Kenaitze Indian Tribe P.O. Box 988 Kenai, Alaska 99611



Phone: 907-335-7200 Fax: 855-335-8865 www.kenaitze.org

KENAITZE INDIAN TRIBE REQUEST FOR PROPOSAL

Install Tempurtech Ice and Snow Melt System Dena'ina Wellness Center

Issued: 2-9-2024

1. INTRODUCTION

1.1 ORGANIZATION

The Kenaitze Indian Tribe is a federally recognized tribal government, reorganized in 1971 under the statutes of the Indian Reorganization Act of 1934, as amended for Alaska in 1936. The Tribe serves over 5,000 community members, Alaska Natives, and American Indians in the central and upper Kenai Peninsula. The Tribe's Administration building is located at 150 N. Willow St. Kenai, Alaska 99611.

1.2 MISSION STATEMENT

To assure Kahtnuht'ana Dena'ina thrive forever.

2. OVERVIEW

The Kenaitze Indian Tribe (Tribe) is seeking a vendor to install Tempurtech Ice and snow melting system on certain sections of Dena'ina Wellness Center (DWC). The purpose of this Request for Proposal (RFP) is to solicit responses from competent and experienced vendors capable of providing the goods/services as specified herein in a prompt, cost-effective, and efficient manner.

3. INQUIRIES

Questions regarding this RFP must be directed to Tami Murray, Procurement Manager, tmurray@kenaitze.org. All emails must identify the RFP title in the subject line, include the contact information for the person submitting the question, and indicate the relevant RFP section number. All questions must be submitted using this format and must be received no later than 5:00 p.m. Alaska Standard Time (AKST) Monday March 4, 2024.

The Tribe will review the submitted questions and respond to all inquiries in writing by emailing all inquirers and interested vendors at once. The email will provide every question received and each accompanying response. This will ensure all potential vendors receive the same information. Responses will be made available by **Friday**, **March 8**, **2024**.

4. PROPOSAL SUBMISSION REQUIREMENTS

All vendors interested in submitting a proposal in response to this RFP must adhere to the following requirements. Failure to do so may result in the Tribe deeming the proposal to be non-responsive and therefore not eligible for consideration.

4.1 Proposal Submittal Items

Vendors must only submit one proposal, follow the format outlined below, and clearly identify each of the following four criteria within the submittal.

- a) Cover Letter Submit a cover letter on company letterhead that is no more than 1 page and includes the following:
 - 1. The company's legal name and contact information.
 - **2.** An overview of the company's qualifications and experience relevant to the scope of work defined herein.
 - **3.** The identity and qualifications of the person(s) whom will be assigned to the job should the vendor be chosen.
 - **4.** The letter must be signed by an authorized company -, and include that person's contact information.
- b) Scope of Work Submit a written, detailed description of how each subsection within <u>section 5 Scope of Work</u> will be accomplished. Please refrain from using marketing information in this part of the proposal submittal.
- **c) Deliverables** If necessary and/or required, submit a schedule of all deliverables and milestones/due dates.
- d) Price Submit a written price proposal to provide the service(s) as specified herein, using the format set forth in <u>subsection 7.1 Proposal Price</u>. This project is jointly funded with Federal and Kenaitze Indian Tribe funds. Federal Davis-Bacon labor wages are required. The proposed price must include all of the vendor's costs associated with providing the good(s) or service(s) as called for within this RFP and including, but not limited to, wages, administrative overhead, travel, transportation, lodging, and other similar costs unless stated otherwise. No other costs will be considered for payment.
- **e)** All proposals will become the property of the Tribe and may be returned only at the option of the Tribe. Any information marked as proprietary or confidential will be held in confidence to the greatest extent possible.

4.2 Proposal Submission Deadline

To be considered, a complete proposal package must be received by the Tribe by the deadline via either of the following methods:

a) Hand delivered or mailed to: Kenaitze Indian Tribe

Attention: Tam Murray Procurement Manager 150 N. Willow St. Kenai, Alaska 99611

b) Electronically transmitted to: tmurray@kenaitze.org

The deadline for submission is 5:00 p.m. Alaska Time, **Monday, March 18, 2024.** Any proposals received after the deadline may not be accepted. Proposals sent via email should be sent in a single PDF document format, with the RFP title noted in the subject line.

4.3 Proposal Preparation Cost

The Tribe shall not be responsible for any costs associated with preparing and/or submitting a proposal in response to this RFP, in any manner or for any reason.

4.4 Proposal Validity

A vendor's price proposal will remain valid for 45 calendar days from the RFP submission deadline or until an award is made to the successful vendor, whichever is sooner. No price proposal will be accepted if marked "price prevailing at time of delivery", "estimated price", or something similar. All price proposals must be in US dollars.

4.5 Sovereign Immunity

The Tribe is reluctant to sign any contract or agreement that specifically asks or implies a waiver of sovereign immunity. If presented with a contract or agreement that contains or implies a waiver, the Tribe will likely ask that the following be included prior to consideration:

"SOVEREIGN IMMUNITY: Kenaitze is a federally-recognized Indian tribe and, as such, possesses sovereign immunity from suit. By entering into this Agreement, the Tribe does not intend to waive its sovereign immunity and does not do so. Nothing in this Agreement shall be construed as a waiver of the sovereign immunity of the Tribe."

5. SCOPE OF WORK

The Tribe is seeking a vendor to;

a) Install owner-supplied Tempurtech Ice and Snow melting system on certain roof sections of DWC (Attachment A)

- b) Upgrade Electrical Service
- c) Provide Electrical Design and Permitting
- d) Supply power and connect new heat pads
- e) Prep Surface
- f) Layout and adhere pads with Sikaflex

DWC is an integrated health care facility offering a wide range of services. The building was constructed in 2014 and is 52,000 square feet it also features a gym, classroom space and 18 bathrooms and 18 examination rooms. DWC is located at 508 Upland St., Kenai, Alaska.

5.1 Site Inspection

A recommended site inspection is encouraged prior to bidding this project to verify existing conditions and for contractor to familiarize itself with the full scope of work. Contact Tami Murray, Procurement Manager to arrange an inspection, at 907-335-7213 or TMurray@kenaitze.org.

5.2 Additional Requirements:

- a) Contractor to provide any and all equipment for project.
- **b)** Contractor responsible for verifying a thorough understanding of the Scope of Work, material dimensions, accuracy, damage, and layout.
- c) Contractor is responsible for all soils and debris removal from the site and must keep the site free of unnecessary debris at all times.
- d) Contractor shall supply a Project Site Specific Safety Plan.
- **e)** Contractor will turn in a Safety Data Sheet for products being used on Kenaitze property.

6. **GENERAL REQUIREMENTS**

6.1 Term of Service

The agreement resulting from this RFP shall be effective from the date of execution of the agreement through the completion of services. In no event shall services under the agreement extend beyond March 1, 2025. In the event the work is not completed within this timeframe, the Tribe, in its sole opinion, may determine the vendor to be in breach of the terms of the agreement.

6.2 RFP Modification

The Tribe reserves the right to:

- a) Modify or otherwise alter any or all of the requirements herein. In the event of a modification, vendors will be given an equal opportunity to modify their proposals as identified in writing by the Tribe.
- **b)** Reject any proposal not adhering to the requirements set forth within this RFP, either in whole or in part.
- c) Reject any or all proposals received.
- d) Terminate this RFP at any time, without reason.

6.3 Order of Precedence in the Event of a Conflict

If an agreement is awarded, all terms and conditions herein shall be incorporated into the award along with the vendor's proposal. Any change to the agreement must be through a written amendment agreed upon by both Parties. In the event of a conflict between the RFP and the vendor's proposal, the more stringent language shall apply.

6.4 Subcontracting

The vendor must disclose to the Tribe the use and identity of all subcontractors it uses in carrying out the requirements herein. The Tribe reserves the right to approve all subcontractors if it so chooses. The vendor is solely responsible for the satisfactory performance of and compensation to any and all subcontractors.

6.5 Insurance

The vendor shall have, maintain, and provide proof of Commercial General Liability Insurance and Workman's Compensation Insurance, in addition to any applicable insurance required by the State of Alaska or the vendor's primary state of location. The vendor must provide the Tribe with proof of the insurance required herein. The vendor shall be financially responsible for all deductibles, costs, and self-insured retention's and/or self-insurance required herein.

The Tribe is a sovereign nation, and as such the vendor waives all rights against the Tribe and its officers, employees, and agents for recovery of damages to the extent these damages are covered by the required policies.

6.6 Indemnification

Except in the case of the sole negligence or willful misconduct of the Tribe, the vendor shall indemnify, defend and hold harmless the Tribe, and the Tribe's officers, agents, and employees from and against any and all liability, claims, damages, losses, expenses, actions, attorney fees and costs and lawsuits whatsoever (including without limitation all claims involving damage to real or personal property, civil rights claims, or claims of infringement of a patent, copyright, trade secret or trademark) caused by or arising out of the performance, acts, or omissions under this RFP by the vendor or any of its officers, agents, representatives, employees or subcontractors or arising from or related to a failure to comply with the requirements herein, and/or applicable state or federal statute, law, regulation, or rule.

Nothing in this RFP is a waiver of Sovereign Immunity.

7. PRICE AND PAYMENT

7.1 Proposal Price

The vendor must submit a written price proposal to provide the good(s) or service(s) as specified herein. The proposed price must include all of the vendor's costs associated with providing the good(s) or service(s) as called for within this RFP and including, but not limited to, wages, administrative overhead, travel, transportation, lodging, and other similar costs unless stated otherwise. No other costs will be considered for payment.

7.2 Davis- Bacon Act

This project must comply with the Davis-Bacon Act: A condition of this project is that any construction contracts in excess of \$2,000 per project funded with Federal and Kenaitze Indian Tribe funding will comply with the Davis-Bacon Act.

a) Davis-Bacon and Alaska Prevailing Wages: The Wage Determinations Online website (https://sam.gov/content/wage-determinations) issues prevailing wage schedules to the Kenai Peninsula Borough for qualifying contracts. These prevailing wage schedules contain hourly wage rates that workers must receive when working on a public project.

Each covered contractor and subcontractor *must*, on a weekly basis, provide the Kenaitze Indian Tribe a copy of all payrolls for the preceding weekly payroll period. Each payroll submitted must be accompanied by a "Statement of Compliance." The contractor, subcontractor, or the authorized officer or employee of the contractor or subcontractor who supervises the payment of wages must sign the weekly statement.

7.3 Payment

The vendor shall be paid for actual work completed in accordance with the requirements herein and the accepted price proposal. The total amount to be paid to the vendor shall not exceed the vendor's quoted amount, unless otherwise specifically agreed to in advance with supporting justification and in writing by both parties.

Payment to the vendor is contingent on the vendor delivering a bill or invoice to the Tribe on a monthly basis. The Tribe retains the right to require additional documentation to support the submitted invoice. The Tribe will provide payment to the vendor within 30 calendar days of acceptance of the invoice.

The vendor shall provide the following information with each monthly invoice:

- a) Identification of billing period
- **b)** A statement describing the actual work completed with sufficient detail to reconcile the charges against the work performed and/or work product received by the Tribe;
- c) Total amount of hours multiplied by the rate billed for the billing period;
- **d)** Total cost billed for the billing period;
- e) Date invoice was submitted;
- f) Entity name and contact information; and
- **g)** Name of authorized person originating or submitting the billing for the entity.

Submit invoices to: Accounts Payable Kenaitze Indian Tribe PO Box 988 Kenai, Alaska 99611

8. EVALUATION AND SELECTION

Proposals will be evaluated by staff based upon the responsiveness to the submission requirements described in Section 4, and/or the following point system, and/or any other manner deemed appropriate by the Tribe to determine the proposal most advantageous to the Tribe.

Point System:

Capability and Experience (20 points)

Provide a summary of the proposed project team, identifying the primary point of contact for the Tribe throughout the project and relevant experiences for the identified individual. List all subcontractors that will play a key role in the project and describe their relevant experiences.

Work Plan (20 points)

Provide a detailed work plan that outlines the timeline for all phases of the project, including, but not limited to, the starting date and other milestones/deadlines for each phase.

• Proposal and Professionalism (10 points)

Provide a comprehensive and professional proposal with all key elements as stated herein.

• Value Proposal (50 points)

The Tribe will award these points based on the vendor's quoted price.

Alaska Native/American Indian Member (5 points) or Tribal Member (10 points) Preference

Provide proof of AN/AI membership or Tribal membership for the vendor's owner to receive preference. In order to be considered for preference, proof of membership and at least 51% ownership must be submitted with the proposal.

The Tribe reserves the right to waive informalities and minor inaccuracies and reject any and/or all proposals which it deems to be not in the best interests of the Tribe and to proceed with the next proposer or to utilize an entirely different process at any time during the process.

Anticipated date for Notice of Award is March 22, 2024 Anticipated Completion of the project by March 1, 2025.

End of Proposal

Attachment A

KENAITZE	FACILITIES	MANAGEM
DENA'INA	WELLNESS	CENTER
2/8/2023		

SYSTEM NOTES



	SYSTEM SPECIFICATIONS						
	POWE	R SUF	PPLY	TOTAL CURRE	NT DRAW	TOTAL POWER CO	NSUMPTION
ĺ	220V	/	1PH	470.24	AMPS	112.76	kW

PRODUCT TOTALS								
5" WIDE EPDM HEATED MAT			12" WID	E EPDM HEA	TED MAT	24" WIDE EPDM HEATED MAT		
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	2939.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	102	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	470.24	AMPS

CUSTOM	WIDTH 1		CUSTOM	WIDTH 2		HEA	T TRACE CA	BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTROL PANEL		
TYPE	QTY	TYPE	QTY	
DS-9C	16	CDP-2	0	

MAT QTY TOTAL	PHYSICAL		
102	WEIGHT		
102	4408.50 LBS		

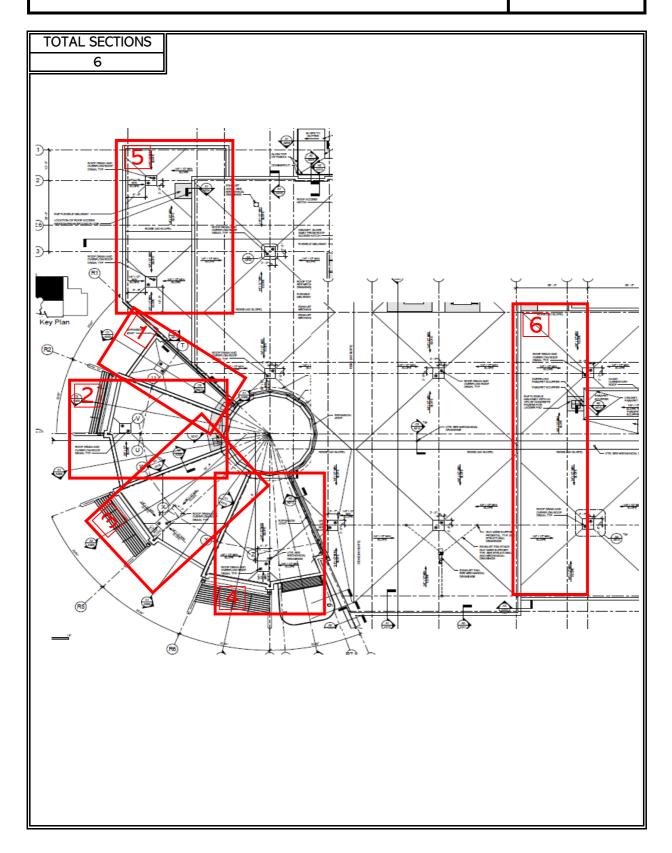
MANUFACTURER NOTES:			

QUESTIONS?

PHONE: (802) 430-3617 EMAIL: tempurtechsales@gmail.com

SECTION OVERVIEW





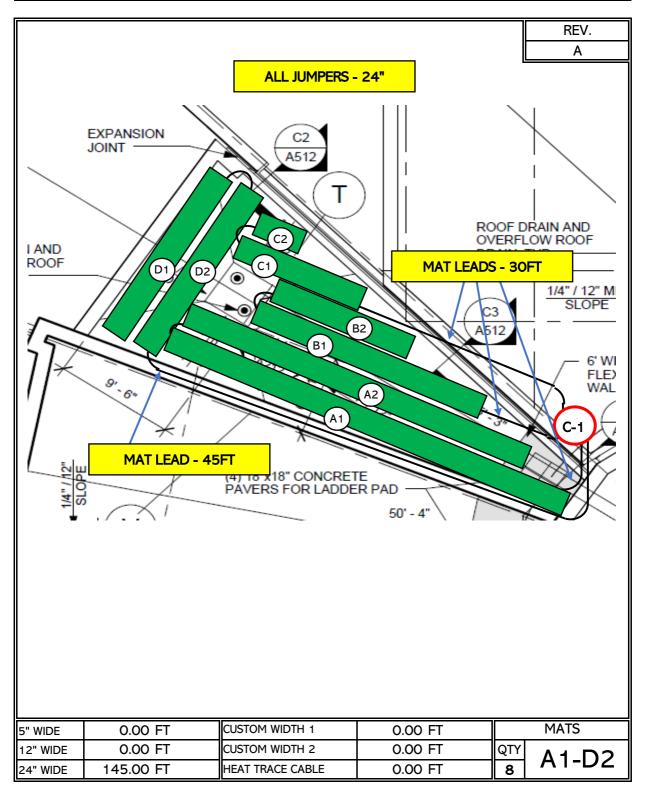
KENAITZE	FACILITIES	MANAGEM
DENA'INA	WELLNESS	CENTER
2/8/2023		

LAYOUT KEY



SYMBOL	DESCRIPTION
C-1	DS-9C CONTROLLER (2 INPUTS <30A)
#	CABLE LENGTH INDICATOR
1	HEAT TRACE CABLE INDICATOR
\supset	JUMPER/LEAD CABLE
(A1)	MAT INDICATOR (CIRCUIT 'A', MAT# '1')

KENAITZE FACILITIES MANAGEMENT DENA'INA WELLNESS CENTER		SECTION		12" WIDE EPD	M HEATED MAT M HEATED MAT	TEMPURTECH MANUFACTURING LLC ICE AND SHOW MELTING STATERS
2/7/2023				5" WIDE EPDM	I HEATED MAT	
SECTION VOLTAGE:	220	SECTION CURREN	N TOTAL T DRAW	23.20	NOT TO	O SCALE



KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 1 KEY



MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
A1	36	24	5.76
A2	31	24	4.96
B1	20	24	3.20
B2	12	24	1.92
C1	10	24	1.60
C2	4	24	0.64
D1	16	24	2.56
D2	16	24	2.56
			Χ
			Χ
			Χ
			Х
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MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
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KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 1 NOTES



SECTION 1 SPECIFICATIONS		
POWER SUPPLY	TOTAL CURRENT DRAW	TOTAL POWER CONSUMPTION
220V / 1PH	23.20 AMPS	5.56 kW

PRODUCT TOTALS								
5" WIDE	EPDM HEAT	ED MAT	12" WID	E EPDM HEA	TED MAT	24" WID	E EPDM HEA	TED MAT
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	145.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	8	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	23.20	AMPS

CUSTOM	WIDTH 1		CUSTOM	WIDTH 2		HEA	T TRACE CA	BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTROL PANEL		
TYPE	QTY	TYPE	QTY	
DS-9C	1	CDP-2	0	

MAT QTY TOTAL	PHYSICAL		
Q	WEIGHT		
	217.50 LBS		

CIRCUITS

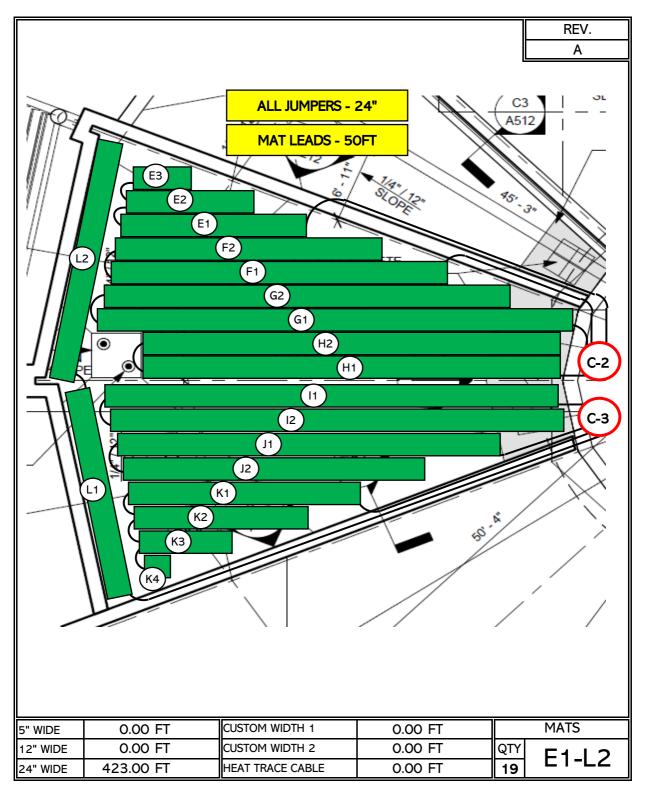
SECTION 1				
SUPPLY	CIRCUIT		CURI	RENT
	Α	24"X36' - 24"X31'	10.72	AMPS
220V	В	24"X20' - 24"X12'	5.12	AMPS
2201	С	24"X10' - 24"X4'	2.24	AMPS
	D	24"X16' - 24"X16'	5.12	AMPS

MANUFACTURER NOTES:			

QUESTIONS?

PHONE: (802) 430-3617 EMAIL: tempurtechsales@gmail.com

KENAITZE FACILITIES MAN	AGEMENT	SECTION		24" WIDE EPD	M HEATED MAT	4
DENA'INA WELLNESS	CENTER	2		12" WIDE EPD	M HEATED MAT	TEMPURTECH MANUFACTURING LLC ICE AND SNOW MELTING SYSTEMS
2/7/2023		_		5" WIDE EPDM	I HEATED MAT	11.1000/Aur. 1.100 (1.100 (1.100 Aur.) 1.100 (1.100
SECTION VOLTAGE:	220	SECTION CURREN	N TOTAL T DRAW	67.68	NOT TO) SCALE



KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 2 KEY



MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
E1	15	24	2.40
E2	10	24	1.60
E3	5	24	0.80
F1	27	24	4.32
F2	21	24	3.36
G1	37	24	5.92
G2	32	24	5.12
H1	33	24	5.28
H2	33	24	5.28
l1	36	24	5.76
12	36	24	5.76
J1	31	24	4.96
J2	26	24	4.16
K1	19	24	3.04
K2	13	24	2.08
K3	7	24	1.12
K4	2	24	0.32
L1	18	24	2.88
L2	22	24	3.52
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MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
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KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 2 NOTES



SECTION 2 SPECIFICATIONS						
POW	ER SUF	PPLY	TOTAL CURRE	NT DRAW	TOTAL POWER CO	ONSUMPTION
220V	/	1PH	67.68	AMPS	16.23	kW

PRODUCT TOTALS								
5" WIDE	EPDM HEAT	ED MAT	12" WID	E EPDM HEA	TED MAT	24" WIDE EPDM HEATED MAT		
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	423.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	19	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	67.68	AMPS

CUSTOM	WIDTH 1		CUSTOM	WIDTH 2		HEA	T TRACE CA	BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTROL PANEL		
TYPE	TYPE QTY		QTY	
DS-9C	2	CDP-2	0	

MAT QTY TOTAL	PHYS	SICAL	
10	WEIGHT		
19	634.50	LBS	

CIRCUITS

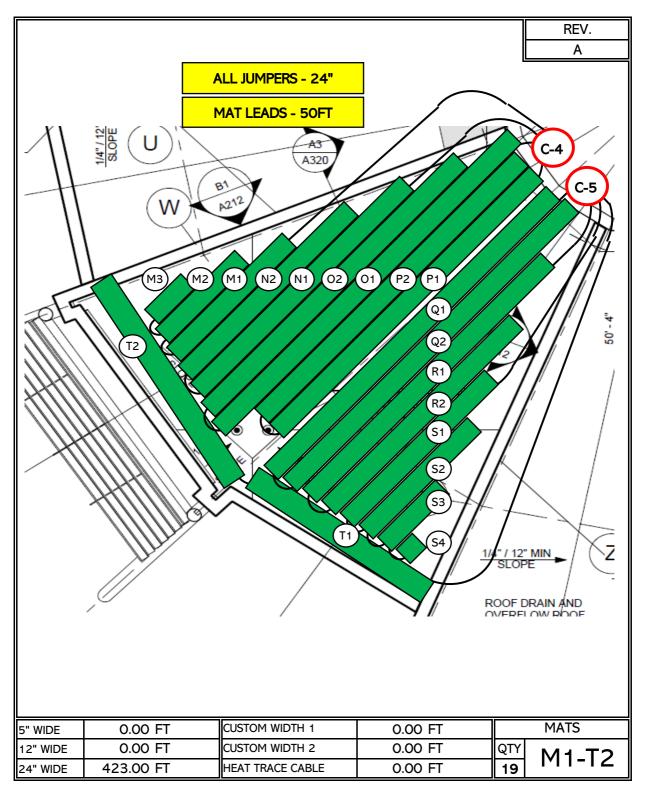
SECTION 2							
SUPPLY	CIRCUIT		CUR	RENT			
	Е	24"X15' - 24"X10' - 24"X5'	4.80	AMPS			
	F	24"X27' - 24"X21'	7.68	AMPS			
	G	24"X37' - 24"X32'	11.04	AMPS			
220V	Н	24"X33' - 24"X33'	10.56	AMPS			
2200		24"X36' - 24"X36'	11.52	AMPS			
	J	24"X31' - 24"X26'	9.12	AMPS			
	K	24"X19' - 24"X13' - 24"X7' - 24"X2'	6.56	AMPS			
	L	24"X18' - 24"X22'	6.40	AMPS			

MANUFACTURER NOTES:		

QUESTIONS?

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KENAITZE FACILITIES MAN	SECTION		24" WIDE EPD	M HEATED MAT	4	
DENA'INA WELLNESS CENTER		C		12" WIDE EPD	M HEATED MAT	TEMPURTECH MANUFACTURING LLC ICE AND SNOW MELTING SYSTEMS
2/7/2023)		5" WIDE EPDM	I HEATED MAT	11.1000/Aur. 1.100 (1.100 (1.100 Aur.) 1.100 (1.100
SECTION VOLTAGE:	220	SECTION CURREN	N TOTAL T DRAW	67.68	NOT TO) SCALE



KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 3 KEY



MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
M1	15	24	2.40
M2	10	24	1.60
M3	5	24	0.80
N1	27	24	4.32
N2	21	24	3.36
01	37	24	5.92
02	32	24	5.12
P1	33	24	5.28
P2	33	24	5.28
Q1	36	24	5.76
Q2	36	24	5.76
R1	31	24	4.96
R2	26	24	4.16
S1	19	24	3.04
S2	13	24	2.08
S3	7	24	1.12
S4	2	24	0.32
T1	18	24	2.88
T2	22	24	3.52
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X	MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
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X				Х
				Х

KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 3 NOTES



S	SECTION 3 SPECIFICATIONS							
	POW	ER SUF	PPLY	TOTAL CURRE	NT DRAW	TOTAL POWER CO	ONSUMPTION	
	220V	/	1PH	67.68	AMPS	16.23	kW	

PRODUCT TOTALS								
5" WIDE EPDM HEATED MAT 12" WIDE EPDM HEATED MAT 24" WIDE EPDM HEATED MA						TED MAT		
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	423.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	19	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	67.68	AMPS

CUSTOM	WIDTH 1		CUSTOM	WIDTH 2		HEA	T TRACE CA	BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTROL PANEL		
TYPE	TYPE QTY		QTY	
DS-9C	2	CDP-2	0	

MAT QTY TOTAL	PHYSICAL		
19	WEIGHT		
19	634.50	LBS	

CIRCUITS

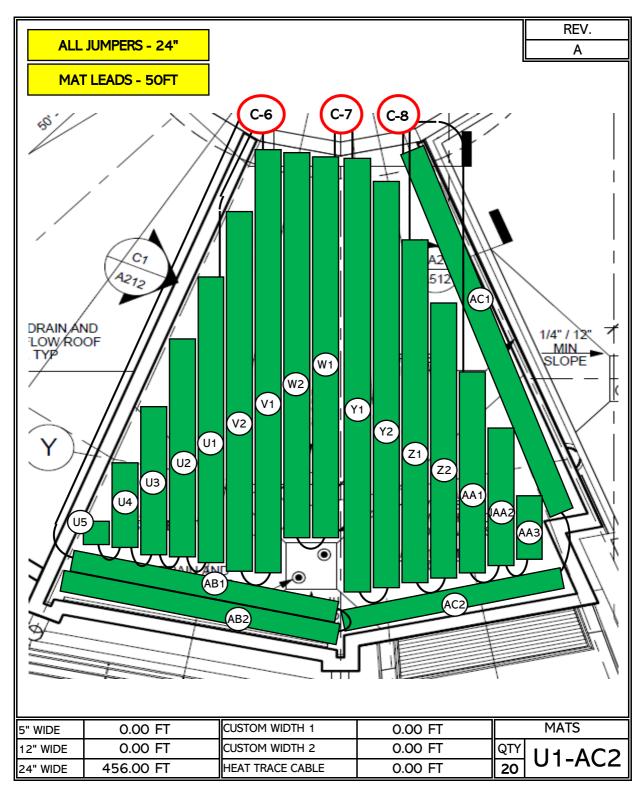
SECTION 3							
SUPPLY	CIRCUIT		CURI	RENT			
	М	24"X15' - 24"X10' - 24"X5'	4.80	AMPS			
	N	24"X27' - 24"X21'	7.68	AMPS			
	0	24"X37' - 24"X32'	11.04	AMPS			
220V	Р	24"X33' - 24"X33'	10.56	AMPS			
2200	Q	24"X36' - 24"X36'	11.52	AMPS			
	R	24"X31' - 24"X26'	9.12	AMPS			
	S	24"X19' - 24"X13' - 24"X7' - 24"X2'	6.56	AMPS			
	Т	24"X18' - 24"X22'	6.40	AMPS			

MANUFACTURER NOTES:		

QUESTIONS?

PHONE: (802) 430-3617 EMAIL: tempurtechsales@gmail.com

KENAITZE FACILITIES MANAGEMENT		SECTION		24" WIDE EPD	M HEATED MAT	4
DENA'INA WELLNESS CENTER		1		12" WIDE EPD	M HEATED MAT	TEMPURTECH MANUFACTURING LLC ICE AND SNOW MELTING SYSTEMS
2/7/2023		4		5" WIDE EPDM	I HEATED MAT	11.1000/Aur. 1.100 (1.100 (1.100 Aur.) 1.100 (1.100
SECTION VOLTAGE:	220	SECTION CURREN	N TOTAL T DRAW	72.96	NOT TO) SCALE



KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 4 KEY



MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
U1	25	24	4.00
U2	19	24	3.04
U3	13	24	2.08
U4	7	24	1.12
U5	2	24	0.32
V1	36	24	5.76
V2	31	24	4.96
W1	33	24	5.28
W2	33	24	5.28
Y1	37	24	5.92
Y2	35	24	5.60
Z1	30	24	4.80
Z2	24	24	3.84
AA1	18	24	2.88
AA2	12	24	1.92
AA3	6	24	0.96
AB1	21	24	3.36
AB2	22	24	3.52
AC1	34	24	5.44
AC2	18	24	2.88
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			Χ

X	MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
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X				Х
X X X X X X X X X X X X X X X X X X X				Х
X X X X X X X X X X X X X X X X X X X				
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KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 4 NOTES



I	SECTION 4 SPECIFICATIONS							
	POW	ER SUF	PPLY	TOTAL CURRE	NT DRAW	TOTAL POWER CO	ONSUMPTION	
Ī	220V	/	1PH	72.96	AMPS	17.50	kW	

PRODUCT TOTALS								
5" WIDE	EPDM HEAT	ED MAT	12" WIDE EPDM HEATED MAT			24" WIDE EPDM HEATED MAT		
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	456.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	20	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	72.96	AMPS

CUSTOM	WIDTH 1		CUSTOM	WIDTH 2		HEA	T TRACE CA	BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTROL PANEL		
TYPE	TYPE QTY		QTY	
DS-9C	3	CDP-2	0	

MAT QTY TOTAL	PHYSICAL		
20	WEIGHT		
20	684.00	LBS	

CIRCUITS

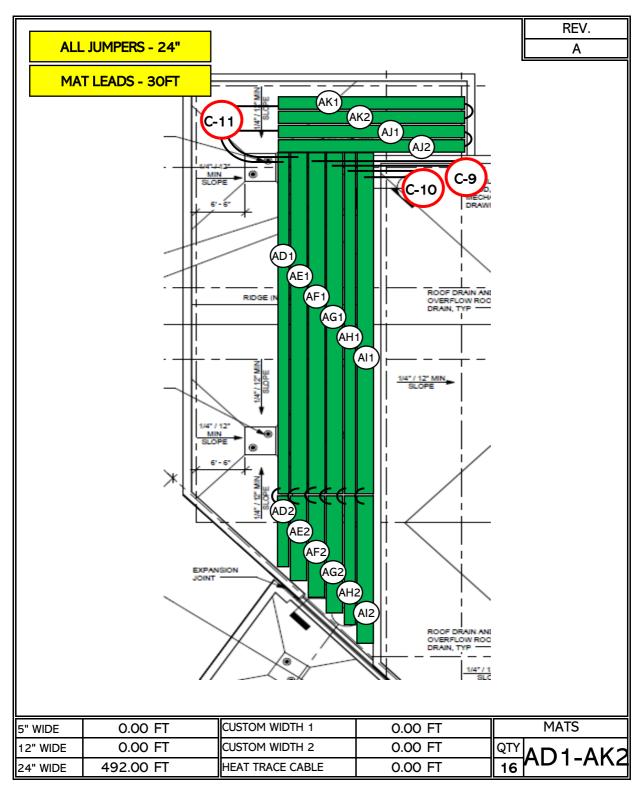
SECTION 4								
SUPPLY	CIRCUIT		CURI	RENT				
	U	24"X25' - 24"X19' - 24"X13' - 24"X7' - 24"X2'	10.56	AMPS				
	٧	24"X36' - 24"X31'	10.72	AMPS				
	W	24"X33' - 24"X33'	10.56	AMPS				
220V	Y	24"X37' - 24"X35'	11.52	AMPS				
2200	Z	24"X30' - 24"X24'	8.64	AMPS				
	AA	24"X18' - 24"X12' - 24"X6'	5.76	AMPS				
	AB	24"X21' - 24"X22'	6.88	AMPS				
	AC	24"X34' - 24"X18'	8.32	AMPS				

MANUFACTURER NOTES:		

QUESTIONS?

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KENAITZE FACILITIES MANAGEMENT		SECTION		24" WIDE EPD	M HEATED MAT	4
DENA'INA WELLNESS CENTER		Г		12" WIDE EPD	M HEATED MAT	TEMPURTECH MANUFACTURING LLC ICE AND SNOW MELTING SYSTEMS
2/7/2023		ว		5" WIDE EPDM	I HEATED MAT	31,000,000
SECTION VOLTAGE:	220	SECTION CURREN	N TOTAL T DRAW	78.72	NOT TO	O SCALE



KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 5 KEY



MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
AD1	50	24	8.00
AD2	11	24	1.76
AE1	50	24	8.00
AE2	13	24	2.08
AF1	50	24	8.00
AF2	15	24	2.40
AG1	50	24	8.00
AG2	17	24	2.72
AH1	50	24	8.00
AH2	19	24	3.04
Al1	50	24	8.00
Al2	21	24	3.36
AJ1	24	24	3.84
AJ2	24	24	3.84
AK1	24	24	3.84
AK2	24	24	3.84
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			Χ

MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
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KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/7/2023

SECTION 5 NOTES



SECTION 5 SPECIFICATIONS							
POWER SUPPLY	TOTAL CURRENT DRAW	TOTAL POWER CONSUMPTION					
220V / 1PH	78.72 AMPS	18.88 kW					

PRODUCT TOTALS								
5" WIDE	EPDM HEAT	ED MAT	12" WID	E EPDM HEA	TED MAT	24" WID	E EPDM HEA	TED MAT
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	492.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	16	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	78.72	AMPS

CUSTOM	WIDTH 1		CUSTOM	WIDTH 2		HEA	T TRACE CA	BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTRO	L PANEL	
TYPE	QTY	TYPE QTY		
DS-9C	3	CDP-2	0	

MAT QTY TOTAL	PHYSICAL		
16	WEIGHT		
10	738.00 LBS		

CIRCUITS

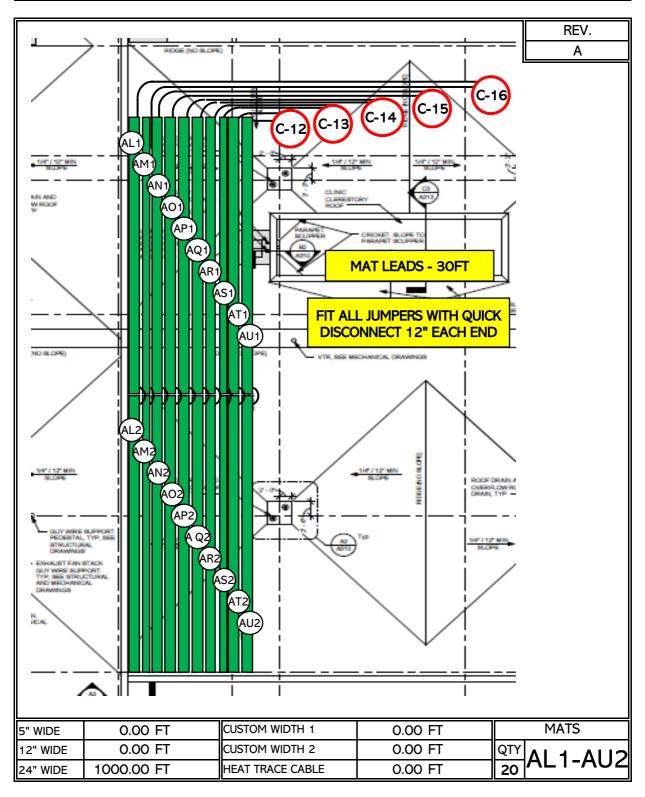
SECTION 5							
SUPPLY	CIRCUIT		CUR	RENT			
	AD	24"X50' - 24"X11'	9.76	AMPS			
	AE	24"X50' - 24"X13'	10.08	AMPS			
	AF	24"X50' - 24"X15'	10.40	AMPS			
220V	AG	24"X50' - 24"X17'	10.72	AMPS			
2200	AH	24"X50' - 24"X19'	11.04	AMPS			
	Al	24"X50' - 24"X21'	11.36	AMPS			
	AJ	24"X24' - 24"X24'	7.68	AMPS			
	AK	24"X24' - 24"X24'	7.68	AMPS			

MANUFACTURER NOTES:		

QUESTIONS?

PHONE: (802) 430-3617 EMAIL: tempurtechsales@gmail.com

KENAITZE FACILITIES MANAGEMENT		SECTION		24" WIDE EPD	M HEATED MAT	
DENA'INA WELLNESS CENTER		6		12" WIDE EPD	M HEATED MAT	TEMPURTECH MANUFACTURING LLC ICE AND SNOW MELTING SYSTEMS
2/8/2023		Ø		5" WIDE EPDM	HEATED MAT	11/1/20/20 1 22/14/00 (100/20/20/20/20/20/20/20/20/20/20/20/20/2
SECTION VOLTAGE:	220	SECTION CURREN	N TOTAL T DRAW	160.00	NOT TO	O SCALE



KENAITZE FACILITIES MANAGEMENT
DENA'INA WELLNESS CENTER
2/8/2023

SECTION 6 KEY



MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
AL1	50	24	8.00
AL2	50	24	8.00
AM1	50	24	8.00
AM2	50	24	8.00
AN1	50	24	8.00
AN2	50	24	8.00
AO1	50	24	8.00
AO2	50	24	8.00
AP1	50	24	8.00
AP2	50	24	8.00
AQ1	50	24	8.00
AQ2	50	24	8.00
AR1	50	24	8.00
AR2	50	24	8.00
AS1	50	24	8.00
AS2	50	24	8.00
AT1	50	24	8.00
AT2	50	24	8.00
AU1	50	24	8.00
AU2	50	24	8.00
			Х
			Χ
			Χ
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			Х
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			Χ
			Х
			Х
			Х

MAT #	LENGTH (FT)	WIDTH (IN)	AMPS
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			Х
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			X
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			Х
	-		

KENAITZE FACILITIES MANAGEMENT	
DENA'INA WELLNESS CENTER	
2/8/2023	

SECTION 6 NOTES



SECTION 6 SPECIFICATIONS						
POWER SUPPLY	TOTAL CURRENT DRAW	TOTAL POWER CONSUMPTION				
220V / 1PH	160.00 AMPS	38.37 kW				

PRODUCT TOTALS								
5" WIDE EPDM HEATED MAT 12" WIDE EPDM HEATED MAT 24" WIDE EPDM HEATED MAT					TED MAT			
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	1000.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	20	MATS
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	160.00	AMPS

CUSTOM WIDTH 1			CUSTOM WIDTH 2			HEAT TRACE CABLE		BLE
LENGTH	0.00	FT	LENGTH	0.00	FT	LENGTH	0.00	FT
QUANTITY	0	MATS	QUANTITY	0	MATS	QUANTITY	0	CABLES
CURRENT	0.00	AMPS	CURRENT	0.00	AMPS	CURRENT	0.00	AMPS

CONTR	ROLLER	CONTROL PANEL		
TYPE QTY		TYPE	QTY	
DS-9C	5	CDP-2	0	

MAT QTY TOTAL	PHYSICAL		
20	WEIGHT		
	1500.00 LBS		

CIRCUITS

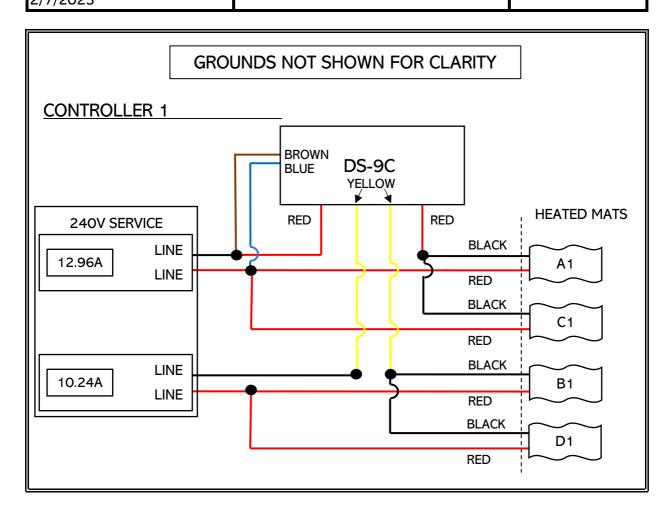
SECTION 6					
SUPPLY	CIRCUIT	CUIT			
	AL	24"X50' - 24"X50'	16.00	AMPS	
	AM	24"X50' - 24"X50'	16.00	AMPS	
	AN	24"X50' - 24"X50'	16.00	AMPS	
220V	AO	24"X50' - 24"X50'	16.00	AMPS	
	AP	24"X50' - 24"X50'	16.00	AMPS	
	AQ	24"X50' - 24"X50'	16.00	AMPS	
	AR	24"X50' - 24"X50'	16.00	AMPS	
	AS	24"X50' - 24"X50'	16.00	AMPS	
	AT	24"X50' - 24"X50'	16.00	AMPS	
	AU	24"X50' - 24"X50'	16.00	AMPS	
MANUEAC	TUDED NOT	TC.			

MANUFACTURER NOTES:

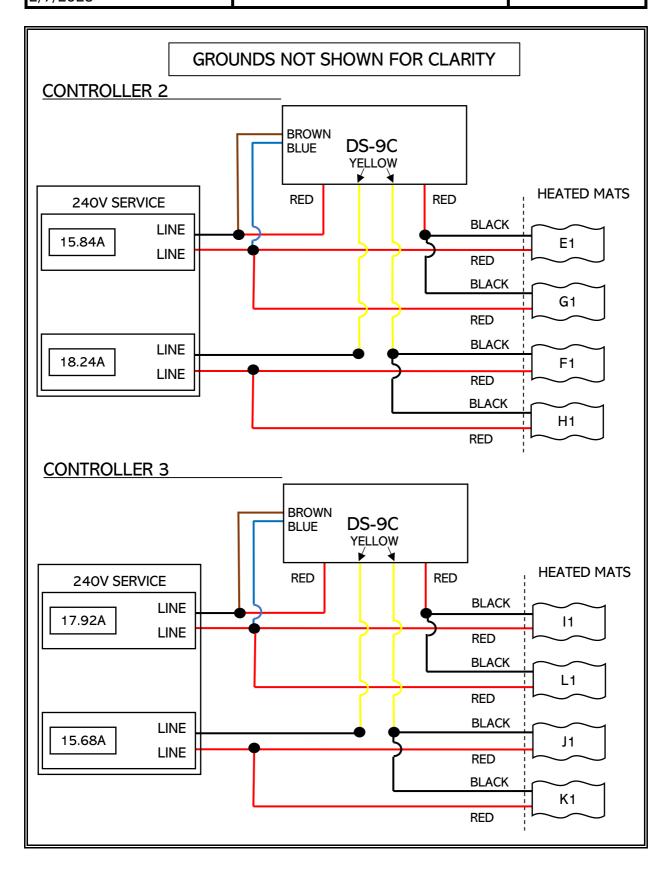
QUESTIONS?

