



NEMO|etc.

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ENGINEER

EVALUATE

TEST

CONSULT

P.E. EVALUATION REPORT (PEER)

Flex Membrane International Corp

2670 Leisch's Bridge Rd, Suite 400
Leesport, PA 19533
(610) 916-9500

PEER-FMI-002.A.R7

FL9798-R9 (NON-HVHZ)

Date of Issuance: 04/21/2009

Revision 7: 08/29/2023

SCOPE:

This P.E. Evaluation Report (henceforth 'PEER') is issued under [Rule 61G20-3](#) and the applicable rules and regulations governing the use of construction materials in the State of Florida. The documentation submitted has been reviewed by Robert Nieminen, P.E. for use of the product under the Florida Building Code. The product described herein has been evaluated for compliance with the **8th Edition (2023) Florida Building Code** [sections noted herein](#).

DESCRIPTION: Flex TPO Plus Single Ply Roof Systems (NON-HVHZ)

LABELING: Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein.

CONTINUED COMPLIANCE: This PEER is valid until such time as the named product(s) changes, the referenced Quality Assurance or production facility location(s) changes, or Code provisions that relate to the product(s) change. Acceptance of our PEERs by the named client constitutes agreement to notify NEMO ETC, LLC of any changes to the product(s), the Quality Assurance or the production facility location(s). NEMO ETC, LLC requires a complete review of its PEER relative to updated Code requirements with each Code Cycle.

ADVERTISEMENT: The Florida Product Approval Number (FL#) preceded by the words "NEMO P.E. Evaluated" may be displayed in advertising literature. If any portion of the PEER is displayed, then it shall be done in its entirety.

INSPECTION: Upon request, a copy of this entire PEER shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

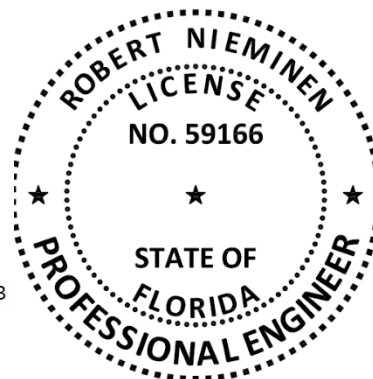
This PEER consists of pages 1 through 3, plus an 8-page Appendix.

Prepared by:

Digitally signed by
Robert Nieminen
Date: 2023.08.29
'09:05:00 -04'00

This item has been digitally signed and sealed by Robert Nieminen, P.E.

Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.
Robert Nieminen, Florida P.E. 59166, FBC ANE1983
NEMO ETC, LLC, Florida CA #32455



CERTIFICATION OF INDEPENDENCE:

1. NEMO ETC, LLC does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products it evaluates.
2. NEMO ETC, LLC is not owned, operated or controlled by any company manufacturing or distributing products it evaluates.
3. Robert Nieminen, P.E. does not have nor will acquire, a financial interest in any company manufacturing or distributing products for which the PEERs are being issued.
4. Robert Nieminen, P.E. does not have, nor will acquire, a financial interest in any other entity involved in the approval process of the product.
5. This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this PEER, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.

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ROOFING SYSTEMS EVALUATION:
1. SCOPE:

Product Category: Roofing
Sub-Category: Single Ply Roof Systems
Product Approval Method: Method 1, Option D: Codified Material, Evaluation by Engineer
Compliance Statement: **Flex TPO Plus Single Ply Roof Systems**, as produced by **Flex Membrane International Corp** have demonstrated compliance with the following sections of the **8th Edition (2023) Florida Building Code** through testing in accordance with the following Standards. Compliance is subject to the [Installation Requirements](#) and [Limitations of Use](#) set forth herein.

2. STANDARDS:

Section	Property	Standard	Year
1504.3.1	Wind resistance	FM 4474	2011
1504.6	Physical properties	ASTM G155	2013
1504.7	Impact resistance	FM 4470	2016
1507.12.2	Material standard	ASTM D6878	2021

3. REFERENCES:

Entity	Examination	Reference	Date
NEMO	PEER	PEER-CRL-003.A	04/14/2023
FM Approvals (TST1867)	FM4470/4474	3030369	08/16/2007
FM Approvals (TST1867)	FM4470/4474	3036349	06/22/2009
UL LLC (QUA9625)	Quality Control	Service confirmation	01/10/2018
UL LLC (QUA9625)	Quality Control	Florida BCIS	Current

4. PRODUCT DESCRIPTION:

This PEER covers **Flex TPO Plus Single Ply Roof Systems** installed in accordance with **Flex Membrane International Corp** published installation instructions and the [Limitations of Use](#) herein.

