SECTION 2

MULE-HIDE PRODUCTS CO., INC.

TPO SYSTEM WARRANTY INFORMATION

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PLEASE CONSULT THE MULE-HIDE WEBSITE FOR THE MOST CURRENT INFORMATION

SECTION 2

MULE-HIDE PRODUCTS CO., INC.

TPO SYSTEM WARRANTY INFORMATION

Warranty Program Overview

Heat Weld Warranty Offerings

Owner's Care and Maintenance

Contractor Eligibility Warranty Program

10 / 15 Year Warranty - LL-TPO Design Summary

10 / 15 Year Warranty - FA-TPO Design Summary

10 / 15 Year Warranty - MA-TPO Design Summary

10 / 15 Year Warranty - Premium Warranty Enhancements

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"The name trusted in roofing since 1906"

MULE - HIDE PRODUCTS CO., INC.

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Warranty Program

OVERVIEW

Overview

Mule-Hide Products Co., Inc. ("Mule-Hide") offers several types of warranties ranging from material warranties to System warranties. These warranties are available in 10, 15, and 20 year durations. Mule-Hide presently offers three types of warranties for our TPO single-ply membranes/systems:

- Roofing Membrane Limited Warranties
- Standard System Warranties
- Premium System Warranties

A Membrane Only warranty may be combined with select Standard or Premium warranties. Available selections are as follows;

- Standard-10 or Premium-10 + Membrane-15 OR Membrane-20
- Standard-15 or Premium-15 + Membrane-20

Roofing Membrane Limited Warranty

This warranty covers only the Mule-Hide membrane (or portion thereof) determined by Mule-Hide to be defective and resulting in roof leaks. This Warranty does not cover workmanship or other components not supplied by Mule-Hide. Mule-Hide does not perform inspections of the installation before issuing the Roofing Membrane Limited Warranty. A Mule-Hide Warranty Application must be submitted to Mule-Hide to obtain this warranty (check with Mule-Hide for those programs that may not require submittal of a Warranty Application). Certain warranties may require fees and proof of purchase. Mule-Hide recommends that Warranty Applications be submitted for review prior to project start.

Note: *Projects requesting a 20-year Roofing Membrane Limited Warranty require specific membranes and design enhancements. Contact Mule-Hide for additional information.*

Standard System Warranty

The Standard System warranty is a "No Dollar Limit" labor and material warranty. It covers the Mule-Hide labeled membrane and other components supplied by Mule-Hide and must be installed by a Mule-Hide Warranty Eligible Applicator. The Standard System warranty does not cover the roof insulation, attachment of the roof insulation, or metal flashing components (unless Mule-Hide Metal Accessories are purchased from Mule-Hide). A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Standard System warranties require inspections by a Mule-Hide representative. Mule-Hide recommends that Warranty Applications be submitted for review prior to project start.

Note: *Projects requesting a 20-year Standard System Warranty require specific membranes and design enhancements. Contact Mule-Hide for additional information.*

Premium System Warranty

The Premium System warranty is a "No Dollar Limit", labor and material warranty. It covers the Mule-Hide labeled membrane, insulation, other components supplied by Mule-Hide, as well as

Mule-Hide Warranty Program Overview - Continued

approved products (such as metal flashing, insulation adhesive and other pre-approved accessories) installed by a Mule-Hide Warranty Eligible Applicator. The Warranty Application and the appropriate fee must be submitted to Mule-Hide by a Mule-Hide Warranty Eligible Applicator. Premium System warranties require inspections by a Mule-Hide representative. Distributor invoices showing purchase of Mule-Hide materials are required and are to be submitted to Mule-Hide before the warranty can be issued. Mule-Hide recommends that Warranty Applications be submitted for review prior to project start. *Premium System Warranties require the use of Mule-Hide Polyisocyanurate Insulation.*

Note: *Projects requesting a 20-year Premium Warranty require specific membranes and design enhancements. Contact Mule-Hide for additional information.*

Fees are required for all System warranties. System Warranties must be obtained through a Mule-Hide Warranty Eligible Applicator. System warranties are not available for residential projects. Membrane material warranties do not require the applicator to be Mule-Hide Warranty Eligible, but certain membrane/material warranties do require fees.

Terms and Conditions of Warranties

Mule-Hide's obligations under these warranties are limited to the specific terms and conditions of the respective Warranty. Sample copies of the Mule-Hide Warranties are available from Mule-Hide upon request for review of the actual terms, conditions and limitations. Mule-Hide warranties are not issued until the warranty fee has been paid and any required Distributor invoices have been received by Mule-Hide.

