FLEECEBACK®

Sure-Seal®/Sure-White™ FleeceBACK® SPF Adhered Roofing System

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CARLISLE SYNTEC SYSTEMS

Sure-Seal®/Sure-White™FleeceBACK® SPF Adhered Roofing System

May 2011

PART I GENERAL

1.01 DESCRIPTION

The FleeceBACK SPF Adhered Roofing System incorporates 45-, 60-, or 90-mil thick Sure-Seal (black) or Sure-White (white-on-black) non-reinforced EPDM membrane laminated to 55-mil thick non-woven polyester fleece-backing. The membrane is fully adhered to Carlisle SPF-245 sprayed polyurethane foam insulation with Carlisle FAST™ Adhesive. Adjoining sheets of membrane are spliced together a minimum of 3" using Factory Applied SecurTAPE (FAT) and primer for up to 20 year warranties and 6" FAT for warranties over 20 years.

1.02 DESIGN CONSIDERATIONS

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

B. Petroleum based products, certain chemicals and waste products (i.e. grease, oil, animal fats, etc.) are not compatible with this roofing system. Carlisle should be contacted for verification of compatibility and recommendations concerning an acceptable roofing assembly.

C. It is the responsibility of the specifier to review local, state and regional codes to determine their impact on this Sure-Seal/Sure-White Roofing System.

D. 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.

E. Drainage

1. Drainage must be evaluated by the specifier in accordance with all applicable codes. Slopes may be provided by tapering the polyurethane foam; 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. 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 damage to the roofing assembly and to the interior of the building.

3. On **Sure-White Roofing Systems**, a slope greater than 1/8" per horizontal foot is recommended to serve the long-term aesthetics.

1.03 QUALITY ASSURANCE

A. Carlisle requires 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.

B. The specified roofing system must be installed by a Carlisle Authorized Roofing Applicator. The Applicator must be certified by Carlisle for installation of the new sprayed polyurethane foam substrate and must have a minimum of 5 years experience spraying polyurethane foam systems.

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

D. 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.

1.04 SUBMITTALS

A. **Prior to installation, all 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.

As-Built projects (roofing systems installed prior to project approval by Carlisle) are not permitted.

B. **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
6. Sprayed polyurethane foam thickness

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.

C. **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 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in the original, unopened containers, labeled with the manufacturer's name, brand name and installation instructions.

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

C. 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.

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

E. Do not store splicing cement, primer, Weathered Membrane Cleaner, etc., containers with opened lids due to the loss of solvent, which will occur from flash-off.

F. 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.

G. Insulation (used as a base layer beneath the sprayed polyurethane foam, where applicable) must be stored so that it is kept dry and is protected from the elements. Store insulation on a skid and completely cover with a breathable material such as tarp or canvas. If the insulation is lightweight, it should be weighted to prevent possible wind damage.

1.06 JOB SITE CONSIDERATIONS

Material Safety Data Sheets (MSDS) 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.

A. 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.

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 phased roofing, temporary closures shall be provided to prevent moisture infiltration.

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 foam and to prevent possible over spray.

1.07 WARRANTY

A 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 Incorporated. The membrane system is defined as membrane, insulation, flashings, sprayed polyurethane foam, adhesives, sealants and other Carlisle brand products utilized in the installation.

A. A **5, 10, 15, 20, or 30-Year Total System Warranty**, with wind speed coverage up to 80 mph is available for a charge. All components used in the installation must be manufactured or marketed by Carlisle. Some of the Carlisle brand materials included are membrane, polyurethane foam, adhesives, sealants, termination bars, metal edgings and copings.

Notes: For 20-year Warranty projects, FleeceBACK 115 membrane must be used with a minimum slope of 1/8". For 30-year Warranty projects, a complete tear-off of existing material is required and FleeceBACK 145 membrane must be used with a minimum slope of ¼ and a minimum 3 lb density SPF. Additional design enhancements may also be required. For approved 30 year details refer to the 30 year FleeceBACK specification. It is required that these projects be submitted to Carlisle prior to bid.

The 20 or 30-year Total System Warranty **is not available for applications directly over existing sprayed polyurethane foam** roof systems.

CAUTIONS:

Industrial pollutants, environmental dirt, and ponding conditions will discolor the surface of the Sure-White FleeceBACK membrane. Lack of additional membrane protection during application will increase the probability of soiling the white surface and will affect aesthetics of the roofing system. All these factors will result in minor color variations of the Sure-White FleeceBACK membrane in comparison to the original undisturbed membrane. When aesthetics are of importance, the specifier's requirements must be added in the project specifications pertaining to precautionary installation methods and necessary clean up.

Carlisle disclaims responsibility for the cleanliness or discoloration of the membrane system caused by environmental conditions including, but not limited to, dirt, pollutants, or biological agents and discoloration caused by or resulting from initial installation.

B. A warranty covering leaks caused by hail, maximum 1" diameter with FleeceBACK 100 membrane, maximum 2" diameter with FleeceBACK 115 membrane, and maximum 3" diameter with FleeceBACK 145 membrane can be issued. Contact Carlisle for specific information.

C. On projects utilizing FleeceBACK 115 membrane, a 10, 15, or 20-year warranty with limited coverage for accidental punctures (up to 16 man-hours per year) is available. On projects utilizing FleeceBACK 145 membrane, up to a 30-year warranty with limited coverage for accidental punctures (up to 32 man-hours per year) is available.

D. 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.

E. **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. Rooftop equipment that does not provide Carlisle with reasonable access to the membrane system for purposes of warranty investigation and related repairs.

4. Severely ponded conditions.

CAUTION: APPLICATIONS SUCH AS WALKING DECKS, TERRACES, PATIOS OR AREAS SUBJECTED TO CONDITIONS NOT TYPICALLY FOUND ON ROOFING SYSTEMS WILL NOT BE ELIGIBLE FOR A MEMBRANE SYSTEM WARRANTY.

PART II PRODUCTS

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.

2.01 MEMBRANE

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-mils. A selvage edge with 3" or 6" wide Factory-Applied SecurTAPE is provided along the length of the membrane for splicing. Membrane is available in widths of 5' or 10' and lengths of 50' or 100' depending on the product and 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)	200 (890) 250 (1,112)	200 (890) 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		 15 20 25	 25 25 32
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, 17,640 kJ/m^2 total radiant exposure at 0.70 W/m□ irradiance 176° F (80°C) black panel temperature	ASTM G 155	No Cracks No Crazing	No Cracks No Crazing	No Cracks No Crazing
ENERGY STAR – Initial solar reflectance	SSR			0.84

ENERGY STAR – Solar reflectance after 3 years (cleaned)	SSR			0.80
CRRC – Initial solar reflectance	ASTM C1549			0.76
CRRC – Solar reflectance after 3 years (uncleaned)	ASTM C1549			0.64
CRRC – Initial thermal emittance	ASTM C1371			0.90
CRRC – Thermal emittance after 3 years (uncleaned)	ASTM C1371			0.87
LEED – Thermal emittance	ASTM E408			0.91
Solar Reflective Index (SRI)	ASTM E1980		9	105
LEED – Pre-consumer recycled content			3%	0%
LEED – Post-consumer recycled content			0%	0%
LEED – Manufacturing location			Carlisle, PA	Carlisle, PA

* 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.

2.02 Carlisle SPF-245 Insulation (Sprayed Polyurethane Foam)

Carlisle SPF-245 is an HFC blown rigid polyurethane foam system with high insulation efficiency and an excellent bond and compressive strength with the following physical properties. **SPF-245** is supplied in 55 gallon "drum sets" (A 55 gallon drum of Part "A" and a 55 gallon drum of Part "B"). 3 lb SPF-245 is required for 30 year warranties.

Physical Properties - Finished Product

Property	Test	2.5 lb Typical Results *	3 lb Typical Results *
Compressive strength (psi) Type III per ASTM C-1029	ASTM D-1621	45	55
Density (pcf)	ASTM D-1622	In place 2.4 – 2.6 pcf	In place 2.9 - 3.2 pcf
Tensile Strength (psi) (per ASTM C-1029	ASTM D-1623	60-80	60-80
Closed Cell Content (per ASTM C-1029	ASTM D-2856	>90%	>90%
K-Factor (BTU Inch/Ft.² Hr° F)	ASTM C-518	6 months TBD Time of Manufacture 0.158	6 months TBD Time of Manufacture 0.158
Water Vapor Permeability	ASTM C-1029 ASTM E-96	1.97 Perms 2.58 Perm Inch	1.97 Perms 2.58 Perm Inch
Water Absorption	ASTM C-1029 ASTM D-2842	0.3 vol %	0.6 vol %
Dimensional Stability-Volume Change (%) 158° F/95% RH 168 hrs/28 days 158° F Dry Heat 28 days -20° F 14 days	ASTM D-2126	2.21%/5.00% 1.75% -0.40%	2.21%/5.00% 1.75% -0.40%
Coverage Rate for 1” pass	Sq.Ft. per set	2,900	2,700
Coverage Rate for 1.5” pass	Sq.Ft. per set	2,150	2,000

* These physical property results are typical for this foam system applied at our development facility under controlled conditions. The foam and resultant physical properties can vary with changes in the application parameters; i.e., temperatures, foam thickness, processing equipment, mix head variations, through-put, etc. As a resultant, these published properties are useful for evaluation guidelines. Physical property specifications should be determined from actual production processed foam.

Physical Properties - Liquid Product

Property	Test	SPF-245
Mix Ratio	By Volume	1 to 1
Specific Gravity	ASTM D-1638	1.18
Viscosity (cps)	Brookfield RVF	500 - 800

Available Reactivities

Formulation Name (Part B)	Ambient Temperature Range
Summer AZ (high temp.)	100-120° F
Summer	85-100° F
Spring/Fall (mid range)	65-90° F
Winter	50-70° F

The recommended application and handling procedures for the specific product being used should be known and followed by the foam applicator. A small "test area" of spray foam should be applied and inspected prior to commencing the project. This simple, low-cost test area can indicate inadequate adhesion, improper surface preparation and/or primer, surface contamination, improper substrate and/or ambient temperature, equipment malfunctions, material contamination, or improper application technique. A simple visual inspection of a sample cut from a test and periodic job samples can reveal potential problems that may be due to one or more of the above conditions.

Shelf life is 3 months for the B Side from the date of manufacture when stored in the original unopened container (50-80° F).

2.03 Flashing

FleeceBACK membrane is generally extended up parapets/curbs and terminated as shown in Carlisle's published details. The following flashing materials are also available for various details.

A. **Sure-Seal/Sure-White Pressure-Sensitive Cured Cover Strip**: a nominal 60-mil, cured EPDM membrane laminated to a nominal 35-mil cured, pre-applied adhesive tape. Available in 6", 9" and 12" widths and 100' long rolls used to flash metal edgings and to overlay splice intersections, tape overlaps or edges of FleeceBACK membrane where fleece-backing is exposed.

B. **Sure-Seal Pressure-Sensitive Overlayment Strip**: a nominal 40-mil black, semi-cured EPDM membrane laminated to a nominal 35-mil cured, pre-applied adhesive tape. Available in 6", 9" and 12" widths and 100' long rolls used to overlay splice intersections, tape overlaps or edges of FleeceBACK membrane where fleece-backing is exposed.

C. **Sure-Seal/Sure-White Pressure-Sensitive Elastoform Flashing:** a nominal 60-mil uncured black EPDM membrane laminted to a nominal 35-mil fully cured splice tape. Available in 6", 9" and 12" and 50' long rolls an easily formed uncured EPDM membrane used mainly to overlay splice intersections or tape overlaps, or 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 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.

E. **Pre-Fabricated Accessories:**

1. **Sure-Seal/Sure-White Pressure-Sensitive Pipe Flashings** with pressure-sensitive adhesive tape pre-applied to the deck flange (for ease of application) are available for use with Sure-Seal/Sure-White Roofing Systems.

2. **Sure-Seal/Sure-White Pourable Sealer Pocket:** a prefabricated pourable sealer pocket which consists of a 2" wide plastic support strip with pre-applied, adhesive tape on the back of 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 pre-applied adhesive 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 Fully Pressure-Sensitive Curb 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.

2.04 Cleaners, Primers, Adhesives and Sealants

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 Material Safety Data Sheets for applicable cautions and warnings.

A. **FAST 100-LV Adhesive:** A two-component (Part A and B) spray applied polyurethane foam adhesive for bonding FleeceBACK membrane to various substrates. FAST Adhesive can also be used as a base insulation adhesive over compatible substrates.

B. **FAST Catalyst:** Added to FAST Adhesive (Part-B) for applications in temperatures between 25° F and 50° F to speed up reaction time.

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

D. **Sure-Seal/Sure-White SecurTAPE:** A 3" or 6" wide 100' long splice tape that complies with the South Coast Air Quality Management District Rule 1168.

E. **Sure-Seal HP-250 Primer**: A primer used to prepare the surface of EPDM membrane for the application of SecurTAPE or Pressure-Sensitive products.

F. **Low VOC Primer:** An optional low VOC (Volatile Organic Compound) primer for use with SecurTAPE or Pressure-Sensitive products. Complies with South Coast Air Quality Management District Rule 1168.

G. **Sure-Seal/Sure-White Splicing Cement**: A high-strength, butyl-based contact cement, which is used for splicing adjoining sections of FleeceBACK membrane or flashing (cured or uncured).

H. **In-Seam Sealant:** A one-part, gun-consistency sealant applied in the **adhesive splice** between **cured** Sure--Seal/Sure-White FleeceBACK membrane sections.

I. **Sure-Seal/Sure-White Lap Sealant:** A heavy-bodied material (trowel or gun consistency) used to seal the exposed edges of an adhesive membrane splice or the edges of Pressure-Sensitive Flashing/Accessories. A preformed Lap Sealant tool is included in each carton of Lap Sealant. The use of Lap Sealant with tape splices is optional.

J. **Water Cut-Off Mastic**: A one-component, low viscosity, self- wetting, butyl blend mastic used as a sealing agent between the FleeceBACK membrane or flashing and applicable substrates.

K. **Universal Single-Ply Sealant**: A single-component, moisture curing, permanently flexible, multi-purpose construction sealant designed to seal most types of construction joints, counterflashings, surface mounted reglets, rain hoods and other metal accessories. Available in 10.3 ounce cartridges, packaged 24 per carton. Available in white only.

L. **One-Part Pourable Sealer**: A single-component, moisture curing, elastomeric polyether sealant designed to provide a flexible, durable long lasting seal around hard to flash penetrations. This product can also be used for attaching lightning rod bases and ground cable clips to the membrane surface. Packaged with four 1/2 gallon pouches per bucket. Available in black or white.

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

existing asphalt roofing systems.

2.05 Fastening Components

Fasteners (for base layer insulation or Dens-Deck securement into steel or wood decks)

A. **HP Fastener:** A threaded, black epoxy electro-deposition coated fastener with recessed square drive head.

B. **InsulFast Fastener**: A threaded Phillips head fastener used with 3" diameter Carlisle Insulation Plates. Used for insulation attachment into steel or wood decks.

C. **Pre-Assembled ASAP Fasteners:** A 3" diameter plastic plate with pre-assembled Fastener. Installed using OMG Fastening Tools.

D. **Insulation Fastening Plate**: A nominal 3" diameter metal plate used in conjunction with Sure-Seal Fasteners for securement of base insulation over steel decks.

E. **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 a serrated back to provide increased stability for vertical membrane terminations.

F. **Termination Bar Nail-In:** A 1-1/4" long expansion anchor with stainless steel drive pin used for fastening the Sure-Seal Termination Bar to concrete, brick or block walls.

2.06 Insulation and Underlayments: Used as base layer for Carlisle SPF-245 Insulation.

A. **Polyisocyanurate HP-H:** Rigid foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer. Available in a minimum flat stock thickness of 1" (also available tapered).

B. **HP Recovery Board:** A 1/2" thick high-density wood fiberboard conforming with ASTM C-208 Class 2 requirements.

C. **Dens-Deck/Dens-Deck Prime:** A glass-faced gypsum board available in 1/4", 1/2" and 5/8" thickness used primarily over steel or wood decks as the base layer for Carlisle SPF-245 Insulation.

D. **Securock:** A gypsum board available in 1/4", 1/2" and 5/8" thickness used primarily over steel or wood decks as the base layer for Carlisle SPF-245 Insulation.

PART III EXECUTION

3.01 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. 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.

C. Substrates shall be clean, smooth and dry. A primer may be required (typically acrylic-based) based on the substrate condition. Contact Carlisle for specific requirements.

D. Acceptable Decks (New Construction or Complete Tear-off, Note: **30 year warranties require complete tear-off**)

I. **Steel Decks**

a. Fluted steel decks require a suitable method of covering or filling the flutes prior to polyurethane foam application. Flutes may be covered with rigid board stock insulation, filled with precut board stock insulation or spray applied polyurethane foam.

b. Minimum 1/2" thick Carlisle supplied Dens-Deck glass-faced gypsum board, Securock or other approved Carlisle insulation may be used as a base layer.

c. Rigid board stock, when specified, may be attached to the steel deck with Carlisle HP or InsulFast Fasteners and insulation plates at a minimum fastening density of 1 per 2 square feet or adhered to the deck with Carlisle FAST Adhesive.

Note: For steel decks less than 22 gauge, pullout tests must be conducted to verify adequate holding power can be achieved. A minimum pullout value of 300 pounds is required.

d. If polyurethane foam is to be used to fill the flutes of the steel deck or FAST Adhesive is used to attach board stock insulation, the deck must be cleaned using compressed air vacuum equipment, hand brooms or power brooms to remove all loose dirt or surface rust. Grease, oil or other contaminants must also be removed with proper cleaning solutions.

Note: In addition to the above cleaning requirements, steel decks shall be primed prior to applying sprayed polyurethane foam in accordance with Carlisle requirements.

2. **Structural Concrete Decks**

a. Remove loose dirt, dust and debris by using compressed air, vacuum equipment or brooming. Oil, grease, form release agents or other contaminants must be removed with proper cleaning solutions.

b. All joint openings in concrete decks that exceed 1/4" shall be grouted or caulked prior to application of polyurethane foam.

c. Newly poured concrete decks must cure for 28 days prior to application of sprayed polyurethane foam.

3. **Wood Decks**

a. Plywood shall be exterior grade not less than 15/32" thick, fastened firmly in place. Wood planks, minimum 3/4" thick, or Oriented Strand Board, minimum 5/8" thick, must also be adequately secured.

b. Wood shall contain no more than 18% moisture, in accordance with ASTM D-4444-84 or D-4442-84.

c. Joints in excess of 1/4" shall be taped or filled with a suitable sealant material.

d. Deck shall be free of loose dirt, grease, oil or other contaminants prior to foam application. Remove loose dirt or debris using compressed air, vacuum or brooming. No washing shall be permitted.

4. **Lightweight Insulating Concrete**

a. A Carlisle G2 Base Sheet, Carlisle Modified Base Sheet or vented base sheet must be installed over the lightweight concrete prior to applying the sprayed polyurethane. Fasten the base sheet to the lightweight substrate using Carlisle Dual Prong Base Sheet fasteners.

b. Pressure relief vents must be specified at a minimum rate of 1 every 2,000 square feet to relieve vapor pressure, which may result from possible moisture entrapment beneath the lightweight insulating concrete between the time of concrete placement and roof installation.

1) Vents must be installed in accordance with FBF-8-E.

2) Carlisle must be contacted for acceptable pressure relief vents.

5. **Cementitious Wood Fiber and Gypsum Decks**

a. Remove loose dirt, dust and debris by using compressed air, vacuum equipment or brooming. Oil, grease, or other contaminants must be removed with proper cleaning solutions.

b. All joints exceeding 1/4" shall be grouted or caulked.

E. **Existing Roof System Requirements (Note: 30 year warranties require complete tear-off)**

1. **Built-up or Modified Bitumen Roofing**

a. The existing roof must be inspected and tested (moisture surveys, core cuts, etc.) to determine if moisture is present within the existing assembly. Wet insulation and membrane shall be removed and replaced with compatible materials.

b. The existing roof shall be inspected for adhesion between plies, insulation and deck. Areas of inadequate adhesion must be secured or removed and replaced. All blisters, buckles, wrinkles and fishmouths shall be cut out or mechanically fastened. Resecuring the perimeter and/or field of the roof may be specified to enhance the wind-uplift resistance of the existing roof.

c. All soft mastic, paraffin-containing cold process adhesives or other materials that impede polyurethane foam adhesion must be removed.

d. Loose gravel, dust and residue shall be removed using power wet vacuum equipment (hydro-vac), a power sweeper, air blowing or other suitable means.

e. In addition to preparing the existing roof surface as outlined above, areas that are subjected to rain or other precipitation after initial surface preparation must be power broomed or manually broomed to remove the residue from low areas prior to proceeding with spray polyurethane foam installation.

2. **Single-Ply Membrane Systems (EPDM, Hypalon, PVC, TPO, etc.)**

Existing single-ply membrane shall be completely removed. Existing dry insulation must be overlaid with an approved insulation, which is mechanically fastened or adhesively attached prior to the application of sprayed polyurethane foam.

When new insulation is to be attached with FAST Adhesive, the existing insulation must be fastened at the minimum rate of 1 per 2 square feet. Carlisle must be contacted regarding specific requirements prior to installation of this system.

Note: Existing perlite or wood fiberboard not meeting ASTM C-208 Class 2 requirements are not acceptable base insulations when FAST Adhesive is used for new insulation attachment.

3. **Existing Sprayed Polyurethane Foam Roof Systems**

When no additional thermal value is required, the FleeceBACK membrane may be adhered with FAST Adhesive directly over the existing sprayed polyurethane foam providing the substrate is dry, relatively smooth, free of protrusions and loose or foreign materials. This option is not approved for

warranties greater than 15 years.

Note: Existing sprayed polyurethane foam roof shall be minimum 1" in thickness.

a. The existing polyurethane foam system must be inspected and tested (core cuts, moisture surveys, etc.) to determine if moisture is present within the existing assembly. Wet polyurethane foam shall be removed and replaced with compatible materials.

b. The existing polyurethane foam must be investigated to determine proper adhesion to the substrate. Areas of inadequate adhesion must be secured or removed or replaced.

c. Substrate preparation procedures are dependent upon the type of existing coating over the polyurethane foam system as follows:

   1) For existing silicone or Hypalon coatings, complete removal of the coating (scarfing) is required prior to adhesion of the FleeceBACK membrane.

   2) For acrylic or urethane coatings, if the coating is tightly adhered, the membrane may be adhered directly over the coating.

      Note: Urethane coatings, which have “reverted” (turned gummy) must be removed by scarfing prior to applying FAST Adhesive.

d. If additional sprayed polyurethane foam is specified over the existing foam, the existing foam substrate shall be primed prior to applying new sprayed polyurethane foam in accordance with Carlisle requirements.

3.02 VAPOR RETARDERS

A. 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.

B. Consult the latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.

C. Vapor retarders, when specified, must be compatible with polyurethane foam and must be fully adhered to the substrate. Available products include asphalt attached base sheets, spray or roller applied butyl coatings or Carlisle supplied 725TR “peel and stick” rubberized asphalt membrane with compatible film coating. Contact Carlisle for specific requirements.

