



EXTERIOR RESEARCH & DESIGN, LLC.

Certificate of Authorization #9503

353 Christian Street

Oxford, CT 06478

(203) 262-9245

EVALUATION REPORT

Mule-Hide Products Co., Inc.

1195 Prince Hall Drive, Suite A

Beloit, WI 53511-5481

(608) 365-3111

Evaluation Report M15060.06.09-R5

FL12772-R5

Date of Issuance: 06/24/2009

Revision 5: 09/11/2017

SCOPE:

This Evaluation Report 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 **6th Edition (2017) Florida Building Code** sections noted herein.

DESCRIPTION: Mule-Hide TPO-c Single Ply Roof Systems

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

CONTINUED COMPLIANCE: This Evaluation Report is valid until such time as the named product(s) changes, the referenced Quality Assurance documentation changes, or provisions of the Code that relate to the product change. Acceptance of this Evaluation Report by the named client constitutes agreement to notify Robert Nieminen, P.E. if the product changes or the referenced Quality Assurance documentation changes. Trinity|ERD requires a complete review of this Evaluation Report relative to updated Code requirements with each Code Cycle.

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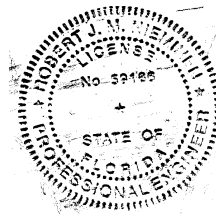
INSPECTION: Upon request, a copy of this entire Evaluation Report shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This Evaluation Report consists of pages 1 through 4, plus a 27-page Appendix.

Prepared by:

Robert J.M. Nieminen, P.E.

Florida Registration No. 59166, Florida DCA ANE1983



The facsimile seal appearing was authorized by Robert Nieminen, P.E. on 09/11/2017. This does not serve as an electronically signed document.

CERTIFICATION OF INDEPENDENCE:

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5. This is a building code evaluation. Neither Trinity|ERD nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.

ROOFING SYSTEMS EVALUATION:

1. SCOPE:

Product Category: Roofing

Sub-Category: Single Ply Roof Systems

Compliance Statement: Mule-Hide TPO-c Single Ply Roof Systems, as produced by Mule-Hide Products Co., Inc. have demonstrated compliance with the following sections of the 6th Edition (2017) Florida Building Code through testing in accordance with the following Standards. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

2. STANDARDS:

<u>Section</u>	<u>Property</u>	<u>Standard</u>	<u>Year</u>
1504.3.1	Wind	FM 4474	2011
1504.7	Impact	FM 4470	2012
1507.13.2	Physical Properties	ASTM D6878	2011
1523.6.2	Wind	TAS 114	2011

3. REFERENCES:

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
ACRC (TST4671)	TAS 114	07-051	08/29/2007
ACRC (TST4671)	TAS 114	07-059	10/15/2007
ACRC (TST4671)	FM4470	10-009	05/19/2010
ACRC(TST4671)	FM4470	11-035	06/28/2011
ACRC (TST4671)	FM4470	10-018	08/25/2010
ACRC(TST4671)	FM4470	10-019	08/25/2010
ATI (TST1588)	FM4470	01-37050.01	03/13/2000
ATI (TST1588)	TAS 114	D7772.01-109-18	07/09/2014
ATI (TST1588)	TAS 114	D7772.02-109-18	07/14/2014
CTL (TST 1577)	TAS 114	CTLA-105R	10/13/2008
CTL (TST 1577)	TAS 114	CTLA-105R-1	10/13/2008
CTL (TST 1577)	TAS 114	CTLA-105R-2	10/13/2008
CTL (TST 1577)	TAS 114	CTLA-106R	10/16/2008
CTL (TST 1577)	TAS 114	CTLA-106R-1	10/16/2008
CTL (TST 1577)	TAS 114	CTLA-106R-2	10/16/2008
CTL (TST 1577)	TAS 114	CTLA-106R-3	10/16/2008
CTL (TST 1577)	TAS 114	CTLA-106R-4	10/16/2008
CTL (TST 1577)	TAS 117	CTLA 111R	01/13/2009
ERD (TST 6049)	FM4470 / FM 4474	02764.09.05-R1	12/10/2007
ERD (TST 6049)	FM 4474	M5830.10.07-R1	01/23/2009
ERD (TST 6049)	FM 4474	M30780.09.09	09/23/2009
ERD (TST 6049)	Physical Properties	A35880.04.12-R1	10/26/2012
ERD (TST 6049)	Physical Properties	C46470.07.14-1A	07/16/2014
ERD (TST 6049)	Physical Properties	C46470.07.14-1B	07/16/2014
ERD (TST 6049)	Physical Properties	C46470.07.14-4-R1	07/21/2014
ERD (TST 6049)	Physical Properties	C46470.07.14-2A	07/30/2014
ERD (TST 6049)	Physical Properties	C46470.07.14-2B	07/30/2014
ERD (TST 11294)	FM 4474	13380.01.17	01/27/2017
ERD (TST 6049)	Physical Properties	CRL-SC14240.17	03/21/2017
ERD (TST 11294)	FM 4474	CEL-CLT16160.08.17-1	08/28/2017
ERD (TST 11294)	FM 4474	CEL-CLT16160.08.17-2	08/28/2017
FM (TST1867)	FM4470	0V7A4.AM	06/10/1992
FM (TST1867)	FM4470	3Z9A1.AM	10/15/1997
FM (TST1867)	FM4470	3001522	03/26/1999
FM (TST1867)	FM4470	3003393	03/30/1999
FM Approvals (TST1867)	FM 4470	3012879	04/04/2003

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
FM Approvals (TST1867)	FM 4470	3013584	06/27/2003
FM (TST1867)	FM4470	3014692	08/05/2003
FM (TST1867)	FM4470 / FM 4474	3017662	06/07/2005
FM (TST1867)	FM4470 / FM 4474	3023032	07/20/2005
FM (TST1867)	FM4470 / FM 4474	3020845	01/25/2006
FM Approvals (TST1867)	FM 4470/4474	3023458	07/18/2006
FM (TST1867)	FM4470 / FM 4474	3022174	09/25/2006
FM Approvals (TST1867)	FM 4470/4474	3026964	07/25/2007
FM Approvals (TST1867)	FM 4470/4474	3029840	09/08/2008
FM Approvals (TST1867)	FM 4470/4474	3034985	12/15/2008
FM Approvals (TST1867)	FM4470	3037400	09/02/2009
FM (TST1867)	FM4470	3037525	09/25/2009
FM (TST1867)	FM4470	3037770	10/22/2009
FM Approvals (TST1867)	FM4470/4474	3036762	03/08/2011
FM Approvals (TST1867)	FM4470/4474	3041535	06/08/2011
FM Approvals (TST1867)	FM4470/4474	3039340	06/24/2011
FM Approvals (TST1867)	FM4470/4474	3039762	09/07/2012
FM Approvals (TST1867)	FM4470/4474	3056207	02/09/2016
FM Approvals (TST1867)	FM 4470/4474	RR209155	04/03/2017
PRI CMT(TST5878)	TAS 114 / FM 4474	CST-016-02-01	05/04/2011
UL, LLC (QUA9625)	Quality Control	MLA; R13850	08/22/2007
UL, LLC (QUA9625)	Quality Control	Inspection Report	06/01/2017

4. PRODUCT DESCRIPTION:

The following roof covers are mechanically attached or fully adhered to Approved substrates using fasteners, stress plates and adhesives, as outlined in the Limitations / Conditions of Use herein.

- 4.1 **Mule-Hide TPO-c** membranes are nominal 45-mil (1.1mm) or 60-mil (1.5 mm) thick, polyester-scrim reinforced, thermoplastic olefin (TPO) single-ply roof membranes.
- 4.2 **Mule-Hide TPO-c EXTRA** membranes are nominal 72-mil (1.8mm) or 80-mil (2.0mm) thick, polyester-scrim reinforced, thermoplastic olefin (TPO), single-ply roof membranes.
- 4.3 **Mule-Hide TPO-c Fleece Back** membrane is a nominal 45-mil (1.1mm) or 60-mil (1.5 mm) thick, polyester-scrim reinforced, thermoplastic olefin (TPO) single-ply roof membrane with a polyester fleece backing.
- 4.4 **Mule-Hide SA-TPO** membrane is a nominal 60-mil (1.5-mm) thick, polyester-scrim reinforced, thermoplastic olefin (TPO) single-ply roof membrane laminated to an elastomeric pressure-sensitive adhesive.

