



TPO AND PVC ROOFING SYSTEMS



Mechanically Attached and Fully Adhered Roofing Systems

January 2012

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VersiWeld® TPO/VersiFlex™ PVC Mechanically Attached and Fully Adhered Roofing Systems

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The information contained in this generic specification represents a part of Versico's requirements for obtaining a roofing system 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. Versico 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 Contractors regarding the design and installation of Versico's Fully Adhered and Mechanically Attached Thermoplastic Membrane Roofing Systems. Additional information essential for the design and installation of the roof system mentioned herein are also included in the Design Reference Section and also listed in the form of a Specification Supplement at the end of the Technical Manual. Specifiers and Authorized Contractors 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. Mechanically Attached Systems (VersiWeld/VersiFlex)

1. The **VersiWeld Mechanically Attached Roofing System** incorporates 12', 10' or 8' wide, white, tan or gray 45, 60, or 80-mil thick scrim-reinforced, VersiWeld Thermoplastic Polyolefin (TPO) membrane field sheets. The Spectro-Weld Mechanically Attached Roofing System incorporates 10' or 6' wide, white, 60- or 80-mil thick scrim-reinforced Thermoplastic Polyolefin (TPO) membrane field sheets. Insulation is mechanically attached to an acceptable roof deck. VersiWeld perimeter sheets (6' used with 10' and 12' wide field sheets; 4' used with 8' wide field sheets) are installed along building edges and field membrane sheets are Mechanically Attached to the roof deck with the appropriate Versico fasteners and fastening plates. Adjoining sheets of VersiWeld membrane are overlapped and joined together with a minimum 1-1/2" wide heat weld. Membrane fastening requirements are outlined in Warranty Tables in Paragraph 1.05 of this Specification.
2. The **VersiFlex Mechanically Attached Roofing System** incorporates 50, 60 or 80-mil Polyester Reinforced VersiFlex Polyvinyl Chloride (PVC) membrane or Polyester Reinforced VersiFlex-E Polyvinyl Chloride (PVC) Membrane with Elvaloy (KEE). Either membrane is available in 10' wide (white membrane only) field sheets and 5' perimeter sheets. Standard Polyester Reinforced membrane is also available in 81" wide (white, gray or tan) field sheets and 40.5" perimeter sheets. VersiFlex sheets are available in rolls in 65', 80' or 100' rolls. All sheets are mechanically attached over an approved insulation/underlayment to an acceptable roof deck with the appropriate Versico Fasteners and Fastening Plates. Adjoining sheets of VersiFlex membrane are overlapped and joined together with a minimum 1-1/2" wide heat weld. Membrane fastening requirements are outlined in Warranty Tables in Paragraph 1.05 of this Specification

NOTE: Either Roofing System may be specified utilizing the RhinoBond attachment method, refer to Attachment I, at the end of this specification for additional information.

NOTE: Either Roofing System may be specified over an existing standing seam, flat seam or corrugated metal roof (mechanically attached systems incorporate membrane securement into the structural purlins). **Refer to the Metal Retrofit Roofing System Specification**, published separately, for applicable requirements.

B. Fully Adhered Roofing Systems (VersiWeld / VersiWeld QA TPO / VersiFlex)

1. The **VersiWeld Fully Adhered Roofing System** incorporates maximum 12' wide white, gray or tan 45, 60 or 80-mil thick scrim-reinforced VersiWeld Thermoplastic Polyolefin (TPO) membrane. Versico Insulation is mechanically attached to the roof deck or secured with DASH or FAST Adhesive, OlyBond 500 BA, or

OlyBond Spot Shot Adhesive and the membrane is fully adhered to the insulation with the appropriate VersiWeld Bonding Adhesive. Adjoining sheets of membrane are overlapped approximately 2" and joined together with a minimum 1-1/2" wide heat weld.

2. The **VersiWeld QA TPO (Quick-Applied TPO) membrane** is a heat-weldable single-ply thermoplastic polyolefin (TPO) sheet available in 10' wide, white 60-mil reinforced TPO membrane laminated to an elastomeric pressure-sensitive adhesive. Limited to 20 Year Maximum Warranty.
3. The **VersiFlex Fully Adhered Roofing System** incorporates maximum 10' wide, 50-mil, 60-mil or 80-mil thick Polyester or Fiberglass reinforced VersiFlex Polyvinyl Chloride (PVC) membrane. Versico Insulation is mechanically attached to the roof deck or secured with an approved adhesive and the membrane is fully adhered to the substrate with VersiFlex PVC Low VOC Bonding Adhesive or AquaBase 120 Bonding Adhesive (for maximum 15-year warranty). Adjoining sheets of membrane are overlapped and joined together with a minimum 1-1/2" wide heat weld.

A KEE enhanced (white only) VersiFlex-E PVC membrane with Polyester Reinforcement is available in 10' width.

Polyester Reinforced membrane is available in widths of 10' (white only) and 81" wide (white, gray and tan).
Fiberglass Reinforced membrane is available in widths of 10' (white only) and 81" wide (white or gray).

1.02 General Design Considerations

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.

- A. The maximum roof slope for Mechanically Attached Roofing Systems is 18" in one horizontal foot. There are no maximum slope restrictions for the application of the Fully Adhered Roofing System.
- B. The mechanically attached roofing system is **not acceptable** for installations on steel decks lighter than 22 gauge unless the steel deck is used in conjunction with lightweight concrete and a minimum of 360 pounds pullout per fastener is achieved with HPVX Fasteners into the steel deck below. A Fully Adhered Roofing System may be specified or refer to the Metal Retrofit Roofing System Specification, published separately for other roofing options.
- C. Certain petroleum based products, chemicals, and waste products may not be compatible with this roofing system. Contact Versico for verification of compatibility and recommendations concerning an acceptable roofing assembly.
- D. Metal-Edge Systems and Copings should be designed in compliance with Section 1504.5 of the International Building Code and shall be tested in accordance with ANSI/SPRI ES-1.
- E. 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.
- F. It is the responsibility of the building owner or his/her designated representative to verify structural load limitation. In addition, a core cut may be taken to verify weight of existing components when the roofing system is to be specified on an existing facility.
- G. VersiWeld white (TPO) and VersiFlex white (PVC) membranes meet the ENERGY STAR® Roofing Products program guidelines for energy efficiency. Energy savings are climate specific and may vary significantly from building to building and geographic location. The greatest savings are experienced in buildings located in hot, sunny climates that have a large roof surface to building volume ratio, and lower levels of insulation with lesser thermal resistance.

For specific information regarding savings obtainable from installing an ENERGY STAR Roofing Product, contact Versico, one of Versico's Representatives or call 1-888-STAR-YES (1-888-782-7937).

For information regarding CRRC (Cool Roof Rating Council) and LEED™, refer to the applicable Technical Data Bulletins and Design Reference DR 07-11 "CRRC/LEED Information".

H. Construction Generated Moisture / Vapor Drive

1. 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 Spec Supplement G-01-11 "Construction Generated Moisture" included in the Versico Technical Manual.
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 adhesive is used to attach the roof insulation.

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

I. 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.

Versico 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 load 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 inches to one horizontal foot, additional membrane securement at the base of the tapered edge strip will be required.
4. Subject to code requirement, it is recommended that a minimum roof slope of 1/8" per horizontal foot be provided to serve long-term aesthetics. On new construction projects, roof drains should be positioned in areas where minimum deflection is anticipated. Slopes greater than 1/8" per foot it is recommended that a minimum roof slope of 1/8" per horizontal foot be provided to serve long-term aesthetics. On New Construction projects, roof drains should be positioned in areas where maximum deflection is anticipated. Slopes greater than 1/8" per foot should be considered due to possible roof deflection.

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. Entrapment of water between old and new membrane can damage and deteriorate new insulation/underlayment between the two membranes. **If a vapor retarder or air barrier is not specified**, Versico recommends existing membrane be perforated to avoid potential moisture accumulation to allow for detection of moisture to enable the building owner to take corrective action. This can be accomplished by drilling approximately 3/4" diameter holes every 100 square feet in the existing built-up roof or single-ply membrane (excluding non-reinforced PVC membrane).
3. If total removal of existing non-reinforced PVC membrane is not specified, existing membrane may be cut into maximum 10' x 10' sections, when the new insulation or membrane underlayment is to be mechanically attached.
4. Regardless of the type of membrane or assembly selected, any loose flashings at the perimeter, roof drains and roof penetrations must be removed.

1.03 Quality Assurance

Building codes are above and beyond the intended purpose of this specification. The respective **owner** or **specifier** should consult 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 Versico Roofing System.

NOTE: For code approvals achieved with the Versico Roofing Systems, refer to the Versico Code Approval Guide, Factory Mutual (FM) Approval Guide or Underwriters Laboratories (UL) Fire Resistance or Roofing Materials and Systems Directories.

- A. Versico recommends the use of Versico supplied products for use with VersiWeld/VersiFlex Roofing Systems. The performance or integrity of products by others, **when selected by the specifier and accepted as compatible by Versico**, is not the responsibility of Versico and is **expressly disclaimed** by the Versico warranty.

- B. This roofing system must be installed by a Versico Authorized Roofing Contractor in compliance with drawings and specifications as approved by Versico.
- C. There must be no deviations made from Versico's specifications or Versico's approved shop drawings without the **PRIOR WRITTEN APPROVAL** of Versico.
- D. After completion of the installation, upon request, an inspection shall be conducted by a Technical Representative of Versico to ascertain that the membrane roofing system has been installed according to Versico'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.
- 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. The solar reflectance of this roofing product may decrease over time due to environmental defacement such as dirt, biological growth, ponded water, etc. The roof should be monitored at regular intervals and maintained or cleaned when necessary to assure the maximum solar reflectance.
- G. Refer to the Design Reference DR-07-11 "CRRC/LEED Information" for information. (i.e. solar emittance, solar reflectance and recycled content)

1.04 Submittals

- A. To ensure compliance with Versico's minimum warranty requirements, the following projects should be forwarded to Versico 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).
 - 2. Cold storage buildings and freezer facilities.
 - 3. Fully Adhered Roofing System projects over 250' in height (maximum 15 year warranties) and 100' in height (warranties greater than 15 years).
 - 4. Mechanically Attached Roofing System projects over 100' in height regardless of warranty duration.
 - 5. Projects where the VersiWeld or VersiFlex membrane is expected to come in direct contact with petroleum-based products or other chemicals.
 - 6. Mechanically Attached systems specified with a fastener length exceeding 12 inches.
- B. Along with the project submittals (shop drawings and Request for Warranty), the roofing contractor must include pullout tests when results are below the requirements identified in this specification.
- C. Shop drawings must be submitted to Versico by the Versico Authorized Roofing Contractor along with a completely executed Copy-A Job Approval Request 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 (for multiple roof areas) with roof heights indicated
- 6. Sheet width and number of perimeter sheets for Mechanically Attached systems
- 7. Fastener type, length and maximum spacing (for membrane securement) for Reinforced Mechanically Attached systems.

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, Table included in Design Reference DR-06-11 "Withdrawal Resistance Criteria".

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

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

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

1. Must conform to Versico's most current published specifications and details applicable at the time of bid.
2. Must be submitted along with a completely executed Copy-B Job Completion.
3. Must include the items identified in Paragraph 1.04.C.

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

E. **Copy-B Job Completion**

After project completion, a Copy-B - Job Completion Date must be submitted to Versico to schedule the necessary inspection of the project prior to issuance of the Versico Warranty.

1.05 **Warranty**

A. Membrane System Warranty is available for roofing systems on commercial buildings within the United States and applies only to **products marketed by Versico**. The membrane system is defined as membrane, flashings, adhesives, sealants and other Versico brand products utilized in the installation. For a complete description of these products, refer to the Part II "Products" Section in this Specification and Spec Supplement "Related Products" P-01-11.

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

1. **TABLE I – Minimum Membrane Thickness for Various Warranty Options** Identifies minimum membrane thickness for Reinforced membranes used in fully adhered or mechanically attached roofing systems.
2. **TABLE II - Mechanically Attached Roofing Systems – TPO Membrane Fastening Criteria - Steel/Concrete Decks** 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.
3. **TABLE III - Mechanically Attached Roofing Systems – PVC Membrane Fastening Criteria - Steel/Concrete Decks** 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.
4. **TABLE IV - Mechanically Attached Roofing Systems – TPO Membrane Fastening Criteria - Wood Decks** 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.
5. **TABLE V - Mechanically Attached Roofing Systems – PVC Membrane Fastening Criteria - Wood Decks** 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.
6. **TABLE VI - Mechanically Attached Roofing Systems – TPO Membrane Fastening Criteria – Up to 20 Yrs - Lightweight Insulating Concrete over Steel/Gypsum/Cementitious Wood Fiber Decks** 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.
7. **TABLE VII - Mechanically Attached Roofing Systems – PVC Membrane Fastening Criteria – Up to 20 Yrs - Lightweight Insulating Concrete over Steel/Gypsum/Cementitious Wood Fiber Decks** 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.
8. **TABLE VIII-Fully Adhered Roofing Systems - Underlayment and Fastening Density for TPO Assemblies with Warranties Up to 20 Yrs** Identifies required underlayments for fully adhered roofing systems with Warranties up to 20 years based on the various wind speed coverages available. The Table also identifies fastening density or adhesive bead spacing and required edge terminations.

9. **TABLE IX – Fully Adhered Roofing Systems - Underlayment and Fastening Density for VersiWeld QA Assemblies with Warranties Up to 20 Yrs** Identifies required underlayments for fully adhered roofing systems with Warranties up to 20 years based on the various wind speed coverages available. The Table also identifies fastening density or adhesive bead spacing and required edge terminations.
10. **TABLE X – Fully Adhered Roofing Systems – Underlayment and Fastening Density for TPO Assemblies with Warranties – 25 to 30 YR** Identifies required underlayments for fully adhered roofing systems with Warranties from 25 to 30 years based on the various wind speed coverages available. The Table also identifies fastening density or adhesive bead spacing and required edge terminations.
11. **TABLE XI – Fully Adhered Roofing Systems - Underlayment and Fastening Density for PVC Assemblies with Warranties Up to 20 Yrs** Identifies required underlayments for fully adhered roofing systems with warranties up to 20 years based on the various wind speed coverages available. The Table also identifies fastening density or adhesive bead spacing and required edge terminations.
12. **TABLE XII – Fully Adhered Roofing Systems – Underlayment and Fastening Density for PVC Assemblies with Warranties – 25 to 30 YR** Identifies required underlayments for fully adhered roofing systems with warranties from 25-30 year based on the various wind speed coverage available. The Table also identifies fastening density or adhesive bead spacing and required edge terminations.

Table I **Mechanically Attached or Fully Adhered Membrane Systems**
Warranty Options (8)

Years	Thermoplastic Membranes (VersiWeld TPO / VersiFlex PVC)						Minimum Membrane Thickness(7)	Additional Puncture Coverage (2)
	55, 72, 80 or 90 mph		100 mph		110 to 120 mph			
	Fully Adhered	Mech. Attached (11)	Fully Adhered	Mech. Attached	Fully Adhered	Mech. Attached		
5, 10, or 15 year	√(3)	√	√	N/A(1)	√	N/A	VersiWeld 45-mil OR VersiFlex 50-mil (6)	Not Available - 80-mil Membrane Required
20 year	√	√	√	N/A	√	N/A	VersiWeld 60-mil (4) OR VersiFlex 60 mil (6)	Not Available - 80-mil Membrane Required
25 year (8)	√	√	√	N/A	N/A	N/A	VersiWeld 80-mil (5) OR VersiFlex 80-mil (6)	Available
30 year (8)	√	√	√	N/A	N/A	N/A	VersiWeld 80-mil (5) OR VersiFlex-E 80-mil	N/A

Notes: N/A = Not Acceptable √= Acceptable

- (1) Contact Versico for specific requirements.
(2) Limits of Hail/Puncture Coverage to be defined by other Tables.
(3) Water based adhesive may be used for projects with 15 year maximum warranty and wind speed coverage up to 55 mph.
(4) Spectro-Weld OR VersiWeld QA TPO 60-mil membranes may be used.
(5) Spectro-Weld 80-mil membrane can be used in lieu of VersiWeld 80-mil membrane.
(6) VersiFlex FRS membrane can be used in lieu of VersiFlex Polyester reinforced membrane for Fully Adhered Roofing Systems Only.
(7) VersiFlex-E PVC 50-mil membrane can be used in lieu of VersiFlex 60-mil membrane for Warranties Up to 20 Year.
(8) VersiFlex-E PVC 60-mil membrane can be used in lieu of VersiFlex 80-mil membrane for Warranties Up to 25 Year.
(9) All "T-joints" must be overlaid with appropriate flashing material or Versico "T-Joint" covers when using 60 or 80-mil membrane.
(10) Enhancements may be required for certain flashing details. Publish details must be referenced for applicable requirements.
(11) RhinoBond Attachment Method Limited to 20 year maximum warranty and wind speed coverage up to 90 mph. Perimeter enhancements will be required on systems greater than 72 mph. Contact Versico for requirements for enhancements.

**TPO Membrane Fastening Criteria (All Warranties)
for Mechanically Attached Roofing Systems
22 GA. Steel Deck or Structural Concrete Only**

Table II

CAUTION: Projects with 25 or 30 year warranties an additional perimeter sheet is required beyond those listed in the table below.

Projects with 25 or 30 year warranties the use of 12' wide sheets is **NOT PERMITTED**.

Peak Gust Wind Speed Warranty	Max. Building Height	Min. Number of Perimeter Sheets			Field* Membrane Width	Perimeter* Sheet Width	Fastening Density* (Field & Perimeter Sheets)
		Local Wind Speed					
		Up to 110 MPH	110-120 MPH	120 MPH or Greater			
55 MPH	Up to 60'	1	2	3	12' or 10'	5' or 6'	12" O.C.
					8'	4'	12" O.C.
	61' to 100'	2	2	3	10'	5' or 6'	** See Note
					8'	4'	12" O.C.
72 MPH	Up to 60'	2	2	3	12' or 10'	5' or 6'	12" O.C.
					8'	4'	12" O.C.
	61' to 100'	3	4	4	10'	5' or 6'	** See Note
					8'	4'	12" O.C.
80 MPH	Up to 60'	3	3	4	10'	5' or 6'	** See Note
					8'	4'	12" O.C.
	61' to 100'	3	4	4	10'	5' or 6'	** See Note
					8'	4'	12" O.C.
90 MPH	Up to 60'	3	4	4	10'	5' or 6'	** See Note
					8'	4'	12" O.C.
	61' to 100'	4	5	5	10'	5' or 6'	** See Note
					8'	4'	12" O.C.

*Using HPVX Fasteners for steel decks and MP 14-10 or CD-10 for structural concrete decks.

** Structural Concrete Decks use 12" O.C. spacing utilizing MP 14-10 or CD-10. Steel Decks use 6" O.C. utilizing HPVX Fasteners. Steel Decks use 12" O.C. spacing utilizing HPV-XL Fasteners.

**PVC Membrane Fastening Criteria (All Warranties)
for Mechanically Attached Roofing Systems
22 GA. Steel Deck or Structural Concrete Only**

Table III

CAUTION: Projects with 25 or 30 year warranties an additional perimeter sheet is required beyond those listed in the table below.

Peak Gust Wind Speed Warranty	Max. Building Height	Min. Number of Perimeter Sheets			Field* Membrane Width	Perimeter* Sheet Width	Fastening Density* (Field & Perimeter Sheets)
		Local Wind Speed					
		Up to 110 MPH	110-120 MPH	120 MPH or Greater			
55 MPH	Up to 60'	1	2	3	10'	5'	12" O.C.
					81"	40.5"	12" O.C.
	61' to 100'	2	2	3	10'	5'	** See Note
					81"	40.5"	12" O.C.
72 MPH	Up to 60'	2	2	3	10'	5'	12" O.C.
					81"	40.5"	12" O.C.
	61' to 100'	3	4	4	10'	5'	** See Note
					81"	40.5"	12" O.C.
80 MPH	Up to 60'	3	3	4	10'	5'	12" O.C.
					81"	40.5"	12" O.C.
	61' to 100'	3	4	4	10'	5'	** See Note
					81"	40.5"	12" O.C.
90 MPH	Up to 60'	3	4	4	10'	5'	6" O.C.
					81"	40.5"	12" O.C.
	61' to 100'	4	5	5	10'	5'	** See Note
					81"	40.5"	12" O.C.

*Using HPVX Fasteners for steel decks and MP 14-10 or CD-10 for structural concrete decks.

** Structural Concrete Decks use 12" O.C. spacing utilizing MP 14-10 or CD-10. Steel Decks use 6" O.C. utilizing HPVX Fasteners. Steel Decks use 12" O.C. spacing utilizing HPV-XL Fasteners.

**TPO Membrane Fastening Criteria (Up to 20 YR Warranty)
for Mechanically Attached Roofing Systems
Wood Decks**

Table IV

Peak Gust Wind Speed Warranty	Deck Type	Projected Pull-Out Values	Min. Number of Perimeter Sheets		Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
			Local Wind Speed				
			Up to 100 MPH	100 MPH to 110 MPH (Max.)			
55 MPH	7/16" OSB *	210 lbs	2	3	10'	6'	9" O.C.
			2	3	8'	4'	12" O.C.
	15/32" 3-Ply Plywood	240 lbs	2	3	8'	4'	12" O.C.
			15/32" 5-Ply Plywood	530 lbs	1	1	10'
	5/8" OSB *	310 lbs	2	3	10'	6'	12" O.C.
			2	3	8'	4'	12" O.C.
72 MPH	15/32" 3-Ply Plywood	240 lbs	2	3	8'	4'	12" O.C.
	15/32" 5-Ply Plywood	530 lbs	1	1	10'	6'	12" O.C.
	5/8" OSB *	310 lbs	2	3	10'	6'	12" O.C.
			2	3	8'	4'	12" O.C.

* Maximum duration for OSB NOT to exceed 20 Years.

**PVC Membrane Fastening Criteria (Up to 20 YR Warranty)
for Mechanically Attached Roofing Systems
Wood Decks**

Table V

Peak Gust Wind Speed Warranty	Deck Type	Projected Pull-Out Values	Min. Number of Perimeter Sheets		Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
			Local Wind Speed				
			Up to 100 MPH	100 MPH to 110 MPH (Max.)			
55 MPH	7/16" OSB *	210 lbs	2	3	10'	5'	9" O.C.
			2	3	81"	40.5"	12" O.C.
	15/32" 3-Ply Plywood	240 lbs	2	3	81"	40.5"	12" O.C.
			15/32" 5-Ply Plywood	530 lbs	1	1	10'
	5/8" OSB *	310 lbs	2	3	10'	5'	12" O.C.
			2	3	81"	40.5"	12" O.C.
72 MPH	15/32" 3-Ply Plywood	240 lbs	2	3	81"	40.5"	12" O.C.
	15/32" 5-Ply Plywood	530 lbs	1	1	10'	5'	12" O.C.
	5/8" OSB *	310 lbs	2	3	10'	5'	12" O.C.
			2	3	81"	40.5"	12" O.C.

* Maximum duration for OSB NOT to exceed 20 Years.

TPO Membrane Fastening Criteria
Up to 20 Yr Warranty for Mechanically Attached Roofing Systems
Lightweight Insulating Concrete over Steel/Gypsum/Cementitious Wood Fiber

Table VI

Peak Gust Wind Speed Warranty	Building Height 50' Max.	Min. Number of Perimeter Sheets			Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
		Local Wind Speed					
	Deck Type	Up to 110 MPH	110 MPH to 120 MPH	120 MPH or Greater			
55 MPH	Lightweight Concrete over Steel Deck	2	3 (1)	N/A	12'	6'	12" O.C.
		1	2	4	10'	6'	12" O.C.(2)
		1	2	3	8'	4'	12" O.C.(3)
	Gypsum Deck or Cementitious Wood Fiber	2 (3)	3	N/A	10'	6'	9" O.C.
		2 (3)	3	4 (4)	8'	4'	12" O.C.

N/A is Not Acceptable

- (1) Fastening Density must be secured 6" O.C.
- (2) For Buildings 51' to 75' with 10' field sheets – Fastening Density must be secured 9" O.C.
- (3) Acceptable for Buildings up to 75' in height.
- (4) Fastening Density must be secured 9" O.C.

Additional Design Considerations

- 1-Membrane configuration and fastening density in Table above is based on HPVX Fasteners penetrating metal pan below Lightweight Insulating Concrete and for Polymer Gyptec Fasteners engaging into Gypsum and Cementitious Fiber Decks.
- 2-See Design Reference DR-06-11 "Withdrawal Resistance Criteria" for more information.

PVC Membrane Fastening Criteria
Up to 20 Warranty for Mechanically Attached Roofing Systems
Lightweight Insulating Concrete over Steel/Gypsum/Cementitious Wood Fiber

Table VII

Peak Gust Wind Speed Warranty	Building Height 50' Max.	Min. Number of Perimeter Sheets			Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
		Local Wind Speed					
	Deck Type	Up to 110 MPH	110 MPH to 120 MPH	120 MPH or Greater			
55 MPH	Lightweight Concrete over Steel Deck	1	2	4	10'	5'	12" O.C.(1)
		2	3	4	81"(3)	40.5"	12" O.C.(2)
	Gypsum Deck or Cementitious Wood Fiber	2	3	N/A	10'	5' or 6'	9" O.C.
		2	3	4	81"	4'	12" O.C.

N/A is Not Acceptable

- (1) For Buildings 51' to 75' with 10' field sheets – Fastening Density must be secured 9" O.C. for field and perimeter sheets.
- (2) Fasteners may be spaced at 18" O.C. in the field for buildings Up to 50' in height, Up to 110 MPH.
- (3) Building Height may be Up to 75' in height.

Additional Design Considerations

- 1- Membrane configuration and fastening density in Table above is based on HPVX Fasteners penetrating metal pan below Lightweight Insulating Concrete and for Polymer Gyptec Fasteners engaging into Gypsum and Cementitious Fiber Decks.
- 2-See Design Reference DR-06-11 "Withdrawal Resistance Criteria" for more information.

Underlayment/Insulation & Required Attachment Assemblies Up to 20 YR Warranty for TPO Fully Adhered Roofing Systems

Table VIII

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

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment*	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' size board		
			Field	Perimeter	
55 MPH	1-1/2" (20 psi) Polyisocyanurate	10	12" (6)(7)	6" (6)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000
	2"(20 psi) Polyisocyanurate	8	12" (6)(7)	6" (6)	
72 or 80 MPH	1/4" Dens-Deck Prime (2)	12	12" (6)(7)(8)	6" (6)(8)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000 may be fastened with ring shank nails staggered 4" on center. Versico HPV or HPVX Fasteners may also be used fastened 12" on center.
	1/4" Securock (2)				
	1/2" Versico Recovery Board (2)	16	12" (6)(7)(8)	6" (6)(8)	
	1/2" HD SecurShield (2)(3)				
	1-1/2" (25-psi) Polyisocyanurate	10	12" (6)(7)(8)	6" (6)(8)	
2" (25 -psi) Polyisocyanurate	8	12" (6)(7)(8)	6" (6)(8)		
90 MPH	1/2" Dens-Deck Prime (2)	12	6" (10)	6" (8)(9)	VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or VersiTrim 1000, 2000 or 3000.
	1/2" Securock (2)				
	1-1/2" (20-psi) SecurShield	16	6" (10)	6" (8)(9)	
	2" (20-psi) SecurShield	8	6" (10)	6" (8)(9)	
	2" HD Polyiso Composite	8	6"(10)	6"(8)(9)	
1-1/2" Insulfoam HD Composite	16	6"(10)	6"(8)(9)		
100 MPH	5/8" Dens Deck Prime (2)	16	4"	4"	VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or VersiTrim 2000 or 3000.
	5/8" Securock (2)				
	7/16" Oriented Strand Board (OSB) (2)	17	4"	4"	
	2" (25-psi) SecurShield (1)	16	4"	4"	
2" HD Polyiso Composite	16	4"	4"		
110 MPH	5/8" Dens Deck Prime (1)(2)	16	4"	4"	VersiTrim 2000 or 3000
	5/8" Securock (1)(2)				
	7/16" Oriented Strand Board (OSB) (2)	17	4"	4"	
120 MPH	5/8" Dens Deck Prime (2)	24	4"	4"	VersiTrim 2000 or 3000
	5/8" Securock (2)				
	7/16" Oriented Strand Board (OSB) (1)(2)	17	4"	4"	

*For Direct Application over Wood Decks and Lightweight Cellular Concrete, Refer to Roof Deck & Substrate Criteria Table.

(1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.

(2) Cover boards must be installed over a min. 1" thick approved Versico Insulation.

(3) 1/2" HD SecurShield limited to 72 mph.

(4) Versico HPV or HPVX Fasteners must be used to secure VersiTrim Drip Edge or VersiTrim 200 Metal Fascia to perimeter wood nailers.

(5) Membrane securement is required at the base of the VersiTrim 200 waterdam.

(6) Gravel Surface BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.

(7) Steel Decks - Field & Perimeter @ 6" O.C.

(8) Cementitious Wood Fiber - Field @ 6" O.C. / Perimeter @ 4" O.C.

(9) Smooth BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.

(10) Gravel Surface BUR - 4" O.C.

Additional Design Considerations

1 – Refer to Table I in paragraph 1.05 for available warranty options and applicable membrane thicknesses.

2 - Building height shall not exceed 100*

3 - Local Wind Zone per ASCE 7 shall not exceed 130 mph*

4 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 3/4" plywood.

* Projects where building height exceeds 100' or wind speed exceeds 130 mph, shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies

Table IX Up to 20 YR Warranty for VersiWeld QA TPO Fully Adhered Roofing Systems

Other Requirements are Listed in Additional Design Considerations following this Table

All Versico Products listed for higher wind speed coverage can also be used for Warranties with lower wind speed coverage. (i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' size board		
			Field	Perimeter	
55 MPH	1-1/2" (20 psi) Polyisocyanurate	11	12" (4)(5)	6" (4)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000
	2" (20 psi) Polyisocyanurate	8	12" (4)(5)	6" (4)	
	2" (1.25 lb/density) Insulfoam SP*	12	12" (4)(5)	6" (4)	
72 or 80 MPH	1/4" Dens-Deck Prime (2)	12	12" (4)(5)(6)	6' (4)(7)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000 may be fastened with ring shank nails staggered 4" on center. Versico HPV or HPVX Fasteners may also be used fastened 12" on center.
	1/4" Securock (2)				
	1/2" HD SecurShield (2)(3)	16	12" (4)(5)(6)	6" (4)(6)	
	1-1/2" (25-psi) Polyisocyanurate	11	12" (4)(5)(6)	6" (4)(6)	
	2" (25 -psi) Polyisocyanurate	8	12" (4)(5)(6)	6" (4)(6)	
	2" (1.25 lb/density) Insulfoam SP**	16	6" (4)(5)(6)	6" (4)(6)	
	1-1/2" Insulfoam HD Composite*	12	12"(8)	6"(6)(7)	

(1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.

(2) Cover boards must be installed over a min. 1" thick approved Versico Insulation.

(3) 1/2" HD SecurShield limited to 72 mph.

(4) Gravel Surface BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.

(5) Steel Decks - Field & Perimeter @ 6" O.C.

(6) Cementitious Wood Fiber - Field @ 6" O.C. / Perimeter @ 4" O.C.

(7) Smooth BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.

(8) Gravel Surface BUR - 4" O.C.

*Maximum warranty available 20 year.

** Maximum warranty available 15 year.

Additional Design Considerations

1 - Minimum membrane thickness 60-mil VersiWeld QA TPO

2 - Building height shall not exceed 100*

3 - Local Wind Zone per ASCE 7 shall not exceed 130 mph*

4 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 3/4" plywood.

5 - All "T-joints" must be overlaid with appropriate flashing material or Versico "T-Joint" covers.

* Projects where building height exceeds 100' or wind speed exceeds 130 mph, shall be submitted to Versico for review.

**Underlayment/Insulation & Required Attachment Assemblies
25 YR or 30 YR Warranty for Fully Adhered TPO Roofing Systems**

Table X

Other Requirements are Listed in Additional Design Considerations following this Table

All Versico Products listed for higher wind speed coverage can also be used for Warranties for lower wind speed coverage. (i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' size board		
			Field	Perimeter	
55 MPH	1-1/2" to 2-1/2" (25 psi) Polyisocyanurate	16	6" (3)(5)	6" (5)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000
	1/2" Versico Recovery Board (1)				
	1/4" Dens-Deck Prime (2)				
	1/4" Securock (2)				
72 or 80 MPH	1-1/2" to 2-1/2" (25-psi) SecurShield	16	6" (4)(5)(6)	6" (5)(6)	VersiTrim Drip Edge (7), VersiTrim 200 (7)(8) or VersiTrim 1000, 2000 or 3000
	1/2" Dens-Deck Prime (2)				
	1/2" Securock (2)				
90 or 100 MPH	5/8" Dens-Deck Prime (2)	16	4"	4"	VersiTrim 2000 or 3000
	5/8" Securock (2)	17	4"	4"	
	7/16" Oriented Strand Board (OSB) (2)				

- (1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.
- (2) Hail coverage offered with substrate.
- (3) Structural Concrete - Field @ 12" O.C. / Perimeter @ 6" O.C.
- (4) 80-mph warranty wind speed coverage over Structural Concrete, Adhesive Ribbon Spacing, for Field & Perimeter shall be at 6" O.C.
- (5) Cementitious Wood Fiber & Wood - 4" O.C.
- (6) 80-mph warranty wind speed coverage over Gypsum Decks – Adhesive Ribbon spacing shall be at 4" O.C
- (7) Versico HPV or HPVX Fasteners must be used to secure VersiTrim Drip Edge or VersiTrim 200 Metal Fascia to perimeter wood nailers.
- (8) Membrane securement is required at the base of the VersiTrim 200 waterdam.

Additional Design Considerations

- 1 - Minimum membrane thickness 80-mil TPO
- 2 - Building height shall not exceed 100'
- 3 - Local Wind Zone per ASCE 7 shall not exceed 130 mph*
- 4 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 3/4" plywood.
- 5 - All "T-joints" must be overlaid with appropriate flashing material or Versico "T-Joint" covers.
- 6- New construction or complete tear-off of existing roofing material.
- 7- Enhancements are required for certain flashing s details. Publish details must be referenced for applicable requirements.
- * Projects where building height exceeds 100' or wind speed exceeds 100 mph, shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies Up to 20 YR Warranty for Fully Adhered Roofing

Table XI

Other Requirements are Listed in Additional Design Considerations following this Table

All Versico Products listed for higher wind speed coverage can also be used for Warranties for a lower wind speed coverage.

(i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment*	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' size board		
			Field	Perimeter	
55 MPH	1-1/2" (20 psi) Polyisocyanurate	10	12" (6)(7)	6"(6)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000
	2"(20 psi) Polyisocyanurate	8	12"(6)(7)	6"(6)	
72 or 80 MPH	1/4" Dens-Deck Prime or Securock(2)	12	12"(6)(7)(8)	6"(6)(8)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000 may be fastened with ring shank nails staggered 4" on center. Versico HPV or HPVX Fasteners may also be used fastened 12" on center.
	1/2" SecurShield HD or Versico Recovery Board (2) (3)	16	12"(6)(7)(8)	6"(6)(8)	
	1-1/2" (25 psi) Polyisocyanurate	10	12"(6)(7)(8)	6"(6)(8)	
	2" (25 psi) Polyisocyanurate	8	12"(6)(7)(8)	6"(6)(8)	
90 MPH	1/2" Dens-Deck Prime or Securock(2)	12	6"(10)	6"(8)(9)	VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or VersiTrim 1000, 2000 or 3000.
	1-1/2" (20 psi) Securshield	16	6"(10)	6"(8)(9)	
	2" (20 psi) SecurShield	8	6"(10)	6"(8)(9)	
	2" HD Polyiso Composite	8	6"(10)	6"(8)(9)	
	1-1/2" Insulfoam HD Composite	16	6"(10)	6"(8)(9)	
100 MPH	2" (25-psi) SecurShield (1)	16	4"	4"	VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or VersiTrim 1000, 2000 or 3000.
	5/8" Dens-Deck (2)		4"	4"	
	5/8" Securock (2)		4"	4"	
	2" HD Polyiso Composite		4"	4"	
110 MPH	5/8" Dens Deck Prime (1)(2)	16	4"	4"	VersiTrim 2000 or 3000
	5/8" Securock (1)(2)		4"	4"	
120 MPH	5/8" Dens Deck Prime (2)	24	4"	4"	VersiTrim 2000 or 3000
	5/8" Securock (2)		4"	4"	

***For Direct Application over Wood Decks and Lightweight Cellular Concrete, Refer to Roof Deck & Substrate Criteria Table.**

(1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.

(2) Cover boards must be installed over a min. 1" thick approved Versico Insulation.

(3) 1/2" HD SecurShield limited to 72 mph.

(4) Versico HPV or HPVX Fasteners must be used to secure VersiTrim Drip Edge or VersiTrim 200 Metal Fascia to perimeter wood nailers.

(5) Membrane securement is required at the base of the VersiTrim 200 waterdam.

(6) Gravel Surface BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.

(7) Steel Decks - Field & Perimeter @ 6" O.C.

(8) Cementitious Wood Fiber - Field @ 6" O.C. / Perimeter @ 4" O.C.

(9) Smooth BUR - Field @ 6" O.C. / Perimeter @ 4" O.C.

(10) Gravel Surface BUR - 4" O.C.

Additional Design Considerations

1 – Refer to Table I in paragraph 1.05 for applicable membrane thickness.

2 - Building height shall not exceed 100'

3 - Local Wind Zone per ASCE 7 shall not exceed 130 mph*

4 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 3/4" plywood.

* Projects where building height exceeds 100' or wind speed exceeds 130 mph, shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies 25 YR or 30 YR Warranty for Fully Adhered Roofing Systems

Table XII

Other Requirements are Listed in Additional Design Considerations following this Table

All Versico Products listed for higher wind speed coverage can also be used for Warranties with a lower wind speed coverage. (i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	Insulation Attachment			Metal Edging
		# of Fasteners per 4' x 8' board size (1)	Adhesive Ribbon Spacing for 4' x 4' size board		
			Field	Perimeter	
55 MPH	1-1/2" to 2-1/2" (25 psi) Polyisocyanurate	16	6" (3)(5)	6" (5)	VersiTrim Drip Edge, VersiTrim 200 or VersiTrim 1000
	1/2" Versico Recovery Board (1)		6" (3)(5)	6" (5)	
	1/4" Dens-Deck Prime (2)		6" (3)(5)	6" (5)	
	1/4" Securock (2)		6" (3)(5)	6" (5)	
72 or 80 MPH	1-1/2" to 2-1/2" (25-psi) SecurShield	16	6" (4)(5)(6)	6" (5)(6)	VersiTrim Drip Edge (7), VersiTrim 200 (7)(8) or VersiTrim 1000, 2000 or 3000
	1/2" Dens-Deck Prime (2)		6" (4)(5)(6)	6" (5)(6)	
	1/2" Securock (2)		6" (4)(5)(6)	6" (5)(6)	
90 or 100 MPH	5/8" Dens-Deck Prime (2)	16	4"	4"	VersiTrim 2000 or 3000
	5/8" Securock (2)		4"	4"	

- (1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.
- (2) Hail coverage offered with substrate.
- (3) Structural Concrete - Field @ 12" O.C. / Perimeter @ 6" O.C.
- (4) 80- mph warranty wind speed coverage over Structural Concrete, Adhesive Ribbon Spacing, for Field & Perimeter 6" O.C.
- (5) Cementitious Wood Fiber & Wood - 4" O.C.
- (6) 80-mph warranty wind speed coverage over Gypsum Decks – Adhesive Ribbon spacing shall be at 4" O.C.
- (7) Versico HPV or HPVX Fasteners must be used to secure VersiTrim Drip Edge or VersiTrim 200 Metal Fascia to perimeter wood nailers.
- (8) Membrane securement is required at the base of the VersiTrim 200 waterdam.

Additional Design Considerations

- 1 - Minimum membrane thickness 80-mil PVC
- 2 - Building height shall not exceed 100'
- 3 - Local Wind Zone per ASCE 7 shall not exceed 130 mph
- 4 - Acceptable decking: 22-gauge or heavier steel, structural concrete, 1-1/2" wood plank, or 3/4" plywood.
- 5 - Enhancements are required for certain flashing details. Publish details must be referenced for applicable requirements.
- 6- New construction or complete tear-off of existing roofing material.

* Projects where building height exceeds 100' or wind speed exceeds 100 mph, shall be submitted to Versico for review.

C. Access for warranty service

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

1. Design features, such as window washer systems, which require the installation of traffic surface units in excess of 80 pounds per unit.
2. Any equipment, ornamentation, building service units and other top surfacing materials which are not defined as part of this specification.
3. Photovoltaic and Mounting systems or other Rooftop equipment that does not provide Versico with reasonable access to the membrane system for purposes of warranty investigation and related repairs.
4. Severely ponded conditions.

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

- 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 Versico and Versico 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, Versico 725-TR in conjunction with CCW 702 or CCW Cav-Grip Primer may be used. Refer to Product Section Part II for additional product information and Specification Supplement G-07-11.
- 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 Adhesives will occur due to low atmospheric pressure.
- D. When roof slopes exceed 5 inches per horizontal foot, use of an Automatic Heat Welder may be more difficult. A Hand Held Hot Air Welder should be specified.
- E. Vapor Retarders
 - 1. Versico does not require a vapor retarder for the protection of the membrane; however, the following criteria should be considered by the specifier:
 - a) Use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly, should be investigated. Consult latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.
 - b) In the generally temperate climate of the United States, during the winter months, water vapor flows upward from a heated, more humid interior toward a colder, drier exterior. Vapor retarders are more commonly required in northern climates than in southern regions, where downward vapor pressure may be expected and the roofing membrane itself becomes the vapor retarder.
 - c) On cold storage/freezer facilities, the perimeter and penetration details must be selected to provide an air seal and prevent outside air from infiltrating and condensing within the roofing assembly.
 - 2. When a vapor retarder is specified, Versico 725TR Air and Vapor Barrier may be used. Refer to Part II "Products" for necessary information and Spec Supplement G-07-11 "Application Procedures for 725 TR Air and Vapor Barrier" for product Installation.
- F. Wood nailers are required for the securement of metal edgings, scuppers, and insulated pipes. Wood Nailer shall be secured per specifier recommendation or in accordance with Factory Mutual's property Loss Prevention Data Sheet 1-49. Refer to Design Reference DR-08-11 "Wood Nailers Securement Criteria" in Versico Technical Manual shall be referenced.
- G. When any of the 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.
- H. On new construction projects, located in colder climates, special consideration should be given to construction practices and the possible migration of hot, humid air and moisture generated during construction. Refer to Paragraph 1.02 I and Spec Supplement G-01-11 "Construction Generated Moisture".

1.07 Product, Delivery, Storage and Handling

- A. Deliver materials to the job site in the original, unopened containers.
- B. When loading materials onto the roof, the Versico Authorized Roofing Contractor 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., adhesives and sealants).
- D. When the temperature is expected to fall below 40° F (5° C), outside storage boxes should be provided on the roof for temporary storage of liquid adhesives and sealants. Adhesive and sealant containers should be rotated to maintain their temperature above 40° F (5° C).
- E. Do not store adhesive containers with opened lids due to the loss of solvent that will occur from flash-off.
- F. Store Versico membrane on provided pallets in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable tarpaulins.
- G. Insulation/underlayment must be stored so that it is kept dry and is protected from the elements. Store insulation on a skid and completely cover with a breathable material such as tarp or canvas. If the insulation is lightweight, it should be weighted to prevent possible wind damage.

Part II – PRODUCTS

2.01 General

The components of this roofing system are to be products of Versico or accepted by Versico as compatible. The installation, performance or integrity of products by others, **when selected by the specifier and accepted by Versico**, is not the responsibility of Versico and is expressly disclaimed by the Versico warranty.

2.02 Membranes

A. VersiWeld Membranes

1. General

1. VersiWeld TPO Membrane meets or exceeds the requirements of ASTM D6878, standard specification for Thermoplastic Polyolefin Based Sheet Roofing. In addition to the physical properties listed below, refer to the VersiWeld Membrane Technical Data Bulletin for Cool Roof Rating Council (CRRC) and LEED™ radiative properties as well as U.S.E.P.A. Toxic Leachate Testing and dynamic puncture resistance.
 2. The VersiWeld TPO membrane (white and tan) meets the CRRC (California Roof Rating Council) requirement for reflectance and emittance. When tested in accordance with ASTM C1549, the material has an initial reflectance of .79 and a 3-year aged reflectance of .70. The material has also been tested for emittance in accordance with ASTM C1371. An initial emittance of .90 and a 3-year aged emittance of .86 were achieved. The Spectro-Weld TPO membrane (white) meets the CRRC (California Roof Rating Council) requirement for reflectance and emittance. When tested in accordance with ASTM C1549, the material has an initial reflectance of .88 and a 3-year aged reflectance of "pending". The material has also been tested for emittance in accordance with ASTM C1371. An initial emittance of .89 and a 3-year aged emittance of "pending" were achieved.
 3. The VersiWeld TPO membrane (white) meets the emittance requirements set forth by the USGBC (US Green Building Council) for their LEED (Leadership in Energy and Environmental Designs) Program. When tested in accordance with ASTM E408, an emittance of .95 was achieved and an SRI (solar reflectance index) of 110 was calculated using ASTM E1980. The Spectro-Weld TPO membrane (white) meets the emittance requirements set forth by the USGBC (US Green Build Council) for their LEED (Leadership in Energy and Environmental Designs) Program. When tested in accordance with ASTM E408, an emittance of .95 was achieved and an SRI (solar reflectance index) of 113 was calculated using ASTM E1980.
2. VersiWeld 45- or 60-mil thick Reinforced Thermoplastic Polyolefin (TPO) membrane, VersiWeld QA TPO (Quick Applied) 60-mil thick Reinforced Thermoplastic Polyolefin (TPO) membrane and VersiWeld 80-mil thick Reinforced Thermoplastic Polyolefin (TPO) conforms to the following physical properties. VersiWeld QA TPO membrane is available in 10' width and VersiWeld Standard / HS membrane available in field sheets in rolls 12', 10' or 8' wide by 100' long. Perimeter membrane sheets are available in widths of 5' or 6' (used with 12' and 10' wide field sheets) or 4' (used with 8' wide field sheets) by 100' long. VersiWeld Membrane is available in white, gray or tan.

NOTE: VersiWeld High Slope (HS)(also known as Extra Slope (ES)) Membrane is specially formulated with higher fire retardancy to accommodate steep slope roof conditions.

PHYSICAL PROPERTY	ASTM D6878 Requirement	45-mil Std & HS	60-mil Std & HS	60-mil QA TPO	80-mil
Tolerance on nominal thickness, % ASTM D751 test method	+15, -10	± 10	± 10	± 10	± 10
Thickness over scrim, in. (mm) ASTM D6878 optical method, average of 3 areas	0.012 min. (0.305)	0.018 typical (0.457)	0.024 typical (0.610)	0.024 typical (0.610)	0.034 typical (0.864)
Breaking strength, lbf (kN) ASTM D751 grab method	220 (976 N) min.	225 (1.0) min. 320 (1.4) typ.	250 (1.1) min. 360 (1.6) typ.	250 (1.1) min. 360 (1.6) typ.	350 (1.6) min. 425 (1.9) typ.
Elongation break of reinforcement, % ASTM D751 grab method	15 min.	15 min. 25 typ.	15 min. 25 typ.	15 min. 25 typ.	15 min. 25 typ.
Tearing strength, lbf (N) ASTM D751 proc. B 8 by 8 in.	55 (245) min.	55 (245) min. 130 (578) typ.	55 (245) min. 130 (578) typ.	55 (245) min. 130 (578) typ.	55 (245) min. 130 (578) typ.
Brittleness point, °F (°C) ASTM D2137	-40 (-40) max.	-40 (-40) max. -50 (-46) typ.	-40 (-40) max. -50 (-46) typ.	-40 (-40) max. - 50 (-46) typ.	-40 (-40) max. - 50 (-46) typ.
Linear dimensional change, % ASTM D1204, 6 hours at 158 °F	± 1 max.	± 1 max. -0.2 typ.	± 1 max. -0.2 typ.	± 0.5 max. -0.2 typ.	± 1 max. -0.2 typ.
Ozone resistance, no cracks 7X ASTM D1149, 100 pphm, 168 hrs	Pass	Pass	Pass	Pass	Pass
Water absorption resistance, mass % ASTM D471 top surface only 166 hours at 158 °F water	± 3.0 max.	3.0 max. 2.0 typ.	3.0 max. 2.0 typ.	4.0 max. 2.0 typ.	3.0 max. 2.0 typ.
Factory seam strength, lbf /in. (kN/m) ASTM D751 grab method	66 (290) min.	66 (290) min.	66 (290) min.	66 (290) min.	66 (290) min.
Field seam strength, lbf /in. (kN/m) ASTM D1876 tested in peel	No requirement	25 (4.4) min. 50 (8.8) typ.	25 (4.4) min. 60 (10.5) typ.	25 (4.4) min. 60 (10.5) typ.	40 (7.0) min. 70 (12.3) typ.
Water vapor permeance, Perms ASTM E96 proc. B	No requirement	0.10 max. 0.05 typ.	0.10 max. 0.05 typ.	0.10 max. 0.05 typ.	0.10 max. 0.05 typ.
Puncture resistance, lbf (kN) FTM 101C, method 2031 (see supplemental section)	No requirement	250 (1.1) min. 325 (1.4) typ.	300 (1.3) min. 350 (1.6) typ.	300 (1.3) min. 350 (1.6) typ.	400 (1.8) min. 450 (2.0) typ.
Properties after heat aging ASTM D573, 670 hrs at 240 °F Breaking strength, % retained Elongation reinf., % retained Tearing strength, % retained Weight change, %	90 min. 90 min. 60 min. ± 1.0 max.	90 min. 90 min. 60 min. ± 1.0 max.	90 min. 90 min. 60 min. ± 1.0 max.	90 min. 90 min. 60 min. ± 1.0 max.	90 min. 90 min. 60 min. ± 1.0 max.