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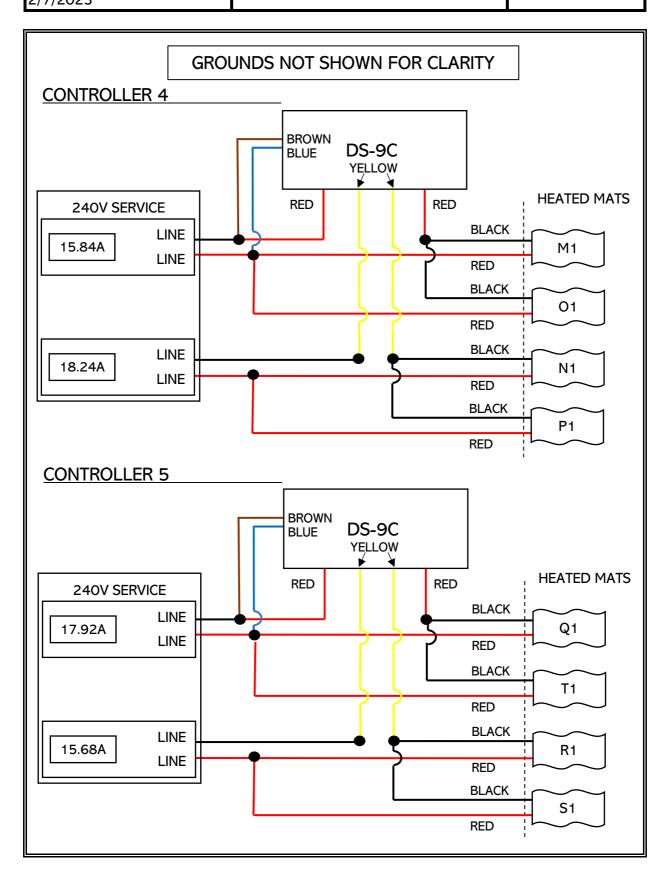




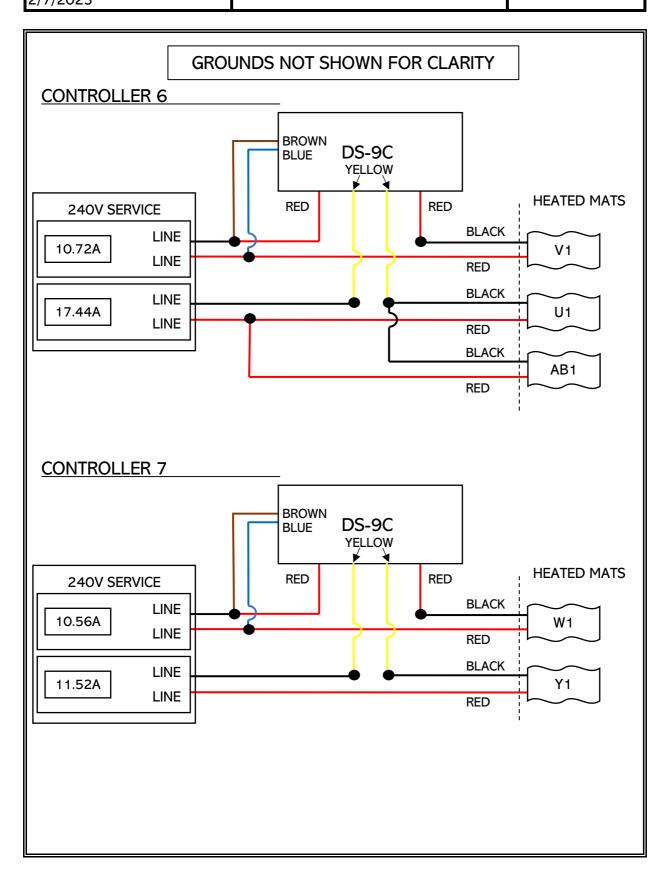




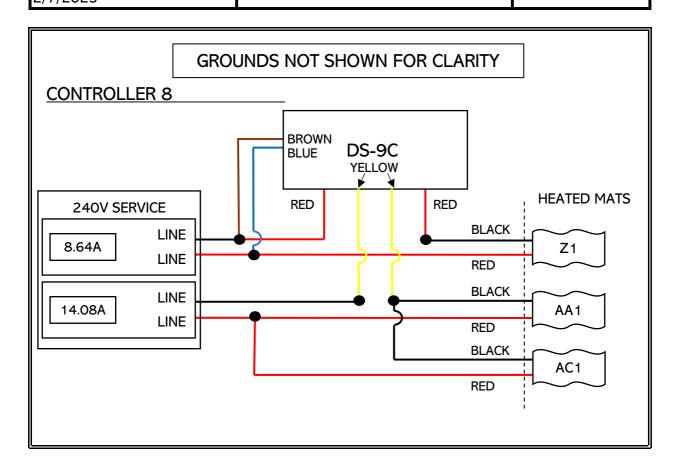




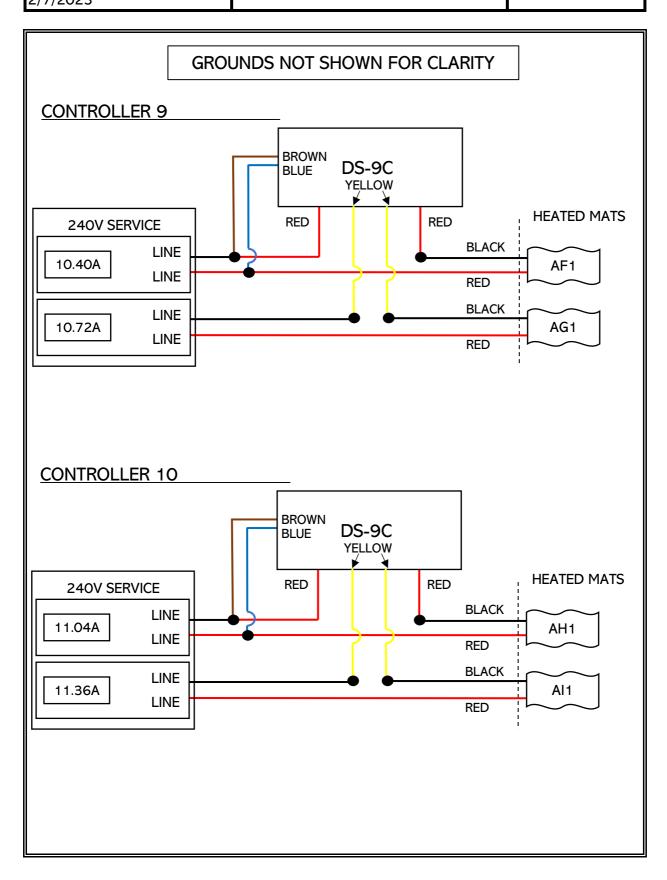




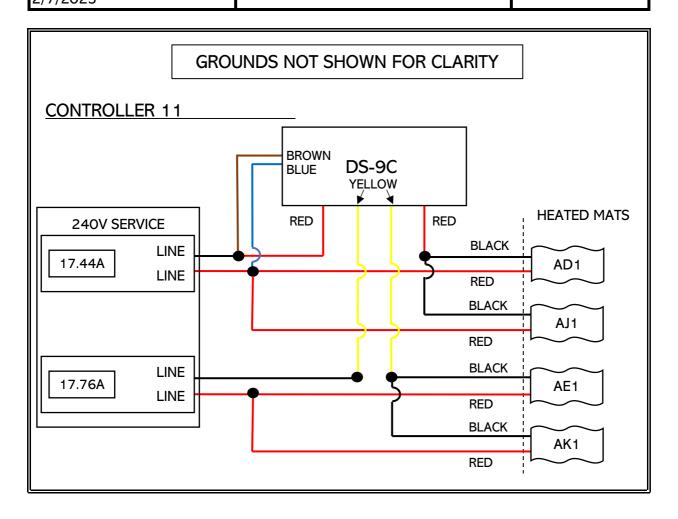






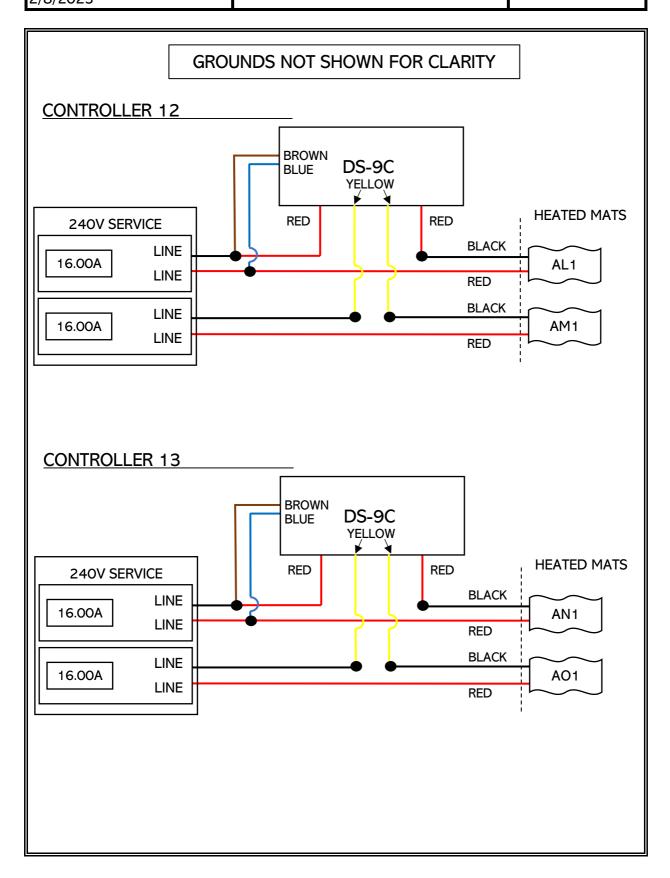






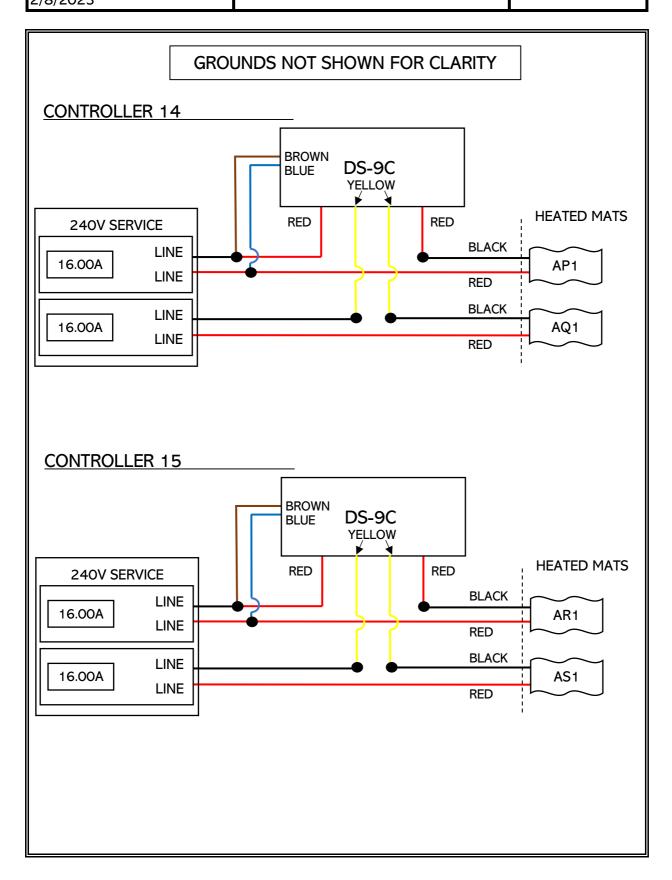
WIRING DIAGRAM





WIRING DIAGRAM

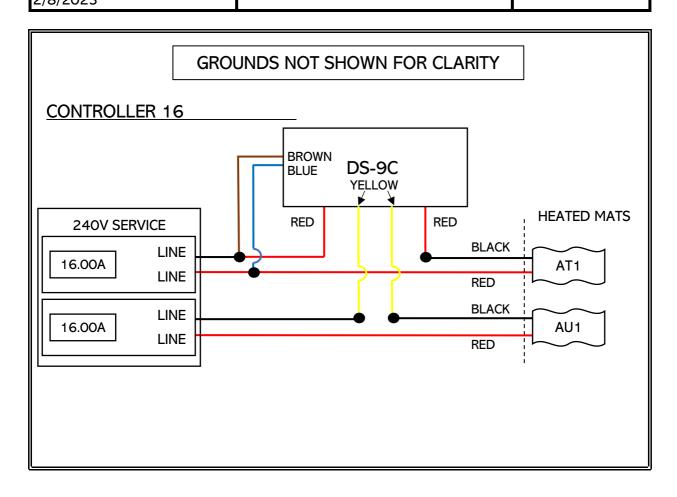




KENAITZE FACILITIES
DENA'INA WELLNESS CENTER
2/8/2023

WIRING DIAGRAM





ADVANCED CARBON TECHNOLOGY

Our heated mats use a carbon heating element with a Positive Tempurature Coefficient (PTC) which limits the maximum current allowed in the system and prevents thermal runaway. When the carbon is excited to its threshold temperature, it demonstrates a rapid increase in resistance to reach its maximum designed tempurature. When this temperature is attained, the increased resistance chokes off the current to ensure the heating element stays within its designed limits. Our systems are designed to offer superior energy efficiency, durability, and safety

FEATURES & BENEFITS

- Mats may be automatically controlled via our DS-9C controller
- Plug-and-play design allows for easy and simple installation. No additional wiring necessary
- High UV and weather resistance allows mats to be installed outdoors year-round
- Low-cost, efficient heating
- Meets all ETL design and component standards that meet or exceed UL standards

Tempurtech Heated Roof Mats















OVERVIEW

Our EPDM Heated Roof Mat is optimal for clearing snow and ice from any problem area on your roof. The mats may be applied to all common roof types to eliminate snow and ice buildup throughout the winter. Whether you're looking to clear valleys, protect eaves and gutters, or prevent excessive snow loads and drifts, our mats stay on to melt snow as it falls and prevent refreezing and ice damming.

Tempurtech uses a parallel carbon resistance heating element to ensure maximum heating area and optimal product performance whereas other common heating products use linearly configured heating elements prone to easy wear, poor coverage, and overheating. Tempurtech's UL-listed sheet heating element contains no internal wires which are typically

INSTALLATION

Our EPDM Heated Roof Mats may be installed over an existing roof or under a new one. They may be installed using EPDM adhesives or Tempurtech's double-sided adhesive tape



Physical Properties

	5" wide	12" wide	24" wide		
Max. Length/Mat (ft)	50	50	50		
Weight (lbs/ln ft)	0.35	0.75	1.5		
Thickness	0.135"				
Slip Resistance	Minimal – Should not be used for traction				
Color	Matte Black				
Max. Element Temperature	110°F (Sustained), 120°F (Max.)				
Bend Radius	90 degrees	s, do not crea	se mats		

Electrical Properties

	5" wide	12" wide	24" wide		
Amps/In ft (120V / 240V)	0.07/N/A	0.15/0.08	0.36/0.16		
Power Req. (kW/ln ft) (120V / 240V)	0.008/N/A	0.018/0.02	0.04/0.038		
Max. Circuit 16 Amps					
Circuit Protection	20 Amp breaker (for max. circuit load) with GFPE protection				



INSTALLATION GUIDE & USER MANUAL

FOR ROOF AND GUTTER HEATING MATS

TEMPURTECH MFG. LLC 160 BENMONT AVE. BENNINGTON, VT 05201

(802) 430-3617

tempurtechsales@gmail.com

www.tempurtechmanufacturing.com

TABLE OF CONTENTS

3
4
4
6
7
8
8
9
10
12
13
14
15



WARNINGS FOR INSTALLATION AND USE



THIS PRODUCT SHOULD ONLY BE INSTALLED BY COMPETENT PERSONNEL WHO ARE FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THE APPARATUS AND ANY RISKS INVOLVED. READ ALL INFORMATION PROVIDED IN THIS GUIDE BEFORE ATTEMPTING TO INSTALL THIS PRODUCT.



NEVER OVERLAP, LAYER, OR STACK HEATING MATS ON TOP OF ANOTHER PIECE OF HEATING MAT.



NEVER TRIM, CUT, OR OTHERWISE MODIFY THE DIMENSIONS OF YOUR HEATING MATS. CONTACT TEMPURTECH IF DIMENSIONS NEED TO BE MODIFIED.



DO NOT CONNECT HEATING MATS TO POWER UNTIL ALL NECESSARY ELECTRICAL CONNECTIONS HAVE BEEN COMPLETED AND INSULATED. ATTEMPTS TO CONNECT ENERGIZED CONDUCTORS WITHOUT PROPER INSULATION MAY RESULT IN ELECTRICAL SHOCK.



CHECK WITH YOUR ROOFING/GUTTER MANUFACTURER FOR MAXIMUM TEMPERATURE RATING. TEMPURTECH HEATED MATS REACH A MAXIMUM TEMPERATURE OF 120°F.



TO REMAIN COMPLIANT WITH THE NATIONAL ELECTRICAL CODE (NEC, ARTICLE 426 SECTION 28) ALL FIXED DEICING EQUIPMENT SHALL BE PROTECTED BY GROUND FAULT PROTECTION DEVICES. THIS IS A REQUIRED PART OF THE INSTALLATION PROCEDURE. HEATING MATS ARE TO BE INSTALLED ON OR CONNECTED TO A DEDICATED ELECTRICAL CIRCUIT(S), NOT TO EXCEED 80% OF THE BREAKER'S RATED CAPACITY.



ELECTRICAL WORK SHOULD BE PERFORMED ONLY BY COMPETENT PERSONNEL. FAILURE TO ADHERE MAY RESULT IN ELECTRICAL SHOCK AND PERSONAL INJURY.

THE DOCUMENTATION PROVIDED HEREIN PERTAINS SOLEY TO THE USE AND INSTALLATION OF TEMPURTECH HEATED ROOF MATS, TEMPURTECH HEATED GUTTER MATS, AND PRODUCTS PRODUCED BY TEMPURTECH MANUFACTURING LLC. SPECIFICATIONS ARE SUBJECT TO CHANGE.

GENERAL PRODUCT INFORMATION

- Please allow up to 20 minutes for mats to heat up. The mats WILL NOT feel
 hot to the touch and surface temperature will decrease with lower ambient temperatures. THIS IS NORMAL FOR OPERATION
- The installation of this heating product must be in accordance with both the
 manufacturer's instructions, and the regulations of the authority having jurisdiction.
- Failure to do so will result in a voided warranty.
- Caution must be taken to guard against risk of electrical shock, fire, and bodily injury
- The heating product must always be connected to a dedicated electrical circuit.
- The system shall be installed with a disconnecting means.
- The system should always be disconnected from its power source during service, this includes service to controllers and control panels.
- All systems MUST be installed with NEC compliant ground fault protection devices.
- The supply wire or terminals cannot be repaired. If the wire or terminal is damaged, it must be replaced.

SPECIFICATIONS (GENERAL)

HEATING MATS

PRODUCT	V**	COMPATIBLE WITH	CURRENT DRAW	POWER CONS.
5" WIDE	110	110V, 120V	~0.07 A/Ln ft.	~0.008kW/Ln ft.
12" WIDE	110	110V, 120V	~0.15 A/Ln ft.	~0.018kW/Ln ft.
12" WIDE	220	208V, 220V, 240V	~0.08 A/Ln ft.	~0.019kW/Ln ft.
24" WIDE	110	110V, 120V	~0.32 A/Ln ft.	~0.038kW/Ln ft.
24" WIDE	220	208V, 220V, 240V	~0.16 A/Ln ft.	~0.038kW/Ln ft.
CUSTOM	*	*	*	*

^{*}Refer to the System Information packet produced with your specific system

SYSTEM CONTROLLER

PRODUCT	COMPATIBLE WITH	CIRCUIT CAPACITY	SWITCHING CAPACITY
ASE DS-9C	110 - 277V	2	30A

⁻ Refer to "DS-9C User Manual" for more information

^{**}All power is single phase

SPECIFICATIONS (GENERAL) CONT'D

SYSTEM CONTROL PANEL

PRODUCT	COMPATIBLE WITH	POWER REQ.	TEMP. RANGE
ASE CDP-2	ASE DS-9C CONTROLLER	CONTROLLER	-40°C - 85°C

⁻ Refer to "CDP-2 User Manual" for more information

SYSTEM SPECIFICATIONS

Applications: For use on roofs and in gutters and downspouts for melting snow. and

ice.

Voltage: 120V/1PH | 50/60Hz

240V/1PH | 50/60Hz

Power: \sim 18 W/sq ft.

Maximum

Circuit Load: 16 Amps

Circuit Overload

Protection: (For max. circuit load) 20 Amp breaker with ground fault protection

required for each circuit.

Minimum Bend

Radius: 1 inch at a 90 degree bend. Do not crease heating mat.

Maximum Element

Temperature: 110°F/43°C (Sustained) 120°F/49°C (Absolute)

Recommended Installation

Temperature: MAX:150°F/65.5°C

MIN: -20°F/-29°C

Recommended >50°F/10°C for easiest installation.

TEMPURTECH MATS MAY BE INSTALLED WITH EITHER SIDE FACING UP



UNDER NO CIRCUMSTANCES SHOULD THE HEATING MATS BE ENERGIZED WHILE OVERLAPPED OR ROLLED UP. ENERGRIZING THE MATS WHILE OVERLAPPED OR ROLLED UP MAY RESULT IN THE DESTRUCTION OF THE MATS AND/OR PERSONAL INJURY.

SYSTEM COMPONENTS



Tempurtech offers adjustable-threshold controllers to better automate your system based on weather and temperature conditions. Each controller includes an embedded temperature sensor and a remote moisture sensor. Each controller contains two single pole relays that operate simultaneously and control power to the mats, each having a switching capacity of 30 Amps. A controller may operate two circuits. Controllers should be mounted outdoors as close to the mats as possible and according to the "DS-9C User Manual" in order to best serve your system.



Tempurtech offers a control panel to indicate the status of the system and provide remote manual override options. Each controller may be paired with a control panel. Control panels should be mounted within sight and reach of system operator and according to the "CDP-2 User Manual" in order to best serve your system.



Tempurtech also offers double-sided adhesive tape for use with EPDM heating mats. The tape may be used to form a semi-permanent waterproof bond between the EPDM and application surface. If not already done, the tape may be applied to the mats by carefully peeling back the plastic film and pressing the tape firmly onto a clean mat. Do not peel back second side of film until the mats are ready for final placement.

REFER TO PAGE 7 AND RESPECTIVE USER MANUALS FOR COMPLETE INSTALLATION INSTRUCTIONS.

TESTING YOUR SYSTEM

Tempurtech recommends testing all systems before final installation in order to ensure proper operation. If one or more mats fails to operate in the expected manner contact your Tempurtech Sales Representative (located on order invoice). Do not attempt to install malfunctioning heating mats.



ELECTRICAL WORK SHOULD BE PERFORMED ONLY BY COMPETENT PERSONNEL. FAILURE TO ADHERE MAY RESULT IN ELECTRICAL SHOCK AND PERSONAL INJURY

- 1. Using a multimeter or other resistance measuring device, test the resistance between the red and black leads of each section. The value should be close to that recorded in the 'TEST MEASUREMENTS' section of your Production Work Slip. If the value is drastically different than the recorded value, DO NOT install the mats. Contact Tempurtech at the listed email address.
- 2. Unroll all mats and connect each circuit directly to a power source compatible with your system (refer to page 4 or your system layout) and a correctly sized circuit breaker, rated for not less than 125% of the circuit current draw listed in "SYSTEM NOTES" in your layout. **IMPORTANT: Do not allow mats to overlap while energized.**

See Figures 1.1 & 1.2.

- 3. Wait 10-15 minutes for mats to completely heat up. Mats should reach a sustained temperature of 110°F-120°F in 60°F ambient temperature. This will feel warm to the touch. NOTE: If testing in colder temperatures, your mats may not feel warm. This is normal. A temperature measurement may need to be taken to confirm heating.
- 4. Inspect each mat individually and ensure that each is warming and is free of defects. Due to the self-regulating heating element, the mats will begin to cool upon placing your hand on the mat. This is normal for operation.

7

5. If each mat is reaching its rated sustained temperature, or the resistance measurements are correct, system testing is complete. Move on to installation.

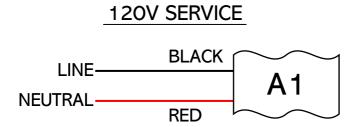


Figure 1.1: Connecting to 120V power

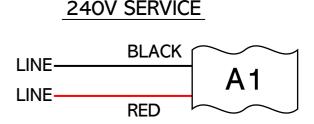


Figure 1.2: Connecting to 240V power

INSTALLATION - PREPARATION



AN INSUFFICIENTLY PREPARED SURFACE MAY LEAD TO MATS BECOMING DETACHED FROM SURFACE AND CAUSING DAMAGE TO BUILDING, PERSONNEL, OR MATS THEMSELVES.

- 1. Ensure roof, gutter, or other surface is structurally sound, installed correctly, and able to bear the complete weight of the mats.
- 2. Surface must be free of oily films and curing compounds. Failure to properly clean the bonding surface will result in ineffective bonding with adhesives.
- 3. Remove from the surface all obstacles that will prevent the heating mats from laying flat such as prodtruding nails, debris, or any item not fastened to or part of the surface.
- 4. Clean all surfaces of dirt and dust as per manufacturer's recommendations. If possible, power wash all surfaces. This will provide the cleanest and best bond with adhesives.

8

UNPREPARED SURFACE

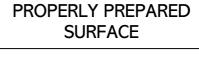






Figure 2.1





Figure 2.2

INSTALLATION - GUIDELINES TO FOLLOW

MATS SHOULD NOT OVERHANG MORE THAN 2 INCHES OVER EDGES, ROOFS OR GUTTERS.

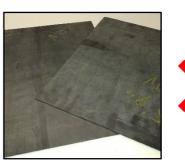
DO NOT ALLOW MATS TO OVERLAP WHILE ENERGIZED.













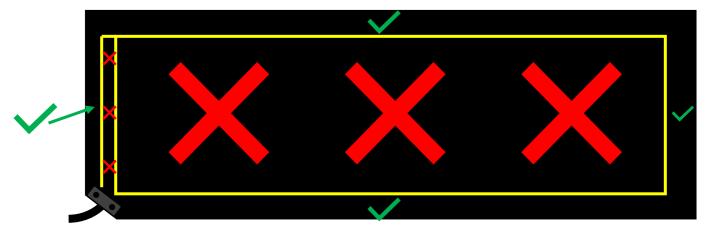
TO PREVENT ICE DAMMING AND RUNOFF REFREEZING, MATS INSTALLED ON DRIP EDGES, NEAR DOWNSPOUTS, OR AT ENDS OF VALLEYS SHOULD BE INSTALLED WITHIN 1 INCH OF AN EDGE.







IF FASTENERS ARE NEEDED WHEN INSTALLING YOUR HEATED MATS, FOLLOW THE DIAGRAM BELOW FOR ACCEPTABLE PENETRATION AREAS





DO NOT PENETRATE MATS INSIDE OR WITHIN 1/2 INCH OF MARKED YELLOW LINES. THIS MAY CAUSE ELECTRICAL SHOCK OR GROUNDING OF THE SYSTEM

INSTALLATION - SYSTEM LAYOUT



PRIOR TO APPLYING ADHESIVE, ALWAYS LAY HEATING MATS OUT FIRST TO ENSURE A PROPER FIT AND CONFIGURATION. CONTACT TEMPURTECH IF MATS DO NOT FIT. DO NOT MODIFY THE MATS YOURSELF

TEMPURTECH MATS MAY BE INSTALLED WITH EITHER SIDE FACING UP

1. Follow Preparation Instructions (pg. 8) to completion. Application surface should resemble that shown below.



2. Unroll the mats and place them in their final positions. DO NOT apply adhesives until certain that the mat's size and configuration is correct for your application.

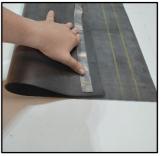
If you mat does not fit in the application area, contact Tempurtech at the listed phone number or email. DO NOT modify the mats yourself.



3. ADHESION

IF USING PRE-APPLIED TAPE:

a) With tape side down, fold mat along its length as shown. DO NOT CREASE



b) Slowly peel back film from a small section



c) Press section firmly back into place. Repeat this process along the length of the mat, then repeat for other side.



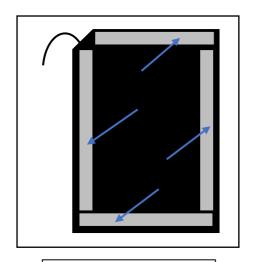
CONTINUED ON NEXT PAGE



INSTALLATION - SYSTEM LAYOUT CONT'D

IF USING TAPE:

- a) Clean surface of mat. Surface must be clean and dry. Moisture, dust, dirt or other foreign matter should be removed. Remove oil and grease, etc. with a small amount of non-residue cleaner such as acetone or lacquer thinner. Remove salt and other contaminants.
- b) Apply the tape to the mat. Remove one side of the film from the tape and apply to the mat using hands or a roller in the shown

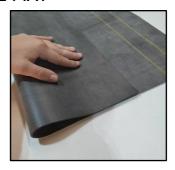


Apply tape within 1 inch of mat edges

c) Follow steps a), b), & c) in the "IF USING PRE-APPLIED TAPE" section (pg. 10) to complete the installation.

IF USING GLUE:

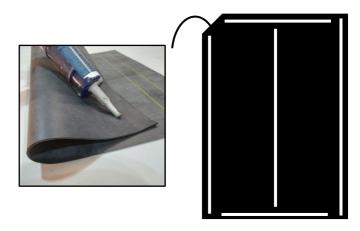
a) Fold half of the mat back on itself and apply EPDM primer around edges of the mat and surface of the application area to ensure the strongest hold. Apply according to primer manufacturer's instructions. DO NOT CREASE MAT



b) Brush on adhesive. Apply adhesive around edges of mat and on application surface. Apply according to adhesive manufacturer's instructions. Roll mat down

IF USING FUSE ADHESIVE:

a) Fold mat in half along its length as shown.

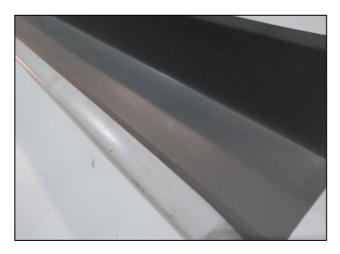


b) Apply adhesive along outer edges of the mat with a single line down the center as shown above Apply adhesive according to adhesive manufacturer's instructions.

INSTALLATION - SYSTEM LAYOUT - GUTTERS

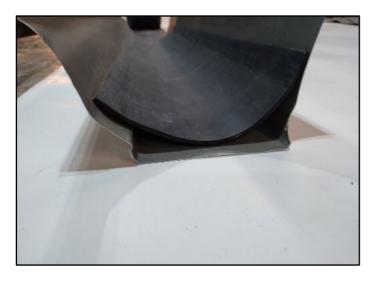
GUTTER MATS MAY BE INSTALLED WITHOUT ADHESIVES

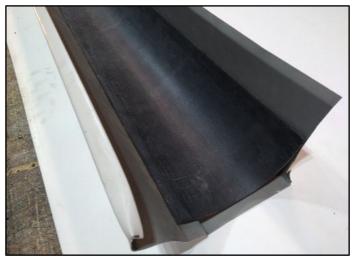
1. Follow Preparation Instructions to completion. Application surface should resemble that shown below.



2. Unroll the mats and place them in the gutter, placing any heat trace cables in the appropriate downspouts. Mats should bend to fit the gutter's shape and should lay completely within the profile of the gutter.

If your mat does not fit in the gutter area, contact Tempurtech at the listed phone number or email. DO NOT modify the mats yourself.





3. If choosing to use adhesives for the mats, refer to PAGE 10 "Adhesion" and follow steps for appropriate adhesive option. This is not necessary for most gutter installations.

INSTALLATION - ELECTRICAL



ELECTRICAL WORK SHOULD BE PERFORMED ONLY BY QUALIFIED AND COMPETENT PERSONNEL. FAILURE TO ADHERE MAY RESULT IN ELECTRICAL SHOCK AND PERSONAL INJURY.



CAUTION MUST BE TAKEN TO GUARD AGAINST RISK OF ELECTRIC SHOCK, FIRE, AND BODILY INJURY DURING INSTALLATION OF THIS PRODUCT.

TEMPURTECH HEATING SYSTEMS ARE MANUFACTURED COMPLETELY TO CUSTOMER REQUIREMENTS AND COME READY TO INSTALL. NO ADDITIONAL WIRING IS REQUIRED WITHIN THE SYSTEM EXCEPT TO SUPPLY POWER TO CIRCUITS/CONTROL UNITS.

DO NOT MODIFY JUMPERS, LEADS, OR MATS UNLESS AUTHORIZED BY A TEMPURTECH SALES REPRESENTATIVE.

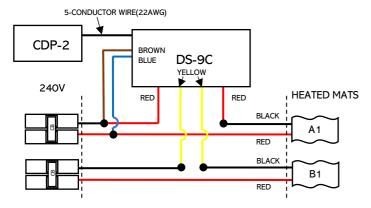
Prior to installation please consult your local codes. If any of the information in this guide is not consistent with local codes, the local codes should be followed. Electrical wiring is required to be run from a circuit breaker or other electrical circuit to the heating mats or control. It is recommended that a qualified electrician perform these installation steps. Please be aware that local codes may require that this product and/or the control be installed by an electrician and inspected by an electrical inspector.

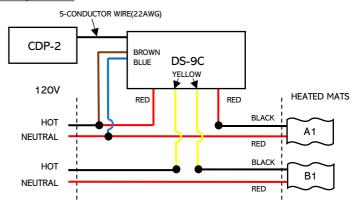
1. Determine Requirements. No system circuit will draw more than 16A. Size circuit breakers according to expected current draw for each circuit as outlined in "SYSTEM NOTES" on your system layout.

Circuits should not draw more than 80% of breaker capacity per NEC.

- **2.** Per NEC Section 426.28 GFPE devices must be used on all fixed snow melting systems for equipment protection.
- **3.** Connect leads for each circuit directly to power using an approved wiring method. If using a switch or other disconnecting means, follow instructions provided by manufacturer.
- **4.** If using a DS-9C controller/CDP-2 control panel to control your system, consult "DS-9C User Manual" or "CDP-2 User Manual" for complete installation and operation instructions.

SAMPLE INSTALLS W/ CDP-2





USER GUIDE - GET THE MOST OUT OF YOUR MATS



ALL ELECTRICAL OUTLETS USED TO SUPPLY POWER TO HEATING MATS MUST BE GROUND FAULT PROTECTED

IF USING A DS-9C OR DS-8C

In its recommended settings (Figure 3.1) your controller will activate and deactivate your heated mat system based on both temperature and precipitation conditions.

Adjuster	Setting	LD	
Delay Off	MID	LTC	
Trig Temp	39	DEL RAIN	
Sensitivity	MORE	SNOW	Z I
			\leftarrow

Figure 3.1: Recommended controller configuration

In most cases, the recommended settings will be sufficient for melting snow in an energy-efficient manner. However, these settings may be adjusted as needed. Please refer to your DS-9C or DS-8C user manual for information regarding preset adjustment.

If expecting snowfall or ice formation, ensure that your system is activated by checking to make sure there the green light is flashing on your controller.

NOTE: A steady green light means that there is power to the controller but the conditions for system activation have not

The controller may be activated manually by flipping the exterior toggle switch to the "Manual On" position.

IF NOT USING A CONTROLLER

When expecting snowfall or ice formation, turn your mats on ahead of time in order to ensure that they are at their maximum melting temperature. This will help the mats to stay ahead of the precipitation and prevent accumulation.

Tempurtech heated mats are intended to melt snow and ice instantaneously as it falls. If snow or ice is allowed to accumulate over the mats, it may impact the mats' effectiveness and ability to melt snow and ice.

NOTE: If you notice excessive snow built up over any mat, the snow may need to be removed in order for the mat to function properly again. Even though the mat may be working underneath, snow cavitation may be preventing it from melting through upper layers of snow.

During cool or cold weather, your mats may be kept on indefinitely. The mats' maximum heating temperature is 120°F, they will not heat above this limit, regardless of how long they are kept on.



DO NOT ACTIVATE OR LEAVE MATS ON DURING WARM/HOT WEATHER IF INSTALLED UNDERNEATH A ROOF. THIS MAY DAMAGE OR DESTROY THE MATS

TROUBLESHOOTING

SYSTEM DOES NOT TURN ON	Check that the circuit breaker is on If you have a controller, check that the green light is on or flashing Check that the Ground Fault Protection is not tripped for each circuit Check wiring for each circuit
CAN'T FEEL ANY HEAT	Confirm that the controller is on and that the temperature threshold is not too low (DS-9C Installation Manual) Check the temperature set point on controller Mats may operate at cooler temperatures in cold weather. This is normal for operation
GROUND FAULT PROTECTION TRIPPING	Tripping is often caused by moisture in loose wire connections Double check circuit continuity & continuity to ground Check for loose connections and accidental grounding in wiring Check mat for incorrect penetrations or delamination
HEAT WORKS, BUT THEN SHUTS OFF	Check the controller temperature threshold setting Ensure that the moisture and temperature sensors are in appropriate locations (DS-9C Installation Manual)
MATS IMMEDIATELY TRIP BREAKER	Ensure that your mats are correctly wired according to your wiring diagram and this installation guide Check that your breaker is sized correctly for the mat Check mat for incorrect penetrations or delamination

PLEASE NOTE THAT THIS IS A TROUBLESHOOTING DOCUMENT. IF YOU ARE NOT QUALIFIED TO DO ELECTRICAL WORK, IT IS RECOMMENDED THAT YOU HIRE A QUALIFIED, LICENSED ELECTRICIAN. ANY TROUBLESHOOTING WORK SHOULD BE DONE WITH THE POWER REMOVED FROM THE CIRCUITS UNLESS OTHERWISE INDICATED. IF YOUR PROBLEM CANNOT BE RESOLVED WITH THESE TIPS, CALL TEMPURTECH AT THE LISTED PHONE NUMBER. THESE TIPS ARE PROVIDED TO ASSIST WITH TROUBLESHOOTING THE HEATING MAT SYSTEM. RESULTS ARE NOT GUARANTEED. TEMPURTECH DOES NOT ASSUME ANY LIABILITY OR RESPONSIBILITY FOR DAMAGE OR INJURY THAT MAY OCCUR FROM USING THESE TIPS. REFER TO THE INSTALLATION GUIDE OR OTHER APPROPRIATE INSTRUCTIONS AND WARNINGS REGARDING INSTALLATION, USE, AND MAINTENANCE.

15



LIMITED WARRANTY

The DS-9C is warranted against defects in workmanship and materials for two years from date of sale. This warranty does not apply to damage resulting from accident, misuse, or alteration nor where connected voltage is more than 5% above the configured operating voltage, nor to equipment improperly installed or wired or maintained in violation of this Owner's Manual. No other written or oral warranty applies. No employee, agent, dealer or other person is authorized to give any warranties on behalf of ASE.

Units returned for warranty repair cannot be modified from shipped condition and leads must protrude a minimum of 6 inches from the base conduit hub. Repair costs of a modified unit will be quoted as the unit must be returned to the original, unmodified condition prior to return shipping. The customer shall be responsible for all costs incurred in the removal and/or reinstallation and shipping of the product for repairs. Within the limitations of this warranty, inoperative units should be returned, freight prepaid, to ASE, and we will repair or replace, at our option, at no charge to you with return freight paid by ASE to destinations within the U.S. and Canada. It is agreed that such repair or replacement is the exclusive remedy available from ASE and that ASE IS NOT RESPONSIBLE FOR DAMAGES OF ANY KIND, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGE. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above exclusion may not apply to you. The warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Input: 100-277 VAC +/- 5%, 47-63 Hz

Control: $2 \times 277 \text{ VAC} @ 30A$ Operating Temp: $-40 \text{ }^{\circ}\text{C}$ to $+85 \text{ }^{\circ}\text{C}$



AUTOMATED SYSTEMS ENGINEERING, INC. 2519 E SAINT VRAIN ST COLORADO SPRINGS, COLORADO 80909 PHONE: 719-599-7477 FAY: 719-599-7482

PHONE: 719-599-7477 FAX: 719-599-7482 Visit us on the Internet at: www.goase.com





Need Indoor Monitoring & Control?

Take a Look at the ASE CDP-2

Simple Installation & Operation at a Competitive Price Approved CS-xxx Interface Cable and EX-50 Sensor Extension Kits Are Also Available

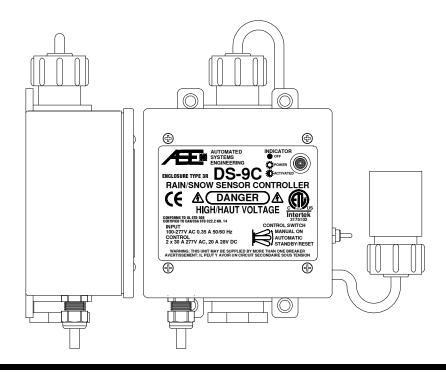
Visit www.goase.com for more information

CAUTION: Read all instructions carefully before installation.

Save this Installation Manual for future reference.

DS-9C

RAIN/SNOW SENSOR CONTROLLER INSTALLATION MANUAL



Manufactured By



2519 East Saint Vrain St Colorado Springs, Colorado 80909

General Safety Instructions

1. THIS UNIT SHOULD BE INSTALLED, OPENED, AND REPAIRED BY QUALIFIED PERSONNEL ONLY!

CETTE UNITÉ DEVRAIT ÊTRE INSTALLÉE, OUVERTE, ET RÉPARÉE PAR LE PERSONNEL QUALIFIÉ SEULEMENT!

To avoid shock hazard do not open the front cover with power connected to the DS-9C or any controlled equipment.

Pour éviter la décharge électrique déconnectez toute la puissance avant d'ouvrir la couverture du DS-9C.

Selecting a Mounting Location for the DS-9C

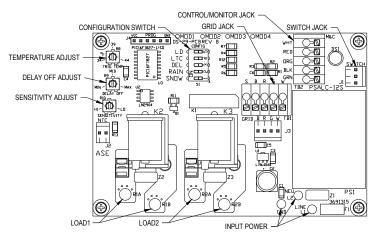
The small corded device with the interleaved grid is the remote precipitation or "moisture" sensor. The brass cylinder protruding from the bottom of the DS-9C enclosure is the temperature sensor. For reliable rain and snow detection the moisture sensor must be exposed to a clear view of the sky. Reference Page 3 "Moisture Sensor Mounting & Termination" for guidance in mounting the DS-9C moisture sensor. For proper temperature detection the DS-9C enclosure <u>must be mounted outdoors</u>, away from furnace vents, dryer vents, and other sources of heat. When powered, the DS-9C moisture grid <u>will always remain hot</u>. This is normal. This allows the sensor to continuously melt/evaporate rain and snow from the grid.

The DS-9C enclosure can be mounted by screwing the base conduit hub onto an appropriate size free-standing conduit or by using the mounting holes in each corner of the enclosure.

DO NOT DRILL HOLES THROUGH THE ENCLOSURE FOR MOUNTING! Ne Font Pas Les Trous De Foret Par La Boîte Pour Le Support!

This can allow water into the enclosure causing a potential shock hazard. It is recommended that a weatherproof junction box be mounted below the DS-9C for termination of the power and load pigtails to the building wiring.

Use Care When Replacing the Front Cover. Do Not Pinch the Gasket or Overtighten the Screws.



ALWAYS FOLLOW LOCAL AND NATIONAL ELECTRICAL CODES
Toujours Suivre Les Codes Électriques Locaux Et Nationaux

External Control/Monitor Operation

Pin	Color	Function
1	White	GND/Common
2	Red	Deice On Mon A
3	Orange	Deice On Mon B
4	Black	Manual On
5	Green	Standby/Reset

The DS-9C provides external control/monitor capability. Cable rated 300V up to 18 AWG can be connected to TB2 to access this feature. Connecting Black (4) to White (1) will activate the "Manual On" function. Connecting Green (5) to White (1) will activate the "Standby/Reset" function. See the "Manual Override Switch Function" for a description of these modes. The Red/Orange (2/3) leads are connected to an internal low power

monitor relay. This relay, rated at 24 VAC/VDC @ 400 mA, 10W maximum, will close with the load relays and can be used to externally monitor activation of the sensor. This terminal block is also the connection point for connecting a CDP-2. Use only tinned, stranded, shielded cable for a reliable connection.

Power & Activation Indicator

A green lamp shines through a lens on the cover of the DS-9C to indicate operational status. If this lamp is **OFF** the DS-9C is not receiving power. If this lamp is steady **ON** the DS-9C is powered but not triggered. If this lamp is **FLASHING** the DS-9C is powered on and triggered, the main relays are closed, and attached equipment should be activated. Note that, even though snow or rain may have stopped, the DS-9C indicator will continue to flash during the Delay-Off drying cycle.

Fine Adjustment for Efficient Operation

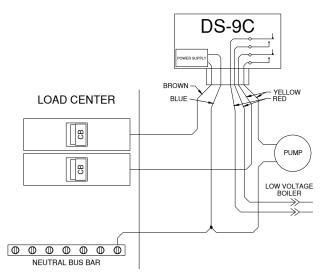
The DS-9C is shipped with the TRIG TEMP and DELAY OFF adjustments in the center position, representing 39°F (3.9°C) and 60 minutes of Delay-Off time respectively. It is also set for highest SENSITIVITY. Depending on local conditions the user may find that fine adjustment of the controls may provide more satisfactory operation. If the sensor does not trigger during very wet snows the trigger temperature may need to be adjusted higher. Constant triggers from snow falling from trees or overhangs may be reduced by adjusting SENSITIVITY. The Delay-Off time can also be adjusted to provide clean melt-off without excessive running time. Fine adjustment can both save operating expense and provide more reliable operation. However, to keep reliability high, always make adjustments in small increments.

Moisture Grid Maintenance & Replacement

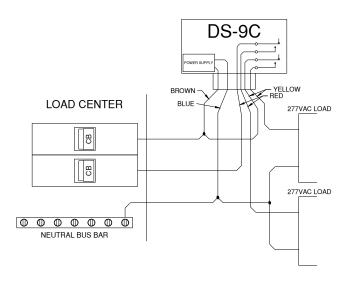
It is recommended that the DS-9C be powered down and the moisture grid wiped clean with clear water at least once every 4 months. Heavy deposits may be removed using a non-metallic scouring pad (Scotch-BriteTM or equivalent.) However, after a number of years, the corrosive elements left behind when water is evaporated out of the moisture grid will eventually damage the grid rings. The moisture grid can be easily replaced by ordering and installing a new MG-6 "Moisture Grid Assembly". Reference the "Moisture Sensor Mounting & Termination" section for information on replacing the moisture grid.

Preseason Snow Detection Testing

It is always a good idea to test the operation of the DS-9C prior to the winter season. Procure some clean water and, if the outdoor temperature is above the trigger point, a can of spray component cooler (Radio Shack Part #64-4321 or equivalent.) Clean the moisture grid following the procedure outlined above and allow it to dry. Apply power to the DS-9C, drip some of the water onto the moisture grid, then spray the temperature sensor protruding from the base of the enclosure with the component cooler. Once the temperature sensor has reached the trigger point with water still present on the grid the DS-9C will activate. The user should hear the internal control relays close and see the green lamp blink. Proper operation has been confirmed. Allow the grid to dry completely. To clear the Delay-Off timer place the override switch into "Standby/Reset", and then back to the "Automatic" position.



120VAC In, 120VAC Circulation Pump, 24VAC Boiler

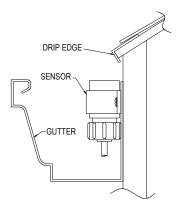


277VAC In, Dual 277VAC Load, Heat Cable or Similar (Also Applies to 120VAC)

These are just some of the possible wiring schemes that can be used to connect the DS-9C to your load for control. Remember, these are only suggestions. You should always consult a qualified electrician or inspector to assure conformance with applicable local and national electrical codes!

DO NOT USE THE DS-9C ENCLOSURE AS A JUNCTION BOX Ne Pas Employer Une DS-9C As Une Boîte De Jonction

Moisture Sensor Mounting & Termination

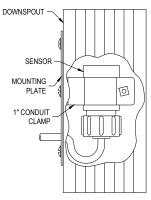


The DS-9C enclosure and moisture sensor must be mounted outdoors. The remote DS-9C moisture sensor may be mounted in a number of ways depending on the application. The unit operates at low voltage and can withstand immersion in water. For roof and gutter deicing applications the sensor head may be mounted in the gutter against the fascia board with a 1" "C"-style conduit clamp. Allow part of the sensor grid to be exposed to snowfall. This allows the sensor to initially trigger when snow starts falling and remain triggered as long as the roof/gutter heater continues to drip melted snow buildup from the roof edge when temperatures are below freezing. Detection can also be achieved by installing the sensor head

near the top of the downspout using a 1" conduit hanger

and mounting plate. As water is melted in the gutter it will run down the downspout, hitting and retriggering the sensor.

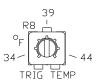
Ten feet of cable is pre-terminated to the sensor head. This cable may be shortened on the controller end as required. Do not add additional cable to the interface. Erratic operation may result. If the cable must be lengthened only use the EX-50 extension kit. Strip the outer insulation and shield from the cable and terminate each conductor following the color code printed on the circuit board. The bare drain wire should be installed into the terminal marked "S" for Shield. Two cable ties are also included. Wrap these ties securely around the cable in



the enclosure to provide additional strain relief between the flexible enclosure gland and the free end of the cable.

Setting the Configuration Switches and Adjustments

The following paragraphs and table outline the operating modes for the DS-9C and explain the functions of the adjustments. Trigger temp (TT) is adjustable from $34^{\circ}F-44^{\circ}F$ ($1^{\circ}C-6^{\circ}C$) using the TRIG TEMP control. When ambient air temperature (AT) is below this setting precipitation is assumed to be snow. When above this setting, precipitation is assumed to be rain.



The DEL configuration switch activates the Delay-Off drying cycle timer on the DS-

9C. The timer allows the DS-9C to continue to operate and dry the heated surface through evaporation



once precipitation has stopped. The drying cycle reduces the chance of moisture left behind refreezing into ice. This timer is restarted by each sensor trigger. Therefore, the DS-9C will continue to operate as long as it is triggered, then for the Delay-Off period once the trigger clears. All "sensor" modes (DEL Off) provide a 2 minute Delay-Off time. When in "controller" mode (DEL On) the Long Delay (LD) configuration switch determines the

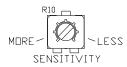
time span of the drying cycle. The Delay-Off time can be adjusted from 30-90 minutes (LD Off) or 2-6 hours (LD On) using the DELAY OFF control.

The Low Temperature Cutoff (LTC) option is typically used on snow melting systems with limited output capacity where melting cannot be maintained at very low temperature. If selected, the snow sensor will

clear a trigger below 5°F (-15°C) even if snow is still falling. It will resume normal operation above 9°F (-13°C). However, the sensor will remember if it was triggered before the drop below 5°F or if snow was detected during the cold period. If so, the sensor will execute one Delay-Off cycle when the temperature rises above 9°F in order to melt any snow left behind during the cold period. This is referred to as RECOVER mode. Care should be exercised in using this mode as the potential exists for ice to be formed on the melting surface.



The DS-9C precipitation sensor is very sensitive and can detect a single snow flake or rain drop. However, if the DS-9C is mounted in an area susceptible to high winds, overhanging trees, or blowing ground snow, nuisance triggering may occur. While proper placement is the best remedy, the SENSITIVITY control can also be used to reduce nuisance triggering. An internal timer checks the precipitation sensor for moisture and compares cleared time with triggered time. The highest sensitivity setting (toward MORE) triggers on



first detection. As the control is adjusted clockwise precipitation must be detected for a longer period to be considered valid. The lowest sensitivity setting (toward LESS) requires 120 seconds of detection before the unit triggers. If a trace amount of snow blows onto the grid from a drift or overhang it will likely be melted and evaporated in less than a minute. Similarly, a very light snowfall may also clear quickly from the grid. If these

conditions should be ignored by the sensor the SENSITIVITY control can be adjusted as required. However, to prevent non-triggering during a true event, it is recommended that the user start at highest sensitivity (MORE), then adjust while monitoring operation over time.