5. LIMITATIONS:

- 5.1 This is a building code evaluation. Neither Trinity|ERD nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
- 5.2 This Evaluation Report is not for use in FBC HVHZ jurisdictions.
- 5.3 Refer to a current UL Roofing Materials Directory for fire ratings of this product.
- 5.4 For steel deck installations, foam plastic insulation shall be separated from the building interior in accordance with **FBC 2603.4** unless the exceptions stated in **FBC 2603.4.1** and **2603.6** apply.
- 5.5 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. Load resistance of the roof deck shall be documented through proper codified and/or FBC Approval documentation.
- 5.6 For recover installations, the existing roof shall be examined in accordance with **FBC 1511**.

- 5.7 For mechanically attached insulation or membrane or strip-bonded insulation, the maximum design pressure for the selected assembly shall meet or exceed the Zone 1 design pressure determined in accordance with FBC Chapter 16. Zones 2 and 3 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 (January 2016)** for Zone 2/3 enhancements.
- 5.8 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.
- 5.9 For mechanically attached insulation or membrane 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 and analysis shall be in accordance with **ANSI/SPRI FX-1** or **Testing Application Standard TAS 105**.
- 5.10 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.
- 5.11 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**.
- 5.12 Metal edge attachment (except gutters), shall be designed and installed for wind loads in accordance with FBC Chapter 16 and tested for resistance in accordance with **ANSI/SPRI ES-1** or **Roofing Application Standard RAS 111**, except the basic wind speed shall be determined from **FBC Figure 1609.3(1)**, **1609.3(2)** or **1609.3(3)**.
- 5.13 All products in the roof assembly shall have quality assurance audit in accordance with **F.A.C. Rule 61G20-3**.

6. INSTALLATION:

- 6.1 **Mule-Hide TPO-c Single Ply Roof Systems** shall be installed in accordance with **Mule-Hide Products Co., Inc.** published installation instructions, subject to the Limitations / Conditions of Use noted herein.
- 6.2 System attachment requirements for wind load resistance are set forth in Appendix 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 pressures.
- 6.3 For mechanically fastened membrane systems (Type D) over profiled steel deck, membrane shall be installed running perpendicular to steel deck flutes.

7. BUILDING PERMIT REQUIREMENTS:

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

8. MANUFACTURING PLANTS:

Contact the noted QA agency for information on product locations covered to F.A.C. Rule 61G20-3 QA requirements.

9. QUALITY ASSURANCE ENTITY:

UL, LLC – QUA9625; (414) 248-6409; karen.buchmann@ul.com

- THE 27-PAGES THAT FOLLOW FORM PART OF THIS EVALUATION REPORT -

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	4
1B	Wood	New, Reroof (Tear-Off), Recover	D-1	Insulated, Mechanically Attached Roof Cover	4
1C	Wood	New, Reroof (Tear-Off), Recover	D-3	Insulated, Mechanically Attached Base Sheet, Bonded Roof Cover	4
1D	Wood	New, Reroof (Tear-Off), Recover	E-1	Non-Insulated, Mechanically Attached Roof Cover	5
1E	Wood	New, Reroof (Tear-Off), Recover	E-2	Non-Insulated, Mechanically Attached Base Sheet, Bonded Roof Cover	5
1F	Wood	New Construction	F	Non-Insulated, Bonded Roof Cover	5
2A	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	B	Mech. Attached Base Insulation, Bonded Top Insulation, Bonded Roof Cover	6-7
2B	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Roof Cover	8-9
2B	Steel	New, Reroof (Tear-Off), Recover	C-2	Mechanically Attached Insulation, Plate-Bonded Roof Cover	10-11
2D	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	D-1	Insulated, Mechanically Attached Roof Cover	12-15
2E	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	D-2	Insulated, Mechanically Attached Roof Cover (RUSS Strips)	16
3A	Structural Concrete	New, Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	17-18
3B	Structural Concrete	New, Reroof (Tear-Off), Recover	C-2	Mechanically Attached Insulation, Plate-Bonded Roof Cover	18-19
3C	Structural Concrete	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	19
4A	LWIC	New, Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	20
4A-1	LWIC over Steel	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	20
4A-2	LWC over Structural Concrete	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	21
5A	Gypsum	Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	22
6A	Various	Recover	A-1	Bonded Insulation, Bonded Roof Cover	23
6B	Steel	Recover	C-2	Mechanically Attached Insulation, Plate-Bonded Roof Cover	24
6C	Steel	Recover	D-1	Insulated, Mechanically Attached Roof Cover	25
6D	Steel or Structural Concrete	Recover	E	Non-Insulated, Mechanically Attached Roof Cover	26
6E	Various	Recover	F-2	New LWC over Existing Roof, Bonded Roof Cover	27

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. Load resistance of the roof deck shall be documented through proper codified and/or FBC Approval documentation.
- Unless otherwise noted, fasteners and stress plates for insulation attachment shall be as follows. Fasteners shall be of sufficient length for the following engagements:
 - Wood Deck: Mule-Hide Drill Point Fastener or Mule-Hide HDP Fastener with Mule-Hide 3 in. Insulation Plate. Minimum ¾-inch steel penetration, engage the top flute of the steel deck
 - Steel Deck: Mule-Hide Drill Point Fastener or Mule-Hide HDP Fastener with Mule-Hide 3 in. Insulation Plate. Minimum ¾-inch steel penetration, engage the top flute of the steel deck.
 - Structural Concrete: Mule-Hide HDP Fastener or Mule-Hide Fluted Concrete Nail with Mule-Hide 3 in. Insulation 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 polyisocyanurate, polystyrene, fiberboard, perlite and/or gypsum-based insulation board that meets the QA requirements of F.A.C. Rule 61G20-3 and is documented as meeting FBC 1505.1 and, for foam plastic, FBC Chapter 26, when installed with the roof cover.
- Minimum 200 psi, minimum 2-inch thick lightweight insulating concrete may be substituted for rigid insulation board for System Type C-2 (plate bonded roof cover) or Type D (mechanically attached membrane), whereby the membrane fasteners are installed through the LWIC to engage the structural steel or concrete deck. The structural deck shall be of equal or greater type, thickness and strength to the steel and concrete deck listings. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction. Load resistance of the roof deck shall be documented through proper codified and/or FBC Approval documentation.

5. 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 (January 2016).
6. Unless otherwise noted, insulation adhesive application rates are as follows. Ribbon or bead width is at the time of application; the ribbons/beads shall expand as noted in the manufacturer's published instructions:
 - Mule-Hide Helix® Low-Rise Adhesive (HELIX): Continuous ¾ to 1-inch wide beads, 12-inch o.c.
 - ICP Adhesives CR-20: Continuous 2½ to 3½-inch wide ribbons, 12-inch o.c.
 - OlyBond 500 (OB-500): Continuous ¾ to 1-inch wide ribbons, 12-inch o.c. using PaceCart or SpotShot application devices.
 - *Note: When multiple layers(s) of insulation and/or coverboard are installed in ribbon-applied adhesive, adhesive ribbons shall be staggered from layer-to-layer a distance of one-half the ribbon spacing.*
 - *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.*
7. 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:
 - ICP Adhesives CR-20: MDP -117.5 psf (Min. 1.0-inch thick)
 - OlyBond 500 (OB500): MDP -315.5 psf (Min. 0.5-inch thick Poly ISO 1, H-Shield or ENRGY 3)
 - OlyBond 500 (OB500): MPD -487.5 psf (Min. 0.5-inch thick Poly ISO 2 or AC Foam II)
8. Bonded polyisocyanurate insulation boards shall be maximum 4 x 4 ft.
9. For mechanically attached components or partially bonded insulation, the maximum design pressure for the selected assembly shall meet or exceed the Zone 1 design pressure determined in accordance with FBC Chapter 16, and Zones 2 and 3 shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Commonly used methods are ANSI/SPRI WD-1, FM Loss Prevention Data Sheet 1-29, Roofing Application Standard RAS 117 or 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 (January 2016) for Zone 2/3 enhancements.
10. 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, and no rational analysis is permitted.
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 existing substrates in a bonded recover or re-roof installation, the existing roof surface or existing roof deck shall be examined for compatibility and bond performance with the selected adhesive, and the existing roof system (for recover) 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 ANSI/SPRI IA-1, ASTM E907, FM Loss Prevention Data Sheet 1-52 or Testing Application Standard TAS 124.
13. For System Type D, steel deck applications, the roof membrane shall be run with its length perpendicular to the steel deck flutes.
14. For Structural Concrete Deck or Recover Applications using System Type C-2 (Plate Bonded Roof Cover) or Type D (Mechanically Attached Roof Cover), the insulation is optional. Alternatively, min. 0.5-inch HP Recovery Board, Poly ISO 1-HD, H-Shield HD or SecurShield HD or min. 0.25-inch to 0.625-inch Dens Deck, Dens Deck Prime, SECUROCK Gypsum-Fiber Roof Board or SECUROCK Glass-Mat Roof Board or min. 3/8-inch Insulfoam R-Tech EPS or Fan-Fold may be used as a separator board, preliminarily attached prior to roof cover installation. The separator component shall be documented as meeting FBC 1505.1 and, for foam plastic, FBC Chapter 26, when installed with the roof cover in Recover applications.
15. Lightweight Insulating Concrete (LWC) shall be cast in accordance with FBC Section 1917 to the satisfaction of the Authority Having Jurisdiction. For systems where specific LWC is referenced, refer to current LWC Product Approval for specific deck construction and limitations. For systems where specific LWC is not referenced, the minimum design mix shall be 300 psi. In all cases, the minimum top-coat thickness is 2-inches. For LWC over structural concrete, reference is made to FBC Section 1917.4.1, Point 1.