3.03 INSTALLATION OF WOOD NAILERS

A. Wood nailers are required for the securement of metal edgings, metal scuppers, and certain curbs, pipes, etc., as shown on the applicable detail. Parapet walls and most curbs do not require the utilization of wood nailers.

Note: The width of the nailers must exceed the width of the metal flange of edgings, scuppers, etc.

B. When treated lumber is specified, it is recommended that only lumber, which has been pressure treated with salt preservatives be specified. Lumber treated with any of the wood preservatives such as, Creosote, Pentachlorophenol, Copper Naphthenate and Copper 8-quinolinolate will adversely affect the FleeceBACK membrane when in direct contact and are, therefore, unacceptable.
If non-treated lumber is to be specified, it must be stored to protect from moisture sources. A seal should be provided between the non-treated lumber and the concrete or gypsum substrate (similar to a sill sealer).

C. Methods used to fasten the nailer vary with building conditions; however, it is essential that secure attachment of durable stock be accomplished. Factory Mutual Loss Prevention Data Sheet 1-49 (Perimeter Flashing, June 1985) contains options for the spacing and sizing of fasteners.

3.04 SPF-245 INSULATION APPLICATION

Carlisle 2.5 lb SPF-245 Sprayed Polyurethane Foam Insulation is utilized for up to 20 year roofing systems and 3 lb SPF-245 is required for longer term 30 year roofing systems. For physical properties and other general information, refer to Attachment I at the end of this section.

A. Areas to be built-up to remove ponded water are to be filled in with sprayed polyurethane foam before the specified thickness of polyurethane foam is applied to the entire roof surface.

B. The sprayed polyurethane foam must be applied in a **minimal pass thickness of 1"** and a **maximum pass thickness of 1-1/2"**. Polyurethane foam shall be applied uniformly over the entire surface except where variations are required to ensure proper drainage or to complete a feathered edge.

C. Where a thickness greater than 1-1/2" is specified, polyurethane foam shall be applied in multiple passes, building up to the desired thickness. If the second or subsequent pass is not applied immediately or while the first pass of foam is still warm, the surface must be primed prior to the application of the next foam pass unless otherwise approved by Carlisle.

D. Sprayed polyurethane foam application shall be limited to that which can be completed to full foam thickness each working day.

E. Wind barriers shall be used if wind conditions could affect the quality of installation and to prevent over spray.

F. The final sprayed polyurethane foam surface shall be “smooth, orange peel, coarse orange peel, or verge of popcorn.” Polyurethane foam surfaces termed “popcorn” or “treebark” are not acceptable. These areas shall be removed and refoamed to an acceptable surface. Refer to Spray Polyurethane Foam Division publications for surface identification.

G. Any damage or defects to the polyurethane foam surface shall be repaired prior to the installation of FAST Adhesive and FleeceBACK membrane.

H. The polyurethane foam surface shall be free of moisture, frost, dust, debris, oils, tars, grease or other materials that will impair adhesion of the FleeceBACK membrane.

I. FleeceBACK membrane shall be adhered to the polyurethane foam with Carlisle FAST Adhesive within 24 hours of foam placement providing the substrate is dry. If the polyurethane foam is exposed to moisture, the surface must be blown dry prior to proceeding with the application of FAST Adhesive and FleeceBACK membrane.

J. If polyurethane foam is left exposed longer than 48 hours, certain surface preparation procedures (brooming, priming, etc.) may be required. Carlisle must be contacted for specific requirements.

3.05 MEMBRANE PLACEMENT AND BONDING

A. **General**

1. Do not apply FAST Adhesive when surface and/or ambient temperatures are below 25° F.

   When using **FAST Adhesive in heated spray equipment**, the adhesive cannot be applied unless surface and/or ambient temperatures are 25° F or warmer. When using **FAST Adhesive in non-heated spray equipment** surface and/or ambient temperatures must be 60° F or warmer.

2. The addition of FAST Adhesive Catalyst to FAST Adhesive (Part B) is recommended to speed up reaction time when temperatures are below 50° F. Refer to "Attachment II", at the end of this section for additional information.

3. The coverage rate of FAST Adhesive **used to adhere the membrane** is approximately 10,000 square feet per 50 gallon “Drum Set” and 3,000 square feet per 15 gallon drum set.

4. **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.

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

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

B. **Membrane Placement/Bonding - Option #1**

1. Position and unroll successive sheets and align to provide the minimum 3" wide splice.

2. Fold adjacent sheets in half widthwise to expose an approximate 10' wide by 50' or 100' long (the length of the sheet) substrate area.

   Notes: Fold the Factory Applied Tape edge under the membrane to prevent overspray onto the splice area.

   Membrane which will have the adjacent sheet spliced over it should be adhered to the substrate first. In this fashion, selvage edge splice area will not be contaminated by setting splice edge into the FAST Adhesive.

3. Spray FAST Adhesive onto the substrate and allow to foam up approximately 1/8" and develop **strings when touched with an HP Splice Wipe**. Roll the membrane with a weighted steel roller, approximately 30 inches wide weighing 100 - 150 pounds and use a nylon bristle push broom, to set the membrane into the adhesive.

4. Apply FAST Adhesive to the substrate and continue process described above until all sheets are fully bonded, allowing for the necessary splice overlaps at selvage edges. At end laps (along the width of the sheet), membrane shall be butted together which will be overlaid with 6" wide Pressure-Sensitive Cured Cover Strip or Pressure-Sensitive Overlayment Strip. Refer to applicable detail for additional requirements.

C. **Membrane Placement/Bonding - 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. **Spray** FAST Adhesive over the substrate area to be covered by the membrane that is folded back. Do not apply adhesive within approximately 18" of the membrane edge adjacent to where the next roll will be installed (this unadhered edge will be folded back to prevent overspraying when installing the next adjoining sheet).

5. Once the FAST Adhesive is sprayed in place and has begun to foam up approximately 1/8" in height and **develop strings when touched with an HP Splice Wipe**, fold the membrane back into the wet adhesive.

6. **Roll** the membrane using an approximately 30” wide, 100 – 150 pound weighted steel roller and a nylon bristle push broom to set the membrane into the adhesive.

7. Proceed to the front of the roll and continue to apply FAST Adhesive and roll the FleeceBACK membrane into the adhesive. At the end of the roll, leave approximately 18" unadhered (to be folded back to prevent overspraying when installing the adjoining sheet).

8. Once the first sheet is positioned, measure to allow for a minimum 3" overlap along the length of the sheet (along selvage edges). At end laps (along the width of the sheet), membrane shall be butted together which will be overlaid with 6" wide Pressure-Sensitive Cured Cover Strip or Pressure-Sensitive Overlayment Strip. Refer to applicable detail for additional requirements.

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

   Note: With the placement of the second sheet and all subsequent sheets, overspray can be controlled by lifting the 18" wide unadhered area of the previous sheet as the FAST Adhesive is applied. FAST Adhesive is sprayed under this area as the next roll is adhered and folded down after the membrane is unrolled.

D. **Do not apply FAST Adhesive to splice areas.** If FAST Adhesive should contaminate the splice area, immediately (while the adhesive is still in liquid form) clean with Weathered Membrane Cleaner or HP 250 Primer to remove.

3.06 MEMBRANE SPLICING (SecurTAPE)

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; adjoining membrane sheets shall be butted together and overlaid with 6” wide Pressure-Sensitive Cured Cover or Overlayment Strip in accordance with the appropriate detail. As an option, sheets can be rotated 90° to form a cap sheet to eliminate flashing overlay.

A. **General**

1. For maximum 20-year warranty projects, tape splices must be a minimum of 2-1/2" wide using 3" wide Factory-Applied SecurTAPE.

   For 30-year warranty projects, projects with roof slopes 1/4" per horizontal foot or greater must incorporate 6" Factory-Applied SecurTAPE for membrane splices.

   Note: 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. Refer to applicable detail for additional requirements.

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

3. **Prior to SecurTAPE application, the splice area must be primed with Sure-Seal HP-250 or Low VOC Primer.** Low VOC Primer is required in areas where volatile organic compound (VOC) regulations are in effect.

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

5. **Cold Weather Restrictions** - When temperatures are below 40°F

   a. 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.

   b. 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 (not applicable with Factory-Applied tape).

   c. When temperatures will fall below 20°F, use a steel roller to apply pressure to the tape prior to removing the release film.

   d. 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.

B. 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.

C. Position membrane sheets to allow for an approximate 3" overlap.

D. **Apply HP-250 or Low VOC Primer** with a 1/2” medium nap roller to achieve a **thin, even coat** on the membrane surfaces. Splice area must be uniform in color, streak free and free of globs or puddles.

   Note: Solvent resistant gloves are required for hand protection when primer is being used.

E. The **coverage rate for HP-250 Primer is approximately 250 square feet per gallon**. This equates to approximately 600 linear feet per gallon for a completed 3" wide splice area (primer applied on 5" wide area of the bottom membrane surface).

   The **coverage rate for Low VOC Primer is approximately 700 square feet per gallon**. This equates to approximately 1,600 linear feet per gallon for a completed 3" wide splice area (primer applied on 5" wide area of the bottom membrane surface).

F. **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 HP-250 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 HP-250 Primer to the previously coated surface and apply SecurTAPE when conditions allow.

G. 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.

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

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

J. **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, prior to rolling the splice, apply heat to the top side of the splice area with a hot air gun.

K. **Install** a Pressure-Sensitive "T" Joint Cover, 6" wide section (with rounded corners) of Pressure-Sensitive Elastoform Flashing or Elastoform Flashing® **over all field splice intersections**. When using non-Pressure-Sensitive Flashing, Lap Sealant is required. Refer to Details FBF-2-A, B and C.

3.07 LAP SEALANT APPLICATION

A. **General**

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

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

3. Lap Sealant is required at the following locations:

   a. Splices between adjoining sections of Pressure-Sensitive Flashing.

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

4. Lap Sealant is required for all adhesive splices and in conjunction with Elastoform Flashing.

5. Lap Sealant may be applied immediately following completion of uncured-to-uncured or uncured-to-cured adhesive splices or splices completed with SecurTAPE (when Lap Sealant is specified).

   Note: When applying Lap Sealant over cured-to-cured adhesive splices, wait at least 2 hours after completion of the splice to apply Lap Sealant.

B. Additional cleaning of the splice edge prior to applying Lap Sealant is not required unless contaminated with dirt or other contaminants.

C. 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.

D. **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.

E. **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.

3.08 FLASHING

A. General Flashing 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 throughwall counterflashing.

   Note: On existing sprayed polyurethane foam roofs, foam must be cut out or shaved around pipes to allow for proper flashing with Pre-Molded Pipe Flashing or Elastoform Flashing.

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

3. 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.

4. **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 EPDM membrane surface.

5. All vertical field splices (adhesive or tape) 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 FBF-12 Details.

6. **Sure-Seal Pressure-Sensitive Uncured Elastoform Flashing or Sure-White Uncured Elastoform Flashing** must be limited to the overlayment of vertical seams (as required at angle changes), or to flash inside/outside corners, vent pipes, scuppers and other unusually shaped penetrations where the use of pre-molded pipe flashing, FleeceBACK membrane, cured EPDM membrane or Pressure-Sensitive Underlayment Strip or Cured Cover Strip is not practical.

   Notes: Even when working in elevated temperatures, in most cases a heat gun will be required to elevate the temperature of uncured Elastoform Flashing to a higher than warm tool temperature (which is between 105°F and 110° F to permit proper forming of the uncured flashing.

7. 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.

8. For 30-year warranty details refer to the FleeceBACK EPDM 30-year specification.

B. Walls, Parapets, Curbs, Skylights, etc. (FBF-12 Details)

1. Use continuous deck membrane where feasible as outlined in Detail FBF-12-A.

2. When the use of continuous deck membrane for wall flashing is not feasible, a separate piece of Cured EPDM Flashing may be used in accordance with Detail FBF-12-B.

3. When **Splice Tape** is used to complete the splice, the **membrane and cured EPDM flashing** must be cleaned with **Sure-Seal Primer**. Refer to Membrane Splicing with SecurTAPE for splicing procedures.

4. As an alternative to the use of a separate piece of Cured EPDM Flashing, a separate piece of FleeceBACK membrane can be used for wall/curb flashings. If a selvage edge is provided, see membrane splicing procedures described in Paragraph 3.08.B.2 above. If a selvage edge is not provided, membrane shall extend onto horizontal deck membrane 1/2" to 1", which must be overlaid with 6" wide Pressure-Sensitive Cured Cover or Overlayment Strip in accordance with the appropriate detail.

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

   As an option, FleeceBACK membrane may be adhered with 90-8-30A Bonding Adhesive, however, a coat of bonding adhesive must be first applied to the fleece backing and allowed to dry. Then apply a standard coat of Bonding Adhesive on the wall and over the dried coat of Bonding Adhesive and allow to properly dry.

   If **Cured EPDM Flashing** is used, adhere membrane to the wall with Sure-Seal **90-8-30A Bonding Adhesive**. Terminate in accordance to the applicable FBF-9 Termination Details.

   Note: 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** (Termination Bar Details FBF-9-A and D) so Water Cut-Off Mastic can be applied directly to the membrane surface. This can be accomplished by applying heat to the fleece and scraping with a pull type scraper to fully remove.

6. Use Pressure-Sensitive "T" Joint Covers or 6" wide Pressure-Sensitive Elastoform Flashing (with rounded corners) to overlay vertical splices as shown on the applicable detail.

7. For **corner flashing** requirements, refer to the applicable details included at the end of this section.

   Note: On existing sprayed polyurethane foam roofs, foam at corners may require cutting or planing/shaving to allow for proper installation.

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. The metal edge must be secured to the wood nailer as specified by the manufacturer.

3. Refer to the appropriate FBF-1 Detail for flashing options and requirements.

4. For 20- or 30-year warranty projects, conventional metal fascia systems which require flanges to be “stripped in” must be overlaid with 1 layer of minimum 6" wide Pre-Sensitive Cured Cover Strip or 2 layers of Pressure-Sensitive Overlayment Strip (6” wide followed by 9” wide).

D. **Expansion Joints (FBF-3 Details)**

At expansion joints, Carlisle offers Sure-Seal Field or Wall Expansion Joint Supports. Refer to the applicable FBF-3 Details for installation requirements.

E. **Roof Drains (FBF-6 Details)**

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 and scrape to fully remove. Refer to Detail FBF-6-A. As an option, a separate section of cured non-reinforced EPDM can extend into the drain sump. Refer to Detail FBF-6-B.

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

F. **Other Penetrations** - Pipes (FBF-8), and Pourable Sealer Pockets (FBF-16)

1. When feasible, flash pipes and round supports with Pressure-Sensitive Pipe Seals in accordance with Detail FBF-8A.

2. When Pressure-Sensitive Pipe Seals cannot be used, install field fabricated pipe seals using uncured Elastoform Flashing or Pressure-Sensitive Uncured Elastoform Flashing around pipe, round supports and structural steel tubing with a corner radius greater than 1/4". Refer to Detail FBF-8-B.

3. Hot pipes which exceed 180° F must be insulated with metal collars and rain hoods and flashed in accordance with Details FBF-8-C.

4. Applicable details included in the Universal Detail Section of the Carlisle Technical Manual shall be utilized. Additional membrane securement around pipes or pourable sealer pockets is not required regardless of size.

3.09 ROOF WALKWAYS

Install walkways in those locations as designated by the specifier.

Discontinue walkways over all field splices to provide a minimum 1" gap over the seam edge.

A. **Pressure-Sensitive Walkway Pad attachment**

1. If necessary, scrub the membrane with warm water and low sudsing soap to remove contaminants. Rinse with clean water and allow the membrane to dry.

2. **Clean** the mating surfaces of the membrane with Sure-Seal HP-250 or Low VOC Primer and allow the primer to dry.

3. **Remove** release film from SecurTAPE and place walkway pad over the primed area of the FleeceBACK membrane.

4. **Walk** the pad into place to ensure proper adhesion.

Note: On Sure-White FleeceBACK Roofing Systems, when aesthetics are of importance, care should be exercised when applying Primer to the membrane to avoid discoloration outside the walkway area.

B. **Sure-Seal Interlocking Pavers™**

Rubber Pavers can be loose laid directly over the membrane. Installation instruction sheets are available from Carlisle.

C. **Concrete Paver Blocks**

Install a slipsheet of cured membrane under all smooth pavers for the protection of the deck membrane. The protective layer must extend a minimum of 2" on each side of the concrete paver.

D. Pavers are not recommended for walkways when slopes exceed 2" in 12".

3.10 DAILY SEAL

A. On phased roofing, when the completion of flashings and terminations is not completed by the end of each work day, provisions must be provided to temporarily close the membrane to prevent water infiltration.

B. Temporarily seal any loose membrane edge down slope using FAST Adhesive, urethane foam or other similar material so the membrane edge will not buck water. Caution must be exercised to ensure the membrane is not temporarily sealed near drains in such a way as to promote water migration below the membrane.

1. On existing built-up roofs, remove the gravel. The surface must be clean and dry.

2. After embedding the membrane in daily seal material, CHECK FOR CONTINUOUS CONTACT. Provide continuous pressure over the length of the temporary seal with 15' lengths of 2-1/2" diameter rubber tubing filled with dry sand.

   Note: Wood nailers will not provide constant compression due to warping and an uneven substrate.

3. When work is resumed, pull the membrane free; trim and remove where the daily seal material was applied.

3.11 CLEAN UP (for Sure-White FleeceBACK Roofing Systems)

If required by the specifier to ensure the aesthetics of the white surface of the Sure-White FleeceBACK membrane, the following procedures should be utilized:

A. Handprints, footprints, general traffic grime, industrial pollutants and dirt may be cleaned from the membrane surface by scrubbing with warm water and low sudsing soap; rinse the area completely with clean water. Carlisle Weathered Membrane Cleaner can also be used.

B. Adhesive and Splicing Cement residue may be cleaned by using the following procedures:

1. Saturate a clean HP Splice Wipe with Weathered Membrane Cleaner.
2. Scrub exposed adhesive or Splicing Cement with the saturated HP Splice Wipe until all residue is removed from the membrane. For easier removal, it may be necessary to change Splice Wipes frequently.

Sure-Seal®/Sure-White™
FleeceBACK®/SPF Adhered Roofing Systems
"Attachment I"
FAST Adhesive Equipment, Catalization and Equipment Set-Up Requirements for Carlisle SPF-245

May 2011

A. The following is a list of necessary equipment for application of FAST Adhesive.

1. Proportioning Unit (Pump) - a hydraulically operated, high pressure metering unit capable of providing minimum 1600 to 2000 psi operating pressure designed to accurately spray two component chemical foam systems.

2. Raw Material Transfer System (for transferring Part-A and Part-B from 50 gallon drum sets to Proportioning Unit) - a minimum of 2 transfer pumps complete with material supply hoses, air supply hose and all necessary fittings.

3. Hoses (for carrying Part-A and B materials from Proportioning Unit to roof) - low voltage automatic dual heated hose assemblies available in lengths of 50'.

4. Spray Gun (for spray applying FAST Adhesive) - a high-pressure spray gun for the application of two-component polyurethane foams.

5. Air Compressor (to power Transfer Pumps and Spray Gun) - a 3 phase, 230 watt unit capable of providing 19 cubic foot per minute at 120 pounds of pressure for hydraulic units.

6. Generator - Building power supplies do not typically provide the proper amount of power necessary for efficient operation of spray foam equipment. The use of a generator with a capacity of 20 kw (3 phase 60 Hz) is recommended for hydraulic units.

Conventional two-component pumping systems manufactured by Graco are readily available new and used. Contact the respective manufacturer for additional information.

B. **Catalizing Instructions for FAST Adhesive (applied into Part-B Drums only)**

When applying FAST Adhesive, substrate and ambient temperatures must be 25° F and rising, and hose temperature maintained at 120° F (hose temperature reading).

Note: FAST Catalyst is not intended for use in Carlisle SPF-245.

1. When temperatures are between 25° F and 50° F, the addition of FAST Catalyst to the Part-B side of FAST Adhesive may be required for adhering the FleeceBACK membrane.

2. Carlisle FAST Adhesive Catalyst is available in 1 gallon (8 pints) containers. The catalyst should be added in small quantities until experience is gained for proper judgment.

3. Mixing can be achieved with a minimum 1/2 horsepower collapsible drum mixer or equivalent such as Binks Model #31296. It is imperative that thorough mixing (minimum 10 minutes) is achieved in order to maintain a consistent blend of materials for proper reaction of adhesive.

   The Part-B side of FAST Adhesive must be at least 70° F prior to adding catalyst. The catalyst must be agitated prior to adding to the Part-B side to promote proper dispersion.

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4. The amount of catalyst to be added to the Part-B side of FAST Adhesive will vary based on the temperature of the surface to be sprayed as follows. This information is also included on the Catalyst container label.

Surface Temperature	Amount of Catalyst Added to Part B Side of FAST 100-LV Adhesive	
	50 Gallon Drum (oz.)	15 Gallon Drum (pints)
25° F	43	8
32° F	34	6-3/4
40° F	24	5
50° F	18	3-14
60° F	8	1-1/2
70° F	4	1/2

C. **Equipment Set-Up Requirements for Carlisle SPF-245**

SPF-245 shall be applied in 1" to 1.5" passes according to APC SPFA Foam Application Guidelines. The following data is based on the following laboratory equipment and set-up:

1. A Graco Reactor E-30 or Graco/Gusmer H-2000 proportioner
2. A Graco Fusion spray gun or GX-7 spray gun configured with a #1 mix module using a 70-pattern disc.
3. Hose Heat 130° F
4. Spray pressure of minimum 1000 psi
5. Ratio 1:1 by volume

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Sure-Seal®/Sure-White™
FleeceBACK®/SPF Adhered Roofing System

"Attachment II"

Membrane and Splice Repairs

May 2011

Pressure-Sensitive Flashing, when approved for repairs, must be limited to new installations only.

A. REPAIRS OF CUTS AND TEARS (Surface Splice)

1. Using a scrub brush, remove field dirt by scrubbing the splice area with warm water and a low sudsing soap; rinse with clean water and allow to dry. As an option, Carlisle Weathered Membrane Cleaner can be used.

2. When repairing cuts or tears in FleeceBACK membrane, use Pressure-Sensitive Cured Cover or Pressure-Sensitive Overlayment Strip or Cured EPDM membrane (in conjunction with splice tape/primer) to overlay the affected area.

3. Extend the repair membrane section at least 3" in every direction from the cut or tear.

4. Round the corners of the repair membrane and follow standard splicing procedures.

B. SPLICE REPAIRS

Repair of Improperly Applied Tape Splices

1. Improperly applied tape splices include, but are not limited to, fishmouths at field splices, lack of or improper use of Primer, condensation formation on primer or incorrect tape placement, etc.

2. Clean the splice area with Sure-Seal Primer on both sides extending past the width of the new flashing overlay to be installed.

   Note: When the membrane has been exposed to the elements for prolonged periods, remove field dirt by scrubbing the attached splice area with a scrub brush, warm water and low sudsing soap, rinse with clean water and allow to dry prior to applying Sure-Seal Primer.

3. Overlay the defective splice area with a minimum 6" wide Pressure-Sensitive Cured Cover Strip or Overlayment Strip centered over the edge of the splice.