Mule-Hide Warranty Eligible Applicator Program

Those contractors wishing to become Mule-Hide Warranty Eligible Applicators for the purpose of offering System Warranties should contact their local Mule-Hide Territory Manager. Please call Mule-Hide at 800-786-1492 or check the Mule-Hide web site (www.mulehide.com) to obtain the name and phone number of your local Mule-Hide Territory Manager.

Mule-Hide Warranty Types

Refer to the appropriate product pages for listings of available warranty types by product line. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide or check the Mule-Hide web site (www.mulehide.com) for the latest updates regarding changes or modifications to this document or the Mule-Hide Warranty Program.

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WARRANTY OFFERINGS

HEAT-WELD

TPO and PVC

Warranty Type	Warranty Fees Cost/SF	Min $
Membrane Only - 10 Years	$0.00	$25.00
Membrane Only - 15 Years [4]	$0.01	$100.00
Membrane Only - 20 Years [4,6]	$0.02	$200.00
Standard - 10 Years [3,4]	$0.05	$400.00
Standard - 15 Years [3,4]	$0.08	$525.00
Standard - 20 Years [2,3,4,6]	$0.11	$800.00
Standard -10 + Membrane -15 [3,4,5]	$0.06	$500.00
Standard -10 + Membrane -20 [3,4,5]	$0.07	$600.00
Standard -15 + Membrane -20 [3,4,5,6]	$0.10	$725.00
Premium - 10 Years [1,3,4]	$0.04	$350.00
Premium - 15 Years [1,3,4]	$0.07	$475.00
Premium - 20 Years [1,2,3,4,6]	$0.10	$750.00
Premium-10 + Membrane-15 [1,3,4,5]	$0.05	$450.00
Premium-10 + Membrane-20 [1,3,4,5,6]	$0.06	$550.00
Premium-15 + Membrane-20 [1,3,4,5,6]	$0.09	$675.00

Important Warranty Notes:

Current Warranty fee schedules are as listed. Please contact Mule-Hide for pre-approval when applying for any non-published Warranty timeframes.

[1] Mule-Hide Premium Warranties are offered only on new construction and total tear-off systems, or for recover (retrofit) systems when an independent company has performed a moisture survey. Accepted survey types are nuclear, infrared and conductive. The moisture survey must be submitted with the Warranty application for recover applications. All wet roofing materials found in the survey must be removed.

[2] Refer to 20-Year Design Enhancement Documents

[3] These warranties are only available to Mule-Hide Warranty Eligible Applicators.

[4] Commercial projects only. Standard and Premium System Warranties are not available for residential projects.

[5] Upon expiration of the Standard or Premium warranty component the terms and conditions of the membrane only warranty apply.

[6] Requires Min. 60 mil reinforced TPO or Min. 60 mil reinforced PVC.

Mule-Hide Limited Membrane and NDL System Warranties are only valid when components are installed according to manufacturers' specifications. Always refer to Mule-Hide Application Guidelines for additional information.

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Care and Maintenance

OVERVIEW

Overview

Following are some recommendations on how to care for your roof to help ensure a long useful service life.

Inspect your roof on a regular basis

All roofs require periodic maintenance and inspections in order to perform as designed and to provide a long useful service life. Mule-Hide recommends that your roofing system be inspected at least twice a year, and after every major storm. These inspections should be performed by a Mule-Hide Warranty Eligible Applicator or by someone specially trained in single-ply and modified bitumen roofing installations.

The inspection should concentrate on high-risk areas such as roof hatches, drains and around all rooftop equipment as well as general inspection of the entire roof. The inspector should be looking for membrane damage (cuts and tears), oil or Freon leaks, chemical spills, or water infiltration into the roofing System.

Such inspections are needed because problems stemming from neglect, abuse, contamination, accidents, or storm damage can result in extensive and costly repairs if not detected and repaired promptly.

Regular inspection and maintenance is also critical to sustaining the roof Warranty in force. Your Warranty could be compromised if the roof fails due to lack of basic maintenance on the part of the building owner. Therefore, it is critical that the owner understands and follows our maintenance requirements.

Drainage

Ponding water is a source of potential damage for all roofing systems. A small puncture or cut in a well-drained roofing system may result in limited damage. However, a significant amount of damage may occur to the roof insulation, roof deck, and building interior if the same puncture or cut occurs in an area of ponding water. Good roofing practice suggests that water not be allowed to remain on the roof for more than 48 hours after a rainfall. Roof drainage should be evaluated by the specifier in accordance with all applicable codes. In addition, the roof surface must be kept clean of debris that can impede drainage. This is especially important at drain areas to avoid clogging. Such areas include roof drains, wall scuppers, gutters and downspouts.