16. For adhered membrane systems, side laps shall be minimum 2-inch wide sealed with min. 1.5-inch heat weld. Unless otherwise noted, membrane adhesive application rates are as follows:

Membrane	Adhesive	Method	Rate
Mule-Hide TPO-c	Mule-Hide TPO-c Bonding Adhesive (TPO-c BA)	Contact (both sides)	60 ft ² /gal
Mule-Hide TPO-c	Aqua Base 120 BA	Contact (both sides)	120 ft ² /gal
Mule-Hide TPO-c Fleece Back	Aqua Base 120 BA	Wet lay (substrate)	120 ft ² /gal
Mule-Hide TPO-c Fleece Back	Mule-Hide Helix® Low-Rise Adhesive (HELIX)	Wet lay (substrate)	FULL = continuous ribbons, maximum 4-inch o.c.

17. For membrane systems attached using TPO 10-inch Pressure-Sensitive RUSS, the underside of the membrane which comes in contact with the tape shall be primed with HP-250 Primer. The membrane shall be secured by placing the primed portion onto the tape portion of the TPO 10-inch Pressure-Sensitive RUSS and roll with a steel hand roller to ensure contact.
18. For bonded membrane systems, unless otherwise noted, reference to “Mule-Hide TPO-c” membrane below also includes “Mule-Hide TPO-c EXTRA”.
19. Vapor barrier options for use over **structural concrete deck** followed by adhesive-applied insulation carry the following Maximum Design Pressure (MDP) limitations. The **lesser** of the MDP listings below vs. those in **Table 3A** applies.

VAPOR BARRIER OPTIONS; STRUCTURAL CONCRETE DECK; FOLLOWED BY ADHESIVE-APPLIED INSULATION PER TABLE 3A:					
Option #	Primer	Vapor Barrier		Insulation Adhesive	MDP (psf)
		Type	Application		
VB-1.	Carlisle CAV-GRIP Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	HELIX (RIBBON, 12-inch o.c.)	-97.5
VB-2.	ASTM D41	Carlisle SureMB 90TG Base or SureMB 120 TG Poly Base	Torch-applied	HELIX (RIBBON, 12-inch o.c.)	-97.5
VB-3.	ASTM D41	Carlisle SureMB 90 Base or SureMB 120 Poly Base	Hot-asphalt	HELIX (RIBBON, 12-inch o.c.)	-97.5

20. “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.

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

System No.	Deck (Note 1)	Base Insulation Layer	Top Insulation Layer			Roof Cover (Note 16)	MDP (psf)
			Type	Fasteners	Attach		
W-1	Min. 19/32" plywood or wood plank	(Optional) One or more layers, any combination, loose laid	Min. 1.5-inch Poly ISO 1, H-Shield, ACFoam II, Poly ISO 2 or ENRGY 3	Note 2	1 per 2 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*

**TABLE 1B: WOOD DECKS – NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE D-1: INSULATED, MECHANICALLY ATTACHED ROOF COVER**

System No.	Roof Deck	Insulation Layer (Note 14)		Roof Cover			MDP (psf)
		Type	Attach	Membrane	Fasteners	Spacing	
W-2	Min. 19/32-inch plywood or wood plank at max. 24" spans attached using 8d ring shank nails spaced 6" o.c. in the field and #10 ring shank nails spaced 4" o.c. at the perimeter	One or more layers, any combination	Preliminarily attached	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	6-inch o.c. within 5.5-inch wide laps spaced 90.5-inch o.c. Outside of lap sealed with 1.5-inch heat-weld	-52.5
W-3	Min. 19/32-inch plywood or wood plank at max. 24" spans attached using 8d ring shank nails spaced 6" o.c. in the field and #10 ring shank nails spaced 4" o.c. at the perimeter	One or more layers, any combination	Preliminarily attached	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	6-inch o.c. within 5.5-inch wide laps spaced 66.5-inch o.c. Outside of lap sealed with 1.5-inch heat-weld	-67.5
W-4	Min. 23/32-inch OSB at max. 24-inch spans attached using 8d ring shank nails spaced 6" o.c. in the field and 8" o.c. at intermediate supports	One or more layers, any combination	Preliminarily attached	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	6-inch o.c. within 5-inch wide laps spaced 67-inch o.c. Outside of lap sealed with 1.5-inch heat-weld and 6-inch o.c. in one row centered between the laps. Center row covered with 6-inch wide cover strip sealed with 1.5-inch heat weld at all edges	-67.5

**TABLE 1C: WOOD DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE D-3: INSULATED, MECHANICALLY ATTACHED BASE SHEET, BONDED ROOF COVER**

System No.	Deck (Note 1)	Insulation (Note 14)		Base Sheet			Roof Cover		MDP (psf)
		Type	Attach	Base Sheet	Fasteners	Attach	Membrane	Adhesive	
W-5	Min. 19/32-inch plywood at max. 24-inch spans; #10 x 2-inch wood screws, 6-inch o.c.	One or more layers, any combination	Loose-laid	Atlas Summit Synthetic Underlayment	Mule-Hide Drill Point Fastener and Mule-Hide 2" Seam Plate	12-inch o.c. at the 4-inch laps and 12-inch o.c. at three, equally spaced rows in the center of the sheet.	Mule-Hide SA-TPO	Self-adhered	-120.0

**TABLE 1D: WOOD DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE E-1: NON-INSULATED, MECHANICALLY ATTACHED ROOF COVER**

System No.	Roof Deck	Thermal Barrier		Roof Cover						MDP (psf)
		Type	Attach	Membrane	Fasteners	Fastener Spacing (inch)	Lap Width (inch)	Lap Spacing (inch)	Seam Weld (inch)	
W-6	Min. 19/32-inch thick Mule-Hide FR Deck Panel A or C or Barrier Technology Corp "Blazeguard A or C" at max. 24-inch spans attached using No. 8 x 2½-inch long course thread screws spaced 6" o.c.	(Optional) Any approved thermal barrier	Loose-laid	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	12	5	48	1.5	-30.0
W-7	Min. 19/32-inch thick Mule-Hide FR Deck Panel A or C or Barrier Technology Corp "Blazeguard A or C" at max. 24-inch spans attached using No. 8 x 2½-inch long course thread screws spaced 6" o.c.	(Optional) Any approved thermal barrier	Loose-laid	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	6	5	72	1.5	-52.5
W-8	Min. 19/32-inch thick Mule-Hide FR Deck Panel A or C or Barrier Technology Corp "Blazeguard A or C" at max. 24-inch spans attached using No. 8 x 2½-inch long course thread screws spaced 6" o.c.	(Optional) Any approved thermal barrier	Loose-laid	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	6	5	48	1.5	-75.0
W-9	Min. 19/32-inch plywood at max. 24-inch spans attached using 8d ring shank nails spaced 6-inch o.c.	(Optional) Any approved thermal barrier	Loose-laid	Mule-Hide TPO-c	Mule-Hide EHD Fasteners and 2.4 Seam Plates	6	5.5	48 (over structural members)	1.5	-75.0