C. **If fishmouths are present in the field splice, the fishmouth** must be cut by removing the top layer of membrane prior to overlaying the splice. The flashing overlay **must be supported** by the bottom layer of cured membrane.

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Sure-Seal®/Sure-White™ FleeceBACK®/SPF Adhered Roofing System

Installation Details

(See 30-year FleeceBACK EPDM Specification for appropriate 30-year Details)

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May 2011

Metal Edging

FBF-1-A Carlisle SecurEdge 200
FBF-1-B Sure-Seal Drip Edge
FBF-1-C Carlisle Anchor Bar Edging

Membrane Splices

FBF-2-A Membrane Splice with SecurTAPE
FBF-2-B End Lap Splice

Expansion Joints

FBF-3-A Deck to Deck Expansion Joint
FBF-3-B Deck to Wall Expansion Joint

Roof Drains

FBF-6-A Roof Drain (Continuous FleeceBACK)
FBF-6-B Roof Drain (Separate EPDM)

Vent Pipes

FBF-8-A Pre-Molded Pressure-Sensitive Pipe Flashing
FBF-8-B Field Fabricated Pipe Flashing
FBF-8-C Field Fabricated Hot Stack Flashing
FBF-8-D One-Way Air Pressure Relief Vent

Membrane Terminations

FBF-9 Vertical Flashing Terminations

Parapet/Curbs

FBF-12-A Parapet/Curb - Continuous FleeceBACK Membrane
FBF-12-B Parapet/Curb with Cured EPDM

Built-Up Roof and EPDM Tie-Ins

FBF-13-A Built-Up Roofing Tie-Ins
FBF-13-B Built-Up Roofing Sloped Away

Corners

FBF-15-A Inside Corner / Continuous Membrane
FBF-15-B Inside Corner / Separate EPDM Flashing
FBF-15-C Outside Corner / Separate EPDM Flashing
FBF-15-D Pressure-Sensitive Inside Corner
FBF-15-E Pressure-Sensitive Outside Corner

Pourable Sealer Pockets

FBF-16-A Pressure-Sensitive Pourable Sealer Pocket
FBF-16-B Field Fabricated Pourable Sealer Pocket

Scupper

FBF-18 Metal Scupper at Deck

Lightning Rods

FBF-20-A Lightning Rod at Parapet
FBF-20-B Lightning Rod at Deck Level

Sleepers

FBF-24 Sleeper

Base Insulation Attachment Over Steel Decks

FBF-27-A Base Layer Insulation Attachment
FBF-27-B Base Layer of 2" Minimum Sure-Seal Polyiso Insulation

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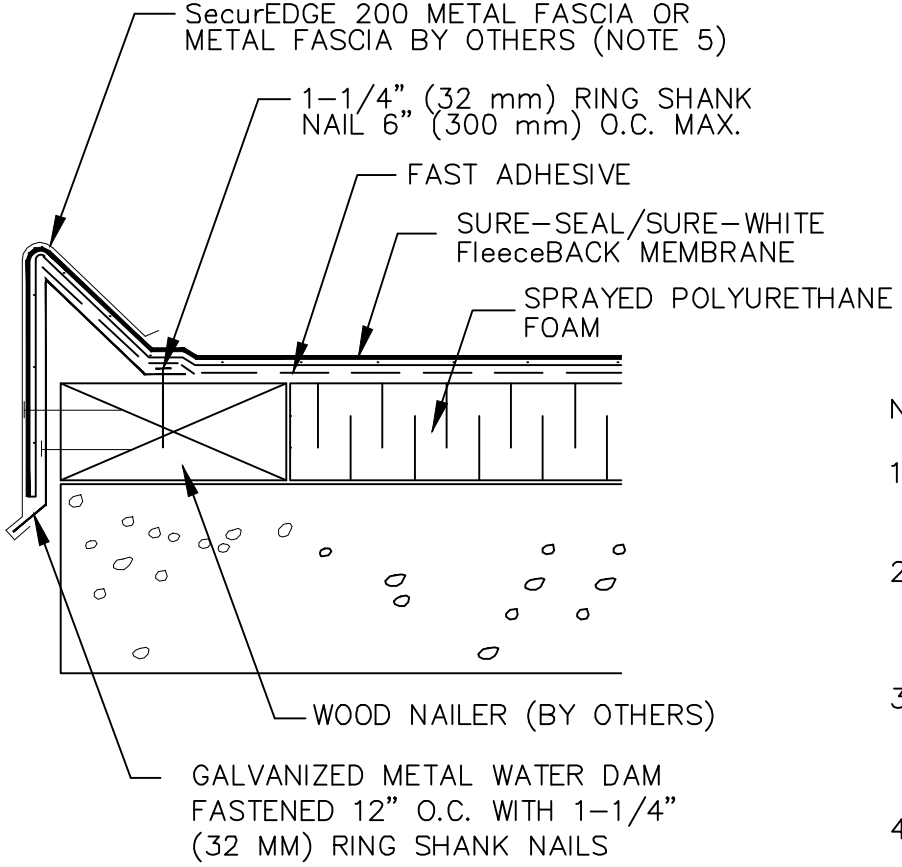
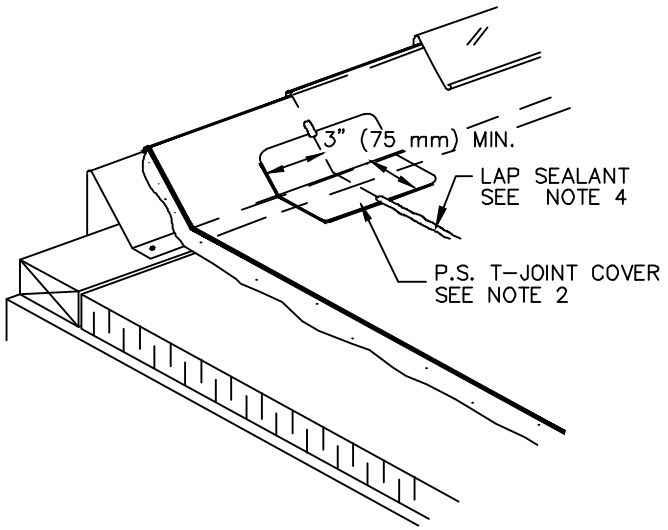




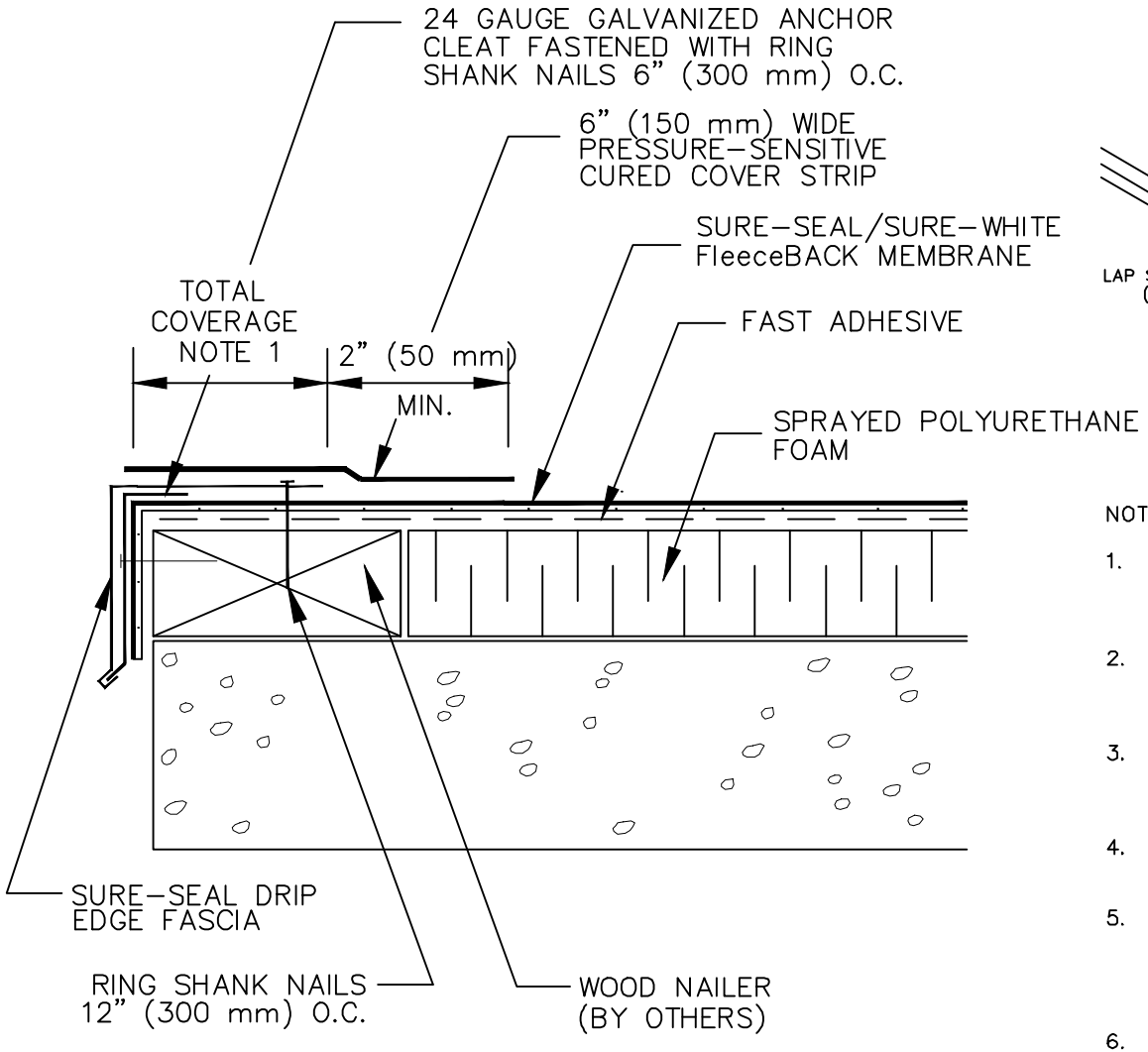
NOTES:

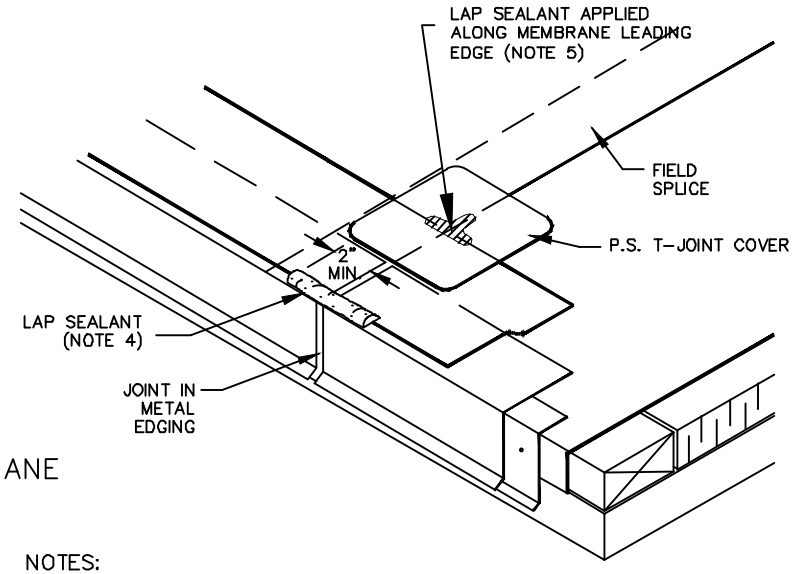
1. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF SecurEDGE DECK FLANGE.
2. 6" (150 mm) WIDE PRESSURE SENSITIVE ELASTOFORM FLASHING FLASHING MAY ALSO BE CENTERED OVER FIELD SPLICE AT ANGLE CHANGE.
3. REFER TO SecurEDGE 200 INSTALLATION INSTRUCTION MANUAL FOR STEP–BY–STEP INSTALLATION PROCEDURES.
4. LAP SEALANT IS OPTIONAL WITH TAPE SPLICES (REFER TO SPECIFICATIONS).
5. FASTENING OF METAL WORK BY OTHERS AS RECOMMENDED BY MANUFACTURER.

FBF–1–A

CARLISLE SecurEdge 200

CARLISLE SYNTEC SYSTEMS





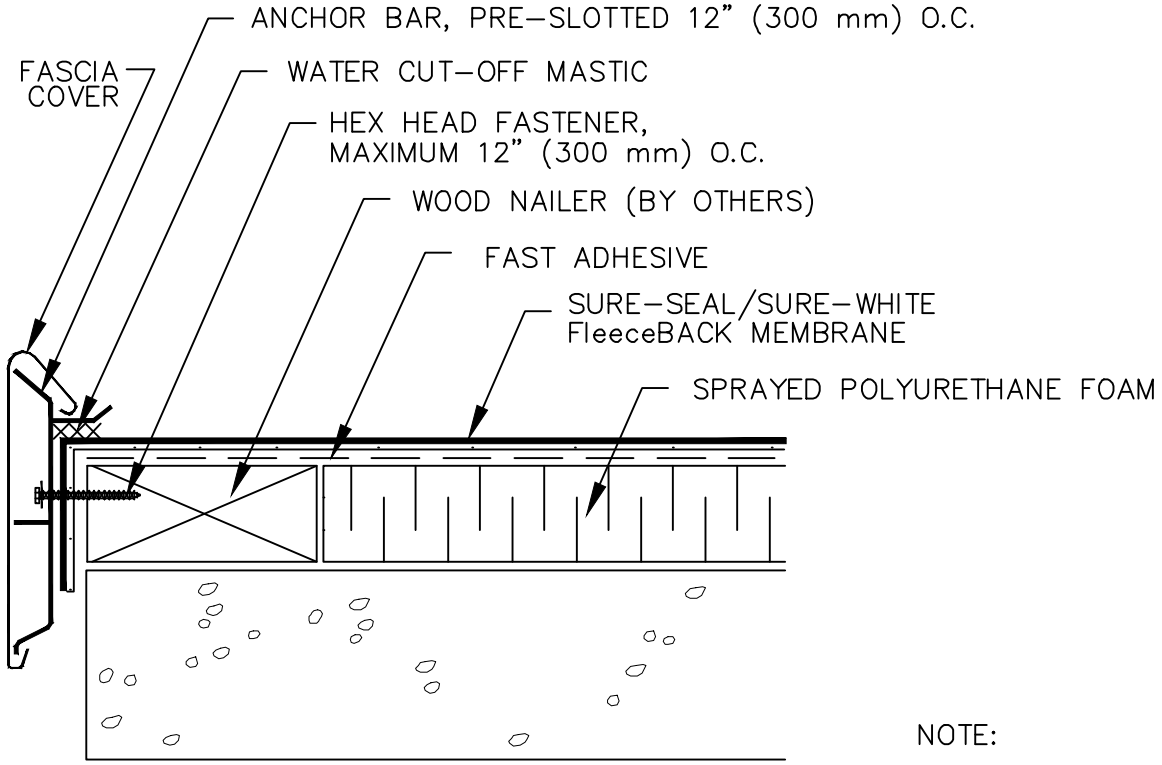
NOTES:

1. DECK FLANGE MUST BE TOTALLY COVERED BY PRESSURE-SENSITIVE FLASHING WITH MINIMUM 2" (50 mm) COVERAGE PAST NAIL HEADS.
2. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
3. APPLY SURE-SEAL PRIMER TO METAL FLANGE AND EPDM MEMBRANE SURFACE PRIOR TO INSTALLING PRESSURE-SENSITIVE FLASHING.
4. LAP SEALANT MUST BE APPLIED AT INTERSECTIONS WITH JOINTS IN METAL EDGING.
5. APPLY LAP SEALANT ALONG THE LEADING EDGE OF THE MEMBRANE SPLICE (UNDER THE 6" X 6" T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 2" (50 mm) IN ALL DIRECTIONS FROM THE SPLICE INTERSECTION.
6. WHEN NECESSARY, OVERLAP THE PRESSURE-SENSITIVE CURED COVER STRIP FLASHING A MINIMUM OF 2". ALL SPLICE INTERSECTIONS/OVERLAPS SHALL BE OVERLAID WITH A PRESSURE-SENSITIVE T-JOINT COVER.

FBF-1-B

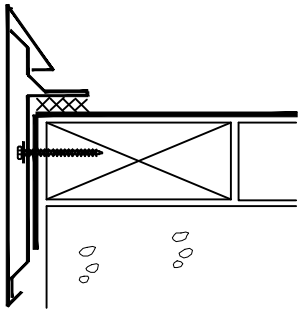
SURE-SEAL DRIP EDGE/PRESSURE-SENSITIVE FLASHING

CARLISLE SYNTEC SYSTEMS

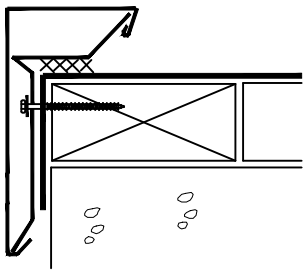


SecurEdge 2000

SecurEdge ANCHOR BAR OPTIONS



SecurEdge 1000



SecurEdge 3000

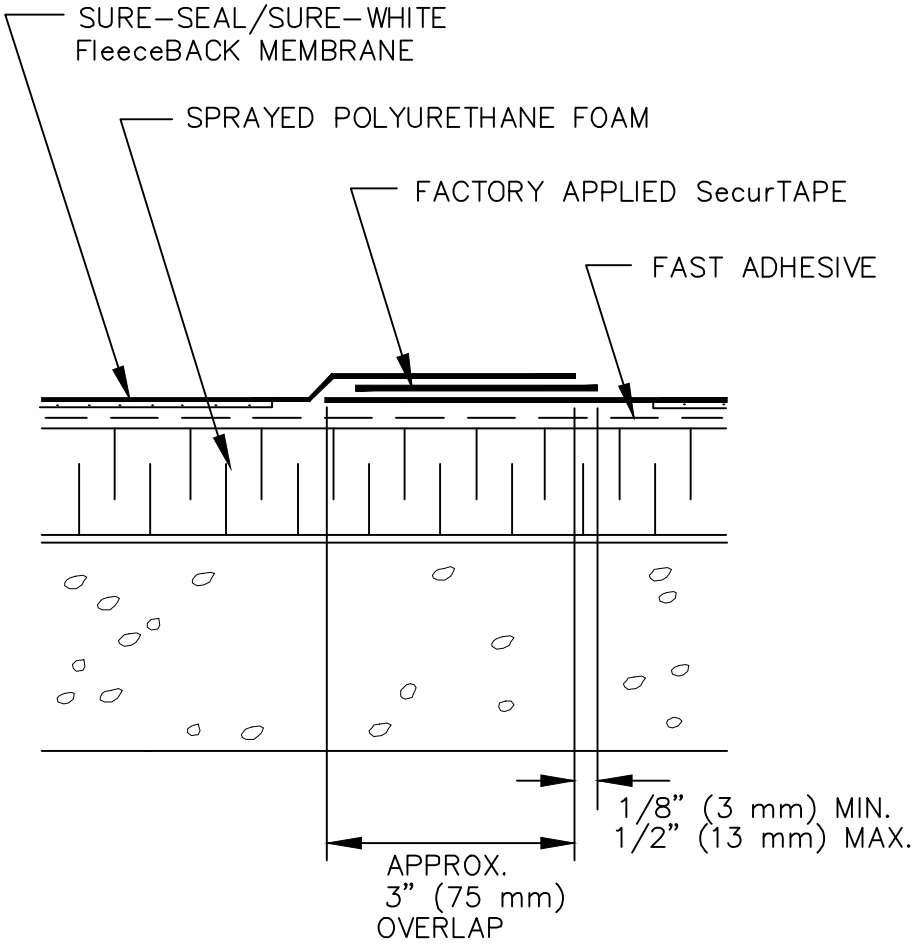
NOTE:

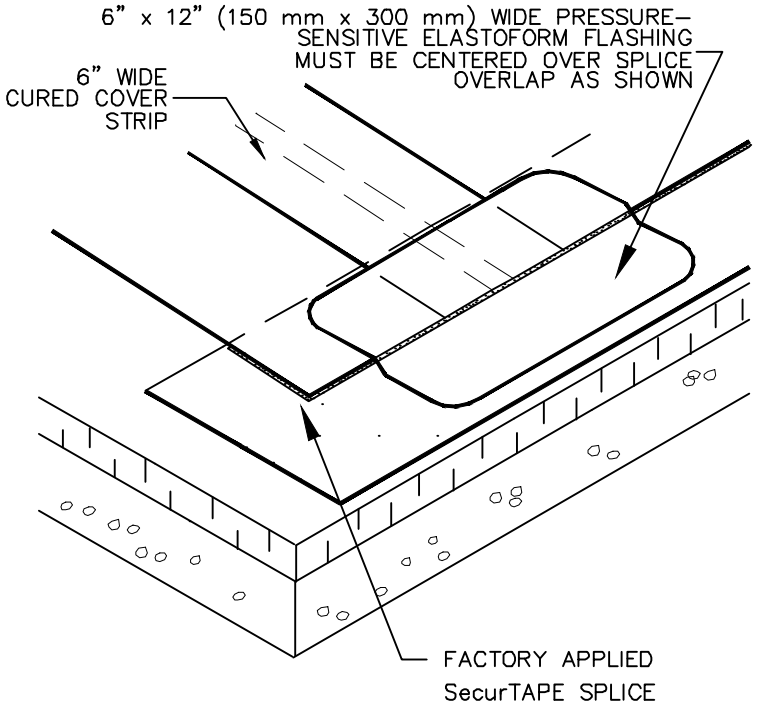
IF INCIDENTAL/TEMPORARY PONDED WATER IS EXPECTED, THE SecurEdge ANCHOR BAR MUST BE ELEVATED AND SCUPPERS PROVIDED FOR DRAINAGE.