Care and Maintenance Information Continued…….

Chemicals & Petroleum Products

Even though our membranes provide outstanding resistance to natural weather, exposure to organic substances such as oils, fats, and organic solvents may affect their durability. How a membrane is affected depends upon the membrane's composition. An adverse reaction to a substance typically results in membrane splitting, cracking, and swelling.

Periodic inspections can help assure that such damage is quickly identified and addressed. If swelling occurs, contact Mule-Hide immediately.

Some common sources of potential problems include:

Air Conditioner Compressors - Oil may be spilled during maintenance of the compressor or it may leak oil.

Kitchen Exhaust Fans - Grease from cooking exhausts can accumulate on the roofing surface, especially if the units are not serviced frequently.

Animal Fats – EPDM & Self-Adhering Mod Bit Membranes

EPDM and Self-Adhered Modified Bitumen Membranes are susceptible to damage from kitchen wastes (vegetable oils) or other animal fats that are vented directly onto the roof surface. If incidental contact is likely, contact Mule-Hide for recommendations on preventative measures.

Animal Fats – TPO & PVC Membranes

The use of TPO and PVC membranes for restaurant rooftops will not void the Warranty. However, a rooftop maintenance program must be in-place to ensure that accumulations of animal fats/grease are regularly removed and the membrane surface cleaned with a mixture of warm soap and water and/or by other approved cleaning methods (see Cleaning below).

Cleaning

General cleaning of the field membrane can be accomplished with detergent and water. Mule-Hide recommends a detergent such as Trisodium phosphate (TSP), a granular detergent that is available at most paint stores. Use of TSP is preferred as it does not leave a 'film' on the membrane that may inhibit seaming or patching.

Mix the TSP with water as per directions and brush wash the affected area by hand with a stiff bristled brush. Thoroughly rinse with clean water and repeat as necessary.

For more aggressive cleaning, a polypropylene scouring pad can be used in conjunction with the TSP detergent.

A light power wash can also be used, however, care must be taken to not damage the membrane, flashings, or field seams.

Before seaming or repairs are attempted, ensure that the surface of the field membrane is clean, has been thoroughly rinsed to remove all detergent and contaminates, and that the membrane has been allowed to dry completely.

To maximize reflectivity, white membrane(s) should be cleaned once every two years.

Care and Maintenance Information Continued…….

Foot Traffic

Mule-Hide membranes are designed to be part of a roofing system and are not a traffic-bearing component of the building. However, virtually all roofs are subjected to some amount of roof traffic, such as that required to service roof top units.

When it is necessary for workers to be on the roof to service rooftop equipment, e.g., HVAC units, antennas, etc., workers should be cautioned to use walkways and to exercise care with their tools and equipment to avoid puncturing the roofing membrane. Mule-Hide recommends that the building owner or property manager keep a "Roof-Top Maintenance and Activity Log" to track dates and activities by personnel or other trades.

Walkways must be provided if regular rooftop traffic is required, such as servicing of rooftop equipment on a regular basis. If a unit on the roof has a monthly maintenance schedule, walkways to and around the unit are recommended. Exercise caution when not walking on walkways, especially on white membranes (White-on-Black EPDM, Elastomeric Acrylic Coatings, TPO and PVC) since ice or frost build-up may not be visible. All membranes are slippery when wet.

Metal Work

Moisture can enter your roofing system in many different ways. Not all leaks are the result of issues with the roofing system. Moisture can also enter the roofing system and building through building walls, parapets, roof top units, skylights, and variety of other items. Maintaining these in a watertight condition will help to prevent damage to your roofing system. In addition, leaking that occurs from any of these items is not covered under the Mule-Hide warranty.

Keep roof maintenance items, such as counterflashings, metal curbs, metal ducts, etc., sealed watertight at all times.

Leaks – Standard & Premium Warranties

If you have a leak, check for the obvious such as clogged roof drains, broken skylights, loose counterflashings, broken water pipes, leaking roof units, and storm damage. Note when the leaking occurs. Items such as heavy or light rain, wind direction, temperature and time of day are important clues for tracking suspected leaks. Does the leak start and stop with the rain, or does leaking continue after the rain has ceased?

