



NEMO|etc.

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ENGINEER

EVALUATE

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EVALUATION REPORT

Mule-Hide Products Co., Inc.
1195 Prince Hall Drive
Beloit, WI 53511
(608) 365-3111

Evaluation Report 10900.02.16-2-R3
FL19969-R3
Date of Issuance: 02/18/2016
Revision 3: 10/05/2020

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 **7th Edition (2020) Florida Building Code, High Velocity Hurricane Zone (HVHZ)** sections noted herein.

DESCRIPTION: Mule-Hide PVC and PVC/KEE Single Ply Roof Systems

LABELING: Labeling shall be in accordance with the requirements of 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 or production facility location(s) changes, or Code provisions that relate to the product(s) change. Acceptance of our Evaluation Reports 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 Evaluation Report relative to updated Code requirements with each Code Cycle.

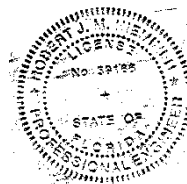
ADVERTISEMENT: The Florida Product Approval Number (FL#) preceded by the words "NEMO|etc. Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

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 3, plus an 18-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 10/05/2020. This does not serve as an electronically signed document.

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 evaluation reports 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 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 PVC and PVC/KEE Single Ply Roof Systems, as produced by Mule-Hide Products Co., Inc., have demonstrated compliance with the following sections of the 7th Edition (2020) Florida Building Code, HVHZ 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:

Section	Property	Standard	Year
TAS 110	Resistance to Foot Traffic	TAS 114, Section 8.9	2011
TAS 110	Wind resistance	TAS 114, Appendix C, D or J	2011
TAS 110	Susceptibility Hail Damage	TAS 114, Appendix F	2011
TAS 110	Susceptibility to Leakage	TAS 114, Appendix G	2011
TAS 110	Material standard	ASTM D4434	2012

3. REFERENCES:

Entity	Examination	Reference	Date
NEMO	Evaluation Report	C42330.06.13-2A-R5	08/29/2017
UL, LLC (QUA9625)	Quality Control	MLA; R8103	05/07/2012
UL, LLC (QUA9625)	Quality Control	MLA; R13850	10/01/2014
UL, LLC (QUA9625)	Quality Control	MLA; R13850	09/15/2017
UL, LLC (QUA9625)	Quality Control	Service confirmation	12/14/2018
UL, LLC (QUA9625)	Quality Control	Florida BCIS	Current

4. PRODUCT DESCRIPTION:

This Evaluation Report covers Mule-Hide PVC and PVC/KEE Single Ply Roof Systems installed in accordance with Mule-Hide Products Co., Inc. published installation instructions and the Limitations / Conditions of Use herein.

TABLE 1: MEMBRANES FOR PVC AND PVC/KEE SINGLE PLY ROOF SYSTEMS

Product	Nominal Thickness (mil)	Material Standard		Plant(s)
		Reference	Type	
Mule-Hide PVC	50, 60, 80	ASTM D4434	III	Greenville, IL
Mule-Hide PVC FRS	60, 80	ASTM D4434	II	Hillside, NJ
Mule-Hide KEE HP	50, 60, 80	ASTM D4434	III	Greenville, IL
Mule-Hide PVC KEE HP FRS Fleece Back	60, 80	ASTM D4434	III	Hillside, NJ

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 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 Non-High Velocity Hurricane Zone jurisdictions.
- 5.3 The evaluation herein pertains to above-deck roof components; deck-attachment details pertain to 'as-tested' conditions under **Testing Application Standard TAS 114, Appendix J**. Roof decks shall be in accordance with **FBC HVHZ** requirements to the satisfaction of the Authority Having Jurisdiction.
- 5.4 This Evaluation Report does not include evaluation of fire classification. Refer to **FBC HVHZ 1516** 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 Evaluation Report does not include evaluation of roof edge termination. Refer to **Roofing Application Standard RAS 111** for requirements and limitations regarding edge securement for low-slope roofs.
- 5.6 Refer to **FBC HVHZ 1521** 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 **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 **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 **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 **Testing Application Standard TAS 114** has already been applied). Refer to **FBC HVHZ 1620** and **Roofing Application Standard RAS 128** for determination of design wind loads.
- 5.7.2 For mechanically attached components, 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 HVHZ 1620** or **Roofing Application Standard RAS 128**. Elevated pressure zones shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Analysis shall be in accordance with **Roofing Application Standard RAS 117** or **Roofing Application Standard RAS 137**. **This extrapolation is not permitted for systems marked with an asterisk*.*
- 5.7.3 For assemblies marked with an asterisk*, the maximum design pressure (MDP) limitation shall be applicable to all roof pressure zones. Rational analysis is not permitted.
- 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 Evaluation Report.