THE UNIT MUST BE IN STANDBY/RESET TO CHANGE CONFIGURATION SWITCHES
L'Appareil Doit Être En Mode STANDBY/RESET Pour Modifier Commutateurs De Configuration

Recommended Switch Settings by Function

Function	Trigger	LD Off	LD On	LTC	DEL	RAIN	SNOW
Snow sensor w\o LTC	TT>AT	2 Min	2 Min	OFF	OFF	OFF	ON
Snow sensor w\LTC	TT>AT>5°F	2 Min	2 Min	ON	OFF	OFF	ON
Snow controller w\o LTC	TT>AT	30-90 Min	2-6 Hr	OFF	ON	OFF	ON
Snow controller w\LTC	TT>AT>5°F	30-90 Min	2-6 Hr	ON	ON	OFF	ON
Precipitation sensor	Not Used	2 Min	2 Min	Х	OFF	ON	ON
Precipitation controller	Not Used	30-90 Min	2-6 Hr	Х	ON	ON	ON
Rain sensor	AT>TT	2 Min	2 Min	Х	OFF	ON	OFF
Rain controller	AT>TT	30-90 Min	2-6 Hr	Х	ON	ON	OFF
LT thermostat w\o LTC	TT>AT	2 Min	2 Min	OFF	Χ	OFF	OFF
LT thermostat w\LTC	TT>AT>5°F	2 Min	2 Min	ON	Х	OFF	OFF

X = Do Not Care

An override switch mounted on the side is provided for testing and special operational requirements. Placing the switch in the AUTOMATIC position will allow the sensor to operate normally, activating the controlled equipment as needed. Placing the switch in MANUAL ON will close the load relay, activating the controlled equipment. The STANDBY/RESET position prohibits triggering of the unit, clears any active delay timer, and opens the load relay. In order to reduce excessive runtime for the heater the "Manual On" mode will remain in effect for up to 40 hours, then return to "Automatic" mode, even if the switch is still in the "Manual On" position. However, any trigger of the system will restart the 40 hour "Manual On" timer. You may put the DS-9C back into "Manual On" mode by switching to AUTOMATIC, then back to MANUAL ON. This will also restart the 40 hour timer.

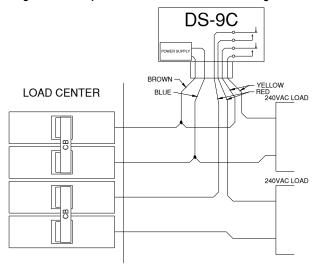
If the override switch is placed in MANUAL ON for less than 2 seconds, then switched back to AUTOMATIC the controller will execute one Delay-Off cycle. This can be used to clear a frost, hail, or drifted snow buildup without the danger of leaving the system in a continuous "Manual On" condition. "Standby/Reset" can still be used to clear this Delay-Off cycle.

Typical Load Wiring

The main relays are dry contacts and do not supply power directly to your load

The Yellow and Red load leads connect to main relays 1 & 2 respectively. Both relays in the DS-9C activate together at all times. These relays act as normally open switches and are fully isolated from each other. Switching capacity of the DS-9C is 30A per circuit, 2 separate circuits. While not as convenient as directly supplying power for the load, dry contacts allow you to operate the DS-9C from one voltage while controlling loads of a different voltage or supplied by different circuits without adding external relays or contactors. The following diagrams show some possible wiring schemes for connecting the DS-9C to your load. For clarity the green safety GROUND leads are not shown.

DO NOT ATTEMPT TO INCREASE SWITCHING CAPACITY BY WIRING THE RELAYS IN PARALLEL Ne Pas Tenter D'Augmenter La Capacité De Commutation Par Le Câblage Des Relais En Parallèle



240VAC In. Dual 240VAC Load, Heat Cable or Similar







Mechanically Attached and Fully Adhered Roofing Systems

January 2023

TABLE OF CONTENTS

	i – General	
1.01	Description	3
1.02	General Design Considerations	4
1.03	Quality Assurance	5
1.04	Submittals	6
1.05	Warranty	7
War	ranty Tables	
	E I - Warranty Options and Minimum Membrane Thickness	9
TABI	E II – Mechanically Attached TPO – Membrane Fastening – Steel/Concrete Decks	10
	E III – Mechanically Attached PVC / KEE HP PVC – Membrane Fastening – Steel/Concrete Decks	
	E IV – Mechanically Attached TPO – Membrane Fastening – Wood Decks	
	E V – Mechanically Attached PVC / KEE HP PVC – Membrane Fastening – Wood Decks	
	E VI – Mechanically Attached TPO – Membrane Fastening – Lightweight/Gypsum/Wood Fiber Decks	
	E VII – Mechanically Attached PVC / KEE HP PVC – Membrane Fastening – Lightweight/Gypsum/Wood Fiber Decks	
	LE VIII – Fully Adhered TPO – Underlayment/Fastening – Up to 20 YR Warranties	
	LE IX – Fully Adhered QA TPO – Underlayment/Fastening – Up to 20 YR Warranties	
TABL	LE X – Fully Adhered TPO – Underlayment/Fastening – 25/30 YR Warranties	10 18
	LE XI – Fully Adhered QA TPO – Underlayment/Fastening – 25/30 YR Warranties	
	LE XII – Fully Adhered PVC / KEE HP PVC – Underlayment/Fastening – Up to 20 YR Warranties	
TABL	LE XIII – Fully Adhered PVC / KEE HP PVC – Underlayment/Fastening – 25/30 YR Warranties	20
	Job Conditions Product Delivery Storage and Handling	
1.07	Product Delivery Storage and nariding	24
	H. Donton	
	II – Product	
	General	
2.02	Membranes	
2.03		
	Related Materials	
2.05		
2.06		
2.07		
2.08	Edgings/Terminations	42
2.09	,	
2.10	Other Versico Accessories	43
	III – Execution	
3.01	General	44
3.02	Roof Deck/Substrate Criteria	44
3.03	Insulation/Underlayment	46
3.04		
3.05	Membrane Placement and Securement Criteria	48
3.06		53
3.07		55
	Flashings	
3.09		
3.10	, , , , , , , , , , , , , , , , , , ,	
3		
Δtta	chments	
	hment I – Induction Welding Attachment Method	50
Attac	hment II – TPO Flashing Procedures utilizing VersiGard White EPDM Products	71
Allac	Infier II - II O Frashing Frocedures utilizing versional write Erbivi Froducts	/ ۱

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



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

January 2023

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 (also available in special colors in 60-mil thick, maximum 10' wide 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 thick Polyester Reinforced VersiFlex Polyvinyl Chloride (PVC) membrane (white, gray, light gray, slate gray and tan) OR 50, 60 or 80-mil thick Polyester Reinforced VersiFlex KEE HP (High Performance) Membrane (white, gray, light gray or tan). Either membrane is available in 10' wide (white, gray, light gray, slate gray and tan) 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 75' 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 (also available in 16' wide white 45, 60 or 80-mil and special colors in 60-mil thick, maximum 10' wide sheets). Versico Insulation is mechanically attached to the roof deck or secured with Flexible DASH 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, tan or gray) 60 or 80-mil thick reinforced TPO membrane laminated to an elastomeric pressure-sensitive adhesive.
- 3. The VersiFlex Fully Adhered Roofing System incorporates maximum 10' wide, 50-mil, 60-mil or 80-mil thick Fiberglass reinforced VersiFlex FRS Polyvinyl Chloride (PVC) membrane (white, gray, light gray, slate gray and tan). 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, CAV-GRIP PVC or Hydrobond Water-Based Adhesive. Adjoining sheets of membrane are overlapped and joined together with a minimum 1-1/2" wide heat weld.

A KEE HP enhanced (white, gray, light gray and tan) VersiFlex KEE HP membrane with Polyester Reinforcement and is available in 5' and 10' width.

Polyester Reinforced membrane is available in widths of 40.5", 5', 81" and 10' wide (white, gray, light gray, slate gray and tan).

Fiberglass Reinforced membrane is available in widths of 10' (white, gray, light gray or tan).

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 these roofing membranes. Contact Versico for verification of compatibility and recommendations concerning an acceptable roofing membranes.
- 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 specifier to review local, state and regional codes to determine their impact on the specified Versico Roofing System.
- G. 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.

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 Design Reference DR-01-21 "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 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 building **owner, owner's representative** or **Specifier** should verify local codes for applicable requirements and limitations. It is the responsibility of the specifier to review local, state and regional codes to determine their impact on the specified Versico Roofing System.

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

- A. When recovering or retrofitting an existing roof system, the addition of new insulation (type and thickness) may alter the fire performance characteristics of the assembly. Building owners or their designated representatives shall consult the local code enforcement agency to avoid potential code violation.
- B. 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.
- C. This roofing system must be installed by a Versico Authorized Roofing Contractor in compliance with drawings and specifications as approved by Versico.
- D. There must be no deviations made from Versico's specifications or Versico's approved shop drawings without the **PRIOR WRITTEN APPROVAL** of Versico.
- E. 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.

- F. 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.
- G. 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.
- H. Refer to the Design Reference DR-07-20 "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:
 - 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 petroleumbased 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-06-19 "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. A Total System Warranty is available for roofing systems on commercial buildings within the United States and applies only to **products marketed by Versico**. The total 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-01-21.
- B. See Tables Below for information regarding Warranted Systems and Design Criteria:
 - 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.
 - 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 / KEE HP 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.
 - TABLE V Mechanically Attached Roofing Systems PVC / KEE HP 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 / KEE HP 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 VersiWeld QA

Assemblies with Warranties – 25 to 30 YR Identifies required underlayments for fully adhered roofing systems with Warranties from 25 to 30 year 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 / KEE HP 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.
- 13. TABLE XIII Fully Adhered Roofing Systems Underlayment and Fastening Density for PVC / KEE HP 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 (9)

		1	hermoplas	tic Membran	es (VersiWe	eld TPO / Ve	rsiFlex PVC / VersiFlex KEE HP)	
Years	55, 72, 80	or 90 mph	100	mph	110 to 1	120 mph	Minimum Membrane Thickness	Additional
	Fully Adhered	Mech. Attached	Fully Adhered	Mech. Attached	Fully Adhered	Mech. Attached	(2)	Hail/Puncture Coverage
5,10, or 15 year	V	√	V	N/A(1)	V	N/A	VersiWeld 45-mil OR VersiFlex 50-mil (6)	See Below
20 year	√(3)	7	√	N/A	√	N/A	VersiWeld 60-mil (4) OR VersiFlex 60 mil (6) OR VersiFlex KEE HP 50-mil	See Below
25 year (9)	V	√	√	N/A	N/A	N/A	VersiWeld 80-mil (5) OR VersiFlex 80-mil (6)(8)(10)	See Below
30 year (9)	V	√	V	N/A	N/A	N/A	VersiWeld 80-mil (5) OR VersiFlex 80-mil (11) OR VersiFlex KEE HP 80-mil (10)	See Below

Notes: N/A = Not Acceptable

√= Acceptable

- (1) Contact Versico for specific requirements.
- (2) All "T-joints" must be overlaid with appropriate flashing material when using 60- or 80-mil TPO or 80-mil PVC/KEE HP membrane.
- (3) Aqua Base 120 adhesive may be used for projects with 20 year maximum warranty and wind speed coverage up to 72 mph. Hydrobond Adhesive may be used for projects with 20 year maximum warranty and wind speed coverage up to 90 mph.
- (4) VersiWeld QA TPO 60-mil membranes may be used. VersiWeld 80-mil TPO in Special Colors are limited to Warranties Up to 20 Year.
- (5) VersiWeld QA TPO 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 KEE HP PVC 50-mil membrane can be used in lieu of VersiFlex 60-mil membrane for Warranties Up to 20 Year.
- (8) VersiFlex KEE HP PVC 60-mil membrane can be used in lieu of VersiFlex 80-mil membrane for Warranties Up to 25 Year.
- (9) Enhancements may be required for certain flashing details. Publish details must be referenced for applicable requirements.
- (10) VersiFlex PVC 60- or 80-mil membranes in Slate Gray are limited to Warranties Up to 20 Year.
- (11) Low-VOC PVC Bonding Adhesive or CAV-GRIP PVC must be utilized.

VersiWeld TPO Membrane

Hai

- 1" Dia. Hail Coverage requires a minimum of 60-mil TPO Adhered to cover board.
- 2" Dia. Hail Coverage requires 80-mil TPO Adhered to cover board.

Additional Design Requirement:

- Cover board (SecurShield HD, SecurShield HD Plus, SecurShield HD or DuraFaceR Composite, DensDeck Prime, DensDeck StormX Prime, or Securock – Adhered Only).

Puncture

Minimum 80-mil TPO Adhered or Mechanically Fastened.

VersiFlex PVC and KEE HP Membrane

Hail

- 1" Dia. Hail Coverage requires a minimum of 60-mil PVC or KEE HP PVC Adhered to cover board.
- 2" Dia. Hail Coverage requires 80-mil PVC or KEE HP PVC Adhered to cover board.

Additional Design Requirement:

- Cover board (SecurShield HD, SecurShield HD Plus, SecurShield HD or DuraFaceR Composite, DensDeck Prime, DensDeck StormX Prime, or Securock – Adhered Only).

Puncture

- Minimum 60-mil PVC with Polyester Reinforcement.

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**.

		Min. Number of Perimeter Sheets			Field* Membrane	Perimeter* Sheet	Fastening Density* (Field & Perimeter
Peak Gust Wind Speed Warranty	Max. Building Height	Building Distance from Coastline					
		Greater than 7 miles	3 to 7 miles	Less than 3 miles	Width	Width	Sheets)
	Up to 60'	1	2	3	12' or 10'	6'	12" O.C.
55 MPH	Ορ το σο				8'	4'	12" O.C.
33 MFH	61! to 100!	2	2	3	10'	6'	** See Note
	61' to 100'				8'	4'	12" O.C.
	Up to 60'	2	2	3	12' or 10'	6'	12" O.C.
72 MPH	Op 10 60	2	2	3	8'	4' 12"	12" O.C.
	041 to 4001	3	4	4	10'	6'	** See Note
	61' to 100'				8'	4'	12" O.C.
80 MPH	Lin to COI	2	3	4	10'	6'	** See Note
	Up to 60	3	3	4	8'	4'	12" O.C.
	041 += 4001	0	4	,	10'	6'	** See Note
	61 10 100	3	4	4	8'	4'	12" O.C.
90 MPH		2	4	4	10'	6'	** See Note
	Op 10 60'	3	4	4	8'	4'	12" O.C.
	Up to 60' 61' to 100' Up to 60'	4	5	5	10'	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.

Table III

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

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

		Min. Number of Perimeter Sheets			Field* Membrane	Perimeter* Sheet		
Peak Gust Wind Speed Warranty	Max. Building Height	Building Distance from Coastline					Fastening Density* (Field & Perimeter	
		Greater than 7 miles	3 to 7 miles	Less than 3 miles	Width	Width	Sheets)	
	Up to 60'	1	2	3	10'	5'	12" O.C.	
55 MPH					81"	40.5"	12" O.C.	
99 MFH	61! to 100!	2	2	3	10'	5'	** See Note	
	61' to 100'				81"	40.5"	12" O.C.	
72 MPH		•	2	3	10'	5'	12" O.C.	
	Up to 60'	2			81"	40.5"	12" O.C.	
	61! to 100!	2	4	4	10'	5'	** See Note	
	61' to 100'	3			81"	40.5"	12" O.C.	
80 MPH	Lin to 60'	2	2		10'	5'	12" O.C.	
	Up to 60'	3	3	4	81"	40.5"	12" O.C.	
	C41 to 4001	2	4	4	10'	5'	** See Note	
	61' to 100'	3	4	4	81"	40.5"	12" O.C.	
90 MPH	Lin to COI	3	4	4	10'	5'	6" O.C.	
	Up to 60'	S	4	4	81"	40.5"	12" O.C.	
	041 to 4001	,	5	5	10'	5'	** See Note	
	61' to 100'	4			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.

Table IV

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

Peak Gust Wind Speed Warranty	Deck Type	Projected Pull-Out Values	Perimete Building Di	Imber of er Sheets stance from stline	Field Membrane Width	Perimeter Sheet Width	Fastening Density (Field & Perimeter Sheets)
			Greater than 7 miles	Less than or equal to 7 miles			
	7/16" OSB *	210 lbs	2	3	10'	6'	9" O.C.
55 MPH			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'	6'	12" O.C.
	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.

Table V

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

Peak Gust Wind Speed Warranty	Deck Type	Projected Pull-Out Values	Min. Number of Perimeter Sheets Building Distance from Coastline		Field Membrane	Perimeter Sheet	Fastening Density (Field &
			Greater than 7 miles	Less than or equal to 7 miles	Width	Width	Perimeter Sheets)
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'	12" O.C.
	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.

Table VI

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

Peak Gust Wind	Building Height 50' Max.	Min. Number of Perimeter Sheets Building Distance from Coastline			Field Membrane	Perimeter Sheet	Fastening Density (Field &
Speed Warranty	Deck Type		Width	Width	Perimeter Sheets)		
		2	3 (1)	N/A	12'	6'	12" O.C.
	Lightweight Concrete over Steel Deck	1	2	4	10'	6'	12" O.C.(2)
55 MPH		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-06-19 "Withdrawal Resistance Criteria" for more information.

Table VII

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

Dook	Building Height 50' Max.	Min. Number of Perimeter Sheets					
Peak Gust	ou max.	Building Di	stance from	Coastline	Field	Perimeter	Fastening Density (Field
Wind Speed Warranty	Deck Type	Greater than 7 miles	3 to 7 miles	Less than 3 miles	Membrane Width	Sheet Width	& Perimeter Sheets)
		1	2	4	10'	5'	12" O.C.(1)
55 MPH	Lightweight Concrete over Steel Deck	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.
- (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-06-19 "Withdrawal Resistance Criteria" for more information.

Table VIII

Underlayment/Insulation & Required Attachment Assemblies Up to 20 YR Warranty for 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)

		Ins	ulation Attachme	nt	
Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment*	# of Fasteners per 4' x 8' board size		ze board	Metal Edging
		(1)	Field	Perimeter	
	1" (20 psi) Polyisocyanurate	16(11)			
	1-1/2" (20 psi) Polyisocyanurate	10			VersiTrim Drip
55 or 72 MPH	2"(20 psi) Polyisocyanurate	8	12" (6)(7)	6" (6)	Edge or VersiTrim
	1/2" SecurShield HD (3)	12			200
	1/4" DensDeck Prime or 1/4" Securock	12			
	1/2" SecurShield HD Plus (3)	8			
	1/2" Versico Recovery Board (2)	16			
00 MPH	2" SecurShield HD Composite	6	40" (0)(7)(0)	6" (6)(8)	VersiTrim Drip
80 MPH	1/2" DensDeck Prime or 1/2" Securock (2)	8	12" (6)(7)(8)		Edge or VersiTrim 200 (12)
	1-1/2" (25-psi) Polyisocyanurate	10			, ,
	2" (25 -psi) Polyisocyanurate	8			
	1/2" DensDeck Prime or 1/2" Securock (2)	12			VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or
	1/2" SecurShield HD (3) or 1-1/2" (20-psi) SecurShield Polyiso	16			
90 MPH	1/2" SecurShield HD Plus (3) or 1/2" DuraStorm VSH (2)	12	6"(10)	6"(8)(9)	
55 IIII 11	2" (20-psi) SecurShield or 2" SecurShield HD Polyiso Composite	8	(10)	0 (0)(0)	VersiTrim 2000 or 3000.
	1-1/2" DuraFaceR (OSB/Polyiso Composite)	8			
	1-1/2" Insulfoam HD Composite	16			
100 MPH	2" (25-psi) SecurShield Polyiso (1)	16	FS	FS	VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or VersiTrim 2000 or 3000.
440 84511	1/2" SecurShield HD Plus (3)	40	F0	F0	VersiTrim 2000 or
110 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH (2)	16	FS	FS	3000
	5/8" DensDeck Prime or 5/8" DensDeck StormX Prime or 5/8" Securock (2)	16			
120 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) (1) or 1/2" DuraStorm VSH	17	FS	FS	VersiTrim 2000 or
	1/2" SecurShield HD Plus (3)	24			3000
	2" SecurShield HD Composite	16			

FS=Full Spray or Ribbons @ 4" O.C.

- *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" SecurShield HD limited to 90 mph. 1/2" SecurShield HD Plus limited to 120 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.
- (a) 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.

- (11) Reduced fastening (11 fasteners per 4 x 8 board) is acceptable on Reroof/No Tear off projects with a maximum roof height of 40'.
- (12) May be fastened with ring shank nails staggered 4" on center. Versico HPV or HPVX Fasteners may also be used fastened 12" on center.

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 15/32" plywood.

^{*} Projects where building height exceeds 100', 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)

		Ins	ulation Attachm	ent	
Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	# of Fasteners per 4' x 8'	Adhesive Ribbon Spacing for 4' x 4' size board		Metal Edging
		board size (1)	Field	Perimeter	
	1" (20 psi) Polyisocyanurate	16 (9)			
	1-1/2" (20 psi) Polyisocyanurate	10			
55 or 72	2"(20 psi) Polyisocyanurate	8	10" (4)(5)	6" (4)	VersiTrim Drip Edge or
MPH	1/2" SecurShield HD (3)		12" (4)(5)	0 (4)	VersiTrim 200
	1/4" DensDeck Prime or 1/4" Securock	12			
	2" (1.25 lb/density) Insulfoam SP*				
	1/2" DensDeck Prime or 1/2" Securock (2)	8			
	1/2" SecurShield HD (3)	16		6" (4)(6)	VersiTrim Drip Edge or VersiTrim 200 (10)
	1/2" SecurShield HD Plus (3)	8	40!! (4)(5)(0)		
00 MPH	2" SecurShield HD Composite	6	12" (4)(5)(6)		
80 MPH	1-1/2" (25-psi) Polyisocyanurate	11			
	2" (25 -psi) Polyisocyanurate	8			
	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)	
	1/2" DensDeck Prime or 1/2" Securock (2)	12			
	1/2" SecurShield HD (3) or 1-1/2" (20-psi) SecurShield Polyiso	16			VersiTrim Drip
90 MPH	1/2" SecurShield HD Plus (3) or 1/2" DuraStorm VSH	12	6" (8)	6" (6)(7)	Edge (11), VersiTrim 200
	1-1/2" DuraFaceR (OSB/Polyiso) Composite	8	- (-)	- (-)(-)	(11)(12) or VersiTrim 2000
	2" (20-psi) SecurShield Polyiso or 2" SecurShield HD Composite	8			or 3000.
	1-1/2" Insulfoam HD Composite	16			
	5/8" DensDeck Prime or 5/8" DensDeck StormX Prime or 5/8" Securock (2)				VansiTrins D. iv
	1/2" SecurShield HD Plus (3)				VersiTrimDrip Edge (11),
100 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH	16	FS	FS	VersiTrim 200 (11)(12) or
	2" (25-psi) SecurShield Polyiso (1)				VersiTrim 2000 or 3000
	2" SecurShield HD Composite				

- FS = Full Spray or Ribbons @ 4" O.C.
 (1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.
- (2) Cover boards must be installed over a min. 1" thick approved Versico Insulation.
- (3) 1/2" SecurShield HD limited to 90 mph. 1/2" SecurShield HD Plus limited to 120 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.
- (9) Reduced Fastening (11 fasteners per 4 x 8 board) is acceptable on Reroof / No Tear off projects with a maximum roof height of 40'.
- (10) may be fastened with ring shank nails staggered 4" on center. Versico HPV or HPVX Fasteners may also be used fastened 12" on center
- (11)Versico HPV or HPVX Fasteners must be used to secure VersiTrim Drip Edge or VersiTrim 200 Metal Fascia to perimeter wood nailers.
- (12) Membrane securement is required at the base of the VersiTrim 200 waterdam.
- *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 15/32" plywood.
- 5 All "T-joints" must be overlaid with appropriate flashing material or Versico "T-Joint" covers.
- * Projects where building height exceeds 100' or warranty wind speed exceeds 100 mph, shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies Table X 25 YR or 30 YR Warranty for Fully Adhered TPO 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 for lower wind speed coverage. (i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

			lation Attach	ment		
Peak Gust Wind Speed	Minimum Membrane Underlayment	# of Fasteners per 4' x 8'	Adhesive Ribbon Spacing for 4' x 4' size board		Metal Edging	
Warranty		board size (1)	Field	Perimeter		
	1" to 2" (25 psi) Polyisocyanurate					
55 or 72	1/2" Versico Recovery Board (1)(9)				VersiTrim Drip Edge	
MPH	1/4" Dens-Deck Prime or 1/4" Securock	16	6" (3)(5)	6" (5)	or VersiTrim 200	
	1/2" SecurShield HD (2)					
	1-1/2" to 2" (25-psi) SecurShield Polyisocyanurate	20			VersiTrim Drip Edge (7), VersiTrim 200 (7)(8) or VersiTrim 2000 or 3000	
80 MPH	1/2" Dens-Deck Prime or 1/2" Securock (2)	16	6" (4)(5)(6)	6" (5)(6)		
OU WIPH	1/2" SecurShield HD Plus (2)	10				
	1/2" SecurShield HD (2)	20			2000 0. 0000	
	1/2" SecurShield HD (2)	24			VersiTrim Drip Edge	
90 MPH	1/2" SecurShield HD Plus (2)	20	FS	FS	(7), VersiTrim 200 (7)(8) or VersiTrim	
	1/2" DensDeck Prime or 1/2" Securock (2)	20			2000 or 3000	
	5/8" Dens-Deck Prime or 5/8" DensDeck StormX Prime or 5/8" Securock (2)					
100 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH (2)	16	FS	FS	VersiTrim 2000 or	
	2" SecurShield HD Composite (2)				3000	
	1/2" SecurShield HD Plus (2)	24				

FS = Full Spray or Ribbons @ 4" O.C.

- (1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.
- (2) Hail coverage offered with substrate.
- (3) Structural Concrete Field @ 12" O.C. / Perimeter @ 6" O.C.
- (4) 80-mph 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.
- (9) 1/2" Recovery Board limited to 55 mph.

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 15/32" 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 warranty wind speed exceeds 100 mph, shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies Table XI 25 YR OR 30 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)

		Insul	ıment		
Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment		Adhesive Ribbon Spacing for 4' x 4' size board		Metal Edging
		board size (1)	Field	Perimeter	
	1" to 2" (25 psi) Polyisocyanurate				VersiTrim Drip
55 or 72 MPH	1/4" DensDeck Prime or 1/4" Securock	16	6" (3)(5)	6" (5)	Edge or
	1/2" SecurShield HD (2)				VersiTrim 200
	1-1/2" to 2" (25-psi) SecurShield Polyisocyanurate	20			VersiTrim Drip Edge (7), VersiTrim 200 (7)(8) or VersiTrim 2000
80 MPH	1/2" DensDeck Prime or 1/2" Securock (2)	- 16	6" (4)(5)(6)	6" (5)(6)	
00 1111 11	1/2" SecurShield HD Plus (2)				
	1/2" SecurShield HD (2)	20			or 3000
	1/2" SecurShield HD (2)	24			VersiTrim Drip Edge (7),
90 MPH	1/2" SecurShield HD Plus (2)		FS	FS	VersiTrim 200 (7)(8) or
	1/2" DensDeck Prime or 1/2" Securock (2)	20			VersiTrim 2000 or 3000
	5/8" DensDeck Prime or 5/8" DensDeck StormX Prime or 5/8" Securock (2)				
100 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH (2)	16	16 FS	FS	VersiTrim 2000
	2" SecurShield HD Composite (2)				or 3000
	1/2" SecurShield HD Plus (2)	24			

FS = Full Spray or Ribbons @ 4" O.C.

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

Additional Design Considerations (25 YR or 30 YR Warranty)

- 1 Minimum membrane thickness 80-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 15/32" 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.
- * Projects where building height exceeds 100' or warranty wind speed exceeds 100 mph, shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies Table XII Up to 20 YR Warranty for Fully Adhered PVC / KEE HP PVC Roofing

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)

		Ins	sulation Attach	ment	
Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment*	# of Fasten ers per 4' x 8'	Adhesive Spacing for boa	4' x 4' size	Metal Edging
			Field	Perimeter	
	1" (20 psi) Polyisocyanurate	16(11)			
	1/1/2" (20 psi) Polyisocyanurate				VersiTrim Drip
55 or 72 MPH	2"(20 psi) Polyisocyanurate	8	12" (6)(7)	6"(6)	Edge or VersiTrim 200
	1/2" SecurShield HD (3)	12			versi i i i i i zoo
	1/4" DensDeck or 1/4" Securock	12			
	1/2" SecurShield HD Plus (3)	8			
	1/2" Versico Recovery Board (2)	16			
00 MPH	2" SecurShield HD Composite	6	4011/02/72/02	011(0)(0)	VersiTrim Drip Edge or
80 MPH	1/2" DensDeck Prime or 1/2" Securock (2)	8	12"(6)(7)(8)	6"(6)(8)	VersiTrim 200 (12)
	1-1/2" (25 psi) Polyisocyanurate	10			(12)
	2" (25 psi) Polyisocyanurate	8			
	1/2" DensDeck Prime or 1/2" Securock (2)	12			
	1/2" SecurShield HD (3) or 1-1/2" (20 psi) SecurShield Polyiso				VersiTrim Drip
	1/2" SecurShield HD Plus	12	6"(10)	6"(8)(9)	Edge (4), VersiTrim 200 (4)(5) or VersiTrim 2000
90 MPH	2" (20 psi) SecurShield Polyiso or 2" SecurShield HD Composite	8			
	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH (2)	8			or 3000.
	1-1/2" Insulfoam HD Composite	16			
100 MPH	2" (25-psi) SecurShield Polyiso (1)	16	FS	FS	VersiTrim Drip Edge (4), VersiTrim 200 (4)(5) or VersiTrim 2000 or 3000.
110 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH (2)	. 16	FS	FS	VersiTrim 2000 or 3000
	1/2" SecurShield HD Plus (3)				
	5/8" DensDeck Prime or 5/8" DensDeck StormX Prime or 5/8" Securock (2)	16			
120 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) (1) or 1/2" DuraStorm VSH (2	17	FS	FS	VersiTrim 2000 or 3000
	1/2" SecurShield HD Plus (3)	24			01 0000
	2" SecurShield HD Composite	16			

FS = Full Spray or Ribbons @ 4" O.C.

*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" SecurShield HD limited to 90 mph. 1/2" SecurShield HD Plus limited to 120 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.
- (11) Reduced fastening (11 fasteners per 4 x 8 board) is acceptable on Reroof/No Tear off projects with a maximum roof height of 40'.
- (12) May be fastened with ring shank nails staggered 4" on center. Versico HPV or HPVX Fasteners may also be used fastened 12" on center.

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 15/32" plywood.
- 5 All "T-Joints" must be overlaid with Versico "T-Joint" Covers.

^{*} Projects where building height exceeds 100', shall be submitted to Versico for review.

Underlayment/Insulation & Required Attachment Assemblies Table XIII 25 YR or 30 YR Warranty for Fully Adhered PVC / KEE HP PVC 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 a lower wind speed coverage. (i.e. 72 MPH underlayment may be used for 55 MPH underlayment)

		In	sulation Attachi	ment	
Peak Gust Wind Speed Warranty	Minimum Membrane Underlayment	# of Fasteners per 4' x 8'	Adhesive Ribbon Spacing for 4' x 4' size board		Metal Edging
		board size (1)	Field	Perimeter	
	1" to 2" (25 psi) Polyisocyanurate				
55 or 72	1/2" Versico Recovery Board (1) (9)	16	6" (2)(5)	6" (E)	VersiTrim Drip Edge or VersiTrim
MPH	1/4" DensDeck Prime or 1/4" Securock	16	6" (3)(5)	6" (5)	200
	1/2" SecurShield HD (2)				
	1-1/2" to 2" (25-psi) SecurShield Polyisocyanurate	20	6" (4)(5)(6)	6" (4)(5)(6) 6" (5)(6)	VersiTrim Drip Edge (7), VersiTrim 200 (7)(8)or VersiTrim 2000 or 3000
80 MPH	1/2" DensDeck Prime or 1/2" Securock (2)	16			
	1/2" SecurShield HD Plus (2)	10			
	1/2" SecurShield HD (2)	20			2000 01 0000
	1/2" SecurShield HD (2)	24			
90 MPH	1/2" SecurShield HD Plus (2)	20	FS	FS	VersiTrim2000 or 3000
	1/2" DensDeck Prime or 1/2" Securock (2)				
	5/8" DensDeck Prime or 5/8" DensDeck StormX Prime or 5/8" Securock (2)				
100 MPH	1-1/2" DuraFaceR (OSB/Polyiso Composite) or 1/2" DuraStorm VSH (2)	16	FS	FS	VersiTrim 2000 or
	2" SecurShield HD Composite (2)				3000
	1/2" SecurShield HD Plus (2)	24			

FS = Full Spray or Ribbons @ 4" O.C.

- (1) For Building heights between 51'-100', enhance 12'-wide perimeter with 50% more fasteners and plates.
- (2) Hail coverage offered with substrate.
- (3) Structural Concrete Field @ 12" O.C. / Perimeter @ 6" O.C.
- (4) 80- mph 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.
- (9) 1/2" Recovery Board limited to 55 mph.

Additional Design Considerations

- 1 Minimum membrane thickness 80-mil PVC or KEE HP 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 15/32" plywood.
- 5 Enhancements are required for certain flashing details. Published 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 warranty 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 100 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 CAV-GRIP 3V Low-VOC Adhesive/Primer may be used. Refer to Product Section Part II for additional product information and Specification Supplement G-07-20.
- 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-07-20 "Application Procedures for 725TR 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-01-18 "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 (4°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 (4°C). Refer to Technical Data Bulletins for individual products for temperature restrictions.
- E. Do not store adhesive or cleaner 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

- a. VersiWeld TPO Membrane meets or exceeds the requirements of ASTM D6878-17, 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.
- b. When tested in accordance with ASTM C1549, the VersiWeld TPO membrane (white and tan) has an initial reflectance of 0.79 (white) and 0.71(tan) and a 3-year aged reflectance of 0.70 (white) and 0.64 (tan). The material has also been tested for emittance in accordance with ASTM C1371. An initial emittance of 0.90 (white) and 0.86 (tan)and a 3-year aged emittance of 0.86 (white) and 0.87 (tan) were achieved.
- c. 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 0.90 was achieved and an SRI (solar reflectance index) of 99 was calculated using ASTM E1980.
- 2. VersiWeld 45- or 60-mil thick Reinforced Thermoplastic Polyolefin (TPO) membrane, VersiWeld QA TPO (Quick Applied) 60 or 80-mil thick Reinforced Thermoplastic Polyolefin (TPO) membrane and VersiWeld Plus 80-mil thick Reinforced Thermoplastic Polyolefin (TPO) conforms to the following physical properties. VersiWeld QAT TPO (white, tan or gray) membrane is available in 10' wide by 50' or 100' long rolls and VersiWeld Standard / HS membrane available in field sheets in rolls 16', 12', 10' or 8' wide by 100' long. Perimeter membrane sheets are available in widths of 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 (16' wide VersiWeld Membrane only available in white). Special Color TPO membrane is available in 5 colors (Medium Bronze, Rock Brown, Terra Cotta, Slate Gray and Patina Green) in 60-mil field sheets in rolls 5' or 10' wide by 100' long and 80-mil field sheets in 10' wide by 100' long. Special Color TPO is a special order product and may require a lead time.

OPTION: 60- or 80-mil, white, VersiWeld TPO (white, tan or gray) reinforced membrane is available with an optional APEEL Protective Film. APEEL Protective Film can be left in place for up to 90 days without affecting the integrity of the film, guarding the TPO membrane's surface from scuffs and dirt accumulation during installation. Durable and easy to remove, APEEL Protective Film improves aesthetics and long-term reflectivity. Available 4', 6', 8', 10' and 12' widths by 100' long rolls. Some sizes and colors of VersiWeld QA TPO with APEEL require a minimum order of 200 squares and 2-3 week lead time. Also available, APEEL 6" Cover Tape, allowing 100% coverage of the TPO surface. APEEL Cover Tape rolls are 1,640 feet long.

NOTE: VersiWeld High Slope (HS)(also known as Extra Slope (ES)) and Special Color TPO 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 Plus
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)	220 (976 N)	225 (1.0) min.	250 (1.1) min.	250 (1.1) min.	350 (1.6) min.
ASTM D751 grab method	min.	320 (1.4) typ.	360 (1.6) typ.	360 (1.6) typ.	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.			
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) max50 (- 46) typ.
Linear dimensional change, % ASTM D1204, 6 hours at 158 °F	± 1 max.	± 1 max0.2 typ.	± 1 max0.2 typ.	± 0.5 max. -0.2 typ.	± 1 max0.2 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.				
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.				

B. VersiFlex Membranes

1. General

- a) 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 0.89 was achieved and an SRI (solar reflectance index) of 108 was calculated using ASTM E1980.
- b) The VersiFlex KEE HP 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 0.89 was achieved and an SRI (solar reflectance index) of 103 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 5' wide. 50-mil thick membrane is available in lengths of 100', 60-mil is available in 100' lengths and 80-mil is available in 75' lengths. VersiFlex PVC Membrane is available in white, gray, light gray, slate gray and tan. VersiFlex PVC KEE HP Membrane is available in white, gray, light gray, and tan.

OPTION: 60-mil VersiFlex PVC or 60-mil VersiFlex KEE HP PVC (white color only) reinforced membrane is available with an optional APEEL Protective Film. APEEL Protective Film can be left in place for up to 90 days without affecting the integrity of the film, guarding the PVC/KEE HP membrane's surface from scuffs and dirt accumulation during installation. Durable and easy to remove, APEEL Protective Film improves aesthetics and long-term reflectivity. Available 5' and 10' widths by 100' long rolls. Also available, APEEL 6" Cover Tape, allowing 100% coverage of the PVC surface.

VersiFlex Polyester Reinforced PVC Membrane							
Physical Property	ASTM D4434 Requirement	50-mil Min.	60-mil Min.	80-mil Min.			
Thickness Over Scrim, in. (mm) ASTM D4434 optical method average of 3 areas	0.016 min. (0.40)	0.022 (0.559)	0.028 (0.711)	0.038 (0.965)			
Weight, lbs/ft ² (kg/m ²)	No requirement	0.33 (1.61)	0.40 (1.95)	0.55 (2.68)			
Breaking Strength (MD X CD), lbf/in (kN/m) ASTM D751 grab method	275 min. (48)	320 x 300 (56 x 53)	330 x 300 (58 x 55)	360 x 330 (63 x 58)			
Elongation break of reinforcement (MD x CD), % ASTM D751 grab method	25 min.	30 x 30	30 x 30	30 x 30			
Seam Strength, min. ASTMD751 grab method (% of breaking strength)	>75	PASS	PASS	PASS			
Tearing Strength (MD x CD), lbf (N) ASTM D751 proc. B, 8 in. x 8 in.	90 min. (400)	100 x 120 (445 x 534)	100 x 130 (445 x 578)	100 x 132 (445 x 587)			
Low Temperature Bend, ASTM D2135, no cracks 5x at -40°C	PASS	PASS (-40°C)	PASS (-40°C)	PASS (-40°C)			
Linear Dimensional Change, % ASTM D1204, 6 hours at 176°F	+/- 0.5 max.	0.4	0.4	0.4			
Ozone Resistance, no cracks 7x ASTM D1149, 100pphm, 168 hrs	PASS	PASS	PASS	PASS			
Water Absorption Resistance, mass % ASTM D570, 166 hours at 158°F	+/- 3.0 max.	2.0	2.0	2.0			
Field Seam Strength, lbf/in. (kN/m) ASTM D1876 tested in peel	No Requirement	25 (4.4) min. 60 (10.5) max.	25 (4.4) min. 60 (10.5) max.	25 (4.4) min. 60 (10.5) max.			
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.			
Puncture Resistance – Federal, lbf (kN) FTM 101C, method 2031	No Requirement	280	320	380			
Puncture Resistance – Dynamic, J (ft-lbf) ASTM D5635	20 (14.7)	PASS	PASS	PASS			
Puncture Resistance – Static, lbf (N) ASTM D5602	33 (145)	PASS	PASS	PASS			
Xenon-Arc Resistance, no cracks/crazing 10x, ASTM G155 0.35 W/m² at 340-nm, 63°C B.P.T. 12,600 kJ/m² total radiant exposure 10,000 hours	PASS	PASS	PASS	PASS			
Properties After Heat Aging, ASTM D3045, 56 days at 176°F Breaking Strength, % retained Elongation reinf., % retained	90 min. 90 min.	90 min. 90 min.	90 min. 90 min.	90 min. 90 min.			
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 10' 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, gray, light gray and tan.

VersiFlex Reinforced FRS PVC Membrane								
Physical Property	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	+/- 0.1 max. 0.05 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/m² 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. (5,000 hours)	No cracks No crazing						
B.P.T. is black panel temperature								

- 4. VersiFlex KEE HP 50-mil, 60-mil or 80-mil thick Polyester Reinforced **PVC** (Polyvinyl Chloride) **KEE HP** (High Performance) 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 KEE HP enhanced PVC based top and bottom plies. The combination of the fabric and PVC plies provide VersiFlex KEE HP membranes with high breaking strength, tearing strength, and puncture resistance.
 - b) Field membrane sheets are packaged in rolls of 5' and 10' wide. 50-mil thick membrane is available in lengths of 100', 60-mil is available in 100' lengths and 80-mil is available in 75' lengths. VersiFlex KEE HP Membrane is available in white, gray, light gray, slate gray and tan.

VersiFlex KEE HP Polyester Reinforced PVC Membrane										
Physical Property	ASTM D4434 Requirement	50-mil	60-mil	80-mil						
Thickness Over Scrim, in. (mm) ASTM D4434 optical method average of 3 areas	0.016 min. (0.40)	0.024 (0.61)	0.029 (0.74)	0.036 (0.91)						
Weight, lbs/ft² (kg/m²)	No requirement	0.33 (1.61)	0.40 (1.95)	0.55 (2.68)						
Breaking Strength (MD X CD), lbf/in (kN/m) ASTM D751 grab method	275 min. (48)	290 x 290 (51 x 51)	320 x 300 (56 x 52)	330 x 320 (58 x 56)						
Elongation break of reinforcement (MD x CD), % ASTM D751 grab method	25 min.	30 x 30	30 x 30	30 x 30						
Tearing Strength (MD x CD), lbf (N) ASTM D751 proc. B, 8 in. x 8 in.	90 min. (400)	120 x 125 (534 x 556)	120 x 125 (534 x 556)	140 x 150 (623 x 667)						
Low Temperature Bend, ASTM D2135, no cracks 5x at -40°C	PASS	PASS (-46°C)	PASS (-46°C)	PASS (-46°C)						
Linear Dimensional Change, % ASTM D1204, 6 hours at 176°F	+/- 0.5 max.	0.4 typ.	0.4 typ.	0.4 typ.						
Ozone Resistance , no cracks 7x ASTM D1149, 100pphm, 168 hrs	PASS	PASS	PASS	PASS						
Water Absorption Resistance, mass % ASTM D570, 166 hours at 158°F	+/- 3.0 max.	1.25	0.87	0.89						
Puncture Resistance – Dynamic, J (ft-lbf) ASTM D5635	20 (14.7)	PASS	PASS	PASS						
Puncture Resistance – Static, lbf (N) ASTM D5602	33 (145)	PASS	PASS	PASS						
Xenon-Arc Resistance, no cracks/crazing 10x, ASTM G155 0.35 W/m² at 340-nm, 63°C B.P.T. 12,600 kJ/m² total radiant exposure 10,000 hours	PASS	PASS	PASS	PASS						
Properties After Heat Aging, ASTM D3045, 56 days at 176°F Breaking Strength, % retained Elongation reinf., % retained	90 min. 90 min.	90 min. 90 min.	90 min. 90 min.	90 min. 90 min.						
B.P.T. is black panel temperature										

2.03 Insulations/Underlayments

A. General

- 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-05-19 "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)					
			Roofing System Acceptability		
Insulations / Underlayment	Minimum Thickness	ASTM	Fully Adhered	Mechanically Fastened	
Versico VersiCore Polyiso	*1.5"	C1289, Type II, Class 1, Grade 2 or 3	√	\checkmark	
Versico VersiCore NH Polyiso	*1.5"	C1289, Type II, Class 1, Grade 2 or 3	√	V	
SecurShield Polyisocyanurate	*1.5"	C1289, Type II Class 2, Grade 2 or 3	\checkmark	$\sqrt{}$	
SecurShield NH Polyisocyanurate	*1.5"	C1289, Type II Class 2, Grade 2 or 3	√	V	
HD Polyiso Composite (SS HD)	2"	C1289, Type IV, Grade 2 or 3	√	V	
DuraFaceR Polyiso Composite (OSB)	1.5"	C1289, Type V, Grade 2 or 3	√	√	
Design Restrictions					

-Extended Warranty, those with longer duration, higher wind speed, or puncture coverage, may require the use of a cover board over Polyiso Insulation, refer to Warranty Tables in Paragraph 1.04 for applicable requirements.

- -Maximum Flute Spanability shall be limited to 2-5/8" when 1" Minimum Polyiso Insulation is to be used.
- -Minimum thickness of insulation board may be restricted by wind speed coverage and warranty duration, refer to Tables V and VI in Paragraph 1.05.
- *1.5 minimum for fully adhered systems. 1" minimum for mechanically attached systems or as a base layer for fully adhered.

Notes: N/A = Not Acceptable $\sqrt{ = Acceptable}$

NOTE: SecurShield HD is listed in Paragraph F below.

- 1. **Versico VersiCore Polyiso** A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available.
- 2. Versico VersiCore NH Polyiso A foam core insulation board covered on both sides with a glass-reinforced felt meeting ASTM C 1289, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 4' and 4' x 8' standard size with a thickness from ½" to 4 inches. VersiCore NH Polyiso contains zero halogenated flame retardants.
- 3. SecurShield Polyisocyanurate— A foam core insulation board covered on both sides with a coasted glass fiber mat facer meeting ASTM C 1289, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available. These flat board products feature a dark-colored coated-glass facer (CGF) on one side of the insulation board and a light-colored CGF on the other, labeled Ready Flash. Ready Flash Technology allows applicators to manage adhesive

- flash-off times by choosing between two different-colored facers on every board.
- 4. **SecurShield NH Polyisocyanurate** A foam core insulation board covered on both sides with a coated glass fiber mat facer meeting ASTM C 1289, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 4' and 4' x 8' standard size with a thickness from ½ inch to 4 inches. SecurShield NH contains zero halogenated flame retardants.
- 5. **SecurShield HD Composite** Composite insulation panel comprised of 1/2-inch high-density (109 psi max) Polyiso cover board laminated during the manufacturing process to SecurShield rigid Polyiso roof insulation meeting ASTM C1289 Type IV, Grade 2 (20 psi) or Grade 3 (25 psi). Available in 4' x 8' boards with thickness from 2" to 4.5". 4' x 4' panels are also available.
- 6. **DuraFaceR Polyiso Composite (OSB)** –Polyiso insulation bonded on the bottom side with a medium weight fiber-reinforced felt face and laminated with a top surface of 7/16" or 5/8" thick Oriented Strand Board (OSB) meeting ASTM C1289, Type V, Grade 2 (20 psi) or Grade 3 (25 psi). Available in 4' x 8' boards with thickness from 1-1/2" to 4".

C. EPS: Expanded Polystyrene

Table C1 EPS : Expanded Polystyrene (See below for product descriptions)					
Inquistions / Hadaylaywayt	Minimum	ACTM	Roofing System Acceptability		
Insulations / Underlayment	Thickness	kness ASTM -		Mechanically Fastened	
InsulFoam I	1"	C578 Type I	N/A	√ (1)(3)	
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)	$\sqrt{}$	N/A	
InsulFoam SP	1"	C578 Type VIII	N/A	V	
InsulFoam SP	2"	C578 Type VIII	(2)	$\sqrt{}$	

Design Restrictions

- (1) VersiFlex PVC and KEE HP Membrane is not acceptable for this application.
- (2) May be used as a substrate for VersiWeld QA TPO membrane Only.
- (3) Minimum 1.25 lbs/cubic ft (pcf) density required For VersiWeld TPO Membrane (White Membrane Only)

Notes: N/A = Not Acceptable $\sqrt{ = Acceptable}$

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

NOTE: Insulation boards listed in a through d may be specified beneath SecurShield HD, Versico Recovery Board, Dens-Deck Prime, DensDeck StormX Prime or Securock.