Leaks resulting from the deterioration or failure of building components or physical damage are not covered by the Warranty. If you believe that the leak is related to the Mule-Hide Warranty, please notify Mule-Hide's Warranty Department at (800) 786-1492 as soon as possible and follow up with written notification. The building owner must pay the investigation and repair cost if the problem is found to be outside the scope of the Warranty.

Temporary Repairs

If your roof becomes damaged, prompt action can limit damage to our roofing system. Small cuts and tears can be repaired with a one-part urethane sealant. Remember, these are only temporary repairs to the Mule-Hide membrane. Contact Mule-Hide for additional information.

Care and Maintenance Information Continued…….

Roof Cement

Do not use Any Asphalt Product to make repairs on single ply membranes (EPDM, TPO, or PVC) as it **WILL** degrade the membrane. If any asphalt product is used on the roofing membrane, that area will have to be removed and replaced at the Owner's expense.

Changes to Roof

Notify Mule-Hide of any changes made to the roofing system. This includes replacement of existing roof top equipment, installation of new roof top equipment, TV Antennas, tie-ins to new roofing systems, etc. Contact Mule-Hide before any changes are made to the roofing system so that the proper procedure can be followed and the change authorized by Mule-Hide. Un-authorized changes to your roofing system can compromise your Mule-Hide warranty.

This overview represents the applicable information available at the time of publication. Please visit the Mule-Hide website at www.mulehide.com, or contact either Mule-Hide or your Mule-Hide Territory Manager for information that may be more current.

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Contractor Warranty Eligibility

PROGRAM

Contractors wishing to become Warranty Eligible, should obtain a **Contractor Warranty Eligibility Application** form from their Mule-Hide Territory Manager. You can find the contact information for your Mule-Hide Territory Manager by checking the Mule-Hide website at www.mulehide.com or by calling (800) 786-1492 and asking for the Warranty Program Coordinator.

The Contractor Warranty Eligibility Application form shall be filled out completely and signed by an officer of the company. Forward the completed application to the Mule-Hide National Support Center, marked to the attention of the Warranty Program Coordinator. Submission of the Contractor Warranty Eligibility Application form does not guarantee or imply acceptance by Mule-Hide.

Upon receipt of the application, the Mule-Hide Territory Manager will be advised of the application submittal and will contact the contractor to evaluate his qualifications and training needs. Training requirements may include attendance at a training seminar and a commitment to a training session for the contractor's crew(s). A review of the Contractor's workmanship on completed roofing projects will be requested and documented by the Mule-Hide Territory Manager.

Only Warranty Eligible Contractors are able to apply for Mule-Hide's Standard or Premium System (labor and material) Warranties and Coatings System Warranties. **It is the contractor's responsibility to contact Mule-Hide should they wish to be able to obtain System Warranties**.

MULE-HIDE PRODUCTS CO., INC
10 or 15 Year Warranty Design Summary
With Standard 55-MPH Wind Speed Coverage
For Ballasted TPO

TPO Systems

All products specified for this roofing system must be manufactured or approved by Mule-Hide Products Co. This criteria is limited to buildings of 100' in height or less, located in urban or suburban exposure areas. Not applicable for coastal or high wind areas.

1. 0.045" or 0.060" or 0.080" thick Mule-Hide Reinforced TPO
2. On 0.045" thick membrane, all 'T' joints must be creased with a roller while still hot as shown in Detail MHT-UN-105A.
3. On 0.060" or 0.080" thick membrane, all "T" joints must be overlaid with TPO Non-Reinforced Flashing Membrane with heat welded seams as shown in Detail MHT-UN-105B.
4. All Field/Wall seam transitions on all membrane thicknesses must be overlaid with TPO Non-Reinforced Flashing Membrane with heat welded seams as shown in Detail MHT-UN-105C.
5. All field seams must be heat welded.

Deck Type / Typical Fastener - Refer to Specifications for minimum pullout criteria.

1. Any roof deck capable of supporting the weight of a Ballasted System may be used.
2. The determination that the roof deck can support the required additional loads shall be the responsibility of the building owner/owner's representative.

Slope Requirement/Drainage

1. Positive drainage required (no ponding 48 hours after a rain)
2. 1/4" per horizontal foot preferred
3. 1/8" slope with sufficient number of drains and crickets/saddles may be considered
4. Maximum slope of 2:12

Construction Type

1. New Construction
2. Reroof - with full tear-off
3. Recover - all wet materials removed

Insulation/Overlayment*

Insulation Type or Overlay
Approved Polyisocyanurate - Min 1" thick - Min 18 psi
Approved Extruded Polystyrene - Min 3/4" - Min 15 psi
Approved Expanded Polystyrene - Min 1" - Min 1 lbs density
HD Fiberboard - Min 1/2" thick- Installed over Approved Insulation

***NOTES:**

1. Thicknesses stated are for single layer of material.
2. Consult Specification Manual for list of approved insulations for use under overlayment.
3. Insulation must be loose-laid over an approved substrate.
4. Mechanical attachment of insulation is not permitted.
5. An approved insulation adhesive may be used with prior approval.