6. INSTALLATION:

Mule-Hide PVC and PVC/KEE Single Ply Roof Systems shall be installed in accordance with **Mule-Hide** published installation instructions, subject to the Limitations / Conditions 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; (414) 248-6409; karen.buchmann@ul.com

- THE 18-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
2A	Steel or Structural concrete	New, Reroof (Tear-Off), Recover	B-1	Mech. Attached Base Insulation, Bonded Top Insulation, Bonded Roof Cover	5-6
2B	Steel or Structural concrete	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Roof Cover	6-8
2C	Steel	New, Reroof (Tear-Off), Recover	C-2	Plate-Bonded Roof Cover	9
2D	Steel	New, Reroof (Tear-Off), Recover	D-1	Insulated, Mechanically Attached Roof Cover	10
3A	Structural concrete	New, Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	11-13
3B	Structural concrete	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	13
4A	Lightweight concrete over steel	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	14
4B	Lightweight concrete over concrete	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	15
5A	Existing gypsum	Reroof (Tear-Off)	F	None-Insulated, Bonded Roof Cover	15
6A	Various	Recover	A-1	Bonded Insulation, Bonded Roof Cover	16-17
6B	Steel	Recover	D-1	Insulated, Mechanically Attached Roof Cover	18
6C	Various	Recover	F	Non-Insulated, Bonded Roof Cover	18

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 HVHZ requirements to the satisfaction of the Authority Having Jurisdiction. Deck-attachment details pertain to 'as-tested' conditions under Testing Application Standard TAS 114, Appendix J.
- Unless otherwise noted, fasteners and stress plates shall be as follows. Fasteners shall be of sufficient length for the following engagements:
 - Wood Deck: Mule-Hide HDP Fastener with Mule-Hide 3 in. Insulation Plate; Minimum 0.75-inch plywood penetration or minimum 1-inch wood plank embedment.
 - Steel Deck: Mule-Hide HDP Fastener with Mule-Hide 3 in. Insulation Plate; Minimum 0.75-inch steel penetration and engage the top flute of the steel deck.
 - Structural Concrete: Mule-Hide HDP Fastener or Mule-Hide CF with Mule-Hide 3 in. Insulation Plate; Minimum 1.25-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 HVHZ 1516 and, for foam plastic, FBC Chapter 26, when installed with the roof cover.
- If mechanical attachment to the structural deck through lightweight insulating concrete is proposed, field withdrawal resistance testing shall be performed to confirm equivalent or determine enhanced fastening patterns and density. All testing and fastening design shall be in compliance with Testing Application Standard TAS 105 and Roofing Application Standard RAS 117 and/or RAS 137. Calculations shall be prepared, signed and sealed by a qualified design professional.
- Preliminary insulation attachment for System Type D: Minimum four fasteners per 4 x 8 ft board or minimum two fasteners per 4 x 4 ft board.
- 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.
 - Helix 2 Low-Rise Adhesive (Helix 2 LRA) (FULL): Full-coverage at 1 gal./square.
 - Helix 2 Low-Rise Adhesive (Helix 2 LRA) (RIBBON): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c.
 - Helix Max Low-Rise Adhesive (Helix Max LRA) (FULL): Full-coverage at 1 gal./square.
 - Helix Max Low-Rise Adhesive (Helix Max LRA) (RIBBON): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c.
 - OlyBond 500 (OB500): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c. using PaceCart or SpotShot. Note: OlyBond 500 Green may be used where OlyBond 500 is referenced.
 - 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.

- 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.
- Helix 2 LRA or Helix Max LRA: MDP: -157.5 psf (Min. 0.5-inch thick)
 - OlyBond 500 (OB500): MDP: -187.5 psf (Min. 0.5-inch thick)
- 8 Bonded polyisocyanurate insulation boards shall be maximum 4 x 4 ft.
- 9 For mechanically attached components, 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 HVHZ 1620 or Roofing Application Standard RAS 128. Elevated pressure zones shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria in accordance with Roofing Application Standard RAS 117 or Roofing Application Standard RAS 137. *This extrapolation is not permitted for systems marked with an asterisk*
- 10 For assemblies marked with an asterisk*, 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 in accordance with Testing Application Standard TAS 105. A qualified design professional shall review the data for comparison to the minimum requirements for the system. Should the fastener resistance be less than that required, a revised fastener spacing – prepared, signed and sealed by a qualified design professional in accordance with Roofing Application Standard RAS 117 or Roofing Application Standard RAS 137 – may be submitted to the Building Official for review and acceptance.
- 12 Refer to FBC HVHZ 1521 for requirements and limitations regarding recover installations. 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 in accordance with Testing Application Standard TAS 124.
- 13 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 HVHZ 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 herein). The separator component shall be documented as meeting FBC HVHZ 1516 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 FBC HVHZ 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 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. For bonded membrane applications, unless otherwise noted, refer to the following.

MEMBRANE / ADHESIVE COMBINATIONS			
MEMBRANE	ADHESIVE	METHOD	RATE
Mule-Hide PVC, Mule-Hide PVC KEE HP	Mule-Hide PVC Bonding Adhesive (PVC BA)	Contact (both sides)	1.67 gal/square (½ applied to substrate and ½ applied to membrane)
Mule-Hide PVC, Mule-Hide PVC KEE HP	Mule-Hide Low VOC PVC Bonding Adhesive (Low VOC PVC BA)	Contact (both sides)	3.1 gal/square (½ applied to substrate and ½ applied to membrane)
Mule-Hide PVC	Aqua Base 120 Bonding Adhesive	Contact (both sides)	0.83 to 1 gal/square (½ applied to substrate and ½ applied to membrane)
Mule-Hide PVC	HydroBond Water-Based PVC Bonding Adhesive (HydroBond)	Wet lay (substrate)	0.75 to 1 gal/square
Mule-Hide PVC FRS Fleece Back or Mule-Hide PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA	Wet lay (substrate)	RIBBON spaced as noted herein or FULL = 1 gal/square or continuous ribbons, maximum 4-inch o.c.