FBF-1-C

CARLISLE ANCHOR BAR EDGING

CARLISLE SYNTEC SYSTEMS





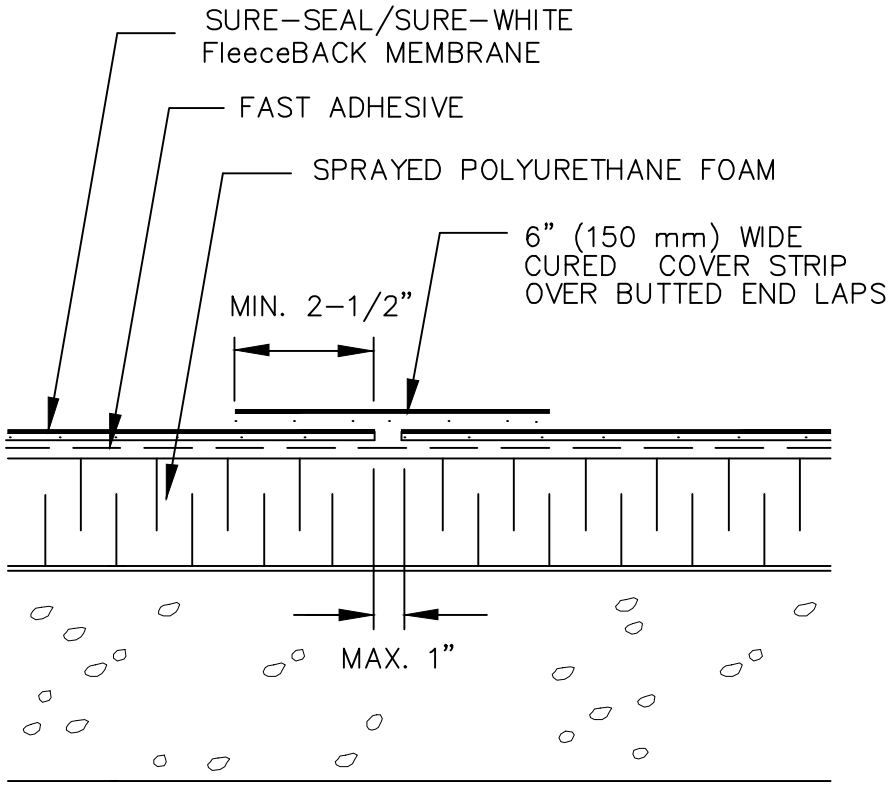
NOTES:

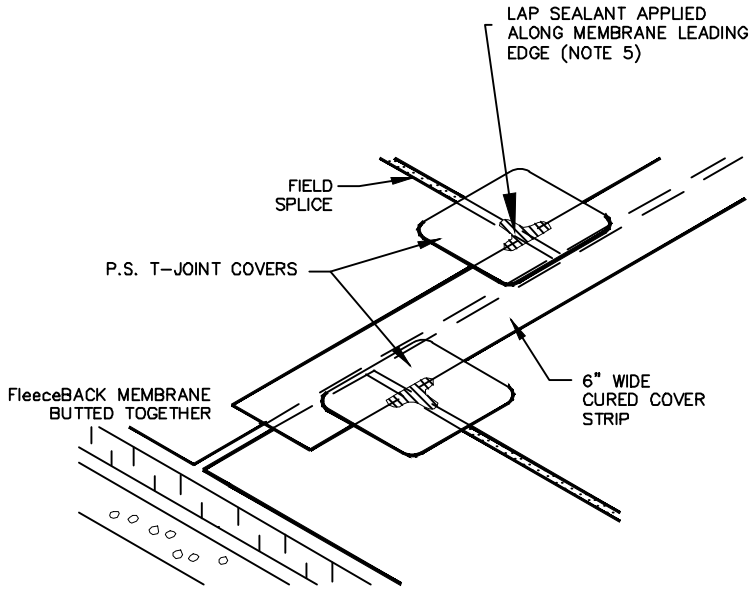
1. PRIOR TO SPLICING FACTORY APPLIED SecurTAPE, APPLY SURE-SEAL PRIMER TO SPLICE AREAS.
2. AT FIELD SPLICE INTERSECTIONS, APPLY A PRESSURE-SENSITIVE "T" JOINT COVER OR 6" (150 mm) WIDE SECTION OF PRESSURE-SENSITIVE ELASTOFORM FLASHING. REFER TO DETAIL FBF-2-B.

FBF-2-A

MEMBRANE SPLICE WITH SecurTAPE

CARLISLE SYNTEC SYSTEMS





NOTES:

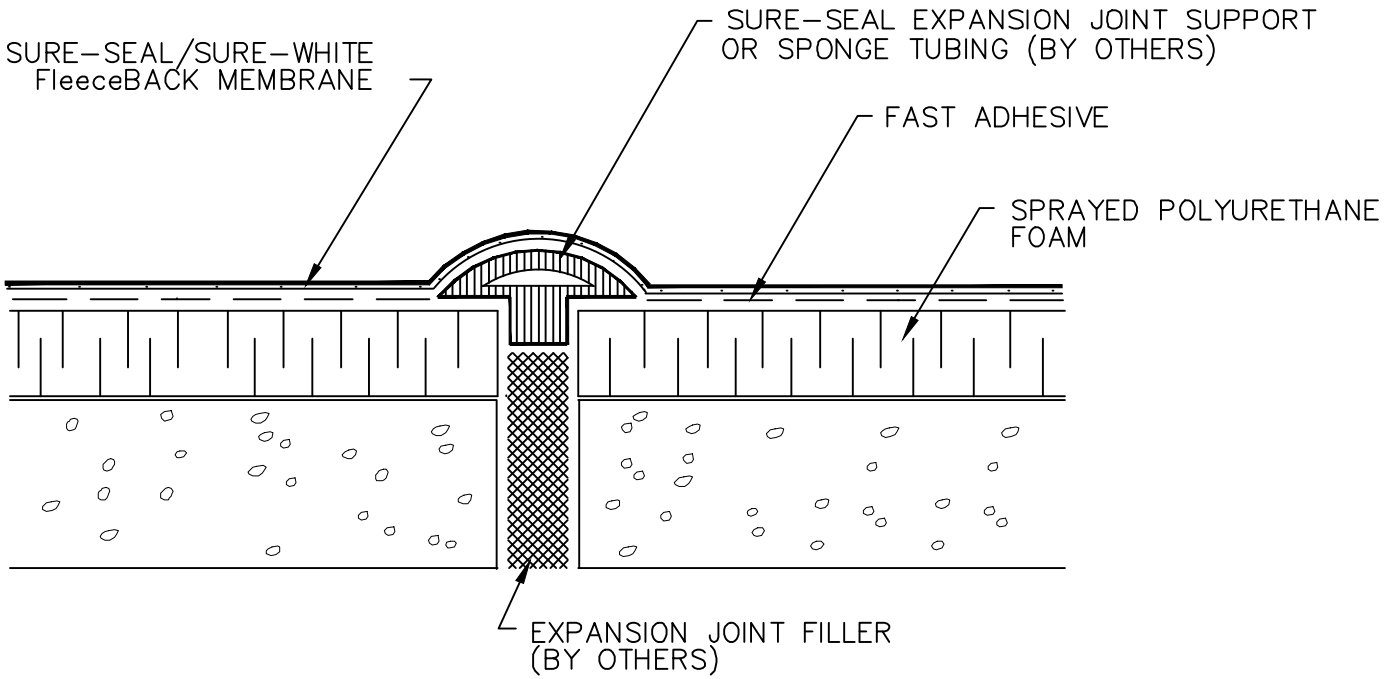
1. APPLY SURE-SEAL PRIMER TO MEMBRANE SURFACES PRIOR TO INSTALLING PRESSURE SENSITIVE CURED COVER STRIP.

2. APPLY SURE-SEAL PRESSURE-SENSITIVE T-JOINT COVERS AT FIELD SPLICE INTERSECTIONS AS SHOWN ABOVE.

FBF-2-B

END LAP SPLICE

CARLISLE SYNTEC SYSTEMS



NOTES:

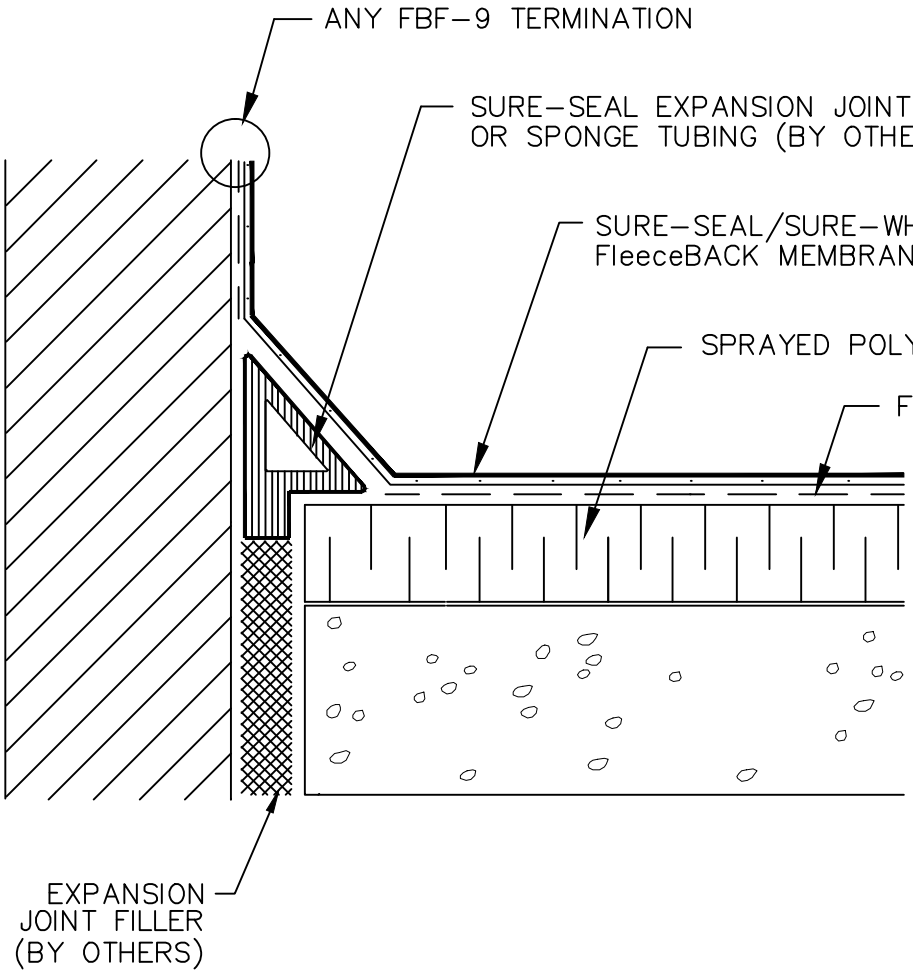
1. FOR EXPANSION JOINT INTERSECTIONS AND INTERSECTIONS BETWEEN EXPANSION JOINTS TO WALL OR EDGING, USE TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING WITH 2ND LAYER 3" (75 mm) LARGER THAN THE PREVIOUS LAYER IN ALL DIRECTIONS.

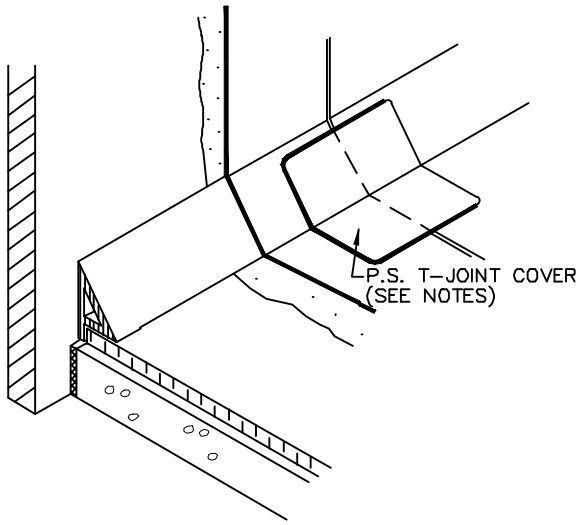
2. WHEN SURE-SEAL EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (19 mm) AND SHALL NOT EXCEED 3" (75 mm).

FBF-3-A

DECK TO DECK EXPANSION JOINT

CARLISLE SYNTEC SYSTEMS





NOTES:

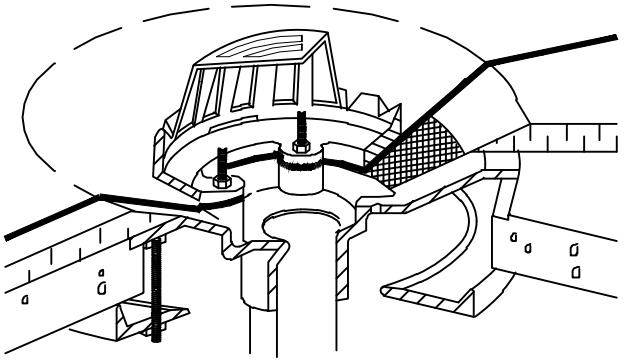
1. ALL OUTSIDE AND INSIDE CORNERS REQUIRE TWO COMPLETE CORNER APPLICATIONS OF PRESSURE SENSITIVE ELASTOFORM FLASHING AS PER DETAILS FBF-15.
2. WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (19 mm) AND SHALL NOT EXCEED 2" (50 mm) WHEN SURE-SEAL EXPANSION JOINT IS USED.
3. 6" (150 mm) WIDE PRESSURE-SENSITIVE ELASTOFORM FLASHING MAY ALSO BE CENTERED OVER FIELD SPLICE AT ANGLE CHANGE.

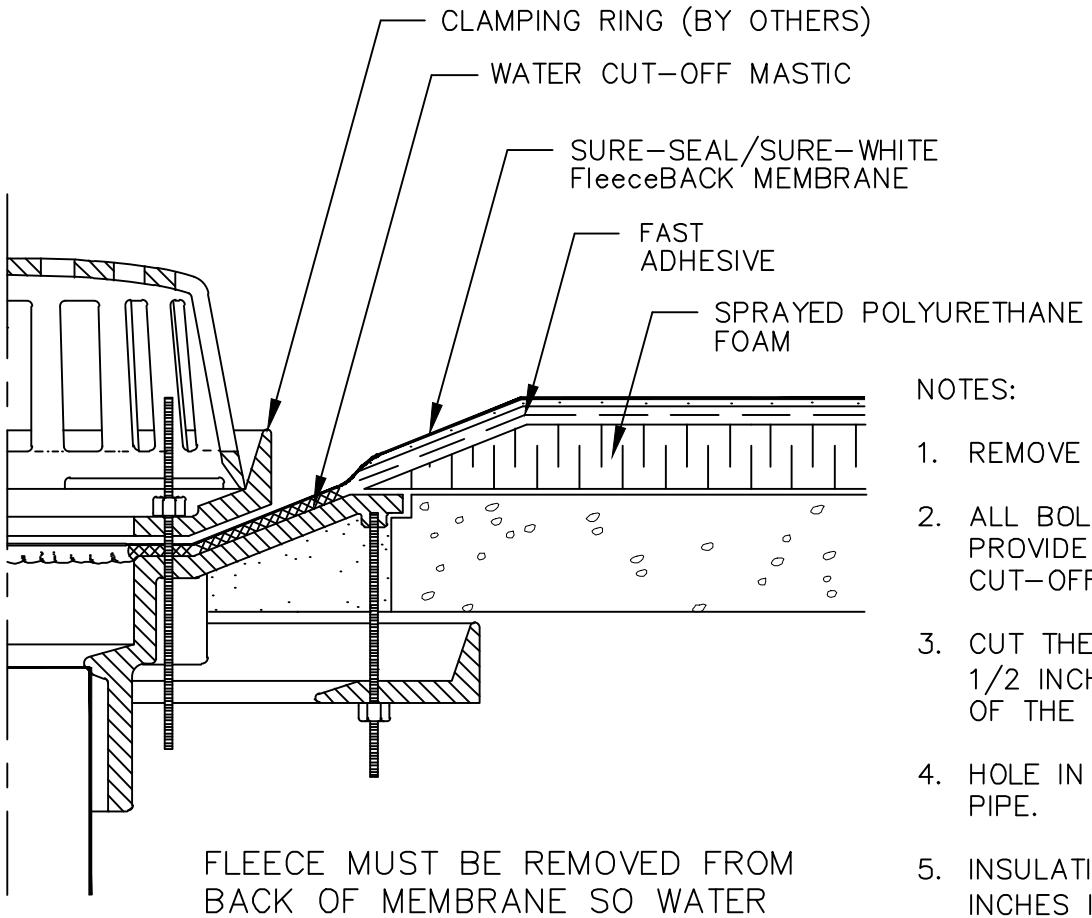
FBF-3-B

DECK TO WALL EXPANSION JOINT

CARLISLE SYNTEC SYSTEMS

FIELD SPLICES MUST BE LOCATED AT LEAST 6 INCHES OUTSIDE THE DRAIN SUMP





FLEECE MUST BE REMOVED FROM BACK OF MEMBRANE SO WATER CUT-OFF MASTIC IS IN DIRECT CONTACT WITH EPDM

NOTES:

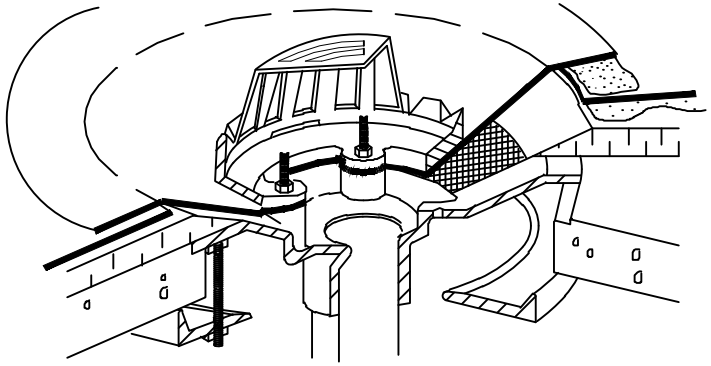
1. REMOVE ALL LEAD AND OTHER FLASHING.
2. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
3. CUT THE MEMBRANE SO IT EXTENDS A MINIMUM OF 1/2 INCH (13 mm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
4. HOLE IN MEMBRANE MUST EXCEED SIZE OF DRAIN PIPE.
5. INSULATION TAPER SHALL NOT BE STEEPER THAN 6 INCHES IN 12 INCHES (150 mm/300 mm).
6. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH LOCAL CODES.

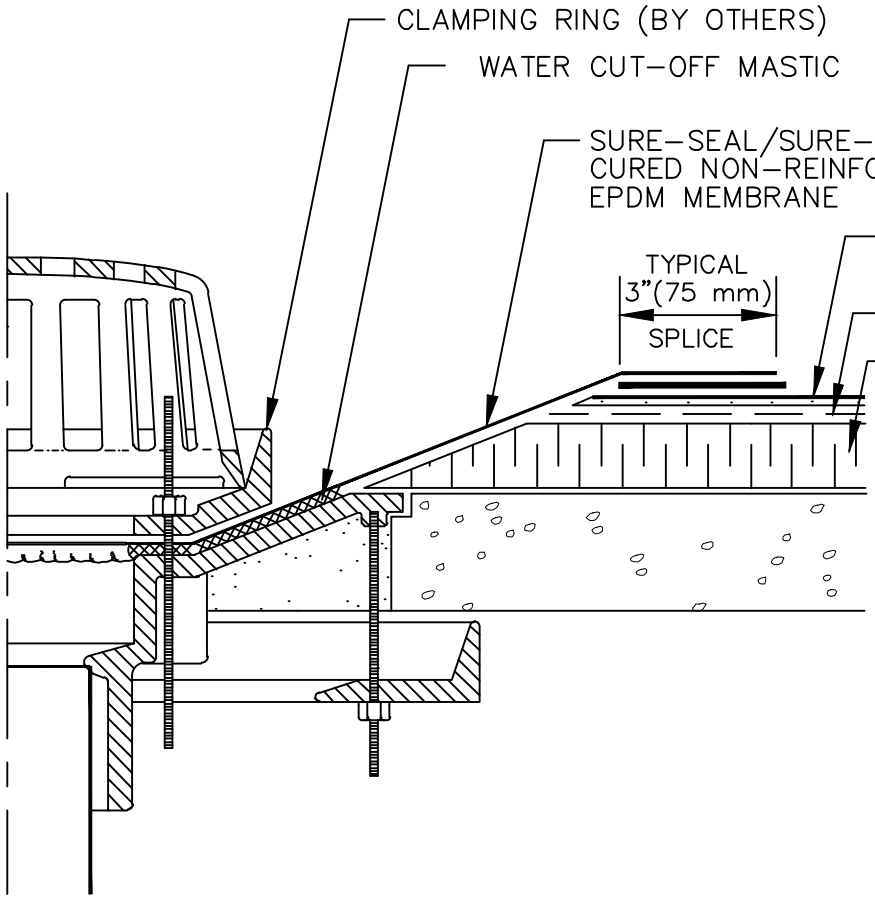
FBF-6-A

ROOF DRAIN (CONTINUOUS FleeceBACK MEMBRANE)

CARLISLE SYNTEC SYSTEMS

FIELD SPLICES MUST BE LOCATED AT LEAST 6 INCHES OUTSIDE THE DRAIN SUMP





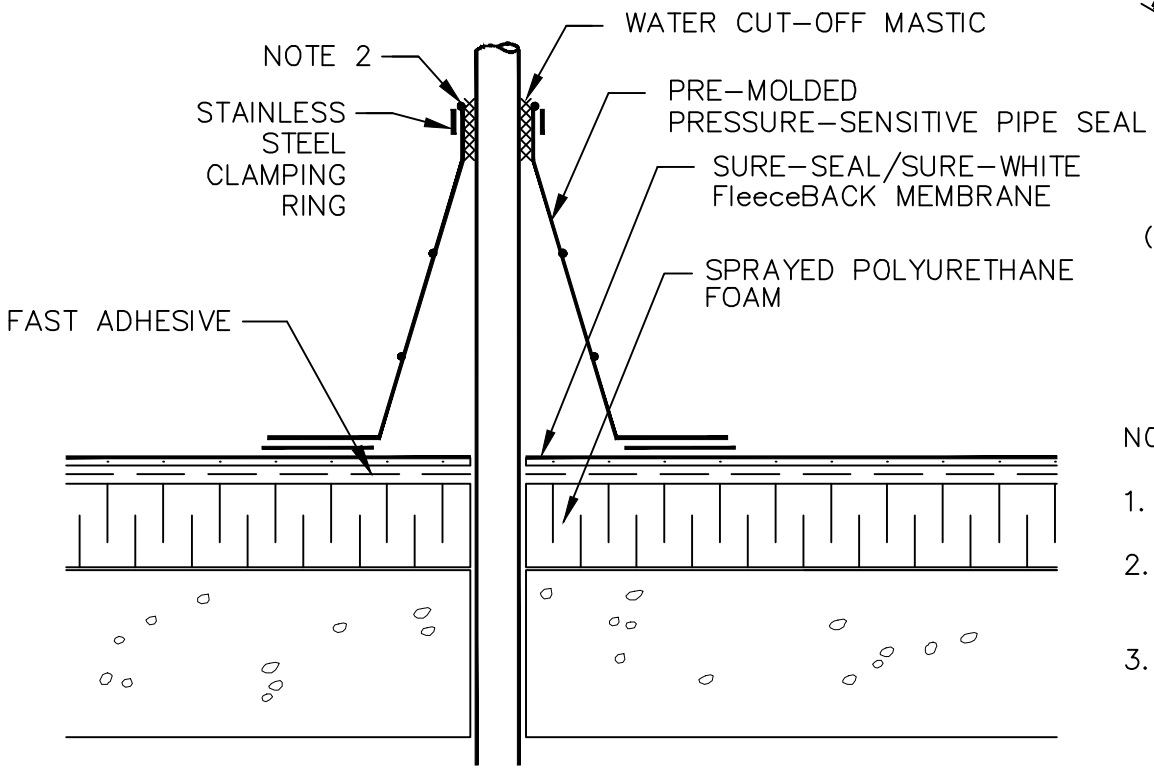
NOTES:

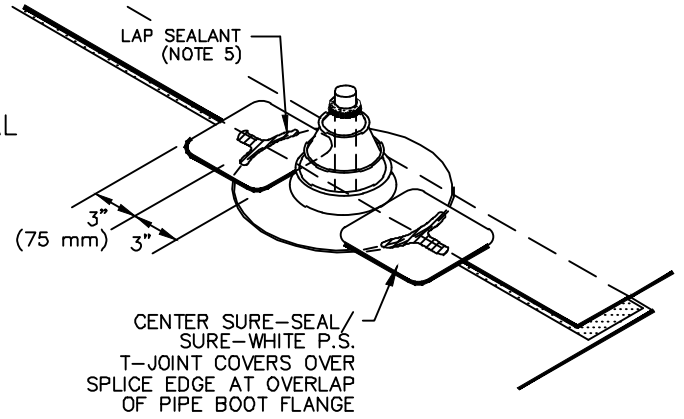
1. REMOVE ALL LEAD AND OTHER FLASHING.
2. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
3. CUT THE MEMBRANE SO IT EXTENDS A MINIMUM OF 1/2 INCH (13 mm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
4. HOLE IN MEMBRANE MUST EXCEED SIZE OF DRAIN PIPE.
5. INSULATION TAPER SHALL NOT BE STEEPER THAN 6 INCHES IN 12 INCHES (150 mm/300 mm).
6. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH LOCAL CODES.