MULE-HIDE PRODUCTS CO., INC.
10 or 15-Year Warranty Design Summary
With Standard 55-MPH Wind Speed Coverage
For Ballasted TPO

Ballast Requirements

Building Height	Ballast Requirements
Up to 25'	#2 Stone @ 13#/SF for 10' wide perimeter #4 Stone @ 10#/SF for field of roof
26' to 50'	#2 Stone @ 13#/SF for 20' corners #2 Stone @ 13#/SF for 10' wide perimeter #4 Stone @ 10#/SF for field of roof
Over 50'	Mule-Hide recommends the use of a interlocking ballast paver system

Concrete Pavers

1. Minimum Size: 2' x 2' x 2"
2. Minimum Weight: 22 pounds per square foot
3. Membrane Protection: Rubber or plastic pedestals, 4" x 4" sections of Mule-Hide Walkway Pads, or HP Protection Mat.
4. Paver type must be submitted to Mule-Hide for approval prior to bid.

Metal Accessories

1. All Metal copings, gravel stops, fascia, and drip aprons must be installed according to Mule-Hide approved details.
2. Conventional metal edge details that require flanges to be 'stripped in' may be overlaid with TPO Cover Tape or White EPDM Cured Cover Tape (Mate-Line Tape).
3. All Metal Scuppers must have welded (soldered) seams.
4. Metal accessories provided by Mule-Hide will be included in Standard and Premium System warranties.

Other Requirements

1. No 'As-Built' projects. All projects are to be reviewed and approved prior to installation.
2. Shop drawings must include all pertinent details.
3. Contact Mule-Hide Technical Department for specific code requirements such as Florida NOA, Factory Mutual (FM) or Underwriters Laboratory (UL).

NOTES:

1. **This is a summary of the Mule-Hide TPO Ballasted System Specification, as written in the Mule-Hide TPO Specification Manual. Refer to Mule-Hide TPO Specification Manual for complete specification and details.**

2. **The information contained in this document is general information. Requirements may be different for each specific job based on the conditions of each building. Always contact Mule-Hide Technical Department to review the specific job conditions prior to bidding the project.**

MULE-HIDE PRODUCTS CO., INC
10 or 15 Year Warranty Design Summary
With Standard 55-MPH Wind Speed Coverage
For Fully Adhered TPO

TPO Systems

All products specified for this roofing system must be manufactured or approved by Mule-Hide Products Co. This criteria is limited to buildings of 100' in height or less, located in urban or suburban exposure areas. Not applicable for coastal or high wind areas.

Membrane / Adhesive Type / Other

1. 0.045" or 0.060" or 0.080" thick Mule-Hide Reinforced TPO
2. Mule-Hide TPO Bonding Adhesive - Solvent Based or Mule-Hide Low Voc Bonding Adhesive – Solvent Based, Mule-Hide Low Voc 1168 Bonding Adhesive, or WBBA-2000 Water Base Bonding Adhesive.
3. On 0.045" thick membrane, all 'T' joints must be creased with a roller while still hot as shown in Detail MHT-UN-105A.
4. On 0.060" or 0.080" thick membrane, all "T" joints must be overlaid with TPO Non-Reinforced Flashing Membrane with heat welded seams as shown in Detail MHT-UN-105B.
5. All Field/Wall seam transitions on all membrane thicknesses must be overlaid with TPO Non-Reinforced Flashing Membrane with heat welded seams as shown in Detail MHT-UN-105C.
6. All field seams must be heat welded.

Deck Type / Typical Fastener - Refer to Specifications for minimum pullout criteria.

