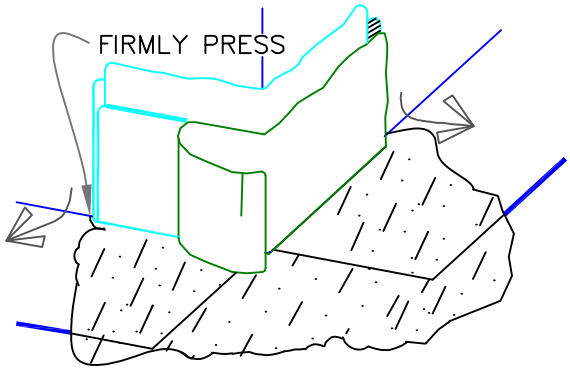
CLEAN THE DRY SPLICE AREA OF THE EPDM MEMBRANE BY SCRUBBING WITH EPDM PRIMER.

2



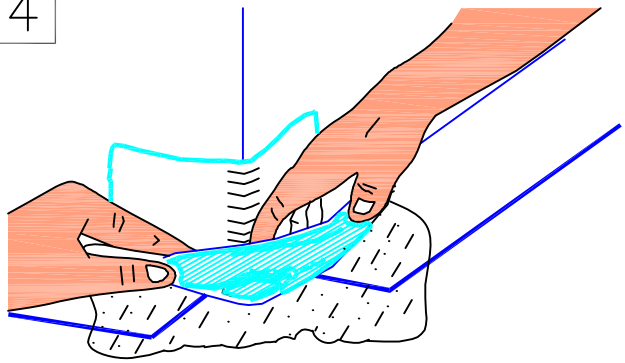
PRIOR TO PLACEMENT OF SURE-SEAL CORNER, PEEL OFF THE BLUE POLY RELEASE FILM AND HEAT THE FLASHING SIDE WITH A HEAT GUN. RE-APPLY THE POLY LOOSELY. FOLD THE FLASHING IN HALF.

3



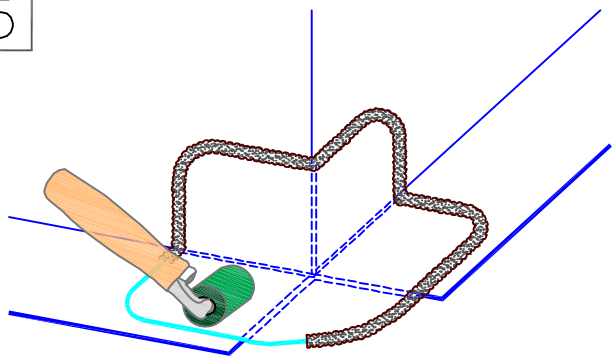
PLACE SURE-SEAL INSIDE/OUTSIDE CORNER AS SHOWN AND REMOVE RELEASE PAPER. PRESS FOLDED FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY PRESS FLASHING AGAINST THE VERTICAL SURFACE.

4



PLACE FOLDED FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY PRESS FLASHING ONTO THE DECK FLANGE BY PRESSING THE FLASHING AGAINST THE HORIZONTAL SURFACE.

5



ROLL WITH A TWO INCH WIDE ROLLER. PAY PARTICULAR ATTENTION TO THE STEP OFFS AND ANGLE CHANGE.

NOTE:

FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES OR WHEN USING 145-MIL MEMBRANE, REFER TO THERMOSET DETAIL U-15H FOR REQUIRED FLASHING ENHANCEMENTS.

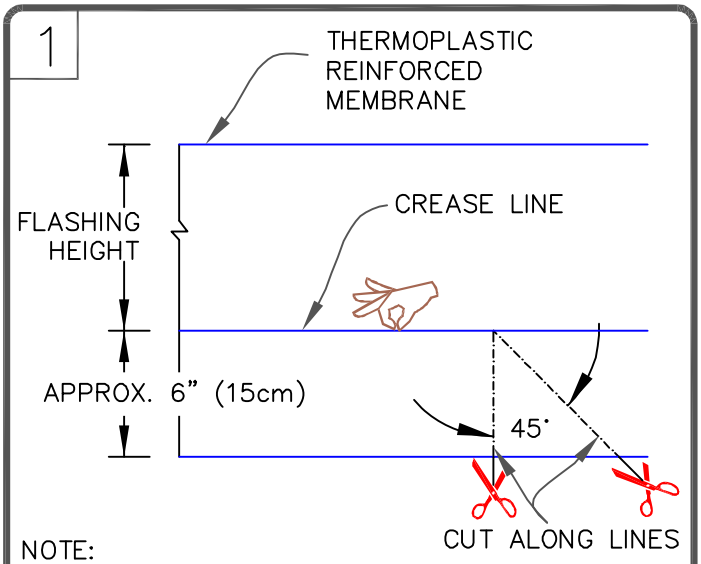
FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

EPDM PRESSURE-SENSITIVE OUTSIDE CORNER

MAXIMUM WARRANTY: 30 YEARS

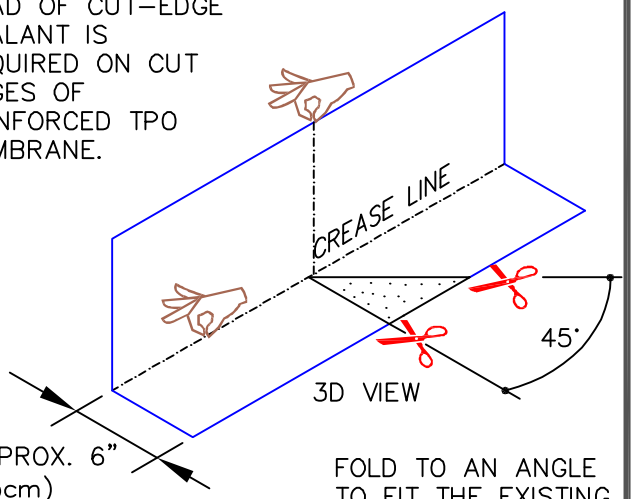
DETAIL NO.
FB-15B.1
FLEECEBACK ADHERED

1

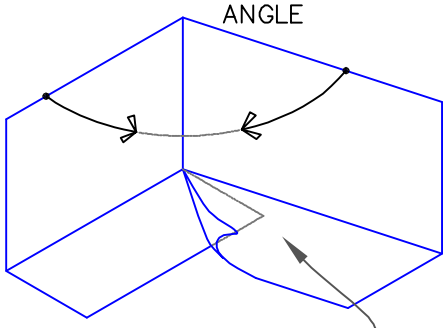


NOTE:

APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.