**TABLE 1E: WOOD DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE E-2: NON-INSULATED, MECHANICALLY ATTACHED BASE SHEET, BONDED ROOF COVER**

System No.	Deck (Note 1)	Thermal Barrier		Base Sheet			Roof Cover		MDP (psf)
		Type	Attach	Base Sheet	Fasteners	Attach	Membrane	Adhesive	
W-10	Min. 19/32-inch plywood at max. 24-inch spans; #10 x 2-inch wood screws, 6-inch o.c.	(Optional) Any approved thermal barrier	Loose-laid	Atlas Summit Synthetic Underlayment	Mule-Hide Drill Point Fastener and Mule-Hide 2" Seam Plate	12-inch o.c. at the 4-inch laps and 12-inch o.c. at three, equally spaced rows in the center of the sheet.	Mule-Hide SA-TPO	Self-adhered	-120.0

**TABLE 1F: WOOD DECKS – NEW CONSTRUCTION
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER**

System No.	Roof Deck	Roof Cover (Note 16)		MDP (psf)
		Membrane	Application	
W-11	Min. 15/32-inch thick Mule-Hide FR Deck Panel A or C or Barrier Technology Corp "Blazeguard A or C" at max. 24-inch spans attached using No. 8 x 2½-inch long course thread screws spaced 6" o.c.	Mule-Hide TPO-c	Aqua Base 120 BA	-45.0
W-12	Min. 19/32-inch thick Mule-Hide FR Deck Panel A or C or Barrier Technology Corp "Blazeguard A or C" at max. 24-inch spans attached using No. 8 x 2½-inch long course thread screws spaced 6" o.c.	Mule-Hide TPO-c	Aqua Base 120 BA	-52.5

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

System No.	Deck (Note 1)	Base Insulation Layer			Top Insulation Layer		Roof Cover (Note 16)	MDP (psf)
		Type	Fastener	Attach	Type	Attach		
MULE-HIDE TPO-C APPLICATIONS:								
SC-1	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H	Note 2	1 per 3.2 ft ²	Min. 1.0-inch base insulation and/or Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	HELIX	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-2	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield, Polyiso HP-H	Note 2	1 per 4.0 ft ²	Min. 1.0-inch base insulation and/or Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	HELIX	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-3	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 0.5-inch Dens Deck or Dens Deck Prime	Note 2	1 per 2.0 ft ²	Min. 1.5-inch ACFoam II, Poly ISO 2, ENRGY 3, Poly ISO 1 or H-Shield followed by Min. 0.25-inch Dens Deck Prime	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-37.5*
SC-4	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1. H-Shield, H-Shield CG	Note 2	1 per 4.0 ft ²	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-37.5*
SC-5	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch ACFoam II, Poly ISO 1, Poly ISO 2, H-Shield CG, ENRGY 3	Note 2	1 per 2.0 ft ²	Additional layers of base insulation	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-6	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch ACFoam II, Poly ISO 1, Poly ISO 2, H-Shield CG, ENRGY 3	Note 2	1 per 2.0 ft ²	Min. 0.25-inch Dens Deck, Dens Deck Prime	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-7	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 0.5-inch Dens Deck or Dens Deck Prime	Note 2	1 per 2.0 ft ²	Min. 1.5-inch ACFoam II, Poly ISO 2, ENRGY 3, H-Shield or Poly ISO 1	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-8	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch ACFoam II, Poly ISO 1, Poly ISO 2, H-Shield CG, ENRGY 3	Note 2	1 per 4.0 ft ²	Additional layers of base insulation	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-9	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch ACFoam II, Poly ISO 1, Poly ISO 2, H-Shield CG, ENRGY 3	Note 2	1 per 4.0 ft ²	Min. 0.25-inch Dens Deck, Dens Deck Prime	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-10	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, H-Shield CG	Note 2	1 per 3.2 ft ²	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-11	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield, H-Shield CG	Note 2	1 per 2.67 ft ²	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-12	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield, H-Shield CG	Note 2	1 per 1.6 ft ²	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-60.0
MULE-HIDE TPO-C FLEECE BACK APPLICATIONS:								

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

System No.	Deck (Note 1)	Base Insulation Layer			Top Insulation Layer		Roof Cover (Note 16)	MDP (psf)
		Type	Fastener	Attach	Type	Attach		
SC-13	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H	Note 2	1 per 3.2 ft ²	Min. 1.0-inch base insulation and/or Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	HELIX	Mule-Hide TPO-c Fleece Back / HELIX (FULL)	-45.0*
SC-14	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield, Polyiso HP-H	Note 2	1 per 4.0 ft ²	Min. 1.0-inch base insulation and/or Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	HELIX	Mule-Hide TPO-c Fleece Back / HELIX (FULL)	-45.0*
SC-15	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield, Polyiso HP-H	Note 2	1 per 1.6 ft ²	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	HELIX	Mule-Hide TPO-c Fleece Back / HELIX (FULL)	-60.0

**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	Top Insulation Layer			Roof Cover (Note 16)	MDP (psf)
			Type	Fasteners	Attach		
MULE-HIDE TPO-C APPLICATIONS:							
SC-16	Min. 22 ga., type B, Grade 33 steel	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	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-37.5*
SC-17	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 Poly ISO 2, ACFoam II or ENRGY 3	Note 2	1 per 1.6 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-37.5*
SC-18	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 0.5-inch H-Shield HD	Note 2	1 per 2.67 ft ²	Mule-Hide TPO-c / TPO-c BA	-37.5*
SC-19	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 2.67 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-37.5*
SC-20	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 0.50-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 3.2 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-21	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 0.625-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 4.0 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-22	Min. 22 ga., type B, Grade 33 steel	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 2.67 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-23	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	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-24	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 Poly ISO 1, H-Shield, H-Shield CG	Note 2	1 per 1.6 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-25	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 ACFoam II, Poly ISO 2, H-Shield, Poly ISO 1, H-Shield CG, ENRGY 3	Note 2	1 per 2.0 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-26	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 ACFoam II, Poly ISO 2, H-Shield, Poly ISO 1, H-Shield CG, ENRGY 3	Note 2	1 per 4.0 ft ²	Mule-Hide TPO-c / TPO-c BA or Aqua Base 120 BA	-45.0*
SC-27	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 0.5-inch H-Shield HD	Note 2	1 per 2.0 ft ²	Mule-Hide TPO-c / TPO-c BA	-45.0*
SC-28	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	Mule-Hide TPO-c / Aqua Base 120 BA	-52.5
SC-29	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 0.5-inch Dens Deck Prime	Note 2	1 per 1.6 ft ²	Mule-Hide TPO-c / TPO-c BA	-60.0
SC-30	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	Mule-Hide TPO-c / TPO-c BA	-75.0
SC-31	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 ACFoam II, Poly ISO 1, Poly ISO 2, H-Shield, H-Shield CG, ENRGY 3	Note 2	1 per 1.6 ft ²	Mule-Hide TPO-c / TPO-c BA	-75.0

