

INTRODUCTION to the MULE-HIDE PRODUCTS CO., INC. EPDM SPECIFICATION MANUAL

The main purpose of this manual is to create a better understanding of specifications and conditions for the installation of Mule-Hide Roofing Systems. This information is intended to assist building owners, architects and design professionals in selecting a suitable roof system.

Each successful roofing project is the product of good design, proper materials and installation. Mule-Hide Products Co., Inc. is committed to help you achieve success by helping you to knowledgeably select and use Mule-Hide products. In addition to our quality products, Mule-Hide offers a full-time technical service department and one of the most comprehensive performance warranty programs in the industry.

Mule-Hide is not responsible, under any circumstance, for the design and construction of any building nor responsible for the adequacy of any structure to support a roof system. Under no circumstances will Mule-Hide be responsible for any roofing system failures due to design errors, structural defects of any building components or damages caused by other trades. Mule-Hide's review of any specifications or building plans is for the sole purpose of making recommendations concerning details for the installation of the Mule-Hide roofing system products.

Mule-Hide reserves the right to make changes or modifications to this publication at any time without prior notice. Although Mule-Hide has attempted to take care in preparing these specifications, no representation or warranty can be made in connection with these specifications. Mule-Hide expressly disclaims all representations and warranties, whether expressed or implied, including warranties of merchantability and fitness for a particular purpose.



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While this manual is published on a periodic basis, no manual can explicitly cover every condition or detail on a specific project or provide a detail for every new design or new product. For conditions or details not covered in this manual, please contact your local Mule-Hide representative, the Mule-Hide Technical Department or Customer Service Department for assistance.

PLEASE CONSULT THE MULE-HIDE WEBSITE FOR THE MOST CURRENT INFORMATION AND LATEST UPDATES

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SECTION 1

MULE-HIDE PRODUCTS CO., INC. GUIDELINES

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Mule-Hide Products Co., Inc.

Design Guide

Mule-Hide EPDM Roofing Systems

1.01 System Selection Guide

Mule-Hide EPDM Roofing Systems may be selected for many commercial and industrial roofing applications. The choice of system is left up to the specifier, however, there are certain guidelines that should be followed in order to assure that the system chosen is appropriate. The following list of systems and their applicability is meant to be a guide in the proper system selection.

- A. Mule-Hide Ballasted Systems may be installed up to a maximum roof slope of 2:12 pitch. They may be installed up to a height of 60 ft. in FM Zones 1 or 2. See FM Loss Prevention Data Sheet 1-28. CAUTION! The specifier must ensure that the deck is capable of withstanding the weight of this system.
- B. Mule-Hide Fully Adhered Systems are not limited by slope. They may be installed up to a height of 100 ft. in FM Zones 1 or 2. See FM Loss Prevention Data Sheet 1-28. A minimum fastener pullout of 360 lbs. is required.
- C. Mule-Hide Mechanically Attached Systems are limited to decks where the slope will not exceed 18:12 pitch. They may be installed up to a height of 60 ft. in FM Zones 1 or 2. See FM Loss Prevention Data Sheet 1-28. A minimum fastener pullout of 360 lbs. is required.

NOTE: Should any of the building parameters fall outside of those listed above, contact Mule-Hide's Technical Department for special consideration.

1.02 System Limitations

- A. Should any of the following conditions exist, Mule-Hide EPDM Systems are not recommended and should not be used. The systems are not warrantable under the following conditions.
 - 1. The structure is unable to support the completed roofing system and other anticipated loads identified by the owner's engineer or architect.
 - 2. The roofing surface will be used for something other than normal commercial roofing conditions, such as plaza decks, waterproofing, or other non-roofing uses or activities.
- B. To ensure that the minimum requirements are met for a Mule-Hide Warranty, Mule-Hide Roofing Systems should not be installed without first consulting Mule-Hide's Technical Department for special consideration if any of the following conditions exist:
 - 1. For Mechanically Attached and Ballasted Systems, the building height exceeds 60 ft.
 - 2. For an Adhered System, the building height exceeds 100 ft.
 - 3. Building is located within 1500 ft. of a coastline or large body of water.
 - 4. Roof is within an area classified as Zone 3 by FM Loss Prevention Sheet 1-28.
 - 5. Roof will be subject to discharge of chemicals or industrial contaminants.
 - 6. Roof will be subject to positive pressure from air infiltration of the deck from

canopies, overhangs, or positive interior pressure from air handlers.

7. Buildings have large openings (in excess of 10% of wall area of any side) in the wall, which could cause positive pressure to occur if they were left open to strong wind, such as aircraft hangers warehouses, loading terminals and large maintenance facilities.
8. Building will be refrigerated, a freezer or have a high interior humidity such as a swimming pool or produce storage area.
9. The Roofing System must meet specific code approvals or meet specific regulations. These might be UL or FM approvals and State and Local building codes.

1.03 Roof Deck/Substrate Criteria

- A. Providing a suitable surface to receive the Mule-Hide Roofing Systems is the responsibility of the General Contractor or building owner. Prior to installation of the Roofing System the Roofing Contractor must accept the surface. Do not proceed with the roofing if there is any doubt as to the acceptability of the substrate. Contact Mule-Hide's Technical Department for recommendations.
- B. Thermal barriers may be necessary to meet local building code requirements.
- C. The following is a table of substrate requirements for Mule-Hide Products Co., Inc. Roofing Systems:

Table of Substrates

Substrate Type	Ballasted System	Adhered System	Mechanically Attached System
Steel (Min. 22 Ga.)	Insulation Required	Insulation Required	Insulation Required
Structural Concrete (Min. 3000 psi)	Insulation Required	Insulation Required (7)	Insulation Required (1)
Wood Plank (3/4" Min. thickness) (2)	Insulation Required	Insulation Required	Insulation Required
Plywood (Min. 15/16" APA grade CDX) (2)	Insulation Required	Insulation Required (4)	Insulation Required
Oriented Strand board (Min. 7/16") (2) (3)	Insulation Required	Insulation Required (4)	NOT APPROVED!
Gypsum	Insulation required	Insulation Required	Insulation Required
Cementitious Wood Fiber	Insulation Required	Insulation Required	Insulation Required
Lightweight Concrete	Insulation Required	Insulation Required	Insulation Required
Existing Smooth Surface Built-up Roofs	Insulation Required	Insulation Required	Insulation Required
Coal Tar Pitch or Gravel			

Surface BUR (5)	Insulation Required	Insulation Required	Insulation Required
Sprayed-in-Place Urethane	Tear-off Required (8)	Tear-off Required (8)	Tear-off Required (8)
Removed Existing Roof to Deck (6)	Insulation Required	Insulation Required	Insulation Required

Notes:

- (1). A protective mat acceptable to Mule-Hide Products Co., Inc. may be used in lieu of rigid insulation, provided that prior written approval is obtained from Mule-Hide's Technical Department.
- (2). Fire Treated material may be used, provided that it has not been treated with ammonium phosphates. Salt-based preservatives are preferred.
- (3). Oriented Strand Board (OSB) must be an APA rated OSB.
- (4). An .060" EPDM membrane may be adhered directly over this product provided that it is clean, smooth, dry and free of sharp edges, fins, splinters, or contaminants such as oil and grease that may damage the membrane. The decking must be properly fastened with an acceptable screw or rink shank-flooring nail. The roof deck must NOT be 'green treated'. OSB must be installed rough side up.
- (5). Loose gravel must be removed to prevent moisture entrapment.
- (6). Follow all laws, regulations and procedures to identify and properly remove and dispose of asbestos materials which are to be torn off.
- (7). If the concrete is trowel finished and free of rough or sharp ridges, and the surface is clean, clear of all debris and contaminants that may harm the membrane or cause loss of adhesion of the Mule-Hide Bonding Adhesive, an .060 inch thick EPDM membrane may be fully adhered directly to the poured structural concrete. New concrete must cure a minimum of 28 days. Only the Mule-Hide Bonding Adhesive (solvent based) may be used.
- (8). Mule-Hide Products does not warrant roofs that have been installed over Sprayed-in-Place Polyurethane Foam (SPUF). All existing SPUF must be removed down to the substrate.

1.04 Roof Drainage

- A. Mule-Hide requires that the roof drains water and recommends a minimum slope of 1/4" per foot to help assure positive drainage. Adequate drainage will assure the long-term performance of the roofing system and eliminate the ponding of water, which might cause the dynamic design load to be exceeded. Ponding water is defined as water that remains on the roof in excess of 48 hours after a precipitation.

1.05 Roof Expansion Joints

- A. Expansion joints shall be located where necessary to accommodate structural and thermal movement.
- B. The need for expansion joints and their placement should be determined by an Architect or Engineer. Expansion joints should be considered whenever the following circumstances exist:

1. There is a construction joint in the structure.
2. Movement between the roof and the wall is anticipated.
3. Structural framing elements change direction (joists, purlins, deck).
4. An addition is connected to an existing building.
5. Different types of decking abut each other, such as concrete and steel.

1.06 Wood Nailers and Blocking

- A. Where wood blocking is required, Mule-Hide Products Co., Inc. recommends the use of lumber that is salt treated.
- B. Wood nailers and blocking shall be fastened to withstand a minimum force of 200 lbs. per linear foot in any direction. Refer to current FM Loss Prevention Bulletin 1-49.
- C. Wood nailers must match the insulation height and are required at the following locations:
 1. At all roof edges.
 2. At sheet metal attachment points (sheet metal shall be totally supported by wood blocking).
 3. Beneath metal equipment curbs, unless they are fastened directly to the deck.
 4. At pitch pockets that are in excess of 12" square.

NOTE: Wood nailers are not required at the base of parapet walls or other walls, unless needed for the attachment of sheet metal.

1.07 Vapor Retarders

- A. Specific climate and humidity conditions may require the use of a vapor retarder. It is the sole responsibility of the design professional to determine the need for a vapor retarder, its type and location in the roofing system.
- B. The need for a vapor retarder should be investigated whenever the following circumstances exist:
 1. The average January outside air temperature is below 40 degrees and the average inside winter humidity will be 45% or greater.
 2. The building usage will be such that there is a high interior humidity (swimming pools, food processing and other wet process plant operations).
 3. Construction products will be used that will release moisture after the roof has been installed (i.e. interior concrete and plaster, poured in place roof decks and fills, fuel burning heaters etc.).
- C. Consult the NRCA Roofing and Waterproofing Manual for recommendations when considering the inclusion of a vapor barrier in the roofing system.

1.08 Insulation

- A. There are certain minimum insulation requirements and product limitations for the different types of insulations that must be considered when specifying a roofing system. Consult the Insulation Guideline section of this manual as a guide to making the proper choices for each Mule-Hide Roofing System.

1.09 Fasteners and Insulation Attachment

- A. The type of Mule-Hide fastener and the proper fastening pattern that is appropriate for each roof is dependant on the type of deck, pullout values, wind zone area, building height and ground roughness. Consult the Insulation Guideline section and the Fastener Guideline section of this manual as a guide to selecting the proper fasteners and fastener patterns.

1.10 Non-Fastener Insulation Attachment

- A. Insulation may be adhered to certain substrates with Type III or IV asphalt, or other types of adhesives specifically designed for this use, on a job-to-job basis, providing that *prior* written approval is obtained from Mule-Hide Products Technical Department. The Technical Department may require documentation from the various manufacturers stating the proper procedures and suitability of their products for the intended use.
- B. Mule-Hide does not manufacturer or supply asphalt for the purpose of adhering insulation to concrete decks and has no control over the quality of the product used. Mule-Hide does not warrant the attachment of the insulation when adhered to the substrate with asphalt.

1.11 Walkways

- A. Walkways should be provided in areas where routine rooftop maintenance occurs and in areas where regular rooftop traffic is expected. This should include but is not limited to all roof access points such as doors, hatches and ladders and around rooftop mechanical equipment.
- B. Mule-Hide recommends the use of rubber walk pads as they may be adhered directly to the roof surface. Do not install walk pads over field seams or flashings. Install the walk pads with a min. 3" spacing between pads to allow for water flow.
- C. When using masonry paver blocks as walkways, a protection membrane layer must be installed prior to the pavers. A layer of EPDM membrane or a polyester slipsheet is acceptable for use as a protection membrane.

1.12 Warranties

- A. Mule-Hide Products Co., Inc. offers several warranties for commercial roofing systems. Refer to the Warranty Information section of this manual see the different warranties available, and any special requirements for their issuance.
- B. Only Mule-Hide Warranty Eligible Contractors may apply for Mule-Hide Standard and Premium warranties.

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MULE-HIDE PRODUCTS CO., INC. FLASHING/ADHESIVES GUIDE

PART 1 - GENERAL

1.01. Introduction

- A. While many roofing projects are likely to have their special problems, the contractor is certain to encounter some common features over and over again, such as curbs, walls, pipes, corners and drains. This guide explains how to address the common roof features quickly and effectively, using the Mule-Hide Products Co., Inc. (Mule-Hide) EPDM Roofing Systems Standard Details. You will be able to execute these details using the various products that Mule-Hide provides to accomplish the various tasks.
- B. Our products are only as good as the workmanship with which they are installed. This is the reason that we emphasize good workmanship and attention to detail. By adhering to the Details and Specifications, you will be installing the various components of the roofing system, using time proven details, methods and procedures. This will provide a roofing system that you can be proud of and one that will give its owner years of service.
- C. This Flashing/Adhesive Guide is designed to provide a quick reference to the materials, procedures and details that you will most often encounter. It answers many of the common questions that will come to mind as you are installing the roofing system. However, it is not a comprehensive guide to all of our details; it is meant to be used in conjunction with our Standard Detail section and the System Specifications. From time to time a condition may be encountered that may not be covered in the Mule-Hide EPDM Manual. When this occurs, contact the Mule-Hide Technical Department.
- D. As you review this guide you will notice a few differences in the details and the use of some of the products. These changes were meant to improve the performance of the roofing system or to simplify and standardize the way things are done. Abide by these changes.

1.02. Scope:

- A. Provide a comprehensive guide to the products that are used when flashing, what they are used for, and the proper way to use them.
- B. Give a step-by-step account of how to construct the common details according to Mule-Hide Standard Details and Specifications.

PART 2-PRODUCTS

2.01 Product Storage and Handling.

- A. All products delivered to the job site shall be in their original unopened containers or wrappings and clearly labeled with the manufacturer's name, product identification and date of manufacture.
- B. Protect all materials from damage during transit, storage and delivery to the job site. Place all materials on pallets and protect from moisture. Materials damaged in handling or storage shall not be used.
- C. Store all materials in a dry, clean area protected from the elements. All adhesive and caulking shall be stored at temperatures between 60°F and 80°F. Materials exposed to lower temperatures affect the workability and performance of the product. Products shall be restored to room temperature prior to use.

- D. All flammable materials shall be stored in a cool, dry area away from open flames and sparks. Follow precautions outlined on containers or supplied by the material manufacturer/supplier.
- E. All damaged materials are to be replaced.

2.02. Materials Used in Flashing.

- A. Mule-Hide non-reinforced EPDM membrane is available for use with a Fully Adhered System in standard widths of 7, 10 and 20 feet, and lengths of 50 and 100 feet. This membrane is used to flash flat surfaces, and is cut to the appropriate size in the field.
- B. Mule-Hide Splice Adhesive - a black or white solvent based, synthetic rubber based (butyl) product designed for splicing EPDM roof membranes and uncured EPDM flashing.
- C. Mule-Hide Single Seal Adhesive - a black synthetic rubber based (blended) adhesive that may be used as either a splice or bonding adhesive for EPDM membranes (cured or uncured). Not to be used for RMS details.
- D. Mule-Hide Bonding Adhesive (solvent based) - an amber colored synthetic rubber based (neoprene) adhesive designed to bond EPDM membranes to approved insulation boards, metal, concrete, wood and other approved substrates.
- E. Mule-Hide Water Base Adhesive - a non-flammable and non-toxic acrylic latex-based adhesive designed to bond EPDM membranes to approved insulation boards, wood, concrete and other approved decking materials. For horizontal surfaces only (not to exceed inclines greater than 2"). Not suitable for vertical surfaces.
- F. Mule-Hide In-Seam Tape - a cured butyl rubber tape designed to adhere EPDM membrane seams in conjunction with Mule-Hide's Tape Primer.
- G. Mule-Hide Tape Primer - a cleaner specifically formulated to clean and prime EPDM membrane surfaces to be bonded with splice adhesives, In-Seam Tapes or Cured and Uncured EPDM Laminates.
- H. Mule-Hide Uncured EPDM Flashing - an uncured EPDM membrane (.060 inches thick) to be used in conjunction with the Mule-Hide EPDM Roofing Systems. Uncured EPDM flashing is easily formed and used to flash pipes, inside and outside corners and various other penetrations that require a moldable product.
- I. Mule-Hide Uncured Laminated Flashing Tape - an uncured EPDM membrane laminated to cured butyl tape. Used to flash pipes, inside and outside corners, T-joints and various other penetrations that require a moldable product. Flashing tape is used in conjunction with the Mule-Hide Tape Primer. Mule-Hide Uncured Laminated Flashing Tapes shall not be used for stripping seams, gravel stops, drip aprons or batten bars.
- J. Mule-Hide Cured Laminated Cover Tape - a cured EPDM membrane laminated to cured butyl tape, used for stripping seams, batten bar, gravel stop, drip apron and to patch EPDM membrane.
- K. Mule-Hide Lap Sealant - a one part, black or white elastomeric caulk designed for sealing the exposed edge of field fabricated membrane laps.
- L. Mule-Hide Water Cut-Off - a butyl based, one-component mastic designed specifically for sealing roofing membranes to wood, metal, concrete, plastic and other substrates.

- M. Mule-Hide Pourable Sealer - a two-component, liquid (100% solids) polyurethane elastomer used as filler for pitch pockets.
- N. Mule-Hide Pipe Boots - an economical premolded EPDM flashing designed for flashing single pipe penetrations.
- O. Mule-Hide All Purpose Bar - a specially extruded aluminum bar, .050" thick x 1" wide x 10' long, that may be used as an anchor bar, batten bar or as a termination bar.
- P. Mule-Hide RMS Strips - 6 inch wide, cured, reinforced EPDM strips used as a base attachment around curbs and walls to mechanically attach the EPDM field sheet.
- Q. Mule-Hide Fasteners - Factory Mutual approved # 14 heavy duty and # 12 drill point fasteners used for fastening insulation, reinforced membrane, Mule-Hide All Purpose Bar and Mule-Hide RMS Strip to roof decks, curbs and walls.
- R. Mule-Hide 2.4" Barbed Seam Plates - Factory Mutual approved 2.4" round Galvalume plates with reinforcing ribs used in conjunction with the Mule-Hide HD Fasteners to attach the reinforced membrane and RMS strips.

2.03. Procedures for Adhesive and Sealant Use.

- A. Splicing seams with Mule-Hide Butyl Splice Adhesive or Mule-Hide Single Seal Adhesive.
 - 1. Position the two membrane sheets, allowing for 4" overlap and fold the top sheet back about 12". Make sure that the laps are shingled so that water runs over the splice edge and not against it.
 - 2. All surfaces to be spliced shall be clean and dry. Remove excess talc by wiping the seam area with a clean damp rag. Dispose of rags as they become dirty.
 - 3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Tape Primer using clean cotton rags or Scotch-Brite pads. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags and Scotch-Brite pads must be replaced with clean ones as they become dirty. The primed membrane should have a uniform black color when dry. There should be no streaks present. The Mule-Hide Tape Primer shall be thoroughly stirred prior to use.
 - 4. Tape Primer and Splice Adhesives must be thoroughly stirred prior to application. Be sure to scrape the sides and bottom of the cans while stirring.
 - 5. Apply the Splice Adhesive to the cleaned surfaces of both sheets. Mule-Hide recommends the use of a solvent resistant, 3" - 4" wide, short bristle paint brush or a solvent resistant 3" wide, " medium nap, paint roller.
 - 6. Apply the adhesive in a uniformly thick even coat. When using a paintbrush do not use a circular motion. Use long, straight strokes applying sufficient adhesive that will achieve a smooth surface without leaving brush marks. When using a roller do not over roll the adhesive. This will cause an uneven application.
 - 7. Do not allow the adhesive to puddle or leave globs, as these areas will not dry properly and may cause excessive swelling of the membrane which will result in fishmouths in the finished seam.

8. Adhesive must be applied to both surfaces of the seam at the same time to allow for uniform drying of the adhesive. The adhesive must fully cover the surface of the splice areas a minimum of 4" wide.
9. Allow the adhesive to dry until tacky to the touch of a dry finger without stringing or sticking to the finger and does not move when pushed forward or the finger is twisted.

Note: Drying time (also referred to as Flash Off time) will vary from day to day depending on the ambient weather conditions. In colder weather, condensation may form on the surface of the adhesive, which is caused by the solvent flashing off. If this occurs, the application of the Splice Adhesive should be discontinued. The surface must be allowed to dry and a thin coat of adhesive must be applied over the existing adhesive.

10. Roll the top sheet onto the bottom sheet being careful not to stretch or wrinkle the membrane. Apply hand pressure brushing from the inside of the sheet outward to the edge removing air and fishmouths.
11. Using a 2" wide steel roller, apply positive pressure rolling from the inside of the seam working out over the edge of the sheet perpendicular to the direction of the seam. The entire seam must be rolled in this manner.
12. All "T-joint" laps in the field membrane shall be reinforced with a 6" piece of uncured EPDM membrane (uncured flashing tape may also be used) centered over the intersection of the edges of the seams. All T-joint patches shall be caulked with Lap Sealant.
13. Field seams and flashing should be allowed to set for several hours prior to the application of Lap Sealant. Lap Sealant should be applied to all seam edges by the end of the workday and before any moisture has a chance to form on the membrane.
14. Just prior to applying the Lap Sealant, the seam and flashing edges shall be cleaned with a clean rag or cloth using the Mule-Hide Seam Cleaner to remove any dirt or talc that may remain along the seam edge. Be sure that all edges of the splice have been covered with a continuous bead of Lap Sealant. It is not necessary to trowel (screed) the caulk. The Lap Sealant shall be applied at a maximum rate of 20 linear feet per tube.

B. Splicing seams with Mule-Hide In-Seam Tapes.

1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 4" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Tape Primer using clean cotton rags or Scotch-Brite pads. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags and Scotch-Brite pads must be replaced with clean ones as they become dirty.

4. The primed membrane should have a uniform black color when dry. There should be no streaks present. The Mule-Hide Tape Primer shall be thoroughly stirred prior to use.
 5. Roll the top sheet back over the bottom sheet and mark the bottom sheet to allow for proper placement of the In-Seam Tape. Mark the bottom sheet along the edge of the top sheet, but " away from the sheet, as a guide for the installation of the In-Seam Tape. Do not use a chalk line or any type of marker that will prevent the seam tape from sticking.
 6. Fold the top sheet back. Approximately 1/8" to 3/8" of In-Seam Tape should be exposed along the completed seam. Unroll 2 or 3 feet of the In-Seam Tape leaving the release liner in place. Align the In-Seam Tape so that the edge of the release liner is touching the guideline. Do not install the tape over the line. Leaving the release paper in place, install the In-Seam Tape along the marks on the bottom sheet. Roll the tape with a 2" steel roller along the entire length of the seam. The roller must run perpendicular to the tape with overlapping strokes. If more than one piece (roll) of tape is required to complete a seam, the second piece of tape must overlap the first a minimum of 1 inch.
 7. Fold the top sheet back onto the tape so that the sheet is lying over the release paper. Peel the release paper off the tape at a 45o angle and parallel with the roof allowing the top sheet to fall freely onto the exposed tape. Press the seam together using hand pressure and wiping toward the splice edge. Immediately roll the seam with a 2 inch wide steel roller, using positive pressure, toward the edge of the seam.
 8. Wait a minimum of 2 hours prior to application of the Lap Sealant. The Lap Sealant is only required at intersections with factory seams, where two pieces of tape overlap within the seam and on patches installed over T-joints. A bead of Lap Sealant should be applied along the overlap for 6" in each direction from the center point of the overlap.
- C. Regardless of the method used to splice the seams, all seams must be thoroughly inspected for fishmouths, bubbles, blisters and wrinkles and repaired as necessary.
1. If fishmouths or wrinkles occur through the seam, they must be cut out and patched with cured membrane (cured cover tape may be used).
 2. Patch with cured EPDM membrane or Cured Cover Tape (do not use uncured flashing or flashing tape) that is at least 3 inches larger in all directions than the area that has been cut out. Round the corners of the patch.
 3. Center the patch over the area to be repaired. Follow the splicing procedures for the appropriate material used.

2.04. Mechanical Attachment Procedures and Options.

- A. Mule-Hide All Purpose Bar may be installed either as a batten bar or a termination bar, depending on the placement in the system.
1. When used as a batten bar its purpose is to secure the field membrane. It is fastened either to the wall or curb through the field membrane, or to the roof deck through any insulation being used as an overlayment. The fastening is accomplished using the proper Mule-Hide fastener for the material to which the membrane shall be anchored.

- a. The batten bars are positioned 1/2" to 1" apart, and held back approximately 6" to 9" from inside and outside corners.
 - b. The batten bar is fastened a maximum of 12" o.c.
 - c. The batten bar must have a fastener within 1-1/2" from each end.
 - d. The batten bar is positioned and fastened by either starting in the middle of each bar and installing fasteners consecutively toward each end, or by starting the fasteners at one end and consecutively fastening toward the other end. Do not fasten at both ends and then install the interior fasteners, as this will cause the bar to buckle between the fasteners and not lay flat.
 - e. The fasteners should be snug, but do not over tighten, causing the bar to deform.
2. When the Mule-Hide All Purpose Bar is used as a termination bar; it is turned over so as to form a caulk edge. Refer to the termination bar Standard Detail.
 - a. The All Purpose Bar is positioned on the membrane so that the fasteners will be compressing the membrane into the bead of water cut off between the membrane and the substrate.
 - b. The termination bar will be fastened, using the Mule-Hide fastener suited to the substrate, at a maximum of 6" o.c., with the required fastener at all bar ends.
 - c. Follow the same fastening order as for batten bar.
 - d. Term bar may be installed horizontally or vertically.
- B. The Mule-Hide 6" RMS strip is rapidly becoming the method of choice for providing mechanical attachment of the field membrane at the base of walls and curbs.
1. Lay the RMS strip along the wall or curb to be flashed.
 2. Cut the RMS strip to the proper length, and position it where it will be fastened.
 3. Fasten the RMS strip either horizontally to the roof deck, or vertically into the wall or curb, using the 2.4" barbed seam plates and appropriate Mule-Hide Fasteners spaced a maximum of 12" on center. Fasteners must be installed within 1-1/2" of each end of the RMS strip.
 4. The field sheet is then spliced to the RMS with Mule-Hide Butyl Splice Adhesive, following the splicing procedure in (2.03.A.). Mule-Hide Single Seal Adhesive is not an acceptable product for this detail. Do not use Single Seal Adhesive to splice the field sheet to the RMS strip.
- C. The Mule-Hide 6" RMS strip is also available with a pre-applied seam tape for even easier installation.
1. Lay the RMS strip along the wall or curb to be flashed with the marked 'X's toward the exterior of the roof and release tape facing upward.
 2. Cut the RMS strip to the proper length, and position it where it will be fastened.
 3. Fasten the RMS strip either horizontally to the roof deck, or vertically into the wall or curb, using the 2.4" barbed seam plates and appropriate Mule-Hide Fasteners spaced a maximum of 12" on center. Fasteners must be installed within 1-1/2" of each end of the RMS strip.

4. The field sheet is then seamed to the RMS using tape primer and the pre-applied tape. Apply tape primer to the underside of the field membrane where it will make contact with the seam tape (see 2.03, B above).
5. Fold the field sheet back onto the tape so that the sheet is lying over the release paper. Peel the release paper off the tape at a 45o angle and parallel with the roof allowing the top sheet to fall freely onto the exposed tape. Press the seam together using hand pressure and wiping toward the splice edge. Immediately roll the seam with a 2 inch wide steel roller, using positive pressure, toward the edge of the seam.

PART 3-EXECUTION

3.01 Flashing Vertical Surfaces.

- A. The field membrane must be mechanically attached at the base of the wall. This can be accomplished with either the All Purpose Bar or the RMS strips (see 2.04 above). If you are installing a Reinforced EPDM field membrane, 2.4" barbed seam plates may be substituted for the All Purpose Bar.

Note: Use of the RMS strip at the base of vertical surfaces allows the field membrane to be used as a continuous field and flashing sheet. The field sheet is adhered to the RMS strip and then adhered to the vertical surface, running to the point of termination. The field sheet should extend up the vertical surface a minimum of 8 inches where possible.

- B. Cut the cured flashing sheet to the size needed, but limit the area to be flashed so that the sheet size is manageable.
- C. Position the flashing sheet along the wall or curb to be flashed with the edge to be spliced to the field sheet along the outside edge of where the splice will occur. This should be a minimum of 3" out from the edge of the plate or bar.
- D. Prepare the flashing sheet and the field membrane for splicing as in sections 2.03., paragraphs A.2. through 9. Prepare both sheets at the same time, especially applying the adhesive at the base of the flashing sheet, so that when it flashes off, a hinge is formed. The edge of the sheet is hinged to the field sheet by the adhesive.
- E. Apply the bonding adhesive to the curb or wall and to the remaining surface of the flashing sheet.
- F. After all of the adhesives have flashed off, roll the flashing sheet into the splice area taking care not to let the sheet bond to the wall until the splice is mated and worked up tight to the wall. Care must be taken to make this splice so that there are no wrinkles in the splice.
- G. When the splice is completed up to the wall, mate the flashing sheet to the vertical surface. Work the sheet up the surface, starting at the middle of the sheet and working up and out to the ends. Do not force or stretch the membrane as wrinkles may occur. Carefully roll all surfaces with a 2" steel roller to ensure positive contact of the membrane to the horizontal and vertical surfaces.
- H. Terminate the flashing sheet at the top using one of the Standard Details. When using Mule-Hides All Purpose Bar, a bead of Water Cut-Off must be installed between the membrane and the substrate at the point where the bar is to be fastened. Do not flatten the bead of Water Cut-Off with a roller. The termination bar must compress the membrane into the water cut-off to create a proper seal. Trim excess membrane with a utility knife prior to applying the final bead of sealant along the top edge of the All Purpose Bar.

3.02. Fabricating an Outside Corner Using Uncured EPDM

- A. Cut two pieces of the uncured EPDM to the proper size keeping in mind that the flashing must extend up the vertical and the flange must extend out onto the horizontal a minimum of 3". Each piece of the flashing must extend around the corner a minimum of 2" in one direction and 4" in the other. Round the corners.
- B. Prepare the uncured corner pieces and the membrane to which they will be applied the same as for a splice.(2.03.A.)
- C. When the adhesives have flashed off, take the first piece of Uncured EPDM and fold the 3" flange up. Mate the corner piece to the vertical surface as follows:
 - 1. Starting at a minimum 2" from the corner, position the corner piece so that the flange edge is down flush with the horizontal surface and mate it to the vertical surface. Wrap the corner piece around the corner a minimum of 4", pressing it into place and allowing no wrinkles.
 - 2. Now form the flange out onto the horizontal surface by starting at each end of the corner piece and working it out without stretching it. Once the ends of the flange have been started without stretching, form the flange by working it out and forming it to the horizontal surface.
 - 3. Roll the corner piece with a 2" steel or silicone roller.
- D. Install the second corner piece following the procedures in C. above, only do it in the opposite direction. The pieces overlap to form a double thickness at the base of the corner.
- E. At the end of the day, apply Lap Sealant to all of the splice edges. It is not necessary to trowel (screed) the bead of Lap Sealant as it is self-leveling.

Note: This detail may also be done using Uncured Laminated Flashing Tape and Tape Primer.

- F. Refer to Mule-Hide Detail # MHE-183 for reference.

3.03. Fabricating an Inside Corner Using Uncured EPDM

- A. Cut a 12"x 12" piece of Uncured EPDM and round the corners.
- B. Prepare the surfaces as for splicing as in section 2.03.A.
- C. When the adhesives have flashed off, fold the piece back in half and position it in the corner so that the midpoint is at the base of the corner and press half of the folded piece onto the horizontal flange area and the other half onto the vertical surface.
- D. To complete the installation of this piece, work the folded material up the wall and into the corner. When this is done correctly there is a triangular flap sticking out called a pig's ear. Splice the pig's ear to the vertical surface.
- E. Roll the fabricated corner with a 2" steel or silicone roller.
- F. With a second piece of Uncured EPDM cover the pig's ear using the splicing method described in section 2.03.A.
- G. Apply a bead of Lap Sealant over the splice edges at the end of the day.

Note: This detail may also be done using Uncured Laminated Flashing Tape and Tape Primer.

- H. Refer to Mule-Hide Detail # MHE-184 for reference.

3.04. Flashing a Roof Drain

- A. Remove the strainer and the drain clamp ring from the drain, saving the parts for later use. If it is a reroof situation, the existing flashing material must be removed, and the drain bowel flange and the clamping ring must be clean of all foreign debris. Remove any lead flashing and properly dispose of it.
- B. Make sure that there is a smooth transition down to the drain bowel flange. This might require that the insulation be tapered in order to provide the smooth transition.
- C. Position the field membrane over the drain and press it down onto the drain bowel flange and mark the spot in the center of the drain pipe where the hole in the membrane will be cut.
- D. Cut a smooth round hole in the membrane, centered on the marked spot, that is larger than the drainpipe, but smaller than the drain clamp ring.
- E. Install a heavy bead of Water Cut-off under the membrane and on top of the drain bowel flange, so that the drain bowel clamping ring rests over the bead of Water Cut-off.
- F. Install the clamping ring and the clamping ring nuts and bolts, tightening the clamping ring securely and forming a compression seal between the membrane and the drain bowel flange. Any clamp bolts that have been broken off or are missing must be replaced.
- G. Install the strainer on the drain.

Note: It is not acceptable for a splice to run through a drain. If this condition occurs, a 4'x 4' target of field sheet must be installed, centered over the drain.

- H. Refer to Mule-Hide Details # MHE-130 to MHE-133

3.05. Installing a Prefabricated Pipe Boot

- A. Prefabricated Pipe Boots are manufactured so that they will work on pipes ranging in size from 1" to 6", depending on where they are cut. Cut off the top of the boot so that it fits the pipe that is to be flashed.
- B. Place the boot over the pipe so that the flange rests flat on the roof surface, and mark the pipe at the top of the boot.
- C. Remove the boot and run a heavy bead of Water Cut-off around the pipe just under the mark on the pipe.
- D. Clean the membrane around the pipe and the bottom side of the boot flange with Mule-Hide Seam Cleaner following the splice procedure in section 2.03.A. When the adhesive has flashed off, replace the boot on the pipe and press the flange to the field sheet. Carefully roll the boot flange with a 2" steel roller to ensure positive contact.
- E. Install a stainless steel clamp at the top of the boot, compressing the boot onto the pipe and bead of Water Cut-off.

- F. At the end of the day, apply a bead of Lap Sealant around the outside edge of the flange and at the top of the boot above the clamping ring.
- G. Refer to Mule-Hide Detail # MHE-140 A and MHE-140 B.

3.06. Field Fabricated Pipe Flashing

- A. Remove any lead or flashing of any type from the pipe to be flashed and clean the pipe.
- B. Cut a one-piece target out of field sheet that is large enough to allow a minimum 6" flange around the pipe (i.e. a 6" pipe would require a minimum 18" target). Round the corners or make the target round.
- C. Mark the center of the target and cut a smooth round hole, centered on the mark, that is half the size of the pipe.
- D. Force the target over the pipe, forming a 3/4" to 1" flange running up the pipe.
- E. Splice the target to the field sheet following the splicing procedure in section 2.03.A.
- F. Cut a piece of uncured EPDM a minimum of 6" wide and long enough to wrap around the pipe and overlap itself by a minimum of 2".
- G. Prepare the target for 3" around the pipe and the uncured strip for splicing as described in section 2.03.A., and apply adhesive to the pipe.
- H. When the adhesives have flashed off, fold back about 1-1/2" of the uncured strip which will be the flange onto the horizontal. Position the folded strip at the base of the pipe and wrap it around the pipe until it almost meets itself. It should be stretched a little during this procedure to obtain a tight, wrinkle free installation.
- I. Before completing the wrap, start to form the flange. Start at the beginning of the wrap and work the folded portion out onto the horizontal portion of the target, taking care not to over stretch the uncured EPDM for the first inch or two. After the flange is started, continue to form it, stretching it out onto the horizontal, for about half way around the pipe.
- J. Make the splice at the 2" overlap, taking care not to stretch the flashing during the initial forming of the flange going back in the other direction.
- K. Complete the forming of the flange, and then roll the wrap and the flange completely with a 2" steel or silicone roller.
- L. At the end of the day apply a bead of Lap Sealant to all of the splice edges and around the top of the wrap.
- M. Refer to Mule-Hide Detail # MHE-141.