TABLE 1: EVALUATED MEMBRANES

Product	Nominal Thickness (mil)	Material Standard	Plant(s)
Flex TPO Plus	45, 60	ASTM D6878	PA
Flex TPO Plus Extra	72, 80	ASTM D6878	PA

5. LIMITATIONS:

- 5.1 This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this PEER, or previous versions thereof, is/was used for permitting or design guidance. PEERs are not to be construed as representing any attributes not specifically listed, nor are PEERs to be construed as an endorsement of the subject, or a recommendation for its use. There is no warranty by NEMO ETC, LLC or Robert Nieminen, P.E., express or implied, as to any finding or other matter in this PEER, or as to any product covered by the PEER.
- 5.2 This PEER is not for use in FBC High Velocity Hurricane Zone jurisdictions, as defined in FBC Chapter 2 (Broward and Miami-Dade Counties).
- 5.3 This PEER pertains to above-deck roof components. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction.
- 5.4 This PEER does not include evaluation of fire classification. Refer to **FBC 1505** for requirements and limitations regarding roof assembly fire classification. Refer to **FBC 2603** for requirements and limitations concerning the use of foam plastic insulation.
- 5.5 This PEER does not include evaluation of roof edge termination. Refer to **FBC 1504.5** for requirements and limitations regarding edge securement for low-slope roofs.

- 5.6 Refer to **FBC 1511** for requirements and limitations regarding recover installations.
- 5.6.1 For mechanically attached components over existing roof decks, fasteners shall be tested in the existing deck for withdrawal resistance. A qualified design professional shall review the data for comparison to the minimum requirements for the system. Testing shall be in accordance with [ANSI/SPRI FX-1](#) or [Testing Application Standard TAS 105](#).
- 5.6.2 For bonded insulation or membrane over existing substrates in a re-roof (tear off) or recover installation, the existing deck or existing roof surface shall be examined for compatibility with the adhesive to be installed. If any surface conditions exist that bring system performance into question, field uplift testing in accordance with [ANSI/SPRI IA-1](#), [ASTM E907](#), [FM Loss Prevention Data Sheet 1-52](#) or [Testing Application Standard TAS 124](#) shall be conducted on mock-ups of the proposed new roof assembly.
- 5.6.3 For bonded insulation or membrane over existing substrates in a recover installation, the existing roof system shall be capable of resisting project design pressures on its own merit to the satisfaction of the Authority Having Jurisdiction, as documented through field uplift testing in accordance with [ASTM E907](#), [FM Loss Prevention Data Sheet 1-52](#) or [Testing Application Standard TAS 124](#).
- 5.7 Refer to Appendix 1 for system attachment requirements for wind load resistance.
- 5.7.1 “MDP” = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads, and reflects the ultimate passing pressure divided by 2 (the 2 to 1 margin of safety per **FBC 1504.9** has already been applied). Refer to **FBC 1609** for determination of design wind loads.
- 5.7.2 For mechanically attached components or partially-bonded insulation, the maximum design pressure for the selected assembly shall meet or exceed at least the Zone 1 PRIME design pressure determined in accordance with **FBC Chapter 16**. Elevated pressure zones shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Commonly used methods are [ANSI/SPRI WD1](#), [FM Loss Prevention Data Sheet 1-29](#), [Roofing Application Standard RAS 117](#) or [RAS 137](#). Assemblies marked with an asterisk* carry the limitations set forth in [Section 2.2.10.1 of FM Loss Prevention Data Sheet 1-29 \(February 2020\)](#) for Zone 2/3 enhancements
- 5.7.3 For assemblies with all components fully bonded in place, the maximum design pressure for the selected assembly shall meet or exceed critical design pressure determined in accordance with **FBC Chapter 16**. No rational analysis is permitted for these systems.
- 5.8 All components in the roof assembly shall have quality assurance audit in accordance with **F.A.C. Rule 61G20-3**. Refer to the Product Approval of the component manufacturer for components listed in Appendix 1 that are produced by a Product Manufacturer other than the report holder on [Page 1](#) of this PEER.