**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	Top Insulation Layer			Roof Cover (Note 16)	MDP (psf)
			Type	Fasteners	Attach		
SC-32	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 1.6 ft ²	Mule-Hide TPO-c / TPO-c BA	-82.5
SC-33	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 7/16-inch APA or TECO rated OSB	Note 2	1 per 1 ft ²	Mule-Hide TPO-c / TPO-c BA	-97.5
SC-34	Min. 20 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 0.625-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 1.33 ft ²	Mule-Hide TPO-c / TPO-c BA	-112.5
SC-35	Min. 18 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch thick, one or more layers, any combination, loose laid	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 1.33 ft ²	Mule-Hide TPO-c / TPO-c BA	-112.5
SC-36	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-inch H-Shield CG	Note 2	1 per 1 ft ²	Mule-Hide TPO-c / TPO-c BA	-120.0
MULE-HIDE SA-TPO APPLICATIONS:							
SC-37	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional for Recover) Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 2-inch Insulfoam SP	Note 2	1 per 2.7 ft ²	Mule-Hide SA-TPO, self-adhered	-30.0*
SC-38	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional for Recover) Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 2-inch Insulfoam SP	Note 2	1 per 2.0 ft ²	Mule-Hide SA-TPO, self-adhered	-45.0*
SC-39	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional for Recover) Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board or min 7/16-inch APA or TECO rated OSB	Note 2	1 per 2.0 ft ²	Mule-Hide SA-TPO, self-adhered	-45.0*
SC-40	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, SecurShield, H-Shield CG	Note 2	1 per 2.0 ft ²	Mule-Hide SA-TPO, self-adhered	-45.0*
SC-41	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min. 2.0-inch Poly ISO 1, H-Shield, Polyiso HP-H, SecurShield, H-Shield CG	Note 2	1 per 1.6 ft ²	Mule-Hide SA-TPO, self-adhered	-60.0

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

System No.	Deck (Note 1)	Insulation Layer	Attachment		Roof Cover	MDP (psf)
			Fasteners	Density		
SC-42	Min. 22 ga., type B, Grade 33 steel	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 5.33 ft ² (6 per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29; Note B	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-45.0
SC-43	Min. 22 ga., type B, Grade 33 steel	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 4 ft ² (8 per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29; Note B	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-52.5
SC-44	Min. 22 ga., type B, Grade 40 steel; 6 ft spans; 5/8" puddle welds 6" o.c.	Min. 1.5-inch thick, one or more layers, any combination.	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 4 ft ² (2 x 2 ft grid pattern)	Mule-Hide TPO-c (minimum 60-mil) bonded to RHINOBOND Insulation Plate (TPO) or RHINOBOND TreadSafe Plate (TPO) with RHINOBOND tool per manufacturer's instructions.	-52.5
SC-45	Min. 22 ga., type B, Grade 80 steel	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 4 ft ² (8 per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29; Note B	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-60.0
SC-46	Min. 22 ga., type B, Grade 33 steel	Min. 1.5-inch thick, one or more layers, any combination. Note C.	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 2 ft ² (16 per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-97.5
SC-47	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	12-inch o.c. in rows 120-inch o.c.	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-30.0
SC-48	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	6-inch o.c. in rows 120-inch o.c.	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-37.5
SC-49	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	12-inch o.c. in rows 60-inch o.c.	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-37.5
SC-50	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	12-inch o.c. in rows 60-inch o.c.	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-45.0
SC-51	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	6-inch o.c. in rows 120-inch o.c.	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-52.5

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

System No.	Deck (Note 1)	Insulation Layer	Attachment		Roof Cover	MDP (psf)
			Fasteners	Density		
SC-52	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide EHD Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	6-inch o.c. in rows 60-inch o.c.	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-67.5
Notes:	<p>A. For these assemblies, the 8 ft insulation board length is placed perpendicular to the steel deck ribs.</p> <p>B. The plate/fastener combination offset 12 inch from adjacent rows.</p> <p>C. For these assemblies, the 8 ft insulation board length is placed perpendicular to the steel deck ribs and each row of insulation is staggered by 1 foot.</p>					

**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.	Roof Deck	Insulation Layer (Note 14)		Roof Cover						MDP (psf)
		Type	Attach	Membrane	Fasteners	Fastener Spacing (inch)	Lap Width (inch)	Lap Spacing (inch)	Seam Weld (inch)	
SC-53	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	18	5.5	66.5	1.5	-30.0
SC-54	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	138.5	1.5	-30.0
SC-55	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	91	1.5	-30.0
SC-56	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination (optional for recover) followed by 3/8-inch Insulfoam R-Tech EPS or Fan-Fold	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate	12	5.5	90.5	1.5	-30.0
SC-57	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination	Prelim. Attach	Mule-Hide TPO-c (min. nominal 60-mil) or TPO-c EXTRA	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate	12	5.5	90.5	1.5	-37.5
SC-58	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	115	1.5	-37.5
SC-59	Min. 22 ga., type B, Grade 40 steel; 6 ft spans; 5/8" puddle welds 6" o.c. or min. 2,500 psi structural concrete	Min. 1-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c (min. 60-mil) or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) Fasteners and Mule-Hide 2.4" Seam Plate	6.	5.5	138.5	1.5	-37.5
SC-60	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	138.5	1.5	-45.0

**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.	Roof Deck	Insulation Layer (Note 14)		Roof Cover						MDP (psf)
		Type	Attach	Membrane	Fasteners	Fastener Spacing (inch)	Lap Width (inch)	Lap Spacing (inch)	Seam Weld (inch)	
SC-61	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate (steel only) or HDP Fastener and Mule-Hide 2.4" Seam Plates	12	5.5	115	1.5	-45.0
SC-62	Min. 18 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fasteners (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plates	12	5.5	115	1.5	-45.0
SC-63	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c (min. nominal 60-mil) or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	114.5	1.5	-45.0
SC-64	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	114.5	1.5	-45.0
SC-65	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate (steel only) or HDP Fastener and Mule-Hide 2.4" Seam Plates	12	5.5	91	1.5	-45.0
SC-66	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	91	1.5	-45.0
SC-67	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	66.5	1.5	-45.0
SC-68	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c (min. nominal 60-mil) or TPO-c EXTRA	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate	6	5.5	114.5	1.5	-52.5
SC-69	Min. 22 ga., type B, Grade 40 steel; 6 ft spans; 5/8" puddle welds 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c (min. 60-mil) or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	114.5	1.5	-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.	Roof Deck	Insulation Layer (Note 14)		Roof Cover						MDP (psf)
		Type	Attach	Membrane	Fasteners	Fastener Spacing (inch)	Lap Width (inch)	Lap Spacing (inch)	Seam Weld (inch)	
SC-70	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	138.5	1.5	-52.5
SC-71	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	91	1.5	-52.5
SC-72	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ ¼"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	90.5	1.5	-52.5
SC-73	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	42.5	1.5	-52.5
SC-74	Min. 22 ga., type B, Grade 33 steel, 6 ft span, 5/8" diameter puddle welds 6" o.c., side laps secured 24" o.c. w/ ¼"-14x1" long self-tapping hex-head screw	Min. 1-inch, one or more layers, any combination (optional for recover) followed by 3/8-inch Insulfoam R-Tech EPS or Fan-Fold	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	138.5	1.5	-60.0
SC-75	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate (steel only) or HDP Fastener and Mule-Hide 2.4" Seam Plates	6	5.5	138.5	1.5	-60.0
SC-76	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	138.5	1.5	-60.0
SC-77	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination followed by 3/8-inch Insulfoam R-Tech EPS	Loose laid	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	91	1.5	-60.0
SC-78	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	12	5.5	54.5	1.5	-60.0

**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.	Roof Deck	Insulation Layer (Note 14)		Roof Cover						MDP (psf)
		Type	Attach	Membrane	Fasteners	Fastener Spacing (inch)	Lap Width (inch)	Lap Spacing (inch)	Seam Weld (inch)	
SC-79	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	90.5	1.5	-67.5
SC-80	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	9	5.5	54.5	1.5	-75.0
SC-81	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	42.5	1.5	-82.5
SC-82	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plate	6	5.5	54.5	1.5	-90.0
SC-83	Min. 22 ga., type B, Grade 80 steel	Min. 1.5-inch, one or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plate	6	5.5	42.5	1.5	-112.5