16 Vapor barrier options for use over structural concrete deck followed by bonded insulation carry the following 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 702 Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	Helix 2 LRA, FULL-coverage at 1 gal/square.	-67.5
VB-2.	Carlisle 702 Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	Helix 2 LRA, RIBBON, 12-inch o.c.	-67.5
VB-3.	Carlisle 702 LV Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	Helix 2 LRA, FULL-coverage at 1 gal/square.	-97.5
VB-4.	Carlisle 702 LV Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	Helix 2 LRA, RIBBON, 12-inch o.c.	-97.5
VB-5.	Carlisle CAV-GRIP Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	Helix 2 LRA, FULL-coverage at 1 gal/square.	-127.5
VB-6.	Carlisle CAV-GRIP Primer	F5™ Air & Vapor Barrier or Carlisle VapAir Seal 725TR	Self-adhering	Helix 2 LRA, RIBBON, 12-inch o.c.	-127.5
VB-7.	ASTM D41	Carlisle SureMB 90TG Base	Torch-applied	Helix 2 LRA, RIBBON, 12-inch o.c.	-165.0
VB-8.	ASTM D41	Carlisle SureMB 90 Base	Hot-asphalt	Hot asphalt at 25 lbs/square	-172.5
VB-9.	ASTM D41	Carlisle SureMB 90TG Base	Torch-applied	Hot asphalt at 25 lbs/square	-180.0

- 17 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
- 18 "MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads. Refer to FBC (HVHZ) 1620 and Roofing Application Standard RAS 128 for determination of design wind loads.

**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 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
W-1	Min. 23/32-inch plywood	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.25-inch Dens Deck Prime	Note 2	1 per 1.6 ft ²	Mule-Hide PVC / Aqua Base 120 BA	-45.0*
W-2	Min. 23/32-inch plywood	(Optional) One or more layers	Min. 1-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 1.6 ft ²	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
W-3	Min. 23/32-inch plywood	(Optional) One or more layers	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 2.0 ft ²	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
W-4	Min. 23/32-inch plywood	Min. 1.0-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch HP Recovery Board	Note 2	1 per 2.0 ft ²	Mule-Hide PVC or PVC KEE HP / Mule-Hide PVC BA or Low VOC PVC BA	-45.0*
W-5	Min. 23/32-inch plywood	Min. 1.0-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.25-inch Dens Deck Prime	Note 2	1 per 2.0 ft ²	Mule-Hide PVC / Mule-Hide PVC BA, Low VOC PVC BA, HydroBond	-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 13)		Roof Cover (Note 15)						MDP (psf)
		Type	Attach	Membrane	Fasteners (Note 11)	Fastener Spacing	Lap Width	Lap Spacing	Seam Weld	
W-6	Min. 23/32-inch plywood or wood plank at max. 24-inch spans attached using Trufast Spax 8x1-1/2, Spax 8x2, Spax 10x1 1/2, Spax 10x2 fasteners or OMG Fasten-Master GuardDog 1-5/8 in. or 2 in. screws spaced 6-inch o.c. in the field and spaced 3-inch o.c. at the panel ends.	One or more layers, any combination	Prelim. attached	Mule-Hide PVC	Mule-Hide EHD Fasteners and Mule-Hide 2.4 in. Seam Plates	6-inch o.c.	5.5-inch	75.5-inch o.c.	1.5-inch outside	-52.5
W-7	Min. 19/32-inch plywood or wood plank at max. 24-inch spans attached using 8d ring shank nails spaced 6-inch o.c. in the field and #10 ring shank nails spaced 4-inch o.c. at the perimeter	One or more layers, any combination	Prelim. attached	Mule-Hide PVC	Mule-Hide EHD Fasteners and Mule-Hide 2.4 in. Seam Plates	6-inch o.c.	5.5-inch	75.5-inch o.c.	1.5-inch outside	-60.0