- 2. **InsulFoam I –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type I. Nominal density of 1.0 lbs/cubic ft (pcf) available in 4' x 4' or 4' x 8' sizes with thickness from 1/4" to 40". Custom lengths, widths and tapered boards are available.
- 3. **InsulFoam VIII** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type VIII. Nominal density of 1.25 lbs/cubic ft (pcf) available in 4' x 4' or 4' x 8' sizes with thickness from 1/4" to 40". Custom lengths, widths and tapered boards are available.
- 4. InsulFoam II A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type II. Nominal density of 1.5 lbs/cubic ft (pcf) available in 4' x 4' or 4' x 8' sizes with thickness from 1/4" to 40". Custom lengths, widths and tapered boards are available.
- InsulFoam IX A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type IX.
 Nominal density of 2.0 lbs/cubic ft (pcf) available in 4' x 4' or 4' x 8' sizes with thickness from 1/4" to 40".
 Custom lengths, widths and tapered boards are available.
- 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"

⁻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.

- thick Oriented Strand Board (OSB),1/2" DensDeck 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)					
Minimum		Roofing System Acceptability			
Thickness	ASTM	Fully Adhered	Mechanically Attached		
.75"	Refer to Technical Data Bulletin	N/A	√ (1)		
1"	Refer to Technical Data Bulletin	N/A	√ (1)		
1"	Refer to Technical Data Bulletin	N/A	√ (1)		
1"	Refer to Technical Data Bulletin	N/A	√ (1)		
	Minimum Thickness .75" 1" 1"	Minimum Thickness Refer to Technical Data Bulletin Refer to Technical Data Bulletin	Minimum Thickness ASTM Fully Adhered		

⁻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.

(1) VersiFlex PVC and KEE HP Membrane is not acceptable for this application.

Notes: N/A = Not Acceptable $\sqrt{\ }$ = Acceptable

- 2. Thermapink 18 or 25 Extruded Polystyrene
- 3. Foamular 400 Extruded Polystyrene
- 4. Dow Styrofoam Deckmate Plus Extruded Polystyrene
- E. Versico Vacuum Insulated Panel (VIP)

Table E1 Vacuum Insulated Panel (VIP) (See below for product descriptions)					
Insulations / Underlayment	Minimum Thickness	ASTM	Roofing System Acceptability		
			Adhered	Mechanically Fastened	
Versico Optim-R VIP	*1.6"	C1484	√	N/A	
Docian Postrictions					

Design Restrictions

*2.6" minimum for total installed system including an additional 2 layers of 1/2" SecurShield HD panels; 1 layer on top and 1 layer on bottom of Optim-R. For adhered systems only. Note: Optim-R VIP cannot be cut or punctured.

Notes: N/A = Not Acceptable $\sqrt{\ }$ = Acceptable

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

⁻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-01-20 "Related Products" for other products which may be suitable for use. Carlisle must be contacted for specific requirements.

F. Cover Boards / Slip Sheets

Table F1 Cover Boards / Slip Sheets (see below for product descriptions)					
Insulations /	Minimum	ACTM	Roofing System Acceptability		
Underlayment	Thickness	ASTM	Fully Adhered	Mechanically Attached	
SecurShield HD	.5"	C1289, Type II, Class 4 (109 psi max)	√	√	
SecurShield HD Plus	.5"	C1289, Type II, Class 4 (109 psi max)	V	√	
VersiCore HD	.5"	C1289, Type II, Class 1, Grade 3	N/A	V	
DuraStorm VSH	.5"	Refer to Technical Data Bulletin	V	V	
Securock Cover Board	.25"	Refer to Technical Data Bulletin		√	
DensDeck StormX Prime	.625"	C1177		√ (1)	
DensDeck Prime	.25"	C1177	$\sqrt{}$	√ (1)	
DensDeck	.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	V	
Design Restrictions					

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

Notes: N/A = Not Acceptable $\sqrt{= Acceptable}$

- 2. **SecurShield HD** a rigid insulation panel composed of a high-density (109 psi max), closed-cell polyisocyanurate foam core laminated to coated-glass fiber-mat facer 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. These flat board products feature a dark-colored coated-glass facer (CGF) on one side of the insulation board and a light-colored CGF on the other, labeled Ready Flash. Ready Flash Technology allows applicators to manage adhesive flash-off times by choosing between two different-colored facers on every board.
- 3. **SecurShield HD Plus** a rigid insulation panel composed of a high-density (109 psi max), closed-cell polyisocyanurate foam core laminated to premium-performance coated-glass fiber-mat facer for use as a cover board or recover board. Available 1/2" thick 4' x 8' panel weight 11 lbs with an R-value of 2.5. Meets an FM 1-90 using only 8 fasteners per 4' x 8' board.
- 4. **VersiCore HD** a closed-cell polyisocyanurate foam core insulation board covered on both sides with glass-reinforced felt (GRF) facer meeting ASTM C 1289, Type II, Class 1, Grade 3. The product is available in 4' x 4' and 4' x 8' standard sizes with a thickness of one half inch.
- 5. **Securock Cover Board** A uniform composition of fiber-reinforced gypsum without a facer, for use as a cover board or a thermal barrier. Available in 1/4" to 5/8" thick and 4' x 4' or 4' x 8' size boards. Long uninterrupted runs (>200') may require slight gapping due to thermal expansion.
- 6. DuraStorm VSH Cover Board an engineered composite building material made from a proprietary blend of

⁻Securock Cover Board, Versico Recovery Board, DensDeck Prime, DensDeck StormX Prime or DensDeck may not be used directly over New or Existing Lightweight Insulating Concrete Decks existing or Structural Concrete.

⁻Due to some warranty restrictions, DensDeck, DensDeck StormX Prime and DensDeck 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 and KEE HP membrane.

plastic and cellulose fiber sourced from post-industrial and post-consumer waste streams. DuraStorm VSH is a durable, extremely moisture and mold resistant building material with a core that does not disintegrate or delaminate in the presence of water. Available in 1/2" thick and 4' x 8' size board.

- 7. **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. When used in reroof / no tear-off projects, warranty is limited to 15-year projects.
- 8. **DensDeck StormX Prime** a reinforced gypsum cover board with an enhanced, moisture-resistant core and coated glass mat facers on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for adhered membrane for use as a cover board. DensDeck StormX Prime is extremely durable and is approved for use in assemblies meeting FM's Very Severe Hail (VSH) Classification. Available in 5/8" thickness and 4' x 4' or 4' x 8' size boards.
- 5. **DensDeck Prime** –gypsum core that incorporates glass-mat facings on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for 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. **DensDeck Cover Board** –gypsum core that incorporates glass-mat facings on the top and bottom side for use as a cover board. Available in 1/4" to 5/8" and 4' x 4' or 4' x 8' size boards.
- 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 and KEE HP 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 300' roll (4500 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, 45-mil by 6" wide by 100' long, 60-mil by 6" wide by 100' long, 9" wide by 50' long and 80-mil 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 30-mil thick non-reinforced TPO membrane laminated to nominal 30-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). 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 Reinforced Overlayment Strip:** A heat-weldable, reinforced thermoplastic polyolefin membrane. It is available in 45-mil 6" x 100' and 60-mil 6" x 100' and 9" x 50' rolls in colors of white, gray or tan. It can be used to cover end laps on VersiFleece and QA TPO systems and to strip in flat metal flanges on details such as TPO coated drip edges, gravel stops, and scuppers.
 - 4. APEEL Cover Tape: A 6"-wide, 1,640' long roll of APEEL Protective Film used to protect areas of VersiWeld TPO or VersiFlex PVC/KEE HP membrane where APEEL Protective Film has been removed (around details) or was not factory applied (seams). APEEL Cover Tape allows contractors to keep 100 percent of the TPO or PVC/KEE HP surface clean during installation and is applied using the APEEL Cover Tape Applicator.
 - 5. **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.
 - 6. **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.
 - 7. Yellow Pressure-Sensitive (PS) Warning Strip: A nominal 30-mil-thick non-reinforced TPO flashing laminated

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

8. **VersiWeld TPO Rib Profile:** Used to obtain the appearance of standing seam metal roofing with the performance of a TPO single-ply membrane. The Rib Profile measures 1-1/4" tall and 1-3/4" wide, including the welding flanges, while the vertical profile is a substantial 3/8" thick. The profile has a continuous 1/8" diameter alignment hole, for use with fiberglass connecting pins, as well as a 1/8" fiberglass reinforcing cord for added strength. The Rib Profile is available in white, gray and tan, as well as Special Colors (Medium Bronze, Rock Brown, terra Cotta, Slate Gray and Patina Green) in 10' lengths and packaged 20 per carton.

9. 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. Four sizes are available to fit curbs up to 6' by 6' in size. One curb requires 4 corners for a complete installation. TPO Curb Corners are packaged in boxes containing twelve corners. Custom sizes are available as a special order product requiring lead time.
- d) **TPO Universal Corners:** a pre-molded flashing for use in a variety of corner details, including inside and outside corners. Available in white, gray and tan and are 60-mil thick.
- e) **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.
- f) **Split Pipe Seals:** A prefabricated flashing consisting of 60-mil thick reinforced VersiWeld Detail Membrane for pipes 1" 6" in diameter. A split (cut) and overlapped tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration. Custom sizes are available as a special order product requiring lead time.
- g) TPO Square Tubing Wraps: Fabricated flashings made of 60-mil thick reinforced VersiWeld Detail membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square penetration. Available for 3", 4", 5" and 6" square tubing
- h) **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.
- i) 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.
- 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, VersiFlex FRS PVC and VersiFlex KEE HP Membrane Assemblies)
 - VersiFlex PVC non-reinforced Flashing (white, gray, light gray, slate gray and tan) is 60-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 Reinforced Cover Strip:** A 8" wide, nominal 80-mil thick, polyester reinforced PVC membrane. Used for stripping in rows of fasteners and plates and covering the butt joints of VersiFlex PVC membranes. Available in rolls 8" wide by 75' long in colors of white, gray or tan.

- 3. **VersiFlex KEE HP Reinforced Cover Strip:** A 8" wide, nominal 80-mil thick, polyester reinforced KEE HP PVC membrane. Used for stripping in rows of fasteners and plates and covering the butt joints of VersiFlex KEE HP PVC membranes. Available in rolls 8" wide by 75' long in colors of white, gray or tan, also available in 60-mil in rolls of 8" wide by 100' long in white only.
- 4. VersiFlex PVC Pressure-Sensitive Cover Strip: A 6" wide, nominal 35-mil thick non-reinforced KEE HP flashing laminated to a nominal 35-mil, fully cured, pressure-sensitive, synthetic rubber adhesive. Used for stripping in flat metal edgings (i.e. drip edge) of VersiFlex PVC and KEE HP PVC membranes. Available in rolls 6" wide by 100' long in colors of white, gray or tan. Used in conjunction with PVC Step 1 Activator and PVC Step 2 Primer.
- 5. **VersiFlex PVC Overlayment Strip:** An 80-mil non-reinforced thermoplastic polyvinyl chloride-based membrane used for stripping in PVC Coated Metal roof edging. VersiFlex PVC Overlayment Strip is available in 6" x 100' rolls with a white top side and gray or tan bottom side to match white and gray VersiFlex PVC membranes.
- 6. **VersiFlex PVC "T" Joint Cover:** A 4-1/2" diameter, 60-mil thick (white) or 40-mil (gray or tan), pre-cut non-reinforced PVC flashing used to overlay "T" joints at field splices when 60-mil or 80-mil VersiFlex PVC or VersiFlex KEE HP membrane is used.
- 7. **APEEL Cover Tape:** A 6"-wide, 1,640' long roll of APEEL Protective Film used to protect areas of VersiWeld TPO or VersiFlex PVC/KEE HP membrane where APEEL Protective Film has been removed (around details) or was not factory applied (seams). APEEL Cover Tape allows contractors to keep 100 percent of the TPO or PVC/KEE HP surface clean during installation and is applied using the APEEL Cover Tape Applicator.
- 8. **VersiFlex PVC Yellow Pressure-Sensitive Warning Strip:** a nominal 30-mil-thick, non-reinforced membrane flashing laminated to a nominal 30-mil-thick, fully cured, synthetic rubber, pressure-sensitive adhesive and is available in 6"-wide by 100'-long rolls. Pressure-Sensitive Warning Strip can be applied to VersiFlex PVC or KEE HP systems to provide a visual warning of an impending hazard (e.g., roof edge, deep drain sump, skylight, etc.).
- 9. **VersiFlex PVC Rib Profile:** Used to obtain the appearance of standing seam metal roofing with the performance of a PVC single-ply membrane. The Rib Profile measures 1-1/4" tall and 2-1/8" wide, including the welding flanges, while the vertical profile is a substantial 3/8" thick. The profile has a continuous 1/8" diameter alignment hole, for use with fiberglass connecting pins, as well as a 1/8" fiberglass reinforcing cord for added strength. The Rib Profile is available in white, gray, light gray, slate gray and tan, 10' lengths and packaged 20 per carton.

10. Pre-Molded Accessories:

- a) VersiFlex PVC Inside Corners: A pre-molded flashing for inside corners. Available in white or gray on tan;
 60-mil thick.
- VersiFlex PVC Outside Corners: A pre-molded flashing for outside corners. Available in white, gray or tan; 60-mil thick.
- c) VersiFlex PVC Curb Wrap Corners: Fabricated flashings are made of 60-mil thick reinforced VersiFlex KEE HP PVC Detail membrane designed to reduce installation time to flash a curb when compared to conventional methods. Each corner is fabricated with a 6" wide base flange and a 12" overall height. Three sizes are available to fit curbs up to 3' by 3' in size. One curb requires 4 corners for a complete installation. PVC Curb Wrap Corners are packaged in boxes containing twelve corners. Custom sizes are available as a special order product requiring lead time.
- d) **PVC Universal Corners:** a pre-molded flashing for use in a variety of corner details, including inside and outside corners. Available in white and are 60-mil thick.
- e) **VersiFlex PVC Pipe Flashings:** A pre-molded pipe flashing used for pipe penetrations. Available in white, gray or tan, for 3/4" 8" diameter pipes with clamping rings included.
- f) **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, gray or tan.
- g) 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. Available for 3", 4" and 6" diameter square tubing. Available in white and gray.

h) **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. Used in conjunction with White One-Part Pourable Sealer for waterproofing pipe clusters or other odd shaped penetrations. Pockets can be adjusted from 11.5" to 7.5" in length by 6" in width by following the cutting lines molded in the pocket. 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 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.</p>
- 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.
- 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-09-18 "Aqua Base 120 Bonding Adhesive" for Warranty limitations and other considerations.
- e) CAV-GRIP 3V Low-VOC Aerosol Contact Adhesive/Primer: a low-VOC, spray-applied aerosol contact adhesive and primer used for a variety of applications: adhering standard VersiWeld TPO and VersiGard EPDM membranes to horizontal and vertical surfaces, adhering VersiFleece membranes to vertical surfaces, as a primer for VapAir Seal 725TR, and as an unexposed asphalt primer for Flexible DASH for insulation attachment.
- f) 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.
- g) 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).
- h) 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 or gray in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.
- i) 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.
- j) Weathered Membrane Cleaner: Used to prepare TPO 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).
- k) **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.
- 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) Hydrobond Adhesive: A wet lay-in, one-sided dispersion adhesive. Compatible with only VersiFlex PVC smooth-backed and VersiFleece membranes, this product is ideal for bonding only PVC membranes to various porous and non-porous substrates (cannot be used with any KEE or KEE HP PVC bareback membranes). Coverage rates vary between 100-133 square foot per gallon using roller or spray applications.
- c) CAV-GRIP PVC Aerosol Contact Adhesive: a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: adhering PVC bareback membranes to a variety of horizontal substrates and vertical walls (cannot be used with any KEE or KEE HP bareback membranes), as well as adhering VersiFleece membranes to vertical walls. Coverage rate is approximately 1,500-2,000 sq. ft. per #40 cylinder and 3,000-4,000 sq. ft. per #85 cylinder as a primer, in a single sided application; 400 sq. ft. per #40 cylinder and 800 sq. ft. per #85 cylinder as an adhesive for vertical walls, in a double-sided application; 750 sq. ft. per #40 cylinder and 1,500 sq. ft. per #85 cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided applications.
- d) 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 or KEE HP Membranes is not required.
- e) 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).
- f) 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.
- g) 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.
- h) **PVC and KEE HP Membrane Cleaner:** Used to prepare PVC/KEE HP membranes that have 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).
- i) VersiFlex Low-VOC PVC Step 1 Activator: A high-strength, solvent-based activator that allows PVC Pressure-Sensitive (PS) Cover Strip to be bonded to VersiFlex PVC or KEE HP membranes. Low-VOC PVC Step 1 Activator meets the < 250 gpl VOC content requirements of the OTC Model Rule. It is specially formulated using a blend of VOC-exempt and non-exempt solvents and follows the state of California Clean Air Act of 1988 (updated in 1997) as further regulated by California's Air Quality Control Districts listing VOC limitations.</p>
- j) VersiFlex Low-VOC PVC Step 2 Primer: A high-solids-content, polymer based splice primer. This product is applied to KEE HP and PVC membranes to improve the adhesion of PVC Pressure-Sensitive Cover Strip. Low-VOC PVC Step 2 Primer meets the < 250 gpl VOC content requirements of the OTC Model Rule.</p>
- k) VersiFlex PVC Step 2 Primer: A high-solids-content, clear (translucent color), polymer-based splice primer used to prepare KEE HP and PVC membranes to be bonded to PVC Pressure-Sensitive Cover Strip.

2.05 Fastening Components

A. Securement Strips (RUSS)

- 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	CD-10	1"	Note (2)	7/32"
or greater	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 or Lite-Deck Fastener	1-1/2"	Note (4)	N/A
Gypsum	Polymer Gyptec or Lite-Deck Fastener	1-1/2"	Note (2)	7/16", 1/2" or 9/16" (5)

Notes: N/A = Not Applicable

- (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.
- 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).
- 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.
- 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.

⁽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.

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

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. **SecurFast Insulation Fastening Plates:** A nominal 2-7/8" hexagon metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener.
- 6. **Accutrac Insulation Plates:** A nominal 3" square, recessed or flat bottomed, metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener. Flat bottom plate is used with manufactured Philips Head fasteners only.
- 7. **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 and KEE HP membranes on Mechanically Attached Roofing Systems.

2.06 Insulation Securement Adhesive

- 1. **Flexible DASH Adhesive:** A two-component (Part A and B), low-rise polyurethane adhesive designed for bonding VersiFleece membrane and/or insulation to various substrates. Coverage rates can be found in Paragraph 3.05 'Membrane Placement and Securement'. Flexible DASH Adhesive is packaged in 50- and 15-gallon drums, as well as, 5-gallon Jug and Dual Cartridges that can be applied in full spray or extrusion, depending on dispensing type.
- 2. Flexible DASH Dual Tank: A two component (Part A and B), extrusion applied, low rise adhesive for bonding insulation to various surfaces. DASH Dual Tanks utilize an HFO blowing agent. HFO (hydrofluoroolefin) blowing agents are widely recognized as the next-generation environmentally friendly blowing agent, replacing their HFC (hydrofluorocarbon) predecessor. When extruded at 12" on center the coverage rate is 3,500 to 3,700 sq.ft. per set of Dual Tanks.
- Flexible DASH Dual Cartridge and 5-gallon Jug Adhesive: A two component (Part A and B), extrusion
 applied, low rise adhesive for bonding insulation to various surfaces. When extruded at 12" on center the
 coverage rate is 400-600 sq.ft. per carton of Dual Cartridges or 2,000-2,500 sq.ft. per set of 5-gallon Jug
 Adhesive.
- 4. OlyBond 500 Bag in a Box A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates. Packaged in 5-gallon boxes of Part A and Part B formulations that are applied using a mechanical dispenser system. Applied in 1/2" to 3/4" beads or ribbons at the rate of 1 gallon per 150-250 square feet for 12" o.c. bead spacing. Perimeter bead spacing patterns and acceptable insulation and deck types are listed in the applicable Product Data Sheet.
- 5. **OlyBond 500 BA Spot Shot** A two-component, polyurethane construction grade, low-rising expanding adhesive designed for bonding insulation to various substrates. Applied in 1/2" to 3/4" beads or ribbons using a portable 1:1 applicator (oversized, dual-cartridge caulking gun). Refer to the Product Data Sheet for bead spacing with reference to building height.

2.07 Vapor / Air Barrier

1. General

If insulation is to be fully adhered to the vapor retarder with Flexible DASH Adhesive, the vapor retarder must be compatible and shall be fully adhered to the substrate. Available products include Versico 725 Air and Vapor Barrier and spray or roller applied butyl coatings. Installation requirements for Versico's VapAir Seal 725TR Air and Vapor Barrier are identified in Spec Supplement G-07-20 "Application Procedures for 725TR Air and Vapor Barrier" and Versico's VapAir Seal MD Air and Vapor Barrier are identified in Spec Supplement G-12-19 "Application Procedures for VapAir Seal MD air and Vapor Barrier" in the Versico Technical Manual.

- 2. **Versico VapAir Seal 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 Flexible DASH Adhesive. 725TR can also function as a temporary roof for up to 120 days. Available in rolls 39" wide by 100' long (325 square feet).
- 3. **Versico VapAir Seal MD Air and Vapor Barrier** a reinforced composite aluminum foil with self-adhesive SBS backing and removable poly release film. Used for direct application over metal decks. Used for direct application over metal decks. Available in rolls 42.5" wide by 131.23" long (460 square feet).
- 4. **CAV-GRIP 3V Low-VOC Aerosol Contact Adhesive/Primer:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: enhancing the bond between Versico's VapAir Seal 725TR and various substrates. Coverage rate is approximately 2,000-2,500 sq. ft. per 40 lb cylinder and 4,000-5,000 sq. ft. per 85 lb cylinder as a primer, in a single-sided application.
- 5. CCW-702 Primer and 702LV Primer (Low-VOC) 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 300 to 350 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. CCW-702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
- 6. CCW-702WB a high-tack, water-based contact adhesive for promoting adhesion of Versico air/vapor barrier membranes and an approved substrate (i.e., concrete, Dens-Deck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW-702WB Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

2.08 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. Also available in TPO Special Colors (Medium Bronze, Rock Brown, Terra Cotta, Slate Gray and Patina Green) and comes packaged 5 sheets per pallet on a direct ship basis.
- 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, light gray, slate gray and tan.
- 3. **VersiTrim 200/300 Drip Edge:** Pre-fabricated TPO or PVC-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 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.
- 6. **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).
- 7. **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.
- 8. **VersiTrim Term Bar Fascia:** A 1.75" wide formed aluminum termination bar with pre-slotted fastening holes for ease of locating and installing. The decorative cover is available in 0.040" aluminum or 24-gauge galvanized steel. VersiTrim Term Bar Fascia is manufactured in 12' lengths for fewer joints/seams, fewer sections to handle and faster installation.
- 9. Refer to Spec Supplement P-01-20 "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 (PVC/KEE HP) membranes in those areas exposed to repetitive foot traffic or other hazards. Walkway material may be heat welded to VersiFlex (PVC/KEE HP) membranes using an automated heat welder or hand held heat welder. Walkway Rolls are 36" wide by 60' long and are nominal 110-mils thick. Available in gray only.
- c) VersiWeld TPO Crossgrip Walkway Rolls: Manufactured from TPO and may be used in lieu of standard VersiWeld TPO Walkway Rolls when a walkway is to be loose-laid and not secured to the membrane. Loose-laid Crossgrip TPO Walkway Rolls are effective for winds up to 55 mph. Rolls are 36" wide by 33' long, available in white, gray and yellow.
- d) VersiFlex PVC Crossgrip Walkway Rolls: Manufactured from PVC and may be used in lieu of standard VersiFlex PVC Walkway Rolls when a walkway is to be loose-laid and not secured to the membrane. Loose-laid Crossgrip PVC Walkway Rolls are effective for winds up to 55 mph. Rolls are 36" wide by 33' long, available in white, gray and yellow.
- e) Versico Interlocking Rubber Pavers: 24" X 2" thick rubber paver weighing approximately 24 pounds per unit, 6 pounds per square foot manufactured from recycled rubber, which provides a resilient, shock absorbing, weather resistant surface. Designed primarily for use as a walkway or on terrace areas offering a unique, environmentally sound advantage over concrete pavers. Features include freeze/thaw stability, bi-directional drainage and no breakage concerns. Available in black and terra cotta.
- f) Hanover Ballast and Lightweight Ballast Pavers: The standard, 24" x 24" x 1-13/16" thick, Ballast Paver comes in a natural color and a non-slip Diamond finish and weighs 22 lbs/sq. ft. The Lightweight, 23-1/2" x 23-1/2" x 1-1/4" thick, Ballast Paver comes in a natural color and a non-slip diamond finish and weighs 15 lbs/sq. ft. Both pavers can be used as ballast or walkways.

2.10 Other Versico Accessories

Refer to Spec Supplement P-01-21 "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. Safety Data Sheets (SDS) 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-06-19 "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 / KEE HP Membrane	
Fully Adhered	Mechanically Attached	NEW CONSTRUCTION	Mechanically Attached	Fully Adhered
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)
Fully Adhered	Mechanically Attached	RETROFIT / NO TEAR-OFF	Mechanically Attached	Fully Adhered
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
Fully Adhered	Mechanically Attached	RETROFIT / TEAR-OFF	Mechanically Attached	Fully Adhered
Insulation	Insulation	Existing roof material removed (regardless of deck type)	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.

- 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.
 - 8. On retrofit projects, all existing phenolic insulation must be removed.
 - 9. Refer to table above for other Recover/Retro-fit considerations.

J. Vapor Retarder Installation

For Versico's Vapor Retarder refer to Spec Supplement G-07-20 "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

- 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.
- 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-05-19 "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-05-21 "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) When Oriented strand board (OSB) is specified for membrane underlayment, utilize DuraFaceR OSB/Polyiso Composite, mechanically fastened to the deck at the rate 17 fasteners for 4 x 8 board in accordance with Versico Details. When positioning OSB, butt edges and stagger joints of adjacent panels.
- 2. **Adhesive attachment**, Versico Urethane Adhesive (Flexible 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-02-21 "Flexible 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 Flexible 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, 150 pound weighted segmented steel roller to ensure full embedment. Optimal set up time should be approximately 5 to 7 minutes.

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

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.

- 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 DensDeck, DensDeck Prime and DensDeck StormX Prime should be limited to assemblies with slopes greater than 2" per foot to ensure compliance with external fire codes.

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

- Adhere VersiWeld or VersiFlex membrane to an acceptable substrate with Versico Bonding Adhesive. CAV-GRIP 3V Low-VOC aerosol adhesive may be utilized with VersiWeld TPO membranes. CAV-GRIP PVC aerosol adhesive may be utilized with VersiFlex PVC membranes (cannot be used with any KEE or KEE HP bareback membranes). Comply with Labels, Safety Data Sheet (SDS) 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.
- 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-09-18 "Aqua Base 120 Bonding Adhesive" for application methods and warranty requirements.

6. Allow adhesive to flash-off until it does not string but remains tacky 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. **HydroBond Adhesive** can be applied directly to the substrate using an airless spray machine or a medium nap roller. Do not apply HydroBond to splice areas to be hot-air welded. When applying HydroBond, ensure that the adhesive has not dried before the membrane is laid in place. This is a wet lay-in adhesive; drying occurs rapidly during high temperatures, and care must be taken to ensure the membrane is laid into wet adhesive. To ensure a wet lay-in, adjust the application technique according to weather conditions. Avoid heavy or thin application of adhesive. Roll the membrane into the wet, adhesive coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the membrane with a soft-bristle push broom or a clean, dry roller applicator to achieve maximum contact and to work out any air bubbles. Immediately after brooming out from the center, roll the membrane in all directions with a minimum 100–150-lb (45–68 kg) weighted roller to achieve maximum contact.

NOTE: When using Hydrobond Adhesive, do not apply when the surface and/or ambient temperatures are below 40 degrees or when the temperature is expected to drop below 32 degrees within 72 hours of application. Hydrobond Adhesive is a wet lay-in, one-sided adhesive with coverage rate is 100-133 square feet per gallon finished surface.

- 10. 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.
- 11. **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	HPVX	HPVX Plates	3/4"
Concrete over Steel**	HPV-XL	HPV-XL Plates	3/4
Structural Concrete, rated	CD-10	HPVX Plates	1"
3,000 psi or greater	MP 14-10	HPVX Plates	!
Wood Plank, min. 15/32" thick	HPVX	HPVX Plates	Min. 1"
Plywood or min. 7/16" OSB**	HPV-XL	HPV-XL Plates	IVIIII. I
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 and KEE HP assemblies, 2-3/4" x 1-1/2" oval metal barbed fastening plates can used in conjunction with HPVX fasteners for membrane securement. (Not recommended for insulation Securement)

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-06-19 "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 10'. Perimeter sheets are not required at the base of the wall at the lower level.

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

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)(KEE HP PVC - 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.
- 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 6" 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 TPO Cut-Edge Sealant to seal any exposed scrim, cut edge sealant is not required for PVC or KEE HP.
- 2) Projects with Warranties greater than 20 Years OR VersiFlex projects regardless of warranty duration center 6" wide section of TPO/PVC/KEE HP 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 TPO Cut-Edge Sealant to seal any exposed scrim, cut edge sealant is not required for PVC or KEE HP.

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

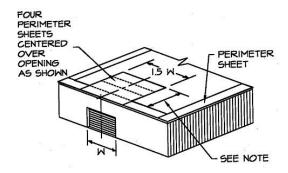
fastening density or other enhancement.

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.

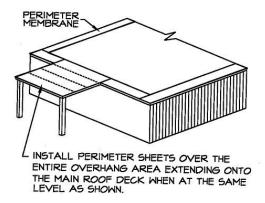
NOTE: Depth of perimeter area, noted above, shall not be less than 2.5 times the width of the opening.



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 30" wide 150 lb weighted segmented 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. APEEL Protective Film should be removed from within areas that are to be heat-welded together. In areas that do not require heat welding, the APEEL Protective Film can be left in place for up to 90 days.
- 2. Heat weld the VersiWeld or VersiFlex membrane sheets using the Automatic Heat Welder or Hot Air Hand Welder and silicone roller.
- 3. When roof slope exceeds 5" per horizontal foot, use of the Automatic Heat Welding Machine may become more difficult; use of the Handheld Hot Air Welder is recommended.
- 4. **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 and KEE HP Membrane Cleaner (Weathered Membrane Cleaner

should not be used to clean VersiFlex PVC). Weathered or PVC and KEE HP 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 Handheld Heat Welder Equipment

Refer to Spec Supplement T-01-18 "Heat Welding Equipment" for:

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

C. Membrane Welding

- 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 or **80-mil** VersiFlex Membrane, a **TPO/PVC "T" Joint Cover** must be applied over all "T" joint splice intersections.
- 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 Handheld 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.
- 10. All membranes, at end laps, a minimum 6" wide, reinforced coverstrip must be used in conjunction with applicable primer.

D. Preventing Membrane Creeping During Welding

 The operator of automatic welding equipment must apply foot pressure to the membrane, keeping the membrane tight under the welder. Refer to Spec Supplement T-01-18 "Heat Welding Equipment" for additional information.

E. Test Cuts

 Perform a test weld at least at the start of work each morning and afternoon. Refer to Spec Supplement T-01-18 "Heat Welding Equipment" for additional information.

F. Seam Probing

A cotter pin puller (blunt or dull for PVC or KEE HP 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-01-18 "Heat Welding Equipment" for additional information.

G. Cut-Edge Sealant

- 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 TPO 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).
 - b) Cut-Edge Sealant is not required on vertical VersiWeld splices.

3.07 Welding Problems / Repairs

- A. A Handheld 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 and KEE HP Membrane Cleaner (Weathered Membrane Cleaner should not be used to clean VersiFlex PVC or KEE HP 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 and KEE HP 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 Handheld Hot Air Welder and a silicone roller. Depending on conditions, a splice overlay may be required.
- D. Position the handheld 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 TPO Cut-Edge Sealant. Cut-Edge Sealant is not required on cut edges of VersiFlex Membranes.

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 25 year or greater warranties Versico Pre-Fabricated accessories must be used when feasible.
- 4. All Projects, regardless of Warranty Duration, shall incorporate Versico supplied pre-fabricated accessories to seal pipes, corners, sealant pockets, etc., when feasible. When field fabrication is required, the flashing material shall not be less than 60-mils thick.
- 5. For wall and curb flashing, the required thickness shall equal the deck membrane thickness.

6. 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 and KEE HP 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/KEE HP) 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/KEE HP) or 160°F (71°C) (TPO).
- 7. 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.
 - The new VersiWeld/VersiFlex membrane flashing must not conceal weep holes or cover existing throughwall flashing.
 - Install surface mounted reglets and compression bar terminations directly to the wall surface.
- 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

- Membrane shall be fully adhered to vertical surfaces with VersiWeld/VersiFlex Bonding Adhesive. CAV-GRIP 3V low-VOC aerosol adhesive may be utilized with VersiWeld TPO membranes. CAV-GRIP PVC aerosol adhesive may be utilized with VersiFlex PVC membranes (cannot be used with any KEE or KEE HP bareback membranes). The Bonding Adhesive shall be applied continuously, without globs or puddles.
- 2. Allow adhesive to flash-off until it is tacky but will not string or transfer to a dry finger touch.
- 3. Roll the membrane into the adhesive.
- 4. 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.
- 5. Terminate the edges of the installed membrane in accordance with Versico's applicable details.
- 6. 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 3.05 F**, 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

 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. VersiWeld/VersiFlex Rib Profiles

- VersiWeld/VersiFlex Rib Profiles are recommended for use with VersiFleece TPO and PVC adhered roofing systems.
- 2. The VersiWeld/VersiFlex Rib Profiles should be positioned parallel to the laps of the installed TPO/PVC roofing system and parallel with the roof slope where possible.
- Ensure that all welding surfaces are clean and dry. Inspect all seam areas for proper weld prior to installing VersiWeld/VersiFlex Rib Profile.
- 4. Rib Profile spacing can be individually determined to achieve the desired appearance.
- Connecting multiple ribs is achieved by using fiberglass pins. Insert a pin half-way into the end of one profile.
 Connect the adjoining rib by inserting the exposed end of the pin into the alignment hole. Repeat previous steps for additional TPO/PVC Rib profiles.
- 6. Consult the VersiWeld or VersiFlex Rib Profile installation guides for instructions on proper installation techniques.

G. 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/KEE HP) 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 or KEE HP PVC membranes require total isolation between the two roofing systems. For TPO membranes refer to applicable Versico details for tie-ins.
- 6. **Flashing of Difficult Penetrations,** refer to Spec Supplement G-11-20 for "LIQUISEAL Liquid Flashing" for additional information and specific requirements.

H. APEEL Protective Film (Optional)

When the optional APEEL Protective Film is utilized on TPO or PVC/KEE HP, remove and discard the APEEL Protective Film after the installation of the entire TPO or PVC/KEE HP Roofing System is complete.

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-05-18 "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-06-20 "Daily Seal & Clean Up**".

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



Thermoplastic (TPO/PVC/KEE HP) Mechanically Fastened Roofing Systems Induction Welding (RhinoBond / Isoweld) Attachment Method

"Attachment I"

January 2023

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

A. Description

The Induction Welding (RhinoBond/Isoweld) 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 or Isoweld plates and welded to the surface using the RhinoBond or Isoweld Induction Welding Tool.

Induction Welding (RhinoBond/Isoweld) Attachment Method Limited to 30 year maximum warranty and wind speed coverage up to 120 mph. Perimeter enhancements will be required on systems greater than 72 mph and/or projects over 50' in height. Contact Versico for requirements for enhancements.

Table I

Induction Welded - Membrane Systems Warranty Options

	-	Thermoplastic Membranes (VersiWeld TPO/VersiFlex PVC)					
Years	Warranty Wind Speed						
	55, 72, 80, 90, 100, 110, or 120 mph	Minimum Membrane Thickness (1)	Additional Puncture Coverage				
5,10, or 15 year	√(2)	VersiWeld 45-mil or VersiFlex 50-mil	Not Available				
20 year	√(2)	VersiWeld 60-mil or VersiFlex 60-mil	Not Available				
25 or 30 year	√(2)	VersiWeld 80-mil or VersiFlex 80-mil	Not Available				

Notes: $\sqrt{=}$ Acceptable

⁽¹⁾ All "T-Joints" must be overlaid with appropriate flashing material when using 60- or 80-mil TPO or 80-mil PVC/KEE HP membrane. (2) Perimeter enhancements required for wind speed coverage greater than 72mph and/or projects over 50' in height. Contact Versico for requirements.

for Induction Welded Roofing Systems (Up to 20 YR Warranty)

Table II

		Min. Numl	per of Perir	neter Sheets				
Peak Gust Wind Speed	Max. Building Height	Building D	Distance fro	om Coastline	Minimum Perimeter Width	inau	ction Weld Plate Do	ensity
Warranty	,	Greater than 7 miles	3 to 7 miles	Less than 3 miles		Field	Perimeter	Corners
55 MPH	Up to 50'	1	2	3	8'	6	8	8
72 MPH	Up to 50'	2	2	3	8'	6	8	8
80 MPH	Up to 50'	3	3	4	8'	8	10	10
90 MPH	Up to 50'	3	4	4	8'	8	12	12
100 MPH	Up to 50'	3	3	4	8'	8	12	16
110 MPH	Up to 50'	3	3	4	8'	10	16	16
120 MPH	Up to 50'	3	4	4	8'	10	16	20

for Induction Welded Roofing Systems (Up to 30 YR Warranty)

Table III

		Min. Numl	per of Perin	neter Sheets		M Industion M		World Plate Pagain	
Peak Gust Wind Speed Warranty	Max. Building Height	Building D	istance fro	om Coastline	Minimum Perimeter Width	Induction Weld Plate Density			
warranty		Greater than 7 miles	3 to 7 miles	Less than 3 miles		Field	Perimeter	Corners	
55 MPH	Up to 50'	1	2	3	16'	8	10	10	
72 MPH	Up to 50'	2	2	3	16'	8	10	10	
80 MPH	Up to 50'	3	3	4	16'	10	12	12	
90 MPH	Up to 50'	3	4	4	16'	10	12	12	
100 MPH	Up to 50'	3	3	4	16'	10	16	20	
110 MPH	Up to 50'	3	3	4	16'	12	16	24	
120 MPH	Up to 50'	3	4	4	16'	12	16	24	

B. Products/Heat Welding Equipment

Products listed in "Part II" of the Versico Thermoplastic Mechanically Fastened Roofing System Specification can be used as part of this alternate securement method in conjunction with the RhinoBond or Isoweld Welding Plates.

- 1. **RhinoBond or Isoweld 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 or Isoweld Induction Welding Tool.
- 2. **RhinoBond or Isoweld 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 or Isoweld Welding Plate to fuse with the roofing membrane. Refer to RhinoBond or Isoweld Owner's Manual for additional information.
- 3. **Magnet:** A stand-up device that allows the weld to cool as it holds the membrane to the heated plate. Refer to RhinoBond or Isoweld Owner's Manual for additional information.

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 or 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 Magnet 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 Magnet.
- 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 trial 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. Isoweld Induction Tool Calibration

Calibrate the Isoweld induction welding tool using the process outlined in the Owner's Manual.

E. Installation

Caution: To avoid false welds and ensure adequate membrane attachment to the plates, induction tool calibration and test welds (along with the proper positioning of the induction welder over the plate and placement of the magnet) must be performed prior to the start of work each day. All test welds must be completed using the exact components of the assembly to be installed.

 After placement of insulation on substrate, secure the insulation at a rate of six HPVX Fasteners and RhinoBond or Isoweld Plates per 4' x 8' in the designated field and eight HPVX Fasteners and RhinoBond or Iswoeld 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 or Isoweld Plates and allow membrane to relax.
- Place RhinoBond Induction Tool centered over the RhinoBond TPO or PVC Welding Plate, under the roofing membrane OR Place the Isoweld Induction Tool over the Isoweld TPO or PVC Welding Plate, until the acoustic search mode signals the inductor is properly positioned.
- 4. Activate induction welding tool and leave in place until heating cycle is complete.
- 5. Immediately place Magnet 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.

F. 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.
- 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.

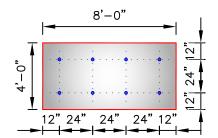
G. Associated Installation Details

Rh	ninoBond Attachment Method – Number of Fasteners and Location	RB-1
Ar	ngle Change Securement Method RhinoBond Plates	RB-2
Ind	duction Welded Wall Attachment	RB-3

Isoweld Attachment Method – Number of Fasteners and Location	IW-1
Angle Change Securement Method with Isoweld Plates	IW-2
Induction Welded Wall Attachment	
Induction Welding Attachment Method – Fastening Patterns/Enhancements	FP-1
Induction Welding Attachment Method – Fastening Patterns/Enhancements	FP-2

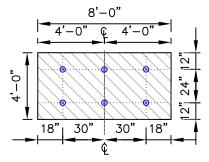
End of Section

- RhinoBond METHOD OF MEMBRANE ATTACHMENT IS NOT FOR USE WITH NON-FACED EPS (EXPANDED POLYSTYRENE) OR XPS (EXTRUDED POLYSTYRENE) INSULATIONS.
- PERIMETER ENHANCEMENTS
 REQUIRED FOR WIND SPEED
 COVERAGE GREATER THAN
 72MPH. CONTACT VERSICO FOR
 REQUIREMENTS.
- 3. ENHANCEMENT SHOWN ARE FOR THE PURPOSE OF THE VERSICO WARRANTY. FOR FM PROJECTS CONSULT FM GLOBAL FOR REQUIRED ENHANCEMENTS.



PERIMETER ZONE

8 FASTENERS PER 4'X8' BOARD



FIELD OF ROOF
6 FASTENERS PER 4'X8' BOARD

PERIMETER AREA

FIELD AREA

VERSICO FASTENER & RhinoBond FASTENER PLATE

ROOF FIELD AREA

PERIMETER ZONE

A

PERIMETER ZONE

RAISED ROOF EDGE OR PARAPET WALL

MEMBRANE FASTENED MINIMUM 12" O.C. AT ANGLE(S) CHANGES. FOR ADDITIONAL INFORMATION SEE DETAIL $\overline{\text{RB-2}}$

SEE A FOR

4'-0"

8'-0" MIN.

PERIMETER ZONE

DIMENSIONS

DECK TYPE	DECK THICKNESS	FASTENER	THERMOPLASTIC COATED PLATE		
STEEL 22 GAUGE (0.8mm)		VERSICO HPVX	3-1/8" (8cm)		
PLYWOOD 15/32" (12mm) FASTENER DIAMETER					
NOTE: AT IN-FILL MINOR PIECES, USE MIN. 2 FASTENERS.					

INCHES TO CENTIMETERS							
inch	2"	3.5"	4"	12"	18"	24"	30"
cm	5	9	10	30	46	61	76

ROOF FIELD AREA

FEET TO CENTIMETERS						
FEET	1'	4'	8			
cm	30	122	244			

DETAIL RB-2



RhinoBond ATTACHMENT METHOD-NUMBER OF FASTENERS AND LOCATION

SEE B FOR

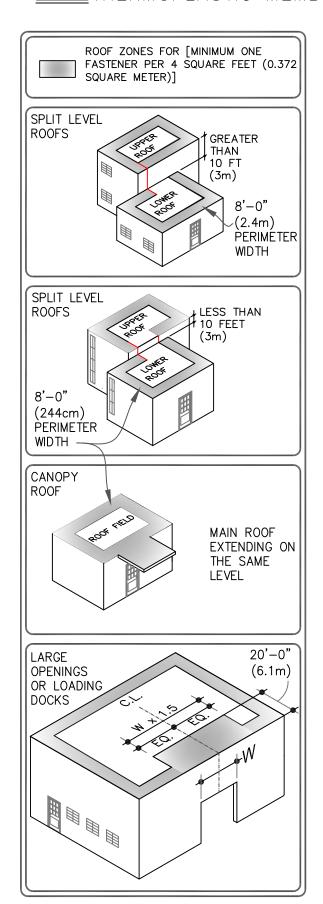
DIMENSIONS

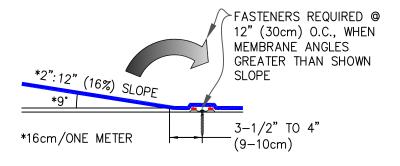
4'-0"

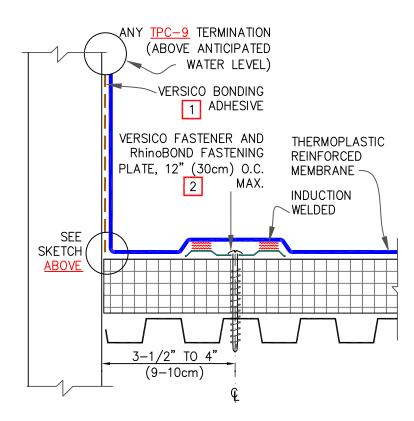
4'-0"

VERSICO RhinoBond

RB-1







ANGLE CHANGE SECUREMENT

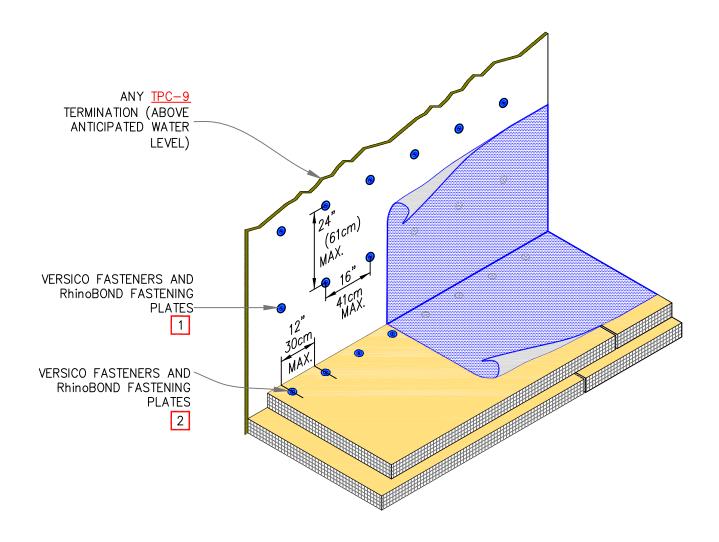
- VersiWELD MEMBRANE REQUIRES VersiWELD BONDING ADHESIVE AND VersiFLEX MEMBRANE REQUIRES VersiFLEX BONDING ADHESIVE.
- 2. HPVX FASTENERS AND RhinoBOND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. FOR WARRANTY WIND SPEEDS GREATER THAN 72 MPH PLEASE CONTACT VERSICO FOR REQUIRED FASTENING ENHANCEMENTS



ANGLE CHANGE SECUREMENT METHOD WITH RhinoBond PLATES

VERSICO RhinoBond

RB-2



- FASTENERS MUST PENETRATE INTO WOOD OR METAL STUDS, WHERE WALL IS BUILT WITH STUDS.
- 2. HPVX FASTENERS AND RhinoBOND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS.

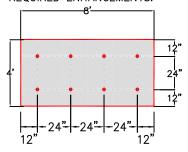


RhinoBOND - WALL ATTACHMENT

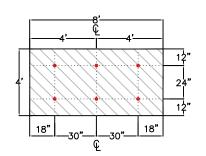
VERSICO RhinoBond

RB - 3

- 1. Isowled METHOD OF MEMBRANE ATTACHMENT IS NOT FOR USE WITH NON-FACED EPS (EXPANDED POLYSTYRENE) OR XPS (EXTRUDED POLYSTYRENE) INSULATIONS.
- 2. PERIMETER ENHANCEMENTS REQUIRED FOR WIND SPEED COVERAGE GREATER THAN 72MPH. CONTACT VERSICO FOR REQUIREMENTS.
- 3. ENHANCEMENT SHOWN ARE FOR THE PURPOSE OF THE VERSICO WARRANTY. FOR FM PROJECTS CONSULT FM GLOBAL FOR REQUIRED ENHANCEMENTS.



PERIMETER ZONE 8 FASTENERS PER 4'X8' BOARD



FIELD OF ROOF 6 FASTENERS PER 4'X8' BOARD

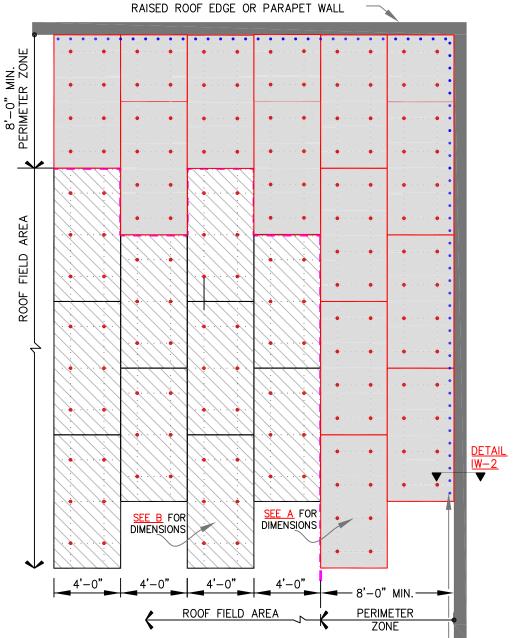


PERIMETER AREA



FIELD AREA

VERSICO FASTENER & Isoweld FASTENER **PLATE**



MEMBRANE FASTENED MINIMUM 12" O.C. AT ANGLE(S) CHANGES.-FOR ADDITIONAL INFORMATION SEE DETAIL IW-2

DECK TYPE	DECK THICKNESS	FASTENER	THERMOPLASTIC COATED PLATE			
STEEL	22 GAUGE (0.8mm)	VERSICO HPVX	3-1/8" (8cm)			
PLYWOOD 15/32" (12mm)		FASTENER	DIAMETER			
NOTE: AT IN-FILL MINOR PIECES, USE MIN. 2 FASTENERS.						

