Sure-Seal® EPDM Roofing Systems

Sure-Tough™ EPDM Roofing Systems

Sure-Seal®/Sure-White®/Sure-Tough™ EPDM Roofing Systems
Adhered, Ballasted and Mechanically Fastened

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

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

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

PART I - GENERAL

1.01 Description

A. **The Design "A" Adhered Roofing System** incorporates **Sure-Seal (black) 60- or 90- mil thick non-reinforced or Sure-Seal (gray) 60-mil thick non-reinforced or Sure-White (white**) **60- or 90-mil thick non-reinforced or 45-, 60- or 75-mil Sure-Tough™ reinforced** EPDM membrane. An acceptable insulation is mechanically fastened to the roof deck or adhered with Carlisle supplied urethane-based insulation adhesive or hot asphalt and the EPDM membrane is fully adhered to the insulation with Carlisle EPDM Bonding Adhesive (Sure-Seal Bonding Adhesive, Low-VOC Bonding Adhesive, Water Based Bonding Adhesive and CAV-GRIP III Bonding Adhesive). Adjoining sheets of EPDM membrane are spliced together using 3" or 6" wide SecurTAPE™ and Primer OR Factory-Applied TAPE (FAT™) and Primer. There are no maximum slope restrictions for the application of this roofing system.

Note: When non-reinforced EPDM membrane is used, Carlisle recommends a minimum of 60-mil thick material. Sure-Seal FR 45-mil non-reinforced EPDM may be utilized when specified or required by the owner or owner's representative.

Water based adhesive may be used for projects with 20 year maximum warranty and wind speed coverage up to 72 mph.

B. **The Design "B" Loose Laid Ballasted Roofing System** incorporates minimum **45-mil thick Sure-Seal (black) non-reinforced or minimum 60-mil Sure-Tough reinforced EPDM membrane**. Both the EPDM membrane and an acceptable membrane underlayment or insulation are loose laid over the substrate and held in place with a minimum of 10 pounds of ballast per square foot depending upon wind load requirements. Adjoining sheets of EPDM membrane are spliced together using 3" or 6" wide SecurTAPE and Primer OR Factory-Applied TAPE (FAT) and Primer. The maximum roof slope for this roofing system is 2" to one horizontal foot.

C. **The Mechanically Fastened Roofing System** incorporates **45-, 60- or 75-mil Sure-Tough reinforced EPDM membrane**. An acceptable insulation is mechanically fastened to the roof deck and, depending on project criteria; the reinforced membrane is mechanically fastened with the appropriate Carlisle Fastener and 2" or 2-3/8" diameter

Fastening Plates (Polymer Seam Plates required over steel deck) or Fastening Bars at 6" minimum to 12" maximum along the center of the membrane splice.

Adjoining sheets of EPDM membrane are spliced together using 6" Factory-Applied TAPE (FAT) and Primer OR 6" SecurTAPE and Primer. Field membrane sheets are either 5', 6.5', 8' or 10' wide depending upon wind load requirements, building height and type of roof deck. At the roof perimeter, a heavier fastening density is required utilizing 5', 6.5' wide sheets or 9" wide Pressure-Sensitive RUSS (Reinforced Universal Securement Strip). The maximum roof slope for this roofing system is 18" in one horizontal foot.

This roofing system can also be specified over an existing standing seam, flat seam or corrugated metal roof with the membrane secured to the structural purlins. Refer to the Metal Retrofit System Specification and Details.

NOTE: The selection of various components (i.e. insulation, underlayment, membrane thickness, etc.) may vary depending on desired Warranty coverage. Refer to appropriate Warranty Tables listed in Paragraph 1.05.

Assemblies with membrane fasteners 12" or longer must be submitted for Carlisle's review to ensure adequate securement due to the possibility of increased dynamic fastener movement. Such assemblies when accepted may require the use of additional insulation fasteners and the use of 1/2" SecurShield™ HD Recover Board.

1.02 General Design Considerations

A. Projects where wind speed coverage greater than 55 mph is specified or those with a 20-year or longer Total System Warranty will require additional enhancements beyond those outlined in this section. Prior to installation, refer to Warranty Tables in Paragraph 1.05.

B. Petroleum based products; certain chemicals and waste products (i.e., grease, oil, animal fats, etc.) are not compatible with these roofing systems. 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 the specified Carlisle Roofing System.

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

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

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

G. Drainage

1. Drainage must be evaluated by the Specifier in accordance with all applicable codes. Slopes may be provided by tapering the structure or through the use of tapered insulation; a sufficient number of roof drains should also be specified and properly located to allow for positive drainage. Significant ponding that could remain after 48 hours should be eliminated with the addition of auxiliary drains in low areas where ponding is anticipated. Carlisle specifically disclaims responsibility for the design and selection of an adequate drainage system and drain accessories. Selection must be made by the building owner or the owner's design professional.

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

3. **Tapered edge strips, crickets or saddles** are recommended where periodic ponding of water may occur. When the slope of the taper exceeds 2" to one horizontal foot additional membrane securement at the base of the tapered edge strip, cricket or saddle will be required.

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

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

I. Vapor Retarders

1. Carlisle does not require a vapor retarder for the protection of the membrane; however, it should be considered by the specifier for the protection of the roofing assembly including insulation, underlayment and adhesives.

2. The following criteria should be considered by the specifier:

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

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

3) When a vapor retarder is specified, Carlisle VapAir Seal 725TR or VapAir Seal MD Air and Vapor Barrier may be used. Refer to Part II "Products" for necessary information and **Spec Supplement G-08 "Application Procedures for 725TR Air and Vapor Barrier"** for product Installation.

4) On cold storage/freezer facilities, the perimeter and penetration details must be selected to provide an air seal and prevent outside air from infiltrating and condensing within the roofing assembly. Consult latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.

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

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

J. **Retrofit - Recover Projects** (when the existing roofing material is left in place)

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

2. A core cut should be taken to verify the weight of existing components when the roofing system is to be specified over an existing roofing assembly.

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

4. Existing PVC membrane must be totally removed, or the existing membrane must be cut into maximum 10' by 10' sections. All PVC flashings at the perimeter, roof drains and roof penetrations must be removed.

K. **Optional Color Coating**

1. Sure-Seal X-Tenda Coat Coating is recommended for color coating the EPDM membrane and flashing when required by the Specifier. Available in white or gray.

X-Tenda Coat Coating can also be specified as a "Restoration System" when applied to an existing Carlisle EPDM membrane system that may qualify for a 5 or 10-year Coating System Warranty. Refer to Carlisle's published Sure-Seal X-Tenda Coat Coating Specification for specific requirements.

NOTE: Carlisle may be contacted for other optional color coatings.

1.03 Quality Assurance

Building codes are above and beyond the intended purpose of this specification. The building **owner, owner's representative** or **Specifier** should verify local codes for applicable requirements and limitations. It is the responsibility of the specifier to review local, state and regional codes to determine their impact on the specified Carlisle Roofing System.

NOTE: For code approvals achieved with the Carlisle EPDM Roofing Systems, refer to the Carlisle EPDM Code Approval Guide, DORA (Directory of Roof Assemblies), Factory Mutual (FM) Approval Guide or Underwriters Laboratories (UL) Fire Resistance or Roofing Materials and Systems Directories.

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

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

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

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

E. Provide EPDM membrane and polyisocyanurate insulation from ISO 14001 (Environmental Management System) Certified Facilities.

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

G. After completion of the installation, upon request, an inspection shall be conducted by a Field Service Representative (FSR) of Carlisle SynTec 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.

H. For ballasted, 30-year warranty projects, the applicator must submit pictures showing the use of EPDM Primer for perimeter RUSS securement or allow random test cuts to confirm the use of EPDM Primer.

1.04 Submittals

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

1. Air pressurized buildings, canopies, and buildings with large openings where the total wall openings exceed 10% of the total wall area on which the openings are located (such as airport hangars, warehouses and large maintenance facilities). Refer to Attachment IV at the end of this section for perimeter considerations, when a Mechanically Fastened System is specified.
2. Cold storage buildings and freezer facilities.
3. Design "A" Adhered Roofing Systems over 250' in height for projects with warranties up to 15 years.
4. Design "A" Adhered Roofing Systems over 100' in height for projects with warranties greater than 15 years.
5. Design "B" Ballasted Roofing System projects over 75' in height.
6. Mechanically Fastened Roofing System projects over 100' in height.
7. Projects where the EPDM is expected to come in direct contact with petroleum-based products, waste products (i.e., grease, oil, animal fats, etc) and other chemicals.
8. Projects where hot asphalt is specified for insulation attachment.
9. Mechanically Fastened projects specified with a fastener length exceeding 12 inches.

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

Shop drawings must include:

1. Outline of roof and size
2. Deck type (for multiple deck types)
3. Location and type of **all** penetrations

4. Perimeter and penetration details
5. Key plan (on multiple roof areas) with roof heights indicated
6. Sheet width and number of perimeter sheets for Reinforced Mechanically Fastened systems
7. Sure-Seal Fastener type, length and maximum spacing (for membrane securement) for Reinforced Mechanically Fastened systems.

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

D. Ballasted projects incorporating a **lightweight insulating concrete** substrate, a **certification letter** is **required** from the lightweight insulating concrete manufacturer for the following conditions:

1. The membrane is specified directly over **vermiculite** or **cellular** lightweight insulating concrete with a maximum compressive strength of 140 psi.
2. The membrane is specified with HP Protective Mat as the membrane underlayment over **vermiculite** or **cellular** lightweight insulating concrete with a compressive strength between 140 - 175 psi.

The certification letter must reference the project name and location, accompany the project submittals (shop drawing and Request for Warranty) and contain the following information pertaining to the lightweight insulating concrete mix design:

1. Manufacturer's brand name
2. Maximum compressive strength
3. Average wet density
4. Average air-dry density

E. When field conditions necessitate modifications to the originally approved shop 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.

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

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

1. Must conform to Carlisle's most current published specifications and details applicable at the time of bid.
2. Must be submitted along with a completely executed Notice of Completion.
3. Must include the items identified in Paragraphs B, C and D above.

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

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

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

1.05 Warranty

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

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

1. **TABLE IA – Non-Reinforced EPDM Membrane Thickness for Various Warranty Options** Identifies minimum membrane thickness for non-reinforced membranes used in adhered or ballasted roofing systems.
2. **TABLE IB – Reinforced EPDM Membrane Thickness for Various Warranty Options** Identifies minimum membrane thickness required for adhered and mechanically fastened assemblies using Reinforced Membrane.
3. **TABLE II – Adhered Roofing System with top layer fastened – Up to a 25-Year Warranty** Identifies mechanical fastening densities with various underlayments for adhered roofing systems with Warranties Up to 25 year based on the various warranty wind speed coverages and insulation board sizes.

4. **TABLE III – Adhered Roofing System with top layer fastened – 30-Year Warranty** Identifies mechanical fastening densities with various underlayments for adhered roofing systems with Warranties 30 year based on the various warranty wind speed coverages and insulation board sizes.
5. **TABLE IV – Up to a 25-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing and Mechanically Fastened Insulation / Substrate Attachment (New Construction or Tear - Off)** Identifies insulation bead spacing and mechanical fastening densities with various insulations and substrate boards for adhered roofing systems with Up to 25-Year Warranties based on the various warranty wind speed coverages and insulation board sizes.
6. **TABLE V – 30-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing and Mechanically Fastened Insulation / Substrate Attachment (New Construction or Tear - Off)** Identifies insulation bead spacing and mechanical fastening densities with various insulations and substrate boards for adhered roofing systems with Up to 25-Year Warranties based on the various warranty wind speed coverages and insulation board sizes.
7. **TABLE VI – Light Deck – Adhered Roofing Systems with top layer fastened – Up to a 20 Year Warranty** Identifies mechanical fastening densities with various underlayments for adhered roofing systems and light decks with Warranties Up to 20 year based on the various warranty wind speed coverages and insulation board sizes.
8. **TABLE VII – Flexible FAST Bead Spacing and Perimeter Width – Minimum Perimeter Width for Insulation Attachment for All Warranties** Identifies minimum perimeter width for insulation attachment for all warranties.
9. **TABLE VIII – Up to a 20-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing on Re-Cover Projects** Identifies insulation bead spacing with various insulations and cover boards for Recover Projects with Up to a 20-Year Warranty based on the various warranty wind speed coverages and insulation board sizes
10. **TABLE IX – Up to a 20-Year EPDM Mechanically Fastened Roofing System – Deck Type: 22- Gauge Steel, 3/4", 5/8" & 15/32" Plywood, Wood Plank and Structural Concrete -** Identifies fastening density, field membrane width and number perimeter sheets required for the various wind zones. The assemblies are categorized based on various building height and specific wind speed warranty coverage.
11. **TABLE X –25/30-Year EPDM Mechanically Fastened Roofing System – Deck Type: 22- Gauge Steel, 3/4", 5/8" & 15/32" Plywood, Wood Plank and Structural Concrete -** Identifies fastening density, field membrane width and number perimeter sheets required for the various wind zones. The assemblies are categorized based on various building height and specific wind speed warranty coverage.
12. **TABLE XI – EPDM – Maximum 20-Year Mechanically Fastened Roofing System – Deck Type: 7/16", 5/8", 3/4" OSB -** Identifies fastening density, field membrane width and number perimeter sheets required for the various wind zones. The assemblies are categorized based on various building height and specific wind speed warranty coverage.
13. **TABLE XII – EPDM – Maximum 20-Year Mechanically Fastened Roofing System – Deck Type: LWC over Steel, Gypsum and Cementitious Wood Fiber (Tectum) -** Identifies fastening density, field membrane width and number perimeter sheets required for the various wind zones. The assemblies are categorized based on various building height and specific wind speed warranty coverage.

Table IA **Non-Reinforced EPDM Membrane Thickness for Various Warranty Options**

SURE-SEAL OR SURE-WHITE NON-REINFORCED MEMBRANES - ADHERED				
Warranty Duration	Warranty Wind Speed Coverage		Minimum Membrane Thickness	Hail Coverage
	55, 72, 80 or 90 mph	100 to 120 mph		*(Cover Board set in Adhesive)
5,10, or 15 year	√	√ (4)	60-mil Sure-Seal OR Sure-White 60-mil Sure-Seal SAT OR Sure-White SAT	1" for Adhered*
20 year	√	√ (4)	60-mil Sure-Seal OR Sure-White 60-mil Sure-Seal SAT OR Sure-White SAT	1" for Adhered*
25 year (3)	√ (1)	√ (4)	60-mil Sure-Seal OR Sure-White 60-mil Sure-Seal SAT OR Sure-White SAT	1" for Adhered*
30 year (3)	√ (1)	√	90-mil Sure-Seal OR Sure-White	2" for Adhered*

SURE-SEAL OR SURE-WHITE NON-REINFORCED MEMBRANES - BALLASTED			
Warranty Duration	Warranty Wind Speed Coverage	Minimum Membrane Thickness	Hail Coverage
	55, 72 or 80 mph		
5,10, 15, 20 or 25 year (3)	√ (2)	Sure-Seal 45-mil	1" for Ballasted
5,10, 15 or 20 year	√ (2)	60-mil Sure-Seal OR Sure-White	2" for Ballasted
25 or 30 year (3)	√ (2)	60-mil Sure-Seal OR Sure-White	2" for Ballasted
30 year (3)	√ (2)	90-mil Sure-Seal OR Sure-White	3" for Ballasted

Notes: N/A = Not Acceptable √= Acceptable

(1) Standard 90-8-30A, EPDM x-23 Low-VOC, Low-VOC EPDM/TPO or CAV-GRIP III Bonding Adhesive must be utilized.

(2) When Sure-Tough Reinforced membrane is specified, 60-mil membrane minimum is required for warranties for up to 20 year. Projects with 25 / 30 Year Warranty must incorporate 75-mil membrane.

(3) See Attachment II '25/30 Year Warranty Design Enhancements' for enhanced design requirements.

(4) Sure-Seal SAT and Sure-White SAT limited to maximum 100 mph warranty wind speed coverage.

Table IB **Reinforced EPDM Membrane Thickness for Various Warranty Options**

Warranty Duration	Sure-Tough Reinforced Membranes						
	Warranty Wind Speed Coverage				Minimum Membrane Thickness	Hail Coverage	Puncture Coverage
	55, 72, 80 or 90 mph		100 to 120 mph			*(Cover Board set in Adhesive)	
	Adhered	Mech. Fastened	Adhered	Mech. Fastened			
5,10, or 15 year	√	√	√	N/A	45-mil Sure-Tough	N/A	8 man hours
20 year	√	√	√	N/A	60-mil Sure-Tough, OR 60-mil Sure-Tough SAT	1" for Adhered*	16 man hours
25 year (2)	√ (1)	√	√ (1)	N/A	75-mil Sure-Tough OR 60-mil Sure-Tough SAT	2" for Adhered*	32 man hours
30 year (2)	√ (1)	√	√ (1)	N/A	75-mil Sure-Tough	2" for Adhered*	32 man hours

Notes: N/A = Not Acceptable √= Acceptable

(1) Standard 90-8-30A, EPDM x-23 Low-VOC, Low-VOC EPDM/TPO or CAV-GRIP III Bonding Adhesive must be utilized.

(2) See Attachment II '25/30 Year Warranty Design Enhancements' for enhanced design requirements.

(3) Carlisle's Accidental Puncture Warranty covers labor hours and material used during the repair. Maximum labor and material hours are dependent upon system design. Refer to the Warranty Availability Quick Reference Guide for coverage.

Table II

Adhered Roofing System with top layer fastened - Up to a 25-Year Warranty

Refer to Table (I) for Maximum Warranty Duration by Membrane Type and Thickness

Membrane Underlayment	Thickness	55-mph and 72-mph		80-mph		90-mph		100-mph	110-mph	120-mph
		4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 8' board	4'x 8' board
20 or 25 psi InsulBase/InsulBase ECO (1), InsulBase RL (8), ThermaThin 7 GRF (9)	1.0" to 1.4"	16		**	**	**	**	**	**	**
	1.5" to 1.9"	10	15	10	15	12	20	**	**	**
	2.0" or greater	8	12	8	12	12	20	**	**	**
20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL (8), ThermaThin 7 CGF (9)	1.0" to 1.4"	16		**		**		**	**	**
	1.5" to 1.9"	10		10		12		**	**	**
	2.0" or Greater	8		8		8		16	**	**
SecurShield HD Composite and SecurShield HD RL Composite (5)	1.5" (4)	6		6		6		**	**	**
	2.0" or Greater	6		6		6		8	12	16
SecurShield HD EPS Composite	2.0" or Greater	8		8		12		16	**	**
StormBase (OSB/ISO composite)	1.5" or Greater	8		8		8		12	16	16
SecurShield HD, SecurShield HD RL	1/2" (2)	8		10		12		20 (5)	(5)	(5)
SecurShield HD Plus, SecurShield HD Plus ECO	1/2" (2)	8		8		10		12	16	20
DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber, Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board, DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Roof Board	1/4" (2)	10		12		16		**	**	**
	3/8" (2)	8		12		**		**	**	**
	7/16" (2)	8		8		12		16	**	**
	1/2"	8		8		12		16	(6)	(6)
	5/8"	8		8		8		12	12	16
EcoStorm VSH	1/2" (2)	8		8		8		12	16	16
HP Recovery Board (Wood Fiberboard) (6)(7)	1/2" (2)	16		**		**		**	**	**
InsulFoam SP (TPO SAT, Sure-White EPDM SAT and reflective FleeceBACK membrane adhered with Flexible FAST) (3)	2.0" or greater	12		16		16		**	**	**
Definitions: SAT = Self -Adhered Technology; RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install										
Contact Carlisle's Technical Team at 877-797-8370 Option 3										

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Over steel decks: Install a minimum 1.0" Carlisle-approved insulation under noted cover boards. Do not install noted cover boards directly over bare steel deck.

3) EPDM color limitation with EPS SP: When EPDM is used with SAT systems over InsulFoam SP, membrane color is limited to White EPDM SAT and White EPDM FleeceBACK (no black EPDM in this assembly)

4) 1.5" SecurShield® HD Composite: Maximum wind speed warranty is **90 mph** for this board. For higher wind speeds, use a minimum 2.0".

5) 1/2" SecurShield HD, 1/2" SecurShield HD RL and listed 1/2" Gypsum boards **may be adhered** to approved insulation using Flexible FAST ribbons spaced 4-inches on center or Rig splatter for **100-mph to 120-mph wind speed warranties**.

6) HP Recovery Board: When installed directly over an existing roof, the maximum warranty duration is **15 years.**

7) HP Recovery Board: Do not install SAT membranes or use CAV-GRIP III Adhesive/Primer directly over wood fiberboard.

8) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

9)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100': Increase fastening/adhesive in the 12'-wide perimeter and corner zones with 50% more fasteners and plates.

B) Projects **exceeding 100-feet tal**l are to be reviewed by Carlisle prior to warranty submission or installation.

C) Acceptable decks for all listed wind-speed warranties include: minimum 22-gauge steel, structural concrete, 1-1/2" wood plank, and minimum 5/8" plywood.

D) Minimum, 15/32" Plywood limited to 90-mph wind speed warranty.

E) For OSB, Gypsum, Cementitious wood fiber (Tectum), Lightweight Insulated Concrete over less than 22-gauge steel. Refer to Table (V**I**) for fastening and wind speed warranty limitations.

F) 5/8" OSB with minimum of 300 lb. pullout values using HP-X fasteners will be eligible for **reduced fastening** rate of 8 per 4'x8' board where cover board/Insulation qualifies for reduced fastening and will be limited to a maximum warranty duration of **20-years and a 55-mph** wind speed warranty.

G) Aqua Base 120 bonding adhesive limited to **20-year 72** mph wind speed warranties.

H) New Construction and Re-Roof with tear-off. Refer to Table (VIII) for Re-cover options.

I) For Cover Board and Insulation bead spacing please refer to Table (IV) for applicable warranty bead spacing.

Table III

Adhered Roofing System with top layer fastened - 30 Year Warranty

Refer to Table (I) for Maximum Warranty Duration by Membrane Type and Thickness

Membrane Underlayment	Thickness	55-mph and 72-mph		80-mph		90-mph		100-mph	110-mph	120-mph
		4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 8' board	4'x 8' board
20/25 PSI InsulBase/InsulBase ECO (1), InsulBase RL (6), ThermaThin 7 GRF (7)	1.0" to 1.4"	16	16	**	**	**	**	**	**	**
	1.5" to 1.9"	16	24	**	**	**	**	**	**	**
	2.0" or Greater	12	20	16	24	16	24	**	**	**
20/25 PSI SecurShield/SecurShield ECO, SecurShield RL (6), ThermaThin 7 CGF (7)	1.0" to 1.4"	16		**		**		**	**	**
	1.5" to 1.9"	16		20		24		**	**	**
	2.0" or Greater	12		16		16		24	**	**
SecurShield HD Composite and SecurShield HD RL Composite (5)	2.0" or Greater	8		10		12		16	16	16
SecurShield HD EPS Composite (4)	2.0" or Greater	12		12		16		**	**	**
StormBase (OSB/ISO composite)	1.5" or Greater	10		12		12		16	16	16
SecurShield HD, SecurShield HD RL	1/2" (2)	12		16		24		(5)	(5)	(5)
SecurShield HD Plus	1/2" (2)	10		12		16		20	24	24
DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber or Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board,DEXcell FA Glass Mat, DEXcell FA VSH Glass Mat	1/4" (2)	16		**		**		**	**	**
	3/8" (2)	16		18		**		**	**	**
	7/16" (2)	16		16		**		**	**	**
	1/2"	12		16		18		(6)	(6)	(6)
	5/8"	10		12		12		16	16	16
EcoStorm VSH	1/2" (2)	10		12		16		16	24	24
InsulFoam SP (80-mil Sure-Weld SAT, 135-mil and 145-mil reflective FleeceBACK adhered with Flexible FAST) (3)	2.0" or greater min 1.5 lb. Density	16		18		**		**	**	**

Definitions: SAT = Self -Adhered Technology; RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Over steel decks: Install a minimum 1.0" Carlisle-approved insulation under noted cover boards. Do not install noted cover boards directly over bare steel deck.

3) EPDM color limitation with EPS SP: When EPDM is used with SAT systems over InsulFoam SP, membrane color is limited to White EPDM SAT and White EPDM FleeceBACK (no black EPDM in this assembly)

4) SecurShield® HD Composite: 30-year warranties require a minimum of 2.0"

5) 1/2" SecurShield HD, 1/2" SecurShield HD RL and listed 1/2" Gypsum boards may be adhered to approved insulation using Flexible FAST ribbons spaced 4-inches on center or Rig splatter for **100-mph to 120-mph wind speed warranties**.

6) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

7)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100': Increase fastening/adhesive in the 12'-wide perimeter and corner zones with 50% more fasteners and plates.

B) Projects **exceeding 100-feet tal**l are to be reviewed by Carlisle prior to warranty submission or installation

C) Acceptable decks for all listed wind-speed warranties include: minimum 22-gauge steel, structural concrete, 1-1/2" wood plank, and minimum 5/8" plywood.

D) Minimum, 15/32" Plywood limited to 90-mph wind speed warranty

E) OSB Decking does not Qualify for a 30-year warranty

F) Aqua Base 120 bonding adhesive limited to **20-year 72** mph wind speed warranties.

G) New Construction and Re-Roof with tear-off. Contact Carlisle Technical Team for recover projects.

H) For Cover Board and Insulation bead spacing please refer to Table (V) for applicable warranty bead spacing.

Table IV

Up to a 25-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing and Mechanically Fastened Insulation / Substrate Attachment (New Construction or Tear - Off) (3)

Applies to: Mechanically fastened substrate with adhered cover board/insulation under single-ply membrane

Refer to Table I for Maximum Warranty Duration by Membrane Thickness

Peak Gust Wind Speed Warranty			55-mph and 72-mph		80-mph		90-mph		100-mph		110-mph		120-mph	
Adhered Coverboard/Insulation	Insulation Board Size (Max.)		4'x 4'		4'x 4'		4'x 4'		4'x4' or 4'x8'		4'x4' or 4'x8'		4'x4' or 4'x8'	
	Bead Spacing for Approved Cover Boards/Insulation (2) (6) Refer to Table number (II) for approved cover boards for each wind speed category	Field	12"		12"		12"		6"		4"		4"	
		Perimeter	6"		6"		6"		4"		4"		4"	
		Corner	6"		6"		4"		4"		4"		4"	
Approved Board Insulation		Thickness	Substrate Fastening (# of fasteners per 4' x 8' board / 4' x 12' boards)											
			4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'
Mechanical Attachment of Substrate to Deck	20 or 25 psi InsulBase/InsulBase ECO (1) (4) (5), ThermaThin 7 GRF (9), InsulBase RL (8), 20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL (8), ThermaThin 7 CGF (9)	1.0" to 1.4"	16	20	16	20	16	20	16	24	16	24	16	24
		1.5" to 1.9"	10	15	10	15	12	18	16	24	16	24	16	24
		2.0" or Greater	8	12	8	12	12	18	16	24	16	24	16	24
	Approved Thermal Barriers / Substrate Boards (7)													
	DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber, Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board, DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Roof Board	1/4"	10		12		16		**		**		**	
		3/8"	8		12		16		**		**		**	
		7/16"	8		12		16		**		**		**	
		1/2"	8		8		12		16		16		16	
		5/8"	8		8		8		12		12		16	

Definitions: RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Rig Splatter of Flexible FAST may be substituted for extruded beads in all roof zones.

3) See Table (II) for approved **cover boards** for appropriate **Wind Speed Warranty**.

4) If using **4'x 8' or 4' x 12**' boards bead spacing is **6" on center** in all roof zones up to **90-mph**

5) 16-fasteners and insulation plates per 4'x8' board for **OSB, Gypsum, Cementitious wood fiber (Tectum), Lightweight Insulated Concrete over less than 22-gauge steel**. These decks are limited to maximum **20-year, 72-**mph warranty wind speed without further review from Carlisle.

6) 5/8" OSB with minimum of 300 lb. pullout values using **HP-X fasteners** will be eligible for reduced fastening rate of 8 per 4'x8' board where cover board/Insulation qualifies for reduced fastening and will be **limited** to a maximum warranty duration of **20-years and a 55-mph** wind speed warranty.

7) Fastening of substrate boards when **Vapor Barrier or insulation are to be adhered to listed boards.**

8) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

9)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100', enhance 12-foot-wide perimeters and corners with 50% more **fasteners and plates when substrate** is being mechanically fastened.

B) Projects exceeding 100-feet tall are to be reviewed by Carlisle prior to warranty submission or installation.

B) Acceptable Decking for all wind speed warranties : 22-gauge or heavier steel, Structural concrete, 1-1/2" Wood Plank, 5/8" Plywood.

C) Minimum, **15/32" Plywood** limited to **90-mph** wind speed warranty.

D) Aqua Base 120 bonding adhesive limited to **20-year 72** mph wind speed warranties.

Table V

30-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing and Mechanically Fastened Insulation Substrate Attachment (New Construction or Tear - Off) (3)

Applies to: Mechanically fastened substrate with adhered cover board/insulation under single-ply membrane. Refer to Table (I) for membrane warranty duration.

Refer to Table I for Maximum Warranty Duration by membrane thickness

Peak Gust Wind Speed Warranty			55-mph, 72-mph		80-mph		90-mph		100-mph		110-mph		120-mph	
Adhered Coverboard/Insulation	Insulation Board Size (Max.)		4'x4'		4'x4'		4'x4'		4'x 4' or 4'x8'		4'x4' or 4'x8'		4'x4' or 4'x8'	
	Ribbon Spacing for Approved Cover Boards/Insulation Refer to Chart number (III) for approved cover boards for each wind speed category (2)	Field	12"		12"		6"		6"		4"		4"	
		Perimeter	6"		6"		6"		4"		4"		4"	
		Corners	4"		4"		4"		4"		4"		4"	
Approved Board Insulation		Thickness	Substrate Fastening (# of fasteners per 4' x 8' or 4'x12' board)											
			4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'
Mechanical Attachment of Substrate to Deck	20 or 25 psi InsulBase/InsulBase ECO (1) (4), ThermaThin 7 GRF (6), InsulBase RL (5), 20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL (5),ThermaThin 7 CGF (6)	1.0" to 1.4"	16	N/A	16	N/A	16	N/A	16	N/A	16	N/A	16	N/A
		1.5" to 1.9"	16	24	16	24	16	24	16	24	16	24	16	24
		2.0" or Greater	12	18	16	24	16	24	16	24	16	24	16	24
	Approved Thermal Barriers / Substrate Boards (1)													
	DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber or Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Board	1/4"	16		**		**		**		**		**	
		3/8"	16		18		**		**		**		**	
		7/16"	**		**		**		**		**		**	
		1/2"	12		16		16		16		16		16	
		5/8"	10		12		12		16		16		16	

Definitions: RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install

This chart is for use of Coverboards as Top Layers adhered to Secondary layer which has been Adhered or Mechanically Fastened to Substrate. Refer to Table (III) for Mechanically Fastened Cover Boards as the Top Layer of Roofing Assembly.

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Rig Splatter of Flexible FAST may be substituted for extruded beads in all roof zones.

3) See Table (II) for approved **cover boards** for appropriate **Wind Speed Warranty**.

4) If using **4'x 8' or 4' x 12**' boards bead spacing is **6" on center** in all roof zones up to **90-mph**.

5) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

6)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100': Increase fastening/adhesive in the 12'-wide perimeter and corner zones with 50% more fasteners and plates.

B) Projects exceeding 100-feet tall are to be reviewed by Carlisle prior to warranty submission or installation.

C) Acceptable Decking for all wind speed warranties : 22-gauge or heavier steel, Structural concrete, 1-1/2" Wood Plank, 5/8" Plywood.

D) Minimum, 15/32" Plywood limited to **90-mph** wind speed warranty.

E) OSB Decking does not Qualify for a 30-year warranty.

F) Aqua Base 120 bonding adhesive limited to **20-year 72** mph wind speed warranties.

Table VI

Light Deck - Adhered Roofing Systems with top layer fastened - Up to a 20-Year Warranty

Refer to Table (I) for Maximum Warranty Duration by membrane thickness limited to 20-year warranties

Light Deck Types			OSB, Tectum, Gypsum, Less Than 22-gauge steel (24 & 26 gauge), Lightweight Insulating Concrete over less than 22-gauge steel	Reduced Fastening		
				Gypsum Decks - if pullouts meet requirements (2)	Gypsum Decks - if pullouts meet requirements (2)	Less Than 22-gauge steel (24 & 26 gauge) on Metal Retrofits Decks - when pullouts meet requirements (1)
Peak Gust Wind Speed Warranty			**55-mph and 72-mph**	**55-mph**	**72-mph**	**55-mph**
Insulation Board Size (max.)		**Thickness**	**4'x8' board**	**4'x8' board**	**4'x8' board**	**4'x8' board**
Membrane Underlayment (A)	20 or 25 psi InsulBase, InsulBase ECO , InsulBase RL, ThermaThin 7 GRF/CGF, 20 or 25 psi SecurShield, SecurShield ECO, SecurShield HD RL	1.0" to 1.4"	16	**	**	**
		1.5" to 1.9"	16	10	10	10
		2.0" or Greater	16	8	10	8
	SecurShield HD Composite	1.5" or Greater	16	8	10	8
	SecurShield HD EPS Composite	1.5" or Greater	16	8	10	8
	StormBase (OSB/ISO composite)	1.5" or Greater	16	**	**	**
	SecurShield HD, SecurShield HD RL	1/2"	16	12	12	12
	SecurShield HD Plus	1/2"	16	8	10	8
	DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber or Securock Ultra Light Coated Glass Mat, Securock Weather Defense Roof Board, DEXcell FA Glass Mat, DEXcell FA VSH Glass Mat, DEXcell Cement Board	1/4"	16	**	**	**
		3/8"	16	12	12	12
		7/16"	16	12	12	12
		1/2"	16	8	10	8
		5/8"	16	8	10	8
	EcoStorm VSH	1/2"	16	8	10	8
	HP Recovery Board (Wood Fiberboard) (4)(5)	1/2"	16	16	16	16
	InsulFoam SP (TPO SAT, EPDM SAT and All FleeceBACK adhered with Flexible FAST) (3)	2.0" or Greater	16	**	**	**

Definitions: RL= RapidLock; VSH = Very Severe Hail; ** = Not applicable for reduced fastening - will be 16 per 4x8 board.

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) For **reduced fastening on Metal Retrofit systems** - required to achieve **360-lb pullout with HP-X** fasteners. Refer to Reduced Insulation Fastening Pattern for Metal Retrofit on Website. Refer to QR code below.

2) For **reduced fastening on Gypsum roof decks** - required to achieve **300-lb pullout with GypTec or LiteDeck fasteners**. Refer to Reduced Insulation Fastening Pattern for Gypsum Deck on Website. Refer to QR code below.

3) EPDM color limitation with EPS SP: When EPDM is used with SAT systems over InsulFoam SP, membrane color is limited to White EPDM SAT and White EPDM FleeceBACK (no black EPDM in this assembly).

4) HP Recovery Board: When installed directly over an existing roof, the maximum warranty duration is 15 years.

5) HP Recovery Board: Do not install SAT membranes or use CAV-GRIP III or PVC CAV-GRIP over this cover board.

Additional Design Considerations

A) For building heights between 61' and 100', enhance 12-foot-wide perimeters and corners with 50% more fasteners and plates.

B) Projects **exceeding 100-feet** tall are to be reviewed by Carlisle prior to warranty submission or installation.

C) Projects **exceeding 72-mph** require prior approval from Carlisle.

Reduced Fastening Metal Retrofit (1)

Reduced Fastening Gypsum Decks (2)

Table VII

Flexible FAST Bead Spacing and Perimeter Width

Minimum Perimeter Width for Insulation Attachment for all Warranties	
Roof Height	**Width of Perimeter**
0 to 25-feet	4-feet
26 to 50-feet	8-feet
51 to 75-feet	12-feet
76 to 100-feet	16-feet
101 to 150-feet	20-feet
Greater than 150-feet	24-feet
Contact Carlisle's Technical Team at 877-797-8370 Option 3	

Additional Design Considerations

A) Rig Splatter or full spray are acceptable for all warranties and all roof zones

B) Dual Tank Splatter is not acceptable for Insulation Attachment.

Table VIII

Up to a 20-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing on Re-Cover Projects (1) (2)

Refer to Table I for Maximum Warranty Duration by membrane thickness

Peak Gust Wind Speed Warranty		55-mph and 72-mph	80-mph
Existing Roofing Assembly (Insulation Board Size (Max.))		4'x 4'	4'x 4'
Smooth Surface BUR / Mineral Surface Cap Sheet/ Modified Bitumen (3)	**Field**	12"	12"
	Perimeter	6"	6"
	Corner	6"	4"
Gravel Surface BUR / Coal Tar Pitch (4) (5)	**Field**	6"	4"
	Perimeter	4"	4"
	Corner	4"	4"
Existing EPDM, TPO or Hypalon (6)	**Field**	12"	6"
	Perimeter	6"	4"
	Corner	6"	4"
Approved Board Insulation	**Thickness**		
20 or 25 psi InsulBase/InsulBase ECO, ThermaThin 7, InsulBase RL 20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL	1.0" to 1.4"	✓	✓
	1.5" to 1.9"	✓	✓
	2.0" or Greater	✓	✓
Approved Cover Boards	**Thickness**		
DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber or Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Board	1/4"	**	**
	3/8"	**	**
	7/16"	**	**
	1/2" (4)	✓	✓
	5/8" (4)	✓	✓
SecurShield HD, SecurShield HD Plus, SecurShield HD RL	1/2" (4)	✓	✓
✓ = Available **- Not Available			

Perimeter Width Requirements
0 to 25' tall - 4-foot wide perimeter zone
26' to 50' tall - 8 foot perimeter zone
51' to 75' tall - 12-foot perimeter zone
61' to 100' tall - 16-foot perimeter zone
Contact Carlisle for projects over 100' tall

Definitions: SAT = Self -Adhered Technology; RL = Rapid Lock; VSH = Very Severe Hail

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) When **fastening insulation/cover board** please refer to table (II) for appropriate fastening requirements.

2) CAV-GRIP III is to be applied to **un-weathered asphalt** roof decks.

3) Flexible FAST is not approved on **Smooth Surface Modified Bitumen APP** systems.

4) Existing **Coal Tar Pitch** Roofing systems require minimum 1-inch of insulation under approved cover boards with reflective membranes. Dark colored membranes require minimum 1-1/2" of insulation.

5) On **gravel surface BUR**'s loose gravel must be **removed**.

6) Existing roofing systems should have minimum **3/4" holes cut** out of the existing roofing membrane every 10'x10' area.

Table IX

Up to 20-Year EPDM Mechanically Fastening Roofing System

Deck Type: 22-Gauge Steel, 3/4", 5/8" & 15/32" Plywood, Wood Plank and Structural Concrete

15 Year Warranty - 45-mil Sure-Tough Reinforced EPDM - 10' & 8' Field and 6.5' and 5' Perimeter sheets					
20 Year Warranty - 60-mil Sure-Tough Reinforced EPDM - 10' & 8' Field and 6.5' and 5' Perimeter sheets					
Add an extra perimeter sheet for 25/30-Year EPDM Mechanically Fastening Roofing System					
25/30 Year Warranty - 75-mil Sure-Tough Reinforced EPDM - 10' Wide Sheets Only					
Peak Gust Wind Speed Warranty	**Max. Building Height**	**Field Membrane Width**	**Minimum Number of Perimeter sheets by Building location from Coastline or Large Body of Water**		**Perimeter Sheet Width**
		EPDM	Greater than 4 Miles	4 miles or less	EPDM
55-MPH	**Up to 60'**	10'	1 @ 12" o.c	2 @ 12" o.c	5' or 6.5'
		8'	1 @ 12" o.c	2 @ 12" o.c	5'
	61' to 100'	10'	2 @ 6" o.c*	3 @ 6" o.c*	5' or 6.5'
		8'	2 @ 12" o.c	3 @ 12" o.c	5'
72-MPH	**Up to 60'**	10'	2 @ 12" o.c	3 @ 12" o.c	5' or 6.5'
		8'	2 @ 12" o.c	3 @ 12" o.c	5'
	61' to 100'	10'	3 @ 6" o.c *	4 @ 6" o.c *	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
80-MPH	**Up to 60'**	10'	2 @ 12" o.c	3 @ 12" o.c	5' or 6.5'
		8'	2 @ 12" o.c	3 @ 12" o.c	5'
	61' to 100'	10'	3 @ 6" o.c *	4 @ 12" o.c *	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
90-MPH	**Up to 60'**	10'	3 @ 12" o.c	4 @ 12" o.c	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	10'	4 @ 6" o.c *	5 @ 6" o.c *	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
100-MPH	**Up to 60'**	10'	4 @ 12" o.c	6 @ 12" o.c	5' or 6.5'
		8'	4 @ 12" o.c	6 @ 12" o.c	5'

New Assembly all Warranties
1.0" to 1.4" = 6 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 4 per 4'x 8' board
All cover boards = 5 per 4'x8' board
Recover over Smooth Surface (Up to 20-year Warranty)
1.0" to 1.4" = 8 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 5 per 4'x 8' board
1/2" Gypsum & 1/2" InsulBase HD = 8 per 4'x 8' board
1/2" R-Tech Fanfold follows Detail MF-27C
1/2" HP Recovery board has max 15-year installed over an existing Smooth Surface. 1/4" Gypsum boards are not acceptable over an existing system.
Recover over Gravel BUR Surface (Remove all loose gravel) (Up to 20-year Warranty)

	61' to 100'	10'	5 @ 6" o.c*	6 @ 6" o.c*	5' or 6.5'
		8'	5 @ 12" o.c	6 @ 12" o.c	5'
110-MPH	**Up to 60'**	All 5' or 6.5' Wide Sheets fastened at 12" o.c across the entire roof.			
	61' to 100'	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
120-MPH	**Up to 60'**	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
	61' to 100'	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
*12" on center spacing can be utilized by using HP-Xtra Fasteners and 2-3/8" Polymer Seam Plates.					
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1.0" to 1.4" = 8 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 5 per 4'x 8' board
1/2" InsulBase HD = 8 per 4'x 8' board

ADDITIONAL DESIGN CONSIDERATIONS

(A) HP Fasteners for 22-Gauge Steel, 3/4", 5/8" and 15/32" Plywood, Wood Plank and HD 14-10 or CD-10 for Structural Concrete Decks

(B) 10' wide field sheet utilizing HP Fasteners and Polymer Seam Plates. HP Fasteners and Seam Plates for Wood decks only.

(C) 10' wide field sheet utilizing HP fasteners require a fastening rate of 12" on center.

(D) As an option, 9" wide Pressure Sensitive RUSS can be used beneath the field sheets for perimeter securement at 12" on center.

(E) 1/2" Gypsum boards are eligible for a maximum 15-year warranty for Gravel BUR recovers.

(F) 1/2" HP Recovery board and 1/4" Gypsum boards are not acceptable over an existing Gravel BUR systems.

(G) A cover board is needed if the insulation thickness exceeds 12 inches in thickness.

(H) Cannot Mechanically Fasten HP Polymer Plates over all Gypsum Boards.

Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type (Refer to the Design Reference DR-06).

Click on this link to take you to the Design Reference DR-06: ..\Letters\Carlisle DR-06 Withdrawal Resistance Criteria.pdf

Table X

25/30-Year EPDM Mechanically Fastening Roofing System

Deck Type: 22-Gauge Steel, 3/4", 5/8" & 15/32" Plywood, Wood Plank and Structural Concrete

25/30 Year Warranty - 75-mil Sure-Tough Reinforced EPDM - 10' Wide Sheets Only					
Peak Gust Wind Speed Warranty	**Max. Building Height**	**Field Membrane Width**	**Minimum Number of Perimeter sheets by Building location from Coastline or Large Body of Water**		**Perimeter Sheet Width**
		EPDM	Greater than 4 Miles	4 miles or less	EPDM
55-MPH	**Up to 60'**	10'	2 @ 12" o.c	3 @ 12" o.c	5' or 6.5'
		8'	2 @ 12" o.c	3 @ 12" o.c	5'
	61' to 100'	10'	3 @ 6" o.c*	4 @ 6" o.c*	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
72-MPH	**Up to 60'**	10'	3 @ 12" o.c	4 @ 12" o.c	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	10'	4 @ 6" o.c *	5 @ 6" o.c *	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
80-MPH	**Up to 60'**	10'	3 @ 12" o.c	4 @ 12" o.c	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	10'	4 @ 6" o.c *	5 @ 12" o.c *	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
90-MPH	**Up to 60'**	10'	4 @ 12" o.c	5 @ 12" o.c	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
	61' to 100'	10'	5 @ 6" o.c *	6 @ 6" o.c *	5' or 6.5'
		8'	5 @ 12" o.c	6 @ 12" o.c	5'
100-MPH	**Up to 60'**	10'	5 @ 12" o.c	7 @ 12" o.c	5' or 6.5'
		8'	5 @ 12" o.c	7 @ 12" o.c	5'
	61' to 100'	10'	6 @ 6" o.c*	7 @ 6" o.c*	5' or 6.5'
		8'	6 @ 12" o.c	7 @ 12" o.c	5'
110-MPH	**Up to 60'**	All 5' or 6.5' Wide Sheets fastened at 12" o.c across the entire roof.			
	61' to 100'	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
120-MPH	**Up to 60'**	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
	61' to 100'	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			

New Assembly all Warranties
1.0" to 1.4" = 6 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 4 per 4'x 8' board
All cover boards = 5 per 4'x8' board
Recover over Smooth Surface (Up to 20-year Warranty)
1.0" to 1.4" = 8 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 5 per 4'x 8' board
1/2" Gypsum & 1/2" InsulBase HD = 8 per 4'x 8' board
1/2" R-Tech Fanfold follows Detail MF-27C
1/2" HP Recovery board has max 15-year installed over an existing Smooth Surface. 1/4" Gypsum boards are not acceptable over an existing system.
Recover over Gravel BUR Surface (Remove all loose gravel) (Up to 20-year Warranty)
1.0" to 1.4" = 8 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 5 per 4'x 8' board
1/2" InsulBase HD = 8 per 4'x 8' board

*12" on center spacing can be utilized by using HP-Xtra Fasteners and 2-3/8" Polymer Seam Plates.

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ADDITIONAL DESIGN CONSIDERATIONS

(A) HP Fasteners for 22-Gauge Steel, 3/4", 5/8" and 15/32" Plywood, Wood Plank and HD 14-10 or CD-10 for Structural Concrete Decks

(B) 10' wide field sheet utilizing HP Fasteners and Polymer Seam Plates. HP Fasteners and Seam Plates for Wood decks only.

(C) 10' wide field sheet utilizing HP fasteners require a fastening rate of 12" on center.

(D) As an option, 9" wide Pressure Sensitive RUSS can be used beneath the field sheets for perimeter securement at 12" on center.

(E) 1/2" Gypsum boards are eligible for a maximum 15-year warranty for Gravel BUR recovers.

(F) 1/2" HP Recovery board and 1/4" Gypsum boards are not acceptable over an existing Gravel BUR systems.

(G) A cover board is needed if the insulation thickness exceeds 12 inches in thickness.

(H) Cannot Mechanically Fasten HP Polymer Plates over all Gypsum Boards.

Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type (Refer to the Design Reference DR-06).

Click on this link to take you to the Design Reference DR-06: ..\Letters\Carlisle DR-06 Withdrawal Resistance Criteria.pdf

Table XI

EPDM - Maximum 20-Year Mechanically Fastening Roofing System

Deck Type: 7/16", 5/8" 3/4" OSB

15 Year Warranty - 45-mil Sure-Tough Reinforced EPDM - 10' & 8' Field and 6.5' and 5' Perimeter sheets									
20 Year Warranty - 60-mil Sure-Tough Reinforced EPDM - 10' & 8' Field and 6.5' and 5' Perimeter sheets									
20 Year Warranty - 75-mil Sure-Tough Reinforced EPDM - 10' Wide Sheets Only									
Peak Gust Wind Speed Warranty	**Max. Building Height**	**Deck Type and Thickness**	**Projected Pull-Out Values**	**Field Membrane Width**	**Minimum Number of Perimeter sheets by Building location from Coastline or Large Body of Water**			**Perimeter Sheet Width**	**New Assembly all Warranties**
				EPDM	Greater than 4 Miles	3 to 7 Miles	4 miles or less	EPDM	
55-MPH	**Up to 60'**	7/16"& 1/2" OSB	210-lbs.	10'	2 @ 9" o.c	3 @ 9" o.c	3 @ 9" o.c	5' or 6.5'	1.0" to 1.4" = 6 per 4' x 8' board
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	1.5" or greater = 5 per 4' x 8' board
		5/8" OSB	310-lbs.	10'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5' or 6.5'	1.5" or greater = 6 per **4' x 12'** board
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	1/2" SecurShield HD = 4 per 4' x 8' board
		3/4" OSB	360-lbs.	10'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5' or 6.5'	All cover boards = 5 per 4'x8' board
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	**Recover over Smooth Surface (up to 20-year Warranty)**
	61' to 100'	7/16"& 1/2" OSB	210-lbs.	10'	2 @ 6" o.c	3 @ 6" o.c	3 @ 6" o.c	5' or 6.5'	1.0" to 1.4" = 8 per 4' x 8' board
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	1.5" or greater = 5 per 4' x 8' board
		5/8" OSB	310-lbs.	10'	2 @ 6" o.c	3 @ 6" o.c	3 @ 6" o.c	5' or 6.5'	1.5" or greater = 6 per **4' x 12' board**
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	1/2" SecurShield HD = 5 per 4' x 8' board
		3/4" OSB	360-lbs.	10'	2 @ 6" o.c	3 @ 6" o.c	3 @ 6" o.c	5' or 6.5'	
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	
72-MPH	**Up to 60'**	7/16"& 1/2" OSB	210-lbs.	10'	3 @ 9" o.c	4 @ 9" o.c	4 @ 9" o.c	5' or 6.5'	1/2" Gypsum & 1/2" InsulBase HD = 8 per 4' x 8' board
				8'	3 @ 12" o.c	4 @ 12" o.c	4 @ 12" o.c	5'	1/2" R-Tech Fanfold follow the Detail MF-27C
		5/8" OSB	310-lbs.	10'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5' or 6.5'	**1/2" HP Recovery board has max 15-year installed over an existing Smooth Surface. 1/4" Gypsum boards are not acceptable over an existing system.**
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	
		3/4" OSB	360-lbs.	10'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5' or 6.5'	
				8'	2 @ 12" o.c	3 @ 12" o.c	3 @ 12" o.c	5'	
	61' to 100'	7/16"& 1/2" OSB	210-lbs.	10'	3 @ 6" o.c	4 @ 6" o.c	4 @ 6" o.c	5' or 6.5'	
				8'	3 @ 9" o.c	4 @ 9" o.c	4 @ 9" o.c	5'	**Recover over Gravel BUR Surface Remove all loose gravel (up to 20-year Warranty)**
		5/8" OSB	310-lbs.	10'	3 @ 6" o.c	4 @ 6" o.c	4 @ 6" o.c	5' or 6.5'	
				8'	3 @ 12" o.c	4 @ 12" o.c	4 @ 12" o.c	5'	
		3/4" OSB	360-lbs.	10'	3 @ 6" o.c	4 @ 6" o.c	4 @ 6" o.c	5' or 6.5'	1.0" to 1.4" = 8 per 4' x 8' board
				8'	3 @ 12" o.c	4 @ 12" o.c	4 @ 12" o.c	5'	1.5" or greater = 5 per 4' x 8' board

80-MPH	**Up to 60'**	5/8" OSB	310-lbs.	8'	3 @ 12" o.c	3 @ 12" o.c	4 @ 12" o.c	5'
		3/4" OSB	360-lbs.	8'	3 @ 12" o.c	3 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	5/8" OSB	310-lbs.	8'	3 @ 12" o.c	4 @ 12" o.c	4 @ 12" o.c	5'
		3/4" OSB	360-lbs.	8'	3 @ 12" o.c	4 @ 12" o.c	4 @ 12" o.c	5'
90-MPH	**Up to 60'**	3/4" OSB	360-lbs.	8'	3 @ 12" o.c	4 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	3/4" OSB	360-lbs.	8'	4 @ 6" o.c	5 @ 6" o.c	5 @ 6" o.c	5'

1.5" or greater = 6 per **4' x 12' board**
1/2" SecurShield HD = 5 per 4' x 8' board
1/2" InsulBase HD = 8 per 4' x 8' board

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ADDITIONAL DESIGN CONSIDERATIONS

(A) Use HP Fasteners and Polymer Seam Plates or Seam Plates for Sure-Tough EPDM into Wood decks.

(B) Only the deck types and thicknesses listed are eligible for the specific wind speed listed.

(C) Maximum duration for OSB shall not exceed 20 Years.

(D) Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type

(E) 1/2" Gypsum boards are eligible for a maximum 15-year warranty for Gravel BUR recovers.

(F) 1/2" HP Recovery board and 1/4" Gypsum boards are not acceptable over an existing Gravel BUR systems.

(G) A cover board is needed if the insulation thickness exceeds 12 inches in thickness

(H) Cannot Mechanically Fasten HP Polymer Plates over all Gypsum Boards.

Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type (Refer to the Design Reference DR-06).

Link to the Design Reference DR-06: ..\Letters\Carlisle DR-06 Withdrawal Resistance Criteria.pdf

Table XII

EPDM - Maximum 20-Year Mechanically Fastening Roofing System

Deck Type: LWC over Steel, Gypsum and Cementitious Wood Fiber (Tectum)

15 Year Warranty - 45-mil Sure-Tough Reinforced EPDM - 10' & 8' Field and 6.5' and 5' Perimeter sheets

20 Year Warranty - 60-mil Sure-Tough Reinforced EPDM - 10' & 8' Field and 6.5' and 5' Perimeter sheets

20 Year Warranty - 75-mil Sure-Tough Reinforced EPDM - 10' Wide Sheets Only

Peak Gust Wind Speed Warranty	Max. Building Height	Deck Type and Thickness	Field Membrane Width	Minimum Number of Perimeter sheets by Building location from Coastline or Large Body of Water		Perimeter Sheet Width
			EPDM	Greater than 4 Miles	4 miles or less	EPDM
55-MPH	Up to 60'	LWC over Steel	10'	1 @ 12" o.c	2 @ 12" o.c	5' or 6.5'
			8'	1 @ 12" o.c	2 @ 12" o.c	5'
		Gypsum	10'	2 @ 9" o.c	3 @ 9" o.c	5' or 6.5'
			8'	2 @ 12" o.c	3 @ 12" o.c	5'
		Tectum	10'	2 @ 9" o.c	3 @ 9" o.c	5' or 6.5'
			8'	2 @ 12" o.c	3 @ 12" o.c	5'
72-MPH	Up to 60'	LWC over Steel	8'	2 @ 12" o.c	3 @ 12" o.c	5'
		Gypsum	10'	3 @ 12" o.c	4 @ 12" o.c	5' or 6.5'
		Tectum	8'	3 @ 12" o.c	4 @ 12" o.c	5'

Contact Carlisle's Project Review Team at 877-797-8370 Option 3

ADDITIONAL DESIGN CONSIDERATIONS

(A) Use HP Fasteners and Polymer Seam Plates **fastened through LWC in to the steel deck. Fasten through LWC in to the deck below.**

(B) GypTec Fasteners and GypTec Plates for Gypsum and Tectum decks.

(C) Only the deck types and thicknesses listed are eligible for the specific wind speed listed.

(D) Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type.

(E) 1/2" Gypsum boards are eligible for a maximum 15-year warranty for Gravel BUR recovers.

(F) 1/2" HP Recovery board and 1/4" Gypsum boards are not acceptable over an existing Gravel BUR systems.

(G) A cover board is needed if the insulation thickness exceeds 12 inches in thickness

Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type (Refer to the Design Reference DR-06).

New Assembly all Warranties
1.0" to 1.4" = 6 per 4' x 8' board
1.5" or greater = 5 per 4' x 8' board
1.5" or greater = 6 per **4' x 12'** board
1/2" SecurShield HD = 4 per 4' x 8' board
All cover boards = 5 per 4'x8' board
Recover over Smooth Surface (up to 20-year Warranty)
1.0" to 1.4" = 8 per 4' x 8' board
1.5" or greater = 5 per 4' x 8' board
1.5" or greater = 6 per **4' x 12' board**
1/2" SecurShield HD = 5 per 4' x 8' board
1/2" Gypsum & 1/2" InsulBase HD = 8 per 4' x 8' board
1/2" R-Tech Fanfold follow Detail MF-27C
1/2" HP Recovery board has max 15-year installed over an existing Smooth Surface. 1/4" Gypsum boards are not acceptable over an existing system.
Recover over Gravel BUR Surface Remove all loose gravel (up to 20-year Warranty)
1.0" to 1.4" = 8 per 4' x 8' board
1.5" or greater = 5 per 4' x 8' board
1.5" or greater = 6 per **4' x 12' board**
1/2" SecurShield HD = 5 per 4' x 8' board
1/2" InsulBase HD = 8 per 4' x 8' board

Link to the Design Reference DR-06: ..\Letters\Carlisle DR-06 Withdrawal Resistance Criteria.pdf

C. **Access for warranty service**

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

a. Design features, such as window washer systems, which require the installation of traffic surface units in excess of 100 pounds per unit.

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

c. Photovoltaic and Mounting Systems or other Rooftop equipment which does not provide Carlisle with reasonable access to the membrane system for purposes of warranty investigation and related repairs.

d. 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. CARLISLE MAY BE CONTACTED FOR OTHER AVAILABLE OPTIONS.

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.

1.06 Job Conditions

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

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

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

D. Wood nailers are required for the securement of metal edgings, deck-level scuppers, and insulated pipes. Treated or non-treated wood nailer may be specified and shall be secured per specifier recommendation or in accordance with Factory Mutual's property Loss Prevention Data Sheet 1-49. Refer to **Design Reference DR-08 "Wood Nailers and Securement Criteria"** in Carlisle Technical Manual shall be referenced.

E. For Adhered or Mechanically Fastened systems specified over existing standing seam, flat seam or corrugated metal roofs, refer to the Carlisle's Metal Retrofit Roofing System Specification in the Carlisle Technical Manual for specific installation requirements.

F. When any of the EPDM Roofing Systems are specified on a portion of a roof, tie-ins to existing roofing membranes will be required. Depending on the type of the existing roofing system, the tie-in method will vary. Total isolation between two roofing systems or weep holes may be required to address moisture migration from one roofing system to the other. Prior to the selection of any tie-in detail, ensure the selected detail will not restrict drainage.

1.07 Product Delivery, Storage and Handling

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

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

C. Job site storage temperatures in excess of 90°F (32°C) may affect shelf life of curable materials (i.e., uncured flashing, adhesives, sealants, primers, SecurTAPE and Pressure-Sensitive Flashing/Accessories).

D. **When the temperature is expected to fall below 40° F (4°C)**, outside storage boxes should be provided on the roof for temporary storage of liquid adhesives, sealants, primers, SecurTAPE and Pressure-Sensitive Flashing/Accessories. Containers must be rotated to maintain their temperature above 40°F (4°C). Refer to Product Data Sheets for individual products for temperature restrictions.

Note: Prolonged exposure of Pressure-Sensitive Flashing and SecurTAPE to temperatures below 40° F (4°C) will cause the pre-applied adhesive tape to lose tack and in extreme cases, not bond to the substrate. Refer to **Spec Supplement E-02 "EPDM Membrane Splicing and Splice Repairs"** in Carlisle Technical Manual for application procedures in colder temperatures.

E. Do not store adhesive containers with opened lids due to the loss of solvent, which will occur from flash-off.

F. Insulation/underlayment must be stored so 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.

Part II- PRODUCTS

2.01 General

The components of this 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 by Carlisle,** is not the responsibility of Carlisle and is expressly disclaimed by the Carlisle warranty.

2.02 Membrane

A. Sure-Seal/Sure-White Non-Reinforced EPDM Membranes

1. Cured non-reinforced EPDM (Ethylene, Propylene, Diene Terpolymer) compounded elastomer.

   45-mil thick (black membrane only), 60-mil thick (black, gray or white), or 90-mil thick (black or white). Non-reinforced EPDM membrane is available in **Sure-Seal (black), Sure-Seal (gray)** or **Sure-White (white)**. Sure-Seal Gray is only available in 60-mil. Sure-White membranes are installed with the white surface facing up. Sure-Seal (black) membrane with thickness up to 60-mil can be available in widths up to 50’ and lengths up to 150’ (200’ for 45-mil membrane only). Sure-White membrane with thickness of 60-mil is available up to 20’ widths and lengths up to 150' long. Sure-Seal / Sure-White 90-mil membranes and Sure-Seal Gray 60-mil membranes are available in widths up to 10’ and lengths up to 100’. Membrane conforms to ASTM D4637, Type I (non-reinforced) and to ASTM E2178 as an air barrier.

2. **Sure-Seal KLEEN (black) EPDM Membrane** (mica dust has been removed during manufacturing) is available for sheets maximum 10' wide.

3. **Sure-Seal Gray Non-Reinforced EPDM Membrane** is available with and without FAT.

4. Refer to the physical properties listed on the following pages.

B. Sure-Tough Reinforced EPDM Membranes

1. Cured reinforced EPDM (Ethylene, Propylene, Diene Terpolymer) compounded elastomer. **Sure-Tough Reinforced EPDM Membrane** is only available in black.

   45, 60, or 75-mil thick Sure-Tough Reinforced EPDM membrane is available in sizes referenced in Table below. Reinforced membrane with polyester fabric conforms to ASTM D4637, Type II (reinforced) and ASTM E2178 as an air barrier.

Sure-Tough Reinforced Membrane Size Availability*			
Membrane Thickness	Sheet Sizes		
45-mil	5’ or 6.5' x 100’	-	10’ x 50’ or 100’
60-mil	5’ or 6.5' x 100’ 5’ x 200’	8’ x 100’	10’ x 50’ or 100'
75-mil	-	-	10' x 50’ or 100’

*Contact Carlisle for other custom sizes available.

2. Refer to the physical properties listed on the following pages:

45, 60 and 90-MIL THICK NON-REINFORCED EPDM MEMBRANE STANDARD AND FIRE RETARDANT (FR)

45-mil thick Sure-Seal (standard) non-reinforced EPDM membrane is used only for Sure-Seal Design "B" Loose Laid Ballasted Roofing Systems.

60 or 90-mil thick Sure-Seal FR (black) or Sure-White (white on black) and 60-mil thick Sure-Seal (gray) non-reinforced EPDM membrane is used primarily for Adhered Roofing Systems. Membranes can also be used for ballasted and protected membrane assemblies.

Note: Although 60-mil thick Non-Reinforced EPDM is recommended for Adhered Roofing Systems, 45-mil thick FR Non-Reinforced EPDM may be utilized, if specified.

SURE-SEAL(Black and Gray) / SURE-WHITE (White) NON-REINFORCED MEMBRANES

Physical Property	Test Method	ASTM SPEC. (Pass)	Typical			
			45-mil	60-mil	60-mil	90-mil
			Standard	FR	White & Gray	Sure-Seal FR / Sure-White
Tolerance on Nominal Thickness, %	ASTM D 412	±10	±10	±10	±10	±10
Weight, lb/ft² (kg/m²)			0.26 (1.3)	0.35 (1.7)	0.39 (1.9)	0.59 (2.9)**
Tensile Strength, min, psi (MPa)	ASTM D 412	1305 (9)	1600 (11)	1600 (11)	1600 (11)	1600 (11)
Elongation, Ultimate, min, %	ASTM D 412	300	480	465	540	540
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	200 (35.0)	200 (35.0)	200 (35.0)	200 (35.0)
Factory Seam Strength, min.	Modified ASTM D 816	Membrane Rupture	Membrane Rupture	Membrane Rupture	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging* Properties after 4 weeks @ 240°F (116°C)	ASTM D 573					
Tensile Strength, min, psi (MPa)	ASTM D 412	1205 (8.3)	1500 (10.3)	1450 (10.0)	1345 (9.3)	1450 (10.0)
Elongation, Ultimate, min, %	ASTM D 412	200	225	280	280	280
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624	125 (21.9)	215 (37.6)	215 (37.6)	185 (32.4)	215 (37.6)
Linear Dimensional Change, max, %	ASTM D 1204	±1.0	-0.4	-0.5	-0.2	-0.5
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg. C)*	ASTM D 746	-49 (-45)	-49 (-45)	-49 (-45)	-67 (-55)	-49 (-45)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471	+8.0, -2.0	[+2]	[+2]	[+3.3]	[+2.0]
Water Vapor Permeance* max, perm	ASTM E 96 (Proc. B or BW)	0.1	0.05	0.03	0.02	0.03
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at .70 W/m² irradiance, 176°F (80º C) black panel temp.	ASTM D 4637 Conditions	No Cracks No Crazing @ 7560 kJ/m²	No Cracks No Crazing @ 41580 kJ/m²	No Cracks No Crazing @ 41580 kJ/m²	No Cracks No Crazing @ 25200 kJ/m²	No Cracks No Crazing @ 41580 kJ/m²(black) 25200 kJ/m²(white)

* 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.
** Sure-White 90-mil Membrane Weight in lb/ft2(kg/m2) is equal to 0.60 (2.9)

45, 60, or 75-MIL THICK REINFORCED EPDM MEMBRANE

The membrane is used for Adhered or Mechanically Fastened Roofing Systems

Sure-Tough membranes are formulated with fire retardants to inhibit spread of flame and meets or exceeds UL Class A requirements for slopes up to 3", depending on the assembly.

SURE-TOUGH REINFORCED MEMBRANES					
Physical Property	**Test Method**	**ASTM SPEC. (Pass)**	**Typical**		
			45-mil	**60-mil**	**75-mil**
Tolerance on Nominal Thickness, %	ASTM D 751	±10	±10	±10	±10
Weight, lb/ft² (kg/m²)			0.27 (1.3)	0.39 (1.9)	0.48 (2.3)
Thickness Over Scrim, min. in.(mm)	ASTM D 4637 Annex	0.015 (.381)	0.016 (.406)	0.020 (.508)	0.032 (0.81)
Breaking Strength, min, lbf (N)	ASTM D 751 Grab Method	90 (400)	140 (623)	140(623)	177(787)
Elongation, Ultimate, min, %	ASTM D 751 Grab Method	250 **	480**	480**	500**
Tear Strength, min, lbf (N)	ASTM D 751 B Tongue Tear	10 (45)	70 (311)	70 (311)	70 (311)
Brittleness Temp., max. deg. F (deg. C)*	ASTM D 2137	[-49] (-45)	[-49] (-45)	[-49] (-45)	[-49] (-45)
Resistance to Heat Aging* Properties after 4 weeks @ 240°F	ASTM D 573				
Breaking Strength, min, lbf (N)	ASTM D 751	80 (355)	182 (823)	182 (823)	182 (823)
Elongation, Ultimate, min, %	ASTM D 751	200**	250**	250**	250**
Linear Dimensional Change, max, %	ASTM D 1204	±1.0	-1.0	-1.0	-1.0
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen wrapped around 3" mandrel	ASTM D 1149	No Cracks	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	+8.0, -2.0	[+5.5**]	[+5.5**]	[+5.5**]
Factory Seam Strength, min.	Modified ASTM D 816	Membrane Rupture	Membrane Rupture	Membrane Rupture	Membrane Rupture
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at .70 W/m² irradiance, 176°F (80º C) black panel temp.	ASTM D 4637 Conditions	No Cracks No Crazing @ 7560 kJ/m²	No Cracks No Crazing @ 35320 kJ/m²	No Cracks No Crazing @ 35320 kJ/m²	No Cracks No Crazing @ 35320 kJ/m²

* 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 to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced product.

2.03 Insulations/Underlayments

A. **General**

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

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

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

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

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

B. **Carlisle Polyisocyanurate**

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

Insulations / Underlayment	Minimum Thickness	ASTM	Roofing System Acceptability		
			Adhered	Mechanically Fastened	Ballasted
Carlisle InsulBase Polyisocyanurate, Carlisle InsulBase Eco	*1.5"	C1289, Type II, Class 1, Grade 2 or 3	√	√	√
Carlisle InsulBase NH Polyisocyanurate	*1.5"	C1289, Type II, Class 1, Grade 2 or 3	√	√	√
Carlisle ThermaThin 7™ GRF	*1.5"	C1289, Type II, Class 1, Grade 2	√	√	√
Carlisle SecurShield Polyisocyanurate, Carlisle SecurShield Eco	*1.5"	C1289, Type II, Class 2, Grade 2 or 3	√	√	√
Carlisle SecurShield NH Polyisocyanurate	*1.5"	C1289, Type II, Class 2, Grade 2 or 3	√	√	√
Carlisle ThermaThin 7™ CGF	*1.5"	C1289, Type II, Class 2, Grade 2	√	√	√
Carlisle SecurShield HD Composite Polyisocyanurate (SS HD)	2"	C1289, Type IV, Grade 2 or 3	√	√	N/A
Carlisle StormBase Composite (OSB)	1.5"	C1289, Type V, Grade 2 or 3	√	√	N/A

Design Restrictions

- Extended Warranty, those with longer duration, higher wind speed, or puncture coverage, may require the use of a cover board over Polyiso Insulation, refer to Warranty Tables in Paragraph 1.04 for applicable requirements.
- Maximum Flute Spanability shall be limited to 2-5/8" when 1" Minimum Polyiso Insulation is to be used.
- Minimum thickness of insulation board may be restricted by wind speed coverage and warranty duration, refer to Tables V and VI in Paragraph 1.05.
- The use of HD Polyiso Composite roof insulation is not recommended for Ballasted Applications.

*1.5" minimum for adhered systems. 1" minimum for mechanically fastened systems or as a base layer for adhered.

Notes: N/A = Not Acceptable √ = Acceptable

SecurShield HD is listed in Paragraph E4 below.

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

2. **Carlisle InsulBase Eco** – A rigid roof insulation panel with 5% ISCC-certified bio-attributed content composed of a closed-cell polyisocyanurate foam core bonded to glass-reinforced felt (GRF) facers, meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available. UL and FM approved for direct application over steel decks, Polyiso provides the highest R-value per inch of any commercially available insulation product.

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

4. **Carlisle ThermaThin 7™ GRF Polyisocyanurate** – A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi). The product is available in 4' x 4' and 4' x 8' standard size with a thickness from 1.45 to 2.5 inches. ThermaThin 7™ GRF Polyisocyanurate formulation has approximately 30 percent higher R-Value per inch than standard Polyisocyanurate.

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

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

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

8. **Carlisle ThermaThin 7™ CGF Polyisocyanurate** – A foam core insulation board covered on both sides with a coated glass fiber mat facer meeting ASTM C 1289, Type II, Class 2, Grade 2 (20 psi). The product is available in 4' x 4' and 4' x 8' standard size with a thickness from 1.45 to 2.5 inches. These flat board products feature a dark-colored coated-glass facer (CGF) on one side of the insulation board and a light-colored CGF on the other, labeled Ready Flash. Ready Flash Technology allows applicators to manage adhesive flash-off times by choosing between two different-colored facers on every board. ThermaThin 7™ CGF Polyisocyanurate formulation has approximately 30 percent higher R-Value per inch than standard Polyisocyanurate.

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

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

C. **EPS: Expanded Polystyrene**

Table C1	**EPS: Expanded Polystyrene** (See below for product descriptions)				
Insulations / Underlayment	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**		
			Adhered	**Mechanically Fastened**	**Ballasted**
InsulFoam I	1”	C578 Type I	N/A	N/A	√
InsulFoam VIII	.75”	C578 Type VIII	N/A	N/A	√
InsulFoam II	.75"	C578 Type II	N/A	N/A	√
InsulFoam IX	.75"	C578 Type IX	N/A	N/A	√
InsulFoam HD Composite (SecurShield HD)	1.5”	C578 Type (I, VIII, II, or IX)	√	√	N/A
InsulLam (Various Cover Boards)	1.5"	C578 Type (I, VIII, II. or IX)	√	N/A	N/A
InsulFoam SP	1"	C578 Type VIII	√ (1)	√	√
Design Restrictions					
- Local Codes must be consulted regarding the acceptance of expanded insulation directly over steel decks. When specified, minimum thickness shall be designated by the manufacturer. - Expanded polystyrene roof insulations cannot be installed directly over coal-tar pitch roof surfaces or existing PVC membranes. A separation layer of minimum 1/2” SecurShield HD, HP Recovery Board or Polyiso Insulation shall be used. (1) Adhered assemblies using Sure-Seal SAT or Sure-Tough SAT. Notes: N/A = Not Acceptable √ = Acceptable					

R-Tech Fanfold Recover Board is listed in Paragraph E4 below.

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

2. **InsulFoam VIII –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type VIII. Nominal density of 1.25 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from ¼” to 40”. Custom lengths, widths and tapered boards are available. May be specified beneath Sure-Seal HP Recovery Board, DensDeck Prime, DensDeck StormX Prime, DensDeck ProFast Prime, Securock Weather Defense, Securock or DEXcell®.

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

4. **InsulFoam IX –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type IX. Nominal density of 2.0 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from 1/4” to 40”. Custom lengths, widths and tapered boards are available. May be specified beneath Sure-Seal HP Recovery Board, DensDeck Prime, DensDeck StormX Prime, DensDeck ProFast Prime, Securock Weather Defense, Securock or DEXcell®.

5. **InsulFoam HD Composite –** InsulFoam expanded polystyrene (EPS) insulation laminated with a top surface of 1/2” thick SecurShield HD. Available in 4’ x 8’ boards with thickness from 1-1/2” to 7”.

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

7. **InsulFoam SP –** A closed-cell lightweight expanded polystyrene (EPS) with a factory-laminated fiber glass facer. Nominal density of 1.25 lbs/cubic ft (pcf), and meets ASTM C578, Type VIII. Designed for low-sloped roof applications that employ mechanically fastened or ballasted membranes. Can also be used in Adhered systems using Sure-Seal or Sure-Tough SAT Membranes.

D. **XPS: Extruded Polystyrene –** Available through Carlisle is dimensionally stable with high thermal and low water absorption performance capability. XPS is available in varying compressive strengths thicknesses and sizes. Refer to specific product data sheets for physical properties and additional technical information.

Table D1	**XPS: Extruded Polystyrene** (See below for product descriptions)				
Insulations / Underlayment	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**		
			Adhered	**Mechanically Fastened**	**Ballasted**
Thermapink 18	.75"	Refer to Product Data Sheet	N/A	N/A	√
Thermapink 25	1"	Refer to Product Data Sheet	N/A	N/A	√
Foamular 400	1"	Refer to Product Data Sheet	N/A	N/A	√
Dow Styrofoam Deckmate Plus	1"	Refer to Product Data Sheet	N/A	N/A	√
Design Restrictions					
- Local Codes must be consulted regarding the acceptance of expanded insulation directly over steel decks. When specified, minimum thickness shall be designated by the manufacturer. - Expanded polystyrene roof insulations cannot be installed directly over coal-tar pitch roof surfaces or existing PVC membranes. A separation layer of minimum 1/2" SecurShield HD, HP Recovery Board or Polyiso Insulation shall be used. - Refer to related products listed in **Spec Supplement P-01 "Related Products"** for other products which may be suitable for use. Carlisle must be contacted for specific requirements.					
Notes: N/A = Not Acceptable √ = Acceptable					

1. **Thermapink 18 or 25 Extruded Polystyrene**
2. **Foamular 400 Extruded Polystyrene**
3. **Dow Styrofoam Deckmate Plus Extruded Polystyrene**

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

Table E1	**Vacuum Insulated Panel (VIP)** (See below for product descriptions)			
Insulations / Underlayment	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**	
			Adhered	**Mechanically Fastened**
Carlisle OPTIM-R® VIP	*1.6"	C1484	√	N/A
ADVANC-R® VIP	0.94	C1484	√	N/A
Design Restrictions				
*2.6" minimum for total installed system including an additional 2 layers of 1/2" SecurShield HD panels; 1 layer on top and 1 layer on bottom of OPTIM-R®. For adhered systems only. Note: OPTIM-R® VIP & ADVANC-R® VIP cannot be cut or punctured.				
Notes: N/A = Not Acceptable √ = Acceptable				

1. **OPTIM-R® Vacuum Insulated Panel (VIP) –** a high R-Value vacuum insulated panel (VIP) used to provide a low-profile solution when height restricted roof conditions such as penthouse doors, window sills, equipment curbs and parapet walls. Provides an R-38 insulating value in a 2.6" system thickness with up to 35% infill (non-VIP material). Available in 23.6" x 23.6" and 23.6" x 47.2" board sizes.

2. **ADVANC-R® VIP –** a thin, rigid, high R-value, non-structural vacuum insulated panel. Provides a low-profile solution for height restricted roof conditions such as penthouse doors, windowsills, equipment curbs and parapet walls. Provides a R-66 insulating value in a 0.94" thick panel. Available in 22.4" x 24.0" and 22.4" x 48.0" panel sizes.

F. **Cover Boards / Slip Sheets**

Table F1	**Cover Boards** (See below for product descriptions)				
Insulations / Underlayment	**Minimum Thickness**	**ASTM**	**Roofing System Acceptability**		
			Adhered	**Mechanically Fastened**	**Ballasted**
SecurShield HD, SecurShield HD Eco	.5"	C1289-06, Type II, Class 4 (109 psi max)	√	√	N/A(2)
SecurShield HD Plus	.5"	C1289-06, Type II, Class 4 (109 psi max)	√	√	N/A(2)
InsulBase HD, InsulBase HD Eco	.5"	C1289-06, Type II, Class 1, Grade 3	N/A	√	N/A
Securock Roof Board	.25"	C1177	√	√	N/A
Securock Weather Defense	.625"	C1177	√	√	N/A
Securock UltraLight Glass-Mat Roof Board	.25"	C1177	N/A	√	N/A
Securock UltraLight Coated Glass-Mat Roof Board	.25"	C1177	√	√	N/A
EcoStorm VSH	.5"	Refer to Product Data Sheet	√	√	N/A
HP Recovery Board	.5"	C208 Grade 2	√	√	√
DensDeck StormX Prime	.625"	C1177	√	√ (1)	N/A
DensDeck Prime	.25"	C1177	√	√ (1)	N/A
DensDeck	.25"	C1177	N/A	√ (1)	N/A
DensDeck ProFast Prime	.375"	C1177	√	√	N/A
R-Tech Fanfold Recovery Board	.5"	C578 Type (I, VIII, II. or IX)	N/A	√	√
HP Protection Mat	6 oz	Refer to Product Data Sheets	N/A	√	√
DEXcell Glass Mat®	.25"	C1177	N/A	√	N/A
DEXcell FA™ Glass Mat	.25"	C1177	√	√	N/A
DEXcell® Cement Roof Board	.4375"	C1325	√	√	N/A
DEXcell FA VSH®	.625"	C1177	√	√ (1)	N/A

Design Restrictions

HP Recovery Board and R-Tech Fanfold not recommended for direct use over Type B and F steel decks.

- Securock Roof Board, HP Recovery Board, DensDeck Prime, DensDeck StormX Prime, DensDeck or DEXcell® may not be used directly over New or Existing Lightweight Insulating Concrete Decks OR Structural Concrete.
- Due to some warranty restrictions, DensDeck Prime, DensDeck StormX Prime, DensDeck and DEXcell® are not recommended for use directly over existing roofing membrane without prior written approval from Carlisle. Contact Carlisle for specific requirements.
- R-Tech Fanfold primarily for use in existing roof re-covers applications or directly over structural or lightweight insulating concrete.
- HP Protection Mat may be used for Ballasted systems over Lightweight Insulating Concrete with a Maximum Warranty duration of up to 15 years. To be used for Mechanically fastened on new construction projects with Lightweight Insulating Concrete, Fiber Cement or Gypsum Deck a Maximum Warranty duration of up to 15 years.
- (1) Permitted with roofs with slopes greater than 2" per foot for compliance with external fire codes, refer to UL listings or contact Carlisle.

(2) Acceptable for some roof system designs, Contact Carlisle for recommendations.

Notes: N/A = Not Acceptable √ = Acceptable

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

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

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

3. **SecurShield HD Plus** - a rigid insulation panel composed of a high-density (109 psi max), closed-cell polyisocyanurate foam core laminated to premium-performance coated-glass fiber-mat facer, meeting ASTM C1289, Type II, Class 4, Grade 1. Specifically designed for use as a cover board or recover board. Available 1/2" thick 4' x 4' (6.5 lbs) and 4' x

8’ panel (13 lbs) with an R-value of 2.5. Meets an FM 1-90 using only 8 fasteners per 4’ x 8’ board.

4. **InsulBase HD** – a closed-cell polyisocyanurate foam core insulation board covered on both sides with glass-reinforced felt (GRF) facer meeting ASTM C 1289, Type II, Class 1, Grade 3. The product is available in 4’ x 4’ and 4’ x 8’ standard sizes with a thickness of one-half inch with an R-value of 2.5. ASTM C1289, Type II, Class 1, Grade 3.

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

6. **Securock Roof Board –** A uniform composition of fiber-reinforced gypsum, without a facer, for use as a cover board or a thermal barrier in mechanically fastened and fully adhered roofing systems. Meets ASTM E84 for flame spread and smoke development; Class A fire performance per UL 790. Available in 1/4” to 5/8” thick and 4’ x 4’ or 4’ x 8’ size boards. 5/8” meets requirements of Type X per ASTM C1177. Long uninterrupted runs (>200’) may require slight gapping due to thermal expansion.

7. **Securock UltraLight Glass-Mat Roof Board –** A fire-resistant, moisture and mold-resistant roof board used in mechanically fastened, low-slope roofing systems, featuring a specially treated lightweight core and high-performance glass-mat facer. Meets ASTM E84 for flame spread and smoke development; Class A fire performance per UL 790. Available in 4’ x 8’ size boards; 1/4”, 1/2” and 5/8” thicknesses available. 5/8” meets requirements of Type X per ASTM C1177.

8. **Securock UltraLight Coated Glass-Mat Roof Board -** A fire-resistant, moisture and mold-resistant roof board used in fully adhered or mechanically fastened, low-slope roofing systems, featuring a specially treated lightweight core. The special coating on the high-performance glass-mat facer provides an exceptional adhesive bond and reduces facer delamination. Meets ASTM E84 for flame spread and smoke development; Class A fire performance per UL 790. Available in 1/4”, 1/2” and 5/8” Type X and 4’ x 8’ size boards. 5/8” meets requirements of Type X per ASTM C1177.

9. **Securock® Weather Defense™ Roof Board** - A reinforced gypsum cover board with an enhanced, moisture-resistant core and high-performance, coated glass mat facers (CGF) on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for adhered membrane for use as a cover board. Securock® Weather Defense™ Roof Board is extremely durable and is approved for use in assemblies meeting FM’s Very Severe Hail (VSH) Classification. Available in 5/8” thickness and 4’ x 4’ or 4’ x 8’ size boards. Meets requirements of Type X per ASTM C1177. Meets ASTM E84 for flame spread and smoke development; Class A fire performance per UL 790; FM Approvals Class 1.

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

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

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

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

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

15. **DensDeck® ProFast™ Prime Roof Board** - A fire-resistant, moisture and mold-resistant roof board used in fully adhered or mechanically fastened, low-slope roofing systems, featuring a specially treated lightweight core. (20% lighter than 1/2” gypsum boards). The special coating on the high-performance glass-mat facer provides an exceptional adhesive bond and reduces facer delamination. Non-combustible per ASTM E108 and meets ASTM E84 for flame spread and smoke development; Class A fire performance per UL 790. Available in 3/8” thickness and 4’ x 8’ size

boards.

16. **R-Tech FanFold Recover Board –** Closed-cell lightweight expanded polystyrene (EPS) with polymeric laminated faces which meets ASTM C 578, while metallic side used with EPDM. Available in thicknesses of 3/8" to 3/4" with coverage 4' x 50' (2 squares). 4' x 8' units are also available.

17. **HP Protection Mat –** A nominal 6-oz per square yard UV resistant polypropylene needle punched fabric used either above the membrane as a slip-sheet for ballast or as an underlayment to the membrane. Available 15' x 300' roll (4500 square foot) weighing 0.06 lbs per square foot.