Standard Roof Deck (4)	**Insulation Fastener** (1)	**Insulation Plate** (5)
Steel (22 gauge or heavier)	Mule-Hide DP #12	Mule-Hide 3" Metal Stress Plates
Structural Concrete (3,000 psi)	Mule-Hide HD-14 (2)	Mule-Hide 3" Metal Stress Plates
Plywood (Min 15/32" thick)	Mule-Hide DP #12	Mule-Hide 3" Metal Stress Plates
Wood Plank (Min 1-1/2" thick)	Mule-Hide DP #12	Mule-Hide 3" Metal Stress Plates
Fibrous Cement & Gypsum (2)(3)	TL Fasteners by Tru-Fast	3" TL Galvalume Insulation Plate by Tru-Fast

Notes:

1. Heavier gauge fasteners may be required to meet Factory Mutual or code requirements.
2. Other fasteners may be considered, submit request to Mule-Hide prior to bidding.
3. Pullout testing is required, must exceed 360 pounds with TL Fastener.
4. Contact Mule-Hide Technical Department for other roof decks or non-standard roof decks.
5. 2.4" Seam Plates are NOT approved for use to fasten insulation.

Slope Requirement/Drainage

1. Positive drainage required (no ponding 48 hours after a rain)
2. 1/4" per horizontal foot preferred
3. 1/8" slope with sufficient number of drains and crickets/saddles may be considered

Construction Type

1. New Construction
2. Reroof - with full tear-off
3. Recover - all wet materials removed

MULE-HIDE PRODUCTS CO., INC.
10 or 15-Year Warranty Design Summary
With Standard 55-MPH Wind Speed Coverage
For Fully Adhered TPO

Insulation/Overlayment - Mechanical Attachment into Standard Roof Decks*

Insulation Type or Overlay	Fasteners per 4' x 8' board		
	Field	**Perimeter**	**Corner**
Approved Polyisocyanurate - Min 2" thick (top layer)	8	12	16
Approved Polyisocyanurate - Min 1.5" up to 2" thick	12	18	24
HD Fiberboard - Min 1/2" thick- Installed over Approved Insulation	16	24	32
Dens Deck Prime - Min 1/4" thick - Installed over Approved Insulation	12	18	24
OSB - Min 7/16" thick - Installed over Approved Insulation	17	25	32
Approved OSB/Polyisocyanurate Composite - Min 2" thick	17	25	32

***NOTES:**

1. Thicknesses stated are for single layer of material.
2. Consult Specification Manual for list of approved insulations for use under overlayment.
3. Polyisocyanurate less than 1.5" in thickness requires approved overlayment.
4. Insulation fastening density shall not be less than 1 per 2 square feet on fibrous cement and gypsum decks.
5. Certain codes may require additional fastening requirements.
6. Mule-Hide defines perimeter areas as a minimum of 8 feet. Corners areas are the intersections of the perimeter areas.
7. Factory Mutual defines perimeter areas as the lesser of 0.1 times the building width or 0.4 times the building height. Corners areas are the intersections of the perimeter areas.

Insulation/Overlayment - Adhesive Attachment

1. Insta-Stik by Dow Chemical Company - Warranty Application must include a copy of the manufacture's letter of acceptance for the project, including application rates for that specific project.
2. Weather-Tite by Millenium - Warranty Application must include a copy of the manufacture's letter of acceptance for the project, including application rates for that specific project.
3. Other Manufactures may be considered, submit prior to bidding.

Metal Accessories

1. All Metal copings, gravel stops, fascia, and drip aprons must be installed according to Mule-Hide approved details.
2. Conventional metal edge details that require flanges to be 'stripped in' may be overlaid with TPO Cover Tape or White EPDM Cured Cover Tape (Mate-Line Tape).
3. All Metal Scuppers must have welded (soldered) seams.
4. Metal accessories provided by Mule-Hide will be included in Standard and Premium System warranties.

Other Requirements

1. No 'As-Built' projects. All projects are to be reviewed and approved prior to installation.
2. Shop drawings must include all pertinent details.
3. Contact Mule-Hide Technical Department for specific code requirements such as Florida NOA, Factory Mutual (FM) or Underwriters Laboratory (UL).

NOTES:

1. **This is a summary of the Mule-Hide TPO Fully Adhered System Specification, as written in the Mule-Hide TPO Specification Manual. Refer to Mule-Hide TPO Specification Manual for complete specification and details.**

2. **The information contained in this document is general information. Requirements may be different for each specific job based on the conditions of each building. Always contact Mule-Hide Technical Department to review the specific job conditions prior to bidding the project.**

MULE-HIDE PRODUCTS CO., INC
10 or 15 Year Warranty Design Summary
With Standard 55-MPH Wind Speed Coverage
For Mechanically Attached TPO

TPO Systems

All products specified for this roofing system must be manufactured or approved by Mule-Hide Products Co. This criteria is limited to buildings of 100' in height or less, located in urban or suburban exposure areas. Not applicable for coastal or high wind areas.