MULE-HIDE PRODUCTS CO., INC. INSULATION GUIDELINES

1.0 Insulation Guidelines

- A. The following is a list of generic insulations acceptable for use with Mule-Hide Roofing Systems. Requests to use other types of insulation boards are to be made to Mule-Hide's Technical Department in writing prior to job bid. Such requests must include the conditions for approval, project name and location of project.
- B. Insulation must be no less than 1 inch thick with the exception of high-density wood fiberboard, high density polyisocyanurate, extruded polystyrene and tapered boards. When the insulation is applied directly over a steel deck, in no case shall the minimum allowable thickness be less than that required to span the flutes of a steel deck.
- C. Applicable building codes should always be checked prior to proposing the application to Mule-Hide or the building owner.
- D. Factory Mutual (FM) and Underwriters Laboratory (UL) assemblies can be found in the Factory Mutual Approval Guide and/or Underwriters Laboratories Building Material Directory and Fire Resistance Directory. Code requirements may dictate the use of specific types and thicknesses of insulation. You can contact the Mule-Hide Technical Department for help in determining which Mule-Hide system may meet your code requirements.

2.0 Insulation

Insulation Type	Used as Overlay Board	Roof Systems		
		Adhered	Ballasted	Mech Attached
Polyisocyanurate - Min 1" thick (top layer) - Min 20 psi	Yes	Yes	Yes	Yes
OSB/Polyisocyanurate Composite - Min 1.5"	Yes	Yes	Yes	Yes
HD Polyisocyanurate Coverboard – Min ½" thick	Yes	Yes	Yes	Yes
HD Fiberboard - Min 1/2" thick ⁸	Yes	Yes	Yes	Yes
Dens Deck Prime / Securock - Min 1/4" thick	Yes	Yes	Yes	Yes
OSB - Min 7/16" thick ²	Yes	Yes	Yes	Yes
Expanded Polystyrene - Min 1" - Type I ^{3 4 6}	NO	NO ¹	Yes	NO ¹
Expanded Polystyrene w/facer - Min 1" - Type II ^{3 4 7}	NO	NO ¹	Yes	Yes ⁵
Extruded Polystyrene - Min 3/4" thick - Type X ^{3 4}	NO	NO ¹	Yes	NO ¹
Extruded Polystyrene - Min 1" - Type IV ^{3 4}	NO	NO ¹	Yes	Yes ⁵
Extruded Polystyrene Fan Fold – Min ¼" thick ^{3 4}	NO	NO ¹	NO	Yes
Protection Mat - Min 6 oz.	NO	NO ¹	Yes	Yes

- Notes:
- 1 - Requires overlay board
 - 2 - OSB must be installed with the rough side up
 - 3 - Not approved over Coal Tar Pitch
 - 4 - Can not be placed in contact with PVC, requires a separation layer
 - 5 - Overlay board recommended
 - 6 - Type I = min 0.90 lb density
 - 7 - Type II = min 1.35 lb density
 - 8 - DO NOT use '6-sided' or asphalt coated board for PVC or water based adhesive

See other requirements listed below.

3.0 Minimum Insulation Specifications

- A. Project or Code requirements may dictate use of materials other than those listed below. Contact Mule-Hide Technical Department with questions regarding use insulations in a Mule-Hide Roofing System.
1. Wood fiberboard (High Density)
Thickness: 1/2" Minimum
Classification: ASTM C-208, Type 2
 2. Polyisocyanurate
Thickness: 1" Minimum
Classification: ASTM C 1289,
Facers: Fiber reinforced facers, both sides
 3. High Density Polyisocyanurate
Thickness: 1/2" Minimum
Compressive Strength: Min 90 psi at 10% deformation
Facers: Fiber reinforced facers, both sides
 4. Extruded Polystyrene Boards (flat stock)
Thickness: 3/4" Minimum
Classification: Type X
Compressive Strength: Min 15 psi at 10% deformation
Not for use over Coal Tar Pitch. Applications may require use of higher density material or overlay.
 5. Extruded Polystyrene Boards (fan fold)
Thickness: 1/4" Minimum
Compressive Strength: Min 15 psi at 10% deformation
Not for use over Coal Tar Pitch.
 6. Expanded Polystyrene Boards
Thickness: 1" Minimum
Classification: Type 1
Compressive Strength: Min 10 psi at 10% deformation
Not for use over Coal Tar Pitch. Applications may require use of higher density material or overlay.
 7. Expanded Polystyrene Boards (fan fold)
Thickness: 1/2" Minimum
Classification: Type 1
Compressive Strength: Min 10 psi at 10% deformation
Not for use over Coal Tar Pitch. Applications may require use of higher density material or overlay.
 8. Perlite is a mineral fiber insulation board that Mule-Hide does not recommend be used in conjunction with the Mule-Hide Roofing Systems. However, should perlite be required to meet building codes, FM, or UL requirements, the perlite **must** be overlaid with an acceptable insulation. **Perlite is not acceptable for use in recover applications.**
 9. Fiberglass is not an acceptable insulation for use in Mule-Hide Roofing Systems.

4.0 Insulation Fastening Patterns

- A. Insulation that is mechanically attached to the substrate shall use approved Mule-Hide fasteners. Minimum insulation attachment rates shall be as per Mule-Hide's requirements or insulation manufacturer's specifications, whichever is greater. Projects requiring Factory Mutual or other Code approvals may require heavier gauge fasteners or additional fasteners. In no case shall the insulation attachment rate be less than Mule-Hide's requirements.
- B. Insulation is always fastened with 3" Galvalume Stress Plates with minimum #12 Drill Point fasteners.
- C. Refer to Mule-Hide specifications and details for minimum fastening rates and patterns.

5.0 Other Methods of Insulation Attachment

- A. Asphalt - While Mule-Hide may accept (on a job to job basis) attachment of insulation with hot asphalt for use with Mule-Hide systems, asphalt is neither supplied nor manufactured by Mule-Hide; therefore, the attachment of the insulation with asphalt shall not be covered by Mule-Hide's Standard Warranty. However, if a qualified project designer specifies asphalt attachment, the following recommendations are given:
 - 1. Steep asphalt ASTM D312, Type III or IV, shall be specified
 - 2. Asphalt may only be used to attach approved insulations to primed structural concrete decks, properly nailed base sheets or a base layer of mechanically attached, approved insulation. Insulation must be approved by Manufacturer for use with hot asphalt.
 - 3. Maximum insulation board size shall not exceed 4'x 4'. **4'x 8' boards are not permitted.**
 - 4. Expanded or extruded polystyrene insulation shall not be attached with asphalt.
- B. Other insulation adhesive products may be an acceptable method of attaching certain insulation boards to approved substrates. As Mule-Hide does not supply or manufacture insulation adhesives, the products must be installed in strict compliance with the requirements published by the manufacturer. Contact the manufacturer for information and recommendations regarding the appropriate use of these products. Mule-Hide must be contacted prior to the use of any such product. The attachment of the insulation is not covered by the Standard Mule-Hide warranty.
- C. Mule-Hide Premium warranties require that Mule-Hide give approval of the insulation adhesive prior to bidding. A copy of the Insulation Adhesive Manufacturer's letter of acceptance for the project must be forwarded to Mule-Hide for review and acceptance by Mule-Hide prior to bidding the project.

6.0 Insulation Storage

- A. Insulation boards stored or stocked on the job site or roof must be stacked on pallets (or other supports) above the deck or ground.
- B. Insulation shall be covered with waterproof tarps to protect insulation from sun and inclement weather. Wet or damaged insulation must not be used in Mule-Hide roofing systems.

- C. Insulation should not be stored on the job site for more than thirty (30) days if at all possible.

7.0 Insulation Application - Recommended Practices

- A. For mechanically attached systems, install field sheets perpendicular to long dimension of the top layer of insulation. Where possible, boards should run parallel to the direction of the flutes of the deck.
- B. Install insulation boards in parallel courses with tightly fitted and staggered joints. Cut all boards accurately to fit neatly around all projections and at all edges. Gaps greater than 1/4" shall be filled. End joints should be staggered a minimum of 6 inches or as approved by insulation manufacturer.
- C. Do not use wet or damaged insulation boards. Install no more insulation than can be covered with seamed membrane and watertight details before any precipitation occurs.
- D. On steel decks, the ends of the insulation boards shall rest on the top of the flutes and not in suspension over the valleys.
- E. When two layers of insulation are used, the second layer must have the joints staggered to the first layer a minimum of 6 inches or as approved by insulation manufacturer. One set of fasteners may be used to secure both layers of insulation unless otherwise required by the insulation board manufacturer or the design professional.
- F. In accordance with Mule-Hide specifications, provide proper water cutoffs to completely seal the insulation on a daily basis.

Caution: Do not install over wet, damp or uneven substrates.

Caution: Keep all insulations away from fire, flame and ignition sources during storage and installation.

End Of Section



MULE-HIDE PRODUCTS CO., INC FASTENER GUIDELINES

Fastener Overview

- A. Mule-Hide offers a variety of fasteners and plates to:
- Attach roof insulation
 - Attach mechanically fastened roofing membranes
 - Secure All Purpose Bar and termination bars

Mule-Hide fasteners must be used to fasten the roof insulation, roof membrane, and All Purpose Bar. On a job-to-job basis, the Mule-Hide Technical Department may accept the use of non-Mule-Hide fasteners and/or insulation adhesives for attachment of Mule-Hide accepted insulation. Any non-Mule-Hide fastener and plate used must be approved by the Mule-Hide Technical Department prior to job start-up. Your local Mule-Hide Territory Manager can advise you of the acceptability of any proposed non-Mule-Hide fastener. The following fastener guidelines apply:

Technical Specifications - Drill Point Fasteners (#12 Insulation fasteners)

A.	<u>Technical Specifications</u>	<u>Minimum Performance</u>
	Material	C-1022 Phillips Cold Heading Wire
	Thread OD	0.209 to 0.218 diameter
	Point	Double Flute Self-Drilling
	Corrosion Coating	Cathodic Epoxy Electrocoat
	Average Pull-out	600 lbs. - 3/4" plywood 480 lbs. - 22 gauge steel

Technical Specifications - HDP Fasteners (#14 membrane or insulation fasteners)

A.	<u>Technical Specifications</u>	<u>Minimum Performance</u>
	Material	C-1022 Phillips Cold Heading Wire
	Thread OD	.233 - .241 diameter
	Point	Double Flute Self-Drilling
	Corrosion Coating	Cathodic Epoxy Electrocoat
	Average Pull-out	710 lbs. - 3/4" plywood 575 lbs. - 22 gauge steel

Technical Specifications - EHD Fasteners (#15 membrane or insulation fasteners)

A.	<u>Technical Specifications</u>	<u>Minimum Performance</u>
	Material	C-1022 Phillips Cold Heading Wire
	Thread OD	.275 - .285 diameter
	Point	Double Flute Self-Drilling
	Corrosion Coating	Cathodic Epoxy Electrocoat
	Average Pull-out	810 lbs. - 3/4" plywood 725 lbs. - 22 gauge steel

Note: Additional information is available on our website at www.mulehide.com

Physical Characteristics - Drill Point & Heavy Duty Fasteners

A. **Drill Point Fasteners (#12 Insulation fasteners)**

Screw Length*	Thread Length*	Pieces / Box*	Weight / Box*
1 5/8	Full	1000	12#
2 1/4	Full	1000	16#
2 7/8	Full	1000	19#
3 1/4	2 7/8	1000	22#
3 3/4	2 7/8	1000	25#
4 1/2	4	1000	29#
5	4	1000	32#
6	4	1000	37#
7	4	500	21#
8	4	500	24#

*Approximate Values - Other sizes available as special order

B. **HDP Fasteners (#14 membrane or insulation fasteners)**

Screw Length*	Thread Length*	Pieces / Box*	Weight / Box*
1 1/2	Full	1000	13#
2	Full	1000	16#
3	2 7/8	1000	24#
4	3 7/8	1000	31#
5	3 7/8	1000	38#
6	3 7/8	1000	44#
7	3 7/8	500	26#
8	3 7/8	500	30#

*Approximate Values - Other sizes available as special order

C. **EHD Fasteners (#15 membrane or insulation fasteners)**

Screw Length*	Thread Length*	Pieces / Box*	Weight / Box*
1 1/4	Full	1000	15#
2	Full	1000	22#
3	2 7/8	1000	29#
4	3 7/8	1000	38#
5	3 7/8	1000	47#
6	3 7/8	500	29#
7	3 7/8	500	33#
8	3 7/8	500	38#

*Approximate Values - Other sizes available as special order

D. Determine minimum screw length per following:

Plywood / OSB Decks:	Fastener length must penetrate deck a minimum of 3/4"
Wood Plank Decks:	Fastener length must embed deck a minimum of 1"
Steel Decks:	Fastener length must penetrate deck a minimum of 3/4"
Structural Concrete Decks:	Fastener length must embed deck a minimum of 1"

Method of Application

- A. Install fasteners with variable low speed drill with depth sensing tip, if possible, to prevent over-drill of fastener. Use a #3 Phillips bit to drill fasteners. Structural concrete should be pre-drilled with a hole 1/2" deeper than the fastener to be used using a masonry 3/16" carbide drill bit. **Caution:** Eye protection is recommended during the installation of all fasteners.

General Requirements

- A. Plywood decks require a 3/4" penetration through the bottom surface of the deck.

- B. Steel decks require 3/4" minimum deck penetration by the fastener. The threaded portion of the fastener must be secured to the deck. Fasteners must engage the top rib of fluted steel decks. Fastening through the bottom rib of a fluted steel deck is not permitted.
- C. Structural concrete decks require the fastening of the insulation with fasteners approved by Mule-Hide for use in concrete roof decks and insulation plates. The fastener must penetrate the deck by at least one inch. It is suggested that each hole drilled in a concrete deck be at least 1/2" deeper than the potential penetration of the concrete fastener. The additional 1/2" depth is for the residual filings left by the concrete after the drill has been removed.
- D. Gypsum, either poured or precast, cementitious fiber decks (tectum, etc.) and lightweight concrete decks must be secured with Mule-Hide TL Fasteners, Peel Rivets (a registered trademark of Creative Construction Components, Inc.) or an acceptable fastening system approved by Mule-Hide Technical Department.
- E. All decks must have a pull-out resistance of 360 pounds minimum. Mule-Hide recommends a test installation be performed to check the pull-out resistance of the appropriate fastener prior to bidding the project. Pull-out tests should be performed by a qualified individual and include different sections of the roof to assure uniformity of the deck.

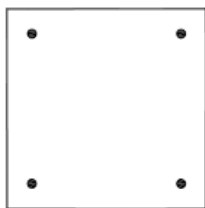
Approved Fasteners

- A. Only approved Mule-Hide fasteners supplied by Mule-Hide Products Co. may be used on warranted Mule-Hide systems. **Caution:** Some fasteners have unusual design characteristics which could harm the membrane if used with the Mule-Hide membrane; therefore, it is recommended that Mule-Hide approved fasteners be used whenever possible.
- B. All fasteners shall be corrosion resistant coated and meet the corrosion resistance requirements of Factory Mutual Standard 4470.
- C. All fasteners shall be compatible with and suitable for the insulation used and the deck to be penetrated.

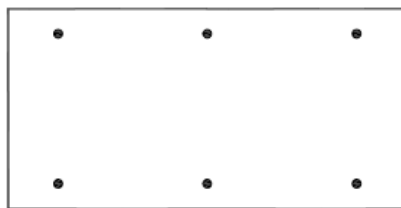
Fastener Patterns - Insulation

- A. Insulation shall be mechanically attached using approved fasteners per insulation manufacturers' specifications and FM wind uplift requirements. Unless the insulation manufacturer's fastening requirements are more stringent, Mule-Hide requires the following minimum fastening rates and suggests the following patterns:

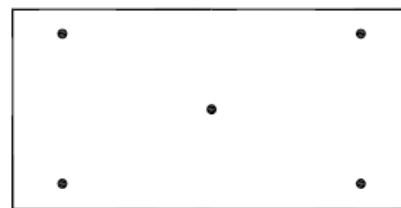
Mechanically Attached Systems



4'x4' BOARDS



4'x8' BOARDS



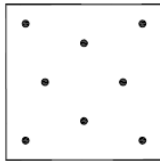
4'x8' BOARDS (2" THICK OR MORE)

All of the insulation must be pre-fastened to the deck with Mule-Hide #12 DP fasteners and 3" plates at a minimum as shown above. All fasteners must be at least six (6) inches from the edge of the board and

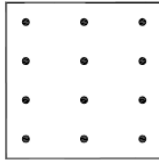
centered as shown.

Fully Adhered

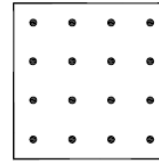
Wood Fiber



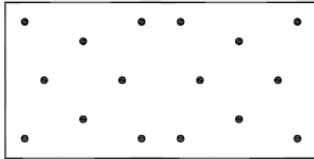
4'x4' FIELD (8)



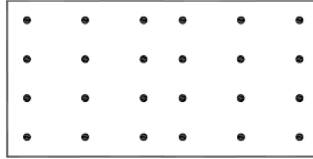
4'x4' PERIMETERS (12)



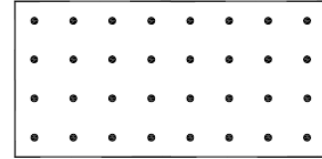
4'x4' CORNERS (16)



4'x8' FIELD (16)



4'x8' PERIMETERS (24)



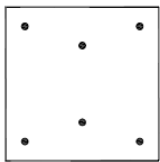
4'x8' CORNERS (32)

1 FASTENER PER EVERY 2 SQ. FT.

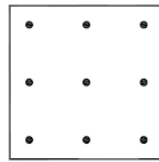
1 FASTENER PER EVERY 1.33 SQ. FT.

1 FASTENER PER EVERY 1 SQ. FT.

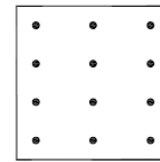
Polyisocyanurate Insulation – 1.5" to less than 2" thick



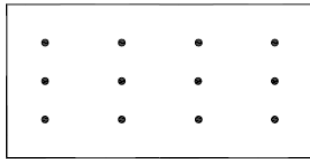
4'x4' FIELD (6)



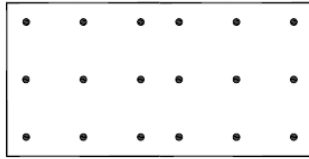
4'x4' PERIMETERS (9)



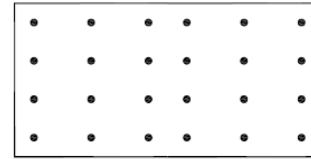
4'x4' CORNERS (12)



4'x8' FIELD (12)



4'x8' PERIMETERS (18)



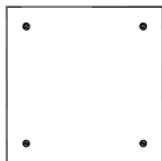
4'x8' CORNERS (24)

1 FASTENER PER EVERY 2.66 SQ. FT.

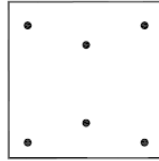
1 FASTENER PER EVERY 1.77 SQ. FT.

1 FASTENER PER EVERY 1.33 SQ. FT.

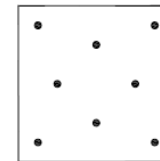
Polyisocyanurate Insulation – 2" thick or greater



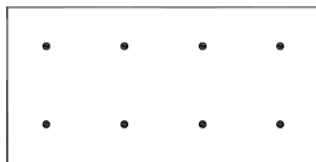
4'x4' FIELD (4)



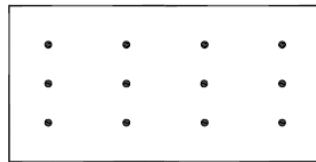
4'x4' PERIMETERS (6)



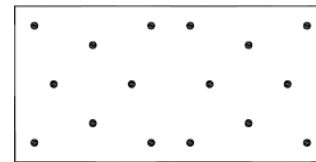
4'x4' CORNERS (8)



4'x8' FIELD (8)



4'x8' PERIMETERS (12)



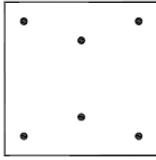
4'x8' CORNERS (16)

1 FASTENER PER EVERY 4 SQ. FT.

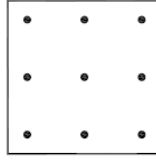
1 FASTENER PER EVERY 2.66 SQ. FT.

1 FASTENER PER EVERY 2 SQ. FT.

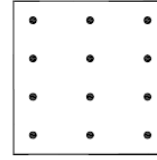
Dens Deck or SecurRock



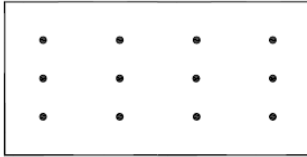
4'x4' FIELD (6)



4'x4' PERIMETERS (9)

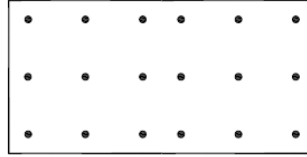


4'x4' CORNERS (12)



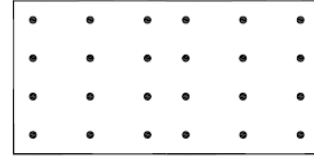
4'x8' FIELD (12)

1 FASTENER PER EVERY 2.66 SQ. FT.



4'x8' PERIMETERS (18)

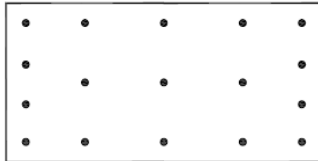
1 FASTENER PER EVERY 1.77 SQ. FT.



4'x8' CORNERS (24)

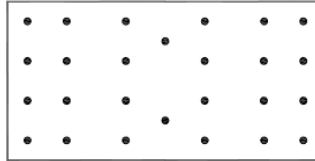
1 FASTENER PER EVERY 1.33 SQ. FT.

OSB



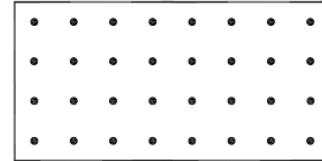
4'x8' FIELD (17)

FASTENER PER EVERY 1.88 SQ. FT.



4'x8' PERIMETERS (26)

1 FASTENER PER EVERY 1.23 SQ. FT.



4'x8' CORNERS (32)

1 FASTENER PER EVERY 1 SQ. FT.

Perimeter enhancements:

To meet increased uplift requirements in the perimeters and corners of each roof area, additional insulation attachment provisions must be installed as follows:

Perimeters – insulation attachment to be increased 50% over the field attachment requirements with a maximum of one (1) fastener every one (1) square feet.

Corners – insulation attachment to be increased 50% over the field attachment requirements with a maximum of one (1) fastener every one (1) square feet.

All of the insulation must be pre-fastened to the deck with Mule-Hide #12 DP fasteners and 3" plates at a minimum as shown above. All fasteners must be at least six (6) inches from the edge of the board and centered as shown.

See attached details MHFM-208, MHFM-212, & MHFM-216 for examples of Factory Mutual Attachment patterns for those projects requiring Factory Mutual Approval.

Fasteners Available From Mule-Hide

Typical Fasteners - Refer to Mule-Hide website at www.mulehide.com for most current information.

Fastener (1) (2)	Uses	Roof Deck (3)
Mule-Hide DP #12	Insulation attachment Only	Steel, Wood
Mule-Hide HDP-14	Insulation attachment System attachment	Steel, Wood, Concrete
Mule-Hide EHD-15 (4)	System attachment	Steel, Wood, Concrete

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. Contact Mule-Hide Technical Department for non-standard roof decks.
4. Required for Factory Mutual, mechanically attached systems

Attachment of Wood Nailers

- A. Wood nailers shall be firmly attached to the deck, wall or existing structurally sound surface, so as to resist a force of 200 pounds per linear foot in any direction (fastening 16 inch o.c. maximum is recommended for most applications). See below the Factory Mutual Loss Prevention Data Bulletin 1-49 for recommended type and size of fasteners, nailers and spacing:

**Factory Mutual
Loss Prevention Bulletin 1-49 and Other Nailer Attachment**

<u>Deck Type</u>	<u>Mule-Hide Fastener</u>	<u>Fastener Type</u>		
		<u>1/2" Dia. Anchor Bolts</u>	<u>3/8" Dia. Anchor Bolts</u>	<u>3/4" Dia. Structural Steel Posts</u>
1/2" to 5/8" Plywood	12" o.c.	N/A	N/A	N/A
5/8" or Greater Plywood	16" o.c.	N/A	N/A	N/A
Wood Plank	16" o.c.	N/A	N/A	N/A
Existing 2X Wood Nailers	16" o.c.	N/A	N/A	N/A
Steel Deck	16" o.c.	N/A	N/A	N/A
Concrete	16" o.c.	4'0" o.c.*	2'8" o.c.**	N/A
Structural Steel	N/A	N/A	N/A	4'0" o.c.
Lightweight Concrete	16" o.c.	N/A	N/A	N/A

* Within 8' of all corners, spacing shall be 2'0" o.c.

** Within 8' of all corners, spacing shall be 16" o.c.

SECTION 2

MULE-HIDE PRODUCTS CO., INC. EPDM SYSTEM WARRANTY INFORMATION

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Warranty Program Overview

EPDM Warranty Offerings

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10 / 15 Year Warranty - Ballasted Design Summary

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10 / 15 Year Warranty - Premium Warranty Enhancements

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

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www.mulehide.com

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Beloit, WI 53512-1057

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 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.*

Mule-Hide Warranty Program Overview - Continued

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 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

EPDM

Warranty Type	Warranty Fees	
	Cost/SF	Min \$
Membrane Only - 10 Years	\$0.00	\$25.00
Membrane Only - 15 Years ⁵	\$0.01	\$100.00
Membrane Only - 20 Years ^{4,5}	\$0.02	\$200.00
Standard - 10 Years ^{3,5}	\$0.05	\$400.00
Standard - 15 Years ^{3,5}	\$0.08	\$525.00
Standard - 20 Years ^{2,3,4,5}	\$0.11	\$800.00
Standard -10 + Membrane -15 ^{3,5,6}	\$0.06	\$500.00
Standard -10 + Membrane -20 ^{3,4,5,6}	\$0.07	\$600.00
Standard -15 + Membrane -20 ^{3,4,5,6}	\$0.10	\$725.00
Premium - 10 Years ^{1,3,5}	\$0.04	\$350.00
Premium - 15 Years ^{1,3,5}	\$0.07	\$475.00
Premium - 20 Years ^{1,2,3,4,5}	\$0.10	\$750.00
Premium-10 + Membrane-15 ^{1,3,5,6}	\$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 Black or White-on-Black – Requires minimum 60-mil membrane.

⁵ Commercial projects only. Standard and Premium System Warranties are not available for residential projects.

⁶ Upon expiration of the Standard or Premium warranty component the terms and conditions of the membrane only warranty apply.

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 contaminants, 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. Unauthorized 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.**

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

EPDM 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.

Membrane / Adhesive Type / Other

1. 0.045" thick Mule-Hide EPDM: Standard Black, or Reinforced Black Membranes.
2. 0.060" thick Mule-Hide EPDM: Standard Black, White-on-Black, or Reinforced Black Membranes.
3. Mule-Hide EPDM Bonding Adhesive - Solvent Based or Water Based
4. Field seams: 3" In-Seam Tape & Primer (10 or 15 year warranty)
5. Field seams: Max 10-Year Warranty - Splice Adhesive with Membrane Cleaner/Tape Primer
6. All 'T' joints overlaid with EPDM uncured flashing tape.

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

Standard Roof Deck (4)	Insulation Fastener (1)	Insulation Plate
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" 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 non-standard roof decks.

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

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.

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

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. 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 manufacturers letter of acceptance for the project, including application rates for that specific project. 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' must be overlaid with Cured Cover Tape.
3. All Metal Scuppers must have welded (soldered) seams.

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 EPDM Fully Adhered System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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 Ballasted EPDM

EPDM 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 75' in height or less.

Membrane / Adhesive Type / Other

1. 0.045" or 0.060" thick Mule-Hide EPDM: Standard Black
2. Field seams: 3" In-Seam Tape & Primer (10 or 15 year warranty)
3. Field seams: Max 10-Year Warranty - Splice Adhesive with Membrane Cleaner/Tape Primer
4. All 'T' joints overlaid with EPDM uncured flashing tape.

Deck Type

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 roof 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.

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

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

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, or 4" x 4" sections of Mule-Hide Walkway Pads.
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' must be overlaid with Cured Cover Tape.
3. All Metal Scuppers must have welded (soldered) seams.

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 Factory Mutual (FM) or Underwriters Laboratory (UL).
4. Rubber walkway pads can not be used within 10' of the roof perimeter for buildings exceeding 50' in height.

NOTES:

1. **These are enhancements to the Mule-Hide EPDM Ballasted System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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 EPDM

EPDM 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 50' in height or less.

Membrane / Adhesive Type / Other

1. 0.045" or 0.060" thick Mule-Hide EPDM Reinforced Black Membranes.
2. Field seams: In-Seam Tape & Primer (6" or two strips of 3") (10 or 15 year warranty)
3. Field seams: Max 10-Year Warranty - Splice Adhesive with Membrane Cleaner/Tape Primer
4. All 'T' joints overlaid with EPDM uncured flashing tape.

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

Standard Roof Deck (3)	Max Sheet Width	Max Fastener Spacing	Fastener (1)	Seam Plate (1)
Steel - Min 22 ga. or Wood Deck - Min 1"	8' 10'	12" OC 6" OC	HD-14 HD-14	2.0" 2.0"
Plywood - Min 15/32"	8'	6" OC	HD-14	2.0"
Structural Concrete - Min 3,000 psi	10'	6" OC	HD-14 (2)	2.0"

Notes:

1. Heavier fasteners and/or plates 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. Contact Mule-Hide Technical Department for non-standard roof decks.

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

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
Extruded Polystyrene - Min 1.0" thick - Min 25 psi	4	6
HD Fiberboard - Min 1/2" thick- Installed over Approved Insulation	4	8
Dens Deck Prime - Min 1/4" thick - Installed over Approved Insulation	4	8

***NOTES:**

1. Thicknesses stated are for single layer of material.
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 - Warranty Application must include application rates of adhesive. Other Manufactures may be considered, submit prior to bidding.

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

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' must be overlaid with Cured Cover Tape.
3. All Metal Scuppers must have welded (soldered) seams.

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 Factory Mutual (FM) or Underwriters Laboratory (UL).

NOTES:

1. **This is a summary of the Mule-Hide EPDM Mechanically Attached System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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.

SECTION 3

MULE-HIDE PRODUCTS CO., INC.

EPDM Ballasted Specification

EPDM Ballasted Summary Specification

***PLEASE CONSULT THE MULE-HIDE WEBSITE FOR THE MOST
CURRENT INFORMATION AT WWW.MULEHIDE.COM***

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MULE-HIDE PRODUCTS CO., INC.
BALLASTED EPDM SYSTEM
SPECIFICATION

07530/MUL

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MULE-HIDE PRODUCTS CO., INC.

BALLASTED EPDM SYSTEM SPECIFICATION

07 53 00/MUL

PART 1 – GENERAL

1.01 Description

A. Scope:

1. Furnish and install a Ballasted EPDM Roofing Membrane with flashings and accessories necessary to comprise a roofing system. The Mule-Hide EPDM products and accessories shall be installed in strict compliance with current specifications and drawings as published by Mule-Hide Products Co., Inc. ("Mule-Hide").
2. The Mule-Hide Ballasted EPDM (Ethylene Propylene Diene Monomer) Membrane Roof System utilizes an .045 inch thick non-reinforced black EPDM sheet. An optional sheet that may be used and is specifically required when a Mule-Hide Premium Warranty is requested is the .060 inch thick non-reinforced black EPDM membrane. The Mule-Hide Reinforced EPDM membrane may also be used for this specification. The EPDM membrane is loose laid over an acceptable substrate and ballasted. Adjoining sheets are overlapped a minimum of 3 inches and spliced with Mule-Hide Butyl Splice Adhesive or with Mule-Hide In-Seam Tapes. A minimum of 10 lbs. per square foot (sf) of smooth river bottom stone is required as ballast.

B. Related Work:

The work includes, but is not necessarily limited to the installation of:

1. Vapor Retarder (where specified)
2. Wood Blocking (Nailers)
3. Insulation
4. Slip Sheet (where required)
5. Fasteners
6. Roof Membrane
7. Roof Membrane Flashings
8. Metal Flashings
9. Adhesives
10. Sealants
11. Walkway

1.02 Quality Assurance

- A. The Mule-Hide Ballasted EPDM Membrane Roofing System shall be installed exclusively by an independent roofing contractor eligible to apply for Mule-Hide warranties when Standard System or Premium System Warranties are requested.
- B. There shall be no deviations from this specification or Mule-Hide's standard details without prior written approval from Mule-Hide's Technical Department.
- C. Upon completion of the installation according to the terms and conditions stated in this specification and in accordance to the information given in the Warranty Application and Pre-Job survey form and any additional approvals which might have been given by Mule-Hide, an authorized representative of Mule-Hide may perform an on-site inspection of the roof to verify that all installation and material requirements have been met.

- D. Mule-Hide reserves the right to reject any roof system and refuse to issue any warranty on roofs which do not comply with Mule-Hide's specifications or current policies.

1.03 Submittals

- A. Prior to the time of bidding, the roofing contractor shall submit to the Owner or Owner's representative the following items:
1. Copies of Mule-Hide specifications and published product data.
 2. Samples of each material to be used in the roof system.
 3. Specimen copy of Mule-Hide Products Co. warranty
 4. Dimensioned shop drawings to include an outline of the roof and appropriate details for flashings and terminations.
 5. Certification from insulation, roofing and accessory components manufacturers that all materials supplied comply with identified ASTM and industry standards.
 6. Verification that system specifications meet all identified code and insurance requirements including but not limited to the following:
 - a. Factory Mutual Research Laboratories
Norwood, MA
 - b. Underwriters Laboratories
Northbrook, IL
- B. Prior to starting the project, the roofing contractor shall submit to Mule-Hide's Technical Department the following items:
1. All project specifications and details where deviations to the Mule-Hide standard specification are requested.
 2. All project specifications where a Premium warranty is required or an extension to the wind coverage is requested.
 3. All information necessary to determine compliance with specified UL or FM requirements.

1.04 Product Delivery, Storage and Handling

- A. All products delivered to the job site shall be in their original unopened containers or wrappings and clearly labeled with the manufacturer's name, product identification and date of manufacture.
- B. Protect all materials from damage during transit, storage and delivery to the job site. Place all materials on pallets and protect from moisture. Materials damaged in handling or storage shall not be used.
- C. Store all materials in a dry, clean area protected from the elements. All adhesive and caulking shall be stored at temperatures between 60°F and 80°F. Materials exposed to lower temperatures affect the workability and performance of the product. Products shall be restored to room temperature prior to use.
- D. All flammable materials shall be stored in a cool, dry area away from open flames and sparks. Follow precautions outlined on containers or supplied by the material manufacturer/supplier.
- E. All materials determined to have been damaged (confirmed by Mule-Hide) are to be replaced.