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

System No.	Deck	Insulation		Roof Cover			MDP (psf)
		Type	Attach	Membrane	Fasteners	Attachment	
SC-84	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Prelim. attached	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plates	TPO 10-inch Pressure-Sensitive RUSS strips are applied over the insulation spaced 138-inch o.c. The plates are centered over each strip and fastened 6-inch o.c. Roof cover adhered to each strip by first priming with TPO Tape Primer at the strip location, then rolling into place with a hand roller.	-30.0
SC-85	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Prelim. attached	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plates	TPO 10-inch Pressure-Sensitive RUSS strips are applied over the insulation spaced 114-inch o.c. The plates are centered over each strip and fastened 6-inch o.c. Roof cover adhered to each strip by first priming with TPO Tape Primer at the strip location, then rolling into place with a hand roller.	-45.0
SC-86	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Prelim. attached	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plates	TPO 10-inch Pressure-Sensitive RUSS strips are applied over the insulation spaced 90-inch o.c. The plates are centered over each strip and fastened 6-inch o.c. Roof cover adhered to each strip by first priming with TPO Tape Primer at the strip location, then rolling into place with a hand roller.	-52.5
SC-87	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Prelim. attached	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plates	TPO 10-inch Pressure-Sensitive RUSS strips are applied over the insulation spaced 120-inch o.c. The plates are centered over each strip and fastened 6-inch o.c. Roof cover adhered to each strip by first priming with HP-250 Primer at the strip location, then rolling into place with a hand roller.	-60.0
SC-88	Min. 22 ga., type B, Grade 80 steel or min. 2,500 psi structural concrete	One or more layers, any combination	Prelim. attached	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide EHD Fastener (steel only) or HDP Fastener (concrete only) and Mule-Hide 2.4" Seam Plates	TPO 10-inch Pressure-Sensitive RUSS strips are applied over the insulation spaced 60-inch o.c. The plates are centered over each strip and fastened 12-inch o.c. Roof cover adhered to each strip by first priming with HP-250 Primer at the strip location, then rolling into place with a hand roller.	-60.0

TABLE 3A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER
 REFER TO NOTE 19 FOR VAPOR BARRIER OPTIONS

System No.	Roof Deck (Note 1)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Note 16)		MDP (psf)
		Type	Attach	Type	Attach	Membrane	Application	
MULE-HIDE TPO-C APPLICATIONS:								
C-1.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	Min. 0.25-inch Dens Deck Prime	HELIX	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
C-2.	Min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	(Optional) Additional layers of base insulation	HELIX	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
C-3.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	Min. 0.25-inch Dens Deck Prime	HELIX	Mule-Hide TPO-c	TPO-c BA	-195.0
C-4.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	HELIX	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-195.0
C-5.	Min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	(Optional) Additional layers of base insulation	HELIX	Mule-Hide TPO-c	TPO-c BA	-232.5
C-6.	Min. 2,500 psi structural concrete	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	(Optional) Additional layers of base insulation	CR-20	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
C-7.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	Min. ¼-inch Dens Deck or Dens Deck Prime	CR-20	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
C-8.	Min. 2,500 psi structural concrete	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	(Optional) Additional layers of base insulation	CR-20	Mule-Hide TPO-c	TPO-c BA	-232.5
C-9.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	Min. ¼-inch Dens Deck or Dens Deck Prime	CR-20	Mule-Hide TPO-c	TPO-c BA	-232.5
C-10.	Min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, H-Shield CG	OB500	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c	TPO-c BA	-120.0
C-11.	Min. 2,500 psi structural concrete	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
C-12.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	OB500	Min. ¼-inch Dens Deck or Dens Deck Prime	OB500	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
C-13.	Min. 2,500 psi structural concrete	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide TPO-c	TPO-c BA	-150.0
C-14.	Min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	OB500	Min. ¼-inch Dens Deck or Dens Deck Prime	OB500	Mule-Hide TPO-c	TPO-c BA	-150.0
C-15.	Min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield, H-Shield CG	OB500	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-247.5
MULE-HIDE TPO-C FLEECE BACK APPLICATIONS:								

TABLE 3A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER
 REFER TO NOTE 19 FOR VAPOR BARRIER OPTIONS

System No.	Roof Deck (Note 1)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Note 16)		MDP (psf)
		Type	Attach	Type	Attach	Membrane	Application	
C-16.	Min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	Min. 0.5-inch Poly ISO 1-HD, H-Shield HD, SecurShield HD Plus	HELIX	Mule-Hide TPO-c Fleece Back	HELIX (FULL)	-165.0
C-17.	Min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	Min. 0.25-inch Dens Deck Prime, DEXcell FA Glass Mat Roof Board, SECUROCK Gypsum-Fiber Roof Board or min. 7/16-inch DEXcell Cement Roof Board	HELIX	Mule-Hide TPO-c Fleece Back	HELIX (FULL)	-195.0
C-18.	Min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, Polyiso HP-H, Poly ISO 2, ACFoam II, H-Shield CG, SecurShield	HELIX	(Optional) Additional layers of base insulation	HELIX	Mule-Hide TPO-c Fleece Back	HELIX (FULL)	-322.5
MULE-HIDE SA-TPO APPLICATIONS:								
C-19.	Min. 2,500 psi structural concrete	(Optional) One or more layers, min. 1-inch Insulfoam I, II, IX, VIII, XIV or XV	HELIX, 4-inch o.c.	Min. 2-inch Insulfoam SP	HELIX, 4-inch o.c.	Mule-Hide SA-TPO	Self-adhered	-315.0

TABLE 3B: STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE C-2: MECHANICALLY ATTACHED INSULATION, PLATE-BONDED ROOF COVER

System No.	Deck (Note 1)	Insulation Layer	Attachment		Roof Cover	MDP (psf)
			Fasteners	Density		
C-20.	Min. 2,500 psi structural concrete	Min. 1-inch thick, one or more layers, any combination.	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 5.33 ft ² (6 parts per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29; Note A	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-45.0
C-21.	Min. 2,500 psi structural concrete	Min. 1-inch thick, one or more layers, any combination.	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 4 ft ² (8 parts per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29; Note A	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-60.0
C-22.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination. Note B.	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	1 per 2 ft ² (16 parts per 4 x 8 ft board) Per FM Loss Prevention Data Sheet 1-29	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-97.5
C-23.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	12-inch o.c. in rows 120-inch o.c.	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-30.0
C-24.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	6-inch o.c. in rows 120-inch o.c.	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-37.5

**TABLE 3B: STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (Tear-Off) or RECOVER
SYSTEM TYPE C-2: MECHANICALLY ATTACHED INSULATION, PLATE-BONDED ROOF COVER**

System No.	Deck (Note 1)	Insulation Layer	Attachment		Roof Cover	MDP (psf)
			Fasteners	Density		
C-25.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	12-inch o.c. in rows 60-inch o.c.	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-37.5
C-26.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	12-inch o.c. in rows 60-inch o.c.	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-45.0
C-27.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	6-inch o.c. in rows 120-inch o.c.	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-52.5
C-28.	Min. 2,500 psi structural concrete	Min. 1.5-inch thick, one or more layers, any combination, prelim attach (Note 14)	Mule-Hide DHP Fastener and RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO	6-inch o.c. in rows 60-inch o.c.	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO or RhinoBond Treadsafe Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-67.5

Notes: A. The plate/fastener combination offset 12 inch from adjacent rows.
B. For these assemblies each row of insulation is staggered by 1 foot.

**TABLE 3C: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER**

System No.	Deck	Primer	Roof Cover		MDP (psf)
			Type	Attach	
C-29.	Structural concrete	None	Mule-Hide SA-TPO	Self-adhered	-425.0

**TABLE 4A: LIGHTWEIGHT CONCRETE DECKS - NEW CONSTRUCTION or REROOF (Tear-Off)
SYSTEM TYPE A-1A: BONDED INSULATION, BONDED ROOF COVER**

System No.	Deck (Note 1)	Lightweight Concrete (Note 15)	Base Insulation Layer		Coverboard		Roof Cover (Note 16)	MDP (psf)
			Type	Attach	Type	Attach		
LWC-1	Structural concrete	Min. 200 psi, Min. 2-inch thick, Elastizell Range II LWIC	Min. 1-inch Poly ISO 1 or H-Shield	CR-20	(Optional) Additional layers base insulation	CR-20	Mule-Hide TPO-c / TPO-c BA	-180.0
LWC-2	Structural concrete	Min. 200 psi, Min. 2-inch thick, Celcore MF Cellular Concrete	Min. 1-inch Poly ISO 1 or H-Shield	CR-20	(Optional) Additional layers base insulation	CR-20	Mule-Hide TPO-c / TPO-c BA	-222.5
LWC-3	Structural concrete	Min. 200 psi, Min. 2-inch thick, Mearlcrete	Min. 1-inch Poly ISO 1 or H-Shield	CR-20	(Optional) Additional layers base insulation	CR-20	Mule-Hide TPO-c / TPO-c BA	-240.0
LWC-4	Structural concrete	Min. 250 psi, Min. 2-inch thick, Elastizell Range II LWIC	Min. 1-inch Poly ISO 1 or H-Shield	OB500	(Optional) Additional layers base insulation	OB500	Mule-Hide TPO-c / TPO-c BA	-225.0