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

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

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

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

2.04 Related Materials

A. Flashing

1. **Sure-Seal/Sure-White or Sure-Seal Gray Pressure-Sensitive Cured Cover Strip:** A 6" or 9" wide and 100' long and 12" wide by 50' long Sure-Seal, Sure-White or Sure-Seal Gray 60-mil cured EPDM membrane laminated to a nominal 30-mil cured Pressure-Sensitive TAPE. The Cured Cover Strip is ideal for flashing gravel stops, metal edging, Carlisle Seam Fastening Plates and for EPDM repairs.

2. **Sure-Seal Pressure-Sensitive Overlayment Strip:** A nominal 40-mil black, **semi-cured** EPDM membrane laminated to a nominal 30-mil cured, Pressure-Sensitive TAPE. Available in 6" and 9" widths and 100' long rolls used to overlay seams, flash gravel stops, metal edgings and Seam Fastening Plates used for additional membrane securement.

3. **Sure-Seal / Sure-White or Sure-Seal Gray Pressure-Sensitive Elastoform® Flashing:** A 6" x 100' and 9" or 12" wide by 50' long, 60-mil thick Sure-Seal (black), Sure-White (white) or Sure-Seal Gray (gray) **uncured** EPDM Flashing laminated to a 30-mil Pressure-Sensitive TAPE used in conjunction with EPDM Primer.

   Sure-Seal/Sure-White or Sure-Seal Gray uncured Pressure-Sensitive Elastoform Flashing is used to flash inside and outside corners, pipes, scuppers and field fabricated pourable sealer pockets when the use of Carlisle pre-fabricated flashing accessories is not feasible.

4. **Sure-Seal/Sure-White or Sure-Seal Gray Pressure-Sensitive Curb Flashing** – A 20" wide by 50' long Sure-Seal (cured 60-mil thick EPDM membrane with 6" wide Pressure-Sensitive TAPE along one edge to be used to flash curbs/skylights, etc.

5. **Sure-Seal / Sure-White or Sure-Seal Gray 20" Pressure-Sensitive Cured Flashing** - A 20" wide by 50' long Sure-Seal (black), Sure-White (white) or Sure-Seal (gray) cured 60-mil thick EPDM membrane, with Pressure-Sensitive TAPE the full width already applied, used to flash curbs/skylights, etc.

6. **Sure-Seal / Sure-White or Sure-Seal Gray Pressure-Sensitive "T" Joint Covers:** A factory cut uncured 60-mil thick EPDM flashing laminated to a nominal 30-mil Pressure-Sensitive TAPE, used to overlay field splice intersections and to cover field splices at angle changes; available in 6" x 6" and 12" x 12" sizes for Sure-Seal

(black) and 6” x 6” sizes for Sure-White and Sure-Seal (gray).

7. **Sure-Seal / Sure-White or Sure-Seal Gray Inside/Outside Corner:** A 7" x 9" precut 60-mil thick (black, gray or white) Elastoform Flashing with a 30-mil Pressure-Sensitive TAPE; used for inside and outside corners, to overlay field splice intersections, and to cover field splices at angle changes.

8. **Sure-Seal / Sure-White or Sure-Seal Gray Pressure-Sensitive Pipe Seals** with Pressure-Sensitive TAPE on the deck flange are available for use with Sure-Seal / Sure-White or Sure-Seal Gray Roofing Systems:

   a. Sure-Seal (black) Pressure-Sensitive Pipe Seals are available in sizes: 1/2" to 3" and 1" to 6".

   b. Sure-White (white) and Sure-Seal (gray) Pressure-Sensitive Pipe Seals are available in one size: 1" to 6".

9. **Sure-Seal / Sure-White or Sure-Seal Gray Pressure-Sensitive Pourable Sealer Pocket**: A pre-fabricated Pourable Sealer Pocket which consists of a 2" wide plastic support strip with Pressure-Sensitive, adhesive backed uncured Elastoform Flashing; available in 4", 6" and 8" diameters for Sure-Seal (black), 6" diameter for Sure-Seal (gray) and 6” and 8” diameter for Sure-White (white).

B. Splice Tapes, Primers, Adhesives and Sealants/Cleaners

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

1. **Sure-Seal or Sure-White Pressure-Sensitive SecurTAPE:** A 3" or 6" wide by 100' long splice tape used for splicing adjoining sections of EPDM membrane. 6” wide splice tape is used for Mechanically Fastened Roofing Systems and 20-year Warranty Systems. Complies with the South Coast Air Quality Management District Rule 1168.

2. **HP-250 EPDM Primer: A** solvent-based primer used to prepare the surface of EPDM membrane for application of SecurTAPE or Pressure-Sensitive products. Available in 1- or 3-gallon pails and as CAV-PRIME Pressurized Cylinders.

3. **Low-VOC EPDM and TPO Primer -** A Low-VOC (volatile organic compound) primer (less than 250 grams/liter) for priming of EPDM or TPO surfaces prior to application of FAT, Cover strip, SecurTAPE and all other pressure-sensitive products. Available in 1- or 3-gallon pails and as CAV-PRIME Pressurized Cylinders.

4. **Sure-Seal or Sure-White Lap Sealant:** A heavy-bodied material used at splice intersections beneath “T”-joint covers, at cut edges of reinforced EPDM membrane and around uncured pressure-sensitive accessories.

5. **Carlisle Weathered Membrane Cleaner: A** clear, solvent-based cleaner used to loosen and remove dirt and other contaminants from the surface of exposed EPDM membrane prior to applying Carlisle EPDM Primer. Available in 1 and 5-gallon pails.

6. **Low-VOC Membrane Cleaner:** A Low-VOC (volatile organic compound) cleaner (100% EPA-exempted solvents) used to loosen and remove dirt and other contaminants from the surface of exposed EPDM membrane prior to applying Carlisle EPDM Primer. Available in 1 and 5-gallon pails.

7. **90-8-30A Bonding Adhesive:** A high-strength, yellow colored, synthetic rubber adhesive used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

8. **EPDM x-23 Low-VOC Bonding Adhesive**: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces. Adhesive is available in 5-gallon pails.

9. **Low-VOC Bonding Adhesive**: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces. Adhesive is available in 5-gallon pails.

10. **Aqua Base 120 Bonding Adhesive**: A semi pressure-sensitive water based adhesive; used as a 2-sided contact adhesive for bonding Sure-Seal/Sure-White EPDM membrane to various surfaces. Complies with the South Coast Air Quality Management District Rule 1168.

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

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

13. **Pourable Sealer**: A black, two-component, solvent-free, polyurethane based product used for tie-ins and as a sealant around hard-to-flash membrane penetrating objects such as clusters of pipes and for a daily seal when the completion of flashings and terminations cannot be completed by the end of each work day.

14. **One-Part Pourable Sealer:** A black, one-component, moisture curing, elastomeric polyether sealant used for attaching lightning rod bases and ground cable clips to the membrane surface and as a sealant around hard-to-flash penetrations such as clusters of pipes.

15. **Universal Single-Ply Sealant** A one-part polyether, non-sagging sealant designed for sealing expansion joints, control joints and counter flashings. Available in white or gray.

2.05 Fastening Components

A. **Securement Strips (RUSS)**

1. **Sure-Seal Pressure-Sensitive RUSS** (Reinforced Universal Securement Strip): A 6" or 9" wide, nominal 45-mil thick, clean, cured reinforced EPDM black membrane with 3" wide Pressure-Sensitive Tape laminated along one edge for the 6" wide RUSS and along both edges for the 9" wide RUSS.

   a. **6" wide Pressure-Sensitive RUSS** is used horizontally or vertically at the base of walls, curbs, etc., in conjunction with Fastening Plates or Bars below the EPDM deck membrane for additional membrane securement.

   b. **9" wide Pressure-Sensitive RUSS** is utilized for perimeter membrane securement on Sure-Seal Mechanically Fastened Roofing Systems and primary securement on Metal Retrofit Roofing Systems.

B. **Fasteners**

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

Insulation Fastening Criteria

Deck Type	Carlisle Fasteners (1)	Min. Penetration	Pilot Hole Depth	Pilot Hole Diameter
Steel or Lightweight Insulating Concrete over Steel	HP, HP-X, ASAP or InsulFast™	3/4"	N/A	N/A
Structural Concrete, rated 3,000 psi or greater	CD-10	1"	Note (2)	7/32"
	HD 14-10	1"	Note (2)	3/16"
Wood Plank, min. 15/32" thick Plywood or min. 7/16" OSB	HP, HP-X, ASAP or InsulFast	Min. 1" (3)	N/A	N/A
Cementitious Wood Fiber	Polymer Gyptec	1-1/2"	Note (4)	N/A
Cementitious Wood Fiber	Lite-Deck Fastener	2”	Note (4)	N/A
Gypsum	Polymer Gyptec	1-1/2"	Note (2)	7/16", 1/2" or 9/16" (5)
Gypsum	Lite-Deck Fastener	2”	Note (5)	Note (6)

Notes: N/A = Not Applicable
(1) Only 3" diameter insulation fastening plates can be used for insulation attachment.
(2) The pilot hole must be predrilled to a sufficient depth to prevent contact between the fastener point and any accumulated dust in the predrilled hole. This will help prevent bottoming out of the fastener during installation.
(3) For wood planks only, fastener penetration shall not exceed 1-1/2".
(4) Most cementitious wood fiber decks do not require pre-drilling; however, Carlisle should be contacted prior to installation for verification of specific types that may require a pilot hole to be predrilled.
(5) Pilot hole size may be varied to maximize pullout resistance.
(6) Gypsum hardness varies, and the desired pullout may determine pilot hole size. This could range from ¼” to 5/16.

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

1. **HP Fastener**: A threaded E-coat square head fastener for insulation and Reinforced membrane attachment

for Mechanically Fastened Systems in conjunction with 2” diameter polymer seam plates. Used into steel, wood plank, minimum 15/32" thick plywood or minimum 7/16" thick oriented strand board (OSB).

2. **HP-X Fastener**: A high-performance fastener with an oversized, heavy shank with #15 thread diameter for single-ply membrane or insulation attachment, used to secure steel decks (20- [0.91 mm] or 22-gauge [0.76 mm]) or wood, minimum 15/32" thick CDX plywood).

3. **HP-Xtra Fastener: An** oversized diameter (.315") steel, threaded fastener used in conjunction with HP-Xtra Polymer Seam Plates for membrane securement into minimum 22-gauge steel or wood decks on Mechanically Fastened Roofing Systems.

4. **Pre-Assembled ASAP Fastener**: Carlisle’s InsulFast Fastener pre-assembled with a 3" diameter plastic plate used for insulation attachment only on Adhered and Mechanically Fastened Roofing Systems.

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

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

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

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

9. **Lite-Deck Fastener:** A deep, coarse threaded fastener used to secure insulation to gypsum and cementitious wood fiber decks in conjunction with Lite-Deck Plates.

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

C. **Fastening Plates and Bars**

1. **HP Polymer Seam Plate**: A 2" diameter plastic barbed fastening plate used with Carlisle HP Fasteners for membrane and Pressure-Sensitive RUSS securement for Mechanically Fastened Roofing Systems over steel roof decks.

2. **HP-Xtra Polymer Seam Plate:** A 2 3/8” diameter plastic barbed fastening plate used with HP-Xtra Fasteners for membrane and Pressure-Sensitive RUSS securement for Mechanically Fastened Roofing Systems over steel roof decks.

3. **Seam Fastening Plates**: A 2" diameter metal plate used for insulation attachment on Mechanically Fastened Roofing Systems or membrane securement on Adhered Roofing Systems in conjunction with the appropriate Carlisle Fastener.

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

5. **SecurFast Insulation Fastening Plates:** A nominal 2-7/8” hexagon metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener.

6. **Accutrac Insulation Plates:** A nominal 3” square, recessed or flat bottomed, metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener. Flat bottom plate is used with manufactured Philips Head fasteners only.

7. **Gyptec Plates**: A 3” (26 gauge) steel plate for insulation and a 2” (22 gauge) steel plate for membrane attachment. The plates are stamped galvalume-coated steel.

8. **Metal Fastening Bar**: A 1" wide metal bar which is pre-punched 6" o. c. and packaged in 10' long strips to be used for membrane securement on Mechanically Fastened Roofing Systems.

2.06 Insulation Securement Adhesive

1. **Flexible FAST Adhesive:** A spray (full coverage) or bead-applied, two-component polyurethane, construction grade, low-rise expanding foam adhesive used for attaching approved insulations to compatible

roof decks or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.

2. **Flexible FAST Dual Tank:** A two component (Part A and B), extrusion applied, low rise adhesive for bonding insulation to various surfaces. Flexible FAST Dual Tanks utilize an HFO blowing agent. HFO (hydrofluoroolefin) blowing agents are widely recognized as the next-generation environmentally friendly blowing agent, replacing their HFC (hydrofluorocarbon) predecessor. When extruded at 12" on center the coverage rate is 3,500 to 3,700 sq.ft. per set of Dual Tanks.

3. **Flexible FAST Dual Cartridge and 5-gallon Jug Adhesive: A** two component (Part A and B), extrusion applied, low rise adhesive for bonding insulation to various surfaces. When extruded at 12" on center the coverage rate is 400-600 sq.ft. per carton of Dual Cartridges or 2,000-2,500 sq.ft. per set of 5-gallon Jug Adhesive.

4. **OlyBond 500 Bag in a Box** – A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates. Packaged in 5-gallon boxes of Part A and Part B formulations that are applied using a mechanical dispenser system. Applied in 1/2" to 3/4" beads or ribbons at the rate of 1 gallon per 150-250 square feet for 12" o.c. bead spacing. Perimeter bead spacing patterns and acceptable insulation and deck types are listed in the applicable Product Data Sheet.

5. **OlyBond 500 BA Spot Shot** - A two-component, polyurethane construction grade, low-rising expanding adhesive designed for bonding insulation to various substrates. Applied in 1/2" to 3/4" beads or ribbons using a portable 1:1 applicator (oversized, dual-cartridge caulking gun). Refer to the Product Data Sheet for bead spacing with reference to building height.

2.07 Vapor/Air Barrier

1. **General**

   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. If insulation is to be adhered to the vapor retarder with FAST Adhesive, the vapor retarder must be compatible and shall be fully adhered to the substrate. Available products include Carlisle's VapAir Seal 725TR Air and Vapor Barrier, VapAir Seal MD Air and Vapor Barrier and spray or roller applied butyl coatings. Installation requirements for Carlisle's VapAir Seal 725TR Air and Vapor Barrier are identified in **Spec Supplement G-08 "Application Procedures for Carlisle's VapAir Seal 725TR Air and Vapor Barrier/Temporary Roof"** and Carlisle's VapAir Seal MD Air and Vapor Barrier are identified in **Spec Supplement G-12 "Application Procedures for Carlisle's VapAir Seal MD Air and Barrier"** in the Carlisle Technical Manual.

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

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

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

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

6. **CCW-702WB –** a high-tack, water-based contact adhesive for promoting adhesion of Carlisle air/vapor barrier membranes and an approved substrate (i.e., concrete, DensDeck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW-702WB

Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

2.08 Edges And Terminations

A. **General**

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

B. **Products**

1. Fascia Products

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

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

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

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

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

2. Coping Products

   a. **SecurEdge Snap-on Coping:** A snap-on coping system that incorporates 20-gauge anchor cleats with pre-slotted holes, a concealed joint cover and 10' or 12' continuous sections of coping cap consisting of 40, 50 or 63-mil thick clear and colored anodized, and Kynar 500 finish or 24-gauge steel with Kynar® 500 finish. The coping cap is available in a variety of standard colors. Custom colors are available upon request. Also available in a variety of widths including custom pieces such as tees, crosses, radius copings, etc. ANSI/SPRI/FM-4435 ES-1 certified.

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

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

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

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

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

3. Water Control Products

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

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

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

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

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

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

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

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

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

2.09 Roof Walkways

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

1. **Walkway types:**

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

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

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

2.10 Other Carlisle Accessories

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

Part III – EXECUTION

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

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

3.01 General

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

B. 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.

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

3.02 Roof Deck/Substrate Criteria

A. Proper decking shall be provided by the building owner. The building owner or their 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 loads and live loads, in accordance with all applicable codes. The specifier must also designate the maximum allowable weight and location for material loading and storage on the roof.

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

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

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

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

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

G. For direct application over an acceptable roof deck/substrate or when HP Protective Mat is specified and approved by Carlisle as the membrane underlayment in accordance with the Roof Deck and Substrate Criteria Table, the substrate must be smooth, steel trowel finished (structural concrete), free of debris, protrusions, sharp edges and loose and foreign material. Cracks or voids in the substrate, greater than 1/4", must be filled with an appropriate material.

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

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

2. **For existing PVC membranes**, if the membrane is not removed, it must be cut into maximum 10' by 10' sections. All PVC flashings at the perimeter, roof drains and roof penetrations must be removed.

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

4. On retrofit projects, all existing phenolic insulation must be removed.

5. Refer to the table below for other Recover/Retro-fit considerations.

H. The following table identifies the **acceptable roof decks/substrates** and the **minimum underlayment** requirements for Carlisle's EPDM Roofing Systems.

Note: Refer to the Warranty Tables, Paragraph 1.05, of this specification, for the minimum underlayment requirements for a specific Warranty Coverage.

Roof Deck & Substrate Criteria

Certain warranty restrictions apply for projects with warranties greater than 15 YR. Refer to Table V "Re-Roofing Substrate Criteria" for warranty limitations in paragraph 1.05.

Acceptable Roof Deck/Substrate	EPDM Membrane		
NEW CONSTRUCTION	Adhered - Design "A"	Ballasted - Design "B"	Mechanically Fastened
Steel (min. 22 gauge) (1)(2)	Insulation	Insulation	Insulation
Structural Concrete (min. 3000 psi)	Direct Application (11)	Insulation	HP Protective Mat (10)
Plywood (min. 15/32" thick) or Oriented Strand Board (min. 7/16" thick)	Direct Application (11)	Insulation	Direct Application (11)
Wood Planks (minimum 3/4" thick)	Direct Application	Insulation	Direct Application (11)
Fibrous Cement	Insulation	Insulation	HP Protective Mat
Lightweight Insulating Concrete	Note 3 (10)	HP Protective Mat (10)	Direct Application (10)
RETROFIT / NO TEAR-OFF	Adhered - Design "A"	Ballasted - Design "B"	Mechanically Fastened
Existing Smooth Surface BUR or Mineral Surface Cap Sheet	Direct Application (4) (11)	Insulation	Direct Application (4) (11)
Gravel Surfaced BUR (5)	Insulation	Insulation	Insulation
Coal Tar Pitch (5)(6)	Insulation (9)	Insulation	Insulation
Modified Bitumen	Direct Application (8) (11)	Insulation	Direct Application (8) (11)
Existing Single-Ply	Insulation	Insulation (7)	Direct Application (7) (11)
Sprayed-in-place Urethane	Complete Tear-off Required	Insulation	Complete Tear-off Required
RETROFIT / TEAR-OFF	Adhered - Design "A"	Ballasted - Design "B"	Mechanically Fastened
Existing roof material removed (regardless of deck type)	Insulation	Insulation	Insulation

Notes:

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

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

(3) The Design "A" Adhered Roofing System may be specified directly over a new approved cellular or perlite lightweight insulating concrete substrate with a minimum compressive strength of 225 psi. Except when the lightweight insulating concrete is poured over slotted steel decks, pressure relief vents must be specified at a minimum rate of 1 every 2000 square feet. Direct Application is not permitted where the lightweight concrete is poured over an existing roofing material. Refer to **Spec Supplement G-04 "Adhered Application Over Lightweight Insulating Concrete".**

(4) Sure-Seal (black) Adhered and Mechanically Fastened Systems may be applied directly to the substrate provided asphalt on existing smooth surfaced built-up roof has a softening point above 185°F (85°C). Sure-White (white-on-black) Roofing Systems are not recommended for direct application to the substrate due to possible staining of the membrane surface. For direct application over smooth BUR or granule surface BUR or in conjunction with HP Mat make sure substrate is clean and free of roofing cement and fresh asphalt to avoid sheet contamination and staining of white color membrane.

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

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

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

(8) Direct application permitted over smooth surfaced modified bitumen. Membrane shall be positioned with length of sheets parallel to modified bitumen field seams. At end laps or other locations where EPDM splices intersect modified bitumen field seams, 6" wide Elastoform or Pressure-Sensitive Flashing must be applied over intersections.

(9) If insulation is specified to be secured to an existing coal tar pitch roof with Carlisle FAST Adhesive or hot asphalt, minimum 1.5" thick Polyisocyanurate insulation is the required minimum thickness when Sure-Seal (black) EPDM is specified. Minimum 1" thick Polyisocyanurate is the required minimum thickness when Sure-White (white) EPDM is specified.

(10) For direct application, membrane system warranties are limited to 15 YR unless specifically approved by Carlisle.
(11) Maximum warranty available is 20 YR with 55 MPH warranty wind speed (72 MPH warranty wind speed over structural concrete, wood planks or plywood) Peak gust wind speed coverage. Carlisle may be contacted for other options.

J. **Vapor Retarder Installation**

For Carlisle's Vapor Retarder refer to **Spec Supplement G-08 "Application Procedures for 725TR Air and Vapor Barrier".** Follow the respective vapor retarder manufacturer's recommended installation procedures and the specifier's instructions for the installation of the product specified. When insulation is to be set in adhesive, verify compatibility with Carlisle when Vapor Retarder by others is specified.

K. **Wood Nailers**

1. Install wood nailers in locations that have been designated by the specifier and as approved by Carlisle. Refer to Design Reference **DR-08 "Wood Nailers and Securement Criteria"** for Wood Nailer Criteria.

2. Wood nailers are not covered by the Carlisle Warranty.

3.03 Insulation/Underlayment

A. **General**

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

2. For new construction projects in cold climate regions, the use of vapor retarders or air barriers is strongly recommended to protect insulation from moisture generated during construction.

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

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

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

6. Restrictions:

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

b. Fiberglass insulation cannot be specified with Carlisle's Design "A" Adhered and Mechanically Fastened Roofing Systems, even if overlaid with additional insulation or membrane underlayment.

c. Do not specify perlite boards directly under the EPDM membrane on Design "A" Adhered or Mechanically Fastened Roofing Systems.

d. Wood fiberboard manufactured by others is not an acceptable underlayment for use with Design "A" Adhered Roofing Systems unless approved in writing by Carlisle prior to installation.

e. For all EPDM Roofing Assemblies, the use of insulation by others is not acceptable when a Carlisle Membrane System Warranty is specified. Carlisle insulation must be used.

3.04 Insulation Attachment

A. **General**

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

B. **Adhered Roofing Systems**

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

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

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

c. On Reroof/No Tear off projects with a maximum roof height of 40', 1/2" SecurShield HD requires 12 fasteners per board. HP Recovery Board and Polyisocyanurate less than 1-1/2" thick require 16 fasteners per board.

d. When Oriented strand board (OSB) is specified for membrane underlayment, utilize StormBase OSB/Polyiso Composite, mechanically fastened to the deck at the rate 17 fasteners for 4 x 8 board in accordance with Carlisle Details. When positioning OSB, butt edges and stagger joints of adjacent panels.

2. **Adhesive attachment**, Carlisle Urethane Adhesive Full Spray (Flexible FAST) or Bead (Flexible FAST or Olybond) may be used. When bead adhesive is specified bead spacing will vary based on Warranty coverage, refer to Warranty Tables, Paragraph 1.05 and appropriate Carlisle Details. CAUTION: Apply adhesive bead so that the distance from the edge of the board does not exceed half the bead spacing (i.e. within 6" of bead spacing of 12" O.C.).

a. **CAUTION: Do not apply urethane adhesives directly to un-weathered asphalt, (new or residual).**

b. **CAUTION: Especially in cold regions on tear-off projects or new construction gaps between horizontal and vertical surfaces of the roof area as well as gaps around penetrations must be sealed to prevent interior warm air from infiltrating and condensing within the roofing assembly. Condensing moisture could weaken bottom insulation facer and eventually result in dislodgement or loose boards when adhesive is used.**

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

d. Check to ensure the substrate is clean, free of debris, other contaminants, and dry. Adhesive cannot be applied to a wet or a damp surface.

e. Apply Adhesive over the dry substrate area at the coverage rates indicated in **Spec Supplement G-03 "Insulation Attachment with Flexible FAST Adhesive".**

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

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

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

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

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

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

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

h. Refer to **Spec Supplement G-02 "Flexible FAST Adhesive Equipment and Set-Up Requirements"** and **G-03 "Insulation Attachment with Flexible FAST Adhesive"** for application procedures and coverage rates.

3. **Alternate attachment method**, the specifier may select an alternate insulation attachment that incorporates a solid mopping of the insulation with hot asphalt (ASTM D312, Type III or IV). If the attachment method is to be covered by the Carlisle Warranty, Carlisle must be contacted for specific requirements. Upon review and acceptance by Carlisle, the maximum warranty coverage available is limited to 20 Year with maximum Peak Gust Wind Speed Coverage of 72 mph.

   a. Extruded or Expanded Polystyrene insulation are not acceptable when this alternate attachment method is specified.

   b. The existing gravel surfaced built-up roof must be scraped to remove all loose gravel. Large blisters that may prevent continuous embedment of insulation must be repaired. The surface of the substrate must also be dry and clear of foreign material.

   c. On coal tar pitch, when deemed compatible by the specifier, minimum 1.5" Polyisocyanurate is the required membrane underlayment when using Sure-Seal (black) membrane. If Sure-White (white) membrane is used, minimum 1" thick Polyisocyanurate is required.

   d. For successful attachment, proper asphalt temperatures must be maintained and the specifier's requirements concerning the installation of a base sheet (where required) and quantity of hot asphalt must be followed.

   e. The maximum insulation board size shall not exceed 4' X 4'. Trim insulation boards around crickets and saddles to ensure continuous embedment.

   f. Care must be exercised to prevent contamination of the top surface of the insulation. Asphalt oozing through insulation joints must be wiped from the surface. Contact with fresh asphalt can result in discoloration of the Sure-White membrane.

   g. Use of grid nailer, subdividing the roof into individual sections of 2400 square feet, is not required, but its use is strongly recommended.

   h. The wood nailers are installed relatively flush with the insulation surface and the membrane is to be fastened with seam fastening plates and Carlisle HP fasteners on 12" o.c. For wood nailer installation, refer to Design Reference **DR-08 "Wood Nailers and Securement Criteria"**.

C. **Ballasted Roofing Systems**

1. Insulation boards shall be loose laid over the substrate.

   Note: If insulation securement is specified, only Carlisle approved insulation adhesive may be used. Mechanical securement of roof insulation is not permitted due to increased probability of membrane puncture during ballast installation or periodic rooftop maintenance.

2. Refer to Roof Deck/Substrate Criteria in Paragraph 3.02 for further information.

   Note: The use of cover boards, such as SecurShield HD, SecurShield HD Plus, DensDeck, DensDeck Prime, DensDeck StormX Prime, DensDeck ProFast Prime Roof Board, Securock, Securock Weather Defense Roof Board or DEXcell®, is not permitted in conjunction with Ballasted Assemblies to reduce possible membrane punctures. Hard cover boards do not provide sufficient cushioning beneath the membrane and therefore when the assembly is subjected to traffic, the membrane is subjected to higher point loading resulting in puncture.

D. **Mechanically Fastened Roofing Systems**

1. **Carlisle Fasteners and Fastening Plates are required for insulation securement**. Refer to Insulation Fastening Criteria Table in Paragraph 2.05, for appropriate fastener and deck penetration. The fastener can be used with either 2" diameter Sure-Seal Seam Fastening Plates or 3" diameter Sure-Seal Insulation Fastening plate.

2. **Any Carlisle approved insulation or cover board** shall be mechanically fastened to the roof deck at the minimum rate of **1.25 fasteners and plates per every 8 square feet** (5 fasteners in a 4 x 8 board) for minimum 1-1/2" thick insulation and coverboards. Insulation less than 1-1/2" thick requires the use of 8 fasteners and plates in a 4' x 8' board (1 per 4 square feet).

CAUTION: Carlisle Polyisocyanurate Insulation with a thickness less than 1.5" installed over an existing roofing membrane without a tear-off must be mechanically fastened to the roof deck with a minimum of **1 fastener and plate for every 4 square feet** or less of insulation.

3. Use of DensDeck, DensDeck Prime, DensDeck StormX Prime, DensDeck® ProFast™ Prime, Securock® Weather Defense™, and DEXcell® should be limited to assemblies with slopes greater than 2" per foot to ensure compliance with external fire codes, care shall be exercised to ensure polymer seam plates are fully seated.

3.05 Membrane Placement and Securement

A. **General**

1. **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 workday.

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

3. If aesthetics are of concern when Sure-White EPDM is to be used, protection should be specified to avoid discoloration of the white membrane surface resulting from adhesive residue or excess foot traffic.

1. Adjoining sheets of EPDM membrane are spliced together using SecurTAPE and Primer.

2. In addition to the primary membrane securement (Bonding for Adhered, Ballasting for Ballasted Systems and Fastening for Mechanically Fastened assemblies), additional membrane securement is required at the perimeter of each roof level, roof section, curb, skylight, interior wall, penthouse, etc., at any inside angle change where slope or combined slopes exceed 2" in one horizontal foot, and at other penetrations in accordance with the applicable Carlisle details. Refer to Paragraph G for additional membrane securement.

B. **Membrane Placement**

EPDM membrane with factory applied tape is available in various widths. Prior to unrolling sheets ensure the tape side is properly located so that seams are properly shingled down slope. (Pre-applied SecurTAPE should always be facing downwards once the sheet is unrolled).

1. **Position** EPDM membrane over the acceptable substrate without stretching. For mechanically fastened assemblies ensure proper number of perimeter sheets are properly positioned along the perimeter of the roof. And field sheets are positioned perpendicular to the steel deck flutes.

2. **Allow** the membrane to relax approximately 1/2 hour prior to splicing (Ballasted systems), bonding (Adhered Systems) or fastening (Mechanically Fastened).

3. **Place** adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width (2-1/2" or 5-1/2" depending on warranty duration). It is recommended all splices be shingled to avoid bucking of water.

C. **Membrane Securement / Bonding - Adhered Roofing Systems (90-8-30A, EPDM x-23 LVOC, Low-VOC Bonding Adhesive or Aqua Base 120)**

1. **Adhere** EPDM membrane to an acceptable substrate with Carlisle Bonding Adhesive. Comply with Labels, Safety Data Sheet (SDS) and Product Data Sheets for installation procedures and use. Contact type bonding adhesive must be applied to both the membrane and the surface to which it is being bonded.

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

3. **Fold** membrane sheet back so approximately half of the underside of the sheet is exposed. Sheet fold should be smooth without wrinkles or buckles.

4. **Stir** Bonding Adhesive thoroughly scraping the sides and the bottom of the can (minimum 5 minutes stirring is recommended). Bonding surfaces must be dry and clean.

CAUTION: If aesthetics are of concern when Sure-White EPDM membrane is used, protect the white surface next to the edges of the folded membrane sheet so Bonding Adhesive will not discolor the white surface. Do not place Bonding Adhesive containers or their lids directly on the white surface of the Sure-White EPDM membrane.

5. **Apply** Bonding Adhesive evenly, without globs or puddles, with a plastic core medium nap paint roller. A 9" roller will easily fit into the 5-gallon containers.

   Apply contact type bonding adhesive to both the membrane sheet and the substrate to achieve continuous coating of both surfaces at a coverage rate of approximately 120 square feet per gallon per one surface (membrane or substrate) or approximately 60 square feet per gallon per finished surface (includes coverage on both membrane and substrate). **Depending on adhesive used and the substrate type adhesive coverage rate will vary**. Refer to Product Data Sheets for the appropriate adhesive for the proper coverage rate.

   A mechanical roller dispenser or a mechanical sprayer can be used to apply Bonding Adhesive when the continuous coating and coverage rate noted above are maintained. When used, **the adhesive must be rolled after applying** with a plastic core medium nap paint roller to provide continuous coverage.

   CAUTION: Due to solvent flash-off, condensation may form on freshly applied Bonding Adhesive when the ambient temperature is near the dew point. If condensation develops, possible surface contamination may occur and the application of Bonding Adhesive must be discontinued. Allow the surface to dry and apply a thin freshener coat at the coverage rate, which is approximately half of the coverage rate stated above to the previously coated surface when conditions allow for continuing.

6. **Allow** adhesive to flash-off until it is tacky but will not string or transfer to a dry finger touch.

7. **Roll** the coated membrane into the coated substrate while avoiding wrinkles.

8. **Brush** down the bonded half of the membrane sheet, immediately after rolling the membrane sheet into the adhesive, **with a soft bristle push broom** to achieve maximum contact.

9. **Fold** back the unbonded half of the membrane sheet and repeat the bonding procedure.

D. **Membrane Securement – Self-Adhering Technology (SAT™) (Application Option 1)**
   1. Sure-Seal SAT™ membrane must be allowed to relax and expand reaching the required minimum sheet temperature prior to installing.
      i. Minimum temperature requirements for Sure-Seal SAT™ installation are based on substrate and fastening method as follows:20º (-6.7ºC) ambient and sheet temperature after relaxation for all approved substrates and fastening methods.
      ii. Use a temperature gun to ensure the membrane is 20º (6.7ºC) prior to installation.

   2. Prior to membrane placement, the surface of the insulation or underlayment board must be cleaned of dust and other foreign matter using a fine push broom or blower.

   3. **Unroll** membrane and allow to relax for 30 minutes.

   4. **Remove** the release liner on one-half of the sheet, starting from the split in the liner at the middle of the sheet. The liner should be removed at an angle to reduce splitting or tearing.

   5. **Pull** the membrane onto the substrate at an angle, avoiding wrinkles. When installing Sure-Seal SAT membrane, it is recommended to maintain a large curve (radius) on the leading edge of the membrane. This will help eliminate creases and bubbles that cannot be removed after the sheet is in place.

   6. **Broom** the membrane in place, starting from the middle of the 10'-wide sheet and working the outer edge.

   7. **Fold** back the remaining half of the sheet and repeat the above process.

   8. After brooming, roll the membrane with a segmented roller to ensure full contact with the substrate. Roller must weigh at least 50 lbs. (22 kg) per linear foot.

   9. To complete seam between two adjoining membrane panels, apply primer to the splice area in conjunction with Carlisle's Factory Applied Tape.

   10. **Strip-in** end laps with 6" Pressure-Sensitive Cured Cover Strip.

E. **Membrane Securement – Self-Adhering Technology (SAT™) (Application Option 2)**
   1. SAT™ membrane must be allowed to relax and expand reaching the required minimum sheet temperature prior to installing.

   2. Minimum temperature requirements for Sure-Seal SAT™ installation are based on substrate and fastening method as follows:

i. 20º (-6.7ºC) ambient and sheet temperature after relaxation for all approved substrates and fastening methods.
ii. Use a temperature gun to ensure the membrane is 20º (6.7ºC) prior to installation.

3. Prior to membrane placement, the surface of the insulation or underlayment board must be cleaned of dust and other foreign matter using a fine push broom or blower.

4. **Unroll** membrane and allow to relax for 30 minutes.

5. **Pull** both release liners off simultaneously from underneath the membrane at a low angle, similarly to removing the release film from splice tape.

6. **Push** a broom lengthwise down the middle of the sheet to tack it in place. Continue brooming to push air out from the middle of the sheet towards the edges.

7. After brooming, roll the membrane with a segmented roller to ensure full contact with the substrate. Roller must weigh at least 50 lbs. (22 kg) per linear foot.

8. To complete seam between two adjoining membrane panels, apply primer to the splice area in conjunction with Carlisle's Factory Applied Tape.

9. **Strip-in** end laps with 6" Pressure-Sensitive Cured Cover Strip.

F. **Membrane Securement / Bonding - Adhered Roofing Systems (CAV-GRIP III)**

1. **Adhere** EPDM membrane to an acceptable substrate with CAV-GRIP III Bonding Adhesive. Comply with Labels, Safety Data Sheet (SDS) and Product Data Sheets for installation procedures and use. Contact type bonding adhesive must be applied to both the membrane and the surface to which it is being bonded.

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

3. **Fold** membrane sheet back so approximately half of the underside of the sheet is exposed. Sheet fold should be smooth without wrinkles or buckles.

4. **Connect CAV-GRIP III Cylinder** with hose and spray gun. Bonding surfaces must be dry and clean.

CAUTION: If aesthetics are of concern when Sure-White EPDM membrane is used, protect the white surface next to the edges of the folded membrane sheet so Bonding Adhesive will not discolor the white surface. Do not place CAV-GRIP III Cylinders directly on the white surface of the Sure-White EPDM membrane.

5. **Spray apply CAV-GRIP III** Bonding Adhesive evenly to both the membrane and substrate with a minimum 2" overlap to ensure 100% coverage. Avoid heavy areas or puddles that can skin over, trap solvent and create a blister. Refer to Product Data Sheets for the proper coverage rate.

CAUTION: Solvent flash-off can lower surface temperature below the dew point causing moisture to form on the adhesive. Slide your hand across the flashed-off adhesive on the insulation or cover board to ensure moisture has evaporated and the adhesive surface is dry and tacky prior to installing the membrane.

6. **Allow** adhesive to flash-off, especially the heavy areas of adhesive, until it is tacky but will not string or transfer to a dry finger touch.

7. **Roll** the coated membrane into the coated substrate while avoiding wrinkles.

8. **Brush** down the bonded half of the membrane sheet, immediately after rolling the membrane sheet into the adhesive, **with a soft bristle push broom**.

9. **Roll the membrane with a 150 lb weighted segmented steel roller after brooming to achieve maximum contact.**

10. **Fold** back the unbonded half of the membrane sheet and repeat the bonding procedure.

G. **Membrane Securement / Ballasting - Ballasted Roofing Systems**

1. Ballasting - General

a. Use of temporary ballast to prevent wind uplift is the responsibility of the Carlisle Authorized Roofing Applicator. For immediate protection against wind uplift, Carlisle requires ballast to be installed as each section of the installation is completed.

b. When using polystyrene insulation directly beneath the membrane, ballast must be applied immediately after membrane installation to prevent potential damage to polystyrene insulation products from excessive heat.

c. Care must be exercised during application of gravel or pavers. Heavily traveled areas during ballast installation must be protected by placing temporary protection courses to prevent possible damage to the EPDM deck membrane and insulation.

2. Ballast Types/Coverage Rates

a. The coverage rates listed in this section are considered minimum and are required by Carlisle for issuance of the standard Carlisle warranty. Depending on specific project conditions (building height, parapet height and project location), additional ballast may be necessary to provide wind uplift protection. Refer to “Attachment I” at the end of this section for suitable ballast types and coverage rates. **Comply with the specifier's requirements when an additional ballast coverage rate is specified.**

b. **Rounded Water-Worn Gravel** must be applied over the EPDM membrane at the minimum rate of **1000 pounds per square** and must be evenly distributed to maintain an average of 10 pounds per square foot.

ASTM D 7765 SIZE NUMBER	MINIMUM COVERAGE RATE (pounds per square)	AVERAGE COVERAGE RATE (lbs./sq. ft. continuously distributed)
4 (1-1/2" nominal diameter)	1000	10
3 (2" nominal diameter)	1000	10
2 (2-1/2" nominal diameter)	1300	13
1 (3-1/2" nominal diameter)	1300	13

Notes: In the field of the roof, some bare spots resulting from installation are permitted; however, they must not exceed 64 square inches and must be limited to no more than 2 per square (100 square feet). No bare spots are permitted in the perimeter area of the roof that is 10' wide.

c. **Crushed Stone** must be applied in conjunction with Sure-Seal HP Protective Mat placed over the EPDM membrane. The crushed stone must be applied at the minimum rate of **1000 pounds per square** and must be evenly distributed to maintain an average of 10 pounds per square foot.

d. **Smooth Surfaced Individual Concrete Pavers** or **Lightweight Interlocking Concrete Pavers**

1) Lightweight interlocking pavers and individual concrete pavers with a surface other than steel troweled finish must be installed over Sure-Seal HP Protective Mat. Contact Carlisle for verification of acceptable pavers.

2) **Individual Concrete Pavers,** when specified, must be installed loose laid and butted with no gaps greater than 1/2".

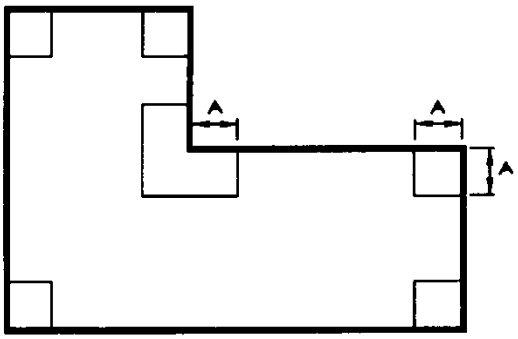
Note: Do not install pavers heavier than 100 pounds per unit unless approved in writing by Carlisle.

3) **Lightweight Interlocking Concrete Pavers**, when specified, must be installed in accordance with the respective manufacturer's specification and as approved by Carlisle prior to installation.

3. Ballast Criteria for Up to 20 Year Extended Warranty

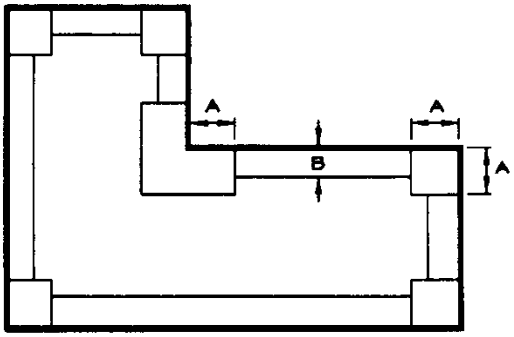
a. Refer to installations below for calculating corner/perimeter areas for the noted warranty wind speeds available.

Ballast Requirements for 72 mph Warranty



A (Corners) = .4 Times the Building Height (10' minimum)

Ballast Requirements for 80 mph Warranty



A (Corners) = .4 Times the Building Height (10' minimum)
B (Perimeters) = 10'

b. At corner and/or perimeter areas, ballast shall be 2-1/2" nominal rounded water worn gravel conforming to gradation #1 or #2 in accordance with ASTM -D7765 method of sizing. Coverage rate shall be a minimum of 13 pounds per square foot.

c. In field areas, ballast shall be 1-1/2" nominal rounded water worn gravel conforming to gradation #4 in accordance with ASTM-D7765 method of sizing. Coverage rate shall be a minimum of 10 pounds per square foot.

4. Placement of Sure-Seal HP Protective Mat

a. When specified or required by Carlisle, position Sure-Seal HP Protective Mat loosely over the membrane with all edges overlapped a minimum of 6".

b. Extend the mat a minimum of 2" above the anticipated ballast level at the perimeter and around penetrations except for roof drains and scuppers.

c. The mat must extend to drain bases, scupper openings and the base of Dutch gutters **but must not restrict drainage**.

d. Additional matting must be installed around penetrations to prevent direct contact between crushed stone or pavers and flashing.

Note: Following the placement of the HP Protective Mat, it is necessary to install the ballast or temporary ballast to prevent the movement or displacement of unballasted fabric.

H. **Membrane Securement / Mechanically Fastened Roofing Systems (Fastening)**

1. EPDM membrane shall be mechanically attached to the structural deck with specified Carlisle Fasteners and designated Plates or Bars, for fastening densities and numbers of perimeter sheets refer to Warranty Tables, Paragraph 1.05.

2. Membrane Fastening Selection Table

Membrane Fastener Selection

Deck Type	Carlisle Fasteners*	Carlisle Plate
Steel or Lightweight Insulating Concrete over Steel	HP	HP Polymer or Seam Fastening Plates**
	HP-Xtra	HP-Xtra Polymer
Structural Concrete, rated 3,000 psi or greater	CD-10	HP Polymer or Seam Fastening Plates
	HD 14-10	HP Polymer or Seam Fastening Plates
Wood Plank, min. 15/32" thick Plywood or min. 7/16" OSB	HP	HP Polymer or Seam Fastening Plates
Cementitious Wood Fiber	Polymer Gyptec	Gyptec Plates – 2" Dia.
Gypsum	Polymer Gyptec	Gyptec Plates – 2" Dia.

Refer to Warranty Tables in Paragraph 1.05 for fastening densities and number of perimeter sheets.
*Determine proper fastener length for deck penetration, refer to Table 2.05B.
**Seam Fastening Plates for Base of Wall Angle Change Only

3. On steel decks, membrane shall be positioned with seams perpendicular to the steel deck flutes. This allows the external forces on the roof assembly to be distributed between multiple steel deck panels. Refer to Design Reference **DR-06 "Withdrawal Resistance Criteria"** in the Carlisle Technical Manual.

4. When mechanical securement is not provided in some of the Carlisle Universal Details (i.e., pipes and pourable sealer pockets), additional Seam Fastening Plates must be used for membrane securement. The plates must be positioned a maximum of 12" away from the penetration, spaced a maximum of 12" on center and flashed in accordance with the applicable Carlisle Detail.

5. **Perimeter Sheets**

The number of perimeter sheets and fastener spacing is dependent on the building height, wind zone location and warranty duration as outlined in Warranty Tables in Paragraph 1.05.

The roof perimeter is defined as all edges of each roof section (i.e., parapets, building expansion joints at adjoining walls, penthouse walls, etc.). When multi-level roofs meet at a common wall, the adjacent edge of the upper roof is treated as a roof perimeter if the difference in height is greater than 10'. Perimeter sheets are not required at the base of the wall at the lower level.

Note: Expansion joints, control joints and fire walls in the field of the roof or roof ridges with slopes less than 3" to the horizontal foot are not considered as part of the roof perimeter.

Perimeter sheets can be formed by using individual 5', 6.5' wide sheets or by sub-dividing 8' or 10' wide field sheet using 9" Pressure-Sensitive RUSS strip or row of seam fastening plates as described below.

a. **Individual perimeter sheets (5', 6.5')**

Position membrane along the perimeter of the roof over the acceptable insulation/underlayment. The perimeter membrane width from line of securement to line of securement should be approximately 4.5' – 6.0' wide depending on perimeter sheet size.

b. **RUSS (Reinforced Universal Securement Strip) Method**

1) When **field sheets are positioned parallel to a roof perimeter, 9" wide Pressure-Sensitive RUSS** shall be placed approximately down the center of the 8' or 10' wide field membrane sheets. When a RUSS divides a field sheet in half, two perimeter sheets are created.

2) When a 8' or 10' wide reinforced **EPDM membrane sheet extends perpendicular to the edge of the roof**, install **9" wide Pressure-Sensitive RUSS** beneath the EPDM membrane sheet approximately of 3'-6"' for the 8' field sheet to approximately of 4' -0" for the 10' field sheet from the edge of the roof. When multiple perimeter sheets are required, additional RUSS may be positioned approximately 3'-6" to 4'-0" from the previous RUSS to create additional perimeter sheets.

CAUTION: 6" wide Pressure-Sensitive RUSS is only available with 3" wide SecurTAPE on one side and therefore cannot be used to form perimeter sheets.

3) Refer to Applicable Carlisle Details for installation.

c. **Fastening Plates Method (When Option a and b are not feasible)**

When field sheets extend to the edge of the roof, approved fastening plates can be installed through the reinforced membrane 3'-6" to 4'-6" from the roof edge which will be flashed with 6" wide Pressure-Sensitive Cured Cover Strip. When field sheets are positioned parallel to the roof edge, fastening through the membrane along the centerline creates two perimeter sheets. When multiple perimeter sheets are required, additional fastening plates shall be positioned 3'-6" to 4'-6" from the previously installed fastening plates. Refer to applicable Carlisle Details for installation.

d. **Building with Special Conditions:**

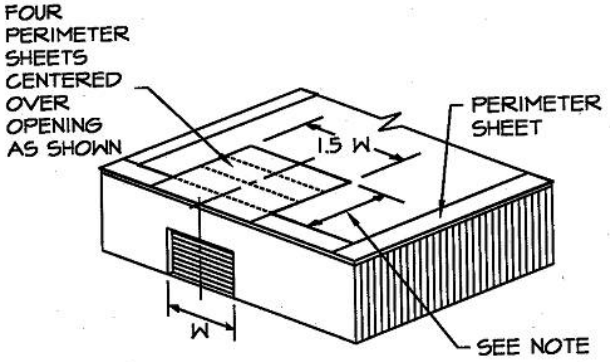
Air pressurized buildings, canopies and buildings with large openings where the total wall openings exceed 10% of the total wall area on which the openings are located (such as airport hangars, warehouses and large maintenance facilities) will typically require additional perimeter membrane securement, an increased fastening density or other enhancement.

e. **Buildings with large openings**

When any wall contains major openings with a combined area which exceeds 10% of the total wall area on which the openings are located, either four 5' or 6.5' wide or two 10' wide reinforced EPDM membrane sheets (centered over the opening) must be specified as shown.

1) 9" wide Pressure-Sensitive RUSS (Reinforced Universal Securement Strip) shall be specified in conjunction with the 8' or 10' wide membrane sheets.

2) The 9" wide Pressure-Sensitive RUSS is to be positioned beneath the 8' or 10' wide membrane sheet along the centerline and shall be secured with Polymer Seam Plates (required for steel decks) or Seam Fastening Plates. All fasteners and plates shall be spaced at the rate required at the roof perimeter as shown on the membrane securement charts on the previous pages.



3) As an option to the above perimeter securement, an adhered membrane section may be used in lieu of the mechanically fastened membrane at large openings in accordance with the Carlisle Specification for the Sure-Seal/Sure-White Adhered Roofing System.

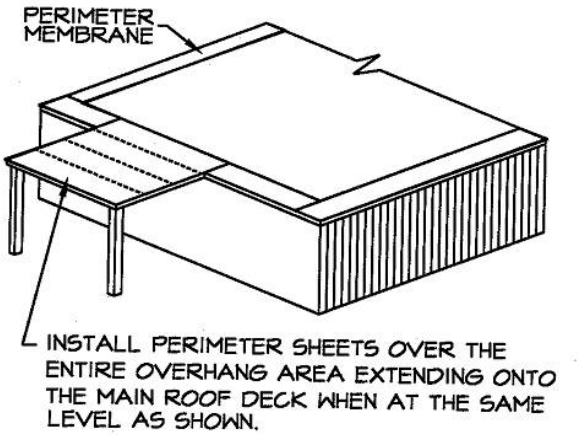
NOTE: Depth of perimeter area, noted above, shall not be less than 2.5 times the width of the opening.

f. **Buildings with overhangs**

The membrane must be specified with securement 3-1/2' to 4-1/2' over the entire overhang area extending onto the main roof deck a minimum of 3-1/2' when at the same level.

1) This can be achieved utilizing 8' or 10' wide membrane sheets in conjunction with 9" wide Pressure-Sensitive RUSS as described above.

2) As an option, an adhered membrane section may be used in lieu of the mechanically fastened membrane at building overhangs in accordance with the Carlisle Specification for the Sure-Seal/Sure-White Adhered Roofing System.



6. **Field Membranes**

a. **Position** field membrane sheets adjacent to perimeter membrane to allow a minimum 6" overlap, 3" from the center of the plate or bar in front and back.

Note: For 20-year warranty projects with a roof slope less than 1/4" in 12" (minimum 1/8" slope required) or when splices buck water, strip in seams with a 6" Pressure Sensitive Overlayment or Cured Cover Strip.

b. **Secure the field and perimeter membrane sheets** along the pre-printed blue line approximately 3" from the edge of the membrane sheet at the approved fastening density with the required Carlisle Fastener and Carlisle Seam Plates or Bars. Refer to "Membrane Fastener Selection" Table in Paragraph 3.05 for further information.

Correct fastener placement must conform to the following:

1) The **minimum** distance between the bottom membrane edge and the nearest edge of the fastening plate or bar must be **2"**.

2) The **minimum** distance between the overlapping membrane edge and the nearest edge of the fastening plate or bar must be **2"**.

c. On new construction projects, where direct application of the membrane is specified over HP Protection Mat over lightweight insulating concrete, standard 2" diameter Seam Fastening Plates must be used since the Polymer Seam Plates will not properly seat.

d. **Position** adjoining membrane sheets to allow a minimum overlap of 6" where Fastening Plates are located (along length of the membrane); at the same time overlap end roll sections (width of the membrane) a minimum of 3", for Projects with a maximum 15 Year Warranty. For 20 Year Warranties, end roll sections should be overlapped 6" with 6" SecurTAPE.

e. Work shall progress across the roof with a minimum 6" overlap provided at the previously secured sheet edge. The opposite length of the sheet must be secured with approved Fastening Plates or bars and overlapped accordingly.

I. **Membrane Splicing**

1. **General**

a. **Sure-Seal/Sure-White - Adhered or Ballasted Roofing Systems**

1) **Projects with 10-, 15-, 20- and 25-year warranties**

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

Splice Intersections: 'T'-Joints are to be flashed with a bead of lap sealant and 6"x6" minimum (black) or 7"x9" (white) Pressure-Sensitive 'T'-Joint Cover, (for membranes of maximum thickness of 75 mil). (**Detail U-2A**)**.** **For membranes of thickness of 90 mil**, Apply a second layer of 12"x12" Pressure-Sensitive 'T'-Joint Cover centered over 6"x6" 'T'-Joint Cover. (**Detail U-2A.1**)

Note: In lieu of the 6"x6" or 12"x12" Pressure-Sensitive 'T'-Joint cover, a 6"x6" or 12"x12" section of Pressure-Sensitive Elastoform flashing may be used as a 'T'-Joint cover. Pressure-Sensitive Elastoform flashing is available in rolls of 6", 9" and 12".

2) **Projects with 30-year warranties**

OPTION 1:

Side Laps / End Laps: Tape splices may be a minimum **3" wide Factory-Applied Tape (FAT) OR 3" wide Field-Applied SecurTAPE**. In addition the entire field splice must be overlaid with a continuous 6" wide Pressure Sensitive Overlayment Strip. **(See Detail U-2A).**

Splice Intersections: Overlay the entire field splice with a continuous 6" wide Pressure-Sensitive Overlayment Strip. Apply Lap Sealant at all Intersections between Pressure-Sensitive Overlayment Strip. (See **Detail U-2A.1**).

OPTION 2:

Side Laps / End Laps: Tape splices may be a minimum of 5-1/2" wide using **6" wide Factory-Applied Tape (FAT) OR 6" wide Field-Applied SecurTAPE**. **(Detail U-2A.1).**

Splice Intersections: 'T'-Joints are to be flashed with a bead of lap sealant and 6"x6" minimum Pressure-Sensitive 'T'-Joint Cover. Apply a second layer of 12"x12" Pressure-Sensitive 'T'-Joint Cover centered over 6" x 6" 'T'-Joint Cover. (**Detail U-2A.1).**

Note: Pressure Sensitive Elastoform flashing is available only in rolls of 6", 9" or 12" rolls. Material used for Overlayment shall be cut from the appropriate roll.

b. **Sure-Tough (reinforced) Mechanically Fastened Roofing Systems**

1) **Projects with 10-, 15-, 20- and 25-year Warranties**

Side Laps: Regardless of Warranty duration, where fastening plates are placed, shall be spliced using **6" wide Factory-Applied Tape (FAT) OR 6" wide Field-Applied SecurTAPE**. The splice tape shall be centered over the plates to extend approximately 2" on each side. SecurTAPE must extend approximately 1/8" beyond the edge of the overlapping membrane. **(Detail MF-2A).**

End Laps: Shall be spliced using either **3" wide SecurTAPE** resulting in a minimum splice of 2-1/2" wide for a maximum of 20-year warranties. **(Detail MF-2B).**

Splice Intersections: 'T'-Joints are to be flashed with a bead of lap sealant and 6"x6" pressure sensitive 'T'-Joint Cover, (for membranes of maximum thickness of 75 mil). **(Detail MF-2A)**.

2) **Projects with 30-year Warranties**

Side Laps: Where fastening plates are placed, shall be spliced using **6" wide Factory-Applied Tape (FAT) OR 6" wide Field-Applied SecurTAPE**. The splice tape shall be centered over the plates to extend approximately 2" on each side. SecurTAPE must extend approximately 1/8" beyond the edge of the overlapping membrane. **(Detail MF-2D).**

End Laps: Shall be spliced using **6" wide Factory-Applied Tape (FAT) OR 6" wide Field-Applied SecurTAPE** resulting in a minimum splice of 5-1/2" wide for a maximum of 30-year warranties. **(Detail MF-2B.1).**

Splice Intersections: 'T'-Joints are to be flashed with a bead of lap sealant and 6"x6" Pressure Sensitive 'T'-Joint Cover. Apply a second layer of 12"x12" Pressure Sensitive 'T'-Joint Cover centered over 6" x 6" 'T'-Joint Cover. **(Detail MF-2D).**

2. For Splicing procedures, cautions and warnings refer to **Spec Supplement E-02 "EPDM Membrane Splicing and Splice Repairs"** for information.

J. **Additional Membrane Securement**

Securement must be provided at the perimeter of each roof level, roof section, expansion joint, curb flashing, skylight, interior wall, penthouse, etc., at any inside angle change where slope exceeds 2" in one horizontal foot, **and at other penetrations** in accordance with Carlisle's details and securement options as listed below.

Securement may be achieved as follows:

1. **Pressure-Sensitive RUSS (Reinforced Universal Securement Strip)**

Pressure-Sensitive RUSS is a 6" wide strip of reinforced EPDM membrane with factory-applied 3" wide SecurTAPE and is installed in conjunction with Sure-Seal Fasteners and 2" diameter Seam Fastening Plates spaced a maximum of 12" on center below the EPDM deck membrane (Polymer Seam Plates or Polymer Batten Strips are required for Mechanically Fastened Roofing Systems over steel decks). The securement strip can be fastened horizontally to the structural deck or vertically at walls and curbs.

a. Loose lay the 6" wide Pressure-Sensitive RUSS along parapet walls 6" to 9" from corners and fasten with Seam

Fastening Plates and the appropriate Carlisle fastener to the roof deck or into the parapet wall. Spacing of the Seam Fastening Plates shall be a maximum of 12" on center for up to 20-year warranties (less than 90 mph warranty wind speed) and a maximum of 6" on center for 25- and 30-year warranties.

1) For horizontal attachment, the reinforced strip must be positioned a minimum of 1/8" to a maximum of 6" away from the angle change with pressure sensitive side facing away from the parapet and towards the roof plane.

2) For vertical attachment, the reinforced strip must be attached to the vertical wall with pressure sensitive side extending onto the roof surface.

CAUTION: Horizontal RUSS attachment is required when insulation is attached with adhesives to a vapor barrier or an existing asphalt based roof. For various options, Refer to **Spec Supplement G-08 "Application Procedures for Carlisle's VapAir Seal 725TR Air and Vapor Barrier".**

b. Adjoining sections of the reinforced strip need not be overlapped; however, gaps between adjoining sections must not exceed 1".

CAUTION: When RUSS is used for membrane securement along metal edgings, refer to the appropriate detail for applicable installation criteria. For some metal edge details, adjoining sections of the reinforced strip must be overlapped and spliced.

c. **When using Pressure-Sensitive RUSS, clean the underside of the membrane with Carlisle Primer** and allow proper flash-off prior to removing the release film from the RUSS.

CAUTION: On Adhered Systems discontinue bonding adhesive application on the underside of the membrane in area of the sheet where contact with the Pressure-Sensitive RUSS is to occur. Contact between Pressure-Sensitive RUSS and membrane coated with bonding adhesive can result in poor peel and shear values.

2. **Seam Fastening Plates**

When the use of Pressure-Sensitive RUSS is not feasible (at smaller curbs or skylights), a 2" diameter Seam Fastening Plates may be used.

a. Seam Fastening Plates may be installed horizontally into the structural deck or into walls or curbs.

b. Securement of the EPDM membrane with the approved Carlisle Fasteners and Seam Fastening Plates must be a maximum of 12" on center starting 6" minimum to 9" maximum from inside and outside corners.

c. If horizontal wood nailers are provided, secure the Seam Fastening Plates to the wood nailer with Carlisle HP Fasteners. Nails (i.e. ringshank, roofing, etc.) are not acceptable for securement.

d. After securing the Seam Fastening Plates, flash in accordance with the appropriate Carlisle Detail.

3.06 Flashings

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

A. **General Considerations**

1. All vertical field splices at the base of a wall or curb must be overlaid with Pressure-Sensitive "T" Joint Covers, a 6" x 6" section (with rounded corners) of Sure-Seal/Sure-White Pressure-Sensitive Uncured Elastoform Flashing centered over the field splice.

2. **Pressure-Sensitive 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 Seals, cured EPDM membrane or Pressure-Sensitive Cured Cover Strip or Overlayment Strip is not practical

N**ote:** When using Pressure-Sensitive products in colder temperatures, use a heat gun to warm the product. Apply heat to the EPDM flashing side of the product. Do not apply heat directly to the preapplied adhesive. The Pressure-Sensitive Flashing must be applied immediately after Primer flashes off. Refer to "Membrane Splicing with SecurTAPE" for application procedures in colder temperatures.

3. When using **Pressure-Sensitive Cured Cover Strip or Overlayment Strip** to overlay Seam Fastening Plates or metal edging, etc., **Sure-Seal HP-250 or LOW-VOC Primer** must be used to clean the membrane and metal flanges.

4. Special requirements may apply for certain flashing details for projects with extended warranty durations. Refer to Carlisle published details for applicable requirements when warranty coverage exceeds beyond 20 years.

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

1. Use continuous deck membrane with Pressure-Sensitive RUSS or Seam Fastening Plates along the angle change.

a. When using Pressure-Sensitive RUSS, refer to Paragraph 3.05 G, Additional Membrane Securement, for attachment criteria.

b. When Seam Fastening Plates are used to secure continuous deck membrane, use minimum 6" wide Pressure-Sensitive Cured Cover Strip or Overlayment Strip to overlay fasteners and plates.

2. When the use of continuous deck membrane for wall flashing is not feasible, a separate piece of cured EPDM membrane may be used.

NOTE: 60-mil cured non reinforced membrane may be used as a separate wall flashing with projects of warranty 20 years or greater. The flashing may also incorporate membrane equal of thickness to that of the EPDM membrane at the deck level.

3. Adhere flashing to the wall and terminate in accordance with the applicable Carlisle Detail.

4. Use a “T” Joint Cover or 6" x 6" Pressure-Sensitive Elastoform Flashing with rounded corners to overlay vertical splices as shown on the applicable Carlisle Detail.

5. Refer to applicable Carlisle Details for various corner flashing options.

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

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

3.07 Roof Walkways

Walkways are to be installed at all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders, etc.), other locations designated by specifier, and if regular maintenance (once a month or more) is necessary to service rooftop equipment. Refer to **Spec Supplement G-06 “Roof Walkway Installations”.**

3.08 Daily Seal

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

3.09 Optional Color Coating

1. **If optional color coating is specified, Carlisle's final inspection for warranty must be conducted prior to the coating application.** This will permit the completion of any “Repair for Warranty” items without consideration for the removal and reapplication of the coating. The owner will then verify that the coating was applied after receiving the warranty.

2. If **Sure-Seal X-Tenda Coat** is specified to color the membrane surface, refer to the Carlisle X-Tenda Coat Specification for installation requirements.

3.10 Clean Up

For Daily tie-off or cleaning procedures refer to **Spec Supplement G-07 “Daily Seal / Clean Up”** in the Carlisle Technical Manual.

1. **General**

   a. Termination bars and surface mounted reglets must be installed directly to the wall surface.

   b. Carlisle recommends SecurEdge Metal Edging/Coping, Sure-Seal Termination Bar or Sure-Seal Drip Edge for membrane termination. Installation instruction sheets for Carlisle supplied accessories are available from Carlisle.

      Note: Refer to Warranty Tables in Section 1.05 for specific metal edge requirements for projects with Total System Warranties or those with extended peak gust wind speed coverage greater than 80 miles per hour.

   c. Metal work by others, when specified, must be fastened to prevent the metal from pulling free or buckling and sealed to prevent moisture from entering the roofing system or building. **Unless supplied by Carlisle, metal work securement is not included in this specification and is excluded from the Carlisle warranty.**

   d. **On retrofit projects**, existing counter flashing, edging, expansion joint covers, copings, etc., shall not be reused unless investigated by the specifier to determine its compliance to Carlisle's current details.

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Carlisle, CAV-GRIP, Elastoform Flashing, Flexible FAST Adhesive, FAT and Factory Applied Tape, FleeceBACK, HPX Fasteners, InsulBase, InsulFast, LIQUISEAL, Piranha Plate, Pre-Kleened, SAT/Self Adhering Technology, SecurEdge, Securfast, SecurShield, SecurTAPE, StormBase, Sure-Seal, Sure-Tough, Sure-White, VapAir Seal, ThermaThin 7 and X-Tenda Coat are Trademarks of Carlisle Construction Materials Incorporated

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This specification represents the applicable information available at the time of its publication. Owners, specifiers and Carlisle authorized roofing applicators should consult Carlisle or their Carlisle Manufacturer's Representative for any information that has subsequently been made available. Review the appropriate Carlisle warranty for specific warranty coverage, terms, conditions and limitations.

Specification
ATTACHMENT

Sure-Seal® Design "B" Loose-Laid Ballasted Roofing Systems
"Attachment I"
Ballast Criteria

July 2026

A. General

The specifier must evaluate the various conditions by which the ballast requirements are dictated. Building height, parapet height and project wind zone are major factors when specifying a minimum ballast requirement. The guidelines for ballast requirements which have been published by the following organizations should be referenced:

1. American National Standards Institute, ANSI/SPRI RP-4 (current edition) Wind Design Guide for Ballasted Single-Ply Roofing Systems. This standard is referenced in the current edition of the International Building Code (IBC).

2. Factory Mutual (FM) Research Corporation Loss Prevention Data Sheets 1-28 and 1-29.

B. Ballast Types/Coverage Rates

The coverage rates listed below are considered minimum and are required by Carlisle for the issuance of the Carlisle warranty. Additional ballast coverage rates may be specified to provide additional wind uplift resistance.

1. **Rounded Water-Worn Gravel** may be placed directly on the EPDM membrane without additional membrane protection.

    a. Minimum acceptable gradation:

        1) Nominal 1-1/2" rounded water worn gravel which conforms to the following gradation: 50% retained by a 3/4" screen, 95% retained by a 1/2" screen and 98% retained by a 1/4" screen. Use ASTM C136 method for sizing gravel.

        2) Alternately, #4, #3 and #24 stone (sized in accordance with ASTM D7765 method of sizing) may be used in lieu of the stone listed above.

        3) Coverage rate shall be no less than 1000 pounds per 100 square feet and ballast must be evenly distributed to maintain an average of 10 pounds per square foot.

    b. Nominal 2-1/2" rounded water worn gravel which conforms to gradation #1 or #2 when sized in accordance with ASTM D7765 method of sizing. Coverage rate shall be no less than 1300 pounds per 100 square feet and gravel must be evenly distributed to maintain an average of 13 pounds per square foot.

2. **Standard sizes of coarse aggregate** - Based on ASTM D7655

Size Number	1	2	3	4
Nominal Size Square Openings	3-1/2" to 1-1/2"	2-1/2" to 1-1/2"	2" to 1"	1-1/2" to 3/4"
Amounts Passing Each Lab Sieve (Square Opening), Percent (%)				
4"	100			
3-1/2"	90 to 100			
3"		100		
2-1/2"	25 to 60	90 to 100	100	
2"		35 to 70	90 to 100	100
1-1/2"	0 to 15	0 to 15	0 to 15	90 to 100
1"				20 to 55
3/4"	0 to 5	0 to 5		0 to 15
1/2"			0 to 5	
3/8"				0 to 5

3. **Crushed Stone**, when specified, shall conform to the gradations approved for rounded water-worn gravel and must be installed in conjunction with Sure-Seal HP Protective Mat.

   a. HP Protective Mat must extend a minimum of 2" above the crushed stone at the perimeter and penetrations, but must be discontinued at scuppers, Dutch gutters and at drain bases.

   b. A minimum 6" overlap between adjacent sheets of HP Protective Mat must be specified.

4. **Individual Concrete Pavers**

   a. Individual pavers with a minimum weight of 18 pounds per square foot may be substituted for nominal 1-1/2" stone. Individual pavers with a minimum weight of 22 pounds per square foot may be substituted for nominal 2-1/2" stone.

   b. Individual pavers must be a maximum of two feet square. Unless otherwise required by Carlisle, pavers must weigh no more than 100 pounds per unit to allow for easy removal and replacement.

   c. Individual pavers with a surface other than a steel troweled finish as approved by Carlisle, must be installed over Sure-Seal HP Protective Mat and must be accepted by Carlisle prior to installation.

      Elevating pavers should increase life expectancy, reduce freeze/thaw effects and promote more positive drainage. Acceptable pedestals can be specified under corners of pavers to elevate paver.

   d. Individual concrete pavers shall be loose laid and butted together with no gaps greater than 1/2".

5. **Lightweight Interlocking Concrete Pavers**

   a. Depending on the type of lightweight interlocking system, Sure-Seal HP Protective Mat or manufacturer's recommended matting may be required by Carlisle as a protection layer for the membrane. **Carlisle must be consulted prior to installation concerning protective matting requirements.**

   b. Lightweight interlocking pavers (minimum 10 pounds per square foot) may be substituted for nominal 1-1/2" stone or nominal 2-1/2" stone.

   c. When lightweight interlocking pavers are specified, the respective paver manufacturer must be consulted concerning installation criteria.

   CAUTION: The securement method suggested by the respective interlocking paver manufacturer must be reviewed by Carlisle to determine membrane accessibility. If access to the membrane system is impaired by the paver interlocking mechanism (mechanical clips, strapping, adhesive, etc.), the building owner must assume the responsibility of providing access to the membrane for the purpose of investigation and warranty related repairs.

   d. Lightweight Ballast Paver – 2’ x 2’ x 1.25” weighing 15 lbs/sq. ft.

1. **Walkways**

CAUTION: Molded Walkway pads not recommended within 10 feet of the perimeter of the roof on ballasted systems to avoid discontinuation of the primary membrane securement (ballast). In lieu of molded walkway pads, concrete pavers can be used when walkway is to be extended into the perimeter area.

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

b. **Carlisle Sure-Seal Interlocking Rubber Pavers**: A 2' x 2' x 2" thick rubber paver weighing approximately 24 pounds per unit, 6 pounds per square foot manufactured from recycled rubber, which provides a resilient, shock absorbing, weather resistant surface. Designed primarily for use as a walkway or on terrace areas offering a environmentally sound design. Paver features bi-directional drainage and freeze/thaw stability. The Sure-Seal Rubber Paver can be installed directly over the EPDM membrane without a separation layer.

c. **Hanover Pedestal Paver** – Used for light traffic areas associated with rooftop or garden roof applications. 2'x2'x2.25" thick precast concrete pavers weighing 22 psf with an elevated clearance of 1/2" from incorporated footing. The pedestal paver can either be installed in conjunction with a separation layer of HP Protective Mat or using Pedestal and shims.

Note: EPDM Pedestal and Leveling Shims – A 3/8" fixed height EPDM rubber pedestal incorporating 1/8" spacer tabs. The pedestal allows pavers to follow the contour of the roof and may be combined with 1/8" or 1/16" leveling shims to prevent paver movement and provide a more stable feel. Both Hanover Pavers and leveling shims are available from Carlisle. (Refer to product section **Spec Supplement P-01 "Related Products"**.)

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

e. **Other Walkway Considerations:**

Smooth concrete pavers when specified in conjunction with insulation that is mechanically fastened, must be loose laid over a slip sheet of membrane or 2 layers of HP Protective Mat. When insulation is attached with Flexible FAST Adhesive, concrete pavers may be placed over one layer of HP Protective Mat. Pavers cannot weigh more than 100 pounds per paver for ease of removal.

1. Walkways are considered a maintenance item and are excluded from the Carlisle warranty.

2. Window washing equipment will require special maintenance. Runways or window washing tracks must be utilized to prevent damage to membrane or insulation. Such details must be reviewed by Carlisle to determine reasonable access to the membrane and associated insulation/underlayment components.

END OF SECTION

Specification
ATTACHMENT

Sure-Seal®/Sure-White®/Sure-Tough™ EPDM Roofing Systems
Adhered, Ballasted and Mechanically Fastened

"Attachment II"
25/30 Year Warranty
Design Enhancements

July 2026

Information contained in this Attachment outlines necessary enhancements required for projects where a 25 or 30-year Warranty is specified. At the applicator's or specifier's discretion, projects may be forwarded to Carlisle for warranty review prior to installation or bid.

Section **Page**

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Reinforced Membrane Criteria and Hail Coverage Table 72
C. Adhered System Design Criteria 72
D. Mechanically Fastened System Design Criteria 80
E. Ballasted System Design Criteria 82
F. Roof Deck Criteria 84
G. Flashing/Terminations 84

A. General

1. All products specified for these roofing assemblies must be products manufactured or marketed by Carlisle.
2. On retrofit projects, all existing roofing material shall be totally removed.
3. All projects, a final shop drawing shall be approved by Carlisle prior to installation. Shop drawings must include all pertaining details. As-Built projects are not recommended.
4. The roof assembly will vary based on warranty wind speed and hail coverage. As identified in Warranty Tables, included in this attachment.
5. An air/vapor barrier shall be used when required and must be sealed around perimeter and roof penetrations. When not specified, the roof membrane shall be adhered over perimeter wood nailer along edges to prevent air infiltration along edging, regardless of assembly type (Ballasted, Adhered and Mechanically Fastened).
6. Due to warranty length, covered in this attachment, special consideration should be given to the total R-Value of the roof assembly. Utilizing the International Energy Conservation Code (IECC) to determine the minimum level of insulation for the building project's location is recommended.
7. To optimize energy efficiency, insulation shall be installed in multiple layers with joints staggered.
8. For limitations and specific types of insulation/underlayments refer to "Section E Insulation/Underlayments"
9. 1/4" per horizontal foot slope is preferred; however, 1/8" slope with sufficient number of drains and crickets / saddles may be accepted. Assemblies described in this attachment are governed by the maximum slope limit described in the current Carlisle publication.
10. Refer to **Spec Supplement E-02 "EPDM Membrane Splicing and Splice Repairs"** and applicable Carlisle Details for additional design enhancements.

B. Membrane Criteria

1. **Adhered Roofing Systems**, the roofing membrane shall be a minimum of **60-mil thick Sure-Seal/Sure-White Non-Reinforced Membrane** utilizing enhanced details for **25 Year Warranty** Duration

   OR

   90-mil Sure-Seal Non-Reinforced Membrane OR 75-mil thick Sure-Tough Reinforced Membrane utilizing enhanced details for **30 Year Warranty** Duration.

2. **Ballasted Roofing Systems**, the roofing membrane shall be a minimum of **60-mil thick Sure-Seal Non-Reinforced Membrane** utilizing enhanced details for **30 Year Warranty** Duration

   OR

   90-mil thick Sure-Seal Non-Reinforced Membrane utilizing enhanced details for **30 Year Warranty** Duration. Maximum membrane width, not to exceed 10' wide.

3. **Mechanically Fastened Roofing Systems**, the roofing membrane shall be a minimum of **75-mil thick Sure-Tough Reinforced Membrane** utilizing enhanced details for 25- or 30-Year Warranty Duration.

4. **Non-Reinforced Membrane Criteria and Hail Coverage**

<table>
<tr><th rowspan="4">Years</th><th colspan="4">Sure-Seal or Sure-White Non-Reinforced Membranes</th></tr>
<tr><th colspan="3">Warranty Wind Speed Coverage</th><th rowspan="3">Minimum Membrane Thickness</th><th rowspan="3">Hail Coverage</th></tr>
<tr><th colspan="2">55, 72, or 80 mph</th><th>90 to 120 mph</th></tr>
<tr><th>Adhered (2)</th><th>Ballasted (1)</th><th>Adhered (2)</th></tr>
<tr><td>25 year</td><td>NA</td><td>✓</td><td>NA</td><td>Sure-Seal 45-mil OR Sure-White 60-mil</td><td rowspan="4"><u>Adhered Systems:</u>

1” Dia. Hail Coverage requires a min. 60-mil Adhered to Cover Board.
2” Dia. Hail Coverage requires a min. 90-mil Adhered to Cover Board.

<u>Additional Design Requirement:</u>

Cover Board set in Flexible FAST Adhesive (SecurShield HD, SecurShield HD Plus, DensDeck Prime, DensDeck StormX Prime, DensDeck ProFast Prime, DEXcell® Glass Mat, DEXcell FA® Glass mat, DEXcell® Cement Roof Board, or DEXcell FA VSH®, Securock Weather Defense, Securock, Securock Ultralight Coated Glass Mat Board – Adhered Only.)

<u>Ballasted Systems (Sure-Seal):</u>

1” Dia. Hail Coverage requires a min. 45-mil.
2” Dia. Hail Coverage requires a min. 60-mil.
3” Dia. Hail Coverage requires a min. 90-mil</td></tr>
<tr><td>25 year</td><td>✓</td><td>NA</td><td>✓</td><td>Sure-Seal / Sure-White 60-mil OR Sure-Seal /Sure-White SAT 60-mil (3)</td></tr>
<tr><td>30 year</td><td>NA</td><td>✓</td><td>NA</td><td>Sure-Seal / Sure-White 60-mil</td></tr>
<tr><td>30 year</td><td>✓</td><td>✓</td><td>✓</td><td>Sure-Seal / Sure-White 90-mil</td></tr>
</table>

Notes: N/A = Not Acceptable ✓ = Acceptable

(1) Sure-White membrane is not recommended for ballasted systems.

(2) Standard 90-8-30A, EPDM x-23 Low-VOC, or CAV-GRIP III Bonding Adhesive must be utilized.

(3) Sure-Seal SAT and Sure-White SAT limited to a maximum warranty wind speed coverage of 100 mph.

5. **Reinforced Membrane Criteria and Hail Coverage**

Years	Sure-Tough Reinforced Membranes					
	Warranty Wind Speed Coverage				Minimum Membrane Thickness	Hail Coverage
	55, 72, 80 or 90 mph		100 to 120 mph			
	Adhered (1)	Mech. Fastened	Adhered (1)	Mech. Fastened		
25 year	✓	N/A	✓	N/A	Sure-Tough SAT 60-mil	**Adhered Systems:** 1" Dia. Hail Coverage requires a min. 60-mil Adhered to Cover Board. 2" Dia. Hail Coverage requires a min. 75-mil Adhered to Cover Board. **Additional Design Requirement:** Cover Board set in Flexible FAST Adhesive (SecurShield HD, SecurShield HD Plus, DensDeck Prime, DensDeck StormX Prime, DensDeck ProFast Prime, Securock, DEXcell Glass Mat®, DEXcell FA™ Glass Mat, DEXcell® Cement Roof Board, or DEXcell FA VSH®, Securock Weather Defense, Securock Ultralight Coated Glass Mat Board – Adhered Only.)
25 OR 30 year	✓	✓	✓	N/A	Sure-Tough 75-mil	

Notes: N/A = Not Acceptable ✓ = Acceptable

(1) Standard 90-8-30A, EPDM x-23 Low-VOC, or CAV-GRIP III Bonding Adhesive must be utilized.

(2) Sure-Tough SAT limited to a maximum warranty wind speed coverage of 100 mph.

C. Adhered System Design Criteria (25 YR / 30 YR Warranty)

1. All Field Splice "T-Joints" must be overlaid as described in **Detail U-2A.1.**
2. The criteria is for compliance with Carlisle's requirements for warranty, when FM Compliance is required for a specific project refer to FM Documentation and Carlisle Code Listings.
3. Tables below outlines insulation/underlayment requirements and application attachment methods:

Adhered Roofing System with top layer fastened - Up to a 25-Year Warranty

Refer to Table (I) for Maximum Warranty Duration by Membrane Type and Thickness

Membrane Underlayment	Thickness	55-mph and 72-mph		80-mph		90-mph		100-mph	110-mph	120-mph
		4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 8' board	4'x 8' board
20 or 25 psi InsulBase/InsulBase ECO (1), InsulBase RL (8), ThermaThin 7 GRF (9)	1.0" to 1.4"	16		**	**	**	**	**	**	**
	1.5" to 1.9"	10	15	10	15	12	20	**	**	**
	2.0" or greater	8	12	8	12	12	20	**	**	**
20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL (8), ThermaThin 7 CGF (9)	1.0" to 1.4"	16		**		**		**	**	**
	1.5" to 1.9"	10		10		12		**	**	**
	2.0" or Greater	8		8		8		16	**	**
SecurShield HD Composite and SecurShield HD RL Composite (5)	1.5" (4)	6		6		6		**	**	**
	2.0" or Greater	6		6		6		8	12	16
SecurShield HD EPS Composite	2.0" or Greater	8		8		12		16	**	**
StormBase (OSB/ISO composite)	1.5" or Greater	8		8		8		12	16	16
SecurShield HD, SecurShield HD RL	1/2" (2)	8		10		12		20 (5)	(5)	(5)
SecurShield HD Plus, SecurShield HD Plus ECO	1/2" (2)	8		8		10		12	16	20
DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber, Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board, DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Roof Board	1/4" (2)	10		12		16		**	**	**
	3/8" (2)	8		12		**		**	**	**
	7/16" (2)	8		8		12		16	**	**
	1/2"	8		8		12		16	(6)	(6)
	5/8"	8		8		8		12	12	16
EcoStorm VSH	1/2" (2)	8		8		8		12	16	16
HP Recovery Board (Wood Fiberboard) (6)(7)	1/2" (2)	16		**		**		**	**	**
InsulFoam SP (Sure-White EPDM SAT and reflective FleeceBACK membrane adhered with Flexible FAST) (3)	2.0" or greater	12		16		16		**	**	**

Definitions: SAT = Self -Adhered Technology; RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Over steel decks: Install a minimum 1.0" Carlisle-approved insulation under noted cover boards. Do not install noted cover boards directly over bare steel deck.

3) EPDM color limitation with EPS SP: When EPDM is used with SAT systems over InsulFoam SP, membrane color is limited to White EPDM SAT and White EPDM FleeceBACK (no black EPDM in this assembly)

4) 1.5" SecurShield® HD Composite: Maximum wind speed warranty is **90 mph** for this board. For higher wind speeds, use a minimum 2.0".

5) 1/2" SecurShield HD, 1/2" SecurShield HD RL and listed 1/2" Gypsum boards **may be adhered** to approved insulation using Flexible FAST ribbons spaced 4-inches on center or Rig splatter for **100-mph to 120-mph wind speed warranties**.

6) HP Recovery Board: When installed directly over an existing roof, the maximum warranty duration is **15 years.**

7) HP Recovery Board: Do not install SAT membranes or use CAV-GRIP III Adhesive/Primer directly over wood fiberboard.

8) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

9)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100': Increase fastening/adhesive in the 12'-wide perimeter and corner zones with 50% more fasteners and plates.

B) Projects **exceeding 100-feet tal**l are to be reviewed by Carlisle prior to warranty submission or installation.

C) Acceptable decks for all listed wind-speed warranties include: minimum 22-gauge steel, structural concrete, 1-1/2" wood plank, and minimum 5/8" plywood.

D) Minimum, 15/32" Plywood limited to 90-mph wind speed warranty.

E) For OSB, Gypsum, Cementitious wood fiber (Tectum), Lightweight Insulated Concrete over less than 22-gauge steel. Refer to Table (V**I**) for fastening and wind speed warranty limitations.

F) 5/8" OSB with minimum of 300 lb. pullout values using HP-X fasteners will be eligible for **reduced fastening** rate of 8 per 4'x8' board where cover board/Insulation qualifies for reduced fastening and will be limited to a maximum warranty duration of **20-years and a 55-mph** wind speed warranty.

G) New Construction and Re-Roof with tear-off. Refer to Table (VIII) for Re-cover options.

H) For Cover Board and Insulation bead spacing please refer to Table (IV) for applicable warranty bead spacing.