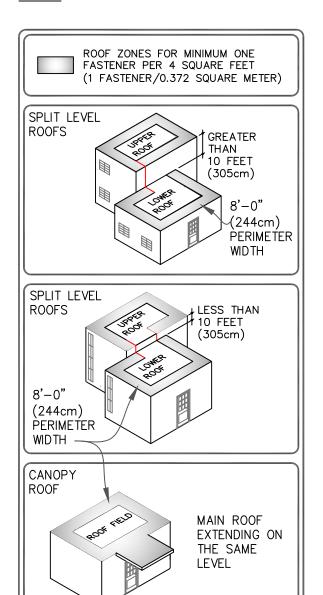
INCHES TO CENTIMETERS							
inch	2"	3.5"	4"	12"	18"	24"	30"
cm	5	9	10	30	46	61	76

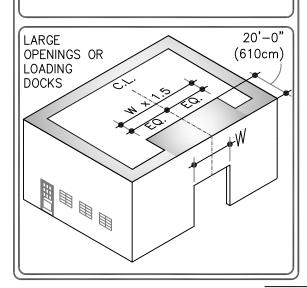
FEET TO CENTIMETERS					
FEET	1'	4'	8'		
cm	30	122	244		

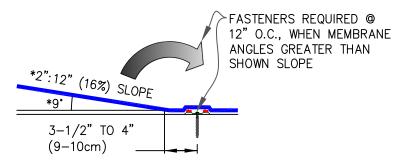


ISOWELD ATTACHMENT METHOD - NUMBER OF FASTENERS AND LOCATIONS

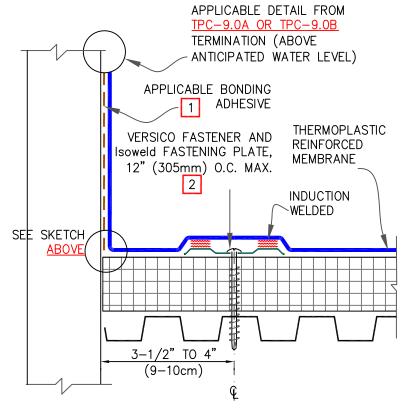
VERSICO Isoweld Attachment







*100mm HORIZONTAL: 16mm VERTICAL



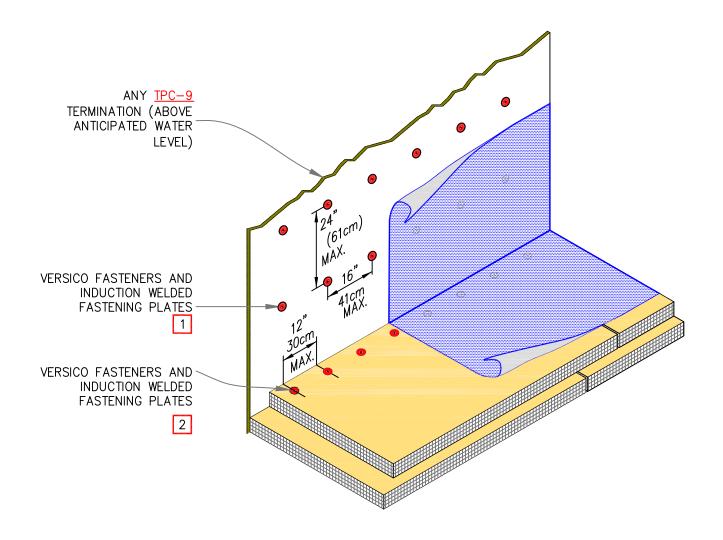
ANGLE CHANGE SECUREMENT

- VersiWELD MEMBRANE REQUIRES VersiWELD BONDING ADHESIVE AND VersiFLEX MEMBRANE REQUIRES VersiFLEX BONDING ADHESIVE.
- 2. HPVX FASTENERS AND Isoweld PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. FOR WARRANTY WIND SPEEDS GREATER THAN 72 MPH PLEASE CONTACT VERSICO FOR REQUIRED FASTENING ENHANCEMENTS.



ANGLE CHANGE SECUREMENT METHOD WITH **ISOWELD PLATES**

VERSICO Isoweld Attachment

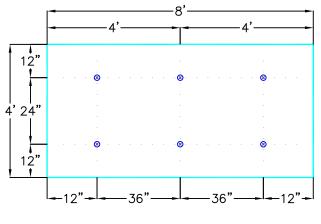


- FASTENERS MUST PENETRATE INTO WOOD OR METAL STUDS, WHERE WALL IS BUILT WITH STUDS.
- 2. HPVX FASTENERS ARE REQUIRED OVER STEEL AND WOOD DECKS.

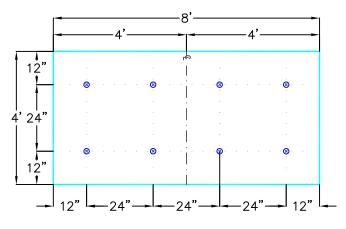


ISOWELD - WALL ATTACHMENT

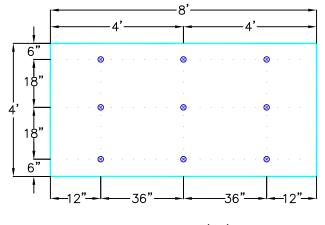
VERSICO Isoweld Attachment



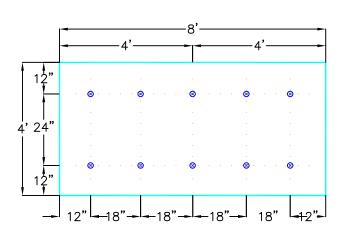
6 FASTENERS PER 4'X8' BOARD



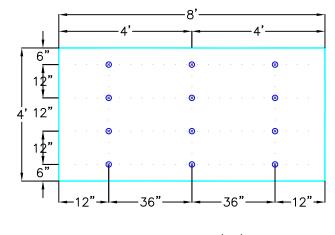
8 FASTENERS PER 4'X8' BOARD



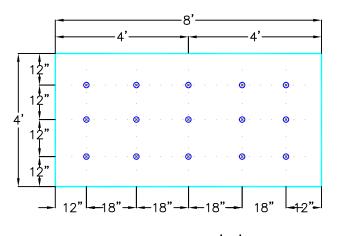
9 FASTENERS PER 4'X8' BOARD



10 FASTENERS PER 4'X8' BOARD



12 FASTENERS PER 4'X8' BOARD



15 FASTENERS PER 4'X8' BOARD

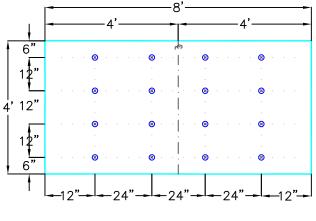
NOTE: FOR FM INSURED PROJECTS, CONSULT FM GLOBAL PRIOR TO INSTALLATION.



INDUCTION WELDING ATTACHMENT METHOD — FASTENING PATTERNS/ENHANCEMENTS

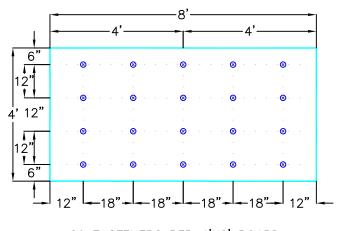
Induction Welding

FP-1



16 FASTENERS PER 4'X8' BOARD

18 FASTENERS PER 4'X8' BOARD



20 FASTENERS PER 4'X8' BOARD

24 FASTENERS PER 4'X8' BOARD

NOTE: FOR FM INSURED PROJECTS, CONSULT FM GLOBAL PRIOR TO INSTALLATION.



INDUCTION WELDING ATTACHMENT METHOD — FASTENING PATTERNS/ENHANCEMENTS

Induction Welding

FP-2



TPO Flashing Procedures utilizing VersiGard White EPDM Products

"Attachment II"

January 2023

This is an alternate method for flashing **Versico's VersiWeld (TPO) membrane ONLY** and is intended to be used in conjunction with the Versico's Thermoplastic Specification and Details.

A. Description

Thermoplastic flashing procedures utilizing Versico's VersiGard White EPDM flashing products incorporates Peel & Stick Uncured EPDM Flashing (White), White EPDM Peel & Stick Inside/Outside Corners, White EPDM Peel & Stick 'T'-Joint Covers, Peel & Stick White EPDM Pipe Seals, and White EPDM Pourable Sealer Pockets. These Peel & Stick products are used as an option and in lieu of welding TPO Flashing products for a **maximum warranty duration of 20 years**.

Versico's VersiGard White EPDM flashing products are comprised of uncured or cured White EPDM membrane laminated to fully cured synthetic rubber adhesive.

B. Products

Products listed below can be used as part of this alternate flashing method in conjunction with TPO Primer.

- 1. **Peel & Stick Uncured EPDM Flashing (White):** A 6" X 100' and 9" or 12" wide by 50' long, 60-mil thick VersiGard White **uncured** EPDM Flashing laminated to a 30-mil synthetic rubber adhesive used in conjunction with TPO Primer.
 - VersiGard White Uncured EPDM Flashing is used to flash inside and outside corners, pipes, scuppers and field fabricated pourable sealer pockets when the use of Versico pre-fabricated flashing accessories is not feasible.
- 2. **Quick Applied (QA) Uncured EPDM Flashing (Gray):** A 12" wide by 50' long, 60-mil thick VersiGard Gray **uncured** EPDM Flashing laminated to a 30-mil synthetic rubber adhesive used in conjunction with TPO Primer.
 - VersiGard Gray Uncured EPDM Flashing is used to flash inside and outside corners, pipes, scuppers and field fabricated pourable sealer pockets when the use of Versico pre-fabricated flashing accessories is not feasible.
- 3. White EPDM Peel & Stick Inside/Outside Corners and T-Joint Covers: A 7" x 9" precut 60-mil thick (white) Uncured EPDM Flashing with a 30-mil synthetic rubber adhesive; used for inside and outside corners, to overlay field splice intersections, and to cover field splices at angle changes.
- 4. **VersiGard White Quick Applied Cured Cover Strip:** A 6" and 9" widths and 100' long and 12" wide by 50' long VersiGard White 60-mil cured EPDM membrane laminated to a nominal 30-mil cured Quick-Applied Tape. The Cured Cover Strip is for flashing Versico Seam Fastening Plates.
- 5. **Peel & Stick White EPDM Pipe Seals** with a synthetic rubber adhesive on the deck flange. Pipe Seals are available in one size: 1" to 6".
- 6. **VersiGard 20" Peel & Stick White EPDM Cured Flashing** A 20" wide by 50' long Sure-White cured 60-mil thick EPDM membrane, with Pressure-Sensitive TAPE the full width already applied, used to flash curbs/skylights, etc.
- 7. **VersiGard Peel & Stick White EPDM Curb Wrap** A precut 20" wide by 50' long VersiGard White cured 60-mil thick EPDM membrane with 6" wide Peel & Stick White EPDM Seam Tape along one edge to be used to flash curbs, skylights or parapet walls.
- 8. White EPDM Pourable Sealer Pocket: A pre-fabricated Pourable Sealer Pocket which consists of a 2" wide plastic support strip with a synthetic rubber adhesive backed to the EPDM flashing; available in 6" diameter.
- Peel & Stick White EPDM Seam Tape: A 3" or 6" wide by 100' long splice tape used to bond VersiGard White EPDM
 or VersiWeld TPO membrane to VersiWeld TPO membrane when flashing a curb or a wall with a separate section of
 membrane.

C. VersiGard White EPDM Flashing Installation Criteria

General

- 1. When using VersiGard White Peel & Stick EPDM products on TPO membrane, TPO primer should be used to prepare the TPO membrane surface.
- 2. VersiGard Peel & Stick White EPDM Seam Tape is not to be used for field membrane seaming.
- 3. **Peel & Stick Uncured EPDM Flashing (White)** must be limited to the overlayment of vertical seams (as required at angle changes), or to flash inside/outside corners, vent pipes, scuppers and other unusually shaped penetrations where the use of Pre-molded Pipe Seals is not practical.

Note: Even when working in warmer temperatures, in most cases a heat gun will be required to elevate the temperature of Peel & Stick Uncured EPDM Flashing between 105°F and 110°F (40°C and 43°C) to permit proper forming of the uncured flashing.

4. Inside/Outside Corners and 'T'-Joint Covers

- a. White EPDM Peel & Stick Inside/Outside Corners and 'T'-Joint Covers are installed on both inside and outside corners in conjunction with TPO Primer.
- b. T-Joint Covers are installed at field splice intersections or at horizontal to vertical transitions of field splices in conjunction with TPO Primer.

5. Other Penetrations

- Flash pipes and round supports with Peel & Stick White EPDM Pipe Seals, when feasible, in accordance with the
 applicable detail.
- b. Form Field Fabricated Pipe Seals using Peel & Stick Uncured EPDM Flashing (White) around pipes, round supports and structural steel tubing with corner radius greater than 1/4".
- c. When flashing seamless metal posts, maximum 4" by 4", with a corner radius less than 1/4", apply a field fabricated pipe flashing with a double vertical wrapping.
- d. For pipe clusters or unusually shaped penetrations, a pourable sealer pocket must be utilized.

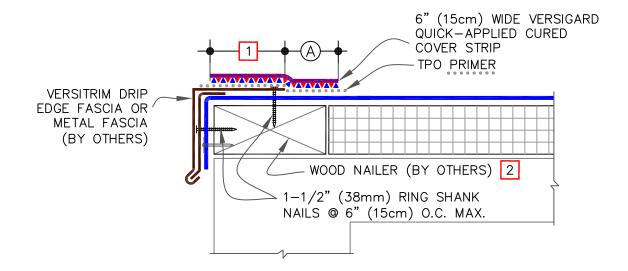
D. Associated Installation Details

Versico Drip Edge Fascia with Sure-White EPDM	TPC-1.1T
Curb/Wall with VersiGard White EPDM and VersiGard White Peel & Stick Seam Tape	TPC-5.1T
Curb with VersiGard White Peel & Stick EPDM Curb Wrap Flashing	TPC-5.2T
Pipe: Pre-Molded Peel & Stick VersiGard White EPDM Pipe Seal	TPC-8.1T
Field-Fabricated Pipe Seal	VGMA-8.2T
Hot Stack: Field Fabricated Flashing with VersiGard Uncured EPDM	TPC-8.4T
Parapet with VersiGard White EPDM and VersiGard White Peel & Stick Seam Tape	TPC-12.1T
VersiGard White Peel & Stick Inside Corner with Continuous TPO Wall Flashing	TPC-15.3T
Outside Corner with Pre-Cut Peel & Stick Flashing (Option 1)	TPC-15.5T
Outside Corner with Peel & Stick EPDM Flashing (Option 2)	TPC-15.7T
Peel & Stick Pourable Sealer Pocket	
Scupper at Deck with Pressure Sensitive Elastoform	TDC 10T

End of Section

CAUTION

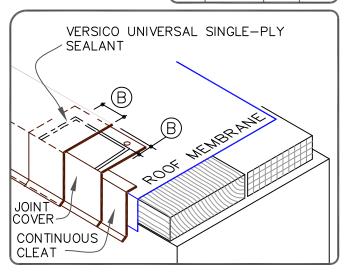
DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS. ACCEPTABLE EDGING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAILS TPC-1.2, 1.3, 1.4, 1.5 OR 1.6.



NOTES:

- METAL FASCIA DECK FLANGE MUST BE TOTALLY COVERED BY TPO QUICK-APPLIED COVER STRIP WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS.
- 2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
- 3. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
- 4. APPLY TPO PRIMER TO METAL FLANGE AND MEMBRANE SURFACE PRIOR TO INSTALLING TPO QUICK-APPLIED COVER STRIP.
- 5. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.
- 6. T-JOINT COVERS ARE REQUIRED AT INTERSECTIONS WITH 60 MIL OR 80 MIL MEMBRANE.
- 7. THIS DETAIL IS NOT RECOMMENDED FOR ROOFS THAT ARE LIKELY TO EXPERIENCE SIGNIFICANT SNOW AND ICE UP-SLOPE FROM THE GUTTER/EDGE. REFER TO DETAILS TPC-1.2 OR TPC-1.3.

DIME	NSIONS	cm	
A	2"	5	MIN.
B	1/2"	1.5	ТО
	1"	2.5	





VERSITRIM DRIP EDGE FASCIA



THERMOPLASTIC ROOFING SYSTEM

TPC-1.1T

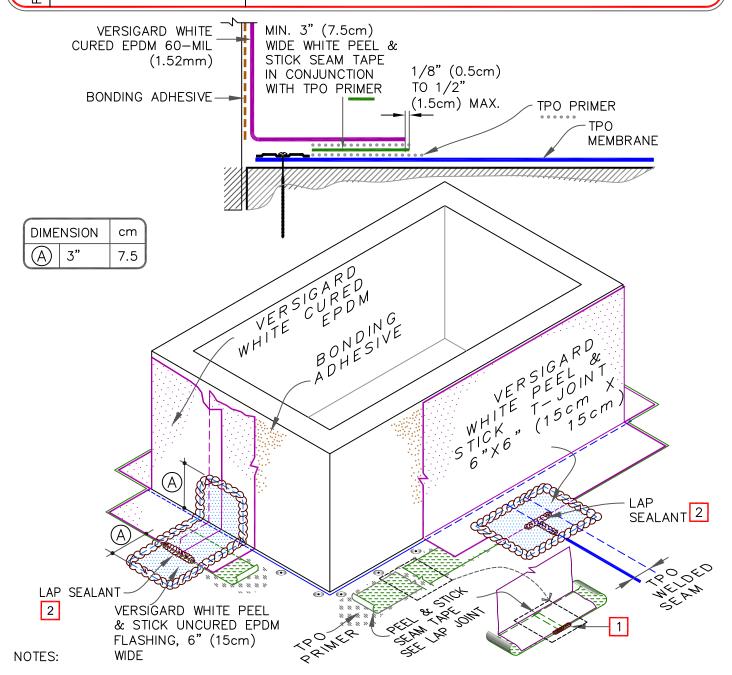
20 YEAR WARRANTY

USE MIN 3" (7.5cm) WIDE PEEL & STICK TAPE OR

MIN 6" (15cm) WIDE FIELD-APPLIED VERSIGARD WHITE PEEL & STICK SEAM TAPE

25 OR 30 YEAR WARRANTY

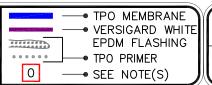
REFER TO VERSICO TYPICAL TPO DETAIL TPC-2.



- 1. FIELD APPLIED VERSIGARD WHITE PEEL & STICK SEAM TAPE IS TO BE OVERLAPPED A MINIMUM OF 1" (2.5cm) AT THE ENDS OF EACH CUT PIECE. APPLY LAP SEALANT AT TAPE OVERLAPS 2" (5cm) IN BOTH DIRECTIONS.
- 2. APPLY VERSICO WHITE LAP SEALANT ALONG THE LEADING EDGE OF THE MEMBRANE SPLICE UNDER THE T-JOINT COVER, COVERING THE EXPOSED SPLICE TAPE 1/2" (1.5cm) IN ALL DIRECTIONS FROM THE SPLICE INTERSECTION.
- 3. INSTALL OUTSIDE CORNERS PER DETAIL VGC-15.7 OR VGC-15.5.



CURB/WALL WITH
VERSIGARD WHITE EPDM &
VERSIGARD WHITE PEEL &
STICK SEAM TAPE



THERMOPLASTIC ROOFING SYSTEM

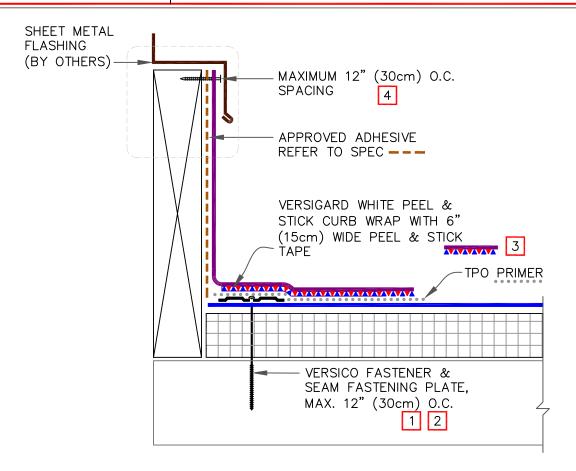
TPC-5.1T

20 YEAR WARRANTY SEE DETAIL BELOW

25 OR 30 YEAR WARRANTY

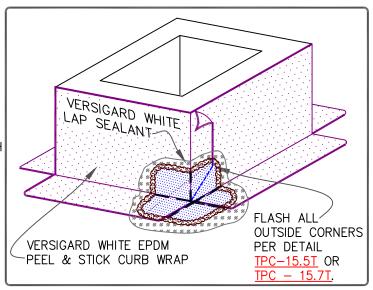
REFER TO VERSICO TYPICAL APPLICABLE TPO DETAIL(S)

TPC-5.1, TPC-5.2 & TPC-5.3 FOR REQUIRED CURB DETAIL



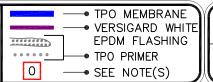
NOTES:

- ON MECHANICALLY FASTENED ROOFING SYSTEMS, HPVX FASTENERS AND HPVX SEAM PLATES ARE REQUIRED OVER STEEL DECKS.
- 2. SEAM FASTENING PLATES/FASTENERS MAY BE INSTALLED INTO THE VERTICAL SUBSTRATE.
- 3. IF THE VERTICAL SPLICE ON THE CURB FLASHING IS NOT LOCATED AT THE CORNER, A 6" (15cm) WIDE PEEL & STICK UNCURED EPDM OR A T-JOINT FLASHING, IN CONJUNCTION WITH TPO PRIMER MUST BE CENTERED OVER FIELD SPLICE AT ANGLE CHANGE.
- 4. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS. APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR APPLY SEALANT ON THE FASTENERS' HEADS.





CURB WITH VERSIGARD
WHITE PEEL & STICK EPDM
CURB WRAP FLASHING



THERMOPLASTIC ROOFING SYSTEM

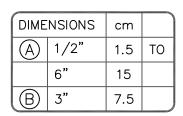
TPC-5.2T

20 YEAR WARRANTY

SEE DETAIL BELOW

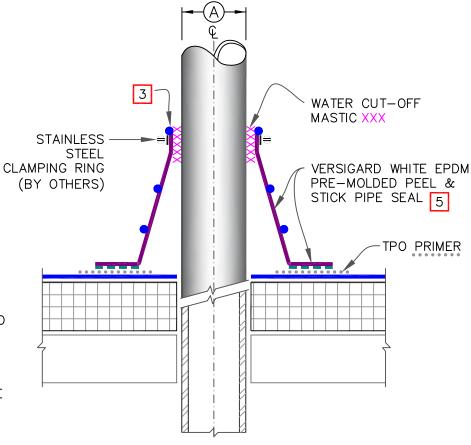
25 OR 30 YEAR WARRANTY

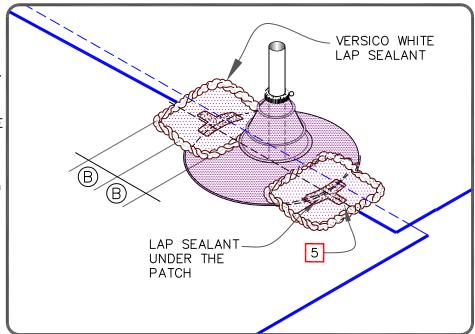
REFER TO VERSICO TYPICAL TPO DETAIL TPC-8.1.
NO FIELD-FABRICATION ALLOWED FOR 25/30 YEAR ROOF.



NOTES:

- REMOVE ALL LEAD AND OTHER FLASHING BEFORE INSTALLING PEEL & STICK PIPE SEAL.
- 2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 180°F (82°C).
- 3. PRE-MOLDED PIPE FLASHING MUST HAVE INTACT RIB AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
- DECK FLANGES OF THE PEEL & STICK PIPE SEAL SHALL NOT BE OVERLAPPED, CUT OR APPLIED OVER ANY ANGLE CHANGE.
- 5. WHEN A FIELD SPLICE
 INTERSECTS A PIPE SEAL, APPLY
 VERSICO WHITE LAP SEALANT
 ALONG THE EDGE OF THE
 MEMBRANE SPLICE COVERING THE
 EXPOSED SEAM TAPE 1/2"
 (1.5cm) IN EACH DIRECTION
 FROM THE SPLICE INTERSECTION
 & OVERLAY WITH A 7"X9" (18cm
 X 23cm) T-JOINT COVER.
- 6. ON MECHANICALLY—FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED. REFER TO TPO DETAIL TPC—8.1

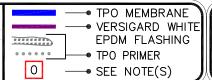






PIPE:

PRE-MOLDED PEEL & STICK VERSIGARD WHITE EPDM PIPE SEAL



THERMOPLASTIC ROOFING SYSTEM

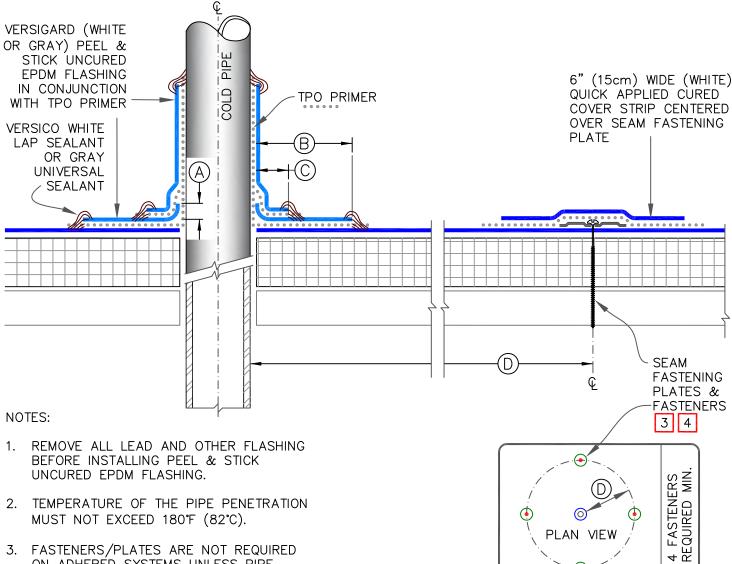
TPC-8.1T

20 YEAR WARRANTY

SEE DETAIL BELOW

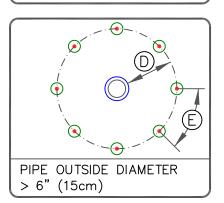
25 OR 30 YEAR WARRANTY

USE ONLY TPO PREFABRICATED ACCESSORIES



- UNCURED EPDM FLASHING.
- TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 180°F (82°C).
- 3. FASTENERS/PLATES ARE NOT REQUIRED ON ADHERÉD SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (50cm).
- ON MECHANICALLY FASTENED SYSTEMS, HPVX FASTENERS AND HPVX PLATES OR HPV-XL FASTENERS AND HPV-XL PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
- 5. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PEEL & STICK UNCURED EPDM FLASHING.
- 6. APPLY TPO PRIMER PRIOR TO APPLYING UNIVERSAL SEALANT.

-			
DIME	NSIONS	cm	
A	1/2"	1.5	
B	3"	7.5	
0	1"	2.5	
0	6"	15	TO
	12"	30	
E	12"	30	MAX.
-24			



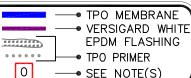
PLAN VIEW

PIPE OUTSIDE DIAMETER

< 6" (15cm)



FIELD FABRICATED PIPE **SEAL**



THERMOPLASTIC ROOFING SYSTEM

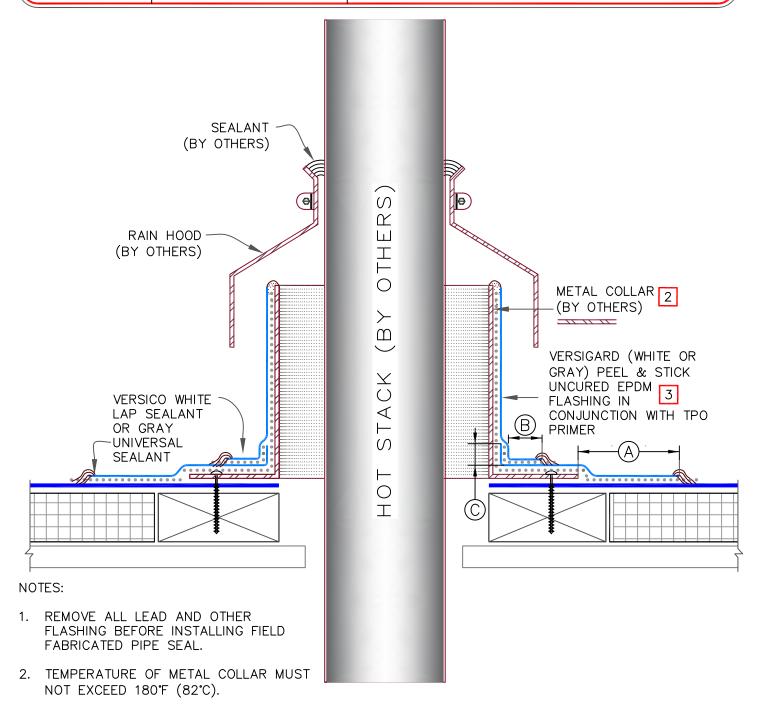
VGMA-8.2

20 YEAR WARRANTY

SEE DETAIL BELOW

25 OR 30 YEAR WARRANTY

REFER TO VERSICO TPO DETAIL TPC.8.6



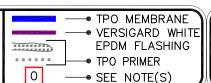
3.	TPO PRIMER MUST BE APPLIED TO THE
	MATING SURFACES PRIOR TO APPLYING
	WHITE PEEL & STICK UNCURED EPDM
	FLASHING.

4. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PEEL & STICK UNCURED EPDM FLASHING.

DIME	NSIONS	cm	
A	3"	7.5	MIN.
B	1"	2.5	MIN.
	1/2"	1.5	MIN.



HOT STACK:
FIELD FABRICATED
FLASHING WITH VERSIGARD
UNCURED EPDM



THERMOPLASTIC ROOFING SYSTEM

TPC-8.41

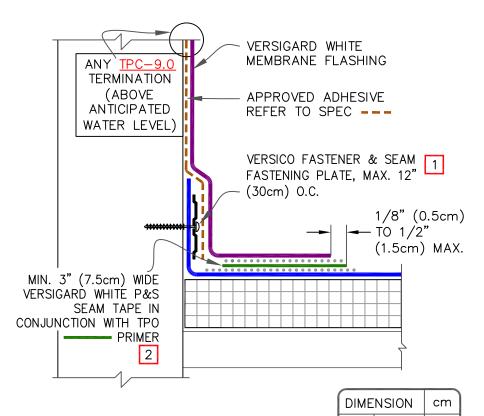
DETAIL NOT FOR USE ON 25-30 YEAR WARRANTY ROOFS. SEE DETAIL $\underline{\mathsf{TPC-12.1}}$ FOR $\mathsf{TPO/PVC}$.

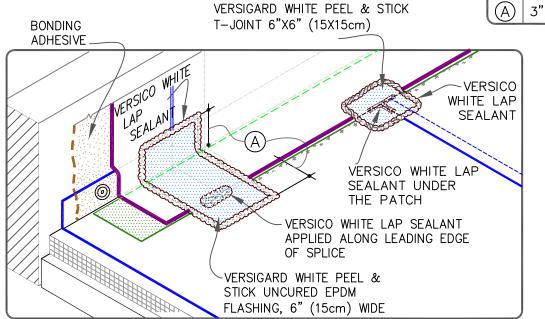
FASTENERS AND PLATES ARE REQUIRED AT 6" (15cm) O.C. FOR ADHERED SYSTEMS WITH WARRANTY WIND SPEED COVERAGE GREATER THAN 90 MPH AND FOR ALL PROJECTS WITH WARRANTIES GREATER THAN 20 YEARS.

SEE NOTE # 2.

NOTES:

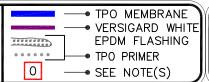
- 1. SEAM FASTENING
 PLATE/FASTENER MAY BE
 INSTALLED INTO THE
 STRUCTURAL DECK.
- FOR PROJECTS WITH 20-YEAR WARRANTY, USE 6" (15cm) WIDE VERSIGARD WHITE P&S SEAM TAPE IN CONJUNCTION WITH TPO PRIMER.







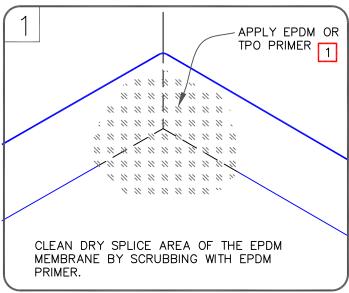
PARAPET/CURB WITH
VERSIGARD WHITE EPDM &
VERSIGARD WHITE PEEL &
STICK SEAM TAPE

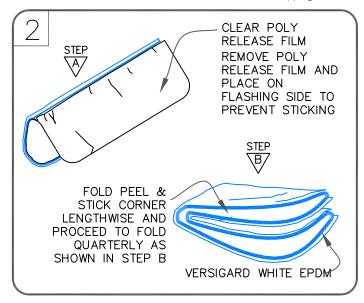


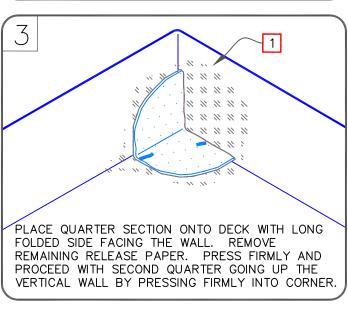
THERMOPLASTIC ROOFING SYSTEM

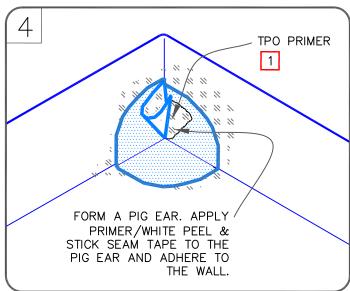
7.5

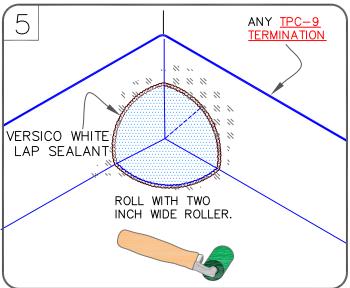
PC-12.1









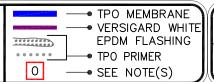


1. TPO PRIMER MUST BE APPLIED TO ALL SPLICE AREAS AND FOR EACH LAYER OF PEEL & STICK FLASHING.

WARRANTY REQUIREMENTS DETAIL NOT FOR USE ON 25-30 YEAR WARRANTY ROOFS.

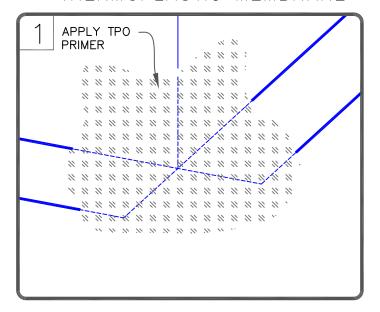


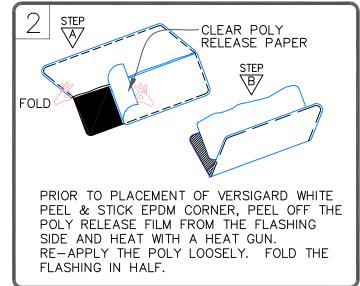
VERSIGARD WHITE PEEL & STICK INSIDE CORNER WITH CONTINUOUS TPO WALL FLASHING

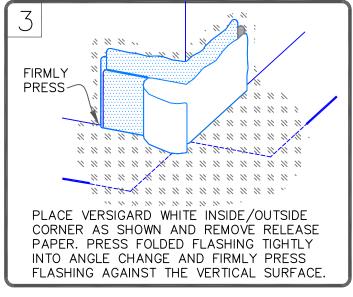


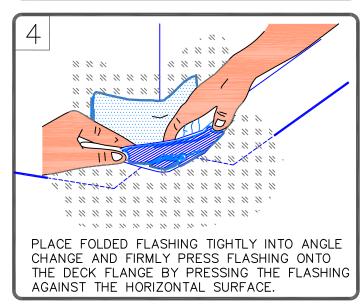
THERMOPLASTIC ROOFING SYSTEM

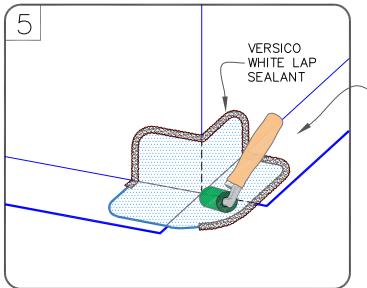
TPC-15.37











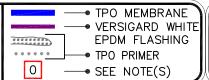
AFTER ADHERING, ROLL WITH A TWO INCH WIDE ROLLER. PAY PARTICULAR ATTENTION TO THE STEP OFFS AND ANGLE CHANGES.

IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PEEL & STICK UNCURED EPDM FLASHING.

WARRANTY REQUIREMENTS DETAIL NOT FOR USE ON 25-30 YEAR WARRANTY ROOFS.

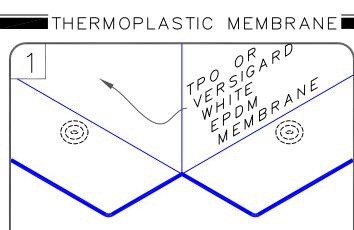


OUTSIDE CORNER WITH PRE-CUT PEEL & STICK FLASHING (OPTION 1)

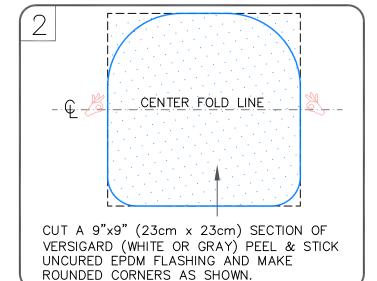


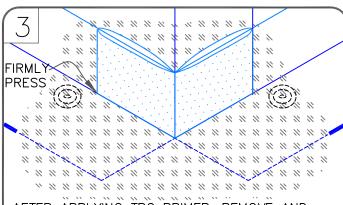
THERMOPLASTIC ROOFING SYSTEM

TPC-15.5T

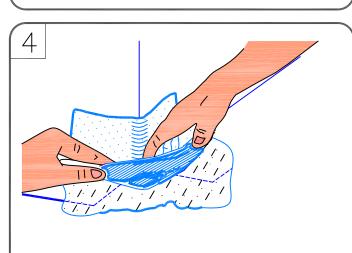


FASTEN MEMBRANE AND FLASH CURB OR WALL WITH MEMBRANE FOLLOWING STANDARD PROCEDURES USING BONDING ADHESIVE AND VERSIGARD WHITE PEEL & STICK SEAM TAPE OR HOT AIR WELDING.

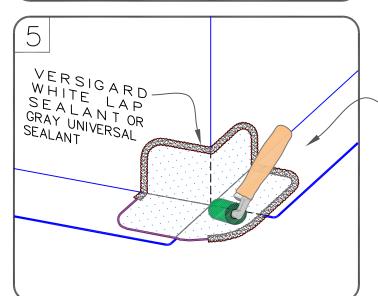




AFTER APPLYING TPO PRIMER, REMOVE AND REPLACE POLY BACKING. ON FLASHING SIDE. FOLD 9"x9" (23cm x 23cm) FLASHING IN HALF WITH ROUNDED PORTION TURNED UP. CENTER FLASHING ON CORNER AND FIRMLY PRESS AGAINST VERTICAL SURFACE.



ROLL AND CREASE FLASHING TIGHTLY INTO ANGLE CHANGE AND FIRMLY ROLL FLASHING ONTO THE DECK MEMBRANE.



AFTER ADHERING, ROLL WITH A TWO INCH WIDE ROLLER. PAY PARTICULAR ATTENTION TO THE STEP OFFS AND ANGLE CHANGES.

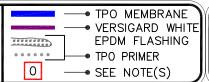
IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PEEL & STICK UNCURED EPDM FLASHING.

APPLY TPO PRIMER PRIOR TO APPLYING UNIVERSAL SEALANT.

WARRANTY REQUIREMENTS DETAIL NOT FOR USE ON 25-30 YEAR WARRANTY ROOFS.



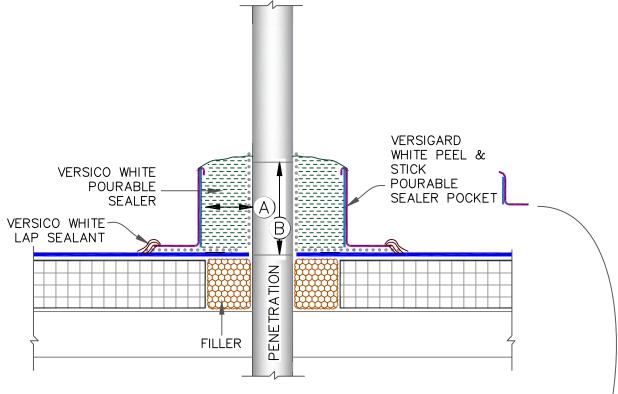
OUTSIDE CORNER WITH PEEL & STICK EPDM FLASHING (OPTION 2)



THERMOPLASTIC ROOFING SYSTEM

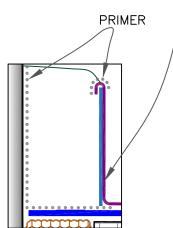
TPC-15.7

DETAIL NOT FOR USE ON 25-30 YEAR WARRANTY ROOFS. SEE THERMOPLASTIC DETAIL TPC 16.1.



NOTES:

- 1. THE MAXIMUM ALLOWABLE SURFACE TEMPERATURE OF THE PENETRATION SHALL NOT EXCEED 180°F (82°C).
- 2. ALL DEBRIS (PAINT, RUST, LEAD, OTHER FLASHINGS, ETC.) MUST BE REMOVED FROM THE PENETRATION.
- 3. PENETRATIONS, MEMBRANE, FLASHING AND METAL (INSIDE POCKET) MUST BE PRIMED WITH TPO PRIMER PRIOR TO APPLYING POURABLE SEALER. DO NOT PRIME THE BLUE PLASTIC SUPPORT STRIP.
- 4. POURABLE SEALER MUST COMPLETELY FILL POURABLE SEALER POCKET TO PREVENT PONDING OF WATER.
- 5. POURABLE SEALER MUST CONTACT PRIMED PEEL & STICK UNCURED EPDM FLASHING AND DECK MEMBRANE.
- 6. SECUREMENT IS REQUIRED FOR POURABLE SEALER POCKETS WHICH ARE GREATER THAN 18" (46cm) IN DIAMETER. REFER TO SPECIFICATIONS.
- 7. ON MECHANICALLY-FASTENED ROOFING SYSTEMS, ADDITIONAL MEMBRANE SECUREMENT IS REQUIRED (SIMILAR TO DETAIL TPC-8.1) REGARDLESS OF SIZE OR DIAMETER.
- 8. PIPE CLUSTERS MUST HAVE MINIMUM 1" (2.5cm) CLEARANCE BETWEEN PENETRATIONS.

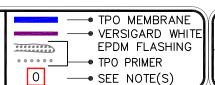


MANDATORY TPO PRIMER AT ALL INTERFACES OF POURABLE SEALER EXCEPT BLUE PLASTIC SUPPORT STRIP •••••

DIME	NSIONS	cm	
A	1"	2.5	MIN.
lacksquare	2"	5	MIN.