6. INSTALLATION:

Flex TPO Plus Single Ply Roof Systems shall be installed in accordance with **Flex Membrane International Corp** published installation instructions, subject to the [Limitations of Use](#) noted herein.

7. BUILDING PERMIT REQUIREMENTS:

As required by the Building Official or Authority Having Jurisdiction to properly evaluate the installation of this product.

8. MANUFACTURING PLANTS:

Contact the named QA entity for manufacturing facilities covered by **F.A.C. Rule 61G20-3** QA requirements. Refer to [Section 4](#) herein for products and production locations having met codified material standards.

9. QUALITY ASSURANCE ENTITY:

[UL, LLC – QUA9625](#): (360) 817-5512; bsai.inspections@ul.com

- THE 8-PAGES THAT FOLLOW FORM PART OF THIS PEER -

APPENDIX 1: ATTACHMENT REQUIREMENTS FOR WIND UPLIFT RESISTANCE

TABLE	DECK	APPLICATION	TYPE	DESCRIPTION	PAGE
1A	Wood	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Roof Cover	3
2A	Steel or Structural concrete	New, Reroof (Tear-Off), Recover	B-1	Mech. Attached Base Insulation, Bonded Top Insulation, Bonded Roof Cover	3
2B	Steel or Structural concrete	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Roof Cover	4
2C	Steel	New, Reroof (Tear-Off), Recover	C-2	Mechanically Attached Insulation, Induction-Welded Roof Cover	5
2D	Steel or Structural concrete	New, Reroof (Tear-Off), Recover	D-1	Insulated, Mechanically Attached Roof Cover	5
3A	Structural concrete	New, Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	8
4A	Various	Recover	A-1	Bonded Insulation, Bonded Roof Cover	8

The following notes apply to the systems outlined herein:

- The roof system evaluation herein pertains to above-deck roof components. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction.
- Unless otherwise noted, fasteners and stress plates shall be as follows. Fasteners shall be of sufficient length for the following engagements:
 - Wood Deck: Flex HD 14 Fastener with Flex TPO ISO Plate. Min. 0.75-inch plywood penetration or minimum 1-inch wood plank embedment.
 - Steel Deck: Flex HD 14 Fastener with Flex TPO ISO Plate. Minimum 0.75-inch steel penetration, engage the top flute of the steel deck.
 - Structural Concrete: Flex HD 14 Fastener with Flex TPO ISO Plate. Minimum 1-inch embedment. Fasteners installed with a pilot hole in accordance with the fastener manufacturer's published installation instructions.
- Unless otherwise noted, insulation may be any one layer or combination of FBC Approved (Local or Statewide) board(s) that meet FBC 1505 and, for foam plastic, FBC Chapter 26, when installed with the roof cover.
- Minimum 200 psi, minimum 2-inch thick FBC Approved lightweight insulating concrete may be substituted for rigid insulation board for System Types B-1, C-1, C-2, D-1 or D-2, whereby fasteners are installed through the lightweight insulating concrete to engage the structural deck. The structural deck shall be of equal or greater type, thickness and strength to the steel and structural concrete deck listings. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction. This is a wind uplift resistance allowance and does not purport to address non-wind-uplift-related issues, such as deck venting or moisture levels within the LWIC and the potential effect on overlying components.
- Preliminary insulation attachment for System Type D: Unless otherwise noted, refer to Section 2.2.10.1.3 of [FM Loss Prevention Data Sheet](#) 1-29.
- Unless otherwise noted, insulation adhesive application rates are as follows. The ribbons/beads shall expand as noted in the manufacturer's published instructions.
 - OMG "OlyBond 500 Adhesive Fastener" or "OlyBond 500 Green" (OB500): Continuous ribbons, 12-inch o.c. using OMG PaceCart, SpotShot or Canister delivery methods.
 - Note: When multiple layers(s) of insulation and/or coverboard are installed in ribbon-applied adhesive, board joints shall be staggered.
 - Note: The maximum edge distance from the adhesive ribbon to the edge of the insulation board shall be not less than one-half the specified ribbons spacing.
- Unless otherwise noted, all insulations are flat-stock or taper board of the minimum thickness noted. Tapered polyisocyanurate at the following thickness limitations may be substituted with the following Maximum Design Pressure (MDP) limitations. In no case shall these values be used to 'increase' the MDP listings in the tables; rather if MDP listing below meets or exceeds that listed for a particular system in the tables, then the thinner board listed below may be used as a drop-in for the equivalent thicker material listed in the table.
 - OMG "OlyBond 500 Adhesive Fastener" (OB500): MDP = -315.0 psf (Min. 0.5-inch thick Hunter Panels "H-Shield" or Johns Manville "ENRGY 3")
 - OMG "OlyBond 500 Adhesive Fastener" (OB500): MDP = -487.5 psf (Min. 0.5-inch thick Atlas Roofing "ACFoam II" or Flex ISO II)
- For adhered roof insulation and board-size: Unless otherwise noted, refer to Section 2.2.10.6.2 of [FM Loss Prevention Data Sheet](#) 1-29.