Adhered Roofing System with top layer fastened - 30 Year Warranty

Refer to Table (I) for Maximum Warranty Duration by Membrane Type and Thickness

Membrane Underlayment	Thickness	55-mph and 72-mph		80-mph		90-mph		100-mph	110-mph	120-mph
		4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 12' board	4'x 8' board	4'x 8' board	4'x 8' board
20/25 PSI InsulBase/InsulBase ECO (1), InsulBase RL (6), ThermaThin 7 GRF (7)	1.0" to 1.4"	16	16	**	**	**	**	**	**	**
	1.5" to 1.9"	16	24	**	**	**	**	**	**	**
	2.0" or Greater	12	20	16	24	16	24	**	**	**
20/25 PSI SecurShield/SecurShield ECO, SecurShield RL (6), ThermaThin 7 CGF (7)	1.0" to 1.4"	16		**		**		**	**	**
	1.5" to 1.9"	16		20		24		**	**	**
	2.0" or Greater	12		16		16		24	**	**
SecurShield HD Composite and SecurShield HD RL Composite (5)	2.0" or Greater	8		10		12		16	16	16
SecurShield HD EPS Composite (4)	2.0" or Greater	12		12		16		**	**	**
StormBase (OSB/ISO composite)	1.5" or Greater	10		12		12		16	16	16
SecurShield HD, SecurShield HD RL	1/2" (2)	12		16		24		(5)	(5)	(5)
SecurShield HD Plus	1/2" (2)	10		12		16		20	24	24
DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber or Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board,DEXcell FA Glass Mat, DEXcell FA VSH Glass Mat	1/4" (2)	16		**		**		**	**	**
	3/8" (2)	16		18		**		**	**	**
	7/16" (2)	16		16		**		**	**	**
	1/2"	12		16		18		(6)	(6)	(6)
	5/8"	10		12		12		16	16	16
EcoStorm VSH	1/2" (2)	10		12		16		16	24	24
InsulFoam SP (135-mil and 145-mil reflective FleeceBACK adhered with Flexible FAST) (3)	2.0" or greater min 1.5 lb. Density	16		18		**		**	**	**
Definitions: SAT = Self -Adhered Technology; RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install										
Contact Carlisle's Technical Team at 877-797-8370 Option 3										

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Over steel decks: Install a minimum 1.0" Carlisle-approved insulation under noted cover boards. Do not install noted cover boards directly over bare steel deck.

3) EPDM color limitation with EPS SP: When EPDM is used with SAT systems over InsulFoam SP, membrane color is limited to White EPDM SAT and White EPDM FleeceBACK (no black EPDM in this assembly)

4) SecurShield® HD Composite: 30-year warranties require a minimum of 2.0"

5) 1/2" SecurShield HD, 1/2" SecurShield HD RL and listed 1/2" Gypsum boards may be adhered to approved insulation using Flexible FAST ribbons spaced 4-inches on center or Rig splatter for **100-mph to 120-mph wind speed warranties**.

6) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

7)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100': Increase fastening/adhesive in the 12'-wide perimeter and corner zones with 50% more fasteners and plates.

B) Projects **exceeding 100-feet tal**l are to be reviewed by Carlisle prior to warranty submission or installation

C) Acceptable decks for all listed wind-speed warranties include: minimum 22-gauge steel, structural concrete, 1-1/2" wood plank, and minimum 5/8" plywood.

D) Minimum, 15/32" Plywood limited to 90-mph wind speed warranty

E) OSB Decking does not Qualify for a 30-year warranty

F) New Construction and Re-Roof with tear-off. Contact Carlisle Technical Team for recover projects.

G) For Cover Board and Insulation bead spacing please refer to Table (V) for applicable warranty bead spacing.

Up to a 25-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing and Mechanically Fastened Insulation / Substrate Attachment (New Construction or Tear - Off) (3)

Applies to: Mechanically fastened substrate with adhered cover board/insulation under single-ply membrane

Refer to Table I for Maximum Warranty Duration by Membrane Thickness

Peak Gust Wind Speed Warranty			55-mph and 72-mph		80-mph		90-mph		100-mph		110-mph		120-mph	
Adhered Coverboard/Insulation	Insulation Board Size (Max.)		4'x 4'		4'x 4'		4'x 4'		4'x4' or 4'x8'		4'x4' or 4'x8'		4'x4' or 4'x8'	
	Bead Spacing for Approved Cover Boards/Insulation (2) (6) Refer to Table number (II) for approved cover boards for each wind speed category	Field	12"		12"		12"		6"		4"		4"	
		Perimeter	6"		6"		6"		4"		4"		4"	
		Corner	6"		6"		4"		4"		4"		4"	
Approved Board Insulation		Thickness	Substrate Fastening (# of fasteners per 4' x 8' board / 4' x 12' boards)											
			4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'
Mechanical Attachment of Substrate to Deck	20 or 25 psi InsulBase/InsulBase ECO (1) (4) (5), ThermaThin 7 GRF (9), InsulBase RL (8), 20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL (8), ThermaThin 7 CGF (9)	1.0" to 1.4"	16	16	16	16	16	16	16	16	16	16	16	16
		1.5" to 1.9"	10	15	10	15	12	18	16	24	16	24	16	24
		2.0" or Greater	8	12	8	12	12	18	16	24	16	24	16	24
	Approved Thermal Barriers / Substrate Boards (7)													
	DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber, Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board, DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Roof Board	1/4"	10		12		16		**		**		**	
		3/8"	8		12		16		**		**		**	
		7/16"	8		12		16		**		**		**	
		1/2"	8		8		12		16		16		16	
		5/8"	8		8		8		12		12		16	

Definitions: RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Rig Splatter of Flexible FAST may be substituted for extruded beads in all roof zones.

3) See Table (II) for approved **cover boards** for appropriate **Wind Speed Warranty**.

4) If using **4'x 8' or 4' x 12'** boards bead spacing is **6" on center** in all roof zones up to **90-mph**

5) 16-fasteners and insulation plates per 4'x8' board for **OSB, Gypsum, Cementitious wood fiber (Tectum), Lightweight Insulated Concrete over less than 22-gauge steel**. These decks are limited to maximum **20-year, 72-**mph warranty wind speed without further review from Carlisle.

6) 5/8" OSB with minimum of 300 lb. pullout values using **HP-X fasteners** will be eligible for reduced fastening rate of 8 per 4'x8' board where cover board/Insulation qualifies for reduced fastening and will be **limited** to a maximum warranty duration of **20-years and a 55-mph** wind speed warranty.

7) Fastening of substrate boards when **Vapor Barrier or insulation are to be adhered to listed boards.**

8) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

9)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100', enhance 12-foot-wide perimeters and corners with 50% more **fasteners and plates when substrate** is being mechanically fastened.

B) Projects exceeding 100-feet tall are to be reviewed by Carlisle prior to warranty submission or installation.

B) Acceptable Decking for all wind speed warranties : 22-gauge or heavier steel, Structural concrete, 1-1/2" Wood Plank, 5/8" Plywood.

C) Minimum, **15/32" Plywood** limited to **90-mph** wind speed warranty.

30-Year Warranty with an Adhered Cover Board / Insulation Bead Spacing and Mechanically Fastened Insulation Substrate Attachment (New Construction or Tear - Off) (3)

Applies to: Mechanically fastened substrate with adhered cover board/insulation under single-ply membrane. Refer to Table (I) for membrane warranty duration.

Refer to Table I for Maximum Warranty Duration by membrane thickness

Peak Gust Wind Speed Warranty			55-mph, 72-mph		80-mph		90-mph		100-mph		110-mph		120-mph	
Adhered Coverboard/Insulation	Insulation Board Size (Max.)		4'x4'		4'x4'		4'x4'		4'x 4' or 4'x8'		4'x4' or 4'x8'		4'x4' or 4'x8'	
	Ribbon Spacing for Approved Cover Boards/Insulation Refer to Chart number (III) for approved cover boards for each wind speed category (2)	Field	12"		12"		6"		6"		4"		4"	
		Perimeter	6"		6"		6"		4"		4"		4"	
		Corners	4"		4"		4"		4"		4"		4"	
Approved Board Insulation		**Thickness**	**Substrate Fastening (# of fasteners per 4' x 8' or 4'x12' board)**											
			4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'	4'x8'	4'x12'
Mechanical Attachment of Substrate to Deck	20 or 25 psi InsulBase/InsulBase ECO (1) (4), ThermaThin 7 GRF (6), InsulBase RL (5), 20 or 25 psi SecurShield/SecurShield ECO, SecurShield RL (5),ThermaThin 7 CGF (6)	1.0" to 1.4"	16	16	16	16	16	16	16	16	16	16	16	16
		1.5" to 1.9"	16	24	16	24	16	24	16	24	16	24	16	24
		2.0" or Greater	12	18	16	24	16	24	16	24	16	24	16	24
	Approved Thermal Barriers / Substrate Boards (1)													
	DensDeck Prime, 3/8" DensDeck ProFast Prime, 5/8" DensDeck StormX Prime, Securock Gypsum Fiber or Securock Ultra Light Coated Glass Mat, 5/8" Securock Weather Defense Roof Board DEXcell FA Glass Mat, 5/8" DEXcell FA VSH Glass Mat, DEXcell Cement Board	1/4"	16		**		**		**		**		**	
		3/8"	16		18		**		**		**		**	
		7/16"	**		**		**		**		**		**	
		1/2"	12		16		16		16		16		16	
		5/8"	10		12		12		16		16		16	

Definitions: RL = Rapid Lock; VSH = Very Severe Hail, ** = Do not Install

This chart is for use of Coverboards as Top Layers adhered to Secondary layer which has been Adhered or Mechanically Fastened to Substrate. Refer to Table (III) for Mechanically Fastened Cover Boards as the Top Layer of Roofing Assembly.

Contact Carlisle's Technical Team at 877-797-8370 Option 3

1) 4' x 12' boards in this system are only available in 20 psi compressive strength.

2) Rig Splatter of Flexible FAST may be substituted for extruded beads in all roof zones.

3) See Table (II) for approved **cover boards** for appropriate **Wind Speed Warranty**.

4) If using **4'x 8' or 4' x 12**' boards bead spacing is **6" on center** in all roof zones up to **90-mph**.

5) InsulBase RL / SecurShield RL only available and approved in 4' x 8' board size for this system.

6)ThermaThin 7 GRF / ThermaThin 7 CGF only available in 4' x 8' board size.

Additional Design Considerations

A) For building heights between 61' and 100': Increase fastening/adhesive in the 12'-wide perimeter and corner zones with 50% more fasteners and plates.

B) Projects exceeding 100-feet tall are to be reviewed by Carlisle prior to warranty submission or installation.

C) Acceptable Decking for all wind speed warranties : 22-gauge or heavier steel, Structural concrete, 1-1/2" Wood Plank, 5/8" Plywood.

D) Minimum, 15/32" Plywood limited to **90-mph** wind speed warranty.
E) OSB Decking does not Qualify for a 30-year warranty.

D. Mechanically Fastened System Design Criteria (25 YR / 30 YR Warranty)

1. All Field Splice “T-Joints” must be overlaid as described in **Detail MF-2D.**
2. This criteria is for compliance with Carlisle’s requirements for extended warranties, when FM Compliance is required for a specific project refer to FM Documentation and Carlisle Code Listings.
3. Fasteners covered in this attachment are limited to a length not to exceed 12”. Assemblies with Tapered Insulation, requiring longer fasteners than 12”, shall be reviewed by Carlisle.
4. Table below outlines insulation/underlayment requirements and application attachment methods:

25/30-Year EPDM Mechanically Fastening Roofing System

Deck Type: 22-Gauge Steel, 3/4", 5/8" & 15/32" Plywood, Wood Plank and Structural Concrete

25/30 Year Warranty - 75-mil Sure-Tough Reinforced EPDM - 10' Wide Sheets Only					
Peak Gust Wind Speed Warranty	**Max. Building Height**	**Field Membrane Width**	**Minimum Number of Perimeter sheets by Building location from Coastline or Large Body of Water**		**Perimeter Sheet Width**
		EPDM	Greater than 4 Miles	4 miles or less	EPDM
55-MPH	**Up to 60'**	10'	2 @ 12" o.c	3 @ 12" o.c	5' or 6.5'
		8'	2 @ 12" o.c	3 @ 12" o.c	5'
	61' to 100'	10'	3 @ 6" o.c*	4 @ 6" o.c*	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
72-MPH	**Up to 60'**	10'	3 @ 12" o.c	4 @ 12" o.c	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	10'	4 @ 6" o.c *	5 @ 6" o.c *	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
80-MPH	**Up to 60'**	10'	3 @ 12" o.c	4 @ 12" o.c	5' or 6.5'
		8'	3 @ 12" o.c	4 @ 12" o.c	5'
	61' to 100'	10'	4 @ 6" o.c *	5 @ 12" o.c *	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
90-MPH	**Up to 60'**	10'	4 @ 12" o.c	5 @ 12" o.c	5' or 6.5'
		8'	4 @ 12" o.c	5 @ 12" o.c	5'
	61' to 100'	10'	5 @ 6" o.c *	6 @ 6" o.c *	5' or 6.5'
		8'	5 @ 12" o.c	6 @ 12" o.c	5'
100-MPH	**Up to 60'**	10'	5 @ 12" o.c	7 @ 12" o.c	5' or 6.5'
		8'	5 @ 12" o.c	7 @ 12" o.c	5'
	61' to 100'	10'	6 @ 6" o.c*	7 @ 6" o.c*	5' or 6.5'
		8'	6 @ 12" o.c	76 @ 12" o.c	5'
110-MPH	**Up to 60'**	All 5' or 6.5' Wide Sheets fastened at 12" o.c across the entire roof.			
	61' to 100'	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
120-MPH	**Up to 60'**	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
	61' to 100'	All 5' or 6.5' Wide Sheets fastened at 6" o.c across the entire roof.			
*12" on center spacing can be utilized by using HP-Xtra Fasteners and 2-3/8" Polymer Seam Plates.					

New Assembly all Warranties
1.0" to 1.4" = 6 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 4 per 4'x 8' board
All cover boards = 5 per 4'x8' board
Recover over Smooth Surface (Up to 20-year Warranty)
1.0" to 1.4" = 8 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 5 per 4'x 8' board
1/2" Gypsum & 1/2" InsulBase HD = 8 per 4'x 8' board
1/2" R-Tech Fanfold follows Detail MF-27C
1/2" HP Recovery board has max 15-year installed over an existing Smooth Surface. 1/4" Gypsum boards are not acceptable over an existing system.
Recover over Gravel BUR Surface (Remove all loose gravel) (Up to 20-year Warranty)
1.0" to 1.4" = 8 per 4'x 8' board
1.5" or greater = 5 per 4'x 8' board
1.5" or greater = 6 per **4'x 12' board**
1/2" SecurShield HD = 5 per 4'x 8' board
1/2" InsulBase HD = 8 per 4'x 8' board

Contact Carlisle's Project Review Team at 877-797-8370 Option 3
ADDITIONAL DESIGN CONSIDERATIONS
(A) HP Fasteners for 22-Gauge Steel, 3/4", 5/8" and 15/32" Plywood, Wood Plank and HD 14-10 or CD-10 for Structural Concrete Decks
(B) 10' wide field sheet utilizing HP Fasteners and Polymer Seam Plates. HP Fasteners and Seam Plates for Wood decks only.
(C) 10' wide field sheet utilizing HP fasteners require a fastening rate of 12" on center.
(D) As an option, 9" wide Pressure Sensitive RUSS can be used beneath the field sheets for perimeter securement at 12" on center.
(E) 1/2" Gypsum boards are eligible for a maximum 15-year warranty for Gravel BUR recovers.
(F) 1/2" HP Recovery board and 1/4" Gypsum boards are not acceptable over an existing Gravel BUR systems.
(G) A cover board is needed if the insulation thickness exceeds 12 inches in thickness.
(H) Cannot Mechanically Fasten HP Polymer Plates over all Gypsum Boards.
Approvals are based upon the Withdrawal Resistance Criteria for the minimum pullout value based upon deck type (Refer to the Design Reference DR-06).
Click on this link to take you to the Design Reference DR-06: ..\Letters\Carlisle DR-06 Withdrawal Resistance Criteria.pdf

E. Ballasted Design Criteria (25 YR to 30 YR Warranty)

1. Building height shall not exceed 60'. For projects where building height exceeds 60' or warranty wind speed exceeds 80 mph, please submit to Carlisle for review.
2. All Field Splice “T-Joints” must be overlaid as described in **Detail U-2A.1.**
3. For applicable membrane thickness, refer to Tables in Section B4.
4. 6” on center fastening required for Pressure Sensitive RUSS.

General

1. Carlisle Polyisocyanurate or Insulfoam EPS Insulation shall be applied in multiple layers with joints staggered between layers, following current energy codes. The layer directly under the membrane shall be 1-1/2” thick insulation and shall be loose-laid or, if specified, may be secured with bead adhesive (12” O.C. bead spacing is acceptable).

   CAUTION: The use of Mechanically Fasteners is not permitted for insulation securement.

Polyisocyanurate Insulation

1. When Polyisocyanurate insulation is specified, Carlisle InsulBase, SecurShield (20 or 25 psi) or ThermaThin 7™ (20 psi) shall be utilized and is recommended. On structural and lightweight structural concrete, to safeguard against residual moisture, the use of SecurShield Polyisocyanurate or ThermaThin 7™ CGF is required.

Expanded Polystyrene (EPS) Insulation

1. When EPS (Expanded Polystyrene) insulation is to be utilized, only Insulfoam EPS may be used as follows:

   a. Insulfoam I (1.0 pcf density) EPS.
   b. Insulfoam VIII (1.25 pcf density) EPS.

2. On steel decks, install EPS insulation in conjunction with thermal barrier, if required for code compliance.

3. When directly installed on steel deck, total thickness of insulation must be adequate to span deck flutes.

Ballast Types/Coverage Rates

a. The coverage rates listed in this attachment are considered minimum and are required by Carlisle for issuance of the standard Carlisle warranty. Depending on specific project conditions (building height, parapet height and project

location), additional ballast may be necessary to provide wind uplift protection. Refer to “Attachment I” in this Specification for suitable ballast types and coverage rates. **Comply with the specifier's requirements when an additional ballast coverage rate is specified.**

b. **Rounded Water-Worn Gravel** must be applied over the EPDM membrane at the minimum rate of **1000 pounds per square** and must be evenly distributed to maintain an average of 10 pounds per square foot.

ASTM D 7765 SIZE NUMBER	MINIMUM COVERAGE RATE (pounds per square)	AVERAGE COVERAGE RATE (lbs./sq. ft. continuously distributed)
4 (1-1/2" nominal diameter)	1000	10
3 (2" nominal diameter)	1000	10
2 (2-1/2" nominal diameter)	1300	13
1 (3-1/2" nominal diameter)	1300	13

Notes: In the field of the roof, some bare spots resulting from installation are permitted; however, they must not exceed 64 square inches and must be limited to no more than 2 per square (100 square feet). No bare spots are permitted in the perimeter area of the roof that is 10' wide.

c. **Smooth Surfaced Individual Concrete Pavers**

1) When the use of concrete paver is specified, Carlisle supplied Hanover Pedestal Paver is recommended and can be covered by the Carlisle Warranty. A pedestal system is recommended, due to increased life expectancy, however, field fabricated, cut sections (8” x 8”) of Sure-Seal/Sure-White Walkway Pads, beneath pavers, at corners of pavers.

2) Individual pavers must be a maximum of two feet square. Unless otherwise required by Carlisle, pavers must weigh no more than 100 pounds per unit to allow for easy removal and replacement.

3) Individual pavers with a surface other than a steel troweled finish as approved by Carlisle, must be installed over Sure-Seal HP Protective Mat and must be accepted by Carlisle prior to installation.

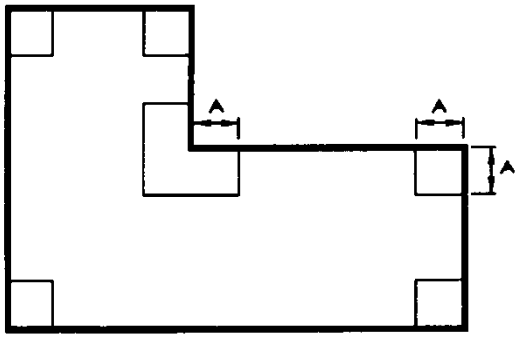
4) Elevating pavers should increase life expectancy, reduce freeze/thaw effects and promote more positive drainage. Acceptable pedestals can be specified under corners of pavers to elevate paver.

5) Individual concrete pavers shall be loose laid and butted together with no gaps greater than 1/2".

Ballast Criteria for Up to 30 Year Extended Warranty

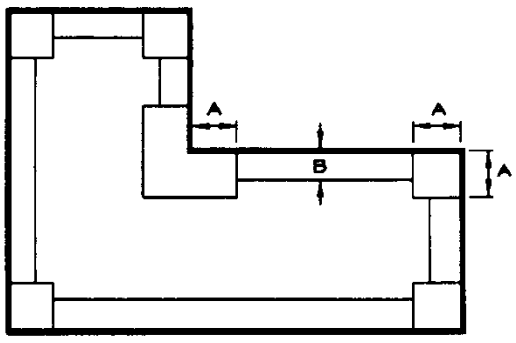
b. Refer to installations below for calculating corner/perimeter areas for the noted warranty wind speeds available.

Ballast Requirements for 72 mph Warranty



A (Corners) = .4 Times the Building Height (10' minimum)

Ballast Requirements for 80 mph Warranty



A (Corners) = .4 Times the Building Height (10' minimum)
B (Perimeters) = 10'

2. At corner and/or perimeter areas, ballast shall be 2-1/2" nominal rounded water worn gravel conforming to gradation #1 or #2 in accordance with ASTM D7765 method of sizing. Coverage rate shall be a minimum of 15 pounds per square foot.

3. In field areas, ballast shall be 1-1/2" nominal rounded water worn gravel conforming to gradation #4 in accordance with ASTM-D7765 method of sizing. Coverage rate shall be a minimum of 12 pounds per square foot.

4. Other ballasting configurations may be authorized by Carlisle, upon review and approval, prior to construction.

F. Roof Deck Criteria

1. Steel (22-gauge or heavier) **– HP, HP-X, HP-Xtra or InsulFAST Fasteners are required, with a minimum pullout of not less than 360 pounds per fastener for adhered systems and 425 pounds per fastener for mechanically fastened systems.**

   NOTE: Carlisle InsulFAST fasteners may be used with adhered systems only, if the minimum pullout requirement is met.

2. Structural Concrete (minimum 3,000 psi) **– HD 14-10 (threaded) Fasteners are required with a minimum pullout of 800 pounds per fastener.** Sure-Seal CD-10 (hammer-driven) is also applicable for adhered membrane assemblies. **In lieu of fastening, Flexible Adhesive is an acceptable alternative for insulation attachment for adhered assembly when used in conjunction with coated glass faced insulation and full spray.**

   NOTE: The use of standard (paper) faced Polyisocyanurate is not acceptable. Due to possible presence of residual moisture in concrete slabs.

3. Wood Plank (minimum 1" thick) or minimum 3/4" thick Plywood **– HP, HP-X, HP-Xtra or InsulFAST Fasteners are required with a minimum pullout of 425 pounds for plywood and wood plank; 450 pounds for mechanically fastened systems. The minimum pullout value for adhered systems is 360 pounds per fastener.**

   NOTE: Carlisle InsulFAST fasteners may be used with adhered systems only, if the minimum pullout requirement is met.

4. For **Ballasted Assemblies**, the structural deck must be able to sustain the weight of a ballasted assembly (12-15 lbs of ballast, as well as other components, i.e. membrane, insulation and vapor barriers, if applicable). The structural deck must be sufficient to support concentrated construction traffic and point loading.

G. Flashing, Terminations and Other Considerations (All Assemblies)

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

2. Wall flashings shall extend above the anticipated slush line, above the roof surface, prior to written approval from Carlisle is required for lower heights of flashing.

3. Project details must be reviewed by Carlisle, preferably prior to bid, and a written approval must be obtained. As a warranty prerequisite, the approval shall be included as part of the project submittals along with the Request for Warranty form that is required for project approval.

4. Only Carlisle supplied Sheet Metal and Edging is to be used on all projects, unless prior authorization from Carlisle has been obtained.

5. Carlisle Termination Bar is required in locations where a compression bar termination has been specified. The Termination Bar must be used in conjunction with new or existing counterflashing.

6. Where new or existing counterflashing is used, Carlisle's Termination Bar must be used as the primary termination.

7. Certain metal accessories by others may be permitted upon Carlisle acceptance for wind speed coverage less than 72 mph.

Sure-Seal® EPDM Roofing Systems

Sure-Tough™ EPDM Roofing Systems

Sure-Seal®/Sure-White®/Sure-Tough™ EPDM Roofing Systems
Adhered, Ballasted and Mechanically Fastened

Installation Details

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Carlisle SecurEdge EX Snap-on Fascia & SecurEdge Snap-on Fascia U-1C
SecurEdge Drip Edge U-1D
SecurEdge Drip Edge **(30 Year Warranty)** U-1D.1
SecurEdge Gravel Stop U-1E
Metal Bar Edge Termination U-1F

Membrane Splices
EPDM Membrane Splice U-2A
EPDM Membrane Splice **(30 Year Warranty)** U-2A.1
EPDM Membrane Splice Intersection U-2B
EPDM Membrane Spice Intersection **(30 Year Warranty or 90-mil Membrane)** U-2B.1
EPDM Membrane Splices at Angle Change U-2C
SAT EPDM Membrane Splices U-2D

Expansion Joints
Deck-to-Deck Roof Expansion Joint – 3/4” to up to 3” **(30 Year Warranty)** U-3A
Deck-to-Deck Curbed Roof Expansion Joint - Greater than 3” **(30 Year Warranty)** U-3A.1
Deck-to-Deck Curbed Roof Expansion Joint – 3/4” to up to 3” **(30 Year Warranty)** U-3B
Deck-to-Deck Curbed Roof Expansion Joint - Greater than 3” **(30 Year Warranty)** U-3B.1
Deck-to-Wall Expansion Joint - 3/4” to up to 2” **(30 Year Warranty)** U-3C
Deck-to-Wall Expansion Joint - Greater than 2” **(30 Year Warranty)** U-3C.1
Shear / Expansion Joint **(30 Year Warranty)** U-3D

Curb Flashing
Curb Flashing – EPDM Membrane…. U-5A

Curb Flashing - Pressure-Sensitive Curb Wrap with 6” Tape....U-5B
Curb With 20” Wide Pressure-Sensitive Cured Flashing....U-5C
Self-Flashing Curb, Roof Hatch or Skylight….. ....U-5D
New Self-Flashing Metal Curb....U-5E

Drains

Roof Drain…….....U-6A
Roof Drain – Reinforced Field Sheet with Sump Exceeding 3” Per Foot……. U-6B
Sure-Seal Insert Drain....U-6C
Insert Drain Through Deck U-6D
Sure-Seal Add-on Drain U-6E

Pipe Flashing

Pressure-Sensitive Pipe Seal....U-8A
Pressure-Sensitive Pipe Seal **with 90-mil Membrane or 30 Year Warranty**....U-8A.1
Field Fabricated Pipe Wrap....U-8B
Field Fabricated Pipe Wrap **(30 Year Warranty)** U-8B.1
Flexible Penetration....U-8C
Flexible Penetration (30-Year Warranty)....U-8C.1
Field Fabricated Hot Stack....U-8D
Field Fabricated Hot Stack **(30 Year Warranty)** U-8D.1

Terminations

Membrane Terminations, Page 1 of 3…….....U-9
Membrane Terminations, Page 2 of 3 ....U-9
Membrane Terminations, Page 3 of 3 ....U-9

Parapet / Curb Flashing

Parapet / Curb with Continuous Membrane U-12A
Parapet / Curb with Separate Membrane Flashing U-12B
Parapet / Curb with Separate regular EPDM Flashing U-12D
Parapet / Curb with Separate SAT Flashing....U-12E
Parapet / Curb with Continuous Membrane – Cover Strip....U-12F

Tie-Ins

Built-Up Roofing Tie-In over Steel Roof Deck U-13A
Built-Up Roofing Tie-In over Concrete Roof Deck....U-13B
Tie-In to Existing EPDM Membrane U-13C
EPDM Tie-In over Concrete Deck U-13D
Tie-In Shingled or Metal Panel Roof....U-13E
Tie-In Between New Carlisle Adhered & Ballasted Roof....U-13F

Inside / Outside Corners

Inside Corner Wall Flashing with RUSS (Option 1)....U-15A
Inside Corner Wall Flashing with RUSS (Option 2)....U-15B
Inside Corner with Continuous EPDM Wall Flashing U-15C
Inside Corner with Separate EPDM Wall Flashing....U-15D
Inside Corner Flashing for Projects **with 90-mil Membrane or 30 Year Warranty** U-15D.1
Outside Corner with Pre-Cut Pressure-Sensitive Flashing....U-15E
Outside Corner with Pressure-Sensitive Elastoform Flashing (2 Piece)....U-15F
Outside Corner with Pressure-Sensitive Elastoform Flashing (1 Piece)....U-15G
Outside Corner Flashing for Projects **with 90-mil Membrane or 30 Year Warranty** U-15G.1

Sealant Pocket

Pressure-Sensitive Pourable Sealer Pocket....U-16A
Pressure-Sensitive Pourable Sealer Pocket **(30 Year Warranty)** U-16A.1
Field Fabricated Pourable Sealer Pocket....U-16B
Field Fabricated Pourable Sealer Pocket **(30 Year Warranty)** U-16B.1
Extended Pourable Sealer Pocket U-16C
Extended Pourable Sealer Pocket **(30 Year Warranty)**....U-16C.1

Through-Wall Scupper

Scupper: Single Layer Flashing U-18A
Scupper: Double Layers of Flashing (Page 1 of 2)....U-18A.1

Scupper: Double Layers of Flashing (Page 2 of 2)..... U-18A.1

Lightning Rods

Lightning Rod at Parapet (Vertical Attachment) U-20A
Lightning Rod at Deck Level U-20B

Valley

Valley…….. ..... U-22

Sleeper

Sleeper…….. ..... U-24

Penetration

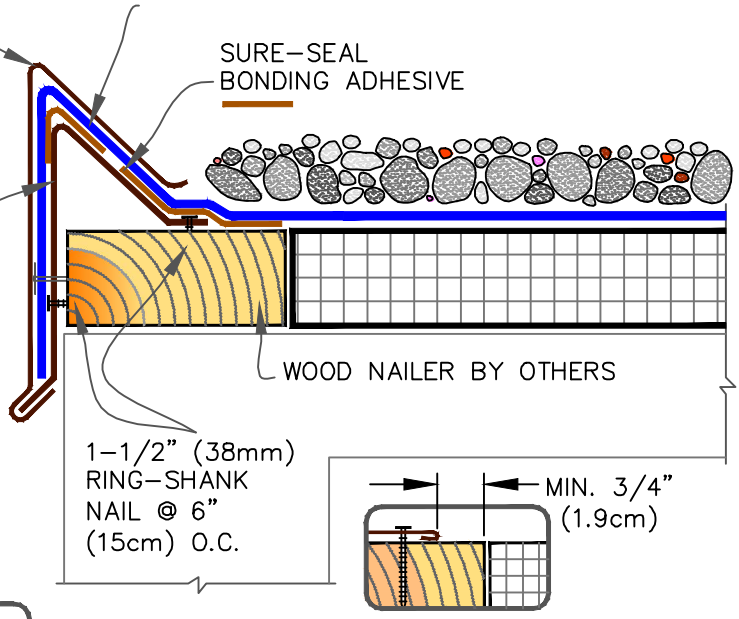
I-Beam Penetration U-30

SecurEdge SNAP–ON CANTED FASCIA OR METAL FASCIA BY OTHERS. ALSO SEE U–1C (BOTTOM DETAIL) FOR DIFFERENT FASCIA OPTION

MAXIMUM MEMBRANE THICKNESS GOING OVER THE WATER DAM IS 60–MIL. FOR THICKER MEMBRANES, RUN FIELD SHEET UNDER THE WATER DAM AND STRIP–IN WITH MAXIMUM 60–MIL MEMBRANE

SURE–SEAL BONDING ADHESIVE

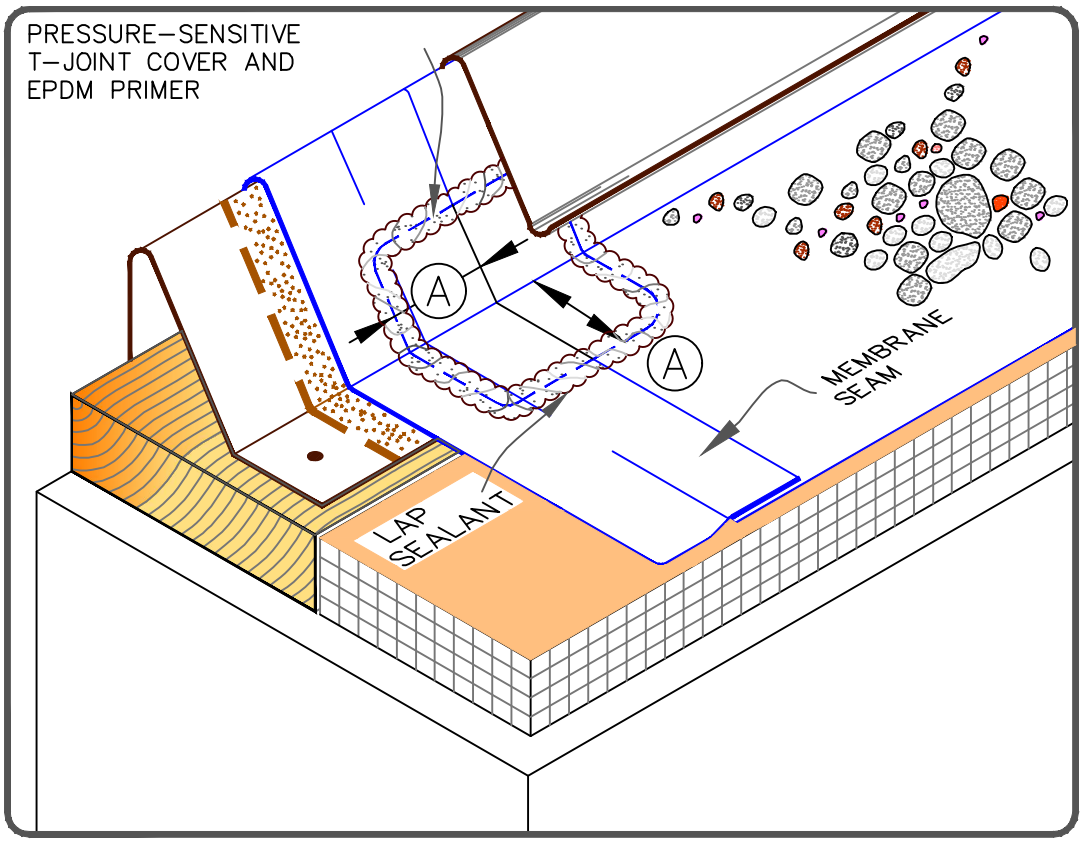
GALVANIZED METAL WATER DAM



NOTE:

1. FOR GUTTER EDGE WITH BALLASTED ROOF ASSEMBLY, SEE DETAIL B ON U–1F

DIMENSION	cm	
Ⓐ 3"	7.5	MIN.



CARLISLE SYNTEC SYSTEMS

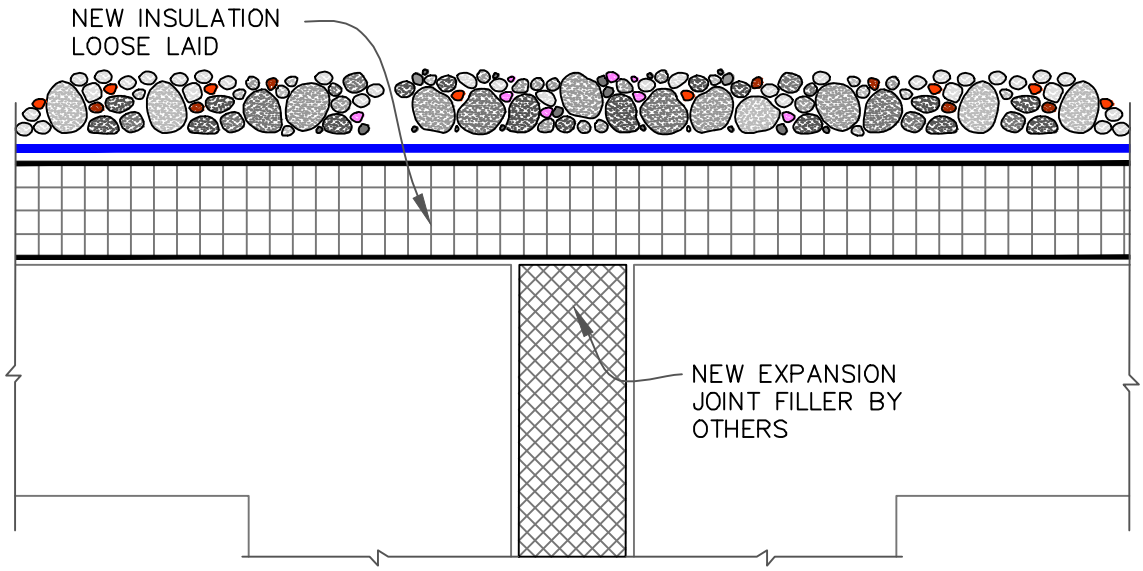
CARLISLE SecurEdge SNAP–ON CANTED FASCIA

MAXIMUM WARRANTY: 30 YEARS

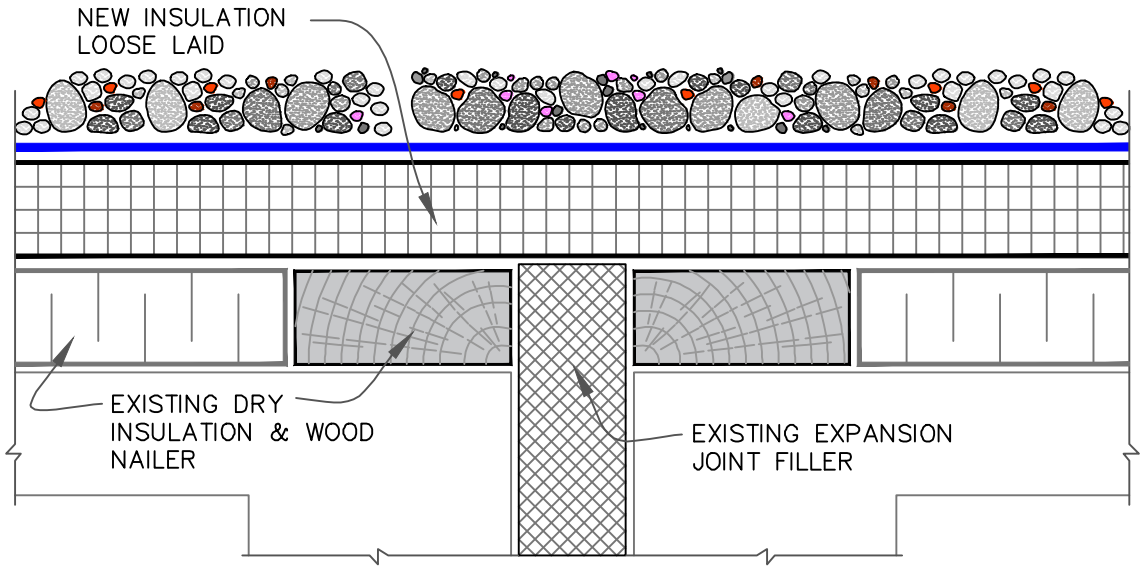
DETAIL NO. B–1A

B (BALLASTED STONE)

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A NEW CONSTRUCTION OR REROOFING



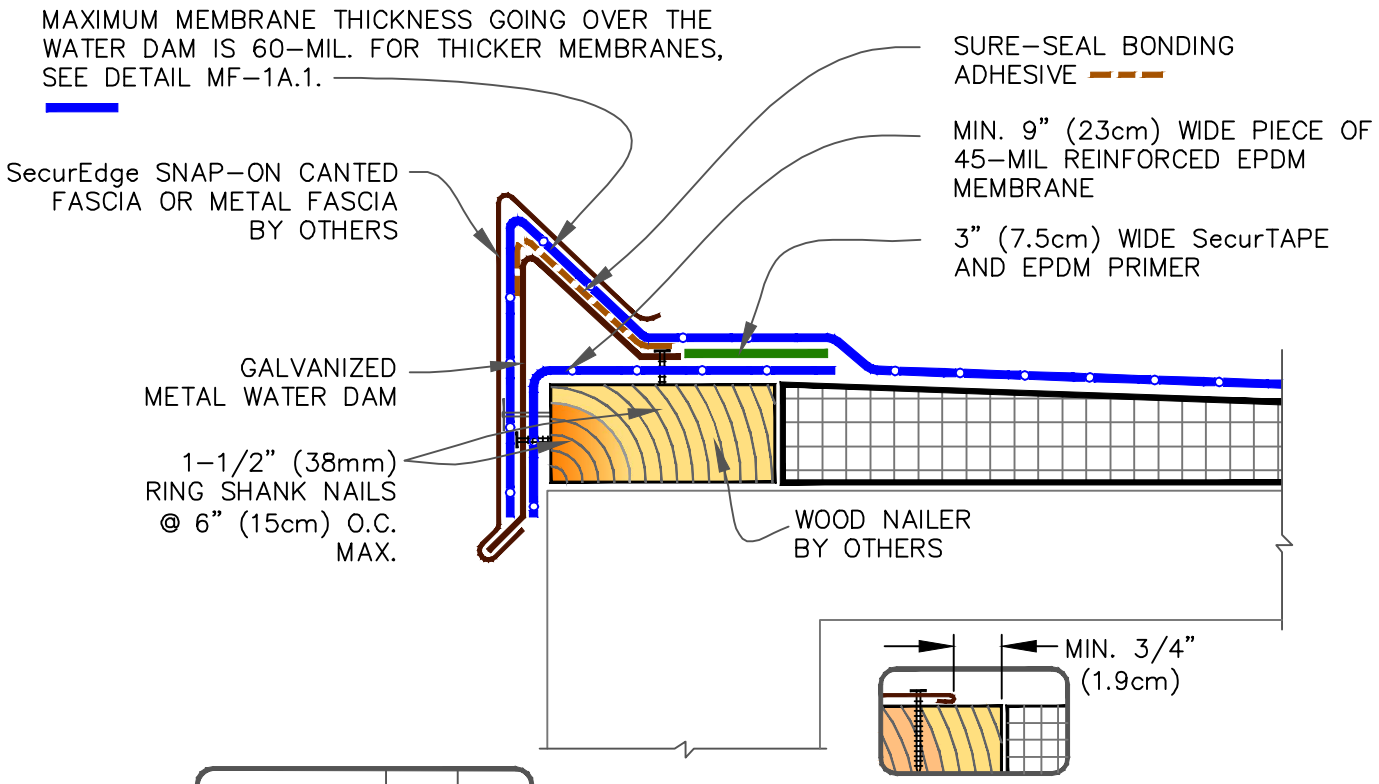
B REROOFING OR RECOVER OF EXISTING ROOF

NOTE:

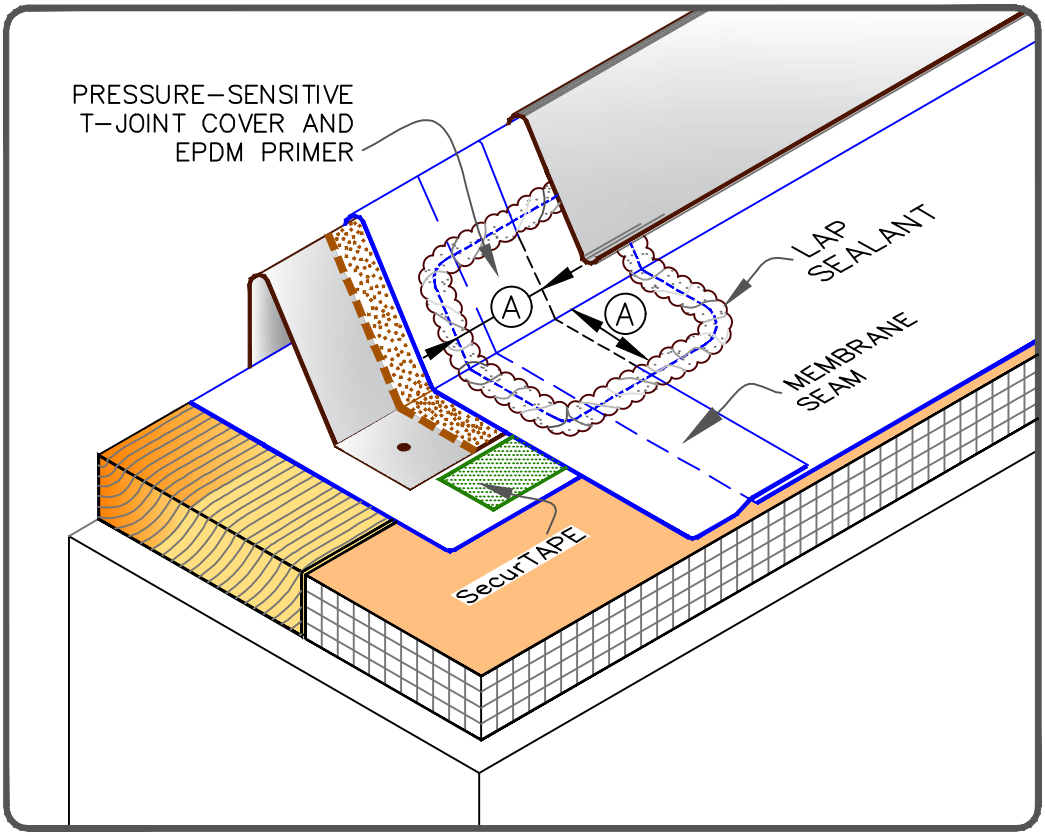
1. ANY OF U-3 (A, B OR C) EXPANSION JOINT DETAIL CAN BE USED WITH THE "B" SYSTEM (BALLASTED STONE ASSEMBLY)

CARLISLE SYNTEC SYSTEMS	DECK-TO-DECK EXPANSION JOINT	DETAIL NO. B-3A
	MAXIMUM WARRANTY: 30 YEARS	B (BALLASTED STONE)

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DIMENSION		cm	
Ⓐ	3"	7.5	MIN.



CARLISLE SYNTEC SYSTEMS

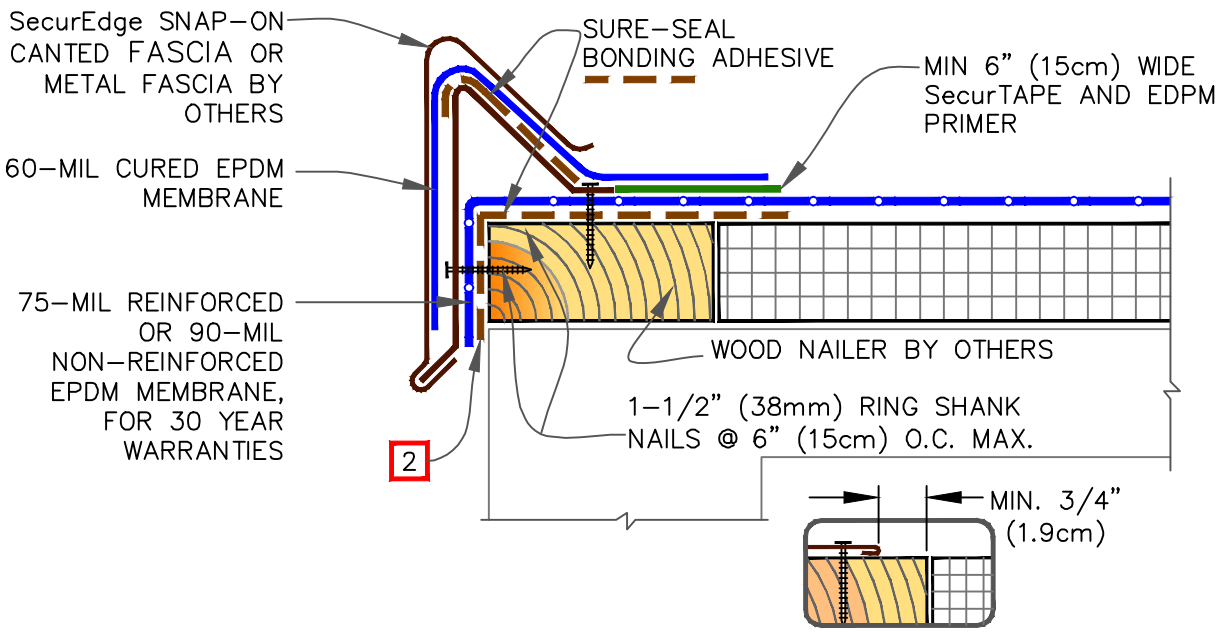
CARLISLE SecurEdge SNAP–ON CANTED FASCIA

MAXIMUM WARRANTY: 20 YEARS

DETAIL NO. MF–1A

MECHANICALLY FASTENED

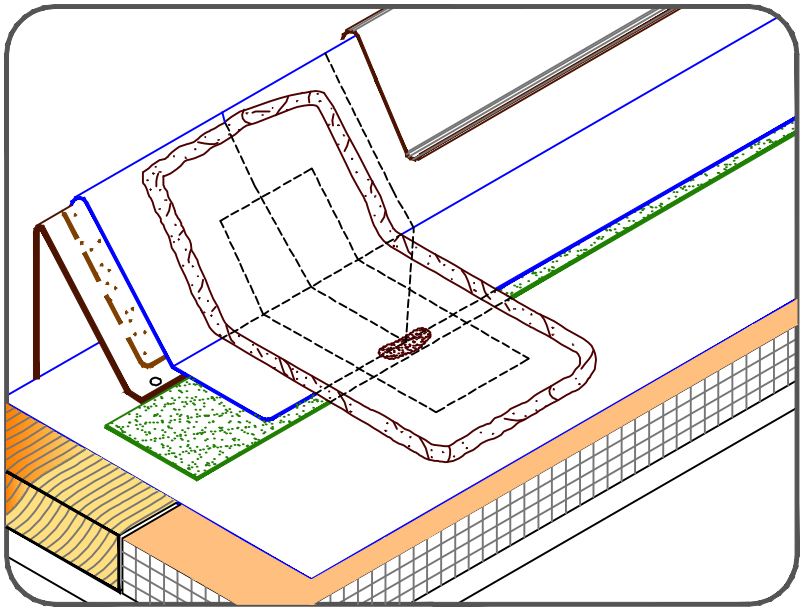
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NOTES:

1. FIELD SPLICES AT THE ANGLE CHANGE SHALL BE OVERLAID WITH EPDM PRIMER AND TWO LAYERS OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. PER DETAIL U–2C.

2. WHEN AND AIR/VAPOR BARRIER IS NOT SPECIFIED, THE ROOF MEMBRANE SHALL BE ADHERED OVER PERIMETER WOOD NAILER ALONG EDGES TO PREVENT AIR INFILTRATION ALONG EDGING, REGARDLESS OF ASSEMBLY TYPE (BALLASTED, ADHERED AND MECHANICALLY FASTENED).



CARLISLE SYNTEC SYSTEMS

CARLISLE SecurEdge SNAP–ON CANTED FASCIA

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. MF–1A.1

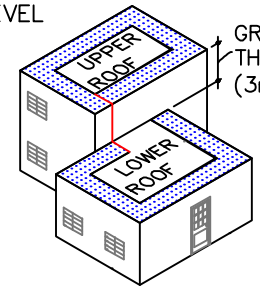
MECHANICALLY FASTENED

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GUIDELINES FOR ROOF PERIMETER ZONES FOR MECHANICALLY ATTACHED ROOF SYSTEM

PERIMETER ZONES

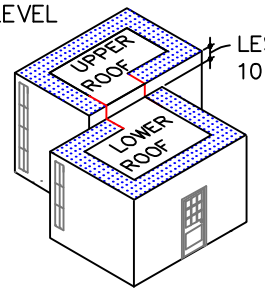
SPLIT LEVEL ROOFS



GREATER THAN 10 FT (3m)

1

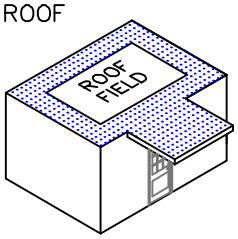
SPLIT LEVEL ROOFS



LESS THAN 10 FT (3m)

2

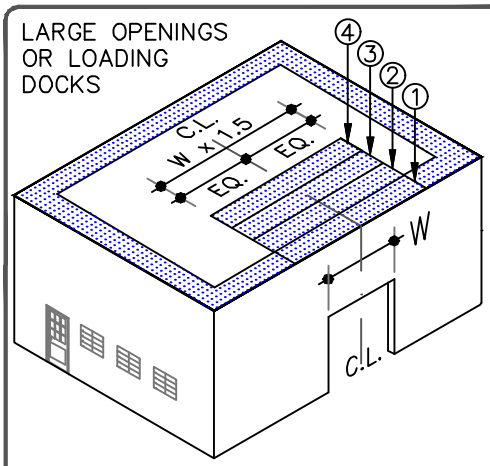
CANOPY ROOF



INSTALL PERIMETER SHEETS OVER THE ENTIRE OVERHANG AREA, EXTENDING ONTO THE MAIN ROOF DECK WHEN AT THE SAME LEVEL AS SHOWN.

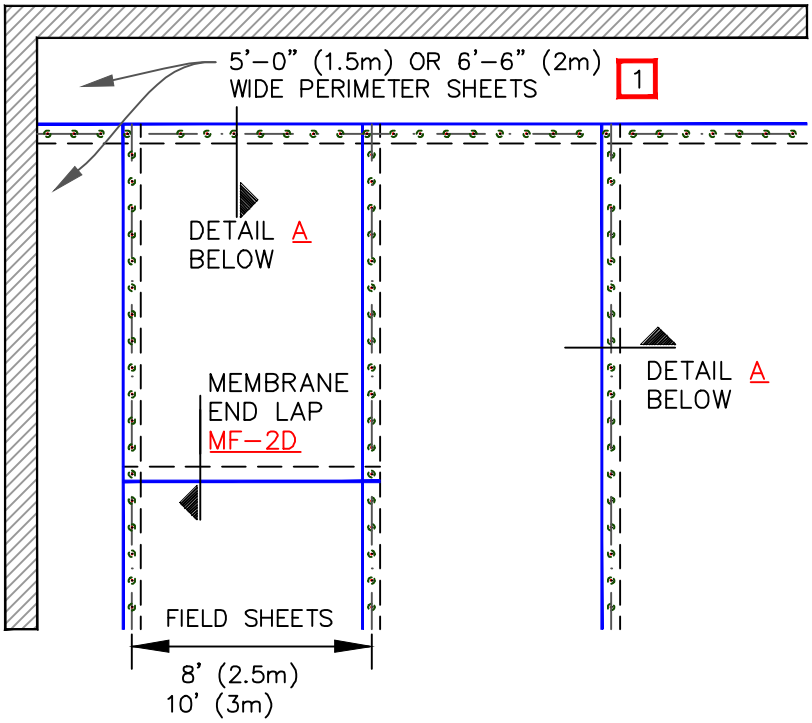
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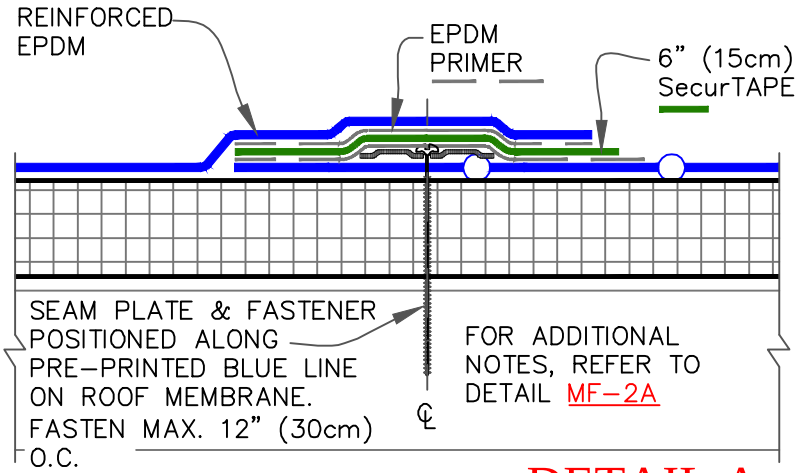
LARGE OPENINGS OR LOADING DOCKS



4 PERIMETER SHEETS CENTERED OVER LARGE OPENINGS

4





2

DETAIL A

NOTES:

1. REFER TO CARLISLE SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
2. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.

CARLISLE SYNTEC SYSTEMS

MECHANICALLY FASTENED EPDM SECUREMENT – OPTION 1

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. MF–2.1

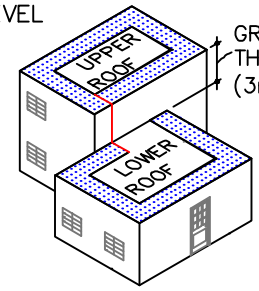
MECHANICALLY FASTENED

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GUIDELINES FOR ROOF PERIMETER ZONES FOR MECHANICALLY ATTACHED ROOF SYSTEM

PERIMETER ZONES

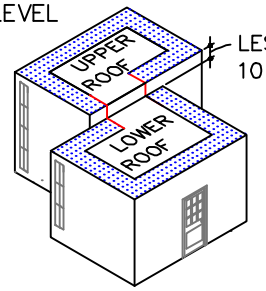
SPLIT LEVEL ROOFS



GREATER THAN 10 FT (3m)

1

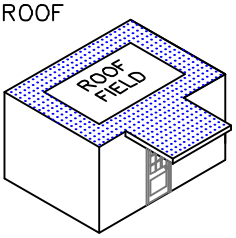
SPLIT LEVEL ROOFS



LESS THAN 10 FT (3m)

2

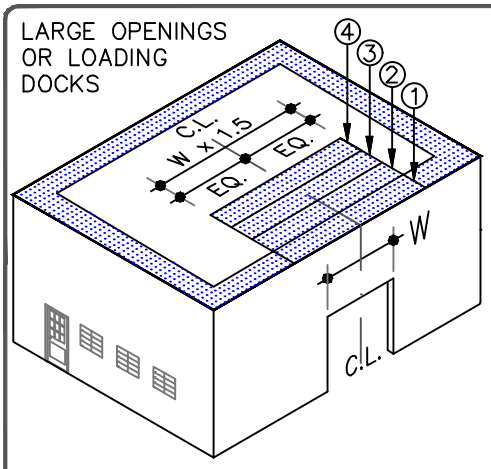
CANOPY ROOF



INSTALL PERIMETER SHEETS OVER THE ENTIRE OVERHANG AREA, EXTENDING ONTO THE MAIN ROOF DECK WHEN AT THE SAME LEVEL AS SHOWN.

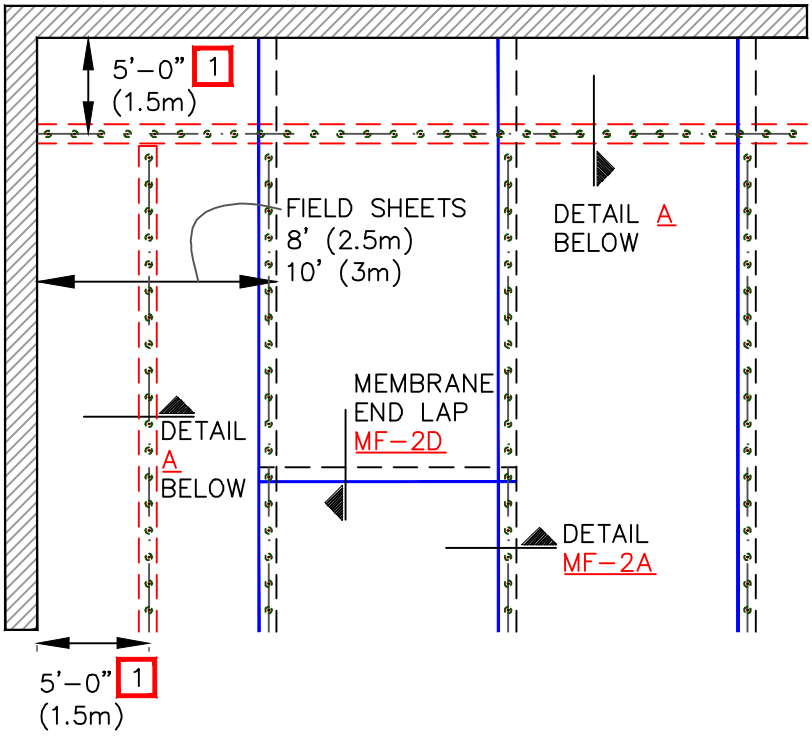
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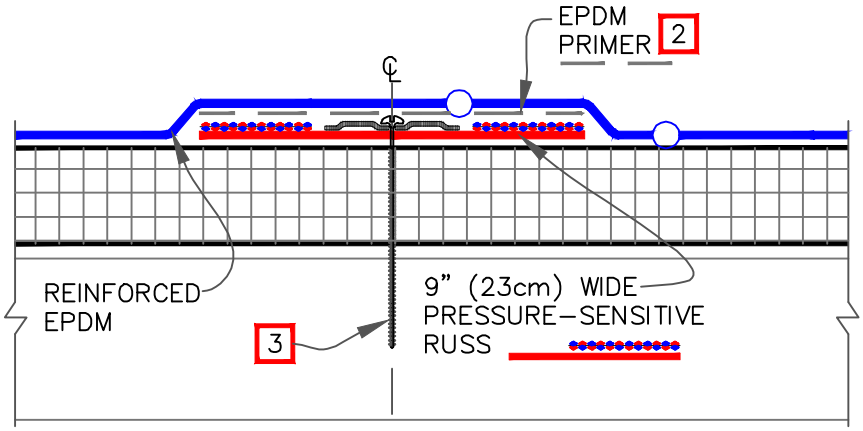
LARGE OPENINGS OR LOADING DOCKS



4 PERIMETER SHEETS CENTERED OVER LARGE OPENINGS

4





DETAIL A

NOTES:

1. REFER TO CARLISLE SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
2. EPDM PRIMER MUST BE APPLIED TO THE BACK SIDE OF MEMBRANE SURFACE PRIOR TO ADHERING MEMBRANE TO PRESSURE–SENSITIVE RUSS.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.

RUSS (REINFORCED UNIVERSAL SECUREMENT STRIP)

CARLISLE SYNTEC SYSTEMS

MECHANICALLY FASTENED EPDM SECUREMENT – OPTION 2 (RUSS)

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. MF–2.2

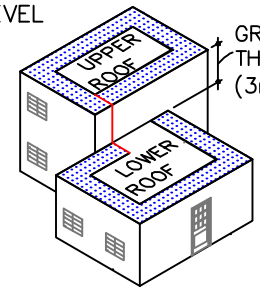
MECHANICALLY FASTENED

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GUIDELINES FOR ROOF PERIMETER ZONES FOR MECHANICALLY ATTACHED ROOF SYSTEM

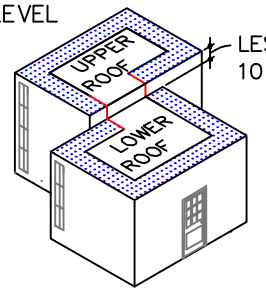
PERIMETER ZONES

SPLIT LEVEL ROOFS



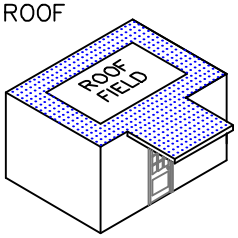
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SPLIT LEVEL ROOFS



2

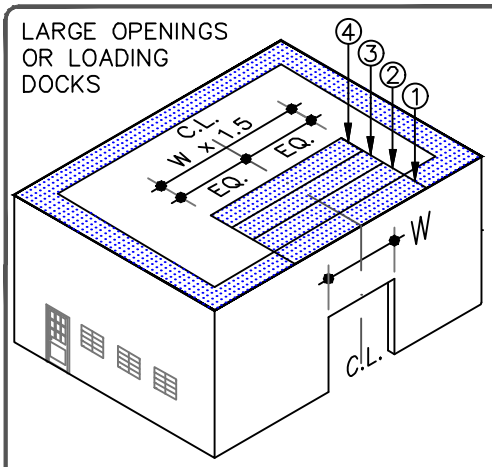
CANOPY ROOF



INSTALL PERIMETER SHEETS OVER THE ENTIRE OVERHANG AREA, EXTENDING ONTO THE MAIN ROOF DECK WHEN AT THE SAME LEVEL AS SHOWN.

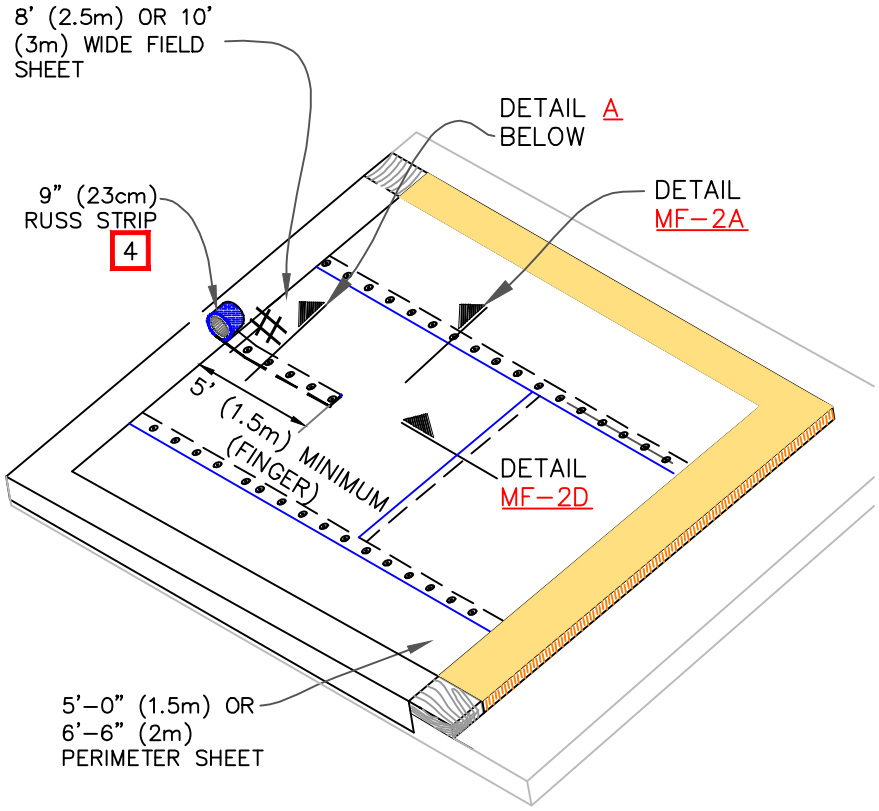
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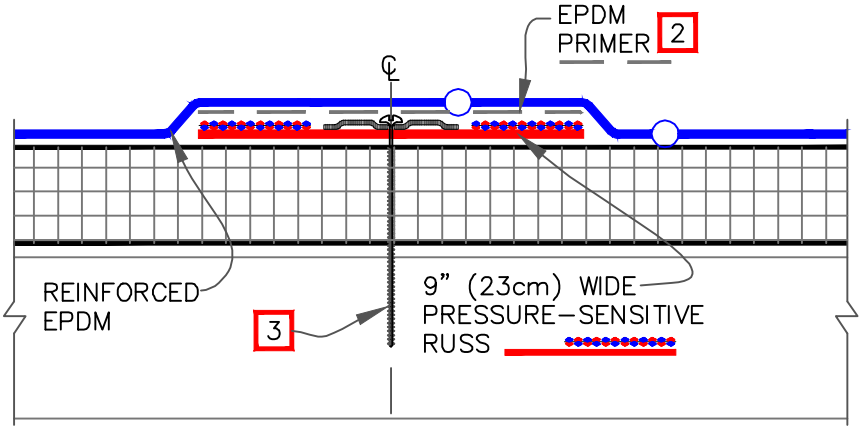
LARGE OPENINGS OR LOADING DOCKS



4 PERIMETER SHEETS CENTERED OVER LARGE OPENINGS

4





DETAIL A

NOTES:

1. REFER TO CARLISLE SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
2. EPDM PRIMER MUST BE APPLIED TO THE BACK SIDE OF MEMBRANE SURFACE PRIOR TO ADHERING MEMBRANE TO PRESSURE-SENSITIVE RUSS.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
4. RUSS "FINGER" MUST EXTEND THE WIDTH OF THE REQUIRED PERIMETER.

RUSS (REINFORCED UNIVERSAL SECUREMENT STRIP)

CARLISLE SYNTEC SYSTEMS

MECHANICALLY FASTENED EPDM SECUREMENT – OPTION 3 (RUSS)

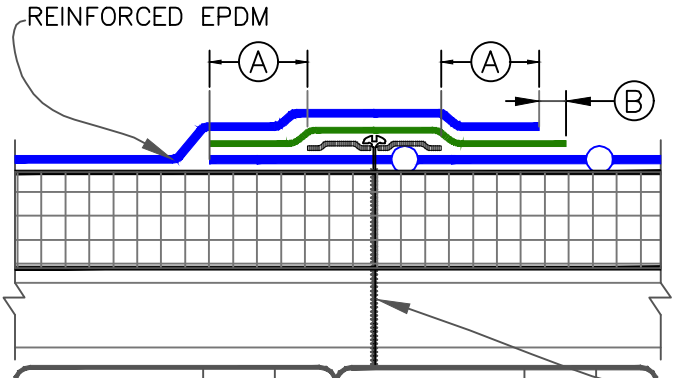
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. MF-2.3

MECHANICALLY FASTENED

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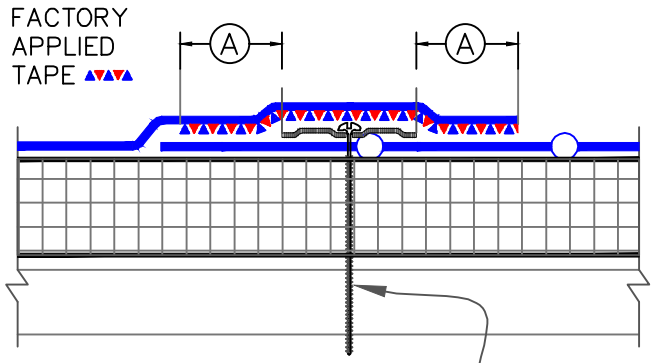
6" (15cm) WIDE SecurTAPE SPLICE



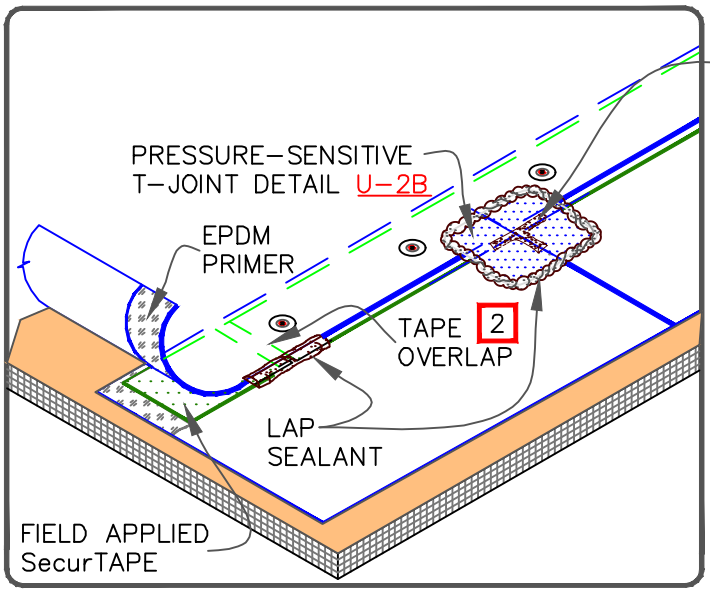
DIMENSIONS		cm	
A	2"	5	

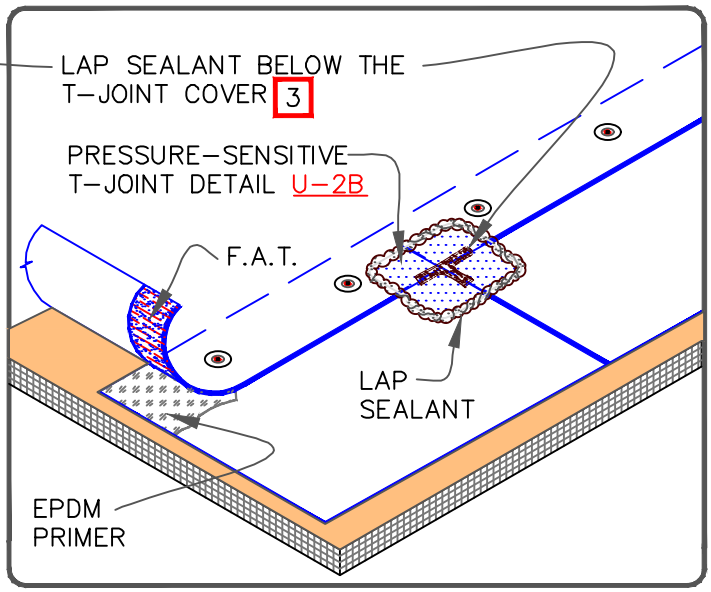
DIMENSIONS		cm	
B	1/8"	0.5	TO
	1/2"	1.5	

6" (15cm) WIDE FACTORY APPLIED TAPE



SEAM PLATE & FASTENER POSITIONED OVER PRE-PRINTED BLUE MARKS. FASTEN MAX. 12" (30cm) O.C. [1]





F.A.T. (FACTORY APPLIED SecurTAPE)

NOTES:

1. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
2. OVERLAP THE ENDS OF FIELD APPLIED SecurTAPE A MINIMUM OF 1" (2.5cm). APPLY LAP SEALANT AT TAPE OVERLAPS 2" (5cm) IN EACH DIRECTION AS SHOWN.
3. APPLY LAP SEALANT ALONG THE LEADING EDGE OF THE MEMBRANE SPLICE UNDER THE 6" (15cm) T-JOINT COVER, COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN ALL DIRECTIONS FROM THE SPLICE INTERSECTION.
4. END LAPS SHALL BE SPLICED USING 3" (7.5cm) WIDE SecurTAPE. REFER TO DETAIL MF-2B.
5. LAP SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED EPDM MEMBRANE.

CARLISLE SYNTEC SYSTEMS

MECHANICALLY FASTENED EPDM MEMBRANE SPLICE

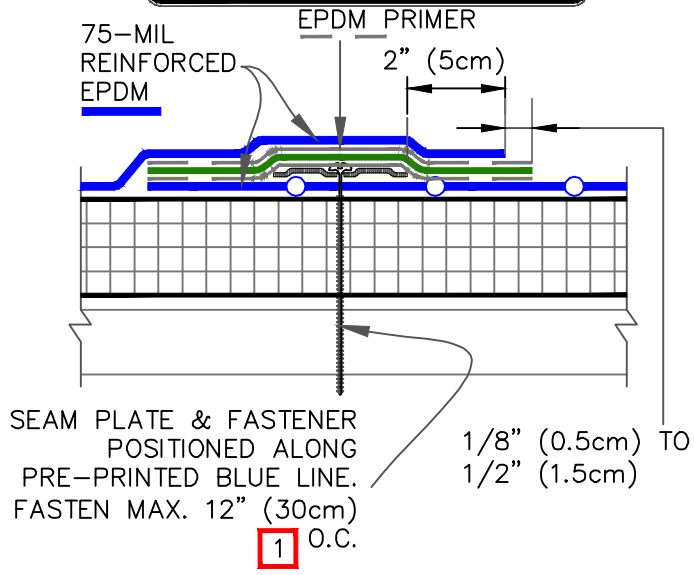
MAXIMUM WARRANTY: 25 YEARS

DETAIL NO. MF-2A

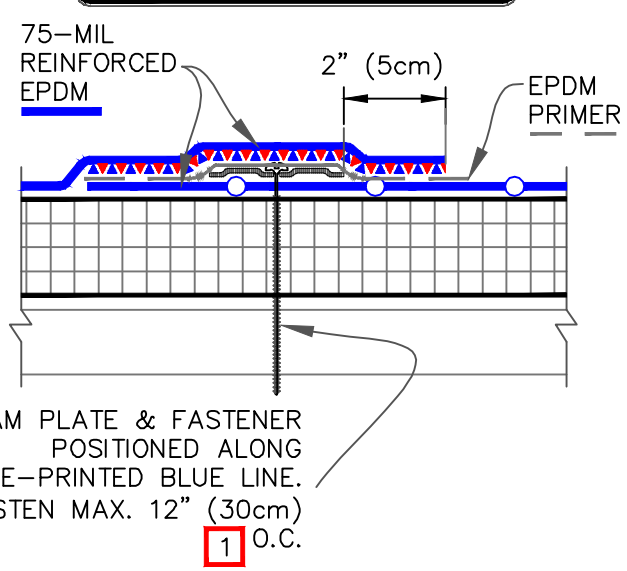
MECHANICALLY FASTENED

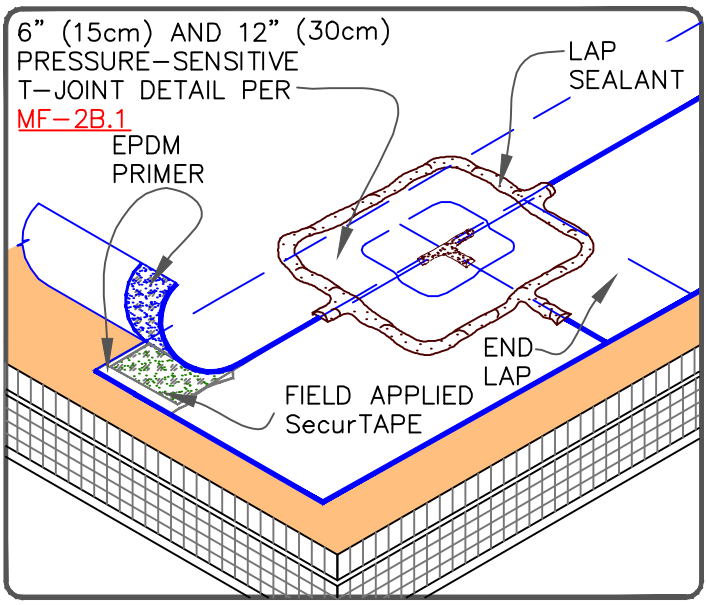
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FIELD APPLIED SecurTAPE

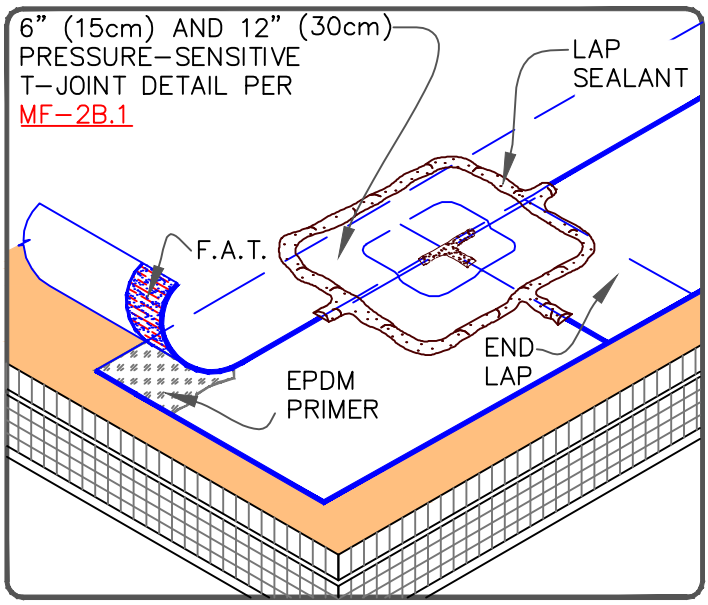


FACTORY APPLIED SecurTAPE





FIELD APPLIED SecurTAPE



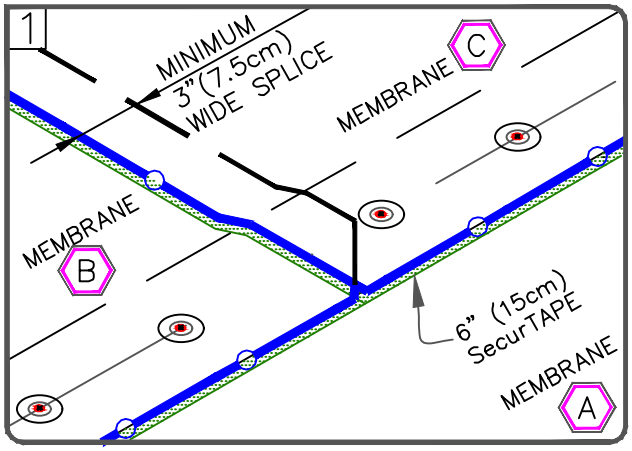
F.A.T. (FACTORY APPLIED SecurTAPE)

NOTES:

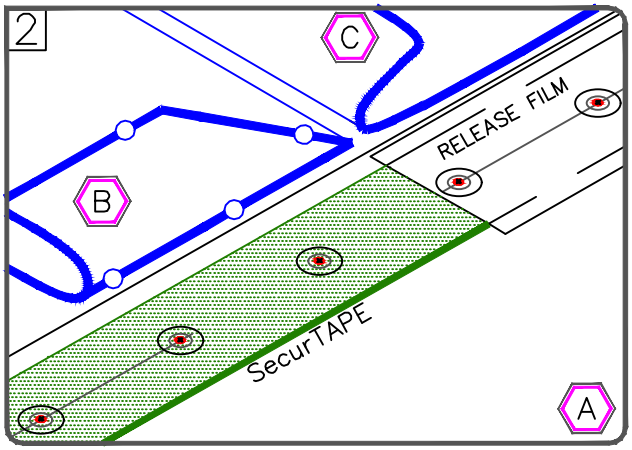
1. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
2. END LAPS SHALL BE SPLICED USING 6" (15cm) WIDE SecurTAPE. REFER TO DETAIL U–2A.1.
3. OVERLAP THE ENDS OF FIELD APPLIED SecurTAPE A MINIMUM OF 1" (2.5cm). APPLY LAP SEALANT AT TAPE OVERLAPS 2" (5cm) IN ALL DIRECTIONS.
4. LAP SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED EPDM MEMBRANE.

CARLISLE SYNTEC SYSTEMS	MECHANICALLY FASTENED EPDM MEMBRANE SPLICE MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. MF–2A.1 MECHANICALLY FASTENED

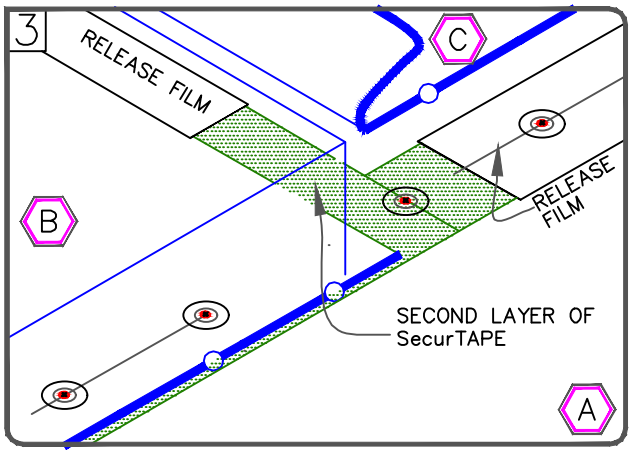
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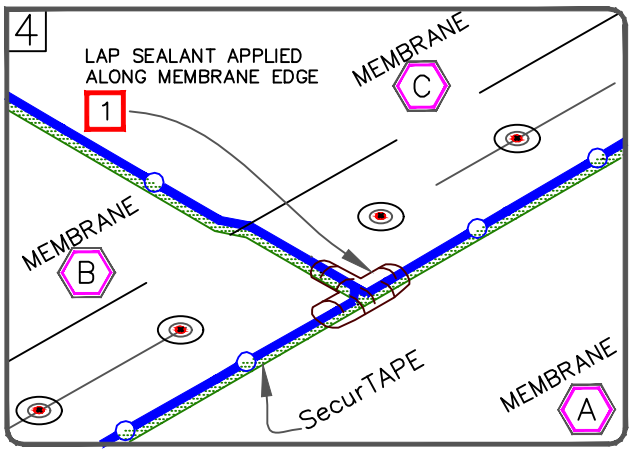
POSITION MEMBRANE TO ALLOW AN APPROXIMATE 7" (17.5cm) OVERLAP ALONG THE LENGTH OF THE MEMBRANE & 4" (10cm) AT END LAPS. THE PRE-MARKED LINE ON THE MEMBRANE EDGE CAN BE USED AS A GUIDE FOR TAPE PLACEMENT.