B. VersiFlex Membranes

1. General

a) The VersiFlex PVC membrane (white) meets the CRRC (California Roof Rating Council) requirement for reflectance and emittance. When tested in accordance with ASTM C1549, the material has an initial reflectance of .87 and a 3-year aged reflectance of .61. The material has also been tested for emittance in accordance with ASTM C1371. An initial emittance of .95 and a 3-year aged emittance of .86 were achieved.

b) The VersiFlex PVC membrane (white) meets the emittance requirements set forth by the USGBC (US Green Building Council) for their LEED (Leadership in Energy and Environmental Designs) Program. When tested in accordance with ASTM E408, an emittance of .94 was achieved and an SRI (solar reflectance index) of 110 was calculated using ASTM E1980.

2. VersiFlex 50-mil, 60-mil or 80-mil thick **Polyester Reinforced PVC** (Polyvinyl Chloride) Membrane conforms to the following physical properties

- a) Physical properties of the membrane are enhanced by a strong, polyester fabric that is encapsulated between the PVC based top and bottom plies. The combination of the fabric and PVC plies provide VersiFlex Reinforced PVC membranes with high breaking strength, tearing strength, and puncture resistance.
- b) Field membrane sheets are packaged in rolls 81" or 120" wide. Perimeter membrane sheets are available in a width of 40.5" or 60" wide. 50-mil thick membrane is available in lengths of 100', 60-mil is available in 80' lengths and 80-mil is available in 65' lengths. VersiFlex membrane is available in white, gray or tan.

VersiFlex Polyester Reinforced PVC Membrane			
Physical Property	Test Method	Property of Unaged Sheet	Property After ASTM D3045 aging 56 days @ 176° F
Tolerance on Nominal Thickness, %	ASTM D 751	± 10	
Thickness over scrim, in. (mm) 50-mil & 60-mil 80-mil	ASTM D 4434 Optical Method (avg. of 3 areas)	0.016 (0.406) min. 0.025 (0.635) min.	
Breaking Strength, lbf/in. (kN/m)	ASTM D 751 (Grab Method)	200 (35) min. 300 (53) typical	90% min. retention of original breaking strength
Elongation at Break of fabric, %	ASTM D 751	15 min. 25 typical	90% min. retention of original elongation
Tearing Strength, lbf (N) 8 x 8 in. specimen	ASTM D 751 (B-Tongue Tear)	45 (200) min. 100 (445) typical	
Low Temperature Bend, ° F (° C)	ASTM D 2136	-40 (-40) max. -50 (-46) typical	
Linear Dimensional Change (shrinkage), % After 6 hours at 176° F (80° C)	ASTM D 1204	+/- 0.5 max. -0.3 typical	
Ozone resistance, 100 pphm, 168 hours	ASTM D1149	No cracks	
Resistance to water absorption After 7 days immersion 158° F (70° C) Change in mass, %	ASTM D 570	3.0 max. 2.0 typical	
Field seam strength lbf/in. (kN/m) Seam tested in peel after welding	ASTM D1876	25 (4.4) min. 60 (10.5) typical	
Water vapor permeance, Perms	ASTM E 96	0.10 max. 0.05 typical	
Puncture resistance, lbf (N) (see supplemental section for additional puncture data)	FTM 101C Method 2031	250 (1110) min. 280 (1245) typical 50-mil 320 (1423) typical 60-mil 380 (1690) typical 80-mil	
Resistance to xenon-arc weathering Xenon-Arc, 12,600 kJ/m ² total radiant exposure, visual condition at 10X (ASTM D 4434 light & spray cycle)	ASTM G155 0.35 W/m ² 63 ° C B.P.T. (10,000 hours)	No cracks No crazing	
B.P.T. is black panel temperature			

3. VersiFlex 50-mil, 60-mil or 80-mil thick Reinforced FRS PVC (Polyvinyl Chloride) Membrane is designed specifically for Fully Adhered applications and conforms to the following physical properties.

- a) Dimensional stability of the membrane is enhanced by fiberglass that is encapsulated between the PVC based top and bottom plies. The combination of fiberglass and PVC plies provide VersiFlex FRS PVC

membranes with enhanced dimensional stability for fully adhered roof systems using liquid applied bonding adhesives.

- b) Membrane sheets are packaged in rolls 81" and 120" wide. 50-mil thick membrane is available in lengths of 100', 60-mil is available in 80' lengths and 80-mil is available in 65' lengths. VersiFlex Reinforced FRS PVC membrane is available in white and gray.

VersiFlex Reinforced FRS PVC Membrane			
Physical Property	Test Method	Property of Unaged Sheet	Property After ASTM D3045 aging 56 days @ 176° F
Tolerance on Nominal Thickness, %	ASTM D 638	± 10	
Thickness over scrim, in. (mm) 50-mil & 60-mil 80-mil	ASTM D 4434 Optical Method (avg. of 3 areas)	0.016 (0.406) min. 0.025 (0.635) min.	
Tensile Strength, psi (MPa) (machine & cross-machine direction)	ASTM D 638 (Grab Method)	1500 (10.4) min. 1900 (13.1) typical	90% min. retention of original breaking strength
Elongation at Break, % Machine direction Cross-machine direction	ASTM D 638	250 min. (270 typical) 220 min. (250 typical)	90% min. retention of original elongation
Tear Resistance, lbf (N)	ASTM D 1004	10 (45) min. 12 (53) typical	
Low Temperature Bend at -40° F (-40° C)	ASTM D 2136	Pass	
Linear Dimensional Change (shrinkage), % after 6 hours at 176° F (80° C)	ASTM D 1204	+/- 0.5 max. 0.1 typical	
Ozone resistance, 100 pphm, 168 hours	ASTM D1149	No cracks	
Resistance to water absorption After 7 days immersion 158° F (70° C) Change in mass, %	ASTM D 570	3.0 max. 0.5 typical	
Seam strength, % of tensile strength	ASTM D638	75 min. 80 typical	
Water vapor permeance, Perms	ASTM E 96	0.10 max. 0.05 typical	
Puncture resistance (see supplemental section for additional puncture data)			
Resistance to xenon-arc weathering Xenon-Arc, 12,600 kJ/m ² total radiant exposure, visual condition at 10X (ASTM D 4434 light & spray cycle)	ASTM G155 0.35 W/m ² 63 ° C B.P.T. (10,000 hours)	No cracks No crazing	
B.P.T. is black panel temperature			

4. VersiFlex 50-mil, 60-mil or 80-mil thick **PVC** (Polyvinyl Chloride) Polyester Reinforced **KEE** Membrane is designed for **Fully Adhered or Mechanically Attached applications** and conforms to the following physical properties.
- a) Physical properties of the membrane are enhanced by a strong, polyester fabric that is encapsulated between the PVC based top and bottom plies. The combination of the fabric and PVC plies provide VersiFlex-E PVC Polyester Reinforced KEE membranes with high breaking strength, tearing strength, and puncture resistance.
- b) Field membrane sheets are packaged in rolls of 120" wide. Perimeter membrane sheets are available in a width of 60" wide. 50-mil thick membrane is available in lengths of 100', 60-mil is available in 80' lengths and 80-mil is available in 65' lengths. VersiFlex-E Membrane is available in white only.

VersiFlex-E PVC Polyester Reinforced KEE Membrane				
PHYSICAL PROPERTY	ASTM Test Method	KEE Membrane		
		50-mil	60-mil	80-mil
Thickness (in.)	D751	0.050"	0.060"	0.080"
Minimum Thickness above scrim (in.)	D751	0.024"	0.029"	0.036"
Weight/Density (oz/yd ²)	D751	47.0	55.0	73.0
Breaking Strength (grab method, lbs.)	D751	235 min. 275 typ.	250 min. 280 typ.	275 min. 300 typ.
Elongation break of reinforcement, %	D751	31 min. 32 typ.	29 min. 30 typ.	28 min. 31 typ.
Heat Aging % Retention	D3045	>90%	>90%	>90%
Tongue Tear Strength, lbs	D751	50 min. 95 typ.	50 min. 105 typ.	50 min. 100 typ.
Low Temperature Bending, °F	D2136	PASS -40 max.	PASS -40 max.	PASS -40 max.
Linear dimensional change, %, 6 hours at 176 °F	D1204	± 0.7 max. -0.36 typ.	± 0.6 max. -0.27 typ.	± 0.5 max. -0.21 typ.
Water Immersion (%)	D570	1.25	0.87	0.89
Ozone resistance, no cracks, 100 pphm, 168 hrs	D1149	PASS	PASS	PASS
Interply Adhesion (lb/in)	D75	20	22	24

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 Versico Applicable Details and Design Reference DR-05-11 "Insulation Fastening Patterns".
5. When new insulation or cover boards are specified, the use of Versico Insulation and Versico marketed cover board is required. Any of the Versico Insulation/Underlayment may be specified subject to design restrictions included with each of the following tables.

B. Versico Polyisocyanurate

Table B1 Polyisocyanurate (See below for product descriptions)				
Insulations / Underlayment	Minimum Thickness	ASTM	Roofing System Acceptability	
			Fully Adhered	Mechanically Fastened
Versico MP-H Polyiso	*1.5"	C1289-06, Type II, Class 1, Grade 2 or 3	√	√
Versico SecurShield Polyisocyanurate	*1.5"	C1289-06, Type II Class 2, Grade 2 or 3	√	√
Versico HD Polyiso Composite (SS HD)	2"	C1289-06, Type II, Class 2, Grade 2 or 3	√	√
Versico MP-HNB Polyiso Composite (OSB)	1.5"	C1289-06, Type V, Class 1, Grade 2 or 3	√	N/A
Design Restrictions				
<p>-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.</p> <p>-Maximum Flute Spanability shall be limited to 2-5/8" when 1" Minimum Polyiso Insulation is to be used.</p> <p>-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.</p> <p>*1.5 minimum for fully adhered systems. 1" minimum for mechanically attached systems or as a base layer for fully adhered.</p>				
Notes: N/A = Not Acceptable √ = Acceptable				

NOTE: SecurShield HD is listed in Paragraph C4 below.

2. **Versico MP-H Polyiso** – A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289-06, 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.
3. **Versico SecurShield Polyisocyanurate**– A foam core insulation board covered on both sides with a coated glass fiber mat facer meeting ASTM C 1289-06, 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.
4. **Versico SecurShield HD Composite** – Composite insulation panel comprised of ½-inch high-density Polyiso cover board laminated during the manufacturing process to SecurShield rigid Polyiso roof insulation meeting ASTM C1289 Type II, Class 2, 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.
5. **Versico MP-HNB Polyiso** – MP-H Polyiso insulation bonded on the bottom side with a medium weight fiber-reinforced felt face and laminated with a top surface of 7/16" or 5/8" thick Oriented Strand Board (OSB) meeting ASTM C1289, Type V, Class1 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
InsulFoam I	1"	C578 Type I	N/A	√ (1)
InsulFoam VIII	.75"	C578 Type VIII	N/A	√ (1)
InsulFoam II	.75"	C578 Type II	N/A	√ (1)
InsulFoam IX	.75"	C578 Type IX	N/A	√ (1)
InsulFoam HD Composite (SecurShield HD)	1.5"	C578 Type (I, VIII, II, or IX)	√	√
InsulLam (Various Cover Boards)	1.5"	C578 Type (I, VIII, II, or IX)	√	N/A
InsulFoam SP	1"	C57□ Type VIII	N/A	√
InsulFoam SP	2"	C57□ Type VIII	(2)	√
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, Versico Recovery Board or Polyiso Insulation shall be used. (1) VersiFlex PVC Membrane is not acceptable for this application. substrate for VersiWeld QA TPO membrane Only.				
Notes: N/A = Not Acceptable √ = Acceptable				

NOTE: R-Tech Fanfold Recover Board is listed in Paragraph E7 below.

2. **InsulFoam I (EPS: Expanded Polystyrene)** – 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.
3. **InsulFoam VIII (EPS: Expanded Polystyrene)** – A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type VIII. Nominal density of 1.25 lbs/cubic ft (pcf) available in 4' x 4' or 4' x 8' sizes with thickness from 1/4" to 40". Custom lengths, widths and tapered boards are available.
4. **InsulFoam II (EPS: Expanded Polystyrene)** – 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.
5. **InsulFoam IX (EPS: Expanded Polystyrene)** – 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.
6. **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".
7. **InsulLam** – InsulFoam expanded polystyrene (EPS) insulation laminated with a top surface of 7/16" or 5/8" thick Oriented Strand Board (OSB), 1/2" Dens Deck Prime, 1/2" Securock, or 1/2" Versico Recovery Board. Available in 4' x 8' boards with thickness from 1-1/2" to 7".
8. **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), available in 4' x 8' size, and meets ASTM C578, Type VIII. Designed for low-sloped roof applications that employ mechanically attached or VersiWeld QA TPO membranes.

- D. **XPS: Extruded Polystyrene** – Available through Versico 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 Technical Data Bulletins 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	
			Fully Adhered	Mechanically Attached
Thermapink 18	.75"	Refer to Product Data Sheet	N/A	√ (1)
Thermapink 25	1"	Refer to Product Data Sheet	N/A	√ (1)
Foamular 400	1"	Refer to Product Data Sheet	N/A	√ (1)
Dow Styrofoam Deckmate Plus	1"	Refer to Product Data Sheet	N/A	√ (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. -Extruded 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, Versico Recovery Board or Polyiso Insulation shall be used. -Refer to related products listed in Spec Supplement P-01-11 "Related Products" for other products which may be suitable for use. Carlisle must be contacted for specific requirements.				
(1) VersiFlex PVC Membrane is not acceptable for this application.				
Notes: N/A = Not Acceptable √ = Acceptable				

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

E. **Cover Boards / Slip Sheets**

Table E1 Cover Boards / Slip Sheets (see below for product descriptions)				
Insulations / Underlayment	Minimum Thickness	ASTM	Roofing System Acceptability	
			Fully Adhered	Mechanically Attached
SecurShield HD	.5"	C1289-06, Type II, Class 2 (100 psi)	√	√
Securock Cover Board	.25"	Refer to Product Data Sheet	√	√
Versico Recovery Board	.5"	C208 Grade 2	√	√
Dens Deck Prime	.25"	C1177	√	√ (1)
Dens Deck	.25"	C1177	N/A	√ (1)
□R-Tech Fanfold Recovery Board	.5"	C578 Type (I, VIII, II. or IX)	N/A	√ (2)
HP Protection Mat	6 oz	Refer to Technical Data Bulletin	N/A	√
Design Restrictions				
-Versico Recovery Board and R-Tech Fanfold not recommended for direct use over Type B and F steel decks. -SecurShield HD not recommended for direct use over steel decks in lieu of thermal barrier. Fire testing standards yet to be established. -Securock Cover Board, Versico Recovery Board, Dens Deck Prime or Dens Deck may not be used directly over New or Existing Lightweight Insulating Concrete Decks existing or Structural Concrete. -Due to some warranty restrictions, Dens Deck and Dens Deck Prime not recommended for use directly over existing roofing membrane without prior written approval from Versico. Contact Versico for specific requirements. -R-Tech Fanfold primarily for use in existing roof re-covers applications or directly over structural or lightweight insulating concrete.				
(1) Permitted for use on combustible decks with slopes greater than 2" per foot for compliance with external fire codes, refer to UL listings or contact Versico.				
(2) Install Polymeric Side Up when installing VersiFlex PVC membrane.				
Notes: N/A = Not Acceptable √ = Acceptable				

2. **SecurShield HD** – a rigid insulation panel composed of a high-density (100 psi), closed-cell polyisocyanurate foam core laminated to coated-glass fiber-mat facer for use as a cover board or recover board. Available 1/2" thick 4' x 8' panel weight 11 lbs with an R-value of 2.5.
3. **Securock Cover Board** – A uniform composition of fiber-reinforced with no facer for use as a cover board or a thermal barrier. Available in 1/4" to 5/8" thick and 4' x 4' or 4' x 8' size boards. Long uninterrupted runs (>200') may require slight gapping due to thermal expansion.
4. **Versico 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.
5. **Dens Deck 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 fully 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.
6. **Dens Deck 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.
7. **R-Tech FanFold Recover Board** – Closed-cell lightweight expanded polystyrene (EPS) with polymeric laminated faces which meets ASTM C 578 for use as a recover board. Polymeric facer compatible with PVC membrane, 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.
8. **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 30' roll (450 square foot) weighing 0.06 lbs per square foot.

2.04 Related Materials

A. VersiWeld Flashing (for use with VersiWeld Adhered, Mechanically Attached and VersiWeld QA Fully Adhered Membrane Assemblies)

1. **VersiWeld Flashing:** VersiWeld **non-reinforced flashing** is available in rolls **12" and 24" wide by 50' long**. Flashing is used for inside/outside corners and field fabricated pipe flashings when the use of pre-molded or pre-fabricated accessories is not feasible. In addition, **0.045 by 6" wide by 100' long and 0.060 by 9" wide by 50' long and 0.080 by 9" wide by 50' long**. VersiWeld **reinforced membrane** is available for overlaying fasteners and fastening plates.
2. **VersiWeld Pressure-Sensitive Cover Strip:** A nominal 40-mil thick non-reinforced TPO membrane laminated to nominal 35-mil thick cured synthetic rubber pressure-sensitive adhesive used in conjunction with TPO Primer or Low VOC TPO Primer to strip in flat metal flanges (i.e., drip edges or rows of fasteners and plates). Available in rolls 6" wide by 100' long in colors of white, gray or tan. Not for use on 25-year or 30-year Warranty projects.
3. **VersiWeld TPO Pressure-Sensitive RUSS:** A nominal 6" and 10" wide, 45-mil thick reinforced TPO membrane with nominal 3" wide 35-mil thick cured synthetic rubber pressure-sensitive adhesive laminated along one end on 6" wide RUSS and along both ends on 10" wide RUSS. Used in conjunction with TPO Primer or Low VOC TPO Primer. 6" wide RUSS is used as a base membrane securement along walls, curbs, etc.; 10" wide RUSS is used to form perimeter sheets on Mechanically Attached Systems.
4. **VersiWeld TPO T-Joint Covers:** A 60-mil thick injection molded TPO flashing formed into a 4.5" diameter circle used to seal step-offs at splice intersections. Installation is mandatory on all 60-, 72-, and 80-mil TPO systems and on 45-mil systems where step-offs have not been properly sealed. Packaged in boxes of 100. Available in white, tan or gray.
5. **Pre-Molded Accessories:**
 - a) **Inside Corners:** A pre-molded corner flashing for inside corners. Available in white, gray or tan; 60-mil thick.
 - b) **Outside Corners:** A one-piece injection molded corner flashing used for flashing outside corners. Available in white, gray or tan; 60-mil thick.
 - c) **TPO Curb Wrap Corners:** Fabricated flashings are made of 60-mil thick reinforced VersiWeld membrane designed to reduce installation time to flash a curb when compared to conventional methods. Each corner is fabricated with a 6" wide base flange and a 12" overall height. Six sizes are available to fit curbs up to

6' by 6' in size. One curb requires 4 corners for a complete installation. TPO Curb Corners are packaged in boxes containing twelve. Corners. Custom sizes are available as a special order product requiring lead time.

- d) **Pipe Flashings:** A pre-molded white, gray or tan pipe flashing used for pipe penetrations. Available for 3/4" – 8" diameter pipes with clamping rings included.
- e) **Split Pipe Seals:** A prefabricated flashing consisting of 60-mil thick reinforced VersiWeld Membrane for pipes 1" – 6" in diameter. A split (cut) and overlapped tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration. Custom sizes are available as a special order product requiring lead time.
- f) **TPO Square Tubing Wraps:** Fabricated flashings made of 60-mil thick reinforced VersiWeld membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square penetration. Available for 3", 4", 5" and 6" square tubing
- g) **Molded TPO Sealant Pockets:** A pre-fabricated, interlocking, 2-piece, injection molded, flexible pocket with a rigid polypropylene vertical wall and pre-formed deck flanges. Pockets can be adjusted from 11.5" to 7.5" in length by 6" in width by following the cutting lines molded into the pocket. Used in conjunction with White One-Part Pourable Sealer for waterproofing pipe clusters or other odd shaped penetrations. Available in white, gray or tan
- h) **Pre-fabricated Sealant Pockets:** A two-piece, pre-fabricated sealant pocket that utilizes reinforced 60-mil TPO membrane and coated metal to form a rigid, oversized sealant pocket with a weldable horizontal deck flange. Available in 12" (total volume of 1.87 gallons). Packaged 2 per carton and available in white only. Refer to the applicable Technical Data Bulletin for dimensions and installation instructions. Custom sizes are available as special order products.
- i) **Sealant Pocket Extension Legs:** Designed for use with the TPO Molded Sealant Pocket and the Pre-Fabricated Sealant Pocket to extend the length in increments of 10". Fabricated from 45-mil thick reinforced TPO membrane and TPO coated metal. Can be used full length, cut to size for customized lengths or welded to each other for extra-long applications. Packaged 10 legs per carton and available in white only.

B. VersiFlex Flashing (for use with VersiFlex PVC Polyester Reinforced, FRS, and KEE Membrane Assemblies)

- 1. **VersiFlex PVC non-reinforced Flashing** is 80-mil thick and available in rolls **12" and 24" wide by 50' long**. Flashing is used for inside/outside corners and field fabricated pipe flashings when use of pre-molded accessories is not feasible.
- 2. **VersiFlex PVC "T" Joint Cover:** A 4-1/2" diameter, 40-mil thick, pre-cut non-reinforced PVC flashing used to overlay "T" joints at field splices when 60-mil or 80-mil VersiFlex PVC membrane is used.
- 3. **Pre-Molded Accessories:**
 - a) **VersiFlex PVC Inside Corners:** A pre-molded flashing for inside corners. Reversible for use as white or gray; 80-mil thick.
 - b) **VersiFlex PVC Outside Corners:** A pre-molded flashing for outside corners. Available in white only; 60-mil thick.
 - c) **VersiFlex PVC Pipe Flashings:** A pre-molded white pipe flashing used for pipe penetrations. Available for 3/4" – 8" diameter pipes with clamping rings included.
 - d) **VersiFlex PVC Split Pipe Seals:** A prefabricated flashing consisting of 60-mil thick reinforced VersiFlex Membrane for pipes 1" – 6" in diameter. A split (cut) and overlapped tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration. Available in white as a standard. Gray or tan can be special ordered and will require a lead time.
 - e) **VersiFlex PVC Square Tubing Wraps:** Fabricated flashings made of 60-mil thick reinforced VersiFlex membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square penetration. Pockets can be adjusted from 7.5" to 11.5" in length by 6" in width by following the cutting lines molded in the pocket. Available in white as a standard.
 - f) **VersiFlex PVC Molded Sealant Pockets:** A pre-fabricated, interlocking, 2-piece, injection molded, flexible

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

C. Primers, Adhesives, Sealants and Cleaners

Refer to Technical Data Bulletins 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. VersiWeld Products

- a) **VersiWeld Bonding Adhesive:** A high-strength, synthetic rubber adhesive used for bonding VersiWeld membrane to various surfaces. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both surfaces).
- b) **Low VOC Bonding Adhesive for TPO:** This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single-Ply Roofing Adhesives. A high strength, solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft² per gallon finished surface. Available in 5 gallon pails. **This product does not comply with certain counties in the State of California which have additional restrictions on solvents.** See Versico's Technical Data Bulletin for a listing of the counties involved.
- c) **Low VOC Bonding Adhesive 1168:** This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single Ply Roofing Adhesives. A high strength, solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft² per gallon finished surface. Available in 5-gallon cans. **This product complies with all counties in the State of California which have additional restrictions on solvents.** See Versico's Technical Data Bulletin for a listing of the counties involved.
- d) **Aqua Base 120 Bonding Adhesive:** A semi pressure-sensitive, water based adhesive used as a two-sided contact adhesive. Coverage rate is 120 square feet per gallon finished surface (applied to membrane and substrate). Refer to Spec Supplement G-09-11 "Aqua Base 120 Bonding Adhesive" for Warranty limitations and other considerations.
- e) **Cut-Edge Sealant:** A clear colored sealant used to seal cut edges of reinforced VersiWeld membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8" diameter bead is applied.
- f) **Water Cut-Off Mastic:** Used as a mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).
- g) **Universal Single-Ply Sealant:** A 100% solids, solvent free, voc free, one part polyether sealant that provides a weather tight seal to a variety of building materials. It is white in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.
- h) **White One-Part Pourable Sealer:** A one-part, moisture curing, elastomeric polyether sealant used to fill Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 122 cubic inches of volume within a sealant pocket.
- i) **Weathered Membrane Cleaner:** Used to prepare membrane for heat welding that has been exposed to the elements or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).
- j) **TPO Primer:** A solvent-based primer used to prepare the surface of VersiWeld Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS.
- k) **TPO Low VOC Primer:** A solvent-based, low solids primer used to prepare the surface of VersiWeld Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS. This low VOC product is ideal for use in states where environmental issues are a concern.

2. VersiFlex Products

- a) **Low VOC PVC Bonding Adhesive:** A high-strength solvent based adhesive that allows bonding of PVC and KEE-enhanced PVC membrane to various porous and non-porous substrates. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (included coverage on both surfaces).
- b) **Aqua Base 120 Bonding Adhesive:** A semi pressure-sensitive, water based adhesive used as a two-sided contact adhesive. Coverage rate is 120 square feet per gallon finished surface (applied to membrane and substrate). Refer to Spec Supplement G-09-11 "Aqua Base 120 Bonding Adhesive" for Warranty limitations and other considerations
- c) **VersiFlex PVC Cut-Edge Sealant:** A clear-colored sealant used to seal cut edges of reinforced VersiFlex membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8" diameter bead is applied. Use of Cut-Edge Sealant to seal cut edges of PVC Membranes is not required, however it is recommended.
- d) **Water Cut-Off Mastic:** Used as mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).
- e) **Universal Single-Ply Sealant:** A 100% solids, solvent free, one-part, polyether sealant that provides a weather tight seal to a variety of building substrates. Can be used as a termination bar sealant or for use in counterflashing, coping, and scupper details.
- f) **White One-Part Pourable Sealer:** A one-part, moisture curing, elastomeric polyether sealant used to fill Molded Sealant Pockets. Packaged in four 1/2 gallon pouches per plastic bucket. One pouch will fill 122 cubic inches of volume within a molded sealant pocket.
- g) **PVC Membrane Cleaner:** Used to prepare membrane that has been exposed to the elements prior to heat welding or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).

2.05 Fastening Components

A. Securement Strips (RUSS)

- 1. **VersiWeld Pressure-Sensitive RUSS (Reinforced Securement Strip):** A 6" or 10" wide, nominal 45-mil thick reinforced TPO membrane STRIP with a nominal 35-mil thick cured TPO splice tape adhesive laminated along one or both edges. (3" wide Quick Applied QA Seam Tape laminated along one edge for the 6" wide RUSS and along both edges for the 10" wide RUSS.)
 - a) 6" wide Pressure-Sensitive RUSS is used horizontally or vertically at the base of walls, curbs, etc., in conjunction with Seam Fastening Plates below the VersiWeld TPO deck membrane for additional membrane securement. Available in rolls 100' long, 2 per carton.
 - b) 10" wide Quick-Applied RUSS is utilized for perimeter membrane securement along the center of field sheets to form perimeter membranes. Available in rolls 100' long, 1 per carton.

B. Fasteners

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

Insulation Fastening Criteria

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

Notes: N/A = Not Applicable

(1) For Fully Adhered Systems, 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, Versico should be contacted prior to installation for verification of specific types that may require a pilot hole to be predrilled.

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

All Fasteners listed below can be used with VersiWeld or VersiFlex Roofing Systems. Refer to the applicable specification for specific requirements.

1. **HPVX Fastener:** A heavy duty #15 threaded fastener with a #3 Phillips drive used with Versico's HPVX Fastening Plate to secure Mechanically Attached Roofing Systems. It is used on minimum 22 gauge steel decks or minimum 15/32" CDX plywood decks. It is also designed to offer an optimum combination of driving performance, back-out and corrosion resistance with excellent pullout performance.
2. **HPV-XL Fastener:** An oversized diameter #22(.315") steel, threaded fastener used in conjunction with HPV-XL Plates for membrane securement into minimum 22 gauge steel or wood decks on Mechanically Attached Roofing Systems.
3. **HPV Fastener:** A threaded E-coat square head fastener **for insulation attachment only**. Used into steel, wood plank, minimum 15/32" thick plywood or minimum 7/16" thick oriented strand board (OSB).
4. **Pre-Assembled InsulTite ASAP Fastener:** Versico's InsulTite Fastener pre-assembled with a 3" diameter plastic plate used for **insulation attachment only** on Fully Adhered and Mechanically Attached Roofing Systems. Installed using Olympic Fasteners' Fastening Tool.
5. **InsulTite Fastener:** A threaded Phillips drive fastener used with Versico Insulation Plates for **insulation attachment** to steel or wood decks.
6. **CD-10 Fastener:** A hammer-driven, non-threaded E-Coat fastener for use with structural concrete decks rated 3,000 psi or greater.
7. **MP 14-10 Concrete Fastener:** A #14 threaded fastener with a #3 Phillips drive used for minimum 3,000 psi concrete decks.
8. **Polymer Gyptec Fastener:** A glass-filled nylon auger fastener designed for securing insulation and/or membrane to specialty decks such as cement wood fiber or gypsum.

C. Fastening Plates

1. **HPVX Plate:** A 2-3/8" diameter metal barbed fastening plate used with Versico HPVX CD-10 or MP 14-10 Fasteners for membrane or insulation securement. This plate can be used for membrane or insulation securement on Mechanically Attached Roofing Systems.
2. **HPV-XL Plate:** A 2-3/8" diameter metal barbed fastening plate with an oversized hole for use with Versico HPV-XL Fasteners for membrane securement on Mechanically Attached Roofing Systems.
3. **Seam Fastening Plate:** A 2" diameter metal plate used for insulation attachment on Mechanically Attached Systems or membrane securement at angle changes on Fully Adhered Systems in conjunction with the appropriate Versico Fastener.

4. **Insulation Fastening Plate:** A nominal 3-inch metal plate used for insulation attachment in conjunction with the appropriate Versico Fastener.
5. **Oval Plate:** A 2-3/4" x 1-1/2" oval metal barbed fastening plate for use with Versico HPVX fasteners for securement of 10' wide PVC membrane on Mechanically Attached Roofing Systems.

2.06 Insulation Securement Adhesive

1. **FAST 100 LV 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. **FAST Catalyst:** Added to FAST Adhesive (Part B Side) to quicken adhesive reaction time.
3. **Versico DASH Dual Cartridge and Bag in a Box 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 600 sq.ft. per carton of Dual Cartridges or 170 sq.ft per gallon for Bag in a Box Adhesive. A standard version is available for temperatures of 50° F (10°C) and above and a winter "IC" formula is available for temperatures between 25-50° F (-4-10°C)..
4. **OlyBond 500 BA** – A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates. Packaged in 5-gallon pails 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 Technical Data Bulletin.
5. **OlyBond 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 Technical Data Bulletin for bead spacing with reference to building height.

2.07 Vapor / Air Barrier

1. General

If insulation is to be fully adhered to the vapor retarder with FAST or DASH Adhesive, the vapor retarder must be compatible and shall be fully adhered to the substrate. Available products include Versico supplied "peel and stick" rubberized asphalt membrane with compatible film coating (Versico 725 Air and Vapor Barrier), and spray or roller applied butyl coatings. Installation requirements for Versico's 725 Air and Vapor Barrier are identified in Spec Supplement G-07-11 "Application Procedures for 725 TR Air and Vapor Barrier" in the Versico Technical Manual.

2. **Versico 725TR Air and Vapor Barrier** - A 40-mil thick composite consisting of 35-mil self-adhering rubberized asphalt membrane laminated to an 5-mil UV resistant poly film with an anti-skid surface which is fully compatible with FAST/DASH Adhesive. 725TR can also function as a temporary roof for up to 120 days. Available in rolls 39" wide by 75' long (244 square feet).
3. **CCW 702 Primer** - A single component, solvent based, high tack primer used to provide maximum adhesion between Versico 725TR Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 250 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., Dens-Deck Prime gypsum board). Available in 5-gallon containers.
4. **CCW Cav-Grip** - is a low VOC contact adhesive used to prime surfaces for the application of 725TR. It features a quick dry time and ease of application from the self-contained pressurized cylinder. Cav-Grip is an alternate, high-strength, adhesive using a blend of VOC exempt and non-exempt solvent which complies with the State of California Clean Air Act of 1988 (updated in 1997). Coverage rate is 2,500-3,000 sq ft per cylinder.

2.08 Metal Accessories, Edgings, Coping and Terminations

A. General

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

B. Products

1. **VersiWeld TPO Coated Metal:** A 24 gauge, galvanized steel sheet coated with a layer of 40-mil non-reinforced VersiWeld Flashing. The sheet is cut to the appropriate width and used to fabricate metal drip edges or other roof perimeter edging profiles. VersiWeld Membrane may be heat welded directly to the coated metal. Coated metal is available in sheets 4' x 10' and comes packaged 25 sheets per pallet (also available packaged 10 sheets per pallet on a direct ship basis). Available in white, gray or tan.
2. **VersiFlex PVC Coated Metal:** A 24 gauge, galvanized steel sheet coated with a layer of 40-mil non-reinforced VersiFlex Flashing. The sheet is cut to the appropriate width and used to fabricate metal drip edges or other roof perimeter edging profiles. VersiFlex Membrane may be heat welded directly to the coated metal. Coated metal is available in sheets 4' x 10' and comes packaged 10 sheets per pallet. Available in white, gray or tan.
3. **VersiTrim Heat-Weldable Drip Edge:** Pre-fabricated PVC or TPO-coated metal edging. Heat-weld membrane directly to edge. Available in sizes up to 8" fascia height and in colors: white, gray or tan.
4. **VersiTrim 200 Fascia:** A snap-on edge system consisting of a 24 gauge galvanized metal water dam and 40, 50 or 63-mil thick aluminum Kynar 500, clear and colored anodized finish or 22 or 24 gauge steel, Kynar 500 finish. The fascia is available in a variety of colors and heights varying from 5" to 12-1/2". Custom fascias and colors are available upon request. ANSI/SPRI ES-1 certified.
5. **VersiTrim 1000 Fascia:** A metal anchor bar fascia system consisting of a formed quarter hard 0.050" aluminum retainer bar, corrosion resistant fasteners and a 0.040" aluminum or 24 gauge steel snap-on fascia cover. Available in two versions, one for Fully Adhered and Mechanically Attached Roofing Systems. ANSI/SPRI ES-1 certified.
6. **VersiTrim 2000 Standard Fascia:** An anchor bar roof edge fascia system consisting of heavy .100" thick extruded aluminum bar, corrosion resistant stainless steel fasteners and snap-on fascia cover used with Fully Adhered, Mechanically Attached assemblies. Refer to installation instructions for various sizes, colors and accessories ANSI/SPRI ES-1 certified. Also available in **VersiTrim 2000 Extended Fascia** (Up to 13" Face Height) and **VersiTrim 2000 Canted Fascia**.
7. **VersiTrim 3000 Roof Edge System:** A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and a 32, 40, 50 or 63-mil thick aluminum or 24 gauge steel snap-on fascia cover. It is for use in Fully Adhered and Mechanically Attached Roofing Systems. ANSI/SPRI ES-1 certified. Also available in **VersiTrim 3000XT Roof Edge System** (Up to 13" Face Height).
8. **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.
9. Refer to Spec Supplement P-01-11 "Related Products" for other edgings and coping materials.

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

NOTE: As an option, walkway rolls may be fully adhered to the membrane surface with QA Seam Tape/TPO Primer.

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

- c) **Versico Interlocking Rubber Pavers**, 24" X 24" X 2", weighing approximately 6 pounds per square foot, may be specified loose-laid directly over the membrane. Installation Instruction sheets are available from Versico.
- d) **Smooth Concrete Pavers**, when specified in conjunction with insulation that is mechanically attached, must be loose laid over a slip sheet of membrane or 2 layers of HP Protective Mat. When insulation is attached with FAST/DASH Adhesive, concrete pavers may be placed over one layer of HP Protective Mat. Pavers cannot weigh more than 80 pounds per paper for ease of removal.

2.10 Other Versico Accessories

Refer to Spec Supplement P-01-11 "Related Products" for additional accessories.

Part III – Execution

Prior to commencing with the installation of any of the Thermoplastic 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 Versico 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. Material Safety Data Sheets (MSDS) must be on location at all times during transportation, storage and application of materials. The contractor 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 its designated representative must ensure that the building structure is investigated by a registered engineer to assure its ability to withstand the total weight of the specified roofing system, as well as construction 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. Withdrawal resistance tests are strongly suggested to determine the suitability of a roof deck. Refer to Design Reference DR-06-11 "Withdrawal Resistance Criteria" in the Versico Technical Manual proper procedures for conducting pullout tests.
- C. Defects in the substrate must be reported and documented to the specifier, general contractor and building owner for assessment. The Versico Authorized Contractor shall not proceed with installation unless defects are corrected.
- D. On structural concrete decks, when a vapor retarder is not used, gaps in the deck along the perimeter and around penetrations must be sealed along with vertical joints between tilt-up panels, if present, to prevent infiltration of hot humid air and possible moisture contamination resulting from condensation. This is specifically important when adhesive is used to attach the roof insulation. (Migrating warm air through gaps left unsealed can result in condensation and weakening of the insulation bottom facer leading to possible board dislodgement.)
- 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 Versico 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.

H. The following chart identifies the acceptable roof decks/substrates and the minimum underlayment requirements, Tables in Paragraph 1.05 for specific acceptable underlayment types, based on warranty duration:

Roof Deck & Substrate Criteria

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

Notes:

- (1) Local codes must be consulted regarding thermal barrier requirements.
- (2) Mechanically Attached Systems cannot be specified on steel decks less than 22 gauge or for corrugated steel decks, regardless of gauge. Refer to the Metal Retrofit Roofing System Specification, published separately, for installation options.
- (3) Loose gravel must be removed to avoid entrapment of moisture.
- (4) 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.
- (5) Maximum Warranty Duration of 15 Years with 55 MPH peak gust wind speed. Versico may be contacted for other warranty options.
- (6) An approved underlayment is required over existing ballasted (ballast removed) single-ply systems and PVC roofing systems of any type.
- (7) Direct application permitted over smooth surfaced modified bitumen. To reduce the probability of cold welds, membrane shall be positioned with length of sheets parallel to modified bitumen field seams. At end laps or other locations where splices intersect modified bitumen field seams, 6" wide VersiWeld or VersiFlex Flashing must be heat welded over intersections.
- (8) Existing Type III or IV smooth asphalt BUR Only.
- (9) Possible staining/discoloration of the membrane may result when installing this system directly over existing smooth surfaced BUR or modified bitumen. If aesthetics are critical, an approved insulation should be specified beneath the membrane.
- (10) New approved cellular lightweight insulating concrete must have a minimum compressive strength of 200 psi. Except when the lightweight concrete is poured over slotted steel decks, pressure relief vents must be installed every 2,000 square feet. Direct application is not permitted where lightweight concrete is poured over an existing roofing material. Equilibrium moisture content after hydration/curing shall not exceed 12%.
- (11) Maximum warranty available 20 YR with 55 MPH peak gust wind speed coverage. Versico may be contacted for other warranty options.

- I. **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**, Versico 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 non-reinforced PVC membrane).
 2. If total removal of existing PVC membrane is not specified, existing non-reinforced membrane may be cut into maximum 10' x 10' sections, when the new insulation or membrane underlayment is to be mechanically attached.
 3. Regardless of the type of membrane or assembly selected, any loose flashings at the perimeter, roof drains and roof penetrations must be removed.
 4. When installing this roofing system over an existing **gravel surfaced built-up roof, loose gravel must be removed**. Power brooming is recommended by Versico to remove the loose gravel, which may trap moisture. Any uneven areas of the substrate must be leveled to prevent insulation from bridging.
 6. On retrofit projects, all existing phenolic insulation must be removed.
 7. Refer to table above for other Recover/Retro-fit considerations.

J. Vapor Retarder Installation

For Versico's Vapor Retarder refer to Spec Supplement G-07-11 "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 Versico 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 Versico. Refer to Design Reference DR-08-11 "Wood Nailers and Securement Criteria" for Wood Nailer Criteria.
2. Wood nailers are not covered by the Versico 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. Consult Design References DR-04-11 "Energy Efficiency" for R-value Tables.
2. 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) Versico Roofing Systems cannot be specified in conjunction with Phenolic Insulation.
 - b) Fiberglass insulation cannot be specified even if overlaid with additional insulation or membrane underlayment.
 - c) For all Thermoplastic Roofing Assemblies, the use of insulation by others is not acceptable when a Versico Membrane System Warranty is specified. Versico insulation must be used.

- d) The direct application of VersiFlex Membrane over expanded or extruded polystyrene insulation is not permitted.

3.04 Insulation Attachment

A. General

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

B. Fully 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 Versico 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-05-11 "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-05-11 "Insulation Fastening Patterns" for various fastening patterns.
 - c) On Reroof/No Tear off projects with a maximum roof height of 40', any Versico Insulation (i.e., 1/2" SecurShield HD, Versico Recovery Board, Polyisocyanurate less than 1-1/2" thick) may be secured at the minimum rate of 11 Fasteners per 4' x 8' board (5 Fasteners per 4' x 4' board).
 - d) Oriented strand board (OSB) when specified as the membrane underlayment, must be mechanically attached to the deck at the rate 17 fasteners for 4 x 8 board in accordance with Versico Details. If OSB is to be used in conjunction with Versico urethane based adhesive, an OSB/Polyisocyanurate composite board is recommended. When positioning OSB it shall not be butted, allow 1/8" gaps between boards to prevent cupping.
2. **Adhesive attachment**, Versico Urethane Adhesive (FAST, DASH 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 Versico 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.).

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

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.

- a) On FM Global insured projects, consult FM Global's local representative concerning the use of adhesive to attach insulation to steel decks.
- b) 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.
- c) Apply Adhesive over the dry substrate area at the coverage rates indicated in Spec Supplement G-02-11 "FAST or DASH Adhesive Application/Coverage Rates".
- d) Allow the adhesive to rise up approximately 1/8" 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 FAST/DASH Adhesive, string time is generally around 1-1/2 – 2 minutes after application at room temperature.

e) **Walk the boards into the adhesive and roll using the 30" wide, 100 – 150 pound weighted steel roller** to ensure full embedment. Optimal set up time should be approximately 5 to 10 minutes.

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

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

A person should be designated to walk/roll-in all boards and trim/slit or apply weight as needed to ensure adequate securement.

f) Refer to Spec Supplement G-02-11 "Adhesive Application/Coverage Rate" 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 Versico Warranty, Versico must be contacted for specific requirements. Upon review and acceptance by Versico, the maximum warranty coverage available is limited to 15 Year with maximum Peak Gust Wind Speed Coverage of 55 mph, for other warranties contact Versico.

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 darker heat weldable membranes (tan or gray). If VersiWeld / VersiFlex 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 VersiWeld / VersiFlex membrane.

g) A grid shall be installed subdividing the roof in individual sections of 2400 square feet. Required for warranties up to 10 years with wind speed coverage up to 55mph.

h) The wood nailers are installed relatively flush with the insulation surface and the membrane is to be fastened with seam fastening plates and Versico HPV or HPVX Fasteners on 12" o.c. For wood nailer installation, refer to Design Reference DR-08-11 "Wood Nailers and Securement Criteria".

C. Mechanically Attached Roofing Systems

1. **Versico 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 2-3/8" diameter HPVX/HPV-XL Plates OR 3" diameter Insulation Fastening plate.

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

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

3. Use of Dens Deck and Dens Deck Prime should be limited to assemblies with slopes greater than 2" per foot to ensure compliance with external fire codes.

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, protection should be specified to avoid discoloration of the white membrane surface resulting from adhesive residue or excess foot traffic.
4. In addition to the primary membrane securement (Bonding for Fully Adhered and Fastening for Mechanically Attached 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 Versico details. Refer to Paragraph F for additional membrane securement.

B. Membrane Placement

Maximum 12' wide VersiWeld or maximum 10' wide VersiFlex Membrane is fully adhered or mechanically attached to an approved insulation or substrate.

1. **Position** VersiWeld or VersiFlex membrane over the acceptable substrate. For a mechanically attached assembly ensure the proper number of perimeter sheets are positioned along the perimeter of the roof as outlined in Paragraph 1.05 "Warranty Tables".
2. **Position** field sheets perpendicular to the steel deck flutes in Mechanically Attached Applications.
3. **Place** adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum overlap width. It is recommended all overlaps be shingled to avoid bucking of water.

C. Membrane Securement / Bonding - Fully Adhered Roofing System

1. **Adhere** VersiWeld or VersiFlex membrane to an acceptable substrate with Versico Bonding Adhesive. Comply with Labels, Material Safety Data Sheet (MSDS) and Technical Data Bulletins for installation procedures and use. 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 half the underside 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.
5. **Apply** Bonding Adhesive to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be heat welded over adjoining sheet.

When using **VersiWeld Bonding Adhesive or VersiFlex Low VOC Bonding Adhesive**, 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) shall be achieved. **Apply** adhesive evenly, without globs or puddles with a plastic core, medium nap paint roller to achieve continuous coating of both surfaces. A 9-inch roller will easily fit into the 5-gallon containers.

A mechanical roller dispenser can be used to apply Bonding Adhesive when the continuous coating and coverage rate noted above are maintained.

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 the coverage rate stated above to the previously coated surface when conditions allow for continuing.

NOTE: When Aqua Base 120 is specified refer to Spec Supplement G-09-11 "Aqua Base 120 Bonding Adhesive" for application methods and warranty requirements.

6. **Allow** adhesive to dry until tacky but will not string or stick to a dry finger touch.

CAUTION: Care must be exercised to ensure proper drying. Avoid thin areas of adhesive because over drying can occur and proper adhesion may not be achieved.

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

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

9. **Fold** back the unbonded half of the sheet and repeat the bonding procedures. **Apply** Bonding Adhesive to the remaining exposed underside of membrane and adjacent substrate and complete this section as described above.

10. **Install** adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches to provide for a minimum 1-1/2 inch heat weld. It is recommended that all splices be shingled to avoid bucking of water.

CAUTION: If aesthetics are of concern, protect completed sections of the roof so Bonding Adhesive will not discolor the membrane surface. Do not place Bonding Adhesive containers or their lids directly on the surface of the VersiWeld/VersiFlex membrane.

D. Membrane Securement / Fastening - Mechanically Attached Roofing Systems

1. Thermoplastic membranes shall be mechanically attached to the structural deck with specified Versico Fasteners and designated Plates, 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	Versico Fasteners*	Versico Plate	Min. Penetration
Steel or Lightweight Insulating Concrete over Steel**	HPVX	HPVX Plates	3/4"
	HPV-XL	HPV-XL Plates	
Structural Concrete, rated 3,000 psi or greater	CD-10	HPVX Plates	1"
	MP 14-10	HPVX Plates	
Wood Plank, min. 15/32" thick Plywood or min. 7/16" OSB**	HPVX	HPVX Plates	Min. 1"
	HPV-XL	HPV-XL Plates	
Cementitious Wood Fiber	Polymer Gyptec	Gyptec Plates – 2" Dia.	1-1/2"
Gypsum	Polymer Gyptec	Gyptec Plates – 2" Dia.	1-1/2"

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.

**For mechanically attached PVC assemblies, 2-3/4" x 1-1/2" oval metal barbed fastening plates can be used in conjunction with HPVX fasteners for membrane securement. (Not recommended for insulation Securement)

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-06-11 "Withdrawal Resistance Criteria" in the Versico Technical Manual.

4. 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 3'. 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.

For VersiWeld membranes, perimeter sheets can be formed by using individual 4' to 6' wide sheets or by sub-dividing 8' or 10' wide field sheet using 10" wide Pressure-Sensitive RUSS strip or row of seam fastening plates as described below. For VersiFlex membranes, perimeter sheets can be formed by using individual 40.5" or 5'-0" wide sheets.

a) **Individual perimeter sheets** (TPO – 4', 5' or 6' wide)(PVC - 40.5" or 5' wide)

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 3'-6" to 4'-0" wide.

b) **RUSS - Reinforced Universal Securement Strip (VersiWeld Membrane Only)**

- 1) When **field sheets are positioned parallel to a roof perimeter, 10" wide VersiWeld Pressure-Sensitive RUSS** (with 3" wide tape each side) shall be placed approximately down the center of the 8'-0", 10'-0" or 12'-0" wide VersiWeld TPO field membrane sheets. When a RUSS divides a field sheet in half, two perimeter sheets are created.
- 2) When field membrane sheets **extend perpendicular to the edge of the roof**, position the **10" wide VersiWeld Pressure-Sensitive RUSS** beneath the membrane along the center of each field sheet extending a distance equal to 0.4 times the building height to create perimeter sheets.