Membrane

1. 0.045" or 0.060" or 0.080" thick Mule-Hide Reinforced TPO
2. Mule-Hide TPO Bonding Adhesive - Solvent Based or Mule-Hide Low Voc Bonding Adhesive – Solvent Based, Mule-Hide Low Voc 1168 Bonding Adhesive, or WBBA-2000 Water Base Bonding Adhesive.
3. On 0.045" thick membrane, all 'T' joints must be creased with a roller while still hot as shown in Detail MHT-UN-105A.
4. On 0.060" or 0.080" thick membrane, and all warranties longer than 15 years, all "T" joints must be overlaid with TPO Non-Reinforced Flashing Membrane with heat welded seams as shown in Detail MHT-UN-105B.
5. All Field/Wall seam transitions on all membrane thicknesses must be overlaid with TPO Non-Reinforced Flashing Membrane with heat welded seams as shown in Detail MHT-UN-105C.
6. All field seams must be heat welded.

Deck Type / Typical Fastener - Refer to Mule-Hide Specifications for minimum pullout criteria.

Standard Roof Deck	**Max Sheet Width**	**Max Fastener Spacing**	**Fastener** (1)	**Seam Plate** (1)(5)
Steel - Min 22 ga.	12' 10' 8'	6" OC 12" OC 12" OC	HD-14 HD-14 HD-14	2.4" 2.4" 2.4"
Wood Plank - Min 2x or Plywood - Min 23/32"	12' 10' 8'	6" OC 12" OC 12" OC	HD-14 HD-14 HD-14	2.4" 2.4" 2.4"
Plywood - Min 15/32"	8'	6" OC	HD-14	2.4"
OSB – Min 15/32" (3)	8'	6" OC	HD-14	2.4"
Structural Concrete - Min 3,000 psi	12' 10' 8'	6" OC 12" OC 12" OC	HD-14 HD-14 HD-14	2.4" 2.4" 2.4"

Notes:

1. Heavier gauge fasteners may be required to meet Factory Mutual or code requirements.
2. Other fasteners may be considered, submit request to Mule-Hide prior to bidding.
3. Mechanically attached systems are not allowed over Oriented Strand Board (OSB) decks without prior approval by the Mule-Hide Technical Department. Mule-Hide will not issue system warranties on "As-Built" projects where Mule-Hide did not grant approval prior to the start of the work.
4. Contact Mule-Hide Technical Department for other roof decks or non-standard roof decks.
5. 3" Insulation Plates are NOT approved for use to fasten membrane.

Slope Requirement/Drainage

1. Positive drainage required (no ponding 48 hours after a rain)
2. 1/4" per horizontal foot preferred
3. 1/8" slope with sufficient number of drains and crickets/saddles may be considered

Construction Type

1. New Construction
2. Reroof - with full tear-off
3. Recover - all wet materials removed

MULE-HIDE PRODUCTS CO., INC.
10 or 15-Year Warranty Design Summary
With Standard 55-MPH Wind Speed Coverage
For Mechanically Attached TPO

Insulation/Overlayment - Mechanical Attachment into Standard Roof Decks*

Insulation Type or Overlay	Board Size	
	4' x 4'	4' x 8'
Approved Polyisocyanurate - Min 1.0" thick (top layer) - Min 20 psi	4	6
Approved Polyisocyanurate - Min 2.0" thick (top layer) - Min 20 psi	4	5
Extruded Polystyrene - Min 1.0" thick - Min 25 psi	4	6
HD Fiberboard - Min 1/2" thick- Installed over Approved Insulation	4	6
Dens Deck Prime - Min 1/4" thick - Installed over Approved Insulation	4	6

***NOTES:**
1. Gypsum board or suitable base sheet may be approved as needed to meet required fire code.
2. Consult Specification Manual for list of approved insulations for use under overlayment.
3. Contact Mule-Hide Technical Department for Polyisocyanurate less than 1.5" in thickness.
4. Certain codes may require additional fastening requirements.

Insulation/Overlayment - Adhesive Attachment
1. Insta-Stik by Dow Chemical Company
2. Weather-Tite by Millenium
3. Other Manufactures may be considered, submit prior to bidding.

Metal Accessories
1. All Metal copings, gravel stops, fascia, and drip aprons must be installed according to Mule-Hide approved details.
2. Conventional metal edge details that require flanges to be ‘stripped in’ may be overlaid with TPO Cover Tape or White EPDM Cured Cover Tape (Mate-Line Tape).
3. All Metal Scuppers must have welded (soldered) seams.
4. Metal accessories provided by Mule-Hide will be included in Standard and Premium System warranties.