FOLD TO AN ANGLE TO FIT THE EXISTING INSIDE CORNER ANGLE

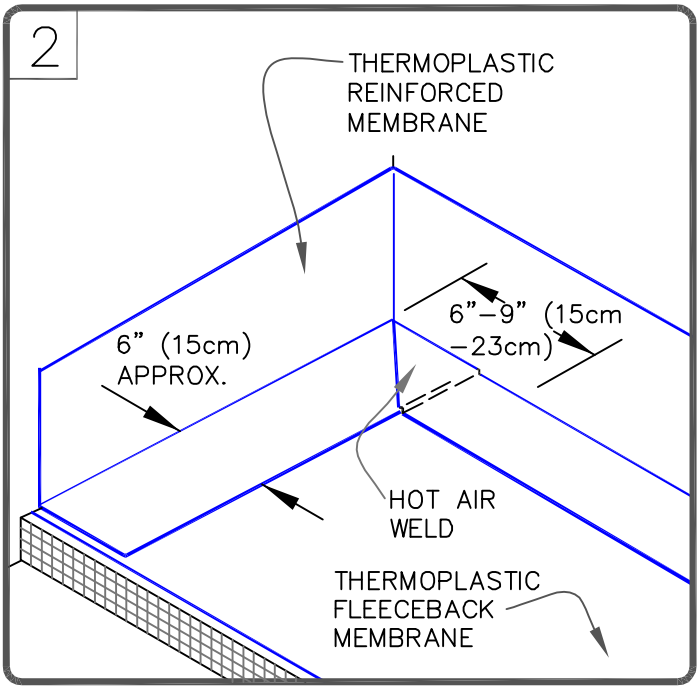


NOTE: THE 45° CUT SIDE GOES ABOVE THE 90° CUT SIDE.

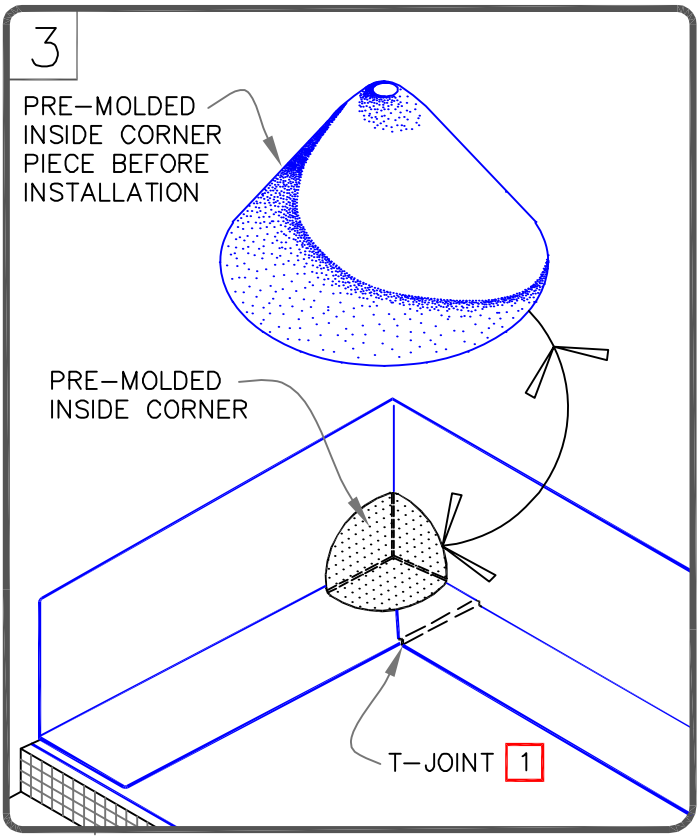
MAKE CREASE

CUT MEMBRANE

2



3



NOTES:

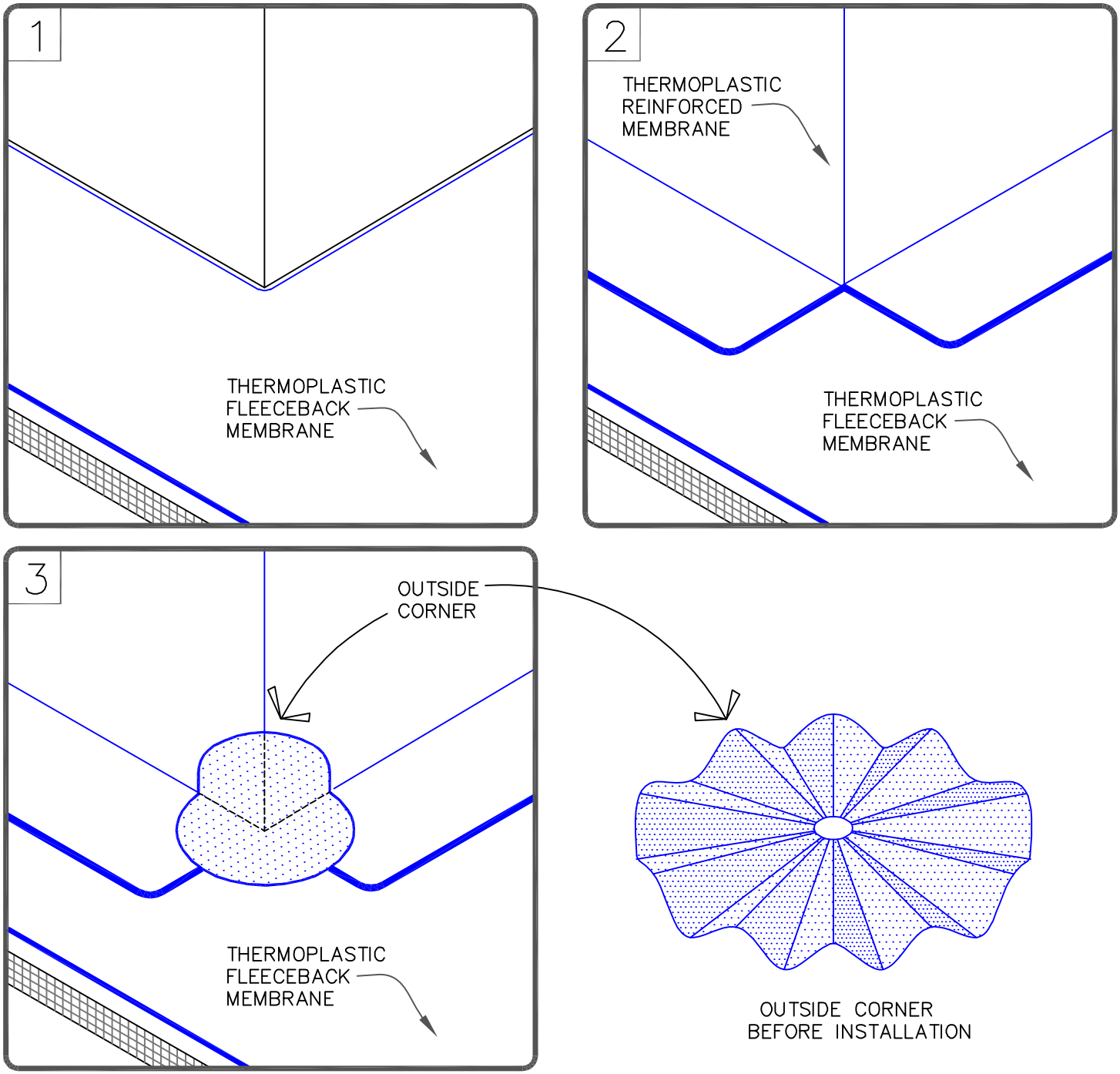
1. WHEN USING 115 OR 135-MIL FLEECEBACK TPO OR 135-MIL FLEECEBACK PVC/KEE HP MEMBRANE, APPLY A 4-1/2" (11cm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
2. WHEN USING 115-MIL FLEECEBACK TPO, MAXIMUM WARRANTY IS 20 YEARS

FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

THERMOPLASTIC PRE-MOLDED INSIDE CORNER

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB-15C.1
FLEECEBACK ADHERED



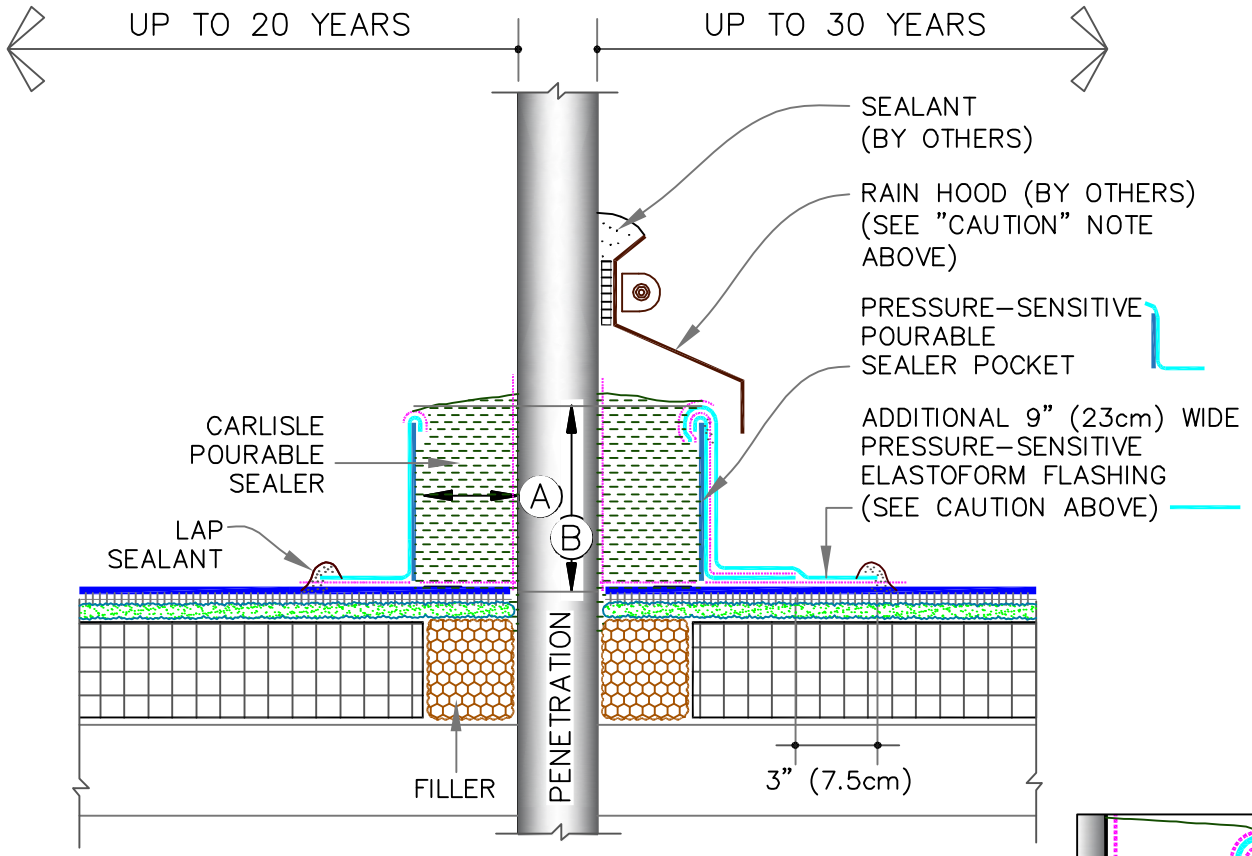
NOTE:

APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

FleeceBACK MEMBRANE APPROVED ADHESIVE APPROVED SUBSTRATE 0 SEE NOTE(S)	THERMOPLASTIC PRE-MOLDED OUTSIDE CORNER MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. FB-15D.1 FLEECEBACK ADHERED

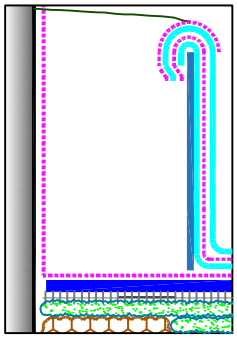
CAUTION

POURABLE SEALER POCKETS MUST BE USED IN CONJUNCTION WITH RAIN HOODS AND AN EXTRA LAYER OF PRESSURE SENSITIVE ELASTOFORM FLASHING [EXTENDING 3" (7.5cm) BEYOND THE BASE LAYER OF FLASHING] FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES.



NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. PENETRATIONS, MEMBRANE, FLASHING AND METAL (INSIDE POCKET) MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER. DO NOT PRIME THE BLUE PLASTIC SUPPORT STRIP.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE-SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
6. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
7. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF-8A) REGARDLESS OF SIZE OR DIAMETER.
8. PIPE CLUSTERS MUST HAVE MINIMUM 1" (2.5cm) CLEARANCE BETWEEN PENETRATIONS.



MANDATORY EPDM PRIMER AT ALL INTERFACES OF POURABLE SEALER EXCEPT BLUE PLASTIC SUPPORT STRIP

DIMENSIONS		cm	
A	1"	2.5	MIN.
B	2"	5	MIN.

FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

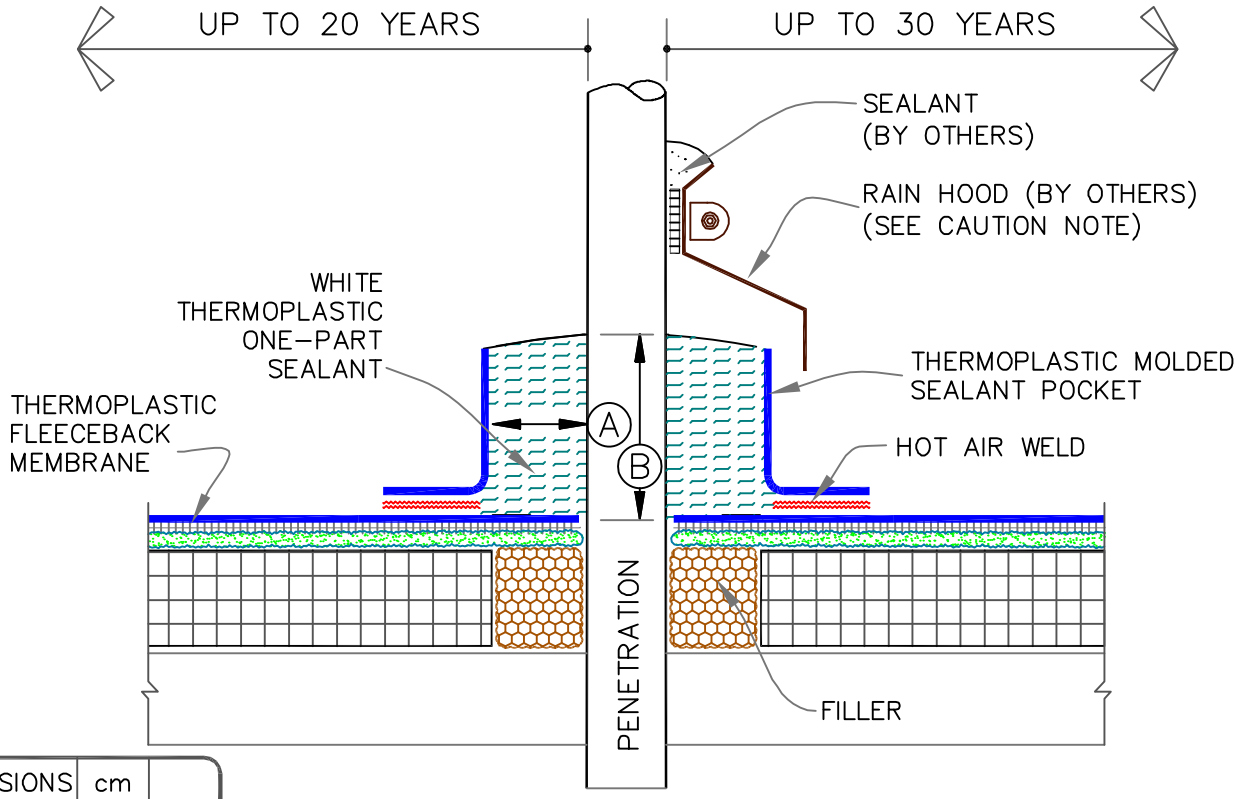
EPDM PRESSURE-SENSITIVE POURABLE SEALER POCKET

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. FB-16A.1

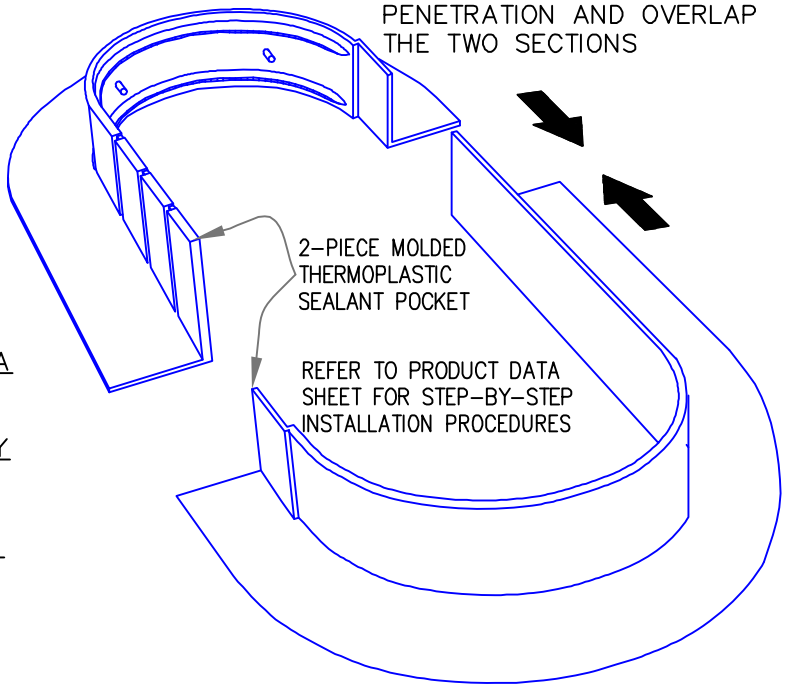
FLEECEBACK ADHERED

CAUTION MOLDED SEALANT POCKETS MUST BE USED IN CONJUNCTION WITH RAIN HOODS FOR PROJECTS WITH 25 AND 30 YEAR WARRANTIES.



DIMENSIONS		cm	
A	1"	2.5	MIN.
B	2"	5	MIN.

PLACE MOLDED THERMOPLASTIC SEALANT POCKET AROUND PENETRATION AND OVERLAP THE TWO SECTIONS



NOTES:

1. TEMPERATURE OF PIPE MUST NOT EXCEED 160°F (71°C).
2. WHEN USING TPO MEMBRANE/MOLDED SEALANT POCKET, APPLY A THIN COAT OF TPO PRIMER TO THE INSIDE AND AROUND THE TOP RIM OF THE POCKET, TO THE DECK MEMBRANE ENCLOSED BY THE POCKET AND TO THE PENETRATION USING A SMALL PAINT BRUSH. WHEN USING PVC MOLDED SEALANT POCKET, CLEAN THE POCKET WITH PVC KEE HP CLEANER, APPLY TPO CLEANER TO PENETRATION(S) ONLY.
3. ONE-PART SEALANT MUST COMPLETELY FILL MOLDED SEALANT POCKET TO PREVENT PONDING OF WATER.
4. PIPE CLUSTERS MUST HAVE MINIMUM 1" (2.5cm) CLEARANCE BETWEEN PENETRATIONS.