**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)		
MULE-HIDE PVC OR PVC KEE HP 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	Note 2	1 per 3.2 ft ²	Min. 1.0-inch base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-2	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch Poly ISO 1, H-Shield	Note 2	1 per 4.0 ft ²	Min. 1.0-inch base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-3	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield	Note 2	1 per 3.2 ft ²	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-4	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch Poly ISO 1, H-Shield	Note 2	1 per 4.0 ft ²	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-5	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 0.5-inch Dens Deck followed by min. 2.0-inch Insulfoam IX	Note 2	1 per 2.0 ft ²	Min. 2.0-inch Insulfoam HD Composite	Helix Max LRA (RIBBON), 6-inch o.c.	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-6	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield	Note 2	1 per 1.6 ft ²	Min. 1.0-inch base insulation	Helix 2 LRA, Helix Max LRA (ribbon, 6-inch o.c.)	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-67.5
SC-7	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 2.0 ft ²	Min. 0.5-inch HP Recovery Board	OB500	Mule-Hide PVC or PVC KEE HP / Mule-Hide PVC BA or Low VOC PVC BA	-45.0*
SC-8	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 2.0 ft ²	Min. 0.25-inch Dens Deck Prime	OB500	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
MULE-HIDE PVC FRS FLEECE BACK OR PVC KEE HP FRS FLEECE BACK APPLICATIONS:								
SC-9	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi concrete	One or more layers Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, or AC Foam II	Note 2	1 per 2.0 ft ²	Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-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	Note 2	1 per 3.2 ft ²	Min. 1.0-inch base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-45.0*
SC-11	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield	Note 2	1 per 3.2 ft ²	Min. 0.25-inch Dens Deck or Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-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-12	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch Poly ISO 1, H-Shield	Note 2	1 per 4.0 ft ²	Min. 1.0-inch base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-45.0*
SC-13	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2.0-inch Poly ISO 1, H-Shield	Note 2	1 per 4.0 ft ²	Min. Dens Deck or 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-45.0*
SC-14	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 0.5-inch Dens Deck followed by min. 2.0-inch Insulfoam VIII	Note 2	1 per 2.0 ft ²	Min. 2.0-inch Insulfoam HD Composite	Helix Max LRA (RIBBON), 6-inch o.c.	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-45.0*
SC-15	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield	Note 2	1 per 1.6 ft ²	Min. 1.0-inch base insulation	Helix 2 LRA, Helix Max LRA (ribbon, 6-inch o.c.)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-67.5
SC-16	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield	Note 2	1 per 2.7 ft ²	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-45.0*
SC-17	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 2-inch Poly ISO 1, H-Shield	Note 2	1 per 1.6 ft ²	Min 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (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 (Note 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
MULE-HIDE PVC OR PVC KEE HP APPLICATIONS:							
SC-18	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.25-inch Dens Deck Prime	Note 2	1 per 1.6 ft ²	Mule-Hide PVC / Aqua Base 120 BA	-45.0*
SC-19	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers	Min. 1-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 1.6 ft ²	Mule-Hide PVC / Mule-Hide PVC BA, Low VOC PVC BA, HydroBond	-45.0*
SC-20	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	(Optional) One or more layers	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 2.0 ft ²	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-21	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.0-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch HP Recovery Board	Note 2	1 per 2.0 ft ²	Mule-Hide PVC or PVC KEE HP / Mule-Hide PVC BA or Low VOC PVC BA	-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 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
SC-22	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.0-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.25-inch Dens Deck Prime	Note 2	1 per 2.0 ft ²	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-23	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch Poly ISO 1-HD, SecurShield HD Plus	Note 2	1 per 4.0 ft ²	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-45.0*
SC-24	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi 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 2.0 ft ²	Mule-Hide PVC / Low VOC PVC BA, HydroBond	-45.0*
SC-25	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch Poly ISO 1-HD, SecurShield HD Plus	Note 2	1 per 1.8 ft ²	Mule-Hide PVC in PVC BA, Low VOC PVC BA or HydroBond or Mule-Hide PVC KEE HP in PVC BA or Low VOC PVC BA	-60.0
SC-26	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	(Optional) One or more layers	Min. 19/32-inch APA rated plywood	Note 2	1 per 1.9 ft ²	Mule-Hide PVC / HydroBond	-60.0
SC-27	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	(Optional) One or more layers	Min. 2.0-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 1.6 ft ²	Mule-Hide PVC / HydroBond	-60.0
SC-28	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 1.6 ft ²	Mule-Hide PVC / HydroBond	-60.0
SC-29	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	(Optional) One or more layers	Min. 19/32-inch APA rated plywood	Note 2	1 per 1.9 ft ²	Mule-Hide PVC or PVC KEE HP / Mule-Hide PVC BA or Low VOC PVC BA	-67.5
SC-30	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	(Optional) One or more layers	Min. 2.0-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Note 2	1 per 1.6 ft ²	Mule-Hide PVC or PVC KEE HP / Mule-Hide PVC BA or Low VOC PVC BA	-67.5
SC-31	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 1.6 ft ²	Mule-Hide PVC or PVC KEE HP / Low VOC PVC BA	-82.5
SC-32	Min. 22 ga., type B, Grade 33 steel; 6' spans, two (2) Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Min. 0.5-inch Poly ISO 1-HD, SecurShield HD Plus	Note 2	1 per 1.3 ft ²	Mule-Hide PVC or PVC KEE HP / Mule-Hide PVC BA	-112.5

**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 13)	Top Insulation Layer			Roof Cover (Note 15)	MDP (psf)
			Type	Fasteners (Note 11)	Attach		
SC-33	Min. 22 ga., type B, Grade 33 steel; 6' spans, two (2) Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, ACFoam II	Min. 2-inch SecurShield	Note 2	1 per 1.0 ft ²	Mule-Hide PVC or PVC KEE HP / Low VOC PVC BA	-112.5
SC-34	Min. 22 ga., type B, Grade 33 steel; 6' spans, two (2) Traxx/5 screws 6" o.c. or min. 2,500 psi structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, ACFoam II	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Note 2	1 per 1.0 ft ²	Mule-Hide PVC or PVC KEE HP / Low VOC PVC BA	-112.5
MULE-HIDE PVC FRS FLEECE BACK OR PVC KEE HP FRS FLEECE BACK APPLICATIONS:							
SC-35	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi 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 2.0 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (RIBBON, 12-inch o.c.)	-45.0*
SC-36	Min. 22 ga., type B, Grade 33 steel or min. 2,500 psi 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 2.0 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-45.0*
SC-37	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 19/32-inch APA or TECO rated plywood	Note 2	1 per 1.9 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-75.0
SC-38	Min. 22 ga., type B, Grade 33 steel; 6' spans, two (2) Traxx/5 screws 6" o.c. or min. 2,500 psi concrete	Min. 1.5-inch thick, one or more layers, any combination, loose laid	Min 19/32-inch APA or TECO rated plywood	Note 2	1 per 1.0 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA or Helix Max LRA (FULL)	-135.0
SC-39	Min. 22 ga., type B, Grade 33 steel; 6' spans, two (2) Traxx/5 screws 6" o.c. or min. 2,500 psi concrete	(Optional) One or more layers, any combination, loose laid	Min. 2.0-inch SecurShield HD Composite, Poly ISO 1-HD Composite, H-Shield HD Composite	Note 2	1 per 1.0 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back / Helix 2 LRA (FULL)	-150.0