- 9 For mechanically attached components or partially-bonded insulation, the maximum design pressure for the selected assembly shall meet or exceed at least the Zone 1 PRIME design pressure determined in accordance with FBC Chapter 16. Elevated pressure zones shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Commonly used methods are [ANSI/SPRI WD1](#), [FM Loss Prevention Data Sheet](#) 1-29, [Roofing Application Standard](#) RAS 117 and [Roofing Application Standard](#) RAS 137. Assemblies marked with an asterisk* carry the limitations set forth in Section 2.2.10.1 of [FM Loss Prevention Data Sheet](#) 1-29 for Zone 2/3 enhancements.
- 10 For assemblies with all components fully bonded, the maximum design pressure for the selected assembly shall meet or exceed critical design pressure determined in accordance with FBC Chapter 16. No rational analysis is permitted for these systems.
- 11 For mechanically attached components over existing decks, fasteners shall be tested in the existing deck for withdrawal resistance. A qualified design professional shall review the data for comparison to the minimum requirements for the system. Testing and analysis shall be in accordance with [ANSI/SPRI FX-1](#) or [Testing Application Standard](#) TAS 105.
- 12 For bonded insulation or membrane over existing substrates in a re-roof (tear off) or recover installation, the existing deck or existing roof surface shall be examined for compatibility with the adhesive to be installed. If any surface conditions exist that bring system performance into question, field uplift testing in accordance shall be conducted on mock-ups of the proposed new roof assembly. For bonded insulation or membrane over existing substrates in a recover installation, the existing roof system shall be capable of resisting project design pressures on its own merit to the satisfaction of the Authority Having Jurisdiction, as documented through field uplift testing. Field uplift testing shall be in accordance with ASTM E907, [FM Loss Prevention Data Sheet](#) 1-52 or [Testing Application Standard](#) TAS 124.
- 13 Refer to FBC 1511 for requirements and limitations regarding recover installations. For Structural Concrete Deck or Recover Applications using System Type C-1, C-2, D-1 or D-2, the insulation is optional. Alternatively, an FBC Approved insulation board or coverboard may be used as a separation layer. Board products shall be preliminarily attached prior to roof cover installation ([Note 5](#)). The separator component shall be documented as meeting FBC 1505 and, for foam plastic, FBC Chapter 26, when installed with the roof cover in Recover applications.
- 14 Lightweight insulating concrete (LWIC) shall be cast in accordance with FBC Section 1917 to the satisfaction of the Authority Having Jurisdiction. For systems where specific LWIC is referenced, refer to current LWIC Product Approval for specific deck construction and limitations. Unless otherwise noted, for systems where specific LWIC is not referenced, the minimum design mix shall be 300 psi. In all cases, the minimum top-coat thickness is 2-inches. For LWIC over structural concrete, reference is made to FBC Section 1917.4.1, Point 1. For “pre-existent” LWIC references, listings were established through testing over lightweight concrete cast using only foaming agent (ASTM C896), water and Portland cement (ASTM C150), with no proprietary additives, in accordance with procedures adopted by Miami-Dade BCCO (FBC CER1592). Use of these listings in new construction or re-roof (tear-off) applications is at the discretion of the Designer or Record and Authority Having Jurisdiction.
- 15 For bonded membrane applications, unless otherwise noted, refer to the following.