**TABLE 4B-1: LIGHTWEIGHT CONCRETE OVER STEEL DECK - NEW CONSTRUCTION OR RE-ROOF (TEAR OFF)
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER**

System No.	Deck (Note 1)	Lightweight Concrete (Note 15)				Roof Cover (Note 16)		MDP (psf)
		Type	Surface Treatment	Supplemental Attachment		Type	Attach	
				Fasteners	Density			
LWC-5	Min. 22 ga., Type B, Grade 33 steel at max. 6 ft spans attached 6-inch o.c.	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1" EPS holey board). <i>Note A.</i>	None	None	N/A	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-60.0
LWC-6	Min. 22 ga., Type B, Grade 33 steel at max. 4 ft spans attached 6-inch o.c.	Min. 38 pcf wet cast density, min. 200 psi, min. 1.625-inch thick Celcore MF Cellular Concrete followed by min. 1-inch EPS holey board with min. 2.0-inch thick top coat. <i>Note A.</i>	Celcore PVA	None	N/A	Mule-Hide TPO-c	TPO-c BA	-67.5
LWC-7	Min. 22 ga., Type B, Grade 33 steel at max. 6 ft spans 6-inch o.c.	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1" EPS holey board). <i>Note A.</i>	None	Mule-Hide HDP Fastener with 3" Insulation Plate	1 per 9 ft ²	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-67.5 <i>Note B</i>
LWC-8	Min. 22 ga., Type B, Grade 33 steel at max. 6 ft spans 6-inch" o.c.	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1" EPS holey board). <i>Note A.</i>	None	Mule-Hide HDP Fastener with 3" Insulation Plate	1 per 1 ft ²	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-120.0 <i>Note B</i>

Note A.) If the type of LWC to be used on the project is unknown, as in a re-roof (tear-off) condition, compressive strength and fastener withdrawal resistance testing shall be conducted. Compressive strength testing shall be in accordance with ASTM C495 (for new pour) or ASTM C109 (for existing) and shall yield a minimum 200 psi result. Field withdrawal resistance testing in accordance with TAS 105 or ANSI/SPRI FX-1 and shall yield an average withdrawal performance not less than 55 lbf with a Trufast FM-90 Base Sheet Fastener. If question exists as to the adhesion to the LWC surface, field testing in accordance with ASTM E907 or FM Loss Prevention Data Sheet 1-29 is recommended. All testing shall be performed by an accredited testing agency acceptable to the Authority Having Jurisdiction.

Note B.) Linear interpolation between supplemental attachment at 1 per 9 ft² for -67.5 psf and 1 per 1 ft² for -120.0 psf is permissible. Such interpolation shall be performed by a qualified design professional to the satisfaction of the Authority Having Jurisdiction.

**TABLE 4B-2: LIGHTWEIGHT CONCRETE OVER STRUCTURAL CONCRETE – NEW CONSTRUCTION
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER**

System No.	Deck (Note 1)	Lightweight Concrete (Note 15)	Roof Cover (Note 16)		MDP (psf)
			Membrane	Application	
LWC-9	Min. 2,500 psi structural concrete	Min. 250 psi, Min. 2" thick, Elastizell Range II LWIC	Mule-Hide TPO-c	Aqua Base 120 BA	-67.5
LWC-10	Min. 2,500 psi structural concrete	Min. 250 psi, Min. 2" thick, Elastizell Range II LWIC (EPS board optional)	Mule-Hide TPO-c	TPO-c BA	-240.0
LWC-11	Min. 2,500 psi structural concrete	Min. 300 psi, Min. 2" thick, Elastizell Range II LWIC (no EPS board)	Mule-Hide TPO-c	TPO-c BA	-495.0
LWC-12	Min. 2,500 psi structural concrete	Min. 300 psi, Min. 2" thick, Celcore Cellular Concrete	Mule-Hide TPO-c	Aqua Base 120 BA	-82.5
LWC-13	Min. 2,500 psi structural concrete	Min. 300 psi, Min. 2" thick, Celcore Cellular Concrete	Mule-Hide TPO-c	TPO-c BA	-135.0
LWC-14	Min. 2,500 psi structural concrete	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1" EPS holey board). <i>Note A.</i>	Mule-Hide TPO-c	Aqua Base 120 BA	-217.5
LWC-15	Min. 2,500 psi structural concrete	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1" EPS holey board). <i>Note A.</i>	Mule-Hide TPO-c	TPO-c BA	-480.0

Note A.) If the type of LWC to be used on the project is unknown, as in a re-roof (tear-off) condition, compressive strength and fastener withdrawal resistance testing shall be conducted. Compressive strength testing shall be in accordance with ASTM C495 (for new pour) or ASTM C109 (for existing) and shall yield a minimum 200 psi result. Field withdrawal resistance testing in accordance with TAS 105 or ANSI/SPRI FX-1 and shall yield an average withdrawal performance not less than 55 lbf with a Trufast FM-90 Base Sheet Fastener. If question exists as to the adhesion to the LWC surface, field testing in accordance with ASTM E907 or FM Loss Prevention Data Sheet 1-29 is recommended. All testing shall be performed by an accredited testing agency acceptable to the Authority Having Jurisdiction.

**TABLE 5A: GYPSUM DECKS – REROOF (Tear-Off)
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER**

System No.	Deck (Notes 1 & 12)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Note 16)		MDP (psf)
		Type	Attach	Type	Attach	Type	Application	
G-1.	Existing sound gypsum or gypsum plank	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	(Optional) Additional layers of base insulation	CR-20	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
G-2.	Existing sound gypsum or gypsum plank	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	Min. ¼-inch Dens Deck or Dens Deck Prime	CR-20	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
G-3.	Existing sound gypsum or gypsum plank	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	(Optional) Additional layers of base insulation	CR-20	Mule-Hide TPO-c	TPO-c BA	-232.5
G-4.	Existing sound gypsum or gypsum plank	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	Min. ¼-inch Dens Deck or Dens Deck Prime	CR-20	Mule-Hide TPO-c	TPO-c BA	-232.5

TABLE 6A: RECOVER APPLICATIONS
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER

System No.	Substrate (Notes 1 & 12)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Note 16)		MDP (psf)
		Type	Attach	Type	Attach	Type	Application	
R-1	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	(Optional) Additional layers of base insulation	CR-20	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
R-2	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	Min. ¼-inch Dens Deck or Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	CR-20	Mule-Hide TPO-c	Aqua Base 120 BA	-127.5
R-3	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	(Optional) Additional layers of base insulation	CR-20	Mule-Hide TPO-c	TPO-c BA	-232.5
R-4	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	CR-20	Min. ¼-inch Dens Deck or Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	CR-20	Mule-Hide TPO-c	TPO-c BA	-232.5
R-5	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-120.0
R-6	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch ACFoam II, H-Shield, ENRGY 3 or Poly ISO 1, Poly ISO 2	OB500	Min. ¼-inch Dens Deck, Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide TPO-c	TPO-c BA or Aqua Base 120 BA	-120.0

**TABLE 6B: STEEL - RECOVER
SYSTEM TYPE C-2: PLATE-BONDED ROOF COVER**

All areas where the existing metal panels do not lay flush on the underlying purlin shall have a 0.25-inch diameter pilot hole pre-drilled into the panel prior to driving the Purlin Fastener into the purlin