FBF-6-B

ROOF DRAIN (SEPARATE SECTION OF CURED EPDM MEMBRANE)

CARLISLE SYNTEC SYSTEMS





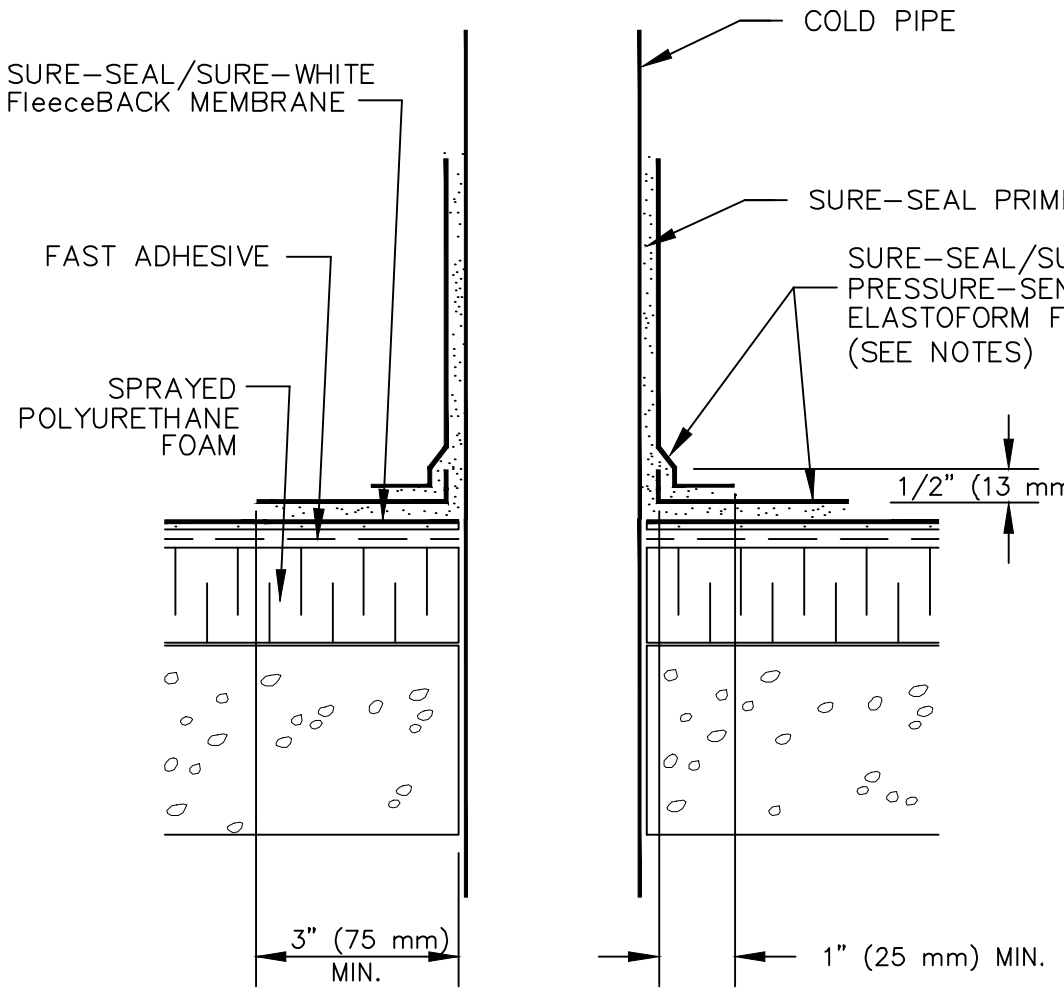
NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING.
2. PIPE SEAL MUST HAVE INTACT RIB AT TOP EDGE, REGARDLESS OF PIPE DIAMETER.
3. DECK FLANGES OF THE PRE-MOLDED PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.
4. TEMPERATURE OF PIPE MUST NOT EXCEED 180°F (82°C).
5. APPLY LAP SEALANT ALONG THE LEADING EDGE OF THE MEMBRANE SPLICE AND THE PIPE SEAL EDGE (UNDER THE 6" X 6" T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 2" (50 mm) IN ALL DIRECTIONS FROM THE SPLICE INTERSECTION.

FBF-8-A

PRE-MOLDED PRESSURE-SENSITIVE PIPE FLASHING

CARLISLE SYNTEC SYSTEMS



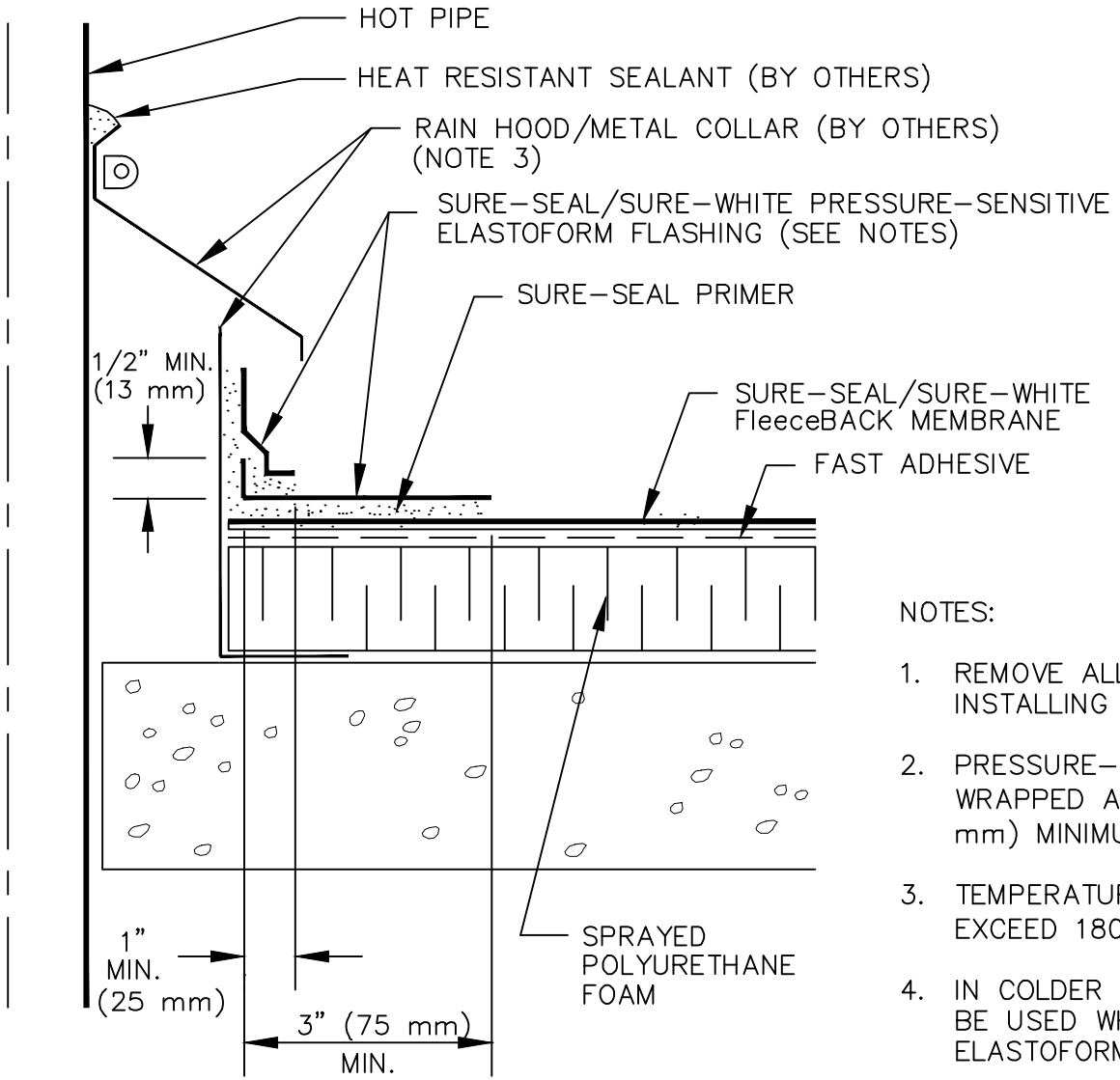
NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD-FABRICATED PIPE SEAL.
2. SECUREMENT REQUIRED AROUND ALL PIPES GREATER THAN 18" (500 mm) IN DIAMETER.
3. PRESSURE-SENSITIVE ELASTOFORM FLASHING WRAPPED AROUND THE PIPE SHALL HAVE 3" (75 mm) MINIMUM SPLICE.
4. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE- SENSITIVE ELASTOFORM FLASHING.

FBF-8-B

FIELD FABRICATED PIPE FLASHING

CARLISLE SYNTEC SYSTEMS



NOTES:

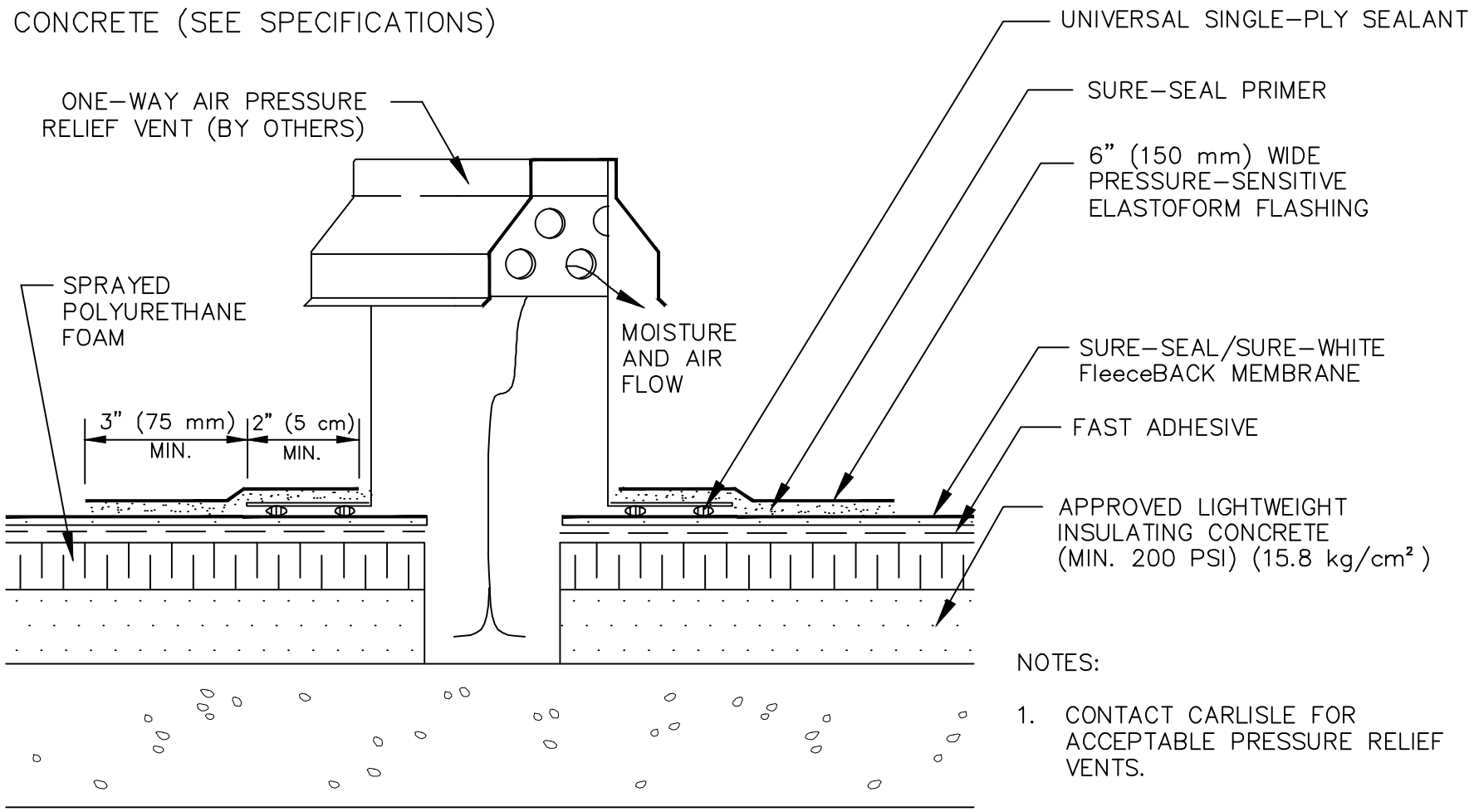
1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD FABRICATED PIPE SEAL.
2. PRESSURE-SENSITIVE ELASTOFORM FLASHING WRAPPED AROUND THE PIPE SHALL HAVE 3" (75 mm) MINIMUM MEMBRANE SPLICE.
3. TEMPERATURE OF METAL COLLAR MUST NOT EXCEED 180° F (82° C).
4. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING.

FBF-8-C

FIELD FABRICATED HOT STACK FLASHING

CARLISLE SYNTEC SYSTEMS

FOR USE WHEN SPRAYED POLYURETHANE FOAM IS APPLIED DIRECTLY OVER LIGHTWEIGHT INSULATING CONCRETE (SEE SPECIFICATIONS)



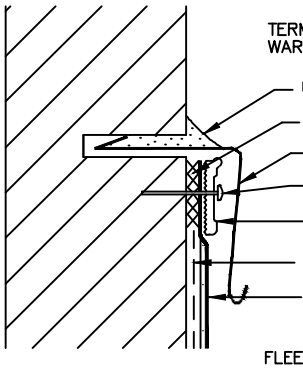
NOTES:

1. CONTACT CARLISLE FOR ACCEPTABLE PRESSURE RELIEF VENTS.
2. POSITION VENTS AT THE RATE OF ONE VENT EVERY 2,000 SQ. FT. (186 m²).

FBF-8-D

ONE-WAY AIR PRESSURE RELIEF VENT

CARLISLE SYNTEC SYSTEMS



TERMINATION BAR IS NOT REQUIRED ON 5 OR 10 YEAR WARRANTY PROJECTS–REFER TO DETAIL FBF–9–C

UNIVERSAL SINGLE–PLY SEALANT OR SEALANT "BY OTHERS"

WATER CUT–OFF MASTIC

METAL COUNTERFLASHING (BY OTHERS)

HP TERMINATION BAR NAIL–IN

TERMINATION BAR

FAST ADHESIVE

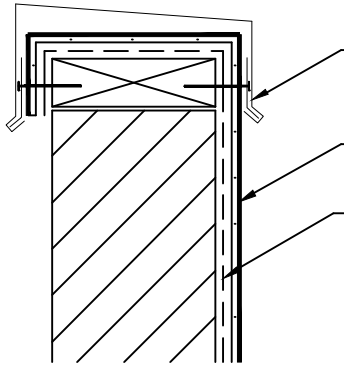
SURE–SEAL/SURE–WHITE FleeceBACK MEMBRANE

FLEECE MUST BE REMOVED FROM BACK OF MEMBRANE SO WATER CUT–OFF MASTIC IS IN DIRECT CONTACT WITH EPDM

NOTES:

1. WATER CUT–OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION.
2. DO NOT WRAP COMPRESSION TERMINATION AROUND CORNERS.
3. ALLOW 1/4" MIN. TO 1/2" MAX. (6 TO 13 mm) SPACING BETWEEN CONSECUTIVE LENGTHS OF TERMINATION BAR.

FBF–9–A COUNTERFLASHING/TERMINATION BAR



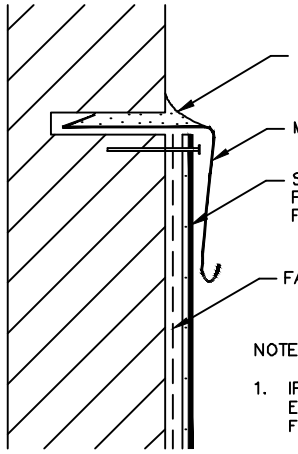
METAL CAP (BY OTHERS)

SURE–SEAL/SURE–WHITE FleeceBACK MEMBRANE

FAST ADHESIVE

FOR CARLISLE SecurEdge COPING, REFER TO INSTALLATION INSTRUCTIONS PUBLISHED SEPARATELY.

FBF–9–B METAL CAP FLASHING



UNIVERSAL SINGLE–PLY SEALANT OR SEALANT "BY OTHERS"

METAL COUNTERFLASHING (BY OTHERS)

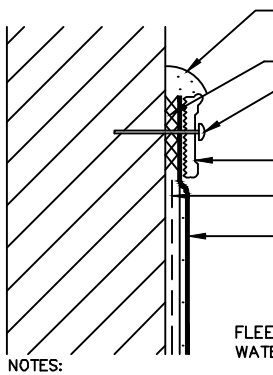
SURE–SEAL/SURE–WHITE FleeceBACK MEMBRANE FASTENED MAXIMUM 12" (300 mm) O.C.

FAST ADHESIVE

NOTES:

1. IF FASTENER PENETRATES METAL COUNTERFLASHING, USE EPDM WASHER OR APPLY WATER CUT–OFF MASTIC OR CAULK FASTENER HEAD.
2. MAXIMUM 10–YEAR WARRANTY (SEE DETAIL FBF–9–A).

FBF–9–C COUNTERFLASHING



UNIVERSAL SINGLE–PLY SEALANT OR SEALANT "BY OTHERS"

WATER CUT–OFF MASTIC

HP TERMINATION BAR NAIL–IN

TERMINATION BAR

FAST ADHESIVE

SURE–SEAL/SURE–WHITE FleeceBACK MEMBRANE

FLEECE MUST BE REMOVED FROM BACK OF MEMBRANE SO WATER CUT–OFF MASTIC IS IN DIRECT CONTACT WITH EPDM

NOTES:

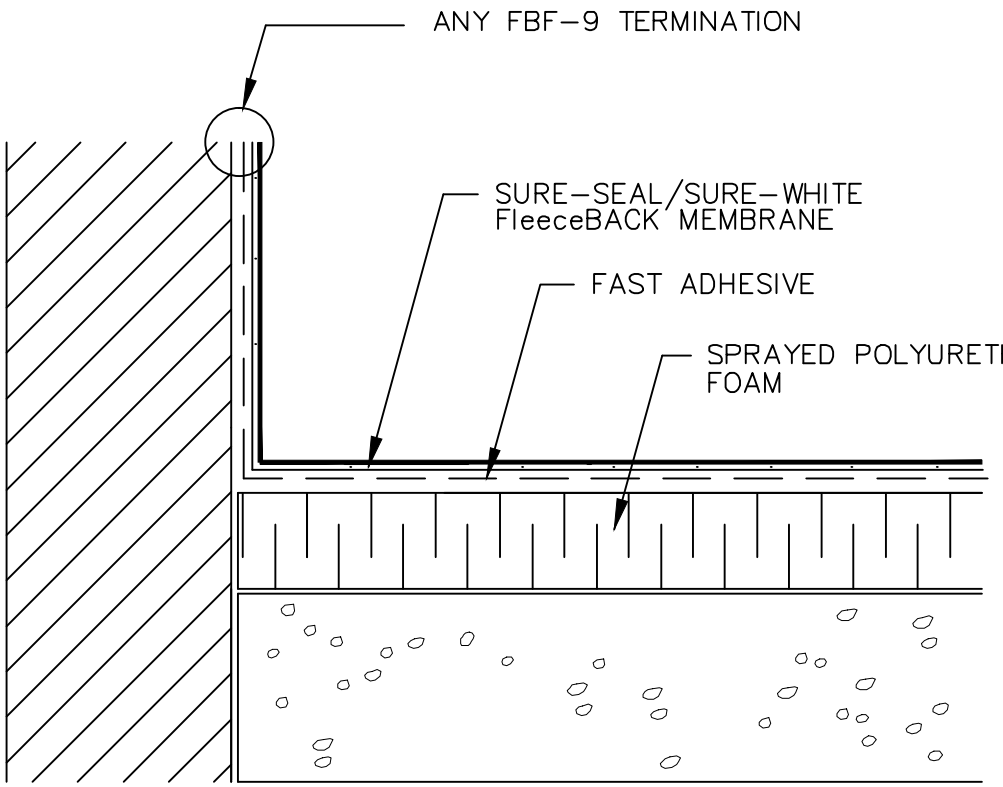
1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. WATER CUT–OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION.
3. DO NOT WRAP COMPRESSION TERMINATION AROUND CORNERS.
4. ALLOW 1/4" (6 mm) MIN. TO 1/2" (13 mm) MAX. SPACING BETWEEN CONSECUTIVE LENTHS OF TERMINATION BAR.