1.05 Job Conditions

- A. This specification shall not be considered applicable without the appropriate additional specifications approved by Mule-Hide if it should be determined that any of the following conditions exist:
 - 1. If the Mule-Hide Roof System should exceed the structural load conditions as determined by an architect or Engineer.
 - 2. When chemical or hazardous materials are discharged onto the Mule-Hide Roof System.
- B. The General Contractor or the building owner shall be responsible for providing adequate surfaces and structures to receive the insulation, Mule-Hide Roof System and related sheet metal necessary for the successful completion of the project.
- C. Only as much new roofing as can be made watertight each day shall be installed each day. This includes all flashing work.
- D. All substrates to receive new insulation, membrane or flashing shall be thoroughly dry. Should surface moisture occur, the contractor shall provide adequate equipment to dry the substrate prior to application of new materials.
- E. Prior to and during application, all dirt, debris and dust shall be removed from surfaces to be roofed for both new and reroofing substrates.
- F. On all projects where the ballasted EPDM system is specified, it is the responsibility of the independent roofing contractor to have the owner or owner's representative verify the condition of the deck or substrate and to confirm the roof deck can withstand the additional load. A ballast waiver, signed by the building owner or owner's representative, or a copy of the project specification shall be submitted to Mule-Hide's Technical Department with the warranty application.
- G. Precautions shall be taken to prevent wind blow-off or wind damage during the course of the roofing application. This may necessitate additional securement of temporary construction, materials and equipment.
- H. The contractor shall verify and ensure that all roof drain lines are unblocked before starting work. Any blockages found shall be reported to the owner's representative and Mule-Hide's Technical Department in writing.
- I. Temporary waterstops shall be installed at the end of each day's work. Temporary waterstops shall be removed at the start of the next day's work and disposed of properly. Waterstops shall be compatible with all materials.
- J. Do not install the Mule-Hide EPDM Roofing Membrane in direct contact with any product containing coal tar pitch, creosote or penta-based materials. Consult the Mule-Hide Technical Department for special installation requirements.
- K. Do not allow contaminants such as petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the Mule-Hide EPDM Roofing Membrane. Contact the Mule-Hide Technical Department for recommendations if such conditions exist.
- L. All work shall be scheduled and executed without exposing interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

- M. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surfaces and equipment movement. Contractor shall provide all necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If excessive traffic over newly installed membrane is necessary, contractor shall provide plywood or polyester felt protection to prevent damage.
- N. All existing roofing materials to be removed for construction shall be immediately removed from the construction site to a dumping area authorized to receive such debris. Follow all laws, regulations and procedures to identify and properly dispose of asbestos materials which are to be torn off.
- O. Any unusual or concealed condition discovered during the course of the work is to be reported to the owner and Mule-Hide immediately in writing. Work is to be halted until the owner has responded with a solution.
- P. All local building codes and requirements should be followed where applicable. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.
- Q. Both interior and exterior building areas affected by construction shall be cleaned up and any damaged areas shall be repaired to the owner's satisfaction.
- R. Certain project conditions may require modifications to this specification. Contact the Mule-Hide Technical Department if any of the following conditions exist:
 - 1. Roof heights greater than 60 feet.
 - 2. Geographical location in wind zone 3, per Factory Mutual's current edition of Loss Prevention Data Sheet 1-28.
 - 3. Geographical location in a 100 mph or greater wind zone, per the ANSI 100 year mean recurrence interval wind isotach.
 - 4. Location with a D exposure as determined in ANSI A58.1
- S. Consideration should be given in the project design to problems that can precipitate from the smooth surface characteristic of the Mule-Hide EPDM membrane. The Ballasted EPDM Roofing System shall not be installed where the slope of the roof exceeds an incline of 2 inches per foot. Walk pads should be installed in areas that are subject to routine foot traffic.

1.06 Warranties

All Mule-Hide warranties are available for commercial projects. A Roofing Membrane Limited Warranty for a maximum of 10 years is available for residential projects.

A. Mule-Hide's Roofing Membrane Limited Warranty

Mule-Hide offers a 10, 15 or 20-year Roofing Membrane Limited Warranty ("Warranty") for a charge. The Warranty covers only the Mule-Hide EPDM 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 and the appropriate fee must be submitted to Mule-Hide to obtain this warranty. Proof of purchase may be required.

Note: Projects requesting a 20-year Roofing Membrane Limited Warranty require the use of the 60-mil thick black EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Ballasted Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project

B. Mule-Hide's Standard System Warranty

Mule-Hide offers a 10, 15 or 20-year Standard System Warranty ("Standard") for commercial projects for a charge. The Standard warranty is a "No Dollar Limit", labor and material warranty that covers the Mule-Hide labeled membrane and other components supplied by Mule-Hide installed by a Mule-Hide Warranty Eligible Applicator. The Standard warranty does not cover insulation or its attachment system. Metal flashing components are not covered under this warranty. A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Standard warranties require inspections by a Mule-Hide representative.

Note: Projects requesting a 20-year Standard System Warranty require the use of the 60-mil thick black EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Ballasted Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

C. Mule-Hide Premium System Warranty

Mule-Hide offers a 10, 15 or 20-year Premium System Warranty ("Premium") for commercial projects for a charge. The Premium warranty is a "No Dollar Limit", labor and material warranty that covers the Mule-Hide labeled membrane, insulation, other components supplied by Mule-Hide and approved products (such as metal flashing, insulation adhesive or other pre-approved accessories) installed by a Mule-Hide Warranty Eligible Applicator. A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Premium warranties require inspections by a Mule-Hide representative.

Note: Projects requesting a 20-year Premium Warranty require the use of the 60-mil thick black EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Ballasted Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

D. Standard and Premium System warranties are not available for residential projects.

E. EPDM tie-ins to built-up (BUR) or any other type of roof system are not covered by Mule-Hide warranties.

F. Contact Mule-Hide for other extended warranties that may be available.

G. Terms and Conditions of Warranties

Mule-Hide's obligations under the Roofing Membrane Limited Warranty, the Standard System Warranty, and the Premium System Warranty are limited to the specific terms and conditions of the respective Warranties. Sample copies of the Mule-Hide Warranties are available from Mule-Hide upon request.

PART 2 - PRODUCTS

2.01 General

- A. The components of the Ballasted Mule-Hide EPDM Membrane Roofing System are to be products manufactured or supplied by Mule-Hide Products Co. as specified in the contract documents.
- B. Mule-Hide EPDM membrane is manufactured in accordance with the guidelines of the RMA (Rubber Manufacturers Association) and meets all government specifications for EPDM.

2.02 Roofing Membrane

- A. Mule-Hide non-reinforced EPDM membrane in standard widths up to 50 feet and lengths of 50 and 100 feet are available for use with Ballasted Systems.
- B. Mule-Hide non-reinforced EPDM membrane is available in thicknesses of .045 and .060 inches. The nominal material weight of .045 inch thick membrane is .29 pounds per square foot and .060 inch thick membrane is .39 pounds per square foot.
- C. Mule-Hide's EPDM Membrane meets or exceeds the ASTM D 4637 Standard Specification.
- D. While non-reinforced EPDM membranes are typically specified for ballasted systems, reinforced EPDM membranes may also be specified.
- E. Refer to the Product Data Sheets for the Non-Reinforced and Reinforced EPDM membranes for physical properties and additional information.

2.03 Accessory Materials

The following Mule-Hide materials must be used to install Mule-Hide Roof Systems. Mule-Hide will not warrant any application where another manufacturer's product is substituted for a Mule-Hide product. **All products listed below are physically and chemically compatible with each other.**

- A. Mule-Hide Splice Adhesive - a black or white solvent based, synthetic rubber based (butyl) adhesive designed for splicing EPDM roof membranes and uncured EPDM Flashings.
- B. Mule-Hide Bonding Adhesive (solvent based) - an amber colored synthetic rubber based (neoprene) adhesive designed to bond EPDM membranes to approved insulation boards, metal, concrete, wood and other approved substrates (horizontal and vertical).
- C. Mule-Hide Water Base Adhesive - a non-flammable and non-toxic acrylic latex-based adhesive designed to bond EPDM membranes to approved insulation boards, wood, concrete and other approved decking materials. For horizontal surfaces only (not to exceed inclines greater than 2" per foot).
- D. Mule-Hide In-Seam Tape - a cured butyl rubber tape designed to adhere EPDM membrane seams in conjunction with Mule-Hide's Tape Primer.
- E. Mule-Hide Tape Primer - a cleaner specifically formulated to clean and prime EPDM membrane surfaces to be bonded with splice adhesives, In-Seam Tapes or Cured and Uncured EPDM Laminates.
- F. Mule-Hide Seam Cleaner - a black or clear solvent based cleaner used to clean and prep the EPDM membrane prior to the application of the Mule-Hide Splice Adhesive.
- G. Mule-Hide Uncured EPDM Flashing - an uncured EPDM membrane (.060 inches thick) to be used in conjunction with the Mule-Hide EPDM Roof Systems. Uncured EPDM flashing is easily formed and used to flash pipes, inside and outside corners and various other penetrations that require a moldable product.
- H. Mule-Hide Uncured Laminated Flashing Tape - an uncured EPDM membrane laminated to cured butyl tape. Used to flash pipes, inside and outside corners, "T-joints" and various other penetrations that require a moldable product. Flashing tape is used in conjunction with the Mule-Hide Tape Primer. Mule-Hide Uncured Laminated Flashing Tapes shall **not** be used for stripping seams, gravel stops, drip aprons or batten bars.
- I. Mule-Hide RMS Strips - 6 inch wide, cured, reinforced EPDM strips used as a base attachment around curbs and walls to mechanically attach the EPDM field sheet.

- J. Mule-Hide Cured Laminated Cover Tape - a cured EPDM membrane laminated to cured butyl tape used as a cover tape to flash gravel stop and drip apron, in conjunction with the Mule-Hide Tape Primer.
- K. Mule-Hide Lap Sealant - a one part, black or white elastomeric caulk designed for sealing the exposed edge of field fabricated membrane laps.
- L. Mule-Hide Water Cut-Off - a butyl based, one-component mastic designed specifically for sealing roofing membranes to wood, metal, concrete, plastic and other substrates.
- M. Mule-Hide Pourable Sealer - a two-component, liquid (100% solids) polyurethane elastomer used as a filler for pitch pockets.
- N. Mule-Hide Pipe Boots - an economical pre-molded EPDM flashing designed for flashing single pipe penetrations.
- O. Mule-Hide All Purpose Bar - a specially extruded aluminum bar, .050" thick x 1" wide x 10' long, that may be used as an anchor bar, batten bar or as a termination bar.
- P. Mule-Hide Fasteners - Factory Mutual approved # 14 heavy duty and # 12 drill point fasteners used for fastening insulation and Mule-Hide All Purpose Bars to roof decks, curbs and walls.
- Q. Mule-Hide 2" Barbed Seam Plates - Factory Mutual approved 2" round Galvalume plates with reinforcing ribs used in conjunction with the Mule-Hide HD Fasteners to attach the reinforced membrane and RMS strips.
- R. Mule-Hide Plates - Factory Mutual approved 3" round (26 gauge) Galvalume plates with reinforcing ribs used in conjunction with Mule-Hide Fasteners to attach insulation to roof decks.
- S. Mule-Hide Insulation - The Mule-Hide Poly ISO 2 polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core laminated to heavy, black (non-asphaltic) glass fiber reinforced felt facers.

2.04 Related Materials By Others

- A. Wood Nailers
 - 1. Mule-Hide recommends wood nailers to be # 2 or better lumber and pressure treated for rot resistance (wolmanized or osmose treated). Creosote and asphaltic preservatives and preservatives containing pentachlorophenol, copper naphthenate or copper 8-quinolinolate are not acceptable.
 - 2. Wood nailers shall be installed in compliance with the recommended options as listed in the Factory Mutual Loss Prevention Data Bulletin 1-49. Methods of attachment (size of fasteners and spacing) are determined by deck type and wind zone requirements. Pull tests may be required prior to the installation of wood nailers to determine the appropriate type of fastener. Refer to the Fastener Guidelines section of this manual for recommended attachment options.
 - 3. Wood Nailers shall be installed as specified on the project drawings and shall be of a height sufficient to match the thickness of the insulation being used. Wood nailers are required for the attachment of drip aprons, gravel stops and certain expansion joints. Wood nailers may be required for metal scuppers, pitch pockets, certain types of curbs.
 - 4. All wood nailers shall be attached to withstand a minimum force of 200 lbs. in any direction. All nailers shall have a minimum of 2 fasteners per board.

B. Vapor Retarders

1. Vapor retarders shall meet specified codes and insurance requirements.
2. Vapor retarders shall be compatible with insulation and other accessories.
3. The use and placement of a vapor retarder should be determined by an architect or engineer. Mule-Hide does not require the use of vapor retarders. However, Mule-Hide recommends that a vapor retarder be considered when both of two conditions are anticipated:
 - a. The outside average January temperature is below 40°F, and
 - b. The expected interior winter relative humidity is 45% or greater.
4. Mule-Hide must be contacted for buildings that are refrigerated (freezers or cold storage) or have a high interior humidity such as, but not limited to, swimming pools, produce storage or locker rooms.

C. Insulation

1. Insulation shall be installed as a protection layer over the existing substrate or to obtain a desired thermal value.
2. Insulation shall be compatible with the Mule-Hide EPDM Membranes, Mule-Hide Adhesives, Mule-Hide EPDM Flashings and other Mule-Hide Accessories.
3. The following generic insulations are acceptable for use in a Mule-Hide Ballasted EPDM Roofing System when a standard warranty is requested:
 - a. Polyisocyanurate insulations having nonasphaltic facers meeting or exceeding the physical property requirements of Fed. Spec. HH-I-1972 and having a minimum compressive resistance of 18 psi. Thickness minimum is 1 inch or greater as required by the insulation manufacturer to span the flutes of a metal deck.
 - b. High density wood fiberboard may be used as an overlay over an existing roof system (recover application). The minimum thickness is ½ inch. Refer to the Insulation Guidelines section of this manual for specific applications.
 - c. Expanded Polystyrene insulation must be a minimum of 1" thick and certified by the manufacturer to have a minimum density of 1.00 lb. Refer to the insulation manufacturer's minimum requirements for installation over a fluted steel deck. Review the Insulation Guidelines section of this manual for specific applications and restrictions.
 - d. Extruded Polystyrene must be a minimum of 3/4" thick (1/2" min. over smooth surfaced BUR). Refer to the Insulation Guidelines section of this manual for specific applications and restrictions.
 - e. State and local building codes should be reviewed regarding the installation of expanded or extruded polystyrene insulation directly over a steel deck.
4. Mule-Hide Premium Warranties require the use of the Mule-Hide Poly ISO 2 insulation. Use of other insulations shall disqualify the project for consideration of the issuance of a Premium warranty. Contact the Mule-Hide Technical Department for specific requirements. Premium warranties are not available for recover applications.

- D. Sheet Metal
1. Sheet metal components such as gravel stops, drip aprons, counterflashings, copings, etc., should be fabricated and installed in accordance with the SMACNA recommendations and requirements.
 2. Sheet metal components supplied by others are not covered by the Mule-Hide warranties. Contact Mule-Hide's Technical Department for specific requirements.

2.05 Precautions

- A. Consult Material Safety Data Sheets and container labels for specific safety instructions prior to use.
- B. Avoid breathing vapors of solvents, cleaners, primers, sealants and adhesives. Use with adequate ventilation. Avoid prolonged contact of solvents, sealants, cleaners, primers and adhesives with skin. Solvent resistant rubber gloves should always be worn during use.
- C. Do not use Mule-Hide EPDM roofing products near fire or flame. Do not use open flames for drying of surfaces, sealants or adhesives. **Do not smoke near flammable products.**
- D. Do not use oil-based paint on EPDM membranes. Contact Mule-Hide's Technical Department for recommendations for compatible color coatings.
- E. Do not allow muriatic acid (masonry cleaner) to come in direct contact with the Mule-Hide EPDM membranes, flashings or accessories.
- F. Do not allow Mule-Hide EPDM membranes or accessories to come into direct contact with steam or vents that produce temperatures in excess of 180°F (82°C).
- G. The Mule-Hide EPDM Roof System may be installed in cold weather provided the adhesives are stored at room temperature until just prior to use and used within 2 hours. Adhesives left in the cold must be returned to room temperature prior to use.
- H. Cover Tapes, Flashing Tapes and In-Seam Tapes may loose tack when exposed to temperatures below 40° F. for extended periods of time. A heat gun may be used to warm the product. Only apply heat to the EPDM side or in the case of In-Seam Tapes, apply heat to the kraft paper side. Be careful not to over heat. Hot boxes are the preferred method to warm tapes.
- I. In colder temperatures when the ambient temperature is near the dew point, condensation may form on the seam cleaner, tape primer and adhesive as the solvents flash off. If condensation occurs, discontinue the application and allow the surface to dry. **Do not attempt to dry the surface with heat guns or torches.** When weather permits apply a new coat of product.

PART 3 - EXECUTION

3.01 General

When installing a Mule-Hide Ballasted EPDM Roofing System in cooler weather, it is recommended that liquids such as solvents, sealants, etc., be stored at temperatures of 60° F. or more until just prior to use in order to facilitate the installation.

3.02 Substrate Conditions

The following general conditions apply to the substrate that will receive a Mule-Hide Ballasted EPDM Membrane Roofing System for recover, reroof and new construction:

- A. The roof deck must be structurally sound and free of defects to provide proper securement for mechanical fasteners. Areas showing a loss of integrity due to corrosion, rotting, warping, concrete spalling, etc., must be repaired or replaced prior to installing the roofing system. The roofing contractor shall make an inspection of the deck prior to starting the roof installation, and if there is no general contractor, the roofing contractor shall be responsible for correcting any defects.
- B. It is imperative that the roofing contractor make test cuts at each roof area prior to recover applications. The condition of the substrate must be suitable to receive a Mule-Hide Ballasted EPDM Membrane Roofing System. Wet insulation must be removed and replaced.
- C. A determination must be made regarding the presence or absence of coal tar pitch within the existing roof assembly. The presence of coal tar pitch may restrict the use of certain insulations. Extruded and expanded polystyrene insulations must not be installed directly over a coal tar pitch roof. An underlayment must be installed prior to the installation of the polystyrene insulation. Contact Mule-Hide's Technical Department for recommendations.
- D. Contact the material manufacturer when the substrate is exposed to excessively high humidity, low temperature or a corrosive environment. Special fasteners (i.e. stainless steel), vapor retarders or details may be required.
- E. It is acceptable to install a Ballasted Mule-Hide EPDM Membrane Roofing System over the following deck substrates provided that an acceptable insulation is installed over the substrate as required and the building owner/owner's representative has confirmed the additional weight of the ballasted roof system shall not exceed the design load limits of the roof deck:
 - 1. Structural Metal Deck (22 gauge minimum) shall conform to recommendations outlined in Factory Mutual's Loss Prevention Data Sheet 1-28. Steel decks require the installation of the Mule-Hide Poly-ISO-2 insulation or other approved insulation.
 - 2. Structural Concrete, pre-cast and pre-stressed concrete (3,000 p.s.i. minimum) shall be cured and dry to industry standards and surface shall be smooth, clean and free of moisture or frost.
 - 3. Wood plank (1" minimum) shall conform to Factory Mutual's requirements for Class I impregnated decks.
 - 4. Plywood (15/32" minimum).
 - 5. Oriented Strand Board (7/16" min.)
 - 6. Cementitious Fiber Substrates (Tectum, etc), Lightweight Concrete and Gypsum Decks may be acceptable upon confirmation that the new roof system shall not exceed the design load limits of the roof deck and support structure.

3.03 Preparation Of Existing Substrate

- A. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges and debris. Inspect substrates and correct defects before application of roofing membrane. Specifier or roofing contractor shall determine the condition of the existing roof deck and roofing system. Areas with deteriorated decking or wet insulation or other failed materials shall have those affected materials removed and replaced. Make sure all decking is securely fastened. The roofing contractor has the final responsibility to ensure an acceptable deck is provided to receive the new roof system.

- B. Significant ponding that remains after a period of 48 hours should be eliminated by either installing tapered insulation to create positive drainage of the roof surface or by installing new drains in the low areas where the ponding remains. Positive drainage shall also eliminate the possibility of excessive live loads caused by ponding water that could cause structural damage or failure.
- C. Ponded water, snow or ice shall be removed before installing the Mule-Hide Ballasted EPDM Roofing System. Do not roof over moisture in any form.
- D. Recover Projects
 - 1. When installing a new roof system over an existing gravel surfaced built-up roof, all loose gravel must be removed to prevent moisture entrapment. Insulation must always be used as a protection course for the EPDM membrane.
 - 2. When installing a new roof system over an existing single-ply roof system, the existing roof membrane must be cut up into maximum 10' x 10' sections to prevent entrapment of water between the two roof systems.
 - 3. Sprayed in place urethane foam roof systems are not acceptable substrates for Mule-Hide Single-Ply roofing systems and **must be removed**.
 - 4. Existing smooth surfaced built-up roof systems and mineral surfaced modified or built-up roof systems must have an acceptable insulation prior to installing the Mule-Hide Ballasted EPDM Roofing System.
 - 5. If a Mule-Hide Premium warranty is requested, the existing roof system **must be removed to the deck** prior to the installation of the new roofing system or a moisture survey must be taken, all wet areas removed and a copy of the survey submitted to Mule-Hide with the warranty application.

3.04 Vapor Retarder

- A. Specific climate and job conditions may require the use of a vapor retarder. It is the sole responsibility of the design professional to determine the need for a vapor retarder, its type and location in the roofing system.
- B. The roofing contractor must follow the recommended installation procedures of the respective vapor retarder manufacturer and the project specifier's instructions for the type of vapor retarder specified for the project.

3.05 Wood Nailers

- A. Nailers shall be firmly anchored to the decks at a maximum 2'-0" o.c. and shall resist a pullout force of 200 lbs./linear foot in any direction. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.
- B. Refer to the Fastener Guidelines section in this manual for the type of fastener to be used with each type of deck and the maximum spacing requirements.
- C. Wood nailers shall be installed as specified by the project specifier and shall be in compliance with the Mule-Hide Standard Details.
- D. The thickness of the wood nailer shall be determined so that the top of the nailer is flush with the top of the surface of the insulation.
- E. Wood nailers installed along the perimeter of a roof surface, where a drip apron or gravel stop shall be installed, shall have a width that is wider than the metal flange to be installed.

- F. Where pitch pans or scuppers are to be installed over wood nailers, the wood nailers must be wider than the metal flanges.

3.06 Insulation Installation

- A. When installing insulation, the end joints of each row of insulation shall be offset against the previous row. When more than one layer of insulation is to be used, succeeding layers are to be laid staggered in relation to the previous layer of insulation and all joints shall be offset
- B. Insulation installed over steel decks shall be checked so that no edges are left unsupported along the flutes. All insulations shall be of sufficient thickness and density to prevent breakage under normal roof construction traffic.
- C. Insulation other than Mule-Hide's Poly ISO 2 must be an FM approved insulation and acceptable to Mule-Hide for use under the Mule-Hide Ballasted Roofing System.
- D. Mule-Hide does not require the insulation to be attached to the roof deck. Should mechanical attachment of the insulation be required by the specifier, an additional layer of insulation must be installed over the plates and fasteners. Contact Mule-Hide Technical Department for recommendations.
- E. Refer to the insulation manufacturers guidelines for the appropriate type, size and thickness of the insulation needed for use over the respective substrate and under the Mule-Hide Ballasted Roofing System.
- F. Insulation shall be cut to fit snugly around or against all protrusions, nailers, drains, pipes and walls. All gaps greater than 1/4" wide shall be filled with the same material.
- G. Do not install any more insulation than can be covered by the membrane by the end of the working day and made watertight.
- H. Crickets and saddles may be installed beneath the specified insulation where possible. Crickets and saddles made from non-compatible insulations or materials must be overlaid with an acceptable insulation or underlayment to which the membrane may be adhered.
- I. Factory Mutual does not test ballasted single-ply roofing systems. FM 1-60 and FM 1-90 ratings are not available. Mule-Hide recommends following the "Wind Design Guide For Ballasted Single-Ply Roofing Systems" as jointly published by the RMA and SPRI.
- J. Only FM approved fasteners and plates may be used to attach the insulation when attachment is required by the specifier. When a Mule-Hide Premium Warranty is requested, only Mule-Hide labeled fasteners and plates may be used to attach the insulation and the only acceptable insulation shall be the Mule-Hide Poly ISO 2.

3.07 Membrane Installation

- A. Mule-Hide strongly recommends using the widest sheets practical for the project.
- B. Unroll the Mule-Hide EPDM Membrane and position without stretching. Large sheets may be moved into final position by encapsulating air under the membrane and floating it into place. Allow the membrane to relax at least 30 minutes prior to installation. Inspect and remove any damaged membrane. Lap sheets a minimum of 3" to allow for a proper field splice. Membrane overlaps shall be shingled with the flow of water.
- C. After carefully positioning several sheets of the EPDM membrane and allowing sufficient time (30 minutes min.) for the sheets to relax, membrane securement and seaming may be started.
- D. The roof membrane shall extend up the vertical surface a minimum of 1" and shall turn down over the edge of the roof a minimum of 2" or as required by the Mule-Hide details.

- E. Refer to the Wind Uplift Guidelines section of this manual for special design layout of the roof's perimeter and corners for installation in high wind areas.

3.08 Splicing Of Lap Areas

- A. Splicing seams with Mule-Hide Splice Adhesive
1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
 2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
 3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Seam Cleaner using clean cotton rags. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags must be replaced with clean ones as they become dirty. The cleaned membrane should have a uniform black color when dry. There should be no streaks present.
 - a. Mule-Hide Black Seam Cleaner must be used only with the black EPDM membranes.
 - b. Mule-Hide Clear Seam Cleaner must be used only with the White-on-Black EPDM membranes.
 - c. Mule-Hide Tape Primer may be used as a substitute for either the Black or Clear Seam Cleaner. Review the section (3.08.B.) on Tape installation for cleaning procedures to be followed when using the Mule-Hide Tape Primer.
 4. Seam Cleaners, Tape Primer and Splice Adhesives must be thoroughly stirred prior to application. Be sure to scrape the sides and bottom of the cans while stirring.
 5. Apply the Splice Adhesive to the cleaned surfaces of both sheets. Mule-Hide recommends the use of a solvent resistant, 3" - 4" wide, short bristle paint brush or a solvent resistant 3" wide, ½" medium nap, paint roller.
 6. Apply the adhesive in a uniformly thick even coat. When using a paintbrush do not use a circular motion. Use long, straight strokes applying sufficient adhesive that will achieve a smooth surface without leaving brush marks. When using a roller do not over roll the adhesive. This will cause an uneven application.
 7. Do not allow the adhesive to puddle or leave globs as these areas will not dry properly and may cause excessive swelling of the membrane which will result in fishmouths in the finished seam.
 8. Adhesive must be applied to both surfaces of the seam at the same time to allow for uniform drying of the adhesive. The adhesive must fully cover the surface of the splice areas a minimum of 3" wide.
 9. Allow the adhesive to dry until tacky to the touch of a dry finger without stringing or sticking to the finger and does not move when pushed forward or the finger is twisted.

Note: Drying time (also referred to as Flash Off time) will vary from day to day depending on the ambient weather conditions. In colder weather, condensation may form on the surface of the adhesive which is caused by the solvent flashing off. If this occurs, the application of the Splice Adhesive should be discontinued. The surface must be allowed to dry and a thin coat of adhesive must be applied over the existing adhesive.

10. Roll the top sheet onto the bottom sheet being careful not to stretch or wrinkle the membrane. Apply hand pressure brushing from the inside of the sheet outward to the edge removing air and fishmouths.
11. Using a 2" wide steel roller, apply positive pressure rolling from the inside of the seam working out over the edge of the sheet perpendicular to the direction of the seam. The entire seam must be rolled in this manner. A J.R. Seamer Power Roller may be used in place of the 2" steel roller.
12. All "T-joint" laps in the field membrane shall be reinforced with a 6" piece of uncured EPDM membrane (uncured flashing tape may also be used) centered over the intersection of the edges of the seams. All "T-joint" patches shall be caulked with Lap Sealant.
13. Field seams and flashings should be allowed to set for several hours prior to the application of Lap Sealant. Lap Sealant should be applied to all seam edges by the end of the workday and before any moisture has a chance to form on the membrane.
14. Just prior to applying the Lap Sealant, the seam and flashing edges shall be cleaned with a clean rag or cloth using the Mule-Hide Seam Cleaner to remove any dirt or talc that may remain along the seam edge. Be sure that all edges of the splice have been covered with a continuous bead of Lap Sealant. It is not necessary to trowel (screed) the caulk. The Lap Sealant shall be applied at a maximum rate of 20 linear feet per tube.

B. Splicing seams with Mule-Hide In-Seam Tapes

1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Tape Primer using clean cotton rags or Scotch-Brite® pads. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags and Scotch-Brite® pads must be replaced with clean ones as they become dirty. The primed membrane should have a uniform black color when dry. There should be no streaks present. The Mule-Hide Tape Primer shall be thoroughly stirred prior to use.
4. Roll the top sheet back over the bottom sheet and mark the bottom sheet to allow for proper placement of the In-Seam Tape. Mark the bottom sheet along the edge of the top sheet, but ½" away from the sheet, as a guide for the installation of the In-Seam Tape. Do not use a chalk line or any type of marker that will prevent the seam tape from sticking.
5. Fold the top sheet back. Approximately 1/8" to 3/8" of In-Seam Tape should be exposed along the completed seam. Unroll 2 or 3 feet of the In-Seam Tape leaving the release liner in place. Align the In-Seam Tape so that the edge of the release liner is touching the guideline.

- 5a. Do not install the tape over the line. Leaving the release paper in place, install the In-Seam Tape along the marks on the bottom sheet. Roll the tape with a 2" steel roller along the entire length of the seam. The roller must run perpendicular to the tape with overlapping strokes. If more than one piece (roll) of tape is required to complete a seam, the second piece of tape must overlap the first a minimum of 1 inch.
 6. Fold the top sheet back onto the tape so that the sheet is laying over the release paper. Peel the release paper off the tape at a 45° angle and parallel with the roof allowing the top sheet to fall freely onto the exposed tape. Press the seam together using hand pressure and wiping toward the splice edge. Immediately roll the seam with a 2 inch wide steel roller, using positive pressure, toward the edge of the seam.
 7. Wait a minimum of 2 hours prior to application of the Lap Sealant. The Lap Sealant is only required at intersections with factory seams, where two pieces of tape overlap within the seam and on patches installed over "T-joints". A bead of Lap Sealant should be applied along the overlap for 6" in each direction from the center point of the overlap.
- C. Regardless of the method used to splice the seams, all seams must be thoroughly inspected for fishmouths, bubbles, blisters and wrinkles and repaired as necessary.
1. If fishmouths or wrinkles occur through the seam, they must be cut out and patched with cured membrane (cured cover tape may be used).
 2. Patch with cured EPDM membrane or Cured Cover Tape (do not use uncured flashing or flashing tape) that is at least 3 inches larger in all directions than the area that has been cut out. Round the corners of the patch.
 3. Center the patch over the area to be repaired. Follow the splicing procedures for the appropriate material used.

3.09 Membrane Securement (Mechanical)

- A. Additional securement of the EPDM membrane by mechanical attachment must be provided at the perimeter of each roof level, base of walls, curbs, skylights, expansion joints, tie-ins, interior walls, bottom of valleys and angle changes that exceed inclines of 2" or greater per foot and various penetrations as shown in the Mule-Hide Standard Details. All securement must be either horizontally to the roof deck or vertically to the base of the various penetrations as shown in the Mule-Hide Standard Details.
- B. The mechanical attachment of the membrane may be achieved by the following methods:
1. Mule-Hide All Purpose Bar
 - a. The Mule-Hide All Purpose Bar is a specially extruded aluminum bar that has prepunched holes 6 inches on center. The bar may be placed either horizontally or vertically depending on the detail followed. Refer to the Mule-Hide Standard Details for the proper placement of the bar.
 - b. The maximum spacing of the fasteners shall not exceed 12 inches on center. Adjoining bars should be spaced approximately ½ inch to 1 inch apart. All bars must be attached at the ends a maximum of 1 inch from the end of each bar. This may require predrilling additional holes. All cut bars shall be deburred.
 - c. Under no circumstances shall the All Purpose Bar be stripped with 6 inch uncured flashing or uncured flashing tape. Mule-Hide allows only the use of Cured Cover Tape or cured field sheet to strip over the All Purpose Bar.

- d. The All Purpose Bar must be installed a minimum of 3 inches to a maximum of 6 inches from inside and outside corners.
2. Mule-Hide RMS (Reinforced Membrane Strip) attachment strip
 - a. The RMS is a 6" wide reinforced strip of EPDM membrane that may be installed at the base of walls and curbs. Mule-Hide 2 inch barbed seam plates are used to attach the RMS either horizontally or vertically with appropriate fasteners. Refer to Mule-Hide Details # MHE-124 and MHE-125 for appropriate placement of the RMS, plates and fasteners. The RMS is installed prior to the placement of the field sheet.
 - b. Follow the standard procedures for cleaning and splicing the RMS and field sheet. Only the Mule-Hide Black Seam Cleaner and Mule-Hide Black Splice Adhesive may be used to seam the RMS to the field sheet. Bonding Adhesive and Single Seal Adhesive are **not permitted** for use with the RMS attachment strips. Lap sealant is not required. RMS is also available a pre-taped product. Use Mule-Hide Tape Primer to prepare the membrane surface when using the pre-taped RMS.
 - c. Spacing of the fasteners shall not exceed 12 inches on center. Adjoining RMS strips shall be spaced a maximum of 1 inch apart. It is not required to overlap the RMS.
 - d. For vertical attachment, the RMS membrane must extend a minimum of 3 inches onto the horizontal surface (roof substrate). Refer to Mule-Hide Detail # MHE-124. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.
 - e. For horizontal attachment, the membrane must be placed a maximum of ½ inch from the base of the angle change extending out onto the horizontal surface (roof substrate). The 2 inch barbed plate must be placed a minimum of ½ inch to a maximum of 1 inch from the exterior edge of the strip. Refer to Mule-Hide Detail # MHE-125. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.
 3. Drip Apron and Gravel Stop
 - a. For drip aprons and gravel stops, the metal flange shall extend a minimum of 3 inches onto the wood nailer. The wood nailer must be wider than the metal flange. Approved screw fasteners shall be installed a maximum of 6 inches on center and ½" to ¾" from the inside edge of the metal flange. Ring shank nails spaced a maximum of 4" on center may also be used.
 - b. All drip aprons and gravel stops shall be primed with Mule-Hide's Tape Primer and stripped with Mule-Hide's Cured Cover Tape. Cleaning the metal with a solvent such as toluene or xylene to remove oil film may be required prior to installing and priming with the Mule-Hide Tape Primer.
 - c. The edge of the Cured Cover Tape overlapping the metal flange shall be caulked with Lap Sealant. For those areas where water flows over a drip apron, both sides of the Cured Cover Tape must be caulked.
 - d. When drip aprons are used, proper ballast retainers must be installed.

3.10 Flashing Installation

All walls, parapets, curbs and penetrations shall be flashed with cured EPDM membrane where possible. The use of uncured EPDM flashing or Uncured Flashing Tape shall be limited to those areas such as corners, pipes, scuppers, patches over "T-joints", patches at the base of all vertical field seams (at the angle change) and other shaped penetrations that require the flashing to be molded and cured product are not practical. All flashing shall be performed in accordance with Mule-Hide's Standard Details. Additional information may be found in the Flashing Guideline section of this manual.

Note: Mule-Hide's Water Base Adhesive is not permitted for use on vertical surfaces.

A. Vertical Wall, Curb and Skylight Flashings

1. Cured EPDM membrane should be used to flash all vertical surfaces except when flashing inside and outside corners or other details that require the flashing to be molded.
2. There are two basic methods of flashing vertical surfaces. Each method is dependent on the mechanical base attachment used.
 - a. When using the RMS strip as the mechanical attachment, the field sheet may be continued up the vertical surface to the point of termination.
 - b. When using the All Purpose Bar as the mechanical attachment, the field sheet is turned up the vertical surface as depicted in details # MHE-120 or MHE-122. Cured EPDM membrane is used to flash over the bars and is continued up the vertical surface to the point of termination.
3. The minimum height of the flashing on a vertical surface is 8 inches where possible. For recover projects where the existing BUR flashings are left in place, the EPDM membrane flashing must extend above the height of the existing flashings with the termination of the membrane being made directly to the wall or curb surface.
4. All loose or unsecured existing flashings must be removed. Excessive asphalt should also be removed to provide a smooth surface. Aluminum coated flashings must be removed or covered with an appropriate rigid substrate. New substrate must be sufficiently attached to provide a rigid surface.
5. Surfaces such as corrugated metal siding, stucco and various other irregular surfaces are not acceptable substrates for adhering vertical flashings. Refer to the Flashing Guidelines section of this manual for recommendations.
6. Existing through-wall counterflashings, weep holes and overflow scuppers must not be covered by the new EPDM membrane flashings. Termination of the membrane must be below the through-wall counterflashings.

B. Pipe Flashings

1. Single pipe penetrations may be flashed with Mule-Hide pre-molded pipe boots where possible. Where a boot cannot be used, Mule-Hide's Uncured Flashing or Uncured Flashing Tape may be used. Pre-molded pipe boots cannot be cut and patched to wrap around a pipe.
2. For recover applications, existing flashings (including lead) must be removed.
3. Hot pipes exceeding 180 degrees shall require the installation of an insulated cold collar (sleeve) to which the flashings may be adhered. Cold collars require the use of rain hoods to prevent leakage.