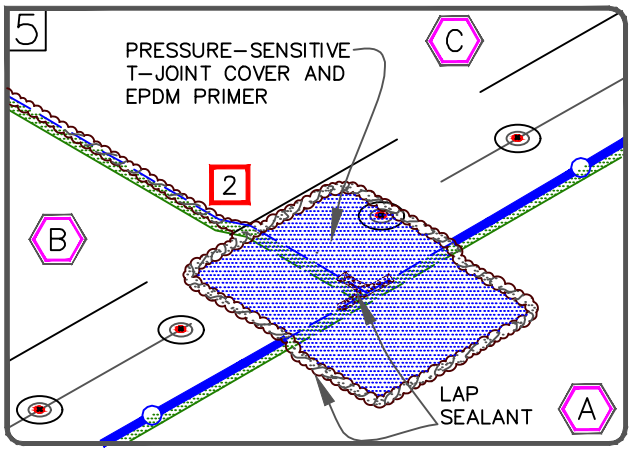
FOLD SHEETS BACK AS SHOWN. APPLY EPDM PRIMER TO THE SPLICE AREA ON BOTH SURFACES AND ALLOW TO FLASH-OFF. APPLY SecurTAPE WITH RELEASE FILM ALIGNED WITH PRE-MARKED LINE.



SPLICE SHEET B TO SHEET A AND APPLY SECOND PIECE OF SecurTAPE BETWEEN SHEET B AND C. TRIM RELEASE FILM AS SHOWN.



SPLICE SHEET C TO SHEET A AND B, PRESS TOP SHEET ONTO BOTTOM SHEET USING HAND PRESSURE TOWARDS THE OUTER EDGE OF THE SPLICE AND ROLL THE SPLICE AREA WITH A 2" (5cm) WIDE STEEL ROLLER.



APPLY PRESSURE-SENSITIVE T-JOINT COVER OR 6" (15cm) WIDE SECTION OF PRESSURE-SENSITIVE ELASTOFORM FLASHING CENTERED OVER THE INTERSECTING POINT OF THE LEADING EDGES OF THE FIELD SPLICE INTERSECTION AS SHOWN.

NOTES:

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

2. APPLY LAP SEALANT AT CUT EDGES OF REINFORCED MEMBRANE AND TAPE OVERLAPS. REFER TO DETAIL MF-2A.

CARLISLE SYNTEC SYSTEMS

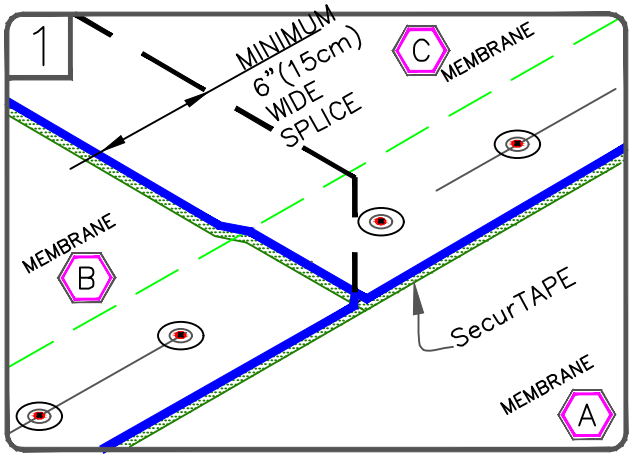
MECHANICALLY FASTENED EPDM MEMBRANE SPLICE INTERSECTION

MAXIMUM WARRANTY: 25 YEARS

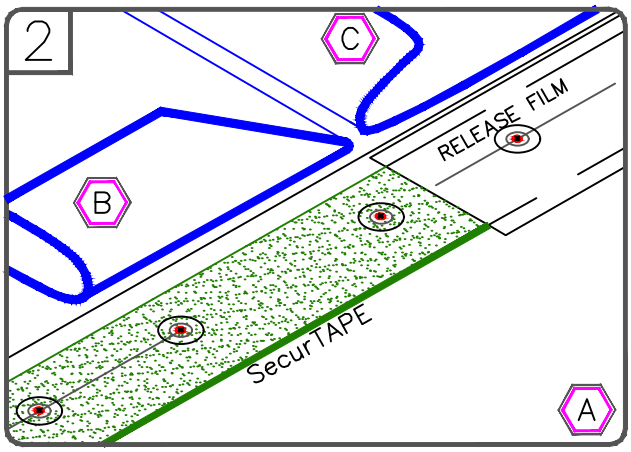
DETAIL NO. MF-2B

MECHANICALLY FASTENED

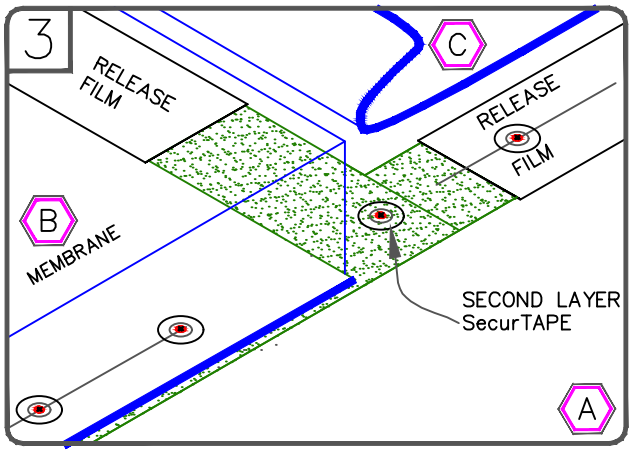
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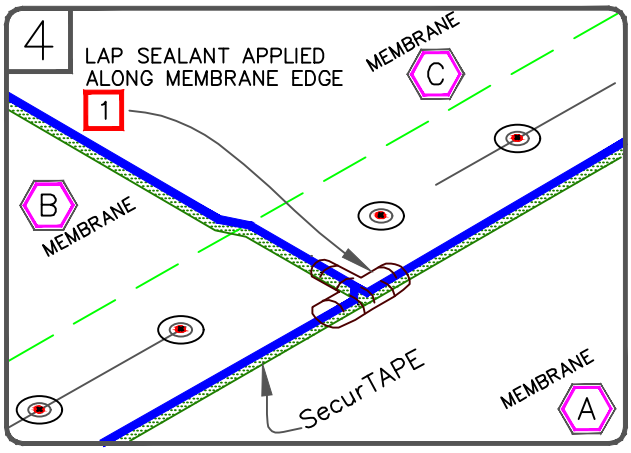
POSITION MEMBRANE TO ALLOW AN APPROXIMATE 7" (17.5cm) OVERLAP. THE PRE-MARKED LINE ON THE MEMBRANE EDGE CAN BE USED AS A GUIDE FOR TAPE PLACEMENT.



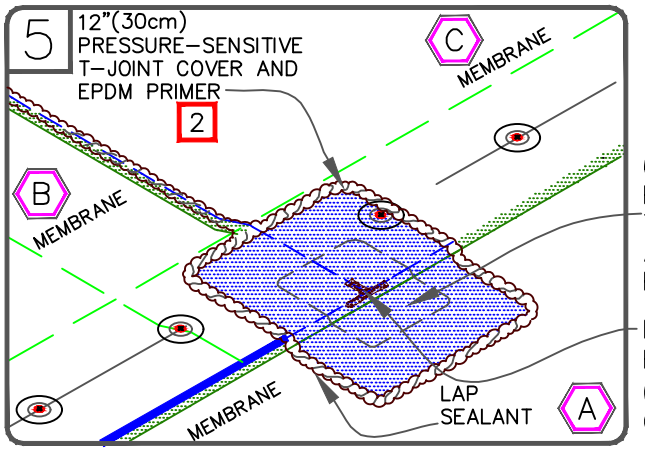
FOLD SHEETS BACK AS SHOWN. APPLY EPDM PRIMER TO THE SPLICE AREA ON BOTH SURFACES AND ALLOW TO FLASH-OFF. APPLY SecurTAPE WITH RELEASE FILM ALIGNED WITH PRE-MARKED LINE.



SPLICE SHEET B TO SHEET A AND APPLY SECOND PIECE OF SecurTAPE BETWEEN SHEET B AND C. TRIM RELEASE FILM AS SHOWN.



SPLICE SHEET C TO SHEET A AND B, PRESS TOP SHEET ONTO BOTTOM SHEET USING HAND PRESSURE TOWARDS THE OUTER EDGE OF THE SPLICE AND ROLL THE SPLICE AREA WITH A 2" (5cm) WIDE STEEL ROLLER.



APPLY 6"(15cm) PRESSURE-SENSITIVE T-JOINT COVER AND 12"(30cm) PRESSURE-SENSITIVE T-JOINT COVER OR PRESSURE-SENSITIVE ELASTOFORM CENTERED OVER THE INTERSECTING POINT OF THE LEADING EDGES OF THE FIELD SPLICE INTERSECTION AS SHOWN.

6"(15cm) PRESSURE-SENSITIVE T-JOINT COVER AND EPDM PRIMER

LAP SEALANT BELOW THE 6" (15cm) T-JOINT COVER 1

NOTES:

1. APPLY LAP SEALANT ALONG THE EDGES OF THE MEMBRANE SPLICE COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.
2. APPLY LAP SEALANT AT CUT EDGES OF REINFORCED MEMBRANE AND TAPE OVER LAPS.

CARLISLE SYNTEC SYSTEMS

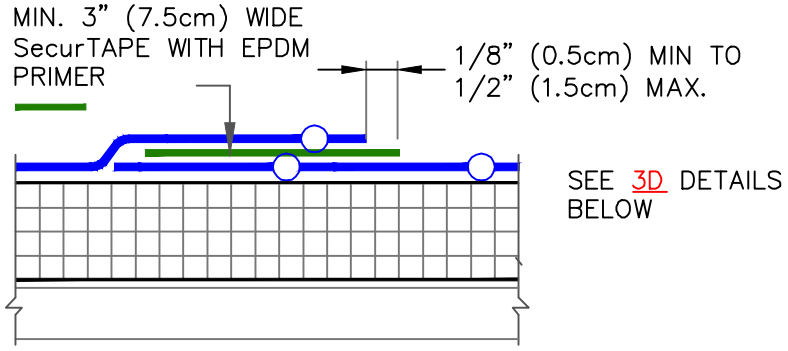
MECHANICALLY FASTENED EPDM MEMBRANE SPLICE INTERSECTION

MAXIMUM WARRANTY: 30 YEARS

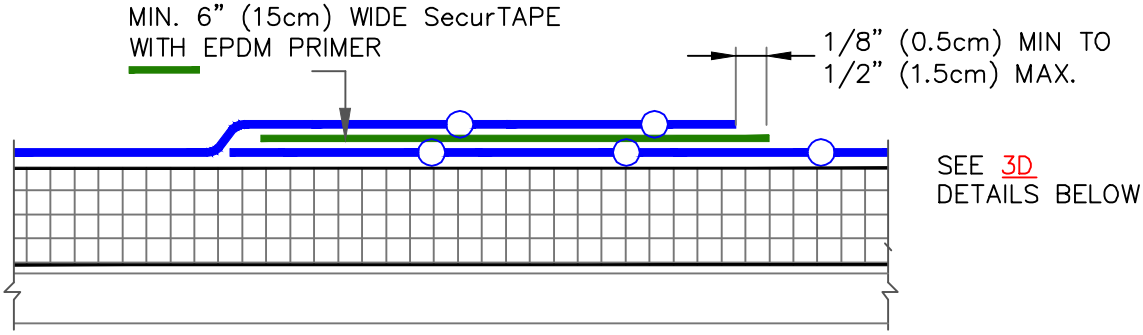
DETAIL NO. MF-2B.1

MECHANICALLY FASTENED

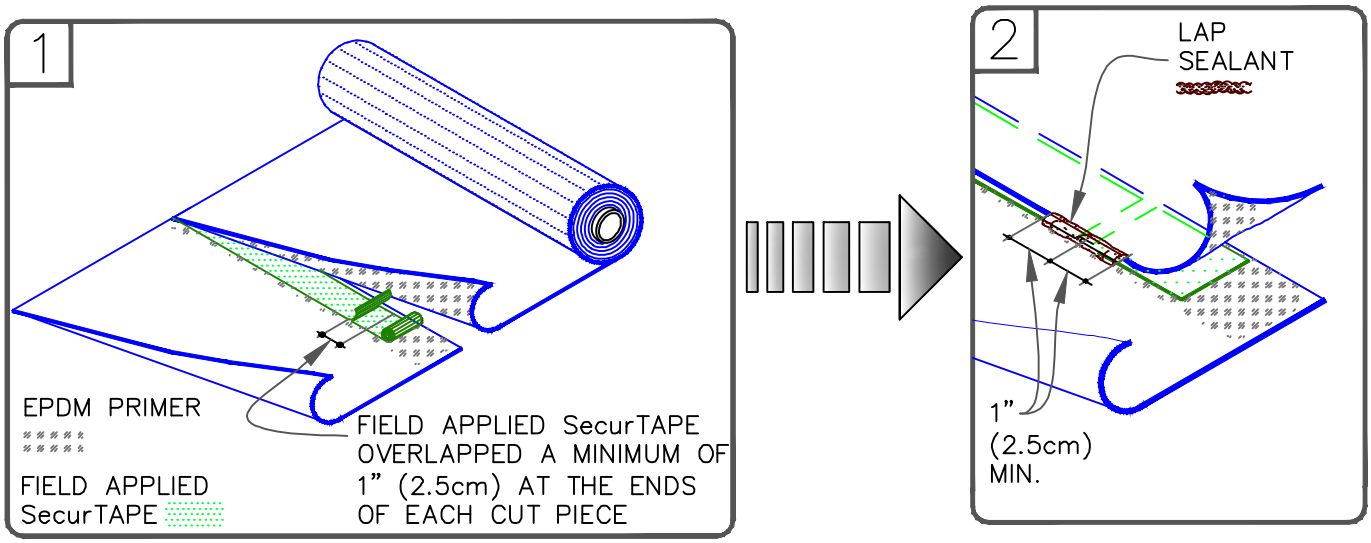
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A UP TO 25-YEAR WARRANTY



B UP TO 30-YEAR WARRANTY

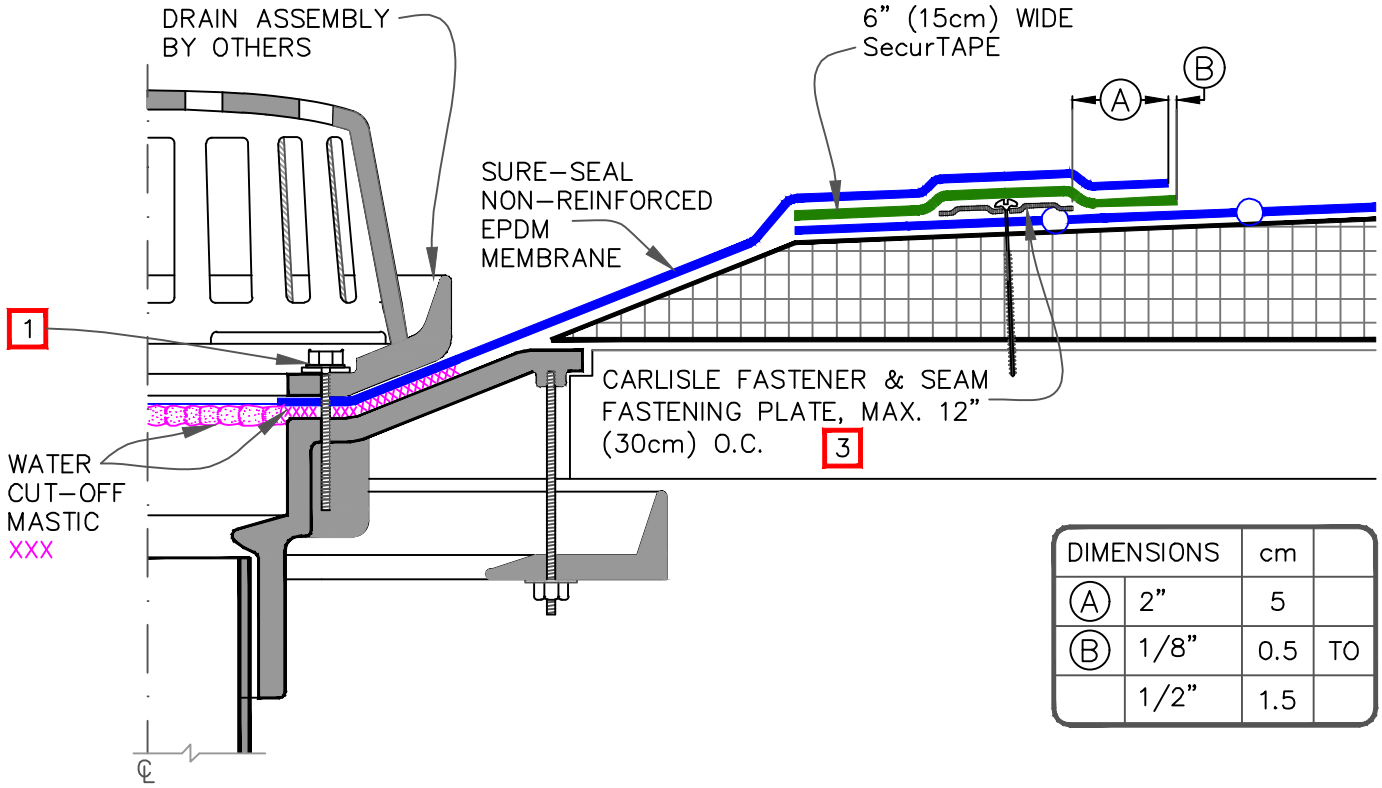


NOTES:

1. APPLY EPDM PRIMER TO THE MEMBRANE SURFACES PRIOR TO INSTALLING PRESSURE-SENSITIVE FLASHING.
2. LAP SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED EPDM MEMBRANE.

CARLISLE SYNTEC SYSTEMS	END LAP SPLICE		DETAIL NO. MF-2D
	MAXIMUM WARRANTY: 30 YEARS		MECHANICALLY FASTENED

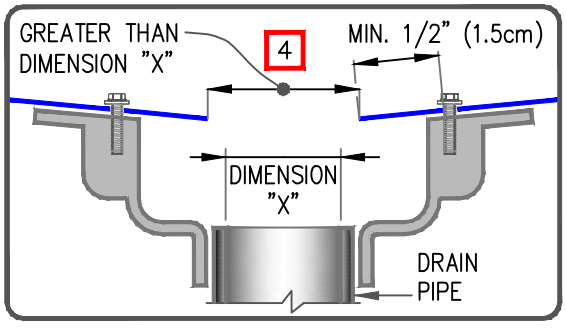
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DIMENSIONS		cm	
A	2"	5	
B	1/8"	0.5	TO
	1/2"	1.5	

NOTES:

1. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
2. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
4. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
5. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.



CARLISLE SYNTEC SYSTEMS

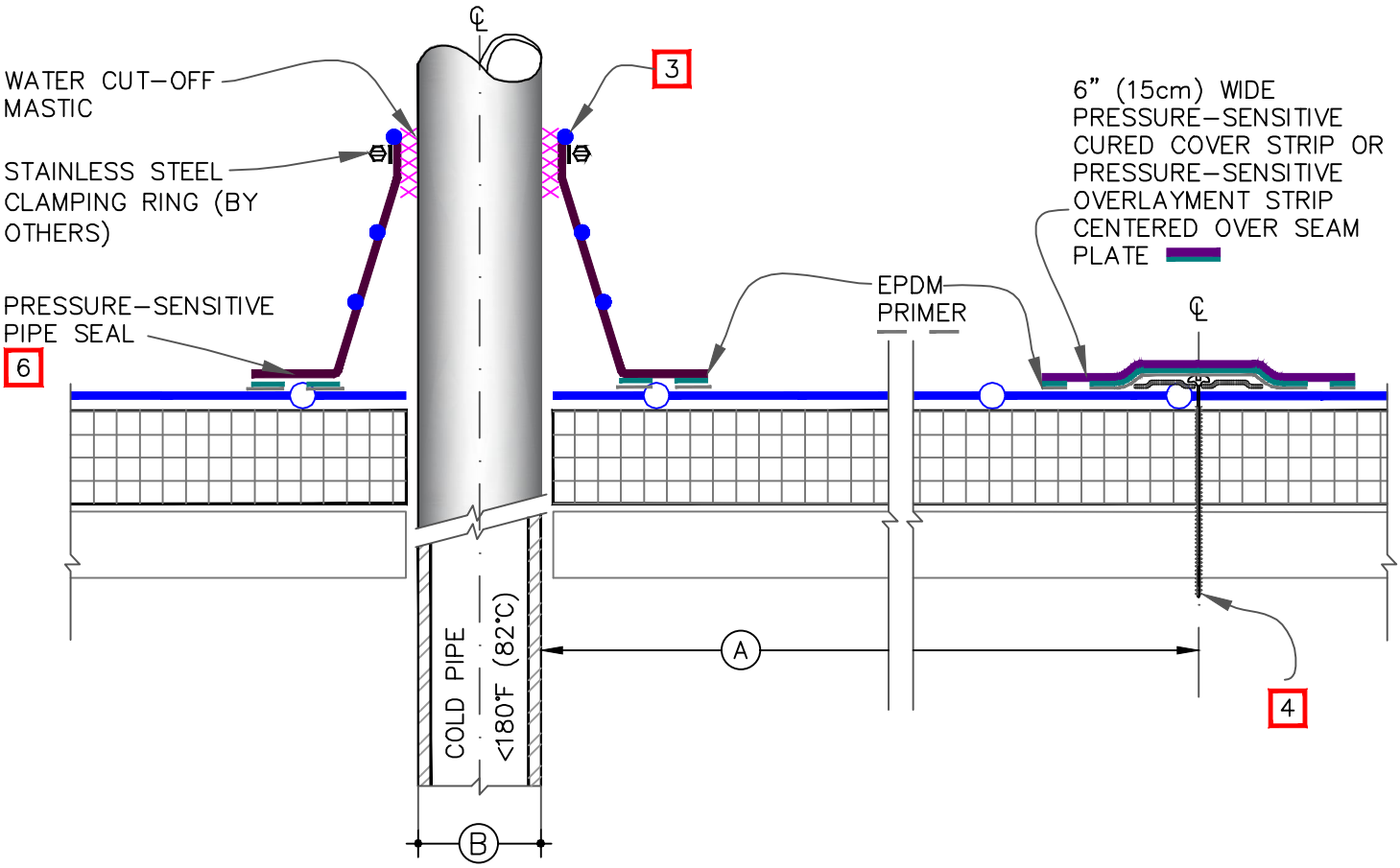
ROOF DRAIN WITH SUMP GREATER THAN 3" PER FOOT

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. MF-6B

MECHANICALLY FASTENED

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING PIPE SEAL.
2. TEMPERATURE OF PIPE MUST NOT EXCEED 180°F (82°C).
3. PRE-MOLDED PIPE SEAL MUST HAVE RIB INTACT AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
4. INSTALL A MINIMUM OF 4 SEAM PLATES FOR PIPES WITH A DIAMETER UP TO 6" (15cm). ADDITIONAL SEAM PLATES WILL BE REQUIRED FOR PIPES GREATER THAN 6" (15cm) IN DIAMETER AND SHALL BE SPACED 12" (30cm) ON CENTER MAXIMUM.
5. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
6. DECK FLANGES OF THE PRESSURE-SENSITIVE PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.

DIMENSIONS		cm	
A	6"	15	TO
	12"	30	
B	1/2"	1.5	TO
	6"	15	

CARLISLE SYNTEC SYSTEMS

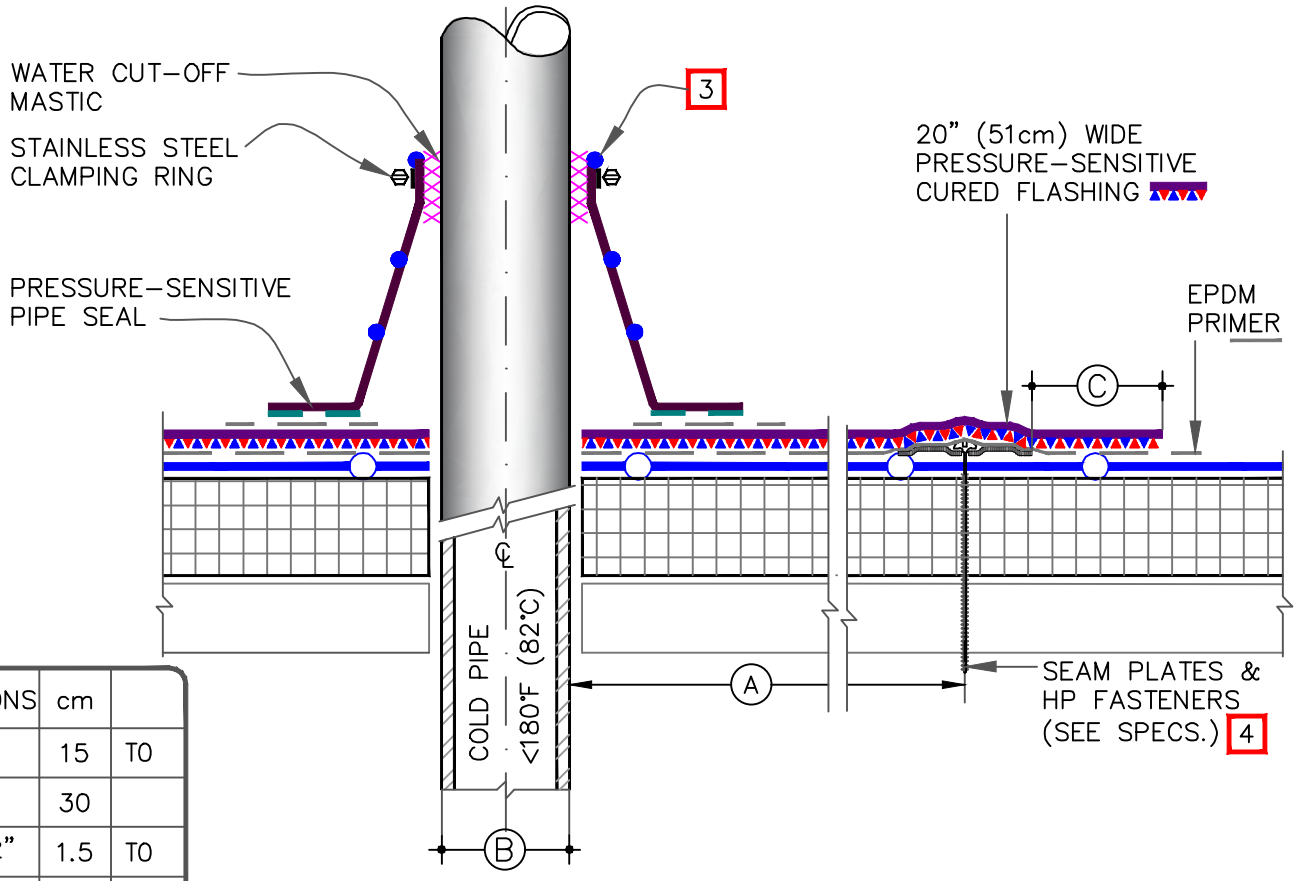
PRESSURE-SENSITIVE PIPE SEAL

MAXIMUM WARRANTY: 25 YEARS

DETAIL NO. MF-8A

MECHANICALLY FASTENED

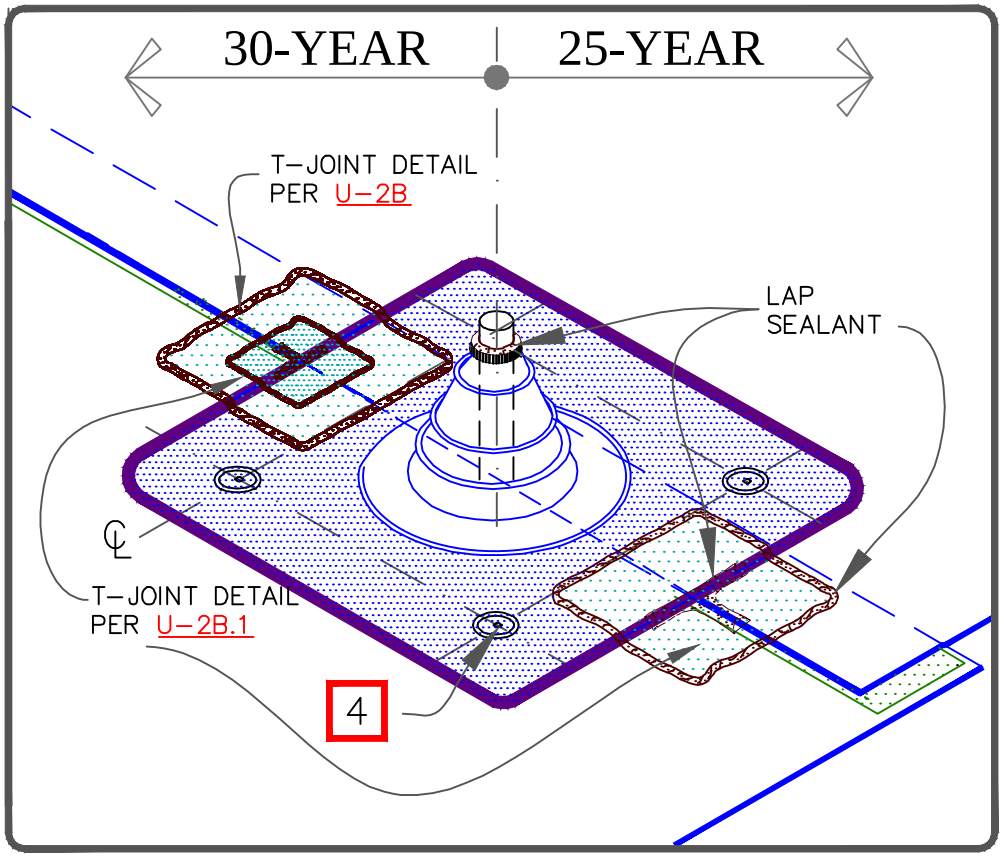
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DIMENSIONS		cm	
Ⓐ	6"	15	TO
	12"	30	
Ⓑ	1/2"	1.5	TO
	6"	15	
Ⓒ	2"	5	

NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING PIPE SEAL.
2. TEMPERATURE OF PIPE MUST NOT EXCEED 180°F (82°C).
3. PRE-MOLDED PIPE SEAL MUST HAVE RIB INTACT AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
4. INSTALL A MIN. OF 4 FASTENERS FOR PIPES WITH OUTSIDE DIAMETER <6" (15cm). SEE DETAIL MF-8B OR MF-8B.1 FOR WIDER PIPES.
5. DECK FLANGES OF THE PRESSURE-SENSITIVE PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.



CARLISLE SYNTEC SYSTEMS

PRESSURE-SENSITIVE PIPE SEAL WITH 20" PRESSURE-SENSITIVE CURED FLASHING

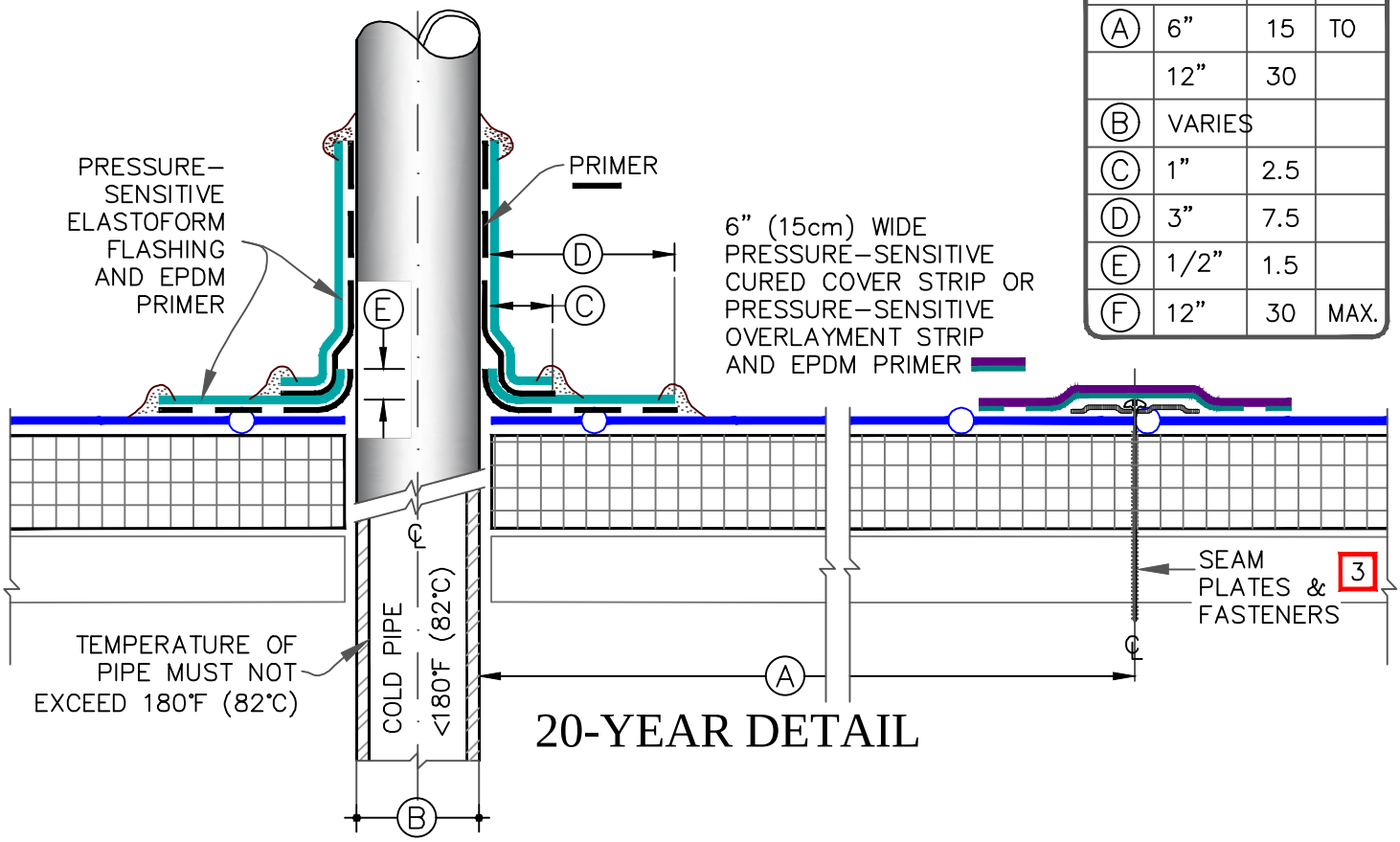
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. MF-8A.1

MECHANICALLY FASTENED

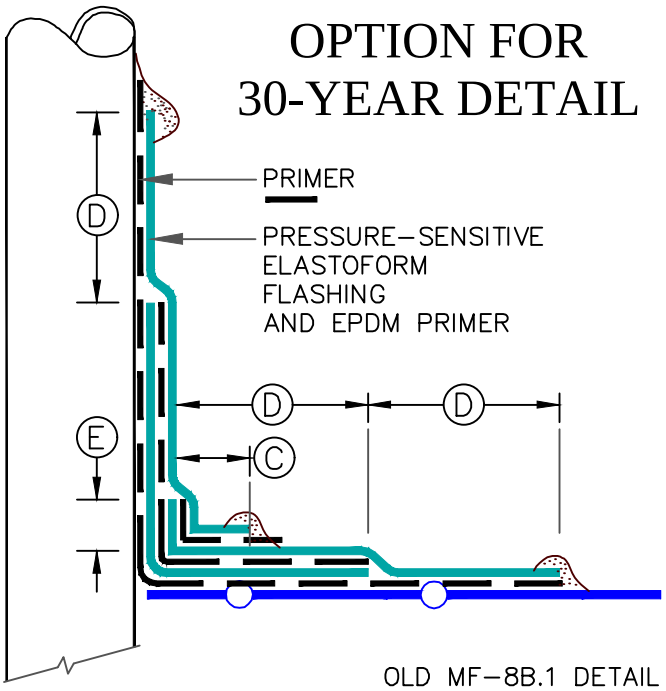
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DIMENSIONS		cm	
A	6"	15	TO
	12"	30	
B	VARIES		
C	1"	2.5	
D	3"	7.5	
E	1/2"	1.5	
F	12"	30	MAX.



20-YEAR DETAIL

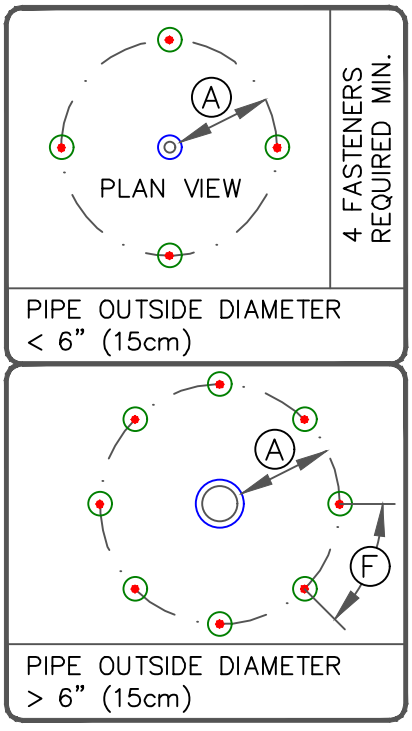
OPTION FOR 30-YEAR DETAIL



OLD MF–8B.1 DETAIL

NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING PRESSURE–SENSITIVE ELASTOFORM FLASHING.
2. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
3. FOR STRUCTURAL STEEL TUBING GREATER THAN 12" ACROSS USE U–5 DETAILS.



CARLISLE SYNTEC SYSTEMS

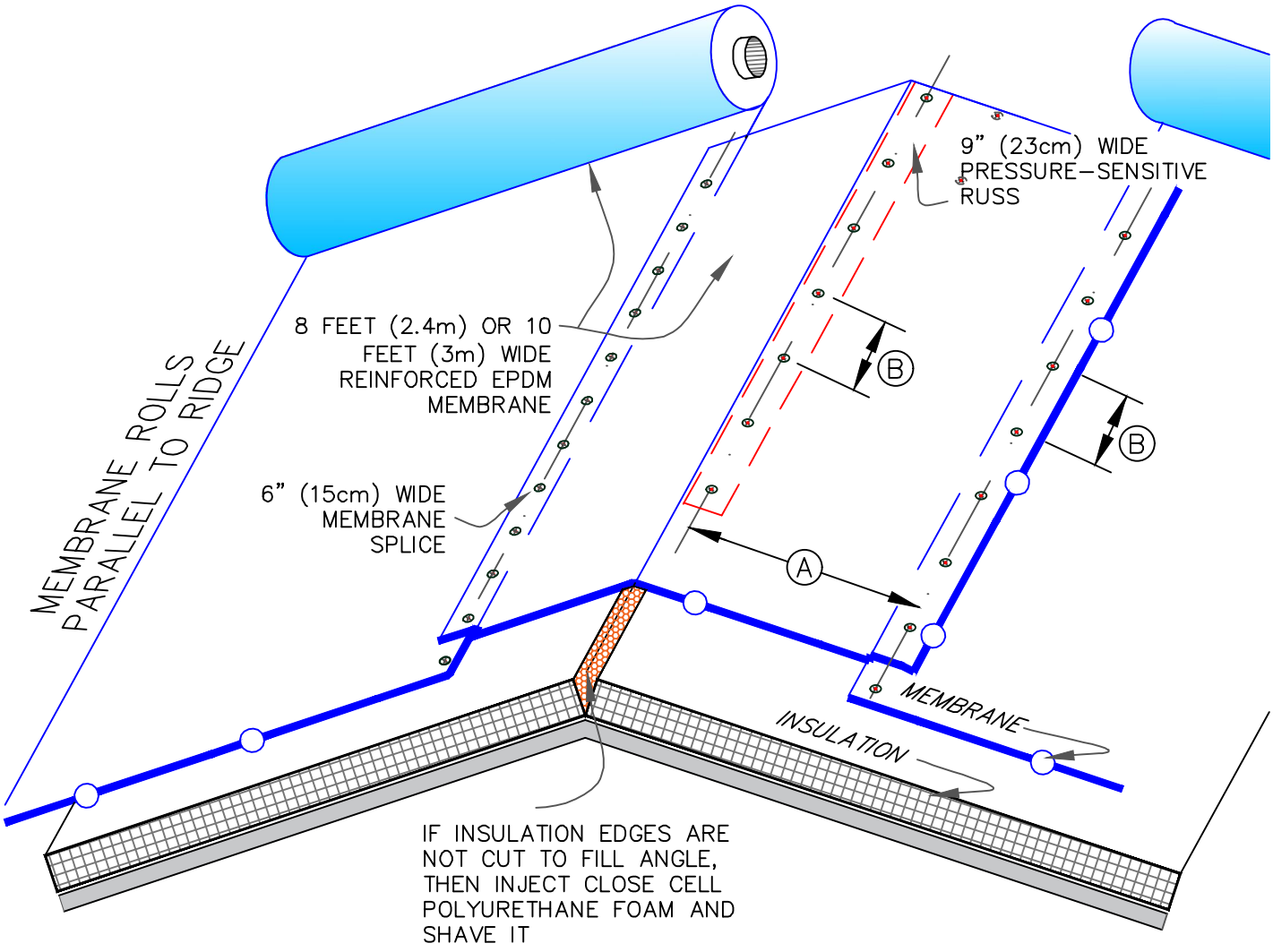
FIELD FABRICATED PIPE WRAP

MAXIMUM WARRANTY: SEE EACH DETAIL

DETAIL NO. MF–8B

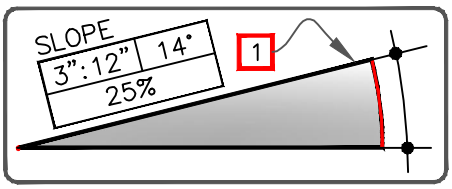
MECHANICALLY FASTENED

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NOTES:

1. RIDGE MEMBRANE ATTACHMENT IS ONLY REQUIRED WHEN ROOF SLOPE EXCEEDS 3" TO THE HORIZONTAL FOOT (7.5cm/30cm).
2. REINFORCED EPDM MEMBRANE SHALL BE INSTALLED PARALLEL WITH RIDGE LINE (WITH MEMBRANE CENTERED OVER THE RIDGE LINE) AS SHOWN.
3. FOR PROPER MEMBRANE ATTACHMENT AND SPLICING, REFER TO APPLICABLE MF-2 DETAIL.
4. REFER TO CARLISLE SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
5. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
6. AS AN OPTION, 9" (23cm) WIDE PRESSURE-SENSITIVE RUSS MAY BE USED BENEATH EPDM FIELD SHEETS FOR PERIMETER SECUREMENT.



DIMENSIONS		cm	
A	3'-6"	110	MIN.
	4'-6"	140	MAX.
B	12"O.C.	30	MAX.

CARLISLE SYNTEC SYSTEMS

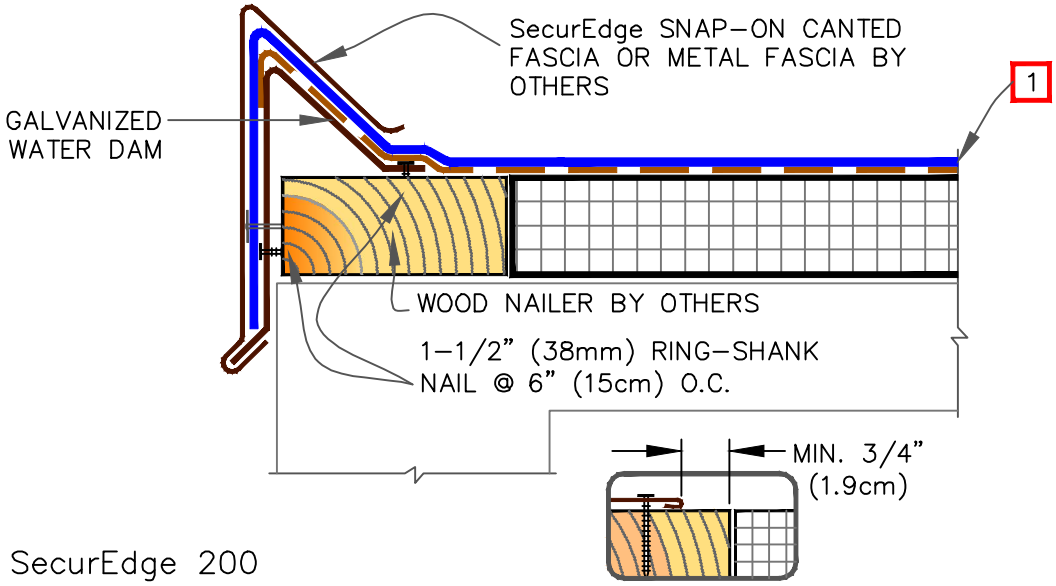
RIDGE MEMBRANE ATTACHMENT

MAXIMUM WARRANTY: 30 YEARS

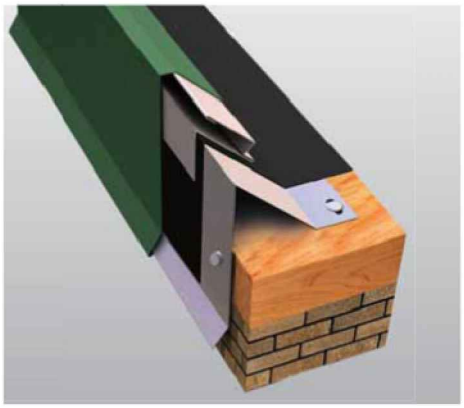
DETAIL NO. MF-22

MECHANICALLY FASTENED

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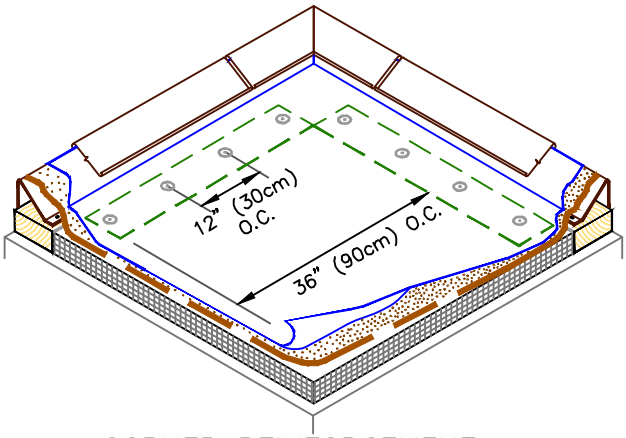
SecurEdge 200



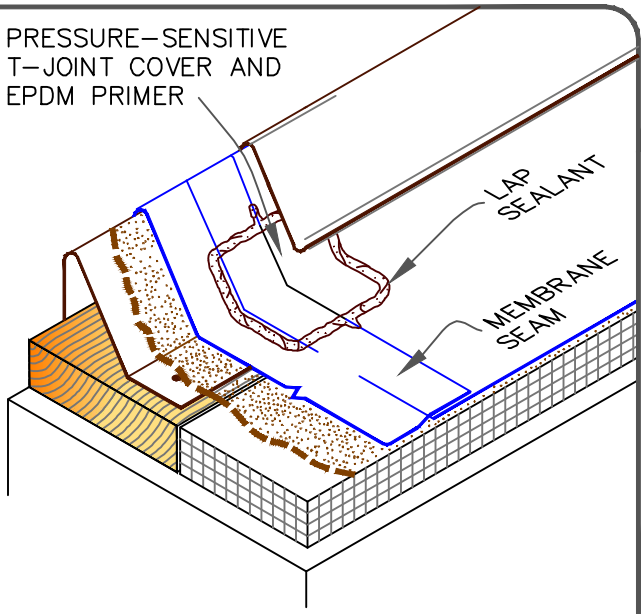
NOTES:

1. MAXIMUM MEMBRANE THICKNESS GOING OVER THE WATER DAM IS 60–MIL. FOR THICKER MEMBRANES, RUN FIELD SHEET UNDER THE WATER DAM AND STRIP–IN WITH MAXIMUM 60–MIL MEMBRANE.
2. USE MF–1A FOR MECHANICALLY FASTENED SYSTEMS AND B–1A FOR BALLASTED SYSTEMS.

AT CORNERS, 6" (15cm) WIDE PRESSURE–SENSITIVE RUSS MUST BE INSTALLED 12" (30cm) MAXIMUM FROM THE BASE OF THE WATER DAM AND EXTEND 36" (90cm) MINIMUM IN EACH DIRECTION.



CORNER REINFORCEMENT



MEMBRANE SEAM AT EDGE

CARLISLE SYNTEC SYSTEMS

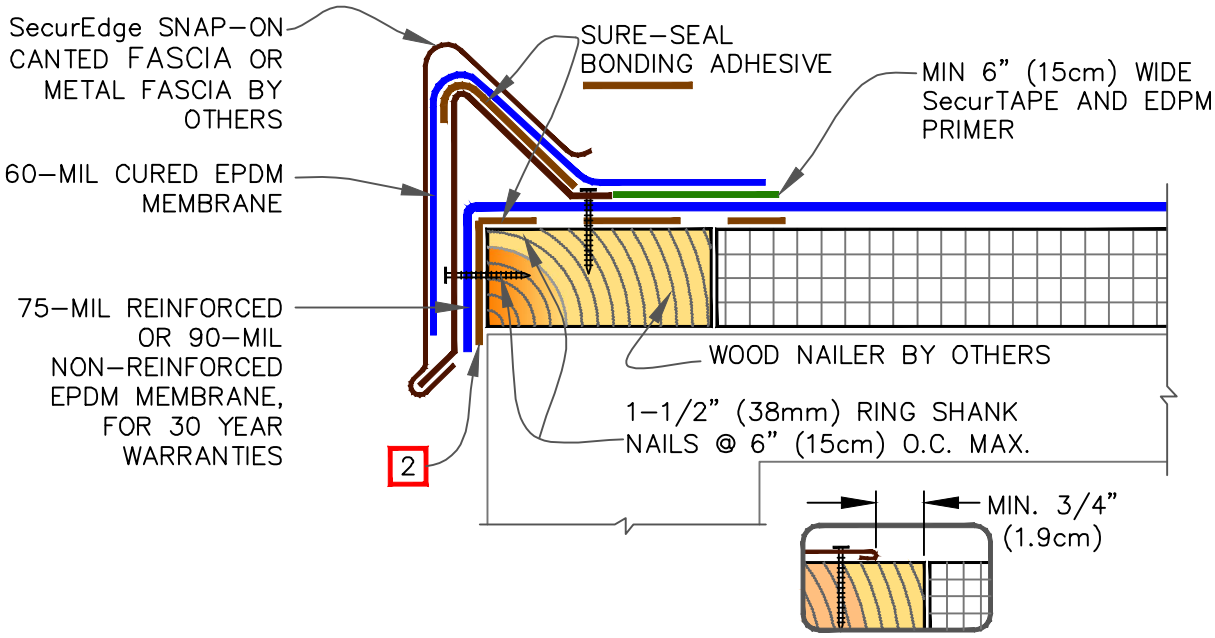
CARLISLE SecurEDGE SNAP–ON CANTED FASCIA

MAXIMUM WARRANTY: 25 YEARS

DETAIL NO. U–1A

U (UNIVERSAL DETAIL)

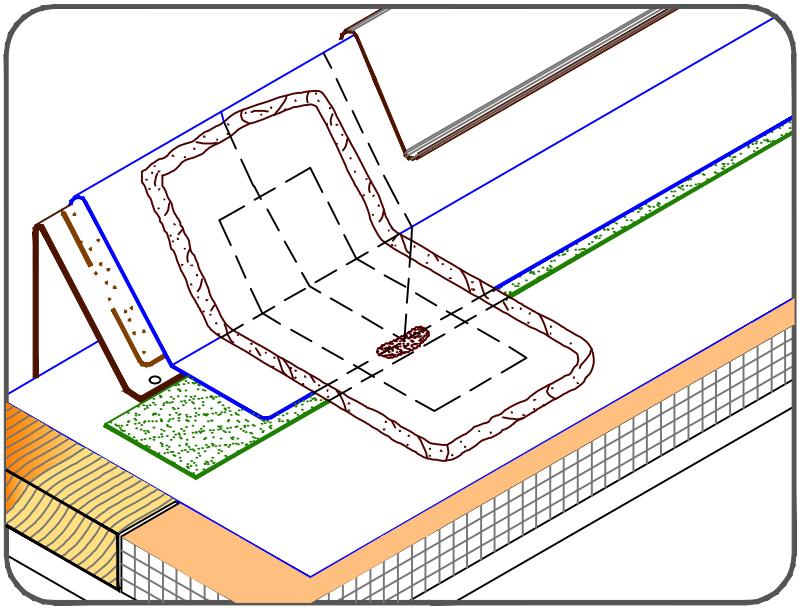
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NOTES:

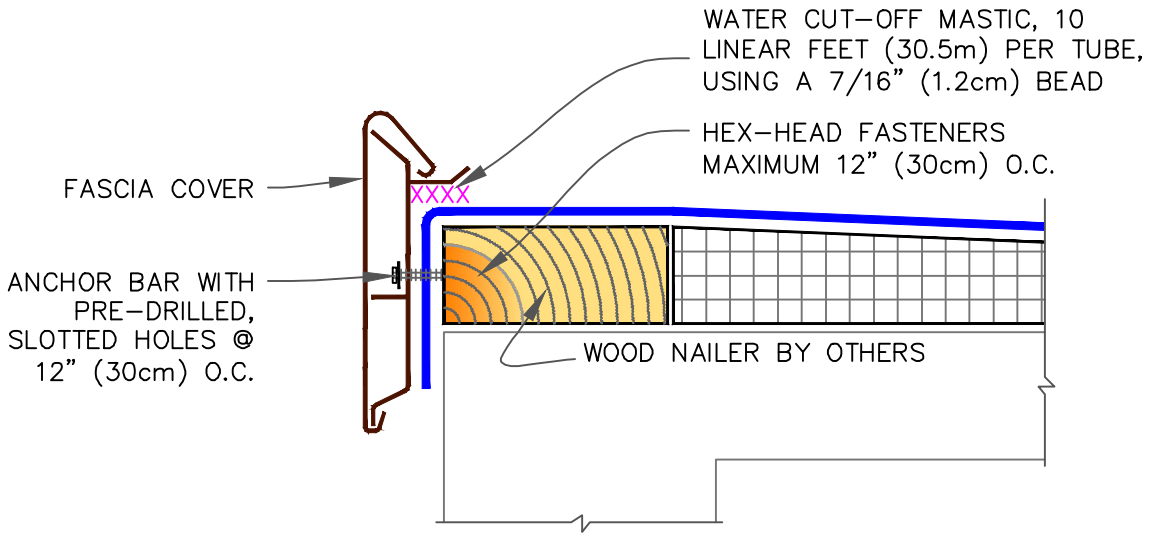
1. FIELD SPLICES AT THE ANGLE CHANGE SHALL BE OVERLAID WITH EPDM PRIMER AND TWO LAYERS OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. PER DETAIL U–2C.

2. WHEN AND AIR/VAPOR BARRIER IS NOT SPECIFIED, THE ROOF MEMBRANE SHALL BE ADHERED OVER PERIMETER WOOD NAILER ALONG EDGES TO PREVENT AIR INFILTRATION ALONG EDGING, REGARDLESS OF ASSEMBLY TYPE (BALLASTED, ADHERED AND MECHANICALLY FASTENED).



CARLISLE SYNTEC SYSTEMS	CARLISLE SecurEdge SNAP–ON CANTED FASCIA	EPDM	DETAIL NO. U–1A.1
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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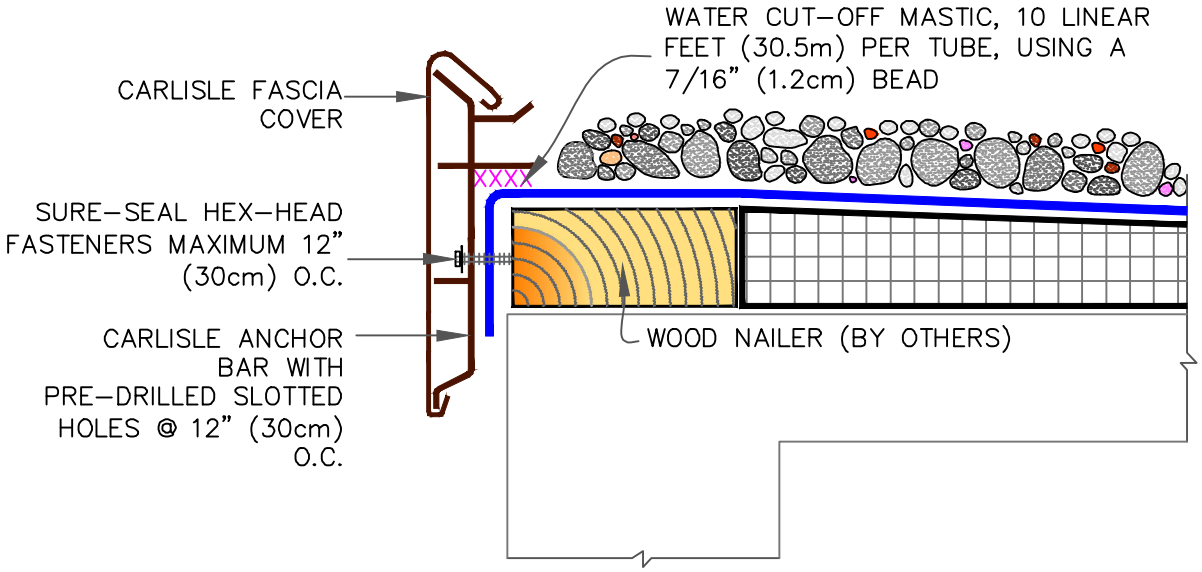
SecurEdge EX SNAP-ON FASCIA

SecurEdge SNAP-ON FASCIA

NOTES:

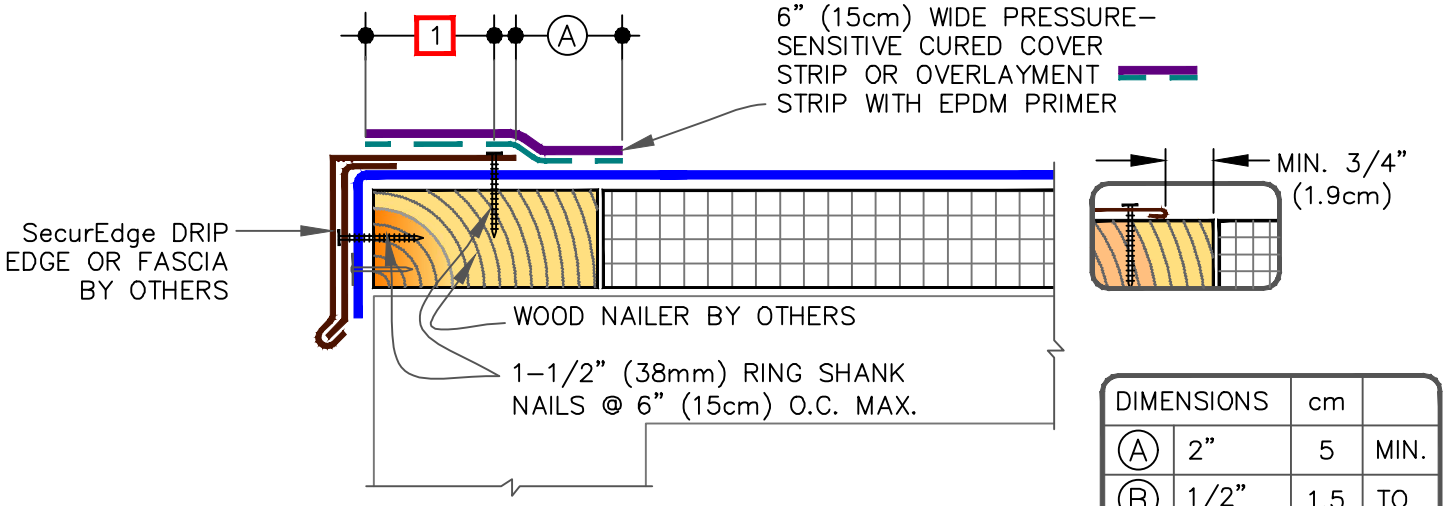
1. IF INCIDENTAL/TEMPORARY PONDED WATER IS EXPECTED, THE SecurEdge MUST BE ELEVATED AND SCUPPERS PROVIDED FOR DRAINAGE.

2. ENSURE ROOF SLOPES AWAY FROM SecurEDGE.



CARLISLE SYNTEC SYSTEMS	CARLISLE SecurEdge EX SNAP-ON FASCIA & SecurEdge SNAP-ON FASCIA	EPDM	DETAIL NO. U-1C
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

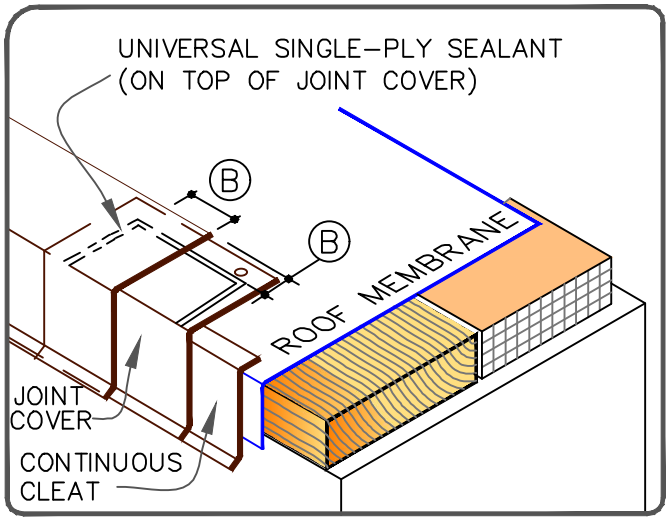
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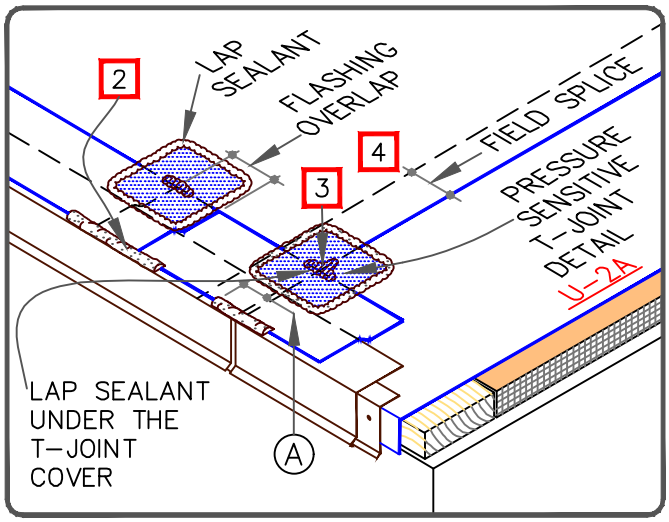


DIMENSIONS		cm	
A	2"	5	MIN.
B	1/2"	1.5	TO
	1"	2.5	

NOTES:

1. DECK FLANGE MUST BE TOTALLY COVERED WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
2. LAP SEALANT MUST BE APPLIED AT FLASHING OVERLAPS AND INTERSECTIONS WITH JOINTS IN METAL EDGING.
3. T-JOINT COVER NOT NEEDED WHEN USING PS OVERLAYMENT STRIP ON MEMBRANE LESS THAN 90-MIL.
4. WHEN USING 90-MIL MEMBRANE INSTALL A 12" (30cm) T-JOINT COVER OVER THE 6" (15cm) T-JOINT COVER PER U-2B.1
5. DETAIL NOT FOR USE WITH DESIGN "B" (BALLASTED STONE ASSEMBLY).

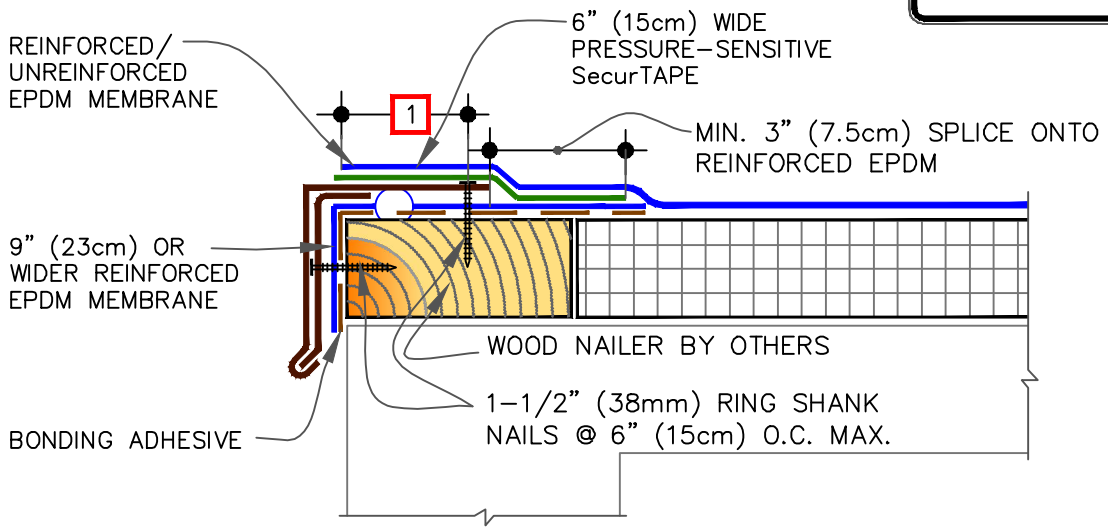




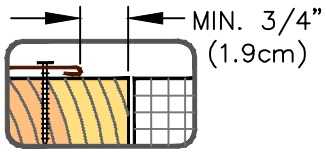
CARLISLE SYNTEC SYSTEMS	SecurEdge DRIP EDGE	DETAIL NO. U-1D
	MAXIMUM WARRANTY: 25 YEARS	U (UNIVERSAL DETAIL)

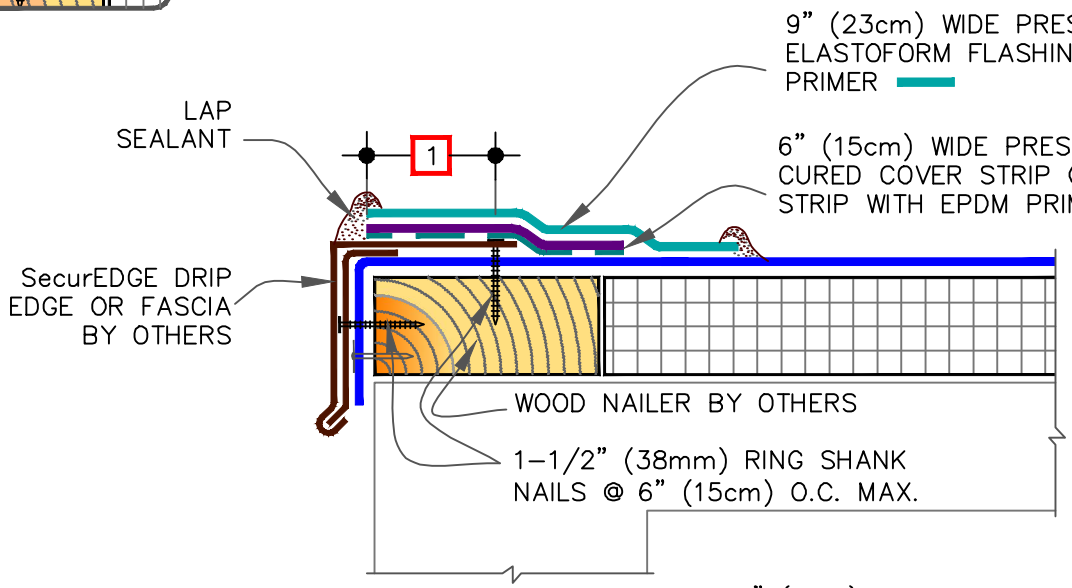
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OPTION 1



OPTION 2





NOTES:

1. DECK FLANGE MUST BE TOTALLY COVERED WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.

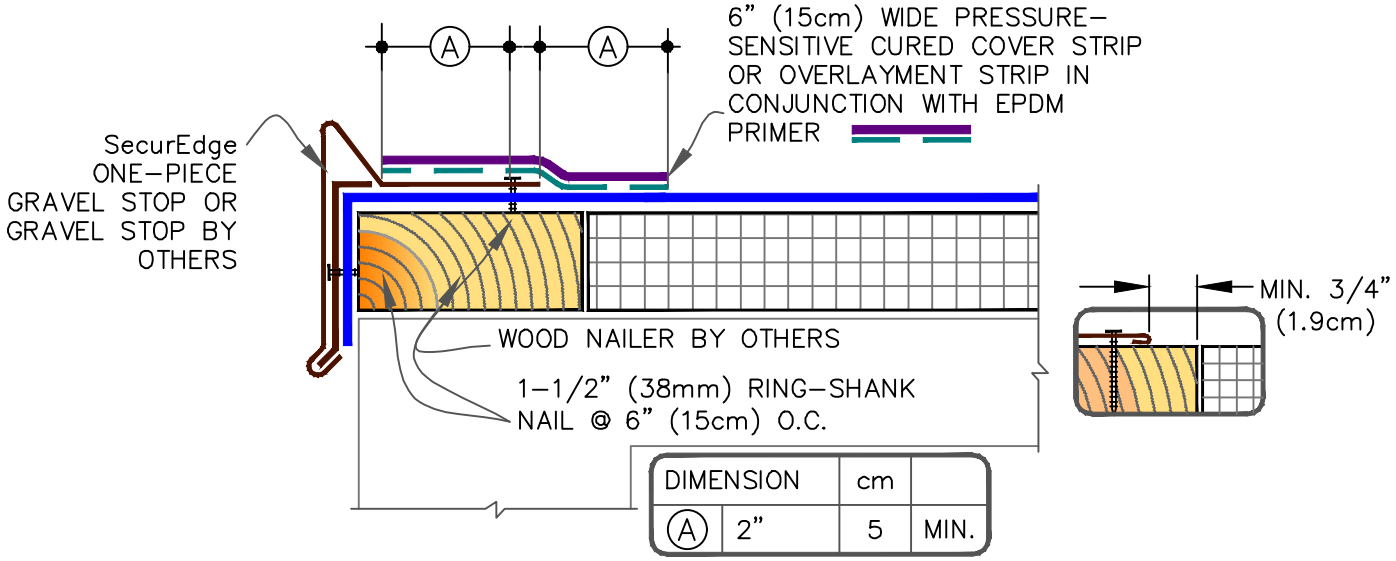
2. LAP SEALANT MUST BE APPLIED AT FLASHING OVERLAPS AND INTERSECTIONS WITH JOINTS IN METAL EDGING.

3. ALL SPLICE INTERSECTIONS MUST BE OVERLAID WITH PRESSURE-SENSITIVE T-JOINT COVERS AND SEALED WITH CONTINUOUS LAP SEALANT. PRIOR TO DOING SO, APPLY LAP SEALANT ALONG THE LEADING EDGE OF THE MEMBRANE SPLICES (UNDER THE 6"X 6" (15cm X 15cm) T-JOINT COVER) COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN ALL DIRECTIONS FROM THE SPLICE INTERSECTION.

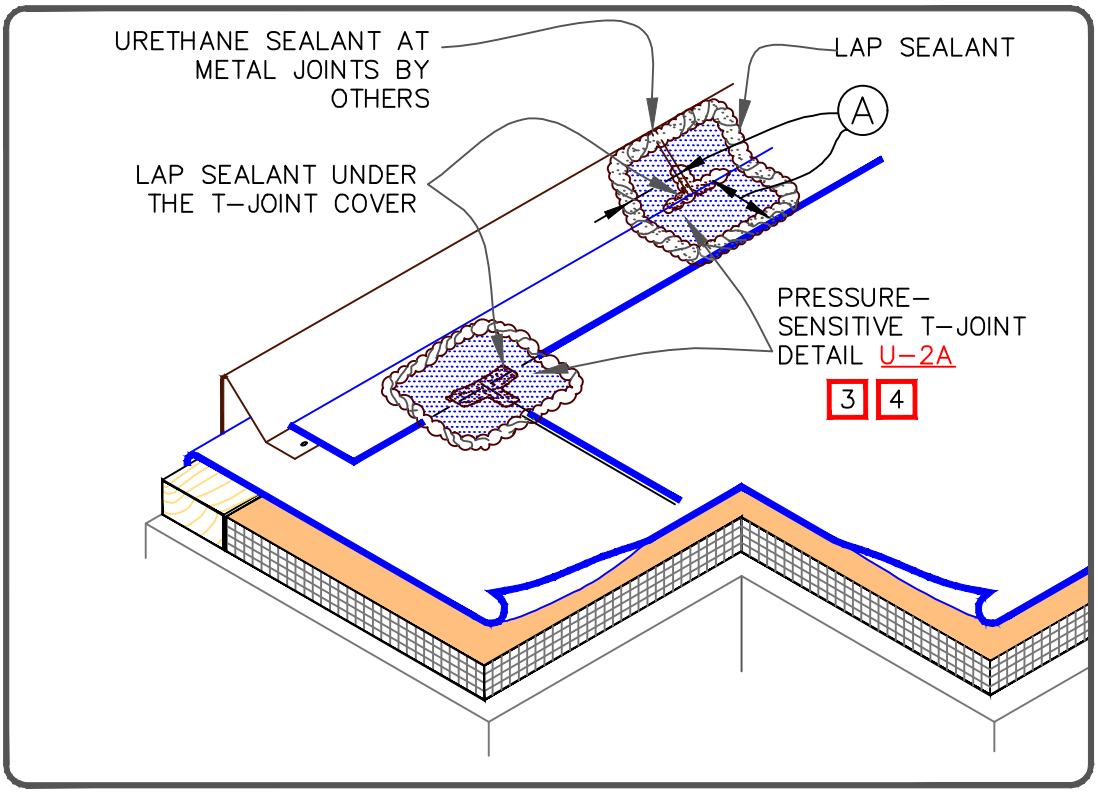
4. DETAIL NOT FOR USE WITH DESIGN "B" (BALLASTED STONE ASSEMBLY).

CARLISLE SYNTEC SYSTEMS	SecurEdge DRIP EDGE	EPDM	DETAIL NO. U-1D.1
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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DIMENSION		cm	
A	2"	5	MIN.

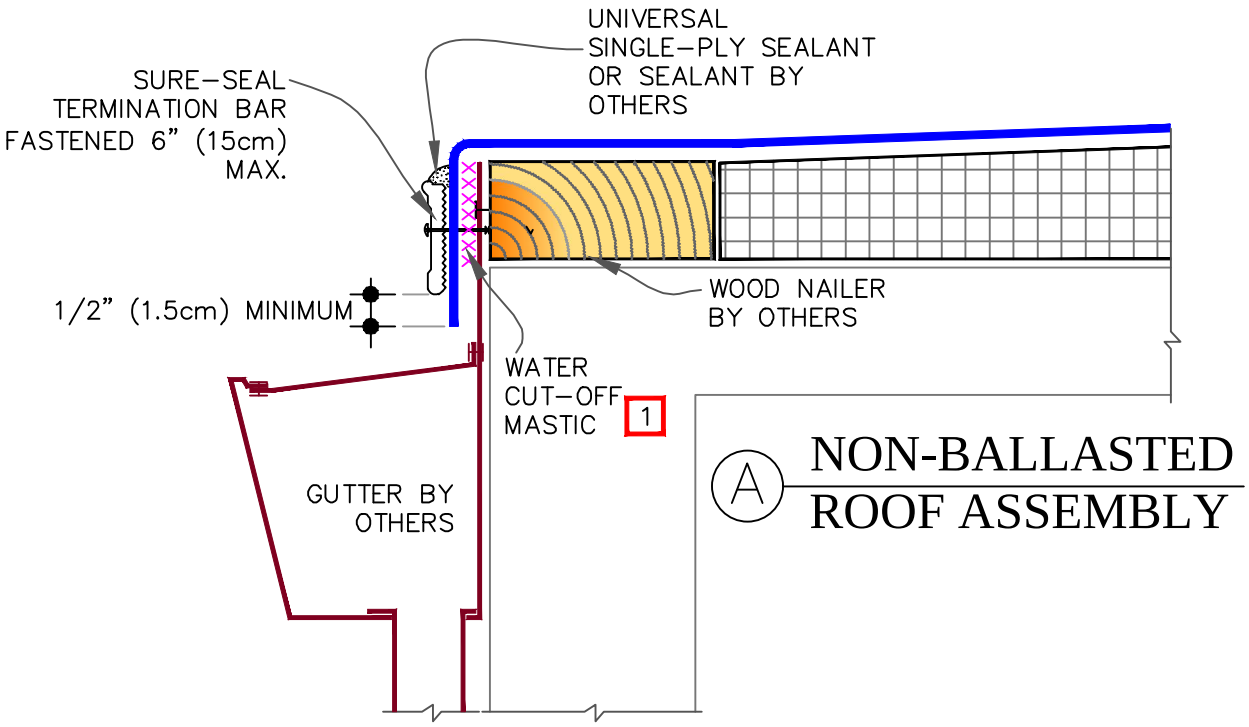


NOTES:

1. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
2. LAP SEALANT MUST BE APPLIED AT FLASHING OVERLAPS AND INTERSECTIONS WITH JOINTS IN METAL EDGING.
3. T-JOINT COVER AT SPLICE INTERSECTION NOT NEEDED WHEN USING PS OVERLAYMENT STRIP ON MEMBRANE LESS THAN 90-MIL.
4. WHEN USING 90-MIL MEMBRANE INSTALL A 12" (30cm) T-JOINT COVER OVER THE 6" (15cm) T-JOINT COVER PER U-2B.1

CARLISLE SYNTEC SYSTEMS	SecurEdge GRAVEL STOP	FACTORY MUTUAL APPROVED	DETAIL NO. U-1E
	MAXIMUM WARRANTY: 25 YEARS		U (UNIVERSAL DETAIL)

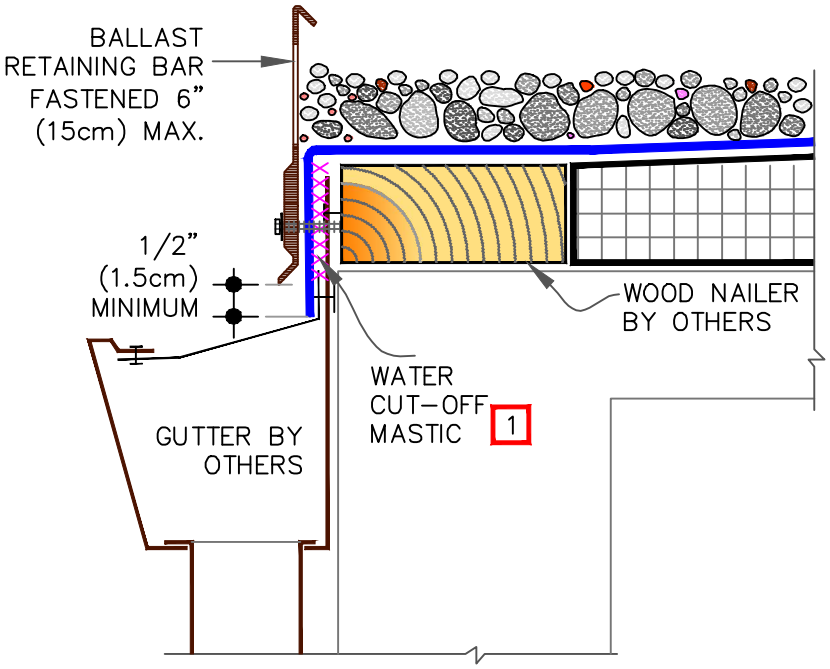
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A NON-BALLASTED ROOF ASSEMBLY

NOTES:

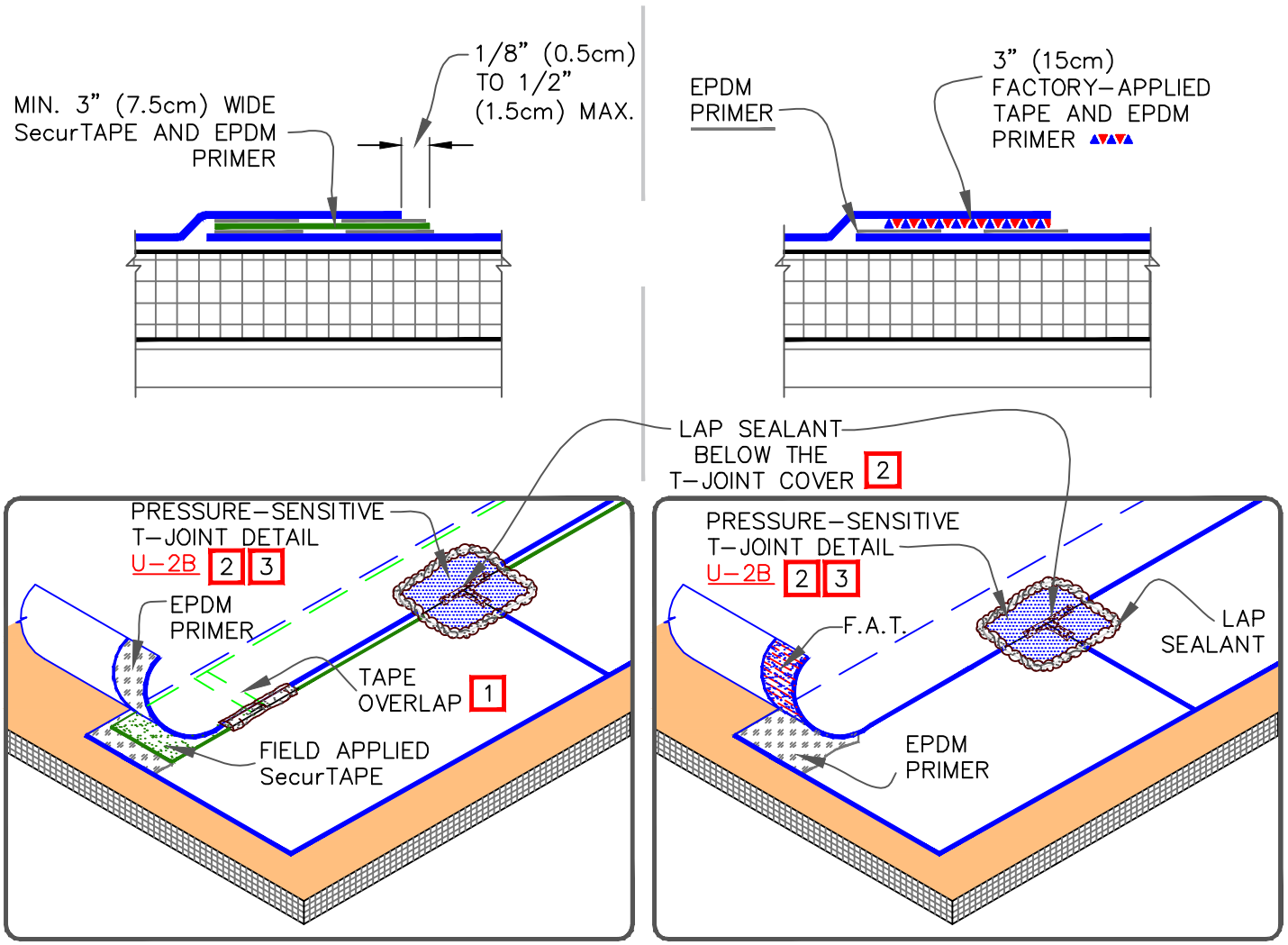
1. FASTENING OF METAL TERMINATION OR BALLAST RETAINING BAR MUST PROVIDE CONSTANT COMPRESSION ON WATER CUT–OFF MASTIC.
2. BALLAST RETAINING BAR MUST EXTEND ABOVE GRAVEL SURFACE SUFFICIENTLY TO RETAIN GRAVEL AND PREVENT GRAVEL MIGRATION.
3. SLOTS IN BALLAST RETAINING BAR MUST BE FLUSH OR SLIGHTLY BELOW MEMBRANE LEVEL.