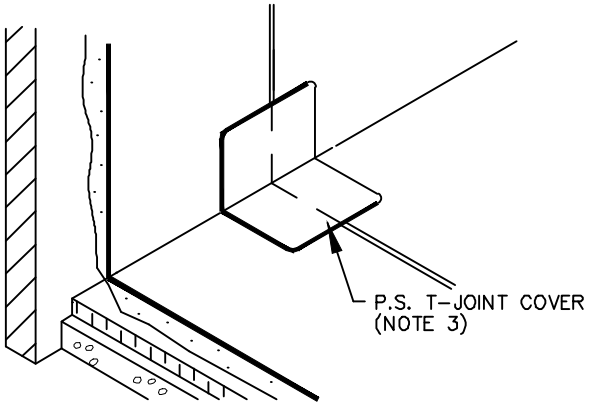
FBF–9–D TERMINATION BAR

FBF–9

VERTICAL FLASHING TERMINATIONS

CARLISLE SYNTEC SYSTEMS





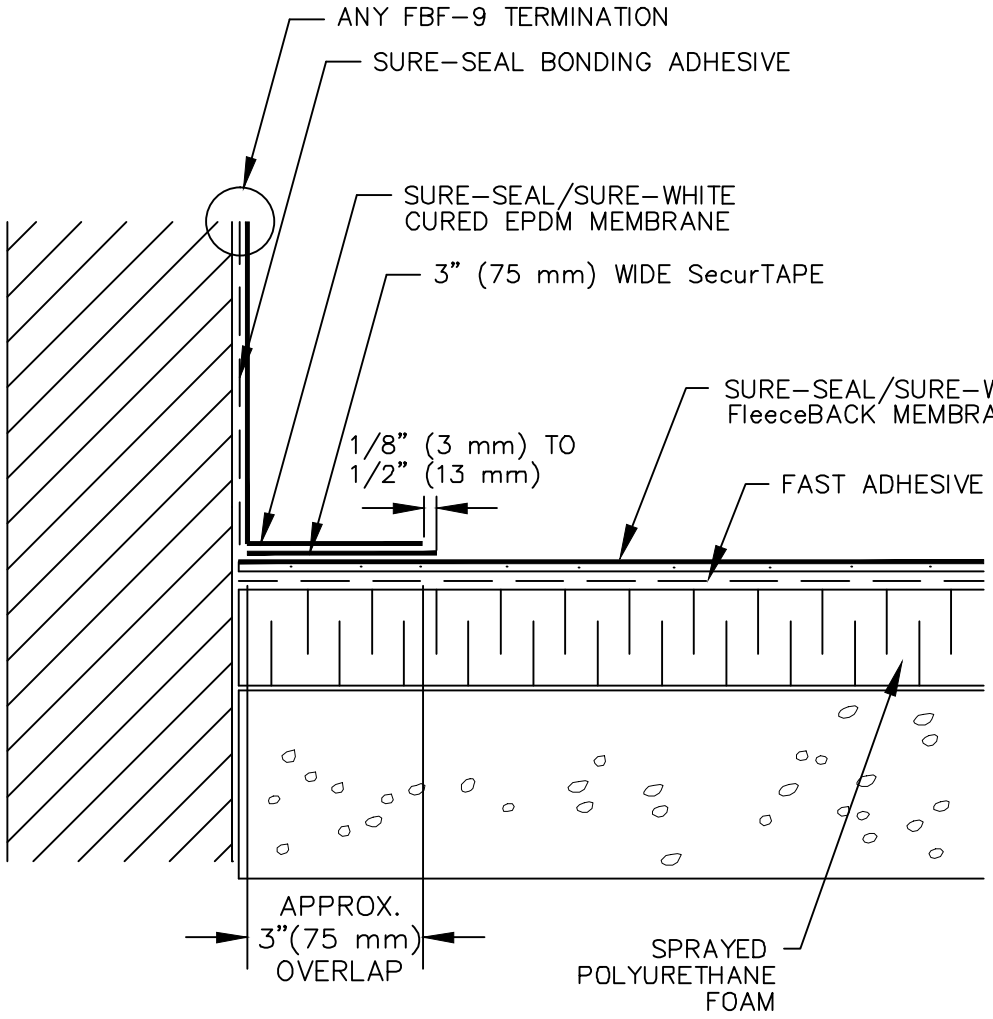
NOTES:

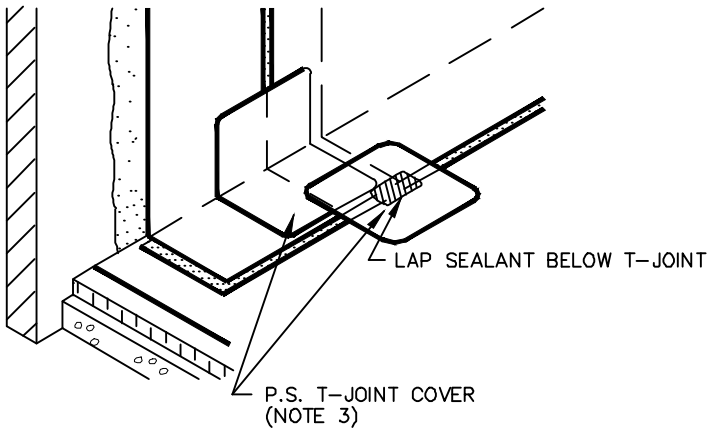
1. LOCATE TERMINATION ABOVE ANTICIPATED WATER LEVEL. FLEECE–BACKING MUST BE REMOVED AT COMPRESSION SEAL TERMINATIONS (FBF–9–A&D) – SEE SPECIFICATIONS.
2. FOR CORNER APPLICATIONS, SEE FBF–15 DETAILS.
3. 6–INCH (150 mm) WIDE PRESSURE SENSITIVE ELASTOFORM FLASHING MAY ALSO BE CENTERED OVER FIELD SPLICE AT ANGLE CHANGE.

FBF–12–A

PARAPET/CURB WITH CONTINUOUS FleeceBACK MEMBRANE

CARLISLE SYNTEC SYSTEMS





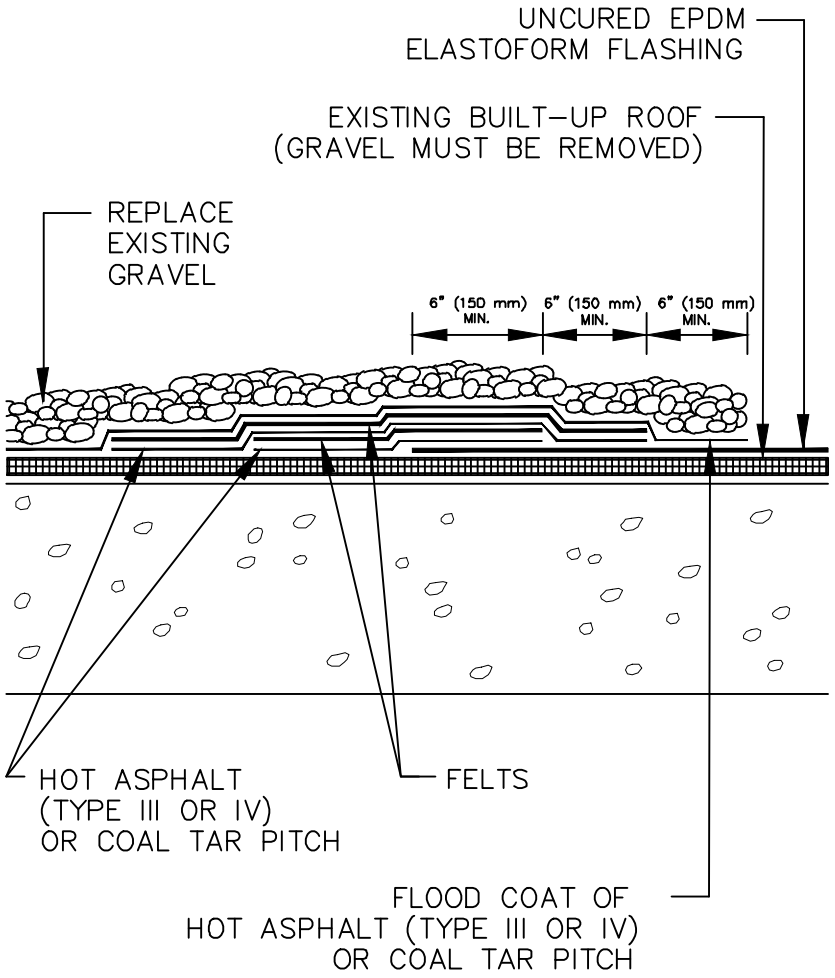
NOTES:

1. LOCATE TERMINATION ABOVE ANTICIPATED WATER LEVEL. FLEECE-BACKING MUST BE REMOVED AT COMPRESSION SEAL TERMINATIONS (FBF-9-A&D) - SEE SPECIFICATIONS.
2. FOR CORNER APPLICATIONS, SEE FBF-15 DETAILS.
3. 6-INCH (150 mm) WIDE PRESSURE SENSITIVE ELASTOFORM FLASHING MAY ALSO BE CENTERED OVER FIELD SPLICE AT ANGLE CHANGE.

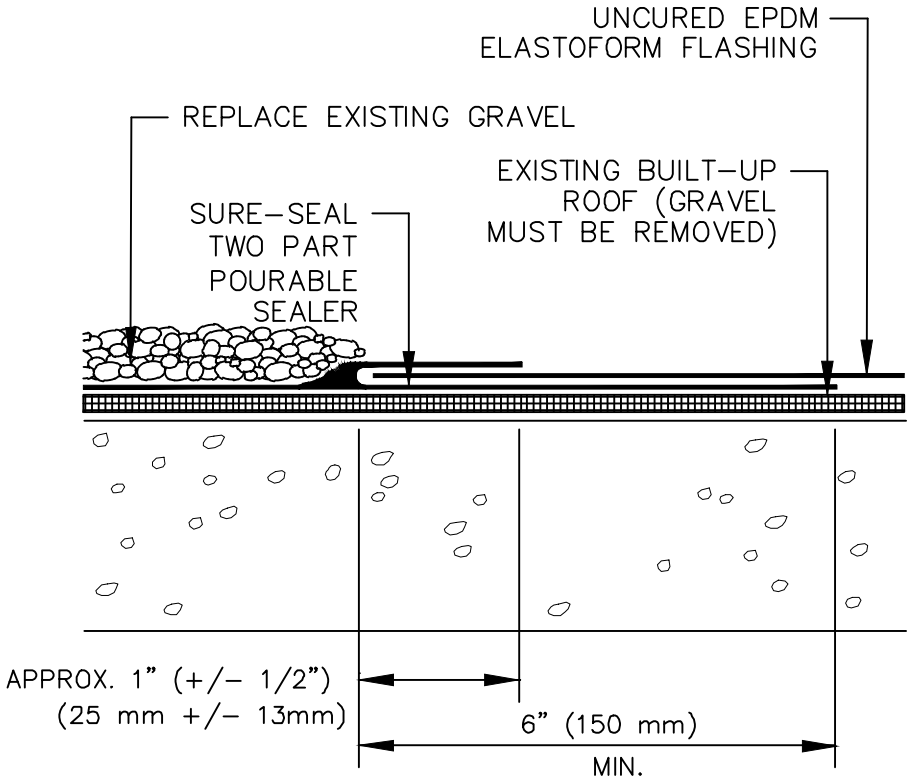
FBF-12-B

PARAPET/CURB WITH SEPARATE EPDM FLASHING

CARLISLE SYNTEC SYSTEMS



OPTION 1 – HOT TIE–IN

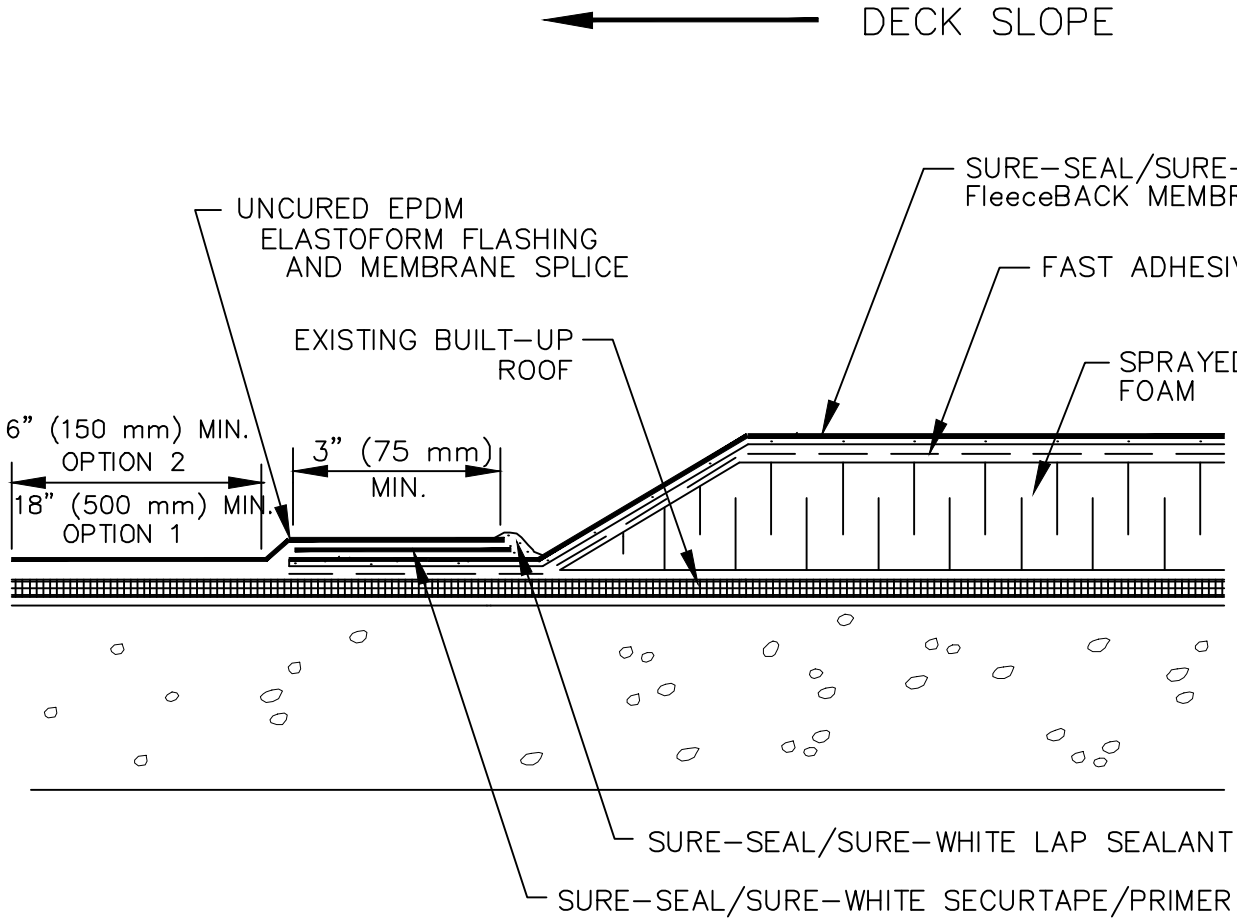


OPTION 2 – COLD TIE–IN

FBF–13–A

BUILT–UP ROOFING TIE–INS

CARLISLE SYNTEC SYSTEMS



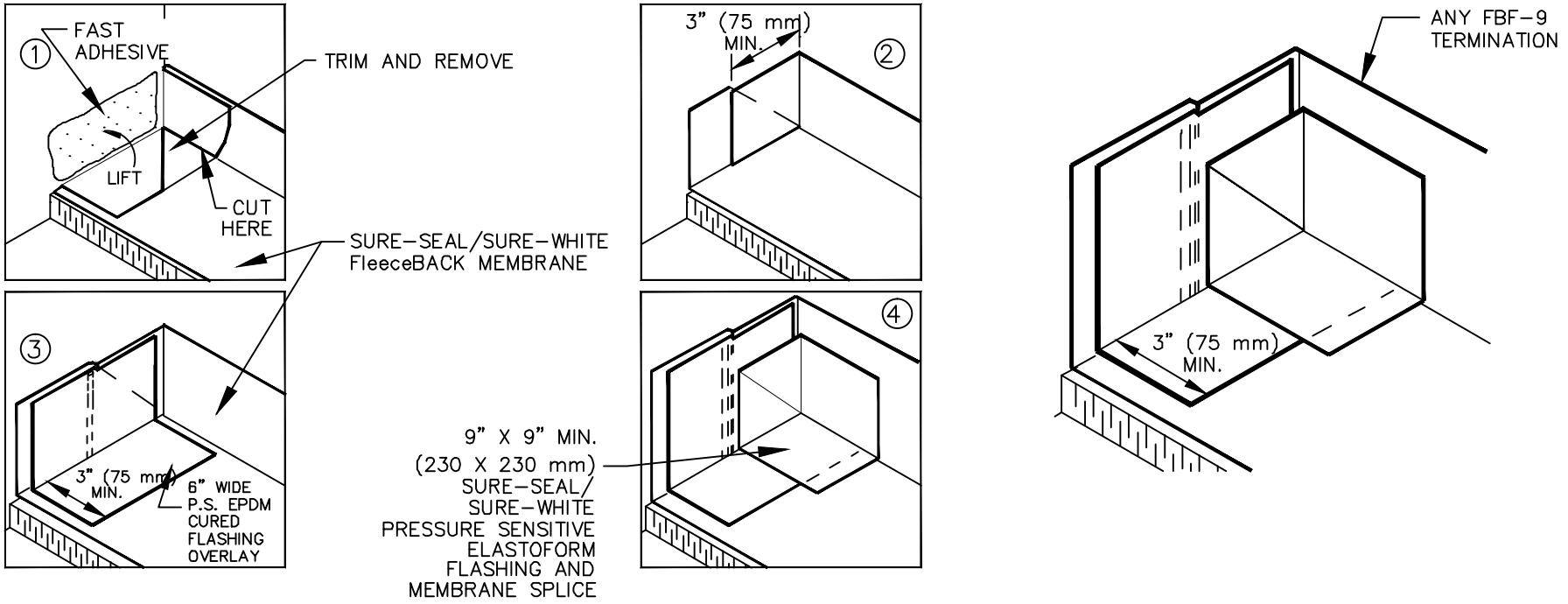
NOTES:

1. DETAIL APPLIES TO RE-ROOFING WITH DECK SLOPE AWAY FROM CARLISLE ROOF.
2. REMOVE ALL GRAVEL AT TIE-IN.
3. REFER TO DETAIL FBF-13 FOR FLASHING OPTIONS AT TIE-IN.

FBF-13-B

BUR TIE-IN SLOPED AWAY

CARLISLE SYNTEC SYSTEMS



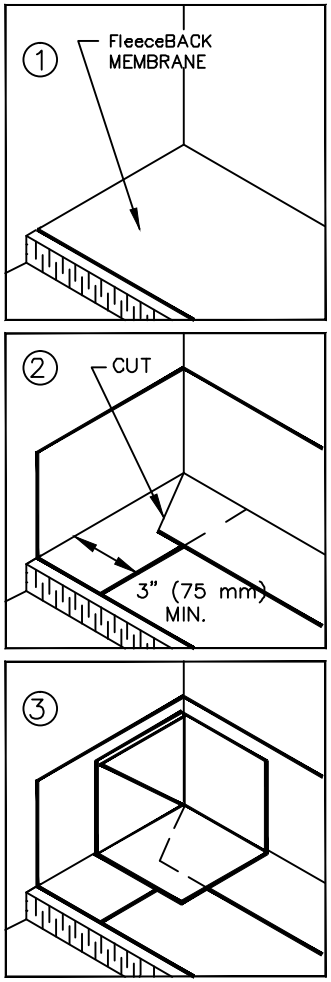
NOTES:

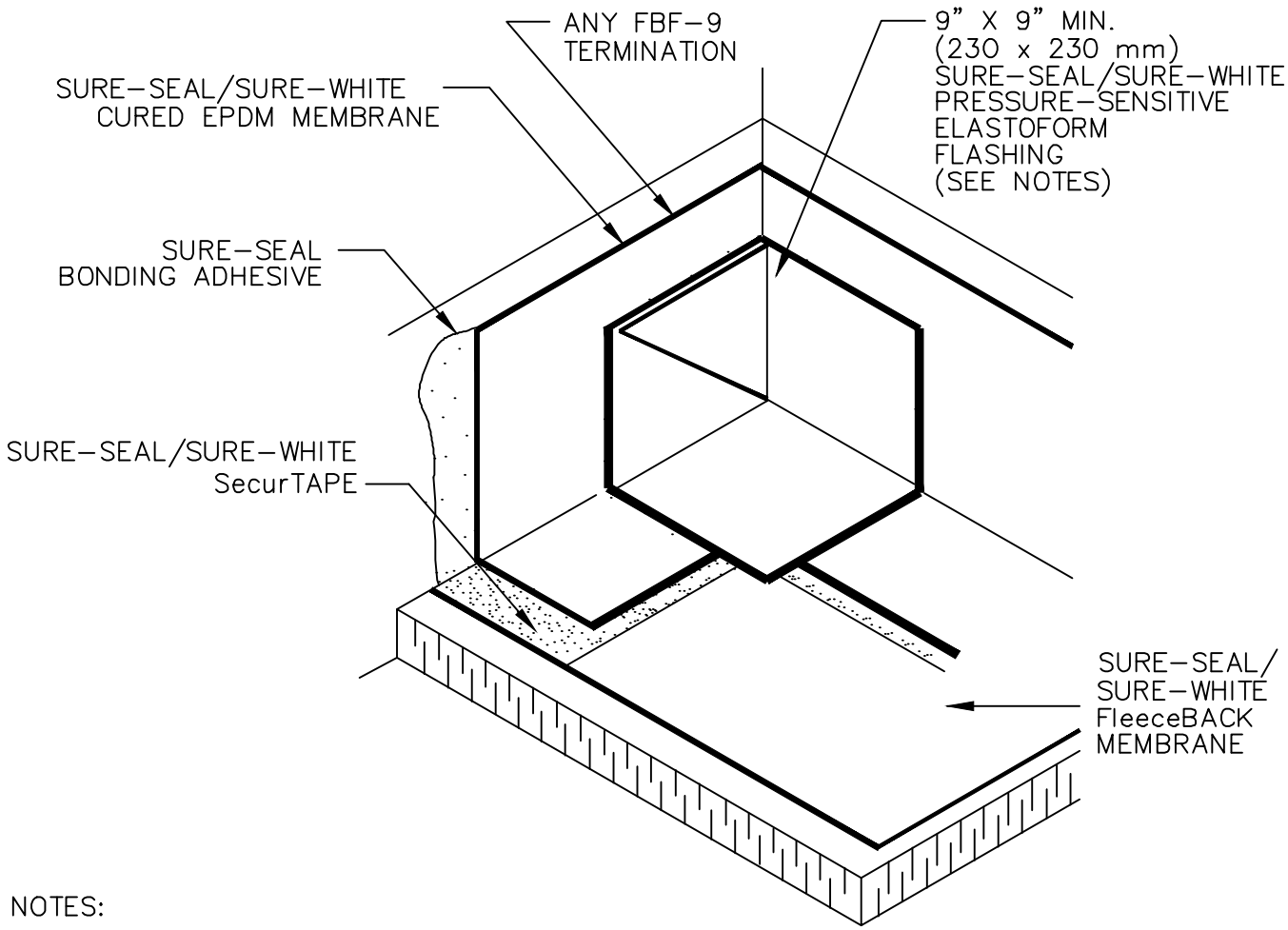
1. FOR USE OF SURE-SEAL INSIDE CORNER FLASHING, REFER TO DETAIL FBF-15-D.
2. SEMI-CURED PRESSURE SENSITIVE FLASHING ROLLS CANNOT BE USED AT CORNERS. PRESSURE SENSITIVE ELASTOFORM FLASHING OR SURE-SEAL INSIDE/OUTSIDE CORNERS MUST BE USED.

FBF-15-A

INSIDE CORNER/CONTINUOUS FleeceBACK MEMBRANE

CARLISLE SYNTEC SYSTEMS





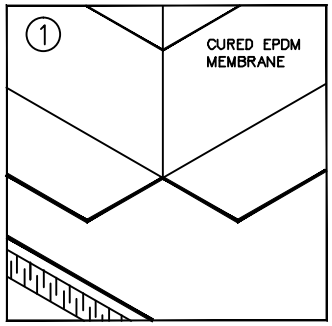
NOTES:

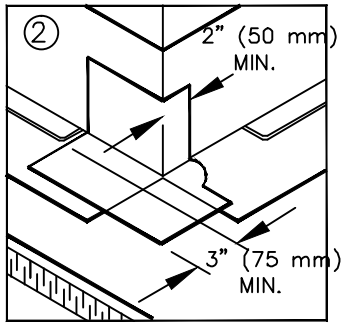
1. FOR USE OF SURE-SEAL INSIDE CORNER FLASHING, REFER TO DETAIL FBF-15-D.
2. SEMI-CURED PRESSURE SENSITIVE FLASHING ROLLS CANNOT BE USED AT CORNERS. PRESSURE SENSITIVE ELASTOFORM FLASHING OR SURE-SEAL INSIDE/OUTSIDE CORNERS MUST BE USED.