4. Pitch pans shall be required to seal pipe clusters where boots or field fabrication is not possible. Pitch pans may also be required for irregular objects of such a configuration that prevents standard flashing procedures.
- C. Drains and Scuppers
1. For recover applications, all existing flashings (including lead) shall be removed. A smooth tapered transition from the new insulation to the drain housing must be provided. The drain must be clean and free of any asphalt where the clamping ring seats. **Lead flashings must be removed.**
 2. Field seams must not run through the drains. Target patches (4'x 4') are required when field seams intersect drains.
 3. For recover applications, existing scuppers should be removed and replaced with new scuppers.
 4. Cured membrane must be flashed to the vertical surface prior to the installation of new scuppers. New scuppers must have welded watertight corners, be set in Mule-Hide's Water Cut-Off and secured to the wall and deck (or wood nailer) with the appropriate fasteners.
- D. Expansion Joints And Existing Roof Tie-Ins
1. Tie-ins to existing roof systems are not covered by the Mule-Hide Warranties. Tie-ins will vary with the type of existing roof system. Mule-Hide strongly recommends that the new roof system be isolated to the deck surface. Refer to the Mule-Hide Details # MHE-160, MHE-161 & MHE-162.
 2. Tie-ins to existing roof systems may require the installation of ballast retainers. Contact Mule-Hide's Technical Department for recommendations.
 3. Whenever there is an expansion joint in the roof deck or walls, an expansion joint may be required in the roof system when installing a ballasted system. Refer to the Mule-Hide Standard Details for various flashing procedures.

3.11 Temporary Night Seals

- A. Install temporary cutoffs around incomplete edges of roofing assembly at the end of each day's work and when work must be postponed due to inclement weather.
- B. All loose membrane edges should be sealed with Mule-Hide's Water Cut-Off or Pourable Sealer to prevent water migration under the finished roof sections.
- C. For temporary tie-ins to existing BUR roof systems, remove all gravel, dirt and debris from the tie-in area and make sure all surfaces are clean and dry. Using either the Water Cut-Off or the Pourable Sealer, apply a heavy continuous bead along the length of the tie-in.
- D. Press the membrane into the sealant making sure there is a complete and continuous seal. Apply weight to the edge of the membrane to prevent possible movement by the wind.
- E. Foam Paks may be used as an alternative to the Water Cut-Off or the Pourable Sealer. Follow the instructions given with the Foam Paks.

Note: Mule-Hide does not warrant or guarantee the water tightness of any nightly tie-in. Temporary night seals are the sole responsibility of the roofing contractor.

3.12 Metal Flashings

- A. Metal work by others, such as copings, gravel stops, drip aprons, counterflashings and expansion joint covers must be properly fastened and sealed to prevent moisture from entering the roof system. Refer to the Mule-Hide Standard Details.
- B. Metal work and securement by others is not covered by the Mule-Hide Warranties.
- C. All metal copings, gravel stops and drip aprons must be premanufactured systems approved in writing by Mule-Hide prior to job bid date to be included under the Mule-Hide Premium warranty. Mule-Hide must be contacted prior to bid date for recommended manufacturers.
- D. Mule-Hide recommends that all sheet metal be installed in compliance with the SMACNA guidelines.

3.13 Walkway Installation

- A. Walkways should be provided in areas where routine rooftop maintenance occurs and in areas where regular rooftop traffic is expected. This should include but is not limited to all roof access points such as doors, hatches and ladders and around rooftop mechanical equipment.
- B. Mule-Hide recommends the use of rubber walk pads as they may be adhered directly to the roof surface. Do not install walk pads over field seams or flashings.
- C. When using masonry paver blocks as walkways, a protection membrane must be installed prior to the pavers. EPDM membrane or polyester slipsheets are acceptable for use as a protection membrane.
- D. Mule-Hide does not include the walk pads under the warranty as they are considered maintenance items and are not part of the roof waterproofing.

End of Section

This specification represents the applicable information available at the time of its publication. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide or check the Mule-Hide website (www.mulehide.com) for the latest updates regarding changes or modifications to this specification.

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MULE-HIDE PRODUCTS CO., INC

Ballasted Roofing System

SUMMARY SPECIFICATION

EPDM Systems

This Summary Specification is a brief overview of Mule-Hide Product's specification and requirements for a Ballasted Mule-Hide Reinforced EPDM Roofing System and is intended for use as a submittal in a bid package. Specifier's and Mule-Hide Warranty Eligible Contractors must comply with Mule-Hide Product's specifications and requirements prior to design or bid.

Part 1 General

1.01 Description

The Mule-Hide Ballasted EPDM Roofing System utilizes a (maximum) 20' wide Mule-Hide EPDM membrane in thickness of 45, 60, or 90-mil. Approved insulation is loosely laid to the substrate, and the EPDM membrane is loosely laid over the insulation. The entire roof assembly is then covered with rock ballast, pavers, or a combination of both. The adjoining sheets are overlapped a minimum of 3" and seamed together with tape primer and minimum 3" in-seam tape.

1.02 Quality Assurance

- A. The roofing system must be installed by a Mule-Hide Warranty Eligible Contractor in accordance with installation guidelines and detail drawings as approved by Mule-Hide. Prior written approval from the Mule-Hide Warranty Department is required for all deviations from Mule-Hide's published specifications and details.
- B. Projects requesting a Labor and Material Warranty will be inspected by a Mule-Hide Representative to verify that Mule-Hide's installation and material requirements have been met.
- C. Mule-Hide roofing systems offer a variety of Underwriters Laboratories (UL), Factory Mutual (FM) and other ratings. Consult the appropriate approval guides and Mule-Hide Products for specific code approvals.

1.03 Submittals

- A. To ensure compliance with Mule-Hide's warranty requirements contact the Mule-Hide Warranty Department if any of the following conditions exist.
 1. Specified wind speed warranty greater than 55 MPH.
 2. Building height > 200'
 3. Projects located in coastal or high wind zones.
 4. Pressurized buildings
 5. Cold Storage or Freezer Buildings
 6. Membrane exposed to chemicals

- B. Submit a completed Warranty Application form to Mule-Hide prior to bidding. Also include fastener pullout testing results as required for non-standard substrates.
- C. All projects must have a Mule-Hide warranty application number assigned prior to inspection.

1.04 Product Delivery, Storage, and Handling

- A. Deliver materials to the job site in original, unopened containers, with the manufacturer's name, brand name and installation instructions.
- B. Store all materials in a dry, clean area protected from the elements, as per manufacturer's recommendations.

1.05 Job Conditions

- A. All existing wet or damaged roofing materials must be removed and replaced with new materials.
- B. All existing phenolic insulation and sprayed-in-place urethane roofs must be removed.
- C. The specifier must determine the use and placement of vapor retarders. Consult ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) publications.
- D. Coordinate work between all trades to avoid traffic over completed sections of roofing.

1.06 Warranty.

Fees are required for all Labor and Material (System) Warranties. System Warranties must be obtained through a Mule-Hide Warranty Eligible Applicator. All projects requesting a System Warranty must be inspected by a Mule-Hide Representative. Components of the roofing system must be supplied by Mule-Hide. Warranty covers only Mule-Hide supplied materials. Sample warranties are available upon request. Contact Mule-Hide Warranty Department for warranty requirements.

Part 2 Products

2.01 General

- A. The components of this roofing system are to be manufactured, supplied, or approved in writing by Mule-Hide Products.

2.02 Membrane

Mule-Hide Standard Black 45, 60, or 90-mil thick EPDM membrane is used for this system. The membrane is available in a variety of widths up to 20' and in lengths of 100'. Refer to our Product Data Sheet for physical properties and other information.

2.03 Related Materials

Mule-Hide products include: Cured and uncured Flashings, Bonding Adhesives, EPDM Lap Sealant, Insulation fasteners and discs, Pourable Sealer, All-Purpose Bar, EPDM Walkway Pad, Universal Single Ply Sealant, and other components.

Part 3 Execution

3.01 General

- A. Work should begin at the highest point of the roof level and proceed to the lowest point. Work should be completed on a daily bases including flashings, terminations, and daily seals.
- B. Prepare the existing roof deck or substrate according to Mule-Hide design guides and full-system specifications prior to applying the new roofing system.

3.02 Roof Deck Criteria

- A. A proper substrate shall be provided by the building owner. The structure shall be able to withstand normal construction loads and live loads.
- B. Substrate must allow for drainage so that all water is removed within 48 hours after a rain.
- C. Roof deck must be capable of supporting a ballasted roofing system.

3.03 Substrate Preparation

- A. Re-cover projects - All wet or damaged materials must be removed and replaced with new materials.
- B. Substrate must be clean, level, and smooth so that the insulation lays flat. Fresh applications of bitumen based roof cement must be removed or covered.

3.04 Installation

Refer to the applicable Product Data Sheets and Material Safety Data Sheets for cautions and warnings.

A. Insulation Attachment

Roof insulation is loosely laid in place over existing substrate.

B. Membrane Installation and Seaming

Place membrane over substrate with minimum 3" overlap at lap seams and positioned so that laps will shed water. Allow membrane to relax. Seal all seams with tape primer and minimum 3" in-seam tape. Ballast membrane with washed river rock at a minimum rate of 10 lbs per square foot or concrete pavers at a minimum rate of 22 lbs per square foot.

C. Additional Membrane Securement

The membrane must be secured at the perimeter of each individual roof area, projection, and any angle change that exceeds 2" per lineal foot. Consult Mule-Hide's published detail drawings.

D. Membrane Flashing

All existing base flashings are to be removed. Install new membrane flashings as per manufactures details and guidelines. Flashings must be terminated along top edge as per appropriate Mule-Hide detail.

E. Other Related Work

1. Walkways should be provided in areas where regular rooftop traffic is expected. Walkways are considered a maintenance item and are excluded from the Mule-Hide warranty.
2. Mule-Hide EPDM Pads are to be installed over clean, dry surfaces, with a minimum 6" spacing over field seams. The Walkway Pad is adhered to the field membrane with pre-applied seam tape.
3. Concrete pavers may be used if installed over one layer of HP Protection Mat.
4. Copings, counter flashing and other metal work shall be fastened to resist wind uplift and prevent buckling. Metal should be sealed to prevent moisture infiltration.

This summary specification represents the applicable information available at time of publication. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide Products or visit our website at www.mulehide.com for the latest updates, changes, or modifications to this summary specification.

SECTION 4

MULE-HIDE PRODUCTS CO., INC.

EPDM Fully Adhered Specification

EPDM Fully Adhered Summary Specification

***PLEASE CONSULT THE MULE-HIDE WEBSITE FOR THE MOST
CURRENT INFORMATION AT WWW.MULEHIDE.COM***

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MULE-HIDE PRODUCTS CO., INC. FULLY ADHERED EPDM SYSTEM SPECIFICATION

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MULE-HIDE PRODUCTS CO., INC.

FULLY ADHERED EPDM SYSTEM SPECIFICATION

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PART 1 – GENERAL

1.01 Description

A. Scope:

1. Furnish and install a Fully Adhered EPDM Roofing Membrane with flashings and accessories necessary to comprise a roofing system. The Mule-Hide EPDM products and accessories shall be installed in strict compliance with current specifications and drawings as published by Mule-Hide products Co., Inc. ("Mule-Hide").
2. The Mule-Hide Fully Adhered EPDM (Ethylene Propylene Diene Monomer) Membrane Roofing System utilizes an .060 inch thick non-reinforced (Black or White-on-Black) EPDM sheet. Optional sheets that may be approved for use in the fully adhered system are .045 inch thick black non-reinforced and .045 inch thick or .060 inch thick polyester reinforced sheets. The EPDM membrane is fully adhered to an acceptable substrate. Adjoining sheets are overlapped a minimum of 3 inches and spliced with Mule-Hide Butyl Splice Adhesive or with Mule-Hide In-Seam Tapes.

B. Related Work:

The work includes, but is not necessarily limited to the installation of:

1. Vapor Retarder (where specified)
2. Wood Blocking (Nailers)
3. Insulation
4. Slip Sheet (where required)
5. Fasteners
6. Roof Membrane
7. Roof Membrane Flashings
8. Metal Flashings
9. Adhesives
10. Sealants
11. Walkways

1.02 Quality Assurance

- A. The Mule-Hide Fully Adhered EPDM Membrane Roofing System shall be installed exclusively by an independent roofing contractor eligible to apply for Mule-Hide warranties when Standard System or Premium System Warranties are requested.
- B. There shall be no deviations from this specification or Mule-Hide's standard details without prior written approval from Mule-Hide's Technical Department.
- C. Upon completion of the installation according to the terms and conditions stated in this specification and in accordance to the information given in the Warranty Application and Pre-Job survey form and any additional approvals which might have been given by Mule-Hide, an authorized representative of Mule-Hide may perform an on-site inspection of the roof to verify that all installation and material requirements have been met.
- D. Mule-Hide reserves the right to reject any roof system and refuse to issue any warranty on roofs which do not comply with Mule-Hide's specifications or current policies.

1.03 Submittals

- A. Prior to the time of bidding, the roofing contractor shall submit to the Owner or Owner's representative the following items:
1. Copies of Mule-Hide specifications and published product data.
 2. Samples of each material to be used in the roof system.
 3. Specimen copy of Mule-Hide Products Co. warranty
 4. Dimensioned shop drawings to include an outline of the roof and appropriate details for flashings and terminations.
 5. Certification from insulation, roofing and accessory components manufacturers that all materials supplied comply with identified ASTM and industry standards.
 6. Verification that system specifications meet all identified code and insurance requirements including but not limited to the following:
 - a. Factory Mutual Research Laboratories
Norwood, MA
 - b. Underwriters Laboratories
Northbrook, IL
- B. Prior to starting the project, the roofing contractor shall submit to Mule-Hide's Technical Department the following items:
1. All project specifications and details where deviations to the Mule-Hide standard specification are requested.
 2. All project specifications where a Premium warranty is required or an extension to the wind coverage is requested.
 3. All information necessary to determine compliance with specified UL or FM requirements.

1.04 Product Delivery, Storage and Handling

- A. All products delivered to the job site shall be in their original unopened containers or wrappings and clearly labeled with the manufacturer's name, product identification and date of manufacture.
- B. Protect all materials from damage during transit, storage and delivery to the job site. Place all materials on pallets and protect from moisture. Materials damaged in handling or storage shall not be used.
- C. Store all materials in a dry, clean area protected from the elements. All adhesive and caulking shall be stored at temperatures between 60°F and 80°F. Materials exposed to lower temperatures affect the workability and performance of the product. Products shall be restored to room temperature prior to use.
- D. All flammable materials shall be stored in a cool, dry area away from open flames and sparks. Follow precautions outlined on containers or supplied by the material manufacturer/supplier.
- E. All materials determined to have been damaged (confirmed by Mule-Hide) are to be replaced.

1.05 Job Conditions

- A. This specification shall not be considered applicable without the appropriate additional specifications approved by Mule-Hide if it should be determined that any of the following conditions exist:
 - 1. If the Mule-Hide Roof System should exceed the structural load conditions as determined by an architect or Engineer.
 - 2. When chemical or hazardous materials are discharged onto the Mule-Hide Roof System.
- B. The General Contractor or the building owner shall be responsible for providing adequate surfaces and structures to receive the insulation, Mule-Hide Roof System and related sheet metal necessary for the successful completion of the project.
- C. Only as much new roofing as can be made watertight each day shall be installed each day. This includes all flashing work.
- D. All substrates to receive new insulation, membrane or flashing shall be thoroughly dry. Should surface moisture occur, the contractor shall provide adequate equipment to dry the substrate prior to application of new materials.
- E. Prior to and during application, all dirt, debris and dust shall be removed from surfaces to be roofed for both new and reroofing substrates.
- F. On all reroof jobs and for all lightweight deck systems, pullout tests shall be performed by the independent roofing contractor, fastener manufacturer or owner's representative to verify the condition of the deck or substrate and to confirm system design pullout values. A minimum of 3 pullout tests for areas up to 50 squares, thereafter 1 test per 100 squares is considered sufficient. Tests should be taken approximately 60% in perimeters and 40% from field areas. Additional tests shall be performed in areas where the integrity of the deck is questionable. A written report of pullout test results shall be submitted to Mule-Hide's Technical Department for review.
- G. Precautions shall be taken to prevent wind blow-off or wind damage during the course of the roofing application. This may necessitate additional securing of temporary construction, materials and equipment.
- H. The contractor shall verify and ensure that all roof drain lines are unblocked before starting work. Any blockages found shall be reported to the owner's representative and Mule-Hide's Technical Department in writing.
- I. Temporary waterstops shall be installed at the end of each day's work. Temporary waterstops shall be removed at the start of the next day's work and disposed of properly. Waterstops shall be compatible with all materials.
- J. Do not install the Mule-Hide EPDM Roofing Membrane in direct contact with any product containing coal tar pitch, creosote or penta-based materials. Consult the Mule-Hide Technical Department for special installation requirements.
- K. Do not allow contaminants such as petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the Mule-Hide EPDM Roofing Membrane. Contact the Mule-Hide Technical Department for recommendations if such conditions exist.
- L. All work shall be scheduled and executed without exposing interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

- M. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surfaces and equipment movement. Contractor shall provide all necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If excessive traffic over newly installed membrane is necessary, contractor shall provide plywood or polyester felt protection to prevent damage.
- N. All existing roofing materials to be removed for construction shall be immediately removed from the construction site to a dumping area authorized to receive such debris. Follow all laws, regulations and procedures to identify and properly dispose of asbestos materials which are to be torn off.
- O. Any unusual or concealed conditions discovered during the course of the work is to be reported to the owner and Mule-Hide immediately in writing. Work is to be halted until the owner has responded with a solution.
- P. All local building codes and requirements should be followed where applicable. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.
- Q. Both interior and exterior building areas affected by construction shall be cleaned up and any damaged areas shall be repaired to the owner's satisfaction.
- R. Certain project conditions may require modifications to this specification. Contact the Mule-Hide Technical Department if any of the following conditions exist:
 - 1. Roof heights greater than 100 feet.
 - 2. Geographical location in wind zone 3, per Factory Mutual's current edition of Loss Prevention Data Sheet 1-28.
 - 3. Geographical location in a 100 mph or greater wind zone, per the ANSI 100 year mean recurrence interval wind isotach.
 - 4. Location with a D exposure as determined in ANSI A58.1
- S. Consideration should be given in the project design to problems that can precipitate from the smooth surface characteristic of the Mule-Hide EPDM membrane. If access is required onto sloped areas when the membrane is wet, walk surfaces may be needed. For northern climates, snow sliding could create a hazard adjacent to the perimeter if a retarding system is not installed above 3 in. per foot slopes.

1.06 Warranties

All Mule-Hide warranties are available for commercial projects. A Roofing Membrane Limited Warranty for a maximum of 10 years is available for residential projects

A. Mule-Hide's Roofing Membrane Limited Warranty

Mule-Hide offers a 10, 15 or 20-year Roofing Membrane Limited Warranty ("Warranty") for a charge. The Warranty covers only the Mule-Hide EPDM 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 and the appropriate fee must be submitted to Mule-Hide to obtain this warranty. Proof of purchase may be required.

Note: Projects requesting a 20-year Roofing Membrane Limited Warranty require the use of the 60-mil thick EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Fully Adhered Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

B. Mule-Hide's Standard System Warranty

Mule-Hide offers a 10, 15 or 20-year Standard System Warranty ("Standard") for commercial projects for a charge. The Standard warranty is a "No Dollar Limit", labor and material warranty that covers the Mule-Hide labeled membrane and other components supplied by Mule-Hide installed by a Mule-Hide Warranty Eligible Applicator. The Standard warranty does not cover insulation or its attachment system. Metal flashing components are not covered under this warranty. A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Standard warranties require inspections by a Mule-Hide representative.

Note: Projects requesting a 20-year Standard System Warranty require the use of the 60-mil thick EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Fully Adhered Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

C. Mule-Hide Premium System Warranty

Mule-Hide offers a 10, 15 or 20-year Premium System Warranty ("Premium") for commercial projects for a charge. The Premium warranty is a "No Dollar Limit", labor and material warranty that covers the Mule-Hide labeled membrane, insulation, other components supplied by Mule-Hide and approved products (such as metal flashing, insulation adhesive or other pre-approved accessories) installed by a Mule-Hide Warranty Eligible Applicator. A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Premium warranties require inspections by a Mule-Hide representative.

Note: Projects requesting a 20-year Premium Warranty require the use of the 60-mil thick EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Fully Adhered Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

D. Standard and Premium System warranties are not available for residential projects.

E. EPDM tie-ins to built-up (BUR) or any other type of roof system are not covered by Mule-Hide warranties.

F. Contact Mule-Hide for other extended warranties that may be available.

G. Terms and Conditions of Warranties

Mule-Hide's obligations under the Roofing Membrane Limited Warranty, the Standard System Warranty, and the Premium System Warranty are limited to the specific terms and conditions of the respective Warranties. Sample copies of the Mule-Hide Warranties are available from Mule-Hide upon request.

PART 2 - PRODUCTS

2.01 General

A. The components of the Fully Adhered Mule-Hide EPDM Membrane Roof System are to be products manufactured or supplied by Mule-Hide Products Co. as specified in the contract documents.

B. Mule-Hide EPDM is membrane is manufactured in accordance with the guidelines of the RMA (Rubber Manufacturers Association) and meets all government specifications for EPDM.

2.02 Roofing Membrane

- A. Mule-Hide non-reinforced EPDM membrane is available for use with a Fully Adhered System in standard widths of 7, 10 and 20 feet, and lengths of 50 and 100 feet.
- B. Mule-Hide non-reinforced EPDM membrane is available in thicknesses of .045 and .060 inches. The nominal material weight of .045 inch thick membrane is .29 pounds per square foot and .060 inch thick membrane is .39 pounds per square foot.
- C. Mule-Hide's EPDM Membrane meets or exceeds the ASTM D 4637 Standard Specification.
- D. While non-reinforced EPDM membranes are typically specified for fully adhered systems, reinforced membranes may also be specified.
- E. Refer to the Product Data Sheets for the Black, White-on-Black non-reinforced and the Black reinforced EPDM membranes for physical properties additional information.

2.03 Accessory Materials

The following Mule-Hide materials must be used to install Mule-Hide Roof Systems. Mule-Hide will not warrant any application where another manufacturer's product is substituted for a Mule-Hide product. **All products listed below are physically and chemically compatible with each other.**

- A. Mule-Hide Splice Adhesive - a black or white solvent based, synthetic rubber based (butyl) product designed for splicing EPDM roof membranes and uncured EPDM Flashings.
- B. Mule-Hide Bonding Adhesive (solvent based) - an amber colored synthetic rubber based (neoprene) adhesive designed to bond EPDM membranes to approved insulation boards, metal, concrete, wood and other approved decking materials.
- C. Mule-Hide Water Base Adhesive - a non-flammable and non-toxic acrylic latex-based adhesive designed to bond EPDM membranes to approved insulation boards, wood, concrete and other approved decking materials. For horizontal surfaces only (not to exceed inclines greater than 2").
- D. Mule-Hide In-Seam Tape - a cured butyl rubber tape designed to adhere EPDM membrane seams in conjunction with Mule-Hide's Tape Primer.
- E. Mule-Hide Tape Primer - a cleaner specifically formulated to clean and prime EPDM membrane surfaces to be bonded with splice adhesives, In-Seam Tapes or Cured and Uncured EPDM Laminates.
- F. Mule-Hide Seam Cleaner - a black or clear solvent based cleaner used to clean and prep the EPDM membrane prior to the application of the Mule-Hide Splice Adhesive.
- G. Mule-Hide Uncured EPDM Flashing - an uncured EPDM membrane (.060 inches thick) to be used in conjunction with the Mule-Hide EPDM Roof Systems. Uncured EPDM flashing is easily formed and used to flash pipes, inside and outside corners and various other penetrations that require a moldable product.
- H. Mule-Hide Uncured Laminated Flashing Tape - an uncured EPDM membrane laminated to cured butyl tape. Used to flash pipes, inside and outside corners, "T-joints" and various other penetrations that require a moldable product. Flashing tape is used in conjunction with the Mule-Hide Tape Primer. Mule-Hide Uncured Laminated Flashing Tapes shall **not** be used for stripping seams, gravel stops, drip aprons or batten bars.
- I. Mule-Hide RMS Strips - 6 inch wide, cured, reinforced EPDM strips used as a base attachment around curbs and walls to mechanically attach the EPDM field sheet.

- J. Mule-Hide Cured Laminated Cover Tape - a cured EPDM membrane laminated to cured butyl tape used as a cover tape to flash gravel stop and drip apron, in conjunction with the Mule-Hide Tape Primer.
- K. Mule-Hide Lap Sealant - a one part, black or white elastomeric caulk designed for sealing the exposed edge of field fabricated membrane laps.
- I. Mule-Hide Water Cut-Off - a butyl based, one-component mastic designed specifically for sealing roofing membranes to wood, metal, concrete, plastic and other substrates.
- M. Mule-Hide Pourable Sealer - a two-component, liquid (100% solids) polyurethane elastomer used as a filler for pitch pockets.
- N. Mule-Hide Pipe Boots - an economical pre-molded EPDM flashing designed for flashing single pipe penetrations.
- O. Mule-Hide All Purpose Bar - a specially extruded aluminum bar, .050" thick x 1" wide x 10' long, that may be used as an anchor bar, batten bar or as a termination bar.
- P. Mule-Hide Fasteners - Factory Mutual approved # 14 heavy duty and # 12 drill point fasteners used for fastening insulation and Mule-Hide All Purpose Bars to roof decks, curbs and walls.
- Q. Mule-Hide 2.4" Seam Plates - Factory Mutual approved round Galvalume plates with reinforcing ribs used in conjunction with the Mule-Hide HD Fasteners to attach the reinforced membrane and RMS strips.
- R. Mule-Hide Plates - Factory Mutual approved 3" round (26 gauge) Galvalume plates with reinforcing ribs used in conjunction with Mule-Hide Fasteners to attach insulation to roof decks.
- S. Mule-Hide Insulation - The Mule-Hide Poly ISO 2 polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core laminated to heavy, black (non-asphaltic) glass fiber reinforced felt facers.

2.04 Related Materials By Others

- A. Wood Nailers
 - 1. Mule-Hide recommends wood nailers to be # 2 or better lumber and pressure treated for rot resistance (wolmanized or osmose treated). Creosote and asphaltic preservatives and preservatives containing pentachlorophenol, copper naphthenate or copper 8-quinolinolate are not acceptable.
 - 2. Wood nailers shall be installed in compliance with the recommended options as listed in the Factory Mutual Loss Prevention Data Bulletin 1-49. Methods of attachment (size of fasteners and spacing) are determined by deck type and wind zone requirements. Pull tests may be required prior to the installation of wood nailers to determine the appropriate type of fastener. Refer to the Fastener Guidelines section of this manual for recommended attachment options.
 - 3. Wood Nailers shall be installed as specified on the project drawings and shall be of a height sufficient to match the thickness of the insulation being used. Wood nailers are required for the attachment of drip aprons, gravel stops and certain expansion joints. Wood nailers may be required for metal scuppers, pitch pockets and certain types of curbs.
 - 4. All wood nailers shall be attached to withstand a minimum force of 200 lbs in any direction. All nailers shall have a minimum of 2 fasteners per board.

B. Vapor Retarders

1. Vapor retarders shall meet specified codes and insurance requirements.
2. Vapor retarders shall be compatible with insulation and other accessories.
3. The use and placement of a vapor retarder should be determined by an architect or engineer. Mule-Hide does not require the use of vapor retarders. However, Mule-Hide recommends that a vapor retarder be considered when both of two conditions are anticipated:
 - a. The outside average January temperature is below 40°F, and
 - b. The expected interior winter relative humidity is 45% or greater.
4. Mule-Hide must be contacted for buildings that are refrigerated (freezers or cold storage) or have a high interior humidity such as, but not limited to, swimming pools, produce storage or locker rooms.

C. Insulation

1. Insulation shall be installed as a protection layer over the existing substrate or to obtain a desired thermal value.
2. Insulation shall be compatible with the Mule-Hide EPDM Membranes, Mule-Hide Adhesives, Mule-Hide EPDM Flashings and other Mule-Hide Accessories.
3. The following generic insulations are acceptable for use in a Mule-Hide Fully Adhered EPDM Roofing System when a standard warranty is requested:
 - a. Polyisocyanurate insulations having nonasphaltic facers meeting or exceeding the physical property requirements of Fed. Spec. HH-I-1972 and having a minimum compressive resistance of 18 psi. Thickness minimum is 1 inch or greater as required by the insulation manufacturer to span the flutes of a metal deck.
 - b. High density wood fiberboard must be used as an overlay when expanded or extruded polystyrene is specified. High density wood fiberboard may be used as an overlay over an existing roof system (recover application). The minimum thickness is ½ inch.
 - c. Expanded Polystyrene insulation must be a minimum of 1" thick and certified by the manufacturer to have a minimum density of 1.00 lb. Refer to the insulation manufacturer's minimum requirements for installation over a fluted steel deck. Review the Insulation Guidelines section of this manual for specific applications and restrictions. **Requires minimum ½ inch high density wood fiberboard as an overlay.**
 - d. Extruded Polystyrene must be a minimum of ¾" thick (½" min. over smooth surfaced BUR). Refer to the Insulation Guidelines section of this manual for specific applications and restrictions. **Requires minimum ½ inch high density wood fiberboard as an overlay.**
 - e. State and local building codes should be reviewed regarding the installation of expanded or extruded polystyrene insulation directly over a steel deck.
4. Mule-Hide Premium Warranties require the use of the Mule-Hide Poly ISO 2 insulation. Use of other insulations shall disqualify the project for consideration of the issuance of a Premium warranty. Contact the Mule-Hide Technical Department for specific requirements. Premium warranties are not available for recover applications without an independent moisture survey.

- D. Sheet Metal
 - 1. Sheet metal components such as gravel stops, drip aprons, counterflashings, copings, etc., should be fabricated and installed in accordance with the SMACNA recommendations and requirements.
 - 2. Sheet metal components supplied by others are not covered by the Mule-Hide warranties. Contact Mule-Hide's Technical Department for specific requirements.

2.05 Precautions

- A. Consult Material Safety Data Sheets and container labels for specific safety instructions prior to use.
- B. Avoid breathing vapors of solvents, cleaners, primers, sealants and adhesives. Use with adequate ventilation. Avoid prolonged contact of solvents, sealants, cleaners, primers and adhesives with skin. Solvent resistant rubber gloves should always be worn during use.
- C. Do not use Mule-Hide EPDM roofing products near fire or flame. Do not use open flames for drying of surfaces, sealants or adhesives. **Do not smoke near flammable products.**
- D. Do not use oil-based paint on EPDM membranes. Contact Mule-Hide's Technical Department for recommendations for compatible color coatings.
- E. Do not allow muriatic acid (masonry cleaner) to come in direct contact with the Mule-Hide EPDM membranes, flashings or accessories.
- F. Do not allow Mule-Hide EPDM membranes or accessories to come into direct contact with steam or vents that produce temperatures in excess of 180°F (82°C).
- G. The Mule-Hide EPDM Roof System may be installed in cold weather provided the adhesives are stored at room temperature until just prior to use and used within 2 hours. Adhesives left in the cold must be returned to room temperature prior to use.
- H. Cover Tapes, Flashing Tapes and In-Seam Tapes may loose tack when exposed to temperatures below 40°F. for extended periods of time. A heat gun may be used to warm the product. Only apply heat to the EPDM side or in the case of In-Seam Tapes, apply heat to the kraft paper side. Be careful not to over heat. Hot boxes are the preferred method to warm tapes.
- I. In cold temperatures when the ambient temperature is near the dew point, condensation may form on the seam cleaner, tape primer and adhesive as the solvents flash off. If condensation occurs, discontinue the application and allow the surface to dry. **Do not attempt to dry the surface with heat guns or torches.** When weather permits apply a new coat of product.

PART 3 - EXECUTION

3.01 General

When installing a Mule-Hide Fully Adhered EPDM roof system in cooler weather, it is recommended that liquids such as solvents, sealants, etc., be stored at temperatures of 60° F. or more until just prior to use in order to facilitate the installation.

3.02 Substrate Conditions

The following general conditions apply to the substrate that will receive a Mule-Hide Fully Adhered EPDM Membrane Roofing System for recover, reroof and new construction:

- A. The roof deck must be structurally sound and free of defects to provide proper securement for mechanical fasteners. Areas showing a loss of integrity due to corrosion, rotting, warping, concrete spalling, etc., must be repaired or replaced prior to installing the roofing system. The roofing contractor shall make an inspection of the deck prior to starting the roof installation, and if there is no general contractor, the roofing contractor shall be responsible for correcting any defects.
- B. It is imperative that the roofing contractor performs test cuts at each roof area prior to recover applications. The condition of the substrate must be suitable to receive a Mule-Hide Fully Adhered EPDM Membrane Roofing System. Wet insulation must be removed and replaced.
- C. A determination must be made regarding the presence or absence of coal tar pitch within the existing roof assembly. The presence of coal tar pitch may restrict the use of certain insulations. Extruded and expanded polystyrene insulations must not be installed directly over a coal tar pitch roof. An underlayment must be installed prior to the installation of the polystyrene insulation. Contact the Mule-Hide Technical Department for recommendations.
- D. Contact the material manufacturer when the substrate is exposed to excessively high humidity, low temperature or a corrosive environment. Special fasteners (i.e. stainless steel), vapor retarders or details may be required.
- E. Fastener pullout tests are strongly recommended to determine the suitability of a roof deck.
- F. It is acceptable to install a Fully Adhered Mule-Hide EPDM Membrane Roofing System over the following deck substrates provided that an acceptable insulation is installed over the substrate as required:
 - 1. Structural Metal Deck (22 gauge minimum) shall conform to recommendations outlined in Factory Mutual's Loss Prevention Data Sheet 1-28. Steel decks require the installation of the Mule-Hide Poly-ISO-2 insulation or other approved insulation. The minimum acceptable pullout value is 360 lbs.
 - 2. Structural Concrete, pre-cast and pre-stressed concrete (3,000 p.s.i. minimum) shall be cured and dry to industry standards and surface shall be smooth, clean and free of moisture or frost. The minimum acceptable pullout value is 360 lbs.
 - 3. Wood plank (1" minimum) shall conform to Factory Mutual's requirements for Class I impregnated decks. The minimum acceptable pullout value is 360 lbs.
 - 4. Plywood (15/32" minimum) - See the Mule-Hide specification manual for specific attachment patterns. The minimum acceptable pullout value is 360 lbs.
 - 5. Cementitious Fiber Substrates (Tectum, etc), Lightweight Concrete and Gypsum Decks may be acceptable after pullout tests have been completed and appropriate fasteners and attachment patterns/densities have been determined. The minimum acceptable pullout value is 300 lbs.

3.03 Preparation Of Existing Substrate

- A. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges and debris. Inspect substrates and correct defects before application of roofing membrane. Specifier or roofing contractor shall determine the condition of the existing roof deck and roofing system. Areas with deteriorated decking or wet insulation or other failed materials shall have those affected materials removed and replaced. Make sure all decking is securely fastened. The roofing contractor has the final responsibility to ensure an acceptable deck is provided to receive the new roof system.
- B. Significant ponding that remains after a period of 48 hours should be eliminated by either installing tapered insulation to create positive drainage of the roof surface or by installing new drains in the low areas where the ponding remains. Positive drainage shall also eliminate the possibility of excessive live loads caused by ponding water that could cause structural damage or failure.
- C. Ponded water, snow or ice shall be removed before installing the Mule-Hide Fully Adhered System. Do not roof over moisture in any form.
- D. Recover Projects
 - 1. When installing a new roof system over an existing gravel surfaced built-up roof, all loose gravel must be removed to prevent moisture entrapment. Insulation must always be used as a protection course for the EPDM membrane.
 - 2. When installing a new roof system over an existing single-ply roof system, the existing roof membrane must be cut up into maximum 10' x 10' sections to prevent entrapment of water between the two roof systems.
 - 3. Sprayed in place urethane foam roof systems are not acceptable substrates for Mule-Hide Single-Ply roof systems and must be removed.
 - 4. Existing smooth surfaced built-up roof systems and mineral surfaced modified or built-up roof systems must have an acceptable insulation prior to installing the Mule-Hide Fully Adhered Roofing System.
 - 5. If a Mule-Hide Premium warranty is requested, the existing roof system **must be removed to the deck** prior to the installation of the new roofing system or a moisture survey must be taken, all wet areas removed and a copy of the survey submitted to Mule-Hide with the warranty application.