MEMBRANE / ADHESIVE COMBINATIONS			
MEMBRANE	ADHESIVE	APPLICATION	RATE
Flex TPO Plus or Flex TPO Plus Extra	Flex TPO WB Adhesive	Contact application	combined rate of 120 ft ² /gal (0.42 gal/square/surface)
Flex TPO Plus or Flex TPO Plus Extra	Flex TPO Bonding Adhesive	Contact application	combined rate of 60 ft ² /gal (0.83 gal/square/surface)

- 15A For single-ply membranes in System Type D-1 steel deck applications, the roof membrane shall be run with its length perpendicular to the steel deck flutes.
- 15B For System Type C-2 (induction weld), care shall be taken to ensure that the plates do not line-up with membrane seams. This condition may preclude proper induction welding of the membrane to the plates.
- 16 “MDP” = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads. Refer to FBC 1609 for determination of design wind loads ([Note 9](#), [Note 10](#)).

TABLE 1A: WOOD DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE C-1: MECHANICALLY ATTACHED INSULATION, BONDED ROOF COVER

System No.	Deck (Note 1)	Base Insulation Layer (Note 3, Note 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
W-1	Min. 19/32-inch CDX plywood or wood plank; 2-ft spans	(Optional) One or more layers, any combination, loose laid	Min. 1.5-inch Flex ISO II or ENRGY 3	Note 2	1 per 2.0 ft²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*

TABLE 2A: STEEL or STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE B-1: MECHANICALLY ATTACHED BASE INSULATION, BONDED TOP INSULATION, BONDED ROOF COVER

System No.	Deck (Note 1)	Base Insulation Layer			Top Insulation Layer		Roof Cover (Note 15)	MDP (psf)
		Type	Fastener (Note 11)	Attach	Type	Attach (Notes 6,7,8)		
SC-1	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 0.5-inch DensDeck or DensDeck Prime	Note 2	1 per 2.0 ft²	Min. 1.5-inch Flex ISO II, H-Shield, ENRGY 3 followed by Min. 0.25-inch DensDeck Prime	OB500	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-37.5*
SC-2	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 2.0 ft²	Additional layers of base insulation	OB500	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-3	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 2.0 ft²	Min. 0.25-inch DensDeck or DensDeck Prime	OB500	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-4	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 0.5-inch DensDeck or DensDeck Prime	Note 2	1 per 2.0 ft²	Min. 1.5-inch Flex ISO II, H-Shield, ENRGY 3	OB500	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-5	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 4.0 ft²	Additional layers of base insulation	OB500	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-6	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 4.0 ft²	Min. 0.25-inch DensDeck or DensDeck Prime	OB500	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*

TABLE 2B: STEEL or STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE C-1: MECHANICALLY ATTACHED INSULATION, BONDED ROOF COVER

System No.	Deck (Note 1)	Base Insulation Layer (Note 3 , Note 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
SC-7	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 1.5-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 3.2 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO Plus Adhesive	-30.0*
SC-8	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5" thick, one or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Trufast SIP LD Fasteners	1 per 3.2 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-30.0*
SC-9	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 1-inch Flex ISO II or ENRGY 3	Note 2	1 per 1.6 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-37.5*
SC-10	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 1.5-inch H-Shield	Note 2	1 per 3.2 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO Plus Adhesive	-37.5*
SC-11	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5" thick, one or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Tru-Fast SIP LD Fasteners	1 per 3.2 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-37.5*
SC-12	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 1-inch H-Shield	Note 2	1 per 1.6 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive, Flex TPO Bonding Adhesive	-45.0*
SC-13	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 1.5-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 2.0 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-14	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 2.0-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 4.0 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-15	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5" thick, one or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Trufast SIP LD Fasteners	1 per 2.7 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-16	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5" thick, one or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Tru-Fast SIP LD Fasteners	1 per 2.7 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-17	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Note 2	1 per 3.6 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive or Flex TPO Bonding Adhesive	-45.0*
SC-18	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5" thick, one or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Note 2	1 per 1.9 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO WB Adhesive	-52.5

TABLE 2B: STEEL or STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE C-1: MECHANICALLY ATTACHED INSULATION, BONDED ROOF COVER

System No.	Deck (Note 1)	Base Insulation Layer (Note 3, Note 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
SC-19	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5" thick, one or more layers, any combination, loose laid	Min 7/16" APA or TECO rated OSB	Note 2	1 per 1.9 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO Bonding Adhesive	-75.0
SC-20	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers, any combination, loose laid	Min 2.0-inch Flex ISO II, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 1.6 ft ²	Flex TPO Plus or Flex TPO Plus Extra / Flex TPO Bonding Adhesive	-75.0