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

c) **Fastening Plates Method**

In lieu of the RUSS securement method, position a row of seam fastening plates in the locations identified in Paragraph 4.b.1 and 4.b.2, secure plates with appropriate fastener and overlay plates either 6" wide Pressure-Sensitive TPO Cover Strip (TPO Only) overlay the plates as follows:

- 1) VersiWeld Installation – Warranties Up to 20 Years – 10" wide Pressure-Sensitive TPO Cover Strip or 6" wide VersiWeld membrane centered over the plates and heat welded to the field membrane. Seal cut edges of TPO overlay with Cut-Edge Sealant to seal any exposed scrim, it is recommended that cut edge sealant should be used for PVC overlay but it is not required.
- 2) Projects with Warranties greater than 20 Years OR VersiFlex projects regardless of warranty duration center 6" wide section of TPO/PVC membrane (equal thickness to the deck membrane) over the plates and heat weld the field sheets. All cut edges of TPO overlay must be sealed with Cut-Edge Sealant to seal any exposed scrim, it is recommended that cut edge sealant should be used for PVC overlay but it is not required.

NOTE: Perimeter sheets can also be formed by positioning RhinoBond plates placed along the center of a field membrane (if heat induction welder is available on job-site). Refer to "Attachment I" for additional information.

d) **Building with Special Conditions:**

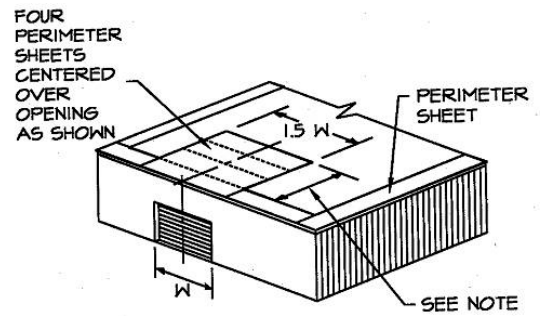
Air pressurized buildings, canopies and buildings with large openings where the total wall openings exceed 10% of the total wall area on which the openings are located (such as airport hangars, warehouses and large maintenance facilities) will typically require additional perimeter membrane securement, 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, four (4) perimeter sheets (centered over the opening) must be specified as shown.

As an option to the above perimeter securement, a fully adhered membrane section may be used in lieu of the mechanically attached membrane at large openings in accordance with the Versico Specification for the VersiWeld/VersiFlex Fully Adhered Roofing System.

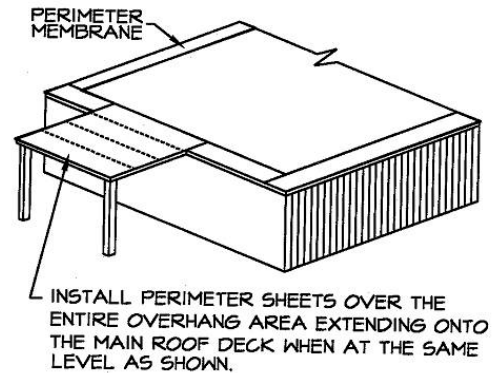
NOTE: Depth of perimeter area, noted above, shall not be less than 2.5 times the width of the opening.



f) Buildings with overhangs

The membrane must be specified with perimeter sheets installed over the entire overhang area extending onto the main roof deck when at the same level.

As an option, a fully adhered membrane section may be used in lieu of the mechanically attached membrane at building overhangs in accordance with the Versico Specification for the VersiWeld/VersiFlex Fully Adhered Roofing System.



5. Field Membrane

- a) **Position** adjoining field membrane sheets to allow an approximate overlap of 5-1/2" at those locations where Fastening Plates are located (along the length of the membrane); at the same time overlap end roll sections (the width of the membrane) a minimum of 2".
- b) **Secure the membrane** at the approved fastening density with the required Versico Fastener and Fastening Plates.
- c) For installation of membrane with fullness, tighten the sheet between fasteners as follows:
 - 1) Unroll sheets and position.
 - 2) Place a fastener and plate in one end of the sheet on the appropriate fastener mark. Go to the opposite end of the sheet, pull it tight and place a fastener and plate at the appropriate mark. Place the remaining fasteners into the sheet.
 - 3) Proceed to weld the sheet in place and continue across the roof.

6. Prevention of membrane distortion during windy conditions:

- a) Unroll sheet approximately 5' and position edge of membrane with overlap line on adjacent sheet.
- b) Install fasteners along the 5' exposed edge.
- c) While the 5' of exposed membrane is being fastened, begin welding the overlapped edge using the Automatic Heat Welder.
- d) As sheet is being welded and fastened concurrently, unroll membrane. Unroll only enough membrane to stay a few feet ahead of welding and fastening process. This reduces amount of unsecured membrane to be distorted by wind.
- e) Continue this process for each adjoining sheet.

E. **VersiWeld QA (Quick-Applied TPO) – Quick-Applied Roofing System (membrane bonding)**

10' wide VersiWeld QA TPO is fully adhered to an approved insulation or substrate with Factory Applied Quick-Applied Adhesive.

1. **Position** VersiWeld QA TPO membrane over the acceptable substrate.
2. **Fold** membrane sheet back so half the underside is exposed.
3. **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 risk of splitting or tearing.
4. **Roll** the membrane onto the substrate while avoiding wrinkles. To achieve the best adhesion, the membrane should be rolled onto the substrate at an angle with 150 lb weighted roller. When applying the VersiWeld QA TPO membrane it is recommended to maintain a large curve on the leading edge of the membrane. This will help eliminate creases and bubbles that cannot be removed after the sheet is in place.
5. **Fold** back the remaining half of the sheet and repeat the above process.

F. **Additional Membrane Securement**

1. Securement must be provided at the perimeter of each roof level, roof section, expansion joint, curb, skylight, interior wall, penthouse, etc., at any inside angle change where slope exceeds 2 inches to one horizontal foot, and at all penetrations as identified on the Versico details.
2. Securement may be achieved as follows:
 - a) On Mechanically Attached Roofing Systems, Versico's HPVX Fastening Plates are used to secure the membrane with the appropriate Versico Fastener at the base of walls and penetrations and flashed as shown on the applicable Versico detail (excluding OSB, cementitious wood fiber and gypsum decks where the required Versico Fastener is installed with the associated 2" diameter plate). On **Fully Adhered Roofing Systems**, Versico standard 2" diameter Seam Fastening Plates may be used in lieu of HPVX Plates.
 - b) Securement of the membrane shall be a maximum of 12 inches on center. Starting 6 inches minimum to 9 inches maximum from the inside or outside corner.
 - c) On Mechanically Attached assemblies, additional membrane securement is required around pipes and sealant pockets as shown on the applicable detail. 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 Versico Detail.
 - d) After securing the membrane, flash in accordance with the appropriate detail.

3.06 Heat Welding Procedures

A. **General**

1. Heat weld the VersiWeld or VersiFlex membrane sheets using the Automatic Heat Welder or Hot Air Hand Welder and silicone roller.
2. When roof slope exceeds 5" per horizontal foot, use of the Automatic Heat Welding Machine may become more difficult; use of the Hand Held Hot Air Welder is recommended.
3. **Check the surfaces** of the membrane to be heat welded to ensure they are properly prepared.

The surfaces to be heat welded must be clean. Membrane overlaps that become contaminated with field dirt must be cleaned with Weathered or PVC Membrane Cleaner (Weathered Membrane Cleaner should not be used to clean VersiFlex PVC). Weathered or PVC Membrane Cleaner should be wiped dry with a clean Splice Wipe prior to welding. No residual dirt or contaminants should be evident.

B. **Automatic and/or Hand Held Heat Welder Equipment**

Refer to **Spec Supplement T-01-11 "Heat Welding Equipment"** for:

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

C. Membrane Welding

1. Prepare the Automatic Heat Welder and allow it to warm for approximately 5 to 10 minutes to reach operating temperature.
2. Position the Automatic Heat Welder properly prior to seaming with the guide handle pointing in the same direction the machine will move along the seam.
3. Lift the overlapping membrane sheet and insert the blower nozzle of the Automatic Heat Welder between the overlap. Machine will begin moving along the seam immediately.
4. Weight plates provided on Automatic Welders must be utilized.
5. Proceed along the seam ensuring that the small guide wheel in front of the machine aligns with the edge of the top membrane sheet. Guide the machine from the front only.

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

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

When using **60-mil or 80-mil** VersiWeld/VersiFlex Membrane, a **TPO/PVC "T" Joint Cover** must be applied over all "T" joint splice intersections. The **use of VersiWeld Non-Reinforced Flashing is not acceptable as an overlay** due to its thickness (80-mil). Reinforced membrane regardless of thickness should not be used since a water tight seal will not be obtainable. VersiFlex 'T'-Joint is the only acceptable 'T'-Joint Cover permitted by Versico.

7. To remove the Automatic Heat Welder from the finished splice, disengage and pull the nozzle from the seam area, the machine will stop automatically.
8. Mark the end of the heat welded seam with a water-soluble marker for easy identification. A Hand Held Welder will be necessary to complete the weld in the area between where the Automatic Heat Welder is stopped and restarted.
9. Perform a test weld, at least, at the start of work each morning and afternoon. Test welds should be made if any changes in substrate or weather conditions occur.

D. Preventing Membrane Creeping During Welding

1. The operator of automatic welding equipment must apply foot pressure to the membrane, keeping the membrane tight under the welder. Refer to **Spec Supplement T-01-11 "Heat Welding Equipment"** for additional information.

E. Test Cuts

1. Perform a test weld at least at the start of work each morning and afternoon. Refer to **Spec Supplement T-01-11 "Heat Welding Equipment"** for additional information.

F. Seam Probing

1. A cotter pin puller (blunt or dull for PVC Membranes) or Versico TPO Seam Probe is recommended to probe all heat-welded seams. Probing seams must be done once heat welds have thoroughly cooled. Refer to **Spec Supplement T-01-11 "Heat Welding Equipment"** for additional information.

G. Cut-Edge Sealant

1. Apply Cut-Edge Sealant on all cut edges of the VersiWeld reinforced membrane (where the scrim reinforcement is exposed) **after seam probing** is completed. When a 1/8" diameter bead of Cut-Edge Sealant is applied, approximately 225 – 275 linear feet of coverage per squeeze bottle can be achieved.
 - a) Cut-Edge Sealant is not required on cut edges of VersiFlex membrane (Horizontal or Vertical) however, it is recommended.
 - b) Cut-Edge Sealant is not required on vertical VersiWeld splices.

3.07 Welding Problems / Repairs

- A. A Hand Held Hot Air Welder and a 2" wide silicone roller must be used when repairing the VersiWeld/VersiFlex membrane. When the **entire** heat welded **seam** is to be **overlaid**, an **Automatic Heat Welder** may be used.
- B. Prior to proceeding with any repair procedure, the area to be repaired must be cleaned with Weathered or PVC Membrane Cleaner (Weathered Membrane Cleaner should not be used to clean VersiFlex PVC Membrane). The membrane can typically be repaired with standard cleaning methods. In cases where the standard cleaning method is not sufficient, the following procedures must be used.
 - 1. Scrub the area to be welded with a "Scotch Brite" Pad and Weathered or PVC Membrane Cleaner.
 - 2. Clean all residue from the area to be welded with a Splice Wipe or a clean natural fiber (cotton) rag.
 - 3. Weld the new membrane to the cleaned area using standard welding procedures.
- C. Voids in welded seams can be repaired using a Hand Held Hot Air Welder and a silicone roller. Depending on conditions, a splice overlay may be required.
- D. Position the hand held welder facing into void so hot air is forced between overlapping membranes. Roll the top membrane surface using positive pressure toward the outer edge until the heated membrane surfaces are fused.
- E. Exposed scrim-reinforcement (resulting from scorching surface of membrane) and test weld areas must be repaired by overlaying the damaged area with a separate piece of VersiWeld/VersiFlex reinforced membrane with rounded corners. The overlay must extend a minimum of 2 inches past the area to be repaired.
- F. **Probe** all edges of the overlay once cooled to ensure a proper weld has been achieved.
- G. **Seal** all cut edges of VersiWeld reinforced membrane with Cut-Edge Sealant. Cut-Edge Sealant is not required on cut edges of VersiFlex Membranes, however, it is recommended.

Note: The same overlay repair procedures may be used for puncture in the VersiWeld/VersiFlex membrane.

3.08 Flashings

A. General Considerations

- 1. The height of new wall flashing must extend above the anticipated water level or slush line.
- 2. On 15- or 20-year warranty projects, Versico's Termination Bar, in conjunction with Water Cut-Off Mastic, must be specified under all metal counterflashings and surface mounted reglets.
- 3. To comply with various warranty options, flashing material must equal the required minimum membrane thickness but shall not be less than 60 mils thick. For projects with 20 year or greater warranties Versico Pre-Fabricated accessories must be used when feasible.

4. On Retrofit Projects

Bitumen-based roof cement and asphaltic-based flashing material, if allowed to remain in contact with the membrane, will cause severe membrane discoloration and for PVC membranes, promote premature plasticizer migration. Existing wall and curb flashing must be removed or concealed with a new acceptable substrate.

- a) The specifier must examine structural supports for rooftop equipment to determine if reasonable access to the membrane beneath the equipment is provided. Versico should be consulted for clarification when access to the membrane system will be restricted.
- b) When hot pipes or other similar penetrations exceed 140°F (60°C) (PVC) or 160°F (71°C) (TPO), they must be designed to incorporate an insulated metal collar and rain hood designed to maintain a surface temperature less than 140°F (60°C) (PVC) or 160°F (71°C) (TPO).
- 5. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using VersiWeld/VersiFlex reinforced membrane. VersiWeld/VersiFlex non-reinforced membrane can be used for flashing pipe penetrations, sealant pockets and scuppers as well as inside and outside corners when the use of pre-molded accessories is not feasible.

6. When possible, all reinforced membrane splices are heat welded with the Automatic Heat Welder. The Hand Held Hot Air Welder should be utilized in hard to reach areas, smaller curbs, vertical splices and when using non-reinforced membrane.
 - a) The new VersiWeld/VersiFlex membrane flashing must not conceal weep holes or cover existing throughwall flashing.
 - b) Install surface mounted reglets and compression bar terminations directly to the wall surface.
7. In areas where metal counterflashing or surface mounted reglets are used as vertical terminations, the counterflashing must be sealed with a rubber grade caulking to prevent moisture migration behind the new wall flashing.

B. Application of Bonding Adhesive

1. Membrane shall be fully adhered to vertical surfaces with VersiWeld/VersiFlex Bonding Adhesive. The Bonding Adhesive shall be applied continuously, without globs or puddles.
2. After the Bonding Adhesive has properly dried, roll the membrane into the adhesive.
3. Care must be taken when setting the flashing to avoid bridging greater than 3/4 inch at angle changes (i.e., where a parapet or roof penetration meets the roof deck). This can be accomplished by creasing the membrane into the angle change.
4. Terminate the edges of the installed membrane in accordance with Versico's applicable details.
5. When using TPO membrane flashing only, bonding adhesive is not required when the flashing height is 12" or less. When Versico termination bar is used beneath the counter-flashing, bonding adhesive can be eliminated when the flashing height is 18" or less.

C. Walls, Parapets, Curbs, Skylights, etc.

The flashing height must be calculated so that the VersiFlex membrane flashing includes a minimum 1-1/2 inch heat weld beyond the Fastening Plates.

1. Fasten at angle change as identified in **Paragraph 3.08**, Additional Membrane Securement, with the required Versico Fastener and plate.
2. Flash the fasteners/plates with a separate piece of VersiWeld/VersiFlex reinforced membrane; apply heat and crease the flashing into the angle change before attaching it to the vertical surface.

D. Metal Edge Terminations

Factory-fabricated metal edge systems must be secured to the wood nailer as specified by the manufacturer. Shop-fabricated edging must be installed in compliance with appropriate Versico Detail using Versico TPO/PVC Coated Metal in order to achieve ES-1 Compliance. Refer to the appropriate Universal Details for other flashing options and requirements.

E. Roof Drains

1. VersiWeld/VersiFlex membrane may extend into the drain sump when the slope of the sump is less than 3" to one horizontal foot.

When the drain sump is greater than 3" to one horizontal foot, additional membrane securement must be installed.

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

F. Other Penetrations

On Mechanically Attached assemblies, additional membrane securement is required around pipes and sealant pockets as shown on the applicable detail. 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 Versico Detail.

1. **Pipes, Round Supports, etc.**

a) Flash pipes with Molded Pipe Flashings or Split Pipe Seals where their installation is possible. Molded pipe flashings cannot be cut and patched; deck flanges cannot be overlapped or installed over angle changes.

b) Where Molded Pipe Flashings or Split Pipe Seals cannot be installed, APPLY FIELD FABRICATED PIPE FLASHING using VersiWeld/VersiFlex non-reinforced membrane.

2. **Flexible Penetrations** (braided cables, conduits, wires, etc.) must be enclosed in a stable "goose neck." Apply a Split Pipe Seal or field fabricated pipe flashing to flash the goose neck.

3. **Hot pipes** that exceed 140°F (60°C)(PVC) and 160°F (71°C) (TPO), must utilize an insulated metal collar and rain hood, flashed with a field fabricated pipe flashing.

4. For **pipe clusters** or unusually shaped penetrations, a Molded Sealant Pocket and White One-Part Sealant must be utilized.

5. **Existing Roof Tie-Ins** for PVC membranes require total isolation between the two roofing systems. For TPO membranes refer to applicable Versico details for tie-ins.

3.09 Roof Walkways

Walkways are to be specified at all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders, etc.), and if regular maintenance (once a month or more) is necessary to service rooftop equipment. **Refer to Spec Supplement G-05-11 "Roof Walkway Installation"**.

3.10 Daily Seal

On phased roofing, when the completion of flashings and terminations is not possible by the end of each workday, provisions must be taken to temporarily close the membrane to prevent water infiltration. **Refer to Spec Supplement G-06-11 "Daily Seal & Clean Up"**.

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This specification represents the applicable information available at the time of its publication. Owners, specifiers and Versico Authorized Roofing Contractors should consult Versico or their Versico Independent Sales Representative for any information, which has subsequently been made available.

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

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SPECIFICATION

ATTACHMENT

Thermoplastic Mechanically Fastened Roofing Systems RhinoBond Attachment Method

“Attachment I”

January 2012

This is an alternate method for securing the Versico's VersiWeld (TPO) or VersiFlex (PVC) membrane and is intended to be used in conjunction with the Versico's Thermoplastic Mechanically Attached Specification and Details.

A. Description

The RhinoBond Attachment Method incorporates 3” diameter corrosion-resistant plate with a hot melt TPO or PVC coating. The Plates are installed with HPVX Fasteners to secure an acceptable insulation to minimum 22 gauge steel deck or minimum 15/32” thick plywood.

Versico's Polyester Reinforced Thermoplastic membrane is positioned over the secured RhinoBond plates and welded to the surface using the RhinoBond Induction Welding Tool.

RhinoBond Attachment Method Limited to 20 year maximum warranty and wind speed coverage up to 90 mph. Perimeter enhancements will be required on systems greater than 72 mph. Contact Versico for requirements for enhancements.

B. Products/Heat Welding Equipment

1. **RhinoBond TPO or PVC Welding Plate:** A 3” diameter, 0.028” thick, corrosion-resistant steel plate with high solids coating on the top surface. The plate is used in conjunction with Versico's HPVX Fasteners to attach the roofing assembly and is activated using the RhinoBond Induction Welding Tool.
2. **RhinoBond Induction Welding Tool:** An induction heating tool is used to emit the magnetic field that activates the hot melt coating on the top surface of the RhinoBond Welding Plate to fuse with the roofing membrane. Refer to RhinoBond Owner's Manual for additional information.
3. **Cooling Clamp Device:** A stand-up device that allows the weld to cool as it clamps the membrane to the heated plate. Refer to RhinoBond Owner's Manual for additional information.
4. Products listed in “Part II” of the Versico Thermoplastic Mechanically Attached Roofing System Specification can be used as part of this alternate securement method in conjunction with RhinoBond Welding Plates.

C. RhinoBond Induction Tool Calibration

Prior to proceeding with membrane attachment to the plate, the RhinoBond Induction Welding Tool must be calibrated with samples of the project specified insulation thickness and type and project specified membrane thickness. Refer to RhinoBond Owner's Manual for additional information.

1. Loose lay five RhinoBond Plates in a row about 12-24” apart on the specified membrane substrate.
2. Place membrane over the RhinoBond Plates.
3. Centering over the RhinoBond Plate under the membrane, place the Induction Welding Tool and use the device's default setting. Weld the membrane to the first plate, and when ready, completely remove Welding Tool. Immediately place the Cooling Clamp on the membrane over the plate and leave in place for 60 seconds.
4. Place Induction Welding Tool on the next plate as previously done and increasing the induction energy one level by depressing the “up” button once. After welding, immediately place the Cooling Clamp.
5. Repeat above procedure for the remainder of the plates, increasing induction energy one level for each plate.

6. After allowing the membrane and plates to cool to ambient temperatures, remove Cooling Clamp and use a pair of pliers and apply force to peel RhinoBond Plate from underside of membrane to determine bonding strength. Desired result is welded ply membrane stays fused to RhinoBond Plate.
7. Repeat process, if needed, adjusting energy level up or down until desired results are achieved.

NOTE: Recalibrating induction tool settings is necessary when ambient temperature changes more than +/- 15°F or power to device have been interrupted.

D. Installation

1. After placement of insulation on substrate, secure the insulation at a rate of six HPVX Fasteners and RhinoBond Plates per 4' x 8' in the designated field and eight HPVX Fasteners and RhinoBond Plates around the perimeter. Refer to appropriate Versico details for patterns and depth of perimeter area.

NOTE: Avoiding fastener overdrive to prevent plate from deforming.

2. Place VersiWeld or VersiFlex membrane over the appropriate RhinoBond Plates and allow membrane to relax.
3. Place RhinoBond Induction Tool centered over the RhinoBond Welding Plate (+/- 1") under the roofing membrane.
4. Elevate the temperature of plate from ambient to 400-500°F using induction tool.
5. Immediately place Cooling Clamp on the membrane over the plate and leave in place for at least 60 seconds.
6. Resume process ensuring membrane is attached to all plates.

E. Membrane Hot Air Welding Procedures & Additional Securement

1. Adjoin membrane sheets by overlapping and heat welding the seam following standard Hot Air Welding Procedures as outlined in the "Part III" of the Thermoplastics Mechanically Attached Roofing System Specification.
2. Base wall securement and securement around roof penetrations as well as flashings of walls and penetrations must comply with Versico requirements for the Thermoplastics Mechanically Attached Roofing System.

F. Associated Installation Details

RhinoBond Attachment Method – Number of Fasteners and Location.....	RB-1
Angle Change Securement Method RhinoBond Plates.....	RB-2

End of Section



**VersiWeld® TPO/VersiFlex™ PVC
Mechanically Attached and Fully Adhered Roofing Systems**

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January 2012

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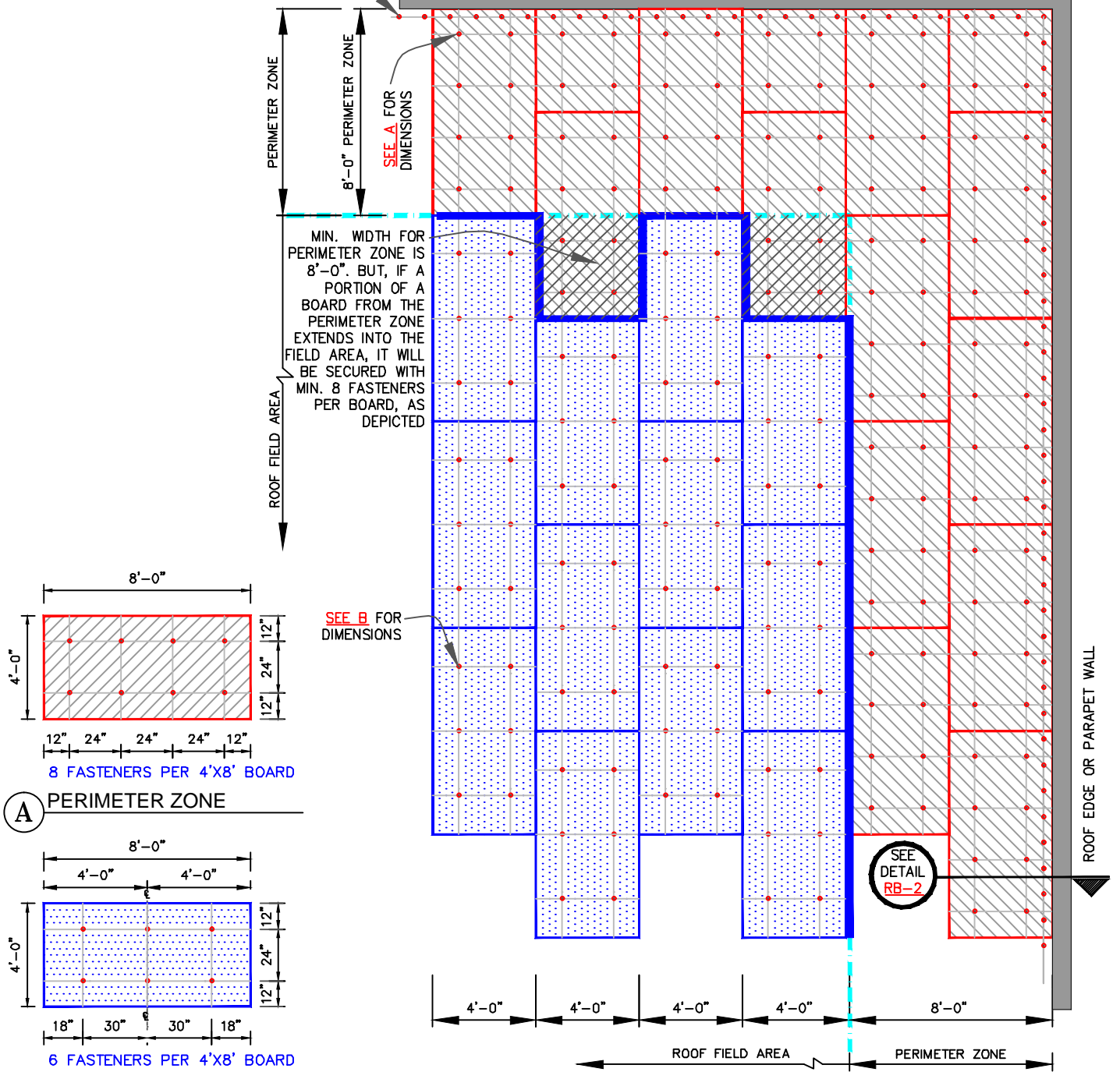
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12" (305mm) O.C. POSITIONED
3-1/2"-4" (89-102mm)
FROM ANGLE CHANGE

ROOF EDGE OR PARAPET WALL



LEGEND - ROOF PLAN

- VERSICO FASTENER & RhinoBond FASTENING PLATE
- PERIMETER AREA
- ROOF FIELD AREA
- TRANSITION AREA

DECK TYPE	DECK THICKNESS	FASTENER	THERMOPLASTIC COATED PLATE
STEEL	22 GAUGE	VERSICO HPVX FASTENER	3-1/8" (79.4mm) DIAMETER
PLYWOOD	15 / 32" (11.91mm)	VERSICO HPVX FASTENER	3-1/8" (79.4mm) DIAMETER

NOTE: AT IN-FILL MINOR PIECES, USE MIN. 2 FASTENERS.



RhinoBond ATTACHMENT METHOD-NUMBER OF FASTENERS AND LOCATION

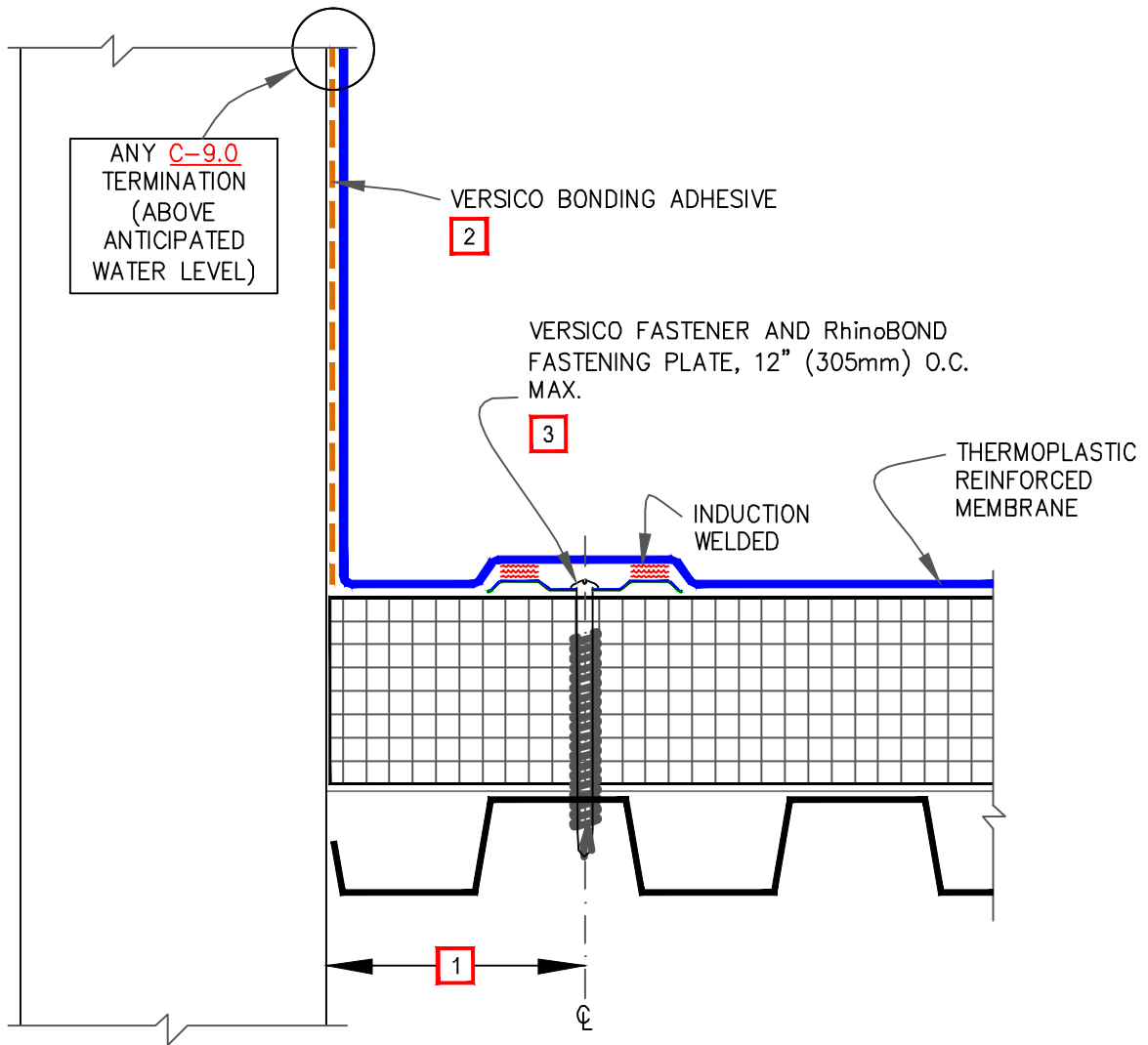
THERMOPLASTIC MEMBRANE

APPROVED SUBSTRATE

SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

RB-1




NOTES:

1. POSITION RhinoBOND PLATES 3-1/2" TO 4" (89 TO 102mm) FROM ANGLE CHANGE.
2. VersiWELD MEMBRANE REQUIRES VersiWELD BONDING ADHESIVE AND VersiFLEX MEMBRANE REQUIRES VersiFLEX BONDING ADHESIVE.
3. HPVX FASTENERS AND RhinoBOND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS.
4. THIS METHOD OF MEMBRANE ATTACHMENT IS NOT FOR USE WITH NON-FACED EPS OR XPS INSULATION.

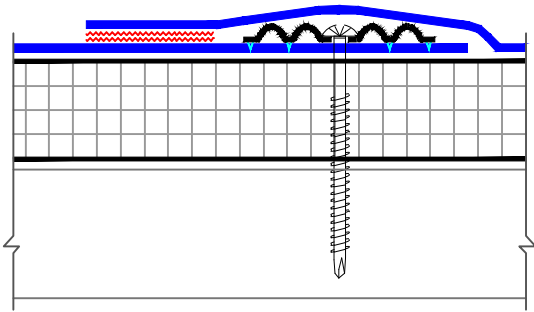


ANGLE CHANGE SECUREMENT METHOD WITH RhinoBond PLATES

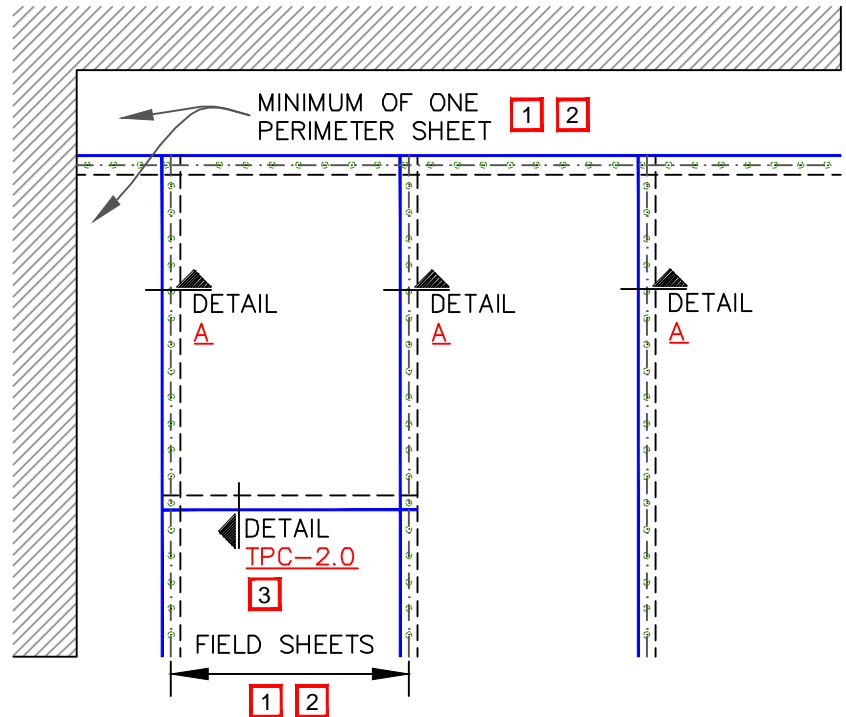
	→ THERMOPLASTIC MEMBRANE
	→ APPROVED SUBSTRATE
	→ SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

RB-2



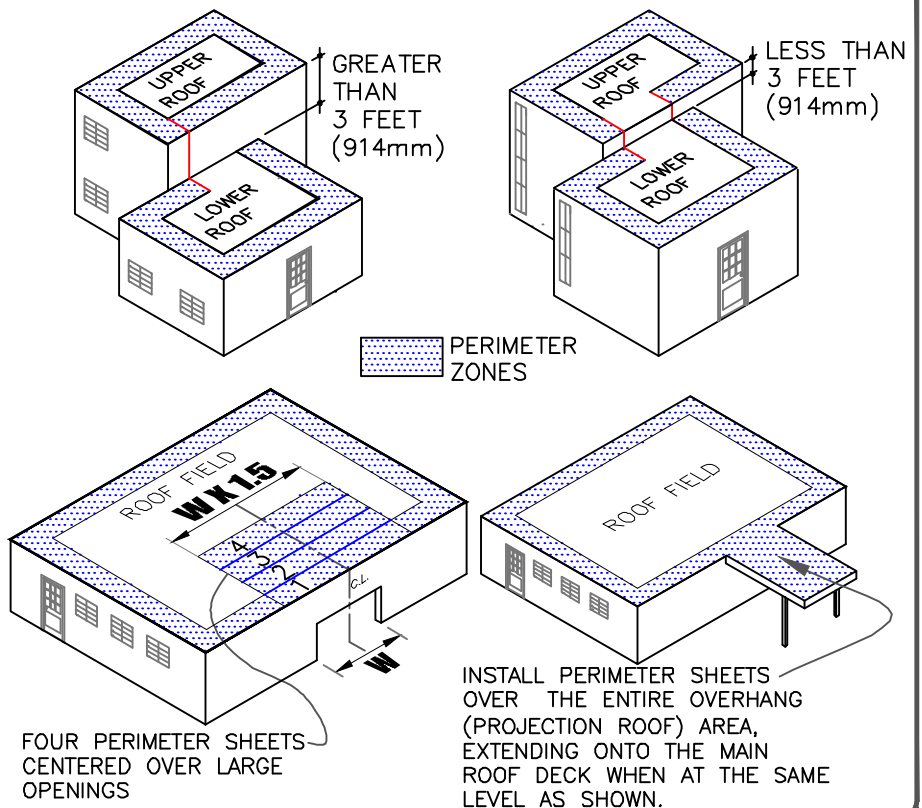
DETAIL A: (FOR RELATED NOTES, REFER TO DETAILS TPMA-2.1 & 2.2)



NOTES:

1. WHEN USING 10' (3048mm) OR 12' (3658mm) WIDE TPO FIELD SHEETS, 6' (1829mm) WIDE PERIMETER SHEETS ARE UTILIZED. WHEN USING 8' (2438mm) WIDE TPO FIELD SHEETS, 4' (1219mm) WIDE PERIMETER SHEETS ARE USED. WHEN USING 10' (3048mm) WIDE PVC FIELD SHEETS, 5' (1524mm) WIDE PERIMETER SHEETS ARE UTILIZED. WHEN USING 81" (2057mm) WIDE PVC FIELD SHEETS, 40.5" (1029mm) WIDE PERIMETER SHEETS ARE USED.
2. REFER TO VERSICO SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
3. END LAPS DO NOT REQUIRE MECHANICAL FASTENING AND SHALL BE OVERLAPPED 2" (51mm) MINIMUM. REFER TO THERMOPLASTIC DETAIL TPC-2.0.

GUIDELINES FOR ROOF PERIMETER ZONES FOR MECHANICALLY ATTACHED ROOF SYSTEM



MEMBRANE SECUREMENT

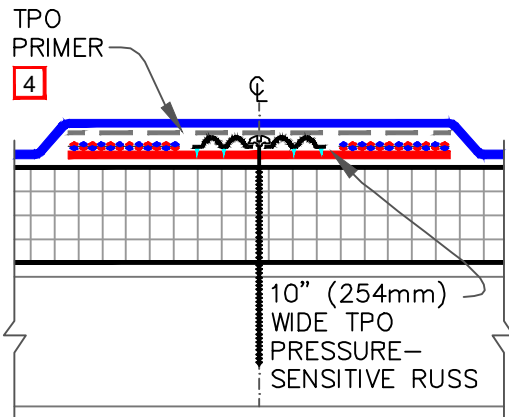
→ THERMOPLASTIC REINFORCED MEMBRANE

→ APPROVED SUBSTRATE

[0] → SEE NOTE(S)

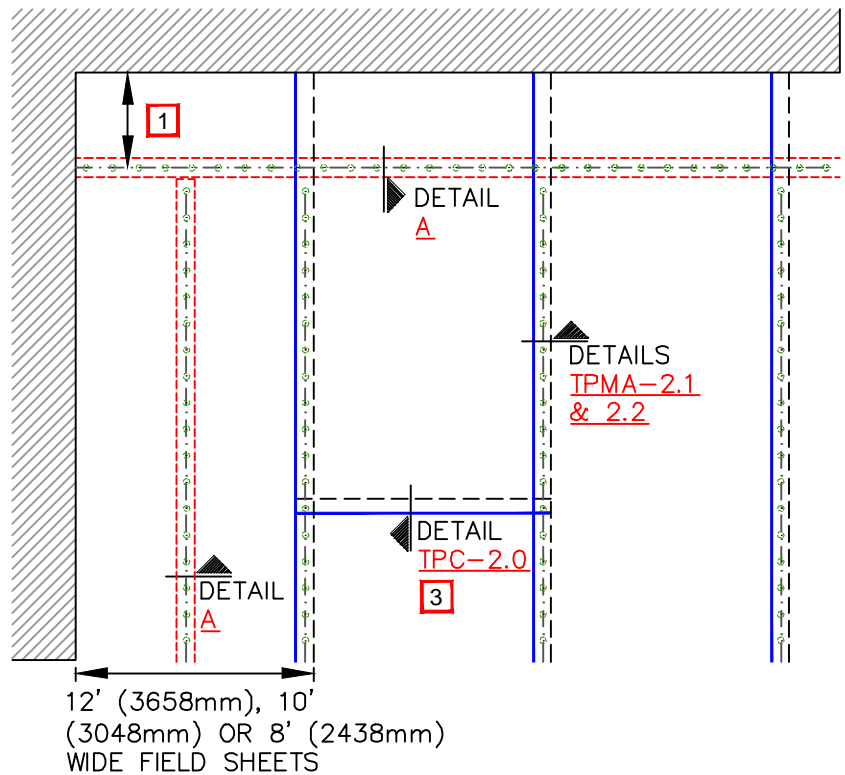
THERMOPLASTIC ROOFING SYSTEM

TPMA-2.0A



DETAIL A

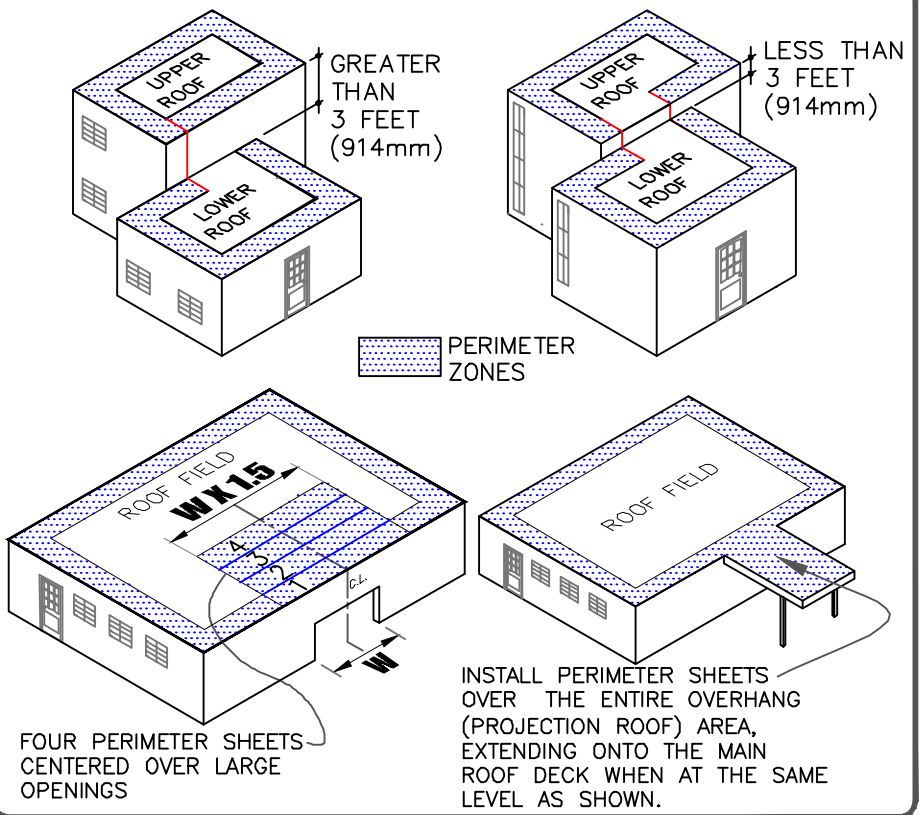
TPO ONLY
(NOT FOR PVC)



NOTES:

1. PRESSURE-SENSITIVE RUS SHALL BE POSITIONED 5' (1524mm) TO 6' (1829mm) FROM THE PERIMETER EDGE WHEN USING 10' (3048mm) OR 12' (3658mm) WIDE TPO FIELD SHEETS. WHEN USING 8' (2438mm) WIDE TPO FIELD SHEETS, PRESSURE-SENSITIVE RUS SHALL BE POSITIONED 4' (1219mm) FROM THE PERIMETER EDGE.
2. REFER TO VERSICO SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
3. END LAPS DO NOT REQUIRE MECHANICAL FASTENING AND SHALL BE OVERLAPPED 2" (51mm) MINIMUM. REFER TO THERMOPLASTIC [DETAIL TPC-2.0](#).
4. TPO PRIMER MUST BE APPLIED TO THE BACK SIDE OF MEMBRANE SURFACE PRIOR TO ADHERING MEMBRANE TO PRESSURE-SENSITIVE RUS.

GUIDELINES FOR ROOF PERIMETER ZONES FOR MECHANICALLY ATTACHED ROOF SYSTEM

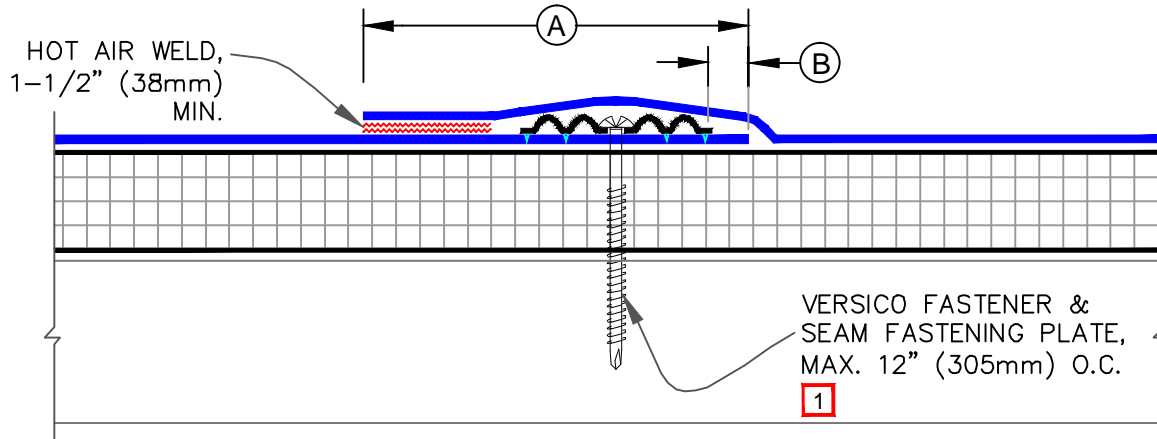


TPO MEMBRANE SECUREMENT WITH PRESSURE-SENSITIVE RUS

→ TPO MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

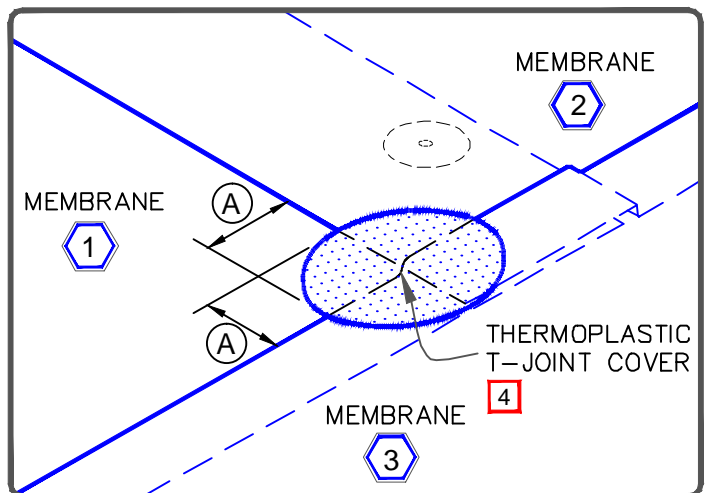
TPMA-2.0B



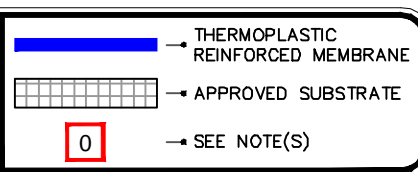
NOTES:

- ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
- POSITION SEAM FASTENING PLATES BEYOND NON-REINFORCED ENCAPSULATED EDGE.
- APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
- WHEN USING 60 OR 80-MIL MEMBRANE, APPLY A 4-1/2" (114mm) DIAMETER THERMOPLASTIC T-JOINT COVER AT ALL FIELD SPLICE INTERSECTIONS.

DIMENSIONS	mm	
(A)	5-1/2"	140 APPROX.
(B)	1/2"	13 APPROX.