3.04 Vapor Retarder

- A. Specific climate and job conditions may require the use of a vapor retarder. It is the sole responsibility of the design professional to determine the need for a vapor retarder, its type and location in the roofing system.
- B. The roofing contractor must follow the recommended installation procedures of the respective vapor retarder manufacturer and the project specifier's instructions for the type of vapor retarder specified for the project.

3.05 Wood Nailers

- A. Nailers shall be firmly anchored to the decks at a maximum 2'-0" o.c. and shall resist a pullout force of 200 lbs./linear foot in any direction. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.
- B. Refer to the Fastener Guidelines section in this manual for the type of fastener to be used with each type of deck and the maximum spacing requirements.
- C. Wood nailers shall be installed as specified by the project specifier and shall be in compliance with the Mule-Hide Standard Details.

- D. The thickness of the wood nailer shall be determined so that the top of the nailer is flush with the top of the surface of the insulation.
- E. Wood nailers installed along the perimeter of a roof surface, where a drip apron or gravel stop shall be installed, shall have a width that is wider than the metal flange to be installed.
- F. Where pitch pans or scuppers are to be installed over wood nailers, the wood nailers must be wider than the metal flanges.

3.06 Insulation Installation

- A. Insulation shall be secured to the roof deck in accordance with Mule-Hide's requirements utilizing Mule-Hide fasteners and plates. When installing insulation, the end joints of each row of insulation shall be offset against the previous row. When more than one layer of insulation is to be used, succeeding layers are to be laid staggered in relation to the previous layer of insulation and all joints shall be offset.
- B. Insulation installed over steel decks shall be checked so that no edges are left unsupported along the flutes. All insulations shall be of sufficient thickness and density to prevent breakage under normal roof construction traffic.
- C. Insulation other than Mule-Hide's Poly ISO 2 must be an FM approved insulation and acceptable to Mule-Hide for use under the Mule-Hide Fully Adhered Roofing System.
- D. Determine the insulation fastening patterns which will be used for the perimeter, corners and field of the roof. This information may be found in the Insulation Guidelines section of this manual. Unless otherwise approved by Mule-Hide prior to the start of the project, the standard mechanical attachment of an acceptable insulation shall be 1 fastener and insulation plate per every 2 square feet. Acceptable deviations to this requirement shall be found in the Insulation Guidelines section of this manual.
- E. Refer to the insulation manufacturers guidelines for the appropriate type, size and thickness of the insulation needed for use over the respective substrate and under the Mule-Hide Fully Adhered Roofing System.
- F. Insulation shall be cut to fit snugly around or against all protrusions, nailers, drains, pipes and walls. All gaps greater than 1/4" wide shall be filled with the same material.
- G. Do not install any more insulation than can be covered by the membrane by the end of the working day and made watertight.
- H. As an alternate method of attachment to a structural concrete deck, hot mopping of the insulation (maximum 4'x 4' sheets) or the use of Insta-Stick is acceptable. The asphalt (Type III or Type IV) must be applied over primed concrete at a minimum rate of 25 lbs. per square. The insulation must be set in a full mopping (100%). Strip or spot mopping is not acceptable. Insta-Stick must be installed in compliance with the recommendations of the manufacturer, Insta-Foam, Inc.
- I. Crickets and saddles may be installed beneath the specified insulation where possible. Crickets and saddles made from non-compatible insulations or materials must be overlaid with an acceptable insulation or underlayment to which the membrane may be adhered. For crickets and saddles with slopes greater than 2" per foot, the membrane must be mechanically attached at each angle change.
- J. When Factory Mutual uplift requirements (FM 1-60 or 1-90) are required, contact the Mule-Hide Technical Department for appropriate attachment patterns and quantities per board size.

- K. Only FM approved fasteners and plates may be used to attach the insulation. When a Mule-Hide Premium Warranty is requested, only Mule-Hide labeled fasteners and plates may be used to attach the insulation and the only acceptable insulation shall be the Mule-Hide Poly-ISO-

3.07 Membrane Installation

- A. Mule-Hide strongly recommends the .060 inch thick EPDM membrane 10' wide and 100' long be used with the Mule-Hide Fully Adhered Roofing System. Sheets wider than 10' will have factory folds that may not relax and lay flat during cold weather that may cause problems while seaming the sheets together. The .045 inch thick EPDM may exhibit wrinkles due to swelling caused by the solvent in the adhesive.
- B. Unroll the Mule-Hide EPDM Membrane and position without stretching. Large sheets may be moved into final position by encapsulating air under the membrane and floating it into place. Allow the membrane to relax at least 30 minutes prior to installation. Inspect and remove any damaged membrane. Lap sheets a minimum of 4" to allow for a proper field splice. Membrane overlaps shall be shingled with the flow of water. Membrane should run perpendicular to the direction of steel deck flutes and orientation of wood decks where possible.
- C. After carefully positioning several sheets of the EPDM membrane, one half of the first sheet's length shall be pulled back to expose the bottom side of the sheet. Mule-Hide suggests the fold in the sheet should run parallel with the length of the sheet. Smooth out the sheet to remove any wrinkles.
- D. A smooth, even coating of Mule-Hide (solvent-based) Bonding Adhesive shall be applied to the substrate that will be covered by the first sheet and allowed to dry 5-20 minutes depending on the substrate and environmental conditions. Apply an even coat of Mule-Hide Bonding Adhesive to the backside of the first sheet. The adhesive shall be applied at a net (both surfaces) rate of 1 gallon per 60 sq. ft. of finished surface with a minimum ½" nap solvent-resistant paint rollers. It is recommended that the adhesive be applied to the substrate and the sheet at the same time to allow both surfaces to dry uniformly. The most common tool used for the application of the adhesive is the 9" paint roller as it will easily fit into the 5 gallon pails. If the adhesive is sprayed, the adhesive must be rolled with a paint roller immediately after spraying.
- E. When the adhesive on the membrane has dried sufficiently to be tacky but not produce adhesive legs or strings with a light touch of a dry finger, the coated membrane shall be slowly rolled onto the coated substrate in such a manner as to eliminate wrinkles and trapped air. If the adhesive on either surface has dried excessively, then the surface in question must be recoated with adhesive. The adhesive must show complete transfer between the substrate and membrane surfaces when peeled back as evidenced by adhesive legs and strings.
- F. After the adhesive coated substrate and membrane surfaces have been mated, the bonded surface must be broomed with a large nylon bristled push broom to promote 100% adhesion. The remaining half of the first sheet shall be folded back and the adhering procedure repeated. On each succeeding sheet of EPDM Membrane, sheet alignment, adhesive application, adhering and rolling procedures shall be repeated. Do not apply bonding adhesive to the seam area. Each succeeding sheet shall be overlapped a minimum of 4" with each lap shingled with the slope of the roof.
- G. Wrinkles that transmit through the seams must be cut out and patched using cured sheet.
- H. All seams shall be spliced following the procedures in section 3.09 of this specification.
- I. The roof membrane shall extend up the vertical surface a minimum of 1" and shall turn down over the edge of the roof a minimum of 2" or as required by the Mule-Hide details.

3.08 Alternate Bonding Procedures

In addition to the Mule-Hide (solvent-based) Bonding Adhesive, one other adhesive is available from Mule-Hide for the purpose of bonding the EPDM membranes to acceptable substrates.

A. Mule-Hide Water Base Bonding Adhesive

1. The Mule-Hide Water Base Bonding Adhesive (WBA) is an acrylic latex-based adhesive that is white in color and becomes clear when dry. The Water Base Bonding Adhesive is only used for adhering the EPDM membrane to horizontal surfaces. **The Water Base Bonding may not be used on slopes exceeding 2" per foot and is not acceptable for vertical applications.**
2. The Water Base Bonding Adhesive may be used as a single-side adhesive when applying over **porous** surfaces such as high density wood fiberboard, plywood, oriented strand board, wood plank, Dens-Deck or moisture-resistant gypsum board.
3. The single-side application is when the adhesive is only applied to the substrate and the membrane is immediately rolled in place into the white, wet adhesive. Mule-Hide does not recommend applying the adhesive to the membrane in a single-side application as the quantity may not be sufficient to properly bond to the substrate.
4. The recommended minimum application rate is 7 to 10 wet mils in thickness.
5. Unroll the Mule-Hide EPDM Membrane and position without stretching. Large sheets may be moved into final position by encapsulating air under the membrane and floating it into place. Allow the membrane to relax at least 30 minutes prior to installation. Inspect and remove any damaged membrane. Lap sheets a minimum of 4" to allow for a proper field splice. Membrane overlaps shall be shingled with the flow of water. Membrane should run perpendicular to the direction of steel deck flutes and orientation of wood decks where possible.
6. After carefully positioning several sheets of the EPDM membrane, one half of the first sheet's length shall be pulled back to expose the bottom side of the sheet. Smooth out the sheet to remove any wrinkles.
7. A smooth, even coating of Mule-Hide Water Base Bonding Adhesive shall be applied to the substrate that will be covered by the first sheet. As the adhesive is being applied to the substrate, the membrane should immediately be rolled into the adhesive while the adhesive is still wet. The coverage rate is approximately 125 to 160 square feet per gallon. The coverage rate will vary with the degree of porosity of the surface being covered.
8. It is recommended that the adhesive be applied to the substrate using a 9" paint roller with a minimum 1/2" nap solvent-resistant paint roller as it will easily fit into the 5 gallon pails. If the adhesive is sprayed, the adhesive must be rolled with a paint roller immediately after spraying. If the adhesive begins to turn clear, it is too dry and shall require a second coat.
9. Once the sheet has been rolled out, it must be broomed with a large nylon bristled push broom to promote 100% adhesion. Fold back the unadhered half of the sheet and repeat the procedure.
10. Mule-Hide recommends periodically checking the adhesive application rate. Immediately after a sheet has been broomed, gently pull the sheet back 1 to 2 feet and examine the surface of the membrane. A uniform coat of adhesive should be visible on the surface of the membrane. This indicates that a sufficient amount of adhesive was applied and the sheet has been rolled into the adhesive at the right time.

Failure to observe sufficient adhesive on the membrane indicates either a less than sufficient amount of adhesive applied or waiting too long to roll in the membrane. The contractor shall adjust the application accordingly. The porosity of the substrate or climatic conditions may require a heavier coat of adhesive.

11. Install subsequent sheets in the same manner, overlapping the previous sheet a minimum of 3" for the splice area. All sheets must be lapped in shingle fashion.
12. The Mule-Hide Water Base Adhesive may be used as a contact adhesive to adhere the EPDM field sheet to certain approved non-porous surfaces such as polyisocyanurate insulation. Refer to the Flashing Guidelines section of this manual for application instructions and coverage rates.

3.09 Splicing Of Lap Areas

A. Splicing seams with Mule-Hide Splice Adhesive

1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Seam Cleaner using clean cotton rags. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags must be replaced with clean ones as they become dirty. The cleaned membrane should have a uniform black color when dry. There should be no streaks present.
 - a. Mule-Hide Black Seam Cleaner must be used with the black EPDM membranes.
 - b. Mule-Hide Clear Seam Cleaner must be used with the White-on-Black EPDM membranes.
 - c. Mule-Hide Tape Primer may be used as a substitute for either the Black or Clear Seam Cleaner. Review the section (3.09.B.) on Tape installation for cleaning procedures to be followed when using the Mule-Hide Tape Primer.
4. Seam Cleaners, Tape Primer and Splice Adhesives must be thoroughly stirred prior to application. Be sure to scrape the sides and bottom of the cans while stirring.
5. Apply the Splice Adhesive to the cleaned surfaces of both sheets. Mule-Hide recommends the use of a solvent resistant, 3" - 4" wide, short bristle paint brush or a solvent resistant 3" wide, 1/2" medium nap, paint roller.
6. Apply the adhesive in a uniformly thick even coat. When using a paintbrush do not use a circular motion. Use long, straight strokes applying sufficient adhesive that will achieve a smooth surface without leaving brush marks. When using a roller do not over roll the adhesive as this will cause an uneven application.
7. Do not allow the adhesive to puddle or leave globs as these areas will not dry properly and may cause excessive swelling of the membrane which will result in fishmouths in the finished seam.

8. Adhesive must be applied to both surfaces of the seam at the same time to allow for uniform drying of the adhesive. The adhesive must fully cover the surface of the splice areas a minimum of 3" wide.
9. Allow the adhesive to dry until tacky to the touch of a dry finger without stringing or sticking to the finger and does not move when pushed forward or the finger is twisted.

Note: Drying time (also referred to as Flash Off time) will vary from day to day depending on the ambient weather conditions. In colder weather, condensation may form on the surface of the adhesive that is caused by the solvent flashing off. If this occurs, the application of the Splice Adhesive should be discontinued. The surface must be allowed to dry and a thin coat of adhesive must be applied over the existing adhesive.

10. Roll the top sheet onto the bottom sheet being careful not to stretch or wrinkle the membrane. Apply hand pressure brushing from the inside of the sheet outward to the edge removing air and fishmouths.
11. Using a 2" wide steel roller, apply positive pressure rolling from the inside of the seam working out over the edge of the sheet perpendicular to the direction of the seam. The entire seam must be rolled in this manner. A J.R. Seamer Power Roller may be used in place of the 2" steel roller.
12. All "T-joint" laps in the field membrane shall be reinforced with a 6" piece of uncured EPDM membrane (uncured flashing tape may also be used) centered over the intersection of the edges of the seams. All "T-joint" patches shall be caulked with Lap Sealant.
13. Field seams and flashings should be allowed to set for several hours prior to the application of Lap Sealant. At the latest, Lap Sealant should be applied to all seam edges at the end of the workday and before any moisture has a chance to form on the membrane.
14. Just prior to applying the Lap Sealant, the seam and flashing edges shall be cleaned with a clean rag or cloth using the Mule-Hide Seam Cleaner to remove any dirt or talc that may remain along the seam edge. Be sure that all edges of the splice have been covered with a continuous bead of Lap Sealant. It is not necessary to trowel (screed) the caulk. The Lap Sealant shall be applied at a maximum rate of 20 linear feet per tube.

B. Splicing seams with Mule-Hide In-Seam Tapes

1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Tape Primer using clean cotton rags or Scotch-Brite® pads. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags and Scotch-Brite® pads must be replaced with clean ones as they become dirty. The primed membrane should have a uniform black color when dry. There should be no streaks present. The Mule-Hide Tape Primer shall be thoroughly stirred prior to use.

4. Roll the top sheet back over the bottom sheet and mark the bottom sheet to allow for proper placement of the In-Seam Tape. Mark the bottom sheet along the edge of the top sheet, but ½" away from the sheet, as a guide for the installation of the In-Seam Tape. Do not use a chalk line or any type of marker that will prevent the seam tape from sticking.
 5. Fold the top sheet back. Approximately 1/8" to 3/8" of In-Seam Tape should be exposed along the completed seam. Unroll 2 or 3 feet of the In-Seam Tape leaving the release liner in place. Align the In-Seam Tape so that the edge of the release liner is touching the guideline. Do not install the tape over the line. Leaving the release paper in place, install the In-Seam Tape along the marks on the bottom sheet. Roll the tape with a 2" steel roller along the entire length of the seam. The roller must run perpendicular to the tape with overlapping strokes. If more than one piece (roll) of tape is required to complete a seam, the second piece of tape must overlap the first a minimum of 1 inch.
 6. Where In-Seam Tapes intersect at the corner of a sheet, the tapes must overlap a minimum of 1 inch.
 7. Fold the top sheet back onto the tape so that the sheet is laying over the release paper. Peel the release paper off the tape at a 45° angle and parallel with the roof allowing the top sheet to fall freely onto the exposed tape. Press the seam together using hand pressure and wiping toward the splice edge. Immediately roll the seam with a 2 inch wide steel roller, using positive pressure, toward the edge of the seam.
 8. Wait a minimum of 2 hours prior to application of the Lap Sealant. The Lap Sealant is only required at intersections with factory seams, where two pieces of tape overlap within the seam and on patches installed over "T-joints". A bead of Lap Sealant should be applied along the overlap for 6" in each direction from the center point of the overlap.
- C. Regardless of the method used to splice the seams, all seams must be thoroughly inspected for fishmouths, bubbles, blisters and wrinkles and repaired as necessary.
1. If fishmouths or wrinkles occur through the seam, they must be cut out and patched with cured membrane (cured cover tape may be used).
 2. Patch with cured EPDM membrane or Cured Cover Tape (do not use uncured flashing or flashing tape) that is at least 3 inches larger in all directions than the area that has been cut out. Round the corners of the patch.
 3. Center the patch over the area to be repaired. Follow the splicing procedures for the appropriate material used.

3.10 Membrane Securement (Mechanical)

- A. Additional securement of the EPDM membrane by mechanical attachment must be provided at the perimeter of each roof level, base of walls, curbs, skylights, expansion joints, tie-ins, interior walls, bottom of valleys and top of ridges of sloped roofs, angle changes that exceed inclines of 2" or greater per foot and various penetrations as shown in the Mule-Hide Standard Details. All securement must be either horizontally to the roof deck or vertically to the base of the various penetrations as shown in the Mule-Hide Standard details.

- B. The mechanical attachment of the membrane may be achieved by the following methods:
1. Mule-Hide All Purpose Bar
 - a. The Mule-Hide All Purpose Bar is a specially extruded aluminum bar that has pre-punched holes 6 inches on center. The bar may be placed either horizontally or vertically depending on the detail followed. Refer to the Mule-Hide Standard Details for the proper placement of the bar.
 - b. The maximum spacing of the fasteners shall not exceed 12 inches on center. Adjoining bars should be spaced approximately ½ inch to 1 inch apart. All bars must be attached at the ends a maximum of 1 inch from the end of each bar. This may require pre-drilling additional holes. All cut bars shall be deburred.
 - c. Under no circumstances shall the All Purpose Bar be stripped with 6 inch uncured flashing or uncured flashing tape. Mule-Hide allows only the use of Cured Cover Tape or cured field sheet to strip over the All Purpose Bar.
 - d. The All Purpose Bar must be installed a minimum of 3 inches to a maximum of 6 inches from inside and outside corners.
 2. Mule-Hide RMS (Reinforced Membrane Strip) attachment strip
 - a. The RMS is a 6" wide reinforced strip of EPDM membrane that may be installed at the base of walls and curbs. Mule-Hide 2.4 inch seam plates are used to attach the RMS either horizontally or vertically with appropriate fasteners. Refer to Mule-Hide Details # MHE-124 and MHE-125 for appropriate placement of the RMS, plates and fasteners. The RMS is installed prior to the placement of the field sheet.
 - b. Follow the standard procedures for cleaning and splicing the RMS and field sheet. Only the Mule-Hide Black Seam Cleaner and Mule-Hide Black Splice Adhesive may be used to seam the RMS to the field sheet. Bonding Adhesive and Single Seal Adhesive are **not permitted** for use with the RMS attachment strips. Lap sealant is not required. The RMS is also available as a pre-taped product. Use Mule-Hide Tape Primer to prepare the membrane surface when using the pre-taped RMS.
 - c. Spacing of the fasteners shall not exceed 12 inches on center. Adjoining RMS strips shall be spaced a maximum of 1 inch apart. It is not required to overlap the RMS.
 - d. For vertical attachment, the RMS membrane must extend a minimum of 3 inches onto the horizontal surface (roof substrate). Refer to Mule-Hide Detail # MHE-124. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.
 - e. For horizontal attachment, the membrane must be placed a maximum of ½ inch from the base of the angle change extending out onto the horizontal surface (roof substrate). The 2.4 inch seam plates must be placed a minimum of ½ inch to a maximum of 1 inch from the exterior edge of the strip. Refer to Mule-Hide Detail # MHE-125. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.

3. Drip Apron and Gravel Stop
 - a. For drip aprons and gravel stops, the metal flange shall extend a minimum of 3 inches onto the wood nailer. The wood nailer must be wider than the metal flange. Approved screw fasteners shall be installed a maximum of 6 inches on center and 1/2" to 3/4" from the inside edge of the metal flange. Ring shank nails spaced a maximum 4" on center may also be used.
 - b. All drip aprons and gravel stops shall primed with Mule-Hide's Tape Primer and stripped with Mule-Hide's Cured Cover Tape. Cleaning the metal with a solvent such as toluene or xylene to remove oil film may be required prior to installing and priming with the Mule-Hide Tape Primer.
 - c. The edge of the Cured Cover Tape overlapping the metal flange shall be caulked with Lap Sealant. For those areas where water flows over the drip apron, both sides of the Cured Cover Tape must be caulked.

3.11 Flashing Installation

All walls, parapets, curbs and penetrations shall be flashed with cured EPDM membrane where possible. The use of uncured EPDM flashing or Uncured Flashing Tape shall be limited to those areas such as corners, pipes, scuppers, patches over "T-joints", patches at the base of all vertical field seams (at the angle change) and other shaped penetrations that require the flashing to be molded and cured product is not practical. All flashing shall be performed in accordance with Mule-Hide's Standard Details. Additional information may be found in the Flashing Guideline Section of this manual.

Note: Mule-Hide's Water Base Adhesive is not permitted for use on vertical surfaces.

- A. Vertical Wall, Curb and Skylight Flashings.
 1. Cured EPDM membrane should be used to flash all vertical surfaces except when flashing inside and outside corners or other details that require the flashing to be molded.
 2. There are two basic methods of flashing vertical surfaces. Each method is dependent on the mechanical base attachment used.
 - a. When using the RMS strip as the mechanical attachment, the field sheet may be continued up the vertical surface to the point of termination.
 - b. When using the All Purpose Bar as the mechanical attachment, the field sheet is turned up the vertical surface as depicted in details # MHE-120 or MHE-122. Cured EPDM membrane is used to flash over the bars and is continued up the vertical surface to the point of termination.
 3. The minimum height of the flashing on a vertical surface is 8 inches where possible. For recover projects where the existing BUR flashings are left in place, the EPDM membrane flashing must extend above the height of the existing flashings with the termination of the membrane being made directly to the wall or curb surface.
 4. All loose or unsecured existing flashings must be removed. Excessive asphalt should also be removed to provide a smooth surface. Aluminum coated flashings must be removed or covered with an appropriate rigid substrate. New substrate must be sufficiently attached to provide a rigid surface.
 5. Surfaces such as corrugated metal siding, stucco and various other irregular surfaces are not acceptable substrates for adhering vertical flashings. Refer to the Flashing Guidelines section of this Manual for recommendations.

6. Existing through-wall counterflashings, weep holes and overflow scuppers must not be covered by the new EPDM membrane flashings. Termination of the membrane must be below the through-wall counterflashings.
- B. Pipe Flashings.
1. Single pipe penetrations may be flashed with Mule-Hide pre-molded pipe boots where possible. Where a boot cannot be used, Mule-Hide's Uncured Flashing or Uncured Flashing Tape may be used. Pre-molded pipe boots cannot be cut and patched to wrap around a pipe.
 2. For recover applications, existing flashings (including lead) must be removed.
 3. Hot pipes exceeding 180 degrees shall require the installation of an insulated cold collar (sleeve) to which the flashings may be adhered. Cold collars require the use of rain hoods to prevent leakage.
 4. Pitch pans may be required to seal pipe clusters where boots or field fabrication is not possible. Pitch pans may also be required for irregular objects of such a configuration that prevents standard flashing procedures.
- C. Drains and Scuppers
1. For recover applications, all existing flashings (including lead) shall be removed. A smooth tapered transition from the new insulation to the drain housing must be provided. The drain must be clean and free of any asphalt where the clamping ring seats. **Lead flashings must be removed.**
 2. Field seams must not run through the drains. Target patches (4'x 4') are required when field seams intersect drains.
 3. For recover applications, existing scuppers should be removed and replaced with new scuppers.
 4. Cured membrane must be flashed to the vertical surface prior to the installation of new scuppers. New scuppers must have welded watertight corners, be set in Mule-Hide's Water Cut-Off and secured to the wall and deck (or wood nailer) with the appropriate fasteners.
- D. Expansion Joints And Existing Roof Tie-Ins
1. Tie-ins to existing roof systems are not covered by the Mule-Hide Warranties. Tie-ins will vary with the type of existing roof system. Mule-Hide strongly recommends that the new roof system be isolated to the deck surface. Refer to the Mule-Hide Details # MHE-160, MHE-161 & MHE-162.
 2. Whenever there is an expansion joint in the roof deck or walls, an expansion joint must be installed in the roof system when installing a fully adhered system. Refer to the Mule-Hide Standard Details for various flashing procedures.

3.12 Temporary Night Seals

- A. Install temporary cutoffs around incomplete edges of roofing assembly at the end of each day's work and when work must be postponed due to inclement weather.
- B. All loose membrane edges should be sealed with Mule-Hide's Water Cut-Off or Pourable Sealer to prevent water migration under the finished roof sections.
- C. For temporary tie-ins to existing BUR roof systems, remove all gravel, dirt and debris from the tie-in area and make sure all surfaces are clean and dry. Using either the Water Cut-Off or the Pourable Sealer, apply a heavy continuous bead along the length of the tie-in.

- D. Press the membrane into the sealant making sure there is a complete and continuous seal. Apply weight to the edge of the membrane to prevent possible movement by the wind.
- E. Foam Paks may be used as an alternative to the Water Cut-Off or the Pourable Sealer. Follow the instructions given with the Foam Paks.

Note: Mule-Hide does not warrant or guarantee the water tightness of any nightly tie-in. Temporary night seals are the sole responsibility of the roofing contractor.

3.13 Metal Flashings

- A. Metal work by others, such as copings, gravel stops, drip aprons, counterflashings and expansion joint covers must be properly fastened and sealed to prevent moisture from entering the roof system. Refer to the Mule-Hide Standard Details.
- B. Metal work and securement by others is not covered by the Mule-Hide Warranties.
- C. All metal copings, gravel stops and drip aprons must be pre-manufactured systems approved in writing by Mule-Hide prior to job bid date to be included under the Mule-Hide Premium warranty. Mule-Hide must be contacted prior to bid date for recommended manufacturers.

3.14 Walkway Installation

- A. Walkways should be provided in areas where routine rooftop maintenance occurs and in areas where regular rooftop traffic is expected. This should include but is not limited to all roof access points such as doors, hatches and ladders and around rooftop mechanical equipment.
- B. Mule-Hide recommends the use of rubber walk pads as they may be adhered directly to the roof surface. Do not install walk pads over field seams or flashings.
- C. When using masonry paver blocks as walkways, a protection membrane must be installed prior to the pavers. EPDM membrane or polyester slipsheets are acceptable for use as a protection membrane.
- D. Mule-Hide does not include the walk pads under the warranty as they are considered maintenance items and are not part of the roof waterproofing.

End of Section

This specification represents the applicable information available at the time of its publication. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide or check the Mule-Hide website (www.mulehide.com) for the latest updates regarding changes or modifications to this specification.



MULE-HIDE PRODUCTS CO., INC

Fully Adhered Roofing System

SUMMARY SPECIFICATION

EPDM Systems

This Summary Specification is a brief overview of Mule-Hide Product's specification and requirements for a Fully Adhered Mule-Hide EPDM Roofing System and is intended for use as a submittal in a bid package. Specifier's and Mule-Hide Warranty Eligible Contractors must comply with Mule-Hide Product's specifications and requirements prior to design or bid.

Part 1 General

1.01 Description

The Mule-Hide Fully Adhered EPDM Roofing System utilizes a Mule-Hide EPDM membrane in thickness of 45, 60, or 90-mil. Approved insulation is attached to the substrate with either Mule-Hide Insulation fasteners and plates or an approved insulation adhesive, and the EPDM membrane is bonded to the insulation with Bonding Adhesive. The adjoining sheets are overlapped a minimum of 3" and seamed together with tape primer and minimum 3" in-seam tape.

1.02 Quality Assurance

- A. The roofing system must be installed by a Mule-Hide Warranty Eligible Contractor in accordance with installation guidelines and detail drawings as approved by Mule-Hide. Prior written approval from the Mule-Hide Warranty Department is required for all deviations from Mule-Hide's published specifications and details.
- B. Projects requesting a Labor and Material Warranty will be inspected by a Mule-Hide Representative to verify that Mule-Hide's installation and material requirements have been met.
- C. Mule-Hide roofing systems offer a variety of Underwriters Laboratories (UL), Factory Mutual (FM) and other ratings. Consult the appropriate approval guides and Mule-Hide Products for specific code approvals.

1.03 Submittals

- A. To ensure compliance with Mule-Hide's warranty requirements contact the Mule-Hide Warranty Department if any of the following conditions exist.
 1. Specified wind speed warranty greater than 55 MPH.
 2. Building height > 100'
 3. Projects located in coastal or high wind zones.
 4. Pressurized buildings
 5. Cold Storage or Freezer Buildings
 6. Membrane exposed to chemicals

- B. Submit a completed Warranty Application form to Mule-Hide prior to bidding. Also include fastener pullout testing results as required for non-standard substrates.
- C. All projects must have a Mule-Hide warranty application number assigned prior to inspection.

1.04 Product Delivery, Storage, and Handling

- A. Deliver materials to the job site in original, unopened containers, with the manufacturer's name, brand name and installation instructions.
- B. Store all materials in a dry, clean area protected from the elements, as per manufacturer's recommendations.

1.05 Job Conditions

- A. All existing wet or damaged roofing materials must be removed and replaced with new materials.
- B. All existing phenolic insulation and sprayed-in-place urethane roofs must be removed.
- C. The specifier must determine the use and placement of vapor retarders. Consult ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) publications.
- E. Coordinate work between all trades to avoid traffic over completed sections of roofing.

1.06 Warranty.

Fees are required for all Labor and Material (System) Warranties. System Warranties must be obtained through a Mule-Hide Warranty Eligible Applicator. All projects requesting a System Warranty must be inspected by a Mule-Hide Representative. Components of the roofing system must be supplied by Mule-Hide. Warranty covers only Mule-Hide supplied materials. Sample warranties are available upon request. Contact Mule-Hide Warranty Department for warranty requirements.

Part 2 Products

2.01 General

- A. The components of this roofing system are to be manufactured, supplied, or approved in writing by Mule-Hide Products.

2.02 Membrane

Mule-Hide Black 45, 60, or 90-mil thick, Black or White 60-mil EPDM membrane is used for this system. The membrane is available in a variety of widths up to 20' and in lengths of 100'. Refer to our Product Data Sheet for physical properties and other information.

2.03 Related Materials

Mule-Hide products include: Cured and uncured Flashings, Bonding Adhesives, EPDM Lap Sealant, Insulation fasteners and discs, Pourable Sealer, All-Purpose Bar, EPDM Walkway Pad, Universal Single Ply Sealant, and other components.

Part 3 Execution

3.01 General

- A. Work should begin at the highest point of the roof level and proceed to the lowest point. Work should be completed on a daily bases including flashings, terminations, and daily seals.
- B. Prepare the existing roof deck or substrate according to Mule-Hide design guides and full-system specifications prior to applying the new roofing system.

3.02 Roof Deck Criteria

- A. A proper substrate shall be provided by the building owner. The structure shall be able to withstand normal construction loads and live loads.
- B. Substrate must allow for drainage so that all water is removed within 48 hours after a rain.

3.03 Substrate Preparation

- A. Re-cover projects - All wet or damaged materials must be removed and replaced with new materials.
- B. Substrate must be clean, level, and smooth so that the insulation lays flat. Fresh applications of bitumen based roof cement must be removed or covered.

3.04 Installation

Refer to the applicable Product Data Sheets and Material Safety Data Sheets for cautions and warnings.

A. Insulation Attachment

Attach roof insulation with Manufacturer supplied roofing fasteners and plates. Attachment rates and insulation requirements will vary depending upon substrate and desired

wind uplift. Consult Mule-Hide Warranty Department for attachment requirements.

B. Membrane Installation and Seaming

Place membrane over substrate with minimum 3" overlap at lap seams and positioned so that laps will shed water. Allow membrane to relax. After membrane has relaxed, fold membrane back so that half of the underside is exposed. Apply EPDM Bonding Adhesive as per manufacturer's instructions. Fold back the unbonding half of membrane and repeat bonding procedure. Seal all seams with tape primer and minimum 3" in-seam tape.

C. Additional Membrane Securement

The membrane must be secured at the perimeter of each individual roof area, projection, and any angle change that exceeds 2" per lineal foot. Consult Mule-Hide's published detail drawings.

D. Membrane Flashing

All existing base flashings are to be removed. Install new membrane flashings as per manufactures details and guidelines. Flashings must be terminated along top edge as per appropriate Mule-Hide detail.

E. Other Related Work

1. Walkways should be provided in areas where regular rooftop traffic is expected. Walkways are considered a maintenance item and are excluded from the Mule-Hide warranty.
2. Mule-Hide EPDM Pads are to be installed over clean, dry surfaces, with a minimum 6" spacing over field seams. The Walkway Pad is adhered to the field membrane with pre-applied seam tape.
3. Concrete pavers may be used if installed over one layer of HP Protection Mat.
4. Copings, counter flashing and other metal work shall be fastened to resist wind uplift and prevent buckling. Metal should be sealed to prevent moisture infiltration.

This summary specification represents the applicable information available at time of publication. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide Products or visit our website at www.mulehide.com for the latest updates, changes, or modifications to this summary specification.

SECTION 5

MULE-HIDE PRODUCTS CO., INC.

EPDM Mechanically Attached Specification

EPDM Mechanically Attached Summary Specification

***PLEASE CONSULT THE MULE-HIDE WEBSITE FOR THE MOST
CURRENT INFORMATION AT WWW.MULEHIDE.COM***

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MULE-HIDE PRODUCTS CO., INC.
MECHANICALLY ATTACHED EPDM SYSTEM
SPECIFICATION

07 53 00/MUL

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MULE-HIDE PRODUCTS CO., INC.

MECHANICALLY ATTACHED REINFORCED EPDM SYSTEM SPECIFICATION

07530/MUL

PART 1 – GENERAL

1.01 Description

A. Scope:

1. Furnish and install a Mechanically Attached Reinforced EPDM Roofing Membrane with flashings and accessories necessary to comprise a roofing system. The Mule-Hide EPDM products and accessories shall be installed in strict compliance with current specifications and drawings as published by Mule-Hide Products Co., Inc. ("Mule-Hide").
2. The Mule-Hide Mechanically Attached Reinforced EPDM (Ethylene Propylene Diene Monomer) Membrane Roof System utilizes an .045 inch thick reinforced Black or an .060 inch thick Black reinforced EPDM sheet. The EPDM membrane is mechanically attached over an approved insulation or protection sheet to an acceptable substrate with Mule-Hide HD Fasteners and 2.4" Seam Plates. Adjoining sheets are overlapped a minimum of 6 inches and spliced with Mule-Hide 6" wide In-Seam Tape.

B. Related Work:

The work includes, but is not necessarily limited to the installation of:

1. Vapor Retarder (where specified)
2. Wood Blocking (Nailers)
3. Insulation
4. Slip Sheet (where required)
5. Fasteners
6. Roof Membrane
7. Roof Membrane Flashings
8. Metal Flashings
9. Adhesives
10. Sealants
11. Walkways

1.02 Quality Assurance

- A. The Mule-Hide Mechanically Attached Reinforced EPDM Membrane Roofing System shall be installed exclusively by an independent roofing contractor eligible to apply for Mule-Hide warranties when Standard System or Premium System Warranties are requested.
- B. There shall be no deviations from this specification or Mule-Hide's standard details without prior written approval from Mule-Hide's Technical Department.
- C. Upon completion of the installation according to the terms and conditions stated in this specification and in accordance to the information given in the Warranty Application and Pre-Job survey form and any additional approvals which might have been given by Mule-Hide, an authorized representative of Mule-Hide may perform an on-site inspection of the roof to verify that all installation and material requirements have been met.
- D. Mule-Hide reserves the right to reject any roof system and refuse to issue any warranty on roofs which do not comply with Mule-Hide's specifications or current policies.