System No.	Substrate (Note 1)	Insulation Layer	Attachment		Roof Cover / Adhesive	MDP (psf)
			Fasteners (Note 11)	Spacing		
R-7	Existing standing seam or lap seam metal roof covers having min. 16 gauge (0.0598 inch), 50 ksi or min. 12 gauge (0.105 in.), 36 ksi steel purlins spaced max. 120-inch o.c.	One or more layers, any combination, preliminarily fastened	Mule-Hide Purlin Fastener and RhinoBond Plate - TPO are fastened through to purlins	12-inch o.c. along purlins	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-30.0
R-8	Existing standing seam or lap seam metal roof covers having min. 16 gauge (0.0598 inch), 50 ksi or min. 12 gauge (0.105 in.), 36 ksi steel purlins spaced max. 120-inch o.c.	One or more layers, any combination, preliminarily fastened	Mule-Hide Purlin Fastener and RHINOBOND Insulation Plate (TPO) are fastened through to purlins	6-inch o.c. along purlins	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-37.5
R-9	Existing standing seam or lap seam metal roof covers having min. 16 gauge (0.0598 inch), 50 ksi or min. 12 gauge (0.105 in.), 36 ksi steel purlins spaced max. 60-inch o.c.	One or more layers, any combination, preliminarily fastened	Mule-Hide Purlin Fastener and RHINOBOND Insulation Plate (TPO) are fastened through to purlins	12-inch o.c. along purlins	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-37.5
R-10	Existing standing seam or lap seam metal roof covers having min. 16 gauge (0.0598 inch), 50 ksi or min. 12 gauge (0.105 in.), 36 ksi steel purlins spaced max. 60-inch o.c.	One or more layers, any combination, preliminarily fastened	Mule-Hide Purlin Fastener and RHINOBOND Insulation Plate (TPO) are fastened through to purlins	12-inch o.c. along purlins	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-45.0
R-11	Existing standing seam or lap seam metal roof covers having min. 16 gauge (0.0598 inch), 50 ksi or min. 12 gauge (0.105 in.), 36 ksi steel purlins spaced max. 120-inch o.c.	One or more layers, any combination, preliminarily fastened	Mule-Hide Purlin Fastener and RHINOBOND Insulation Plate (TPO) are fastened through to purlins	6-inch o.c. along purlins	Mule-Hide TPO-c (minimum 60-mil) bonded to RhinoBond Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-52.5
R-12	Existing standing seam or lap seam metal roof covers having min. 16 gauge (0.0598 inch), 50 ksi or min. 12 gauge (0.105 in.), 36 ksi steel purlins spaced max. 60-inch o.c.	One or more layers, any combination, preliminarily fastened	Mule-Hide Purlin Fastener and RHINOBOND Insulation Plate (TPO) are fastened through to purlins	6-inch o.c. along purlins	Mule-Hide TPO-c bonded to RhinoBond Plate - TPO with RHINOBOND tool per manufacturer's instructions.	-67.5

TABLE 6C: STEEL – RECOVER
SYSTEM TYPE D-1: INSULATED, MECHANICALLY ATTACHED ROOF COVER

(All areas where the existing metal panels do not lay flush on the underlying purlin shall have a 0.25-inch diameter pilot hole pre-drilled into the panel prior to driving the Purlin Fastener into the purlin.)

System No.	Deck (Note 1)	Insulation		Roof Cover			MDP (psf)
		Type	Attach	Membrane	Fasteners (Note 11)	Attachment	
R-13	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 138.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	12-inch o.c. within 5.5-inch wide laps spaced max. 138.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-30.0
R-14	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 115-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	12-inch o.c. within 5.5-inch wide laps spaced max. 115-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-45.0
R-15	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 54.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	12-inch o.c. within 5.5-inch wide laps spaced max. 54.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-60.0
R-16	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 138.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	6-inch o.c. within 5.5-inch wide laps spaced max. 138.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-60.0
R-17	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 90.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	6-inch o.c. within 5.5-inch wide laps spaced max. 90.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-67.5
R-18	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 114.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	9-inch o.c. within 5.5-inch wide laps spaced max. 114.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-75.0
R-19	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 42.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	6-inch o.c. within 5.5-inch wide laps spaced max. 42.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-82.5
R-20	Existing standing seam or lap seam metal roof covers having min. 16 ga. (0.0598-inch) to max. 3/16-inch thick steel purlins spaced max. 114.5-inch o.c.	One or more layers, any combination	Prelim. attach	Mule-Hide TPO-c or TPO-c EXTRA	Mule-Hide Purlin Fastener and 2.4 Seam Plate	6-inch o.c. within 5.5-inch wide laps spaced max. 114.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-90.0

TABLE 6D: RECOVER APPLICATIONS
SYSTEM TYPE E-1: NON-INSULATED, MECHANICALLY ATTACHED ROOF COVER

System No.	Deck (Note 1)	Roof Cover						MDP (psf)
		Membrane	Fasteners (Note 11)	Fastener Spacing (inch)	Lap Width (inch)	Lap Spacing (inch)	Seam Weld (inch)	
R-21	Existing steel deck	Mule-Hide TPO-c Fleece Back, 60-mil	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 695 lbf</i>)	12	5	139	1.5	-30.0
R-22	Existing steel deck, min. Grade 80	Mule-Hide TPO-c Fleece Back	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 695 lbf</i>)	12	5.5	139	1.5	-30.0
R-23	Existing steel deck	Mule-Hide TPO-c Fleece Back, 60-mil	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate installed through to engage existing deck (<i>Field W/D ≥ 434 lbf</i>)	6	5	139	1.5	-37.5
R-24	Existing steel deck, min. Grade 80	Mule-Hide TPO-c Fleece Back	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 434 lbf</i>)	6	5.5	139	1.5	-37.5
R-25	Existing steel deck	Mule-Hide TPO-c Fleece Back, 60-mil	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate installed through to engage existing deck (<i>Field W/D ≥ 719 lbf</i>)	12	5	115	1.5	-37.5
R-26	Existing steel deck, min. Grade 80	Mule-Hide TPO-c Fleece Back	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate installed through to engage existing deck (<i>Field W/D ≥ 719 lbf</i>)	12	5.5	115	1.5	-37.5
R-27	Existing steel deck, min. Grade 80	Mule-Hide TPO-c Fleece Back	Mule-Hide EHD Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 455 lbf</i>)	6	5.5	91	1.5	-60.0
R-28	Existing steel deck, min. Grade 80	Mule-Hide TPO-c Fleece Back, 60-mil	Mule-Hide EHD Plus Fasteners and Mule-Hide 2.4" PLUS Seam Plate installed through to engage existing deck (<i>Field W/D ≥ 910 lbf</i>)	12	5	91	1.5	-60.0
R-29	Existing structural concrete	Mule-Hide TPO-c Fleece Back	Mule-Hide HDP Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 695 lbf</i>)	12	5.5	139	1.5	-30.0
R-30	Existing structural concrete	Mule-Hide TPO-c Fleece Back	Mule-Hide HDP Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck Plates (<i>Field W/D ≥ 434 lbf</i>)	6	5.5	139	1.5	-37.5
R-31	Existing structural concrete	Mule-Hide TPO-c Fleece Back	Mule-Hide HDP Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 719 lbf</i>)	12	5.5	115	1.5	-37.5
R-32	Existing structural concrete	Mule-Hide TPO-c Fleece Back	Mule-Hide HDP Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 455 lbf</i>)	6	5.5	91	1.5	-60.0
R-33	Existing structural concrete	Mule-Hide TPO-c Fleece Back, 60-mil	Mule-Hide HDP Fastener and Mule-Hide 2.4" Seam Plates installed through to engage existing deck (<i>Field W/D ≥ 910 lbf</i>)	12	5	91	1.5	-60.0

TABLE 6E: RECOVER APPLICATIONS
SYSTEM TYPE F-2: NEW LIGHTWEIGHT CONCRETE OVER EXISTING ROOF, BONDED ROOF COVER

System No.	Substrate (Notes 1 & 12)		Lightweight Concrete (Note 15)	Roof Cover (Note 16)		MDP (psf)
	Deck	Existing Roof		Type	Attach	
R-34	Structural concrete	Existing asphalt BUR or smooth- or granule-surface SBS modified bitumen	Min. 250 psi, Min. 2-inch thick, Elastizell Range II LWIC (EPS board optional)	Mule-Hide TPO-c	Aqua Base 120 BA	-67.5
R-35	Structural concrete	Existing asphalt BUR or granule-surface SBS modified bitumen	Min. 250 psi, Min. 2-inch thick, Elastizell Range II LWIC (EPS board optional)	Mule-Hide TPO-c	TPO-c BA	-302.5
R-36	Structural concrete	Existing asphalt BUR or smooth-surface SBS modified bitumen	Min. 250 psi, Min. 2-inch thick, Elastizell Range II LWIC (EPS board optional)	Mule-Hide TPO-c	TPO-c BA	-342.0