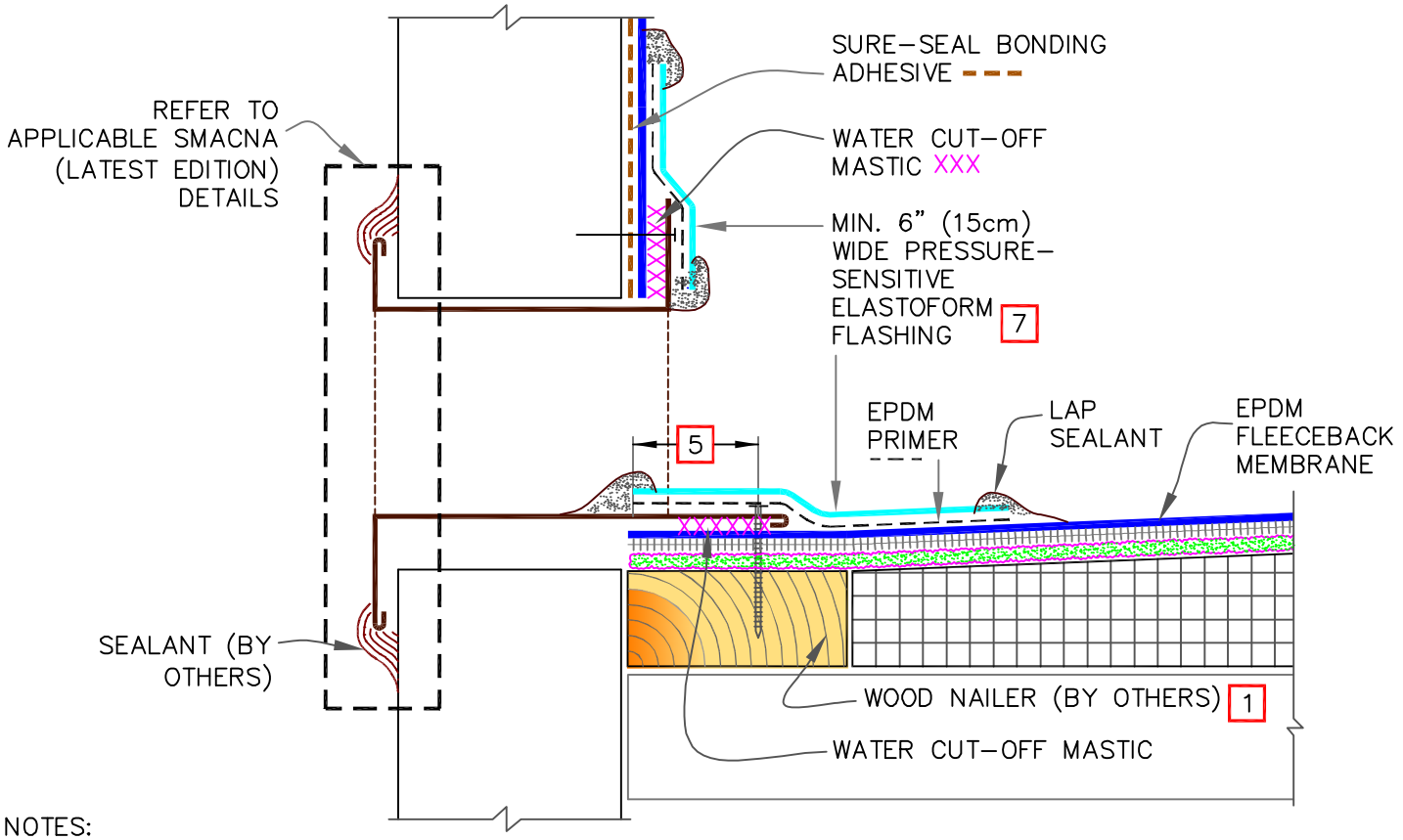
FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

THERMOPLASTIC MOLDED SEALANT POCKET

MAXIMUM WARRANTY: 30 YEARS

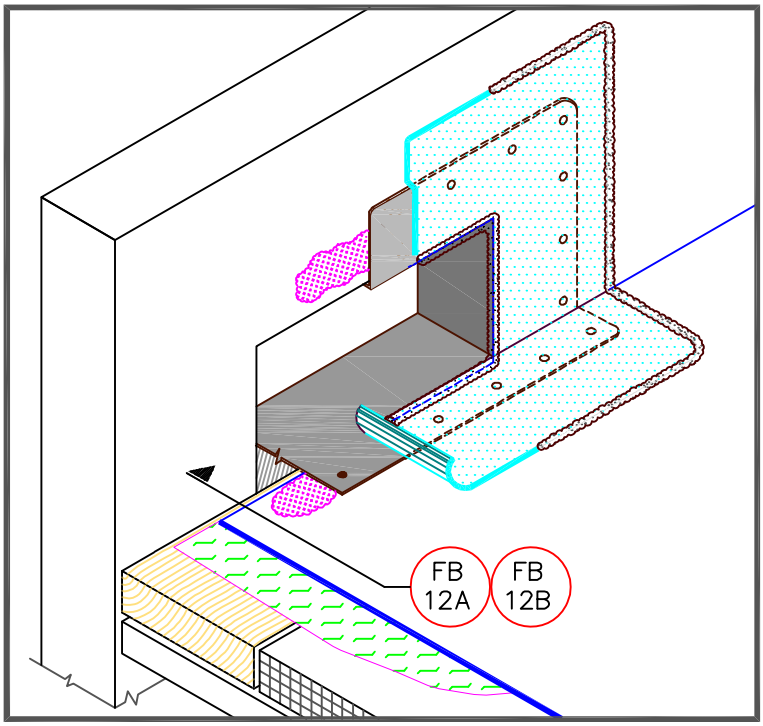
DETAIL NO. FB-16B.1

FLEECEBACK ADHERED



NOTES:

1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
2. INSTALL WALL FLASHING PRIOR TO SCUPPER INSTALLATION.
3. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS. SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
4. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT COMPRESSION.
5. SCUPPER FLANGES MUST BE TOTALLY COVERED BY PRESSURE-SENSITIVE ELASTOFORM FLASHING WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS.
6. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING EPDM PRIMER.
7. APPLY EPDM PRIMER TO METAL FLANGE AND MEMBRANE SURFACE PRIOR TO INSTALLING PRESSURE-SENSITIVE ELASTOFORM FLASHING.