TABLE 2C: STEEL DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE C-2: MECHANICALLY ATTACHED INSULATION, INDUCTION-WELDED ROOF COVER

System No.	Deck (Note 1)	Insulation Layer (Note 3, Note 13)	Attachment		Roof Cover (Note 15B)	MDP (psf)
			Fasteners (Note 11)	Density		
SC-21	Min. 22 ga., type B, Grade 33 steel	Min. 1-inch thick, one or more layers, any combination*	Flex TPO HP Fasteners and RHINO BOND Insulation Plates (TPO) fastened through to deck	1 per 5.3 ft ² (6 parts per 4 x 8 ft board)	Flex TPO Plus induction welded using RHINO BOND Portable Bonding Tool, per manufacturer's published instructions.	-45.0*
SC-22	Min. 22 ga., type B, Grade 33 steel	Min. 1-inch thick, one or more layers, any combination*	Flex TPO HP Fasteners and RHINO BOND Insulation Plates (TPO) fastened through to deck	1 per 4.0 ft ² (8 parts per 4 x 8 ft board)	Flex TPO Plus induction welded using RHINO BOND Portable Bonding Tool, per manufacturer's published instructions.	-52.5
SC-23	Min. 22 ga., type B, Grade 80 steel	Min. 1-inch thick, one or more layers, any combination*	Flex TPO HP Fasteners and RHINO BOND Insulation Plates (TPO) fastened through to deck	1 per 4.0 ft ² (8 parts per 4 x 8 ft board)	Flex TPO Plus induction welded using RHINO BOND Portable Bonding Tool, per manufacturer's published instructions.	-60.0

* For these assemblies, the 8 ft insulation board length is placed perpendicular to the steel deck ribs with the plate/fastener combination offset 12 inch from adjacent rows.

TABLE 2D: STEEL or STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE D-1: INSULATED, MECHANICALLY ATTACHED ROOF COVER

System No.	Deck (Note 1)	Insulation Layer (Note 3, Note 13)		Roof Cover (Note 15)						MDP (psf)
		Type	Attach (Note 5)	Membrane	Fasteners (Note 11)	Fastener Spacing	Lap Width	Lap Spacing	Seam Weld	
SC-24	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	12-inch o.c.	5.5-inch	138.5-inch o.c.	1.5-inch outside	-30.0
SC-25	Min. 22 ga., type B, Grade 33 steel	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Trufast #15 EHD Fastener with Trufast 2.4" Barbed Metal Seam Plate	12-inch o.c.	5.5-inch	138-inch o.c.	1.5-inch outside	-30.0

TABLE 2D: STEEL or STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE D-1: INSULATED, MECHANICALLY ATTACHED ROOF COVER

System No.	Deck (Note 1)	Insulation Layer (Note 3 , Note 13)		Roof Cover (Note 15)						MDP (psf)
		Type	Attach (Note 5)	Membrane	Fasteners (Note 11)	Fastener Spacing	Lap Width	Lap Spacing	Seam Weld	
SC-26	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	12-inch o.c.	5.5-inch	90.5-inch o.c.	1.5-inch outside	-30.0
SC-27	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	18-inch o.c.	5.5-inch	66.5-inch o.c.	1.5-inch outside	-30.0
SC-28	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	12-inch o.c.	5.5-inch	114.5-inch o.c.	1.5-inch outside	-37.5
SC-29	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus	Flex TPO HP-X Fasteners and Flex TPO Plus Xtra Plates (steel only) or Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) Fasteners and Flex HP Plus Plates	12-inch o.c.	5.5-inch	114.5-inch o.c.	1.5-inch outside	-45.0
SC-30	Min. 18 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	12-inch o.c.	5.5-inch	114.5-inch o.c.	1.5-inch outside	-45.0
SC-31	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	114.5-inch o.c.	1.5-inch outside	-45.0
SC-32	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP-X Fasteners and Flex TPO Plus Xtra Plates (steel only) or Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) Fasteners and Flex HP Plus Plates	12-inch o.c.	5.5-inch	90.5-inch o.c.	1.5-inch outside	-45.0
SC-33	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	12-inch o.c.	5.5-inch	90.5-inch o.c.	1.5-inch outside	-45.0
SC-34	Min. 22 ga., type B, Grade 33 steel	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Trufast #15 EHD Fastener with Trufast 2.4" Barbed Metal Seam Plate	12-inch o.c.	5.5-inch	90.5-inch o.c.	1.5-inch outside	-45.0
SC-35	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	138.5-inch o.c.	1.5-inch outside	-52.5
SC-36	Min. 22 ga., type B, Grade 33 steel	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Trufast #15 EHD Fastener with Trufast 2.4" Barbed Metal Seam Plate	6-inch o.c.	6-inch	138.5-inch o.c.	1.5-inch outside	-52.5