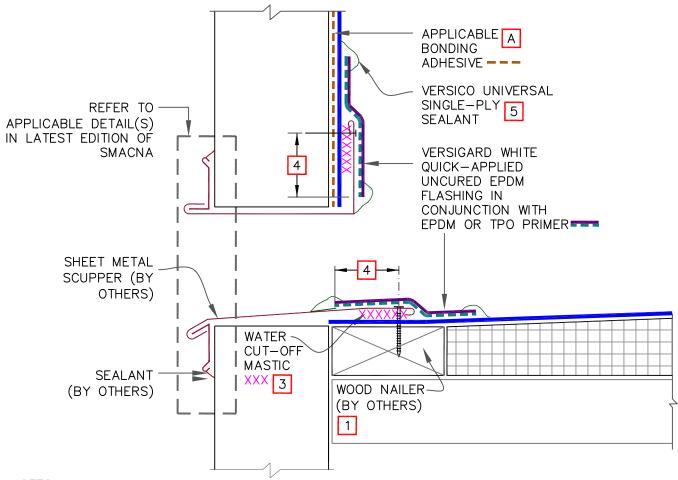


PEEL & STICK POURABLE SEALER POCKET

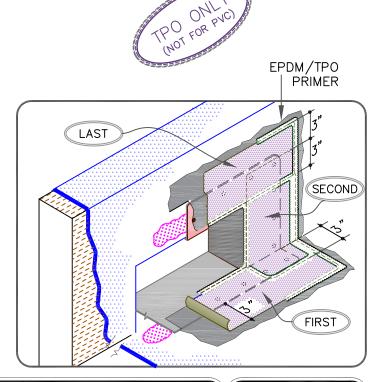


THERMOPLASTIC ROOFING SYSTEM

PC-16.27

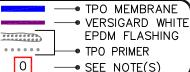


- 1. WOOD NAILERS ARE INSTALLED AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
- 2. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
- 3. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGES MUST BE UNDER CONSTANT COMPRESSION.
- 4. SCUPPER FLANGES MUST BE TOTALLY COVERED BY PRESSURE-SENSITIVE ELASTOFORM FLASHING WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEAD.
- 5. 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 WITH PRESSURE SENSITIVE ELASTOFORM



THERMOPLASTIC ROOFING SYSTEM

TPC-18T



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

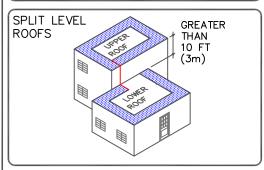
Installation Details Table of Contents

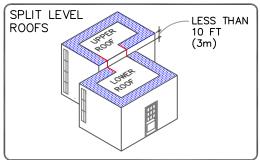
January 2023

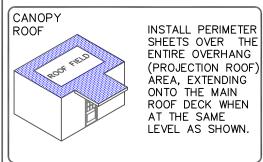
TPO Membrane Securement with Pressure-Sensitive RUSS	Mechanically Attached Membrane Securement	Detail
Mechanically Attached Membrane Splice. TPMA-2.1 Fastener and Palze Placement. TPMA-2.2 Ridge Membrane Attachment. TPMA-2.2 Resisting Place Fascia. TPC-1.1 Resisting Place Fascia. TPC-1.2 Retail Ridge Fascia. TPC-1.2 Retail Ridge Fascia. TPC-1.2 Retail Ridge Fascia. TPC-1.2 Retail Ridge Fascia. TPC-1.3 Resisting 200 TPC-1.4 Resisting 200 TPC-1.4 Rembrane Splice. TPC-1.5 Rembrane Splice. TPC-1.7 Rembrane Splice. TPC-2.0 Rembrane Splice. TPC-2.0 Rembrane Splice. TPC-2.1 Rembrane Splice. TPC-2.1 Rembrane Splice. TPC-2.1 Rembrane Splice. TPC-3.1 Reck-to-Deck Expansion Detail. TPC-3.1 Reck-to-Deck Expansion Detail. TPC-3.2 Retail Ridge Splice. TPC-3.1 Reck-to-Deck Expansion Detail. TPC-3.2 Reck-to-Deck Expansion Detail. TPC-3.2 Reck-to-Deck Expansion Detail. TPC-5.2 Reck-to-Wall Expansion Detail. TPC-5.2 Reck-to-Wall Expansion Detail. TPC-5.2 Reck-to-Wall Expansion Detail. TPC-5.2 Reck-to-Deck Expansion Detail. TPC-5.3 Reck-to-Deck Expansion Detail. TPC-5.2 Reck-to-Wall Expansion Detail. TPC-6.2 Reck-to-Wall Expansion Detail. TPC-6.2 Reck-to-Wall Expansion Detail. TPC-6.3 Reck-to-Wall Expansion Detail. TPC-6.3 Reck-to-Wall Expansion Detail. TPC-6.3 Reck-to-Wall Expansion Detail.		
Fastener and Plate Placement. TPMA-2.2	Mechanically Attached Membrane Splice.	TPMA-2.1
Metal Edges and Gravel Stops		
VersTirm Drip Edge Fascia TPC-1.1 VersTirm Heat Weldable Drip Edge Fascia TPC-1.2 Metal Bar Edge Termination TPC-1.3 VersTirm 200 TPC-1.5 VersTirm 200.8. 3000. TPC-1.5 VersTirm 200.8. 3000. TPC-1.6 VersTirm 200.8. 3000. TPC-1.7 Membrane Splices TPC-1.7 Membrane Splices TPC-2.0 Membrane Splice TPC-2.1 Expansion Joints TPC-2.1 Deck-to-Deck Expansion Detail. TPC-3.1 Deck-to-Deck Expansion Detail. TPC-3.2 Curb Flashing TPC-3.2 Curb Flashing With TPO Or PVC Membrane TPC-3.2 Curb Flashing With TPO Or PVC Membrane TPC-5.1 Coated Flashing With TPO Or PVC Metal Curb Flashing TPC-5.1 Curb Flashing With CPA TPO or PVC Curb Wrap Corners TPC-5.1 Portal Spling With CPA TPO or PVC Curb Wrap Corners TPC-6.3 Portal Drain (Drain Sump Up to 3 inches to 1 Horizontal Foot) Option 1 TPC-6.3 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2. Page 1 of 2. TPC-6.1 Roof Drain (Drain Sump Greater t		
VersiTrim Heat Weldable Drip Edge Fascia TPC-1.2 Metal Bar Edge Termination TPC-1.3 VersiTrim 200 TPC-1.5 VersiTrim 200. TPC-1.5 VersiTrim 200. TPC-1.5 VersiTrim 200. TPC-1.5 VersiTrim 200.0 & 3000. TPC-1.7 Membrane Splices TPC-1.7 Membrane Splices TPC-1.7 Membrane Splice TPC-2.0 TPO QA Membrane Splice TPC-2.1 Expansion Joints TPC-3.1 Deck-to-Deck Expansion Detail TPC-3.1 Deck-to-Wall Expansion Detail TPC-3.1 Curb Flashing TPC-5.2 Curb Flashing With TPO Or PVC Membrane TPC-5.2 Curb Flashing With TPO Or PVC Membrane TPC-5.2 Curb Flashing With TPO Or PVC Metal Curb Flashing TPC-5.2 Curb Flashing With TPO Or PVC Metal Curb Flashing TPC-5.2 Curb Flashing With TPO Or PVC Curb Wrap Corners TPC-5.3 Self-Flashing Curb TPC-5.2 Curb Flashing With CFA TPO or PVC Curb Wrap Corners TPC-5.2 Curb Flashing Urb to 3 inches to 1 Horizontal Foot) Option 1		
Metal Bar Edge Termination. TPC-1.3 VersiTrim 200. TPC-1.4 VersiTrim 300. TPC-1.5 VersiTrim 200. TPC-1.6 VersiTrim 200. TPC-1.6 VersiTrim 200. TPC-1.7 Membrane Splices TPC-1.7 Membrane Splices TPC-2.1 Membrane Splice TPC-2.0 TPC QAD Membrane Splice TPC-2.1 Expansion Joints TPC-3.1 Deck-to-Deck Expansion Detail. TPC-3.2 Curb Flashing TPC-3.2 Curb Flashing With TPO Or PVC Membrane TPC-3.2 Curb Flashing With TPO Or PVC Metal Curb Flashing TPC-5.1 Coated Flashing With TPO Or PVC Warp Corners TPC-5.3 Self-Flashing Curb TPC-5.3 Self-Flashing Curb TPC-5.4 Drains TPC-5.4 Port Drain (Drain Sump Up to 3 inches to 1 Horizontal Foot) TPC-6.1 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 1 TPC-6.1 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. TPC-6.38 Acd- Drain TPC-8.1<		
VersiTrim 200. TPC-1.4 VersiTrim 300. TPC-1.5 VersiTrim 2000 & 3000. TPC-1.6 Pressure-Sensitive PVC/KEE HP Cover Strip. TPC-1.7 Membrane Splices TPC-2.0 Membrane Splice TPC-2.0 TPO QA Membrane Splice TPC-2.1 Expansion Joints TPC-3.1 Deck-to-Wall Expansion Detail. TPC-3.2 Curb Flashing TPC-3.2 Curb Flashing With TPO Or PVC Membrane TPC-5.1 Coated Flashing With TPO or PVC Metal Curb Flashing TPC-5.1 Coated Flashing With CFA TPO or PVC Gurb Wrap Corners TPC-5.1 Self-Flashing Curb TPC-5.4 Drains TPC-5.4 Drains TPC-5.3 Self-Flashing Curb TPC-6.3 Drains Curb TPC-6.3 Self-Flashing Curb TPC-6.1 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 1 TPC-6.1 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2 TPC-6.2 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2 TPC-6.3 <t< td=""><td></td><td></td></t<>		
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Curb Flashing With TPO or PVC Membrane		
Coated Flashing With TPO Or PVC Metal Curb Flashing TPC-5.2 Curb Flashing With CFA TPO or PVC Curb Wrap Corners TPC-5.3 Self-Flashing Curb TPC-5.4 Drains Roof Drain (Drain Sump Up to 3 inches to 1 Horizontal Foot) TPC-6.1 Roof Drain (Drain Sump Up to 3 inches to 1 Horizontal Foot) Option 1 TPC-6.2 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2 TPC-6.3A Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2 TPC-6.3A Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2 TPC-6.3B Add-On Drain TPC-6.4 Pipe Flashing Pre-Molded Flashing TPC-8.1 Field Fabricated Pipe Flashing TPC-8.2 Certified Pre-Fabricated Square Tube Wrap TPC-8.3 Field-Fabricated Square Tube Flashing TPC-8.4 Certified Pre-Fabricated Split Pipe Seal TPC-8.5 Certified Pre-Fabricated Split Pipe Seal TPC-8.5 Certified Hot Pipe Flashing TPC-8.6 Terminations Membrane Terminations, Page 1 of 2 TPC-9.0A Membrane Terminations, Page 2 of 2 TPC-9.0B Parapet Flashing Pastened Into Deck TPC-12.1 Parapet Flashing Fastened Into Wall TPC-12.1A Parapet Flashing With Pressure-Sensitive RUSS, Page 2 of 2 TPC-12.2B Coated Metal Wall Flashing TPC-12.3	Curb Flashing	
Curb Flashing With CFA TPO or PVC Curb Wrap Corners TPC-5.3 Self-Flashing Curb TPC-5.4 Drains Roof Drain (Drain Sump Up to 3 inches to 1 Horizontal Foot) TPC-6.1 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 1 TPC-6.2 Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. TPC-6.3A Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-6.3B Add-On Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-6.3B Add-On Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-6.3B Add-On Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-6.3B Add-On Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-6.3B Add-On Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-8.3 Field Fabricated Pipe Flashing TPC-8.1 Field Fabricated Pipe Flashing TPC-8.1 Field Fabricated Square Tube Wrap TPC-8.3 Field-Fabricated Square Tube Flashing TPC-8.5 Certified Pre-Fabricated Square Tube Flashing TPC-8.5 Certified Hot Pipe Flashing TPC-8.5 Certified Hot Pipe Flashing TPC-8.5 TPC-8.6 TPC-9.0A Membrane Terminations, Page 1 of 2 TPC-9.0B Parapet Flashing Fastened Into Deck TPC-9.0B Parapet Flashing Fastened Into Wall TPC-12.1 Parapet Flashing Fastened Into Wall TPC-12.1 Parapet Flashing with Pressure-Sensitive RUSS, Page 1 of 2 TPC-12.2B Coated Metal Wall Flashing TPC-12.2B	Curb Flashing With TPO Or PVC Membrane	TPC-5.1
Self-Flashing Curb		
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Roof Drain (Drain Sump Up to 3 inches to 1 Horizontal Foot). Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 1. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of	Self-Flashing Curb	TPC-5.4
Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 1		TD0 0.4
Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 1 of 2. TPC-6.3A Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2. TPC-6.3B Add-On Drain TPC-6.4 Pipe Flashing Pre-Molded Flashing TPC-8.1 Field Fabricated Pipe Flashing TPC-8.2 Certified Pre-Fabricated Square Tube Wrap TPC-8.3 Field-Fabricated Square Tube Flashing TPC-8.4 Certified Pre-Fabricated Split Pipe Seal TPC-8.5 Certified Hot Pipe Flashing TPC-8.6 Terminations Membrane Terminations, Page 1 of 2 TPC-9.0A Membrane Terminations, Page 2 of 2 TPC-9.0B Parapet Flashing Fastened Into Deck TPC-12.1 Parapet Flashing Fastened Into Wall Parapet Flashing with Pressure-Sensitive RUSS, Page 1 of 2 TPC-12.2B Coated Metal Wall Flashing TPC-12.3	Roof Drain (Drain Sump Up to 3 Inches to 1 Horizontal Foot)	IPC-6.1
Roof Drain (Drain Sump Greater than 3 inches to 1 Horizontal Foot) Option 2, Page 2 of 2		
Add-On Drain		
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Field-Fabricated Square Tube Flashing		
Certified Pre-Fabricated Split Pipe Seal TPC-8.5 Certified Hot Pipe Flashing TPC-8.6 Terminations Membrane Terminations, Page 1 of 2 TPC-9.0A Membrane Terminations, Page 2 of 2 TPC-9.0B Parapet Flashing Parapet Flashing — Fastened Into Deck TPC-12.1 Parapet Flashing — Fastened Into Wall TPC-12.1A Parapet Flashing with Pressure-Sensitive RUSS, Page 1 of 2 TPC-12.2A Parapet Flashing with Pressure-Sensitive RUSS, Page 2 of 2 TPC-12.2B Coated Metal Wall Flashing TPC-12.3		
Terminations Membrane Terminations, Page 1 of 2		
Membrane Terminations, Page 1 of 2 TPC-9.0A Membrane Terminations, Page 2 of 2 TPC-9.0B Parapet Flashing Parapet Flashing – Fastened Into Deck TPC-12.1 Parapet Flashing – Fastened Into Wall TPC-12.1A Parapet Flashing with Pressure-Sensitive RUSS, Page 1 of 2 TPC-12.2A Parapet Flashing with Pressure-Sensitive RUSS, Page 2 of 2 TPC-12.2B Coated Metal Wall Flashing TPC-12.3	Certified Hot Pipe Flashing.	TPC-8.6
Membrane Terminations, Page 2 of 2		
Parapet Flashing Parapet Flashing – Fastened Into Deck		
Parapet Flashing – Fastened Into Deck TPC-12.1 Parapet Flashing – Fastened Into Wall TPC-12.1A Parapet Flashing with Pressure-Sensitive RUSS, Page 1 of 2 TPC-12.2A Parapet Flashing with Pressure-Sensitive RUSS, Page 2 of 2 TPC-12.2B Coated Metal Wall Flashing TPC-12.3	Membrane Terminations, Page 2 of 2	TPC-9.0B
Parapet Flashing – Fastened Into Wall		
Parapet Flashing with Pressure-Sensitive RUSS, Page 1 of 2		
Parapet Flashing with Pressure-Sensitive RUSS, Page 2 of 2		
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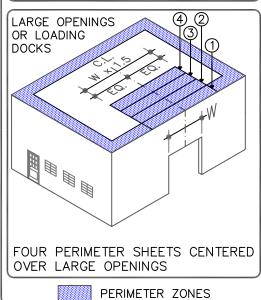
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VersiWeld QA TPO Parapet Flashing with TPO PS RUSS	TPC-12.7
VersiWeld QA TPO Parapet Flashing with VersiWeld PS RUSS	TPC-12.8
Tie-Ins	
TPO Tie-In To Built-Up Roofing Over Steel Roof Deck	
TPO Tie-In To Built-Up Roofing Over Concrete Roof Deck	
TPO/PVC Tie-In To Existing Single-Ply	
TPO Tie-In to Existing EPDM Membrane	
EPDM Tie-In on Concrete Deck	
TPO/PVC Tie-In to Shingled Roof	
PVC/KEE HP Tie-In to Existing Single-Ply Roof Membranes on Concrete Deck	
PVC/KEE HP Tie-In to Existing Single-Ply Roof Membranes on Metal Deck	1PC-13.8
Inside / Outside Corners Pre-Molded Inside Corner Flashing	TDC 15 1
Field Fabricated Inside Corner Flashing	
Inside Corner with Coated Metal Wall Flashing.	
Pre-Molded Outside Corner Flashing	
Field Fabricated Outside Corner Flashing.	
Outside Corner with Coated Metal Wall Flashing	
PVC or TPO Universal Corners – Combination Inside & Outside Corners	
Sealant Pocket Molded Sealant Pocket	TPC-16.1
Through-Wall Scupper	
Scupper with Coated Metal	TPC-18.1
Scupper at Deck – TPO	
Scupper at Deck with PVC/KEE HP Flashing	
Scupper with VersiFlex PVC Pressure Sensitive Cover Strip Flashing	
Lightning Rods	
Lightning Rod at Parapet (Vertical Attachment)	
Lightning Rod at Deck Level	TPC-20.2
Sleeper	TD0 04.0
Sleeper Detail	1PC-24.0

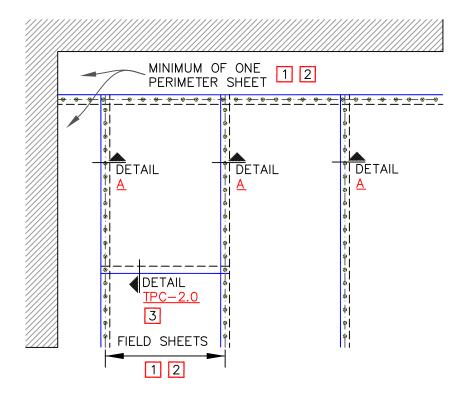
GUIDELINES FOR ROOF PERIMETER ZONES FOR MECHANICALLY ATTACHED ROOF SYSTEM

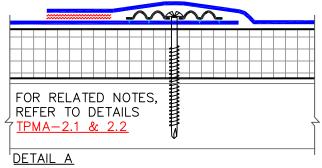










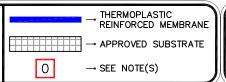


NOTES:

- WHEN USING 10' (3m) OR 12' (3.7m) WIDE TPO FIELD SHEETS, 6' (1.8m) WIDE PERIMETER SHEETS ARE UTILIZED. WHEN USING 8' (2.4m) WIDE TPO FIELD SHEETS, 4' (1.2m) WIDE PERIMETER SHEETS ARE USED. WHEN USING 10' (3m) WIDE PVC FIELD SHEETS, 5' (1.5m) WIDE PERIMETER SHEETS ARE UTILIZED. WHEN USING 81" (2.1m) WIDE PVC FIELD SHEETS, 40.5" (1m) WIDE PERIMETER SHEETS ARE USED.
- REFER TO VERSICO SPECIFICATIONS FOR REQUIRED NUMBER OF PERIMETER SHEETS, SHEET WIDTH AND MEMBRANE FASTENING DENSITY.
- END LAPS DO NOT REQUIRE MECHANICAL FASTENING AND SHALL BE OVERLAPPED 2" (5cm) MINIMUM. REFER TO THERMOPLASTIC DETAIL TPC-2.0.

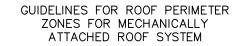


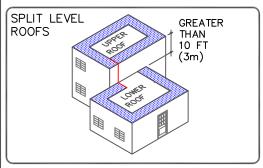
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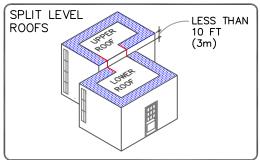


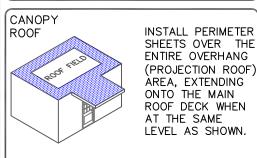
THERMOPLASTIC ROOFING SYSTEM

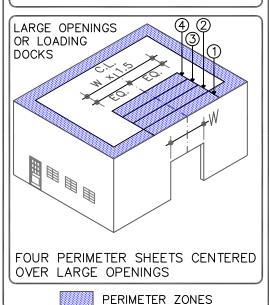
PMA-2.0A

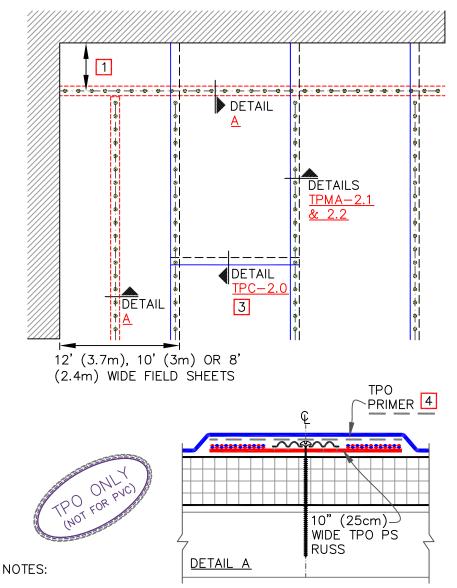












- 1. QUICK-APPLIED RTS SHALL BE POSITIONED 5' (1.5m) TO 6' (1.8m) FROM THE PERIMETER EDGE WHEN USING 10' (3.5m) OR 12' (3.7m) WIDE TPO FIELD SHEETS. WHEN USING 8' (2.4m) WIDE TPO FIELD SHEETS, QUICK-APPLIED RTS SHALL BE POSITIONED 4' (1.2m) FROM THE PERIMETER EDGE.
- 2. REFER TO VERSICO SPECIFICATIONS 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" (5cm) 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 PS RUSS.

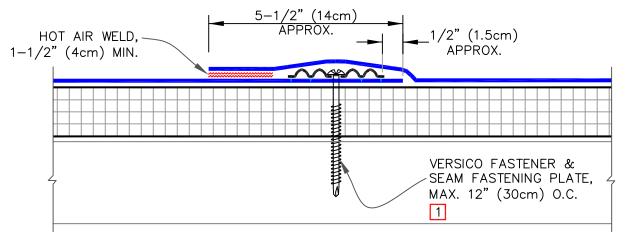


TPO MEMBRANE SECUREMENT WITH PS RUSS



THERMOPLASTIC ROOFING SYSTEM

TPMA-2.0B

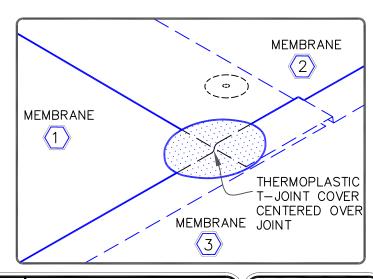


T-JOINT REQUIREMENTS

MEMBRANE	THICKNESS		
MEMBRANE	45/50	60	80
PVC	N/A	N/A	YES
KEE HP	N/A	N/A	YES
TPO	N/A	YES	YES

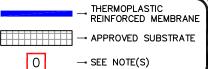
NOTES:

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



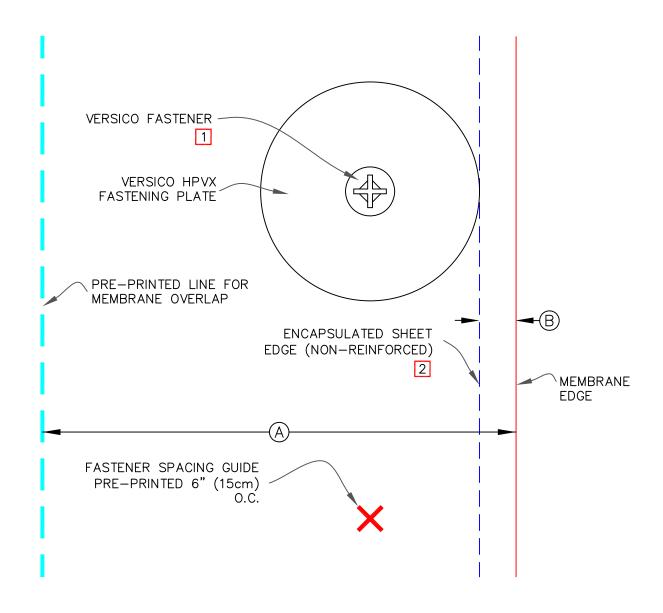


MECHANICALLY ATTACHED MEMBRANE SPLICE



THERMOPLASTIC ROOFING SYSTEM

TPMA-2.1

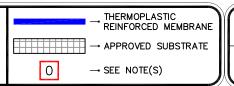


DIME	NSIONS	cm	
A	5-1/2"	14	APPROX.
B	1/2"	1.5	APPROX.

- 1. 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.
- 2. POSITION SEAM FASTENING PLATES BEYOND NON-REINFORCED ENCAPSULATED EDGE.



FASTENER AND PLATE PLACEMENT



THERMOPLASTIC ROOFING SYSTEM

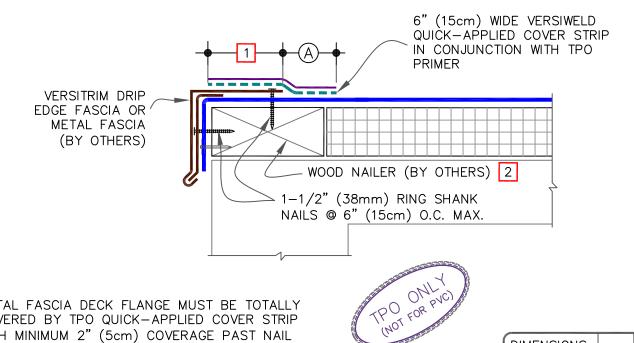
TPMA-2.2

- 1. RIDGE MEMBRANE ATTACHMENT IS ONLY REQUIRED WHEN ROOF SLOPE EXCEEDS 3" (7.5cm) TO ONE HORIZONTAL FOOT.
- 2. POSITION FASTENING PLATES 1/2" (1.5cm) MINIMUM TO 1" (2.5cm) MAXIMUM FROM THE EDGE OF THE DECK MEMBRANE.
- 3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO 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" (25cm) WIDE TPO QA RTS MAY BE USED BENEATH TPO FIELD SHEETS ONLY FOR PERIMETER SECUREMENT.



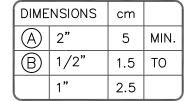
CAUTION

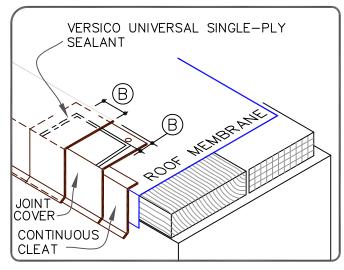
DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS. ACCEPTABLE EDGING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAILS TPC-1.2, 1.3, 1.4, 1.5 OR 1.6.



NOTES:

- 1. METAL FASCIA DECK FLANGE MUST BE TOTALLY COVERED BY TPO QUICK-APPLIED COVER STRIP WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEADS.
- 2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
- 3. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH WEATHERED MEMBRANE CLEANER: ALLOW TO DRY PRIOR TO APPLYING PRIMER.
- 4. APPLY TPO PRIMER TO METAL FLANGE AND MEMBRANE SURFACE PRIOR TO INSTALLING TPO QUICK-APPLIED COVER STRIP.
- 5. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.
- 6. TO ENSURE TPO QUICK-APPLIED COVER STRIP CONFORMS TO STEP-OFFS, HEAT COVER STRIP AT SPLICE INTERSECTIONS PRIOR TO ROLLING.
- 7. THIS DETAIL IS NOT RECOMMENDED FOR ROOFS THAT ARE LIKELY TO EXPERIENCE SIGNIFICANT SNOW AND ICE UP-SLOPE FROM THE GUTTER/EDGE. REFER TO DETAILS TPC-1.2 OR TPC-1.3.





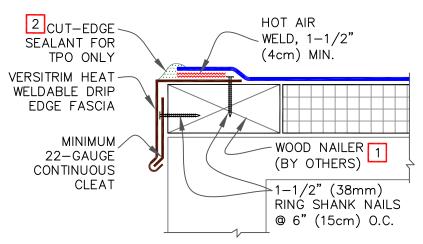


VERSITRIM DRIP EDGE FASCIA

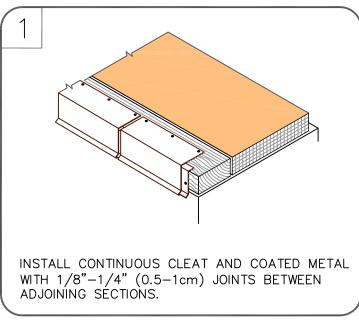


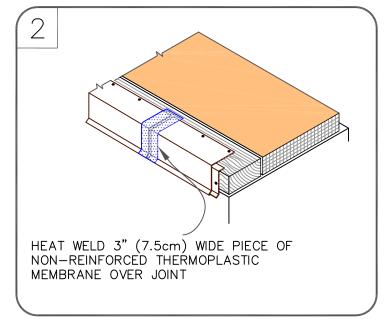
THERMOPLASTIC ROOFING SYSTEM

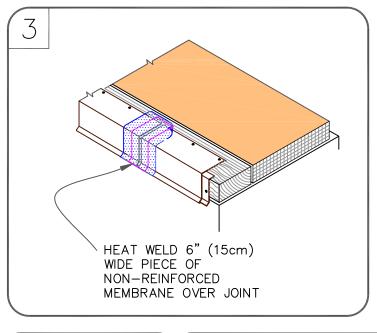
TP C — 1.1

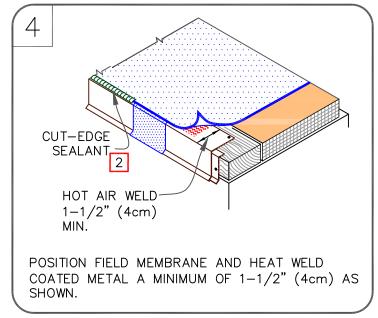


- WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
- 2. APPROXIMATELY 1/8" (0.5cm)
 DIAMETER BEAD OF CUT-EDGE
 SEALANT IS REQUIRED ON CUT
 EDGES OF REINFORCED TPO
 MEMBRANE.







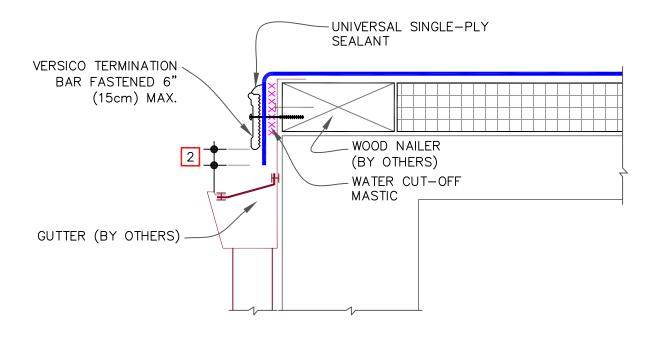




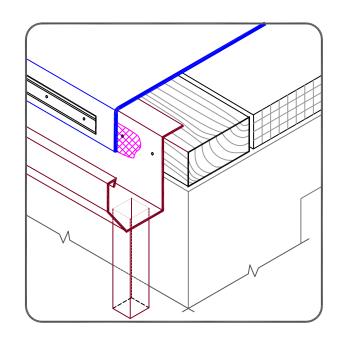
VERSITRIM HEAT WELDABLE DRIP EDGE FASCIA



THERMOPLASTIC ROOFING SYSTEM

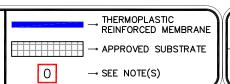


- 1. FASTENING OF METAL TERMINATION BAR MUST PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
- 2. ALLOW MEMBRANE SHEET TO EXTEND 1/2" (1.5cm) MINIMUM BELOW THE METAL TERMINATION BAR.

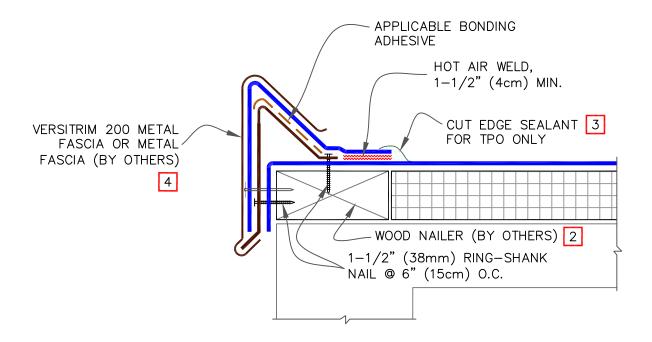




METAL BAR EDGE TERMINATION



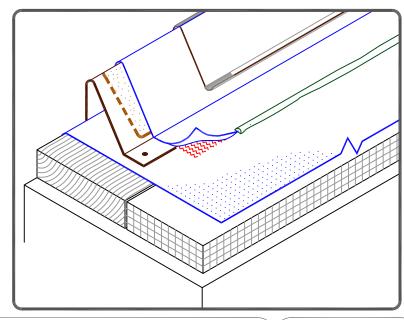
THERMOPLASTIC ROOFING SYSTEM



- 1. REFER TO <u>VERSITRIM 200 INSTRUCTION</u>

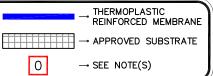
 <u>MANUAL</u> FOR STEP-BY-STEP

 INSTALLATION PROCEDURES.
- 2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF VERSITRIM DECK FLANGE.
- 3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 4. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.

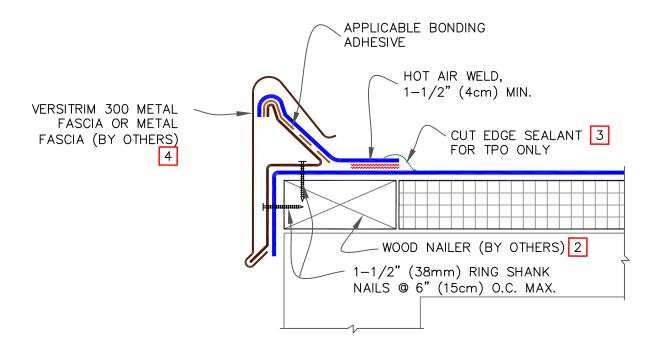




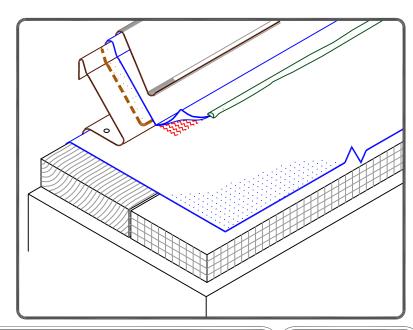
VERSITRIM 200



THERMOPLASTIC ROOFING SYSTEM

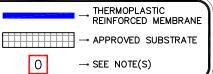


- 1. REFER TO <u>VERSITRIM 300 INSTRUCTION</u>
 <u>MANUAL</u> FOR STEP-BY-STEP
 INSTALLATION PROCEDURES.
- 2. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF VERSITRIM DECK FLANGE.
- 3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 4. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.

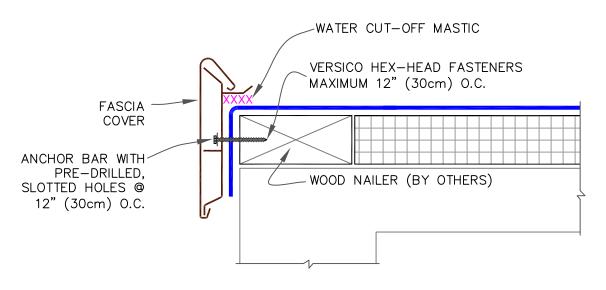




VERSITRIM 300



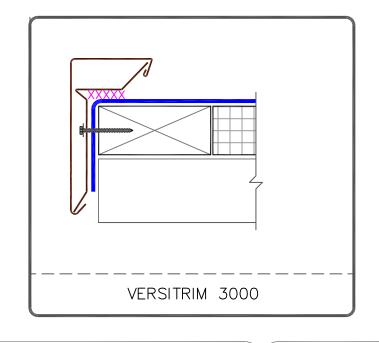
THERMOPLASTIC ROOFING SYSTEM



VERSITRIM 2000

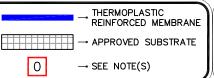
NOTES:

- 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.

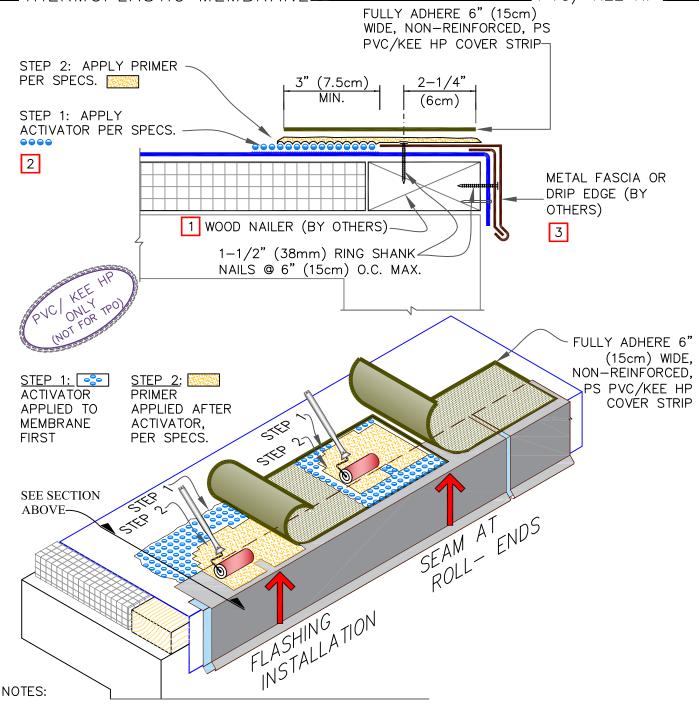




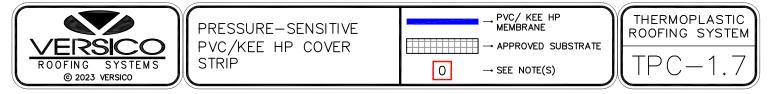
VERSITRIM 2000 & 3000

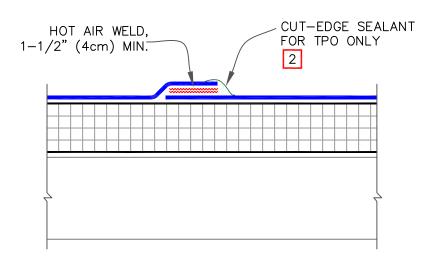


THERMOPLASTIC ROOFING SYSTEM



- 1. WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF METAL FASCIA DECK FLANGE.
- 2. TO REMOVE FINISHING OILS, SCRUB METAL FLANGE WITH PVC & KEE HP MEMBRANE CLEANER; ALLOW TO DRY PRIOR TO APPLYING PRIMER.
- 3. WHEN METAL FASCIA BY OTHERS IS USED, FASTENER TYPE AND FASTENING FREQUENCY SHALL BE RECOMMENDED BY METAL EDGE MANUFACTURER.
- 4. TO ENSURE PVC PRESSURE-SENSITIVE COVER STRIP CONFORMS TO STEPS-OFF, HEAT COVER STRIP AT SPLICE INTERSECTIONS PRIOR TO ROLLING.
- 5. THIS DETAIL IS NOT RECOMMENDED FOR ROOFS THAT ARE LIKELY TO EXPERIENCE SIGNIFICANT SNOW AND ICE. REFER TO COATED EDGE METAL DETAILS.

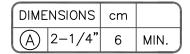


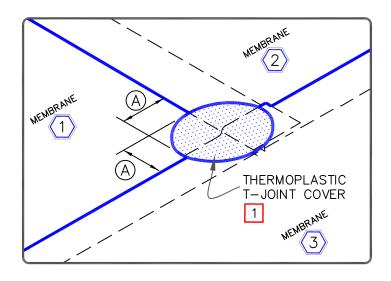


- 1. WHEN USING 60-MIL TPO OR 80-MIL TPO OR PVC MEMBRANE, APPLY A 4-1/2" (11cm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 3. WHEN USING 60-MIL TPO, MAXIMUM WARRANTY IS 20 YEARS

T-JOINT	REQU	IREM	ENTS
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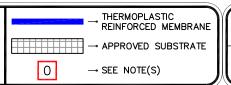
ATT.			(0)
	THICKNESS		
MEMBRANE	45/50	60	80
PVC	N/A	N/A	YES
KEE HP	N/A	N/A	YES
TPO	N/A	YES	YES







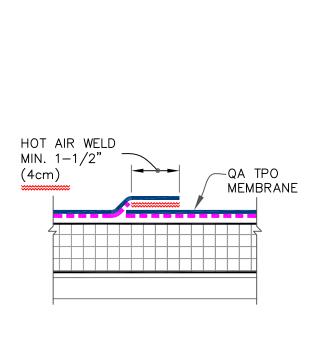
MEMBRANE SPLICE

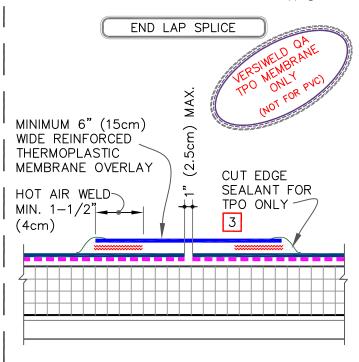


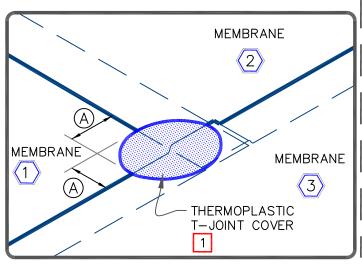
THERMOPLASTIC ROOFING SYSTEM

TPC-2.0

MEMBRANE SPLICE

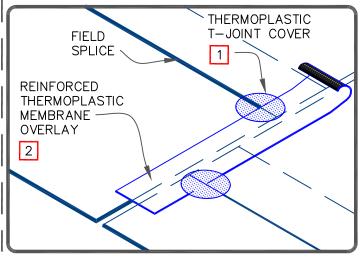






DIMENSION

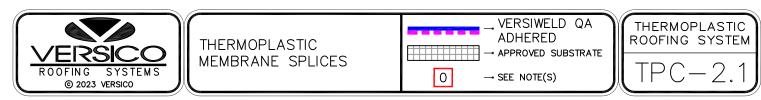
2-1/4"

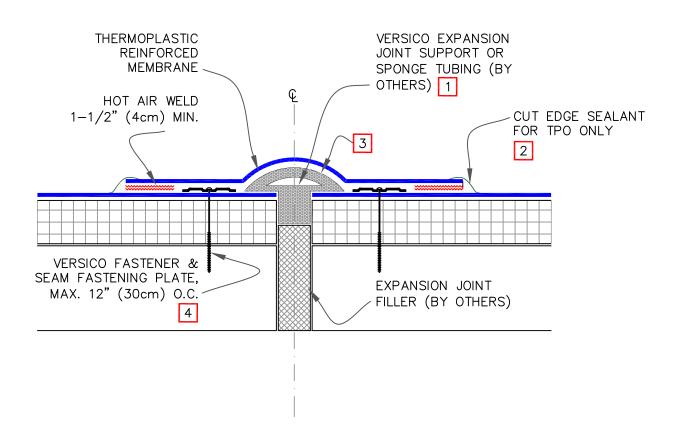


NOTES:

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

cm

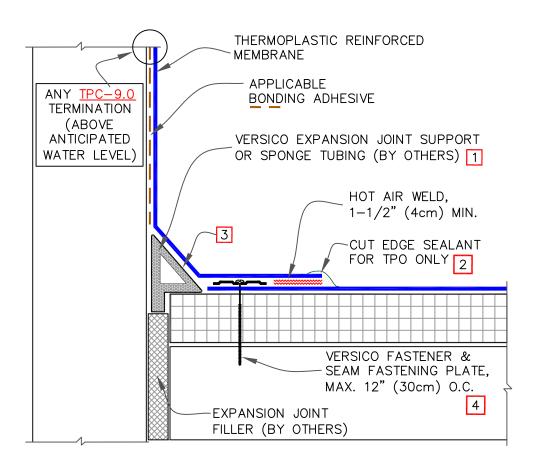




- 1. WHEN VERSICO EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (2cm) AND SHALL NOT EXCEED 3" (7.5cm).
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 3. MEMBRANE FLASHING SHALL <u>NOT</u> BE ADHERED 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.



WHEN A WARRANTY WIND SPEED GREATER THAN 90MPH IS SPECIFIED, VERSICO FASTENERS AND SEAM FASTENING PLATES SHALL NOT EXCEED 6" (15cm) ON CENTER FOR ADHERED MEMBRANE ASSEMBLIES.

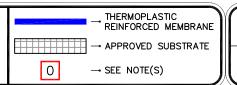


NOTES:

- 1. WHEN VERSICO EXPANSION JOINT SUPPORT IS USED, WIDTH OF JOINT SHALL BE A MINIMUM OF 3/4" (2cm) AND SHALL NOT EXCEED 2" (5cm).
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 3. MEMBRANE FLASHING SHALL <u>NOT</u> 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.



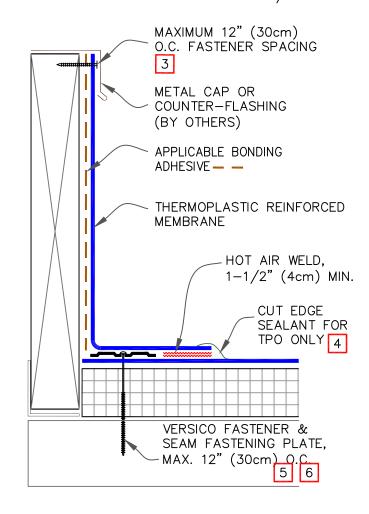
DECK-TO-WALL EXPANSION DETAIL

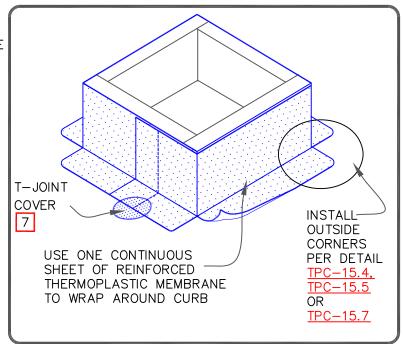


THERMOPLASTIC ROOFING SYSTEM

TPC-3.2

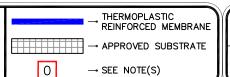
- 1. WHEN USING TPO MEMBRANE, BONDING ADHESIVE IS <u>NOT</u> REQUIRED WHEN THE FLASHING HEIGHT IS 12" (30cm) OR LESS AND THE MEMBRANE IS FASTENED "AS SHOWN" ON TOP OF THE CURB. WHEN VERSICO TERMINATION BAR IS USED BENEATH THE COUNTER-FLASHING, BONDING ADHESIVE CAN BE ELIMINATED WHEN THE MEMBRANE HEIGHT IS 18" (46cm) OR LESS.
- 2. APPLICABLE BONDING ADHESIVE FOR PVC OR TPO. IN CASE OF TPO, CAV-GRIP 3V ADHESIVE MAY ALSO BE USED ON VERTICAL PORTION.
- 3. 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.
- 4. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENER AND PLATE.
- MECHANICAL SECUREMENT MAY BE INSTALLED INTO THE VERTICAL SUBSTRATE.
- 7. WHEN USING 60 MIL (1.5mm) OR 80 MIL (2.03mm) THICK CURB FLASHING, THE INTERSECTIONS BETWEEN SPLICES MUST BE OVERLAID WITH A THERMOPLASTIC "T-JOINT" COVER.





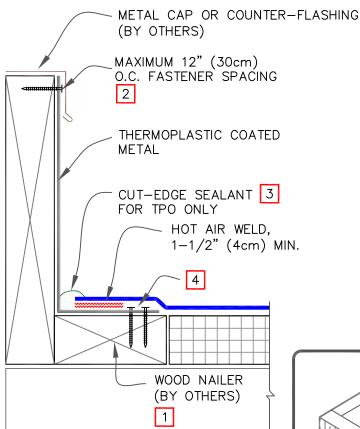


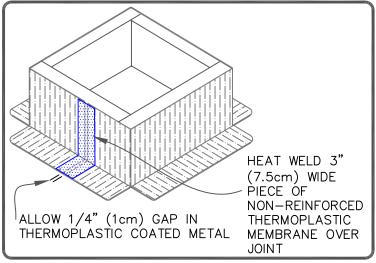
CURB FLASHING WITH TPO OR PVC MEMBRANE



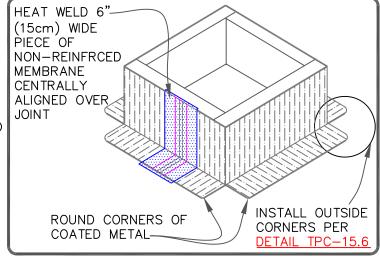
THERMOPLASTIC ROOFING SYSTEM

TPC - 5.1



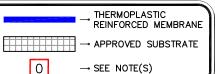


- WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF COATED METAL DECK FLANGE.
- 2. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR CAULK THE FASTENER HEADS.
- 3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 4. FASTEN COATED METAL USING 1-1/2" (4cm) MIN. RING SHANK NAILS AT 6" (15cm) STAGGERED APPROX. 1/2" (1.5cm).



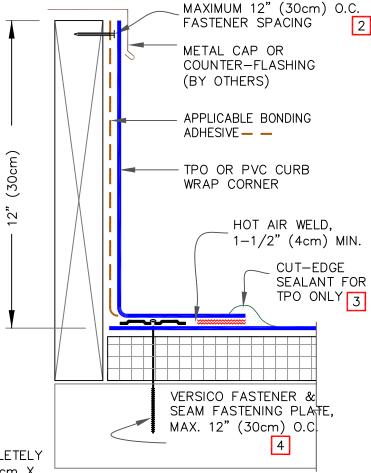


COATED FLASHING WITH TPO OR PVC METAL CURB FLASHING

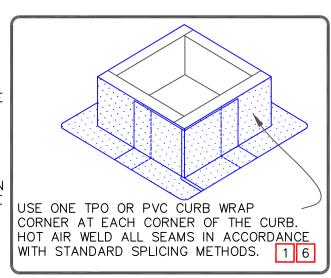


THERMOPLASTIC ROOFING SYSTEM

TPC-5.2

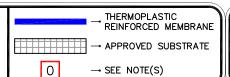


- FOUR (4) CURB WRAP CORNERS WILL COMPLETELY FLASH A MAXIMUM CURB SIZE OF 3'X3' (90cm X 90cm). FOR LARGER CURBS USE THE TPO CURB WRAP CORNERS IN CONJUNCTION WITH ADDITIONAL SECTIONS OF VERSIWELD TPO MEMBRANE.
- 2. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR CAULK THE FASTENER HEADS.
- 3. APPROXIMATELY 1/8" (0.5cm) 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" (30cm).
- 6. APPLICABLE BONDING ADHESIVE FOR PVC OR TPO. IN CASE OF TPO CAV-GRIP 3V ADHESIVE MAY ALSO BE USED ON VERTICAL PORTION.



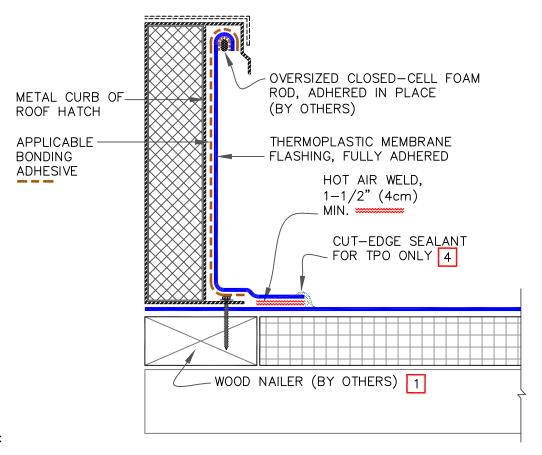


CURB FLASHING WITH CFA TPO OR PVC CURB WRAP CORNERS

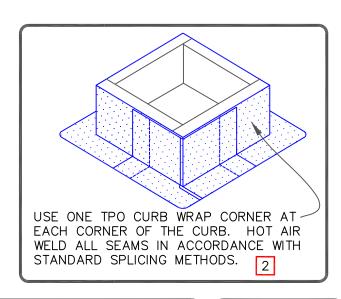


THERMOPLASTIC ROOFING SYSTEM

TPC-5.3

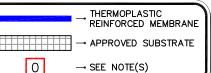


- WOOD NAILER MUST EXTEND PAST TOTAL WIDTH OF CURB FLANGE.
- 2. FOUR (4) CURB WRAP CORNERS WILL COMPLETELY FLASH A MAXIMUM CURB SIZE OF 3'X3' (91cmX 91cm). FOR LARGER CURBS USE THE TPO CURB WRAP CORNERS IN CONJUNCTION WITH ADDITIONAL SECTIONS OF VERSIWELD TPO MEMBRANE.
- 3. IF CURB WRAP CORNER IS NOT USED, THEN USE TPC-15.7 DETAIL FOR OUTSIDE CORNERS.
- 4. APPROXIMATELY 1/8" (0.5cm) BEAD OF CUT-EDGE SEALANT IS REQUIRED ON THE CUT EDGES OF THE TPO FIELD WRAP CORNER.
- 5. REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENERS AND PLATES.
- 6. CUSTOM SIZES ARE AVAILABLE FOR CURB FLASHING HEIGHTS GREATER THAN 12" (30cm).
- 7. APPLICABLE BONDING ADHESIVE FOR PVC OR TPO. IN CASE OF TPO, CAV-GRIP 3V ADHESIVE MAY ALSO BE USED ON VERTICAL PORTION.