**TABLE 2C: STEEL DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE C-2: PLATE-BONDED ROOF COVER**

System No.	Deck (Note 1)	Insulation Layer (Note 13)	Attachment		Roof Cover	MDP (psf)
			Fasteners (Note 11)	Density / Pattern		
SC-40	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	1 per 5.3 ft ² (6 parts per 4 x 8 ft board) Per FM LPDS 1-29; Note B	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-45.0
SC-41	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	1 per 4.0 ft ² (8 parts per 4 x 8 ft board) Per FM LPDS 1-29; Note B	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-52.5
SC-42	Min. 22 ga., type B, Grade 40 steel; 6 ft spans; 5/8" puddle welds 6" o.c.	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	1 per 4.0 ft ² (2 x 2 ft grid pattern)	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-52.5
SC-43	Min. 22 ga., type B, Grade 80 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	1 per 4.0 ft ² (8 parts per 4 x 8 ft board) Per FM LPDS 1-29; Note B	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-60.0
SC-44	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch thick, one or more layers, any combination. Note A.	Mule-Hide EHD Plus Fastener and Rhinobond Plates (PVC)	1 per 4.0 ft ² (8 parts per 4 x 8 ft board) 2 x 2 ft grid pattern	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-67.5
SC-45	Min. 22 ga., type B, Grade 80 steel; 6' spans, Traxx/5 screws 6" o.c. or min. 2,500 psi concrete	Min. 1.5-inch thick, one or more layers, any combination, preliminarily attached	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	Max. 12-inch o.c. in rows max. 60-inch o.c.	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-52.5
SC-46	Min. 22 ga., type B, Grade 80 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch thick, one or more layers, any combination, preliminarily attached	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	Max. 6-inch o.c. in rows max. 120-inch o.c.	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-60.0
SC-47	Min. 22 ga., type B, Grade 80 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch thick, one or more layers, any combination, preliminarily attached	Mule-Hide EHD Fastener and Rhinobond Plates (PVC)	Max. 6-inch o.c. in rows max. 60-inch o.c.	Mule-Hide PVC or PVC KEE HP bonded to Rhinobond Plates (PVC) with Rhinobond bonding tool.	-90.0

- Notes: A. For these assemblies, the 8 ft insulation board length is placed perpendicular to the steel deck ribs
 B. The plate/fastener combination is offset 12 inch from adjacent rows.

**TABLE 2D: STEEL DECKS – NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE D-1: INSULATED, MECHANICALLY ATTACHED ROOF COVER**

System No.	Roof Deck	Insulation Layer (Note 13)		Roof Cover (Note 15)						MDP (psf)
		Type	Attach	Membrane	Fasteners (Note 11)	Fastener Spacing	Lap Width	Lap Spacing	Seam Weld	
SC-48	Min. 22 ga., type B, Grade 80 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	12-inch o.c.	5.5-inch	75.5-inch o.c.	1.5-inch outside	-45.0
SC-49	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC or PVC KEE HP	Mule-Hide EHD Plus Fastener and Mule-Hide 2.4" Plus Seam Plate	12-inch o.c.	5.5-inch	75.5-inch o.c.	1.5-inch outside	-45.0
SC-50	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC KEE HP	Mule-Hide EHD Fastener and Dekfast 1-1/2" x 2-3/4" Oval Barbed Plates	6-inch o.c.	6-inch	114-inch o.c.	1.5-inch outside	-45.0
SC-51	Min. 22 ga., type B, Grade 33 steel; 6' spans, 5/8" puddle welds or Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination (optional for recover) followed by 3/8-inch Insulfoam R-Tech EPS or Fan-Fold	Loose laid	Mule-Hide PVC or PVC KEE HP	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	6-inch o.c.	5.5-inch	75.5-inch o.c.	1.5-inch outside	-52.5
SC-52	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	12-inch o.c.	5-inch	35.5-inch o.c.	1.5-inch outside	-52.5
SC-53	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	12-inch o.c.	5.5-inch	35-inch o.c.	1.5-inch outside	-60.0
SC-54	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	6-inch o.c.	5.5-inch	75.5-inch o.c.	1.5-inch outside	-60.0
SC-55	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	Min. 60-mil Mule-Hide PVC or min. 50-mil Mule-Hide PVC KEE HP	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	6-inch o.c.	5.5-inch	114.5-inch o.c.	1.5-inch outside	-60.0
SC-56	Min. 22 ga., type B, Grade 33 steel; 6' spans, Traxx/5 screws 6" o.c.	Min. 1.5-inch, one or more layers, any combination	Prelim. Attached	Mule-Hide PVC or PVC KEE HP	Mule-Hide EHD Fastener and Mule-Hide 2.4 in. Seam Plate	6-inch o.c.	5.5-inch	35-inch o.c.	1.5-inch outside	-82.5

NOTE: As-tested steel deck performance under Testing Application Standard TAS 114, Appendix J indicates steel deck at max. 6' spans attached with 5/8" diameter puddle welds spaced 6" o.c.; with deck side laps secured max. 24" o.c. w/ 1/4"-14x1" long self-tapping hex-head screws may be substituted for Traxx/5 screws in the Table 2D assemblies up to a maximum design pressure of -60.0 psf. Note 1.