TABLE 2D: STEEL or STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE D-1: INSULATED, MECHANICALLY ATTACHED ROOF COVER

System No.	Deck (Note 1)	Insulation Layer (Note 3 , Note 13)		Roof Cover (Note 15)						MDP (psf)
		Type	Attach (Note 5)	Membrane	Fasteners (Note 11)	Fastener Spacing	Lap Width	Lap Spacing	Seam Weld	
SC-37	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	90.5-inch o.c.	1.5-inch outside	-52.5
SC-38	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	12-inch o.c.	5.5-inch	42.5-inch o.c.	1.5-inch outside	-52.5
SC-39	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP-X Fasteners and Flex TPO Plus Xtra Plates (steel only) or Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) Fasteners and Flex HP Plus Plates	6-inch o.c.	5.5-inch	138.5-inch o.c.	1.5-inch outside	-60.0
SC-40	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	138.5-inch o.c.	1.5-inch outside	-60.0
SC-41	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	114.5-inch o.c.	1.5-inch outside	-60.0
SC-42	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	90.5-inch o.c.	1.5-inch outside	-67.5
SC-43	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO HP Fasteners (steel only), Carlisle HD 14-10 (concrete only) or CD-10 (concrete only) and Flex TPO Plus Plates	6-inch o.c.	5.5-inch	42.5-inch o.c.	1.5-inch outside	-82.5
SC-44	Min. 22 ga., type B, Grade 80 steel	One or more layers, any combination	Preliminarily attached	Flex TPO Plus or Flex TPO Plus Extra	Trufast #15 EHD Fastener with Trufast 2.4" Barbed Metal Seam Plate	6-inch o.c.	6-inch	42.5-inch o.c.	1.5-inch outside	-112.5

TABLE 3A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION or REROOF (Tear-Off)
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER

System No.	Deck (Note 1)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Note 15)		MDP (psf)
		Type	Attach (Notes 6,7,8)	Type	Attach (Notes 6,7,8)	Membrane	Application	
C-1.	Min. 2,500 psi structural concrete	Min. 1.5-inch Flex ISO II or H-Shield	OB500	Min. 0.25-inch DensDeck Prime	OB500	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO Bonding Adhesive	-150.0
C-2.	Min. 2,500 psi structural concrete	Min. 2.0-inch STYROFOAM DEKMATE FA	OB500	Min. 0.25-inch DensDeck	OB500	Flex TPO Plus or TPO Plus Extra	Flex TPO WB Bonding Adhesive	-232.5

TABLE 4A: RECOVER APPLICATIONS
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER

^A The reported MDP documents the allowable maximum design pressure of the new insulation, coverboard and roof cover when adhered to the substrate, irrespective of the deck type (See Note 1) or performance of the substrate (See Note 12). The deck and substrate shall be capable of resisting the project design pressure requirements, not to exceed the noted MDP, to the satisfaction of the Authority Having Jurisdiction.

System No.	Substrate (Note 1 , Note 12)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Note 15)		MDP (psf) ^A
		Type	Attach (Notes 6,7,8)	Type	Attach (Notes 6,7,8)	Type	Application	
R-1	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Flex ISO II or H-Shield, or min. 2.0-inch Dekmate FA	OB500	Min. 0.25-inch DensDeck Prime	OB500	Flex TPO Plus or Flex TPO Plus Extra	Flex TPO Bonding Adhesive	-120.0
R-2	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Flex ISO II or H-Shield, or min. 2.0-inch STYROFOAM DECKMATE FA	OB500	Min. 0.25-inch DensDeck	OB500	Flex TPO Plus, TPO Plus Extra	Flex TPO WB Bonding Adhesive	-120.0