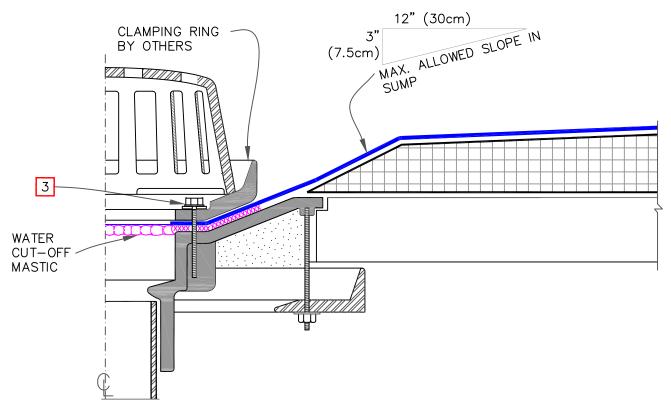


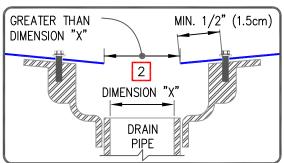
SELF-FLASHING CURB

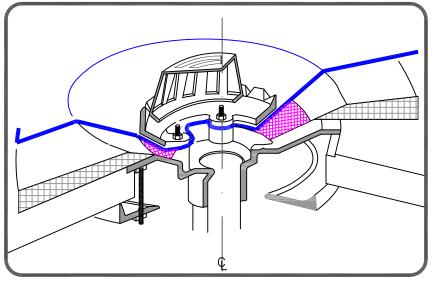


THERMOPLASTIC ROOFING SYSTEM

TPC-5.4



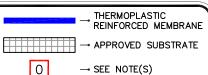




- ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
- 2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
- ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
- 4. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.

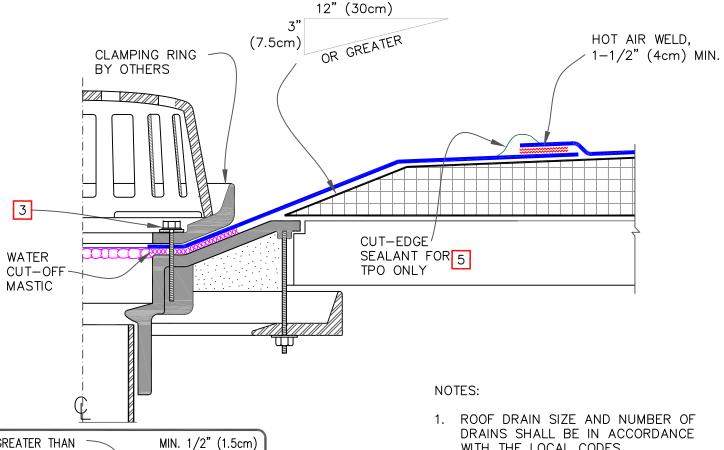


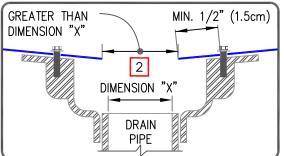
ROOF DRAIN (DRAIN SUMP UP TO 3 INCHES TO 1 HORIZONTAL FOOT)



THERMOPLASTIC ROOFING SYSTEM

TPC-6.1



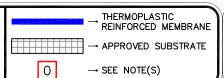


ENTIRE SPLICE OVERLAP AT DRAIN BASE MUST BE HOT AIR WELDED 4 TRIANGULAR SECTIONS OF DECK (FIELD) **MEMBRANE MEMBRANE** HOT AIR WELD, 1-1/2" (4cm) MIN. PLAN

- 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" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
- 3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
- 4. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
- 5. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

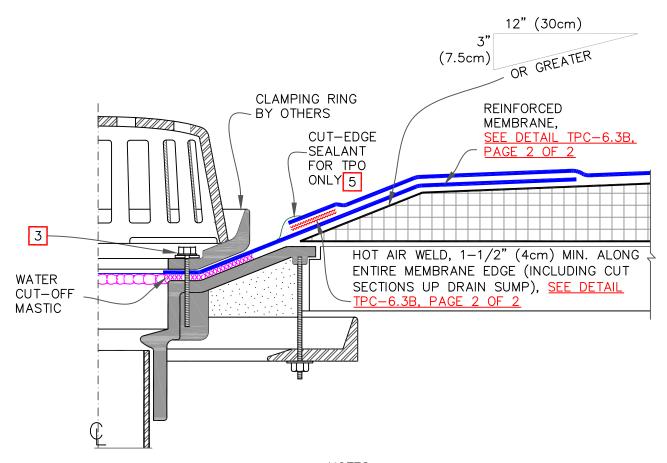


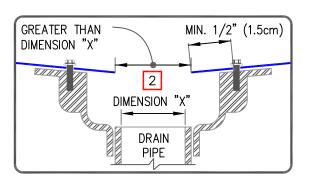
ROOF DRAIN (DRAIN SUMP GREATER THAN 3" TO 1 HORIZONTAL FOOT) OPTION 1



THERMOPLASTIC ROOFING SYSTEM

TPC-6.2

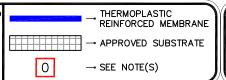




- 1. ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
- 2. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
- 3. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
- 4. REMOVE EXISTING LEAD, FLASHING MATERIAL & ENSURE THE DRAIN RING IS COMPLETELY CLEAN DOWN TO BARE METAL.
- 5. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

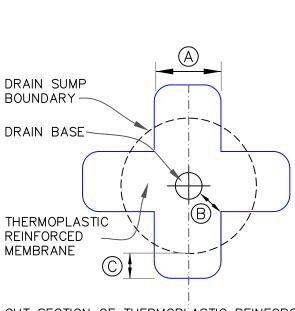


ROOF DRAIN (DRAIN SUMP GREATER THAN 3" TO 1 HORIZONTAL FOOT) OPTION 2, PAGE 1 OF 2

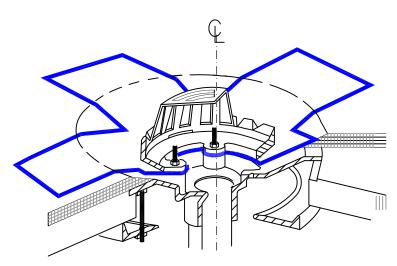


THERMOPLASTIC ROOFING SYSTEM

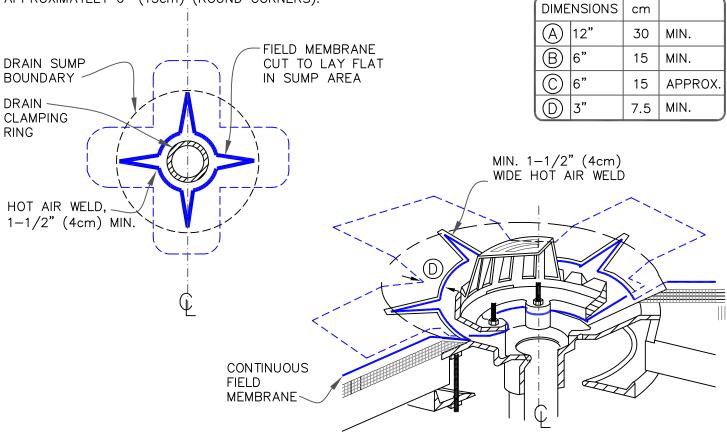
TPC-6.3A



CUT SECTION OF THERMOPLASTIC REINFORCED MEMBRANE AS SHOWN AND POSITION INTO DRAIN SUMP. EXTEND MEMBRANE OUT OF DRAIN SUMP APPROXIMATELY 6" (15cm) (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" (4cm) COMPLETELY SURROUNDING ÁREA.





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

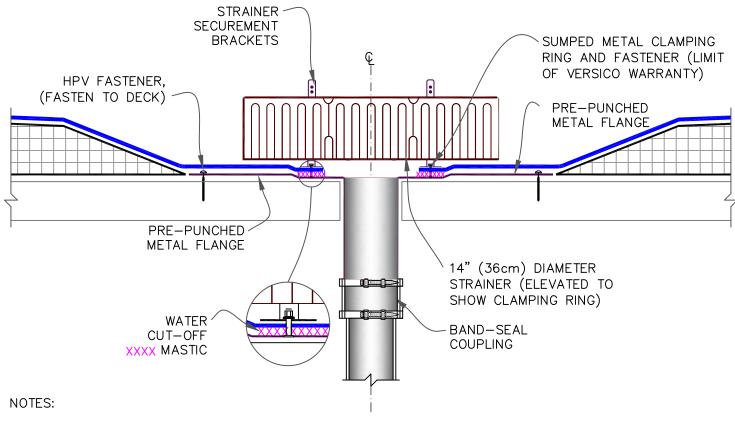
→ APPROVED SUBSTRATE

→ SEE NOTE(S)

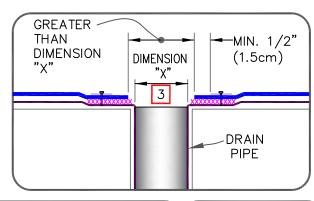
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THERMOPLASTIC ROOFING SYSTEM

TPC-6.3B

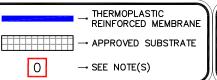


- ROOF DRAIN SIZE AND NUMBER OF DRAINS SHALL BE IN ACCORDANCE WITH THE LOCAL CODES.
- 2. ALL BOLTS OR CLAMPS MUST BE IN PLACE TO PROVIDE CONSTANT COMPRESSION ON WATER CUT-OFF MASTIC.
- 3. THE HOLE IN THE MEMBRANE SHALL EXCEED THE DIAMETER OF THE DRAIN PIPE, BUT SHALL BE NO LESS THAN 1/2" (1.5cm) FROM THE ATTACHMENT POINTS OF THE DRAIN CLAMPING RING.
- 4. FIELD SPLICES MUST BE LOCATED AT LEAST 6" (15cm) OUTSIDE THE DRAIN SUMP.
- 5. INSULATION TAPER SHALL NOT BE GREATER THAN 6" (15cm) IN 12" (30cm) HORIZONTAL.



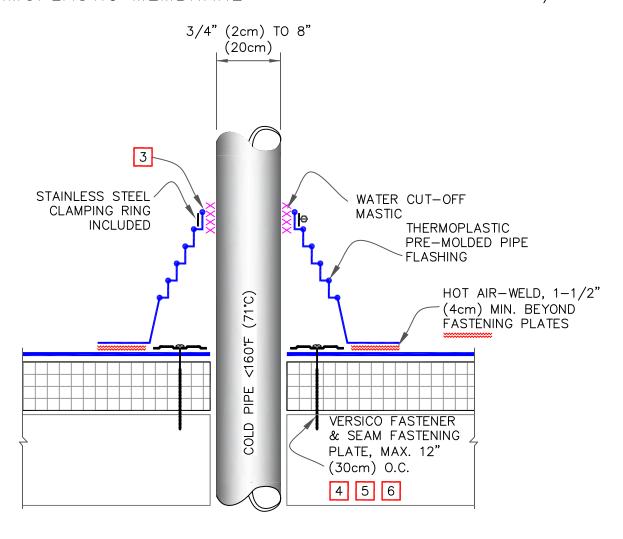


ADD-ON DRAIN

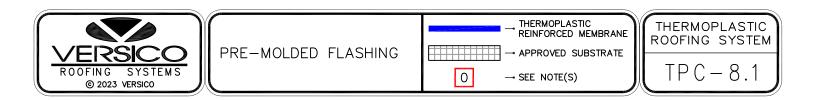


THERMOPLASTIC ROOFING SYSTEM

TPC-6.4

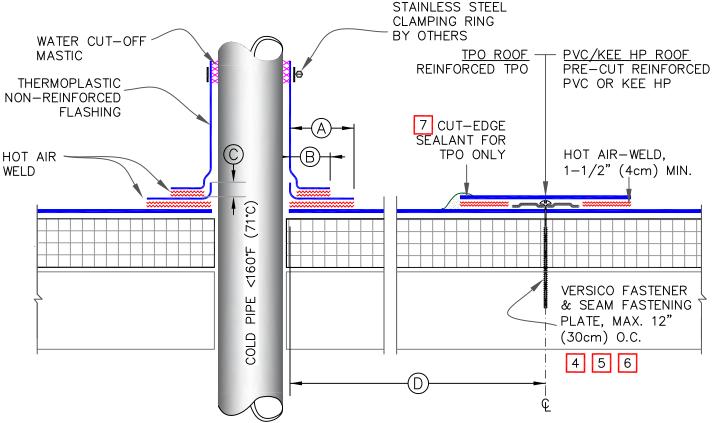


- REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING PRE-MOLDED PIPE FLASHING.
- 2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
- 3. PIPE SEAL MUST HAVE INTACT RIB AT TOP EDGE, REGARDLESS OF PIPE DIAMETER.
- 4. 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" (30cm) 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" (46cm).
- 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.



AUTION

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 JPC-8.1, JPC-8.4.

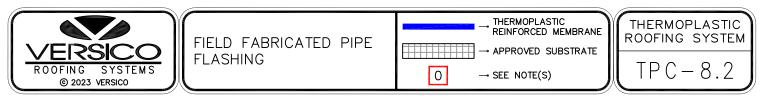


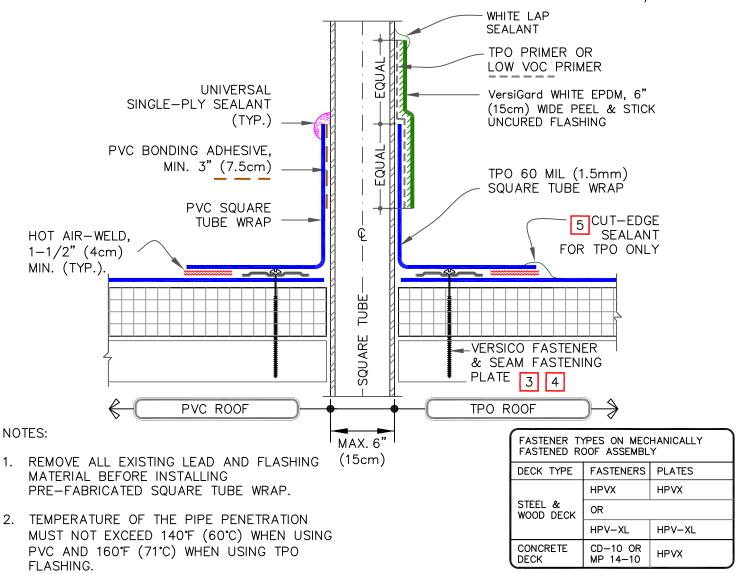
NOTES:

- 1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING FIELD FABRICATED PIPE FLASHING.
- 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" (4cm) VERTICAL HOT AIR WELD.

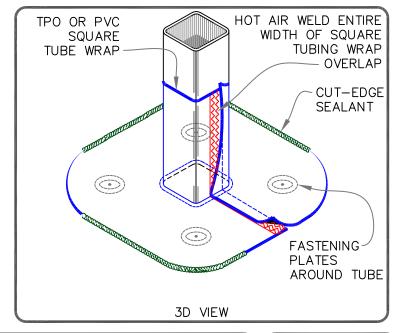
DIME	NSIONS	cm	
A	1-1/2"	4	ТО
	2"	5	
B	1"	2.5	MIN.
0	1/2"	1.5	MIN.
(D)	12"	30	APPROX.

- 4. INSTALL A MINIMUM OF 4 SEAM FASTENING PLATES FOR PIPES WITH A DIAMETER UP TO 6" (15cm). ADDITIONAL SEAM FASTENING PLATES WILL BE REQUIRED FOR PIPES GREATER THAN 6" (15cm) IN DIAMETER AND SHALL BE SPACED 12" (30cm) ON CENTER MAXIMUM.
- 5. FASTENERS/PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (50cm).
- 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" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.



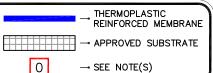


- 3. INSTALL A MINIMUM OF 4 SEAM FASTENING PLATES FOR TUBE SIDE DIMENSIONS UP TO 6" (15cm).
- 4. FASTENERS AND PLATES ARE NOT REQUIRED ON ADHERED SYSTEM. SEE TABLE FOR MF SYSTEM.
- APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 6. T-JOINT COVERS ARE NOT REQUIRED ON STANDARD COLORS (WHITE, TAN, GRAY), FOR ADDITIONAL COLORS IT IS REQUIRED TO COVER T-JOINTS.



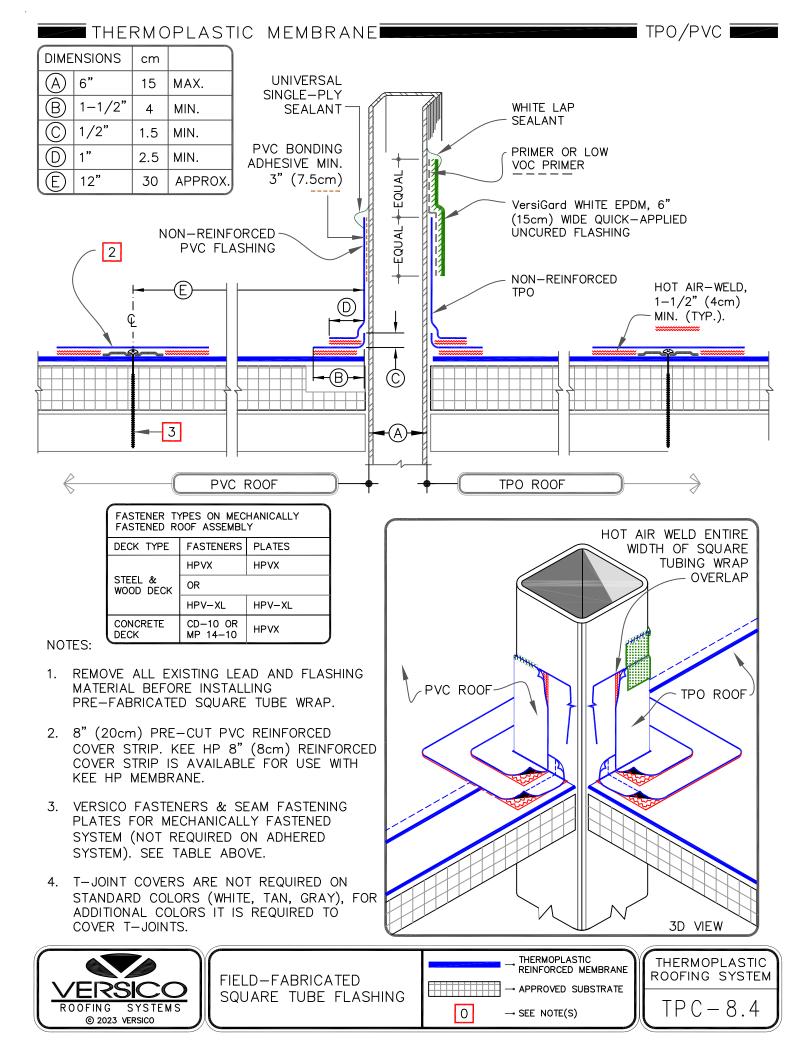


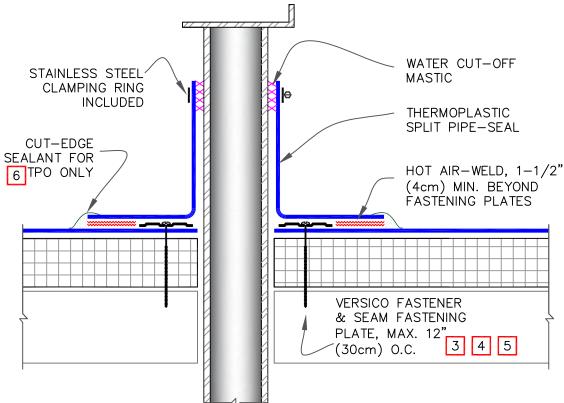
CERTIFIED PRE-FABRICATED SQUARE TUBE WRAP



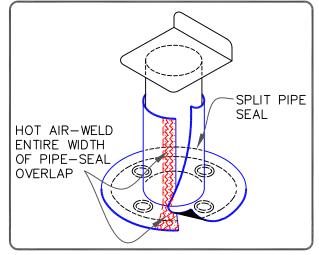
THERMOPLASTIC ROOFING SYSTEM

TPC-8.3





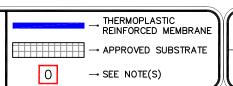
- REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING SPLIT PIPE FLASHING.
- 2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO.
- 3. INSTALL A MINIMUM OF 4 FASTENERS AND PLATES AROUND THE PIPE, EQUALLY SPACED. IF FASTENERS AND PLATES CANNOT BE INSTALLED AS SHOWN, THEY MAY ALSO BE POSITIONED OUTSIDE THE PIPE MAXIMUM 12" (30cm) 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" (46cm).



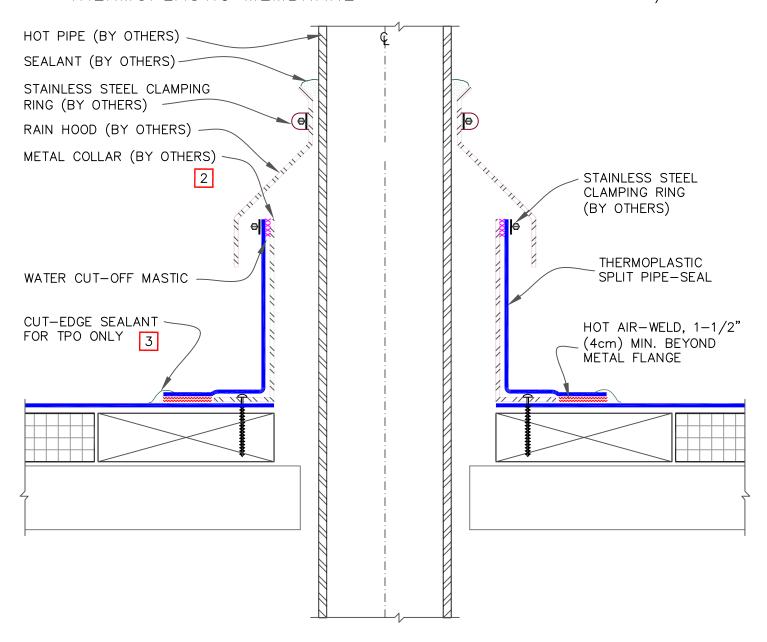
- 5. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV-XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR MP 14-10 FASTENERS ARE USED WITH HPVX PLATES.
- 6. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 7. T-JOINT COVERS ARE NOT REQUIRED ON WHITE, TAN OR GRAY, FOR ADDITIONAL COLORS IT IS REQUIRED TO COVER T-JOINTS.



CERTIFIED
PRE-FABRICATED SPLIT
PIPE SEAL



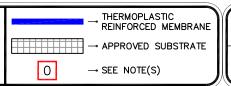
THERMOPLASTIC ROOFING SYSTEM



- 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.
- 3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 4. T-JOINT COVERS ARE NOT REQUIRED ON STANDARD COLORS (WHITE, TAN, GRAY), FOR ADDITIONAL COLORS IT IS REQUIRED TO COVER T-JOINTS.

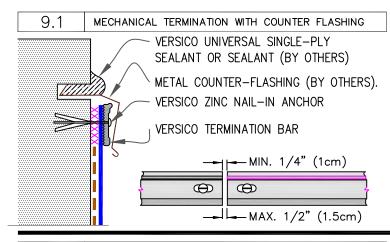


CERTIFIED HOT PIPE FLASHING



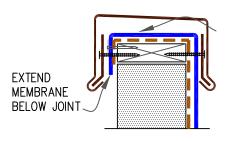
THERMOPLASTIC ROOFING SYSTEM

TPC-8.6

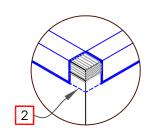


- 1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
- 2. DO NOT WRAP TERMINATION BAR AROUND CORNERS.
- 3. <u>DETAIL REQUIRED FOR USE ON WARRANTY</u> PROJECTS EXCEEDING 20—YEARS.
- DETAIL 9.5 MUST BE USED AT VERTICAL JOINTS IN PANEL WALLS.

9.2 SHEET METAL COPING (BY OTHERS)



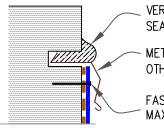
METAL CAP (BY OTHERS), SLOPE DOWNWARD TOWARDS ROOF



NOTES:

- I. 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.





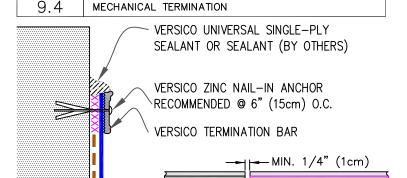
VERSICO UNIVERSAL SINGLE-PLY SEALANT OR SEALANT (BY OTHERS)

METAL COUNTER-FLASHING (BY OTHERS).

FASTEN MEMBRANE @ 12" (30cm) O.C. MAX.

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. <u>DETAIL NOT FOR USE ON WARRANTY</u> PROJECTS EXCEEDING 10-YEARS.



NOTES:

- APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
- 2. DO NOT WRAP COMPRESSION TERMINATION BAR AROUND CORNERS.
- 3. <u>DETAIL NOT FOR USE ON WARRANTY</u> PROJECTS EXCEEDING 20-YEARS.
- 4. DETAIL 9.5 MUST BE USED AT VERTICAL JOINTS IN PANEL WALLS.

APPLICABLE BONDING ADHESIVE.

0

0

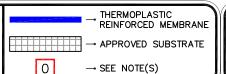
-MAX. 1/2" (1.5cm)

XXXXXXXX

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

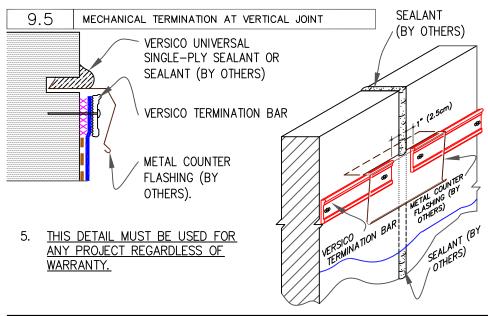


MEMBRANE TERMINATIONS, PAGE 1 OF 2

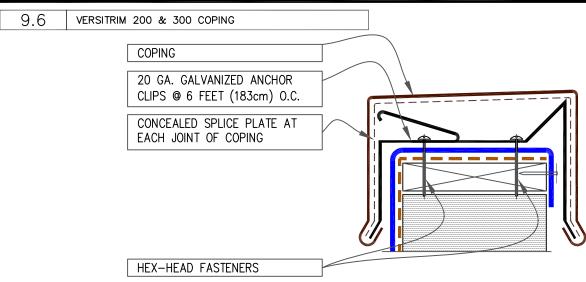


THERMOPLASTIC ROOFING SYSTEM

TPC - 9.0A

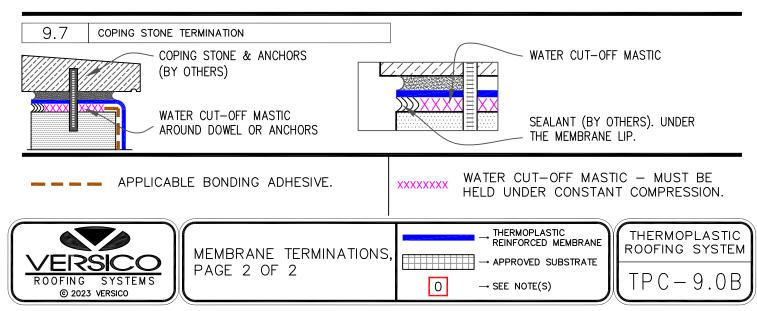


- 1. APPLY ON HARD SMOOTH SURFACE ONLY.
- DO NOT WRAP COMPRESSION TERMINATION BAR AROUND CORNERS.
- 3. VERTICAL JOINTS IN THE PRE-CAST PANEL AS WELL AS ALL GAPS AT THE JUNCTION OF THE TILT-UP PANEL AND ROOF DECK MUST BE FULLY SEALED TO PREVENT AIR INFILTRATION.
- 4. CONTINUOUS COUNTER FLASHING REQUIRED FOR WARRANTY PROJECTS EXCEEDING 20-YEARS.



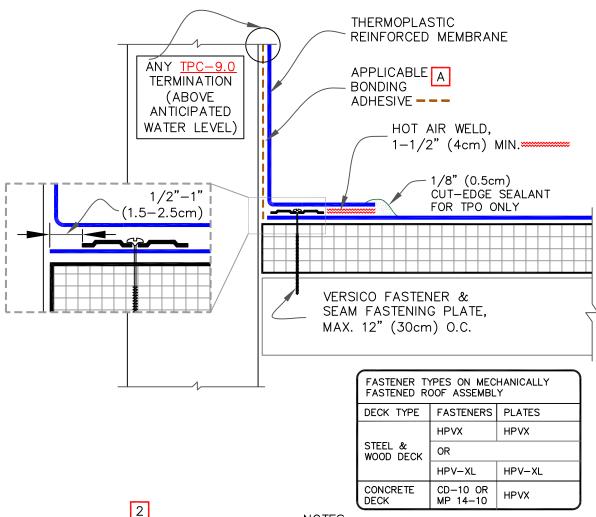
NOTE:

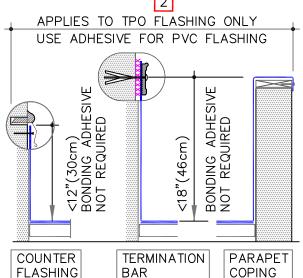
- 1. MEMBRANE SHOULD BE EXTENDED AT CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE. REFER TO DETAIL TPC-9.0.
- 2. REFER TO <u>VERSITRIM COPING INSTALLATION INSTRUCTION</u> MANUAL FOR STEP-BY-STEP INSTRUCTION PROCEDURES.



AUTION

FASTENERS AND PLATES ARE REQUIRED AT 6" (15cm) O.C. FOR ADHERED SYSTEMS WITH WARRANTY WIND SPEED COVERAGE GREATER THAN 90 MPH AND FOR ALL PROJECTS WITH WARRANTIES GREATER THAN 20 YEARS.



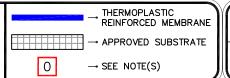


NOTES:

- 1. IN CASE WHERE FASTENERS MUST BE FASTENED INTO THE VERTICAL SURFACE, CARE MUST BE TAKEN TO PRESS THE MEMBRANE TIGHTLY INTO THE ANGLE CHANGE. PLACING THE PLATES TIGHT INTO THE ANGLE CHANGE WILL HELP HOLD THE MEMBRANE IN THE PROPER POSITION.
- FOLLOW <u>TPC-9.0A</u> & <u>TPC-9.0B</u> DETAILS FOR WARRANTY DURATION.



PARAPET FLASHING — FASTENED INTO DECK

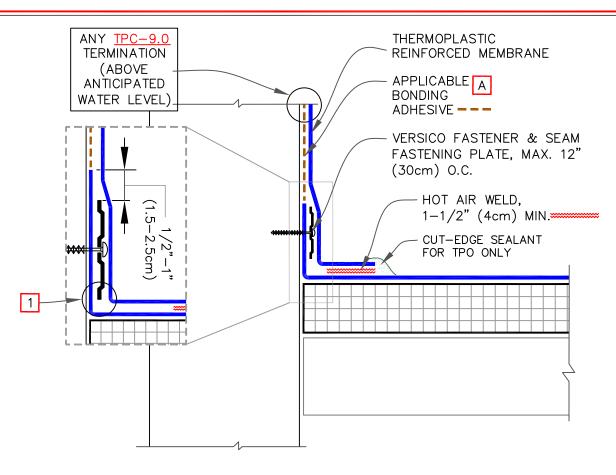


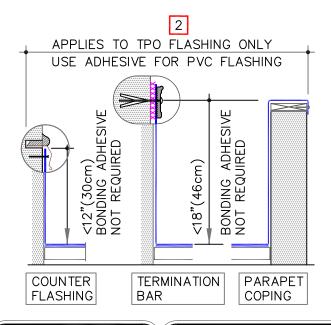
THERMOPLASTIC ROOFING SYSTEM

PC-12.1

AUTION

FASTENERS AND PLATES ARE REQUIRED AT 6" (15cm) O.C. FOR ADHERED SYSTEMS WITH WARRANTY WIND SPEED COVERAGE GREATER THAN 90 MPH AND FOR ALL PROJECTS WITH WARRANTIES GREATER THAN 20 YEARS.



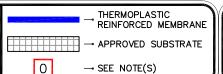


NOTES:

- 1. CARE MUST BE TAKEN TO PRESS THE MEMBRANE TIGHTLY INTO THE ANGLE CHANGE. PLACING THE PLATES TIGHT INTO THE ANGLE CHANGE WILL HELP HOLD THE MEMBRANE IN THE PROPER POSITION.
- 2. FOLLOW TPC-9.0A & TPC-9.0B DETAILS FOR WARRANTY DURATION.



PARAPET FLASHING - FASTENED INTO WALL

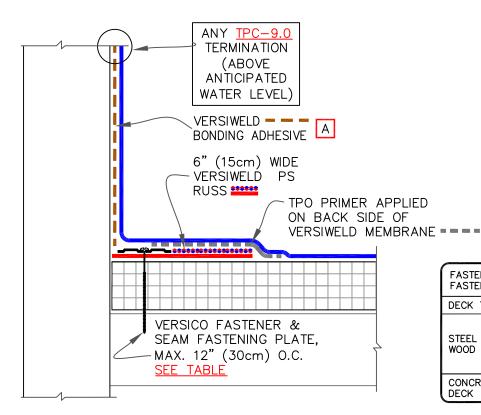


THERMOPLASTIC ROOFING SYSTEM

TPC - 12.1A

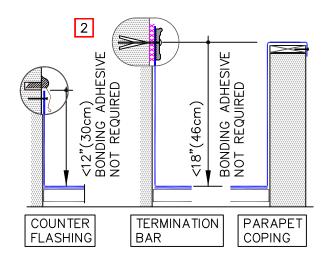
AUTION

FASTENERS AND PLATES ARE REQUIRED AT 6" (15cm) O.C. FOR ADHERED SYSTEMS WITH WARRANTY WIND SPEED COVERAGE GREATER THAN 90 MPH AND FOR ALL PROJECTS WITH WARRANTIES GREATER THAN 20 YEARS.



FASTENER TYPES ON MECHANICALLY FASTENED ROOF ASSEMBLY				
DECK TYPE	FASTENERS PLATES			
	HPVX	HPVX		
STEEL & WOOD DECK	OR			
	HPV-XL	HPV-XL		
CONCRETE DECK	CD-10 OR MP 14-10	HPVX		





NOTE:

- 1. IN A CASE WHERE FASTENERS MUST BE FASTENED INTO THE VERTICAL SURFACE, CARE MUST BE TAKEN TO PRESS 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.
- 2. FOLLOW TPC-9.0A & TPC-9.0B DETAILS FOR WARRANTY DURATION.

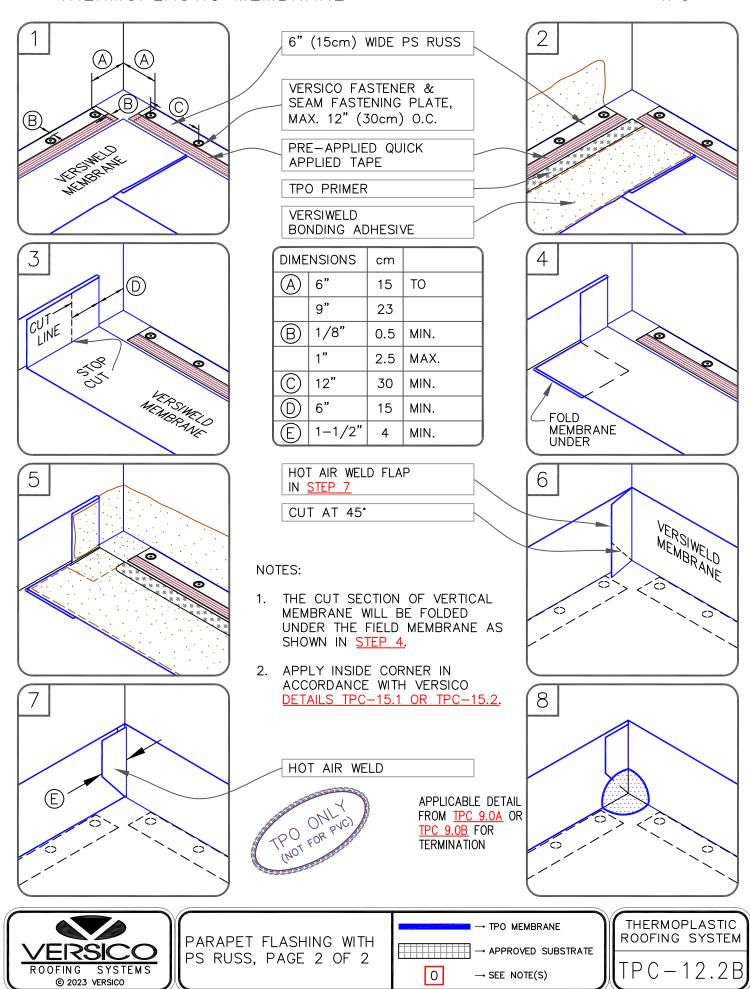


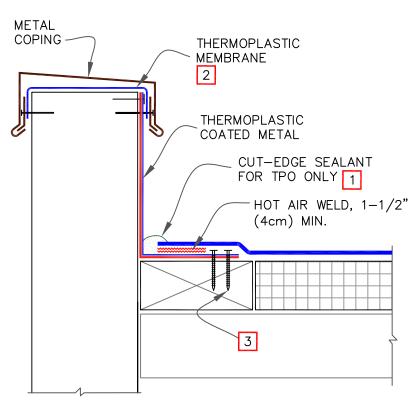
PARAPET FLASHING WITH PS RUSS, PAGE 1 OF 2

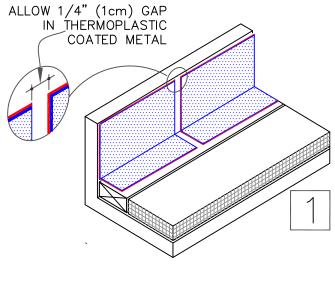


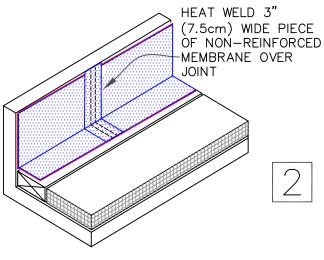
THERMOPLASTIC ROOFING SYSTEM

TPC-12.2A



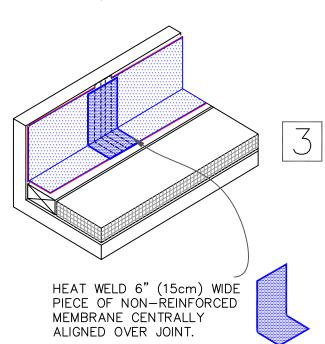








- 1. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 2. PLACE A LAYER OF THERMOPLASTIC MEMBRANE UNDER THE METAL CAP TO PROTECT AGAINST MOISTURE INFILTRATION AT JOINTS.
- 3. FASTEN COATED METAL FLASHING TO WOOD NAILERS USING 1-1/2" (4cm) MIN. RING SHANK NAILS SPACED 6" (15cm) ON CENTER AND STAGGERED APPROX. 1/2" (1.5cm).





COATED METAL WALL FLASHING

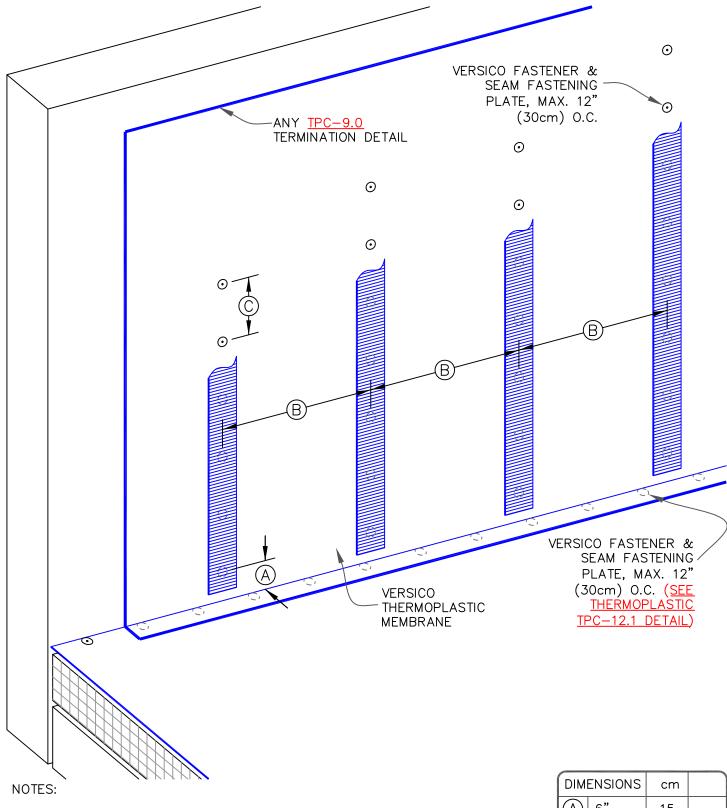
→ THERMOPLASTIC
REINFORCED MEMBRANE

→ APPROVED SUBSTRATE

O → SEE NOTE(S)

THERMOPLASTIC ROOFING SYSTEM

TPC-12.3

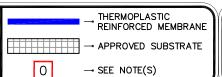


1. FOR TPO, USE 6" (15cm) WIDE PS COVERSTRIP, FOR PVC USE 6" (15cm) WIDE REINFORCED PVC MEMBRANE, HOT AIR WELD ALL EDGES WITH MIN. 1-1/2" (4cm) PAST FASTENING PLATES

DIM	DIMENSIONS		ľ
A	6"	15	
B	32"	80	мах.
	12"	30	MAX.

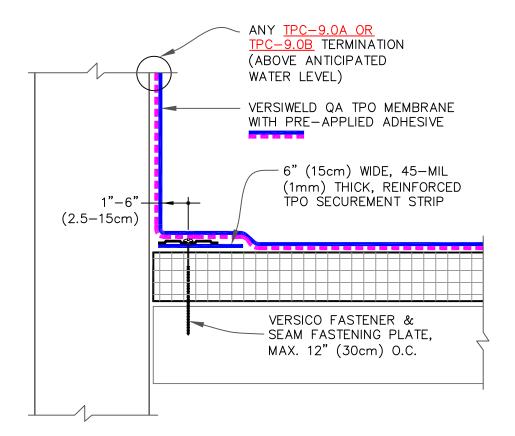


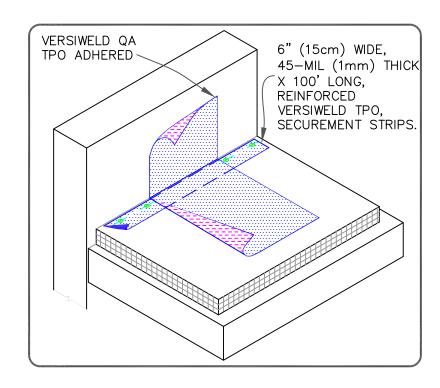
PARAPET FLASHING / NO ADHESION — ANY HEIGHT OPTION



THERMOPLASTIC ROOFING SYSTEM

TPC-12.6







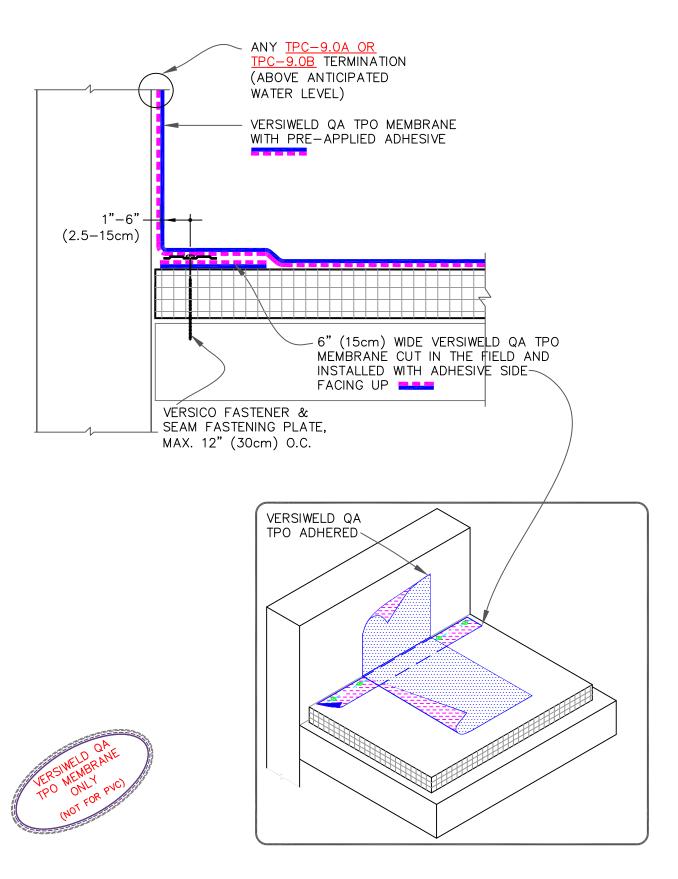


VERSIWELD QA TPO PARAPET FLASHING WITH TPO PS SECUREMENT STRIP



THERMOPLASTIC ROOFING SYSTEM

TPC-12.7



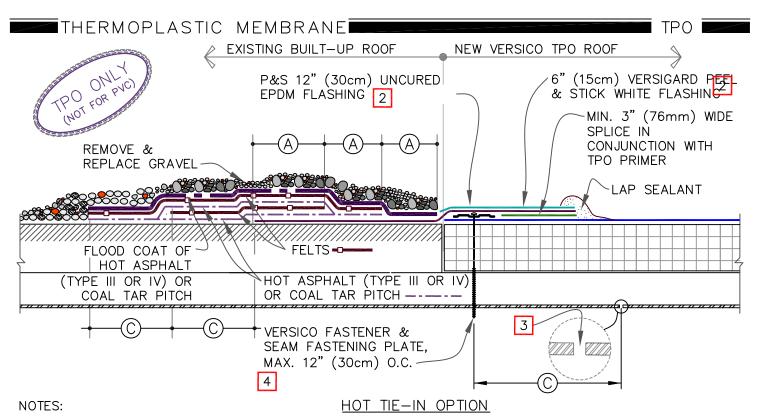


VERSIWELD QA PARAPET FLASHING WITH VERSIWELD PS SECUREMENT STRIP

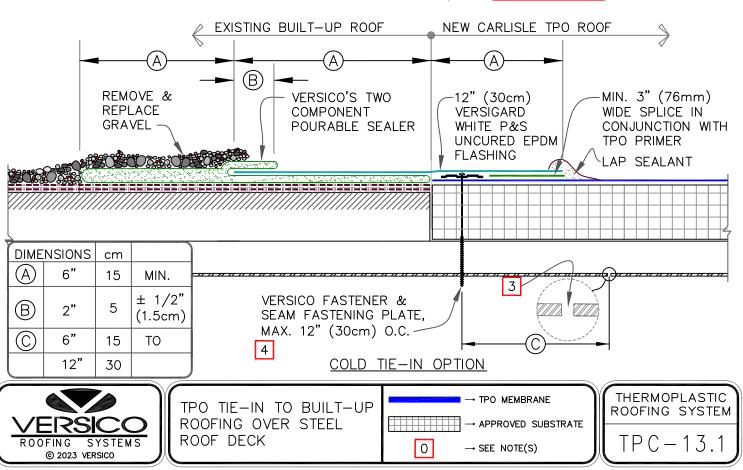


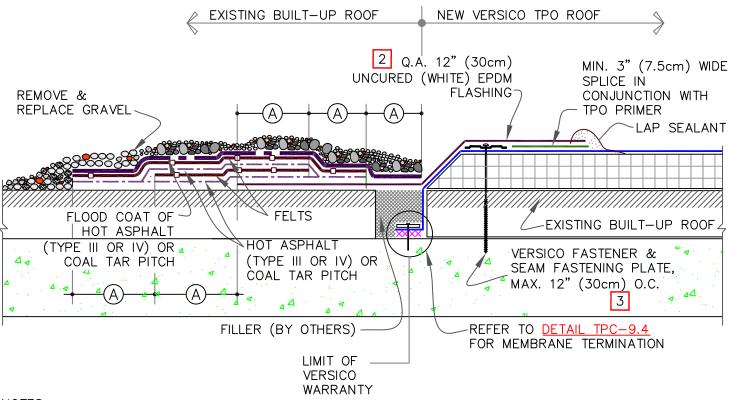
THERMOPLASTIC ROOFING SYSTEM

TPC - 12.8



- 1. REMOVE ALL GRAVEL AT TIE-IN.
- 2. OVERLAY UNCURED EPDM FLASHING WITH 6" (15cm) VERSIGARD WHITE PEEL & STICK FLASHING TO REDUCE HEAT GAIN ON TPO MEMBRANE
- 3. IF FLUTES ARE PERPENDICULAR TO THE TIE—IN DRILL A 3/8" (1cm) DIAMETER WEEP HOLE INTO THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE PERIMETER OF THE TIE—IN 6" (15cm) MINIMUM TO 12" (30cm) MAXIMUM FROM THE SEAM FASTENING PLATE.
- 4. ON MECHANICALLY FASTENED SYSTEMS, HPVX FASTENERS AND HPVX PLATES OR HPV-XL FASTENERS AND HPV-XL PLATES ARE REQUIRED OVER STEEL DECKS.
- 5. IF WATER PONDS OR FLOWS OVER TIE-IN FROM BUR SURFACE, USE DETAIL TPC-13.2.