B BALLASTED ROOF ASSEMBLY

CARLISLE SYNTEC SYSTEMS	METAL BAR EDGE TERMINATION	DETAIL NO. U–1F
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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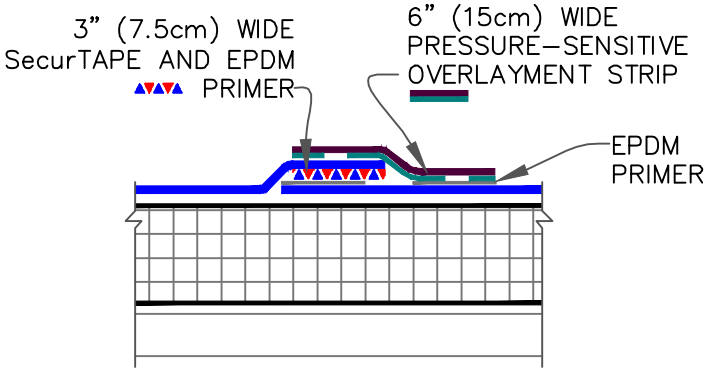
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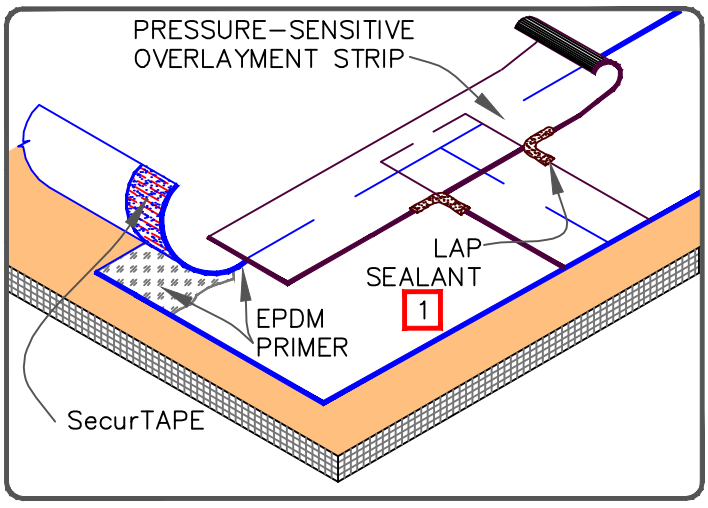
1. OVERLAP THE ENDS OF THE FIELD APPLIED SecurTAPE A MINIMUM OF 1" (2.5cm). APPLY LAP SEALANT AT TAPE OVERLAPS 2" (5cm) IN EACH DIRECTION AS SHOWN.
2. APPLY LAP SEALANT ALONG THE EXPOSED EDGE OF THE MEMBRANE SPLICE COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION AND OVERLAY WITH A 6" (15cm) T-JOINT COVER.
3. WHEN USING 90-MIL MEMBRANE, INSTALL A 12" (30cm) T-JOINT COVER CENTERED OVER THE FIRST T-JOINT COVER PER DETAIL U-2B.1.
4. LAP SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED EPDM MEMBRANE.
5. REFER TO DETAIL MF-2A FOR MECHANICALLY FASTENED SPLICES.

CARLISLE SYNTEC SYSTEMS	EPDM MEMBRANE SPLICE	DETAIL NO. U-2A
	MAXIMUM WARRANTY: 25 YEARS	U (UNIVERSAL DETAIL)

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OPTION 1

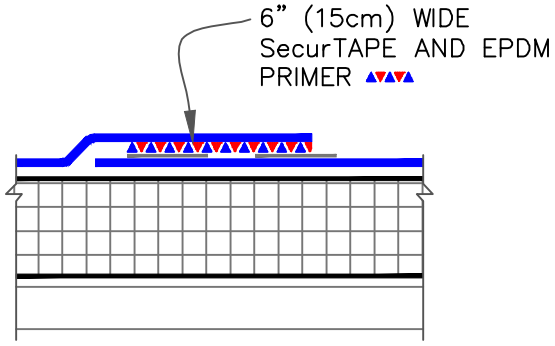


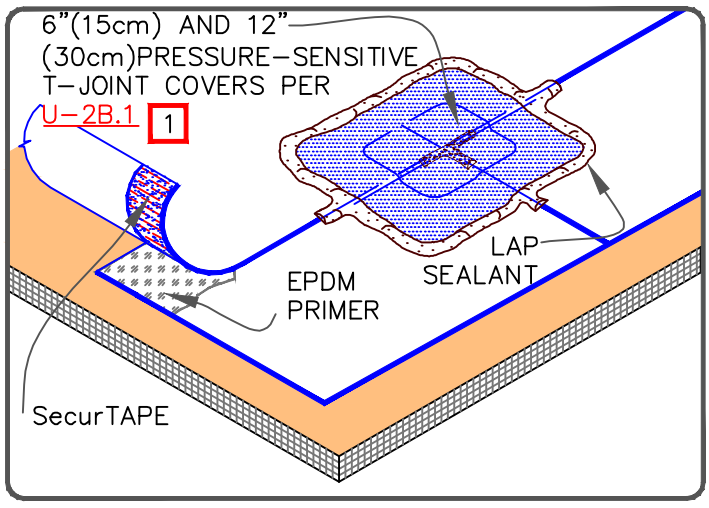


NOTES:

1. APPLY LAP SEALANT AT ALL INTERSECTIONS BETWEEN PRESSURE-SENSITIVE OVERLAYMENT STRIP.
2. REFER TO DETAIL MF-2A.1 FOR MECHANICALLY-FASTENED SPLICES.

OPTION 2





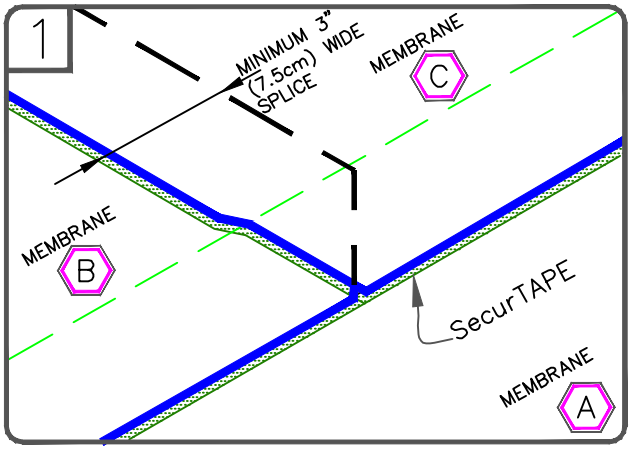
F.A.T. (FACTORY APPLIED SecurTAPE)

NOTE:

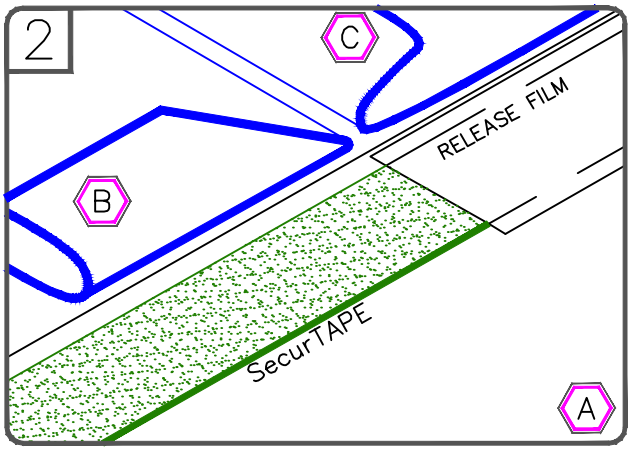
1. APPLY LAP SEALANT ALONG THE EXPOSED EDGE OF THE MEMBRANE SPLICE COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION AND OVERLAY WITH A 6" (15cm) T-JOINT COVER. INSTALL A 12" (30cm) T-JOINT COVER CENTERED OVER THE FIRST T-JOINT COVER PER DETAIL U-2B.1.

CARLISLE SYNTEC SYSTEMS	EPDM MEMBRANE SPLICE	EPDM	DETAIL NO. U-2A.1
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

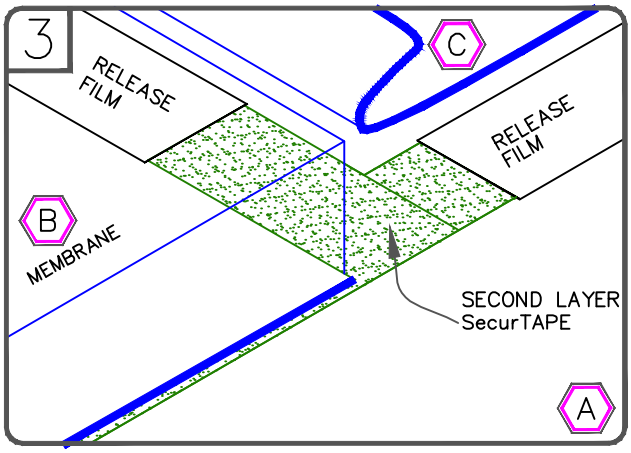
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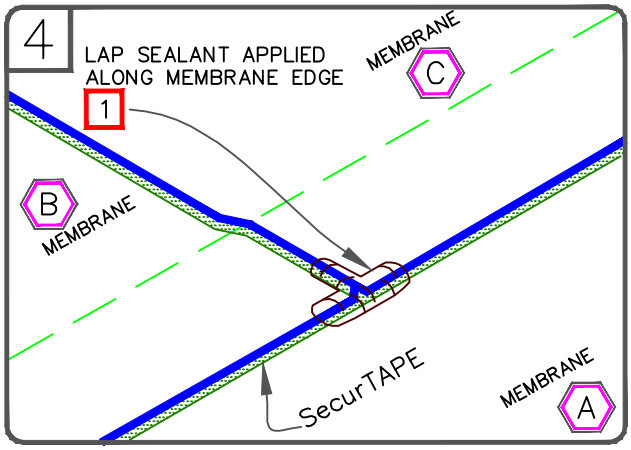
POSITION MEMBRANE TO ALLOW AN APPROXIMATE 4" (10cm) OVERLAP. MARK THE BOTTOM SHEET WITH AN INDELIBLE MARKER 1/2" (1.5cm) FROM THE EDGE OF THE TOP SHEET AS SHOWN. THE PRE-MARKED LINE ON THE MEMBRANE EDGE CAN ALSO BE USED AS A GUIDE.



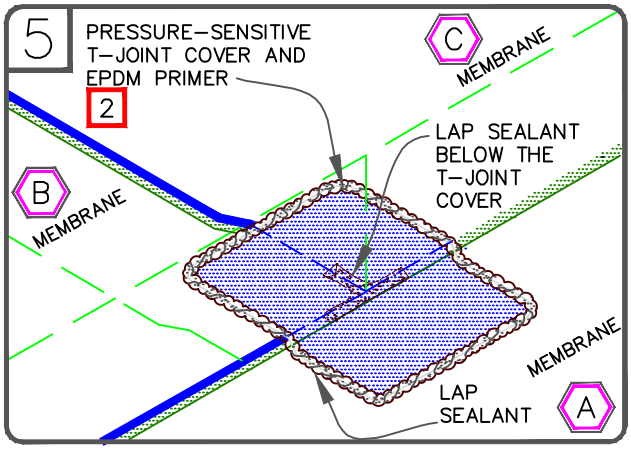
FOLD SHEETS BACK AS SHOWN. APPLY EPDM PRIMER TO THE SPLICE AREA ON BOTH SURFACES AND ALLOW TO FLASH-OFF. APPLY SecurTAPE WITH RELEASE FILM ALIGNED WITH MARKED LINE.



SPLICE SHEET B TO SHEET A AND APPLY SECOND PIECE OF SecurTAPE BETWEEN SHEET B AND C. TRIM RELEASE FILM AS SHOWN.



SPLICE SHEET C TO SHEET A AND B, PRESS TOP SHEET ONTO BOTTOM SHEET USING HAND PRESSURE TOWARDS THE OUTER EDGE OF THE SPLICE AND ROLL THE SPLICE AREA WITH A 2" (5cm) WIDE STEEL ROLLER.



APPLY PRESSURE-SENSITIVE T-JOINT COVER OR 6" (15cm) WIDE SECTION OF PRESSURE-SENSITIVE ELASTOFORM FLASHING CENTERED OVER THE INTERSECTING POINT OF THE LEADING EDGES OF THE FIELD SPLICE INTERSECTION AS SHOWN.

NOTES:

1. APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE BELOW THE 6" (15cm) T-JOINT COVER, COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.
2. APPLY LAP SEALANT AT CUT EDGES OF REINFORCED MEMBRANE AND TAPE OVERLAPS. REFER TO DETAIL U-2A.
3. REFER TO DETAIL U-2B.1 WHEN USING 90-MIL MEMBRANE.

CARLISLE SYNTEC SYSTEMS

EPDM MEMBRANE SPLICE INTERSECTION

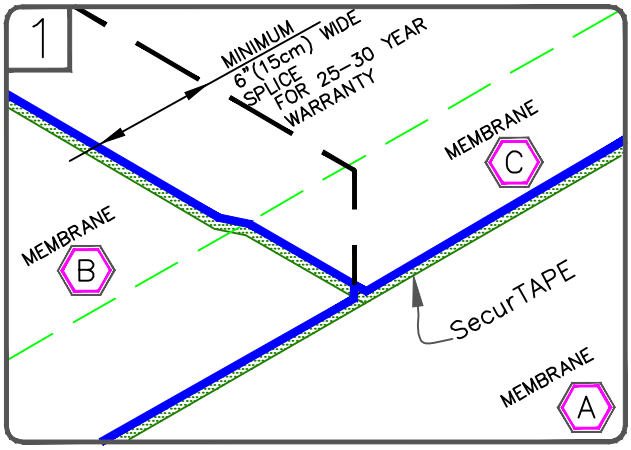
MAXIMUM WARRANTY: 25 YEARS

DETAIL NO.

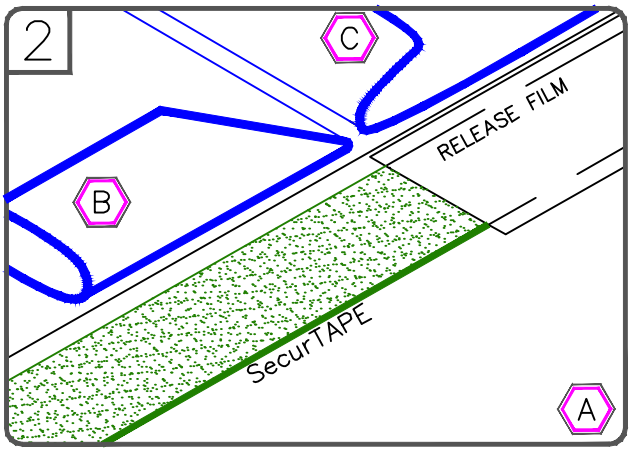
U-2B

U (UNIVERSAL DETAIL)

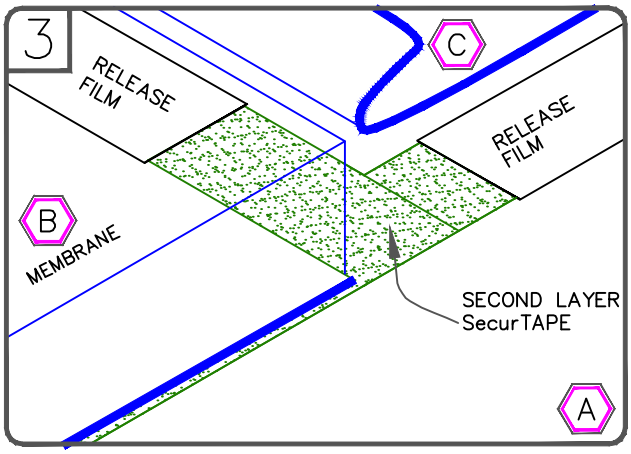
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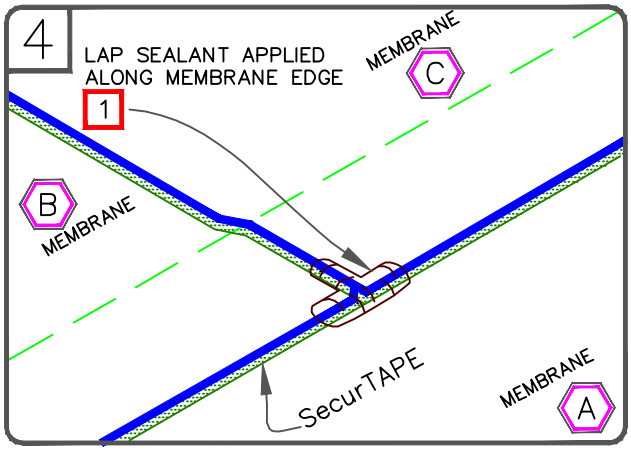
POSITION MEMBRANE TO ALLOW AN APPROXIMATE 7" (17.5cm) OVERLAP. MARK THE BOTTOM SHEET WITH AN INDELIBLE MARKER 1/2" (1.5cm) FROM THE EDGE OF THE TOP SHEET AS SHOWN. THE PRE-MARKED LINE ON THE MEMBRANE EDGE CAN ALSO BE USED AS A GUIDE.



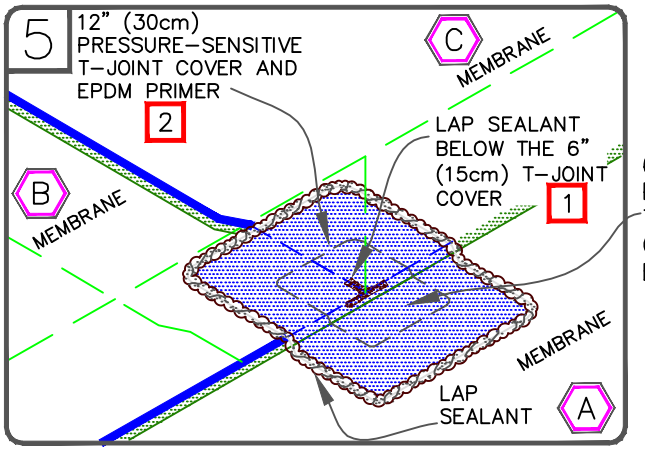
FOLD SHEETS BACK AS SHOWN. APPLY EPDM PRIMER TO THE SPLICE AREA ON BOTH SURFACES AND ALLOW TO FLASH-OFF. APPLY SecurTAPE WITH RELEASE FILM ALIGNED WITH MARKED LINE.



SPLICE SHEET B TO SHEET A AND APPLY SECOND PIECE OF SecurTAPE BETWEEN SHEET B AND C. TRIM RELEASE FILM AS SHOWN.



SPLICE SHEET C TO SHEET A AND B, PRESS TOP SHEET ONTO BOTTOM SHEET USING HAND PRESSURE TOWARDS THE OUTER EDGE OF THE SPLICE AND ROLL THE SPLICE AREA WITH A 2" (5cm) WIDE STEEL ROLLER.



APPLY 6" (15cm) PRESSURE-SENSITIVE T-JOINT COVER AND 12" (30cm) PRESSURE-SENSITIVE T-JOINT COVER OR PRESSURE-SENSITIVE ELASTOFORM CENTERED OVER THE INTERSECTING POINT OF THE LEADING EDGES OF THE FIELD SPLICE INTERSECTION AS SHOWN.

NOTES:

1. APPLY LAP SEALANT ALONG THE EDGES OF THE MEMBRANE SPLICE COVERING THE EXPOSED SPLICE TAPE 1/2" (15cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.
2. APPLY LAP SEALANT AT CUT EDGES OF REINFORCED MEMBRANE AND TAPE OVER LAPS.

CARLISLE SYNTEC SYSTEMS

EPDM MEMBRANE SPLICE INTERSECTION (30 YEAR WARRANTY OR 90-MIL MEMBRANE)

MAXIMUM WARRANTY: 30 YEARS

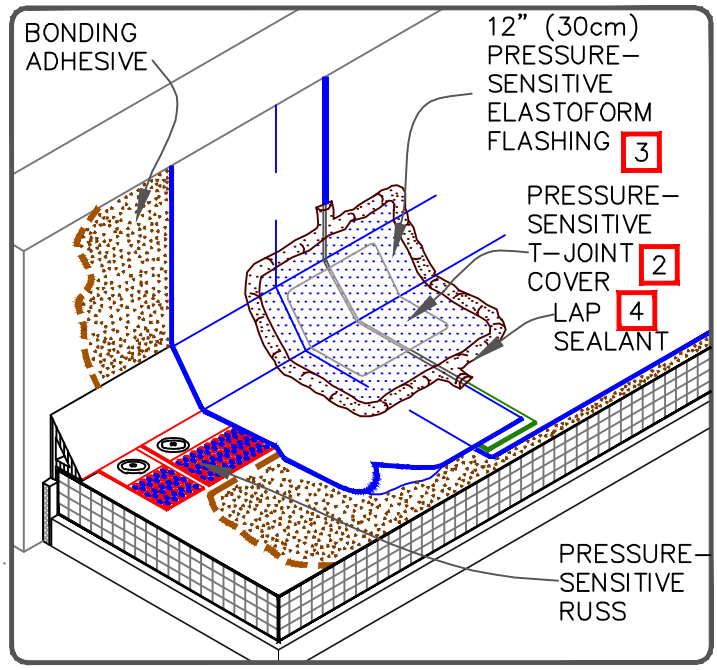
EPDM

DETAIL NO. U-2B.1

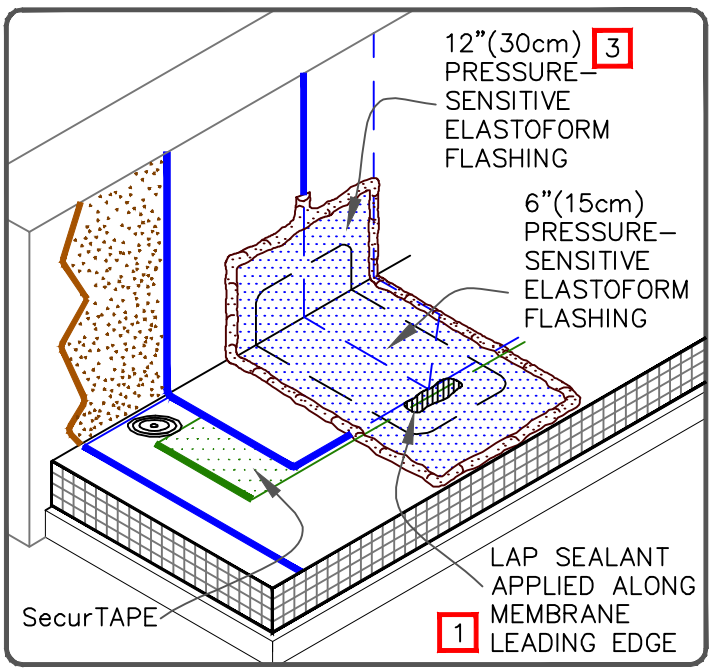
U (UNIVERSAL DETAIL)

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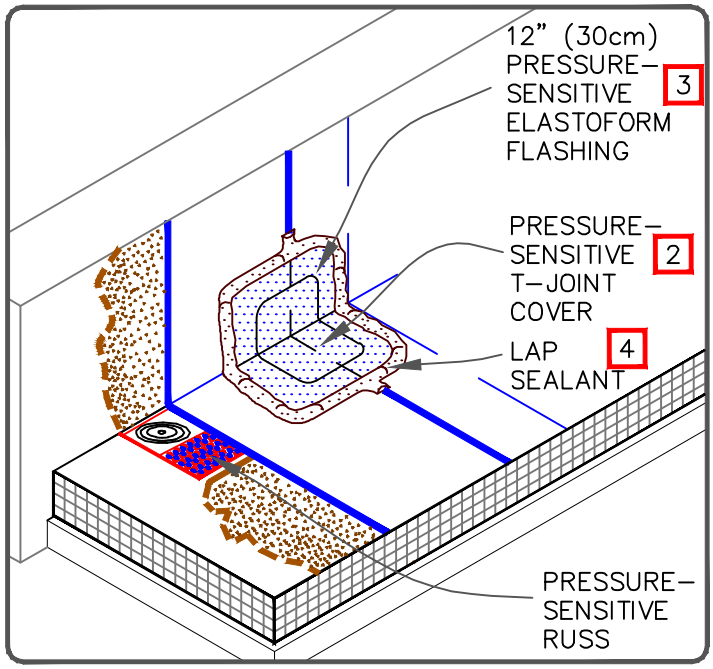
CONTINUOUS WALL FLASHING



SEPARATE WALL FLASHING



CONTINUOUS WALL FLASHING



NOTES:

1. APPLY LAP SEALANT ALONG THE LEADING EDGE OF THE MEMBRANE SPLICE (UNDER THE PRESSURE-SENSITIVE ELASTOFORM FLASHING) COVERING THE EXPOSED SPLICE TAPE APPROXIMATELY 1/2" (1.5cm) BEYOND THE SPLICE EDGE.

2. PRESSURE-SENSITIVE T-JOINT COVER OR 6" (15cm) WIDE PRESSURE-SENSITIVE FLASHING, IN CONJUNCTION WITH EPDM PRIMER, MUST BE CENTERED OVER FIELD SPLICES AT THE ANGLE CHANGE.

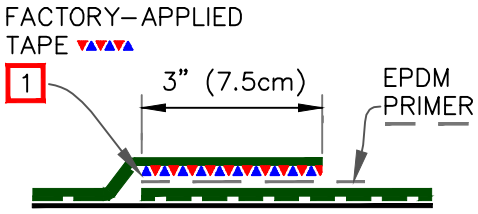
3. PROJECTS WITH 30-YEAR WARRANTY OR WHEN USING 90-MIL MEMBRANE REQUIRE FIELD SPLICES TO BE OVERLAID WITH TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING. THE BOTTOM LAYER SHALL BE 6" (15cm) WIDE COVERED WITH A 12" (30cm) WIDE TOP LAYER. BOTH LAYERS SHALL BE CENTERED.

4. SEAL EXPOSED LAYER WITH LAP SEALANT.

CARLISLE SYNTEC SYSTEMS	EPDM MEMBRANE SPLICES AT ANGLE CHANGE	EPDM	DETAIL NO. U-2C
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

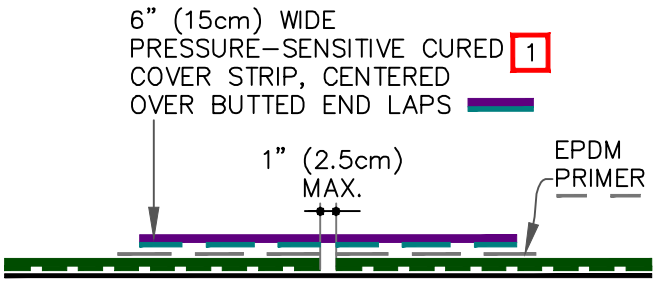
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SIDE LAP SPLICE

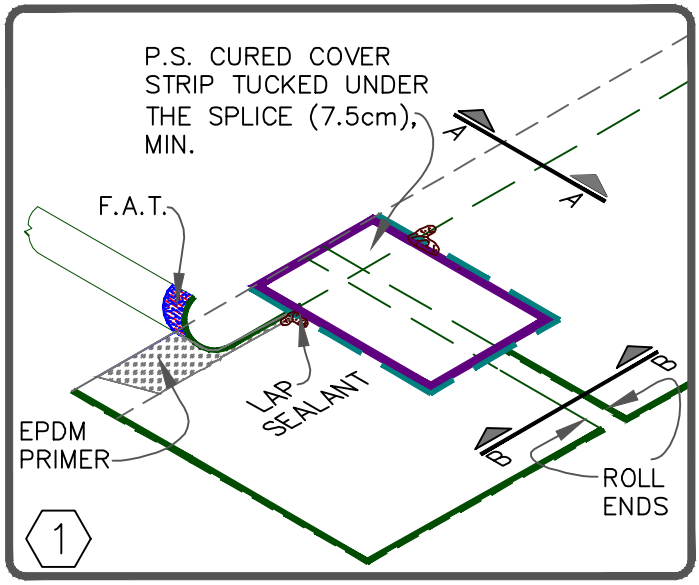


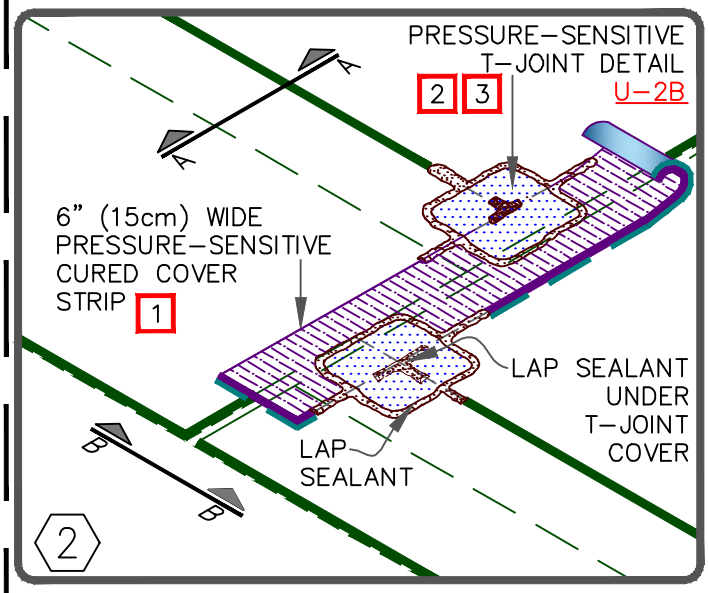
SECTION AA

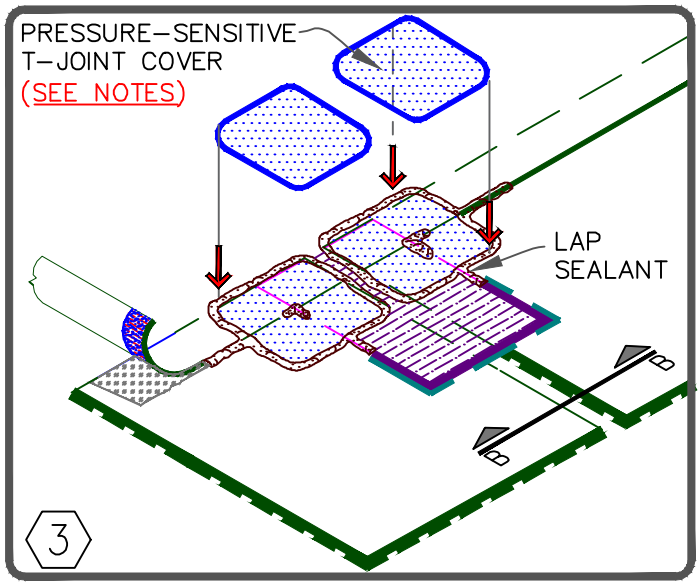
END LAP SPLICE



SECTION BB







NOTES:

1. PRESSURE–SENSITIVE OVERLAYMENT STRIP CAN BE USED WHEN SAT IS OVERLAPPED A MINIMUM 1" (2.5cm) ELIMINATING THE NEED FOR T–JOINT COVERS.
2. APPLY LAP SEALANT ALONG THE EDGE OF THE MEMBRANE SPLICE UNDER THE 6" (15cm) T–JOINT COVER COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN EACH DIRECTION FROM THE SPLICE INTERSECTION.
3. APPLY A 6" (15cm) T–JOINT COVER OR PRESSURE–SENSITIVE ELASTOFORM FLASHING AND LAP SEAL THE EDGES.

CARLISLE SYNTEC SYSTEMS

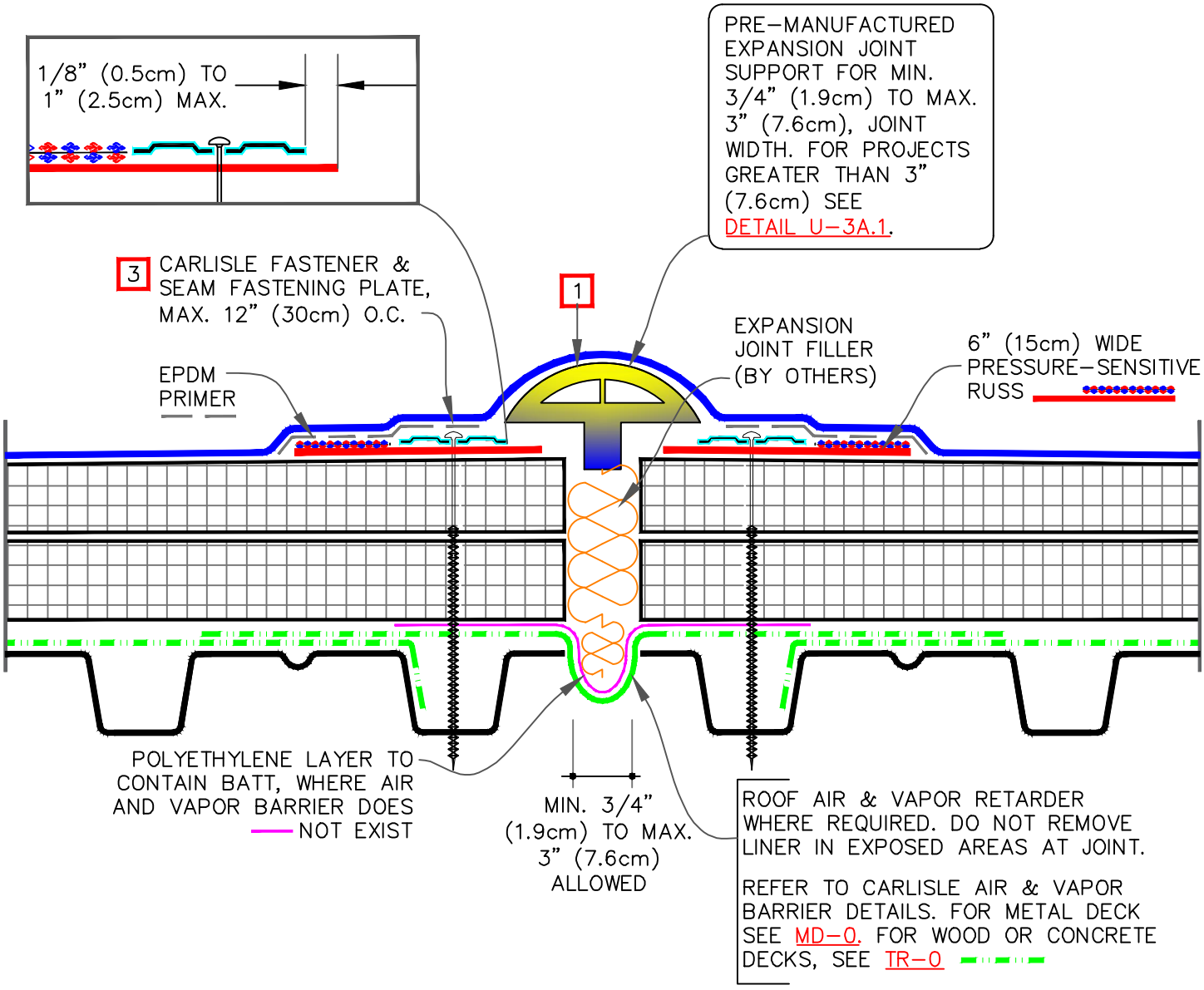
SAT EPDM MEMBRANE SPLICES

MAXIMUM WARRANTY: 25 YEARS

DETAIL NO. U–2D

SELF ADHERING TECHNOLOGY

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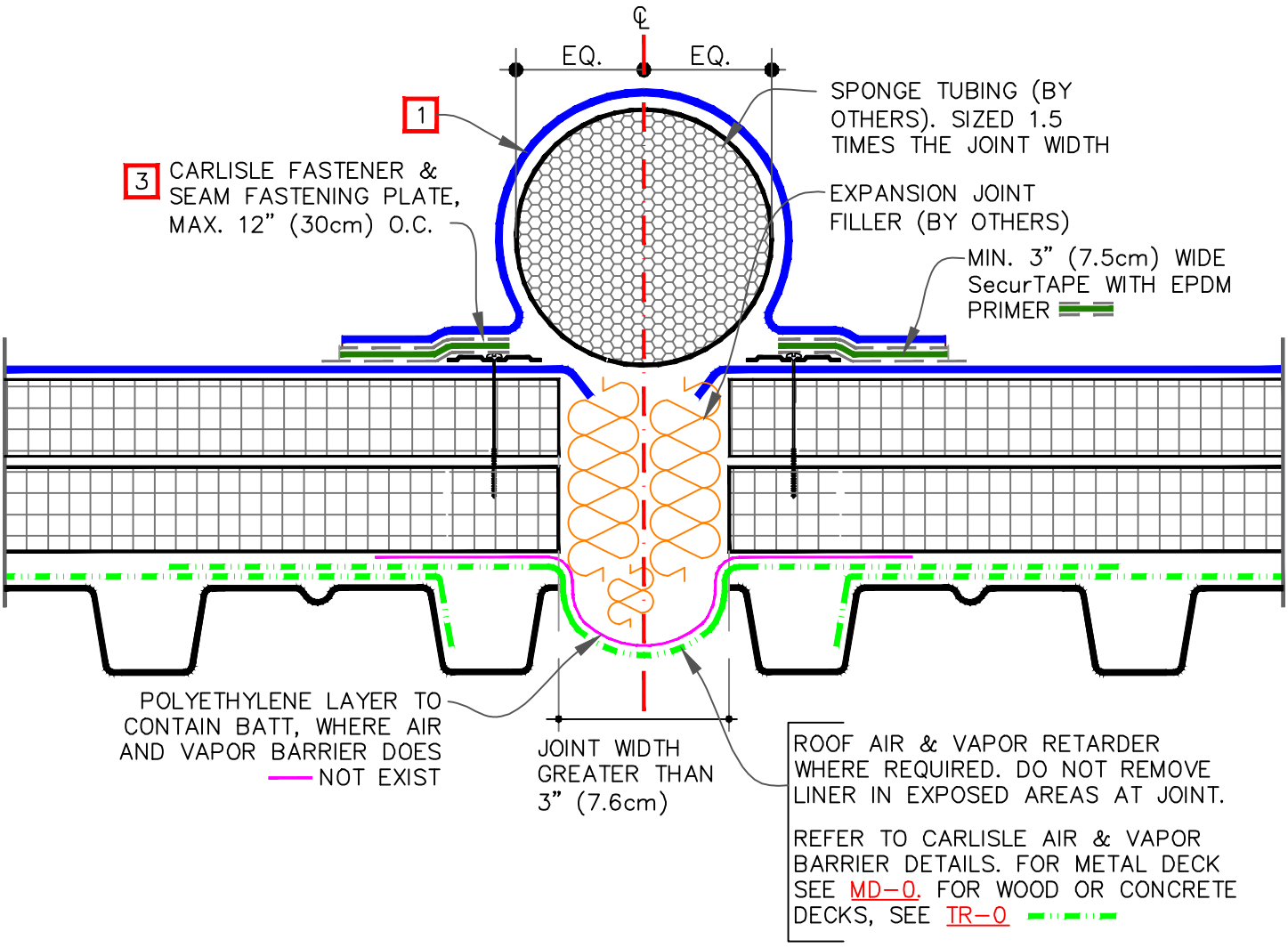


NOTES:

1. MEMBRANE SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT.
2. FOR EXPANSION JOINT INTERSECTIONS AND INTERSECTIONS BETWEEN EXPANSION JOINTS TO WALL OR EDGING, USE TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING WITH SECOND LAYER 3" (7.5cm) LARGER THAN PREVIOUS LAYER IN ALL DIRECTIONS.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED ON MECHANICALLY FASTENED SYSTEMS OVER STEEL DECKS.

CARLISLE SYNTEC SYSTEMS	DECK-TO-DECK ROOF EXPANSION JOINTS 3/4" TO UP TO 3"	EPDM	DETAIL NO. U-3A
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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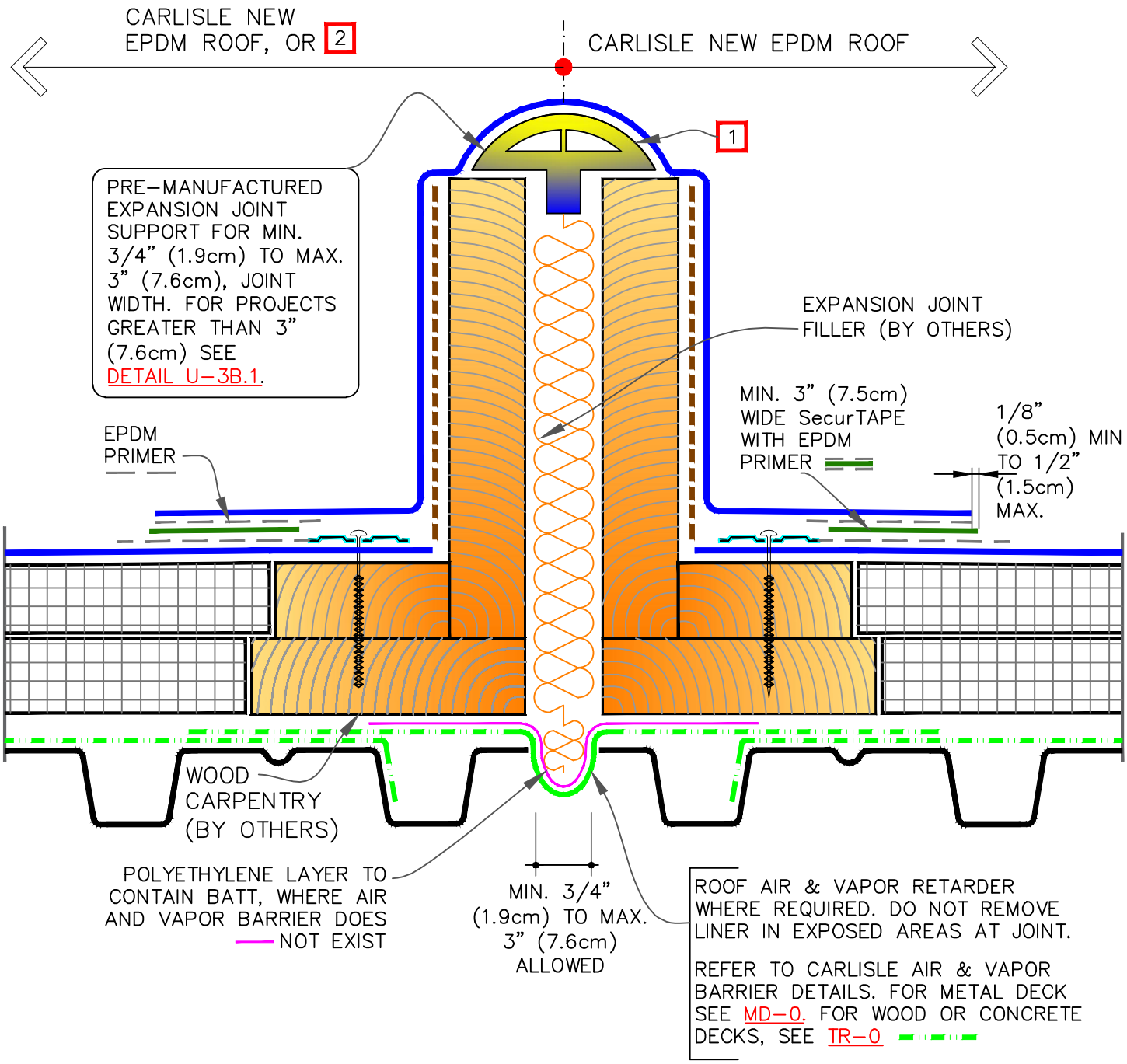


NOTES:

1. MEMBRANE SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT.
2. FOR EXPANSION JOINT INTERSECTIONS AND INTERSECTIONS BETWEEN EXPANSION JOINTS TO WALL OR EDGING, USE TWO LAYERS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING WITH SECOND LAYER 3" (7.5cm) LARGER THAN PREVIOUS LAYER IN ALL DIRECTIONS.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED ON MECHANICALLY FASTENED SYSTEMS OVER STEEL DECKS.

CARLISLE SYNTEC SYSTEMS	DECK-TO-DECK ROOF EXPANSION JOINTS GREATER THAN 3"	DETAIL NO. U-3A.1
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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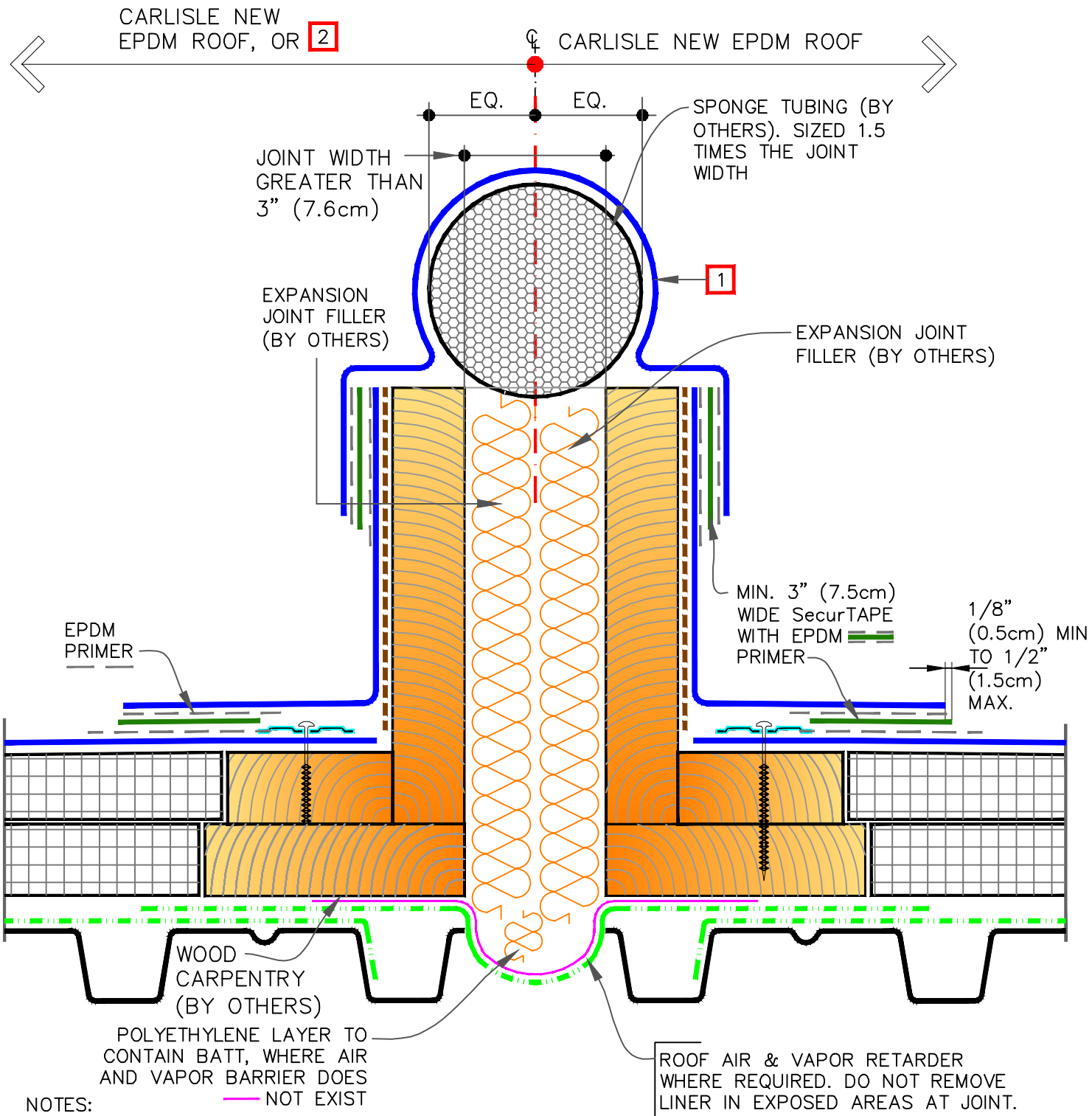
NOTES:

1. MEMBRANE FLASHING SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT.

2. IN CASE THE ROOF TYPE IS DIFFERENT, DESIGNER TO PROVIDE ROOF TYPE AND ITS CONDITION TO CARLISLE TO DEVELOP A TIE-IN DETAIL ON THIS SIDE ACCORDINGLY.

CARLISLE SYNTEC SYSTEMS	DECK-TO-DECK CURBED ROOF EXPANSION JOINTS 3/4" TO UP TO 3"	DETAIL NO. U-3B
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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NOTES:

1. MEMBRANE FLASHING SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT.
2. IN CASE THE ROOF TYPE IS DIFFERENT, DESIGNER TO PROVIDE ROOF TYPE AND ITS CONDITION TO CARLISLE TO DEVELOP A TIE-IN DETAIL ON THIS SIDE ACCORDINGLY.

CARLISLE SYNTEC SYSTEMS

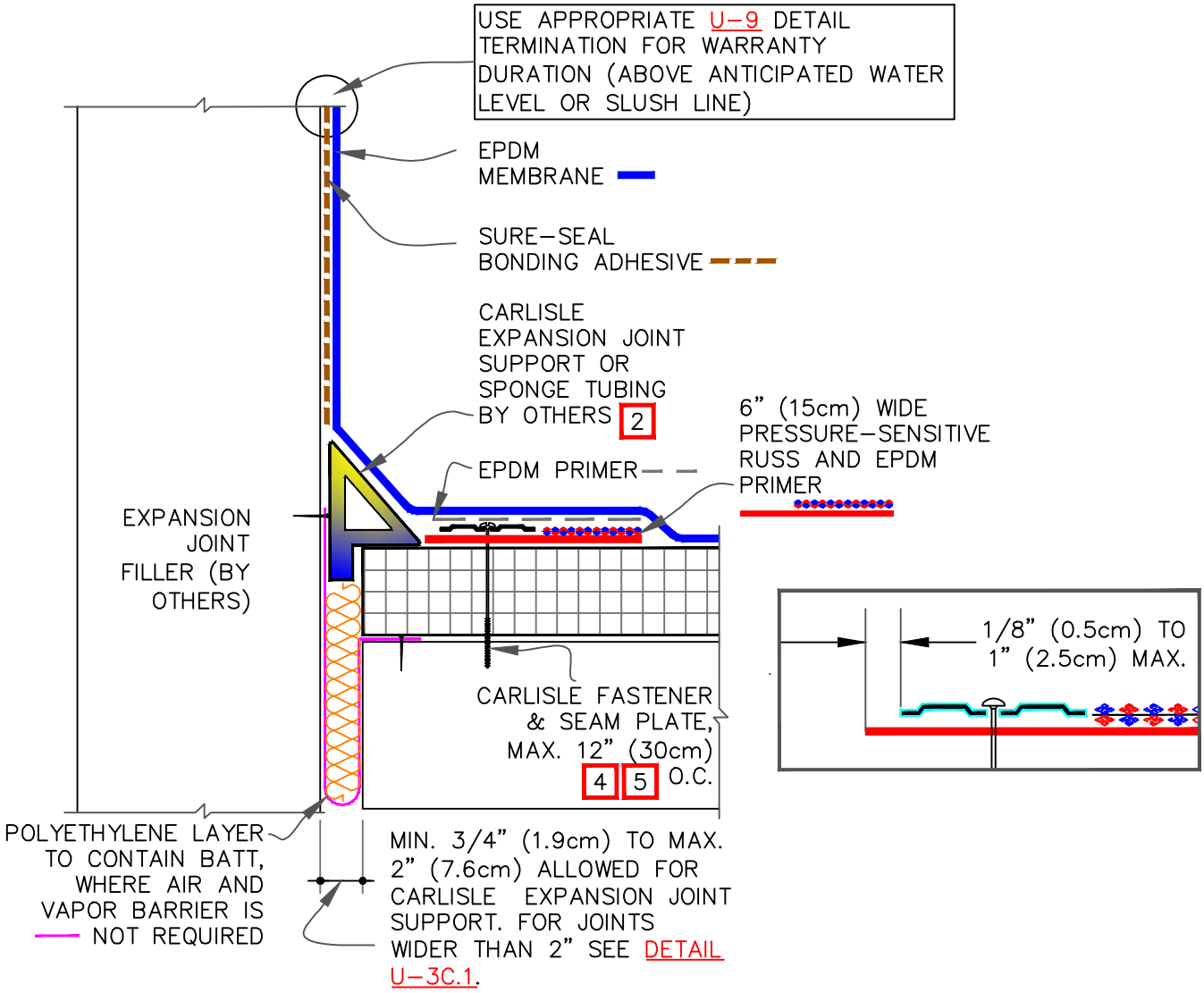
DECK-TO-DECK CURBED ROOF EXPANSION JOINT GREATER THAN 3"

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-3B.1

U (UNIVERSAL DETAIL)

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NOTES:

1. ALL OUTSIDE AND INSIDE CORNERS REQUIRE TWO COMPLETE CORNER APPLICATIONS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING AS PER DETAILS U-15D.1 OR U-15G.1.

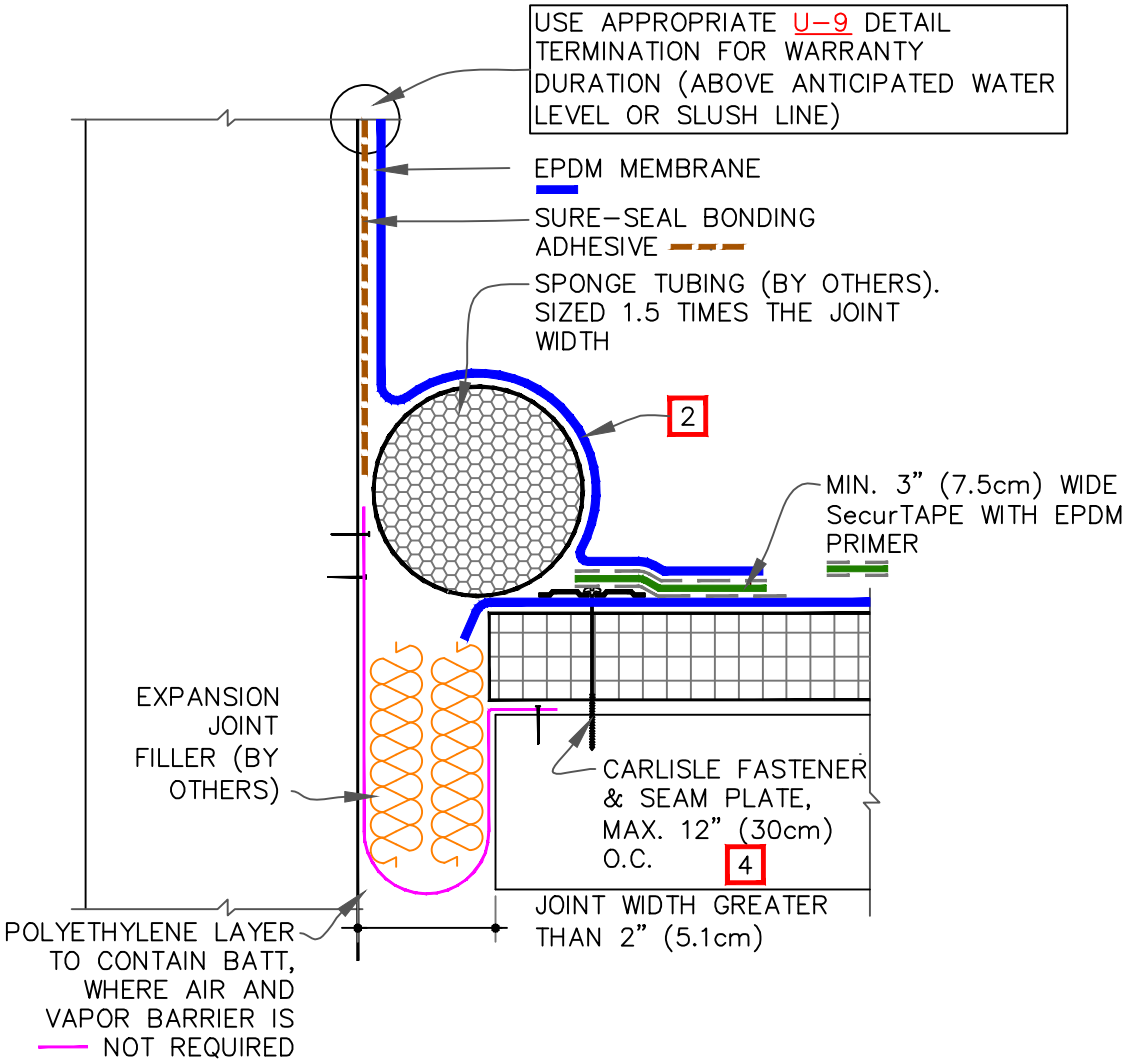
2. ROOF MEMBRANE SHALL BE LOOSE-LAID OVER THE EXPANSION JOINT SUPPORT OR SPONGE TUBING.

3. USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.

4. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED ON MECHANICALLY FASTENED SYSTEMS OVER STEEL DECKS.

CARLISLE SYNTEC SYSTEMS	DECK-TO-WALL EXPANSION JOINTS 3/4" TO UP TO 2"	EPDM	DETAIL NO. U-3C
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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NOTES:

1. ALL OUTSIDE AND INSIDE CORNERS REQUIRE TWO COMPLETE CORNER APPLICATIONS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING AS PER DETAILS U-15D.1 OR U-15G.1.

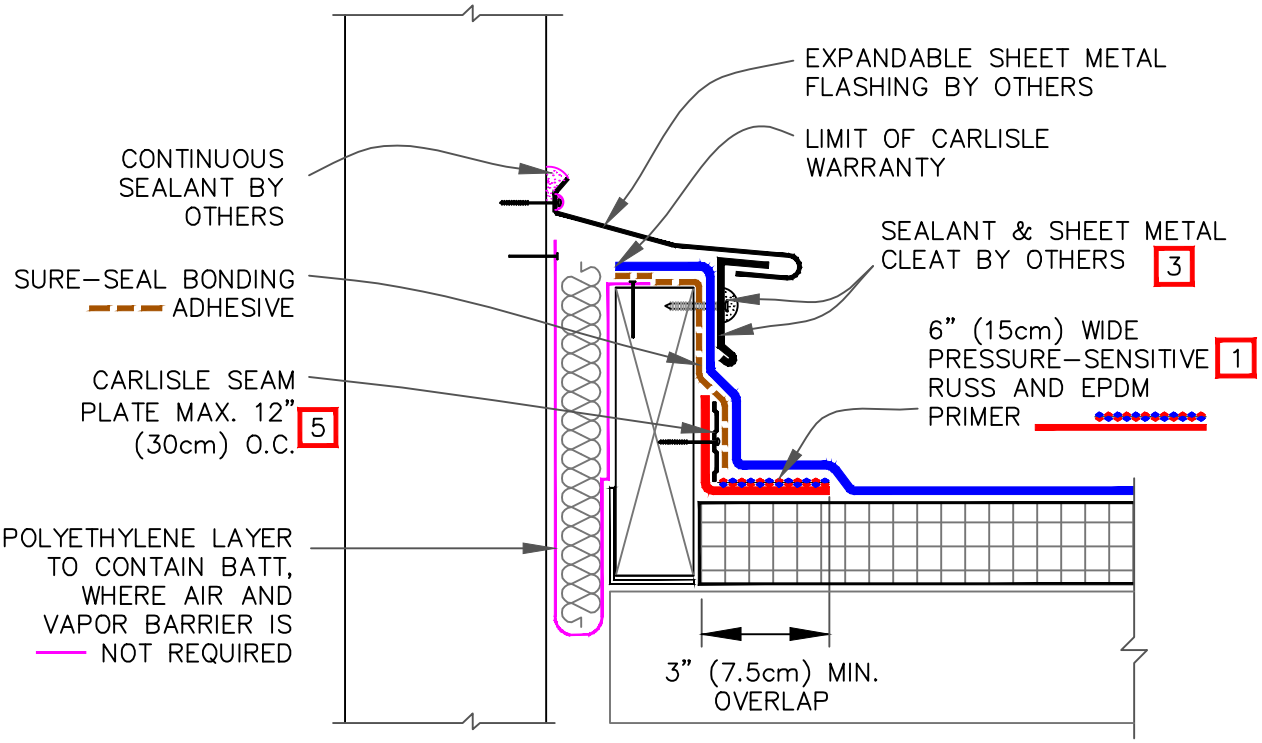
2. ROOF MEMBRANE SHALL BE LOOSE-LAID OVER THE EXPANSION JOINT SUPPORT OR SPONGE TUBING.

3. USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.

4. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED ON MECHANICALLY FASTENED SYSTEMS OVER STEEL DECKS.

CARLISLE SYNTEC SYSTEMS	DECK-TO-WALL EXPANSION JOINTS GREATER THAN 2"	EPDM	DETAIL NO. U-3C.1
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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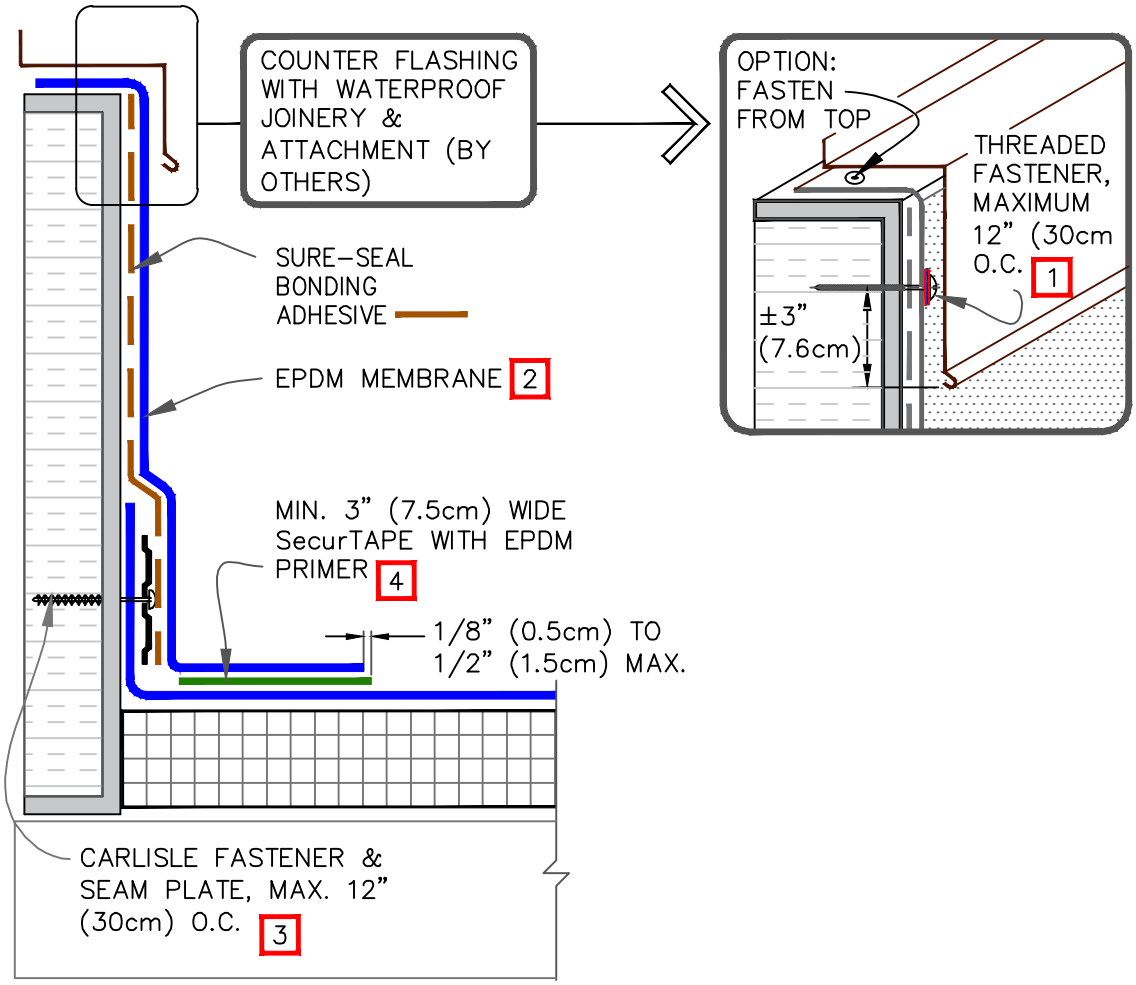


NOTES:

1. PRESSURE-SENSITIVE RUSS MAY BE INSTALLED INTO THE STRUCTURAL DECK. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED ON MECHANICALLY-FASTENED ROOFING SYSTEMS OVER STEEL DECKS.
2. USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.
3. SEAL FASTENERS BY APPLYING WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING, OR USING EPDM WASHERS, OR CAULKING THE FASTENERS HEAD.
4. ALL OUTSIDE AND INSIDE CORNERS REQUIRE TWO COMPLETE CORNER APPLICATIONS OF PRESSURE-SENSITIVE ELASTOFORM FLASHING AS PER DETAILS U-15D.1 OR U-15G.1.

CARLISLE SYNTEC SYSTEMS	SHEAR/EXPANSION JOINT	DETAIL NO. U-3D
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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NOTES:

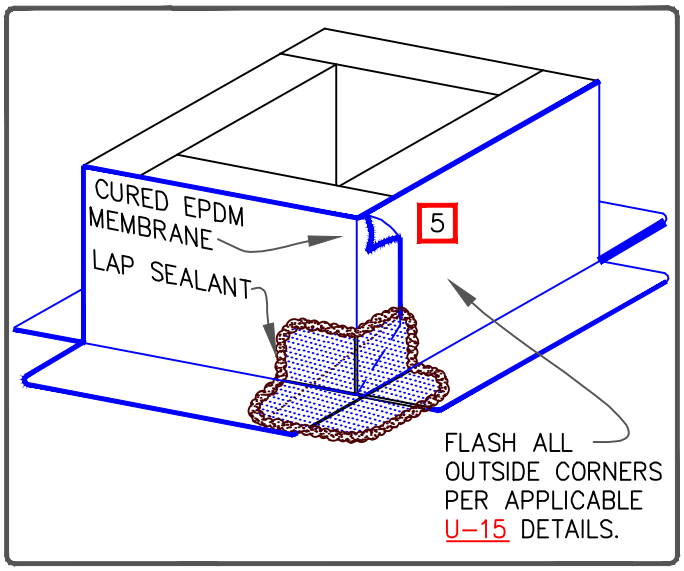
1. IN CASE THE THREADED FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR SEAL THE FASTENER HEADS WITH SEALANT.

2. LAP SEALANT IS REQUIRED ON CUT-EDGES OF REINFORCED MEMBRANE.

3. SEAM PLATES AND FASTENERS MAY BE INSTALLED INTO THE STRUCTURAL DECK AND THEN HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED FOR MECHANICALLY-FASTENED ROOFING SYSTEMS OVER STEEL DECKS.

4. MEMBRANE SPLICES SHALL INCORPORATE 3" (7.6cm) WIDE SecurTAPE FOR PROJECTS WITH 25-YEAR AND 6" (15.2cm) FOR 30-YEAR WARRANTIES.

5. IF THE VERTICAL SPLICE ON THE CURB FLASHING IS NOT LOCATED AT THE CORNER, USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.



CARLISLE SYNTEC SYSTEMS

CURB FLASHING – EPDM MEMBRANE

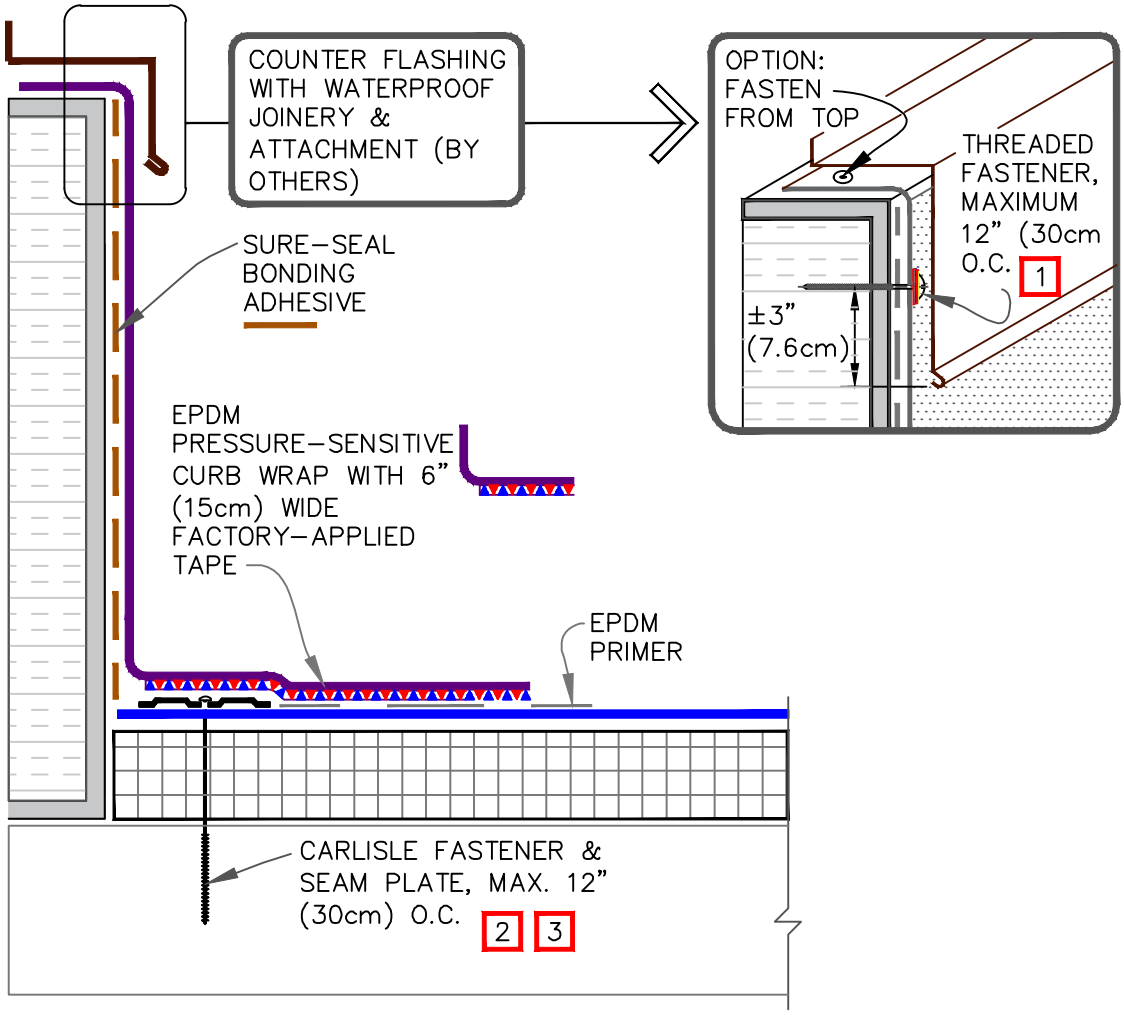
MAXIMUM WARRANTY: 30 YEARS

EPDM

DETAIL NO. U-5A

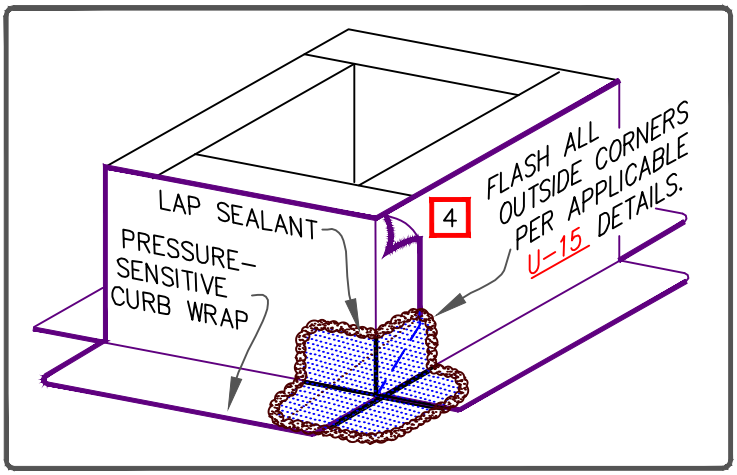
U (UNIVERSAL DETAIL)

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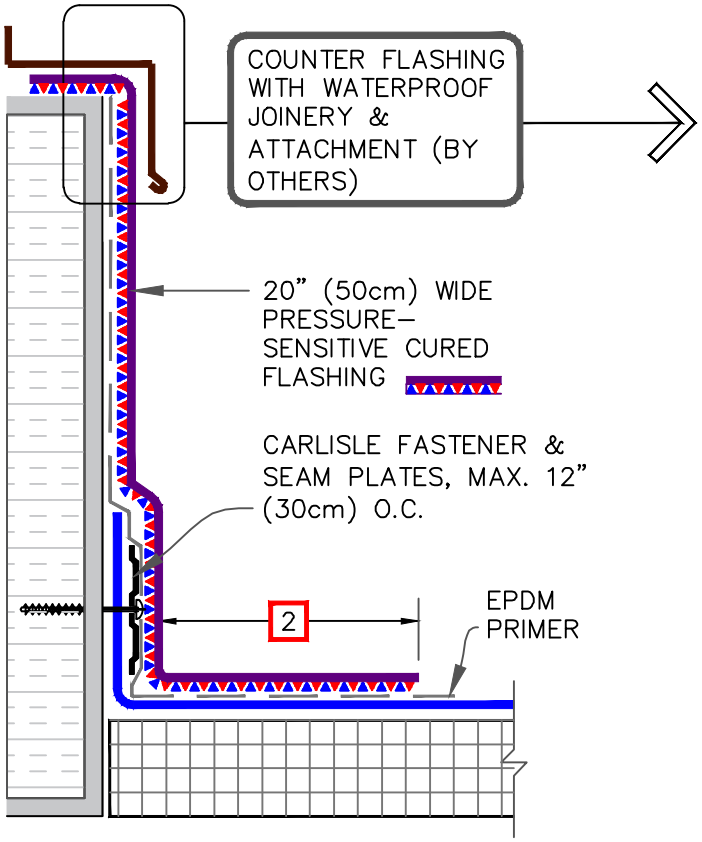
NOTES:

1. IN CASE THE THREADED FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR SEAL THE FASTENER HEADS WITH SEALANT.
2. SEAM PLATES AND FASTENERS MAY BE INSTALLED INTO THE VERTICAL SUBSTRATE.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED FOR MECHANICALLY FASTENED SYSTEMS OVER STEEL DECKS.
4. IF THE VERTICAL SPLICE ON THE CURB FLASHING IS NOT LOCATED AT THE CORNER, USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.

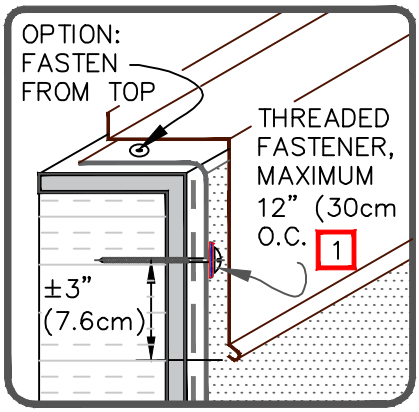


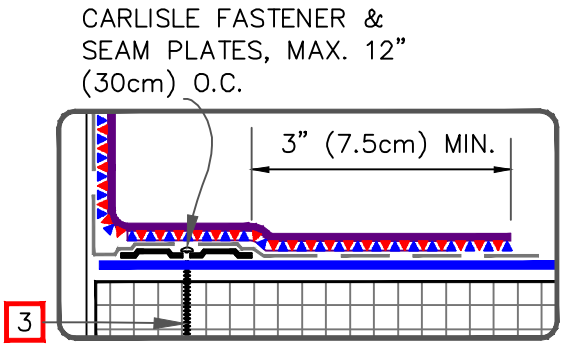
CARLISLE SYNTEC SYSTEMS	CURB FLASHING – PRESSURE-SENSITIVE CURB WRAP WITH 6" TAPE MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. U-5B U (UNIVERSAL DETAIL)

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FASTENERS INTO CURB

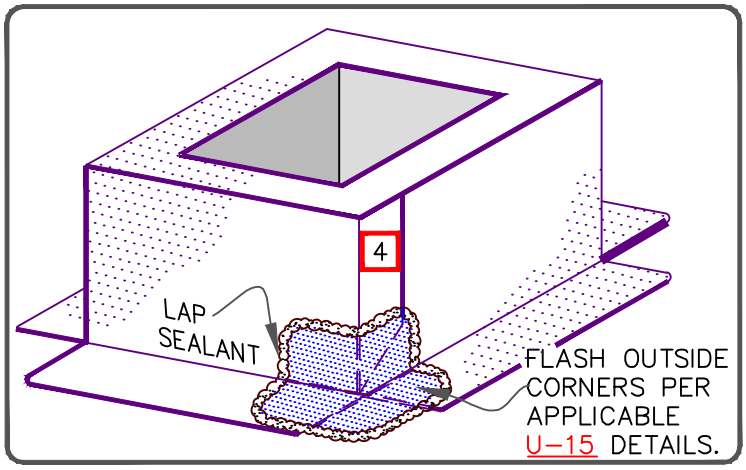




FASTENERS INTO DECK

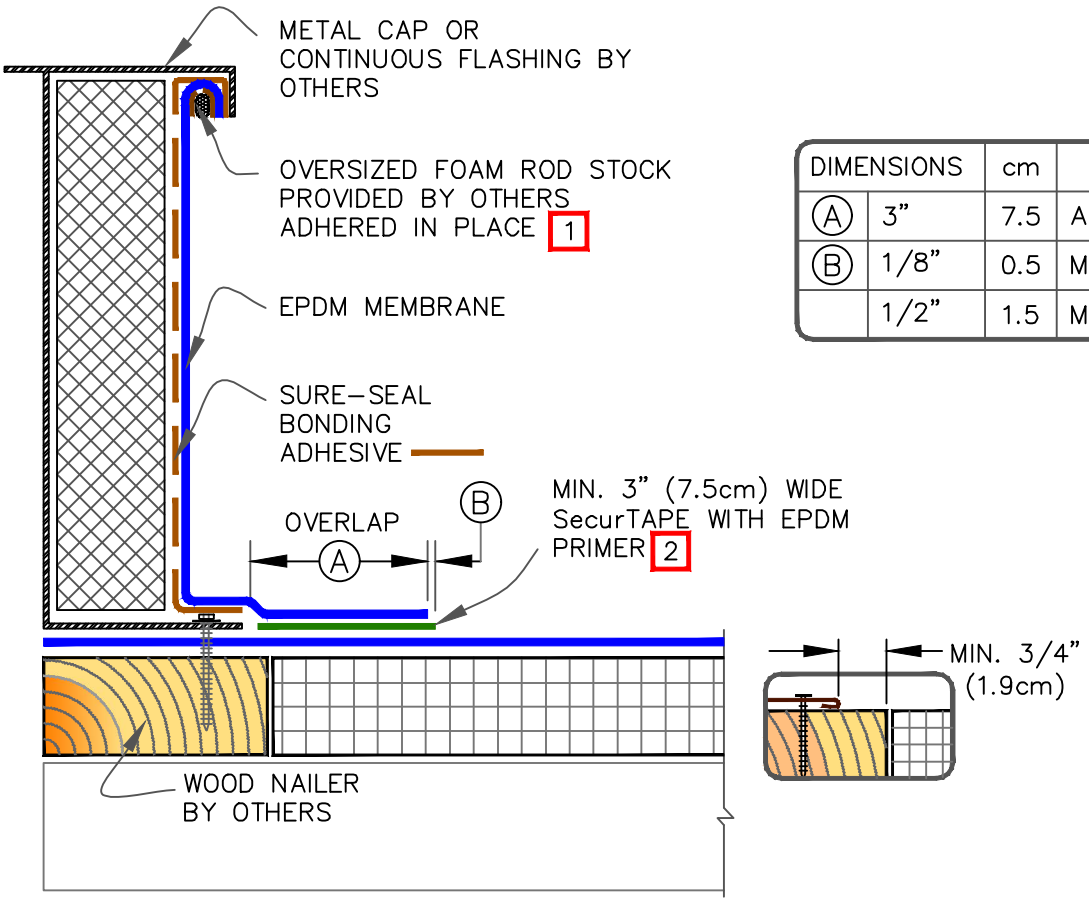
NOTES:

1. IN CASE THE THREADED FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR SEAL THE FASTENER HEADS WITH SEALANT.
2. 3" (7.5cm) FOR UP TO 25 YEARS AND 6" (15cm) FOR 30 YEARS WARRANTY.
3. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED FOR MECHANICALLY-FASTENED ROOFING SYSTEMS OVER STEEL DECKS.
4. IF THE VERTICAL SPLICE ON THE CURB FLASHING IS NOT LOCATED AT THE CORNER, USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.



CARLISLE SYNTEC SYSTEMS	CURB FLASHING – WITH 20" PRESSURE-SENSITIVE CURED FLASHING MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. U-5C U (UNIVERSAL DETAIL)

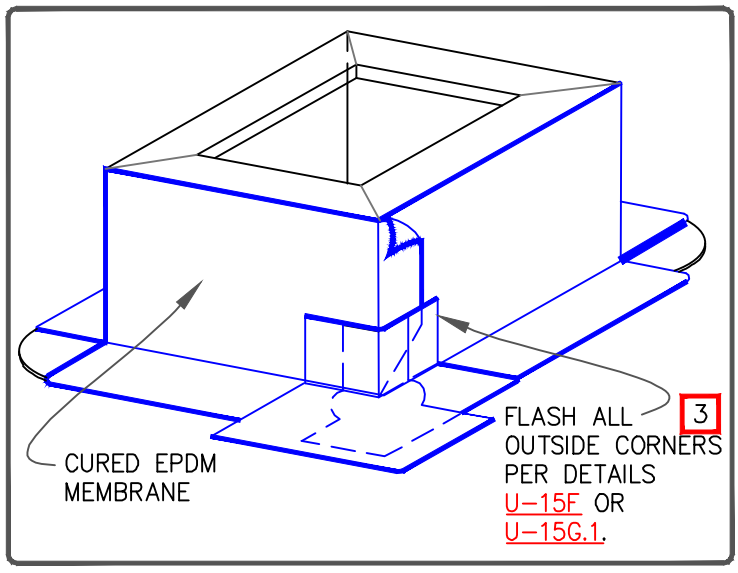
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DIMENSIONS		cm	
A	3"	7.5	APPROX.
B	1/8"	0.5	MIN.
	1/2"	1.5	MAX.

NOTES:

1. LENGTH OF ROD STOCK IS LIMITED TO 4' (1.2m). USE INDIVIDUAL SECTIONS OF ROD STOCK FOR LONGER DIMENSIONS.
2. MEMBRANE SPLICES SHALL INCORPORATE 3" (7.6cm) WIDE SecurTAPE FOR PROJECTS WITH 25-YEAR AND 6" (15.2cm) FOR 30-YEAR WARRANTIES.
3. WHEN METAL FLANGE IS ON TOP OF MEMBRANE USE DETAIL U-15F (20 YEAR) OR U-15G.1 (25/30 YEAR) TO ACHIEVE SUFFICIENT COVERAGE AT THE CORNERS.
4. DETAIL IS NOT ACCEPTABLE FOR VIBRATING ROOF TOP UNITS.