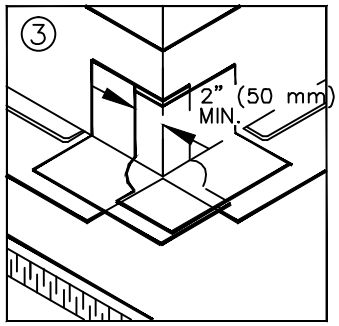
FBF-15-B

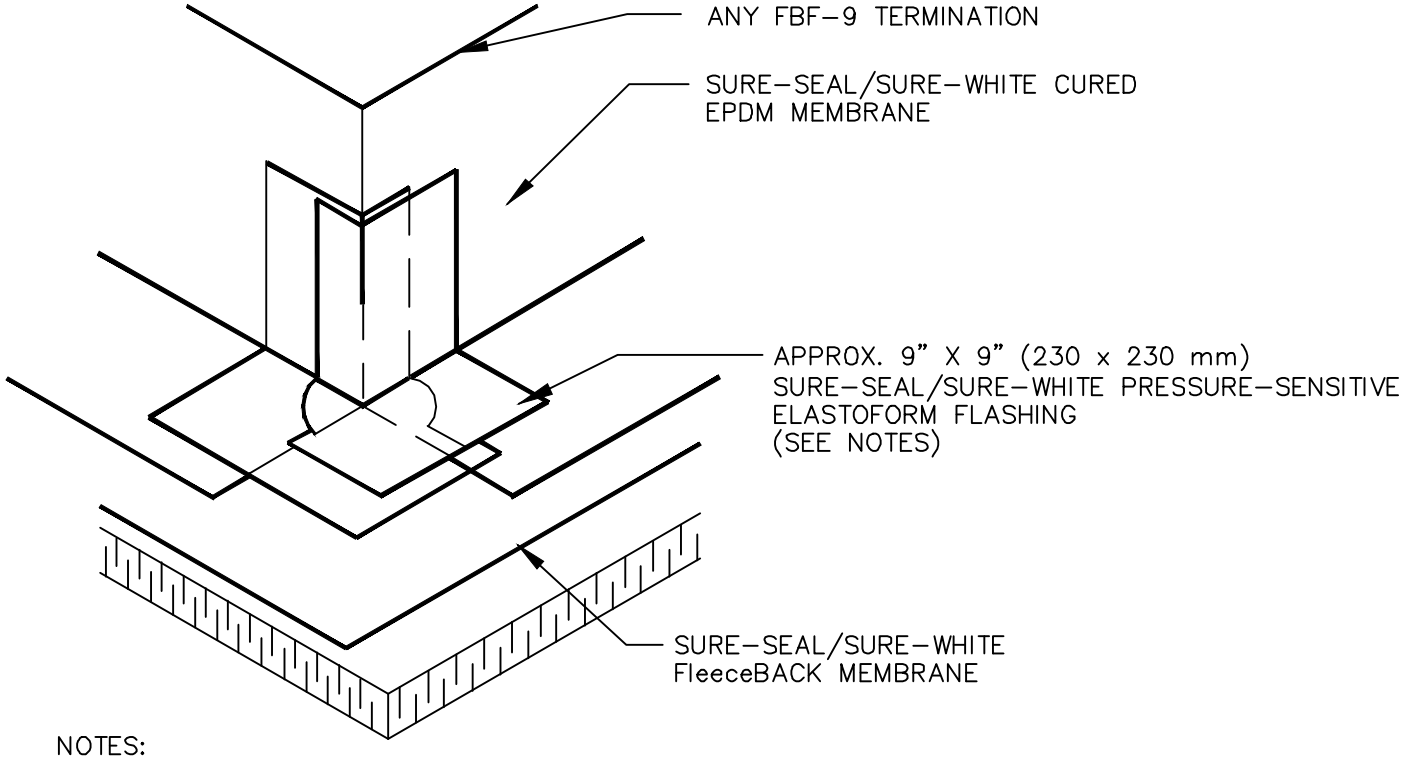
INSIDE CORNER/SEPARATE EPDM WALL FLASHING

CARLISLE SYNTEC SYSTEMS









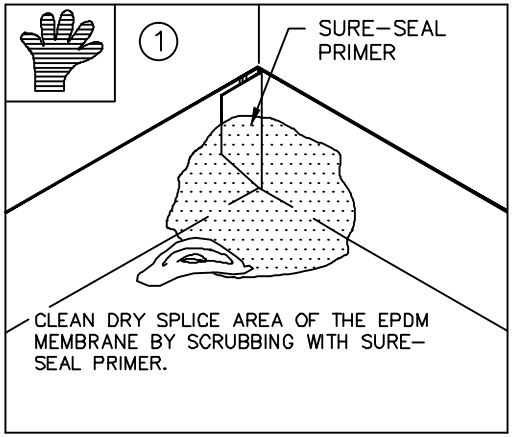
NOTES:

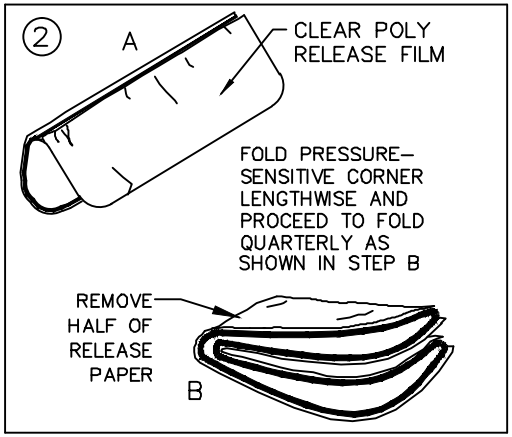
1. PRESSURE SENSITIVE ELASTOFORM FLASHING TO OVERLAP DECK MEMBRANE 3 IN. (75 mm) MINIMUM AND EXTEND 2 IN. (50 mm) MINIMUM AROUND CORNERS.
2. FOR USE OF SURE-SEAL PRESSURE-SENSITIVE OUTSIDE CORNER FLASHING REFER TO DETAIL FBF-15-E.
3. A HEAT GUN MUST BE USED WHEN FORMING SURE-WHITE FLASHING.
4. SEMI-CURED PRESSURE-SENSITIVE FLASHING ROLLS CANNOT BE USED AT CORNERS. PRESSURE-SENSITIVE ELASTOFORM FLASHING OR SURE-SEAL INSIDE/OUTSIDE CORNERS MUST BE USED.

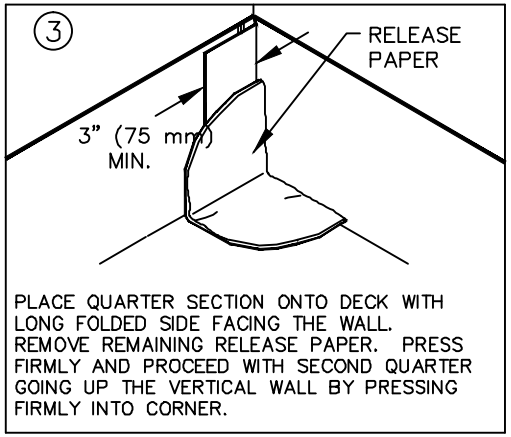
FBF-15-C

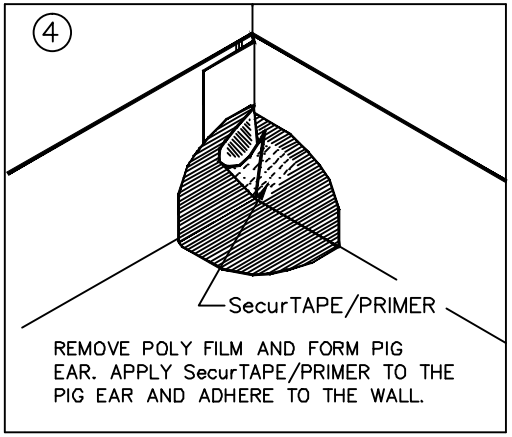
OUTSIDE CORNER/SEPERATE EPDM WALL FLASHING

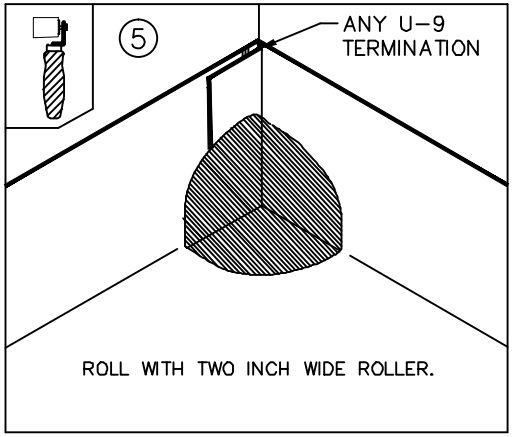
CARLISLE SYNTEC SYSTEMS





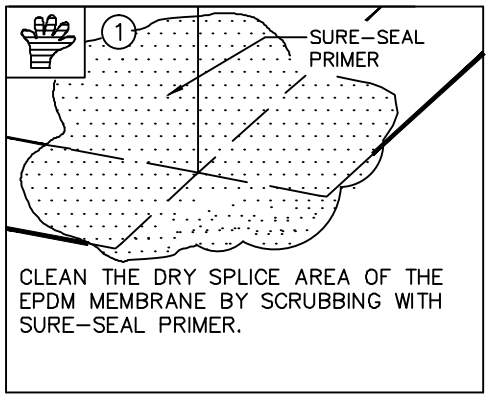




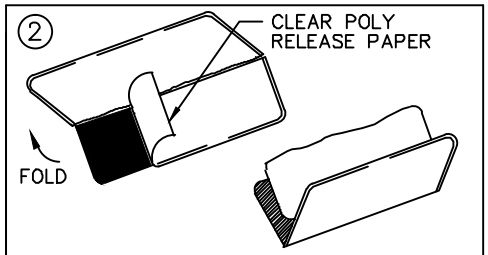


FBF-15-D
SURE-SEAL PRESSURE-SENSITIVE INSIDE CORNER

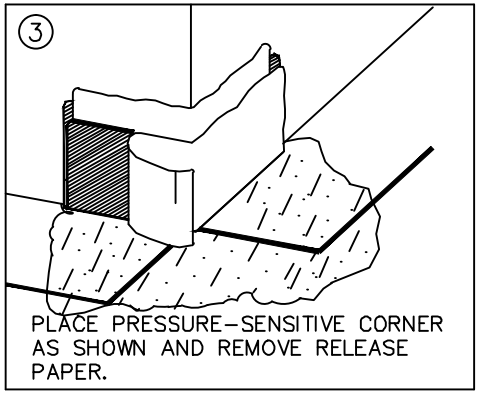
CARLISLE SYNTEC SYSTEMS



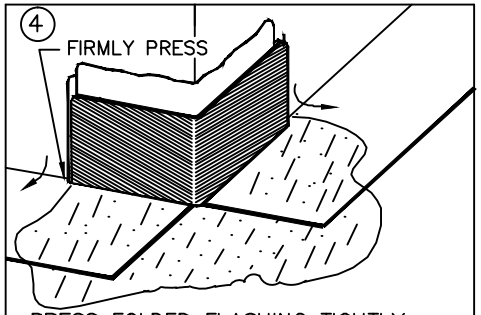
CLEAN THE DRY SPLICE AREA OF THE EPDM MEMBRANE BY SCRUBBING WITH SURE-SEAL PRIMER.



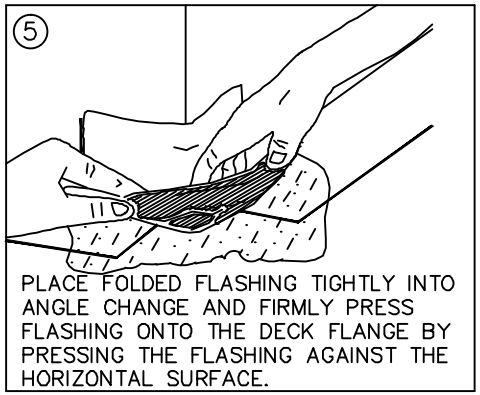
PRIOR TO PLACEMENT OF THE PRESSURE-SENSITIVE CORNER, PEEL OFF THE CLEAR POLY RELEASE FILM AND HEAT THE FLASHING SIDE WITH A HEAT GUN. RE-APPLY THE POLY LOOSELY. FOLD THE FLASHING IN HALF.



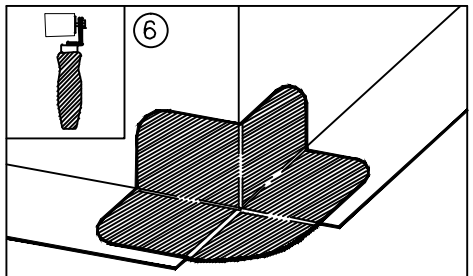
PLACE PRESSURE-SENSITIVE CORNER AS SHOWN AND REMOVE RELEASE PAPER.



PRESS FOLDED FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY PRESS FLASHING AGAINST THE VERTICAL SURFACE.



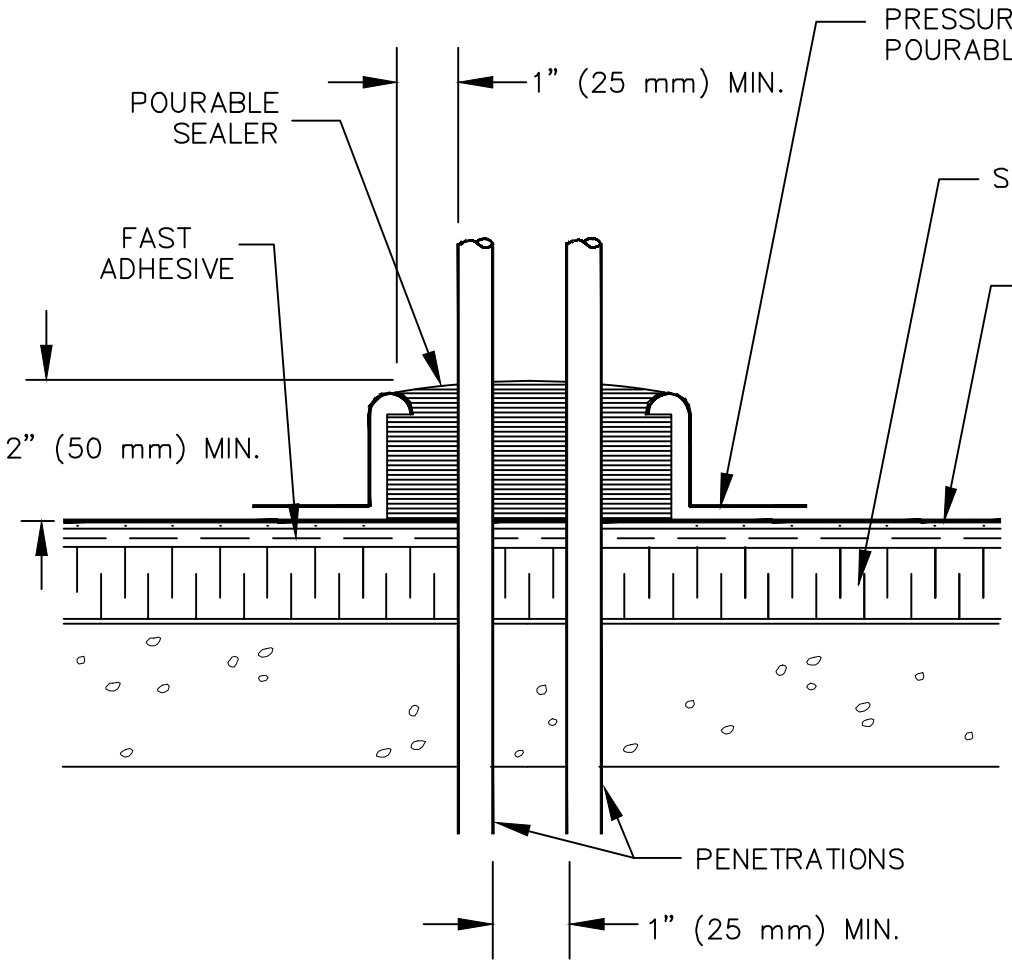
PLACE FOLDED FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY PRESS FLASHING ONTO THE DECK FLANGE BY PRESSING THE FLASHING AGAINST THE HORIZONTAL SURFACE.



ROLL WITH A TWO INCH WIDE ROLLER. PAY PARTICULAR ATTENTION TO THE STEP OFFS AND ANGLE CHANGE.

FBF-15-E
SURE-SEAL PRESSURE-SENSITIVE OUTSIDE CORNER

CARLISLE SYNTEC SYSTEMS



PENETRATIONS, MEMBRANE, FLASHING AND METAL DAM (INSIDE POCKET) MUST BE PRIMED PRIOR TO APPLYING POURABLE SEALER.

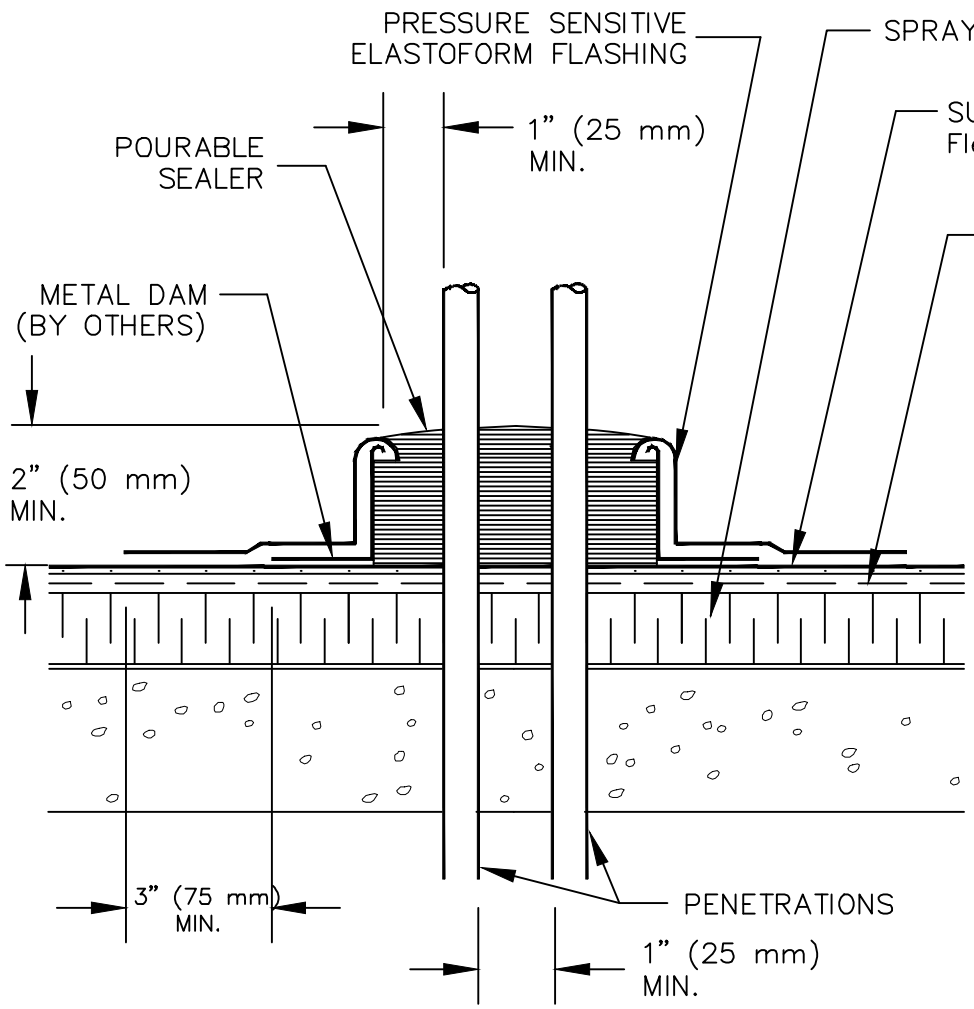
NOTES:

1. TEMPERATURE OF PENETRATION MUST NOT EXCEED 180°F (82°C).
2. POURABLE SEALER MUST CONTACT PRESSURE SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
3. POURABLE SEALER POCKET TO BE 1" (25 mm) MINIMUM FROM PENETRATION ON ANY SIDE.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER TO BE MIN. 2" (50 mm) DEEP.
6. POURABLE SEALER MUST CONTACT THE BARE SURFACE OF THE PENETRATION. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.

FBF–16–A

PRESSURE–SENSITIVE POURABLE SEALER POCKET

CARLISLE SYNTEC SYSTEMS



PENETRATIONS, MEMBRANE, FLASHING AND METAL DAM (INSIDE POCKET) MUST BE PRIMED PRIOR TO APPLYING POURABLE SEALER.

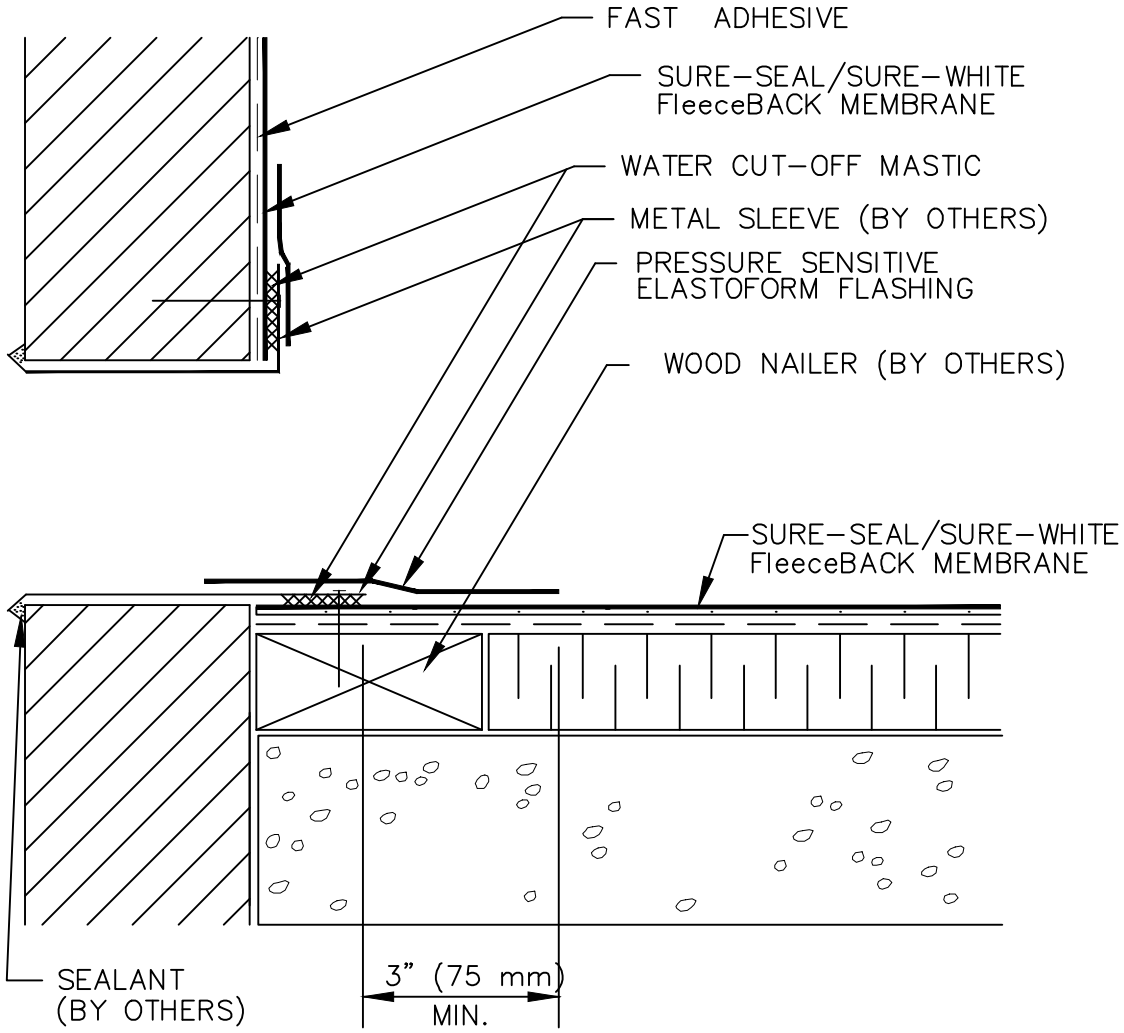
NOTES:

1. TEMPERATURE OF PENETRATIONS MUST NOT EXCEED 180°F (82°C).
2. POURABLE SEALER MUST CONTACT PRESSURE SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
3. DECK FLANGE MUST BE CONTINUOUS WITH ROUNDED CORNERS.
4. POURABLE SEALER POCKET MAY BE ROUND.
5. POURABLE SEALER POCKET TO BE 1 IN. (25 mm) MIN. FROM PENETRATION ON ANY SIDE.
6. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
7. POURABLE SEALER TO BE MIN. 2 IN. (50 mm) DEEP.
8. POURABLE SEALER MUST CONTACT THE BARE SURFACE OF THE PENETRATION. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.