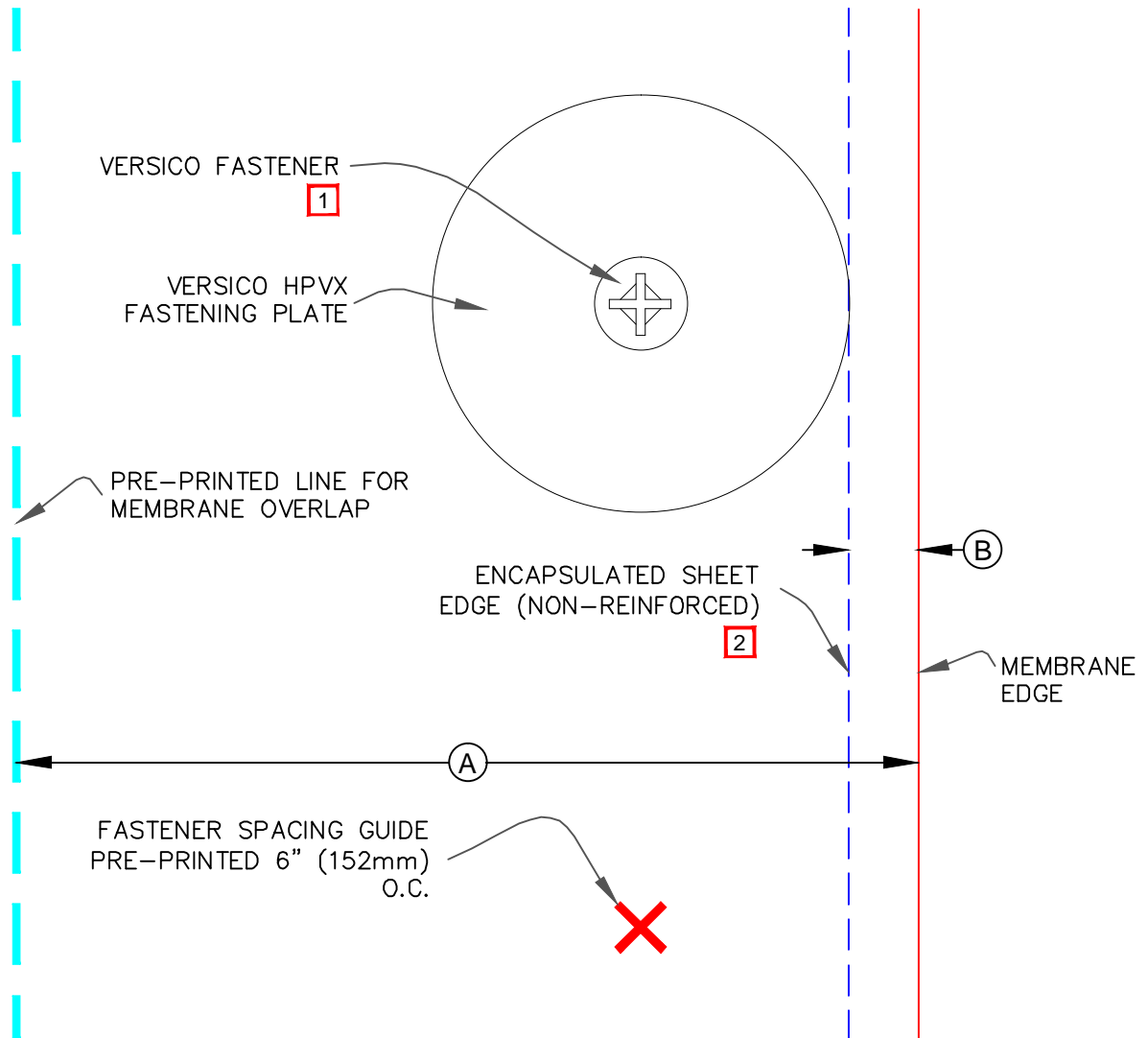


MECHANICALLY ATTACHED MEMBRANE SPLICE



THERMOPLASTIC ROOFING SYSTEM

TPMA-2.1




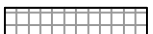

DIMENSIONS	mm	
(A)	5-1/2"	140 APPROX.
(B)	1/2"	13 APPROX.

NOTE:

- ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
- POSITION SEAM FASTENING PLATES BEYOND NON-REINFORCED ENCAPSULATED EDGE.

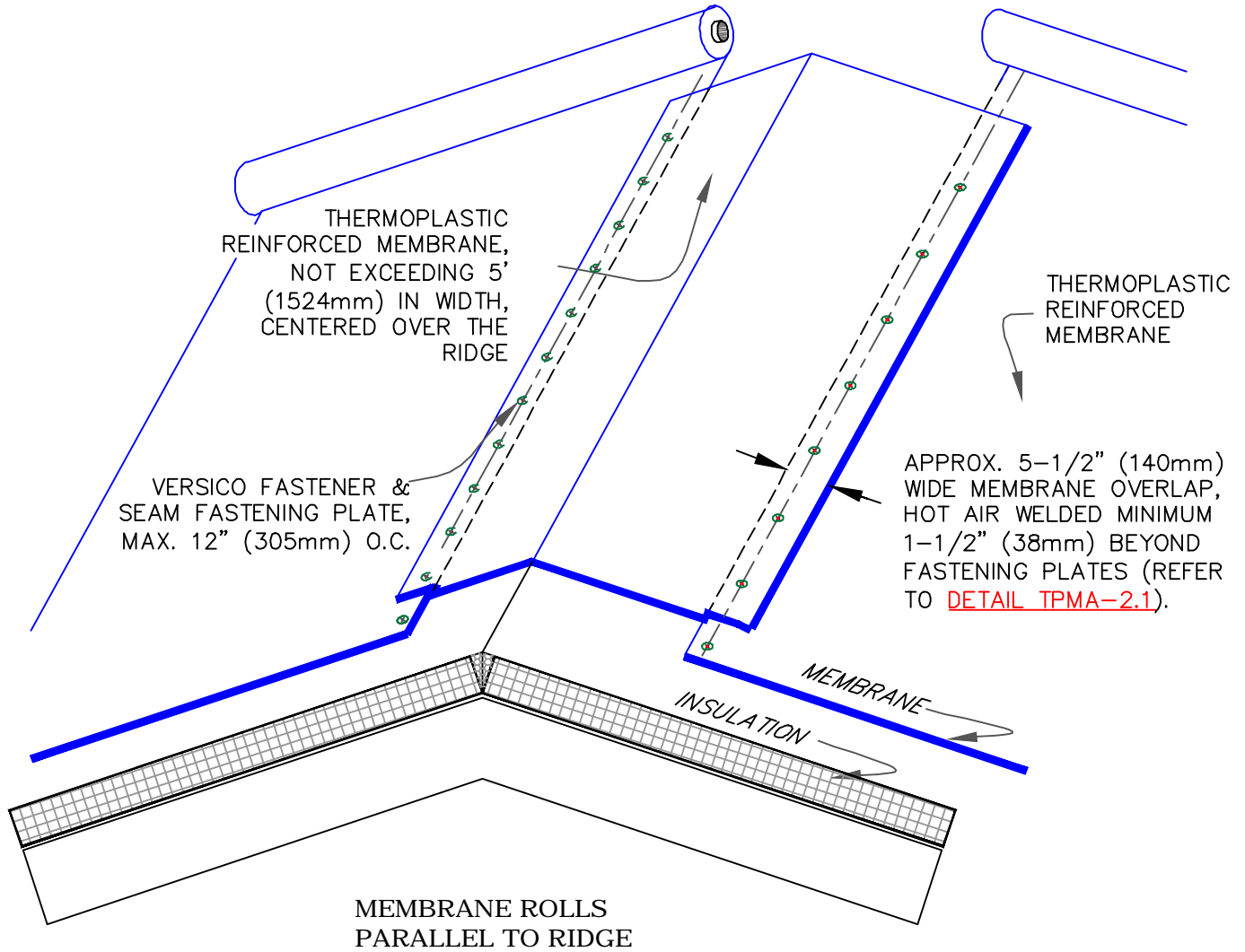


FASTENER AND PLATE PLACEMENT

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPMA-2.2



NOTES

1. RIDGE MEMBRANE ATTACHMENT IS ONLY REQUIRED WHEN ROOF SLOPE EXCEEDS 3" (76mm) TO ONE HORIZONTAL FOOT.
2. POSITION FASTENING PLATES 1/2" (13mm) MINIMUM TO 1" (25mm) MAXIMUM FROM THE EDGE OF THE DECK MEMBRANE.
3. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
4. REFER TO VERSICO SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
5. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
6. AS AN OPTION TO USING PERIMETER SHEETS, 10" (254mm) WIDE TPO PRESSURE-SENSITIVE RUSS MAY BE USED BENEATH TPO FIELD SHEETS ONLY FOR PERIMETER SECUREMENT.



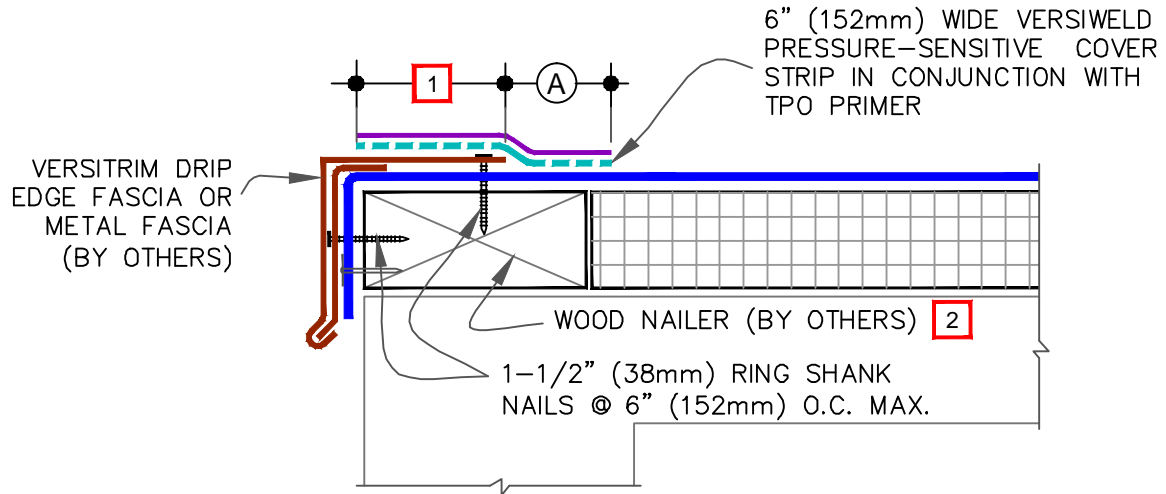
RIDGE MEMBRANE ATTACHMENT

	→ THERMOPLASTIC REINFORCED MEMBRANE
	→ APPROVED SUBSTRATE
	→ SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPMA-22.0

CAUTION

DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS. ACCEPTABLE EDGING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAILS TPC-1.2, 1.3, 1.4, 1.5 OR 1.6.

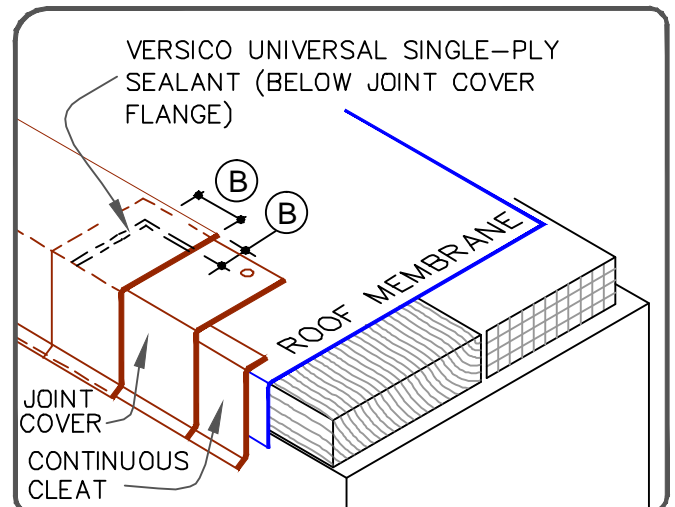


TPO ONLY
(NOT FOR PVC)

NOTES:

- METAL FASCIA DECK FLANGE MUST BE TOTALLY COVERED BY TPO PRESSURE-SENSITIVE COVER STRIP WITH MINIMUM 2" (51mm) COVERAGE PAST NAIL HEADS.
- WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
- TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
- APPLY TPO PRIMER TO METAL FLANGE AND MEMBRANE SURFACE PRIOR TO INSTALLING TPO PRESSURE-SENSITIVE COVER STRIP.
- WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.
- TO ENSURE TPO PRESSURE-SENSITIVE COVER STRIP CONFORMS TO STEP-OFFS, HEAT COVER STRIP AT SPLICE INTERSECTIONS PRIOR TO ROLLING.

DIMENSIONS	mm	
(A)	2"	51 MIN.
(B)	1/2"	13 TO
	1"	25



VERSITRIM DRIP EDGE FASCIA

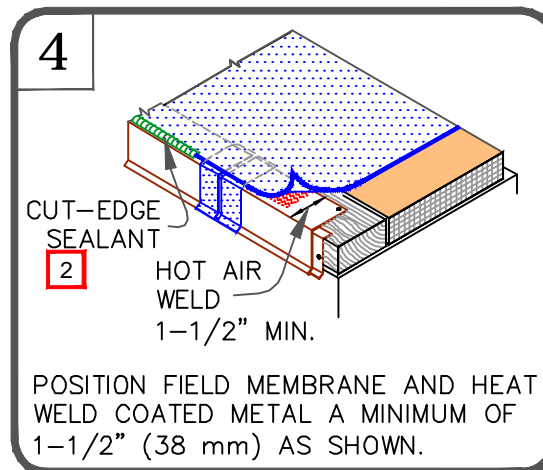
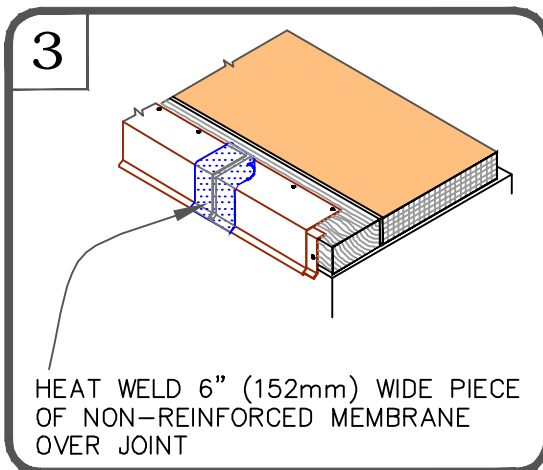
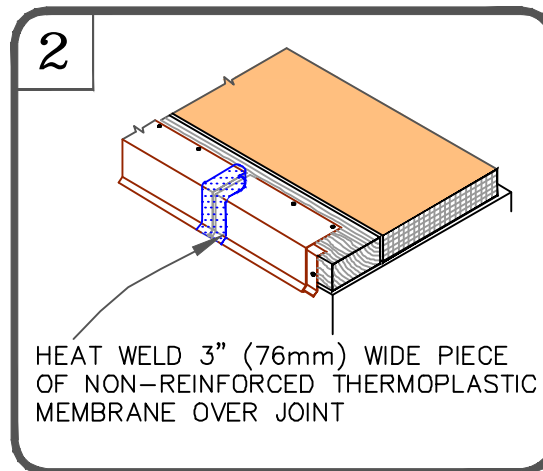
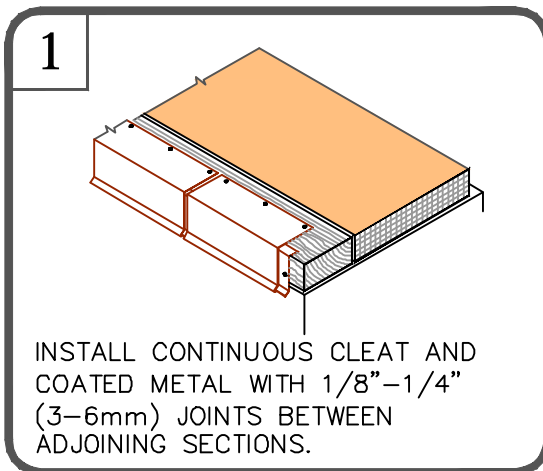
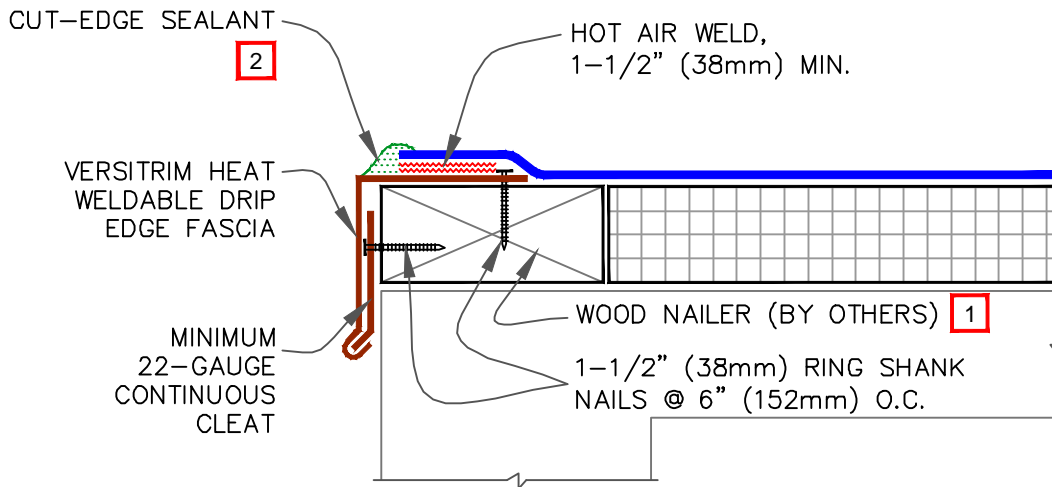
— TPO MEMBRANE

— APPROVED SUBSTRATE

0 — SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-1.1



NOTES:

1. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.



VERSITRIM HEAT WELDABLE DRIP EDGE FASCIA

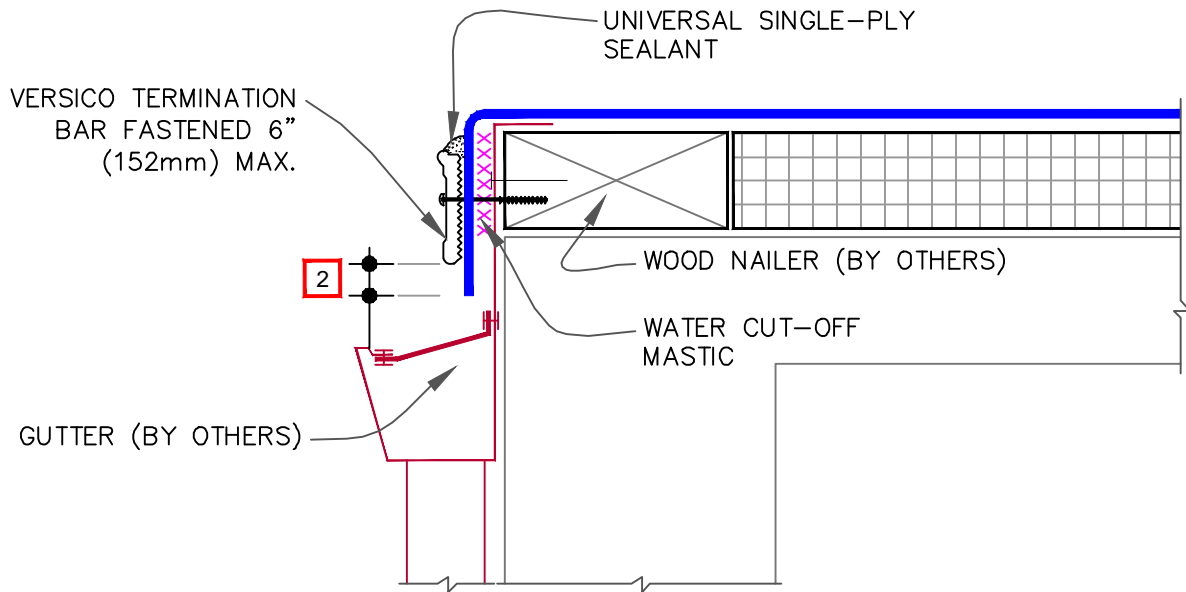
— THERMOPLASTIC REINFORCED MEMBRANE

— APPROVED SUBSTRATE

0 → SEE NOTE(S)

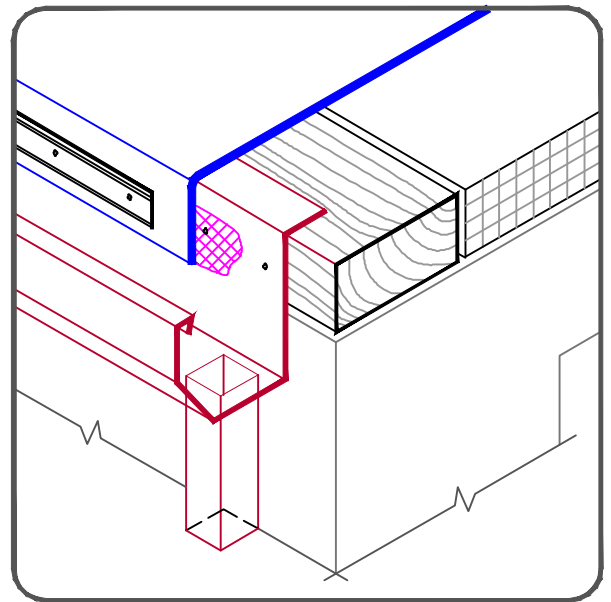
THERMOPLASTIC ROOFING SYSTEM

TPC-1.2






NOTE:

1. FASTENING OF METAL TERMINATION BAR MUST PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
2. ALLOW MEMBRANE SHEET TO EXTEND 1/2" (13mm) MINIMUM BELOW THE METAL TERMINATION BAR.

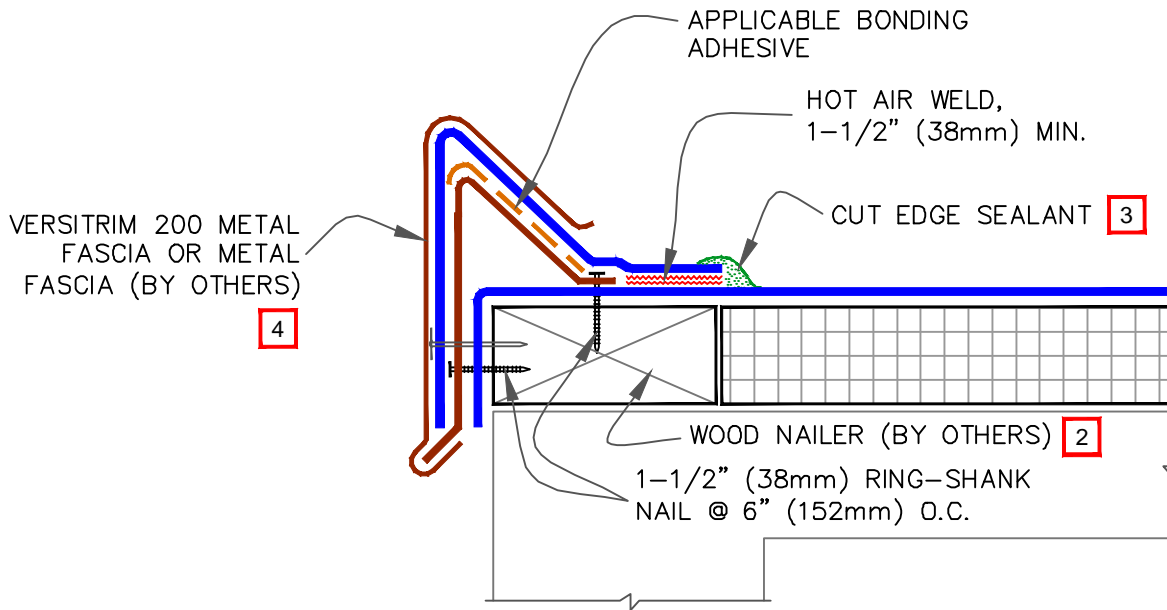


METAL BAR EDGE
TERMINATION

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

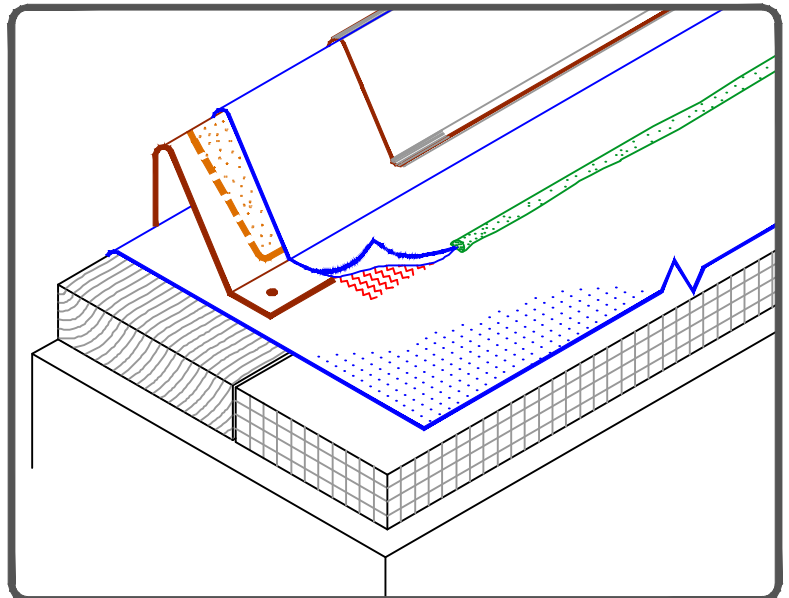
THERMOPLASTIC
ROOFING SYSTEM

TPC-1.3



NOTES:

1. REFER TO [VERSITRIM 200 INSTRUCTION MANUAL](#) FOR STEP-BY-STEP INSTALLATION PROCEDURES.
2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF VERSITRIM DECK FLANGE.
3. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
4. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.



VERSITRIM 200

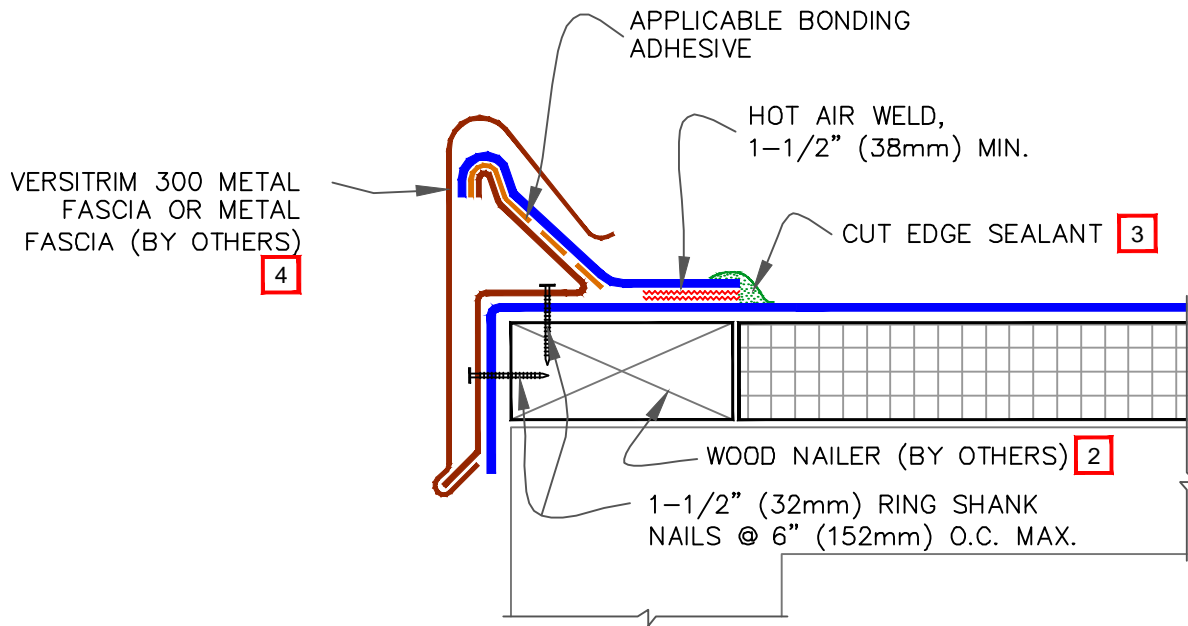
— THERMOPLASTIC REINFORCED MEMBRANE

— APPROVED SUBSTRATE

0 — SEE NOTE(S)

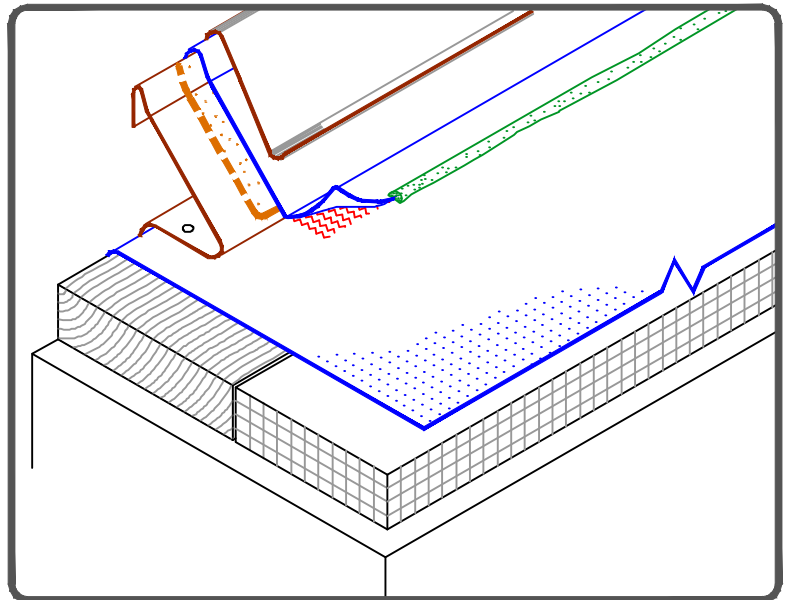
THERMOPLASTIC ROOFING SYSTEM

TPC-1.4






NOTES:

1. REFER TO [VERSITRIM 300 INSTRUCTION MANUAL](#) FOR STEP-BY-STEP INSTALLATION PROCEDURES.
2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF VERSITRIM DECK FLANGE.
3. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
4. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.

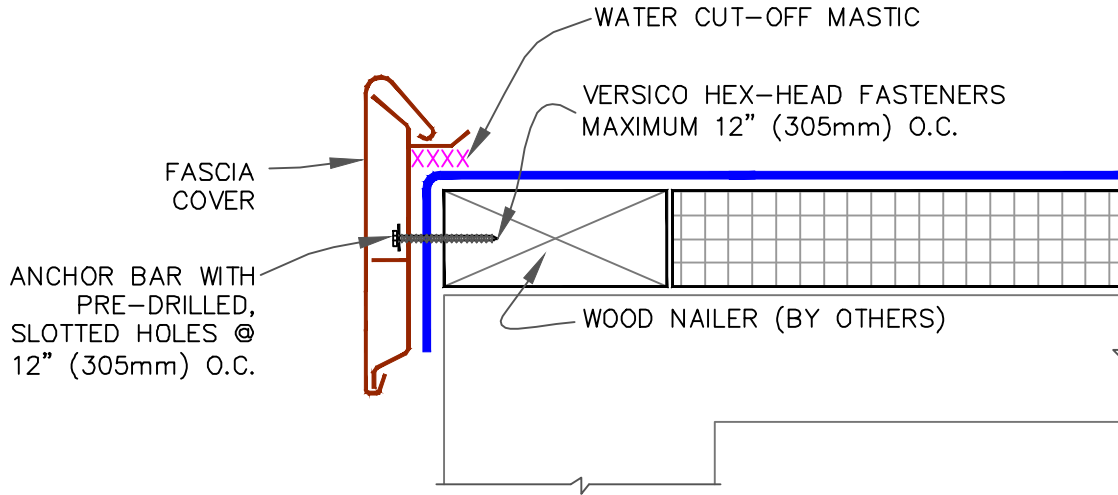


VERSITRIM 300

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

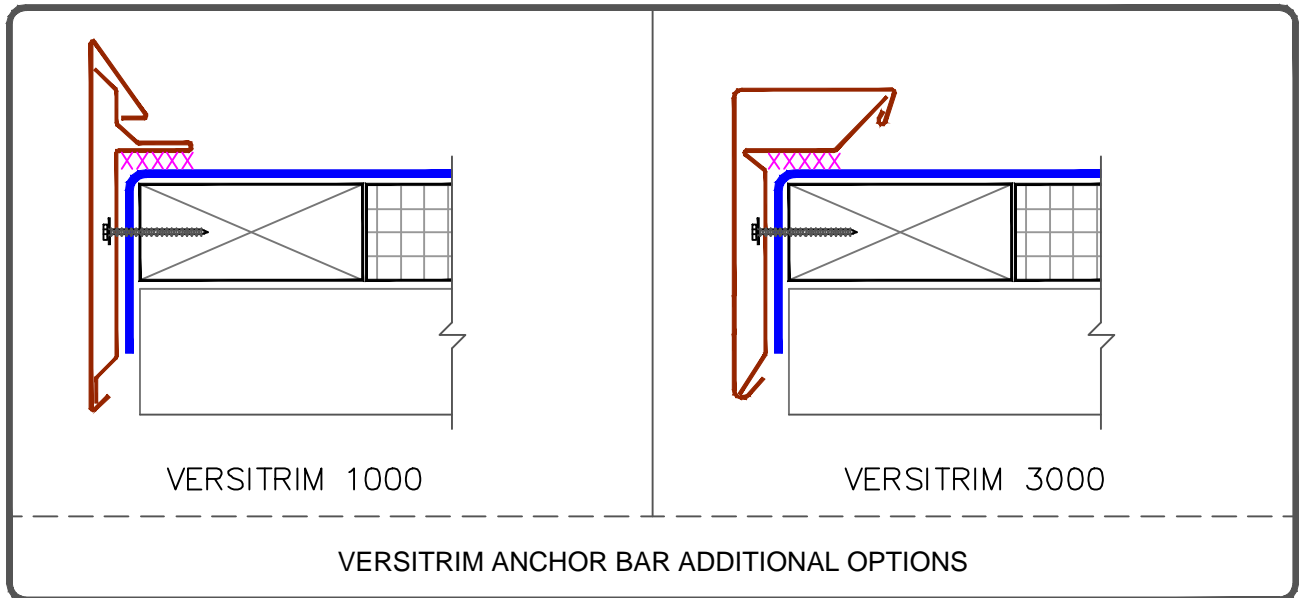
TPC-1.5




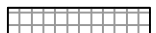

VERSITRIM 2000

NOTES:

1. REFER TO VERSITRIM INSTALLATION INSTRUCTION MANUAL FOR THE STEP BY STEP INSTALLATION PROCEDURES AND FOR THE VARIOUS PRODUCT FEATURES AVAILABLE.
2. IF INCIDENTAL/TEMPORARY PONDED WATER IS EXPECTED, THE VERSITRIM MUST BE ELEVATED AND SCUPPERS PROVIDED FOR DRAINAGE.
3. ENSURE ROOF SLOPES AWAY FROM VERSITRIM.

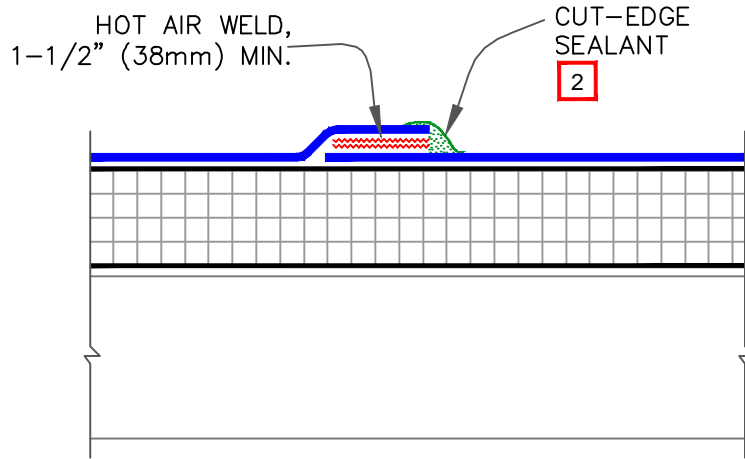


VERSITRIM 1000, 2000 & 3000

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

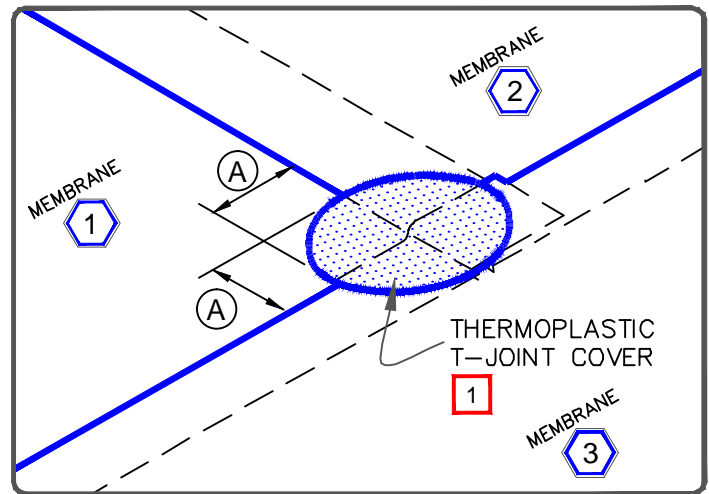
TPC-1.6






DIMENSIONS	mm	
(A)	2-1/4"	57 MIN.

NOTE:

1. WHEN USING 60 OR 80-MIL MEMBRANE, APPLY A 4-1/2" (114mm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.

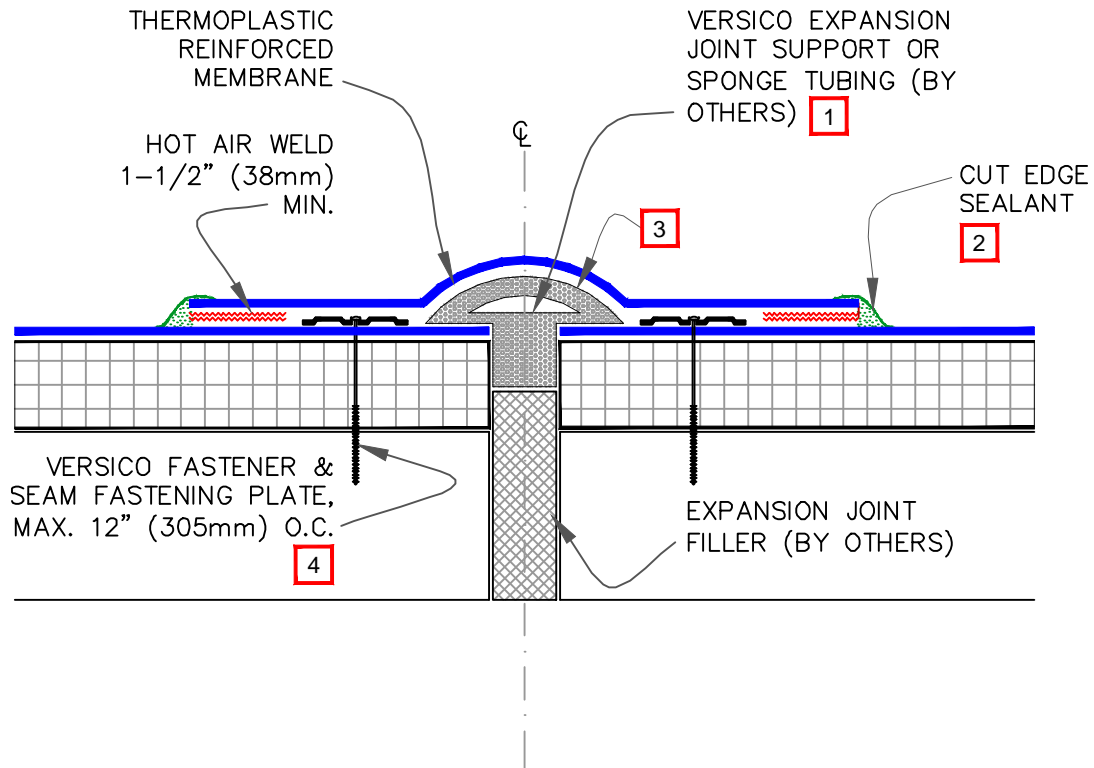


MEMBRANE SPLICE

	→ THERMOPLASTIC REINFORCED MEMBRANE
	→ APPROVED SUBSTRATE
	→ SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-2.0



NOTES:

1. WHEN VERSICO EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (19mm) AND SHALL NOT EXCEED 3" (75mm).
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
3. MEMBRANE FLASHING SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT OR SPONGE TUBING.
4. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.



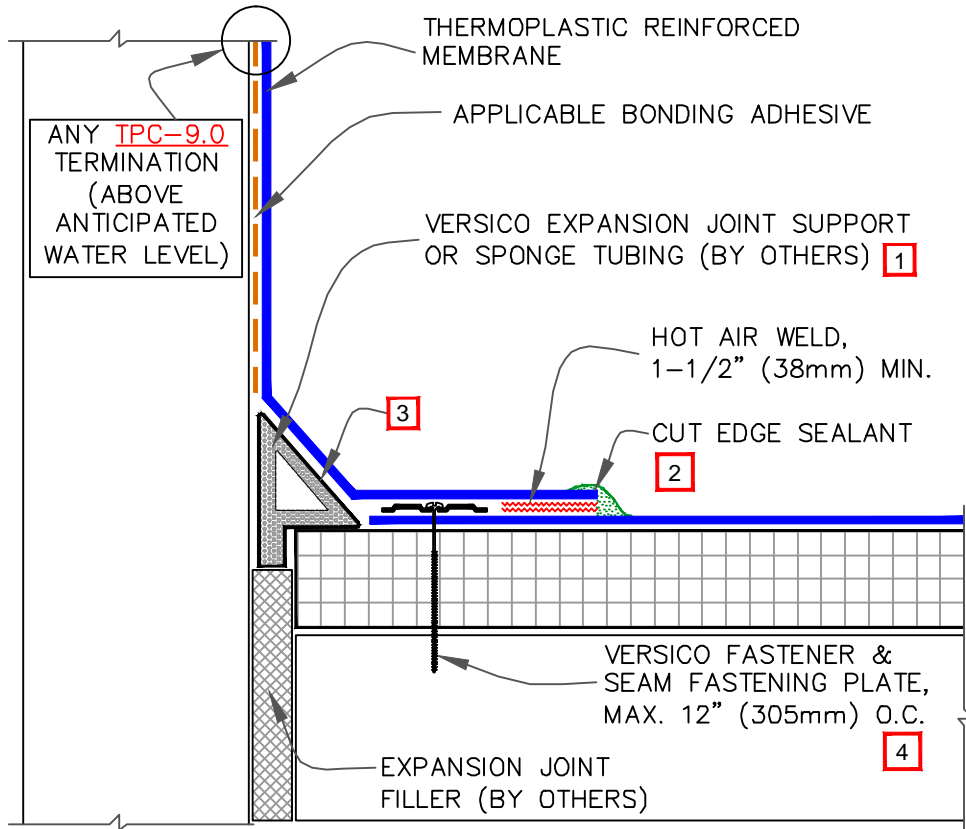
DECK-TO-DECK
EXPANSION DETAIL

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC
ROOFING SYSTEM

TPC-3.1

CAUTION WHEN A WARRANTY WIND SPEED GREATER THAN 90MPH IS SPECIFIED, VERSICO FASTENERS AND SEAM FASTENING PLATES SHALL NOT EXCEED 6" (152mm) ON CENTER FOR ADHERED MEMBRANE ASSEMBLIES.



NOTES:

1. WHEN VERSICO EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (19mm) AND SHALL NOT EXCEED 2" (51mm).
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
3. MEMBRANE FLASHING SHALL NOT BE ADHERED OVER THE EXPANSION JOINT SUPPORT OR SPONGE TUBING.
4. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.

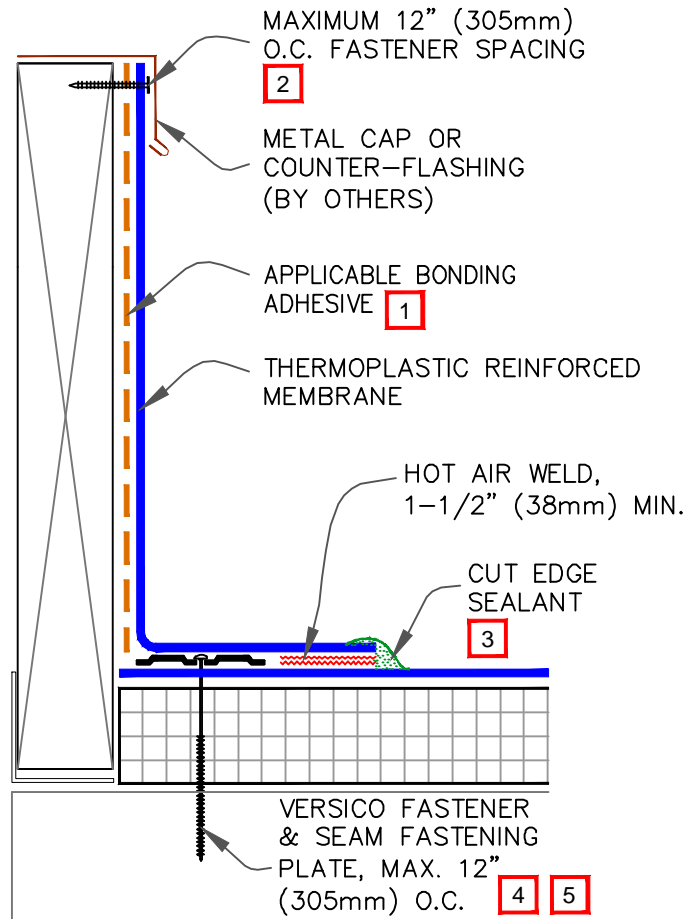


DECK-TO-WALL EXPANSION DETAIL

0 → THERMOPLASTIC REINFORCED MEMBRANE
0 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

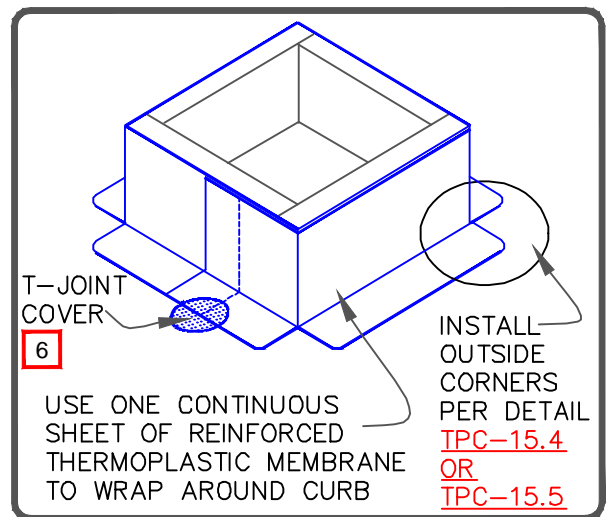
THERMOPLASTIC ROOFING SYSTEM

TPC-3.2



NOTES:

1. WHEN USING TPO MEMBRANE, BONDING ADHESIVE IS NOT REQUIRED WHEN THE FLASHING HEIGHT IS 12" (305mm) OR LESS AND THE MEMBRANE IS FASTENED "AS SHOWN" ON TOP OF THE CURB. WHEN VERSICO TERMINATION BAR IS USED BENEATH THE COUNTER-FLASHING, BONDING ADHESIVE CAN BE ELIMINATED WHEN THE MEMBRANE HEIGHT IS 18" (457mm) OR LESS.
2. 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.
3. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
4. REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENER AND PLATE.
5. MECHANICAL SECUREMENT MAY BE INSTALLED INTO THE VERTICAL SUBSTRATE.
6. WHEN USING 60 OR 80 MIL THICK CURB FLASHING, THE INTERSECTIONS BETWEEN SPLICES MUST BE OVERLAID WITH A THERMOPLASTIC "T-JOINT" COVER.