1.03 Submittals

- A. Prior to the time of bidding, the roofing contractor shall submit to the Owner or Owner's representative the following items:
1. Copies of Mule-Hide specifications and published product data.
 2. Samples of each material to be used in the roof system.
 3. Specimen copy of Mule-Hide Products Co. warranty
 4. Dimensioned shop drawings to include an outline of the roof and appropriate details for flashings and terminations.
 5. Certification from insulation, roofing and accessory components manufacturers that all materials supplied comply with identified ASTM and industry standards.
 6. Verification that system specifications meet all identified code and insurance requirements including but not limited to the following:
 - a. Factory Mutual Research Laboratories
Norwood, MA
 - b. Underwriters Laboratories
Northbrook, IL
- B. Prior to starting the project, the roofing contractor shall submit to Mule-Hide's Technical Department the following items:
1. All project specifications and details where deviations to the Mule-Hide standard specification are requested.
 2. All project specifications where a Premium warranty is required or an extension to the wind coverage is requested.
 3. All information necessary to determine compliance with specified UL or FM requirements.

1.04 Product Delivery, Storage and Handling

- A. All products delivered to the job site shall be in their original unopened containers or wrappings and clearly labeled with the manufacturer's name, product identification and date of manufacture.
- B. Protect all materials from damage during transit, storage and delivery to the job site. Place all materials on pallets and protect from moisture. Materials damaged in handling or storage shall not be used.
- C. Store all materials in a dry, clean area protected from the elements. All adhesive and caulking shall be stored at temperatures between 60°F and 80°F. Materials exposed to lower temperatures affect the workability and performance of the product. Products shall be restored to room temperature prior to use.
- D. All flammable materials shall be stored in a cool, dry area away from open flames and sparks. Follow precautions outlined on containers or supplied by the material manufacturer/supplier.
- E. All materials determined to have been damaged (confirmed by Mule-Hide) are to be replaced.

1.05 Job Conditions

- A. This specification shall not be considered applicable without the appropriate additional specifications approved by Mule-Hide if it should be determined that any of the following conditions exist:
 - 1. If the Mule-Hide Roof System should exceed the structural load conditions as determined by an architect or Engineer.
 - 2. When chemical or hazardous materials are discharged onto the Mule-Hide Roof System.
- B. The General Contractor or the building owner shall be responsible for providing adequate surfaces and structures to receive the insulation, Mule-Hide Roof System and related sheet metal necessary for the successful completion of the project.
- C. Only as much new roofing as can be made watertight each day shall be installed each day. This includes all flashing work.
- D. All substrates to receive new insulation, membrane or flashing shall be thoroughly dry. Should surface moisture occur, the contractor shall provide adequate equipment to dry the substrate prior to application of new materials.
- E. Prior to and during application, all dirt, debris and dust shall be removed from surfaces to be roofed for both new and reroofing substrates.
- F. On all reroof jobs and for all lightweight deck systems, pullout tests shall be performed by the independent roofing contractor, fastener manufacturer or owner's representative to verify the condition of the deck or substrate and to confirm system design pullout values. A minimum of 3 pullout tests for areas up to 50 squares, thereafter 1 test per 100 squares is considered sufficient. Tests should be taken approximately 60% in perimeters and 40% from field areas. Additional tests shall be performed in areas where the integrity of the deck is questionable. A written report of pullout test results shall be submitted to Mule-Hide's Technical Department for review.
- G. Precautions shall be taken to prevent wind blow-off or wind damage during the course of the roofing application. This may necessitate additional securing of temporary construction, materials and equipment.
- H. The contractor shall verify and ensure that all roof drain lines are unblocked before starting work. Any blockages found shall be reported to the owner's representative and Mule-Hide's Technical Department in writing.
- I. Temporary waterstops shall be installed at the end of each day's work. Temporary waterstops shall be removed at the start of the next day's work and disposed of properly. Waterstops shall be compatible with all materials.
- J. Do not install the Mule-Hide EPDM Roofing Membrane in direct contact with any product containing coal tar pitch, creosote or penta-based materials. Consult the Mule-Hide Technical Department for special installation requirements.
- K. Do not allow contaminants such as petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the Mule-Hide EPDM Roofing Membrane. Contact the Mule-Hide Technical Department for recommendations if such conditions exist.

- L. All work shall be scheduled and executed without exposing interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.
- M. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surfaces and equipment movement. Contractor shall provide all necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If excessive traffic over newly installed membrane is necessary, contractor shall provide plywood or polyester felt protection to prevent damage.
- N. All existing roofing materials to be removed for construction shall be immediately removed from the construction site to a dumping area authorized to receive such debris. Follow all laws, regulations and procedures to identify and properly dispose of asbestos materials that are to be torn off.
- O. Any unusual or concealed condition discovered during the course of the work is to be reported to the owner and Mule-Hide immediately in writing. Work is to be halted until the owner has responded with a solution.
- P. All local building codes and requirements should be followed where applicable. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.
- Q. Both interior and exterior building areas affected by construction shall be cleaned up and any damaged areas shall be repaired to the owner's satisfaction.
- R. Certain project conditions may require modifications to this specification. Contact the Mule-Hide Technical Department if any of the following conditions exist:
 - 1. Roof heights greater than 60 feet.
 - 2. Geographical location in wind zone 3, per Factory Mutual's current edition of Loss Prevention Data Sheet 1-28.
 - 3. Geographical location in a 100 mph or greater wind zone, per the ANSI 100 year mean recurrence interval wind isotach.
 - 4. Location with a D exposure as determined in ANSI A58.1
- S. Consideration should be given in the project design to problems that can precipitate from the smooth surface characteristic of the Mule-Hide EPDM membrane. If access is required onto sloped areas when the membrane is wet, walk surfaces may be needed. For northern climates, snow sliding could create a hazard adjacent to the perimeter if a retarding system is not installed above 3 in. per foot slopes.

1.06 Warranties

All Mule-Hide warranties are available for commercial projects. A Roofing Membrane Limited Warranty for a maximum of 10 years is available for residential projects.

A. Mule-Hide's Roofing Membrane Limited Warranty

Mule-Hide offers a 10, 15 or 20-year Roofing Membrane Limited Warranty ("Warranty") for a charge. The Warranty covers only the Mule-Hide EPDM 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 and the appropriate fee must be submitted to Mule-Hide to obtain this warranty. Proof of purchase may be required.

Note: Projects requesting a 20-year Roofing Membrane Limited Warranty require the use of the 60-mil thick reinforced EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Mechanically Attached Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

B. Mule-Hide's Standard System Warranty

Mule-Hide offers a 10, 15 or 20-year Standard System Warranty ("Standard") for commercial projects for a charge. The Standard warranty is a "No Dollar Limit", labor and material warranty that covers the Mule-Hide labeled membrane and other components supplied by Mule-Hide installed by a Mule-Hide Warranty Eligible Applicator. The Standard warranty does not cover insulation or its attachment system. Metal flashing components are not covered under this warranty. A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Standard warranties require inspections by a Mule-Hide representative.

Note: Projects requesting a 20-year Standard System Warranty require the use of the 60-mil thick reinforced EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Mechanically Attached Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

C. Mule-Hide Premium System Warranty

Mule-Hide offers a 10, 15 or 20-year Premium System Warranty ("Premium") for commercial projects for a charge. The Premium warranty is a "No Dollar Limit", labor and material warranty that covers the Mule-Hide labeled membrane, insulation, other components supplied by Mule-Hide and approved products (such as metal flashing, insulation adhesive or other pre-approved accessories) installed by a Mule-Hide Warranty Eligible Applicator. A Mule-Hide Warranty Eligible Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Premium warranties require inspections by a Mule-Hide representative.

Note: Projects requesting a 20-year Premium System Warranty require the use of the 60-mil thick reinforced EPDM membrane and shall incorporate additional design enhancements as outlined in the 20-year Design Enhancements for EPDM Mechanically Attached Roofing System Specification. Mule-Hide recommends that Warranty Applications be submitted for review prior to bidding the project.

- D. Standard and Premium System warranties are not available for residential projects.
- E. EPDM tie-ins to built-up (BUR) or any other type of roof system are not covered by Mule-Hide warranties.
- F. Contact Mule-Hide for other extended warranties that may be available.
- G. Terms and Conditions of Warranties

Mule-Hide's obligations under the Roofing Membrane Limited Warranty, the Standard System Warranty, and the Premium System Warranty are limited to the specific terms and conditions of the respective Warranties. Sample copies of the Mule-Hide Warranties are available from Mule-Hide upon request.

PART 2 - PRODUCTS

2.01 General

- A. The components of the Mechanically Attached Reinforced Mule-Hide EPDM Membrane Roof System are to be products manufactured or supplied by Mule-Hide Products Co. as specified in the contract documents.

- B. Mule-Hide reinforced EPDM is available in black only. The membrane is manufactured in accordance to the guidelines of the RMA (Rubber Manufacturers Association) and meets all government specifications for EPDM.

2.02 Roofing Membrane

- A. Mule-Hide reinforced EPDM membrane is available for use with a Mechanically Attached System in standard widths of 7 or 10 feet and lengths of 100 feet.
- B. Mule-Hide's Reinforced EPDM Membrane meet or exceeds the following ASTM D 4637 Standard Specification:
- D. Refer to the Product Data Sheets for the Standard and FR Reinforced EPDM membranes for physical properties and additional information.

2.03 Accessory Materials

The following Mule-Hide materials must be used to install Mule-Hide Roof Systems. Mule-Hide will not warrant any application where another manufacturer's product is substituted for a Mule-Hide product. **All products listed below are physically and chemically compatible with each other.**

- A. Mule-Hide Splice Adhesive - a black or white solvent based, synthetic rubber based (butyl) product designed for splicing EPDM roof membranes and uncured EPDM Flashings.
- B. Mule-Hide Bonding Adhesive (solvent based) -an amber colored synthetic rubber based (neoprene) adhesive designed to bond EPDM membranes to approved insulation boards, metal, concrete, wood and other approved decking materials.
- C. Mule-Hide Water Base Adhesive - a non-flammable and non-toxic acrylic latex-based adhesive designed to bond EPDM membranes to approved insulation boards, wood, concrete and other approved decking materials. For horizontal surfaces only (not to exceed inclines greater than per foot).
- D. Mule-Hide In-Seam Tape - a cured butyl rubber tape designed to adhere EPDM membrane seams in conjunction with Mule-Hide's Tape Primer.
- E. Mule-Hide Tape Primer - a cleaner specifically formulated to clean and prime EPDM membrane surfaces to be bonded with splice adhesives, In-Seam Tapes or Cured and Uncured EPDM Laminates.
- F. Mule-Hide Seam Cleaner - a black or clear solvent based cleaner used to clean and prep the EPDM membrane prior to the application of the Mule-Hide Splice Adhesive.
- G. Mule-Hide Uncured EPDM Flashing - an uncured EPDM membrane (.060 inches thick) to be used in conjunction with the Mule-Hide EPDM Roof Systems. Uncured EPDM flashing is easily formed and used to flash pipes, inside and outside corners and various other penetrations that require a moldable product.
- H. Mule-Hide Uncured Laminated Flashing Tape - an uncured EPDM membrane laminated to cured butyl tape. Used to flash pipes, inside and outside corners, "T-joints" and various other penetrations that require a moldable product. Flashing tape is used in conjunction with the Mule-Hide Tape Primer. Mule-Hide Uncured Laminated Flashing Tapes shall **not** be used for stripping seams, gravel stops, drip aprons or batten bars.
- I. Mule-Hide RMS Strips - 6 inch wide, cured, reinforced EPDM strips used as a base attachment around curbs and walls to mechanically attach the EPDM field sheet.
- J. Mule-Hide Cured Laminated Cover Tape - a cured EPDM membrane laminated to cured butyl tape used as a cover tape to flash gravel stop and drip apron, in conjunction with the Mule-Hide Tape Primer.

- K. Mule-Hide Lap Sealant - a one part, black or white elastomeric caulk designed for sealing the exposed edge of field fabricated membrane laps.
- L. Mule-Hide Water Cut-Off - a butyl based, one-component mastic designed specifically for sealing roofing membranes to wood, metal, concrete, plastic and other substrates.
- M. Mule-Hide Pourable Sealer - a two-component, liquid (100% solids) polyurethane elastomer used as a filler for pitch pockets.
- N. Mule-Hide Pipe Boots - an economical pre-molded EPDM flashing designed for flashing single pipe penetrations.
- O. Mule-Hide All Purpose Bar - a specially extruded aluminum bar, .050" thick x 1" wide x 10' long, that may be used as an anchor bar, batten bar or as a termination bar.
- P. Mule-Hide Fasteners - Factory Mutual approved # 14 heavy duty and # 12 drill point fasteners used for fastening insulation and Mule-Hide All Purpose Bars to roof decks, curbs and walls.
- Q. Mule-Hide 2.4" Seam Plates - Factory Mutual approved round Galvalume plates with reinforcing ribs used in conjunction with the Mule-Hide HD Fasteners to attach the reinforced membrane and RMS strips.
- R. Mule-Hide Plates - Factory Mutual approved 3" round (26 gauge) Galvalume plates with reinforcing ribs used in conjunction with Mule-Hide Fasteners to attach insulation to roof decks.
- S. Mule-Hide Insulation - The Mule-Hide Poly ISO 2 polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core laminated to heavy, black (non-asphaltic) glass fiber reinforced felt facers.

2.04 Related Materials By Others

- A. Wood Nailers
 - 1. Mule-Hide recommends wood nailers to be # 2 or better lumber and pressure treated for rot resistance (wolmanized or osmose treated). Creosote and asphaltic preservatives and preservatives containing pentachlorophenol, copper naphthenate or copper 8-quinolinolate are not acceptable.
 - 2. Wood nailers shall be installed in compliance with the recommended options as listed in the Factory Mutual Loss Prevention Data Bulletin 1-49. Methods of attachment (size of fasteners and spacing) are determined by deck type and wind zone requirements. Pull tests may be required prior to the installation of wood nailers to determine the appropriate type of fastener. Refer to the Fastener Guidelines section of this manual for recommended attachment options.
 - 3. Wood Nailers shall be installed as specified on the project drawings and shall be of a height sufficient to match the thickness of the insulation being used. Wood nailers are required for the attachment of drip aprons, gravel stops and certain expansion joints. Wood nailers may be required for metal scuppers, pitch pockets and certain types of curbs.
 - 4. All wood nailers shall be attached to withstand a minimum force of 200 lbs in any direction. All nailers shall have a minimum of 2 fasteners per board.
- B. Vapor Retarders
 - 1. Vapor retarders shall meet specified codes and insurance requirements.

2. Vapor retarders shall be compatible with insulation and other accessories.
3. The use and placement of a vapor retarder should be determined by an architect or engineer. Mule-Hide does not require the use of vapor retarders. However, Mule-Hide recommends that a vapor retarder be considered when both of two conditions are anticipated:
 - a. The outside average January temperature is below 40°F, and
 - b. The expected interior winter relative humidity is 45% or greater.
4. Mule-Hide must be contacted for buildings that are refrigerated (freezers or cold storage) or have a high interior humidity such as, but not limited to, swimming pools, produce storage or locker rooms.

C. Insulation

1. Insulation shall be installed as a protection layer over the existing substrate or to obtain a desired thermal value.
2. Insulation shall be compatible with the Mule-Hide EPDM Membranes, Mule-Hide Adhesives, Mule-Hide EPDM Flashings and other Mule-Hide Accessories.
3. The following generic insulations are acceptable for use in a Mule-Hide Mechanically Attached Reinforced EPDM Roofing System when a standard warranty is requested:
 - a. Polyisocyanurate insulations having nonasphaltic facers meeting or exceeding the physical property requirements of Fed. Spec. HH-I-1972 and having a minimum compressive resistance of 18 psi. Thickness minimum is 1 inch or greater as required by the insulation manufacturer to span the flutes of a metal deck.
 - b. High density wood fiberboard must be used as an overlay when expanded or extruded polystyrene is specified. High density wood fiberboard may be used as an overlay over an existing roof system (recover application). The minimum thickness is ½ inch.
 - c. Expanded Polystyrene insulation must be a minimum of 1" thick and certified by the manufacturer to have a minimum density of 1.00 lb. Refer to the insulation manufacturer's minimum requirements for installation over a fluted steel deck. Review the Insulation Guidelines section of this manual for specific applications and restrictions. **Requires minimum ½ inch high density wood fiberboard as an overlay.**
 - d. Extruded Polystyrene must be a minimum of 3/4" thick (½" min. over smooth surfaced BUR). Refer to the Insulation Guidelines section of this manual for specific applications and restrictions. **Requires minimum ½ inch high density wood fiberboard as an overlay.**
 - e. State and local building codes should be reviewed regarding the installation of expanded or extruded polystyrene insulation directly over a steel deck.
4. Mule-Hide Premium Warranties require the use of the Mule-Hide Poly ISO 2 insulation. Use of other insulations shall disqualify the project for consideration of the issuance of a Premium warranty. Contact the Mule-Hide Technical Department for specific requirements. Premium warranties are not available for recover applications without an independent moisture survey.

- D. Sheet Metal
 - 1. Sheet metal components such as gravel stops, drip aprons, counterflashings, copings, etc., must be fabricated and installed in accordance with the SMACNA recommendations and requirements.
 - 2. Sheet metal components supplied by others are not covered by the Mule-Hide warranties. Contact Mule-Hide's Technical Department for specific requirements.

2.05 Precautions

- A. Consult Material Safety Data Sheets and container labels for specific safety instructions prior to use.
- B. Avoid breathing vapors of solvents, cleaners, primers, sealants and adhesives. Use with adequate ventilation. Avoid prolonged contact of solvents, sealants, cleaners, primers and adhesives with skin. Solvent resistant rubber gloves should always be worn during use.
- C. Do not use Mule-Hide EPDM roofing products near fire or flame. Do not use open flames for drying of surfaces, sealants or adhesives. **Do not smoke near flammable products.**
- D. Do not use oil-based paint on EPDM membranes. Contact Mule-Hide's Technical Department for recommendations for compatible color coatings.
- E. Do not allow muriatic acid (masonry cleaner) to come in direct contact with the Mule-Hide EPDM membranes, flashings or accessories.
- F. Do not allow Mule-Hide EPDM membranes or accessories to come into direct contact with steam or vents that produce temperatures in excess of 180°F (82°C).
- G. The Mule-Hide EPDM Roof System may be installed in cold weather provided the adhesives are stored at room temperature until just prior to use and used within 2 hours. Adhesives left in the cold must be returned to room temperature prior to use.
- H. Cover Tapes, Flashing Tapes and In-Seam Tapes may loose tack when exposed to temperatures below 40°F. for extended periods of time. A heat gun may be used to warm the product. Only apply heat to the EPDM side or in the case of In-Seam Tapes, apply heat to the kraft paper side. Be careful not to over heat. Hot boxes are the preferred method to warm tapes.
- I. In cold temperatures when the ambient temperature is near the dew point, condensation may form on the seam cleaner, tape primer and adhesive as the solvents flash off. If condensation occurs, discontinue the application and allow the surface to dry. **Do not attempt to dry the surface with heat guns or torches.** When weather permits apply a new coat of product.

PART 3 - EXECUTION

3.01 General

When installing a Mule-Hide Mechanically Attached Reinforced EPDM Roofing System in cooler weather, it is recommended that liquids such as solvents, sealants, etc. be stored at temperatures of 60° F. or more until just prior to use in order to facilitate the installation.

3.02 Substrate Conditions

The following general conditions apply to the substrate that will receive a Mule-Hide Mechanically Attached Reinforced EPDM Membrane Roofing System for recover, reroof and new construction:

- A. The roof deck must be structurally sound and free of defects to provide proper securement for mechanical fasteners. Areas showing a loss of integrity due to corrosion, rotting, warping, concrete spalling, etc., must be repaired or replaced prior to installing the roofing system. The roofing contractor shall make an inspection of the deck prior to starting the roof installation, and if there is no general contractor, the roofing contractor shall be responsible for correcting any defects.
- B. It is imperative that the roofing contractor performs test cuts at each roof area prior to recover applications. The condition of the substrate must be suitable to receive a Mule-Hide Mechanically Attached Reinforced EPDM Membrane Roofing System. Wet insulation must be removed and replaced.
- C. A determination must be made regarding the presence or absence of coal tar pitch within the existing roof assembly. The presence of coal tar pitch may restrict the use of certain insulations. Extruded and expanded polystyrene insulations must not be installed directly over a coal tar pitch roof. Contact the Mule-Hide Technical Department for specific recommendations.
- D. Contact the material manufacturer when the substrate is exposed to excessively high humidity, low temperature or a corrosive environment. Special fasteners (i.e. stainless steel), vapor retarders or details may be required.
- E. Fastener pullout tests are strongly recommended to determine the suitability of a roof deck.
- F. It is acceptable to install a Mule-Hide Mechanically Attached Reinforced EPDM Membrane Roofing System over the following deck substrates provided that an acceptable insulation is installed over the substrate as required:
 - 1. Structural Metal Deck (22 gauge minimum) shall conform to recommendations outlined in Factory Mutual's Loss Prevention Data Sheet 1-28. Steel decks require the installation of the Mule-Hide Poly ISO 2 insulation or other approved insulation. The minimum acceptable pullout value is 360 lbs.
 - 2. Structural Concrete, pre-cast and pre-stressed concrete (3,000 p.s.i. minimum) shall be cured and dry to industry standards and surface shall be smooth, clean and free of moisture or frost. The minimum acceptable pullout value is 360 lbs.
 - 3. Wood plank (1" minimum) shall conform to Factory Mutual's requirements for Class I impregnated decks. The minimum acceptable pullout value is 360 lbs.
 - 4. Plywood (15/32" minimum) - See the Mule-Hide specification manual for specific attachment patterns. The minimum acceptable pullout value is 360 lbs.
 - 5. Cementitious Fiber Substrates (Tectum, etc), Lightweight Concrete and Gypsum Decks may be acceptable after pullout tests have been completed and appropriate fasteners and attachment patterns/densities have been determined. The minimum acceptable pullout value is 300 lbs. These decks require special fasteners. Contact Mule-Hide's Technical Department for recommendations.

3.03 Preparation Of Existing Substrate

- A. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges and debris. Inspect substrates and correct defects before application of roofing membrane. Specifier or roofing contractor shall determine the condition of the existing roof deck and roofing system. Areas with deteriorated decking or wet insulation or other failed materials shall have those affected materials removed and replaced. Make sure all decking is securely fastened. The roofing contractor has the final responsibility to ensure an acceptable deck is provided to receive the new roof system.

- B. Significant ponding that remains after a period of 48 hours should be eliminated by either installing tapered insulation to create positive drainage of the roof surface or by installing new drains in the low areas where the ponding remains. Positive drainage shall also eliminate the possibility of excessive live loads caused by ponding water that could cause structural damage or failure.
- C. Ponded water, snow or ice shall be removed before installing the Mule-Hide Mechanically Attached Reinforced EPDM Roofing System. Do not roof over moisture in any form.
- D. Recover Projects
 - 1. When installing a new roof system over an existing gravel surfaced built-up roof, all loose gravel must be removed to prevent moisture entrapment. Insulation must always be used as a protection course for the EPDM membrane.
 - 2. When installing a new roof system over an existing single-ply roof system, the existing roof membrane must be cut up into maximum 10' x 10' sections to prevent entrapment of water between the two roof systems.
 - 3. Sprayed in place urethane foam roof systems are not acceptable substrates for Mule-Hide Single-Ply roofing systems and must be removed.
 - 4. Existing smooth surfaced built-up roof systems and mineral surfaced modified or built-up roof systems must have an acceptable insulation prior to installing the Mule-Hide Mechanically Attached Reinforced Roofing System.
 - 5. If a Mule-Hide Premium warranty is requested, the existing roof system **must be removed to the deck** prior to the installation of the new roofing system or a moisture survey must be taken, all wet areas removed and a copy of the survey submitted to Mule-Hide with the warranty application.

3.04 Vapor Retarder

- A. Specific climate and job conditions may require the use of a vapor retarder. It is the sole responsibility of the design professional to determine the need for a vapor retarder, its type and location in the roofing system.
- B. The roofing contractor must follow the recommended installation procedures of the respective vapor retarder manufacturer and the project specifier's instructions for the type of vapor retarder specified for the project.

3.05 Wood Nailers

- A. Nailers shall be firmly anchored to the decks at a maximum 2'-0" o.c. and shall resist a pullout force of 200 lbs./linear foot in any direction. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.
- B. Refer to the Fastener Guidelines section in this manual for the type of fastener to be used with each type of deck and the maximum spacing requirement.
- C. Wood nailers shall be installed as specified by the project specifier and shall be in compliance with the Mule-Hide Standard Details.
- D. The thickness of the wood nailer shall be determined so that the top of the nailer is flush with the top of the surface of the insulation.
- E. Wood nailers installed along the perimeter of a roof surface, where a drip apron or gravel stop shall be installed, shall have a width that is wider than the metal flange to be installed.
- F. Where pitch pans or scuppers are to be installed over wood nailers, the wood nailers must be wider than the metal flanges.

3.06 Insulation Installation

- A. Insulation shall be secured to the roof deck in accordance with Mule-Hide's requirements utilizing Mule-Hide fasteners and plates. When installing insulation, the end joints of each row of insulation shall be offset against the previous row. When more than one layer of insulation is to be used, succeeding layers are to be laid staggered in relation to the previous layer of insulation and all joints shall be offset.
- B. Insulation installed over steel decks shall be checked so that no edges are left unsupported along the flutes. All insulations shall be of sufficient thickness and density to prevent breakage under normal roof construction traffic.
- C. Insulation other than Mule-Hide's Poly ISO 2 must be an FM approved insulation and acceptable to Mule-Hide for use under the Mule-Hide Mechanically Attached Reinforced EPDM Roofing System.
- D. Determine the insulation fastening patterns that will be used for the perimeter, corners and field of the roof. This information may be found in the Insulation Guidelines section of this manual.
- E. Refer to the insulation manufacturers' guidelines for the appropriate type, size and thickness of the insulation needed for use over the respective substrate and under the Mule-Hide Mechanically Attached Reinforced EPDM Roofing System.
- F. Insulation shall be cut to fit snugly around or against all protrusions, nailers, drains, pipes and walls. All gaps greater than 1/4" wide shall be filled with the same material.
- G. Do not install any more insulation than can be covered by the membrane by the end of the working day and made watertight.
- H. As an alternate method of attachment to a structural concrete deck, hot mopping of the insulation (maximum 4'x 4' sheets) or the use of Insta-Stick is acceptable. The asphalt (Type III or Type IV) must be applied over primed concrete at a minimum rate of 25 lbs per square. The insulation must be set in a full mopping (100%). Strip or spot mopping is not acceptable. Insta-Stick must be installed in compliance with the recommendations of the manufacturer, Insta-Foam, Inc.
- I. Crickets and saddles may be installed beneath the specified insulation where possible. Crickets and saddles made from non-compatible insulations or materials must be overlaid with an acceptable insulation or underlayment. Crickets and saddles, with slopes greater than 2" per foot, installed against walls or curbs shall be fully adhered with Mule-Hide Bonding Adhesive or Single Seal Adhesive with mechanical attachment at each angle change.
- J. When Factory Mutual uplift requirements (FM 1-60 or 1-90) are required, contact the Mule-Hide Technical Department for appropriate attachment patterns and quantities per board size.
- K. Only FM approved fasteners and plates may be used to attach the insulation. When a Mule-Hide Premium Warranty is requested, only Mule-Hide labeled fasteners and plates may be used to attach the insulation and the only acceptable insulation shall be the Mule-Hide Poly ISO 2.

3.07 Membrane Installation

- A. Mule-Hide's Mechanically Attached Reinforced EPDM Roofing System utilizes sheets 7' or 10' wide and lengths of 100'. Either .045 or .060 inch thick sheets may be used. Mule-Hide's 2.4" seam plates are installed in the center of each seam and attached with Mule-Hide (HD) heavy duty fasteners.

- B. Unroll the Mule-Hide EPDM Membrane and position without stretching. Sheets may be moved into final position by encapsulating air under the membrane and floating it into place. Allow the membrane to relax at least 30 minutes prior to securing the sheet with fasteners. Inspect and remove any damaged membrane. Lap sheets a minimum of 6" to allow for a proper field splice. Membrane overlaps shall be shingled with the flow of water. Membrane should run perpendicular to the direction of steel deck flutes and orientation of wood decks where possible.
- C. After carefully positioning several sheets of the EPDM membrane, smooth out the sheets to remove any wrinkles. The minimum seam lap is 6 inches.
- D. Mule-Hide requires the installation of perimeter sheets to be installed parallel to each exterior roof edge/wall. Refer to section 3.08 of this specification.
- E. Mule-Hide's 2.4" Seam Plates shall be installed (centered) 3 inches in from the edge of the sheet. This will center the plates in the seam. Refer to Mule-Hide Detail # MHE-112.
- F. Using Mule-Hide Heavy Duty fasteners, fasten the 2.4" Seam Plates at a maximum spacing of 12" o.c. starting at one end of the seam and working toward the other end.
- G. All seams shall be spliced following the procedures in section 3.09 of this specification.
- H. Wrinkles that transmit through the seams must be cut out and patched using cured sheet.
- I. The roof membrane shall extend up the vertical surface a minimum of 1" and shall turn down over the edge of the roof a minimum of 2" or as required by the Mule-Hide details.

3.08 Perimeter Sheet Installation

- A. Mule-Hide requires the installation of perimeter sheets installed (picture frame) parallel to each roof edge/wall.
- B. When buildings are insured by FM, the requirements for perimeter areas are defined as 4/10ths the height or 1/10th of the lesser plan dimension, whichever is less. Mule-Hide's minimum perimeter width is 7 feet. Mule-Hide's standard requirement is 2 half rolls along each exterior wall and 1 half roll along all interior walls.
- C. Please note that if the perimeter per FM requirements is narrower than the Mule-Hide minimum perimeter requirement, the additional width to satisfy the Mule-Hide requirements must be followed.
- D. All building corners are to be "L" shaped areas. When figuring the corner "legs", if the length or width is less than the perimeter width, the "thickness" of the corner areas shall be the same as the perimeter width. Calculations for corner "legs" shall be 10% of the length of the building and 10% of the width of the building.
- E. Half rolls may be made by cutting full rolls in half lengthwise (minimum of 2 half rolls required) or a full roll (7' or 10' wide) may be used with an additional RMS strip installed under the center of the full perimeter sheet. The RMS strips must be installed in a picture frame parallel to the roof edge.
- F. All half rolls/perimeter sheets shall be fastened in the seams with the same spacing as that of the field sheet. Contact Mule-Hide's Technical Department for attachment spacing and sheet sizes when compliance with FM 1-60 or 1-90 testing is specified.

3.09 Splicing Of Lap Areas

- A. Splicing seams with Mule-Hide Splice Adhesive

1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 6" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Seam Cleaner using clean cotton rags. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags must be replaced with clean ones as they become dirty. The cleaned membrane should have a uniform black color when dry. There should be no streaks present.
 - a. Mule-Hide Black Seam Cleaner must be used with the black EPDM membranes.
 - b. Mule-Hide Clear Seam Cleaner must be used with the White-on-Black EPDM membranes.
 - c. Mule-Hide Tape Primer may be used as a substitute for either the Black or Clear Seam Cleaner. Review the section (3.09.B.) on Tape installation for cleaning procedures to be followed when using the Mule-Hide Tape Primer.
4. Seam Cleaners, Tape Primer and Splice Adhesives must be thoroughly stirred prior to application. Be sure to scrape the sides and bottom of the cans while stirring.
5. Apply the Splice Adhesive to the cleaned surfaces of both sheets. Mule-Hide recommends the use of a solvent resistant, 3" - 4" wide, short bristle paint brush or a solvent resistant 3" wide, 1/2" medium nap, paint roller.
6. Apply the adhesive in a uniformly thick even coat. When using a paintbrush do not use a circular motion. Use long, straight strokes applying sufficient adhesive that will achieve a smooth surface without leaving brush marks. When using a roller do not over roll the adhesive as this will cause an uneven application.
7. Do not allow the adhesive to puddle or leave globs as these areas will not dry properly and may cause excessive swelling of the membrane which will result in fishmouths in the finished seam.
8. Adhesive must be applied to both surfaces of the seam at the same time to allow for uniform drying of the adhesive. The adhesive must fully cover the surface of the splice areas a minimum of 6" wide. All seams with 2.4" seam plates must be a minimum of 6" wide. All field sheet end laps must be a minimum of 6" wide.
9. Allow the adhesive to dry until tacky to the touch of a dry finger without stringing or sticking to the finger and does not move when pushed forward or the finger is twisted.

Note: Drying time (also referred to as Flash Off time) will vary from day to day depending on the ambient weather conditions. In colder weather, condensation may form on the surface of the adhesive that is caused by the solvent flashing off. If this occurs, the application of the Splice Adhesive should be discontinued. The surface must be allowed to dry and a thin coat of adhesive must be applied over the existing adhesive.

10. Roll the top sheet onto the bottom sheet being careful not to stretch or wrinkle the membrane. Apply hand pressure brushing from the inside of the sheet outward to the edge removing air and fishmouths.
11. Using a 2" wide steel roller, apply positive pressure rolling from the inside of the seam working out over the edge of the sheet perpendicular to the direction of the seam. The entire seam must be rolled in this manner. A J.R. Seamer Power Roller may be used in place of the 2" steel roller.
12. All "T-joint" laps in the field membrane shall be reinforced with a 6" piece of uncured EPDM membrane (uncured flashing tape may also be used) centered over the intersection of the edges of the seams. All "T-joint" patches shall be caulked with Lap Sealant.
13. Field seams and flashings should be allowed to set for several hours prior to the application of Lap Sealant. At the latest, Lap Sealant should be applied to all seam edges at the end of the workday and before any moisture has a chance to form on the membrane.
14. Just prior to applying the Lap Sealant, the seam and flashing edges shall be cleaned with a clean rag or cloth using the Mule-Hide Seam Cleaner to remove any dirt or talc that may remain along the seam edge. Be sure that all edges of the splice have been covered with a continuous bead of Lap Sealant. It is not necessary to trowel (screed) the caulk. The Lap Sealant shall be applied at a maximum rate of 20 linear feet per tube.

B. Splicing seams with Mule-Hide In-Seam Tapes

Note: The following procedure shall only pertain to the seaming of flashings, end laps or other seams that shall not contain fasteners. Mechanically attached field seams must be spliced with Mule-Hide Splice Adhesive.

1. Make sure that the top sheet is lapped over the bottom sheet in shingle fashion so that the water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 6" and fold back the top sheet approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the cleaned areas with Mule-Hide Tape Primer using clean cotton rags or Scotch-Brite® pads. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Rags and Scotch-Brite® pads must be replaced with clean ones as they become dirty. The primed membrane should have a uniform black color when dry. There should be no streaks present. The Mule-Hide Tape Primer shall be thoroughly stirred prior to use.
4. Roll the top sheet back over the bottom sheet and mark the bottom sheet to allow for proper placement of the In-Seam Tape. Mark the bottom sheet along the edge of the top sheet, but 1/2" away from the sheet, as a guide for the installation of the In-Seam Tape. Do not use a chalk line or any type of marker that will prevent the seam tape from sticking.
5. Fold the top sheet back. Approximately 1/8" to 3/8" of In-Seam Tape should be exposed along the completed seam. Unroll 2 or 3 feet of the In-Seam Tape leaving the release liner in place. Align the In-Seam Tape so that the edge of the release liner is touching the guideline. Do not install the tape over the line. Leaving the release paper in place, install the In-Seam Tape along the marks on the bottom sheet. Roll the tape with a 2" steel roller along the entire length of the seam.

The roller must run perpendicular to the tape with overlapping strokes. If more than one piece (roll) of tape is required to complete a seam, the second piece of tape must overlap the first a minimum of 1 inch.

6. All end laps shall be seamed with 6" wide In-Seam Tape. Where In-Seam Tapes intersect at the corner of a sheet, the tapes must overlap a minimum of 1 inch.
 7. Fold the top sheet back onto the tape so that the sheet is laying over the release paper. Peel the release paper off the tape at a 45° angle and parallel with the roof allowing the top sheet to fall freely onto the exposed tape. Press the seam together using hand pressure and wiping toward the splice edge. Immediately roll the seam with a 2 inch wide steel roller, using positive pressure, toward the edge of the seam. The interior (along the interior side of the bar) release paper must be removed first.
 8. Wait a minimum of 2 hours prior to application of the Lap Sealant. The Lap Sealant is only required at intersections with factory seams, where two pieces of tape overlap within the seam and on patches installed over "T-joints". A bead of Lap Sealant should be applied along the overlap for 6" in each direction from the center point of the overlap.
- C. Regardless of the method used to splice the seams, all seams must be thoroughly inspected for fishmouths, bubbles, blisters and wrinkles and repaired as necessary.
1. If fishmouths or wrinkles occur through the seam, they must be cut out and patched with cured membrane (cured cover tape may be used).
 2. Patch with cured EPDM membrane or Cured Cover Tape (do not use uncured flashing or flashing tape) that is at least 3 inches larger in all directions than the area that has been cut out. Round the corners of the patch.
 3. Center the patch over the area to be repaired. Follow the splicing procedures for the appropriate material used.