CARLISLE SYNTEC SYSTEMS

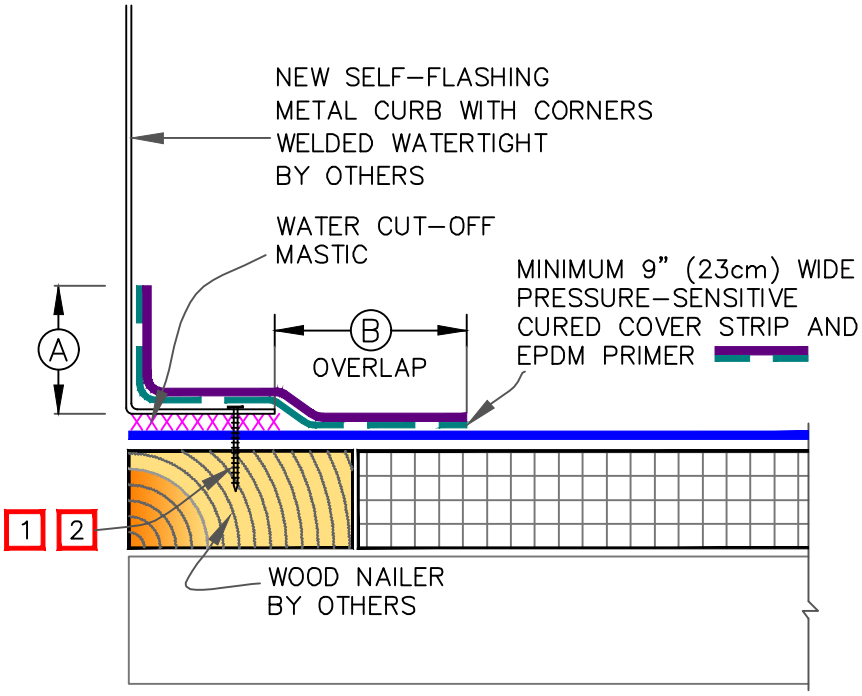
SELF-FLASHING CURB, ROOF HATCH OR SKYLIGHT

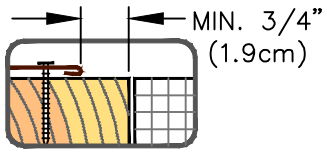
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-5D

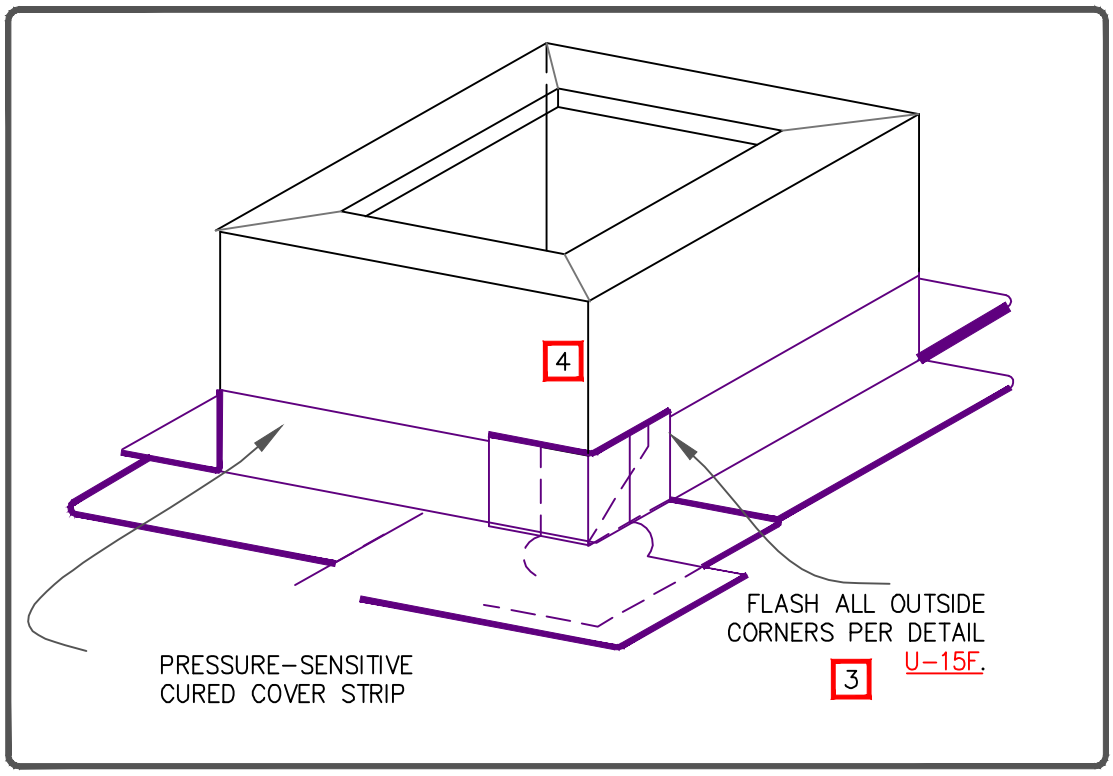
U (UNIVERSAL DETAIL)

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DIMENSIONS		cm	
A	2"	5	MIN.
B	3"	7.5	APPROX.

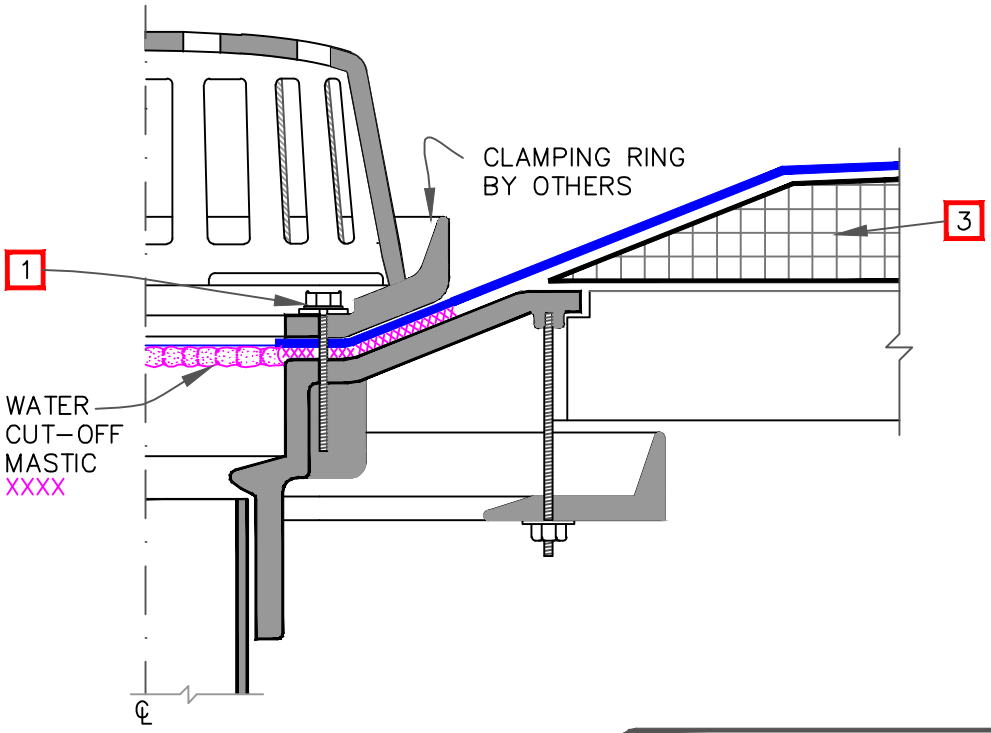


NOTES:

1. CONSULT THE RESPECTIVE MANUFACTURER OF THE SELF-FLASHING METAL CURB FOR PROPER SECUREMENT.
2. WATER CUT-OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION.
3. USE DETAIL U-15F TO ACHIEVE SUFFICIENT COVERAGE OF METAL FLANGE AT CORNERS.
4. IF THE VERTICAL SPLICE ON THE CURB FLASHING IS NOT LOCATED AT THE CORNER, USE DETAIL U-2C FOR EPDM MEMBRANE SPLICES AT ANGLE CHANGES.

CARLISLE SYNTEC SYSTEMS	NEW SELF-FLASHING METAL CURB	EPDM	DETAIL NO. U-5E
	MAXIMUM WARRANTY: 25 YEARS		U (UNIVERSAL DETAIL)

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NOTES:

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

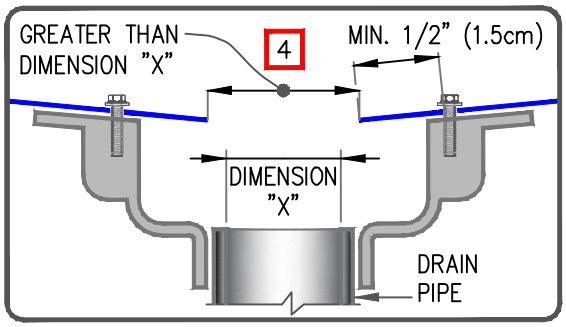
2. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.

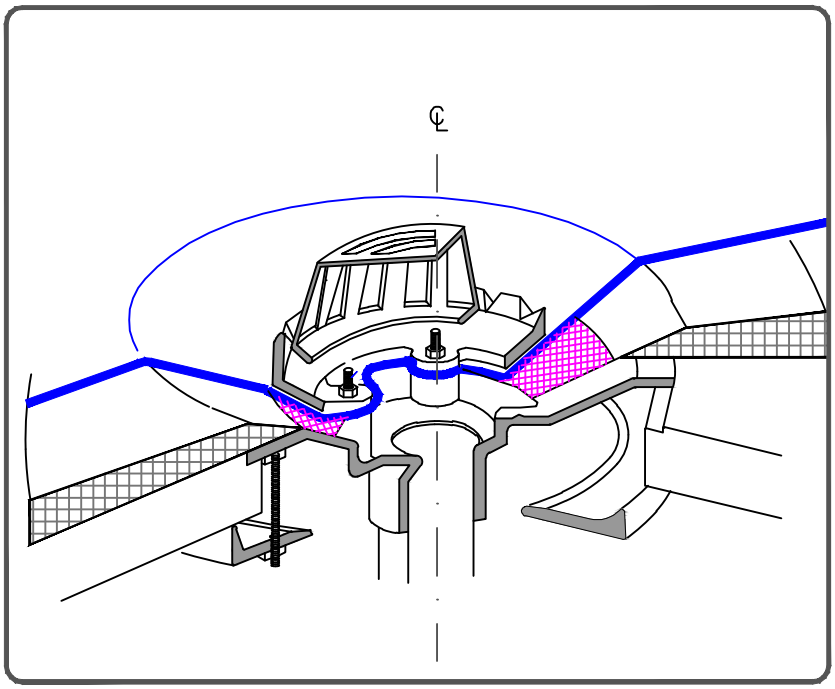
3. INSULATION TAPER SHALL NOT BE GREATER THAN 6" (15cm) IN 12" (30cm) HORIZONTAL. REINFORCED EPDM IS LIMITED TO A TAPER LESS THAN 3" (7.5CM) PER FOOT. IF GREATER USE DETAIL U–6B.

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

5. FIELD SPLICES MUST BE LOCATED AT LEAST 6" (15cm) OUTSIDE THE DRAIN SUMP.

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





CARLISLE SYNTEC SYSTEMS

ROOF DRAIN

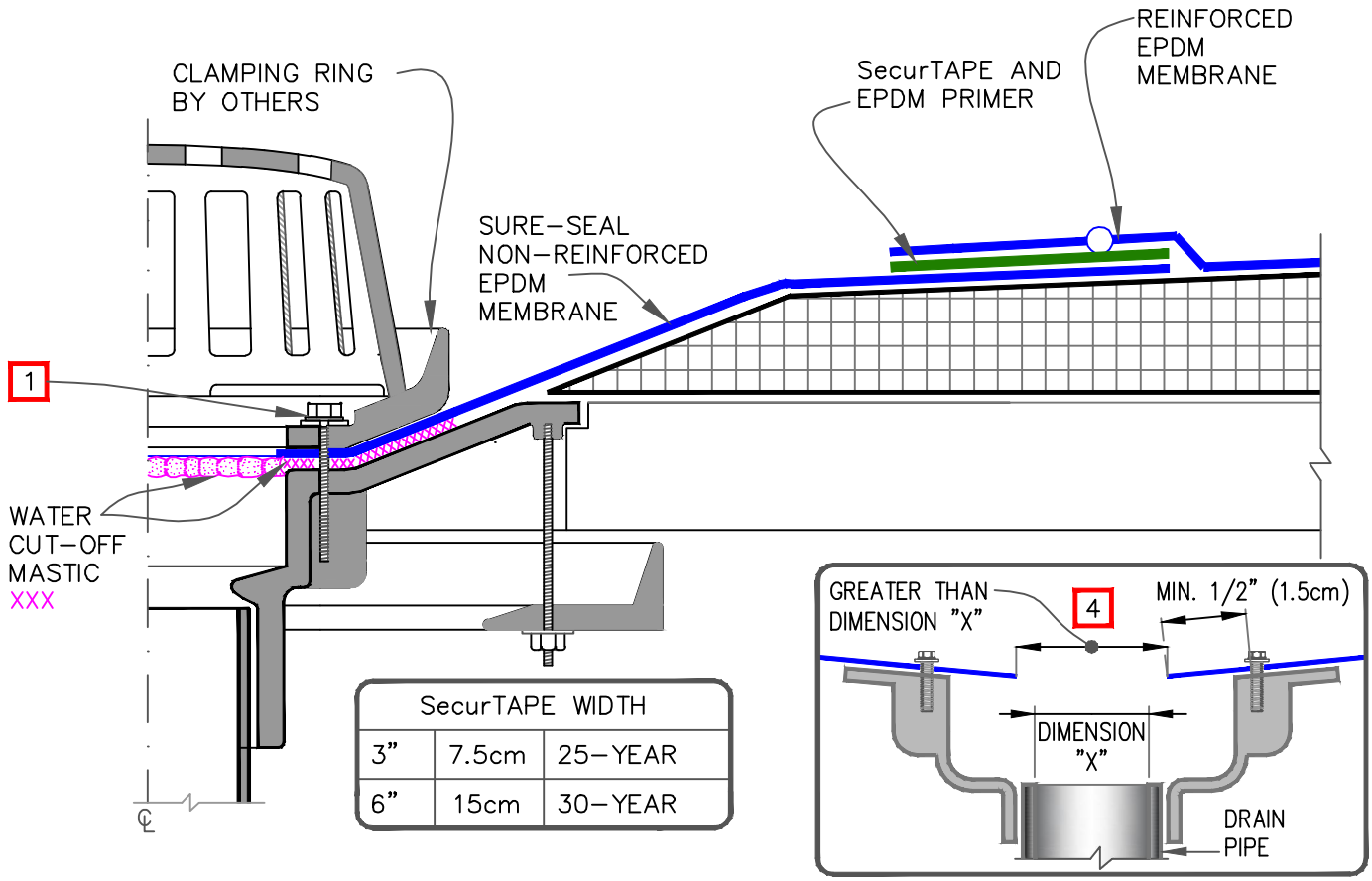
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.

U–6A

U (UNIVERSAL DETAIL)

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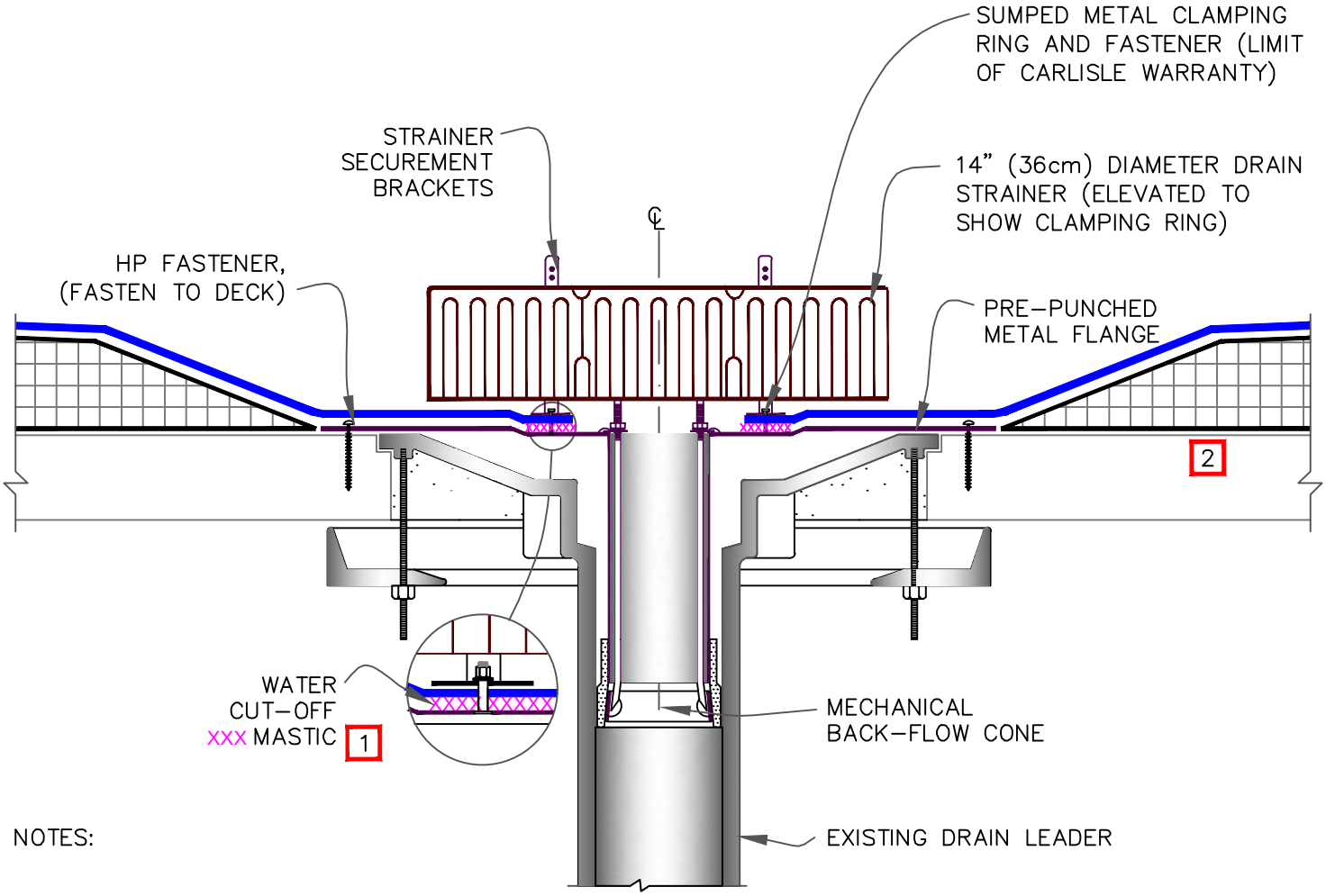


NOTES:

1. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
2. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
3. USE DETAIL MF-6B FOR MECHANICALLY-FASTENED SYSTEMS.
4. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
5. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
6. FIELD SPLICES MUST BE LOCATED AT LEAST 6" (15cm) OUTSIDE THE DRAIN SUMP.
7. CARLISLE RECOMMENDS THE DRAIN TARGET SPLICE BE SHINGLED
   - 7.1. CUT A SQUARE HOLE IN THE FIELD SHEET TO BE AT LEAST 6" (15cm) OUTSIDE THE DRAIN SUMP
   - 7.2. APPLY PRIMER AND SecurTAPE TO THE BOTTOM OF THE FIELD SHEET
   - 7.3. PRIME THE TARGET PIECE OF NR EPDM
   - 7.4. MATE THE TARGET TO THE TAPE
   - 7.5. APPLY BONDING ADHESIVE TO ADHERE FIELD AND TARGET MEMBRANE TO THE SUBSTRATE

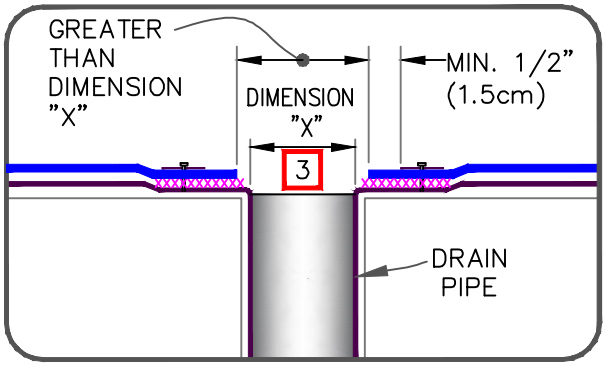
CARLISLE SYNTEC SYSTEMS	ROOF DRAIN – REINFORCED FIELD SHEET WITH SUMP EXCEEDING 3" PER FOOT	NEW	DETAIL NO. U-6B
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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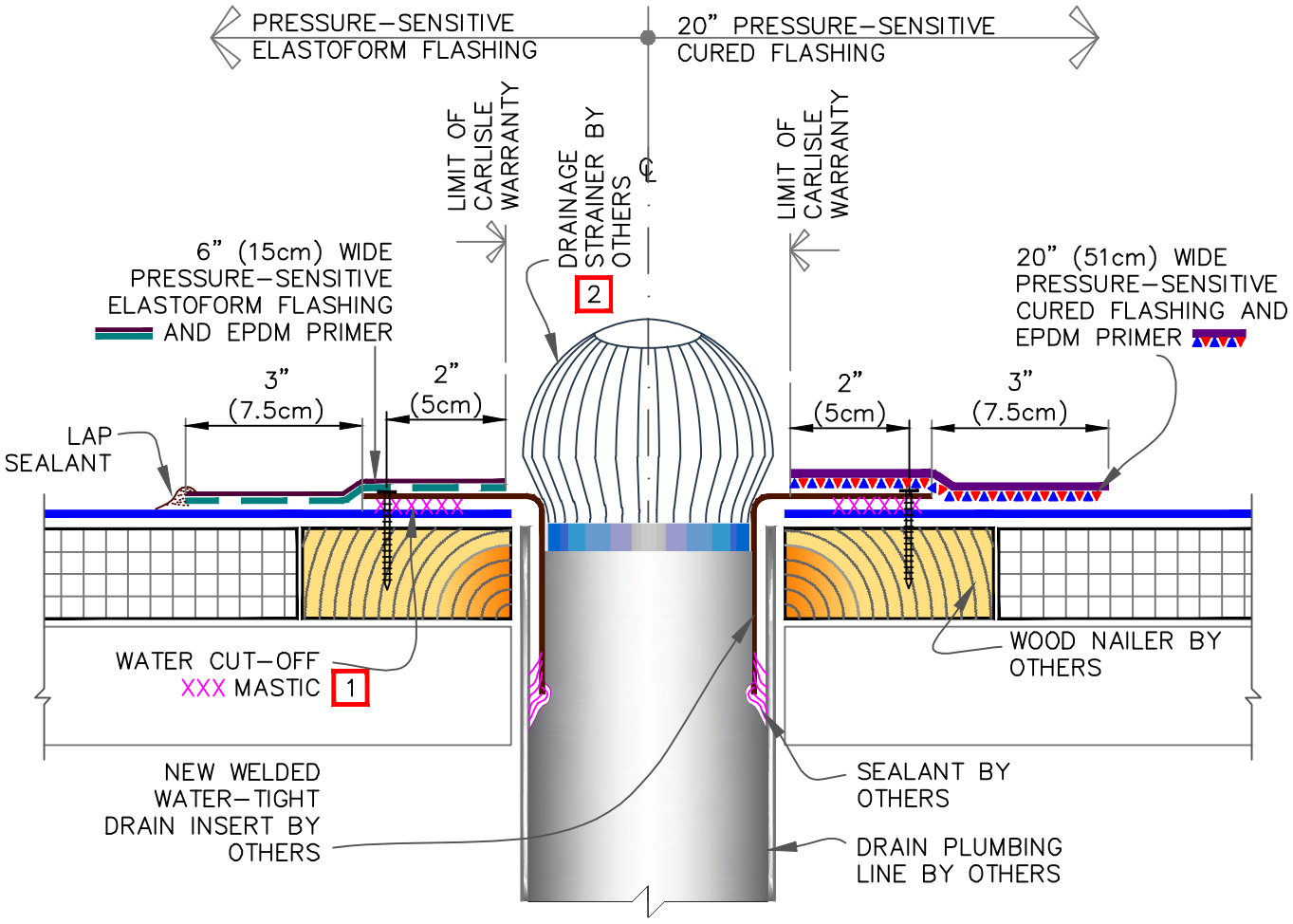
NOTES:

1. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
2. INSULATION TAPER SHALL NOT BE GREATER THAN 6" (15cm) IN 12" (30cm) HORIZONTAL.
3. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
4. FIELD SPLICES MUST BE LOCATED AT LEAST 6" (15cm) OUTSIDE THE DRAIN SUMP.
5. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.



CARLISLE SYNTEC SYSTEMS	SURE-SEAL INSERT DRAIN	DETAIL NO. U-6C
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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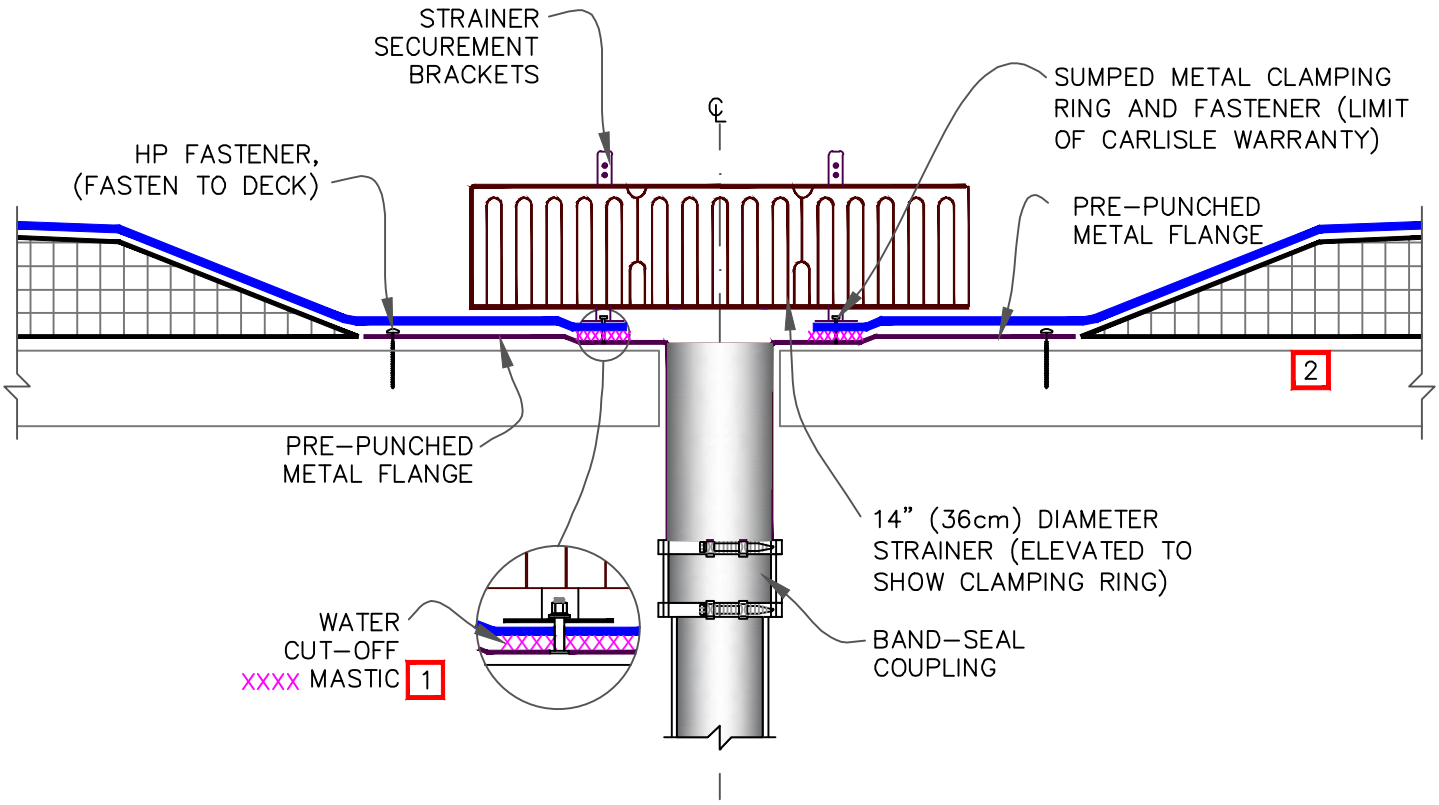


NOTES:

1. WATER CUT–OFF MASTIC MUST BE UNDER CONSTANT COMPRESSION.
2. CONSULT SPECIFIER OR APPLICABLE CODES FOR ADEQUATE DRAINAGE STRAINER TO AVOID PONDING WATER. DO NOT RESTRICT WATER FLOW.
3. FOR PROJECTS WITH 30–YEAR WARRANTIES, THE DRAIN INSERT FLANGE MUST BE OVERLAID WITH TWO LAYERS OF PRESSURE–SENSITIVE FLASHING. THE BOTTOM LAYER SHALL BE 6" (15cm) WIDE PRESSURE–SENSITIVE ELASTOFORM OR CURED COVER STRIP COVERED WITH A 9" (23cm) WIDE TOP LAYER OF PRESSURE–SENSITIVE ELASTOFORM FLASHING. SEAL TOP LAYER WITH CONTINUOUS LAP SEALANT.

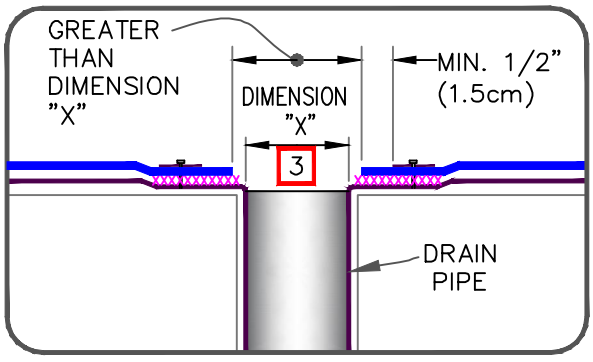
CARLISLE SYNTEC SYSTEMS	INSERT DRAIN THROUGH DECK	EPDM	DETAIL NO. U–6D
	MAXIMUM WARRANTY: 30 YEARS. SEE NOTE 3		U (UNIVERSAL DETAIL)

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NOTES:

1. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
2. INSULATION TAPER SHALL NOT BE GREATER THAN 6" (15cm) IN 12" (30cm) HORIZONTAL.
3. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
4. FIELD SPLICES MUST BE LOCATED AT LEAST 6" (15cm) OUTSIDE THE DRAIN SUMP.
5. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.



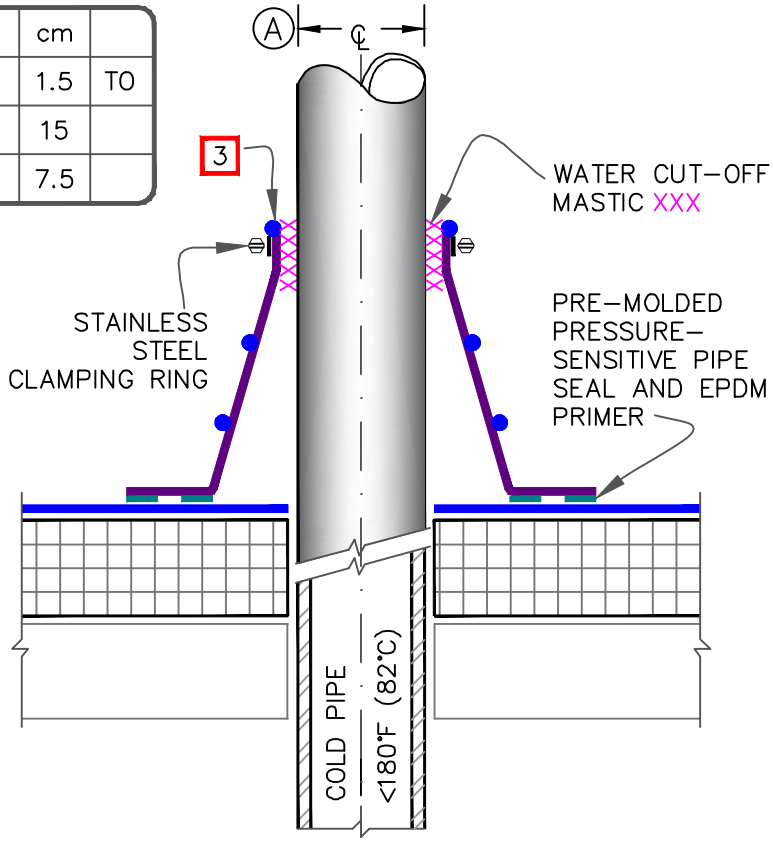
CARLISLE SYNTEC SYSTEMS	SURE-SEAL ADD-ON DRAIN	DETAIL NO. U-6E
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

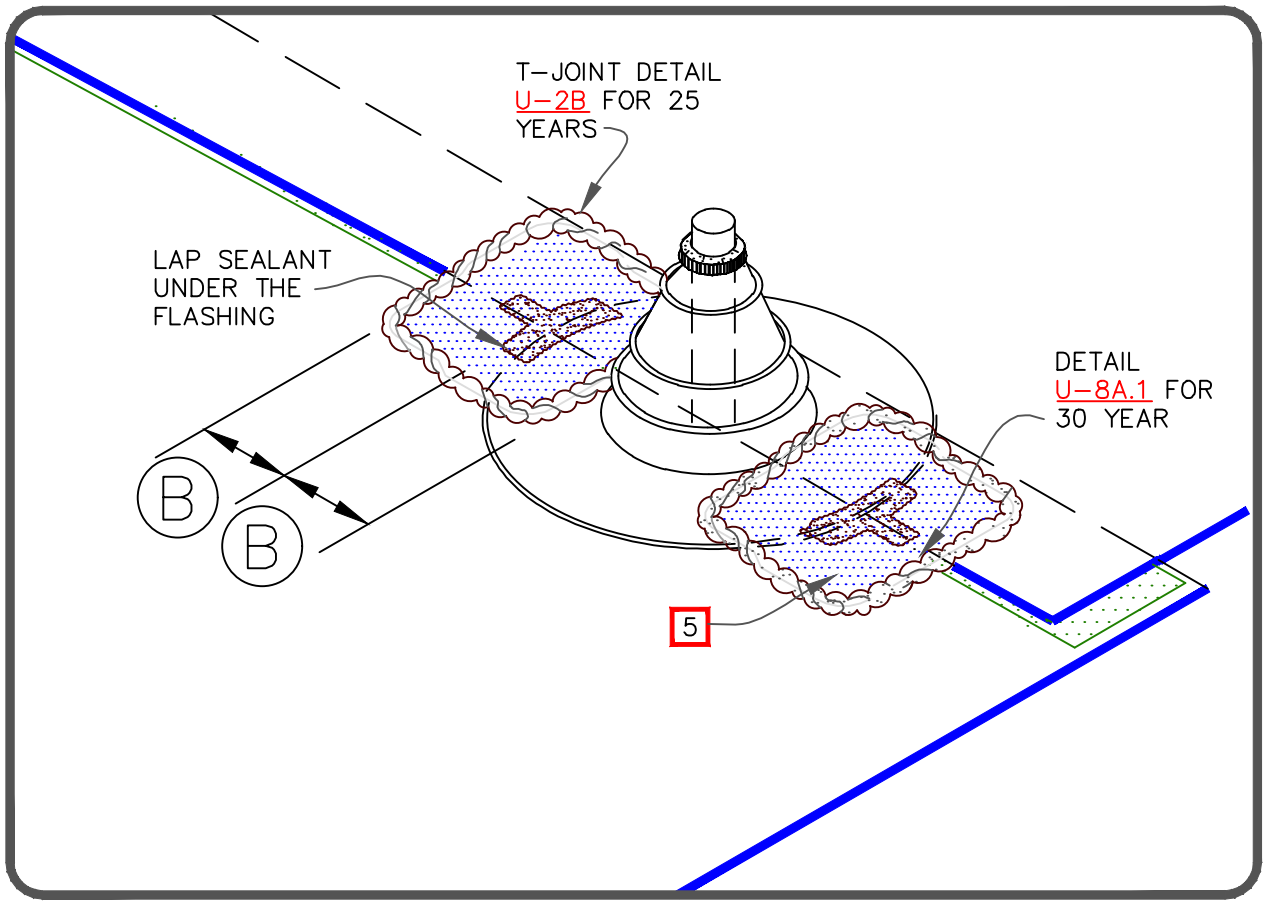
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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING PRESSURE-SENSITIVE PIPE SEAL.
2. TEMPERATURE OF PIPE PENETRATION MUST NOT EXCEED 180°F (82°C).
3. PRE-MOLDED PIPE FLASHING MUST HAVE RIB INTACT AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
4. DECK FLANGES OF THE PRESSURE-SENSITIVE PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.
5. USE DETAIL U-8A.1 WHEN PIPE BOOT INTERSECTS A SPLICE ON 30-YEAR WARRANTY.
6. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, REFER TO DETAIL MF-8A.

DIMENSIONS		cm	
(A)	1/2"	1.5	TO
	6"	15	
(B)	3"	7.5	





CARLISLE SYNTEC SYSTEMS

PRESSURE-SENSITIVE PIPE SEAL

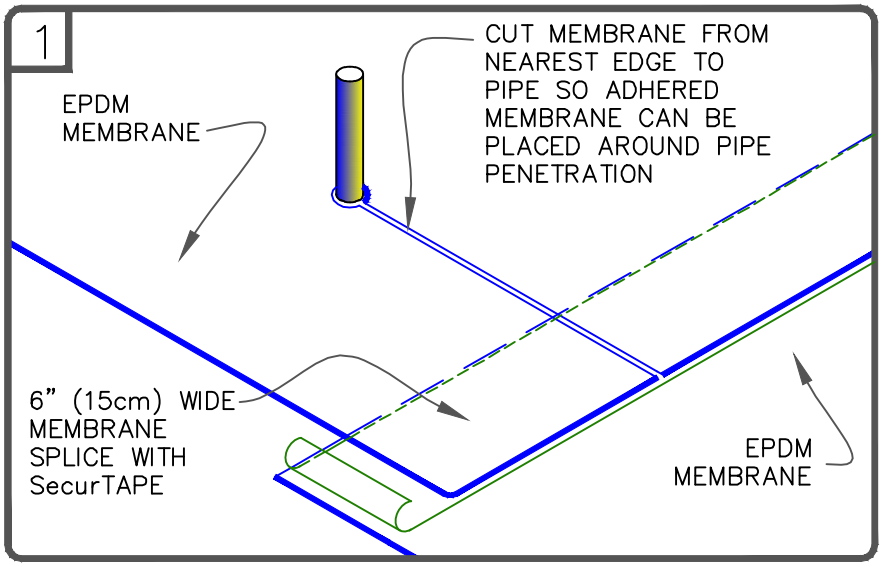
MAXIMUM WARRANTY: 30 YEARS

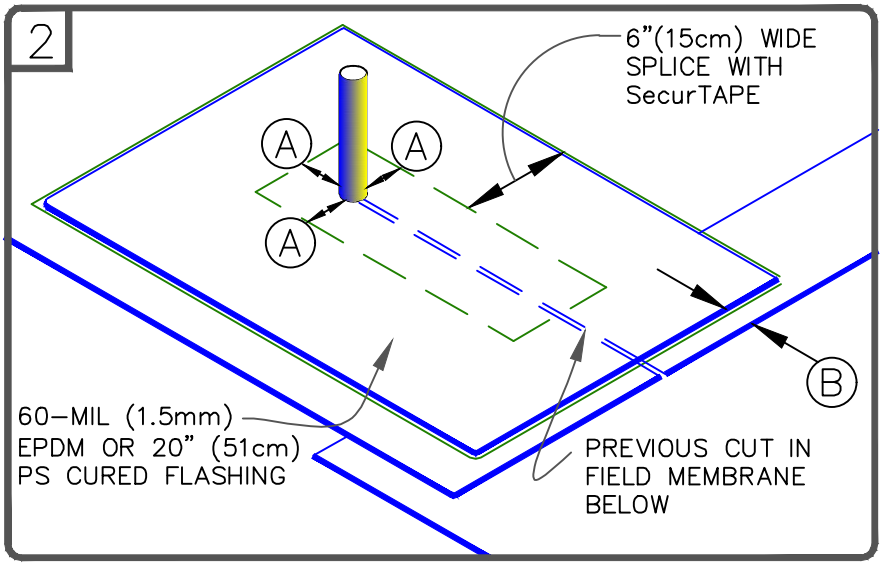
DETAIL NO.

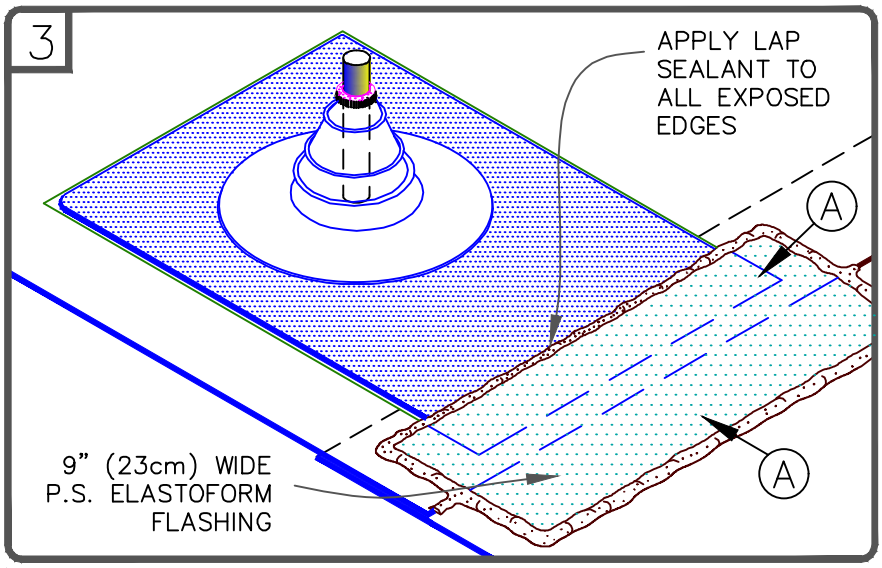
U-8A

U (UNIVERSAL DETAIL)

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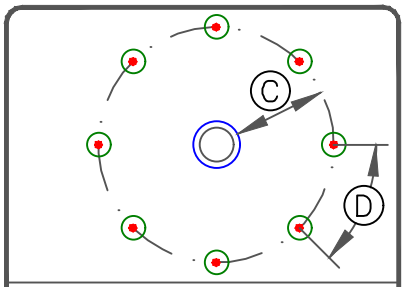






NOTES:

1. THIS DETAIL FOR USE WHEN A RELIEF CUT OR MEMBRANE SPLICE IS PRESENT AT THE PIPE SEAL. USE DETAIL U-8A WHEN NO CUT OR SPLICE IS PRESENT.
2. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING PRESSURE-SENSITIVE PIPE SEAL.
3. PIPE SEAL MUST HAVE INTACT RIB AT TOP EDGE, REGARDLESS OF PIPE DIAMETER.
4. DECK FLANGES OF THE MOLDED PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.
5. ON MECHANICALLY FASTENED ROOFING SYSTEMS REFER TO DETAIL MF-8A.1.
6. MEMBRANE SECUREMENT IS REQUIRED AROUND ALL ROUND PIPE PENETRATIONS GREATER THAN 18"(45.7cm) IN DIAMETER.



PIPE OUTSIDE DIAMETER > 18" (45.7cm)

DIMENSIONS		cm	
A	3"	7.5	MIN.
B	1"	2.5	MIN.
C	6"-12"	20-30	MIN-MAX
D	12"	30	MAX.

CARLISLE SYNTEC SYSTEMS

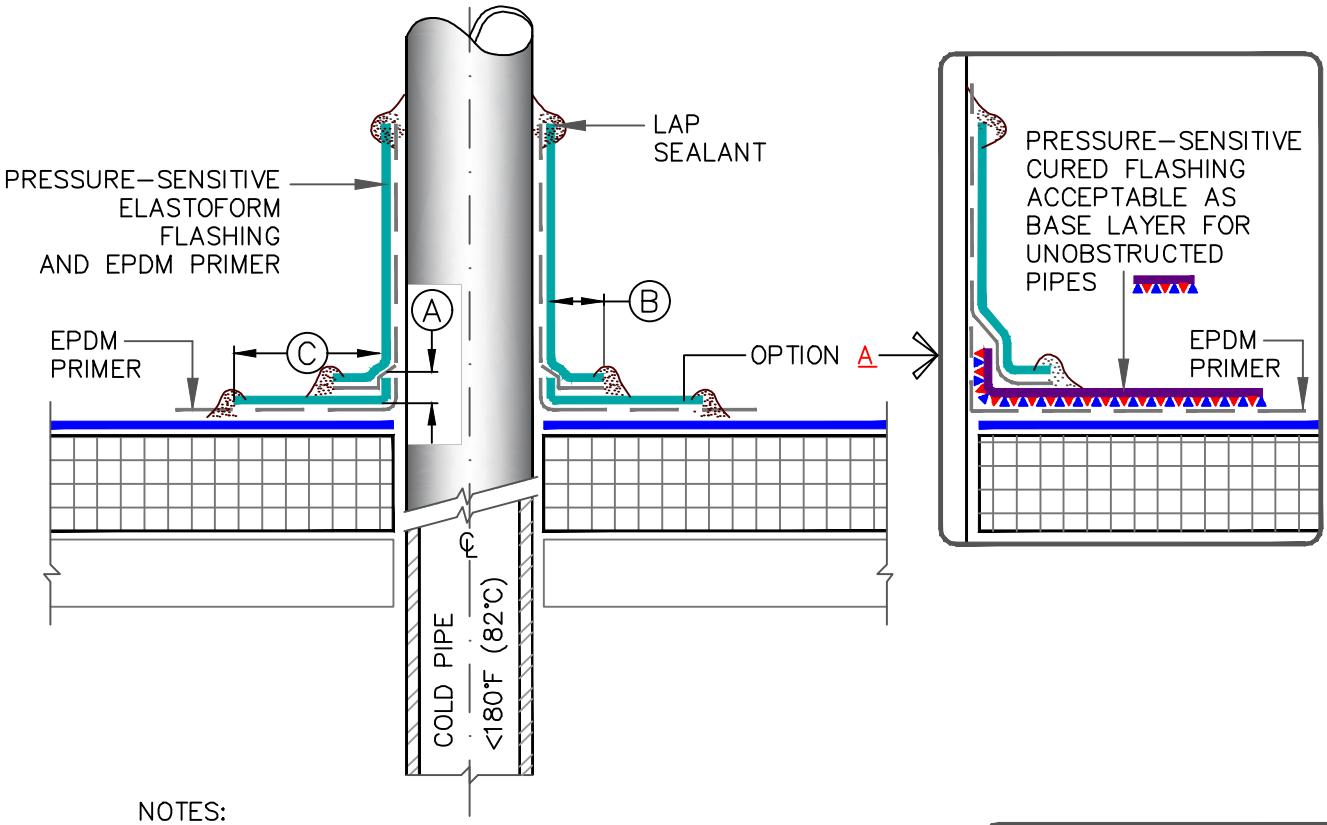
PRESSURE-SENSITIVE PIPE SEAL WITH 90-MIL MEMBRANE OR 30-YEAR WARRANTY

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-8A.1

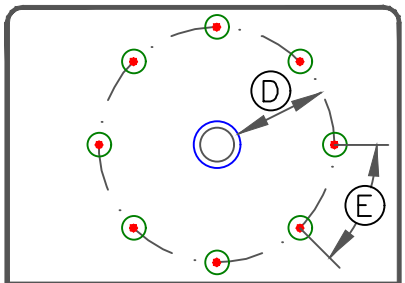
U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD–FABRICATED FLASHING.
2. TEMPERATURE OF PIPE PENETRATION MUST NOT EXCEED 180°F (82°C).
3. ACCEPTABLE WITH SQUARE OR RECTANGULAR STRUCTURAL TUBING WITH ROUNDED CORNERS UP TO 12"(30cm). USE DETAIL U–5 IF GREATER THAN 12" (30cm).
4. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE–SENSITIVE ELASTOFORM OR CURED FLASHING.
5. ON MECHANICALLY FASTENED ROOFING SYSTEMS. REFER TO DETAIL MF–8B.
6. MEMBRANE SECUREMENT IS REQUIRED AROUND ALL ROUND PIPE PENETRATIONS GREATER THAN 18" (46cm) IN DIAMETER.



PIPE OUTSIDE DIAMETER > 18" (45.7cm)

DIMENSIONS		cm	
A	1/2"	1.5	MIN.
B	1"	2.5	MIN.
C	3"	7.5	MIN.
D	6"–12"	20–30	MIN–MAX
E	12"	30	MAX.

CARLISLE SYNTEC SYSTEMS

FIELD FABRICATED PIPE WRAP

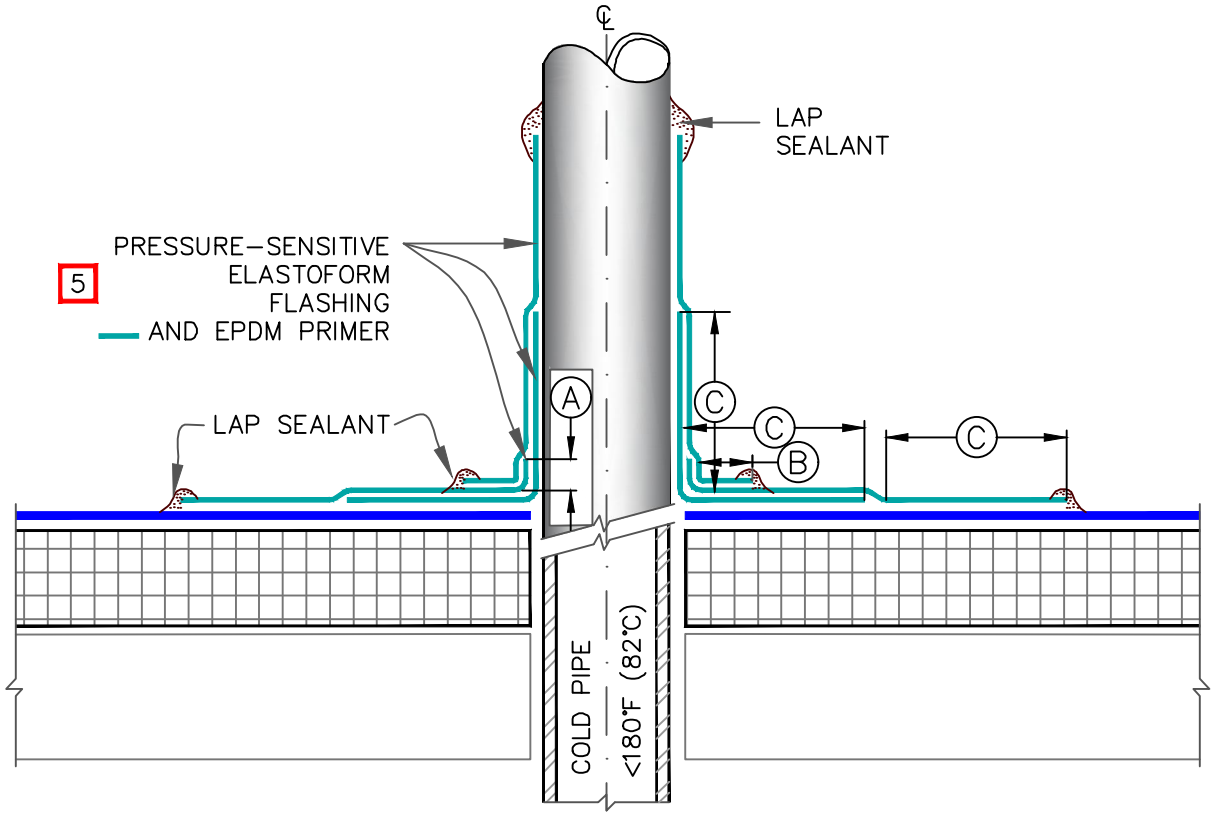
MAXIMUM WARRANTY: 20 YEARS

DETAIL NO.

U–8B

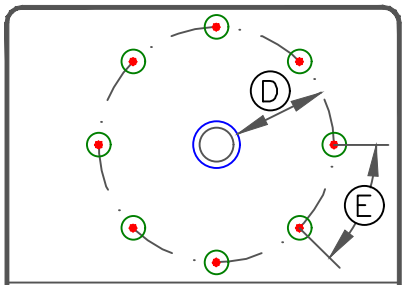
U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD–FABRICATED FLASHING.
2. TEMPERATURE OF PIPE PENETRATION MUST NOT EXCEED 180°F (82°C).
3. PIPE FLASHING MAY BE USED WITH SQUARE OR RECTANGULAR STRUCTURAL TUBING WITH ROUNDED CORNERS.
4. FOR STRUCTURAL STEEL TUBING GREATER THAN 12" (30cm) ACROSS, USE DETAIL(S) U–5.
5. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE–SENSITIVE ELASTOFORM FLASHING.
6. ON MECHANICALLY FASTENED ROOFING SYSTEMS, REFER TO DETAIL MF–8B.1.
7. MEMBRANE SECUREMENT IS REQUIRED AROUND ALL ROUND PIPE PENETRATIONS GREATER THAN 18" (46cm) IN DIAMETER.



PIPE OUTSIDE DIAMETER > 18" (45.7cm)

DIMENSIONS		cm	
A	1/2"	1.5	MIN.
B	1"	2.5	MIN.
C	3"	7.5	MIN.
D	6"–12"	20–30	MIN–MAX
E	12"	30	MAX.

CARLISLE SYNTEC SYSTEMS

FIELD FABRICATED PIPE WRAP

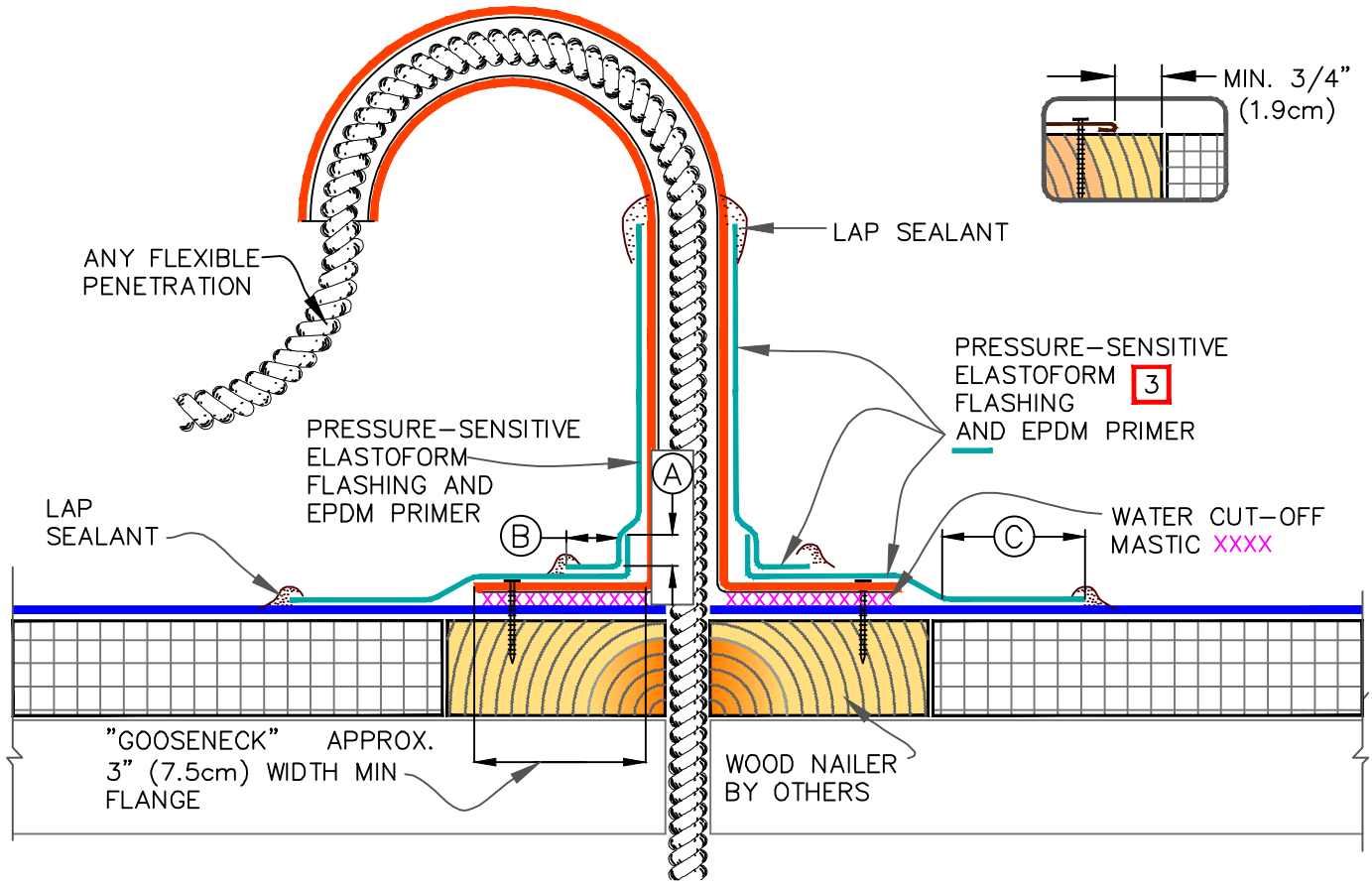
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.

U–8B.1

U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD-FABRICATED PIPE SEAL.
2. TEMPERATURE OF PENETRATION MUST NOT EXCEED 180°F (82°C).
3. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING.

DIMENSIONS		cm	
Ⓐ	1/2"	1.5	MIN.
Ⓑ	1"	2.5	MIN.
Ⓒ	3"	7.5	MIN.

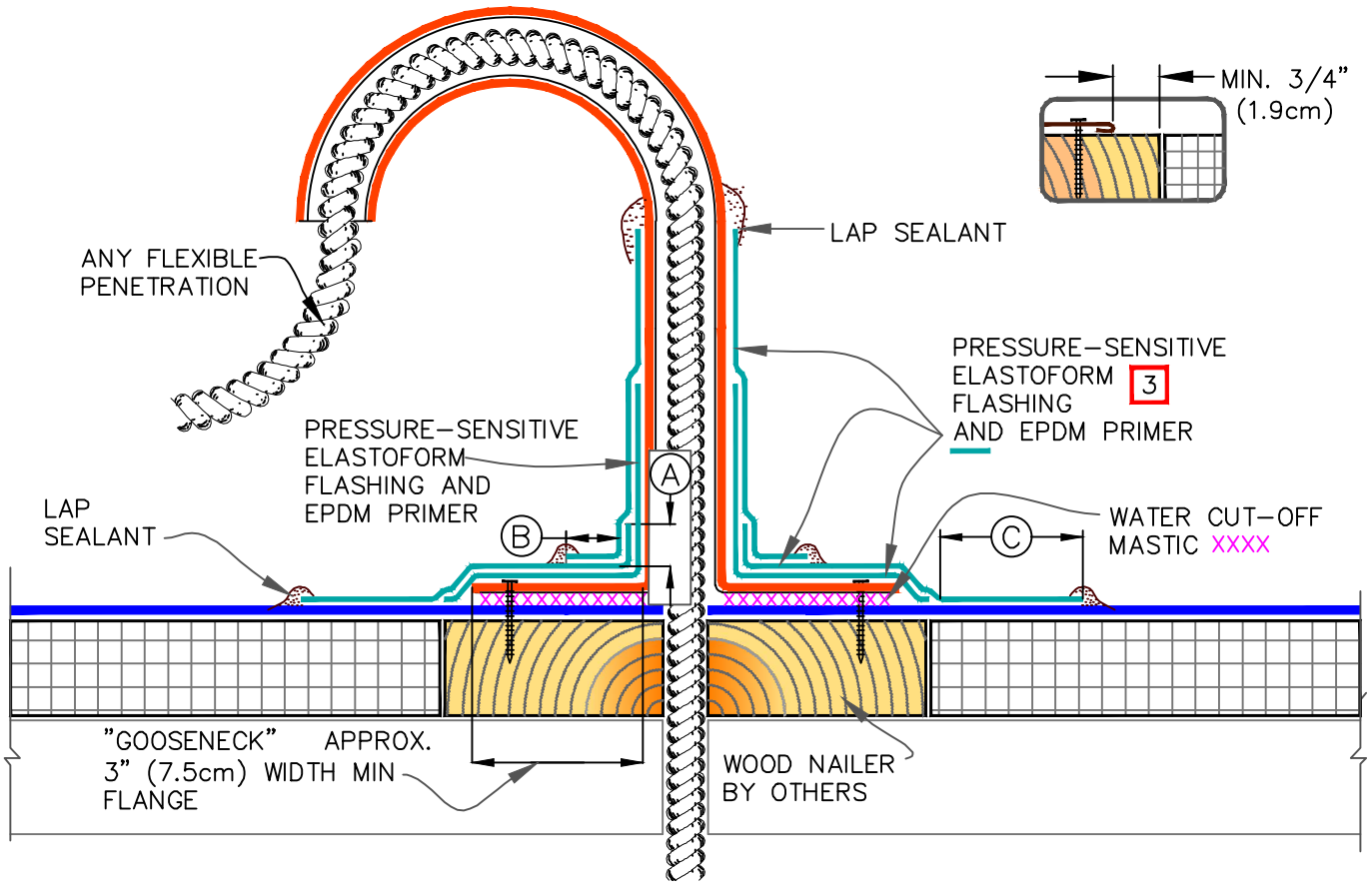
CARLISLE SYNTEC SYSTEMS

FLEXIBLE PENETRATION

MAXIMUM WARRANTY: 20 YEARS

DETAIL NO.
U-8C
U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD–FABRICATED PIPE SEAL.
2. TEMPERATURE OF PENETRATION MUST NOT EXCEED 180°F (82°C).
3. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE–SENSITIVE ELASTOFORM FLASHING.

DIMENSIONS		cm	
Ⓐ	1/2"	1.5	MIN.
Ⓑ	1"	2.5	MIN.
Ⓒ	3"	7.5	MIN.

CARLISLE SYNTEC SYSTEMS

FLEXIBLE PENETRATION
(30 YEAR WARRANTY)

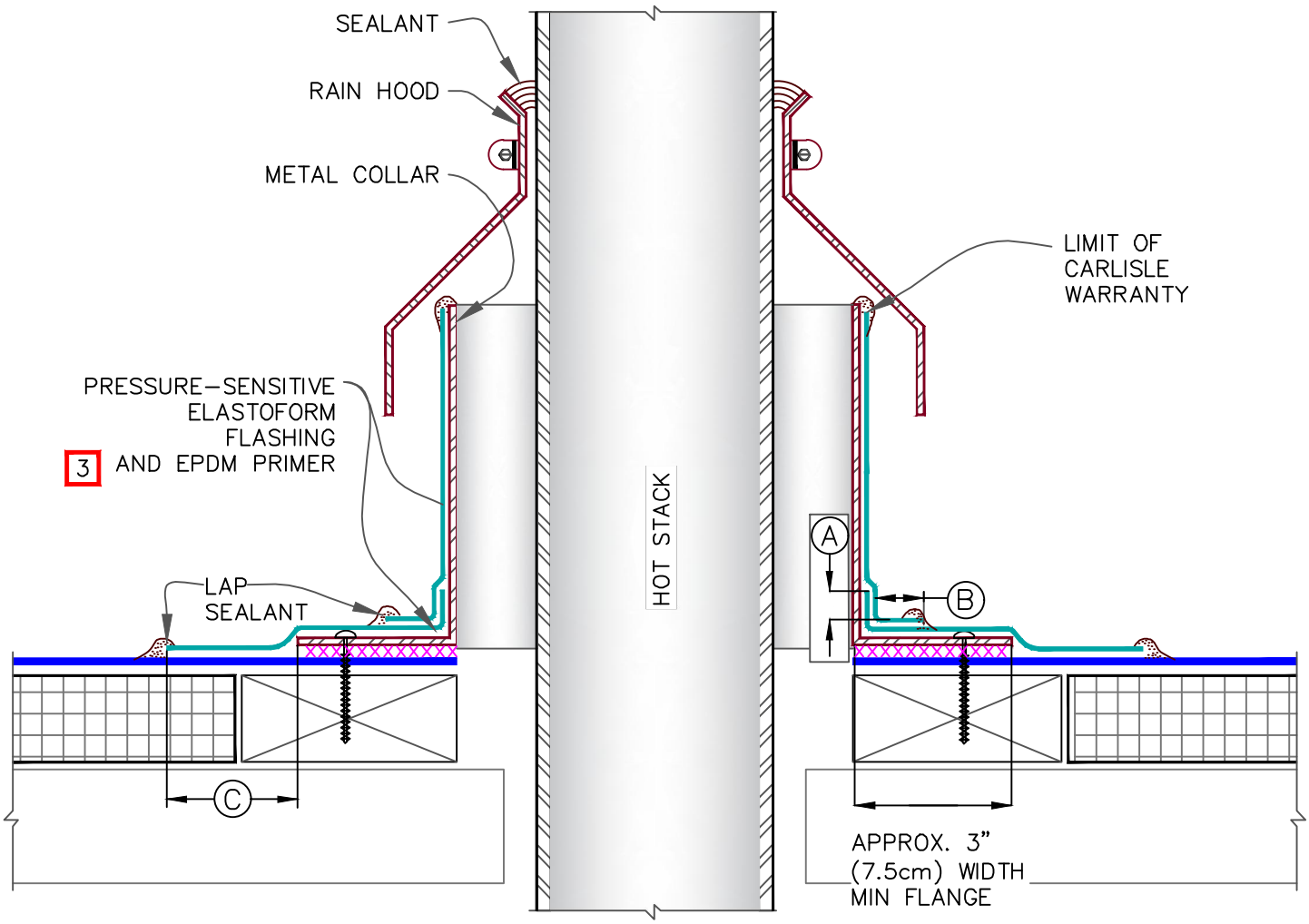
MAXIMUM WARRANTY: 30 YEARS

EPDM

DETAIL NO.
U–8C.1

U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD FABRICATED PIPE SEAL.
2. TEMPERATURE OF METAL COLLAR MUST NOT EXCEED 180°F (82°C).
3. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE–SENSITIVE ELASTOFORM FLASHING.

DIMENSIONS		cm	
A	1/2"	1.5	MIN.
B	1"	2.5	MIN.
C	3"	7.5	MIN.

CARLISLE SYNTEC SYSTEMS

FIELD FABRICATED HOT STACK

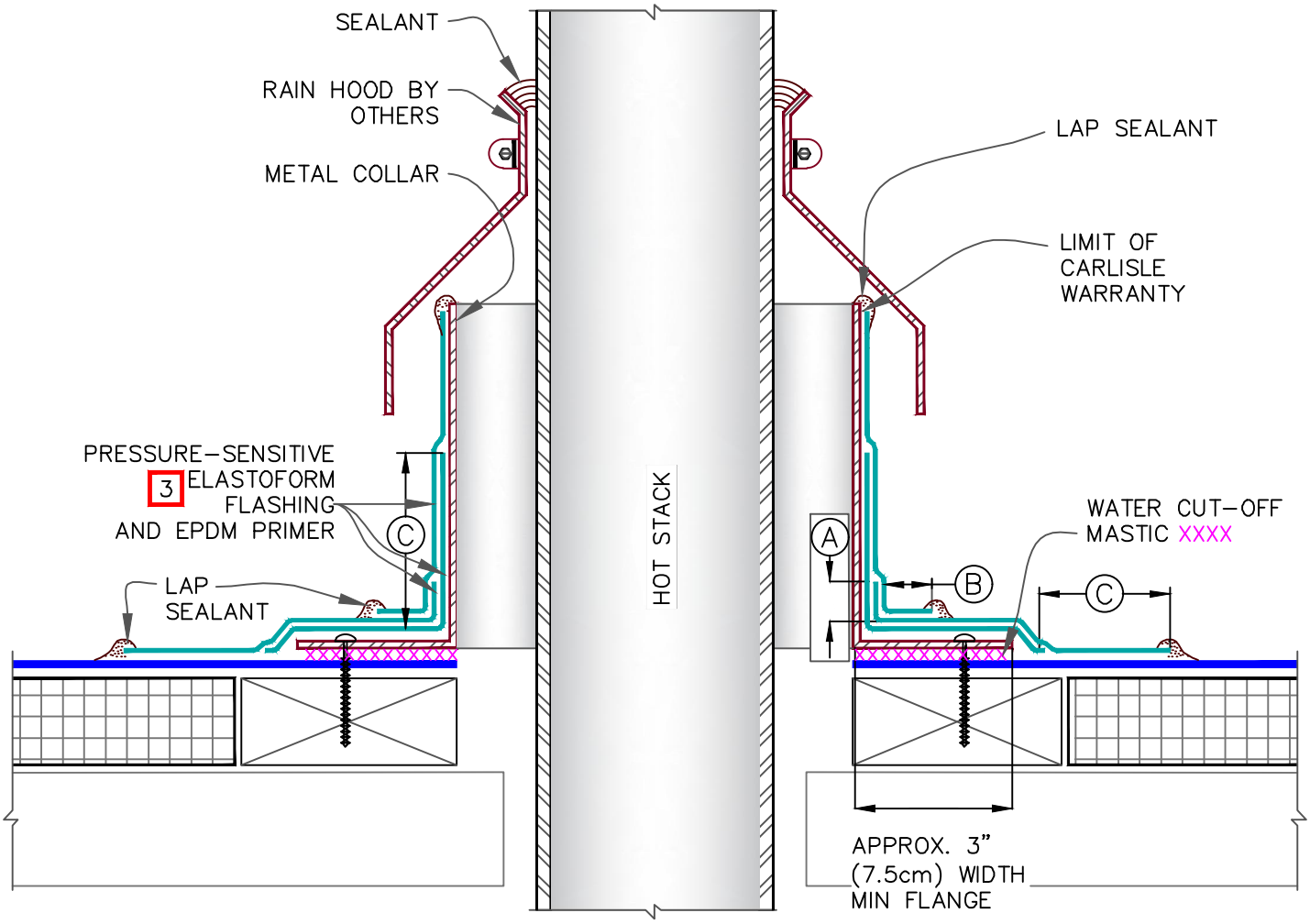
MAXIMUM WARRANTY: 20 YEARS

DETAIL NO.

U–8D

U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING FIELD FABRICATED PIPE SEAL.
2. TEMPERATURE OF METAL COLLAR MUST NOT EXCEED 180°F (82°C).
3. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING.

DIMENSIONS		cm	
A	1/2"	1.5	MIN.
B	1"	2.5	MIN.
C	3"	7.5	MIN.

CARLISLE SYNTEC SYSTEMS

FIELD FABRICATED HOT STACK

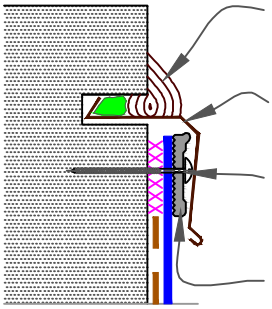
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-8D.1

U (UNIVERSAL DETAIL)

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9A MECHANICAL TERMINATION WITH COUNTER FLASHING



CARLISLE UNIVERSAL SINGLE–PLY SEALANT OR SEALANT (BY OTHERS)

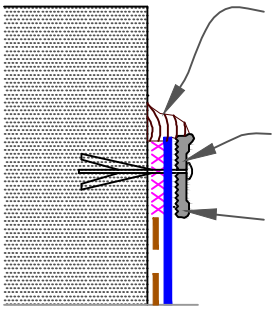
METAL COUNTER–FLASHING WITH LEAD WEDGES, AS REQUIRED (BY OTHERS).

THREADED FASTENERS OR CARLISLE HP TERM BAR NAIL–IN. 6"(15cm) O.C. FASTENING RECOMMENDED.

CARLISLE TERMINATION BAR

WARRANTY UP TO 30 YEARS | SEE INSET A

9B MECHANICAL TERMINATION



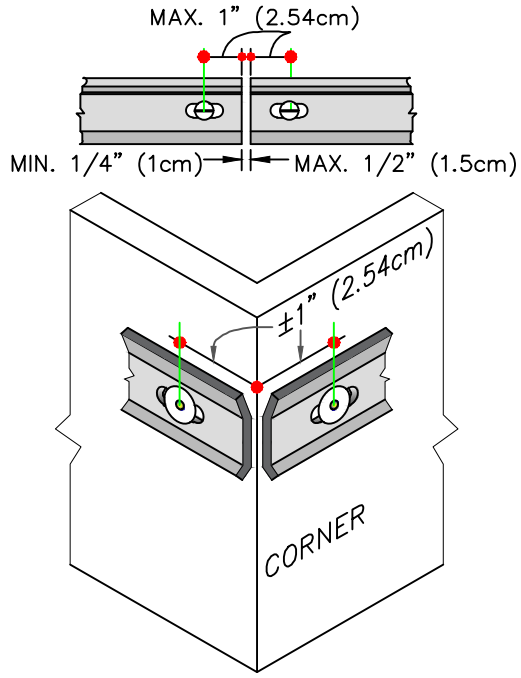
CARLISLE UNIVERSAL SINGLE–PLY SEALANT OR SEALANT (BY OTHERS)

CARLISLE HP TERM BAR NAIL–IN. 6"(15cm) O.C. FASTENING RECOMMENDED.

CARLISLE TERMINATION BAR

WARRANTY UP TO 20 YEARS | SEE INSET A

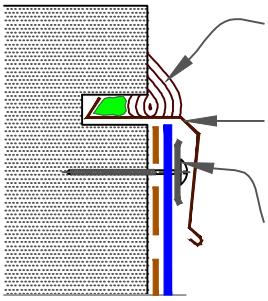
INSET A



NOTES:

1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. DO NOT WRAP TERMINATION BAR AROUND CORNERS.
3. DETAIL 9D MUST BE USED AT VERTICAL JOINTS IN PANEL WALLS.

9C COUNTER FLASHING TERMINATION



CARLISLE UNIVERSAL SINGLE–PLY SEALANT OR SEALANT (BY OTHERS)

METAL COUNTER–FLASHING WITH LEAD WEDGES, AS REQUIRED (BY OTHERS).

FASTEN MEMBRANE @ 12" (30cm) O.C. MAX. USE GALVANIZED WASHERS, MIN. 1", (2.54cm) DIAMETER

NOTE:

1. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER–FLASHING, USE EPDM WASHERS, APPLY WATER CUT–OFF MASTIC UNDER THE COUNTER–FLASHING OR CAULK THE FASTENER HEADS.

WARRANTY UP TO 10 YEARS

— — APPLICABLE BONDING ADHESIVE

xxx WATER CUT–OFF MASTIC– MUST BE HELD UNDER CONSTANT COMPRESSION.

CARLISLE SYNTEC SYSTEMS

MEMBRANE TERMINATIONS (PAGE 1 OF 3)

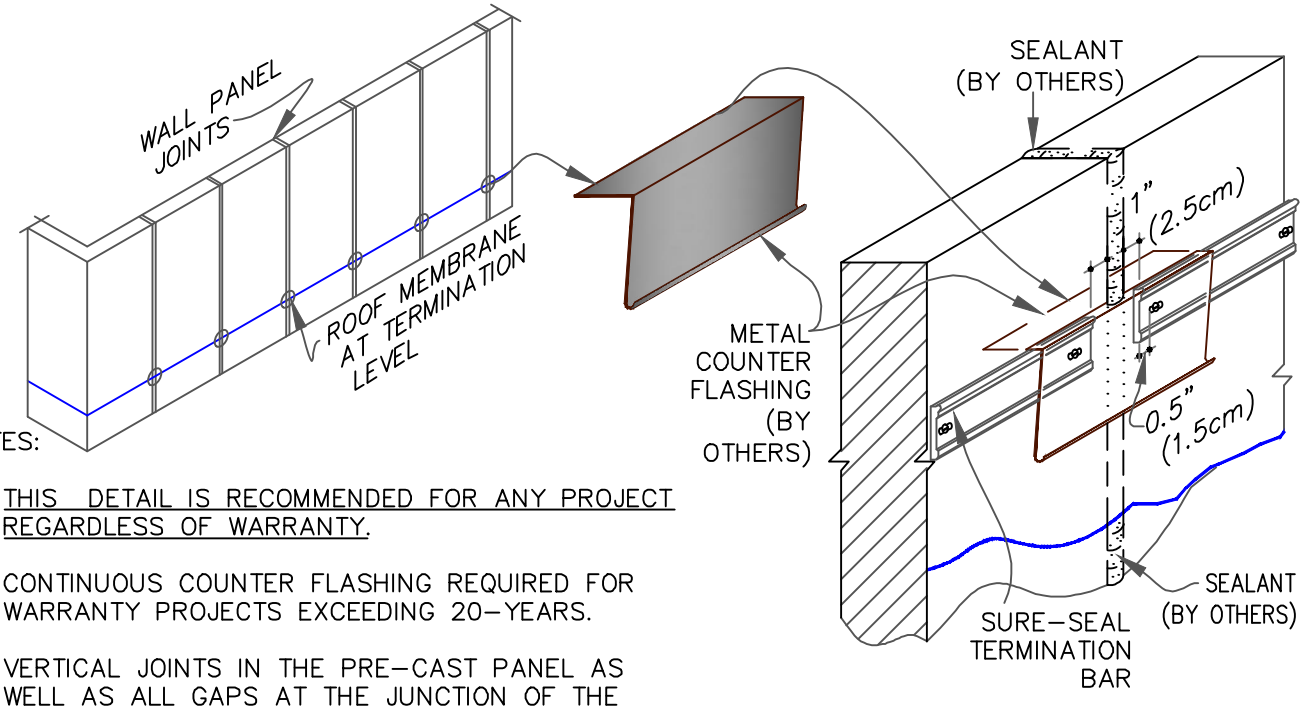
WARRANTY AS NOTES FOR EACH DETAIL

DETAIL NO. U–9

U (UNIVERSAL DETAIL)

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9D MECHANICAL TERMINATION AT VERTICAL JOINTS



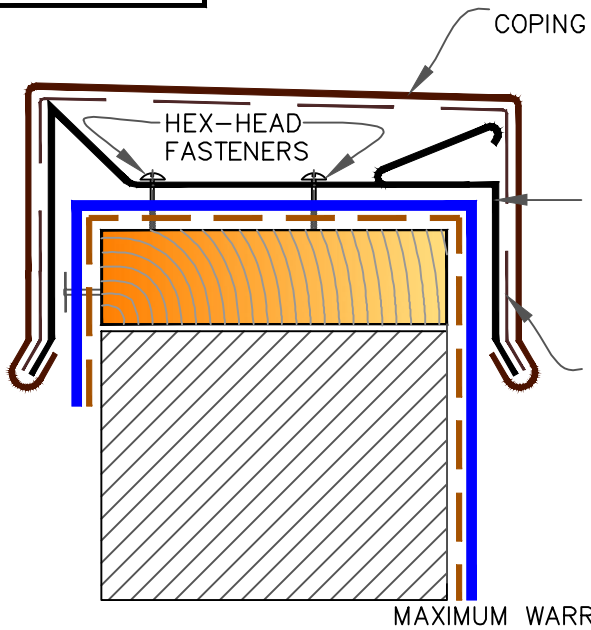
NOTES:

1. THIS DETAIL IS RECOMMENDED FOR ANY PROJECT REGARDLESS OF WARRANTY.
2. CONTINUOUS COUNTER FLASHING REQUIRED FOR WARRANTY PROJECTS EXCEEDING 20-YEARS.
3. VERTICAL JOINTS IN THE PRE-CAST PANEL AS WELL AS ALL GAPS AT THE JUNCTION OF THE TILT-UP PANEL AND ROOF DECK MUST BE FULLY SEALED TO PREVENT AIR INFILTRATION.
4. APPLY ON HARD SMOOTH SURFACE ONLY.

9E SecurEdge & SecurEdge 300 COPINGS

NOTES:

1. MEMBRANE MUST BE EXTENDED AT CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE. REFER TO 3D DETAIL ON DETAIL U-9F.
2. REFER TO SecurEdge COPING INSTALLATION INSTRUCTION MANUAL FOR STEP-BY-STEP INSTRUCTION PROCEDURES.



MAXIMUM WARRANTY: 30 YEARS

— — APPLICABLE BONDING ADHESIVE

xxx WATER CUT-OFF MASTIC- MUST BE HELD UNDER CONSTANT COMPRESSION.

CARLISLE SYNTEC SYSTEMS

MEMBRANE TERMINATIONS (PAGE 2 OF 3)

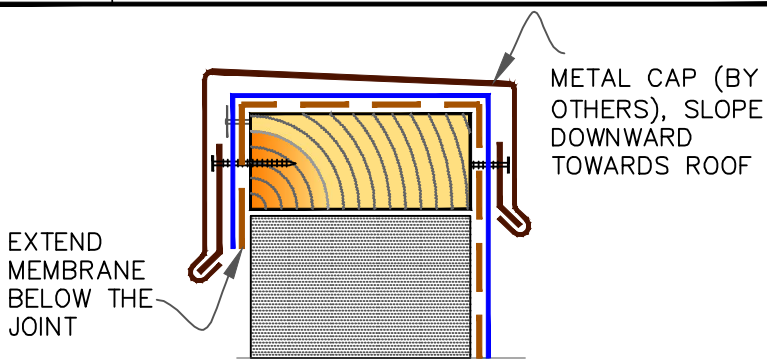
WARRANTY AS NOTES FOR EACH DETAIL

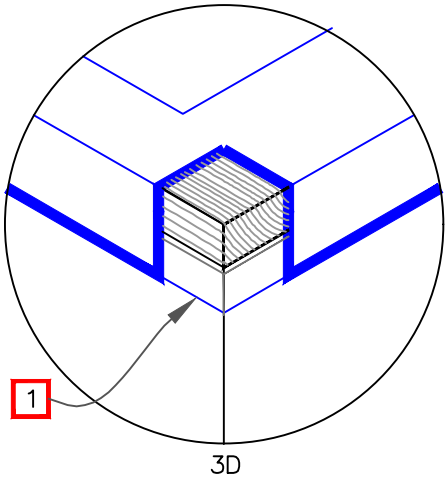
DETAIL NO. U-9

U (UNIVERSAL DETAIL)

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9F SHEET METAL COPING (BY OTHERS)

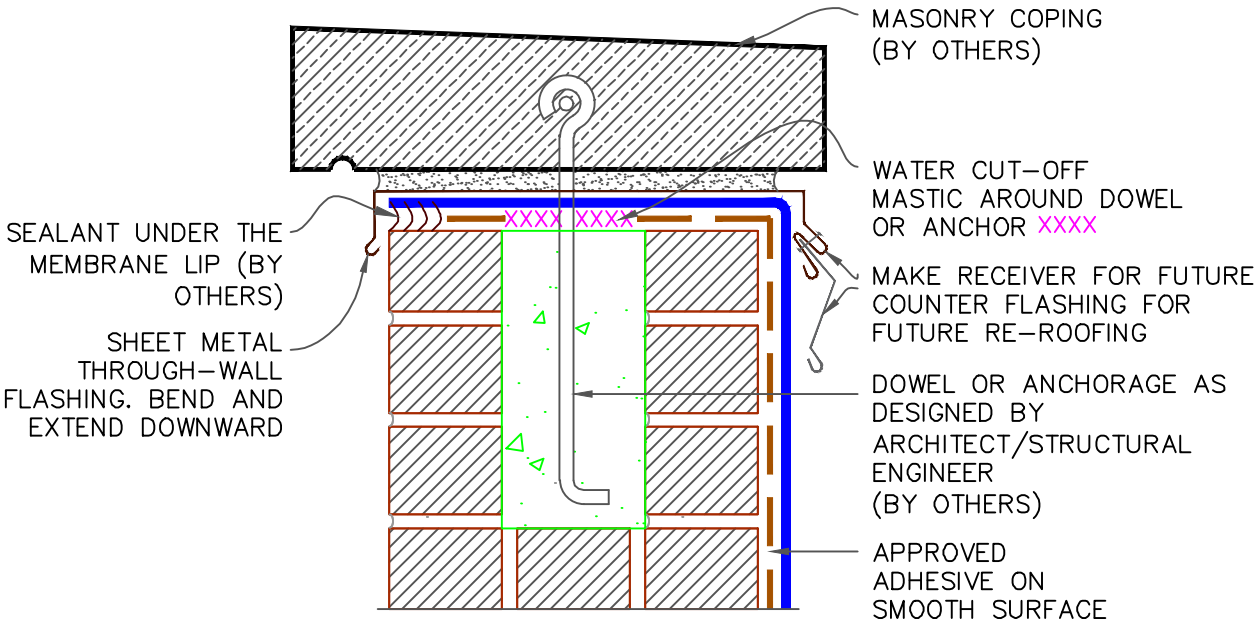




NOTES:

1. MEMBRANE MUST BE EXTENDED TO CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE.
2. WARRANTY AS PROVIDED (BY OTHERS).

9G MASONRY COPINGS (BY OTHERS)



MAXIMUM WARRANTY: 30 YEARS

— — APPLICABLE BONDING ADHESIVE

xxx WATER CUT-OFF MASTIC- MUST BE HELD UNDER CONSTANT COMPRESSION.