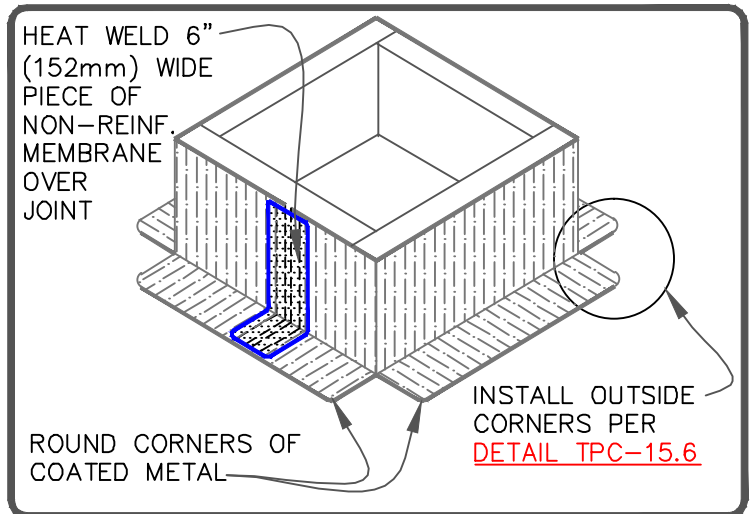
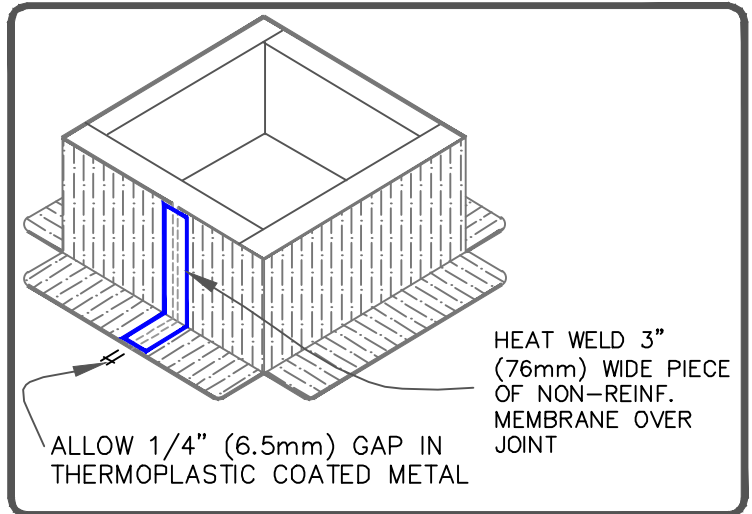
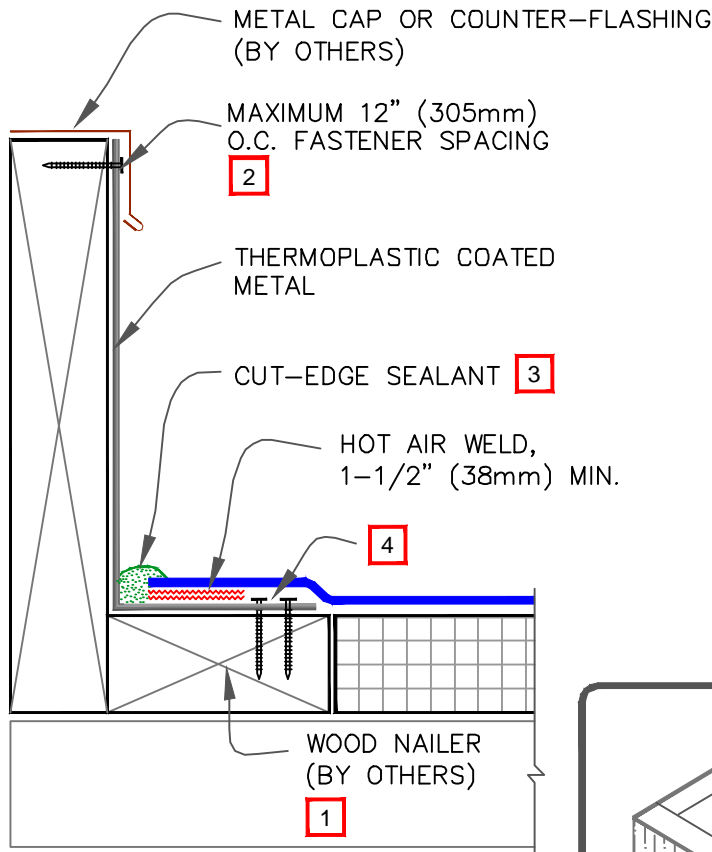


CURB FLASHING

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-5.1

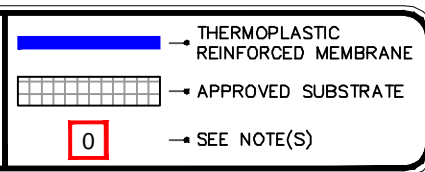


NOTES:

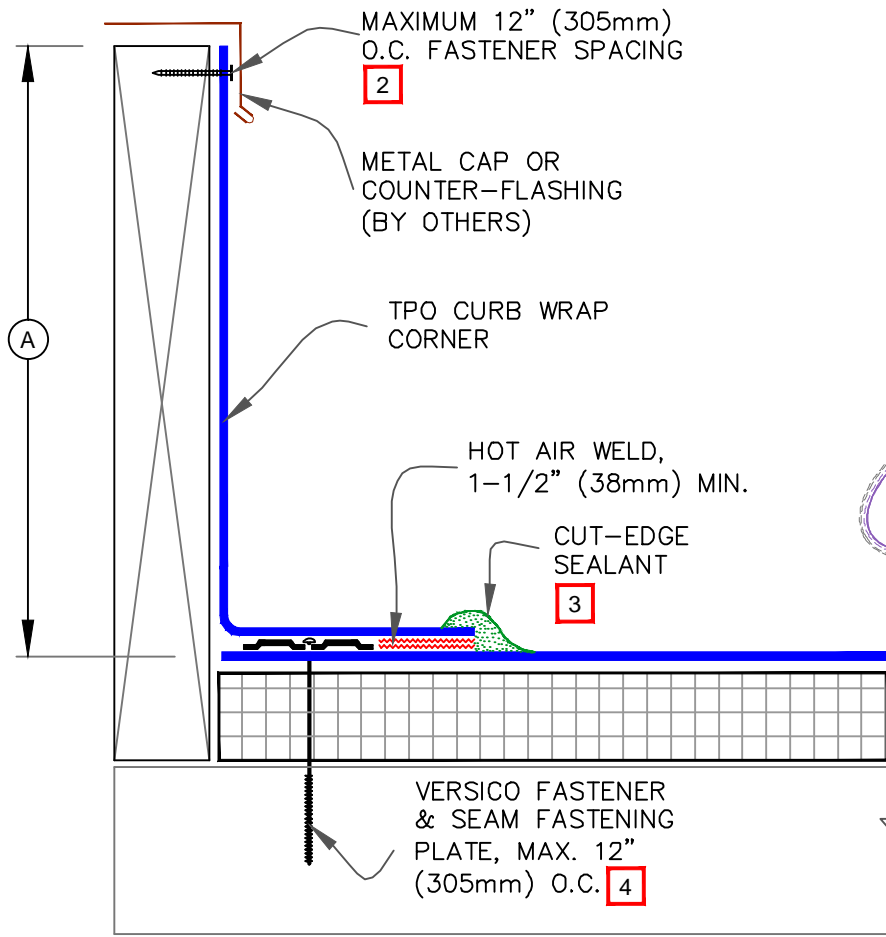
1. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF COATED METAL DECK FLANGE.
2. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR CAULK THE FASTENER HEADS.
3. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
4. FASTEN COATED METAL USING 1-1/2" (38mm) MIN. RING SHANK NAILS AT 6" (152mm) STAGGERED APPROX. 1/2" (13mm).



COATED METAL CURB FLASHING



THERMOPLASTIC ROOFING SYSTEM
TPC-5.2

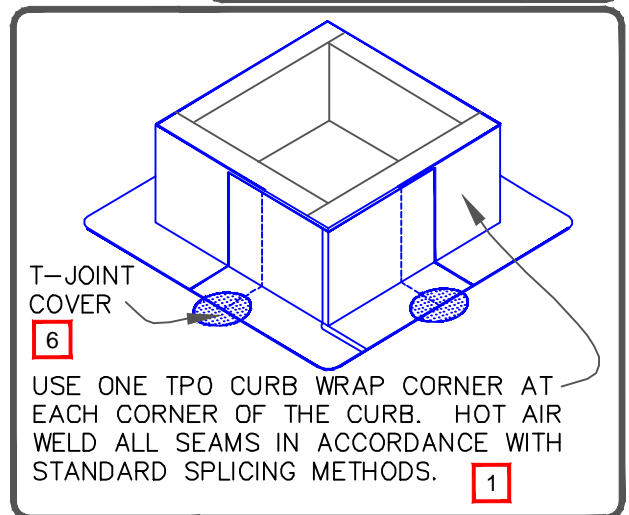


TPO ONLY
(NOT FOR PVC)

NOTES:

1. FOUR (4) CURB WRAP CORNERS WILL COMPLETELY FLASH A MAXIMUM CURB SIZE OF 3'X3' (914mm X 914mm). FOR LARGER CURBS USE THE TPO CURB WRAP CORNERS IN CONJUNCTION WITH ADDITIONAL SECTIONS OF VERSIWELD TPO MEMBRANE.
2. 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.
3. APPROXIMATELY 1/8" (3mm) BEAD OF CUT-EDGE SEALANT IS REQUIRED ON THE CUT EDGES OF THE TPO FIELD WRAP CORNER.
4. REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENERS AND PLATES.
5. CUSTOM SIZES ARE AVAILABLE FOR CURB FLASHING HEIGHTS GREATER THAN 12" (305mm).
6. REGARDLESS OF THE FIELD MEMBRANE THICKNESS, THE INTERSECTIONS BETWEEN SPLICES MUST BE OVERLAID WITH A THERMOPLASTIC "T-JOINT" COVER.

DIMENSIONS		mm
(A)	12"	305



T-JOINT COVER
6

USE ONE TPO CURB WRAP CORNER AT EACH CORNER OF THE CURB. HOT AIR WELD ALL SEAMS IN ACCORDANCE WITH STANDARD SPLICING METHODS. **1**

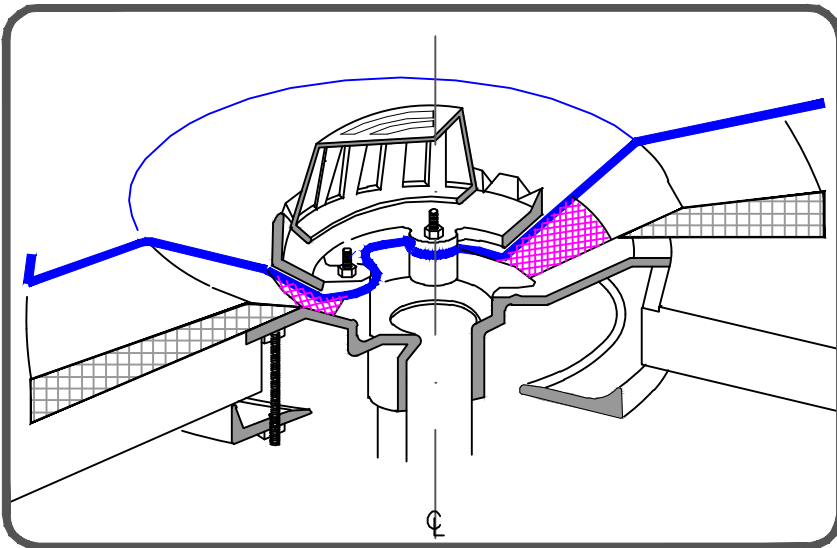
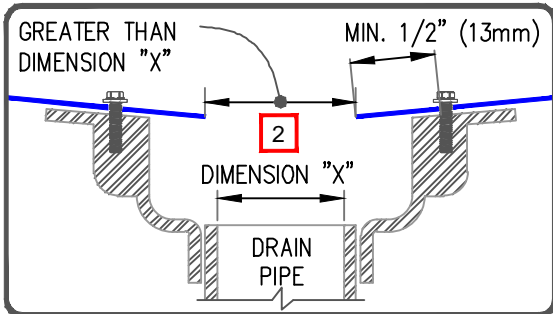
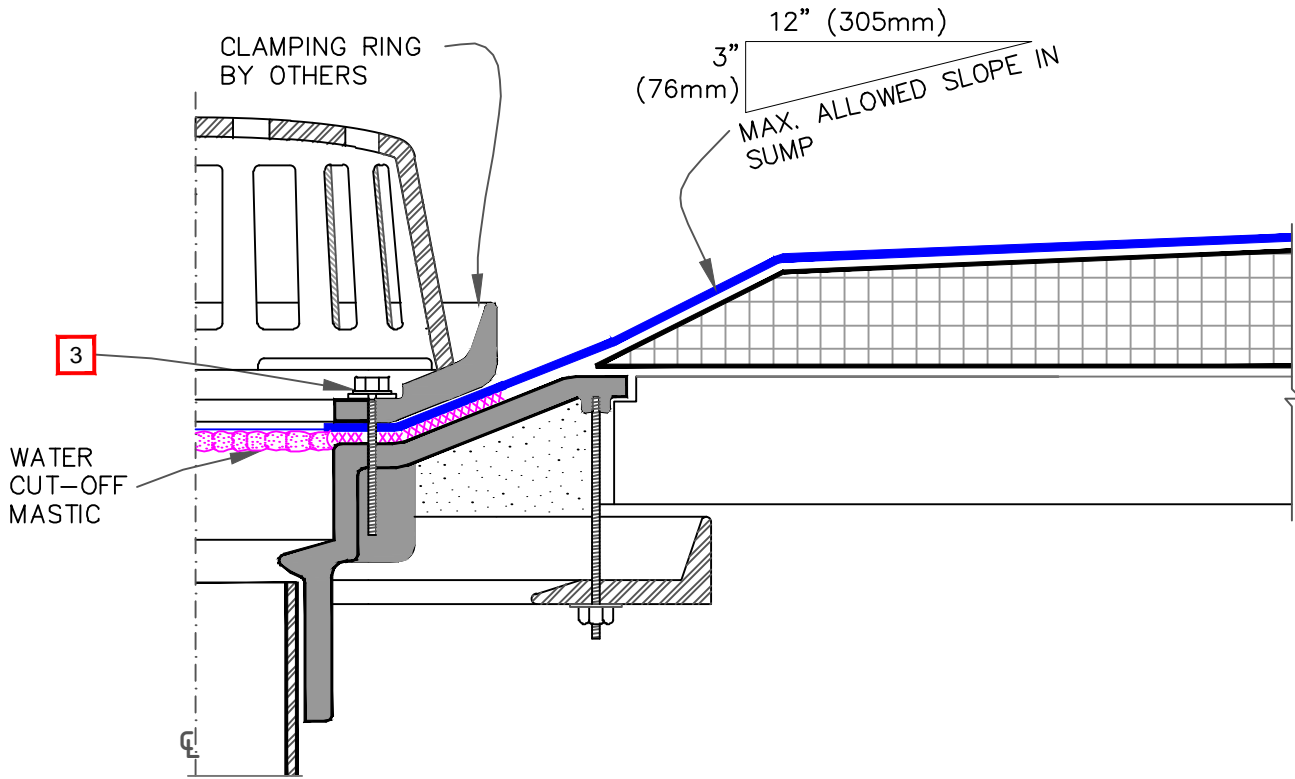


PRE-FABRICATED TPO CURB WRAP CORNER

0 → TPO MEMBRANE
1 → APPROVED SUBSTRATE
2 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-5.3



NOTES:

1. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (13mm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
4. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.

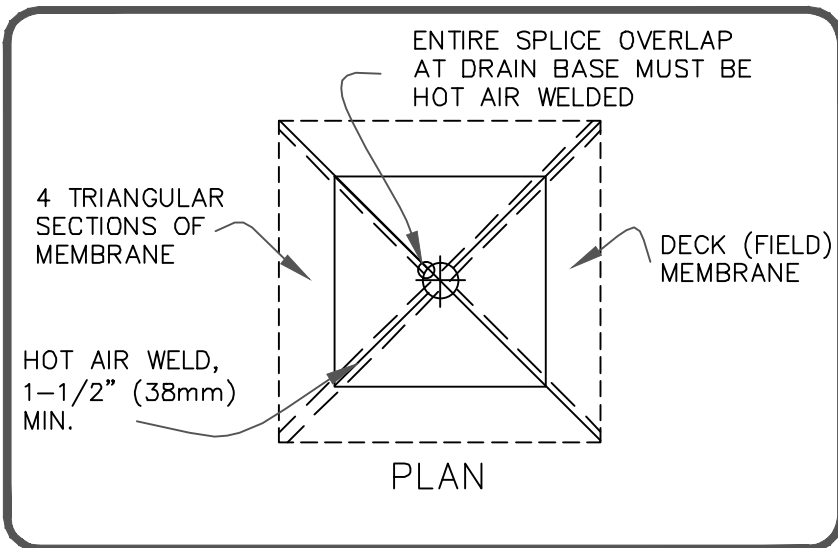
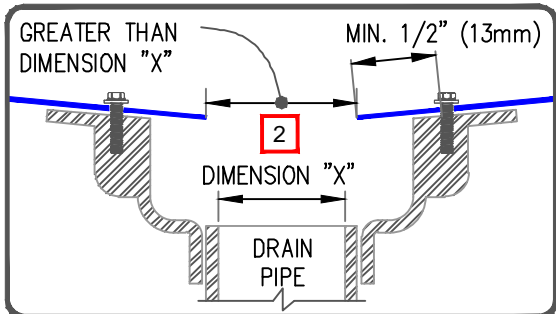
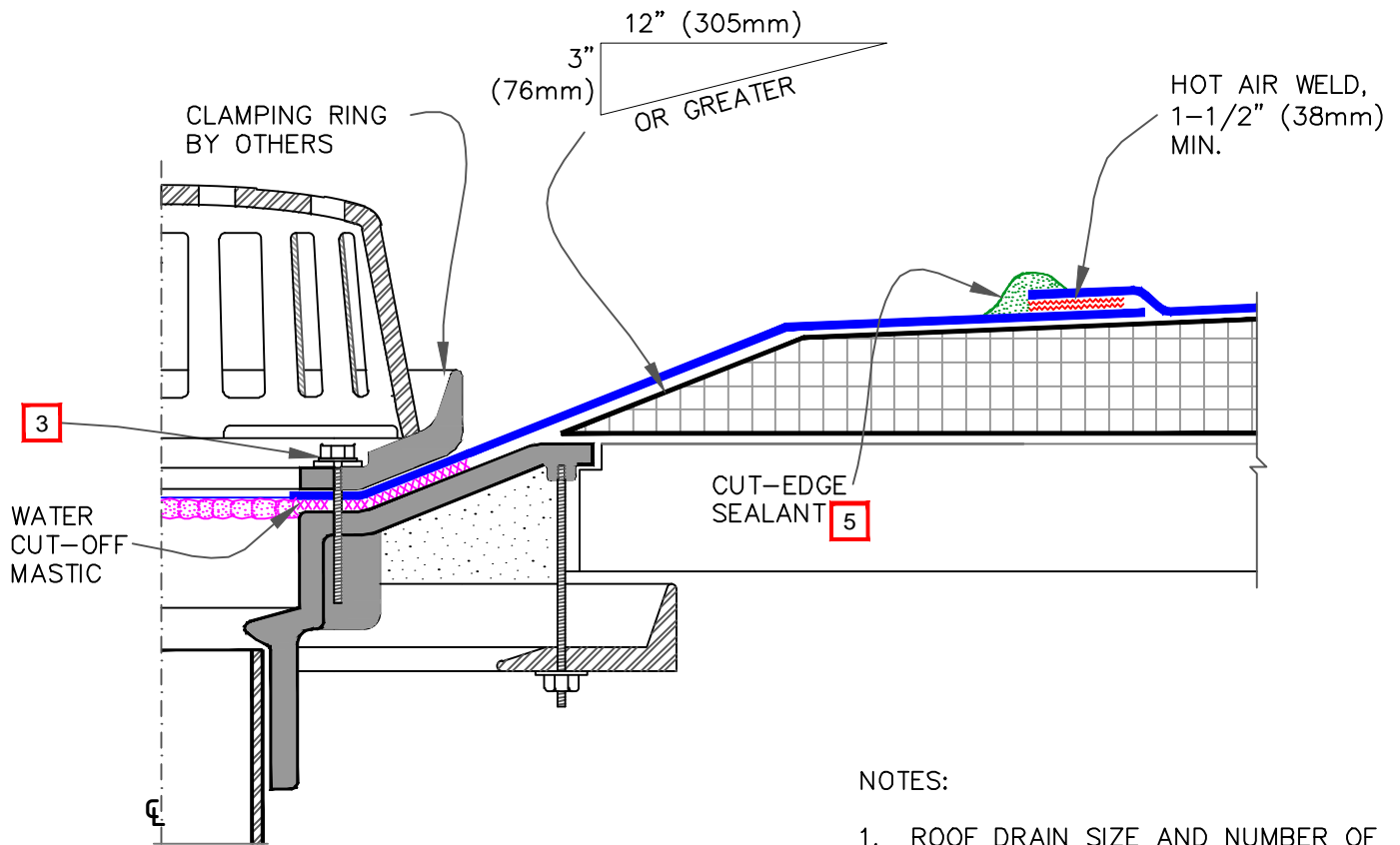


ROOF DRAIN (DRAIN SUMP UP TO 3 INCHES TO 1 HORIZONTAL FOOT)

— → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-6.1






NOTES:

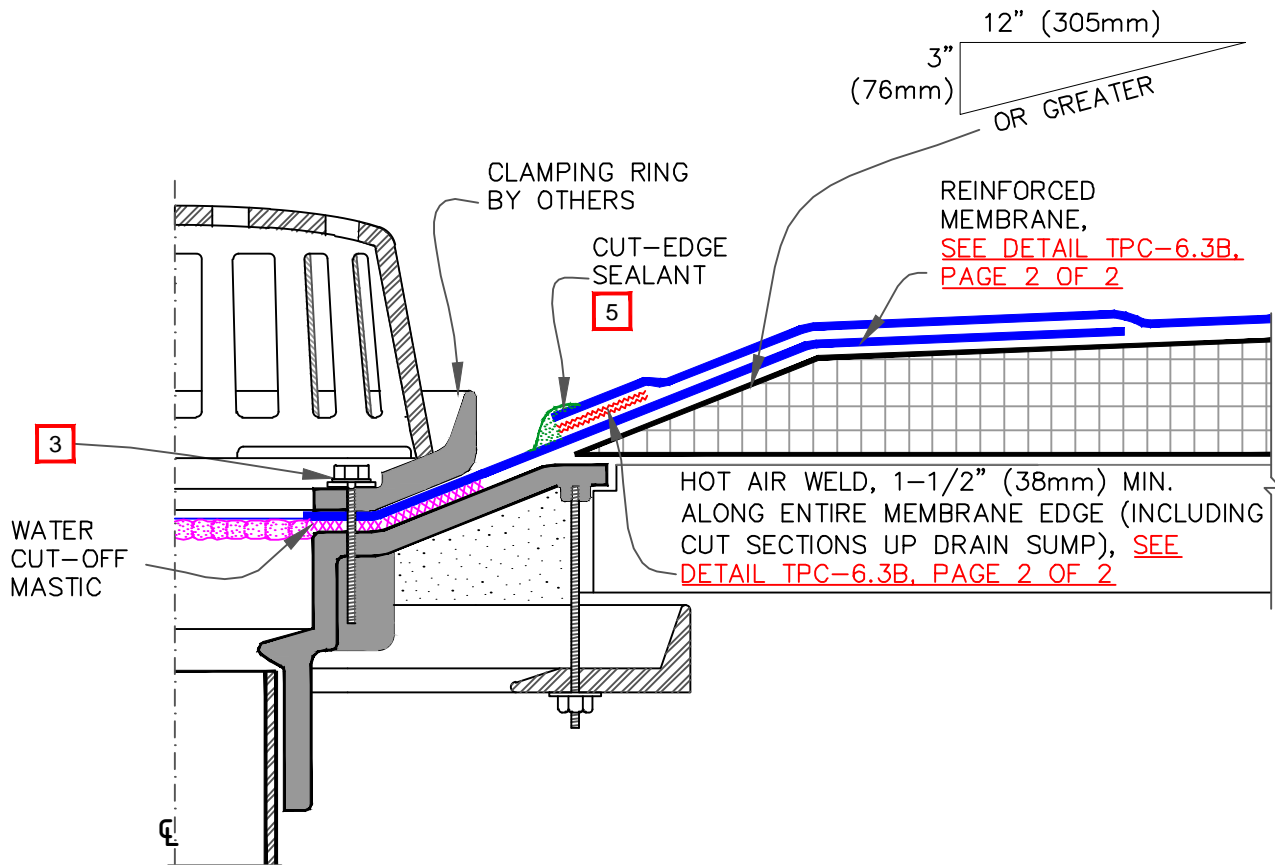
1. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (13mm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
4. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
5. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.



ROOF DRAIN (DRAIN SUMP GREATER THAN 3" TO 1 HORIZONTAL FOOT) OPTION 1

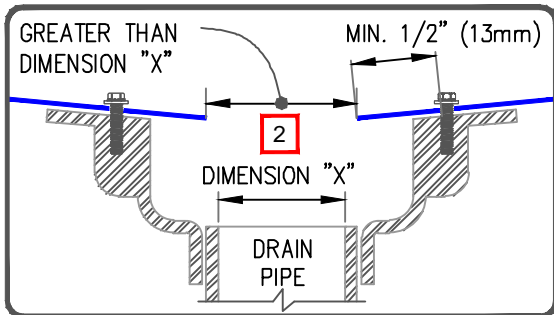
 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-6.2



NOTES:

1. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (13mm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
4. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
5. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.

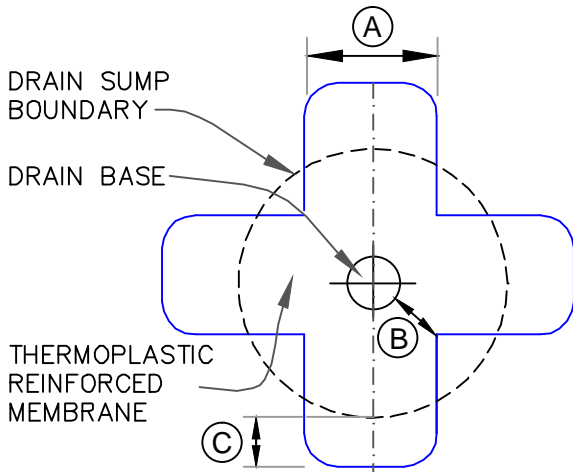


ROOF DRAIN (DRAIN SUMP GREATER THAN 3" TO 1 HORIZONTAL FOOT) OPTION 2, PAGE 1 OF 2

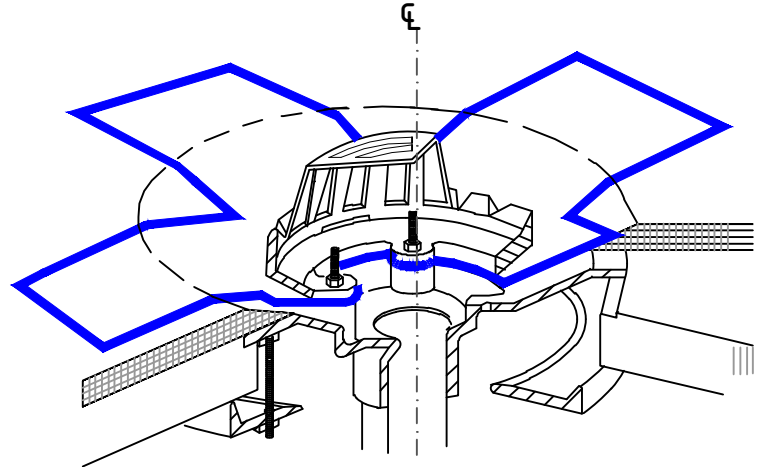
——— → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

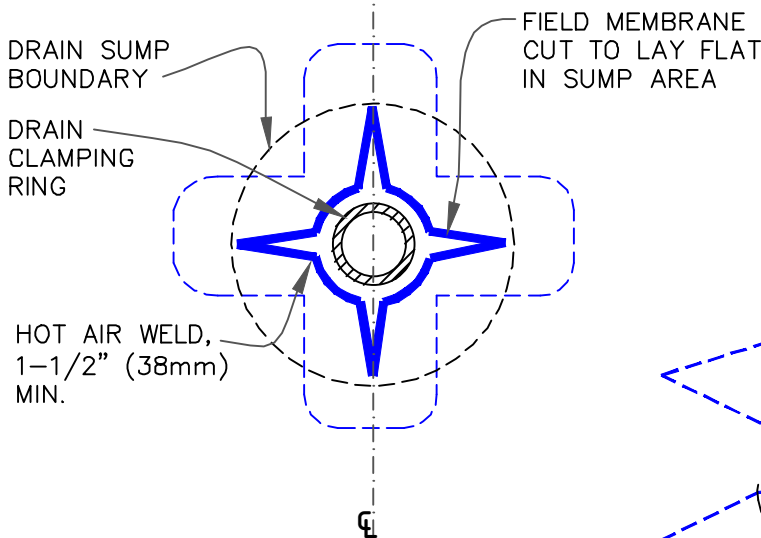
TPC-6.3A



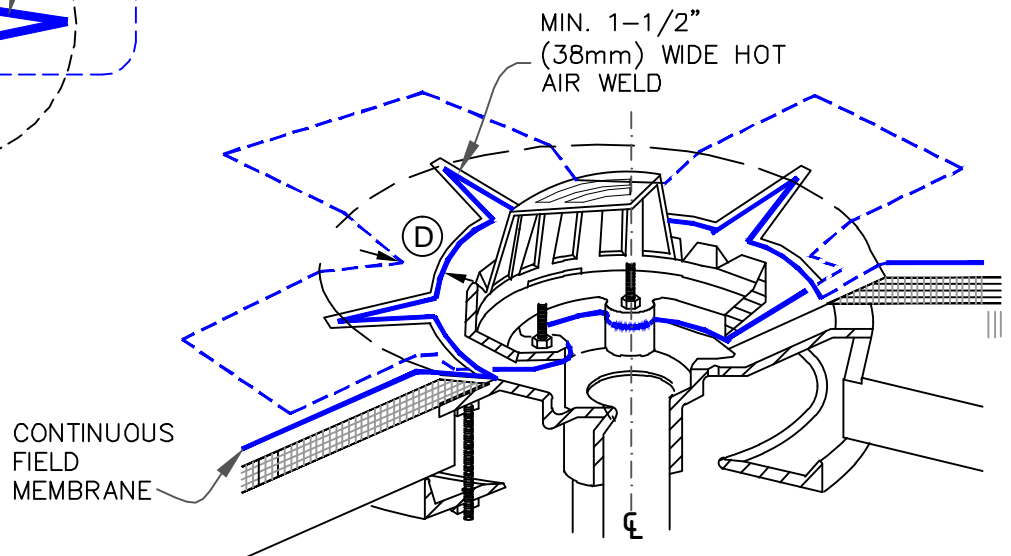
CUT SECTION OF THERMOPLASTIC REINFORCED MEMBRANE AS SHOWN AND POSITION INTO DRAIN SUMP. EXTEND MEMBRANE OUT OF DRAIN SUMP APPROXIMATELY 6" (152mm) (ROUND CORNERS).






EXTEND THERMOPLASTIC MEMBRANE ONTO MEMBRANE SECTION POSITIONED AT DRAIN SUMP AND CUT AS SHOWN TO LAY FLAT IN SUMP. HOT AIR WELD A MINIMUM OF 1-1/2" (38mm) COMPLETELY SURROUNDING AREA.



DIMENSIONS		mm	
(A)	12"	305	MIN.
(B)	6"	152	MIN.
(C)	6"	152	APPROX.
(D)	3"	76	MIN.

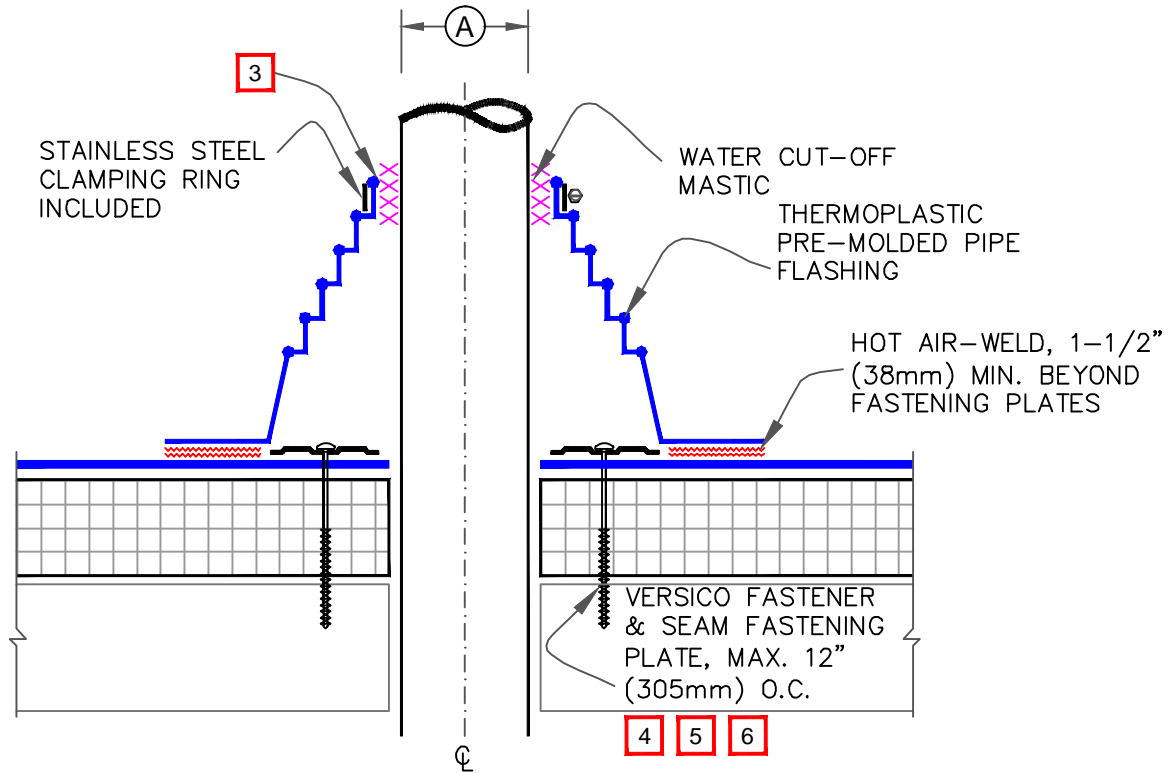


ROOF DRAIN (DRAIN SUMP GREATER THAN 3" TO 1 HORIZONTAL FOOT) OPTION 2, PAGE 2 OF 2

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-6.3B




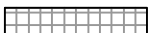

DIMENSIONS	mm	
Ⓐ	3/4"	19 TO
	8"	203

NOTES:

1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING PRE-MOLDED PIPE FLASHING.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
3. PIPE SEAL MUST HAVE INTACT RIB AT TOP EDGE, REGARDLESS OF PIPE DIAMETER.
4. INSTALL A MINIMUM OF 4 FASTENERS AND PLATES AROUND THE PIPE, EQUALLY SPACED. IF FASTENERS AND PLATES CANNOT BE INSTALLED AS SHOWN, THEY MAY ALSO BE POSITIONED OUTSIDE THE PIPE MAXIMUM 12" (305mm) O.C. AND FLASHED WITH THERMOPLASTIC REINFORCED MEMBRANE/CUT-EDGE SEALANT. REFER TO [DETAIL TPC-8.2](#).
5. FASTENERS AND PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (457mm).
6. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.



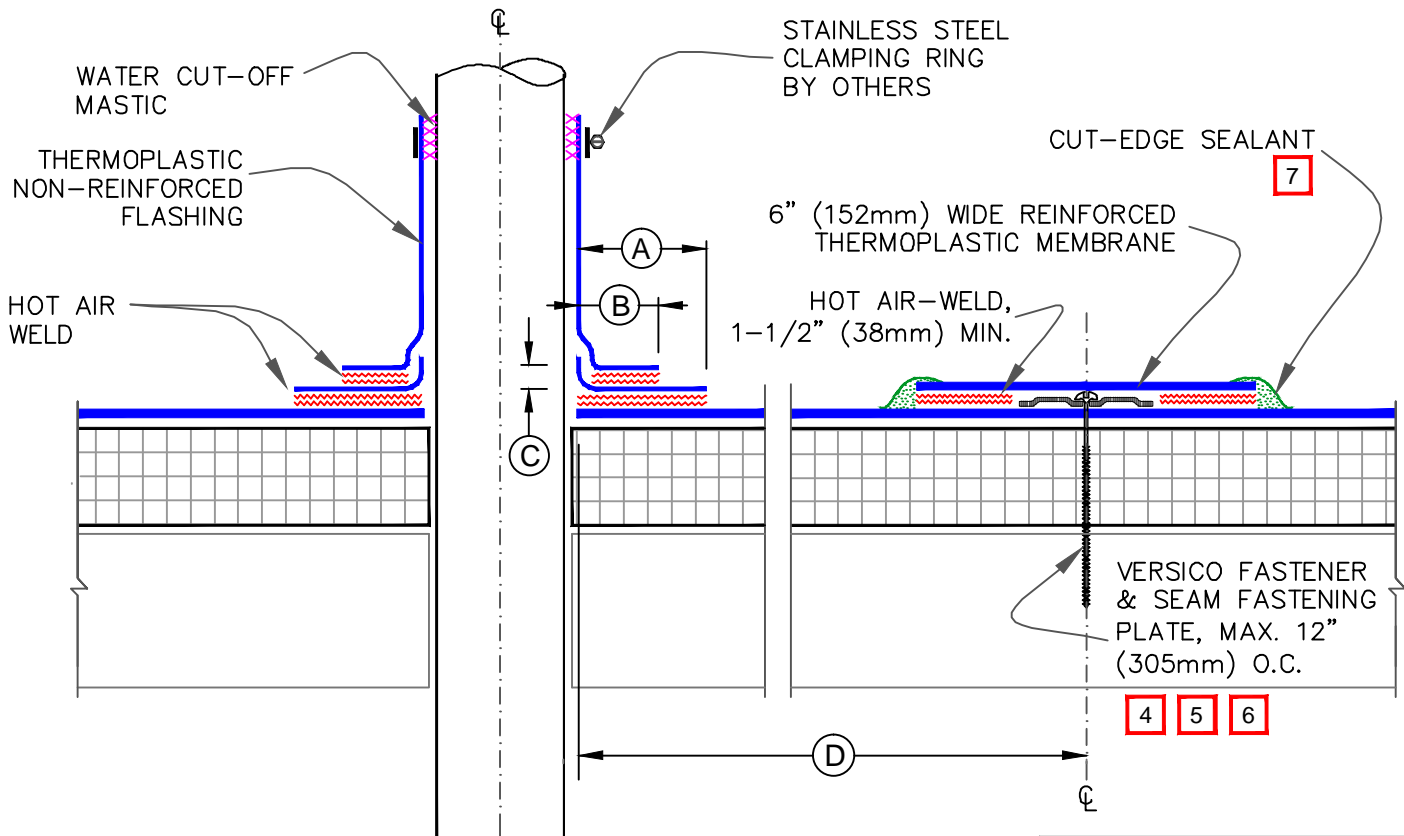
PRE-MOLDED FLASHING

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-8.1

CAUTION DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS, PRE-FABRICATED/PRE-MOLDED ACCESSORIES MUST BE UTILIZED. ACCEPTABLE PIPE FLASHINGS SHALL CONFORM WITH THERMOPLASTIC COMMON DETAILS TPC-8.1, 8.3 OR 8.4.



NOTES:

1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING FIELD FABRICATED PIPE FLASHING.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
3. THERMOPLASTIC NON-REINFORCED FLASHING WRAPPED AROUND PIPE SHALL HAVE MINIMUM 1-1/2" (38mm) VERTICAL HOT AIR WELD.
4. INSTALL A MINIMUM OF 4 SEAM FASTENING PLATES FOR PIPES WITH A DIAMETER UP TO 6" (152mm). ADDITIONAL SEAM FASTENING PLATES WILL BE REQUIRED FOR PIPES GREATER THAN 6" (152mm) IN DIAMETER AND SHALL BE SPACED 12" (305mm) ON CENTER MAXIMUM.
5. FASTENERS/PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (500mm).
6. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
7. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.

DIMENSIONS	mm	
(A) 1-1/2"	38	TO
2"	51	
(B) 1"	25	MIN.
(C) 1/2"	13	MIN.
(D) 12"	305	APPROX.

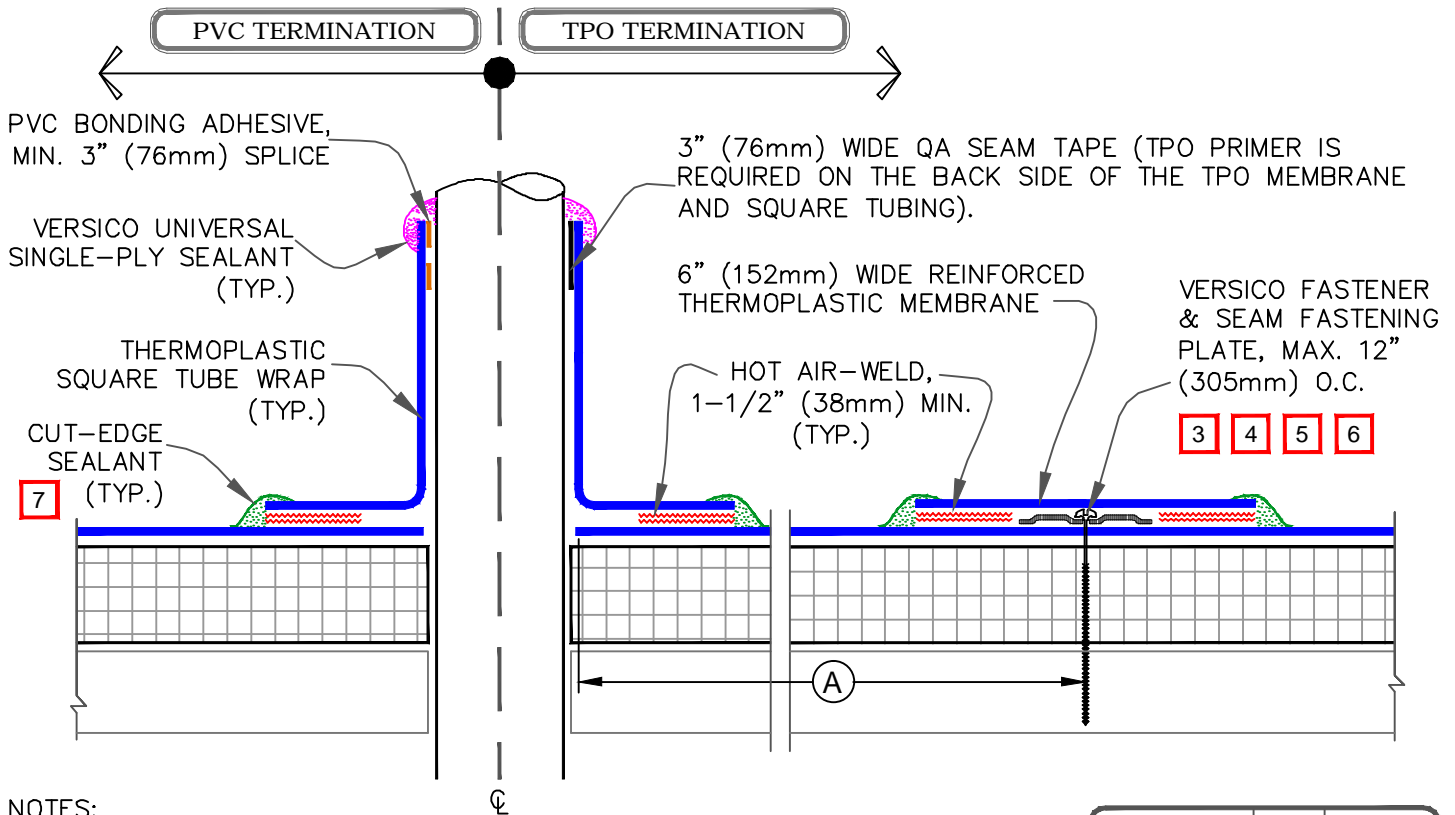


FIELD FABRICATED PIPE FLASHING

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

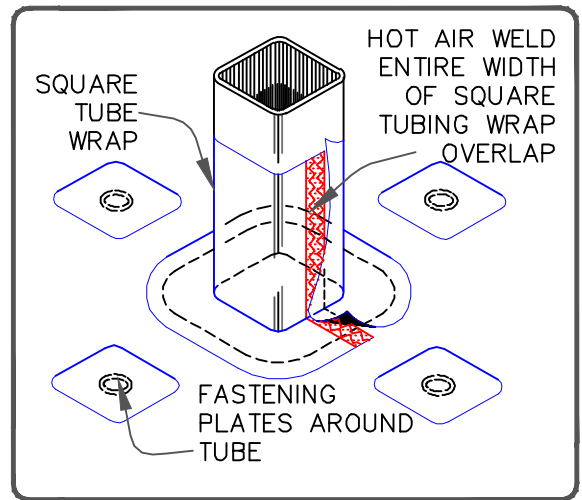
TPC-8.2



NOTES:

1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING PRE-MOLDED PIPE FLASHING.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
3. INSTALL A MINIMUM OF 4 SEAM FASTENING PLATES FOR TUBE SIDE DIMENSIONS UP TO 6" (152mm). ADDITIONAL SEAM FASTENING PLATES WILL BE REQUIRED FOR SIDES GREATER THAN 6" (152mm) AND SHALL BE SPACED 12" (305mm) ON CENTER MAXIMUM.
4. SEAM PLATES MAY BE POSITIONED INSIDE (OR BELOW) THE PIPE FLASHING PROVIDED MINIMUM 1-1/2" (38mm) HOT AIR WELD IS ACHIEVED BEYOND THE PLATES.
5. FASTENERS AND PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS TUBE DIMENSION EXCEEDS 12" (305mm).
6. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
7. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
8. REGARDLESS OF THE FIELD MEMBRANE THICKNESS, THERMOPLASTIC "T-JOINT" COVERS ARE REQUIRED OVER THE SPLICE INTERSECTIONS OF THE SQUARE TUBE WRAP.

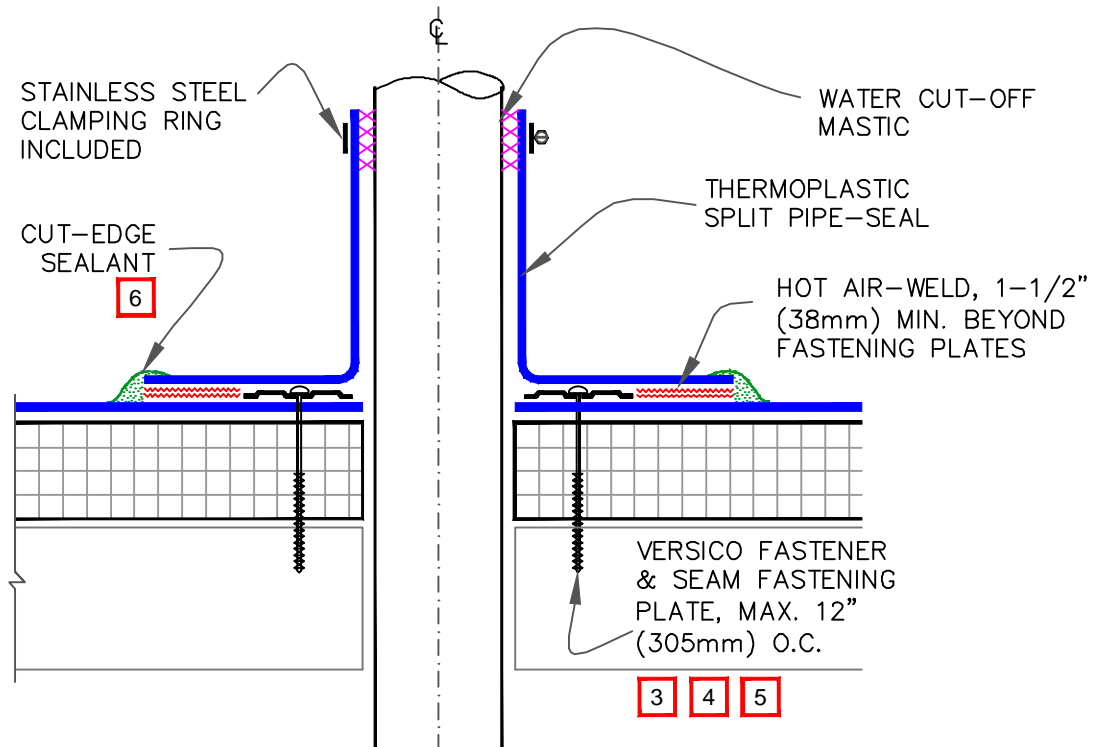
DIMENSIONS		mm
(A)	12"	305 APPROX.