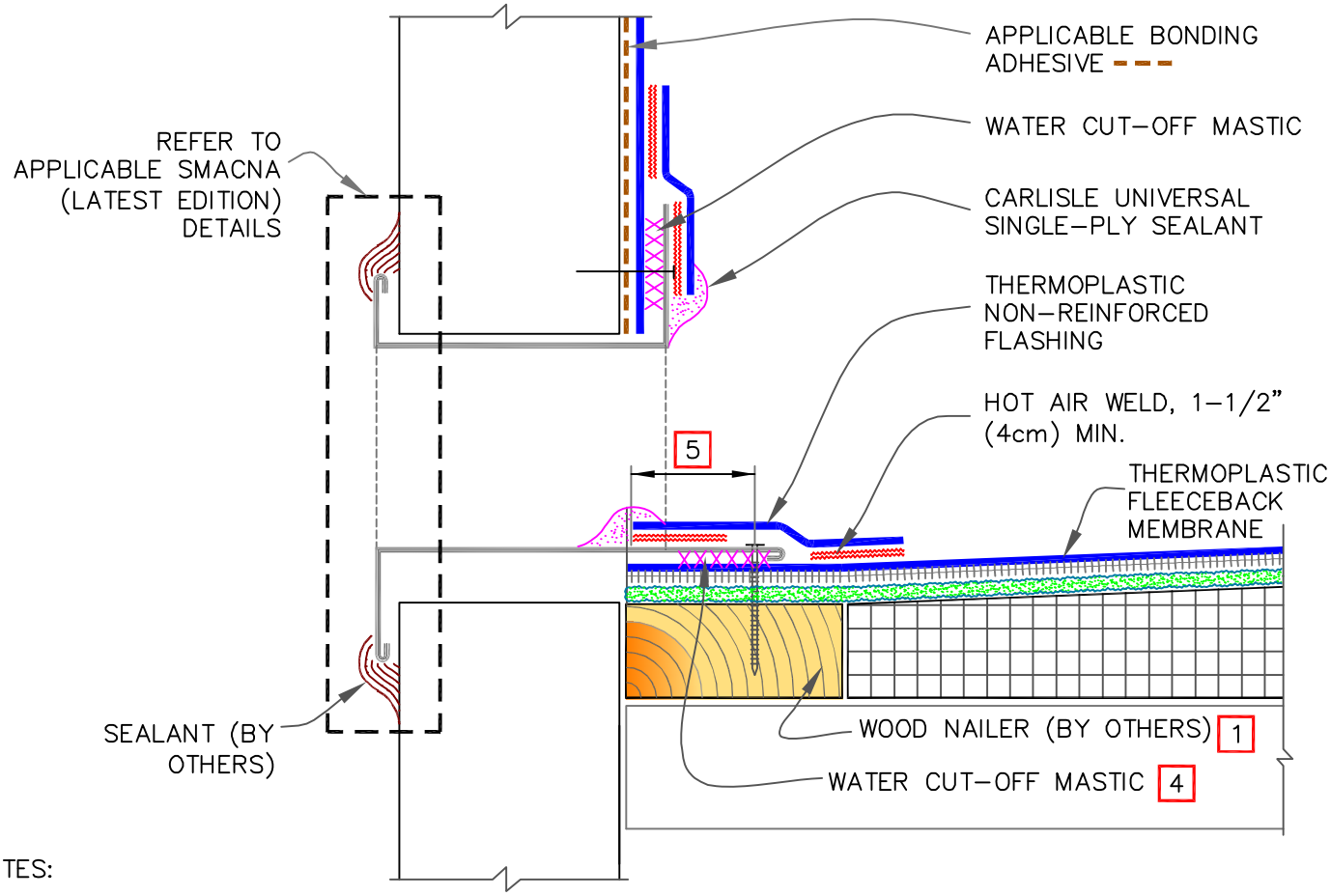


FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

THROUGH-WALL SCUPPER WITH PRESSURE-SENSITIVE EPDM FLASHING

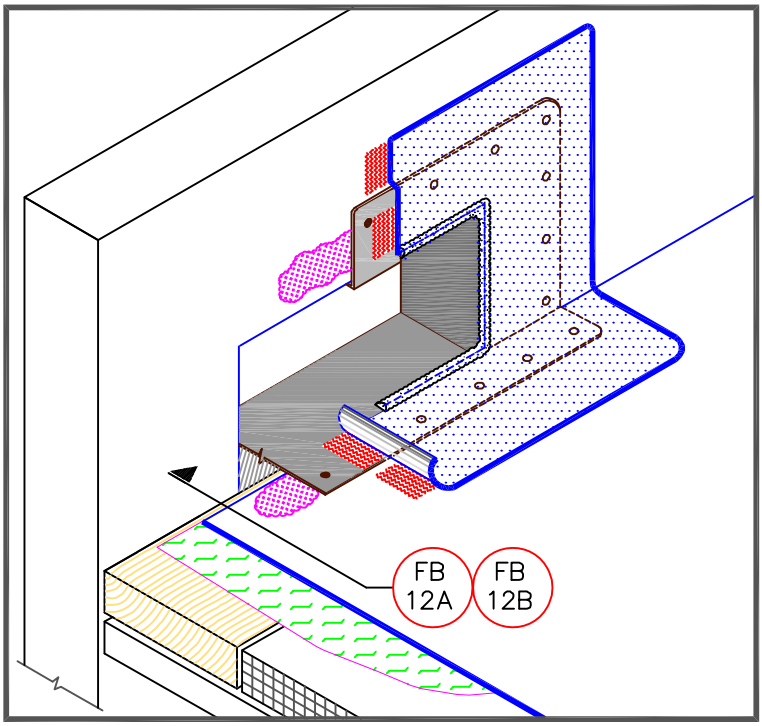
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB-18A.1
FLEECEBACK ADHERED



NOTES:

1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
2. INSTALL WALL FLASHING PRIOR TO SCUPPER INSTALLATION.
3. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS. SOLDER ALL SCUPPER SEAMS WATER–TIGHT.
4. WATER CUT–OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT COMPRESSION.
5. SCUPPER FLANGES MUST BE TOTALLY COVERED BY THERMOPLASTIC NON–REINFORCED FLASHING WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS.
6. UNIVERSAL SINGLE–PLY SEALANT IS REQUIRED AT FLASHING EDGES ON SCUPPER EDGE. WHEN USING TPO MEMBRANE, TPO PRIMER MUST BE USED TO PREPARE SURFACES PRIOR TO THE APPLICATION OF SEALANT.