CARLISLE SYNTEC SYSTEMS

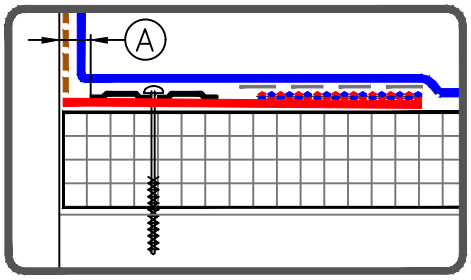
MEMBRANE TERMINATIONS (PAGE 3 OF 3)

MAXIMUM WARRANTY: 30 YEARS

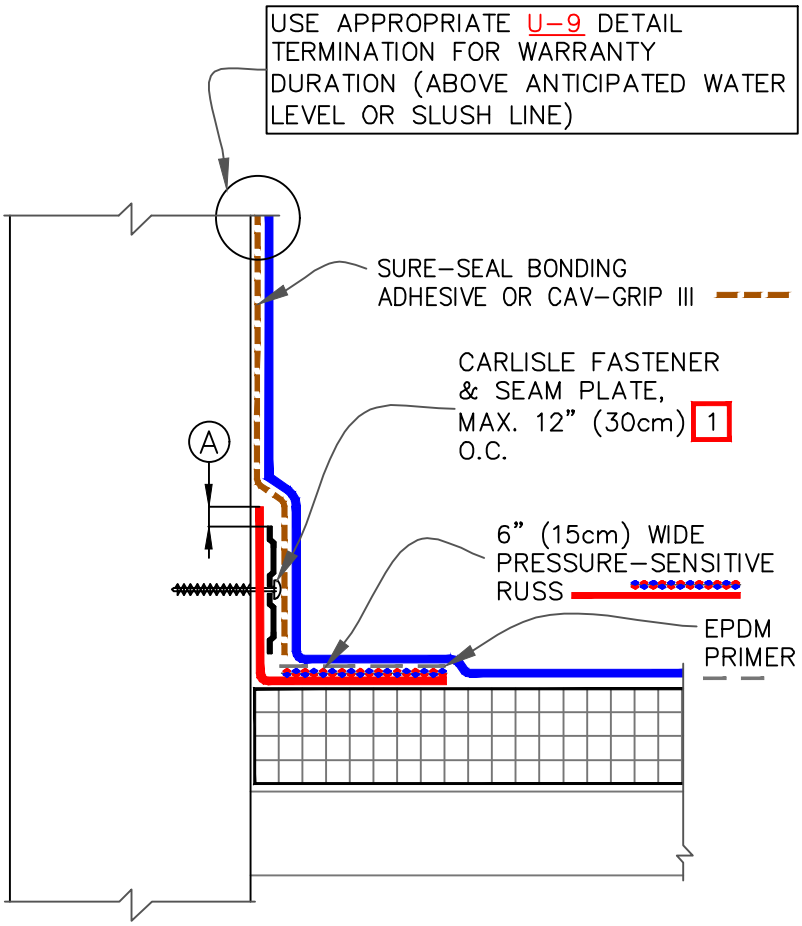
DETAIL NO. U-9

U (UNIVERSAL DETAIL)

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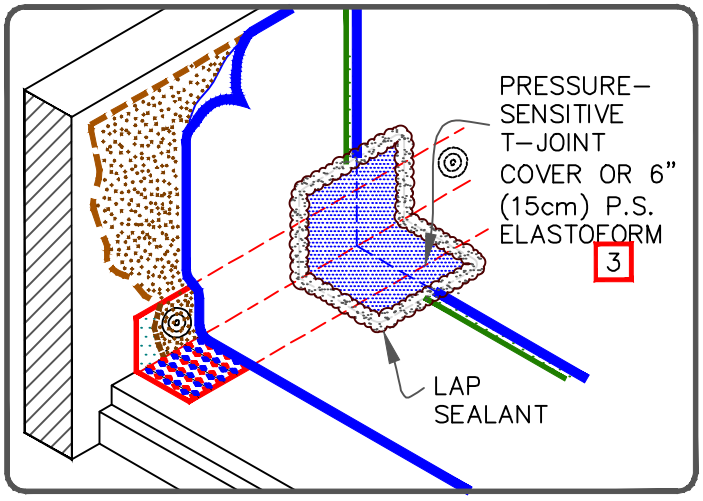
OPTIONAL: SEAM PLATE/FASTENER MAY BE INSTALLED INTO THE STRUCTURAL DECK UP TO 6" (15cm) FROM ANGLE CHANGE.



DIMENSION		cm
A	1/8"-1"	0.5-2.5

NOTES:

1. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS ON MECHANICALLY FASTENED SYSTEMS.
2. PROJECTS WITH 30-YEAR WARRANTY OR WHEN USING 90-MIL MEMBRANE. REFER TO DETAIL U-2C.
3. FOR CORNERS AND RUSS APPLICATION REFER TO DETAILS U-15A OR U-15B.



CARLISLE SYNTEC SYSTEMS

PARAPET / CURB WITH CONTINUOUS MEMBRANE

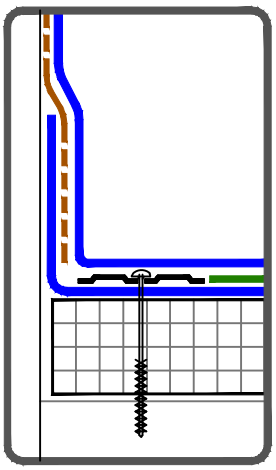
MAXIMUM WARRANTY: 30 YEARS

EPDM

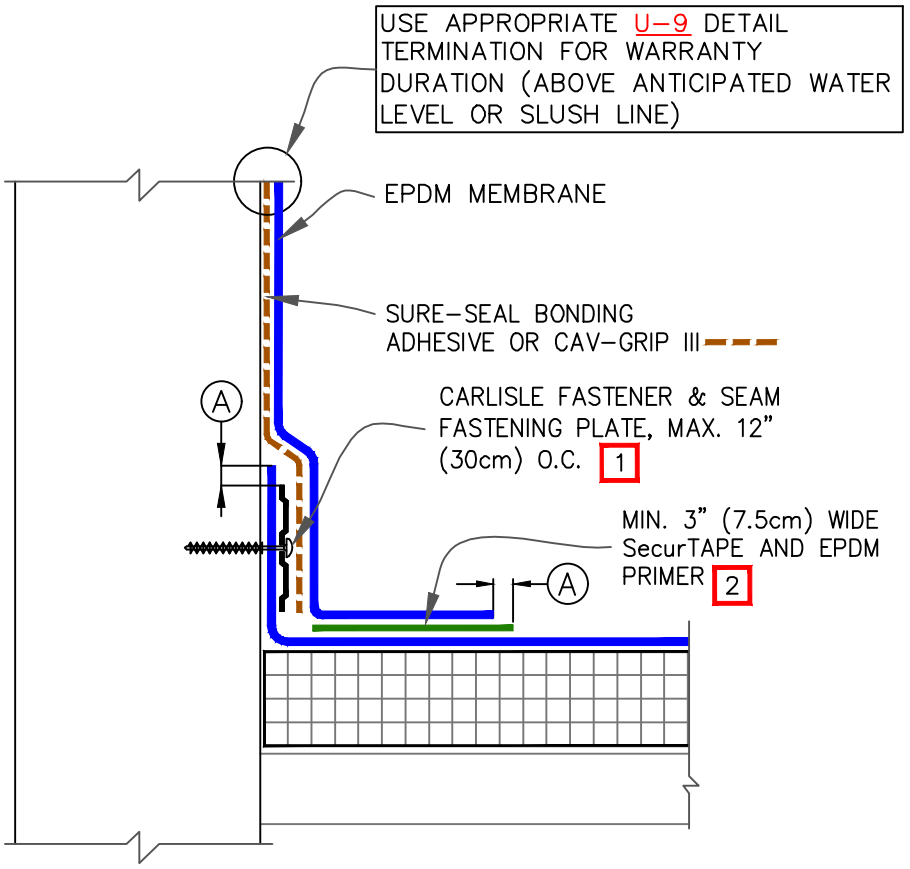
DETAIL NO. U-12A

U (UNIVERSAL DETAIL)

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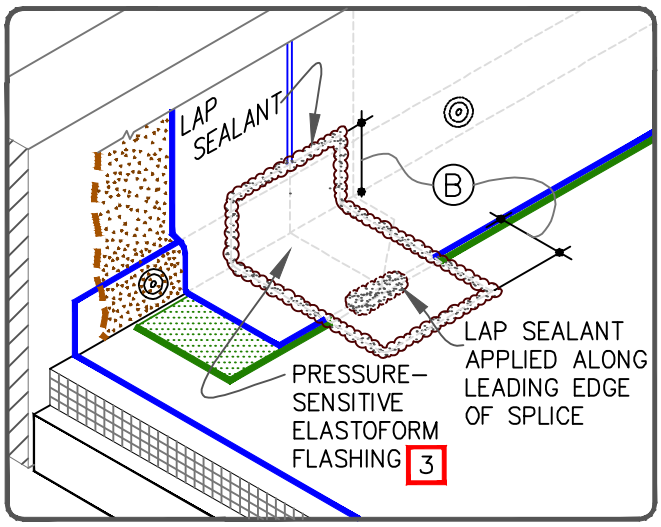
OPTIONAL: SEAM PLATE/FASTENER MAY BE INSTALLED INTO THE STRUCTURAL DECK UP TO 6" (15cm) FROM ANGLE CHANGE.



DIMENSIONS		cm	
A	1/8"	0.5	TO
	1/2"	1.5	MAX.
B	3"	7.5	

NOTES:

1. HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS ON MECHANICALLY FASTENED SYSTEMS.
2. USE 6" (15cm) WIDE SecurTAPE FOR 30-YEAR WARRANTY. LAP SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED MEMBRANE.
3. PROJECTS WITH 30-YEAR WARRANTY OR WHEN USING 90-MIL MEMBRANE, REFER TO DETAIL U-2C.



CARLISLE SYNTEC SYSTEMS

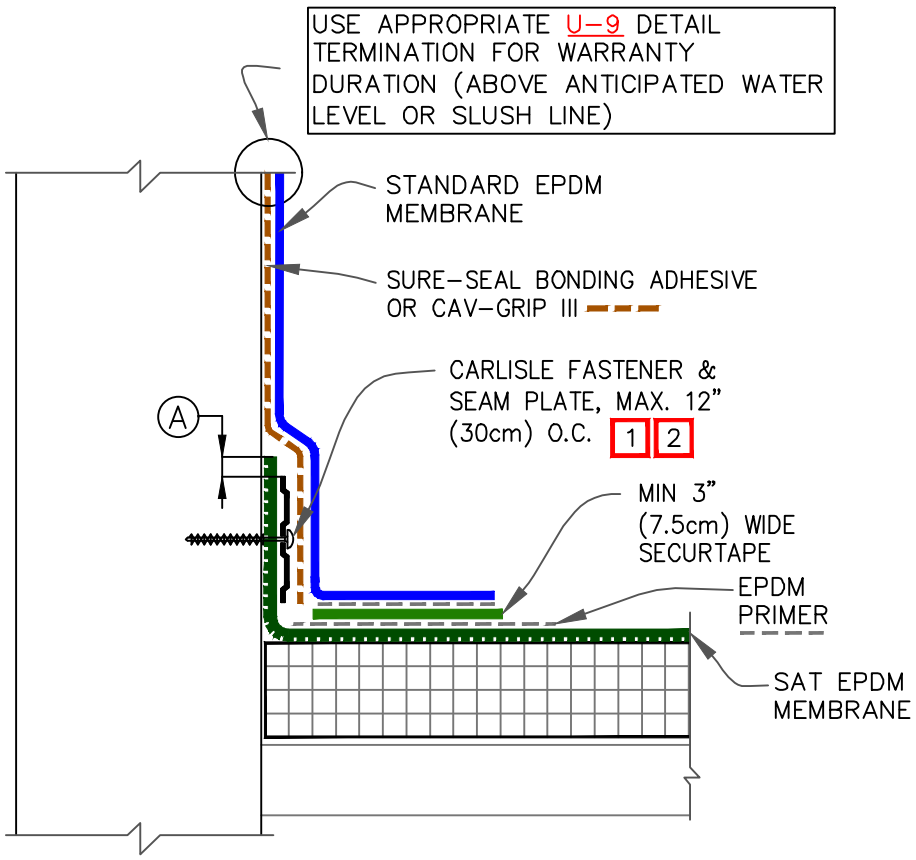
PARAPET / CURB WITH SEPARATE MEMBRANE FLASHING

MAXIMUM WARRANTY: 30 YEARS

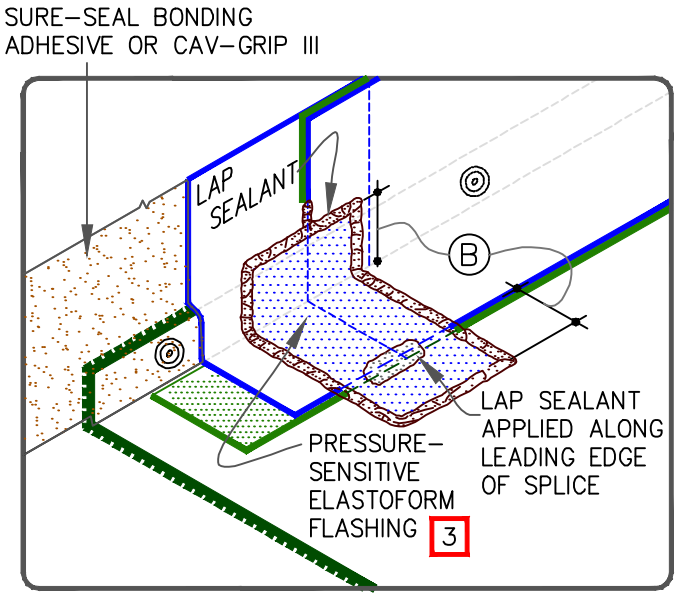
DETAIL NO. U-12B

U (UNIVERSAL DETAIL)

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DIMENSION		cm
A	1/8"–1"	0.5–2.5
B	3"	7.5



NOTES:

1. SEAM FASTENING PLATE/FASTENER MAY BE INSTALLED INTO THE STRUCTURAL DECK ALSO.
2. FASTENRES AND PLATES REQUIRED AT 6" (7.5cm) O.C. FOR WARRANTY WIND SPEEDS EXCEEDING 90 MPH.
3. APPLY PRESSURE SENSITIVE ELASTOFORM FLASHING COVERING VERTICAL SPLICE INTERSECTIONS.

CARLISLE SYNTEC SYSTEMS

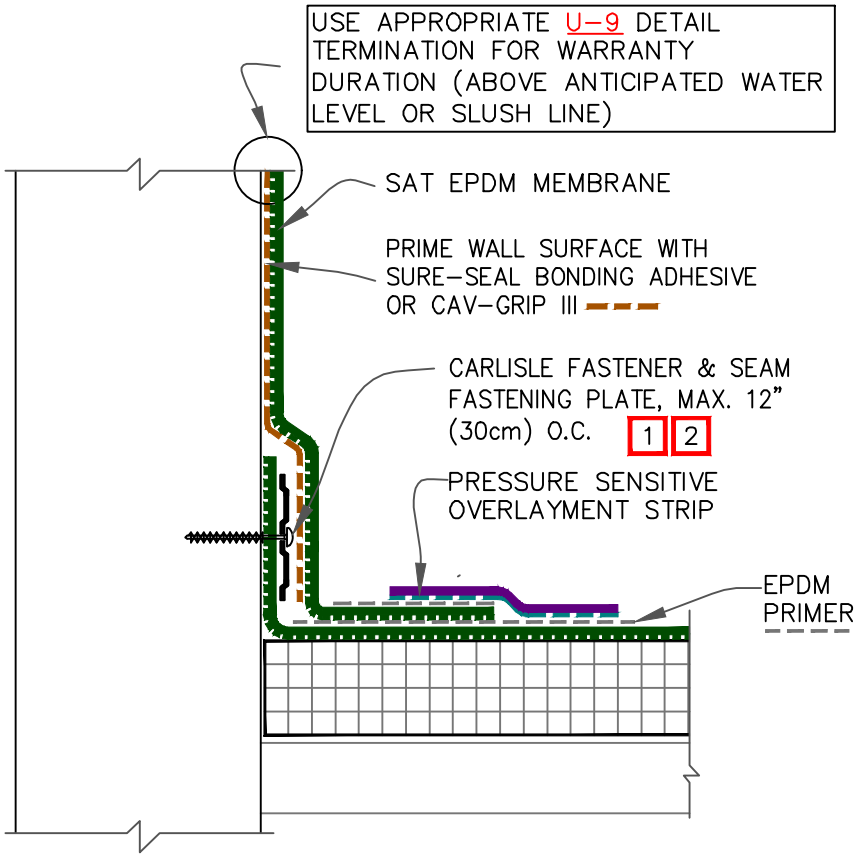
PARAPET/CURB WITH SEPARATE REGULAR EPDM FLASHING

MAXIMUM WARRANTY: 25 YEARS

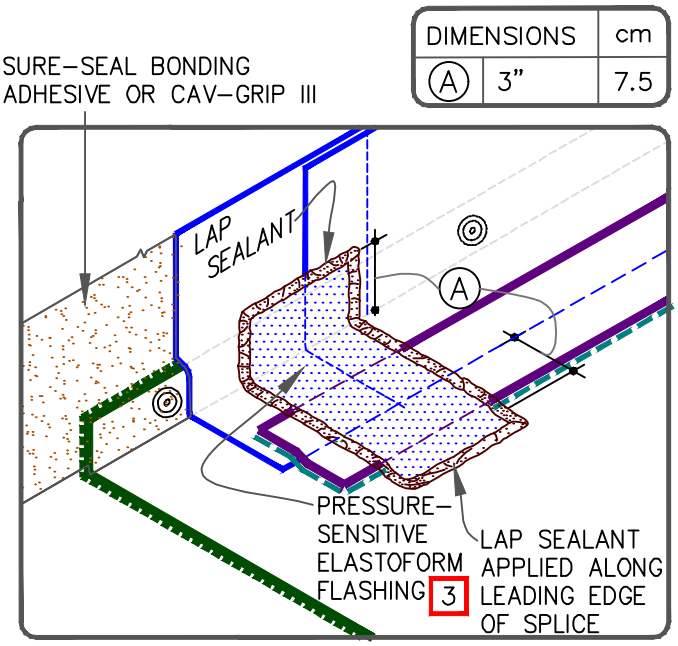
DETAIL NO. U-12D

SELF ADHERING TECHNOLOGY

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DIMENSIONS		cm
A	3"	7.5



NOTES:

1. SEAM FASTENING PLATE/FASTENER MAY BE INSTALLED INTO THE STRUCTURAL DECK ALSO.
2. FASTENERS AND PLATES REQUIRED AT 6" (7.5cm) O.C. FOR WARRANTY WIND SPEEDS EXCEEDING 90 MPH.
3. APPLY PRESSURE SENSITIVE ELASTOFORM FLASHING COVERING VERTICAL SPLICE INTERSECTIONS.

CARLISLE SYNTEC SYSTEMS

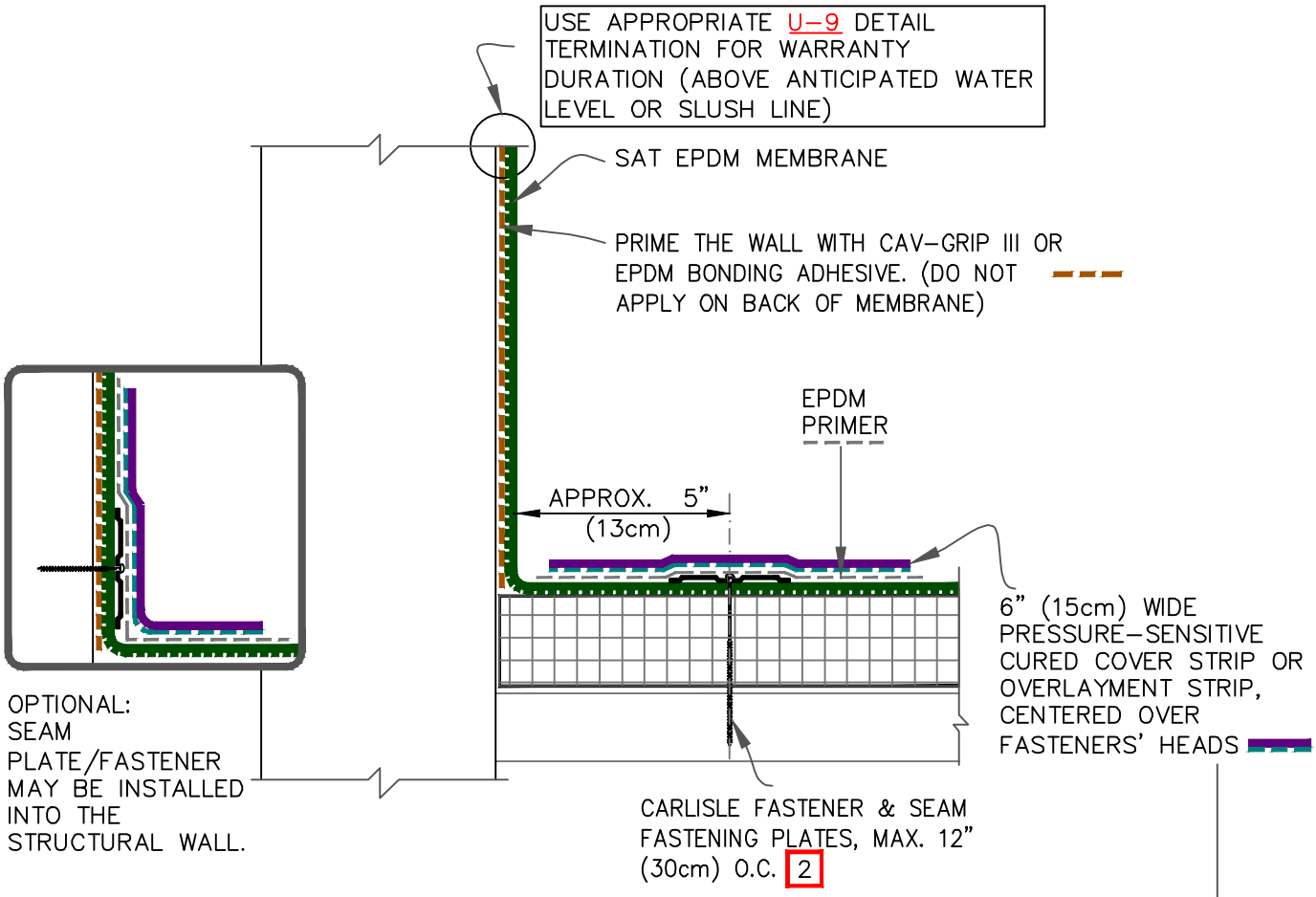
PARAPET/CURB WITH SEPARATE SAT EPDM

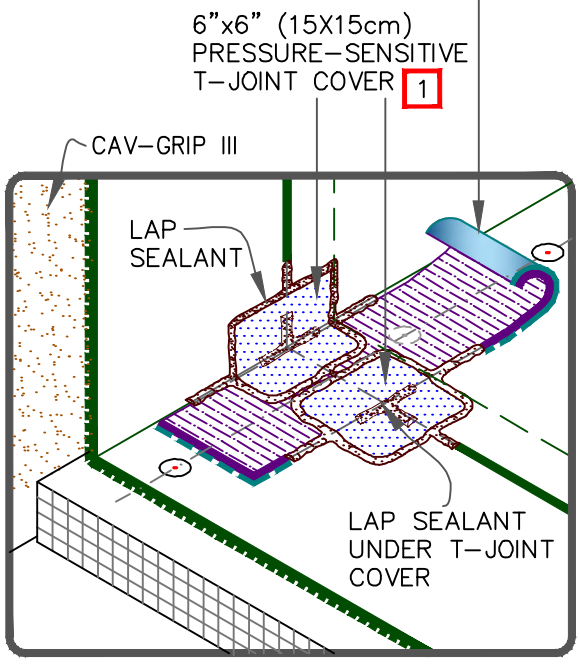
MAXIMUM WARRANTY: 25 YEARS

DETAIL NO. U-12E

SELF ADHERING TECHNOLOGY

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NOTES:

1. T-JOINTS CAN BE ELIMINATED WHEN PRESSURE-SENSITIVE OVERLAYMENT STRIP IS USED.
2. FASTENERS AND PLATES REQUIRED AT 6" (7.5cm) O.C. FOR WARRANTY WIND SPEEDS EXCEEDING 90 MPH.

CARLISLE SYNTEC SYSTEMS

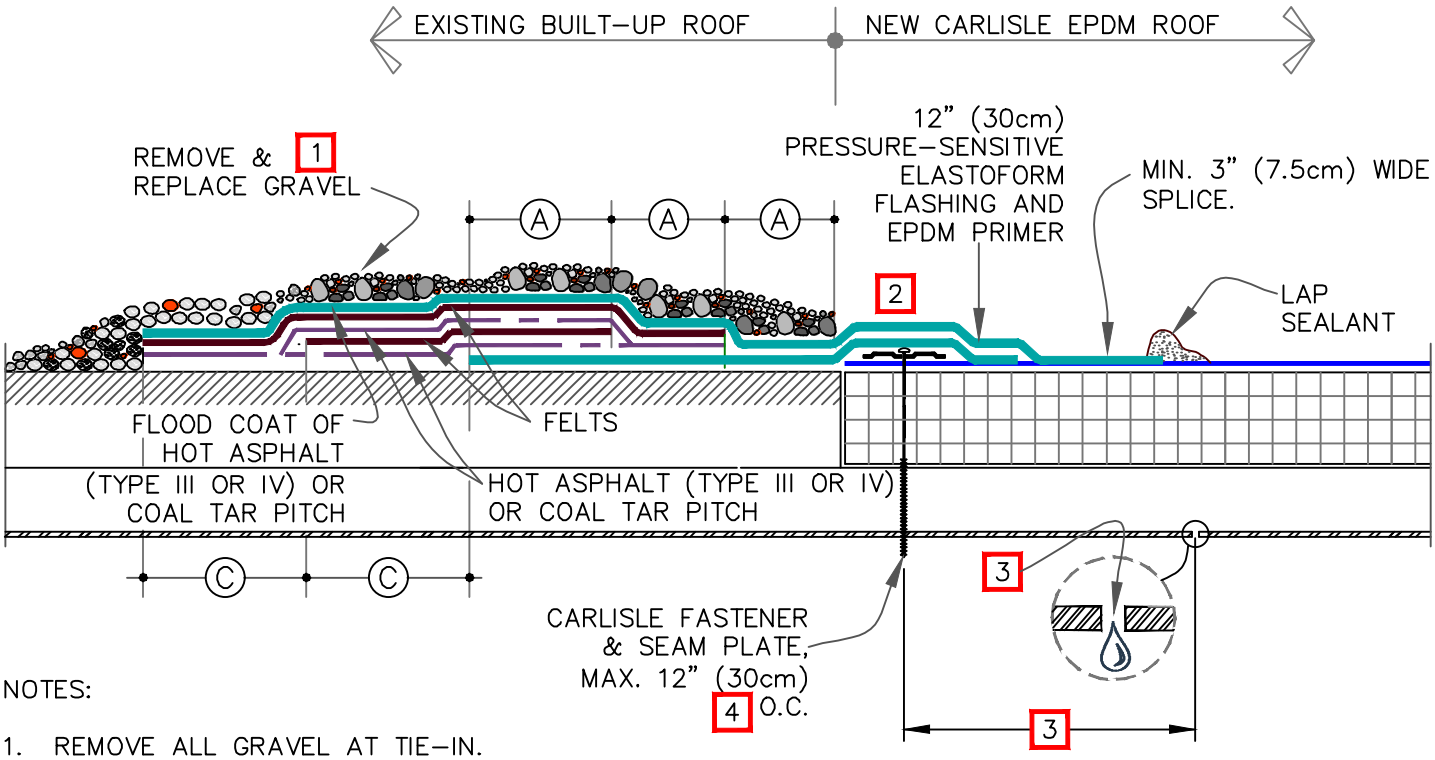
PARAPET/CURB WITH CONTINUOUS MEMBRANE – COVER STRIP

MAXIMUM WARRANTY: 25 YEARS

DETAIL NO. U-12F

SELF ADHERING TECHNOLOGY

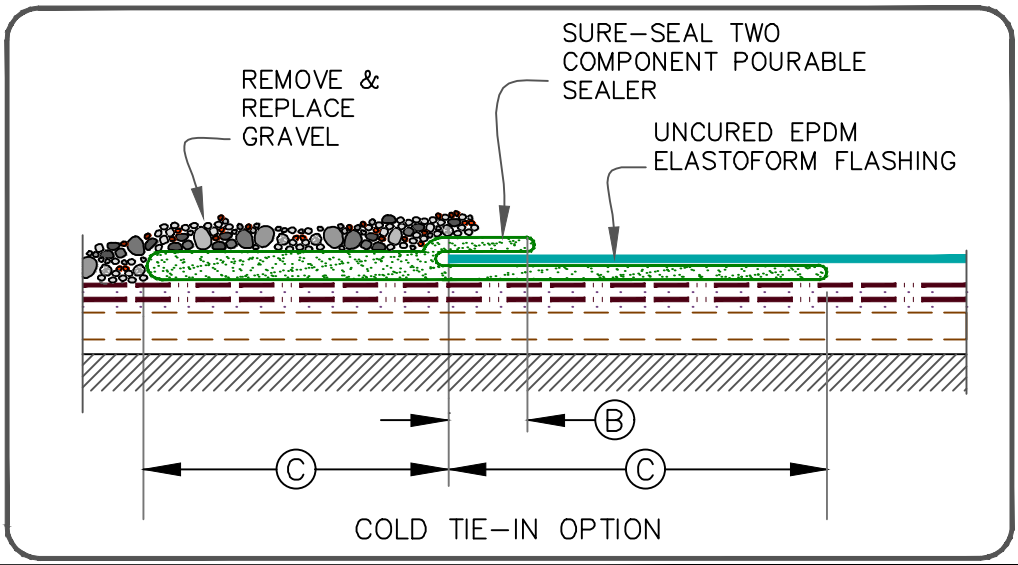
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NOTES:

1. REMOVE ALL GRAVEL AT TIE-IN.
2. SPLICE TWO PIECES OR MORE OF ELASTOFORM OR PRESSURE-SENSITIVE ELASTOFORM TOGETHER TO ACHIEVE DESIRED WIDTH.
3. IF FLUTES ARE PERPENDICULAR TO THE TIE-IN DRILL A 3/8" (1cm) DIAMETER WEEP HOLE ON THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE PERIMETER TO THE TIE-IN 6" (15cm) FROM THE SEAM FASTENING PLATE.
4. ON MECHANICALLY FASTENED SYSTEMS, HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
5. IF WATER PONDS OR FLOWS OVER TIE-IN FROM BUR SURFACE, USE DETAIL U-13B.
6. ON BALLASTED SYSTEMS, USE CONCRETE PAVERS TO PREVENT BALLAST MIGRATION.

DIMENSIONS	cm	
(A) 5"	13	MIN.
(B) 2"	5	± 1/2" (1.5cm)
(C) 6"	15	



CARLISLE SYNTEC SYSTEMS

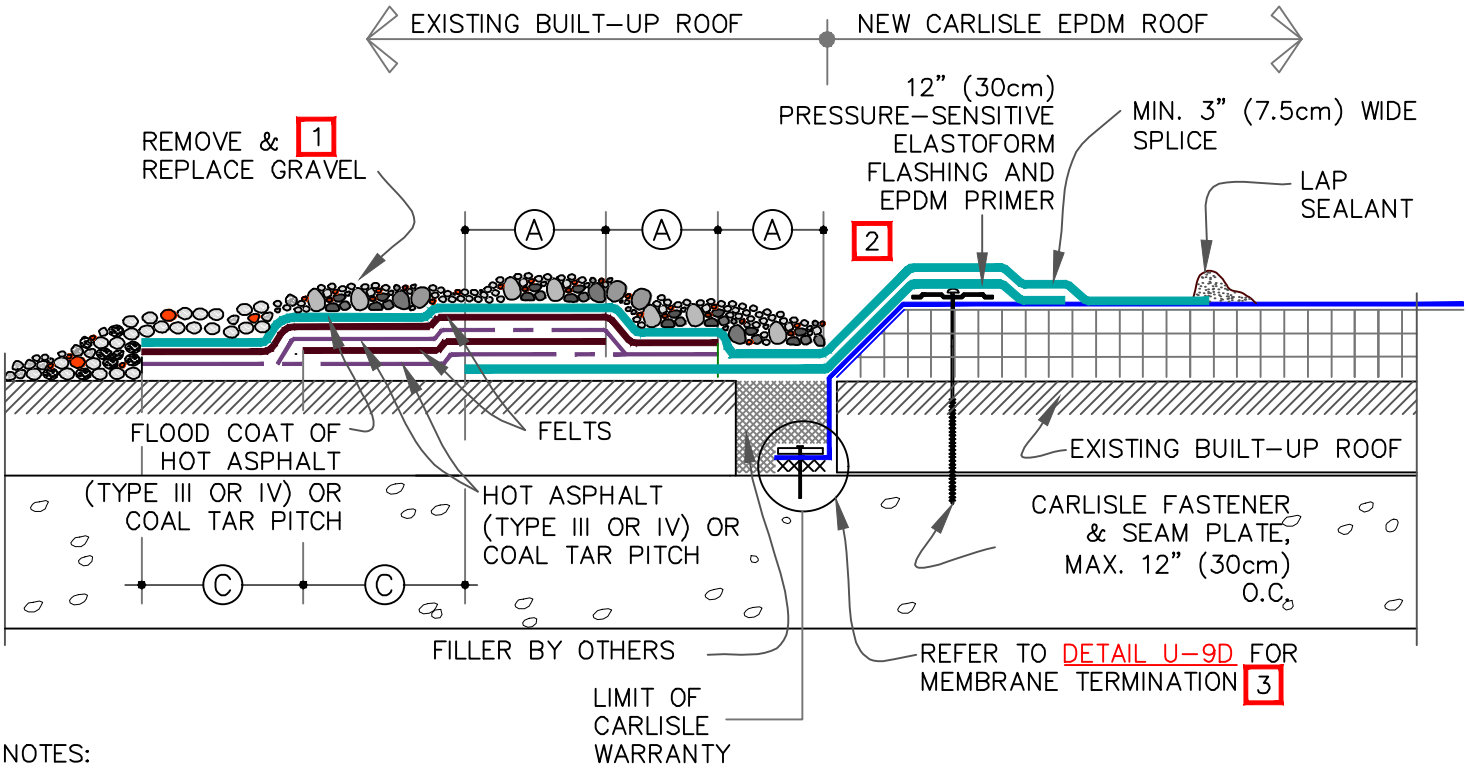
BUILT-UP ROOFING TIE-IN OVER STEEL ROOF DECK

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-13A

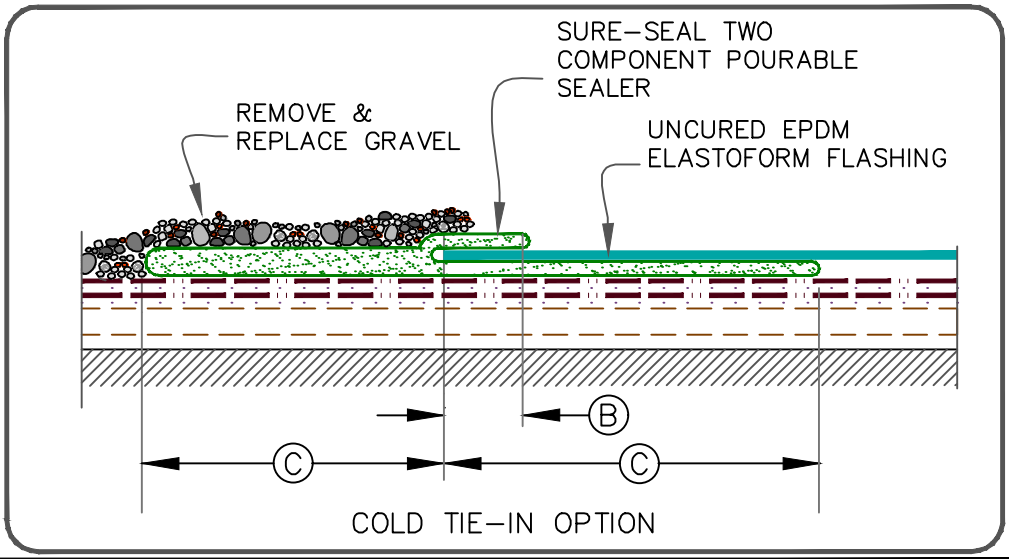
U (UNIVERSAL DETAIL)

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NOTES:

1. REMOVE ALL GRAVEL AT TIE-IN.
2. SPLICE TWO PIECES OF ELASTOFORM OR PRESSURE-SENSITIVE ELASTOFORM TOGETHER TO ACHIEVE DESIRED WIDTH.
3. WATER CUT-OFF MUST BE UNDER CONSTANT COMPRESSION.
4. CARLISLE IS NOT RESPONSIBLE FOR DAMAGE TO THE BUILT-UP ROOF OR STRUCTURAL DECK RESULTING FROM PONDED WATER; THIS DETAIL APPLIES TO RE-ROOFING WHEN A TEAR-OFF IS NOT SPECIFIED AND WAS DESIGNED TO PREVENT MIGRATION OF WATER INTO THE NEW ROOFING SYSTEM.
5. ON BALLASTED SYSTEMS, USE CONCRETE PAVERS TO PREVENT BALLAST MIGRATION.



DIMENSIONS		cm	
A	5"	13	MIN.
B	2"	5	± 1/2" (1.5cm)
C	6"	15	

CARLISLE SYNTEC SYSTEMS

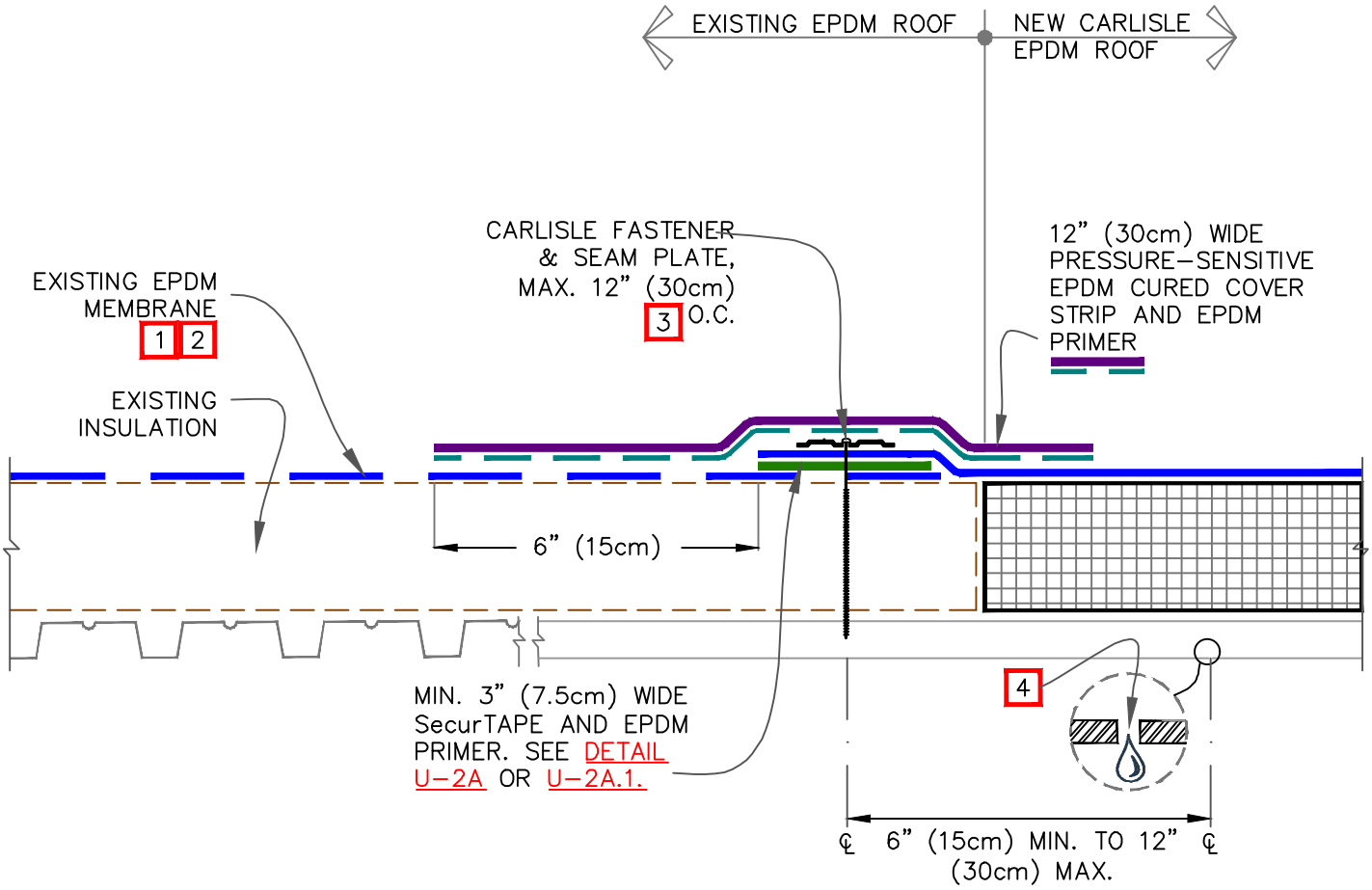
BUILT-UP ROOFING TIE-IN OVER CONCRETE ROOF DECK

MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-13B

U (UNIVERSAL DETAIL)

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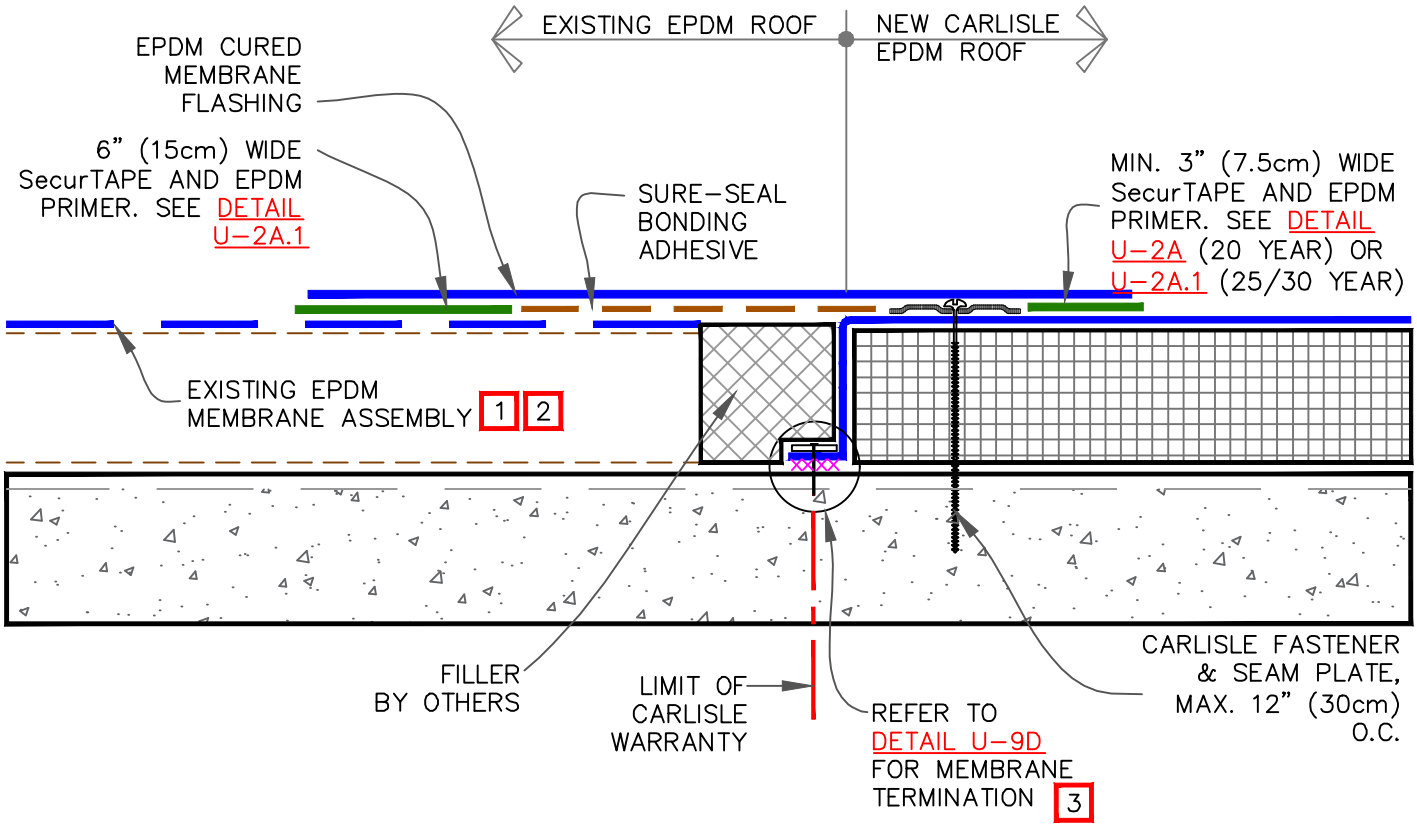


NOTES:

1. CONTACT MANUFACTURER OF EXISTING EPDM MEMBRANE ROOFING SYSTEM TO VERIFY ACCEPTANCE OF TIE-IN AND TO NOT VOID EXISTING WARRANTY.
2. PRIOR TO SPLICING, CLEAN EXISTING EPDM MEMBRANE BY SCRUBBING THE SPLICE AREA WITH WEATHERED MEMBRANE CLEANER AND ALLOW TO DRY.
3. ON MECHANICALLY FASTENED SYSTEMS, HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
4. IF FLUTES ARE PERPENDICULAR TO THE TIE-IN DRILL A 3/8" (1cm) DIAMETER WEEP HOLE INTO THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE PERIMETER OF THE TIE-IN 6" (15cm) MINIMUM TO 12" (30cm) MAXIMUM FROM THE SEAM FASTENING PLATE.

CARLISLE SYNTEC SYSTEMS	TIE-IN TO EXISTING EPDM MEMBRANE	DETAIL NO. U-13C
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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NOTES:

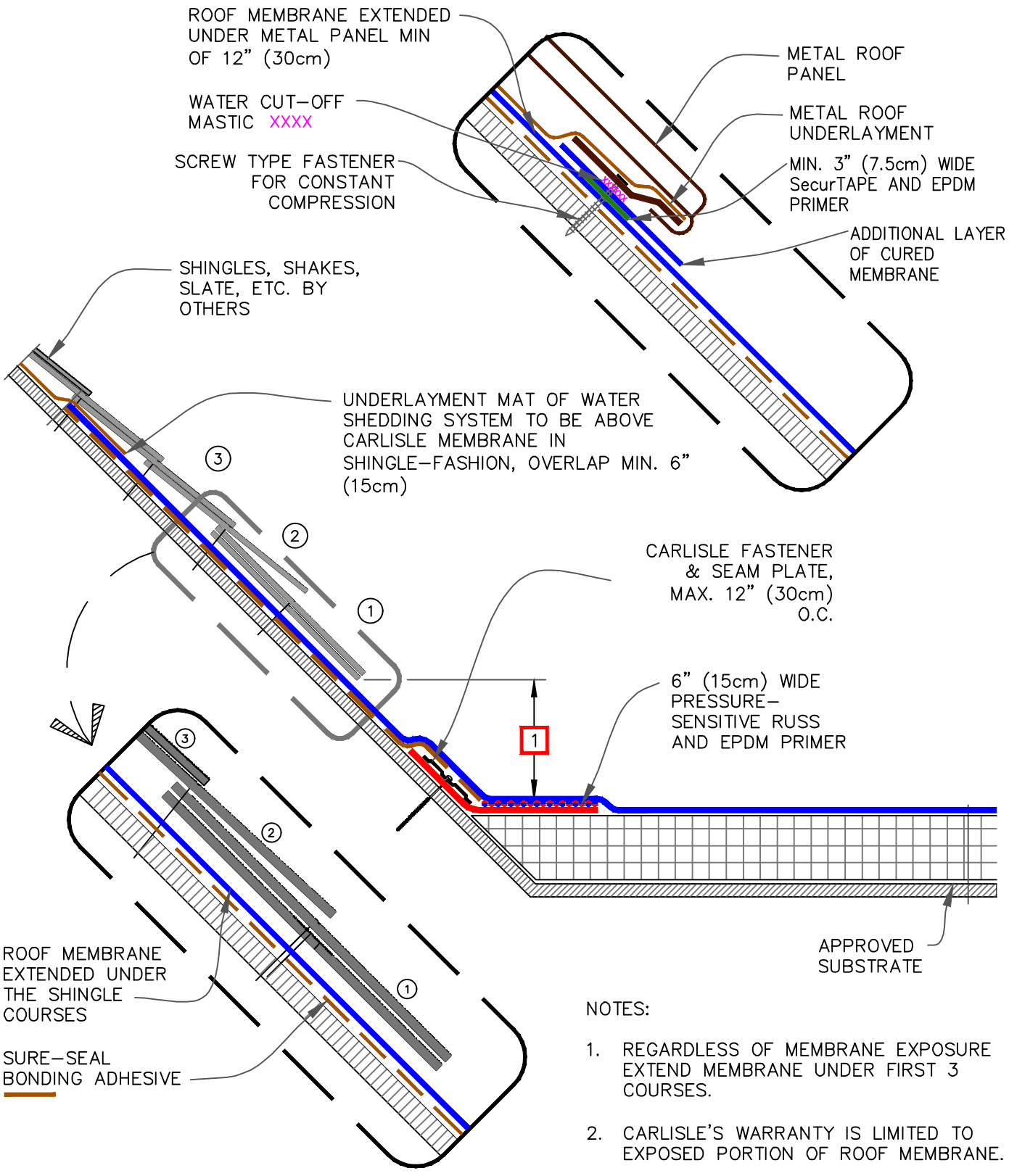
1. CONTACT MANUFACTURER OF EXISTING EPDM MEMBRANE ROOFING SYSTEM TO VERIFY ACCEPTANCE OF TIE-IN AND TO NOT VOID EXISTING WARRANTY.

2. PRIOR TO SPLICING, CLEAN EXISTING EPDM MEMBRANE BY SCRUBBING THE SPLICE AREA WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY.

3. WATER CUT-OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION. WHEN RE-ROOFING OVER PRE-CAST CONCRETE, APPLY LIBERAL BEAD OF WATER CUT-OFF MASTIC IN THE JOINTS TO PREVENT MOISTURE MIGRATION.

CARLISLE SYNTEC SYSTEMS	EPDM TIE-IN OVER CONCRETE DECK	EPDM	DETAIL NO. U-13D
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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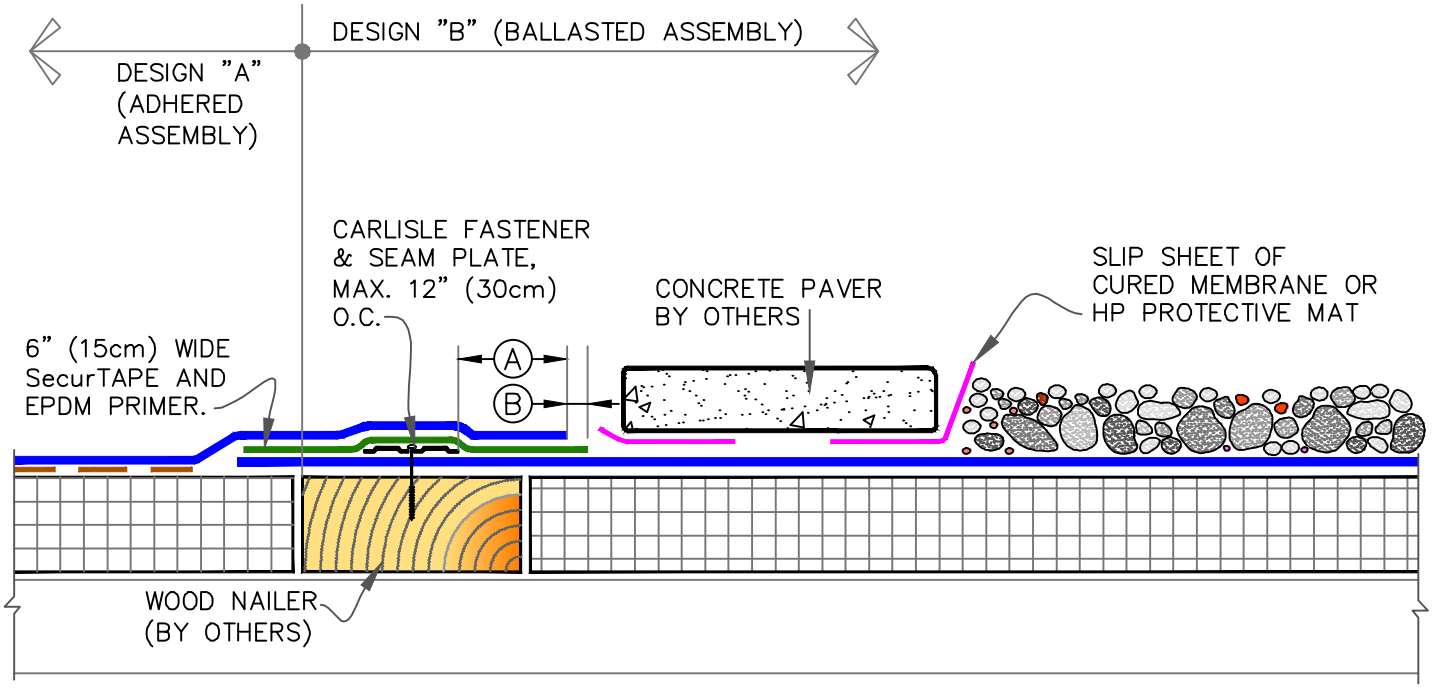


NOTES:

1. REGARDLESS OF MEMBRANE EXPOSURE EXTEND MEMBRANE UNDER FIRST 3 COURSES.
2. CARLISLE'S WARRANTY IS LIMITED TO EXPOSED PORTION OF ROOF MEMBRANE.

CARLISLE SYNTEC SYSTEMS	TIE-IN SHINGLED OR METAL PANEL ROOF	DETAIL NO. U-13E
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

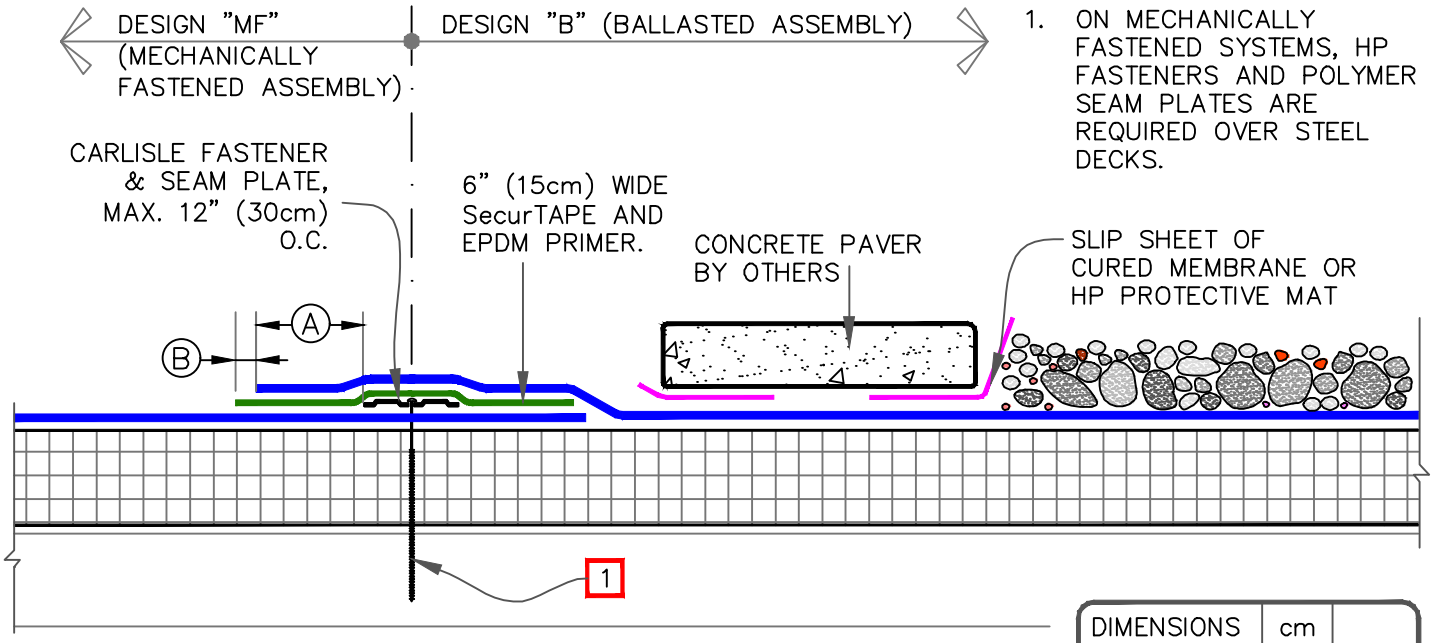
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A BALLASTED TO ADHERED TIE-IN

NOTE:

1. ON MECHANICALLY FASTENED SYSTEMS, HP FASTENERS AND POLYMER SEAM PLATES ARE REQUIRED OVER STEEL DECKS.



B BALLASTED TO MECHANICALLY FASTENED TIE-IN

DIMENSIONS		cm	
A	2"	5	MIN.
B	1/8"	0.5	MIN.
	1/2"	1.5	MAX.

CARLISLE SYNTEC SYSTEMS

TIE-IN BETWEEN BALLASTED TO NEW ADHERED OR MECHANICALLY FASTENED ROOF

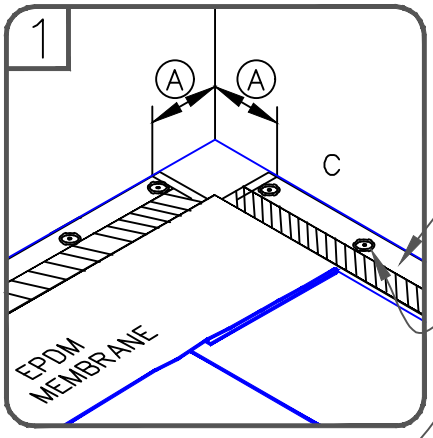
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-13F

U (UNIVERSAL DETAIL)

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1



6" (15cm) WIDE PRESSURE-SENSITIVE RUSS (MAY BE FASTENED INTO VERTICAL SUBSTRATE)

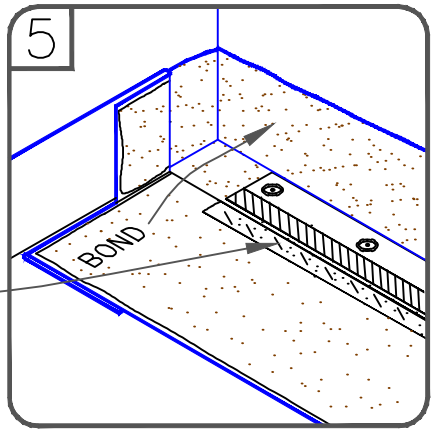
CARLISLE SEAM PLATE & FASTENER.

EPDM PRIMER

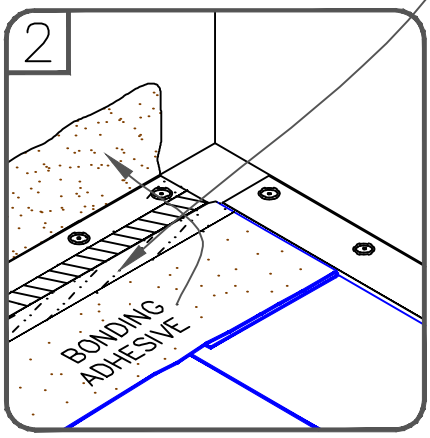
CUT 45° AND APPLY EPDM PRIMER/SecurTAPE

DIMENSIONS	cm	
Ⓐ 6"	15	TO
9"	23	

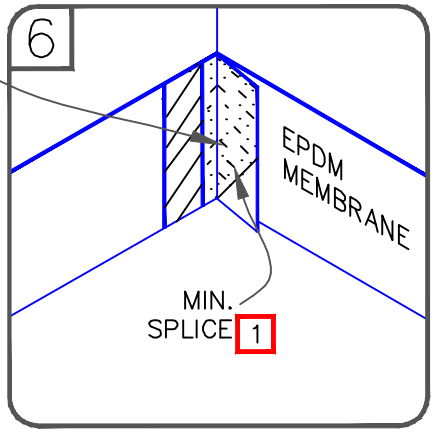
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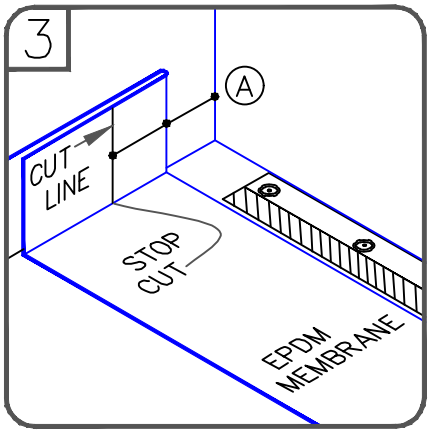
2



6



3

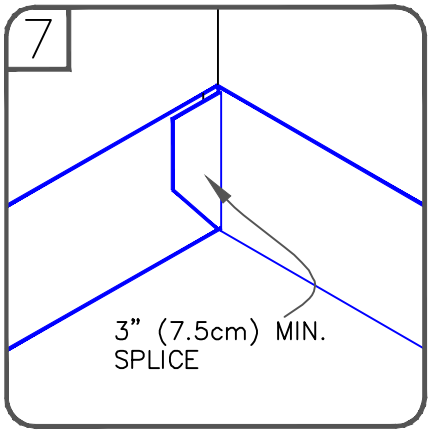


NOTES:

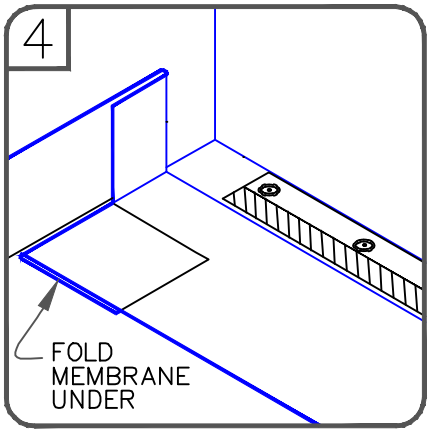
1. MINIMUM SPLICE WIDTH:
   1.1. 3" (7.5cm) UP TO 20 YEAR WARRANTIES
   1.2. 6" (15cm) FOR 25/30 YEAR WARRANTIES

2. REFER TO DETAIL U-15C (20 YEAR) OR U-15D.1 (25/30 YEAR) FOR INSIDE CORNER INSTALLATION REQUIREMENTS.

7

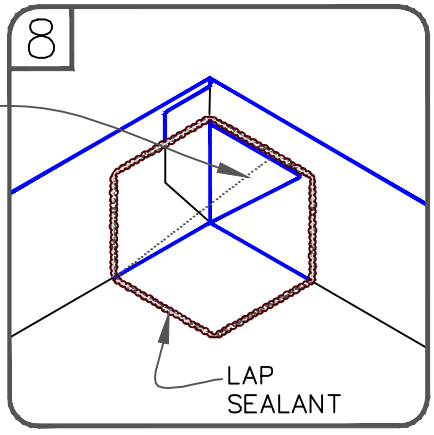


4



PIG EAR ON OPPOSITE WALL

8



CARLISLE SYNTEC SYSTEMS

INSIDE CORNER WALL FLASHING WITH RUSS (OPTION 1)

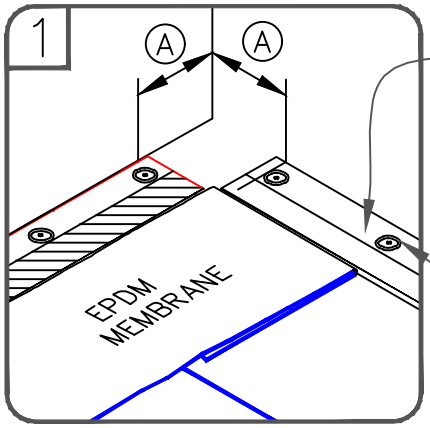
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO. U-15A

U (UNIVERSAL DETAIL)

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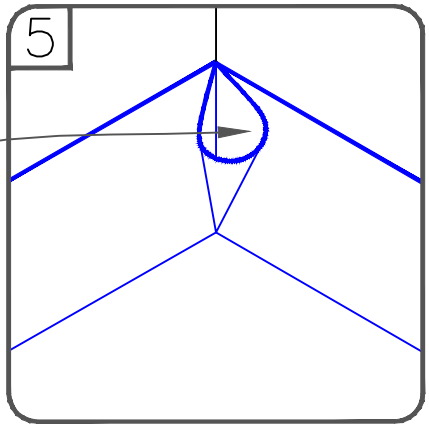
1



6" (15cm) WIDE PRESSURE-SENSITIVE RUSS (MAY BE FASTENED INTO VERTICAL SUBSTRATE)

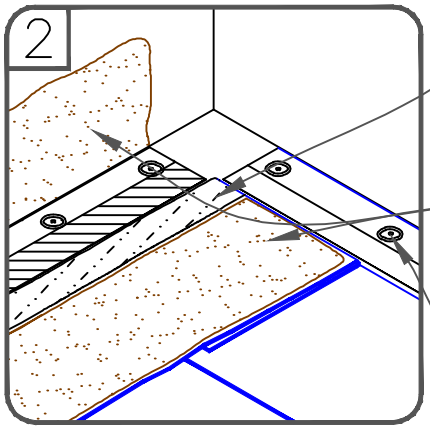
CARLISLE SEAM PLATE & FASTENER.

5



FORM PIG EAR WITH CONTINUOUS MEMBRANE AT CORNER AS SHOWN

2



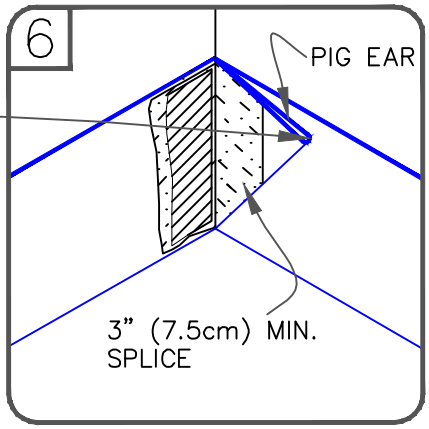
EPDM PRIMER

CUT & REMOVE EXCESSIVE MEMBRANE

SURE-SEAL BONDING ADHESIVE

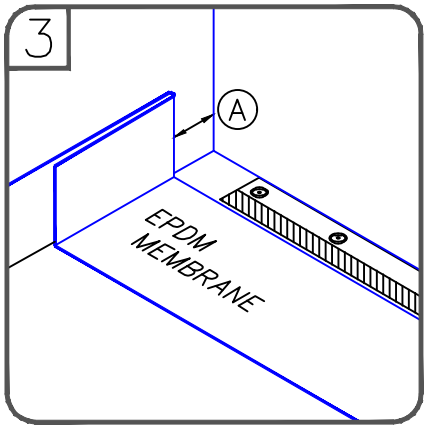
CARLISLE SEAM FASTENING PLATE & FASTENER.

6

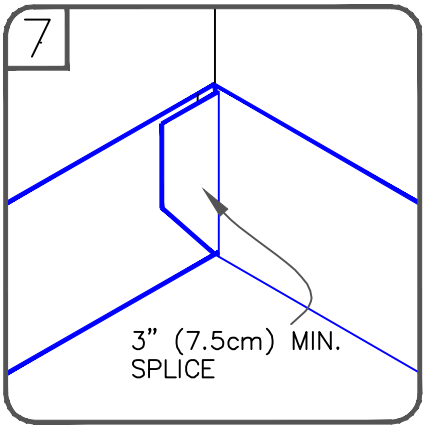


DIMENSIONS		cm	
A	6"	15	TO
	9"	23	

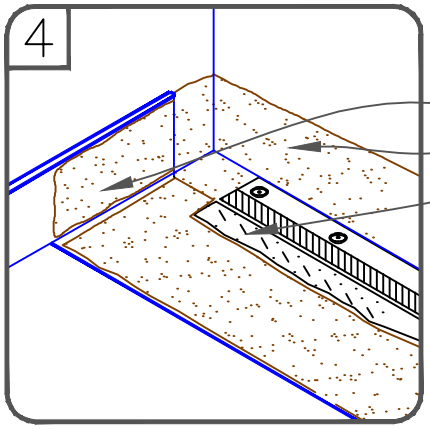
3



7



4

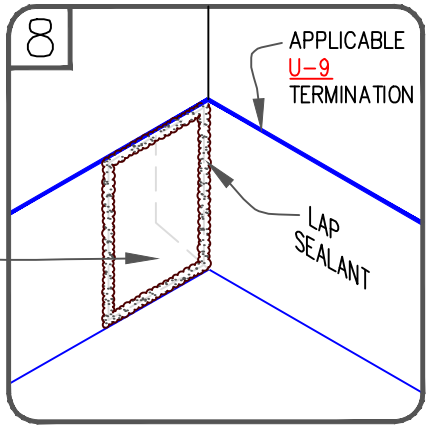


SURE-SEAL BONDING ADHESIVE

EPDM PRIMER

6" (15cm) WIDE PRESSURE-SENSITIVE ELASTOFORM FLASHING AND EPDM PRIMER

8



CARLISLE SYNTEC SYSTEMS

INSIDE CORNER WALL FLASHING WITH RUSS (OPTION 2)

MAXIMUM WARRANTY: 30 YEARS

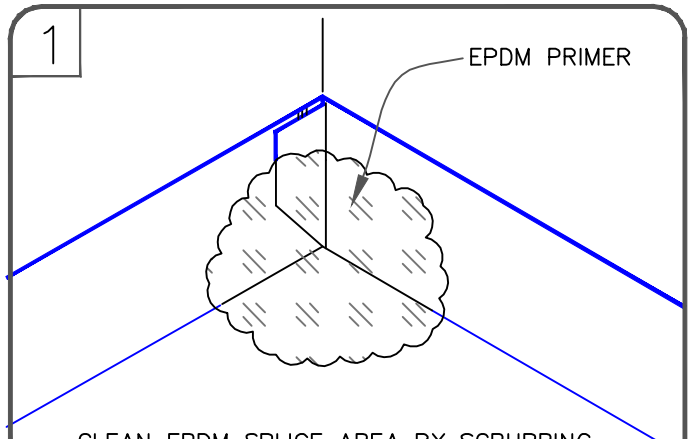
DETAIL NO.

U-15B

U (UNIVERSAL DETAIL)

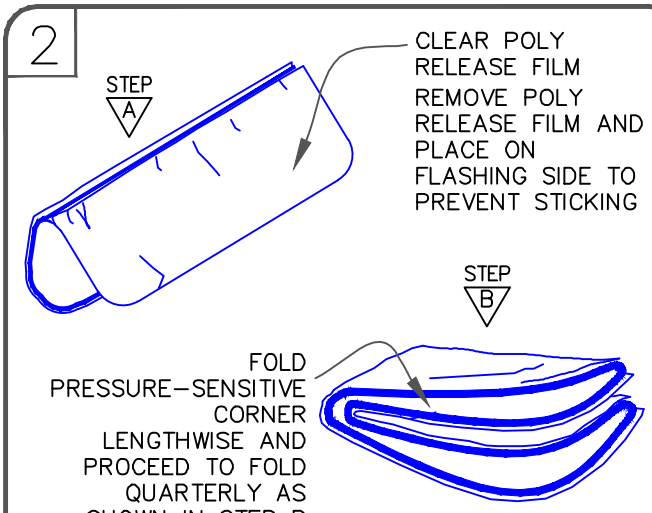
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1

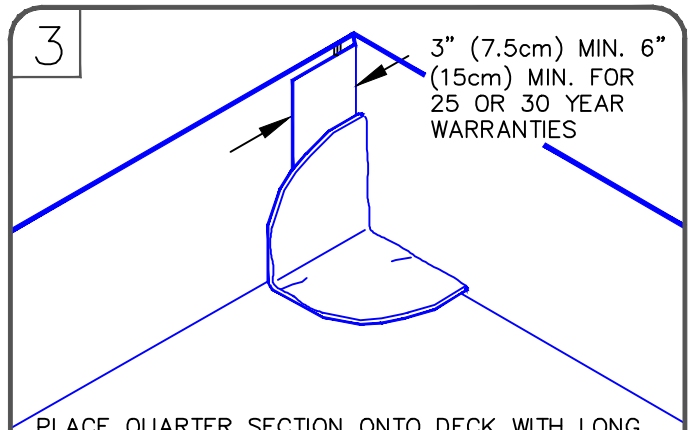


CLEAN EPDM SPLICE AREA BY SCRUBBING WITH EPDM PRIMER.

2

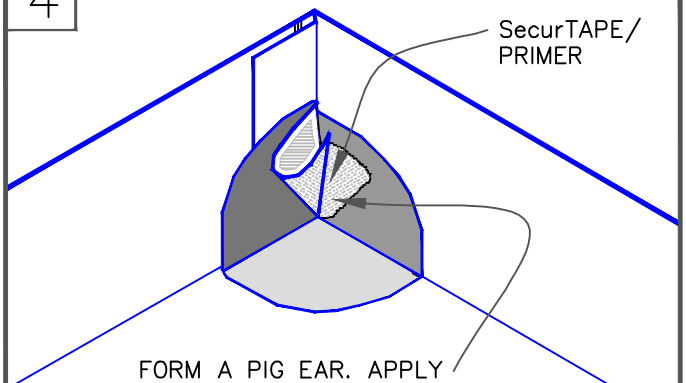


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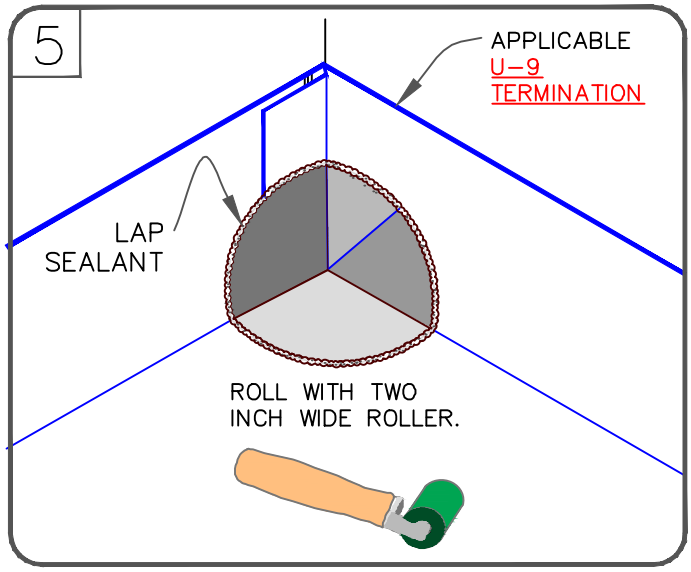


PLACE QUARTER SECTION ONTO DECK WITH LONG FOLDED SIDE FACING THE WALL. REMOVE REMAINING RELEASE PAPER. PRESS FIRMLY AND PROCEED WITH SECOND QUARTER GOING UP THE VERTICAL WALL BY PRESSING FIRMLY INTO CORNER.

4



5



NOTES:

1. PRE-CUT 7" X 9" CORNER OR 9" X 9" PRESSURE SENSITIVE ELASTOFORM.
2. FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES OR WHEN USING 90-MIL MEMBRANE, INSTALL A 6" T-JOINT COVER PRIOR TO INSTALLING A 12" T-JOINT COVER. SEAL TOP LAYER WITH CONTINUOUS LAP SEALANT. PER DETAIL U-15D.1
3. A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING IN COLDER TEMPERATURES.

CARLISLE SYNTEC SYSTEMS

INSIDE CORNER WITH CONTINUOUS EPDM WALL FLASHING

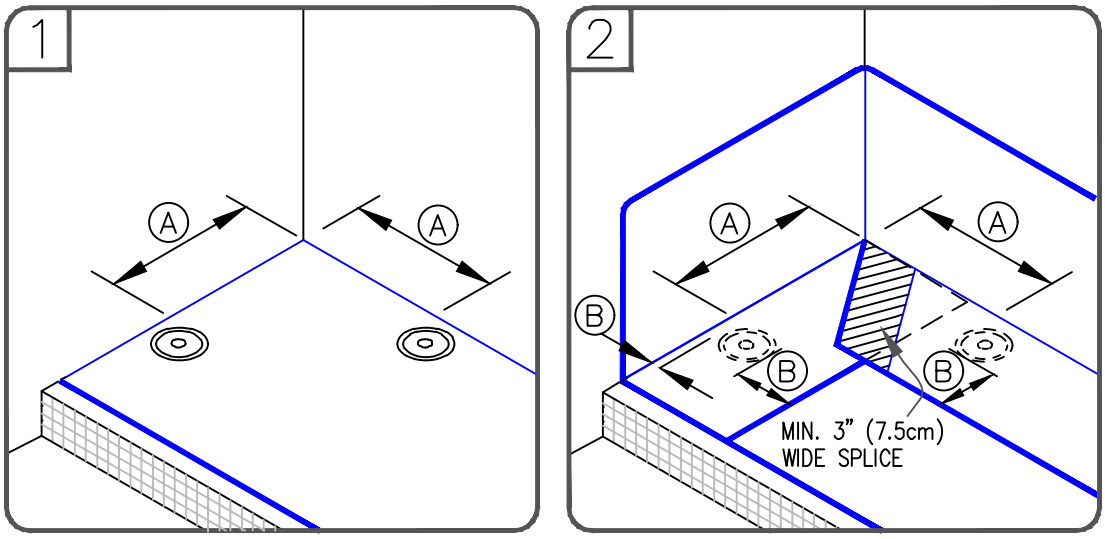
MAXIMUM WARRANTY: 20 YEARS. SEE NOTE 2

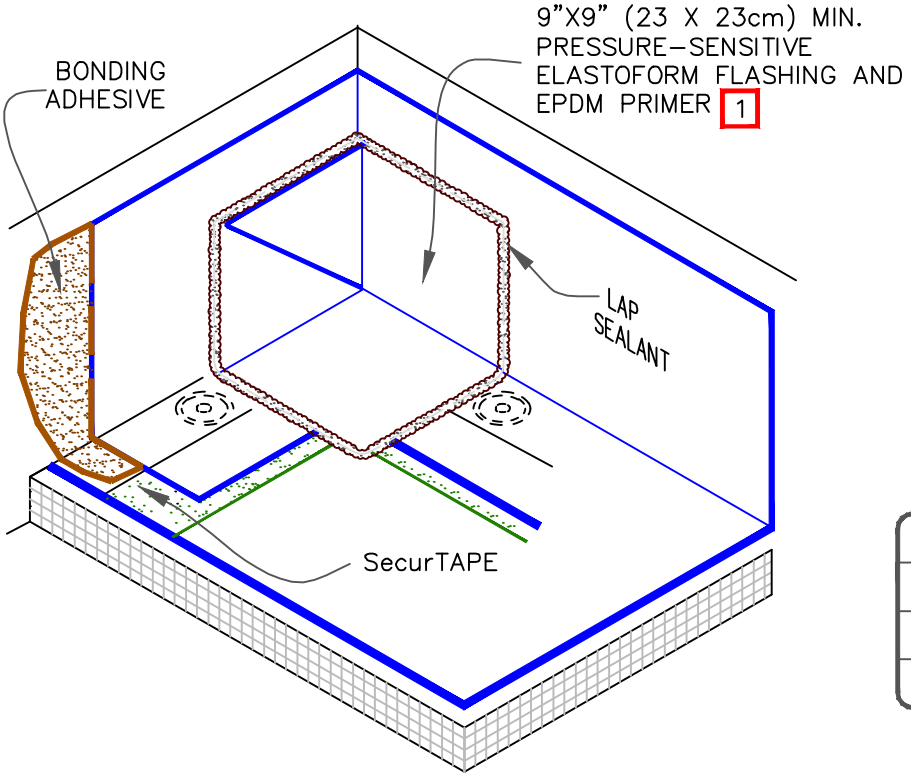
EPDM

DETAIL NO. U-15C

U (UNIVERSAL DETAIL)

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DIMENSIONS		cm	
A	6"	15	TO
	9"	23	
B	3"	7.5	

NOTES:

1. A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING IN COLDER TEMPERATURES.
2. FOR PROJECTS WITH 25 & 30-YEAR WARRANTIES OR WHEN USING 90-MIL MEMBRANE, REFER TO DETAIL U-15D.1 FOR REQUIRED FLASHING ENHANCEMENTS.

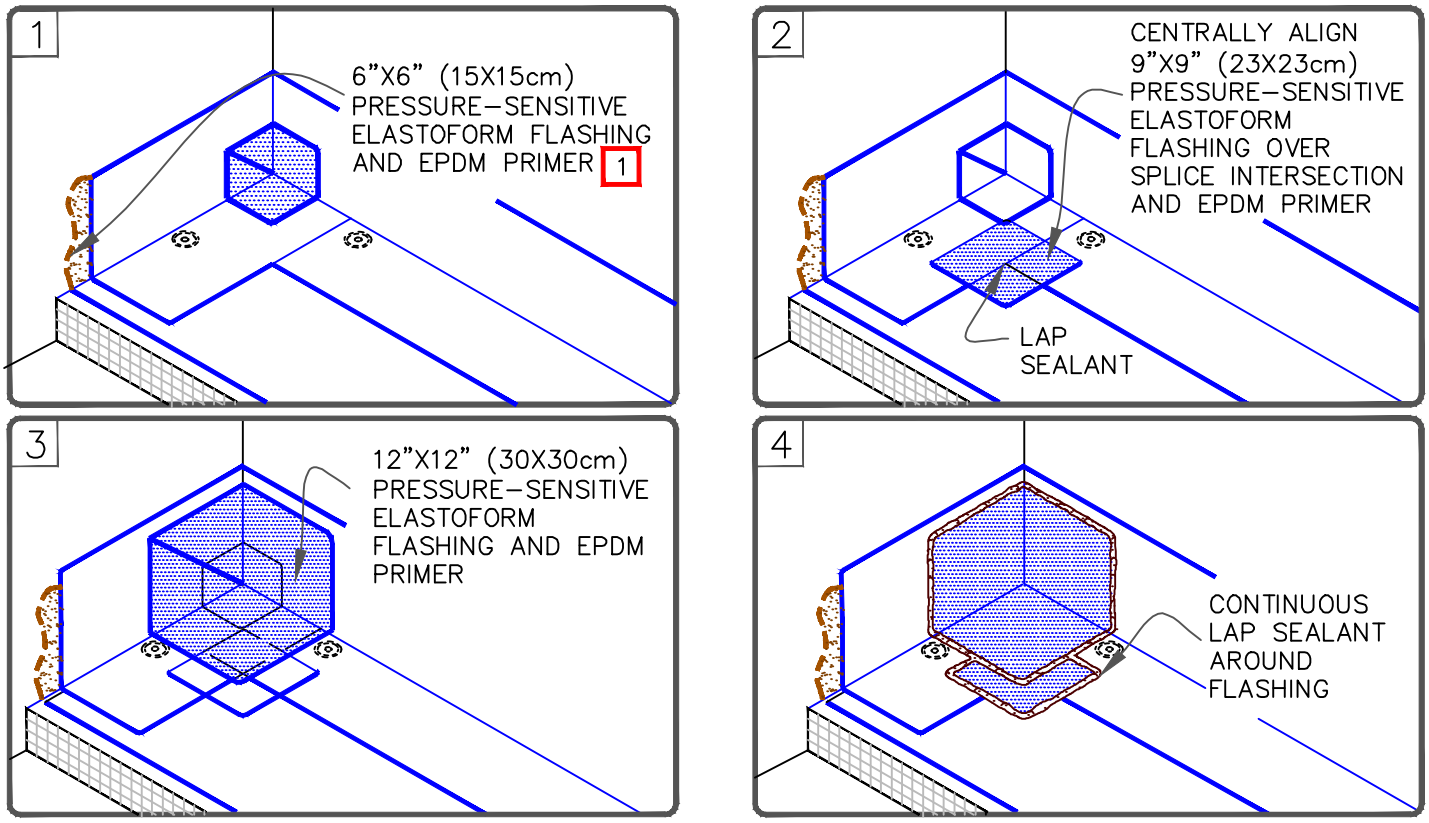
CARLISLE SYNTEC SYSTEMS

INSIDE CORNER WITH SEPARATE EPDM WALL FLASHING

MAXIMUM WARRANTY: 20 YEARS. SEE NOTE 2

DETAIL NO.
U-15D
U (UNIVERSAL DETAIL)

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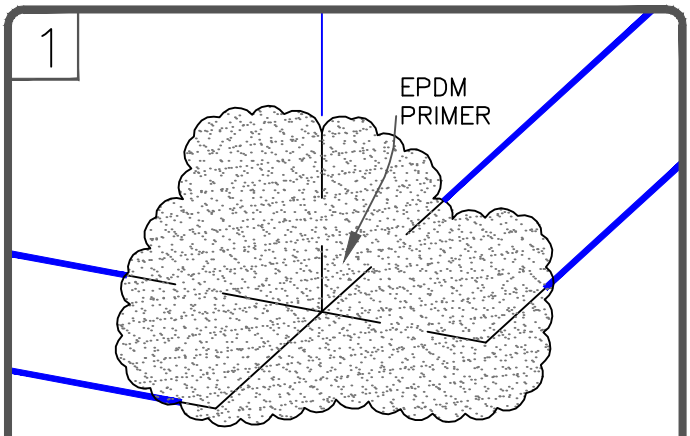
NOTES:

1. A 7"X9" (17.5cm X 23cm) PRESSURE-SENSITIVE PRE-CUT INSIDE/OUTSIDE CORNER MAY BE CUT DOWN TO 6" X 6" (7.5cm X 7.5cm).
2. A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING IN COLDER TEMPERATURES.
3. APPLY PRIMER AND SecurTAPE TO ADHERE PIG EAR TO THE WALL.