FBF–16–B

FIELD FABRICATED POURABLE SEALER POCKET

CARLISLE SYNTEC SYSTEMS



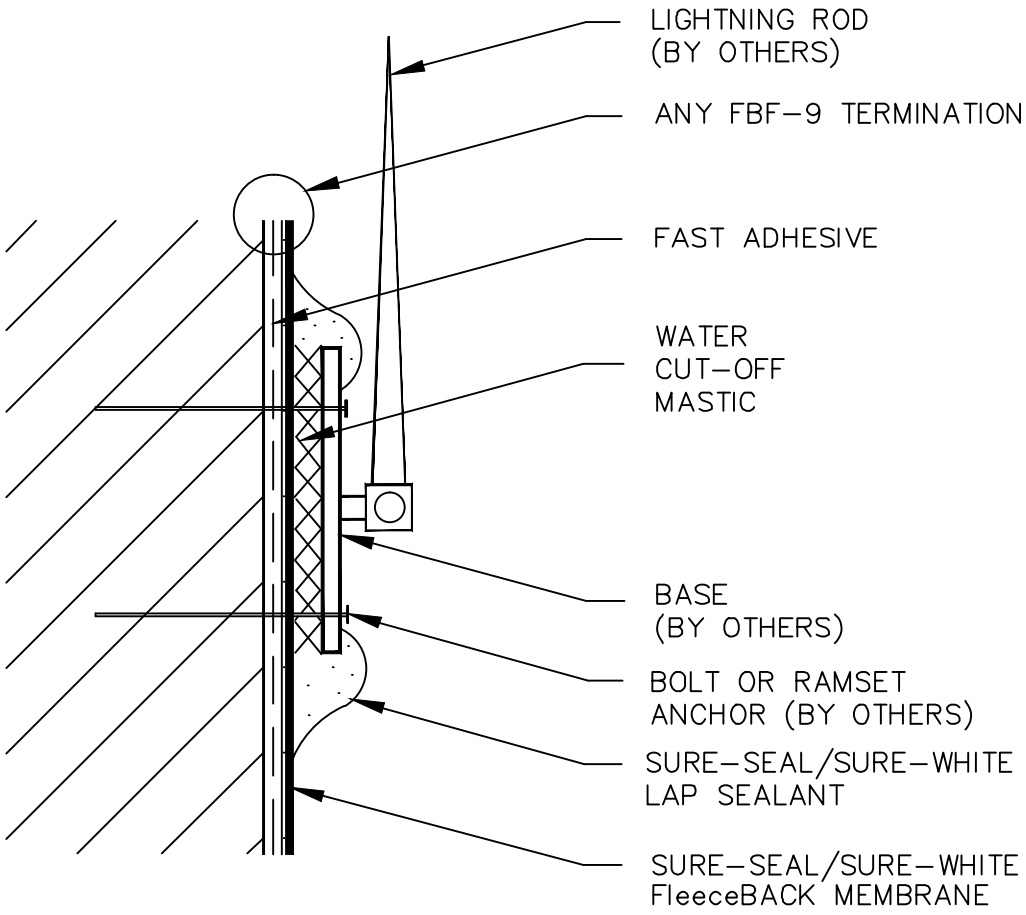
NOTES:

1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVES AND MUST EXTEND PAST THE WIDTH OF THE METAL SLEEVE.
2. METAL SCUPPER BOX MUST HAVE CONTINUOUS SIDES; METAL FLANGE MUST BE CONTINUOUS WITH ROUNDED CORNERS.
3. WATER CUT-OFF MASTIC MUST BE UNDER CONSTANT COMPRESSION.
4. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF DECK FLANGE.
5. A MIN. 2" (50 mm) FLASHING SPLICE IS REQUIRED PAST THE NAIL HEAD ON THE METAL FLANGE OF THE SCUPPER.
6. SOLDER ALL SCUPPERS.

FBF-18

METAL SCUPPER AT DECK

CARLISLE SYNTEC SYSTEMS



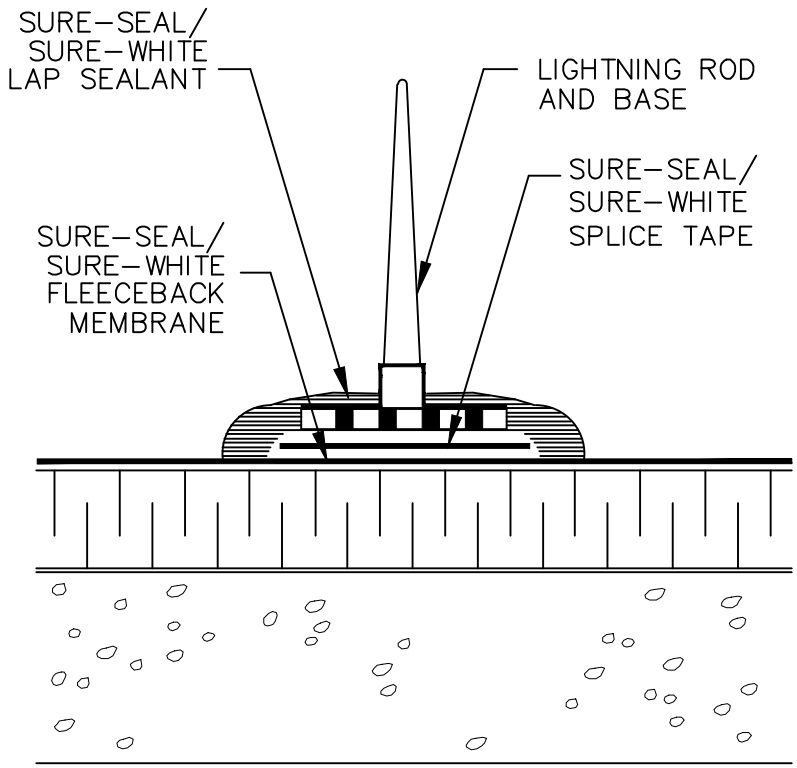
NOTES:

1. DETAIL MAY BE USED FOR ANY FASTENER PENETRATION (E.G., ACCESS LADDER, ANCHOR SUPPORT TO PARAPET).
2. WATER CUT-OFF MASTIC MUST BE UNDER CONSTANT COMPRESSION.
3. UNACCEPTABLE FOR HORIZONTAL APPLICATION ON ROOF DECK.

FBF-20-A

LIGHTNING ROD AT PARAPET

CARLISLE SYNTEC SYSTEMS



NOTES:

1. CLEAN EXPOSED MEMBRANE WITH SURE-SEAL WEATHERED MEMBRANE CLEANER AND ALLOW TO DRY.

2. APPLY SURE-SEAL PRIMER TO THE MEMBRANE AND LIGHTING ROD BASE ACHIEVING A VERY THIN, EVEN COAT ON BOTH SURFACES. ALLOW PRIMER TO DRY UNTIL IT IS TACK FREE.

3. INSTALL A SECTION OF SecurTAPE (APPROXIMATELY THE SIZE OF THE METAL BASE) TO THE MEMBRANE SURFACE. LEAVE THE RELEASE FILM IN PLACE AND ROLL THE TAPE FROM THE CENTER TO THE OUTER EDGES.

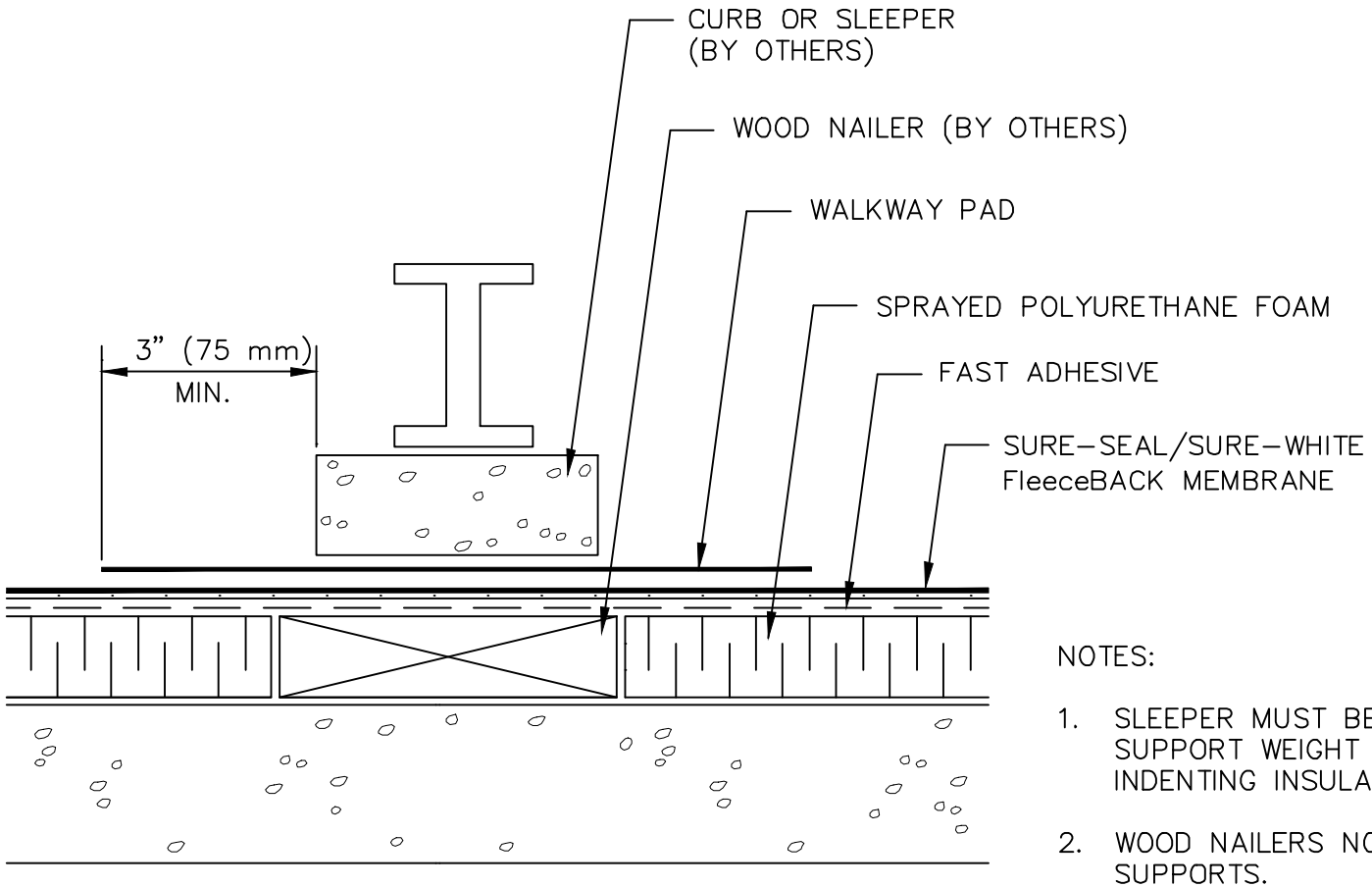
4. REMOVE RELEASE FILM AND CAREFULLY PLACE METAL BASE OVER SPLICE TAPE.

5. APPLY SURE-SEAL PRIMER TO THE EPDM MEMBRANE WHERE LAP SEALANT IS TO BE APPLIED TO ACHIEVE A THIN, EVEN COAT. ALLOW TO DRY UNTIL TACK FREE. SEAL ALL EDGES AND ANY EXPOSED AREAS OF TAPE (AT PERFORATED BASE) WITH LAP SEALANT.

FBF-20-B

LIGHTNING ROD AT DECK LEVEL

CARLISLE SYNTEC SYSTEMS



NOTES:

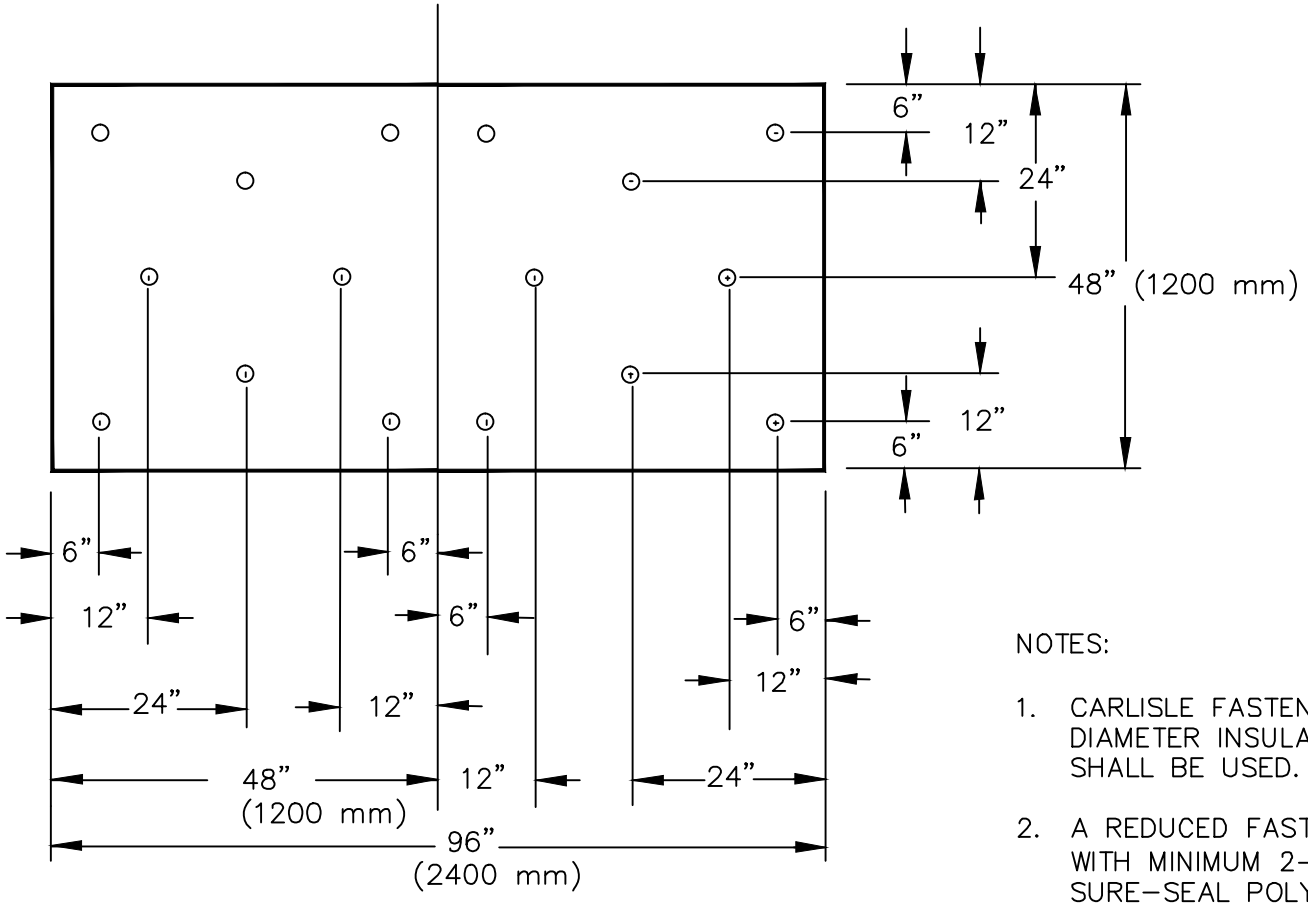
1. SLEEPER MUST BE LARGE ENOUGH TO SUPPORT WEIGHT OF EQUIPMENT WITHOUT INDENTING INSULATION.

2. WOOD NAILERS NOT REQUIRED UNDER PIPE SUPPORTS.

FBF-24
SLEEPER

CARLISLE SYNTEC SYSTEMS

FASTENING PATTERN FOR SURE-SEAL INSULATION USED AS A BASE LAYER BENEATH SPRAYED POLYURETHANE FOAM OVER STEEL DECKS



4' (1200 mm) X 8' (2400 mm) INSULATION BOARDS

NOTES:

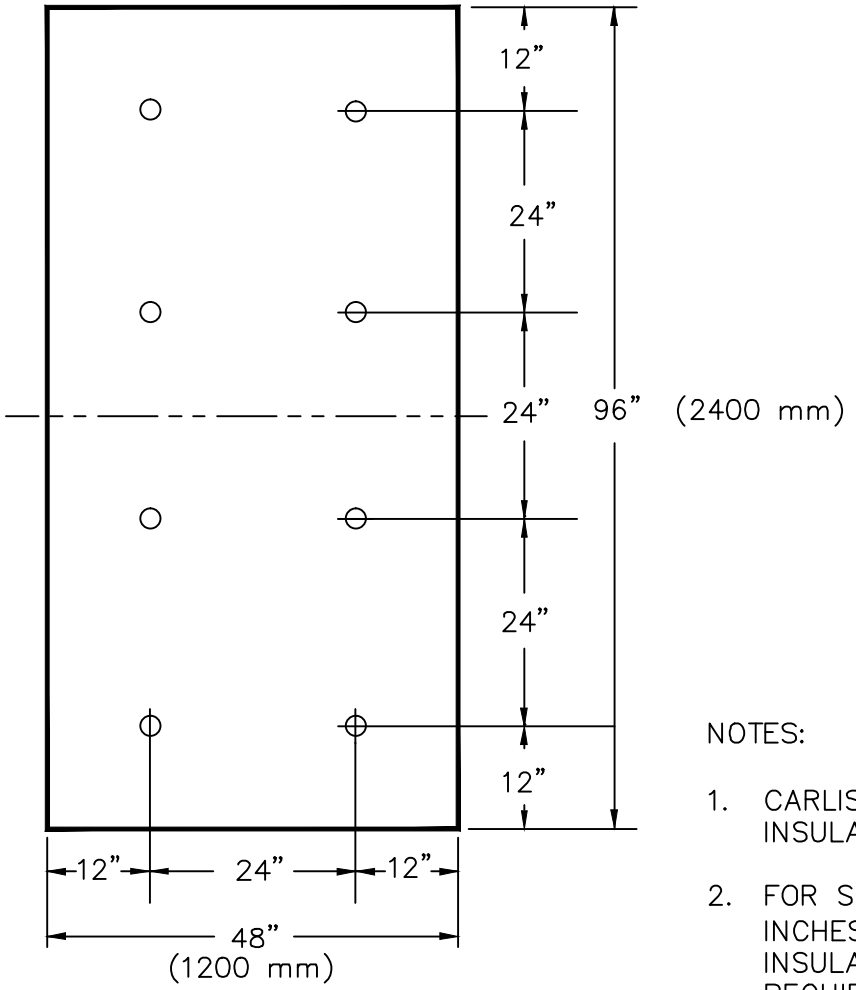
1. CARLISLE FASTENERS AND 3 INCH (75 mm) DIAMETER INSULATION FASTENING PLATES SHALL BE USED.
2. A REDUCED FASTENING PATTERN CAN BE USED WITH MINIMUM 2-INCH (40 mm) THICK SURE-SEAL POLYISOCYANURATE INSULATION. REFER TO DETAIL FBF-27-B.

FBF-27-A

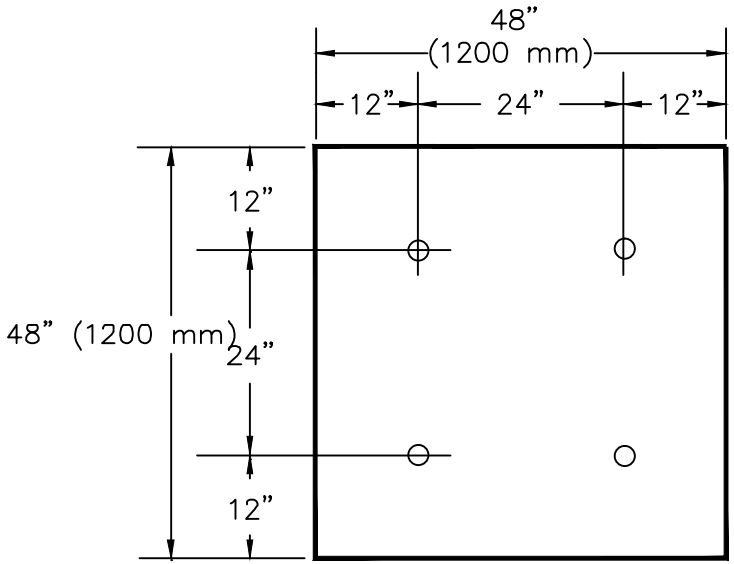
BASE LAYER INSULATION ATTACHMENT

CARLISLE SYNTEC SYSTEMS

FASTENING PATTERN FOR MINIMUM 2 IN. THICK SURE-SEAL POLYISOCYANURATE INSULATION (SINGLE LAYER) USED AS A BASE LAYER BENEATH SPRAYED POLYURETHANE FOAM OVER STEEL DECKS



4' (1200 mm) x 8' (2400 mm) INSULATION BOARDS



4' (1200 mm) x 8' (1200 mm) INSULATION BOARDS

NOTES:

1. CARLISLE FASTENERS AND 3 INCH (75 mm) DIAMETER INSULATION FASTENING PLATES SHALL BE USED.
2. FOR SURE-SEAL POLYISOCYANURATE INSULATION LESS THAN 2 INCHES (40 mm) THICK OR FOR OTHER ACCEPTABLE CARLISLE INSULATIONS, REFER TO DETAIL FBF-27-A FOR FASTENING REQUIREMENTS.

FBF-27-B
BASE LAYER OF 2" MIN. SURE-SEAL POLYISOCYANURATE INSULATION

CARLISLE SYNTEC SYSTEMS