Other Requirements
1. No ‘As-Built’ projects. All projects are to be reviewed and approved prior to installation.
2. Shop drawings must include all pertinent details.
3. Contact Mule-Hide Technical Department for specific code requirements such as Florida NOA, Factory Mutual (FM) or Underwriters Laboratory (UL).

MULE-HIDE PRODUCTS CO., INC.
10 or 15-Year Warranty Design Summary
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Perimeter Enhancement Widths - Number Required

Building Height	Perimeter Sheets
0 to 34 feet	Minimum of one (1) perimeter enhancement width
35 to 69 feet	Minimum of two (2) perimeter enhancement widths
70 to 100 feet	Minimum of two (2) perimeter enhancement widths (for wind zones up to 80 mph)
70 to 100 feet (wind zones over 80 mph)	Contact Mule-Hide Technical Department
Over 100 feet	Contact Mule-Hide Technical Department

Perimeter Enhancement – Width Dimension

Width of Field Sheet	Width of Perimeter Enhancement		
	Half Sheets	10” RUSS	Plates/Fasteners Through Membrane
8'	4'	4'	4'
10'	6’	5’	5’
12'	6'	6'	6'

NOTES:

1. **This is a summary of the Mule-Hide TPO Mechanically Attached System Specification, as written in the Mule-Hide TPO Specification Manual. Refer to Mule-Hide TPO Specification Manual for complete specification and details.**

2. **The information contained in this document is general information. Requirements may be different for each specific job based on the conditions of each building. Always contact Mule-Hide Technical Department to review the specific job conditions prior to bidding the project.**

MULE-HIDE PRODUCTS CO., INC
10 or 15 Year **Premium** Warranty Upgrade Requirements With Standard 55-MPH Wind Speed Coverage

ALL Systems

All products specified for this roofing system must be manufactured or approved by Mule-Hide Products Co. These are upgrades to Mule-Hide's Standard Specifications that are required for either a 10 or 15 Year Premium Warranty.

INSULATION/OVERLAYMENT

A 10 or 15 Year Premium Warranty requires the use of following insulation / overlayments .

Insulation Type or Overlay
Mule-Hide Polyisocyanurate (1) (2)
Insulfoam II, VIII, IX, XIV and XV expanded polystyrene (1), (3), (4), (5)
Insulfoam R-Tech expanded polystyrene (1), (3), (5), (6), (7)
Insulfoam R-Tech Fan-Fold (3), (5), (6), (7), (8)
Approved Overlay - Installed over Mule-Hide Polyisocyanurate or Insulfoam

NOTES:

1. Minimum 1" thickness for Ballasted or Mechanically Attached Systems.
2. Minimum 1.5" Thickness for Fully Adhered Systems.
3. Contractor to provide proof of purchase of Mule-Hide / Insulfoam Insulation.
4. Minimum 1.25 lb density for all systems.
5. Must have approved overlay for Fully Adhered Systems.
6. Polymeric facer side up
7. Coverboard recommended for high traffic areas

INSULATION ATTACHMENT

Mechanical Attachment - Must use Mule-Hide Insulation plates and fasteners. Fastener density and placement must be as per Mule-Hide Specifications and recommendations. Contact Mule-Hide Technical Department for job specific attachment requirements.

Insulation Adhesive - Insta-Stik by Dow Chemical Company or Weather-Tite by Millenium - Warranty Application must include a copy of the manufacturer's letter of acceptance for the project, including application rates for that specific project. Other Manufactures may be considered, submit request prior to bidding.

SHEET METAL

If the perimeter sheet metal is to be included in the Mule-Hide Warranty, it must be Mule-Hide Metal Accessories purchased from Mule-Hide or Anchor-Tite as manufactured by Metal-Era. Contractor to submit proof of purchase of Mule-Hide Metal Accessories. Contractor to provide proof of purchase and copy of Metal-Era Warranty for project.

MULE-HIDE PRODUCTS CO., INC.
10 or 15-Year Premium Warranty Enhancements
With Standard 55-MPH Wind Speed Coverage

NOTES:

1. **This is a summary of the Mule-Hide upgrade requirements for a 10 or 15 year Premium Warranty. Refer to Mule-Hide's Specification Manuals for complete specification and details.**

2. **The information contained in this document is general information. Requirements may be different for each specific job based on the conditions of each building. Always contact Mule-Hide Technical Department to review the specific job conditions prior to bidding the project.**