**TABLE 3A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER
REFER TO NOTE 16 FOR VAPOR BARRIER OPTIONS**

System No.	Roof Deck	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	
MULE-HIDE PVC OR PVC KEE HP APPLICATIONS:								
C-1.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC	HydroBond	-60.0*
C-2.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC	HydroBond	-60.0*
C-3.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield	Helix Max LRA (RIBBON)	Min. 1.5-inch SecureShield	Helix Max LRA (RIBBON)	Mule-Hide PVC	HydroBond	-60.0*
C-4.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 0.5-inch HP Recovery Board	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-180.0*
C-5.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II or SecureShield	Helix 2 LRA, Helix Max LRA (RIBBON)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-225.0*
C-6.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-240.0*
C-7.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield	Helix Max LRA (RIBBON)	Min. 1.5-inch SecureShield	Helix Max LRA (RIBBON)	Mule-Hide PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-255.0*
C-8.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC	HydroBond	-60.0*
C-9.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	HydroBond	-60.0*
C-10.	Structural concrete	Min. 1.5-inch Insulam (GYP), min. Type IX core or Insulfoam HD Composite	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC	HydroBond	-60.0*
C-11.	Structural concrete	Min. 1.5-inch Insulam (GYP), min. Type IX core	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA	-67.5*
C-12.	Structural concrete	Min. 1.5-inch Insulam (GYP), min. Type IX core	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC or PVC KEE HP	Low VOC PVC BA	-112.5*
C-13.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 2.0-inch Poly ISO 1-WF, H-Shield-WF	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-180.0*
C-14.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.5-inch HP Recovery Board	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-180.0*

**TABLE 3A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER
REFER TO NOTE 16 FOR VAPOR BARRIER OPTIONS**

System No.	Roof Deck	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-15.	Structural concrete	Min. 1.5-inch Insulam (WF), min. Type IX core	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-180.0*
C-16.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II or SecureShield	Helix 2 LRA, Helix Max LRA (FULL)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-225.0*
C-17.	Structural concrete	Min. 1.5-inch Insulfoam HD Composite	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC	Mule-Hide PVC BA or Low VOC PVC BA	-225.0*
C-18.	Structural concrete	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC	Mule-Hide PVC BA or Low VOC PVC BA	-315.0*
C-19.	Structural concrete	Min. 1.5-inch Insulam (GYP), min. Type IX core	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA	-247.5*
C-20.	Structural concrete	Min. 1.5-inch Insulfoam HD Composite	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-247.5*
C-21.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide PVC	HydroBond	-60.0*
C-22.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	OB500	Min. 0.25-inch Dens Deck Prime or SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC	HydroBond	-60.0*
C-23.	Structural concrete	Min. 1.5-inch HP-W, Poly ISO 1, H-Shield, Poly ISO 2, AC Foam II	OB500	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC or PVC KEE HP	Low VOC PVC BA	-112.5*
C-24.	Structural concrete	Min. 1.5-inch ENRGY 3	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-127.5*
C-25.	Structural concrete	Min. 1.5-inch HP-W, Poly ISO 1, H-Shield, Poly ISO 2, AC Foam II	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-150.0*
C-26.	Structural concrete	Min. 1.5-inch ENRGY 3	OB500	Min. 0.25-inch Dens Deck Prime	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-127.5*
C-27.	Structural concrete	(Optional) Min. 1.5-inch HP-W, Poly ISO 1, H-Shield, Poly ISO 2, AC Foam II	OB500	Min. 0.25-inch Dens Deck Prime	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-150.0*
C-28.	Structural concrete	Min. 1.5-inch HP-W, Poly ISO 1, H-Shield, Poly ISO 2, AC Foam II	OB500	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA	-247.5*

MULE-HIDE PVC FRS FLEECE BACK OR PVC KEE HP FRS 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 16 FOR VAPOR BARRIER OPTIONS

System No.	Roof Deck	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-29.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II, Pactiv GreenGuard or Foamular 150 or Min. 1.0-inch Dow Styrofoam	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 1.5-inch SecurShield HD Composite, Poly ISO 1-HD Composite, H-Shield HD Composite	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-285.0*
C-30.	Structural concrete	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II, Pactiv GreenGuard or Foamular 150 or Min. 1.0-inch Dow Styrofoam	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 0.5-inch HP Recovery Board	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-330.0*
C-31.	Structural concrete	(Optional) Poly ISO 1, H-Shield, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Poly ISO 1-NB, H-Shield NB	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-187.5*
C-32.	Structural concrete	Min. 1-inch Insulfoam SP (min. Type IX)	Helix 2 LRA (FULL)	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA (FULL)	-272.5*
C-33.	Structural concrete	One or more layers, min. 1-inch Insulfoam IX	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.5-inch FM approved fiberboard	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-322.5*
C-34.	Structural concrete	Min. 1-inch Insulfoam SP (min. Type IX)	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix Max LRA (FULL)	-335.0*
C-35.	Structural concrete	Min. 1.5-inch SecurShield HD Composite, Poly ISO 1-HD Composite, H-Shield HD Composite	Helix 2 LRA, Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA (FULL)	-427.5*
C-36.	Structural concrete	Min. 19/32-inch APA rated plywood, 0.25-inch Dens Deck or thick Dens Deck Prime	Helix 2 LRA, Helix Max LRA (FULL)	(Optional) One or more layers min. 19/32-inch APA rated plywood, 0.25-inch Dens Deck or thick Dens Deck Prime	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-457.5*
C-37.	Structural concrete	Poly ISO 1, H-Shield, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 19/32-inch APA rated plywood, 0.25-inch Dens Deck or thick Dens Deck Prime	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-457.5*
C-38.	Structural concrete	Min. 2-inch Poly ISO 1, H-Shield	OB500	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-247.5*