PRE-FABRICATED SQUARE TUBE WRAP

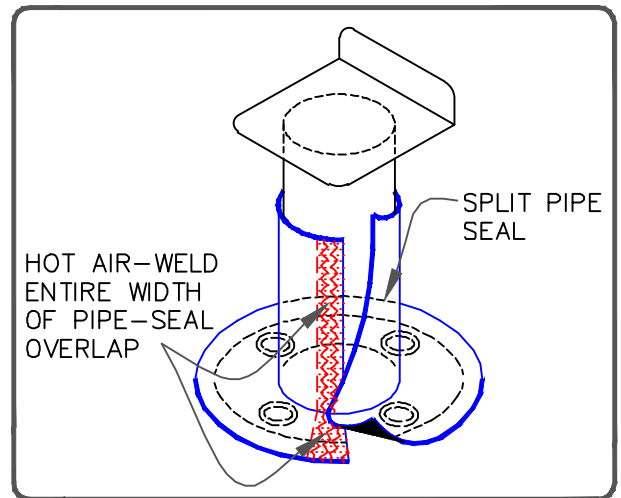
→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-8.3



NOTES:

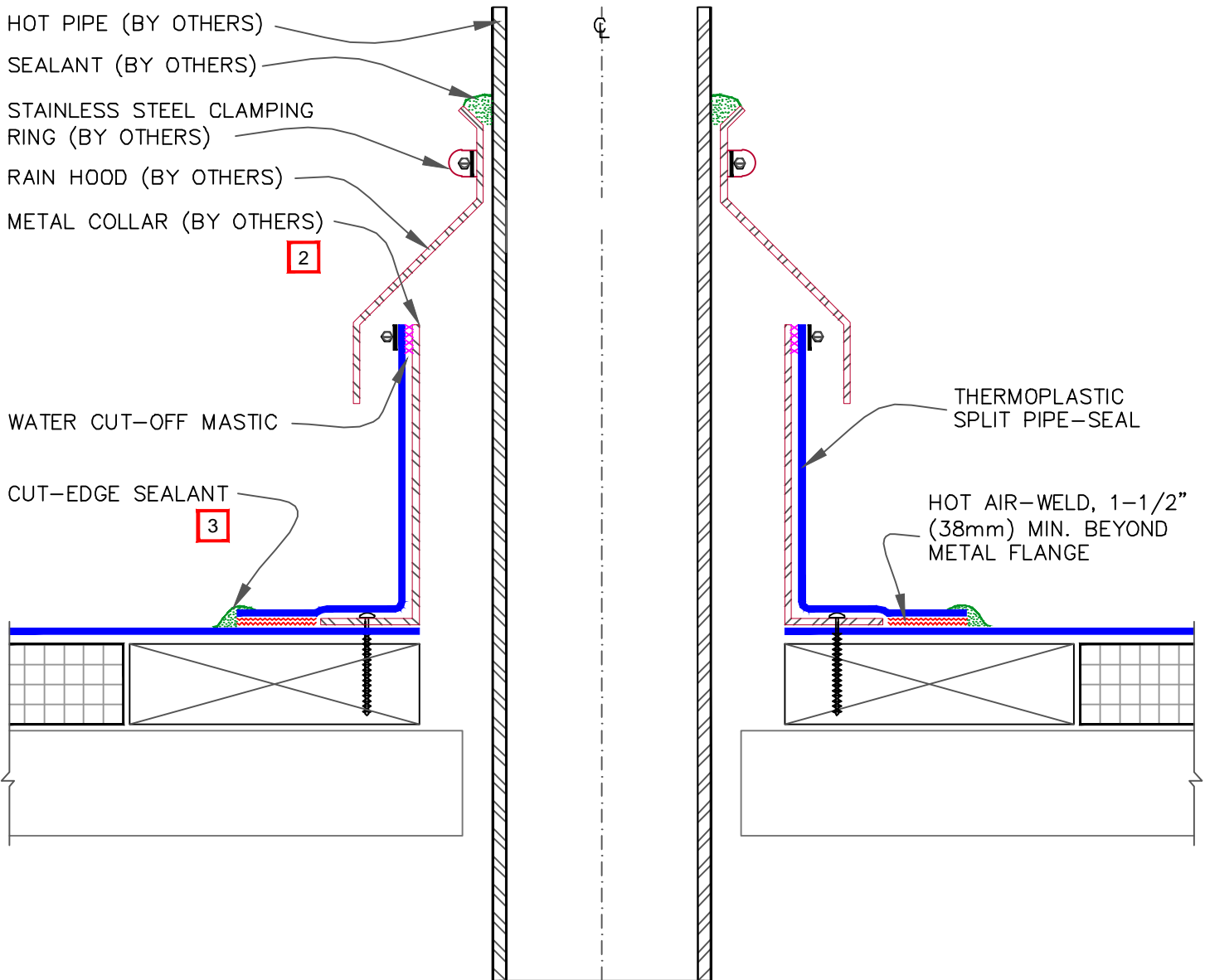
1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING SPLIT PIPE FLASHING.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
3. INSTALL A MINIMUM OF 4 FASTENERS AND PLATES AROUND THE PIPE, EQUALLY SPACED. IF FASTENERS AND PLATES CANNOT BE INSTALLED AS SHOWN, THEY MAY ALSO BE POSITIONED OUTSIDE THE PIPE MAXIMUM 12" (305mm) O.C. AND FLASHED WITH THERMOPLASTIC REINFORCED MEMBRANE/CUT-EDGE SEALANT. REFER TO [DETAIL TPC-8.2](#).
4. FASTENERS AND PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (457mm).
5. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
6. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
7. REGARDLESS OF THE FIELD MEMBRANE THICKNESS, THERMOPLASTIC "T-JOINT" COVERS ARE REQUIRED OVER THE SPLICE INTERSECTIONS OF THE SPLIT PIPE SEAL.



PRE-FABRICATED SPLIT PIPE SEAL

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-8.4



NOTES:

1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING PIPE FLASHING.
2. TEMPERATURE OF THE METAL COLLAR MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
3. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
4. REGARDLESS OF THE FIELD MEMBRANE THICKNESS, THERMOPLASTIC "T-JOINT" COVERS ARE REQUIRED OVER THE SPLICE INTERSECTIONS OF THE SPLIT PIPE SEAL.



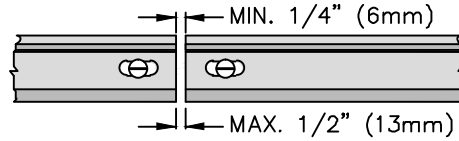
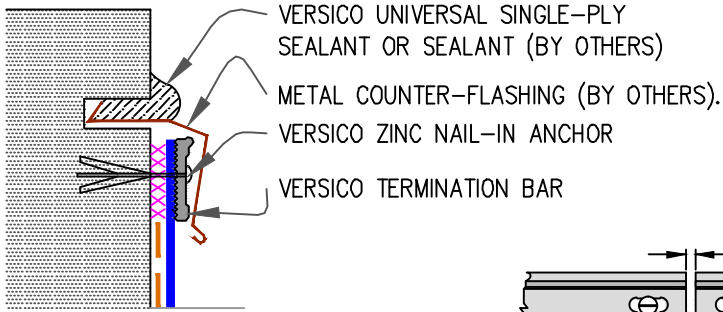
HOT PIPE FLASHING

	→ THERMOPLASTIC REINFORCED MEMBRANE
	→ APPROVED SUBSTRATE
0	→ SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-8.5

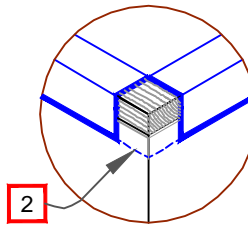
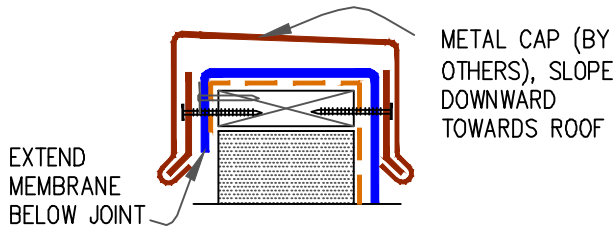
9.1 MECHANICAL TERMINATION WITH COUNTER FLASHING



NOTES:

1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. DO NOT WRAP TERMINATION BAR AROUND CORNERS.

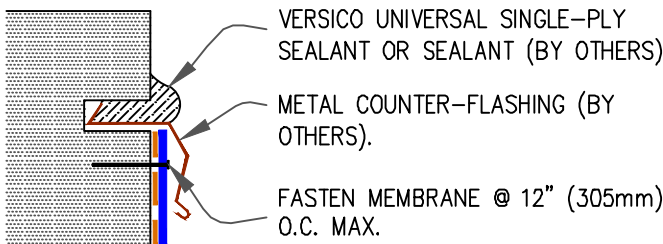
9.2 SHEET METAL COPING (BY OTHERS)



NOTES:

1. FOR VERSICO VERSITRIM COPING, REFER TO INSTALLATION INSTRUCTIONS PUBLISHED SEPARATELY.
2. MEMBRANE MUST BE EXTENDED TO CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE.

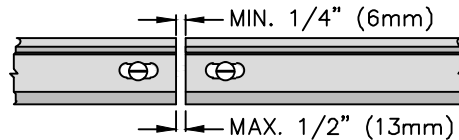
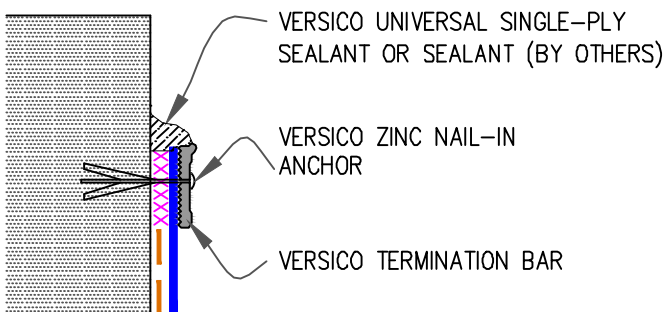
9.3 COUNTER FLASHING TERMINATION



NOTES:

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.
2. DETAIL NOT FOR USE ON WARRANTY PROJECTS EXCEEDING 10-YEARS.

9.4 MECHANICAL TERMINATION



NOTES:

1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. DO NOT WRAP COMPRESSION TERMINATION BAR AROUND CORNERS.
3. DETAIL NOT FOR USE ON WARRANTY PROJECTS EXCEEDING 20-YEARS.

— VERSICO BONDING ADHESIVE

XXXXXXX WATER CUT-OFF MASTIC – MUST BE HELD UNDER CONSTANT COMPRESSION.

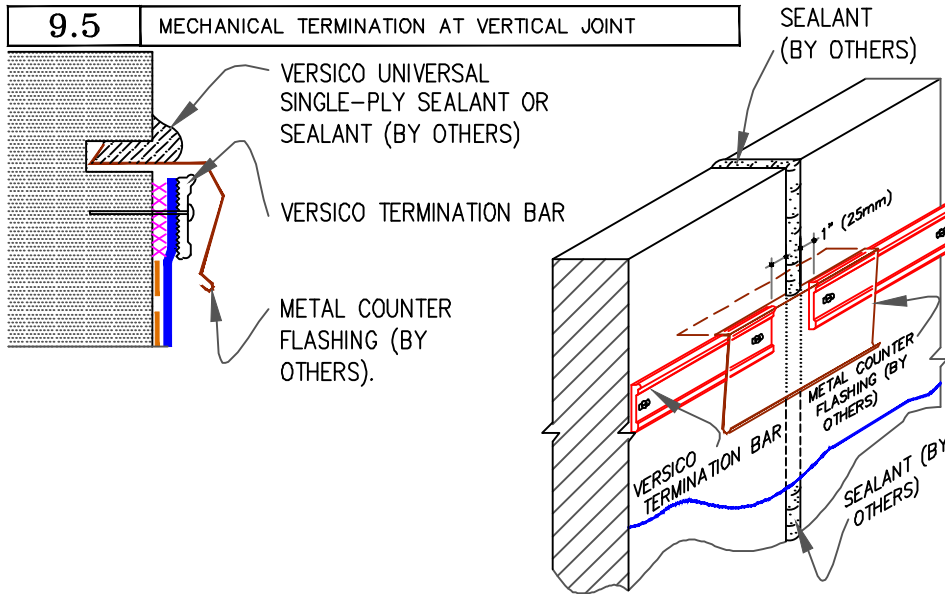


MEMBRANE TERMINATIONS, PAGE 1 OF 2

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-9.0A

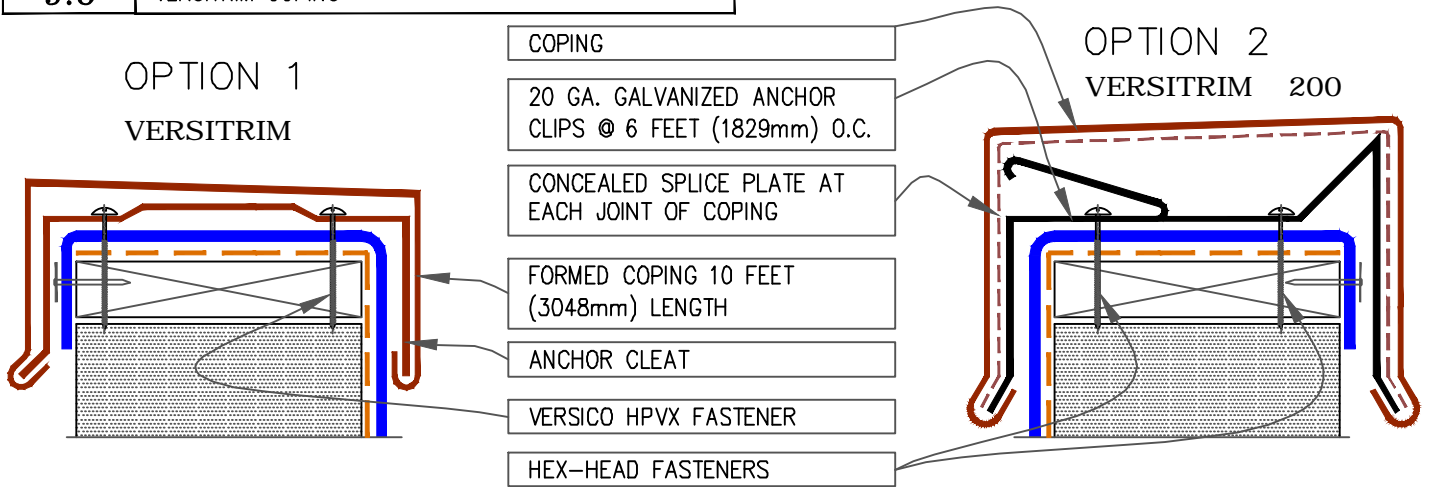
9.5 MECHANICAL TERMINATION AT VERTICAL JOINT



NOTES:

1. APPLY ON HARD SMOOTH SURFACE ONLY.
2. DO NOT WRAP COMPRESSION TERMINATION BAR AROUND CORNERS.
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. CONTINUOUS COUNTER FLASHING REQUIRED FOR WARRANTY PROJECTS EXCEEDING 20-YEARS.

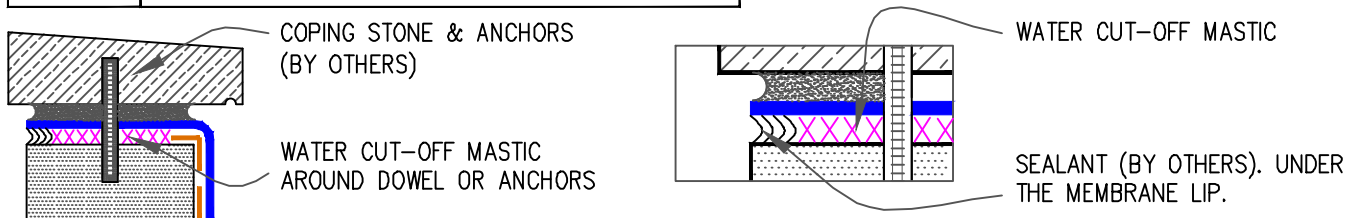
9.6 VERSITRIM COPING



NOTE:

1. MEMBRANE SHOULD BE EXTENDED AT CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE. REFER TO [DETAIL TPC-9.2](#).
2. REFER TO [VERSITRIM COPING INSTALLATION INSTRUCTION](#) MANUAL FOR STEP-BY-STEP INSTRUCTION PROCEDURES.

9.7 COPING STONE TERMINATION

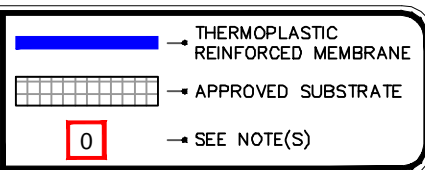


— VERSICO BONDING ADHESIVE

xxxxxxx WATER CUT-OFF MASTIC— MUST BE HELD UNDER CONSTANT COMPRESSION.

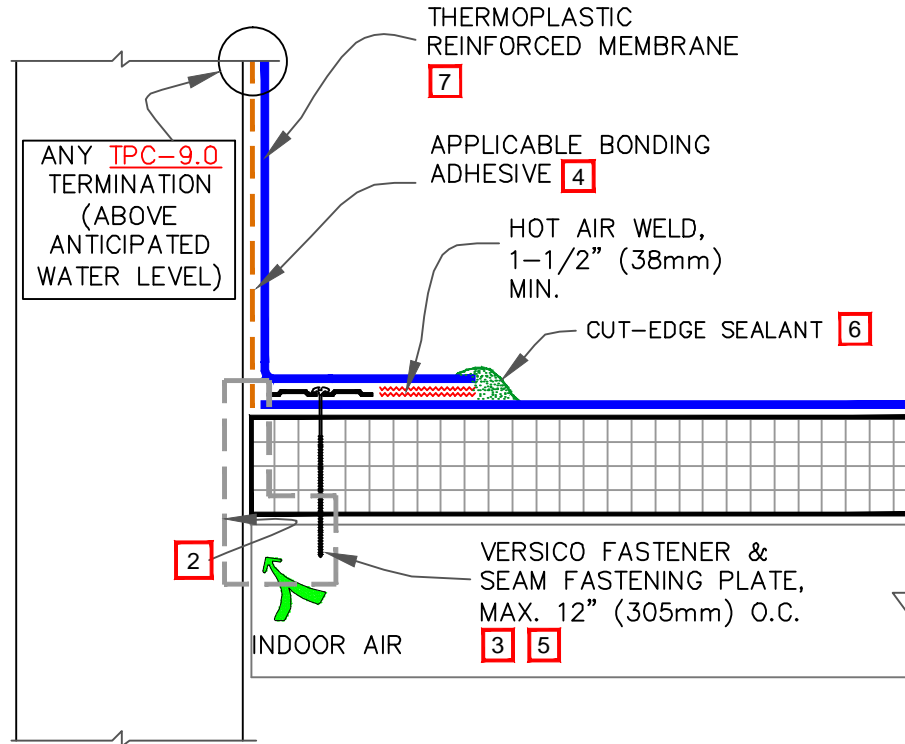


MEMBRANE TERMINATIONS, PAGE 2 OF 2



THERMOPLASTIC ROOFING SYSTEM
TPC-9.0B

CAUTION WHEN A WARRANTY WIND SPEED GREATER THAN 90MPH IS SPECIFIED, VERSICO FASTENERS AND SEAM FASTENING PLATES SHALL NOT EXCEED 6" (152mm) ON CENTER FOR ADHERED MEMBRANE ASSEMBLIES.

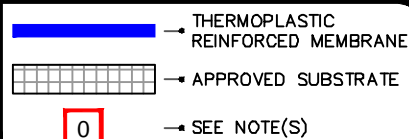


NOTES:

1. POSITION FASTENING PLATES 1/2" (13mm) TO 1" (25mm) FROM EDGE OF DECK MEMBRANE.
2. REFER TO SPECIAL CONDITION [SPEC. SUPPLEMENTS G-01-11 OR G-07-11](#):
 - 2.1. TO BLOCK INDOOR AIR INFILTRATION AND HUMIDITY AT THE JUNCTION (G-01-11).
 - 2.2. WHERE ROOF SYSTEM IS DESIGNED WITH A VAPOR RETARDER (G-07-11).
3. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
4. WHEN USING TPO MEMBRANE, BONDING ADHESIVE IS NOT REQUIRED WHEN THE FLASHING HEIGHT IS 12" (305mm) AND COUNTERFLASHING IS USED FOR TERMINATION. WHEN COPING OR VERSICO TERMINATION BAR IS USED, BONDING ADHESIVE MAY BE ELIMINATED WHEN THE FLASHING HEIGHT IS 18" (457mm) OR LESS.
5. IN A CASE WHERE FASTENERS MUST BE FASTENED INTO THE VERTICAL SURFACE, CARE MUST BE TAKEN TO CREASE THE MEMBRANE TIGHTLY INTO THE ANGLE CHANGE. PLACING THE PLATES TIGHT INTO THE ANGLE CHANGE WILL HELP HOLD THE MEMBRANE IN THE PROPER POSITION.
6. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
7. WHEN PARAPET WALL HEIGHT EXCEEDS 48" (1219mm), REFER TO DETAILS TPC-12.4 OR TPC-12.5 FOR ADDITIONAL REQUIREMENTS WHEN USING PVC MEMBRANE ONLY.

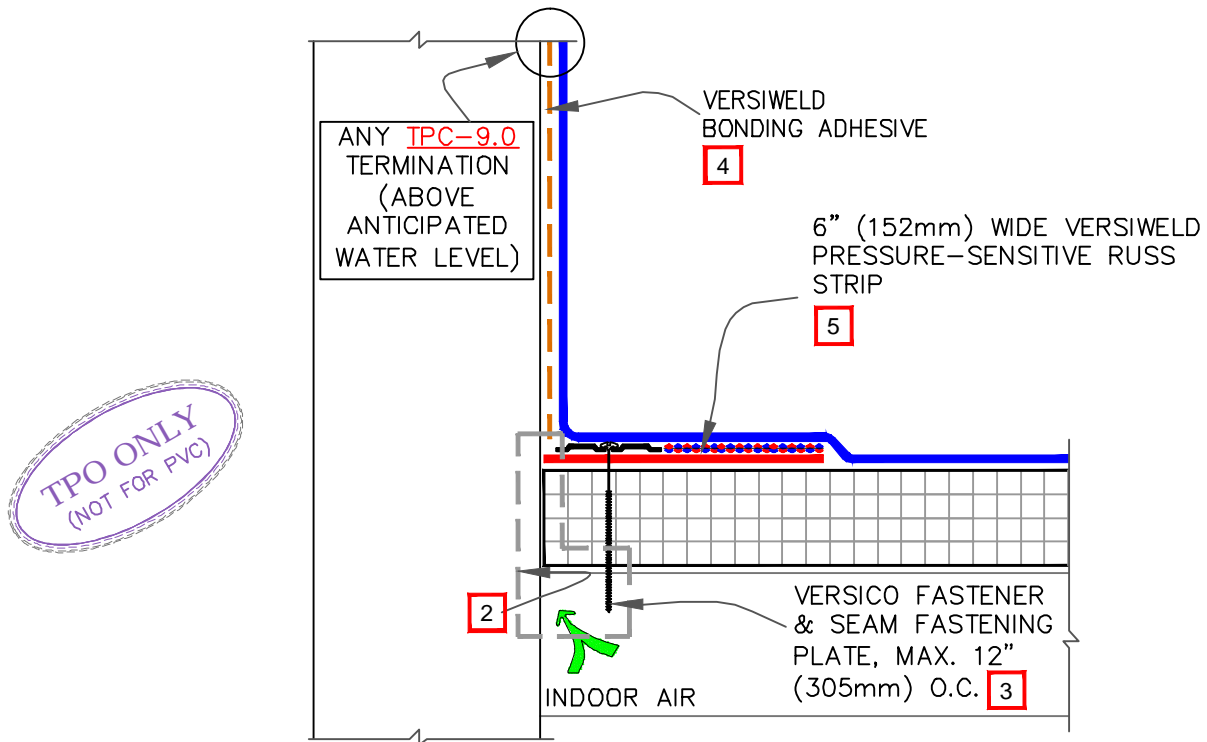


PARAPET FLASHING

THERMOPLASTIC
ROOFING SYSTEM

TPC-12.1

CAUTION WHEN A WARRANTY WIND SPEED GREATER THAN 90MPH IS SPECIFIED, VERSIWELD FASTENERS AND SEAM FASTENING PLATES SHALL NOT EXCEED 6" (152mm) ON CENTER FOR ADHERED MEMBRANE ASSEMBLIES.

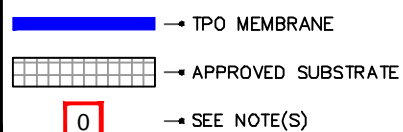


NOTES:

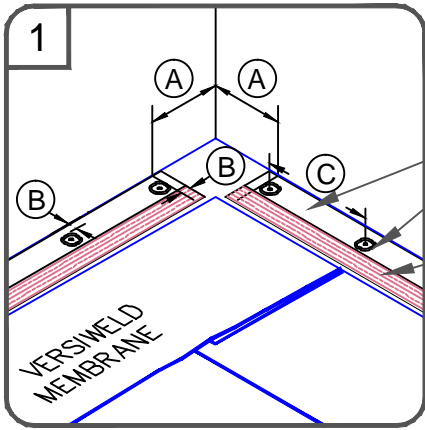
1. FOR INSIDE CORNER AND RUSS APPLICATION SEE [TPC-12.2B](#).
2. REFER TO SPECIAL CONDITION [SPEC. SUPPLEMENTS G-01-11 OR G-07-11](#):
 - 2.1. TO BLOCK INDOOR AIR INFILTRATION AND HUMIDITY AT THE JUNCTION (G-01-11).
 - 2.2. WHERE ROOF SYSTEM IS DESIGNED WITH A VAPOR RETARDER (G-07-11).
3. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
4. WHEN COUNTERFLASHING IS USED FOR TERMINATION, BONDING ADHESIVE IS NOT REQUIRED WHEN FLASHING HEIGHT IS 12" (305 mm) OR LESS. WHEN COPING OR TERMINATION BAR IS USED, ADHESIVE MAY BE ELIMINATED WHEN FLASHING HEIGHT IS 18" (457mm) OR LESS.
5. TPO PRIMER MUST BE APPLIED TO BACK SIDE OF THE VERSIWELD MEMBRANE PRIOR TO COMPLETING SPLICE TO PRESSURE-SENSITIVE RUSS.
6. IN A CASE WHERE FASTENERS MUST BE FASTENED INTO THE VERTICAL SURFACE, CARE MUST BE TAKEN TO CREASE THE RUSS AS WELL AS THE MEMBRANE TIGHTLY INTO THE ANGLE CHANGE TO MAXIMIZE CONTACT BETWEEN THE TAPE AND MEMBRANE. MEMBRANE MUST BE ADHERED TO THE FULL WIDTH OF THE TAPE. PLACING THE PLATES TIGHT INTO THE ANGLE CHANGE WILL HELP HOLD THE RUSS IN THE PROPER POSITION.



PARAPET FLASHING WITH
PRESSURE-SENSITIVE
RUSS, PAGE 1 OF 2



THERMOPLASTIC
ROOFING SYSTEM
TPC-12.2A



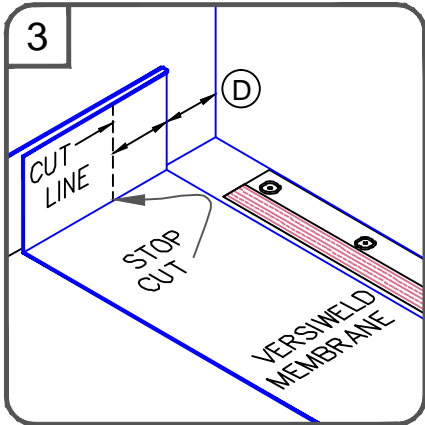
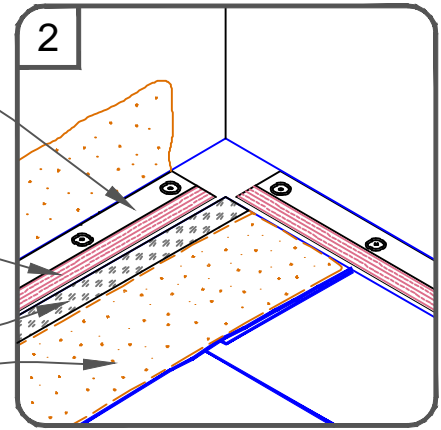
6" (152mm) WIDE
PRESSURE-SENSITIVE
RUSS

VERSICO FASTENER &
SEAM FASTENING PLATE,
MAX. 12" (305mm) O.C.

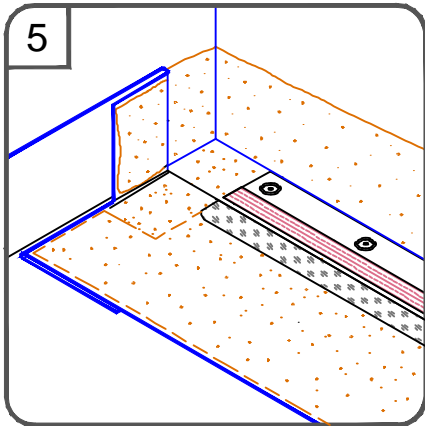
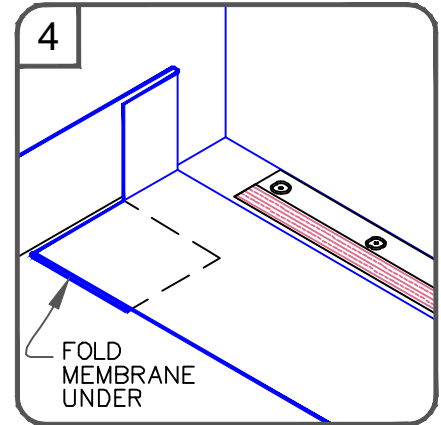
PRE-APPLIED QUICK
APPLIED TAPE

TPO PRIMER

VERSIWELD
BONDING ADHESIVE

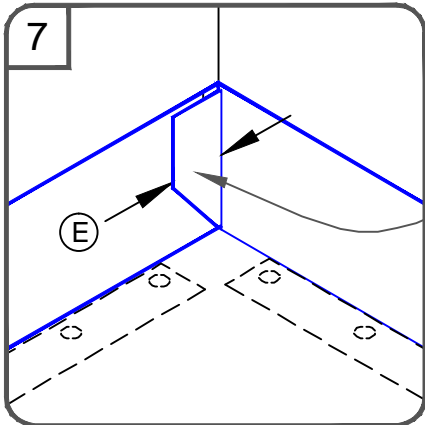
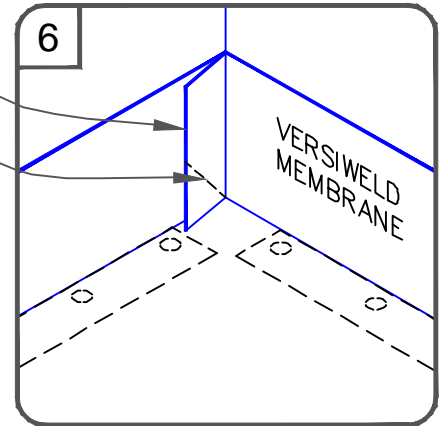


DIMENSIONS	mm	
(A) 6"	152	TO
9"	229	
(B) 1/8"	3	MIN.
1"	25	MAX.
(C) 12"	305	MIN.
(D) 6"	152	MIN.
(E) 1-1/2"	38	MIN.

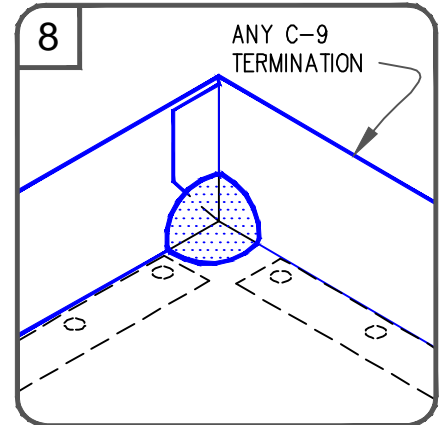


HOT AIR WELD FLAP
IN STEP 7

CUT AT 45°



HOT AIR WELD



NOTES:

1. THE CUT SECTION OF VERTICAL MEMBRANE WILL BE FOLDED UNDER THE FIELD MEMBRANE AS SHOWN IN STEP 4.
2. APPLY INSIDE CORNER IN ACCORDANCE WITH VERSICO [DETAILS TPC-15.1 OR TPC-15.2.](#)

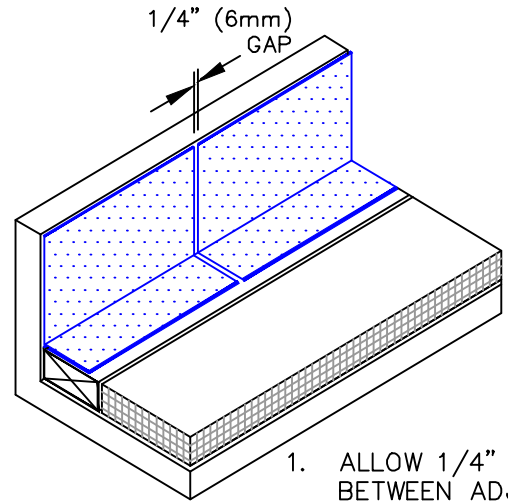
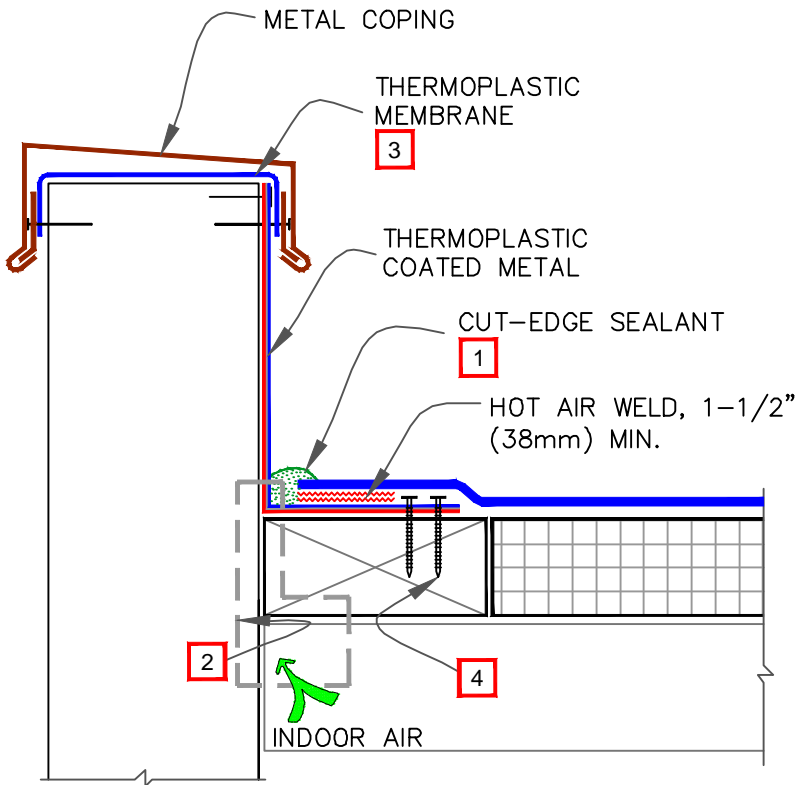
TPO ONLY
(NOT FOR PVC)



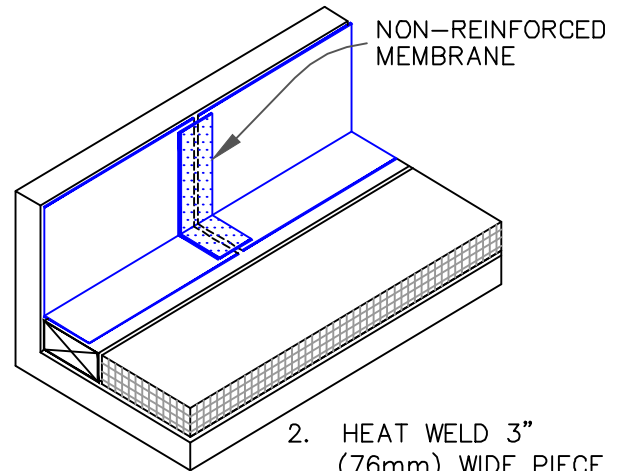
PARAPET FLASHING WITH
PRESSURE-SENSITIVE
RUSS, PAGE 2 OF 2

→ TPO MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

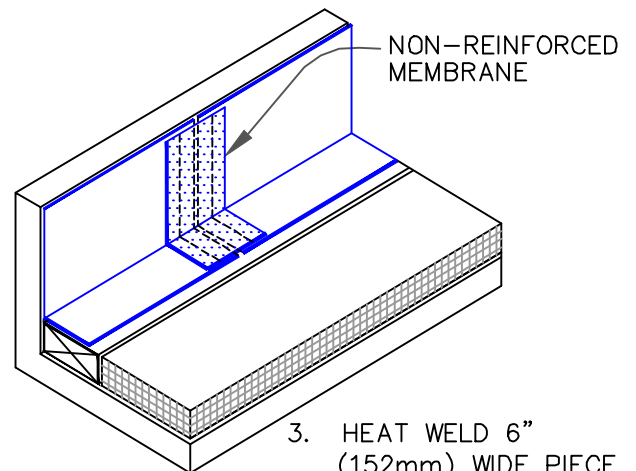
THERMOPLASTIC
ROOFING SYSTEM
TPC-12.2B



1. ALLOW 1/4" GAP BETWEEN ADJOINING SECTIONS OF COATED METAL.



2. HEAT WELD 3" (76mm) WIDE PIECE OF NON-REINF. MEMBRANE OVER JOINT.



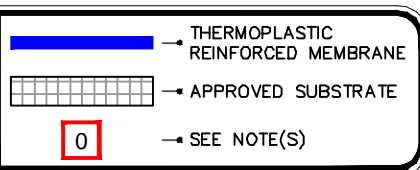
3. HEAT WELD 6" (152mm) WIDE PIECE OF NON-REINF. MEMBRANE OVER JOINT.

NOTES:

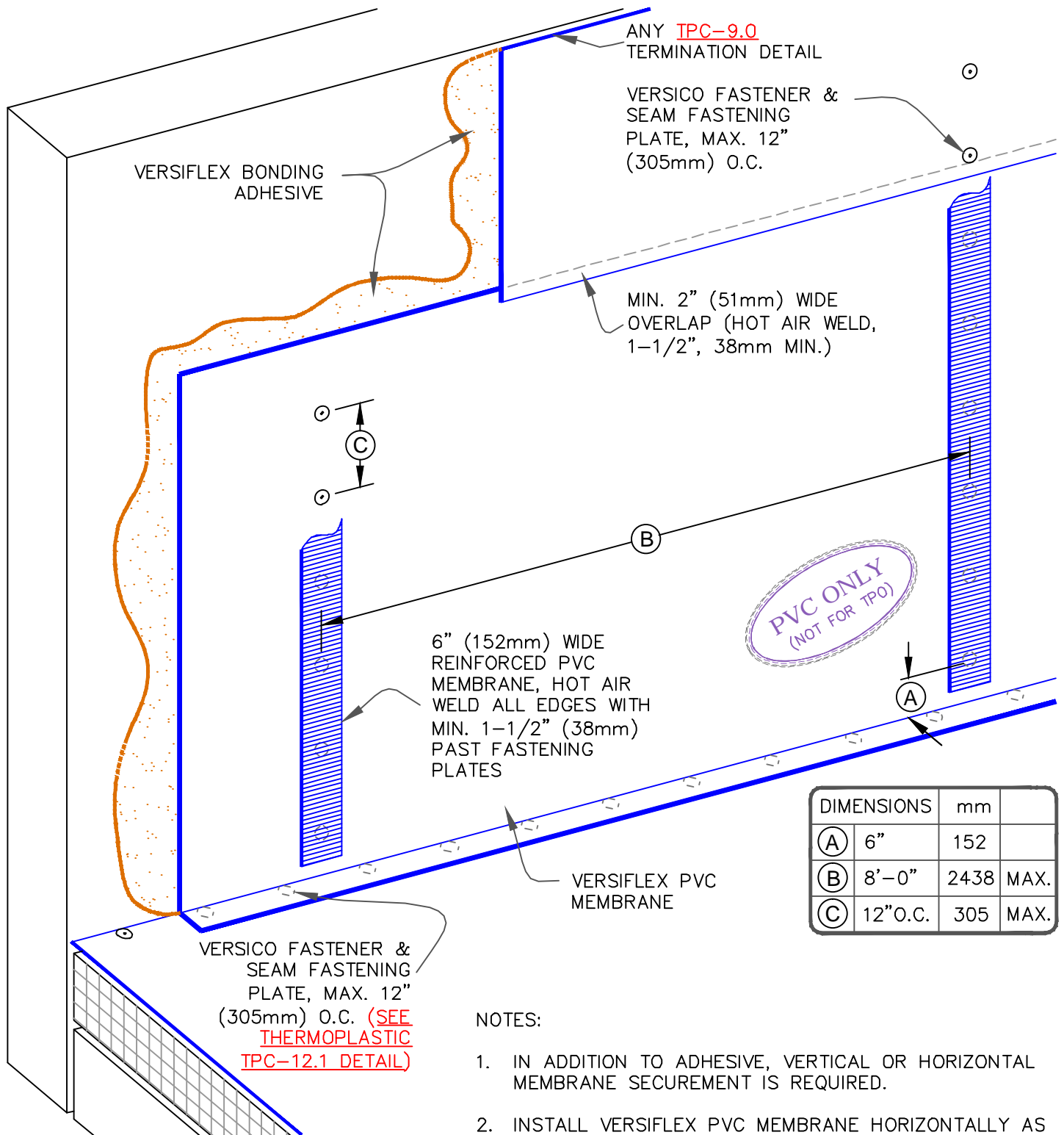
1. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
2. REFER TO SPECIAL CONDITION [SPEC. SUPPLEMENTS G-01-11 OR G-07-11](#):
 - 2.1. TO BLOCK INDOOR AIR INFILTRATION AND HUMIDITY AT THE JUNCTION (G-01-11).
 - 2.2. WHERE ROOF SYSTEM IS DESIGNED WITH A VAPOR RETARDER (G-07-11).
3. PLACE A LAYER OF THERMOPLASTIC MEMBRANE UNDER THE METAL CAP TO PROTECT AGAINST MOISTURE INFILTRATION AT JOINTS.
4. FASTEN COATED METAL FLASHING TO WOOD NAILERS USING 1-1/2" (38mm) MIN. RING SHANK NAILS SPACED 6" (152mm) ON CENTER AND STAGGERED APPROX. 1/2" (13mm).



COATED METAL WALL FLASHING



THERMOPLASTIC ROOFING SYSTEM
TPC-12.3



NOTES:

1. IN ADDITION TO ADHESIVE, VERTICAL OR HORIZONTAL MEMBRANE SECUREMENT IS REQUIRED.
2. INSTALL VERSIFLEX PVC MEMBRANE HORIZONTALLY AS SHOWN WITH LENGTH PARALLEL TO THE BASE OF THE WALL.
3. ADDITIONAL SECUREMENT IS NOT REQUIRED WHEN FLASHING TERMINATION IS 48" (1219mm) OR LESS.

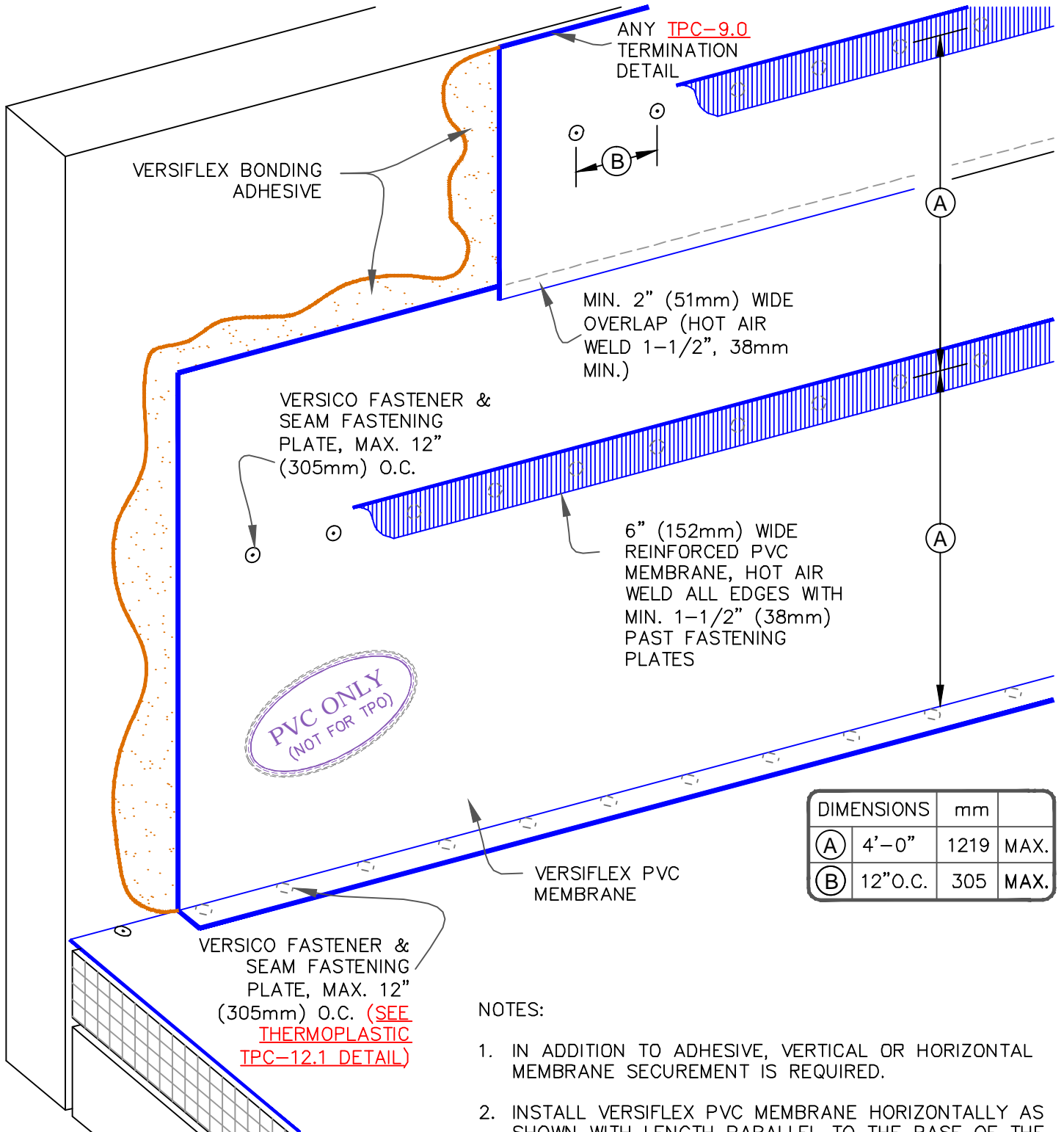


PARAPET FLASHING > 48" (1200mm) - VERTICAL SECUREMENT

→ PVC MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-12.4


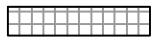



NOTES:

1. IN ADDITION TO ADHESIVE, VERTICAL OR HORIZONTAL MEMBRANE SECUREMENT IS REQUIRED.
2. INSTALL VERSIFLEX PVC MEMBRANE HORIZONTALLY AS SHOWN WITH LENGTH PARALLEL TO THE BASE OF THE WALL.
3. ADDITIONAL SECUREMENT IS NOT REQUIRED WHEN FLASHING TERMINATION IS 48" (1219mm) OR LESS.

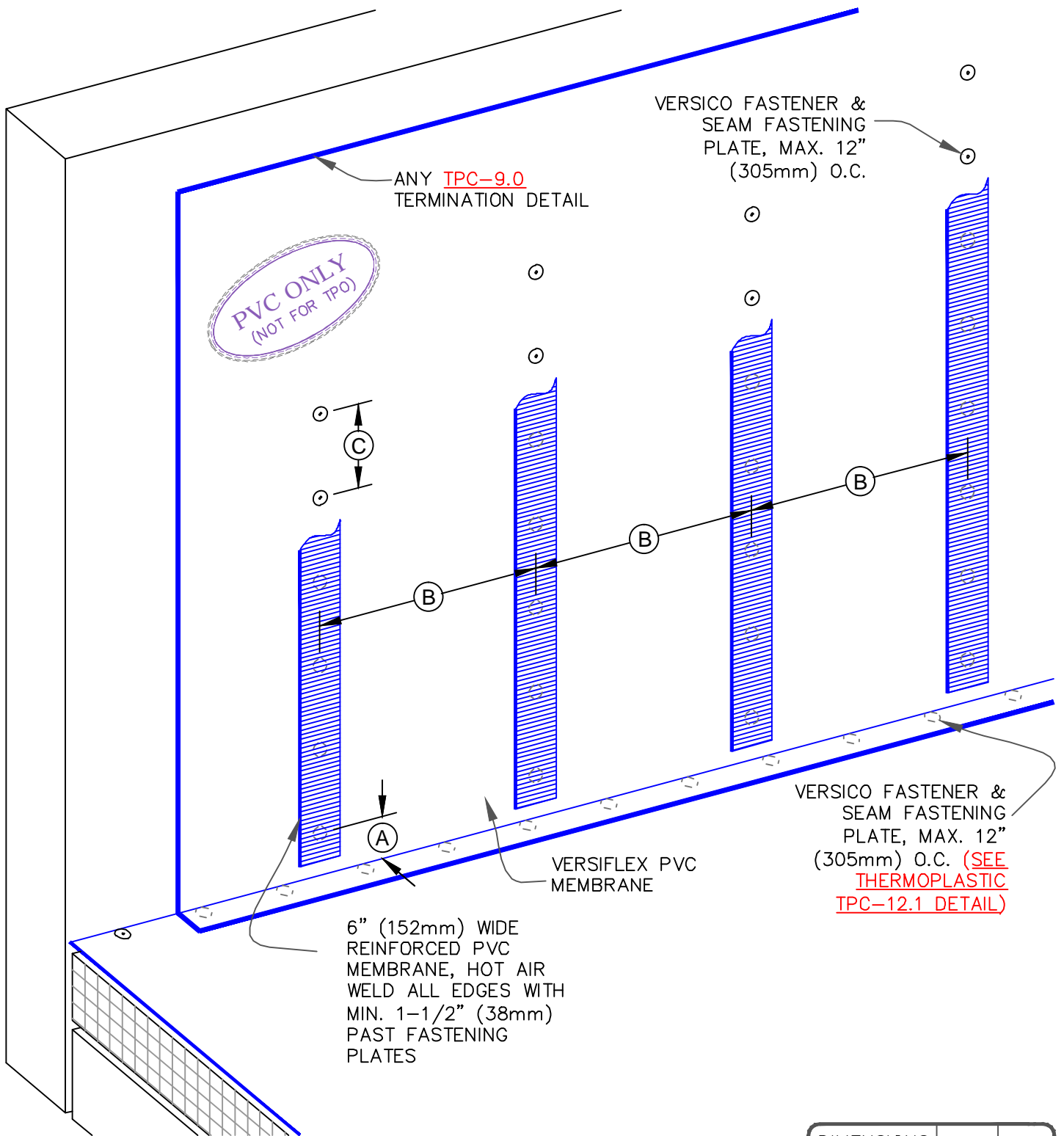


PARAPET FLASHING > 48" (1200mm) - HORIZONTAL SECUREMENT

 → PVC MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-12.5



PVC ONLY
(NOT FOR TPO)

ANY **TPC-9.0**
TERMINATION DETAIL

VERSICO FASTENER &
SEAM FASTENING
PLATE, MAX. 12"
(305mm) O.C.