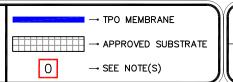


- 1. REMOVE ALL GRAVEL AT TIE-IN.
- 2. SPLICE TWO PIECES OF WHITE QUICK APPLIED UNCURED EPDM FLASHING TO ACHIEVE DESIRED WIDTH.
- 3. ON MECHANICALLY ATTACHED SYSTEMS, CD-10 OR MP 14-10 FASTENERS AND HPVX PLATES ARE REQUIRED OVER CONCRETE DECKS.
- 4. WATER CUT-OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION.
- 5. 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 INTO THE NEW ROOFING SYSTEM.

	VERSICO'S TWO PART POURABLE SEALER
DIMENSIONS cm A 6" 15 MIN. B 2" 5 ± 1/2" (1.5cm)	REMOVE AND REPLACE GRAVEL The state of the
TPO ONLY (NOT FOR PUC)	COLD TIE-IN OPTION

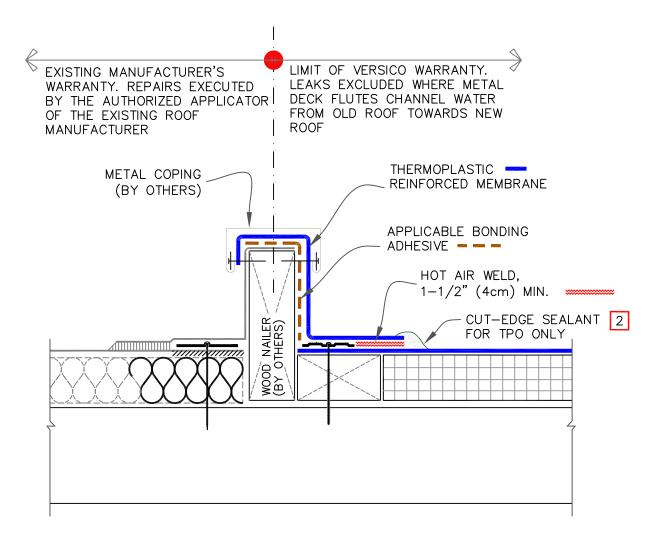


TPO TIE-IN TO BUILT-UP ROOFING OVER CONCRETE ROOF DECK



THERMOPLASTIC ROOFING SYSTEM

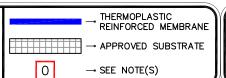
TPC-13.2



- POSITION MEMBRANE FASTENING PLATES 1/2" (1.5cm) TO 1" (2.5cm) FROM EDGE OF DECK MEMBRANE.
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- ENSURE THE LOCATION OF CURB WILL NOT IMPEDE THE FLOW OF WATER AT EXISTING ADJACENT ROOF.

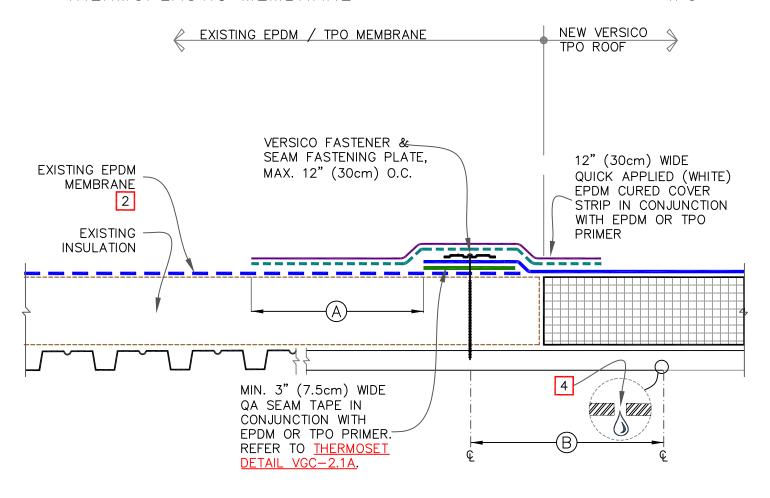


TPO/PVC TIE-IN TO EXISTING SINGLE-PLY



THERMOPLASTIC ROOFING SYSTEM

TPC - 13.3



- 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" (1cm) DIAMETER WEEP HOLE INTO THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE PERIMETER OF THE TIE-IN 6" (15cm) MINIMUM TO 12" (30cm) MAXIMUM FROM THE SEAM FASTENING PLATE.
- 5. ON MECHANICALLY ATTACHED SYSTEMS, HPVX FASTENERS AND PLATES OR HPV—XL FASTENERS AND PLATES ARE REQUIRED OVER STEEL DECKS.

DIMENSIONS		cm	
\bigcirc	6"	15	
B	6"	15	MIN.
	12"	30	MAX.



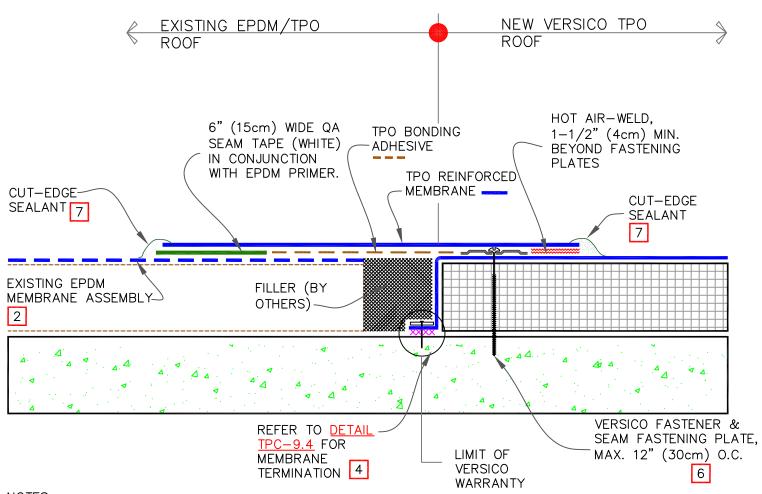


TPO TIE-IN TO EXISTING EPDM MEMBRANE

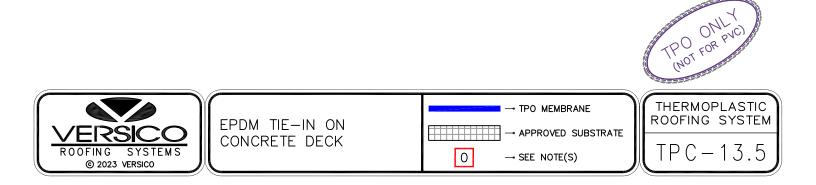


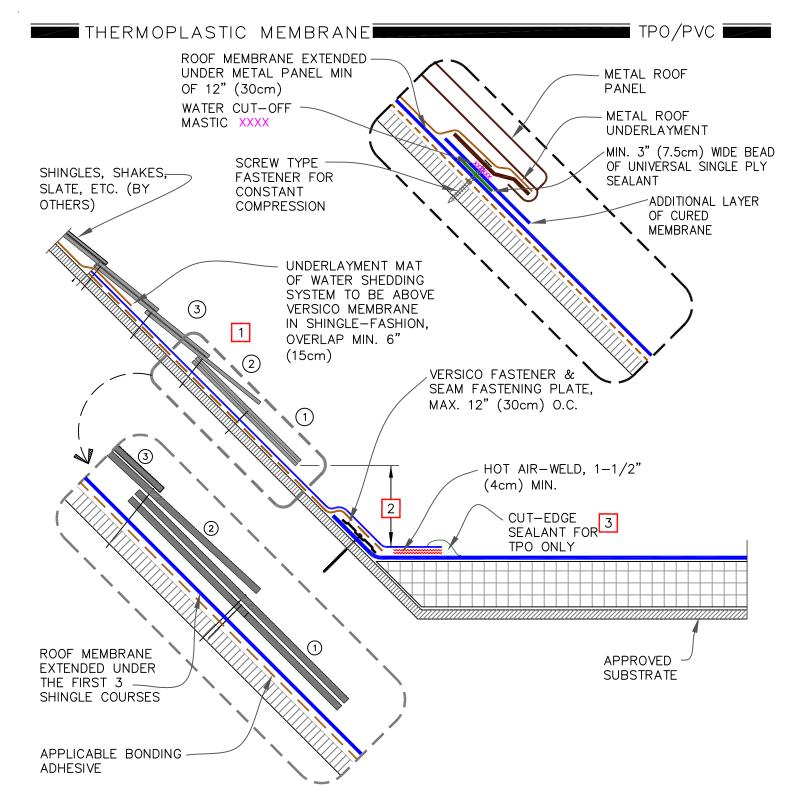
THERMOPLASTIC ROOFING SYSTEM

TPC - 13.4

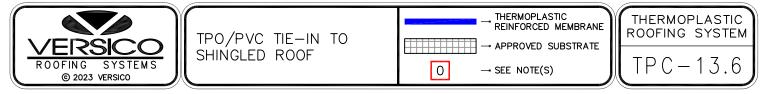


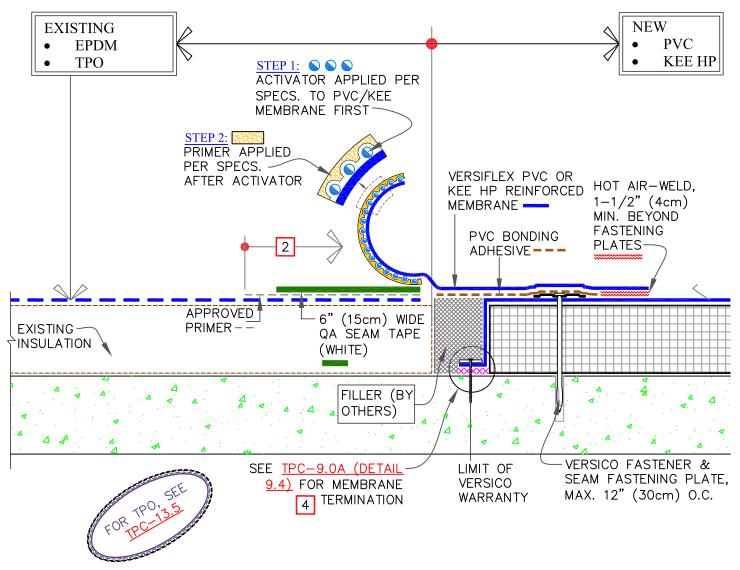
- 1. PRIOR TO SPLICING, CLEAN EXISTING EPDM MEMBRANE BY SCRUBBING THE SPLICE AREA WITH WEATHERED MEMBRANE CLEANER; ALLOW TO DRY.
- 2. CONTACT MANUFACTURER OF EXISTING WARRANTED EPDM MEMBRANE ROOFING SYSTEM TO VERIFY ACCEPTANCE OF TIE-IN.
- 3. ON EXISTING BALLASTED ROOFING SYSTEMS, CONSULT RESPECTIVE 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" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.





- 1. METAL (MIN. 24 GA.) SEPARATION SHALL BE PROVIDED BETWEEN PVC MEMBRANE AND ASPHALTIC SHINGLES. REFER TO SPECIFICATIONS.
- 2. VERSICO'S WARRANTY IS LIMITED TO EXPOSED PORTION OF ROOF MEMBRANE.
- 3. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.





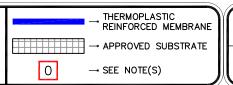
- 1. ON EXISTING WARRANTED ROOFS, SEEK WRITTEN APPROVAL OF ITS MANUFACTURER FOR ACCEPTANCE OF THIS DETAIL. FOR EXISTING BALLASTED SYSTEMS BY OTHERS, CONSULT RESPECTIVE MANUFACTURER FOR ACCEPTABLE GRAVEL CONTAINMENT TO PREVENT GRAVEL MIGRATION.
- 2. <u>EXISTING EPDM/TPO MEMBRANES:</u> CLEAN THE SEAMING AREA WITH WEATHERED MEMBRANE CLEANER AND ALLOW TO DRY. APPLY APPROVED PRIMER.

EXISTING PVC OR KEE MEMBRANES: IF EXISTING MEMBRANE IS NOT ACCEPTABLE FOR WELDING, UTILIZE STEP 1 ACTIVATOR AND STEP 2 PRIMER PROCESS.

- 3. WHEN USING 80-MIL PVC/KEE HP REINFORCED THERMOPLASTIC MEMBRANE, APPLY A 4-1/2" (11cm) DIAMETER THERMOPLASTIC T-JOINT COVER AT ALL FIELD SPLICE INTERSECTIONS.
- 4. WATER CUT-OFF MASTIC MUST BE HELD UNDER CONSTANT COMPRESSION. WHEN RE-ROOFING OVER PRECAST CONCRETE, APPLY LIBERAL BEAD OF WATER CUT-OFF MASTIC IN JOINTS TO PREVENT MOISTURE MIGRATION.

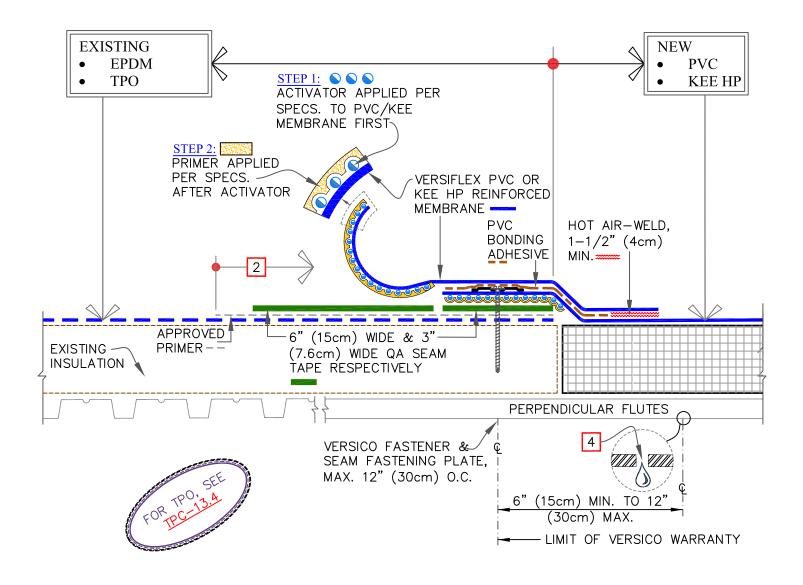


PVC/KEE HP TIE-IN TO EXISTING SINGLE-PLY ROOF MEMBRANES ON CONCRETE DECK

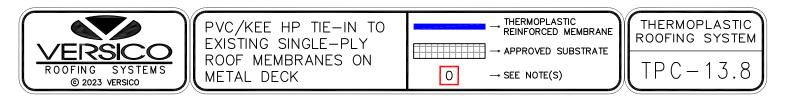


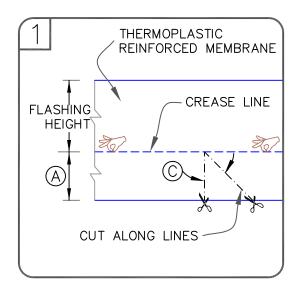
THERMOPLASTIC ROOFING SYSTEM

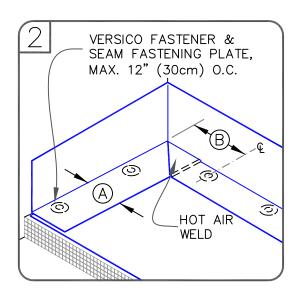
TPC-13.7

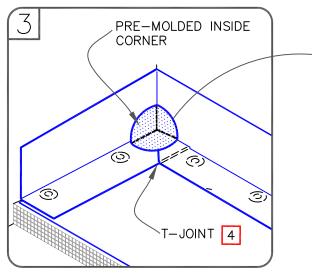


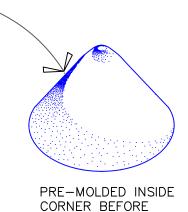
- ON EXISTING WARRANTED ROOFS, SEEK WRITTEN APPROVAL OF ITS MANUFACTURER FOR ACCEPTANCE OF THIS DETAIL. FOR EXISTING BALLASTED SYSTEMS BY OTHERS, CONSULT RESPECTIVE MANUFACTURER FOR ACCEPTABLE GRAVEL CONTAINMENT TO PREVENT GRAVEL MIGRATION.
- 2. <u>EXISTING EPDM/TPO MEMBRANES:</u> CLEAN THE SEAMING AREA WITH WEATHERED MEMBRANE CLEANER AND ALLOW TO DRY. APPLY APPROVED PRIMER.
 - EXISTING PVC OR KEE MEMBRANES: IF EXISTING MEMBRANE IS NOT ACCEPTABLE FOR WELDING, UTILIZE STEP 1 ACTIVATOR AND STEP 2 PRIMER PROCESS.
- 3. WHEN USING 80-MIL PVC/KEE HP REINFORCED THERMOPLASTIC MEMBRANE, APPLY A 4-1/2" (11cm) DIAMETER THERMOPLASTIC T-JOINT COVER AT ALL FIELD SPLICE INTERSECTIONS.
- 4. IF FLUTES ARE PERPENDICULAR, DRILL 3/8" (1cm) DIAMETER WEEP HOLES INTO THE BOTTOM FLUTES OF THE STEEL DECK ALONG THE TIE-IN.











INSTALLATION

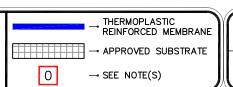
NOTES:

- 1. POSITION FASTENING PLATES 6" TO 9" (15 TO 23cm) FROM THE CORNER AND 1/2" TO 1" (1.5 TO 2.5cm) FROM EDGE OF MEMBRANE.
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO 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" (11cm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

DIMENSIONS		cm	
A	6"	15	APPROX.
B	6"-9"	15-23	
	45-DEGREES APPROX.		

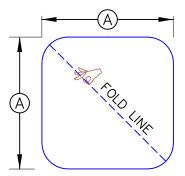


PRE-MOLDED INSIDE CORNER FLASHING

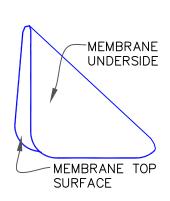


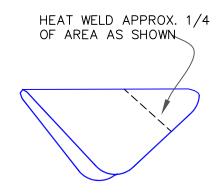
THERMOPLASTIC ROOFING SYSTEM

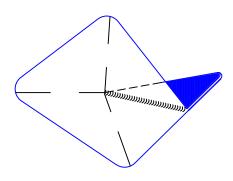
DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS, PRE-FABRICATED/PRE-MOLDED ACCESSORIES MUST BE UTILIZED. ACCEPTABLE FLASHING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAIL TPC-15.1.

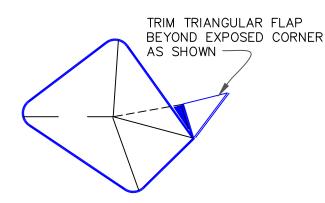


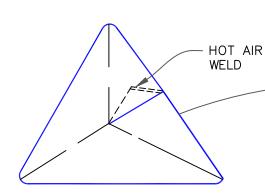
CUT A SECTION OF THERMOPLASTIC NON-REINFORCED MEMBRANE WITH ROUNDED CORNERS



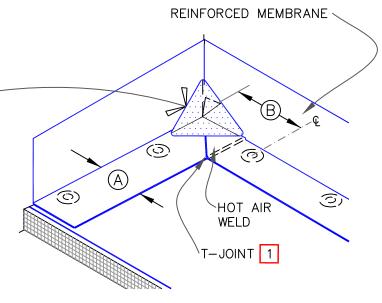








POSITION AND HEAT WELD CORNER IN PLACE AS SHOWN



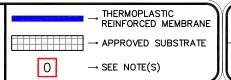
DIMENSIONS		cm	
\bigcirc	6"	15	APPROX.
\bigcirc	6"-9"	15-23	

NOTE:

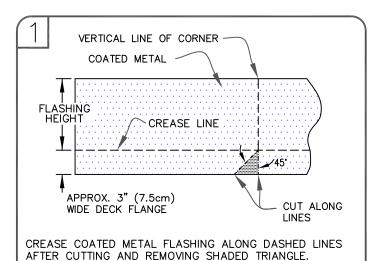
WHEN USING 60 OR 80-MIL MEMBRANE, APPLY A 4-1/2" (11cm) DIAMETER "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.

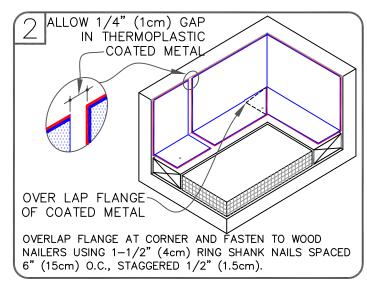


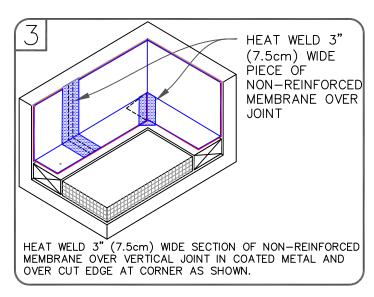
FIELD FABRICATED INSIDE CORNER FLASHING

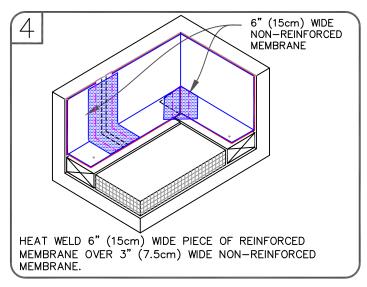


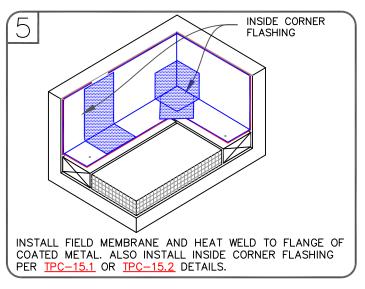
THERMOPLASTIC ROOFING SYSTEM







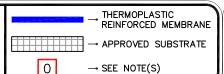




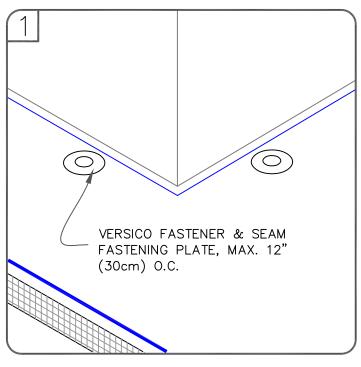
- FASTEN COATED METAL FLASHING TO WOOD NAILERS USING 1-1/2" (4cm) MIN. RING SHANK NAILS SPACED 6" (15cm) ON CENTER AND STAGGERED APPROX. 1/2" (1.5cm).
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

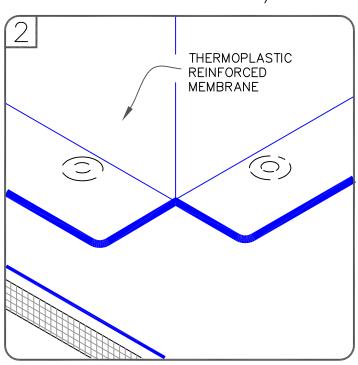


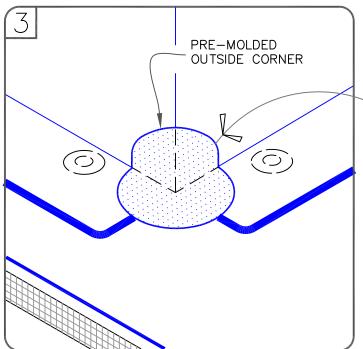
INSIDE CORNER WITH COATED METAL WALL FLASHING

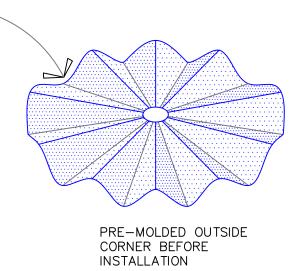


THERMOPLASTIC ROOFING SYSTEM





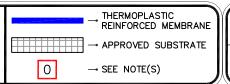




- 1. POSITION FASTENING PLATES 6" (15cm) FROM THE CORNER AND 1/2" TO 1" (1.5 TO 2.5cm) FROM EDGE OF MEMBRANE.
- 2. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
- 3. REFER TO VERSICO SPECIFICATIONS FOR ACCEPTABLE VERSICO FASTENERS AND PLATES.



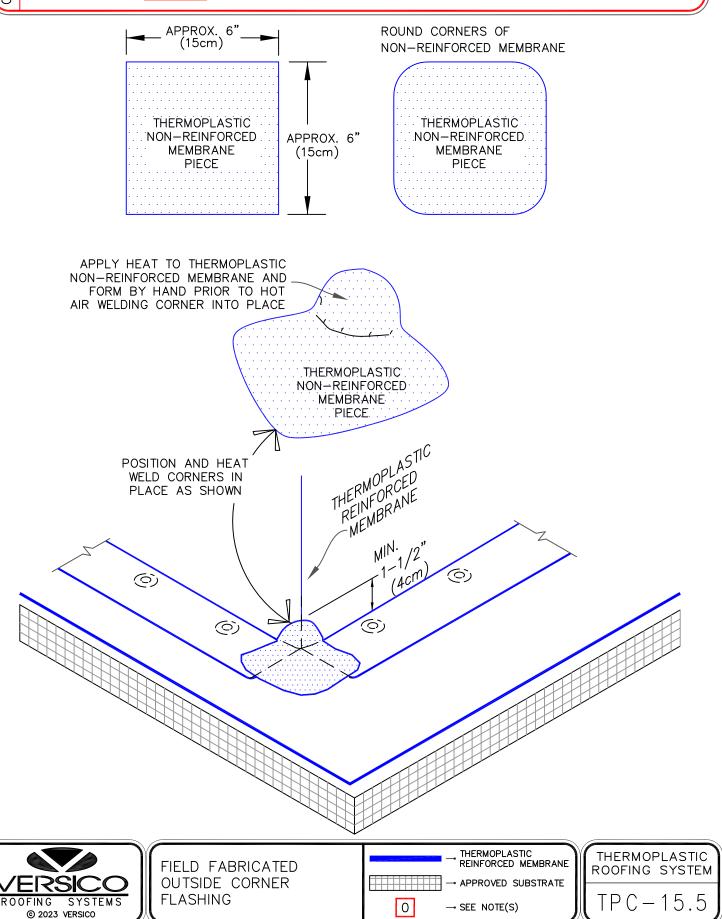
PRE-MOLDED OUTSIDE CORNER FLASHING

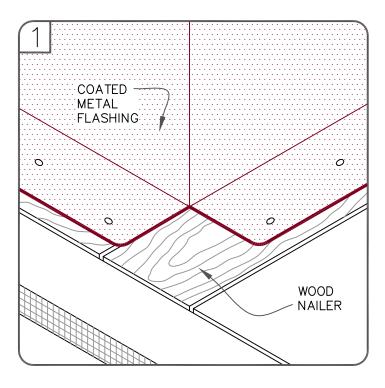


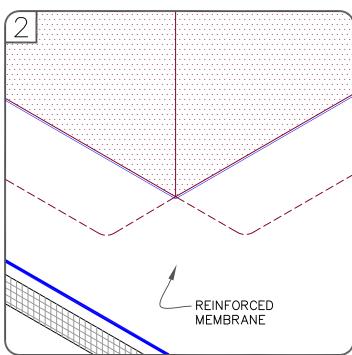
THERMOPLASTIC ROOFING SYSTEM

TPC - 15.4

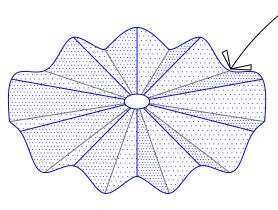
DETAIL NOT FOR USE ON 25 OR 30-YEAR WARRANTY PROJECTS, PRE-FABRICATED/PRE-MOLDED ACCESSORIES MUST BE UTILIZED. ACCEPTABLE FLASHING SHALL CONFORM WITH THERMOPLASTIC COMMON DETAIL $\frac{1}{1}$



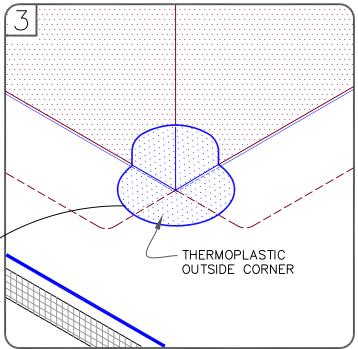




- FASTEN COATED METAL FLASHING TO WOOD NAILERS USING 1-1/2" (38mm) MIN. RING SHANK NAILS SPACED 6" (15cm) ON CENTER AND STAGGERED APPROX. 1/2" (1.5cm).
- 2. REFER TO THERMOPLASTIC TPC-5.2
 DETAIL FOR FLASHING VERTICAL JOINTS
 IN COATED METAL.

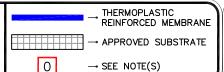


OUTSIDE CORNER BEFORE INSTALLATION





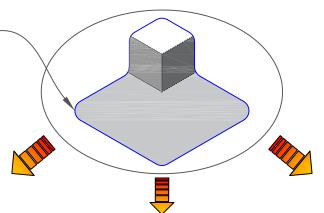
OUTSIDE CORNER WITH COATED METAL WALL FLASHING



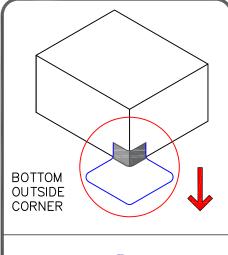
THERMOPLASTIC ROOFING SYSTEM

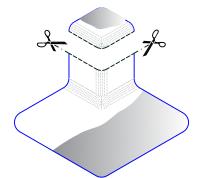
TPC - 15.6

60-MIL (1.27mm) THICK -PVC/TPO, UNIVERSAL CORNERS CAN BE USED FOR 3 DIFFERENT CORNER CONDITIONS AS SHOWN BELOW

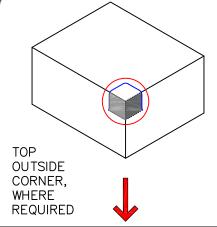


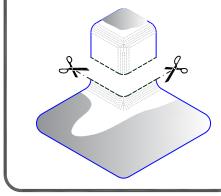
OPTION A



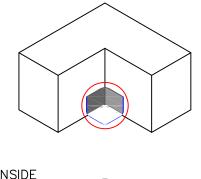


OPTION B

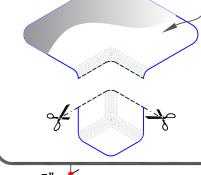




OPTION C

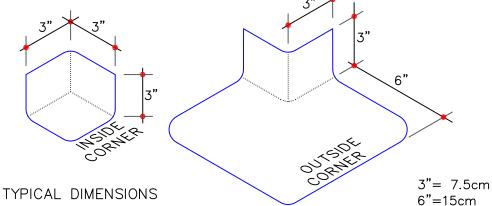






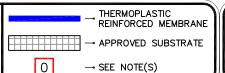
NOTES:

- 1. ROOF SYSTEMS MUST NOT HAVE FIELD FABRICATED OR BUILT-IN CANT STRIP.
- 2. REFER TO TECHNICAL DATA BULLETINS FOR COLOR AVAILABILITY.





PVC OR TPO UNIVERSAL CORNERS — COMBINATION INSIDE & OUTSIDE CORNERS

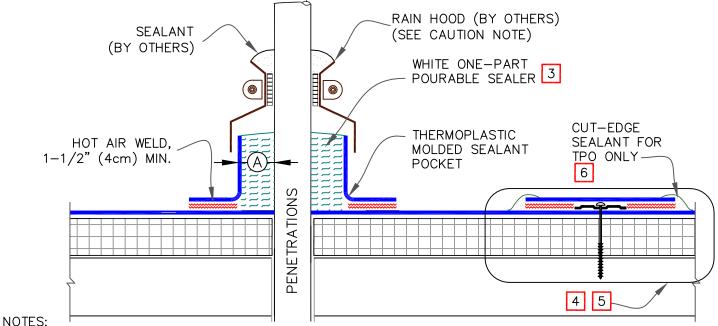


THERMOPLASTIC ROOFING SYSTEM

BOTTOM SIDE UP

CAUTION

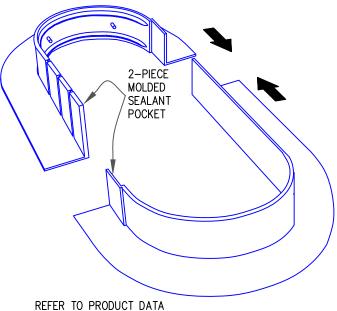
MOLDED SEALANT POCKETS MUST BE USED IN CONJUNCTION WITH RAIN HOODS FOR PROJECTS WITH 25 AND 30-YEAR WARRANTIES.



- 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. WHEN USING PVC MOLDED SEALANT POCKET, CLEAN THE POCKET WITH PVC CLEANER, APPLY TPO PRIMER TO PENETRATION(S) ONLY.
- 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" (15cm). ADDITIONAL FASTENING PLATES WILL BE REQUIRED FOR SEALANT POCKETS GREATER THAN 6" (15cm) IN DIAMETER AND SHALL BE SPACED 12" (30cm) ON CENTER MAXIMUM.
- REFER TO VERSICO SPECIFICATIONS FOR PROPER FASTENERS AND PLATES.
- 6. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

ĺ	DIMENSION		cm	
	A	1"	2.5	MIN.

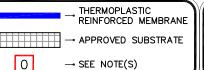
PLACE MOLDED THERMOPLASTIC SEALANT POCKET AROUND PENETRATION AND OVERLAP THE TWO SECTIONS



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

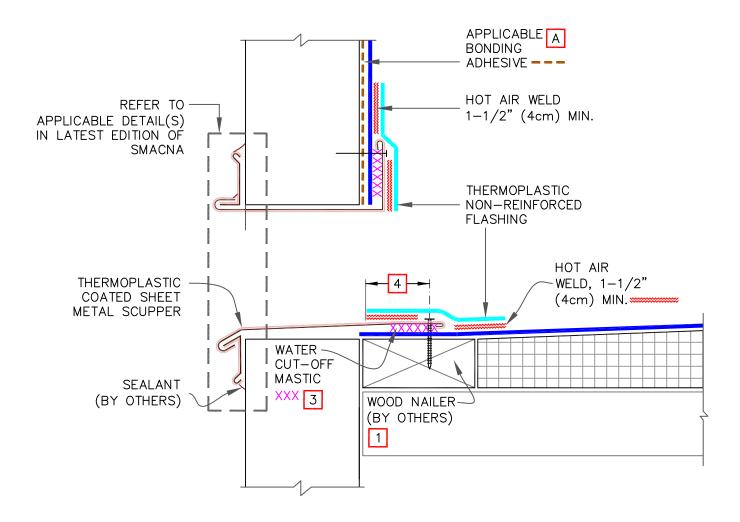


MOLDED SEALANT POCKET

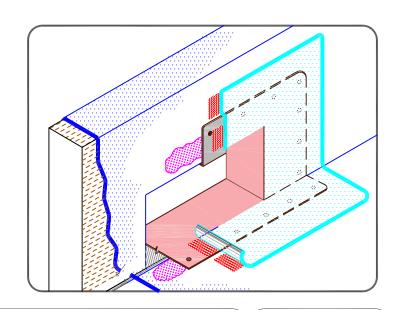


THERMOPLASTIC ROOFING SYSTEM

TPC-16.1

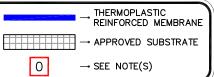


- WOOD NAILERS ARE INSTALLED AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
- 2. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS. SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
- 3. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGES MUST BE UNDER CONSTANT COMPRESSION.
- 4. SCUPPER FLANGES MUST BE TOTALLY COVERED BY NON-REINFORCED FLASHING WITH MINIMUM 2" (5cm) COVERAGE PAST NAIL HEAD.



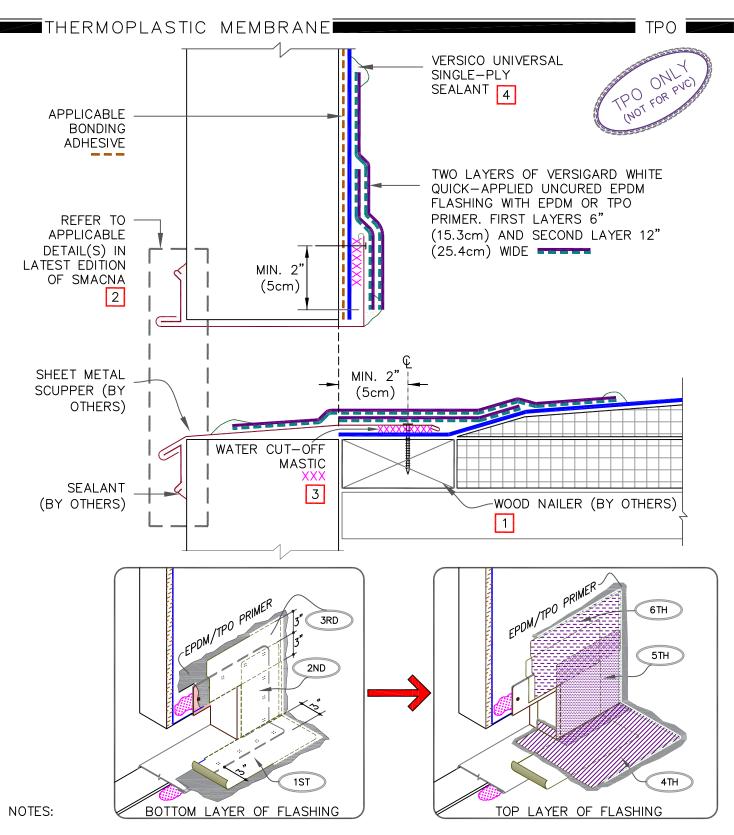


SCUPPER WITH COATED METAL

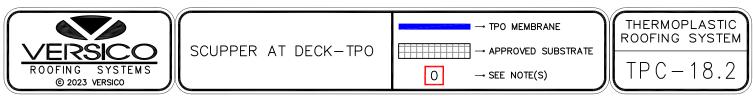


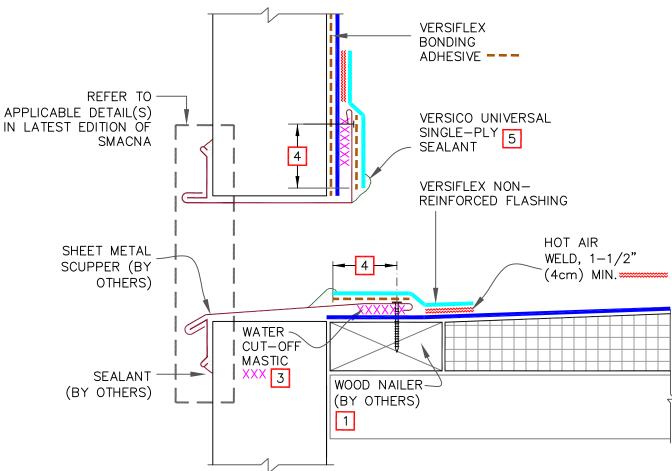
THERMOPLASTIC ROOFING SYSTEM

TPC-18.1



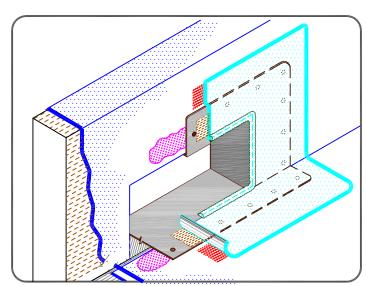
- 1. WOOD NAILERS ARE INSTALLED AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
- 2. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS WATER—TIGHT.
- 3. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGES MUST BE UNDER CONSTANT COMPRESSION.
- 4. 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.





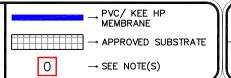
- 1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
- 2. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
- 3. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT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





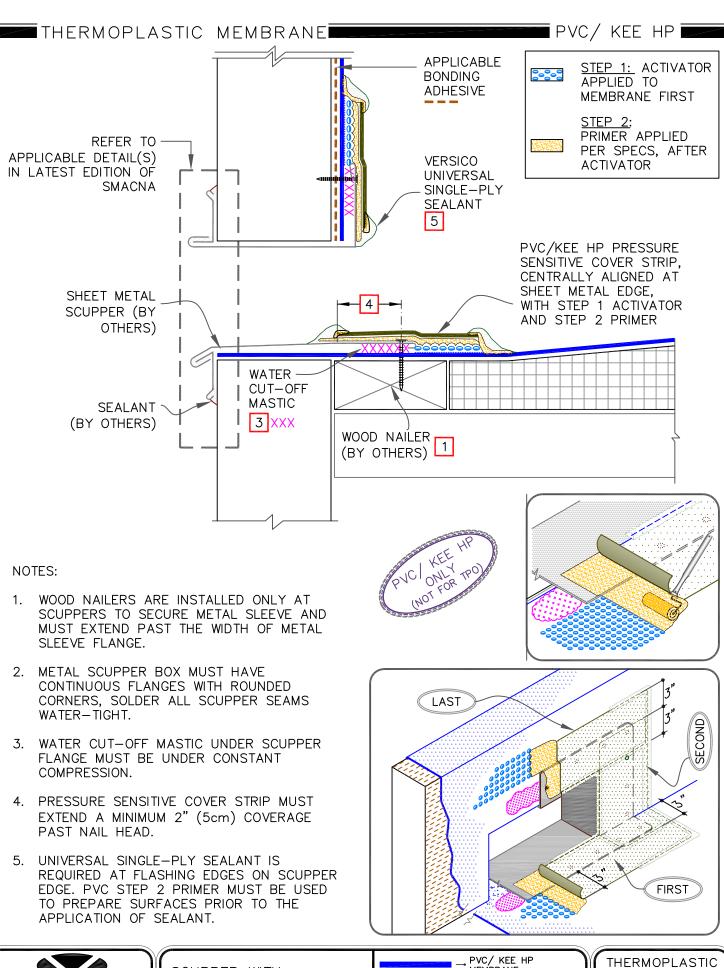


SCUPPER AT DECK-PVC/KEE HP



THERMOPLASTIC ROOFING SYSTEM

TPC - 18.3



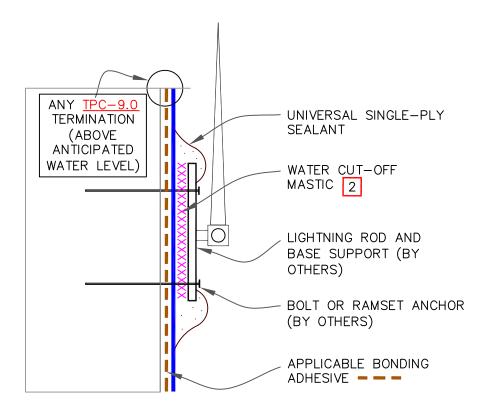


SCUPPER WITH
VERSIFLEX PVC PS
COVER STRIP FLASHING



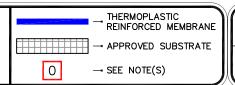
THERMOPLASTIC 'ROOFING SYSTEM

PC-18.4



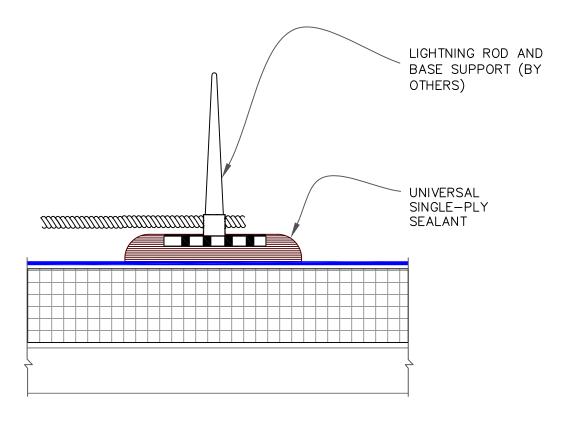
- 1. DETAIL MAY BE USED FOR ANY FASTENER PENETRATION (E.G., ACCESS LADDER, ANCHOR SUPPORT TO PARAPET).
- 2. WATER CUT-OFF MASTIC MUST BE UNDER CONSTANT COMPRESSION.
- 3. DETAIL UNACCEPTABLE FOR HORIZONTAL APPLICATION ON ROOF DECK.
- 4. COMPLY WITH ZONING ORDNANCE AND LOCAL CODES FOR MOUNTING A LIGHTNING SYSTEM.

LIGHTNING ROD AT PARAPET (VERTICAL ATTACHMENT)



THERMOPLASTIC ROOFING SYSTEM

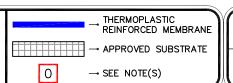
TPC - 20.1



- 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.
- 3. COMPLY WITH ZONING ORDNANCE AND LOCAL CODES FOR MOUNTING A LIGHTNING SYSTEM.

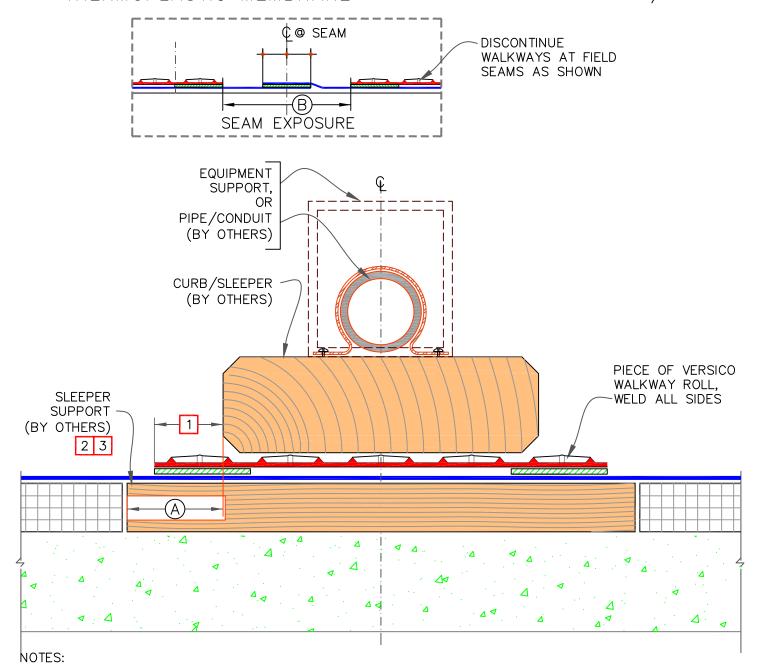


LIGHTNING ROD AT DECK LEVEL



THERMOPLASTIC ROOFING SYSTEM

IPC - 20.2



- 1. SLEEPER MUST BE LARGE ENOUGH TO SUPPORT WEIGHT OF EQUIPMENT WITHOUT INDENTING INSULATION. EXTEND SLEEPER OUT AS REQUIRED BY STRUCTURAL ENGINEER TO DISTRIBUTE SUBJECT LOAD OR AT LEAST EXTEND OUT MIN. 3" (7.5cm).
- 2. ENSURE SCREW/ANCHOR HEADS IN TOP SURFACE OF WOOD BLOCKING ARE RECESSED TO PROTECT MEMBRANE.

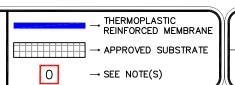
- 3. SLEEPER NOT REQUIRED UNDER CONDUIT OR PIPE SUPPORTS.
- 4. CONSULT STRUCTURAL ENGINEER AND/OR SPECIFIER TO AVOID WATER PONDING DUE TO DECK DEFLECTION.
- 5. RAISE CONDUIT AND PIPES ABOVE THE REGIONAL SNOW LINE WHEN SLOPE OF THE ROOF CAN LEAD TO SLIDING SNOW.

DIMENSIONS		cm	
A	3"	7.5	MIN. ALL SIDES
lacksquare	8"	20	

WELD



SLEEPER DETAIL



THERMOPLASTIC ROOFING SYSTEM

TPC-24