TABLE 3B: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION or REROOF (Tear-Off)
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER

System No.	Deck (Note 1)	Primer	Roof Cover (Note 15)		MDP (psf)	
			Type	Attach		
C-39.	Structural concrete	None	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back		Helix 2 LRA or Helix Max LRA, (FULL)	-495.0*

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

System No.	Deck (Note 1)	Lightweight Concrete (Note 14)				Roof Cover (Note 15)		MDP (psf)
		Type	Surface Treatment	Supplemental Attachment		Type	Attach	
				Fasteners	Density			
LWC-1	Min. 22 ga., Type B, Grade 33 vented steel at max. 6 ft spans attached with ½-inch dia. puddle welds with weld-washers spaced 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-inch EPS holey board). <i>Note A.</i>	None	None	N/A	Mule-Hide PVC	Mule-Hide PVC BA	-60.0*
LWC-2	Min. 22 ga., Type B, Grade 33 vented steel at max. 6 ft spans attached with ½-inch dia. puddle welds with weld-washers spaced 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-inch EPS holey board). <i>Note A.</i>	None	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-60.0*
LWC-3	Min. 22 ga., Type B, Grade 33 vented steel at max. 6 ft spans attached with ½-inch dia. puddle welds with weld-washers spaced 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-inch EPS holey board). <i>Note A.</i>	None	Mule-Hide HDP Fastener with 3 in. Insulation Plate	1 per 9.0 ft ²	Mule-Hide PVC	Mule-Hide PVC BA	-67.5*
LWC-4	Min. 22 ga., Type B, Grade 33 vented steel at max. 6 ft spans attached with ½-inch dia. puddle welds with weld-washers spaced 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-inch EPS holey board). <i>Note A.</i>	None	Mule-Hide HDP Fastener with 3 in. Insulation Plate	1 per 9.0 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-67.5*
LWC-5	Min. 22 ga., Type B, Grade 33 vented steel at max. 4 ft spans attached with puddle welds with 3/8-inch weld-washers spaced 6-inch o.c.	Min. 38 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1-inch EPS holey board). <i>Note A.</i>	Celcore PVA	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-67.5*
LWC-6	Min. 22 ga., Type B, Grade 33 vented steel at max. 6 ft spans attached with ½-inch dia. puddle welds with weld-washers spaced 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-inch EPS holey board). <i>Note A.</i>	None	Mule-Hide HDP Fastener with 3 in. Insulation Plate	1 per 1.0 ft ²	Mule-Hide PVC	Mule-Hide PVC BA	-120.0*
LWC-7	Min. 22 ga., Type B, Grade 33 vented steel at max. 6 ft spans attached with ½-inch dia. puddle welds with weld-washers spaced 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-inch EPS holey board). <i>Note A.</i>	None	Mule-Hide HDP Fastener with 3 in. Insulation Plate	1 per 1.0 ft ²	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-120.0*

Note A.) If the LWC to be used on the project is not Celcore MF, or if the LWC is existing 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 Testing Application Standard TAS 105 and shall yield a Minimum Characteristic Resistance Force (MCRF) 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 Testing Application Standard TAS 124 is recommended. All testing shall be performed by an accredited testing agency acceptable to the Authority Having Jurisdiction.

**TABLE 4B: LIGHTWEIGHT CONCRETE OVER STRUCTURAL CONCRETE – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER**

System No.	Deck (Note 1)	Lightweight Concrete (Note 14)	Roof Cover (Note 15)		MDP (psf)
			Membrane	Application	
LWC-8	Min. 2,500 psi concrete	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1-inch EPS holey board). <i>Note A.</i>	Mule-Hide PVC	Mule-Hide PVC BA	-220.0*
LWC-9	Min. 2,500 psi concrete	Min. 36 pcf wet cast density, min. 200 psi, min. 2-inch thick Celcore MF Cellular Concrete (cast with or without min. 1-inch EPS holey board). <i>Note A.</i>	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-232.5*

Note A.) If the LWC to be used on the project is not Celcore MF, or if the LWC is existing 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 Testing Application Standard TAS 105 and shall yield a Minimum Characteristic Resistance Force (MCRF) 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 Testing Application Standard TAS 124 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 F: NON-INSULATED, BONDED ROOF COVER**

System No.	Deck (Notes 1 & 12)	Primer	Roof Cover (Note 15)		MDP (psf)
			Type	Attach	
G-1.	Existing poured gypsum or gypsum plank	None	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-295.0*