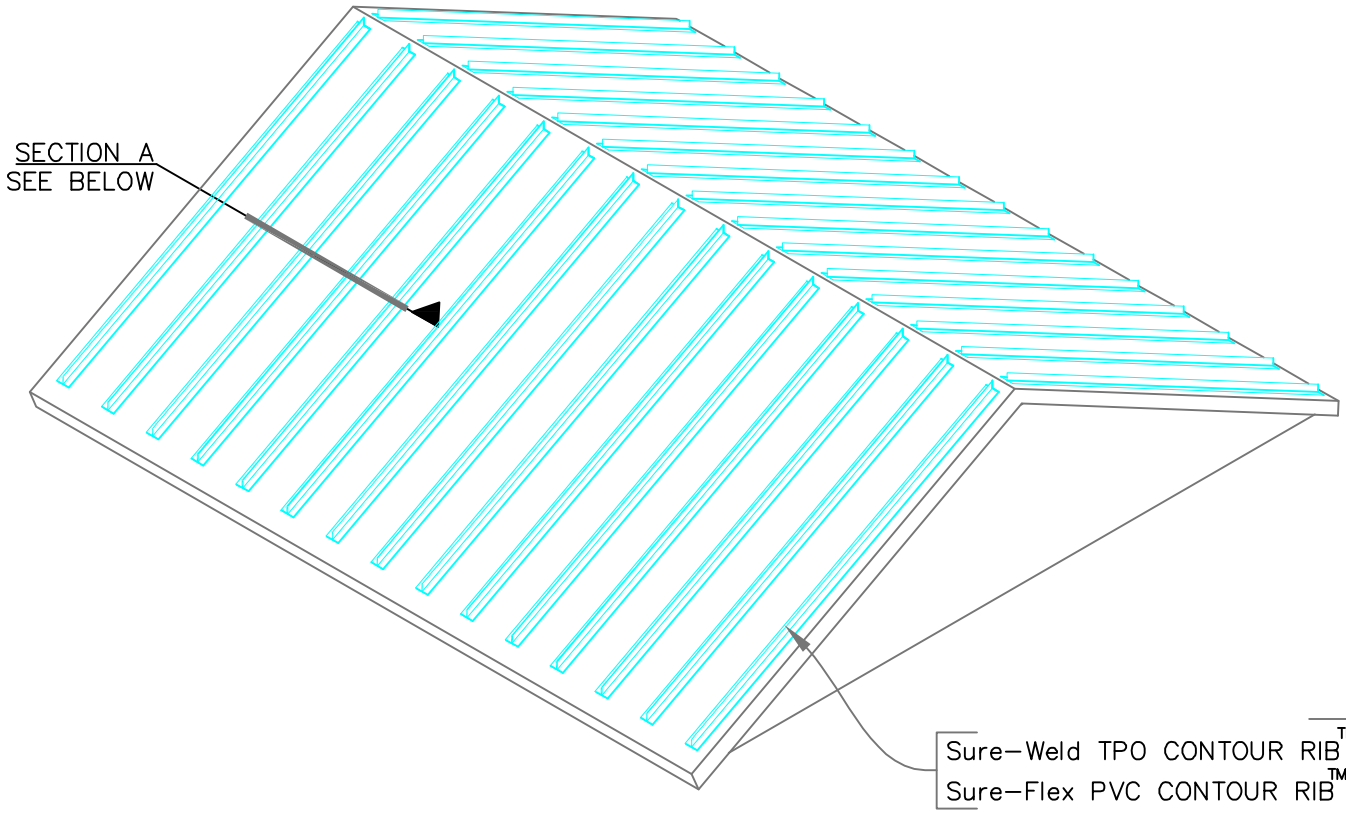


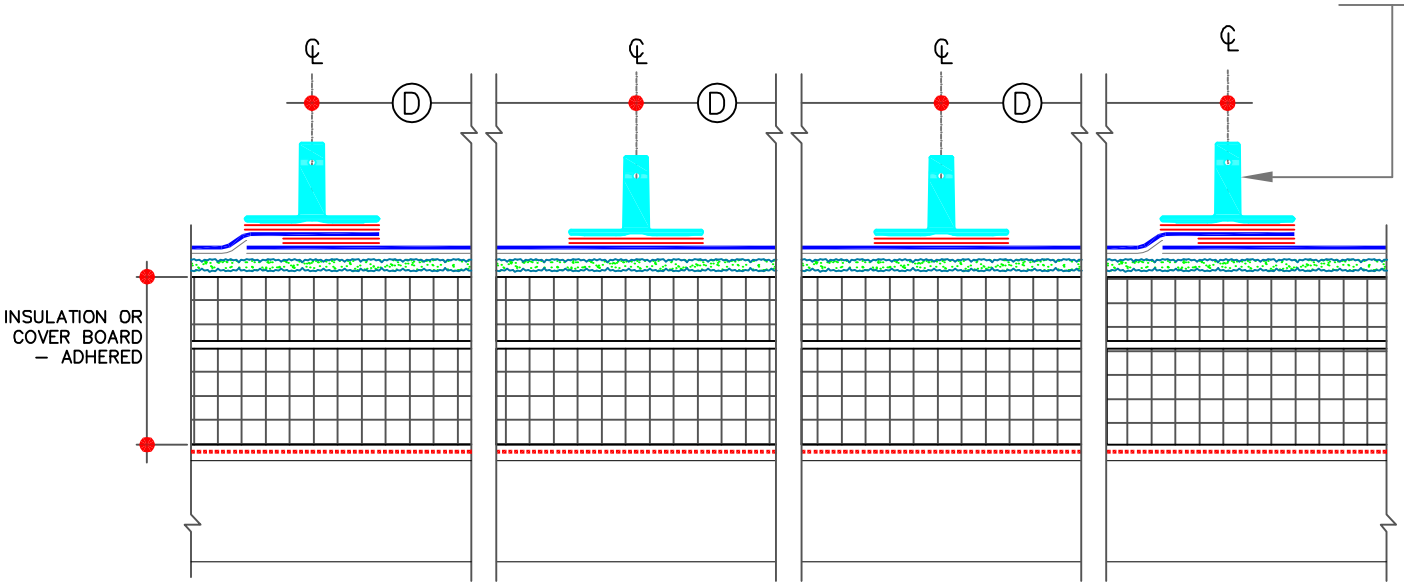
FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

THROUGH–WALL SCUPPER WITH SecurWELD OR SURE–FLEX METAL

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–18B.1
FLEECEBACK ADHERED





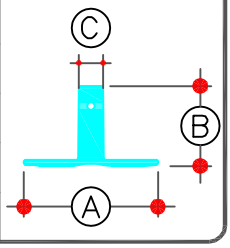
SECTION A: PVC/TPO CONTOUR RIB PROFILE

HOT AIR WELD
(REFER TO SPECS)

AIR/VAPOR BARRIER
(WHERE REQUIRED)

RIB PROFILE DIMENSIONS

	INCH	cm
A	1–3/4"	4.5
B	1–1/4"	3
C	1/2"	1
D	VARIES	



FleeceBACK MEMBRANE
APPROVED ADHESIVE
APPROVED SUBSTRATE
0 SEE NOTE(S)

SIMULATION OF METAL ROOF IN THERMOPLASTIC MEMBRANES

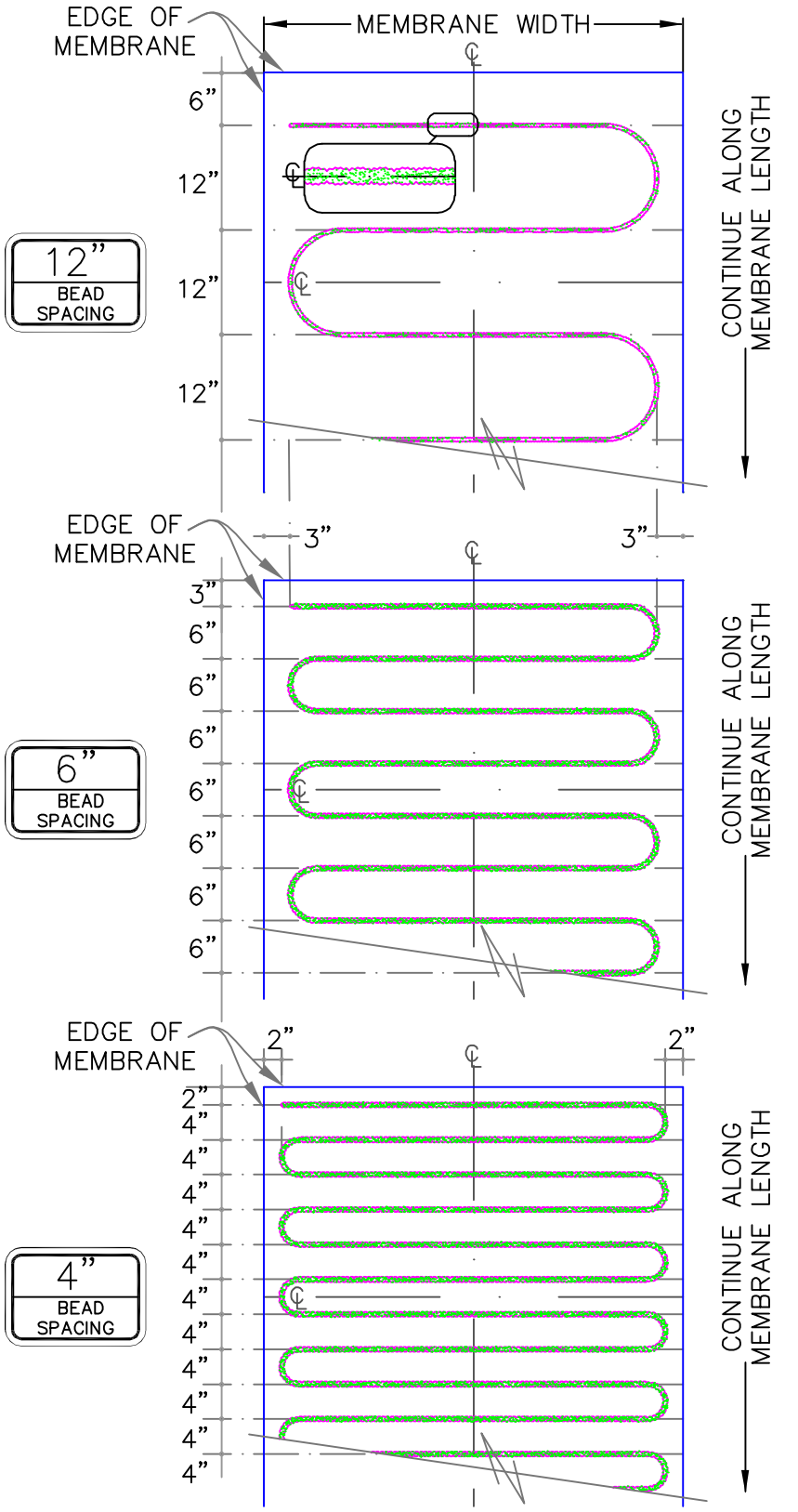
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.
FB–25.1
FLEECEBACK ADHERED