VERSICO FASTENER &
SEAM FASTENING
PLATE, MAX. 12"
(305mm) O.C. (SEE
TPC-12.1 DETAIL)

6" (152mm) WIDE
REINFORCED PVC
MEMBRANE, HOT AIR
WELD ALL EDGES WITH
MIN. 1-1/2" (38mm)
PAST FASTENING
PLATES

VERSIFLEX PVC
MEMBRANE

DIMENSIONS	mm		
(A)	6"	152	
(B)	32"	813	MAX.
(C)	12"	305	MAX.

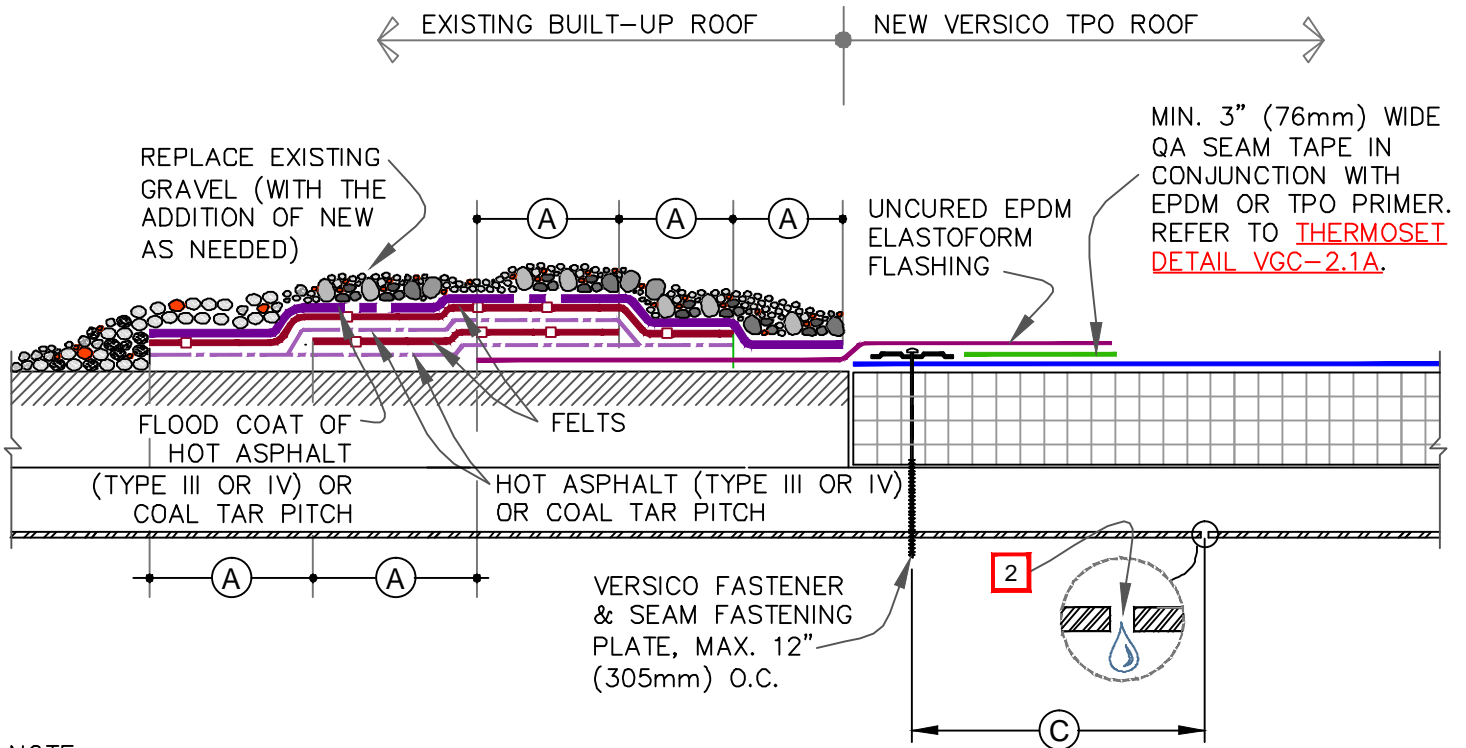


PARAPET FLASHING / NO ADHESION - ANY HEIGHT OPTION

- PVC MEMBRANE
- APPROVED SUBSTRATE
- 0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-12.6

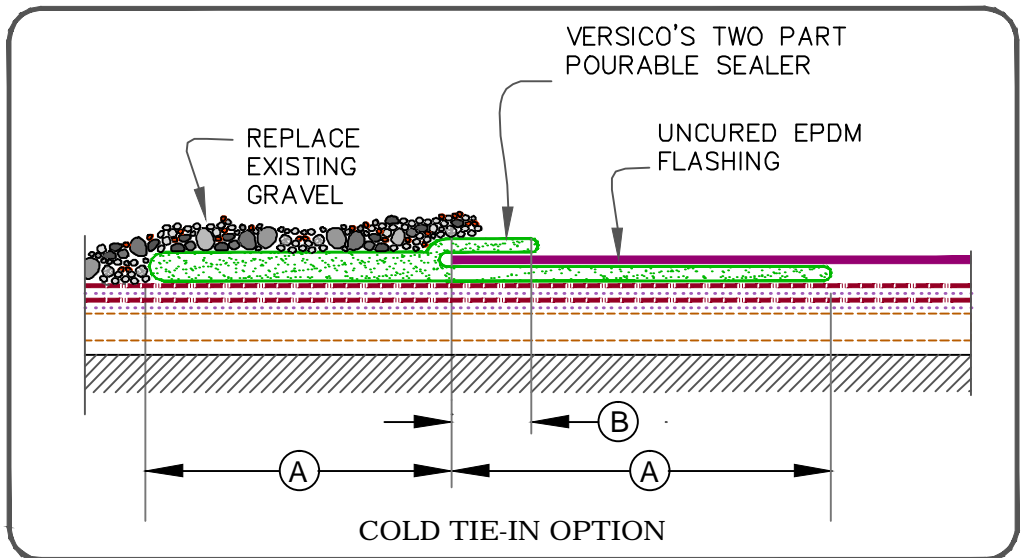


NOTE:

1. REMOVE ALL GRAVEL AT TIE-IN.
2. DRILL A 3/8" (10mm) DIAMETER WEEP HOLE INTO THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE PERIMETER TO THE TIE-IN 6" (152mm) MINIMUM TO 12" (305mm) MAXIMUM FROM THE SEAM FASTENING PLATE.
3. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL DECKS.
4. IF WATER PONDS OR FLOWS OVER TIE-IN FROM BUR SURFACE, VERSICO ROOFING SYSTEM MUST BE TOTALLY ISOLATED; SEE [DETAIL TPC-13.2](#).

DIMENSIONS	mm		
(A)	6"	152	MIN.
(B)	2"	51	± 1/2" (13mm)
(C)	6"	152	TO
	12"	305	

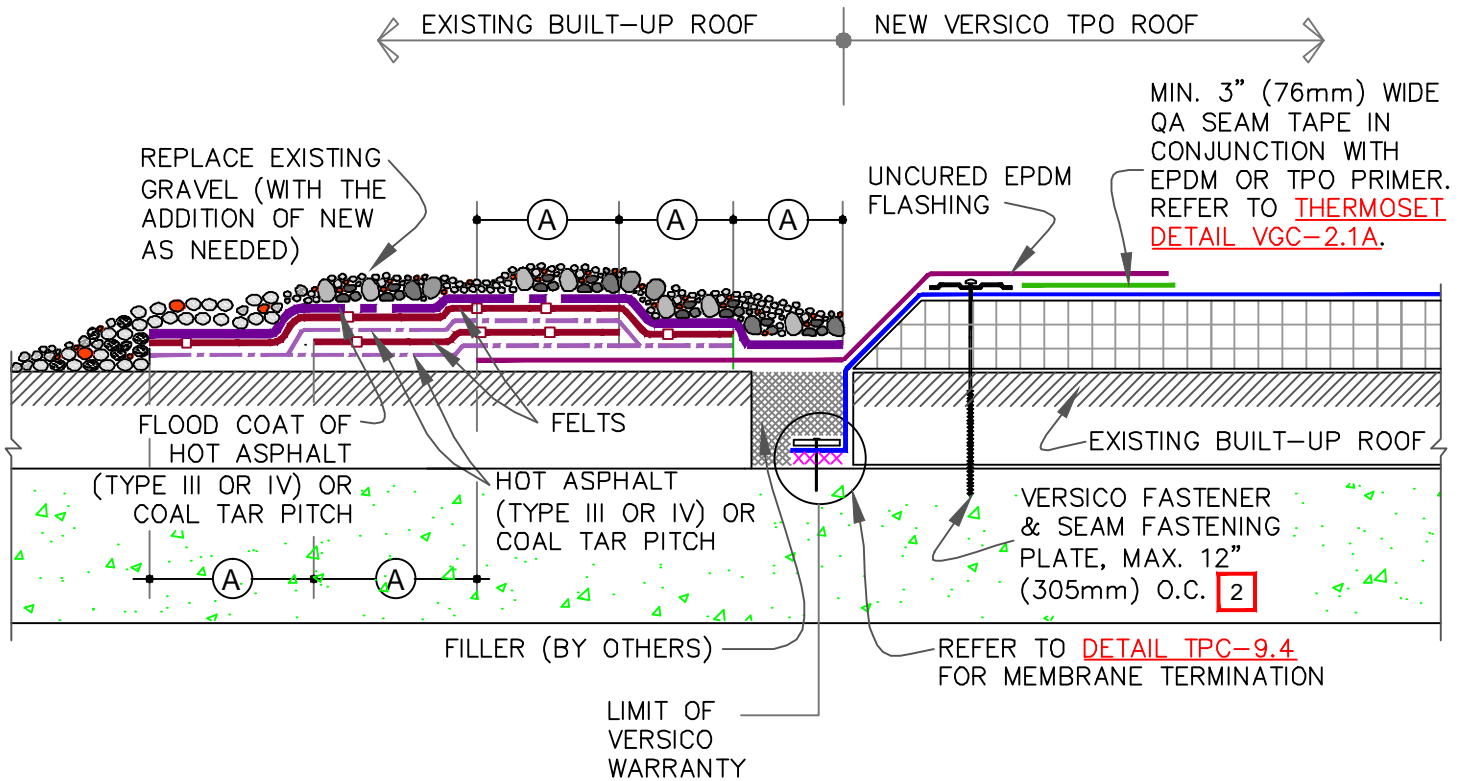
TPO ONLY
(NOT FOR PVC)



TPO TIE-IN TO BUILT-UP ROOFING OVER STEEL ROOF DECK

- TPO MEMBRANE
- APPROVED SUBSTRATE
- 0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-13.1

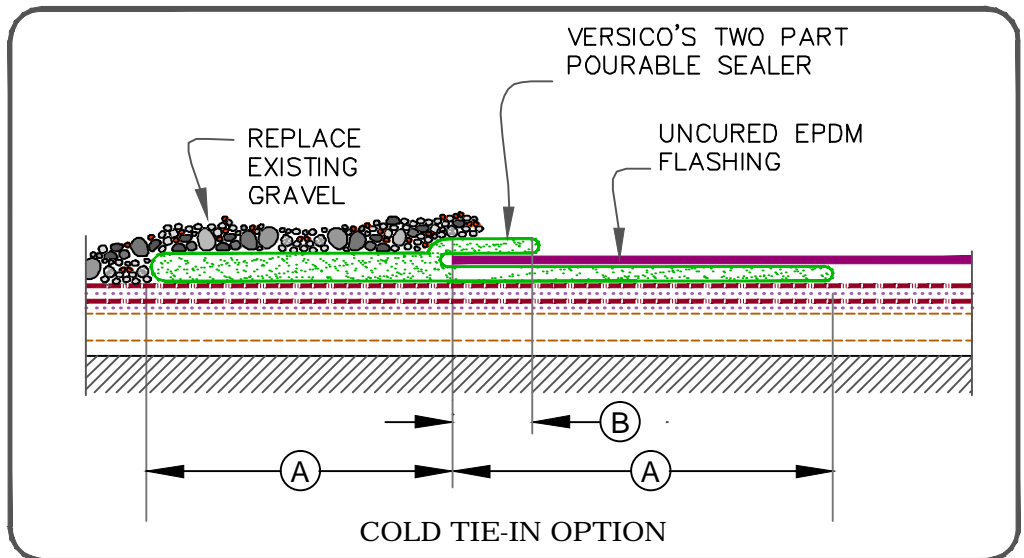


NOTE:

1. REMOVE ALL GRAVEL AT TIE-IN.
2. ON MECHANICALLY ATTACHED SYSTEMS, CD-10 OR MP 14-10 FASTENERS AND HPVX PLATES ARE REQUIRED OVER CONCRETE DECKS.
3. WATER CUT-OFF MUST BE HELD UNDER CONSTANT COMPRESSION.
4. VERSICO 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 WITHIN THE ROOFING SYSTEM.

DIMENSIONS	mm		
(A)	6"	152	MIN.
(B)	2"	51	± 1/2" (13mm)

TPO ONLY
(NOT FOR PVC)

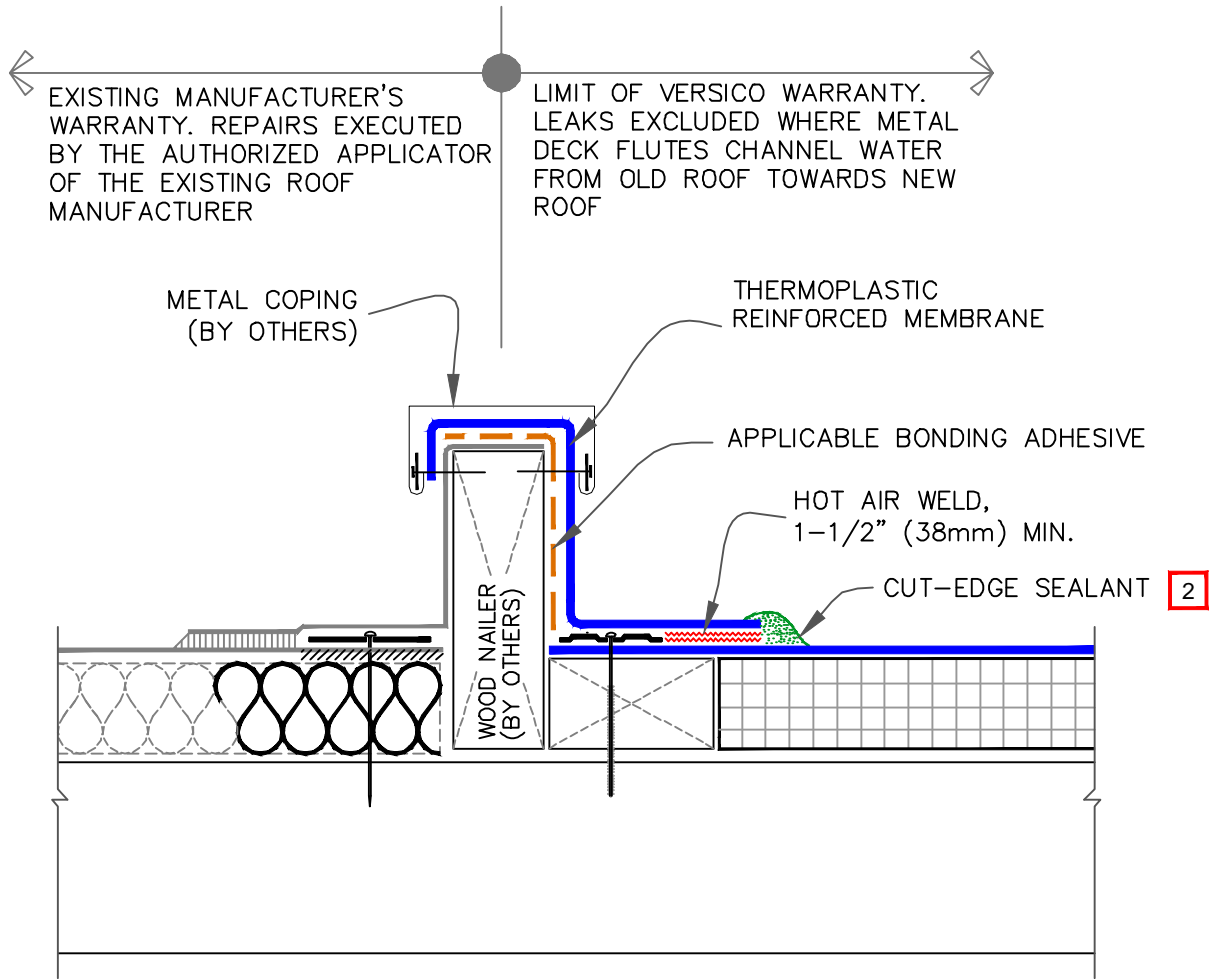


TPO TIE-IN TO BUILT-UP ROOFING OVER CONCRETE ROOF DECK

→ TPO MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-13.2






NOTES:

1. POSITION MEMBRANE FASTENING PLATES 1/2" (13mm) TO 1" (25mm) FROM EDGE OF DECK MEMBRANE.
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
3. ENSURE THE LOCATION OF CURB WILL NOT IMPEDE THE FLOW OF WATER AT EXISTING ADJACENT ROOF.

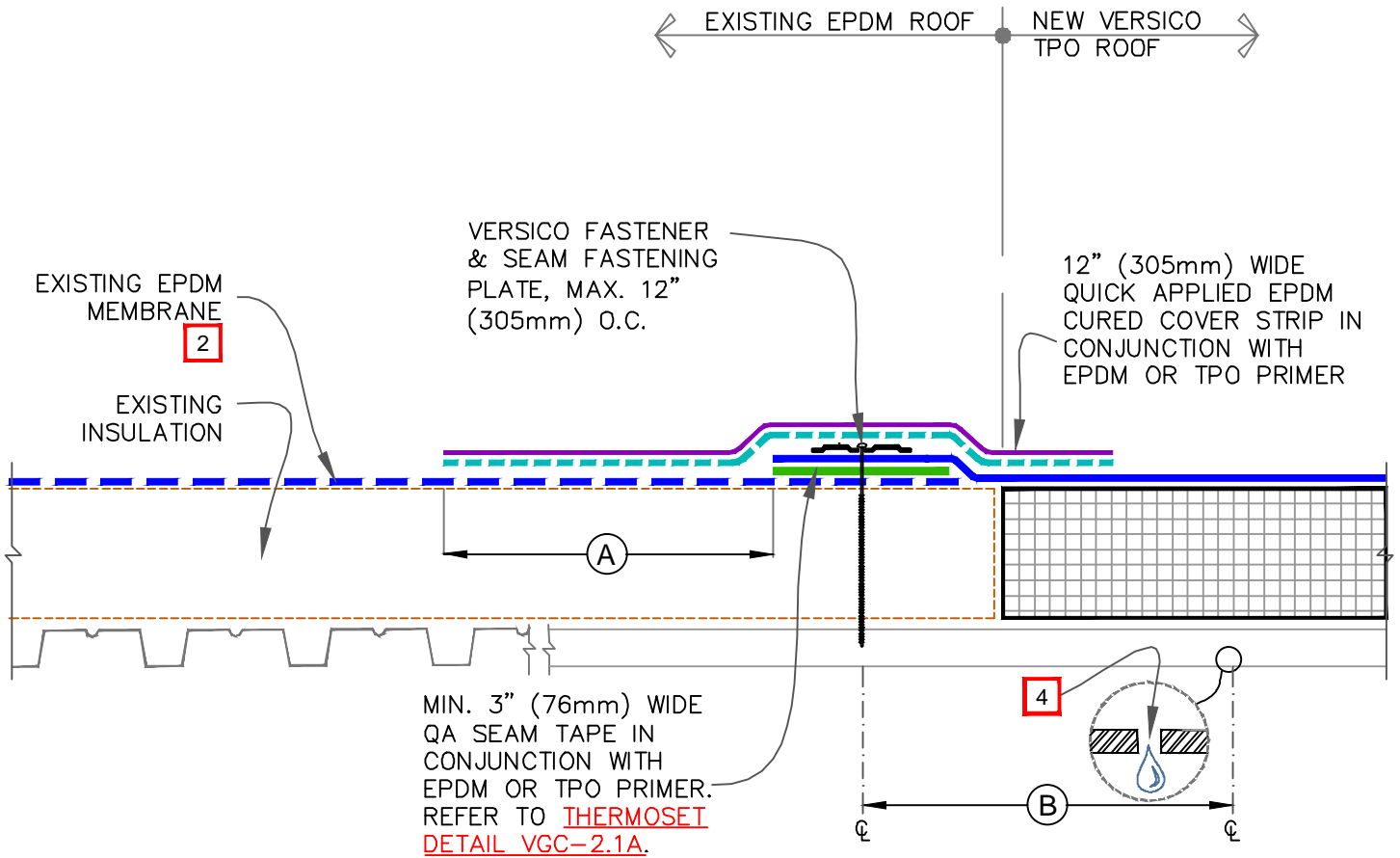


TPO/PVC TIE-IN TO EXISTING SINGLE-PLY

	→ THERMOPLASTIC REINFORCED MEMBRANE
	→ APPROVED SUBSTRATE
	→ SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-13.3



NOTES:



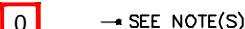
1. PRIOR TO SPLICING, CLEAN EXISTING EPDM MEMBRANE BY SCRUBBING THE SPLICE AREA WITH WEATHERED MEMBRANE CLEANER AND ALLOW TO DRY.
2. CONTACT MANUFACTURER OF EXISTING WARRANTED EPDM MEMBRANE ROOFING SYSTEM TO VERIFY ACCEPTANCE OF TIE-IN.
3. FOR EXISTING BALLASTED SYSTEMS BY OTHERS, CONSULT RESPECTIVE MANUFACTURER FOR ACCEPTABLE GRAVEL CONTAINMENT TO PREVENT GRAVEL MIGRATION.
4. DRILL A 3/8" (10mm) DIAMETER WEEP HOLE INTO THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE PERIMETER OF THE TIE-IN 6" (152mm) MINIMUM TO 12" (305mm) MAXIMUM FROM THE SEAM FASTENING PLATE.
5. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL DECKS.

DIMENSIONS		mm	
(A)	6"	152	
(B)	6"	152	MIN.
	12"	305	MAX.

TPO ONLY
(NOT FOR PVC)

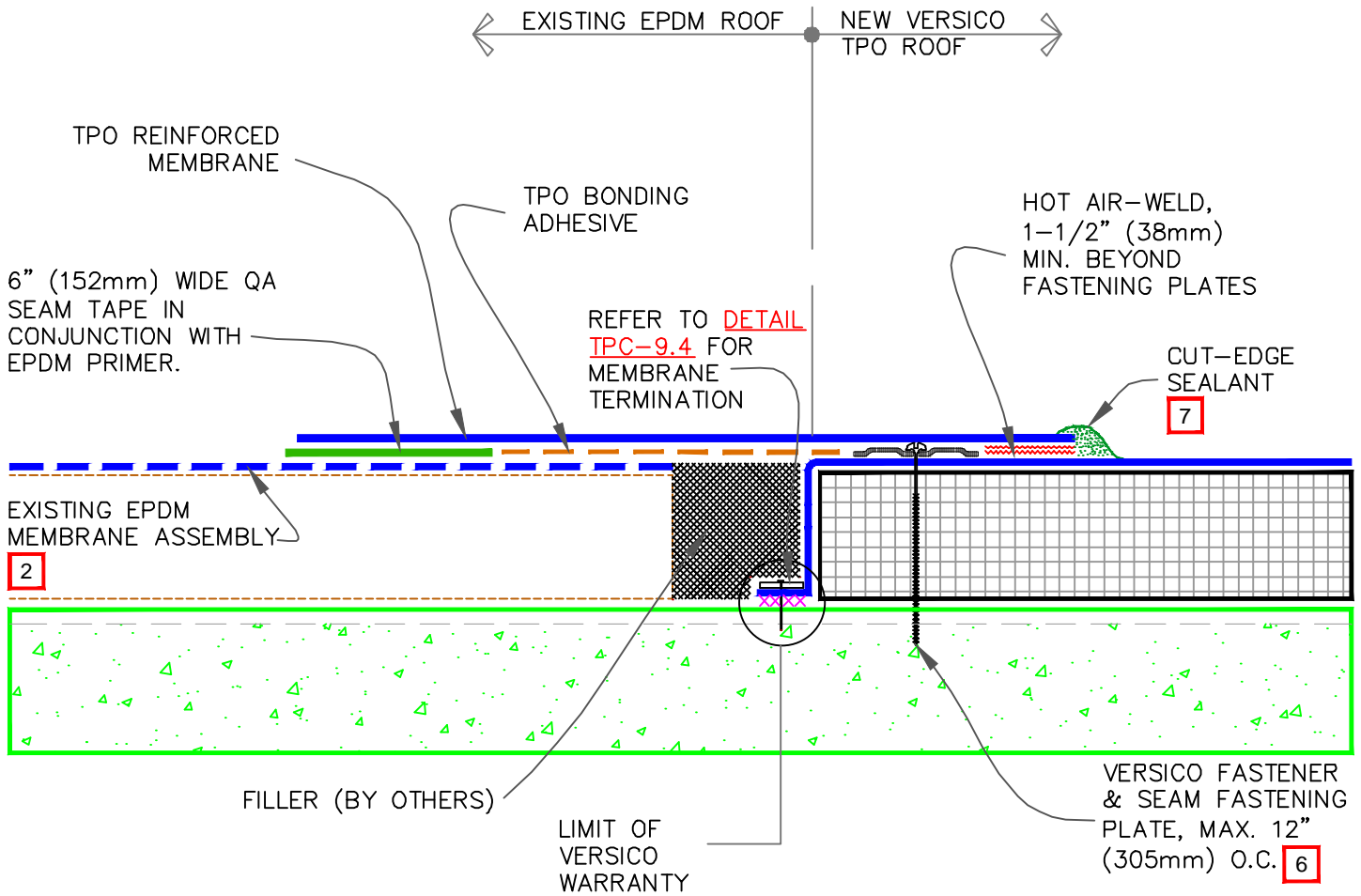


TPO TIE-IN TO EXISTING EPDM MEMBRANE

 → TPO MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-13.4



NOTES:

1. PRIOR TO SPLICING, CLEAN EXISTING EPDM MEMBRANE BY SCRUBBING THE SPLICE AREA WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY.
2. CONTACT MANUFACTURER OF EXISTING WARRANTED EPDM MEMBRANE ROOFING SYSTEM TO VERIFY ACCEPTANCE OF TIE-IN.
3. ON EXISTING BALLASTED ROOFING SYSTEMS, CONSULT RESPECTIVE MANUFACTURER FOR ACCEPTABLE GRAVEL CONTAINMENT TO PREVENT GRAVEL MIGRATION.
4. WATER CUT-OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION.
5. WHEN RE-ROOFING OVER PRE-CAST CONCRETE, APPLY LIBERAL BEAD OF WATER CUT-OFF MASTIC IN THE JOINTS TO PREVENT MOISTURE MIGRATION.
6. ON MECHANICALLY ATTACHED SYSTEMS, CD-10 OR MP 14-10 FASTENERS AND HPVX PLATES ARE REQUIRED OVER CONCRETE DECKS.
7. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

TPO ONLY
(NOT FOR PVC)

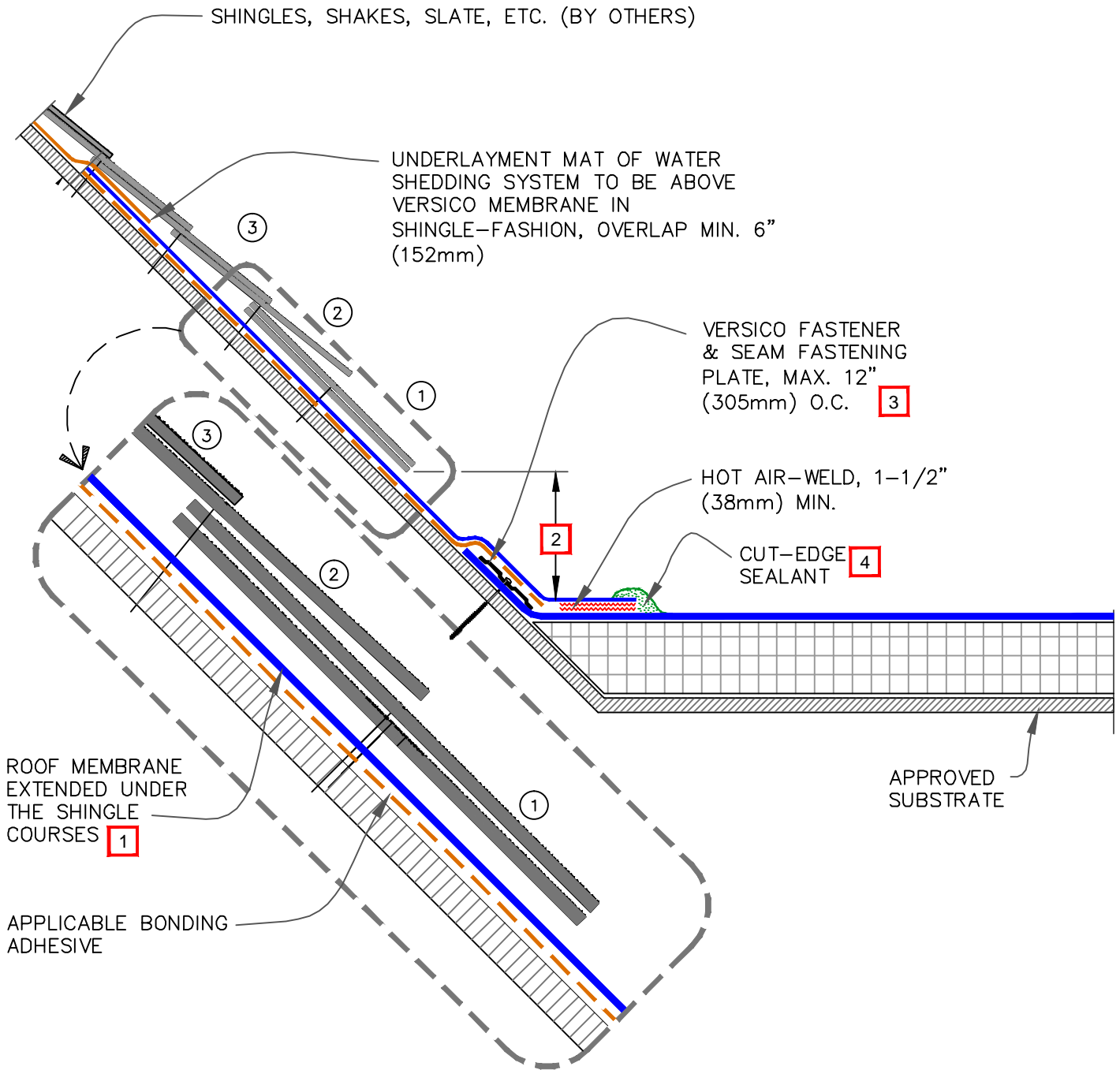


EPDM TIE-IN ON CONCRETE DECK

→ TPO MEMBRANE	→ APPROVED SUBSTRATE
<div style="border: 1px solid red; display: inline-block; padding: 2px 5px;">0</div> → SEE NOTE(S)	

THERMOPLASTIC ROOFING SYSTEM

TPC-13.5



NOTES:

1. REGARDLESS OF MEMBRANE EXPOSURE EXTEND MEMBRANE UNDER FIRST 3 COURSES.
2. VERSICO'S WARRANTY IS LIMITED TO EXPOSED PORTION OF ROOF MEMBRANE.
3. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL OR WOOD DECKS.
4. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.

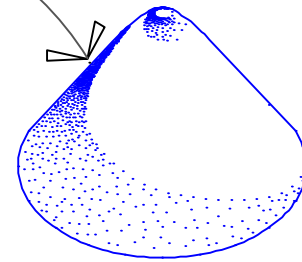
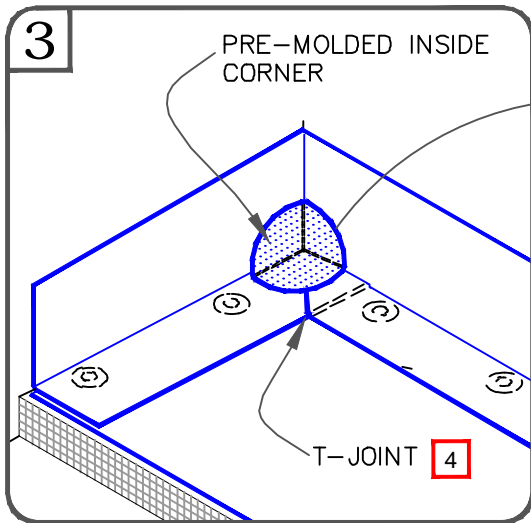
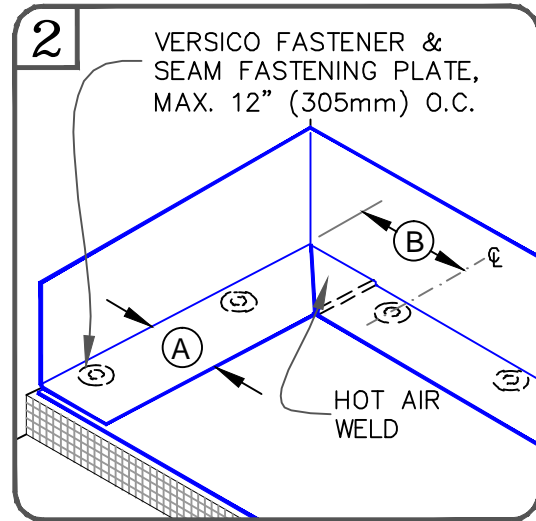
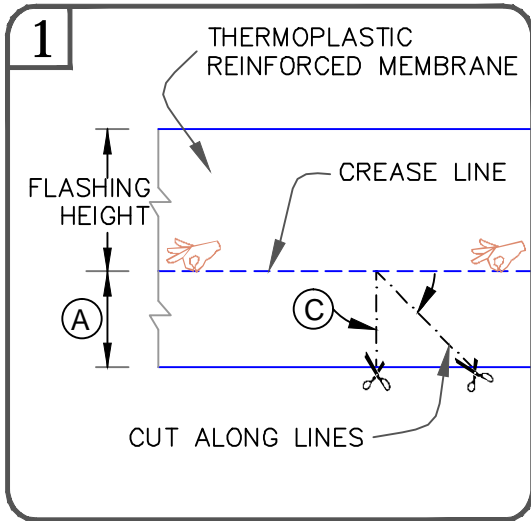


TPO/PVC TIE-IN TO SHINGLED ROOF

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-13.6



PRE-MOLDED INSIDE CORNER BEFORE INSTALLATION




NOTES:

1. POSITION FASTENING PLATES 6" TO 9" (152 TO 229mm) FROM THE CORNER AND 1/2" TO 1" (13 TO 25mm) FROM EDGE OF MEMBRANE.
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
3. REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENERS AND PLATES.
4. WHEN USING 60 OR 80-MIL MEMBRANE, APPLY A 4-1/2" (114mm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

DIMENSIONS	mm		
(A)	6"	152	APPROX.
(B)	6"-9"	152-229	
(C)	45-DEGREES APPROX.		



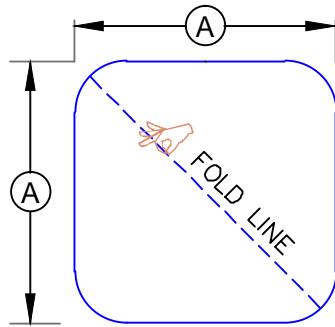
PRE-MOLDED INSIDE CORNER FLASHING

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

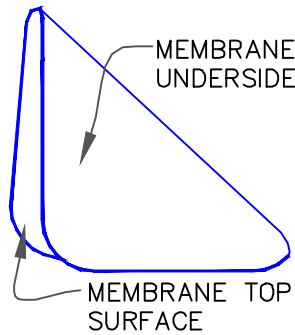
THERMOPLASTIC ROOFING SYSTEM
TPC-15.1

CAUTION

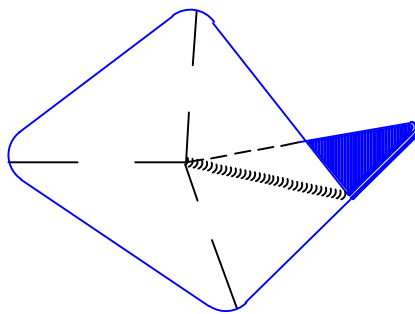
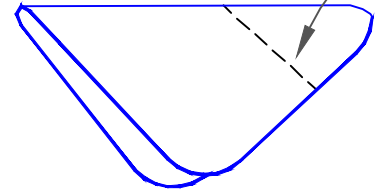
DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS, PRE-FABRICATED/PRE-MOLDED ACCESSORIES MUST BE UTILIZED. ACCEPTABLE FLASHING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAIL TPC-15.1.



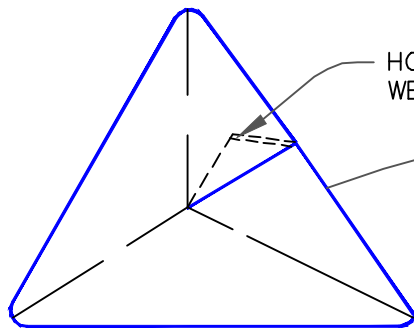
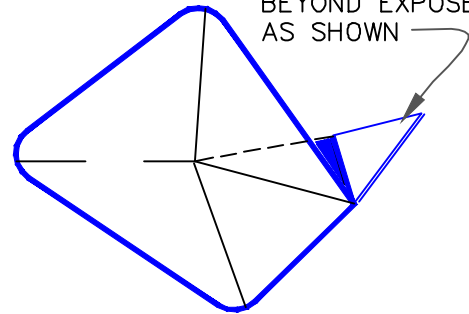
CUT A SECTION OF THERMOPLASTIC NON-REINFORCED MEMBRANE WITH ROUNDED CORNERS



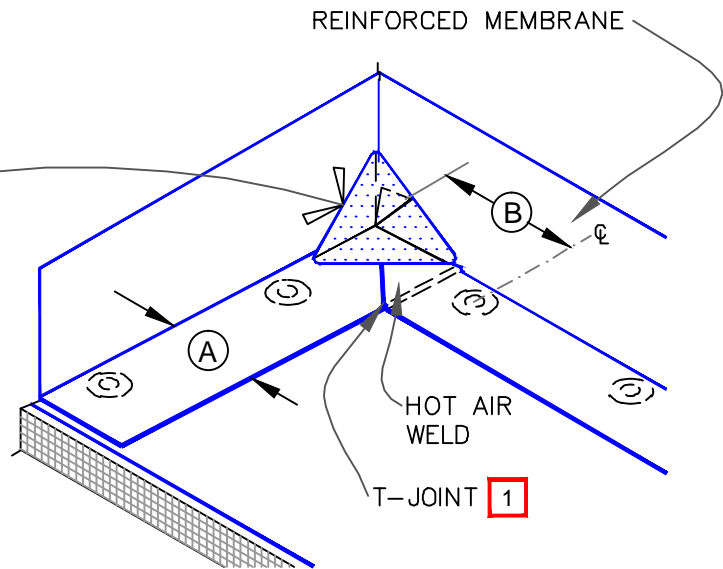
HEAT WELD APPROX. 1/4 OF AREA AS SHOWN



TRIM TRIANGULAR FLAP BEYOND EXPOSED CORNER AS SHOWN



POSITION AND HEAT WELD CORNER IN PLACE AS SHOWN



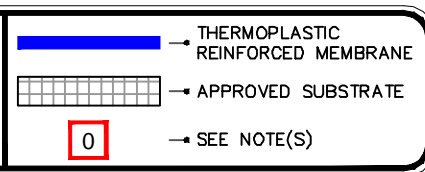
DIMENSIONS	mm	
(A)	6"	152 APPROX.
(B)	6"-9"	152-229

NOTES:

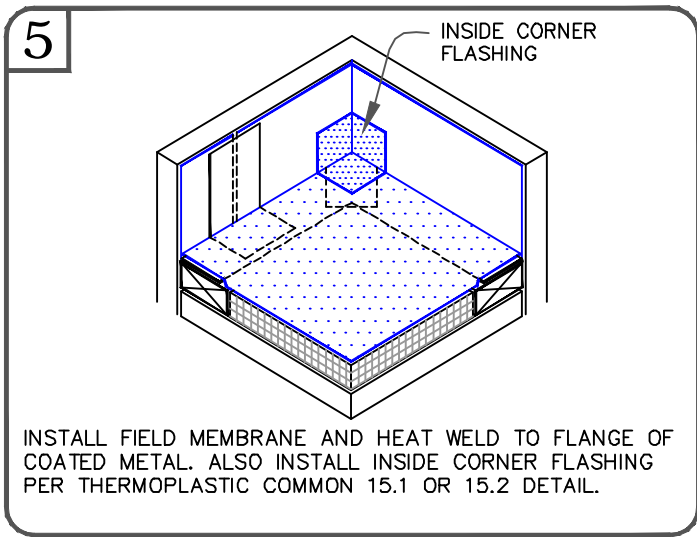
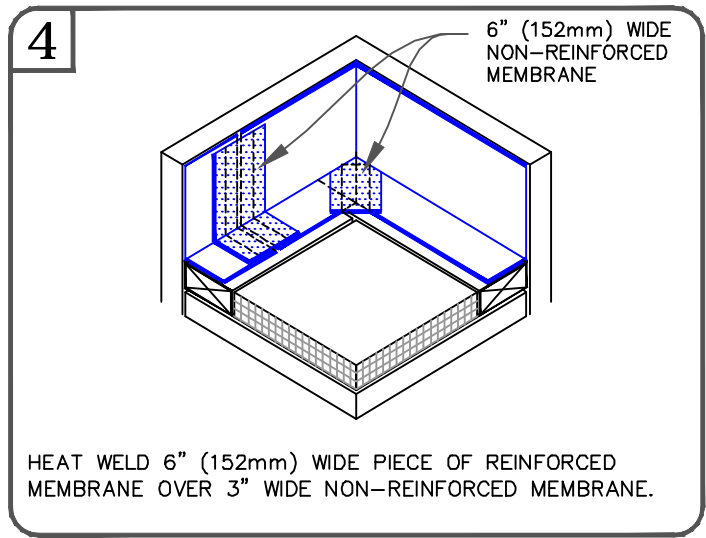
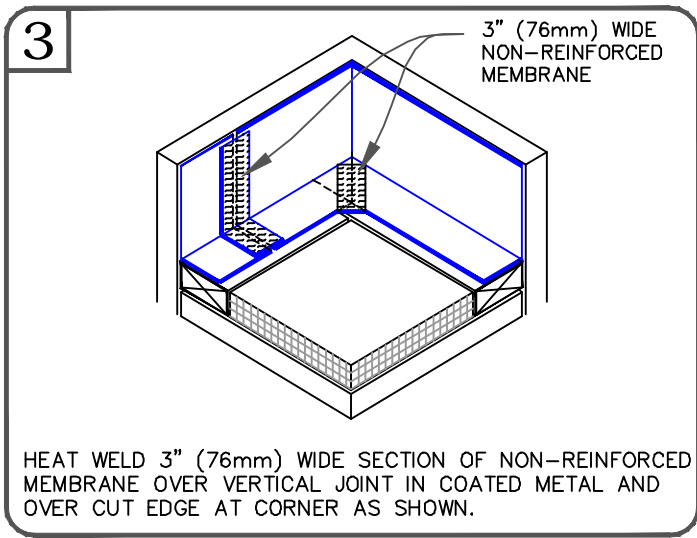
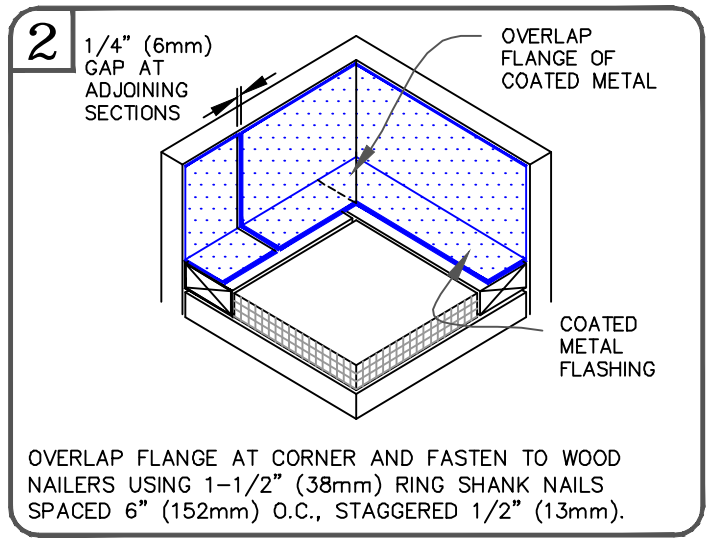
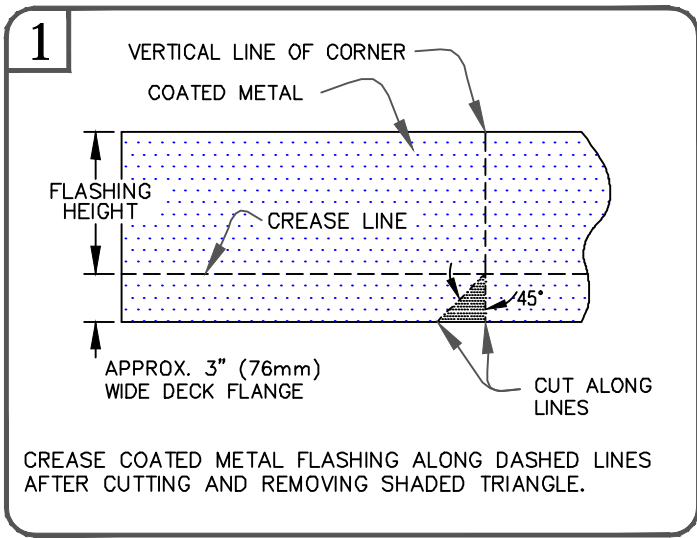
1. WHEN USING 60 OR 80-MIL MEMBRANE, APPLY A 4-1/2" (114mm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.



FIELD FABRICATED INSIDE CORNER FLASHING



THERMOPLASTIC ROOFING SYSTEM
TPC-15.2






NOTES:

1. FASTEN COATED METAL FLASHING TO WOOD NAILERS USING 1-1/2" (38mm) MIN. RING SHANK NAILS SPACED 6" (152mm) ON CENTER AND STAGGERED APPROX. 1/2" (13mm).
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.