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 15)		MDP (psf)
		Type	Attach (Notes 6,7,8)	Type	Attach (Notes 6,7,8)	Type	Application	
MULE-HIDE PVC OR PVC KEE HP APPLICATIONS:								
R-1	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 0.5-inch HP Recovery Board	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-45.0*
R-2	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC	Mule-Hide PVC BA, Low VOC PVC BA, HydroBond	-45.0*
R-3	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (RIBBON)	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (RIBBON)	Mule-Hide PVC	Mule-Hide PVC BA, Low VOC PVC BA, HydroBond	-45.0*
R-4	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC	HydroBond	-60.0*
R-5	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.25-inch Dens Deck Prime or SECURROCK Gypsum-Fiber Roof Board	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC	HydroBond	-60.0*
R-6	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 2.0-inch Poly ISO 1-WF, H-Shield-WF	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-180.0*
R-7	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.5-inch HP Recovery Board	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-180.0*
R-8	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-225.0*
R-9	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	Helix 2 LRA, Helix Max LRA (FULL)	Min. 0.25-inch Dens Deck Prime	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-232.5*
R-10	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide PVC	HydroBond	-60.0*
R-11	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	OB500	Min. 0.25-inch Dens Deck Prime or SECURROCK Gypsum-Fiber Roof Board	OB500	Mule-Hide PVC	HydroBond	-60.0*
R-12	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	OB500	(Optional) Additional layers of base insulation	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-120.0*

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 15)		MDP (psf)
		Type	Attach (Notes 6,7,8)	Type	Attach (Notes 6,7,8)	Type	Application	
R-13	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Poly ISO 1, H-Shield, ENRGY 3, Poly ISO 2, AC Foam II	OB500	Min. 0.25-inch Dens Deck Prime	OB500	Mule-Hide PVC or PVC KEE HP	Mule-Hide PVC BA or Low VOC PVC BA	-120.0*
MULE-HIDE PVC FRS FLEECE BACK OR PVC KEE HP FRS FLEECE BACK APPLICATIONS:								
R-14	Existing gravel-surfaced asphaltic BUR	Min. 1-inch Insulfoam SP (min. Type IX)	Helix Max LRA (FULL)	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix Max LRA (FULL)	-294.1*
R-15	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.0-inch Poly ISO 1, H-Shield	Helix 2 LRA, Helix Max LRA (FULL)	(Optional) Additional layers of base insulation	Helix 2 LRA, Helix Max LRA (FULL)	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (FULL)	-300.0*
R-16	Existing gravel-surfaced asphaltic BUR	Min. 1-inch Insulfoam SP (min. Type IX)	Helix 2 LRA (FULL)	None	N/A	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA (FULL)	-475.0*

TABLE 6B: 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-17	Existing standing seam or lap seam metal roof covers having min. 3/16-inch to max. ¼-inch thick steel purlins spaced max. 75.5-inch o.c.	One or more layers, any combination	Prelim. attached	Mule-Hide PVC	Mule-Hide Purlin Fastener and Mule-Hide 2.4 in. Seam Plate	12-inch o.c. within 5.5-inch wide laps spaced max. 75.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-45.0
R-18	Existing standing seam or lap seam metal roof covers having min. 3/16-inch to max. ¼-inch thick steel purlins spaced max. 75.5-inch o.c.	One or more layers, any combination	Prelim. attached	Mule-Hide PVC or PVC KEE HP	Mule-Hide Purlin Fastener and Mule-Hide 2.4 in. Seam Plate	6-inch o.c. within 5.5-inch wide laps spaced max. 75.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-52.5
R-19	Existing standing seam or lap seam metal roof covers having min. 3/16-inch to max. ¼-inch thick steel purlins spaced max. 35.5-inch o.c.	One or more layers, any combination	Prelim. attached	Mule-Hide PVC	Mule-Hide Purlin Fastener and Mule-Hide 2.4 in. Seam Plate	12-inch o.c. within 5-inch wide laps spaced max. 35.5-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-52.5
R-20	Existing standing seam or lap seam metal roof covers having min. 3/16-inch to max. ¼-inch thick steel purlins spaced max. 35-inch o.c.	One or more layers, any combination	Prelim. attached	Mule-Hide PVC	Mule-Hide Purlin Fastener and Mule-Hide 2.4 in. Seam Plate	12-inch o.c. within 5.5-inch wide laps spaced max. 35-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-60.0
R-21	Existing standing seam or lap seam metal roof covers having min. 3/16-inch to max. ¼-inch thick steel purlins spaced max. 35.5-inch o.c.	One or more layers, any combination	Prelim. attached	Mule-Hide PVC or PVC KEE HP	Mule-Hide Purlin Fastener and Mule-Hide 2.4 in. Seam Plate	6-inch o.c. within 5.5-inch wide laps spaced max. 35-inch o.c. to engage steel purlin. Laps sealed with 1.5-inch heat weld.	-82.5

TABLE 6C: RECOVER APPLICATIONS
SYSTEM TYPE F: NON-INSULATED, BONDED ROOF COVER

System No.	Substrate (Notes 1 & 12)	Roof Cover (Note 15)		MDP (psf)
		Type	Attach	
R-22	Existing asphaltic BUR or mineral surface cap sheet	Mule-Hide PVC FRS Fleece Back or PVC KEE HP FRS Fleece Back	Helix 2 LRA or Helix Max LRA (RIBBON, 6-inch o.c. or FULL)	-75.0*