CARLISLE SYNTEC SYSTEMS	INSIDE CORNER FLASHING FOR PROJECTS WITH 90-MIL MEMBRANE OR 30 YEAR WARRANTIES	HDRW	DETAIL NO. U-15D.1
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

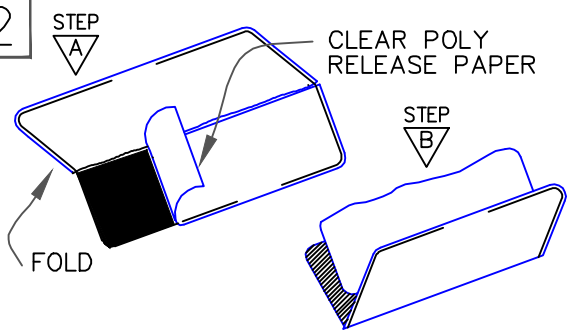
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1



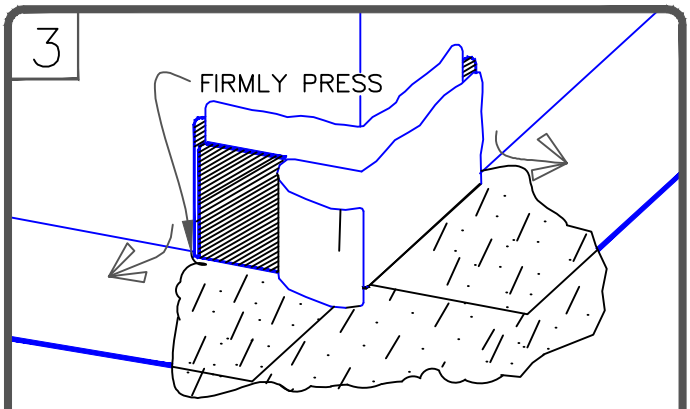
CLEAN EPDM SPLICE AREA PRIOR TO APPLYING EPDM PRIMER.

2



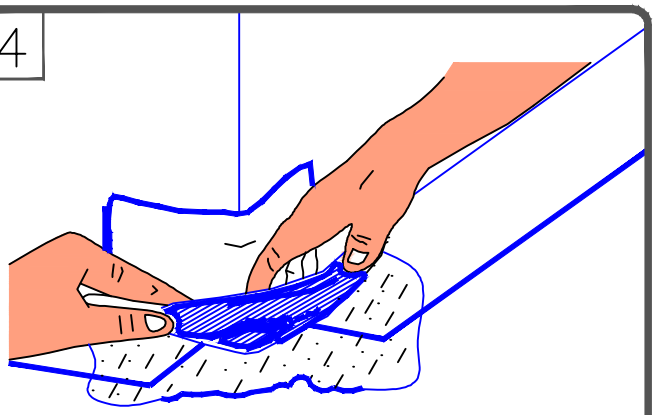
PRIOR TO PLACEMENT OF SURE-SEAL CORNER, PEEL OFF THE BLUE POLY RELEASE FILM AND HEAT THE FLASHING SIDE WITH A HEAT GUN. RE-APPLY THE POLY LOOSELY. FOLD THE FLASHING IN HALF.

3



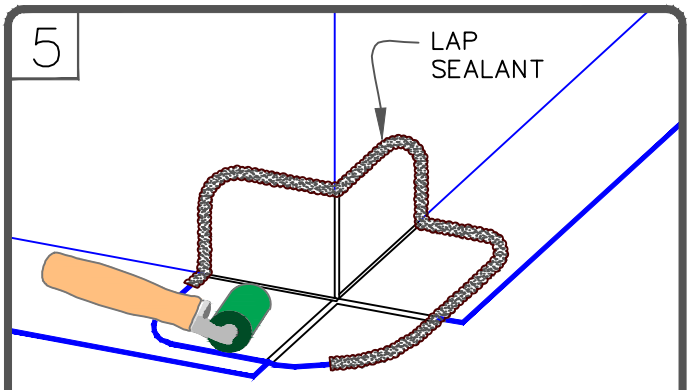
PLACE SURE-SEAL INSIDE/OUTSIDE CORNER AS SHOWN AND REMOVE RELEASE PAPER. PRESS FOLDED FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY PRESS FLASHING AGAINST THE VERTICAL SURFACE.

4



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

5



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

NOTE:

1. FOR PROJECTS WITH 25 & 30-YEAR WARRANTIES OR WHEN USING 90-MIL MEMBRANE, REFER TO DETAIL U-15G.1 FOR REQUIRED FLASHING ENHANCEMENTS.

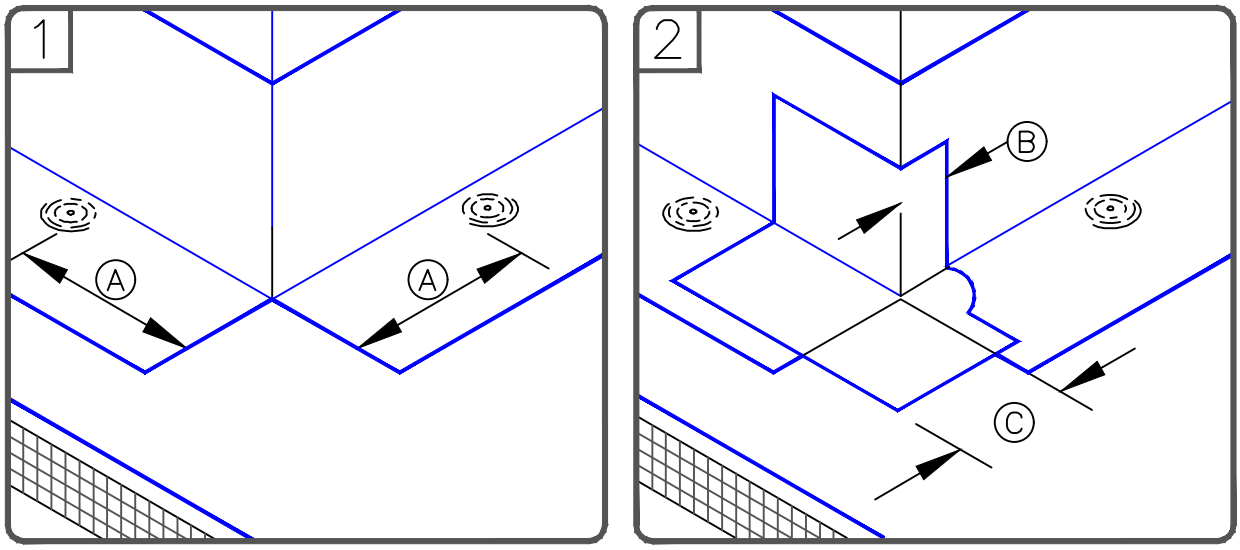
CARLISLE SYNTEC SYSTEMS

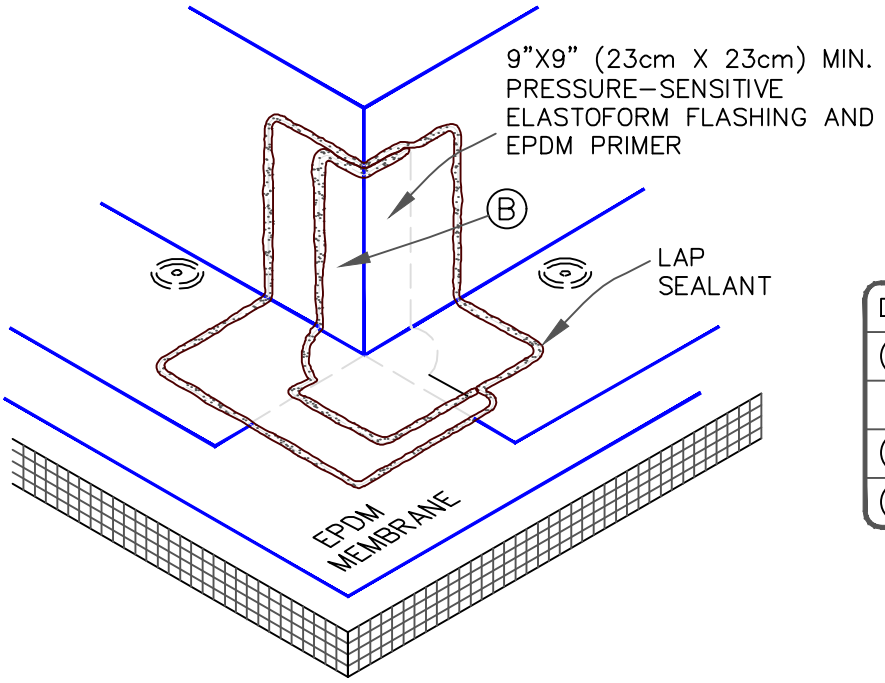
OUTSIDE CORNER WITH PRE-CUT PRESSURE-SENSITIVE CORNER

MAXIMUM WARRANTY: 20 YEARS. SEE NOTE 1

DETAIL NO.
U-15E
U (UNIVERSAL DETAIL)

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DIMENSIONS		cm	
A	6"	15	TO
	9"	23	
B	2"	5	MIN.
C	3"	7.5	MAX.

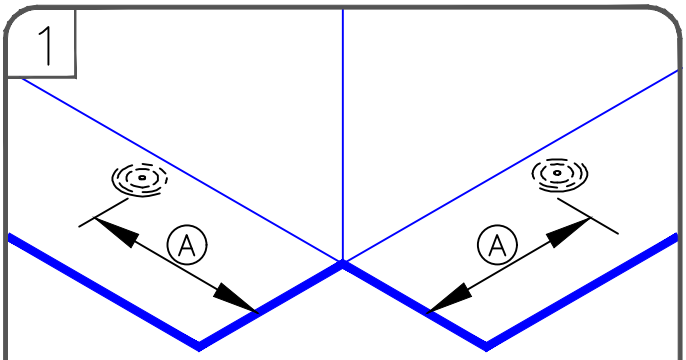
NOTES:

1. A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING IN COLDER TEMPERATURES.
2. FOR PROJECTS WITH 30-YEAR WARRANTY OR WHEN USING 90-MIL MEMBRANE, REFER TO DETAIL U-15G.1 FOR REQUIRED FLASHING ENHANCEMENTS.

CARLISLE SYNTEC SYSTEMS	OUTSIDE CORNER WITH PRESSURE-SENSITIVE ELASTOFORM FLASHING (2 PIECE) MAXIMUM WARRANTY: 25 YEARS	DETAIL NO. U-15F U (UNIVERSAL DETAIL)

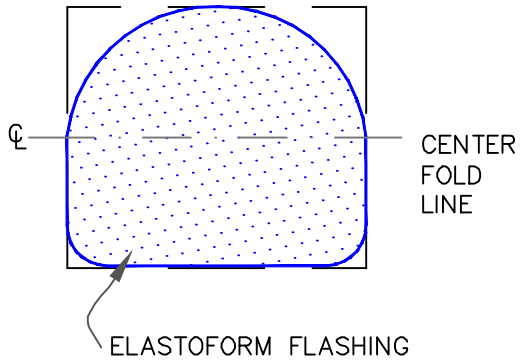
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1



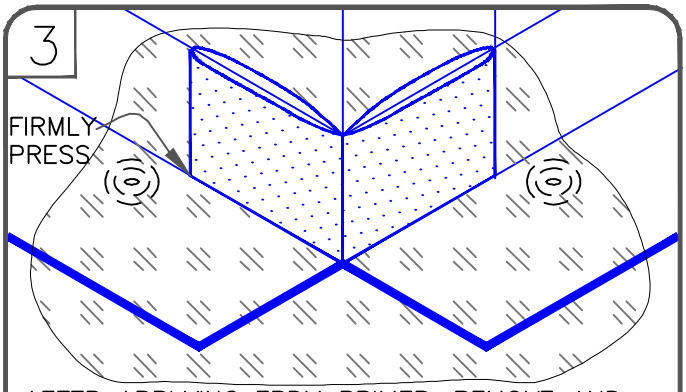
FASTEN MEMBRANE AND FLASH CURB OR WALL WITH CURED EPDM MEMBRANE FOLLOWING STANDARD PROCEDURES USING BONDING ADHESIVE and SecurTAPE.

2



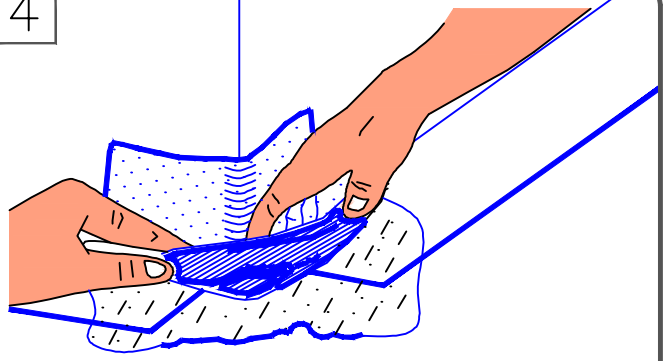
CUT A 9"x9" (23cm x 23cm) SECTION OF PRESSURE-SENSITIVE ELASTOFORM FLASHING AND MAKE ROUNDED CORNERS AS SHOWN.

3



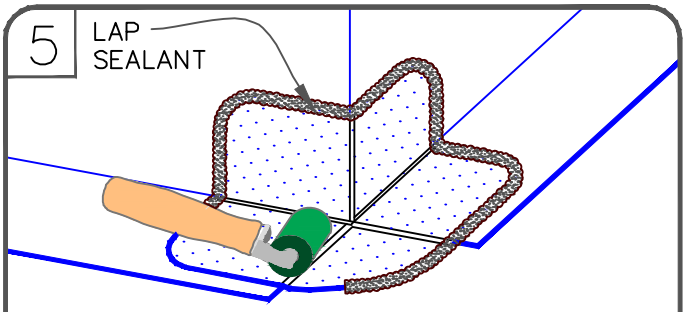
AFTER APPLYING EPDM PRIMER, REMOVE AND REPLACE POLY BACKING. FOLD FLASHING IN HALF WITH ROUNDED PORTION TURNED UP. CENTER FLASHING ON CORNER AND FIRMLY PRESS AGAINST VERTICAL SURFACE.

4



ROLL AND CREASE FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY ROLL FLASHING ONTO THE DECK MEMBRANE.

5



AFTER ADHERING, ROLL WITH A TWO INCH WIDE STEEL HAND ROLLER. PAY PARTICULAR ATTENTION TO THE STEP OFFS AND ANGLE CHANGES.

DIMENSIONS		cm	
Ⓐ	6"	15	TO
	9"	23	

NOTES:

1. FOR PROJECTS WITH 25 & 30-YEAR WARRANTIES OR WHEN USING 90-MIL MEMBRANE, REFER TO DETAIL U-15G.1 FOR REQUIRED FLASHING ENHANCEMENTS.

2. A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM FLASHING IN COLDER TEMPERATURES.

CARLISLE SYNTEC SYSTEMS

OUTSIDE CORNER WITH PRESSURE-SENSITIVE ELASTOFORM FLASHING (1 PIECE)

MAXIMUM WARRANTY: 20 YEARS. SEE NOTE 1

EPDM

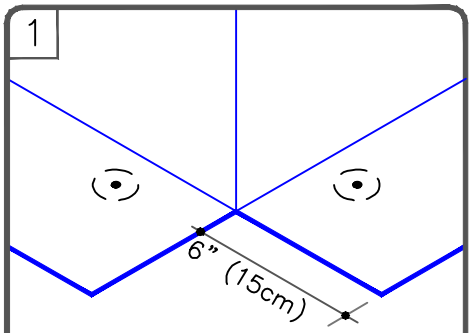
DETAIL NO.

U-15G

U (UNIVERSAL DETAIL)

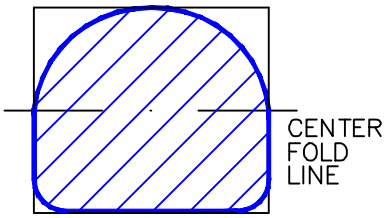
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1



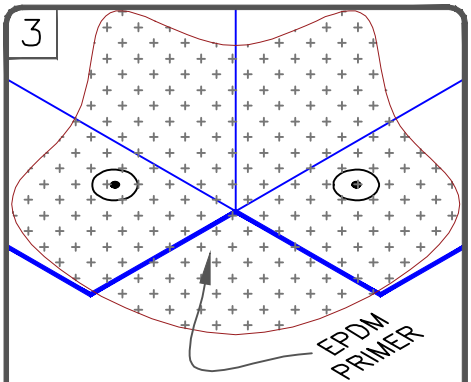
FASTEN MEMBRANE AND FLASH CURB OR WALL WITH CURED EPDM MEMBRANE FOLLOWING STANDARD PROCEDURES.

2



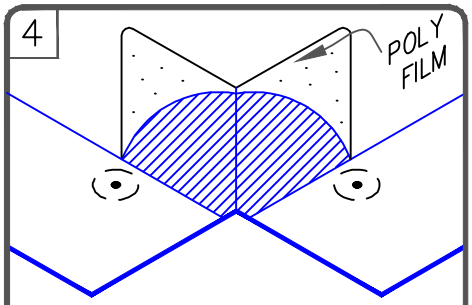
USE PRE–CUT T–JOINT COVERS OR CUT A 6"x6" (15X15cm) & 12"x12" (30X30cm) SECTION OF PRESSURE– SENSITIVE ELASTOFORM FLASHING AND ROUND CORNERS

3



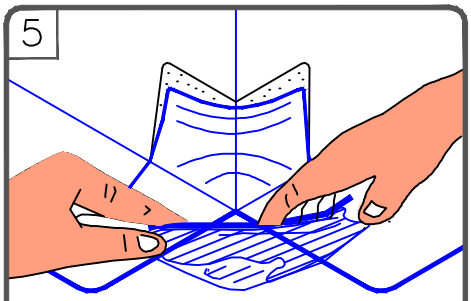
CLEAN EPDM SPLICE AREA WITH WEATHERED MEMBRANE CLEANER PRIOR TO APPLYING EPDM PRIMER

4



REMOVE & REPLACE POLY BACKING ON FLASHING. FOLD FLASHING IN HALF WITH ROUNDED PORTION TURNED UP. CENTER ON CORNER & FIRMLY PRESS AGAINST VERTICAL SURFACE

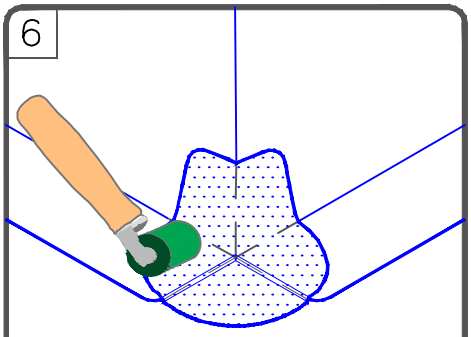
5



ROLL & CREASE FLASHING TIGHTLY INTO ANGLE CHANGE & FIRMLY ROLL FLASHING ONTO THE DECK MEMBRANE

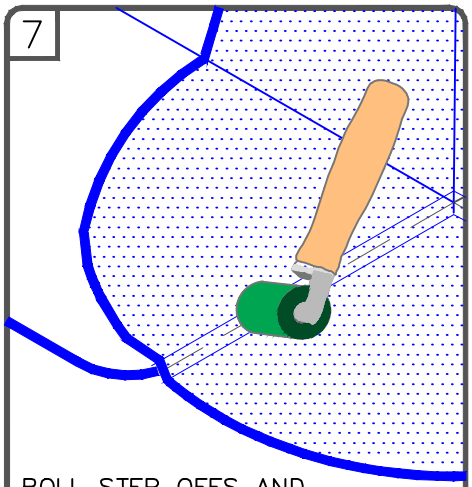
USE HEAT GUN TO WARM THE FLASHING IN COLD WEATHER

6



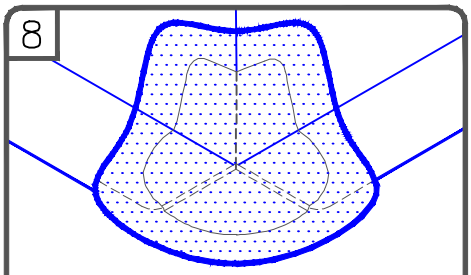
ROLL WITH A TWO INCH WIDE STEEL HAND ROLLER. PAY PARTICULAR ATTENTION TO THE STEP OFFS AND ANGLE CHANGES

7



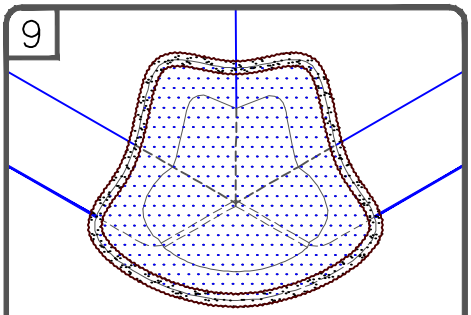
ROLL STEP OFFS AND ANGLE CHANGES

8



APPLY EPDM PRIMER TO SPLICE AREA. INSTALL THE 12"X12" (30cmX30cm) SECTION OF PRESSURE– SENSITIVE ELASTOFORM FLASHING CENTERED OVER PREVIOUSLY APPLIED FLASHING.

9



SEAL ALL EDGES WITH LAP SEALANT AS SHOWN

CARLISLE SYNTEC SYSTEMS

OUTSIDE CORNER FLASHING FOR PROJECTS WITH 90–MIL MEMBRANE OR 30 YEAR WARRANTIES

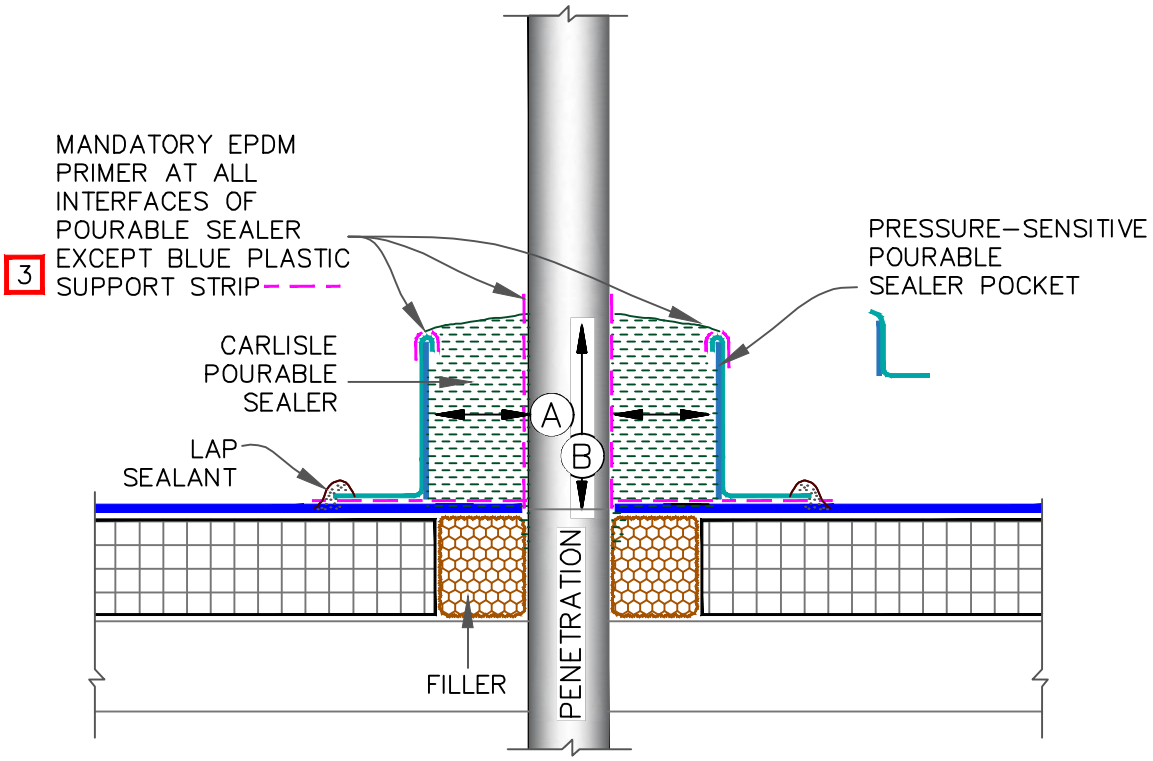
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.

U–15G.1

U (UNIVERSAL DETAIL)

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NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. ALL SURFACES MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER. DO NOT PRIME THE BLUE PLASTIC SUPPORT STRIP.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE–SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
6. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
7. ON MECHANICALLY–FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF–8A) REGARDLESS OF SIZE OR DIAMETER.
8. MINIMUM 1" (2.5cm) CLEARANCE REQUIRED BETWEEN PENETRATIONS.

DIMENSIONS		cm	
A	1"	2.5	MIN.
B	2"	5	MIN.

CARLISLE SYNTEC SYSTEMS

PRESSURE–SENSITIVE POURABLE SEALER POCKET

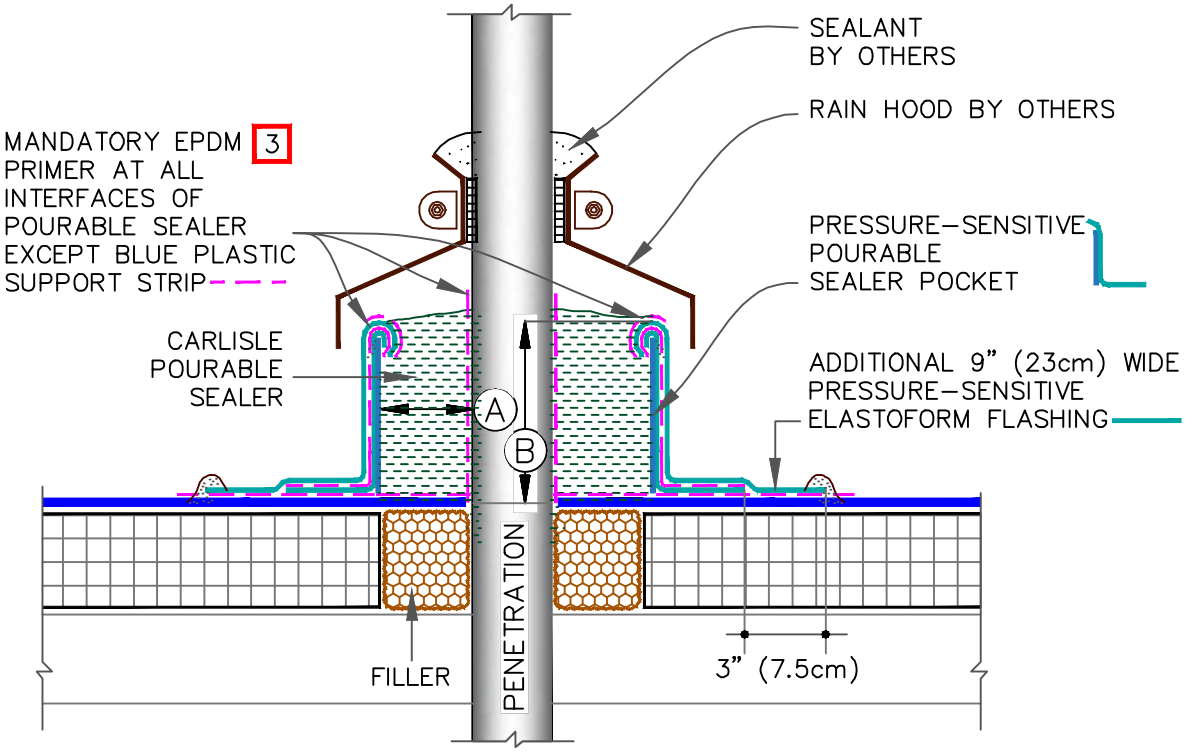
MAXIMUM WARRANTY: 20 YEARS

DETAIL NO.

U–16A

U (UNIVERSAL DETAIL)

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NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. ALL SURFACES MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER. DO NOT PRIME THE BLUE PLASTIC SUPPORT STRIP.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE-SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
6. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
7. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF-8A) REGARDLESS OF SIZE OR DIAMETER.
8. MINIMUM 1" (2.5cm) CLEARANCE REQUIRED BETWEEN PENETRATIONS.

DIMENSIONS		cm	
A	1"	2.5	MIN.
B	2"	5	MIN.

CARLISLE SYNTEC SYSTEMS

PRESSURE-SENSITIVE POURABLE SEALER POCKET

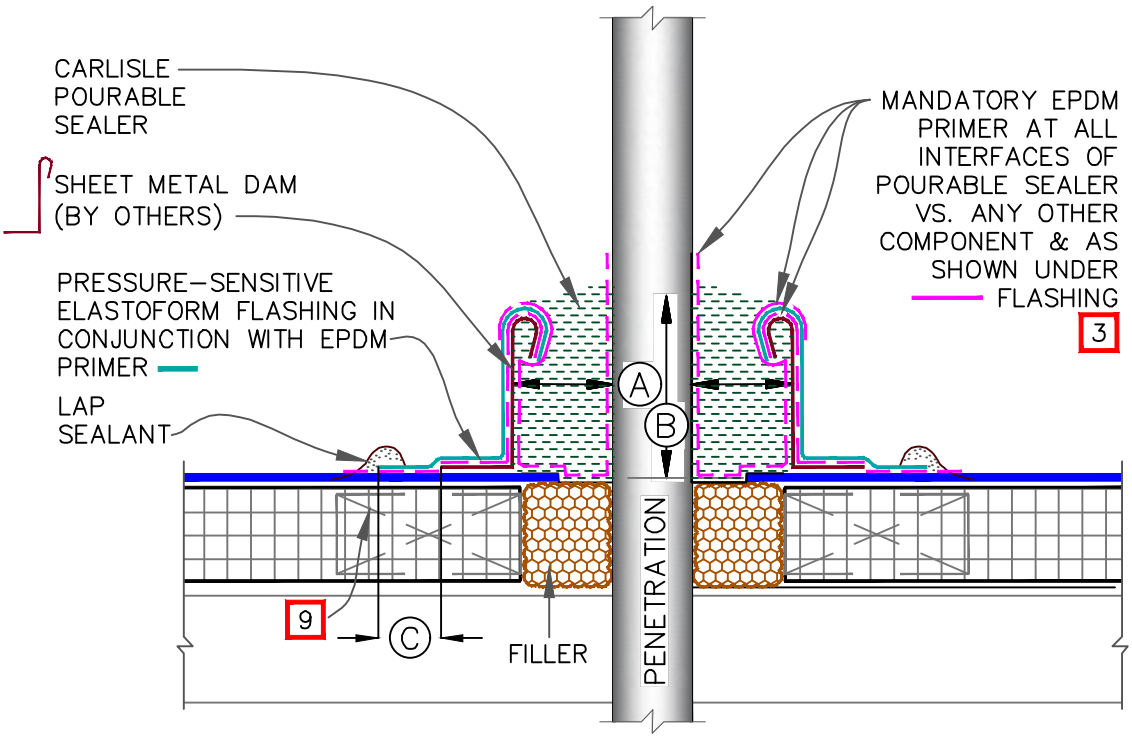
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.

U-16A.1

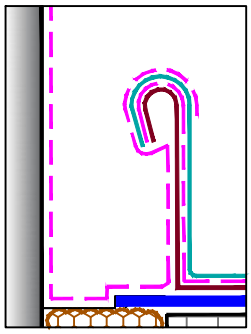
U (UNIVERSAL DETAIL)

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NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. ALL SURFACES MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE–SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
6. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
7. ON MECHANICALLY–FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF–8A) REGARDLESS OF SIZE AND DIAMETER, UNLESS WOOD NAILERS ARE PRESENT.
8. DECK FLANGE MUST BE CONTINUOUS WITH ROUNDED CORNERS.
9. WHEN ANY ONE SIDE OF THE FIELD FABRICATED POURABLE SEALER POCKET EXCEEDS 12" (30cm), USE WOOD BLOCKING TO ANCHOR SHEET METAL.
10. MINIMUM 1" (2.5cm) CLEARANCE REQUIRED BETWEEN PENETRATIONS.



MANDATORY EPDM PRIMER AT ALL INTERFACES OF POURABLE SEALER VS. ANY OTHER COMPONENT & AS SHOWN UNDER FLASHING

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

CARLISLE SYNTEC SYSTEMS

FIELD FABRICATED POURABLE SEALER POCKET

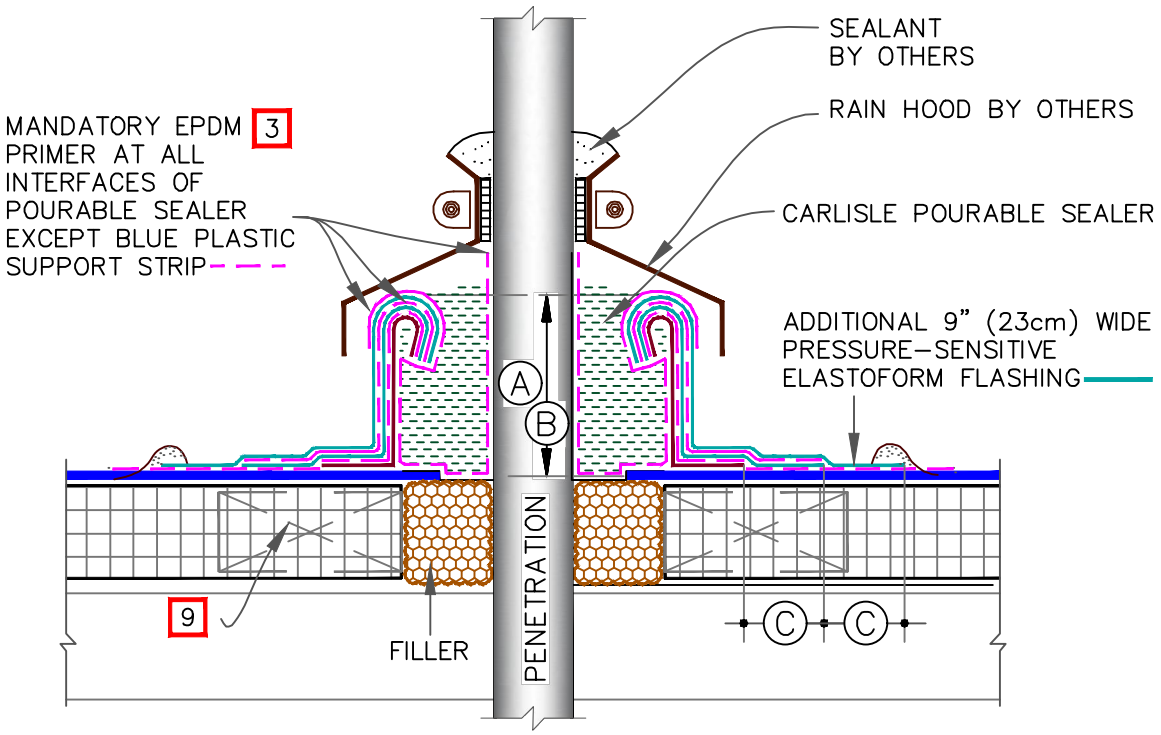
MAXIMUM WARRANTY: 20 YEARS

DETAIL NO.

U–16B

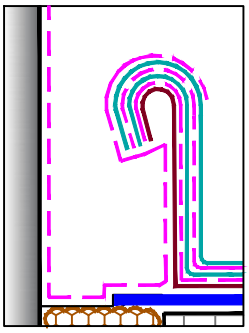
U (UNIVERSAL DETAIL)

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NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. ALL SURFACES MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE-SENSITIVE ELASTOFORM FLASHING AND DECK MEMBRANE.
6. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
7. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF-8A) REGARDLESS OF SIZE AND DIAMETER, UNLESS WOOD NAILERS ARE PRESENT.
8. DECK FLANGE MUST BE CONTINUOUS WITH ROUNDED CORNERS.
9. WHEN ANY ONE SIDE OF THE FIELD FABRICATED POURABLE SEALER POCKET EXCEEDS 12" (30cm), USE WOOD BLOCKING TO ANCHOR SHEET METAL.
10. MINIMUM 1" (2.5cm) CLEARANCE REQUIRED BETWEEN PENETRATIONS.



MANDATORY EPDM PRIMER AT ALL INTERFACES OF POURABLE SEALER VS. ANY OTHER COMPONENT & AS SHOWN UNDER FLASHING

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

CARLISLE SYNTEC SYSTEMS

FIELD FABRICATED POURABLE SEALER POCKET

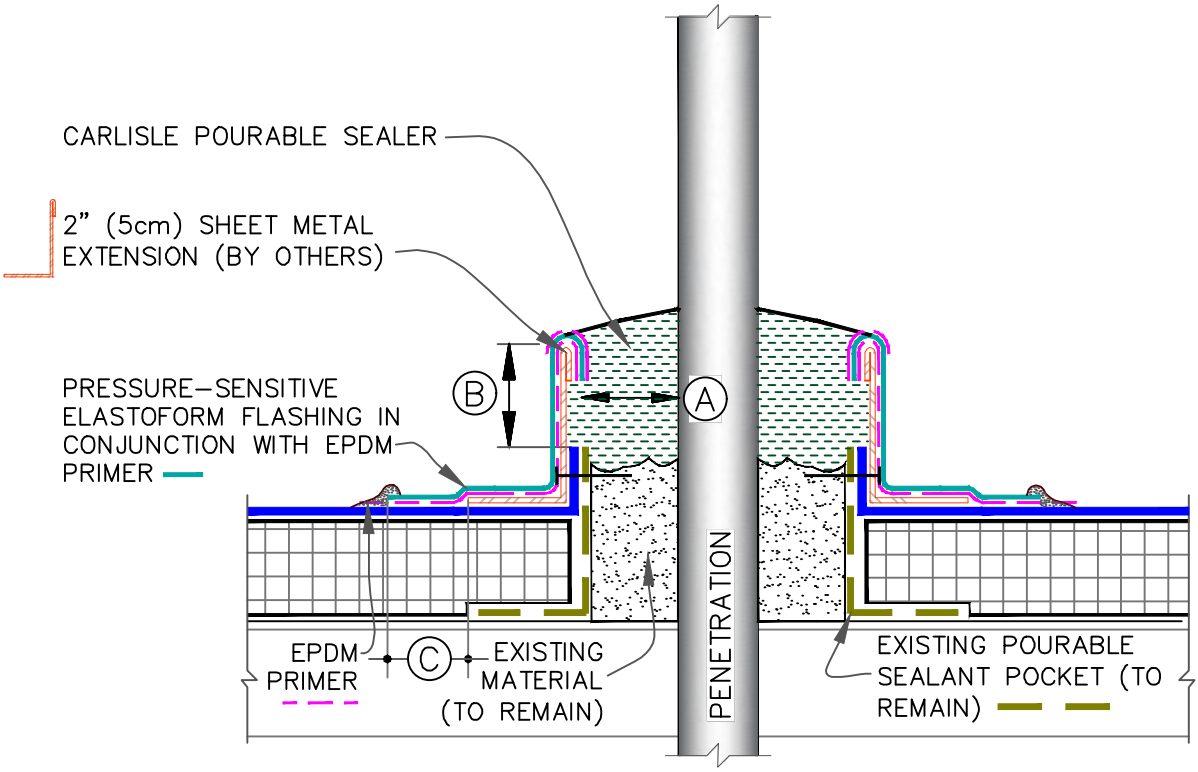
MAXIMUM WARRANTY: 30 YEARS

DETAIL NO.

U-16B.1

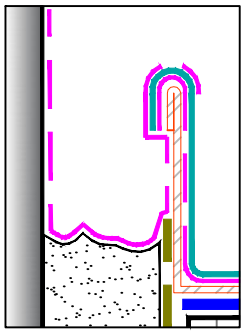
U (UNIVERSAL DETAIL)

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NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. ALL SURFACES MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE-SENSITIVE ELASTOFORM FLASHING.
6. SHAPE METAL DAM TO FIT EXISTING PITCH POCKET.
7. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
8. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF-8A) REGARDLESS OF SIZE OR DIAMETER.
9. MINIMUM 1" (2.5cm) CLEARANCE REQUIRED BETWEEN PENETRATIONS.



MANDATORY EPDM PRIMER AT ALL INTERFACES OF POURABLE SEALER

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

CARLISLE SYNTEC SYSTEMS

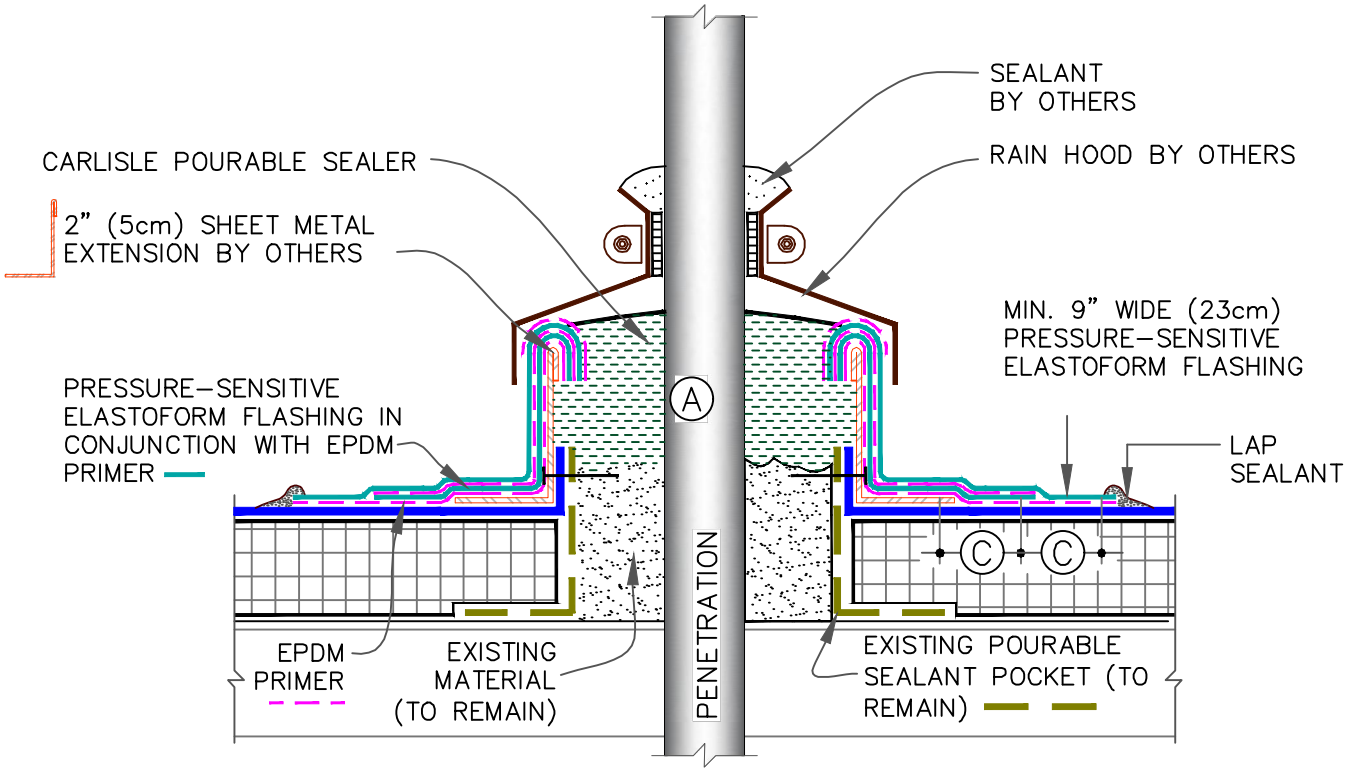
EXTENDED POURABLE SEALER POCKET

MAXIMUM WARRANTY: 20 YEARS

DETAIL NO. U-16C

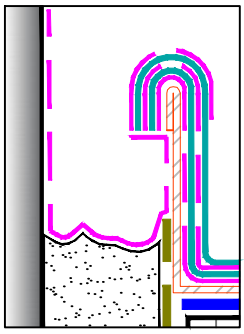
U (UNIVERSAL DETAIL)

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NOTES:

1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180° F (82° C).
2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
3. ALL SURFACES MUST BE PRIMED WITH EPDM PRIMER PRIOR TO APPLYING POURABLE SEALER.
4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
5. POURABLE SEALER MUST CONTACT PRIMED PRESSURE-SENSITIVE ELASTOFORM FLASHING.
6. SHAPE METAL DAM TO FIT EXISTING PITCH POCKET.
7. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
8. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL MF-8A) REGARDLESS OF SIZE OR DIAMETER.
9. MINIMUM 1" (2.5cm) CLEARANCE REQUIRED BETWEEN PENETRATIONS.



MANDATORY EPDM PRIMER AT ALL INTERFACES OF POURABLE SEALER

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

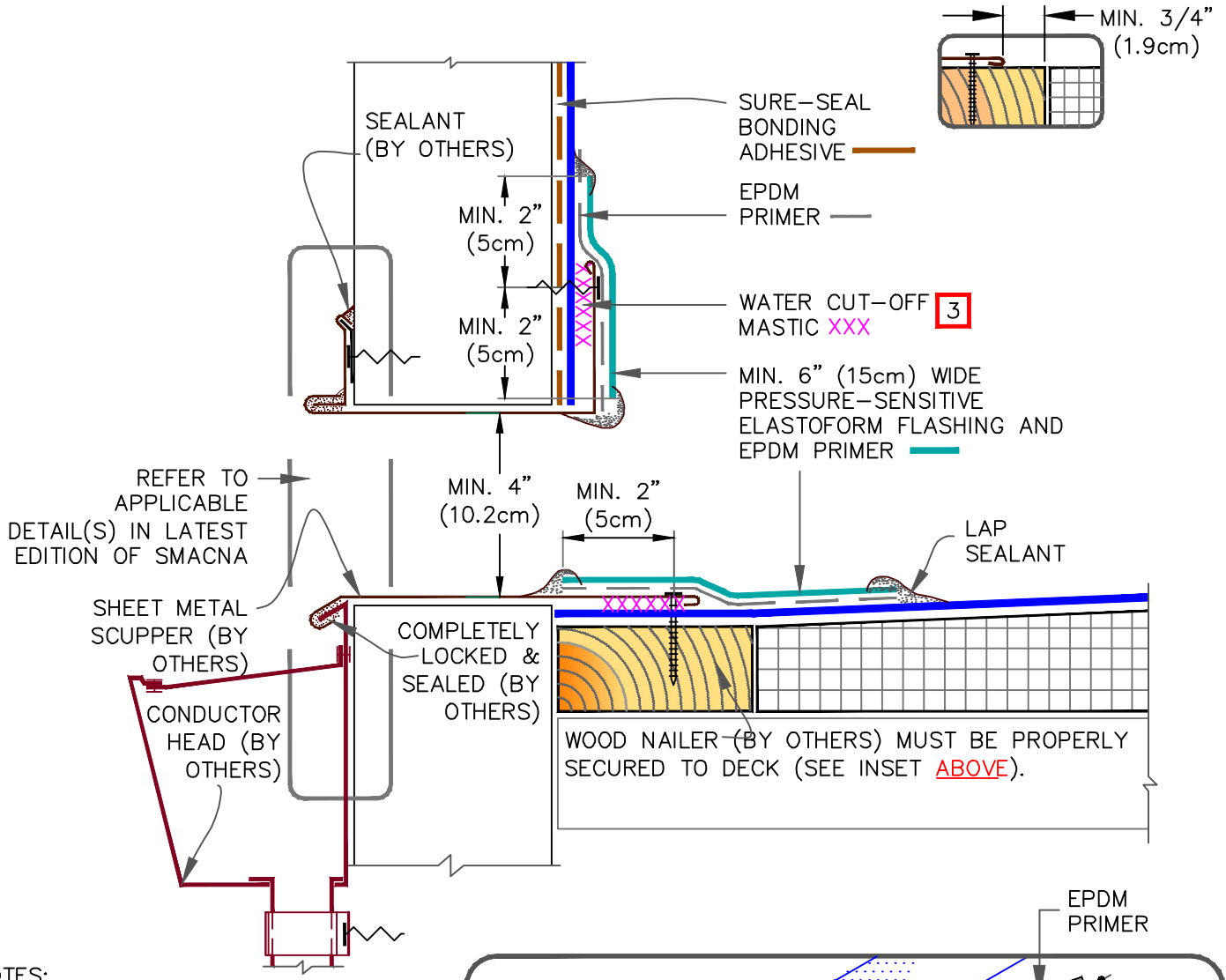
CARLISLE SYNTEC SYSTEMS

EXTENDED POURABLE SEALER POCKET

MAXIMUM WARRANTY: 30 YEARS

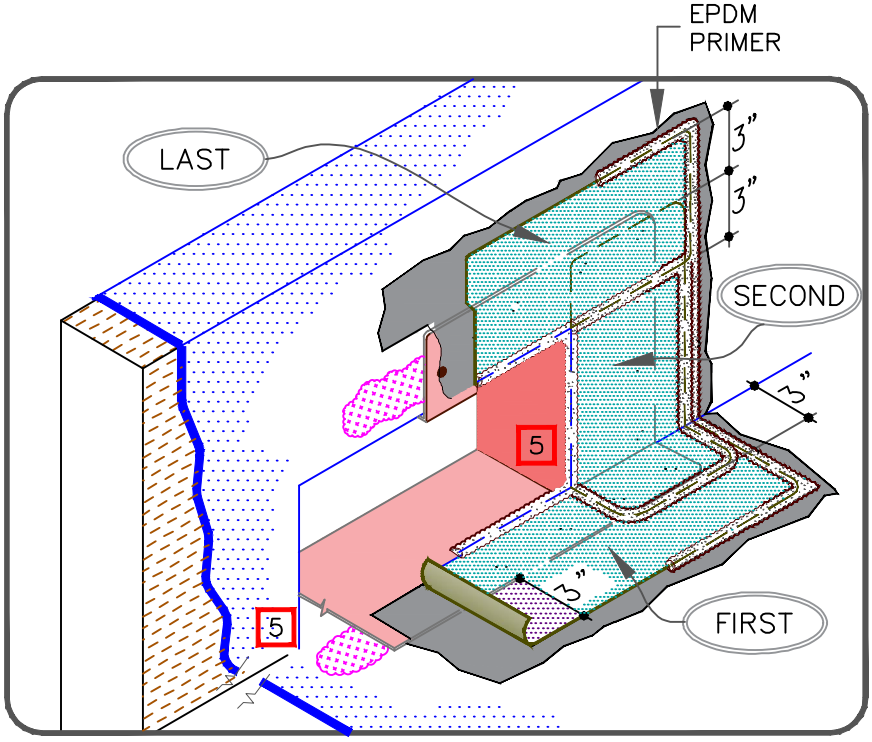
DETAIL NO.
U-16C.1
U (UNIVERSAL DETAIL)

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NOTES:

1. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS. SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
2. INSTALL U-15 CORNERS IF SCUPPER BOX DOES NOT HAVE A CONTINUOUS FLANGE.
3. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGES MUST BE UNDER CONSTANT COMPRESSION.
4. CLEAN METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; AND ALLOW TO DRY.
5. SCUPPERS WITHOUT A CONTINUOUS WATERTIGHT DESIGN MUST BE FLASHED IN PER DETAIL U-15 OUTSIDE CORNER.



CARLISLE SYNTEC SYSTEMS

SCUPPER: SINGLE LAYER FLASHING

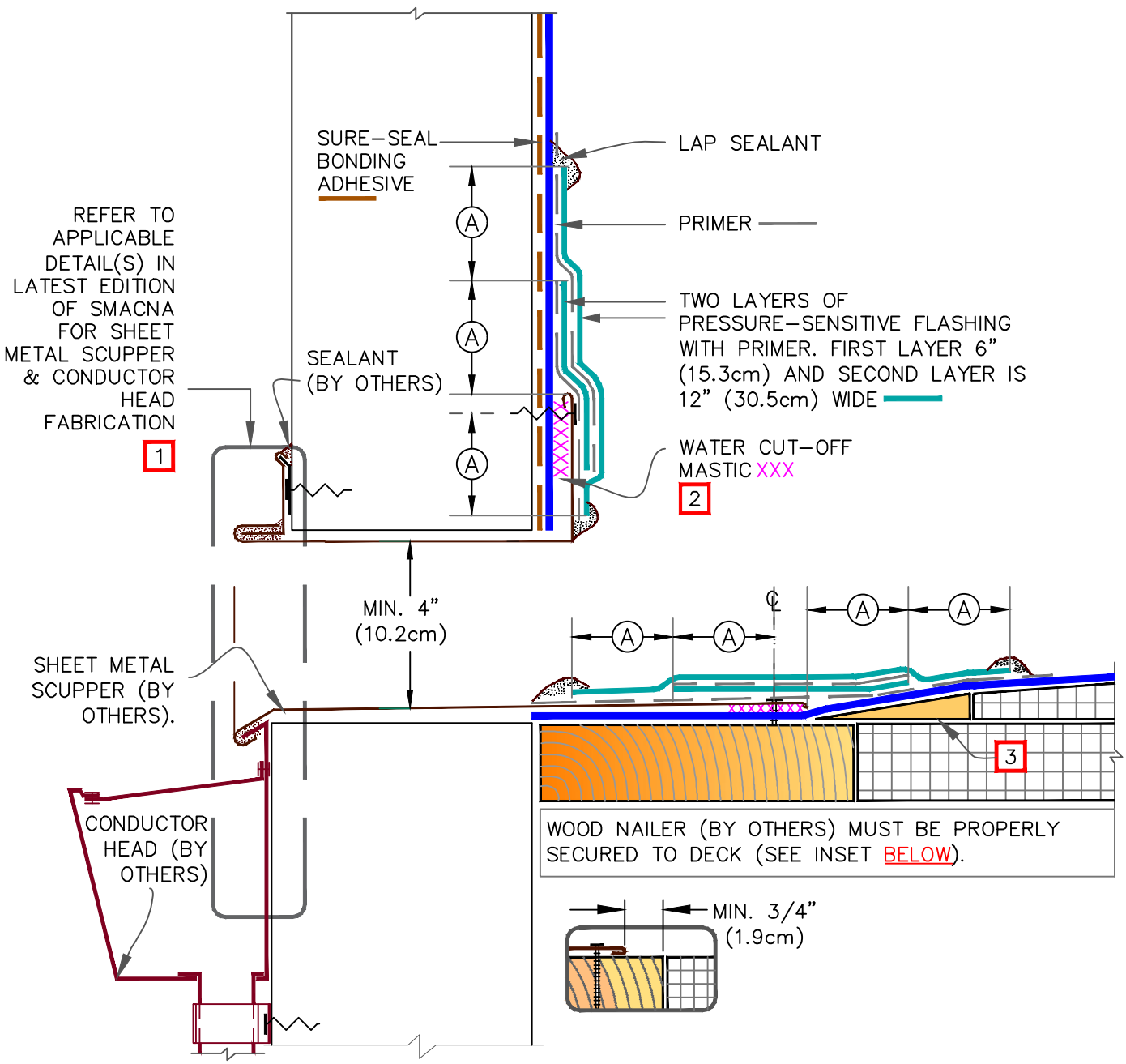
MAXIMUM WARRANTY: 25 YEARS

DETAIL NO.

U-18A

U (UNIVERSAL DETAIL)

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NOTES:

1. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS AIR & WATER-TIGHT.
2. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGES MUST BE UNDER CONSTANT COMPRESSION.
3. TAPERED EDGE STRIP BY HUNTER OR CANT STRIP, AS REQUIRED & SET IN ADHESIVE OR SHAVE THE EDGES OF TAPERED INSULATION.

DIMENSIONS		cm	
(A)	2"	5	MIN.
(B)	3"	7.6	MIN.

CARLISLE SYNTEC SYSTEMS

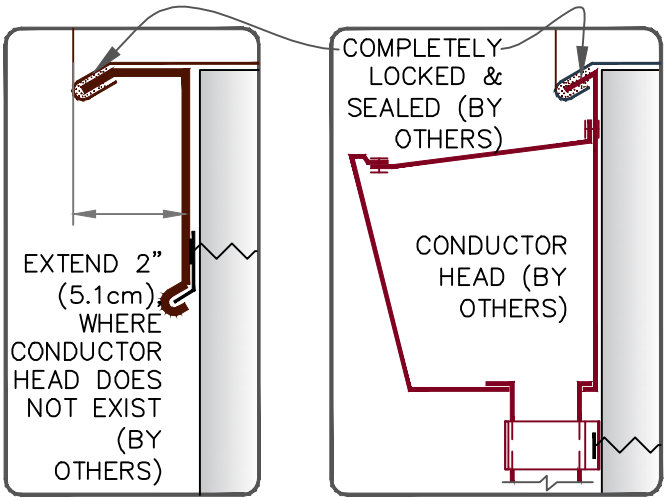
SCUPPER: DOUBLE LAYERS FLASHING
PAGE 1 OF 2

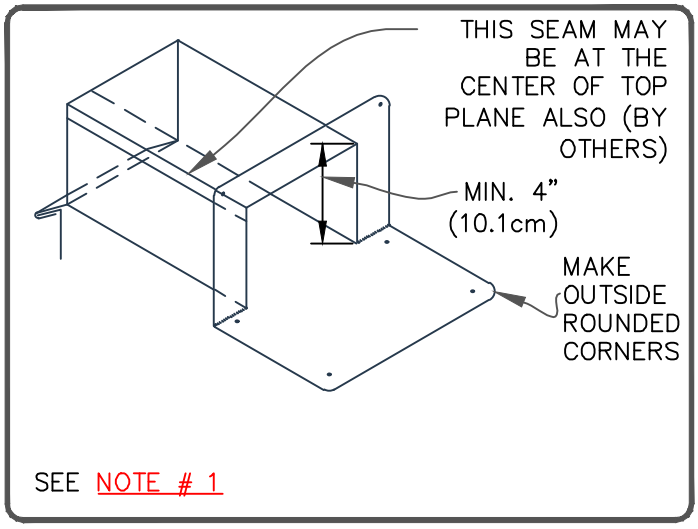
MAXIMUM WARRANTY: 30 YEARS

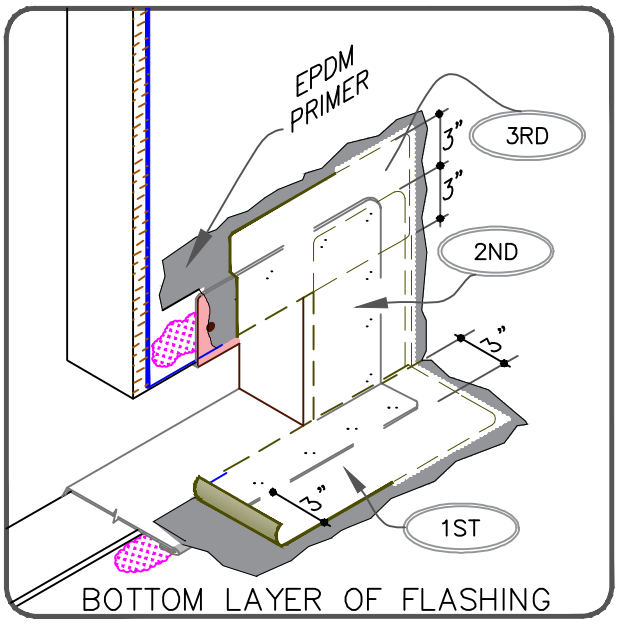
EPDM

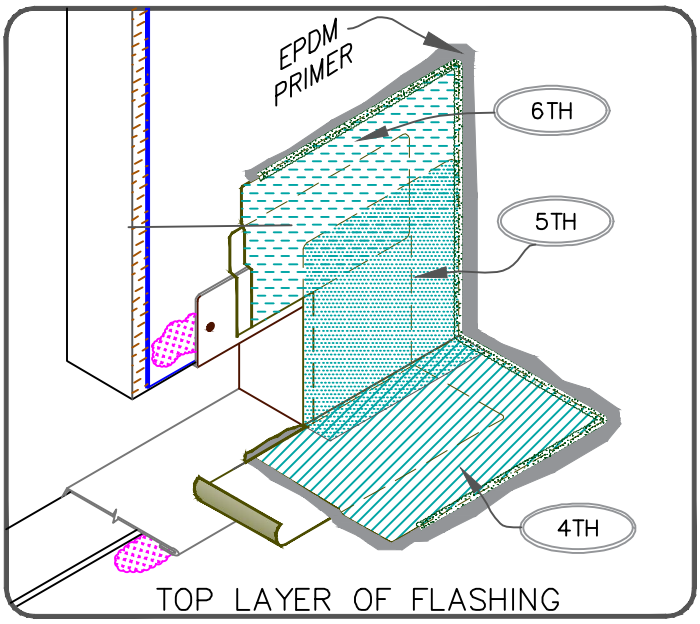
DETAIL NO.
U-18A.1
U (UNIVERSAL DETAIL)

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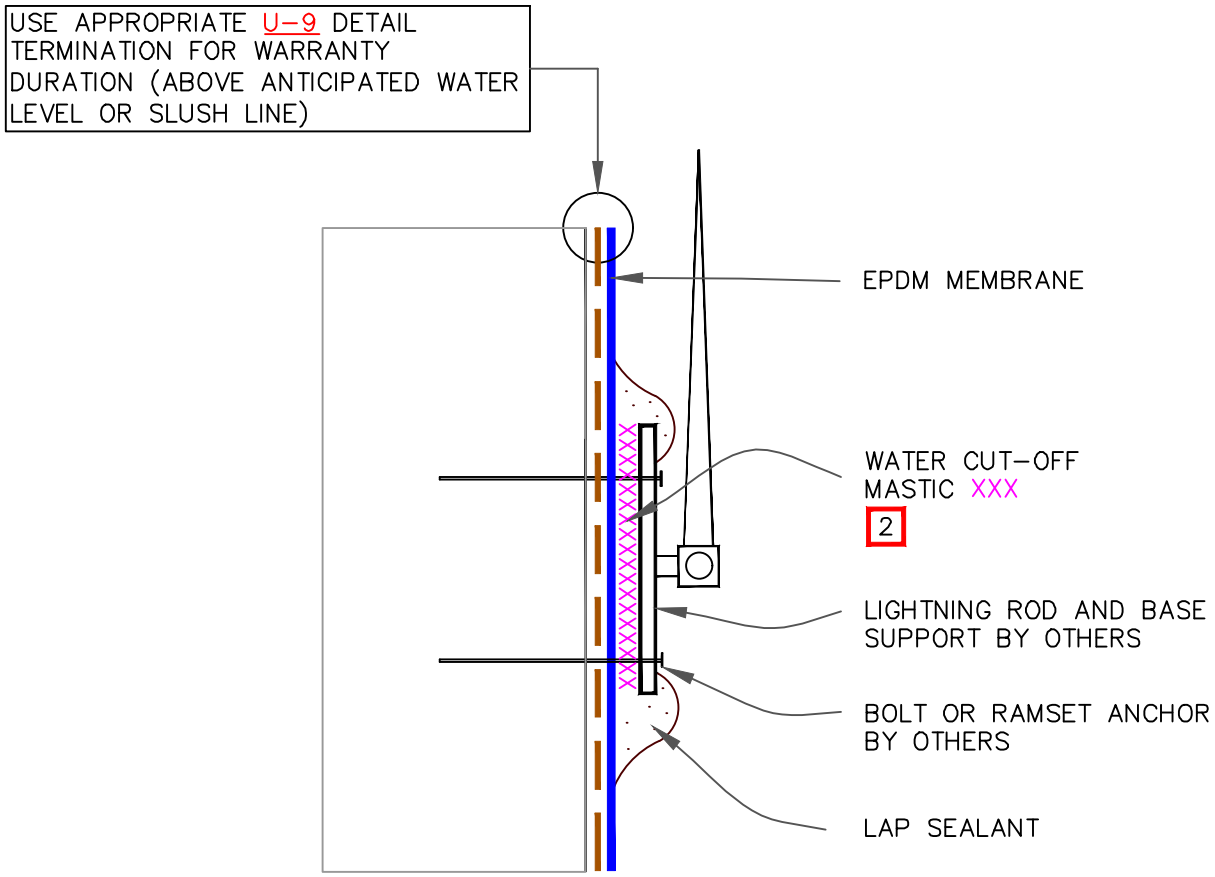






CARLISLE SYNTEC SYSTEMS	SCUPPER: DOUBLE LAYERS FLASHING PAGE 2 OF 2	DETAIL NO. U–18A.1
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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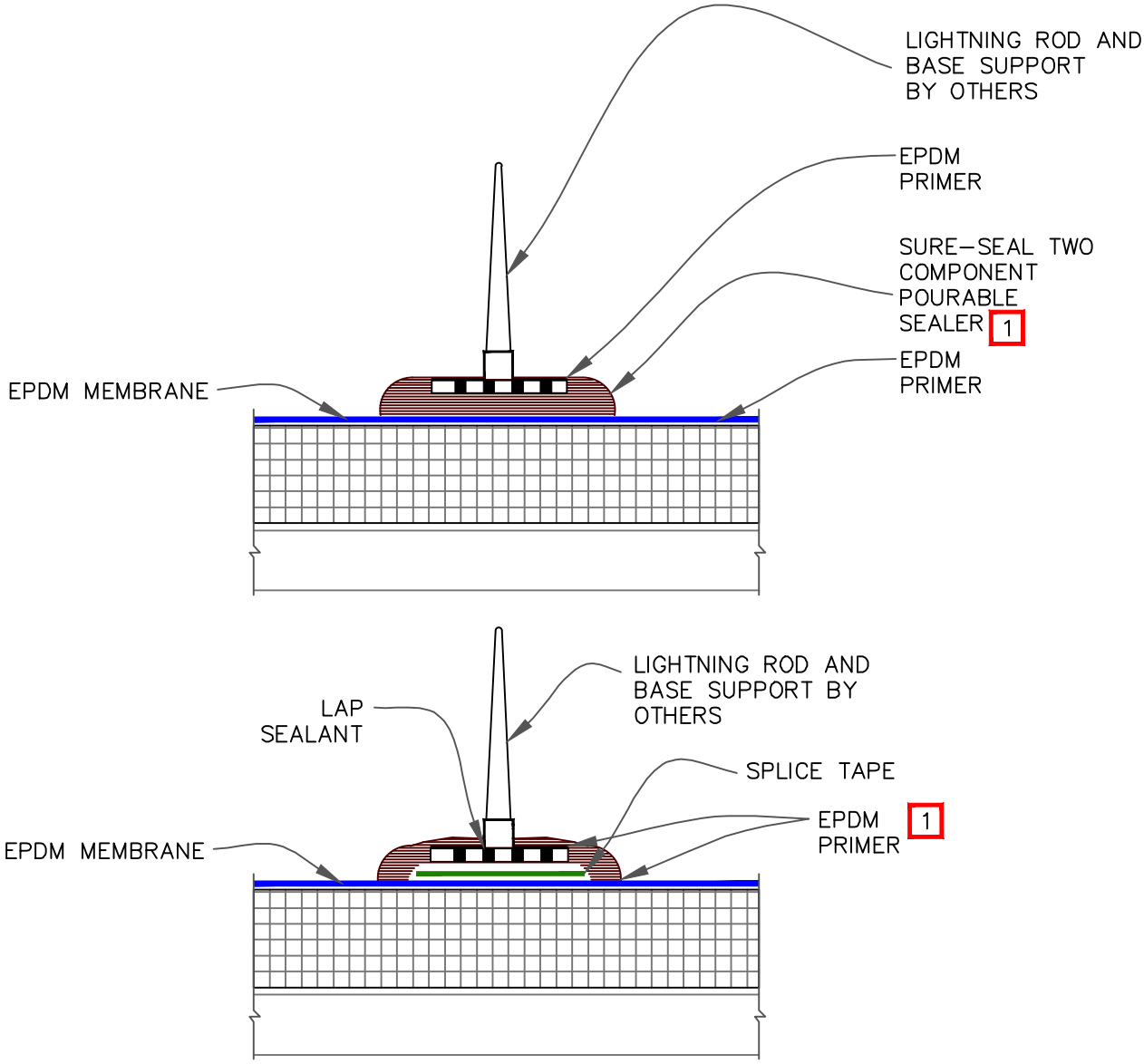


NOTES:

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. COMPLY WITH ZONING ORDNANCE AND LOCAL CODES FOR MOUNTING A LIGHTNING SYSTEM.
4. DETAIL UNACCEPTABLE FOR HORIZONTAL APPLICATIONS ON ROOF DECK.

CARLISLE SYNTEC SYSTEMS	LIGHTNING ROD AT PARAPET (VERTICAL ATTACHMENT) MAXIMUM WARRANTY: 30 YEARS	DETAIL NO. U–20A U (UNIVERSAL DETAIL)

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NOTES:

1. SURE-SEAL TWO COMPONENT POURABLE SEALER IN CONJUNCTION WITH EPDM PRIMER, OR UNIVERSAL SINGLE-PLY SEALANT.

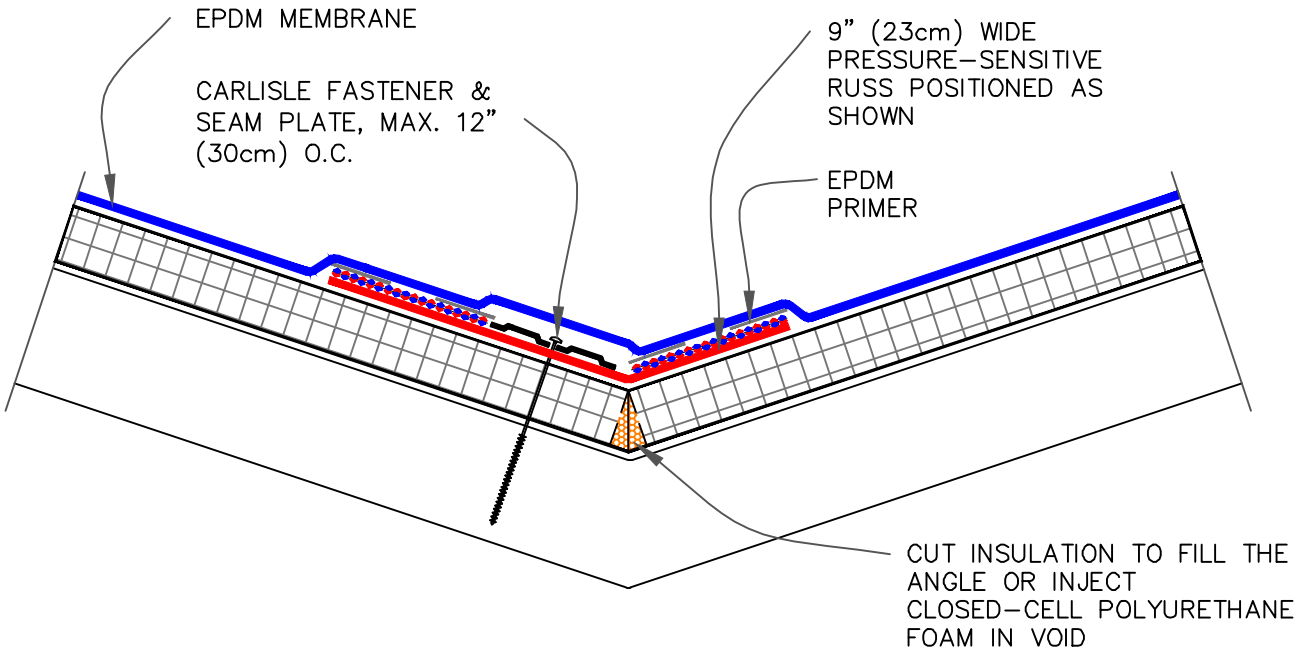
2. CLEAN EXPOSED MEMBRANE WITH WEATHERED MEMBRANE CLEANER AND ALLOW TO DRY.

3. PRIOR TO THE APPLICATION OF POURABLE SEALER, APPLY EPDM PRIMER TO THE MEMBRANE AND LIGHTNING ROD BASE ACHIEVING A VERY THIN EVEN COAT ON BOTH SURFACES. ALLOW PRIMER TO DRY UNTIL IT IS TACK FREE.

4. COMPLY WITH ZONING ORDNANCE AND LOCAL CODES FOR MOUNTING A LIGHTNING SYSTEM.

CARLISLE SYNTEC SYSTEMS	LIGHTNING ROD AT DECK LEVEL	DETAIL NO. U-20B
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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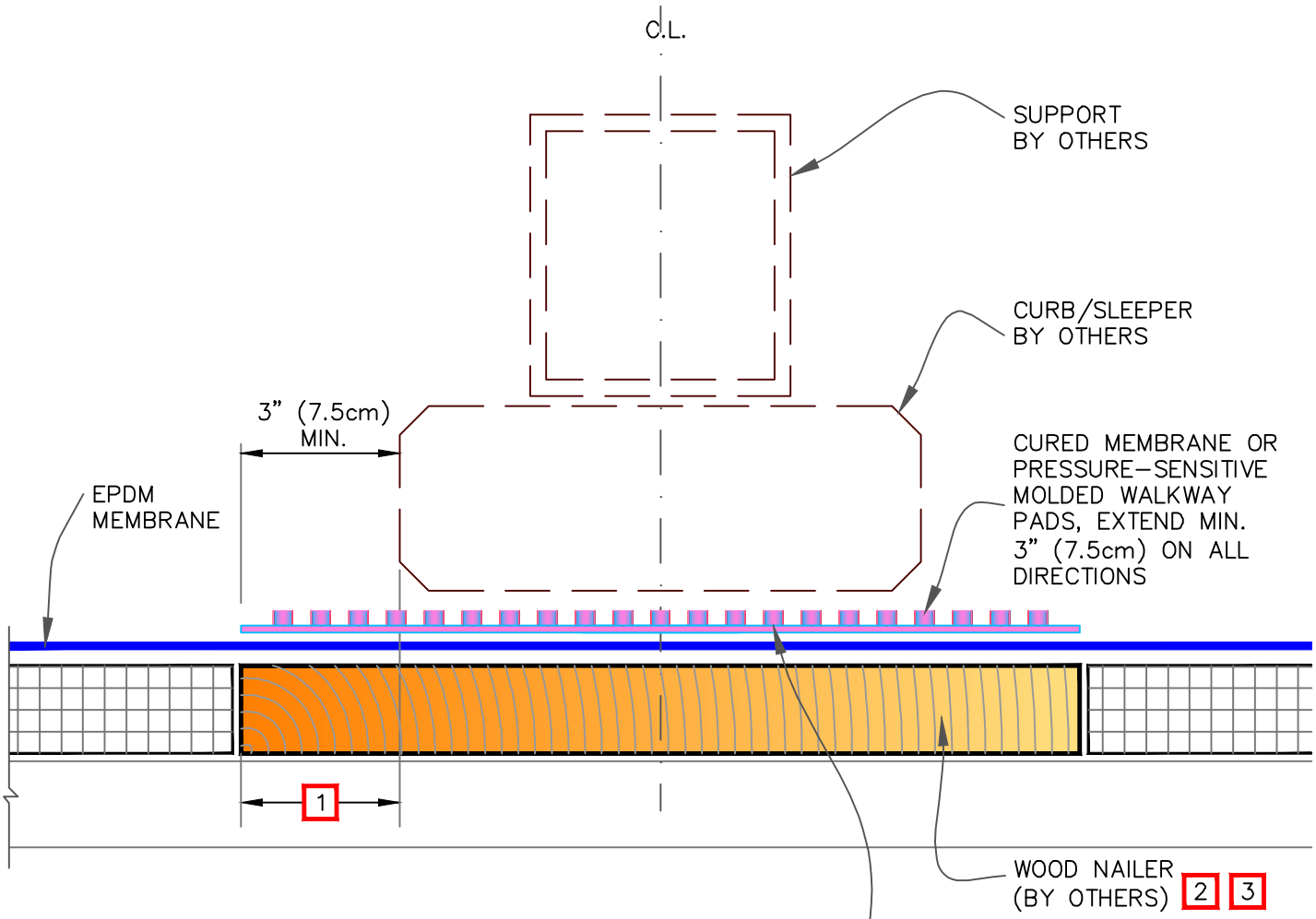


NOTES:

1. DETAIL FOR SURE-SEAL/SURE-WHITE ADHERED AND SURE-TOUGH MECHANICALLY-FASTENED ROOFING SYSTEMS WHEN SLOPE AT VALLEY EXCEEDS 2" (5cm) IN ONE HORIZONTAL FOOT.
2. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, HP FASTENERS AND POLYMER SEAMS ARE REQUIRED OVER STEEL DECKS.
3. EPDM PRIMER MUST BE APPLIED TO BACK SIDE OF DECK MEMBRANE PRIOR TO COMPLETING SPLICE TO PRESSURE-SENSITIVE RUSS.

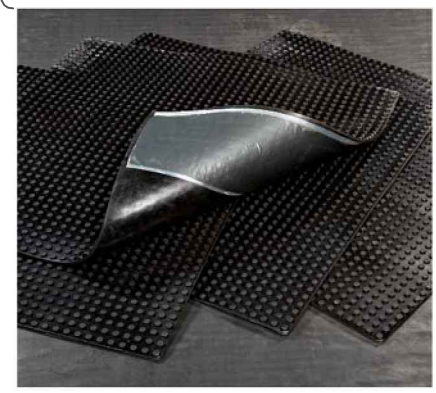
CARLISLE SYNTEC SYSTEMS	VALLEY	DETAIL NO. U-22
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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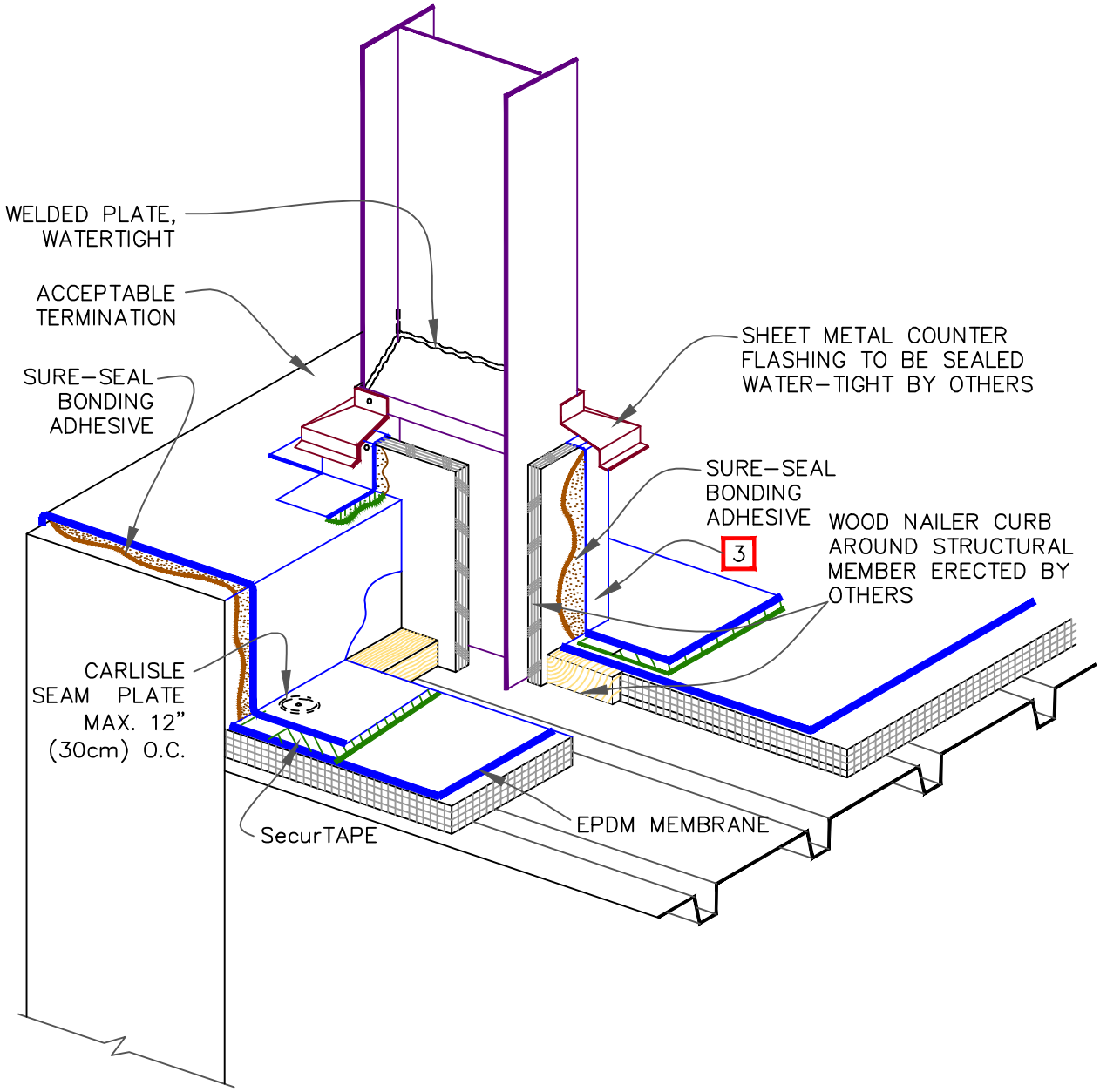
NOTES:

1. SLEEPER MUST BE LARGE ENOUGH TO SUPPORT WEIGHT OF EQUIPMENT WITHOUT INDENTING INSULATION. EXTEND WOOD NAILER OUT AS REQUIRED BY STRUCTURAL ENGINEER TO DISTRIBUTE SUBJECT LOAD OR AT LEAST EXTEND OUT MIN. 3" (7.5cm).
2. ENSURE SCREW/ANCHOR HEADS IN TOP SURFACE OF WOOD BLOCKING ARE RECESSED TO PROTECT MEMBRANE.
3. WOOD NAILERS REQUIRED IF WEIGHT OF SLEEPER MAY INDENT OR DAMAGE INSULATION.
4. CONSULT STRUCTURAL ENGINEER AND/OR SPECIFIER TO AVOID WATER PONDING DUE TO DECK DEFLECTION.



CARLISLE SYNTEC SYSTEMS	SLEEPER	DETAIL NO. U-24
	MAXIMUM WARRANTY: 30 YEARS	U (UNIVERSAL DETAIL)

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NOTES:

1. FOR PARAPET FLASHING, REFER TO DETAIL(S) U-12.
2. FOR CURB FLASHING, REFER TO DETAIL(S) U-5.
3. FOR CORNER APPLICATION, REFER TO DETAIL(S) U-15.

CARLISLE SYNTEC SYSTEMS	I-BEAM PENETRATION	EPDM	DETAIL NO. U-30
	MAXIMUM WARRANTY: 30 YEARS		U (UNIVERSAL DETAIL)

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