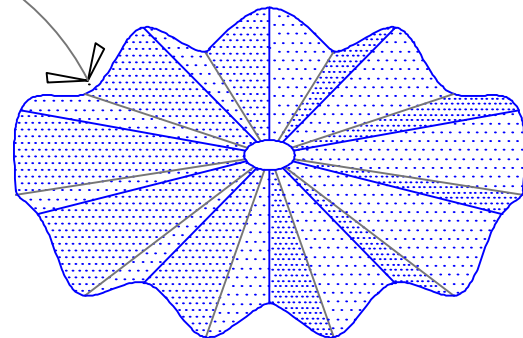
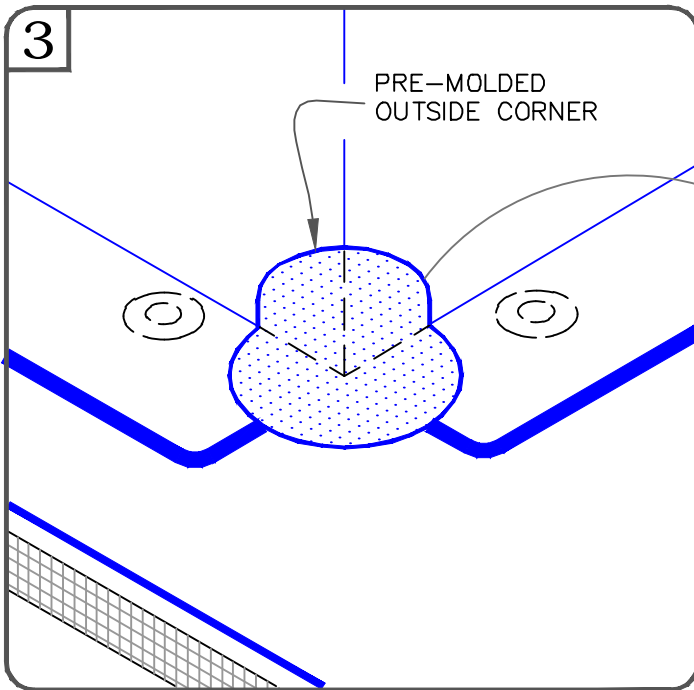
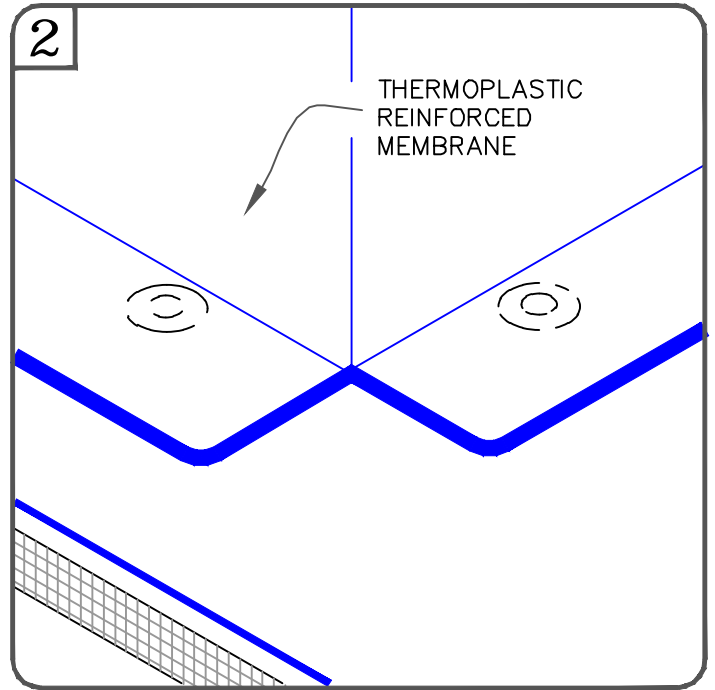
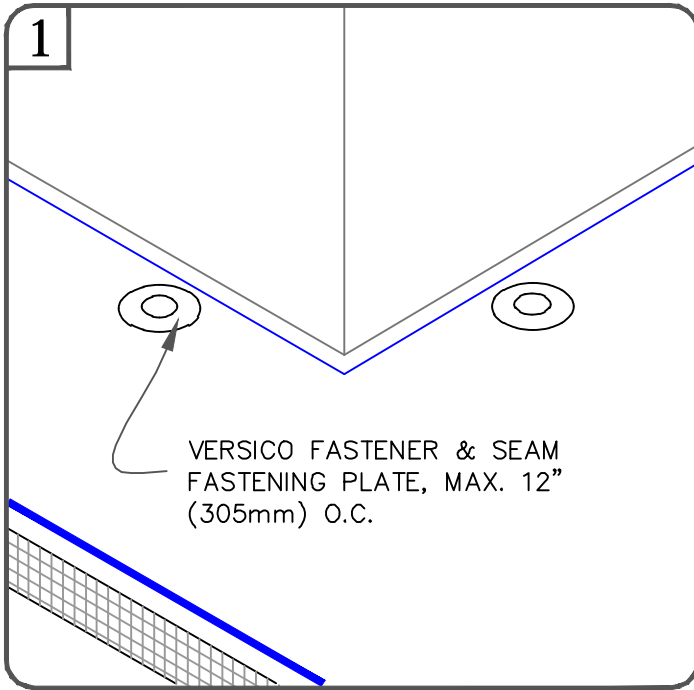


INSIDE CORNER WITH COATED METAL WALL FLASHING

-  → THERMOPLASTIC REINFORCED MEMBRANE
-  → APPROVED SUBSTRATE
-  → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-15.3



PRE-MOLDED OUTSIDE CORNER BEFORE INSTALLATION

NOTES:

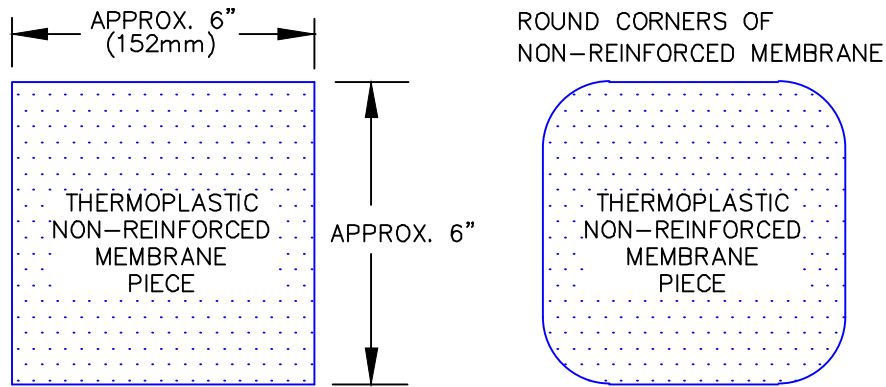
1. POSITION FASTENING PLATES 6" (152mm) FROM THE CORNER AND 1/2" TO 1" (13 TO 25mm) FROM EDGE OF MEMBRANE.
2. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
3. REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENERS AND PLATES.



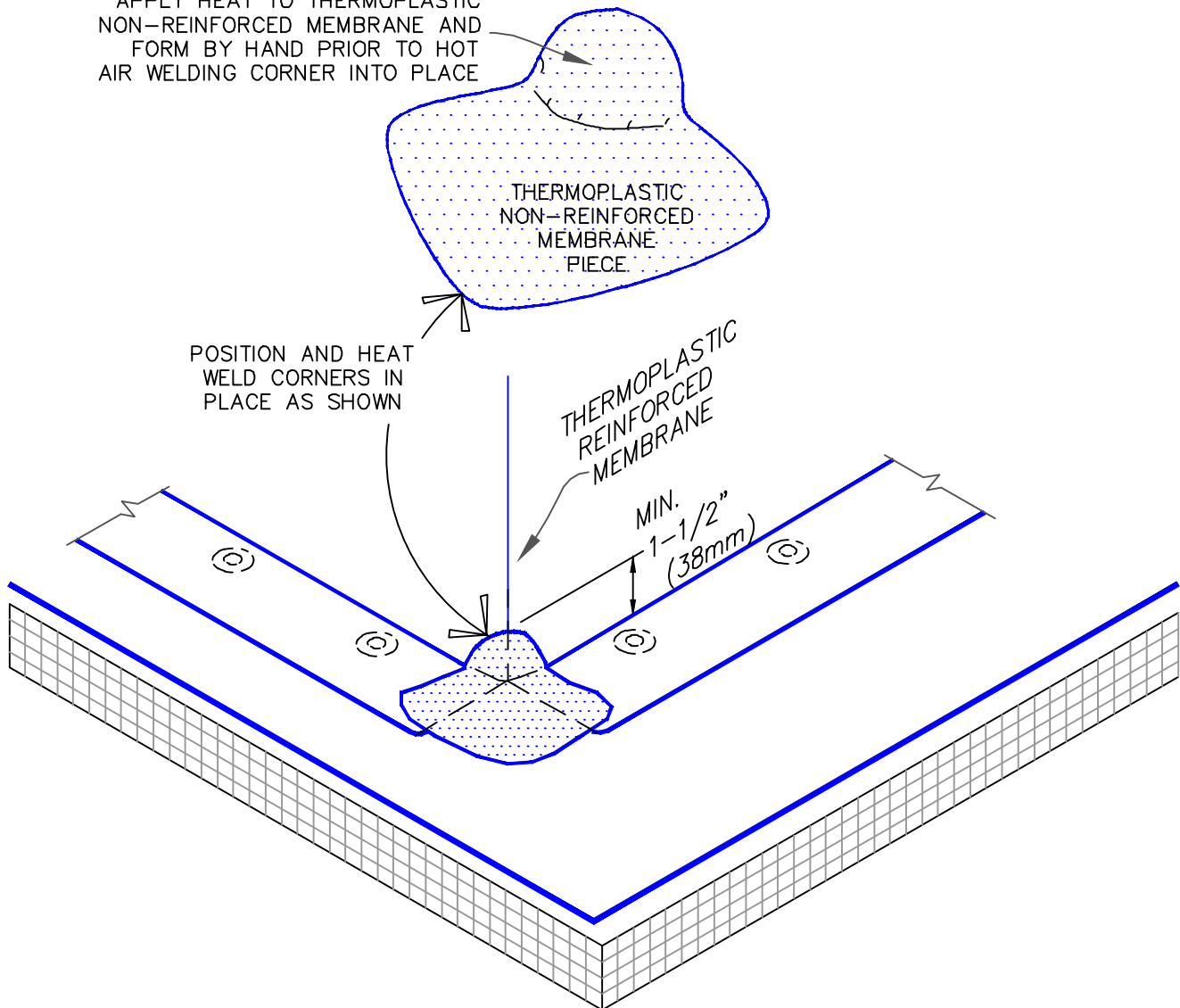
PRE-MOLDED OUTSIDE CORNER FLASHING

THERMOPLASTIC ROOFING SYSTEM
TPC-15.4




CAUTION DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS, PRE-FABRICATED/PRE-MOLDED ACCESSORIES MUST BE UTILIZED. ACCEPTABLE FLASHING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAIL TPC-15.4.



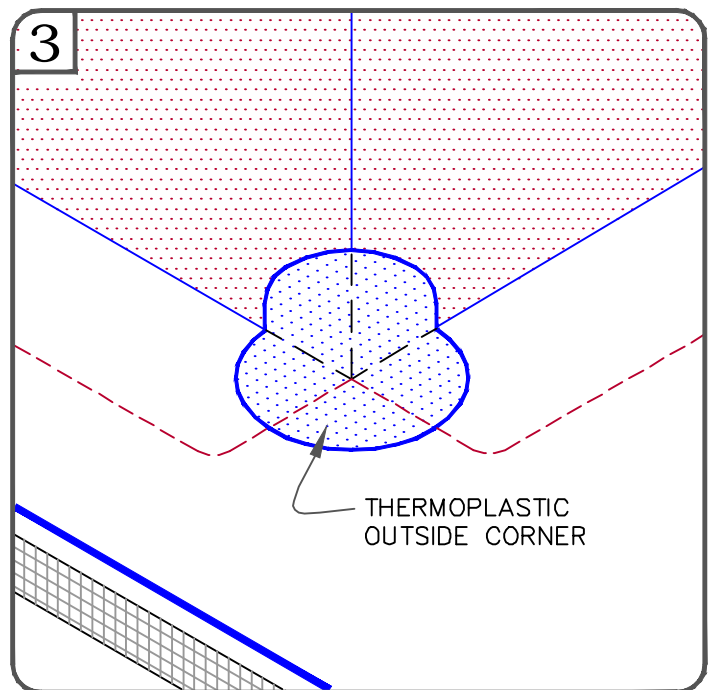
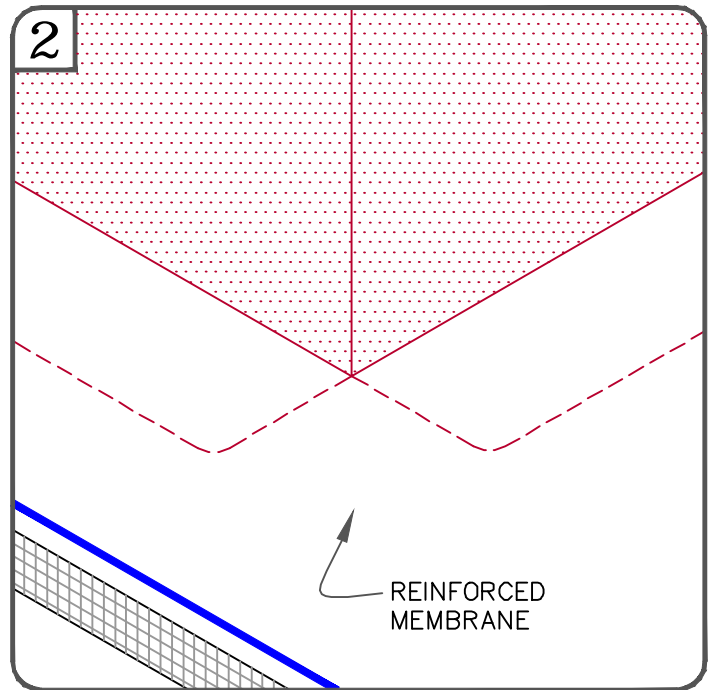
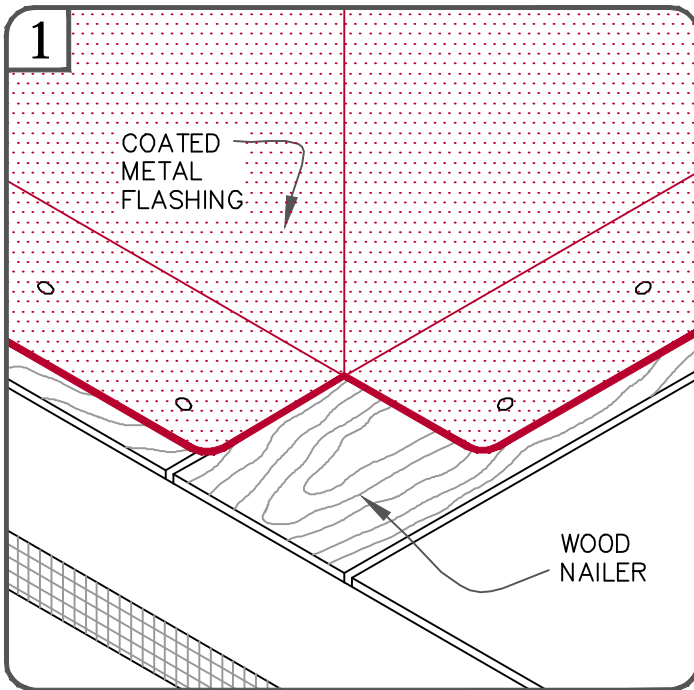
APPLY HEAT TO THERMOPLASTIC NON-REINFORCED MEMBRANE AND FORM BY HAND PRIOR TO HOT AIR WELDING CORNER INTO PLACE



FIELD FABRICATED
OUTSIDE CORNER
FLASHING

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-15.5






NOTES:

1. FASTEN COATED METAL FLASHING TO WOOD NAILERS USING 1-1/2" (38mm) MIN. RING SHANK NAILS SPACED 6" (152mm) ON CENTER AND STAGGERED APPROX. 1/2" (13mm).
2. REFER TO THERMOPLASTIC TPC-15.3 DETAIL FOR FLASHING VERTICAL JOINTS IN COATED METAL.



OUTSIDE CORNER WITH COATED METAL WALL FLASHING

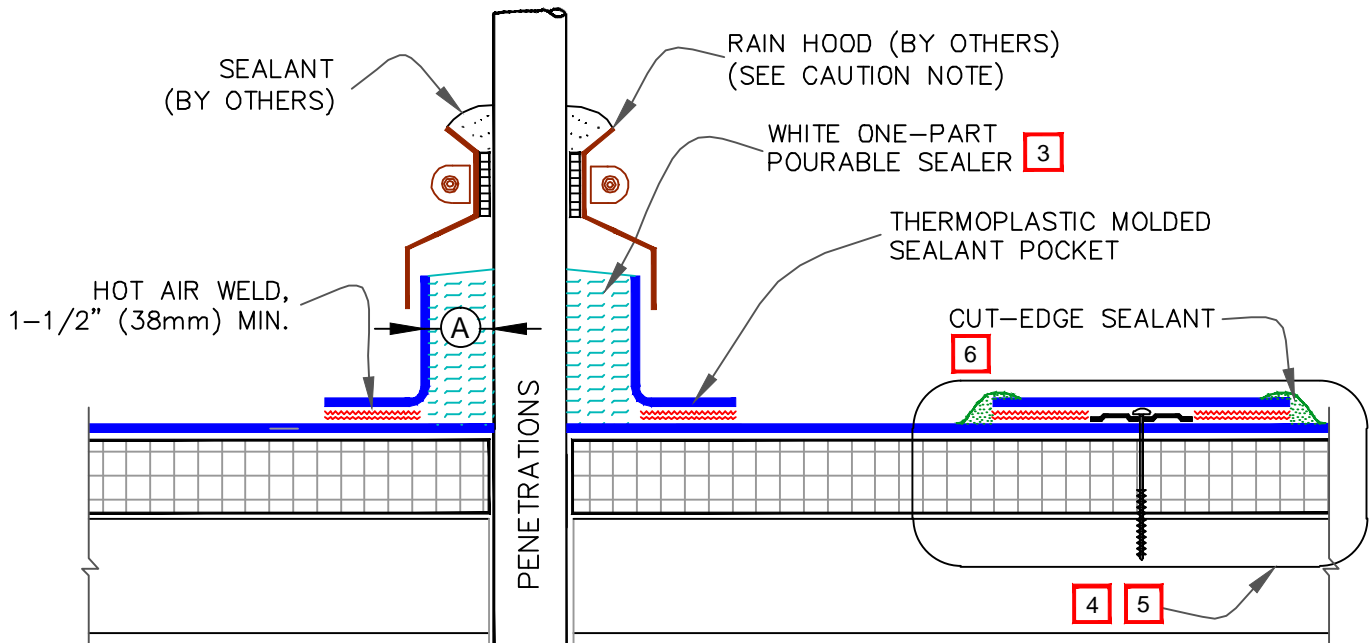
 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-15.6

CAUTION

MOLDED SEALANT POCKETS MUST BE USED IN CONJUNCTION WITH RAIN HOODS FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES.

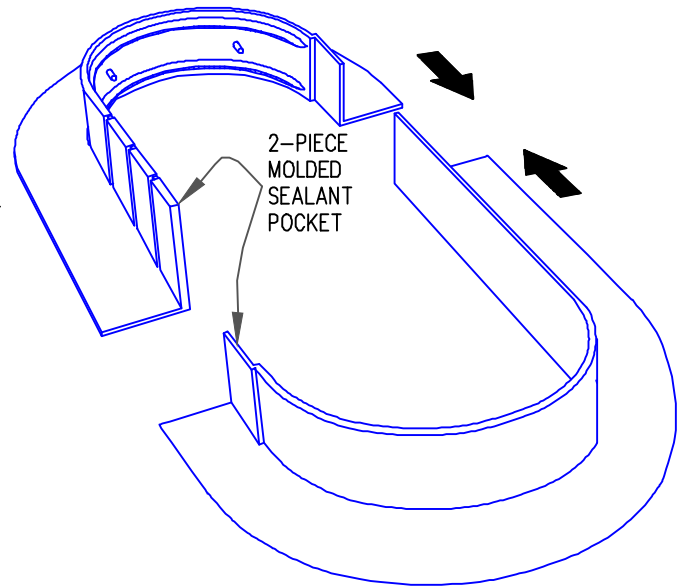


NOTES:

1. TEMPERATURE OF PIPE MUST NOT EXCEED 160° F (71° C).
2. WHEN USING TPO MOLDED SEALANT POCKET, TPO PRIMER MUST BE APPLIED TO ALL INSIDE SURFACES AND PENETRATIONS PRIOR TO FILLING WITH SEALANT.
3. FILL POCKET COMPLETELY WITH WHITE ONE-PART POURABLE SEALER UNTIL RIM IS COVERED WITH SEALANT; ENSURE ALL VOIDS ARE FILLED.
4. ON MECHANICALLY-ATTACHED SYSTEMS, INSTALL A MINIMUM OF 4 FASTENING PLATES AROUND SEALANT POCKETS WITH A DIAMETER UP TO 6" (152mm). ADDITIONAL FASTENING PLATES WILL BE REQUIRED FOR SEALANT POCKETS GREATER THAN 6" IN DIAMETER AND SHALL BE SPACED 12" (305 mm) ON CENTER MAXIMUM. FASTENERS/PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS SEALANT POCKET DIAMETER EXCEEDS 12" (305mm).
5. REFER TO VERSICO SPECIFICATIONS FOR PROPER FASTENERS AND PLATES.
6. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.

DIMENSION	mm	
(A)	1"	25 MIN.

PLACE MOLDED THERMOPLASTIC SEALANT POCKET AROUND PENETRATION AND OVERLAP THE TWO SECTIONS



REFER TO PRODUCT DATA SHEET FOR STEP-BY-STEP INSTALLATION PROCEDURES



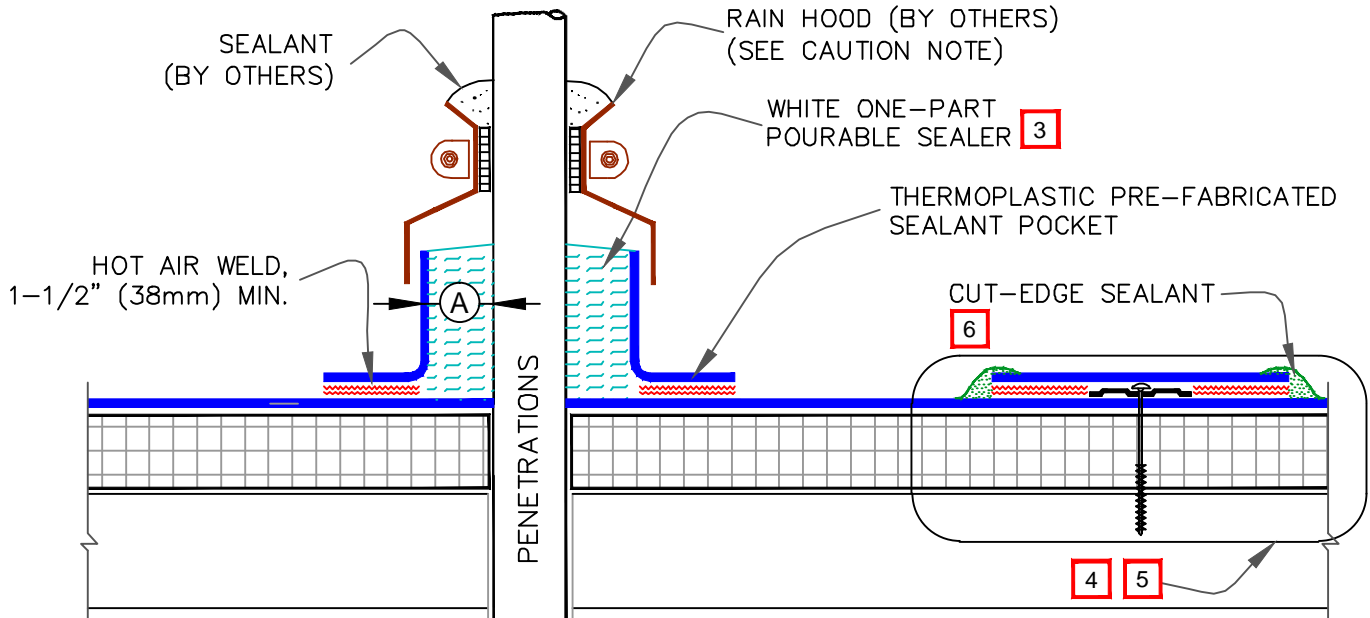
MOLDED SEALANT POCKET

→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-16.1

CAUTION

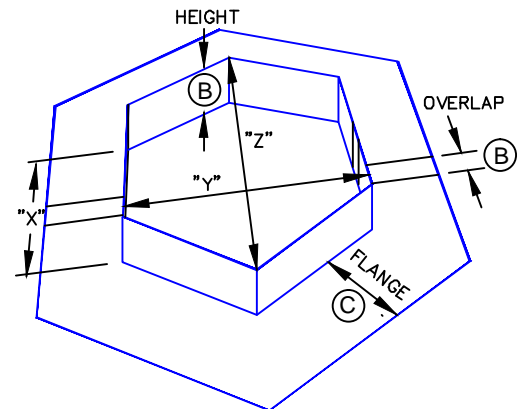
PRE-FABRICATED SEALANT POCKETS MUST BE USED IN CONJUNCTION WITH RAIN HOODS FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES.



NOTES:

- TEMPERATURE OF PIPE MUST NOT EXCEED 160° F (71° C).
- WHEN USING TPO SEALANT POCKET, APPLY TPO PRIMER TO THE TPO MEMBRANE AND PENETRATION(S) SURFACES ONLY. DO NOT APPLY TPO PRIMER TO THE GALVANIZED METAL SURFACE ON THE INSIDE OF THE SEALANT POCKET.
- FILL POCKET COMPLETELY WITH WHITE ONE-PART POURABLE SEALER UNTIL RIM IS COVERED WITH SEALANT; ENSURE ALL VOIDS ARE FILLED.
- ON MECHANICALLY-ATTACHED SYSTEMS, INSTALL A MINIMUM OF 4 FASTENING PLATES AROUND SEALANT POCKETS WITH A DIAMETER UP TO 6" (152mm). ADDITIONAL FASTENING PLATES WILL BE REQUIRED FOR SEALANT POCKETS GREATER THAN 6" IN DIAMETER AND SHALL BE SPACED 12" (305mm) ON CENTER MAXIMUM. FASTENERS/PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS SEALANT POCKET DIAMETER EXCEEDS 12" (305mm).
- REFER TO VERSICO SPECIFICATIONS FOR PROPER FASTENERS AND PLATES.
- APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE AND RECOMMENDED ON CUT EDGES OF VERSIFLEX PVC MEMBRANE.
- CUSTOM SIZES ARE AVAILABLE FOR BOTH TPO AND PVC SEALANT POCKETS.

DIMENSIONS	mm		
(A)	1"	25	MIN.
(B)	2"	51	MIN.
(C)	4"	102	MIN.



POCKET SIZE	DIMENSIONS		
	"X"	"Y"	"Z"
12"(305mm)	12"(305mm)	12"(305mm)	24"(607mm)

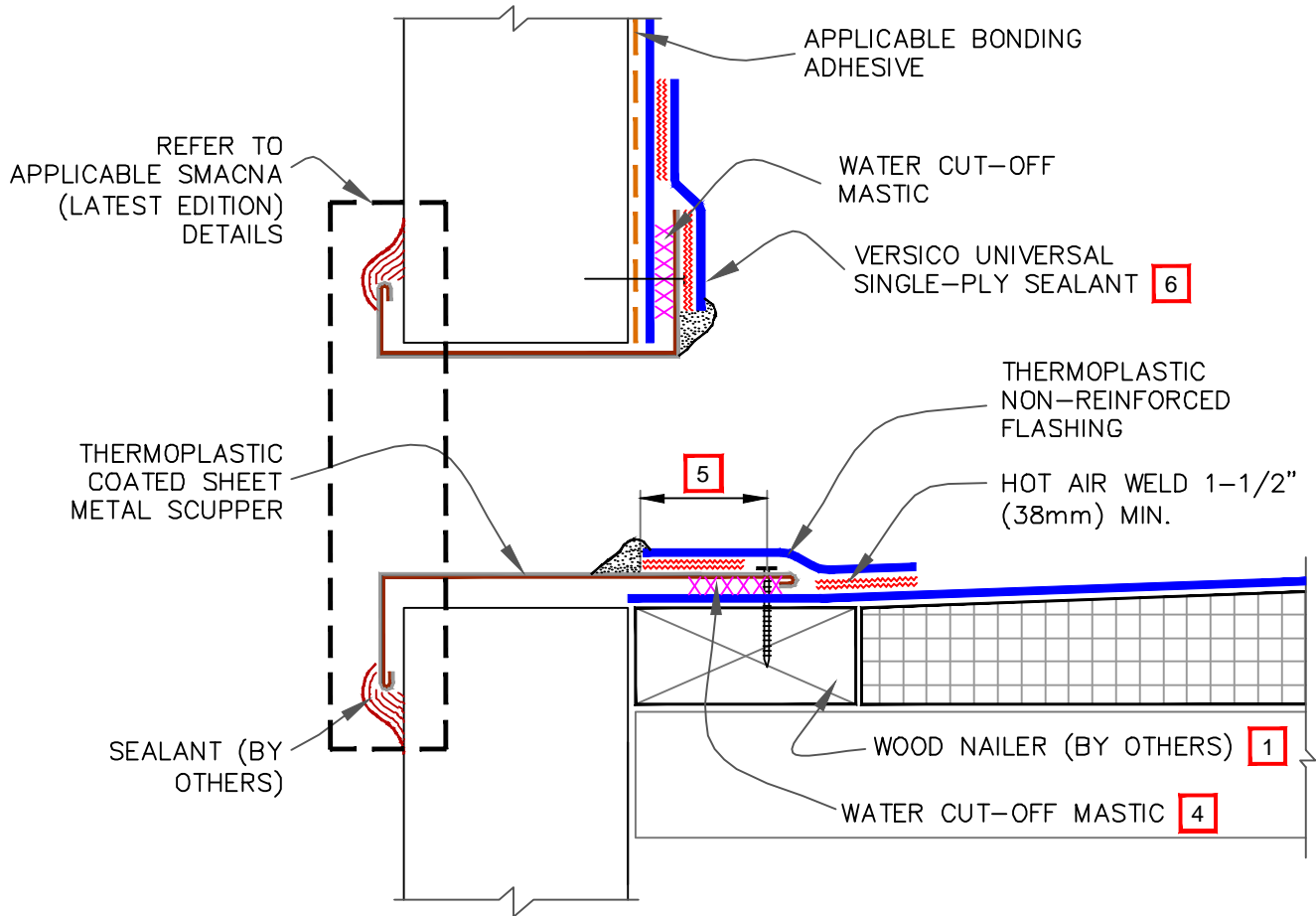
SEALANT POCKET EXTENSION LEGS CAN BE USED TO EXTEND THE LENGTH IN 10" (254mm) INCREMENTS. REFER TO PRODUCT DATA SHEET (PDS) FOR STEP-BY-STEP INSTALLATION PROCEDURES



PRE-FABRICATED SEALANT POCKET

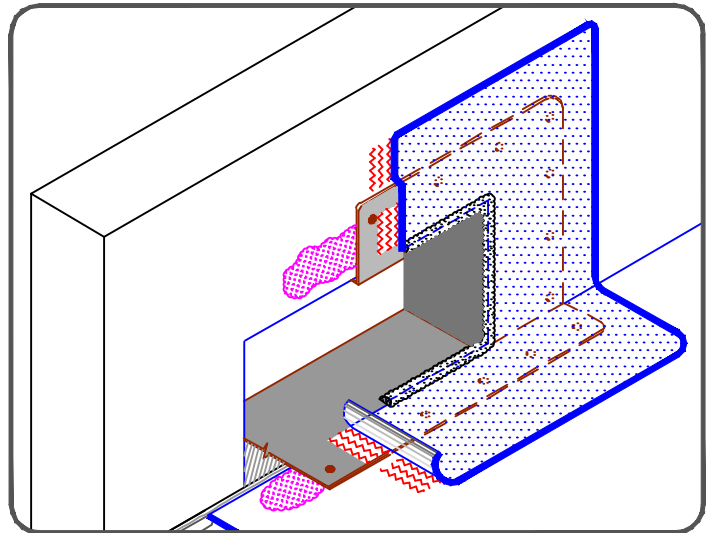
→ THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-16.2



NOTES:

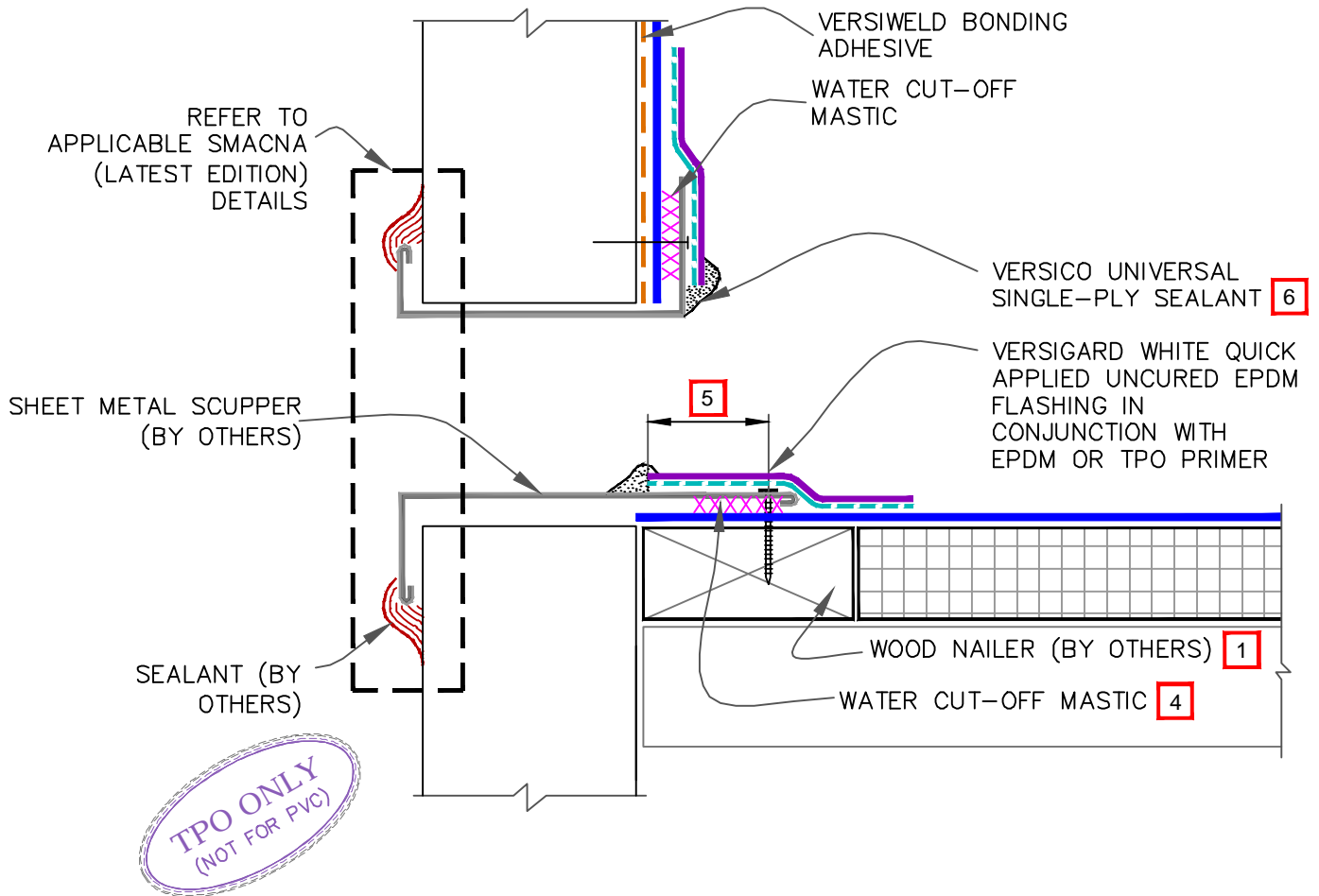
1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
2. INSTALL WALL FLASHING PRIOR TO SCUPPER INSTALLATION.
3. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS.
4. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT COMPRESSION.
5. SCUPPER FLANGES MUST BE TOTALLY COVERED BY NON-REINFORCED FLASHING WITH MINIMUM 2" (51mm) COVERAGE PAST NAIL HEAD.
6. UNIVERSAL SINGLE-PLY SEALANT IS REQUIRED AT FLASHING EDGES ON SCUPPER EDGE. WHEN USING TPO MEMBRANE, TPO PRIMER MUST BE USED TO PREPARE SURFACES PRIOR TO THE APPLICATION OF SEALANT.



SCUPPER WITH COATED METAL

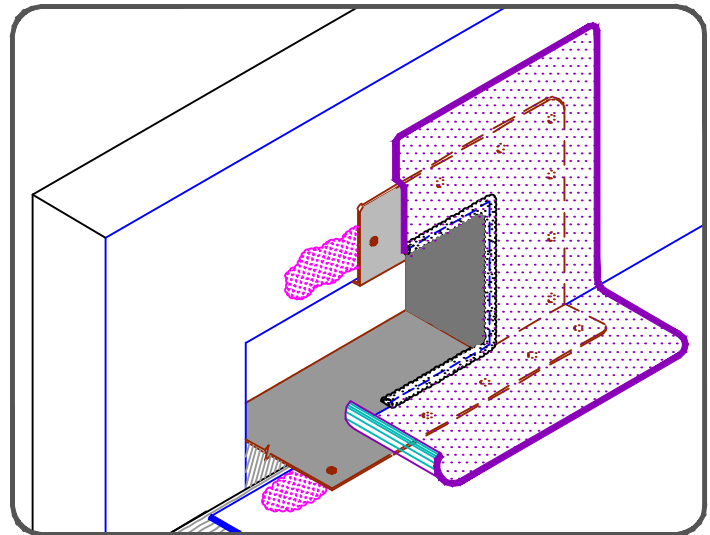
0 → THERMOPLASTIC REINFORCED MEMBRANE
1 → APPROVED SUBSTRATE
6 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM
TPC-18.1



NOTES:

1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
2. INSTALL WALL FLASHING PRIOR TO SCUPPER INSTALLATION.
3. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
4. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT COMPRESSION.
5. SCUPPER FLANGES MUST BE TOTALLY COVERED BY QUICK APPLIED UNCURED EPDM FLASHING WITH MINIMUM 2" (51mm) COVERAGE PAST NAIL HEAD.
6. UNIVERSAL SINGLE-PLY SEALANT IS REQUIRED AT FLASHING EDGES ON SCUPPER EDGE. TPO PRIMER MUST BE USED TO PREPARE SURFACES PRIOR TO THE APPLICATION OF SEALANT.

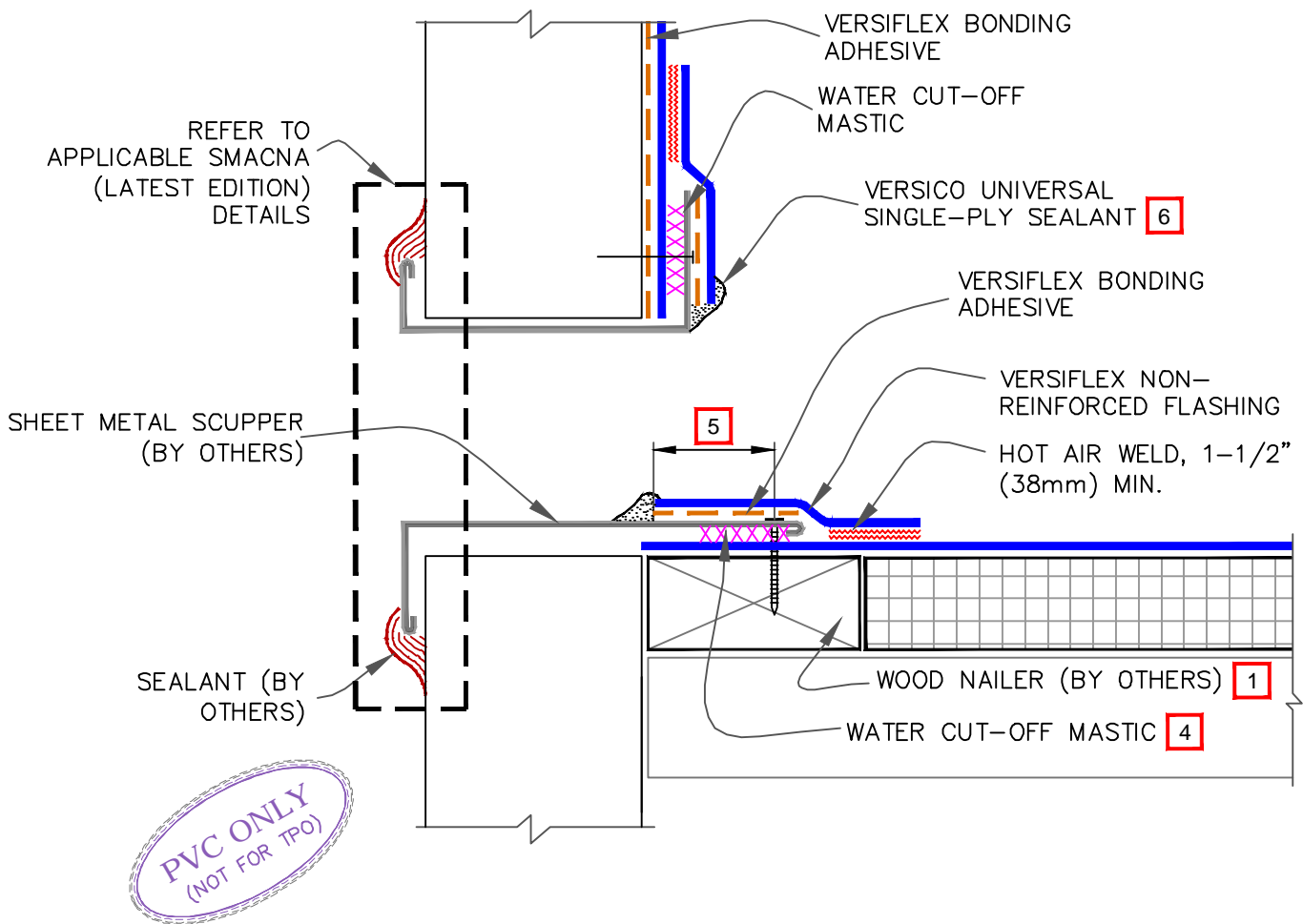


SCUPPER AT DECK-TPO

→ TPO MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

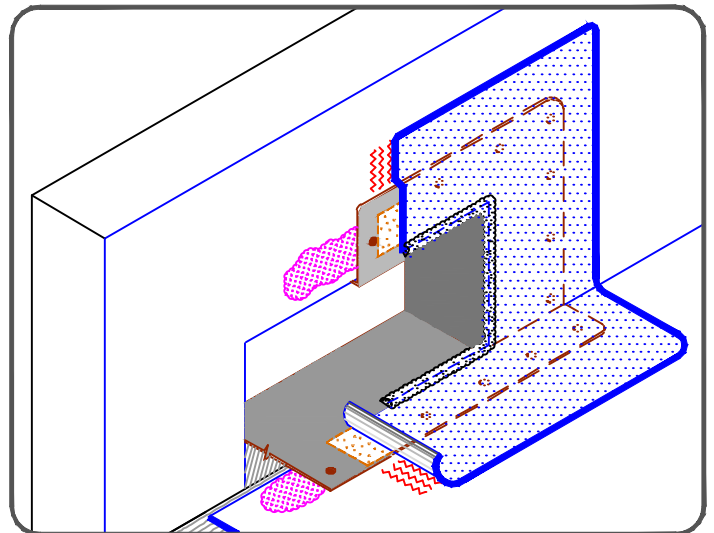
TPC-18.2



PVC ONLY
(NOT FOR TPO)

NOTES:

1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
2. INSTALL WALL FLASHING PRIOR TO SCUPPER INSTALLATION.
3. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
4. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT COMPRESSION.
5. SCUPPER FLANGES MUST BE TOTALLY COVERED BY NON-REINFORCED PVC FLASHING WITH MINIMUM 2" (51mm) COVERAGE PAST NAIL HEAD.
6. UNIVERSAL SINGLE-PLY SEALANT IS REQUIRED AT FLASHING EDGES ON SCUPPER EDGE.

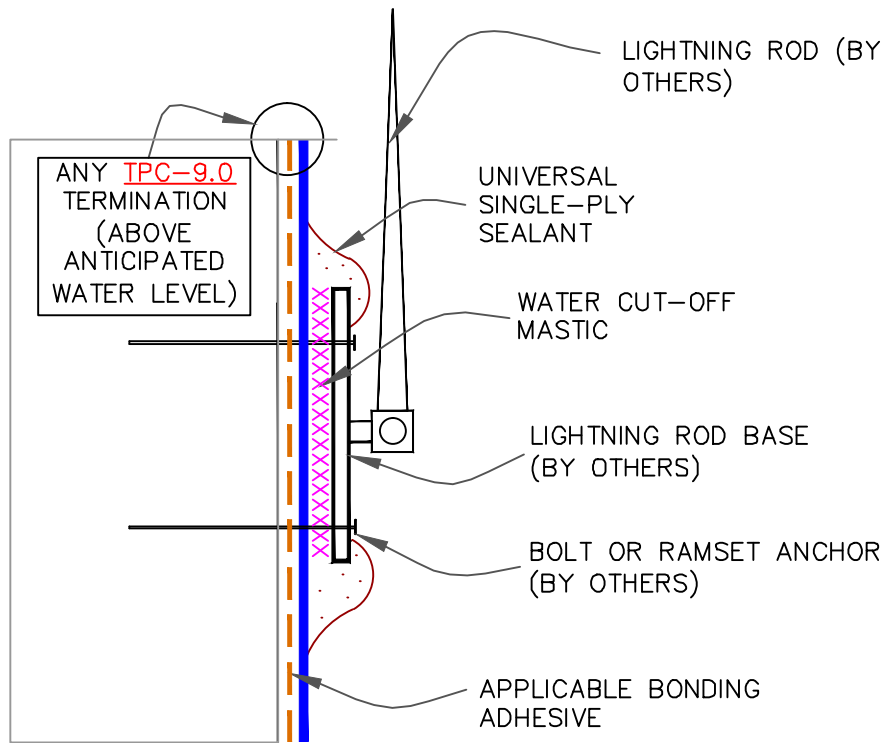


SCUPPER AT DECK-PVC

→ PVC MEMBRANE
 → APPROVED SUBSTRATE
0 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-18.3


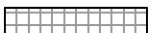



NOTES:

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. DETAIL UNACCEPTABLE FOR HORIZONTAL APPLICATION ON ROOF DECK.

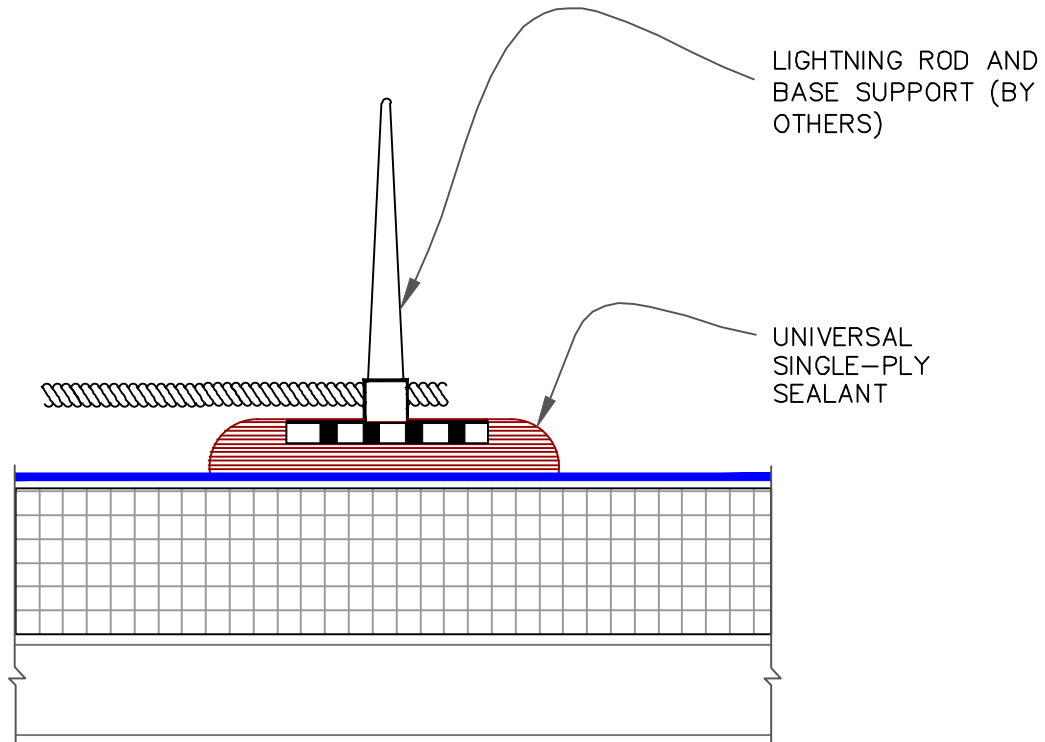


LIGHTNING ROD AT PARAPET (VERTICAL ATTACHMENT)

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-20.1


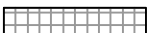



NOTES:

1. CLEAN EXPOSED MEMBRANE SURFACE WITH WEATHERED MEMBRANE CLEANER (WHEN USING TPO) AND PVC MEMBRANE CLEANER (WHEN USING PVC) AND ALLOW TO DRY.
2. WHEN USING TPO MEMBRANE, APPLY TPO PRIMER TO THE MEMBRANE SURFACE PRIOR TO THE APPLICATION OF UNIVERSAL SINGLE-PLY SEALANT.



LIGHTNING ROD AT DECK LEVEL

 → THERMOPLASTIC REINFORCED MEMBRANE
 → APPROVED SUBSTRATE
 → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-20.2