FLEXIBLE FAST ADHESIVE BEADS ATTACHMENT

NOTES:

1. REFER TO CARLISLE SPECIFICATIONS FOR PRODUCT DATA SHEETS FOR APPROPRIATE BEAD SPACING BASED UPON THE BUILDING HEIGHT, WARRANTY TERM AND ACCEPTABLE SUBSTRATE.
2. THE SURFACE TO WHICH ADHESIVE IS TO BE APPLIED SHALL BE DRY, FREE OF FINS, PROTRUSIONS, SHARP EDGES, LOOSE AND FOREIGN MATERIALS, OIL AND GREASE. AREA SHOULD BE CLEANED WITH AN AIR BLOWER.
3. PREVIOUSLY UNEXPOSED ASPHALT OR RESIDUE MUST BE PRIMED WITH CARLISLE CAVGRIP III, 702 OR 702LV PRIMER.
4. SEAL ALL GAPS IN THE CONCRETE DECK WITH CARLISLE 725TR OR OTHER SUITABLE MATERIAL TO AVOID CONDENSATION ISSUES OR FILL WITH CARLISLE INSULATION ADHESIVE.
5. UNROLL 10' TO 15' OF MEMBRANE TO ENSURE IT IS PROPERLY ALIGNED AND FOLD UNROLLED SECTION BACK OVER ROLL.
6. APPLY FLEXIBLE FAST ADHESIVE OVER THE SUBSTRATE AREA TO BE COVERED BY THE MEMBRANE THAT IS FOLDED BACK.
7. ALLOW FLEXIBLE FAST ADHESIVE TO RISE AND DEVELOP "STRING / BODY" (APPROX. 1–1/2 TO 2 MINUTES). STRING TIME WILL VARY BASED ON ENVIRONMENTAL CONDITIONS LIKE TEMPERATURE AND HUMIDITY. DO NOT ALLOW THE ADHESIVE TO OVER–CURE PRIOR TO SETTING INSULATION BOARDS.
8. ROLL THE MEMBRANE USING A 30" WIDE, 150 POUND WEIGHTED SEGMENTED STEEL ROLLER, TO SET THE MEMBRANE BACK INTO THE ADHESIVE.



FEET TO CENTIIMETERS	
4'	8'
120	250

	INCHES TO CENTIMETERS																			
inch	1/8"	1/4"	15/32"	1/2"	5/8"	3/4"	1"	1.5"	2"	2.5"	3"	4"	6"	8"	9"	11"	12"	18"	24"	36"
cm	0.5	1	1.2	1.5	1.6	2	2.5	4	5	6.5	7.5	10	15	20	23	28	30	46	61	91

℄ CENTER LINE
GUIDE LINE
FOAM ADHESIVE

FLEECEBACK MEMBRANE ATTACHMENT USING BEAD ADHESIVE

For additional information, refer to Specifications

DETAIL NO.
FB–27
ADHERED SYSTEM

NOTES:

1. Flexible FAST ADHESIVE SHOULD BE DISPENSED IN LARGE DROPLETS, NOT A FINE MIST. AIR PRESSURE/FLOW IS TOO HIGH IF THE Flexible FAST ADHESIVE IS DISPENSING IN A FINE MIST.

2. REFER TO CARLISLE DOCUMENT, SPEC SUPPLEMENT, SECTION G-02-22.3a FOR EQUIPMENT INFORMATION.

3. THE SURFACE TO WHICH ADHESIVE IS TO BE APPLIED SHALL BE DRY, FREE OF FINS, PROTRUSIONS, SHARP EDGES, LOOSE AND FOREIGN MATERIALS, OIL AND GREASE. AREA SHOULD BE CLEANED WITH AN AIR BLOWER.

4. PREVIOUSLY UNEXPOSED ASPHALT OR RESIDUAL MUST BE PRIMED WITH CARLISLE CAVGRIP III, 702 OR 702LV PRIMER.

5. SEAL ALL GAPS IN THE CONCRETE DECK WITH CARLISLE 725TR OR OTHER SUITABLE MATERIAL TO AVOID CONDENSATION ISSUES OR FILL WITH CARLISLE INSULATION ADHESIVE.

6. UNROLL 10' TO 15' (305-457cm) OF MEMBRANE TO ENSURE IT IS PROPERLY ALIGNED AND FOLD UNROLLED SECTION BACK OVER ROLL.

7. APPLY Flexible FAST ADHESIVE OVER THE SUBSTRATE AREA TO BE COVERED BY THE MEMBRANE THAT IS FOLDED BACK.

8. ALLOW Flexible FAST ADHESIVE TO RISE AND DEVELOP "STRING/BODY" (APPROX. 1-1/2 TO 2 MINUTES). STRING TIME WILL VARY BASED ON ENVIRONMENTAL CONDITIONS LIKE TEMPERATURE AND HUMIDITY. DO NOT ALL THE ADHESIVE TO OVER-CURE PRIOR TO SETTING INSULATION BOARDS.

9. ROLL THE MEMBRANE USING A 30" (76cm) WIDE, 150 POUND (68 KILOGRAM) WEIGHTED SEGMENTED STEEL ROLLER, TO SET THE MEMBRANE BACK INTO THE ADHESIVE. REFER TO CARLISLE DOCUMENT G-03-22.4.

FIG 1. CORRECT COVERAGE – SPLATTER APPLICATION

FIG 2. LIGHT COVERAGE – SPLATTER APPLICATION

	FLEECEBACK MEMBRANE ATTACHMENT USING SPLATTER For additional information, refer to Specifications	FB	DETAIL NO. FB-27.1 ADHERED SYSTEM