3.10 Membrane Securement (Mechanical)

- A. Additional securement of the EPDM membrane by mechanical attachment must be provided at the perimeter of each roof level, base of walls, curbs, skylights, expansion joints, tie-ins, interior walls, bottom of valleys and top of ridges of sloped roofs, angle changes that exceed inclines of 2" or greater per foot and various penetrations as shown in the Mule-Hide Standard Details. All securement must be either horizontally to the roof deck or vertically to the base of the various penetrations as shown in the Mule-Hide Standard Details.
- B. The mechanical attachment of the membrane may be achieved by the following methods:
1. Mule-Hide All Purpose Bar
 - a. The Mule-Hide All Purpose Bar is a specially extruded aluminum bar that has pre-punched holes 6 inches on center. The bar may be placed either horizontally or vertically depending on the detail followed. Refer to the Mule-Hide Standard Details for the proper placement of the bar.
 - b. The maximum spacing of the fasteners shall not exceed 12 inches on center. Adjoining bars should be spaced approximately ½ inch to 1 inch apart. All cut bars must be attached at the ends a maximum of 1 inch from the end of each bar. This may require pre-drilling additional holes. All cut bars shall be deburred.

- c. Under no circumstances shall the All Purpose Bar be stripped with 6 inch uncured flashing or uncured flashing tape. Mule-Hide allows only the use of Cured Cover Tape or cured field sheet to strip over the All Purpose Bar.
 - d. The All Purpose Bar must be installed a minimum of 3 inches to a maximum of 6 inches from inside and outside corners.
2. Mule-Hide RMS (Reinforced Membrane Strip) attachment strip
- a. The RMS is a 6" wide reinforced strip of EPDM membrane that may be installed at the base of walls and curbs. Mule-Hide 2.4 inch Seam Plates are used to attach the RMS either horizontally or vertically with appropriate fasteners. Refer to Mule-Hide Details # MHE-124 and MHE-125 for appropriate placement of the RMS, plates and fasteners. The RMS is installed prior to the placement of the field sheet.
 - b. Follow the standard procedures for cleaning and splicing the RMS and field sheet. Only the Mule-Hide Black Seam Cleaner and Mule-Hide Black Splice Adhesive may be used to seam the RMS to the field sheet. Bonding Adhesive and Single Seal Adhesive are **not permitted** for use with the RMS attachment strips. Lap sealant is not required. The RMS is also available as a pre-taped product. Use Mule-Hide Tape Primer to prepare the membrane when installing the pre-taped RMS.
 - c. Spacing of the fasteners shall not exceed 12 inches on center. Adjoining RMS strips shall be spaced a maximum of 1 inch apart. It is not required to overlap the RMS.
 - d. For vertical attachment, the RMS membrane must extend a minimum of 3 inches onto the horizontal surface (roof substrate). Refer to Mule-Hide Detail # MHE-124. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.
 - e. For horizontal attachment, the membrane must be placed a maximum of ½ inch from the base of the angle change extending out onto the horizontal surface (roof substrate). The 2.4 inch Seam Plates must be placed a minimum of ½ inch to a maximum of 1 inch from the exterior edge of the strip. Refer to Mule-Hide Detail # MHE-125. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.
3. Mule-Hide 2.4" Seam Plates
- a. The Mule-Hide 2.4" Seam Plates may be used at the base of walls, parapets, curbs and other various penetrations. Maximum spacing of the 2.4" Seam Plates shall not exceed 12" o.c.
 - b. For horizontal attachment refer to Detail # MHE-123. For vertical attachment refer to detail # MHE-121.
4. Drip Apron and Gravel Stop
- a. For drip aprons and gravel stops, the metal flange shall extend a minimum of 3 inches onto the wood nailer. The wood nailer must be wider than the metal flange. Approved screw fasteners shall be installed a maximum of 6 inches on center and ½" to ¾" from the inside edge of the metal flange. Ring shank nails spaced and staggered a maximum of 4" on center may also be used.

- b. All drip aprons and gravel stops shall be primed with Mule-Hide's Tape Primer and stripped with Mule-Hide's Cured Cover Tape. Cleaning the metal with a solvent such as toluene or xylene to remove oil film may be required prior to installing and priming with the Mule-Hide Tape Primer.
- c. The edge of the Cured Cover Tape overlapping the metal flange shall be caulked with Lap Sealant. For those areas where water flows over the drip apron, both sides of the Cured Cover Tape must be caulked.

3.11 Flashing Installation

All walls, parapets, curbs and penetrations shall be flashed with cured EPDM membrane where possible. The use of uncured EPDM flashing or Uncured Flashing Tape shall be limited to those areas such as corners, pipes, scuppers, patches over "T-joints", patches at the base of all vertical field seams (at the angle change) and other shaped penetrations that require the flashing to be molded and cured product is not practical. All flashing shall be performed in accordance with Mule-Hide's Standard Details. Additional information may be found in the Flashing Guideline section of this manual.

Note: Mule-Hide's Water Base Adhesive is not permitted for use on vertical surfaces.

- A. Vertical Wall, Curb and Skylight Flashings.
 1. Cured EPDM membrane should be used to flash all vertical surfaces except when flashing inside and outside corners or other details that require the flashing to be molded.
 2. There are three basic methods of flashing vertical surfaces. Each method is dependent on the mechanical base attachment used.
 - a. When using the RMS strip as the mechanical attachment, the field sheet may be continued up the vertical surface to the point of termination.
 - b. When using the All Purpose Bar as the mechanical attachment, the field sheet is turned up the vertical surface as depicted in details # MHE-120 or MHE-122. Cured EPDM membrane is used to flash over the bars and is continued up the vertical surface to the point of termination.
 - c. When using 2.4" Seam Plates as the mechanical attachment, refer to Details # MHE-121 and MHE-123. Cured EPDM membrane is used to flash over the plates and is continued up the wall to the point of termination.
 3. The minimum height of the flashing on a vertical surface is 8 inches where possible. For recover projects where the existing BUR flashings are left in place, the EPDM membrane flashing must extend above the height of the existing flashings with the termination of the membrane being made directly to the wall or curb surface.
 4. All loose or unsecured existing flashings must be removed. Excessive asphalt should also be removed to provide a smooth surface. Aluminum coated flashings must be removed or covered with an appropriate rigid substrate. New substrate must be sufficiently attached to provide a rigid surface.
 5. Surfaces such as corrugated metal siding, stucco and various other irregular surfaces are not acceptable substrates for adhering vertical flashings. Refer to the Flashing Guidelines section of this manual for recommendations.
 6. Existing through-wall counterflashings, weep holes and overflow scuppers must not be covered by the new EPDM membrane flashings. Termination of the membrane must be below the through-wall counterflashings.

7. Mule-Hide Bonding Adhesive must be used to bond the EPDM membrane (flashing) to all vertical substrates.
 8. Mule-Hide Bonding Adhesive is not permitted to bond EPDM to EPDM. Splice Adhesive must be used.
- B. Pipe Flashings
1. Single pipe penetrations may be flashed with Mule-Hide pre-molded pipe boots where possible. Where a boot cannot be used, Mule-Hide's Uncured Flashing or Uncured Flashing Tape may be used. Pre-molded pipe boots cannot be cut and patched to wrap around a pipe.
 2. For recover applications, existing flashings (including lead) must be removed.
 3. Hot pipes exceeding 180 degrees shall require the installation of an insulated cold collar (sleeve) to which the flashings may be adhered. Cold collars require the use of rain hoods to prevent leakage.
 4. Pitch pans may be required to seal pipe clusters where boots or field fabrication is not possible. Pitch pans may also be required for irregular objects of such a configuration that prevents standard flashing procedures.
- C. Drains and Scuppers
1. For recover applications, all existing flashings (including lead) shall be removed. A smooth tapered transition from the new insulation to the drain housing must be provided. The drain must be clean and free of any asphalt where the clamping ring seats. **Lead flashings must be removed.**
 2. Field seams must not run through the drains. Target patches (4'x 4') are required when field seams intersect drains.
 3. For recover applications, existing scuppers should be removed and replaced with new scuppers.
 4. Cured membrane must be flashed to the vertical surface prior to the installation of new scuppers. New scuppers must have welded watertight corners, be set in Mule-Hide's Water Cut-Off and secured to the wall and deck (or wood nailer) with the appropriate fasteners.
- D. Expansion Joints And Existing Roof Tie-Ins
1. Tie-ins to existing roof systems are not covered by the Mule-Hide Warranties. Tie-ins will vary with the type of existing roof system. Mule-Hide strongly recommends that the new roof system be isolated to the deck surface. Refer to the Mule-Hide Details # MHE-160, MHE-161 & MHE-162.
 2. Whenever there is an expansion joint in the roof deck or walls, an expansion joint must be installed in the roof system. Refer to the Mule-Hide Standard Details for various flashing procedures.

3.12 Temporary Night Seals

- A. Install temporary cutoffs around incomplete edges of roofing assembly at the end of each day's work and when work must be postponed due to inclement weather.
- B. All loose membrane edges should be sealed with Mule-Hide's Water Cut-Off or Pourable Sealer to prevent water migration under the finished roof sections.

- C. For temporary tie-ins to existing BUR roof systems, remove all gravel, dirt and debris from the tie-in area and make sure all surfaces are clean and dry. Using either the Water Cut-Off or the Pourable Sealer, apply a heavy continuous bead along the length of the tie-in.
- D. Press the membrane into the sealant making sure there is a complete and continuous seal. Apply weight to the edge of the membrane to prevent possible movement by the wind.
- E. Foam Paks may be used as an alternative to the Water Cut-Off or the Pourable Sealer. Follow the instructions given with the Foam Paks.

Note: Mule-Hide does not warrant or guarantee the water tightness of any nightly tie-in. Temporary night seals are the sole responsibility of the roofing contractor.

3.13 Metal Flashings

- A. Metal work by others, such as copings, gravel stops, drip aprons, counterflashings and expansion joint covers must be properly fastened and sealed to prevent moisture from entering the roof system. Refer to the Mule-Hide Standard Details.
- B. Metal work and securement by others is not covered by the Mule-Hide Warranties.
- C. All metal copings, gravel stops and drip aprons must be pre-manufactured systems approved in writing by Mule-Hide prior to job bid date to be included under the Mule-Hide Premium warranty. Mule-Hide must be contacted prior to bid date for recommended manufacturers.

3.14 Walkway Installation

- A. Walkways should be provided in areas where routine rooftop maintenance occurs and in areas where regular rooftop traffic is expected. This should include but is not limited to all roof access points such as doors, hatches and ladders and around rooftop mechanical equipment.
- B. Mule-Hide recommends the use of rubber walk pads as they may be adhered directly to the roof surface. Do not install walk pads over field seams or flashings.
- C. When using masonry paver blocks as walkways, a protection membrane must be installed prior to the pavers. EPDM membrane or polyester slipsheets are acceptable for use as a protection membrane.
- D. Mule-Hide does not include the walk pads under the warranty as they are considered maintenance items and are not part of the roof waterproofing.

End of Section

This specification represents the applicable information available at the time of its publication. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide or check the Mule-Hide website (www.mulehide.com) for the latest updates regarding changes or modifications to this specification.



MULE-HIDE PRODUCTS CO., INC

Mechanically Attached Roofing System

SUMMARY SPECIFICATION

EPDM Systems

This Summary Specification is a brief overview of Mule-Hide Product's specification and requirements for a Mechanically Attached Mule-Hide Reinforced EPDM Roofing System and is intended for use as a submittal in a bid package. Specifier's and Mule-Hide Warranty Eligible Contractors must comply with Mule-Hide Product's specifications and requirements prior to design or bid.

Part 1 General

1.01 Description

The Mule-Hide Mechanically Attached Reinforced EPDM Roofing System utilizes a (maximum) 10' wide, reinforced Mule-Hide EPDM membrane in thickness of 45, 60 or 75-mil. Approved insulation is attached to the substrate with either Mule-Hide Insulation fasteners and plates or an approved insulation adhesive, and the EPDM membrane is attached to the substrate with System Fasteners and Plates. Adjoining sheets are overlapped approximately 6" and seamed together with tape primer and 6" in-seam tape.

1.02 Quality Assurance

- A. The roofing system must be installed by a Mule-Hide Warranty Eligible Contractor in accordance with installation guidelines and detail drawings as approved by Mule-Hide. Prior written approval from the Mule-Hide Warranty Department is required for all deviations from Mule-Hide's published specifications and details.
- B. Projects requesting a Labor and Material Warranty will be inspected by a Mule-Hide Representative to verify that Mule-Hide's installation and material requirements have been met.
- C. Mule-Hide roofing systems offer a variety of Underwriters Laboratories (UL), Factory Mutual (FM) and other ratings. Consult the appropriate approval guides and Mule-Hide Products for specific code approvals.

1.03 Submittals

- A. To ensure compliance with Mule-Hide's warranty requirements contact the Mule-Hide Warranty Department if any of the following conditions exist.
 1. Specified wind speed warranty greater than 55 MPH.
 2. Building height > 50'
 3. Projects located in coastal or high wind zones.
 4. Pressurized buildings

- 5. Cold Storage or Freezer Buildings
- 6. Membrane exposed to chemicals

- B. Submit a completed Warranty Application form to Mule-Hide prior to bidding. Also include fastener pullout testing results as required for non-standard substrates.
- C. All projects must have a Mule-Hide warranty application number assigned prior to inspection.

1.04 Product Delivery, Storage, and Handling

- A. Deliver materials to the job site in original, unopened containers, with the manufacturer's name, brand name and installation instructions.
- B. Store all materials in a dry, clean area protected from the elements, as per manufacturer's recommendations.

1.05 Job Conditions

- A. All existing wet or damaged roofing materials must be removed and replaced with new mat'ls.
- B. All existing phenolic insulation and sprayed-in-place urethane roofs must be removed.
- C. The specifier must determine the use and placement of vapor retarders. Consult ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) publications.
- E. Coordinate work between all trades to avoid traffic over completed sections of roofing.

1.06 Warranty.

Fees are required for all Labor and Material (System) Warranties. System Warranties must be obtained through a Mule-Hide Warranty Eligible Applicator. All projects requesting a System Warranty must be inspected by a Mule-Hide Representative. Components of the roofing system must be supplied by Mule-Hide. Warranty covers only Mule-Hide supplied materials. Sample warranties are available upon request. Contact Mule-Hide Warranty Department for warranty requirements.

Part 2 Products

2.01 General

The components of this roofing system are to be manufactured, supplied, or approved in writing by Mule-Hide Products.

2.02 Membrane

Mule-Hide White reinforced 45, 60 or 75-mil thick EPDM membrane is used for this system. The membrane is available in widths up to 10' and in lengths of up to 100'. Refer to our Product Data Sheet for physical properties and other information.

2.03 Related Materials

Mule-Hide products include: Cured and uncured Flashings, Bonding Adhesives, EPDM Lap Sealant, Membrane fasteners and discs, Pourable Sealer, All-Purpose Bar, EPDM Walkway Pads, Universal Single Ply Sealant, and other components.

Part 3 Execution

3.01 General

- A. Work should begin at the highest point of the roof level and proceed to the lowest point. Work should be completed on a daily bases including flashings, terminations, and daily seals.
- B. Prepare the existing roof deck or substrate according to Mule-Hide design guides and full-system specifications prior to applying the new roofing system.

3.02 Roof Deck Criteria

- A. A proper substrate shall be provided by the building owner. The structure shall be able to withstand normal construction loads and live loads.
- B. Substrate must allow for drainage so that all water is removed within 48 hours after a rain.

3.03 Substrate Preparation

- A. Re-cover projects - All wet or damaged materials must be removed and replaced with new materials.
- B. Substrate must be clean, level, and smooth so that the insulation lays flat. Fresh applications of bitumen based roof cement must be removed or covered.

3.04 Installation

Refer to the applicable Product Data Sheets and Material Safety Data Sheets for cautions and warnings.

A. Insulation Attachment

Attach roof insulation with Manufacturer supplied roofing fasteners and plates. Attachment rates will vary depending upon type and size of insulation board installed. Consult

Mule-Hide Warranty Department for attachment requirements.

B. Membrane Installation and Seaming

Place membrane over substrate with minimum 6" overlap at lap seams and positioned so that laps will shed water. Allow membrane to relax. After membrane has relaxed, fold membrane back to expose underlying sheet. Install System Fasteners and Plates along seam edge. Sheet width, as well as spacing of Fasteners and plates will vary depending upon wind uplift requirements. Fold sheet back and seam with tape primer and 6" in-seam tape. Consult Mule-Hide Warranty Department for attachment requirements.

C. Additional Membrane Securement

The membrane must be secured at the perimeter of each individual roof area, projection, and any angle change that exceeds 2" per lineal foot. Consult Mule-Hide's published detail drawings.

D. Membrane Flashing

All existing base flashings are to be removed. Install new membrane flashings as per manufactures details and guidelines. Flashings must be terminated along top edge as per appropriate Mule-Hide detail.

E. Other Related Work

1. Walkways should be provided in areas where regular rooftop traffic is expected. Walkways are considered a maintenance item and are excluded from the Mule-Hide warranty.
2. Mule-Hide EPDM Pads are to be installed over clean, dry surfaces, with a minimum 6" spacing over field seams. The Walkway Pad is adhered to the field membrane with pre-applied seam tape.
3. Concrete pavers may be used if installed over one layer of HP Protection Mat.
4. Copings, counter flashing and other metal work shall be fastened to resist wind uplift and prevent buckling. Metal should be sealed to prevent moisture infiltration.

This summary specification represents the applicable information available at time of publication. Mule-Hide reserves the right to change this information at any time. Contact Mule-Hide Products or visit our website at www.mulehide.com for the latest updates, changes, or modifications to this summary specification.

SECTION 6

MULE-HIDE PRODUCTS CO., INC. 20 YEAR WARRANTY SPECIFICATION ENHANCEMENTS

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20 Yr. Premium Fully Adhered EPDM Warranty System Enhancements

20 Yr. Premium Mechanically Attached EPDM Warranty System Enhancements

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

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MULE-HIDE PRODUCTS CO., INC
20-Year Warranty Design Enhancements
For Ballasted EPDM
Roofing System Specification

EPDM 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 50' in height or less.

Membrane / Adhesive Type / Other

1. 0.060" thick Mule-Hide EPDM: Standard Black, White-on-Black, or Reinforced Black Membranes.
2. Field seams:
 - 6" In-Seam Tape & Primer
 - 3" Pre-Taped EPDM & Primer
 - 3" In-Seam Tape & Primer with 6" Cured Cover Tape
3. RMS and Tape Primer must be used at base of all parapet walls
4. All 'T' joints overlaid with EPDM uncured flashing tape.
5. Inside and outside corners are to be double flashed.

Deck Type

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 roof slope of 2:12

Construction Type

1. New Construction
2. Reroof - with full tear-off
3. Recover - all wet materials removed and verification by a Independent 3rd party moisture scan

Insulation/Overlayment*

Insulation Type or Overlay
Approved Polyisocyanurate - Min 1" thick - Min 20 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.
20-Year Warranty Design Enhancements
For Ballasted EPDM

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, or 4" x 4" sections of Mule-Hide Walkway Pads.
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 Mule-Hide Metal Accessories or pre-manufactured as per approved details.
2. Mule-Hide All Purpose Bar is required when a compression bar termination is specified and must be utilized in conjunction with counterflashing.
3. Mule-Hide Metal Accessories or the Metal-Era Anchor-Tite System must be used when the sheet metal is to be included under the warranty.
4. Conventional metal edge details that require flanges to be 'stripped in' must be overlaid with Cured Cover Tape.
5. All Metal Scuppers must have welded (soldered) seams.

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 Factory Mutual (FM) or Underwriters Laboratory (UL).
4. Rubber walkway pads can not be used within 10' of the roof perimeter for buildings exceeding 50' in height.

Warranty Wind Speed (Maximum Peak Gusts)

Wind speed coverage for a specific project will vary depending on a variety of factors, including the deck type, location, height of the roof, and edge details.

Contact Mule-Hide Technical Department for specific requirements.

NOTES:

1. **These are enhancements to the Mule-Hide EPDM Ballasted System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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
20-Year Warranty Design Enhancements
For Fully Adhered EPDM
Roofing System Specification

EPDM 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.

Membrane / Adhesive Type / Other

1. 0.060" thick Mule-Hide EPDM: Standard Black, White-on-Black, or Reinforced Black Membranes.
2. Field seams:
 - 6" In-Seam Tape & Primer
 - 3" Pre-Taped EPDM & Primer
 - 3" In-Seam Tape & Primer with 6" Cured Cover Tape
3. RMS and Tape Primer must be used at base of all parapet walls
4. All 'T' joints overlaid with EPDM uncured flashing tape.
5. Inside and outside corners are to be double flashed.

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

Standard Roof Deck (4)	Insulation Fastener (1)	Insulation Plate
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" Galvalume Insulation Plate by Tru-Fast

NOTES:

1. Heavier gauge fasteners may be required for Factory Mutual, code, or wind warranties.
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 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 and verification by a Independent 3rd party moisture scan

Insulation/Overlayment - Mechanical Attachment*

Insulation Type or Overlay	Fasteners per 4' x 8' board		
	Field	Perimeter	Corner
Approved Polyisocyanurate - Min 2" thick (top layer) - Min 20 psi	8	12	16
Approved Polyisocyanurate - Min 1.5" up to 2" thick - Min 20 psi	12	18	24
StructoDek HD Fiberboard with Primed Red Coating - Min 1/2" thick- Installed as an overlay or recover board	16	24	32
Dens Deck Prime or Securock - Min 1/4" - Installed as an overlay or recover board	12	18	24
OSB - Min 7/16" thick - Installed as an overlay	17	25	32

MULE-HIDE PRODUCTS CO., INC.
20-Year Warranty Design Enhancements
For Fully Adhered EPDM

***NOTES:**

1. InsulFoam and InsulFoam R-Tech insulation is approved for warranty but it must be installed with an approved overlay board.
2. Thicknesses stated are for single layer of material.
3. Consult Specification Manual for list of approved insulations for use under overlayment.
4. Polyisocyanurate less than 1.5" and InsulFoam expanded polystyrene must have approved overlayment.
5. Insulation fastening density shall not be less than 1 per 2 square feet on fibrous cement and gypsum decks. 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. Weather-Tite One-Step by Millenium or Insta-Stik by Dow Chemical Company - 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 prior to bidding.

Metal Accessories

1. All Metal copings, gravel stops, fascia, and drip aprons must be Mule-Hide Metal Accessories or pre-manufactured as per approved details.
2. Mule-Hide All Purpose Bar is required when a compression bar termination is specified and must be utilized in conjunction with counterflashing.
3. Mule-Hide Metal Accessories or the Metal-Era Anchor-Tite System must be used when the sheet metal is to be included under the warranty.
4. Conventional metal edge details that require flanges to be 'stripped in' must be overlaid with Cured Cover Tape.
5. All metal scuppers must have welded (soldered) seams.

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 Factory Mutual (FM) or Underwriters Laboratory (UL).

Warranty Wind Speed (Maximum Peak Gusts)

Wind speed coverage for a specific project will vary depending on a variety of factors, including the deck type, fastening density, location, height of the roof, and edge details.

Contact Mule-Hide Technical Department for specific requirements.

NOTES:

1. These are enhancements to the Mule-Hide EPDM Fully Adhered System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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.



MULE-HIDE PRODUCTS CO., INC
20-Year Warranty Design Enhancements
For Mechanically Attached EPDM
Roofing System Specification

EPDM 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 50' in height and does not include buildings within 20 miles of hurricane coastlines.

Membrane / Adhesive Type / Other

1. 0.060" thick Mule-Hide EPDM Reinforced Membrane
2. Field seams: 6" In-Seam Tape & Primer
3. RMS and Tape Primer must be used at base of all parapet walls.
4. All 'T' joints overlaid with EPDM uncured flashing tape.
5. Inside and outside corner details must be double flashed.

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

	Max Sheet Width	Max Fastener Spacing	Fastener (1)	Seam Plate (1)
Standard Roof Deck (3)				
Steel - Min 22 ga. or Wood Deck - Min 1"	8'	12" OC	HD-14	2.0"
	10'	6" OC	HD-14	2.0"
Plywood - Min 15/32"	8'	6" OC	HD-14	2.0"
Structural Concrete - Min 3,000 psi	10'	6" OC	HD-14 (2)	2.0"

Notes:

1. Heavier fasteners and/or plates may be required for Factory Mutual, code, or wind warranties.
2. Other fasteners may be considered, submit request to Mule-Hide prior to bidding.
3. Contact Mule-Hide Technical Department for non-standard roof decks.

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 and verification by a Independent 3rd party moisture scan

Insulation/Overlayment - Mechanical Attachment*

Insulation Type or Overlay	Board Size	
	4' x 4'	4' x 8'
Approved Polyisocyanurate - Min 1.5" thick (top layer) - Min 20 psi	4	6
HD Fiberboard - Min 1/2" thick- Installed over Approved Insulation	4	8
Dens Deck Prime - Min 1/4" thick - Installed over Approved Insulation	4	8

***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.
5. An approved insulation adhesive may be used with prior approval.

MULE-HIDE PRODUCTS CO., INC
20 - Year Warranty Design Enhancements
For Mechanically Attached EPDM
Roofing System Specification

Metal Accessories

1. All Metal copings, gravel stops, fascia, and drip aprons must be Mule-Hide Metal Accessories or pre-manufactured as per approved details.
2. Mule-Hide All Purpose Bar is required when a compression bar termination is specified and must be utilized in conjunction with counterflashing.
3. Mule-Hide Metal Accessories or the Metal-Era Anchor-Tite System must be used when the sheet metal is to be included under the warranty.
4. Conventional metal edge details that require flanges to be 'stripped in' must be overlaid with Cured Cover Tape.
5. All metal scuppers must have welded (soldered) seams.

Other Requirements

1. No 'As-Built'. 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 Factory Mutual (FM) or Underwriters Laboratory (UL).

Warranty Wind Speed (Maximum Peak Gusts)

Wind speed coverage for a specific project will vary depending on the deck type, fastening density, location and height of the roof. Certain codes may require additional fastening requirements.

Contact Mule-Hide Technical Department for specific requirements such as sheet width and fastener spacing.

NOTES:

1. **These are enhancements to the Mule-Hide EPDM Mechanically Attached System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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
20-Year Premium Warranty Design Enhancements
For Ballasted EPDM
Roofing System Specification

EPDM 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 50' in height or less.

Membrane / Adhesive Type / Other

1. 0.060" thick Mule-Hide EPDM: Standard Black, White-on-Black, or Reinforced Black Membranes.
2. Field seams:
 - 6" In-Seam Tape & Primer
 - 3" Pre-Taped EPDM & Primer
 - 3" In-Seam Tape & Primer with 6" Cured Cover Tape
3. RMS and Tape Primer must be used at base of all parapet walls
4. All 'T' joints overlaid with EPDM uncured flashing tape.
5. Inside and outside corners are to be double flashed.

Deck Type

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 roof slope of 2:12

Construction Type

1. New Construction
2. Reroof - with full tear-off
3. Recover - all wet materials removed and verification by a Independent 3rd party moisture scan

Insulation/Overlayment*

Insulation Type or Overlay
Mule-Hide Polyisocyanurate - Min 1" thick - Min 20 psi
HD Fiberboard - Min 1/2" thick- Installed over Mule-Hide Polyisocyanurate

***NOTES:**

1. Thicknesses stated are for single layer of material.
2. Premium Warranty requires the use of Mule-Hide Polyisocyanurate insulation.
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.

MULE-HIDE PRODUCTS CO., INC.
20-Year Premium Warranty Design Enhancements
For Ballasted EPDM

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, or 4" x 4" sections of Mule-Hide Walkway Pads.
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 Mule-Hide Metal Accessories or pre-manufactured as per approved details.
2. Mule-Hide All Purpose Bar is required when a compression bar termination is specified and must be utilized in conjunction with counterflashing.
3. Mule-Hide Metal Accessories or the Metal-Era Anchor-Tite System must be used when the sheet metal is to be included under the warranty.
4. Conventional metal edge details that require flanges to be 'stripped in' must be overlaid with Cured Cover Tape.
5. All Metal Scuppers must have welded (soldered) seams.

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 Factory Mutual (FM) or Underwriters Laboratory (UL).
4. Rubber walkway pads can not be used within 10' of the roof perimeter for buildings exceeding 50' in height.

Warranty Wind Speed (Maximum Peak Gusts)

Wind speed coverage for a specific project will vary depending on a variety of factors, including the deck type, location, height of the roof, and edge details.

Contact Mule-Hide Technical Department for specific requirements.

NOTES:

1. These are enhancements to the Mule-Hide EPDM Ballasted System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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
 20-Year **Premium** Warranty Design Enhancements
 For Fully Adhered EPDM
 Roofing System Specification

EPDM 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.

Membrane / Adhesive Type / Other

1. 0.060" thick Mule-Hide EPDM: Standard Black, White-on-Black, or Reinforced Black Membranes.
2. Field seams:
 - 6" In-Seam Tape & Primer
 - 3" Pre-Taped EPDM & Primer
 - 3" In-Seam Tape & Primer with 6" Cured Cover Tape
3. RMS and Tape Primer must be used at base of all parapet walls
4. All 'T' joints overlaid with EPDM uncured flashing tape.
5. Inside and outside corners are to be double flashed.

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

Standard Roof Deck (4)	Insulation Fastener (1)	Insulation Plate
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" Galvalume Insulation Plate by Tru-Fast

NOTES:

1. Heavier gauge fasteners may be required for Factory Mutual, code, or wind warranties.
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 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 and verification by a Independent 3rd party moisture scan

Insulation/Overlayment - Mechanical Attachment*

Insulation Type or Overlay	Fasteners per 4' x 8' board		
	Field	Perimeter	Corner
Mule-Hide Polyisocyanurate - Min 2" thick (top layer) - Min 20 psi	8	12	16
Mule-Hide Polyisocyanurate - Min 1.5" up to 2" thick - Min 20 psi	12	18	24
StructoDek HD Fiberboard with Primed Red Coating - Min 1/2" thick- Installed as an overlay or recover board	16	24	32
Dens Deck Prime or Securock - Min 1/4" - Installed as an overlay or recover board	12	18	24
OSB - Min 7/16" thick - Installed as an overlay	17	25	32

MULE-HIDE PRODUCTS CO., INC.
20-Year Warranty Design Enhancements
For Fully Adhered EPDM

***NOTES:**

1. InsulFoam and InsulFoam R-Tech insulation is approved for warranty but it must be installed with an approved overlay board.
2. Thicknesses stated are for single layer of material.
3. Consult Specification Manual for list of approved insulations for use under overlayment.
4. Polyisocyanurate less than 1.5" and InsulFoam expanded polystyrene must have approved overlayment.
5. Premium Warranty requires the use of Mule-Hide Polyisocyanurate insulation.
6. Insulation fastening density shall not be less than 1 per 2 square feet on fibrous cement and gypsum decks. Certain codes may require additional fastening requirements.
7. Mule-Hide defines perimeter areas as a minimum of 8 feet. Corners areas are the intersections of the perimeter areas.
8. 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. Weather-Tite One-Step by Millenium or Insta-Stik by Dow Chemical Company - 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 prior to bidding.

Metal Accessories

1. All Metal copings, gravel stops, fascia, and drip aprons must be Mule-Hide Metal Accessories or pre-manufactured as per approved details.
2. Mule-Hide All Purpose Bar is required when a compression bar termination is specified and must be utilized in conjunction with counterflashing.
3. Mule-Hide Metal Accessories or the Metal-Era Anchor-Tite System must be used when the sheet metal is to be included under the warranty.
4. Conventional metal edge details that require flanges to be 'stripped in' must be overlaid with Cured Cover Tape.
5. All metal scuppers must have welded (soldered) seams.

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 Factory Mutual (FM) or Underwriters Laboratory (UL).

Warranty Wind Speed (Maximum Peak Gusts)

Wind speed coverage for a specific project will vary depending on a variety of factors, including the deck type, fastening density, location, height of the roof, and edge details.

Contact Mule-Hide Technical Department for specific requirements.

NOTES:

1. **These are enhancements to the Mule-Hide EPDM Fully Adhered System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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.**



MULE-HIDE PRODUCTS CO., INC
20-Year Premium Warranty Design Enhancements
For Mechanically Attached EPDM
Roofing System Specification

EPDM 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 50' in height and does not include buildings within 20 miles of hurricane coastlines.

Membrane / Adhesive Type / Other

1. 0.060" thick Mule-Hide EPDM Reinforced Membrane
2. Field seams: 6" In-Seam Tape & Primer
3. RMS and Tape Primer must be used at base of all parapet walls.
4. All 'T' joints overlaid with EPDM uncured flashing tape.
5. Inside and outside corners must be double flashed.

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

	Max Sheet Width	Max Fastener Spacing	Fastener (1)	Seam Plate (1)
Standard Roof Deck (3)				
Steel - Min 22 ga. or Wood Deck - Min 1"	8'	12" OC	HD-14	2.0"
	10'	6" OC	HD-14	2.0"
Plywood - Min 15/32"	8'	6" OC	HD-14	2.0"
Structural Concrete - Min 3,000 psi	10'	6" OC	HD-14 (2)	2.0"

Notes:

1. Heavier fasteners and/or plates may be required for Factory Mutual, code, or wind warranties.
2. Other fasteners may be considered, submit request to Mule-Hide prior to bidding.
3. Contact Mule-Hide Technical Department for non-standard roof decks.

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 and verification by a Independent 3rd party moisture scan

Insulation/Overlayment - Mechanical Attachment*

Insulation Type or Overlay	Board Size	
	4' x 4'	4' x 8'
Mule-Hide Polyisocyanurate - Min 1.5" thick (top layer) - Min 20 psi	4	6
HD Fiberboard - Min 1/2" thick- Installed over Mule-Hide Polyisocyanurate	4	8
Dens Deck Prime - Min 1/4" thick - Installed over Mule-Hide Polyisocyanurate	4	8

***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. Premium warranties require the use of Mule-Hide Polyisocyanurate roof insulation
5. Certain codes may require additional fastening requirements.
5. An approved insulation adhesive may be used with prior approval.

MULE-HIDE PRODUCTS CO., INC
20 - Year Premium Warranty Design Enhancements
For Mechanically Attached EPDM
Roofing System Specification

Metal Accessories

1. All Metal copings, gravel stops, fascia, and drip aprons must be Mule-Hide Metal Accessories or pre-manufactured as per approved details.
2. Mule-Hide All Purpose Bar is required when a compression bar termination is specified and must be utilized in conjunction with counterflashing.
3. Mule-Hide Metal Accessories or the Metal-Era Anchor-Tite System must be used when the sheet metal is to be included under the warranty.
4. Conventional metal edge details that require flanges to be 'stripped in' must be overlaid with Cured Cover Tape.
5. All metal scuppers must have welded (soldered) seams.

Other Requirements

1. No 'As-Built'. 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 Factory Mutual (FM) or Underwriters Laboratory (UL).

Warranty Wind Speed (Maximum Peak Gusts)

Wind speed coverage for a specific project will vary depending on the deck type, fastening density, location and height of the roof. Certain codes may require additional fastening requirements.

Contact Mule-Hide Technical Department for specific requirements.

NOTES:

1. **These are enhancements to the Mule-Hide EPDM Mechanically Attached System Specification, as written in the Mule-Hide EPDM Specification Manual. Refer to Mule-Hide EPDM 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.**

SECTION 7

MULE-HIDE PRODUCTS CO., INC.

EPDM
Technical Bulletins

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Bulletin	Title
07-1001	Attaching flashings to pre-painted metal
07-1003	Pactiv GreenGuard Roof Insulation
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07-1301	Mule-Hide Edge Metal
07-1302	InsulFoam Insulation
07-1303	Blue Ridge Structodek HD (with red primer)
07-1304	Revised LTTR Values (2014 change)

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

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Technical Bulletin

No. 1001

Attaching flashings to pre-painted metal

June 16, 2010

Most pre-finished metal surfaces are very slick and difficult to adhere to. The best results are obtained when the top (mating) surface of the pre-painted metal is abraded or scuffed up. This can be accomplished using a hand drill with a wire wheel, or by using steel wool.

The proper steps for bonding to pre-finished metal are as follows:

1. Verify that the metal is properly secured in place.
2. Abrade or scuff up the area to be bonded. *Caution* - Do not abrade the metal surface beyond the area to be bonded. Leaving abraded surfaces exposed to the elements may result in premature aging.
3. Prime the surface to be bonded (Tape primers for Single-Ply membranes, ASTM D-41 Asphalt primer for SAMB membranes and asphalt products).
4. Bond the membrane to the primed surface following an approved Mule-Hide Detail.

Please visit our website at www.mulehide.com or contact Mule-Hide Products at (608) 365-3111 for questions or additional information.

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T e c h n i c a l B u l l e t i n

No. 1003

Use of Pactiv GreenGuard Roof Insulation In Mule-Hide Roofing Systems

October 22, 2010

Pactiv offers several roof insulations that may be used in Mule-Hide roofing systems. The Pactiv insulation is an extruded polystyrene product and care must be taken when using this material over coal tar pitch. The following is a brief summary of how these insulations may be utilized in a Mule-Hide system.

Insulation

Sizes

PB6 Series	Supplied as fanfold bundles, 4' x 50', 3/8" thick
PB38 Series	Supplied as 4' x 8' sheets, 3/8" thick

Warranties – Pactiv insulations may be used for Standard 10, 15, or 20 year warranties when following our guidelines and Pactiv recommendations. (Not for use with Mule-Hide Premium Warranties)

Ballasted Systems

Membrane	Insulation	Installation
EPDM TPO	PB6, PB6FA or PB6FA90	Loosely laid in place*
	PB38, PB38FA or PB38FA90	
PVC	NONE	Ballasting not permitted

*Note: Insulation may be spot attached with adhesive to facilitate installation. Mechanical attachment of insulation is not allowed under a ballasted system.

Mechanically Attached Systems

Membrane	Insulation	Attachment (Min fasteners required) ⁽⁴⁾
TPO ⁽¹⁾ (Light Colored)	PB6, PB6FA or PB6FA90	2 per 2' x 4' panel – FM pattern - Fig 2
	PB38, PB38FA or PB38FA90	4 per 4' x 8' board – FM pattern – Fig 1
EPDM ⁽²⁾ (Dark Colored)	PB6, PB6FA or PB6FA90	3 per 2' x 4' panel – FM pattern – Fig 4
	PB38, PB38FA or PB38FA90	8 per 4' x 8' board – FM pattern – Fig 3
PVC ⁽³⁾ (Light Colored)	PB6W	2 per 2' x 4' panel – FM pattern - Fig 2

(1) TPO (White, Tan, Gray)

(2) Reinforced EPDM

(3) PVC (White, Tan, Gray)

(4) See fastening patterns attached to this Tech Bulletin.

Fully Adhered Systems

Pactiv FA and FA90 products have a special facer that allows certain membranes to be adhered to them.

Insulation	Uplift ⁽⁵⁾ (MDP)	Insulation Attachment			
		Field	Perimeter	Corner	Detail ⁽⁶⁾
PB6FA – fanfold	FM 1-60	4 per 2' x 4'	6 per 2' x 4'	8 per 2' x 4'	Fig 5
PB38FA – 4' x 8'	(-30 psf)	16 per 4' x 8'	24 per 4' x 8'	32 per 4' x 8'	MHFM-216
PB6FA90 - fanfold	FM 1-90	3 per 2' x 4'	5 per 2' x 4'	8 per 2' x 4'	Fig 6
PB38FA90 – 4' x 8'	(-45 psf)	12 per 4' x 8'	18 per 4' x 8'	32 per 4' x 8'	MHFM-212

(5) The maximum attainable wind classification under the ANSI/FM 4474 Appendix C test procedure. ANSI/FM 4474, associated FM Loss Prevention Data Sheets and building codes require a 2 to 1 margin of safety be applied to the windstorm classification for comparison to roof cladding design pressures. The maximum design pressures associated with these assemblies are:

FM 1-90 = -45 psf (maximum design pressure)

FM 1-60 = -30 psf (maximum design pressure)

(6) See fastening patterns attached to this Tech Bulletin.

Membrane	Adhesives
EPDM	Solvent Based Bonding Adhesive Low VOC Bonding Adhesive (Not for use with Acrylic Water Based Bonding Adhesive) ⁽⁷⁾
TPO	TPO Bonding Adhesive Low VOC Bonding Adhesive (Not for use with WBBA-2000 Adhesive) ⁽⁷⁾
PVC	Not approved at this time

(7) These adhesives have not been tested with Pactiv Insulation.

Follow GreenGuard application instructions, available at www.green-guard.com

Always check with local code bodies to ensure that this assembly meets local building code requirements. Not for use in high wind uplift areas. Contact Mule-Hide Technical Department for additional information.

Any information given on this Technical Bulletin is subject to change without notice. Please visit our website at www.mulehide.com or contact Mule-Hide Products at (608) 365-3111 for questions or additional information.

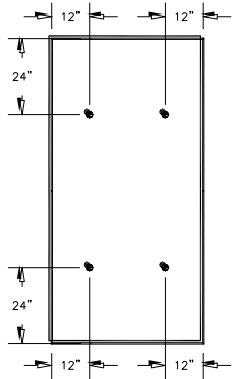


FIGURE 1
4' X 8' INSULATION BOARDS

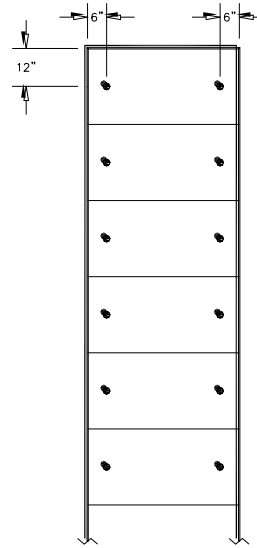


FIGURE 2
4' X 50' FANFOLD INSULATION

FASTENING PATTERN FOR GREENGARD® ROOFING RECOVERY BOARDS USED UNDER MECHANICALLY ATTACHED LIGHT-COLORED ROOF MEMBRANES

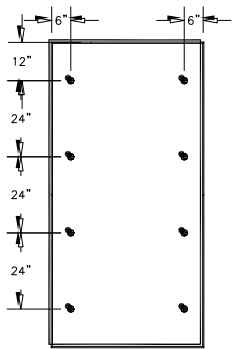


FIGURE 3
4' X 8' INSULATION BOARDS

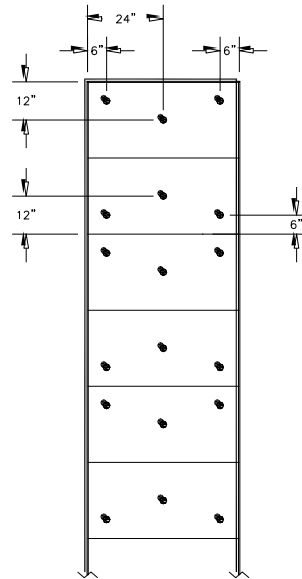
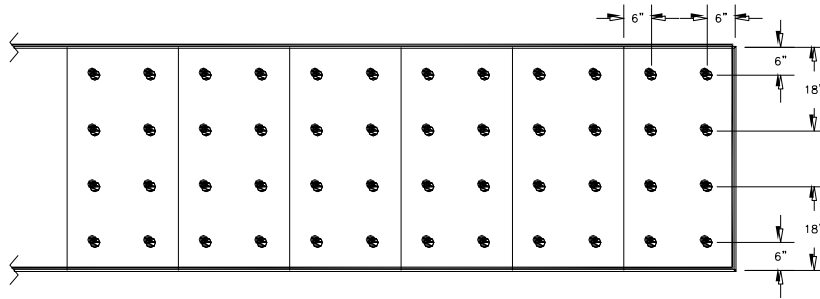
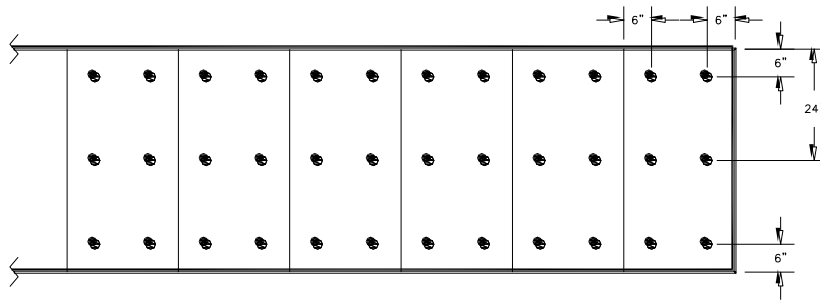


FIGURE 4
4' X 50' FANFOLD INSULATION

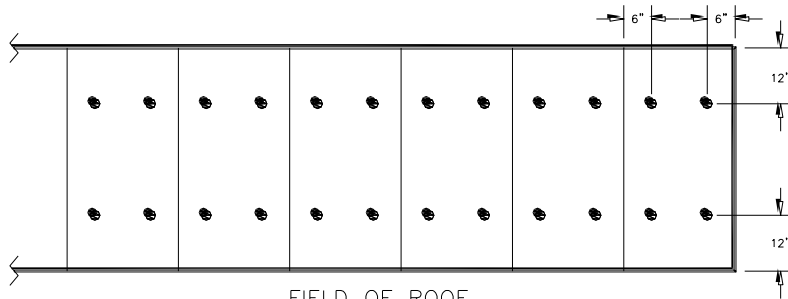
FASTENING PATTERN FOR GREENGARD® ROOFING RECOVERY BOARDS USED UNDER MECHANICALLY ATTACHED DARK-COLORED ROOF MEMBRANES



CORNERS



PERIMETERS



FIELD OF ROOF

FIGURE 5
4' X 50' PB6FA FANFOLD INSULATION

FASTENING PATTERN FOR GREENGARD® PB6FA ROOFING RECOVERY BOARDS
USED UNDER FULLY ADHERED ROOF MEMBRANES TO ACHIEVE FM I-60

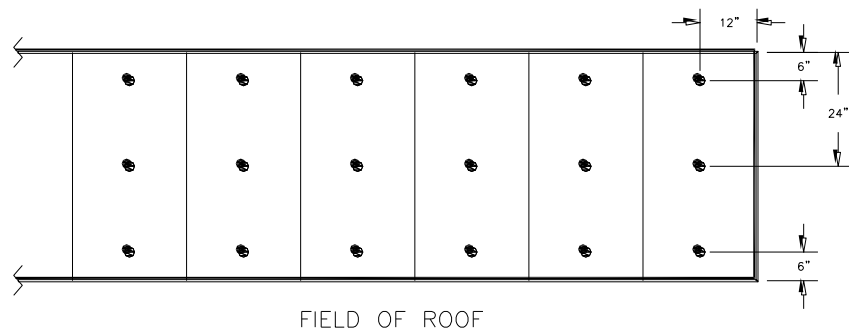
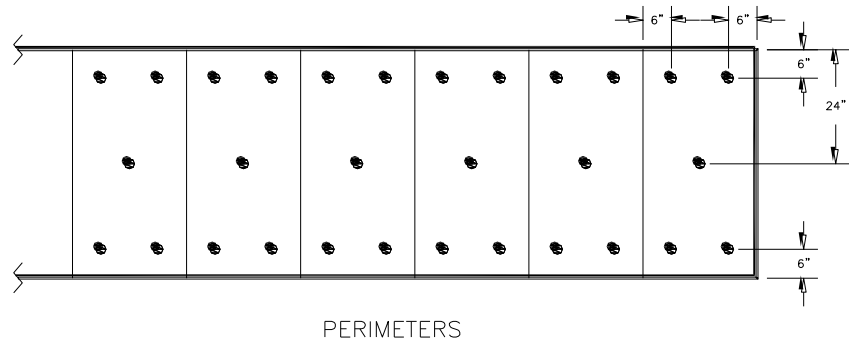
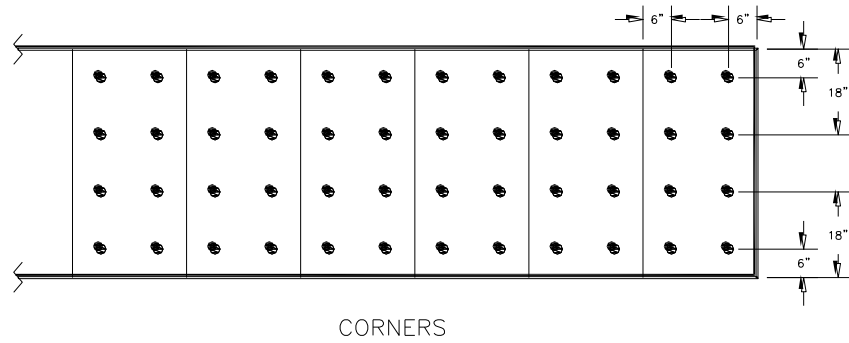
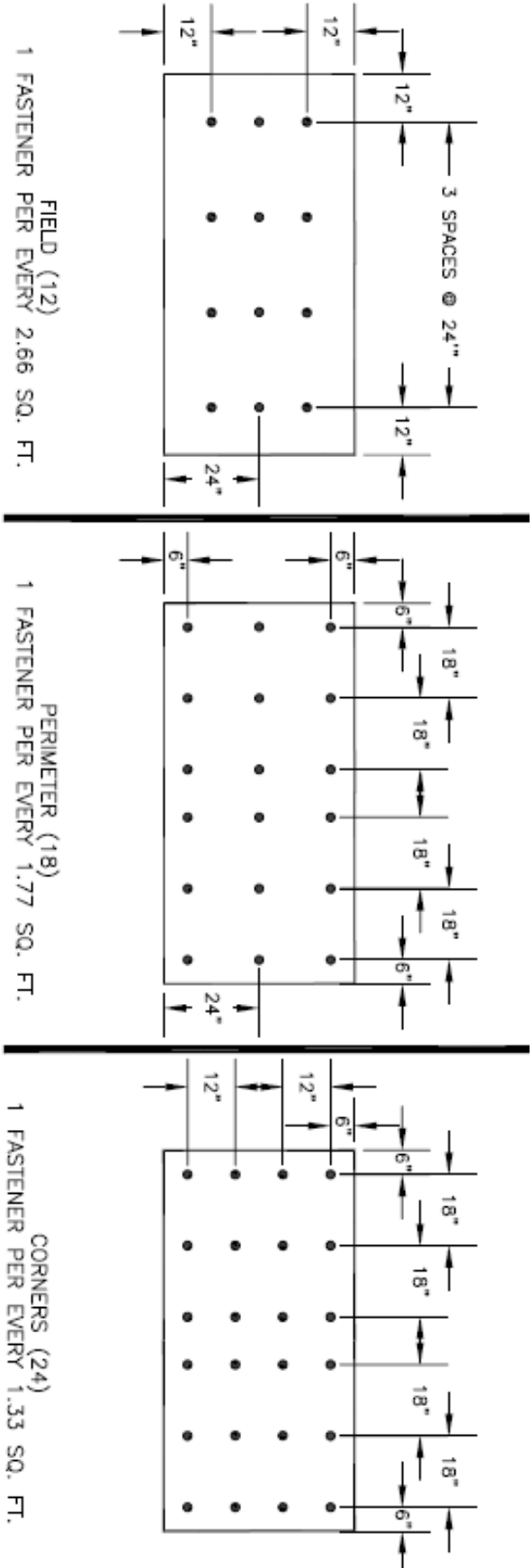


FIGURE 6
4' X 50' PB6FA90 FANFOLD INSULATION

FASTENING PATTERN FOR GREENGARD® PB6FA90 ROOFING RECOVERY BOARDS
USED UNDER FULLY ADHERED ROOF MEMBRANES TO ACHIEVE FM I-90

NOTES:

1. 12 FASTENERS PER 4' X 8' BOARD IN THE FIELD IS APPROVED FOR 1-1/2" TO 2" THICK POLYISOCYANURATE INSULATIONS WHEN USED AS THE TOP LAYER OR 1/4" DENS DECK INSTALLED AS A COVER BOARD.
2. PERIMETER AND CORNER DIMENSIONS ARE TO BE A MINIMUM OF 8" WIDE UNLESS THE PROJECT REQUIRES FACTORY MUTUAL COMPLIANCE. CONTACT MULE-HIDE TECHNICAL DEPARTMENT FOR FACTORY MUTUAL REQUIREMENTS.
3. MULE-HIDE FASTENERS AND 3" STRESS PLATES MUST BE USED FOR INSULATION ATTACHMENT.
4. REFER TO MULE-HIDE WIND UPLIFT RATINGS FOR APPROPRIATE FASTENER DENSITY REQUIRED.
5. FASTENER DENSITY INCREASES BASED ON THE FOLLOWING:
 - 50% FOR PERIMETERS
 - 100% FOR CORNERS



FIELD (12)
1 FASTENER PER EVERY 2.66 SQ. FT.

PERIMETER (18)
1 FASTENER PER EVERY 1.77 SQ. FT.

CORNERS (24)
1 FASTENER PER EVERY 1.33 SQ. FT.

MULE-HIDE
PRODUCTS CO., INC.

INSULATION ATTACHMENT
12 FASTENERS PER 4' X 8' IN FIELD
SYSTEMS:

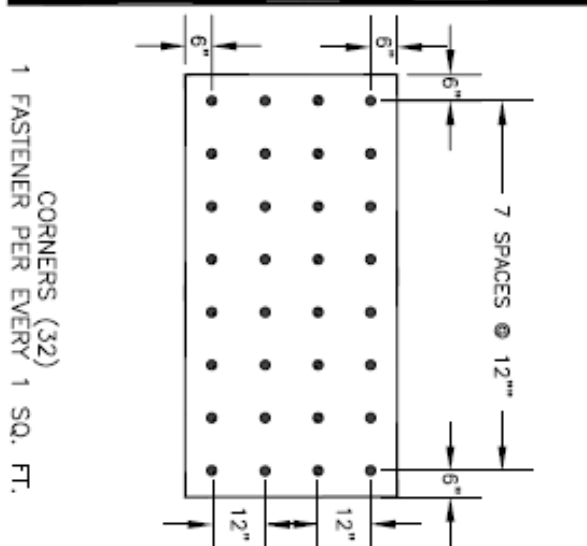
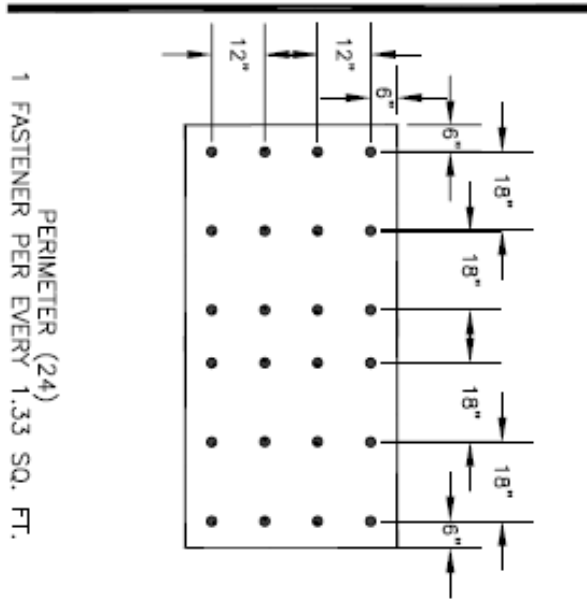
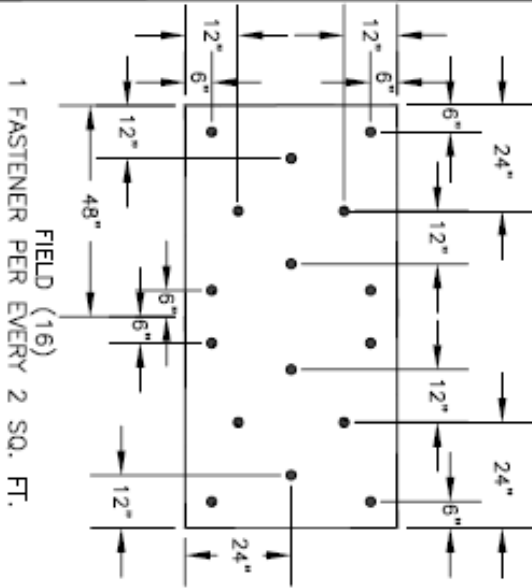
FULLY ADHERED

DETAIL NO.:
MHT-FA-721

REVISION DATE: 10/2013

NOTES:

1. 16 FASTENERS PER 4' X 8' BOARD IN THE FIELD IS MULE-HIDE'S STANDARD FOR FULLY ADHERED TPO ROOFING SYSTEMS.
2. PERIMETER AND CORNER DIMENSIONS ARE TO BE A MINIMUM OF 8' WIDE UNLESS THE PROJECT REQUIRES FACTORY MUTUAL COMPLIANCE. CONTACT MULE-HIDE TECHNICAL DEPARTMENT FOR FACTORY MUTUAL REQUIREMENTS.
3. MULE-HIDE FASTENERS AND 3" STRESS PLATES MUST BE USED FOR INSULATION ATTACHMENT.
4. REFER TO MULE-HIDE WIND UPLIFT RATINGS FOR APPROPRIATE FASTENER DENSITY REQUIRED.
5. FASTENER DENSITY INCREASES BASED ON THE FOLLOWING:
 - 50% FOR PERIMETERS
 - 100% FOR CORNERS



MULE-HIDE
PRODUCTS CO., INC.

INSULATION ATTACHMENT
16 FASTENERS PER 4' X 8' IN FIELD
SYSTEMS:
FULLY ADHERED

DETAIL NO.:
MHT-FA-722
REVISION DATE: 10/2013

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Technical Bulletin

No. 1101

Mule-Hide Membranes and Adhesives - Cold Weather Installation

Revised Oct-2014

During periods of cold weather, special storage and application methods must be used to facilitate the installation of our roofing materials. For best results, roofing materials should be stored between 60°F and 80°F prior to application. As the products cool and the properties and application deteriorate, restore products to room temperature.

Listed below are some tips for installing single ply membranes during periods of cold weather (40°F or less). As a rule, roofing materials become stiffer and more difficult to work with as temperatures decrease. Proper storage and installation of all your roofing materials is crucial to the successful outcome of your project.

EPDM – EPDM membrane is available in large sheet sizes that are folded. During periods of cold weather, these folded sheets are more difficult to relax and install. Mule-Hide recommends the use of smaller, non-folded sheets for installation during cold weather. Allow extra time for the sheet to relax during colder weather.

EPDM flashing products may require supplemental warming from a heat gun. Be careful to keep the heat gun away from flammable materials such as cleaners, tape primers and adhesives.

TPO & PVC – Remove the outer wrapping and un-roll the membrane. Flip the membrane over so that the back side is up, facing the sunlight. This will allow the darker, back side of the membrane to absorb warmth from the sun while relaxing. Only un-wrap as much material as will be used during that day. Allow extra time for the sheet to relax.

Welding techniques and parameters must also be adjusted for cold weather applications. In general, welding speeds need to be decreased. It is imperative that test welds be conducted at start up and after the automatic welder has been shut down to assure that a proper weld is being made. It is also important to conduct test welds with hand welders also, due to the slower speeds needed to affect a proper weld.

SAMB (Self Adhering Modified Bitumen) - In order to perform properly, Mule-Hide SAMB materials require a minimum application temperature of 40°F and rising for 48 continuous hours. This applies to the roofing materials and approved substrate. During installation, the membrane must be promptly rolled with a minimum 75# roller. Failure to abide by these requirements may result in poor adhesion or cracking issues. During periods of colder weather, the Mule-Hide SAMB materials should always be stored at room temperature (60° to 80° F) until just prior to use. Materials that are not stored at room temperature (or not used within 4 hours) should be restored to room temperature prior to use.

Adhesives & Sealants

Acrylic Water Based Bonding Adhesive, WBBA-2000 & HydroBond

Water based adhesives must not be allowed to freeze either during storage or application. These adhesives must be stored in original unopened containers at temperatures between 60°F and 90°F prior to application. In general, these products should be installed when temperatures are 45°F and above and must not be allowed to freeze within a minimum of 48 hours of application. Once subjected to freezing temperatures the product will not perform and must be disposed off. Consult the appropriate Product Data Sheets for specific information on the adhesive being installed.

Mule-Hide Bonding Adhesive (EPDM), Mule-Hide TPO Bonding Adhesive, Mule-Hide PVC Bonding Adhesive, Low-VOC Bonding Adhesive, Low-VOC PVC Bonding Adhesive, Low-VOC Bonding Adhesive 1168 (CA only)

Solvent based adhesive and sealants must be stored in original unopened containers at temperatures between 60°F and 90°F for 24 hours prior to use. Storage at temperatures over 90°F may alter product shelf life. Mix product thoroughly until all settled pigments are dispersed and adhesive is uniform in color. Mule-Hide recommends a minimum of 5 minutes of stirring with a variable speed drill and mixing paddle. Products stored at cold temperatures and then restored to room temperatures may experience separation of solvents. Always remix products thoroughly prior to use.

Working in low temperatures will also result in longer drying times for solvent based products. Failure to allow the products to properly flash off will result in solvent blistering of the membrane. To determine when the adhesive or primer has flashed off, form a fist and press your knuckles into the surface and give your wrist a quarter turn and lift. If surface is tacky but does not string, the surfaces are ready to mate together.

In addition to extended drying times, there is an increased likelihood of condensation forming on the surface of the adhesive. If condensation forms, the surfaces cannot be mated and work must stop until conditions improve. Wait until conditions improve and allow the adhesive to dry completely. Make sure the surface is completely dry before reapplying another coat of adhesive or primer.

Low-VOC Adhesives - Opened containers of Low-VOC adhesives must be used within 48 hours. Stir adhesive occasionally while using. Adhesive will begin to thicken after this point, making it difficult to control applied thickness. In hot weather, do not leave sealed containers on roof for prolonged periods of time. In cold weather, keep material at room temperature until ready to use.

Coverage rates are average and will vary based on job site conditions. Porous or slightly rough surfaces may require the use of a prime coat followed by a finish coat of adhesive. The performance of the roofing system will be diminished if proper amounts of adhesive are not applied.

Any information given on this Technical Bulletin is subject to change without notice. Please visit our website at www.mulehide.com or contact Mule-Hide Products at (608) 365-3111 for questions or additional information.



Technical Bulletin

No. 1301

Mule-Hide edge metal requirements for warranted projects

February 11, 2013

Sheet metal not covered by warranty

Sheet metal by others – Sheet metal that is provided by others is not covered under our Mule-Hide warranties, and cannot be used on projects that require extended wind speed coverage.

Sheet metal covered by warranty³

Mule-Hide coated metal (TPO & PVC) – Mule-Hide coated metal that is properly formed (by others) and installed according to our published details, may be covered under our system warranties, but cannot be used for projects that require extended wind speed coverage.

Sheet metal covered by warranty and eligible for extended wind speed coverage³

Mule-Hide pre-manufactured Edge Metal – Mule-Hide pre-manufactured Edge Metal that is properly installed according to our details, is covered under our Mule-Hide System Warranties and is to be used for projects that require extended wind speed coverage.

Description	Warranted	Extended Wind Speed
Sheet Metal by Others	No	No
Mule-Hide Coated Metal	Yes ^{1,3}	No
Mule-Hide pre-manufactured Edge Metal	Yes ³	Yes ^{2,3}

Notes:

1. Mule-Hide Coated Metal must be properly formed (by others) and installed according to our published details.
2. Contact the Mule-Hide Technical Department for information regarding the availability of extended wind speed coverage, appropriate products and specific system requirements.
3. Rain carrying sheet metal such as collector heads, gutters, downspouts and accessories are explicitly excluded from any warranty coverage.

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Technical Bulletin

No. 1302

Use of InsulFoam Roof Insulation In Mule-Hide Roofing Systems

September 2013

InsulFoam roof insulations may be used in Mule-Hide roofing systems and will qualify for a Premium warranty if purchased from Mule-Hide. The InsulFoam products include Expanded and Extruded Polystyrene insulations and care must be taken when using these materials over coal tar pitch. The following is a brief summary of how these insulations may be utilized in a Mule-Hide system.

Warranties – InsulFoam insulations may be used for either Standard or Premium, 10, 15, or 20 year warranties when following Mule-Hide guidelines and InsulFoam recommendations. Must provide proof of purchase (copy of the distributor's invoice showing Mule-Hide SKU numbers) when applying for a Premium Warranty.

Fully Adhered – All fully adhered systems require the use of an approved cover board.

Mechanically Attached

TPO

1. Minimum 1.25 density InsulFoam
2. R-Tech insulation or fanfold with polymeric facer side up

PVC

1. Minimum 1.25 density InsulFoam with slip sheet or cover board
2. R-Tech insulation or fanfold with polymeric facer side up

EPDM

1. Cover board required over InsulFoam
2. R-Tech insulation or fanfold with polymeric facer side up

Ballasted

TPO & EPDM

1. Minimum 1.00 density InsulFoam*
 2. R-Tech insulation or fanfold with polymeric facer side up*
- *cover board recommended for high traffic areas

PVC Ballasting not permitted with PVC membranes

Notes:

1. Local building codes must be consulted for the acceptance of installing polystyrene insulations directly over metal decking.
2. Polystyrene insulation cannot be installed directly over coal-tar pitch surfaces or existing PVC membranes. For coal-tar pitch, a min 1-1/2" thick layer of insulation with a min R value of 5 is required as separation.
3. PVC membranes require separator sheets between the PVC membranes and polystyrene products unless using R-Tech board with polymeric facer side up.

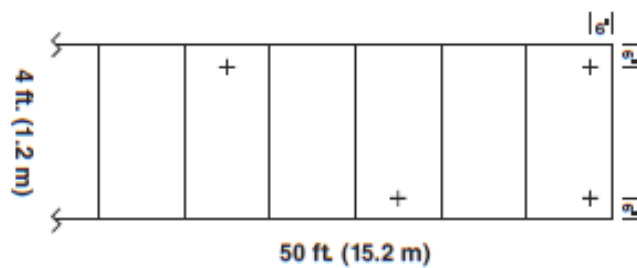
Insulation Attachment

Fully Adhered Systems – Attachment will vary depending upon type and thickness of cover board, type of roof deck and wind uplift requirements. Contact the Mule-Hide Technical Department for acceptable attachment patterns.

Mechanically Attached Systems

- 4' x 4' boards – Secure with four fasteners per board
- 4' x 8' boards – Secure with eight fasteners per board

FanFold – Attach with two fasteners at each end panel and then install one fastener at every other panel (see drawing)



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Technical Bulletin

No. 1303

Use of Structodek High Density Fiberboard Insulation Cover Board with Primed Red Coating In Mule-Hide Roofing Systems

October 2013

The use of Structodek HD with Primed Red Coating high density wood fiberboard, as manufactured by Blue Ridge Fiberboard, Inc., is approved for use in Mule-Hide warranted roofing systems using either EPDM, TPO & PVC single ply roofing membranes or our self-adhering modified bitumen membranes.

This product is coated two-sides with a red primer that is compatible with all of our single ply adhesives (solvent and water based) as well as our self-adhering modified bitumen membranes.

Structodek HD is to be installed in a conventional manner using either fasteners or insulation adhesives. Attachment rates will vary depending upon project requirements.

Attached is a copy of the data sheet for the Structodek HD board for reference.

Any information given on this Technical Bulletin is subject to change without notice. Please visit our website at www.mulehide.com for the most current information or contact the Mule-Hide Technical Department at (800) 786-1492 for questions or additional information.



STRUCTODEK® HIGH DENSITY

FIBERBOARD ROOF INSULATION COVER BOARD WITH PRIMED RED COATING

DESCRIPTION

The proprietary, patent pending, non-asphaltic Primed Red Coating integrated on the surface of STRUCTODEK HD possesses unique bonding characteristics that ultimately result in superior adhesion capabilities with the current membrane & adhesive technology on the market today. The non-asphaltic Primed Red Coating is compatible with all single-ply membranes including PVC, TPO, EPDM, and CSPE without concern of premature membrane degradation that is often associated with asphalt emulsion coated fiberboard products. Additionally the Primed Red Coating, unlike asphalt emulsion coated products, has proven to be compatible with traditional, low VOC and water-based adhesives as well as many foam adhesives. The Primed Red Coating allows adhesives & foams to “key” into the STRUCTODEK HD surface while at the same time deterring excessive adhesive absorption. The unique Primed Red Coating allows for a solid membrane bond while still providing optimal square foot per gallon of adhesive coverage thus insuring a quality & cost effective membrane installation.

While STRUCTODEK HD with Primed Red Coating was designed with the single-ply application in mind it contains many of the same great attributes as STRUCTODEK HD with the traditional non-asphaltic black coating. Accordingly it also works well with asphaltic based systems (BUR), coal tar, and cold-process adhesive products. Additionally, STRUCTODEK HD with Primed Red Coating has also been successful in peel-and-stick applications without the typical need for an additional primer in many instances. The rigid and strong, yet light-weight nature of STRUCTODEK HD with Primed Red Coating is better than heavier alternatives and will keep the roof load below the specified maximum weight. Structodek HD with Primed Red Coating is offered coated on 2 sides and available in 4'x4' and 4'x8' panels.

USES

STRUCTODEK HD with Primed Red Coating can be used as an insulation board, cover board, or re-roof/recover board. The product is a high-density roofing board designed for low-slope single-ply, as well as traditional roof system applications.

SPECIFICATIONS

- ASTM C 208, Type II, Grade 1 and Grade 2
- CAN/ULC-S706-09 Type II, Classes 1 and 2
- UL Classified to Canadian Std CAN/ULC-S107 and US Std UL 790
- FM Approved Class 1 – FM Approval Standard 4450/4470
- Canadian Evaluation CCMC #13186-L
- NOA 10-0120.04; Miami-Dade County, FL; Expiration date 09/18/13

MASTERFORMAT NUMBER AND TITLE

07 22 16 - Roof Board Insulation

FEATURES/BENEFITS

- Compatible with PVC, TPO, EPDM, CSPE single-ply membranes as well as more traditional systems.
- Compatible with most low VOC, water-based and traditional adhesives.
- Superior adhesion without excess adhesive absorption.
- Compatible with most direct peel-and-stick applications.
- BUR compatible - easily handles hot asphalt.
- Approved in thousands of FM RoofNav® & UL Class A rated roof system assemblies.
- Green, non-asphaltic coating – contributes to LEED credits.
- Hail resistant, structurally rigid, easily handles heavy foot traffic and wheeled loads.
- Possesses SOUNDSTOP® sound deadening technology.
- Contributes to thermal insulation with R-values of 1.3 per ½”.
- Lightweight, fiberglass free, cuts with a standard utility knife.
- Compressive strength exceeds the Canadian standard at 10% deformation for ½” thickness.
- Coated 2 sides Primed Red provides optimal surface bonding characteristics ideal for use in single and multiple layer roof systems.
- Waxes & other moisture resistant components are added early in the manufacturing process providing superior core and edge protection. The integral moisture resistant components protect the edges in stock panel size (4'x4' or 4'x8') and, more importantly, also protects the edges when the product is cut on the jobsite.
- Cost effective solution- a value engineered champion.

PRECAUTIONS

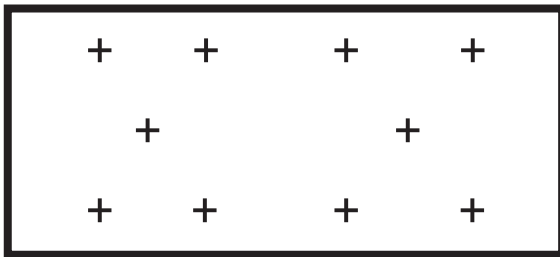
Do not expose to open flame or excessive heat. May smolder if ignited. If ignited, extinguish completely. Do not apply flame directly to material when installing a modified bitumen system. Material must be kept dry at all times; in storage and during application. Apply only as much STRUCTODEK HD with Primed Red Coating in one day as can be covered by completed roofing system that day. Do not use as an underlayment for shingles. In re-roofing applications, all wet areas in old roof should be cut out and replaced. Before material is installed, remove all loose and protruding gravel. STRUCTODEK HD with Primed Red Coating must not be used in close proximity to chimneys, heater units, fireplaces, steam pipes, or other surfaces which could provide long-term exposure to

excessive heat (maximum 212 F) without adequate thermal protection. Consult appropriate heating appliance manufacturer's instructions before installation.

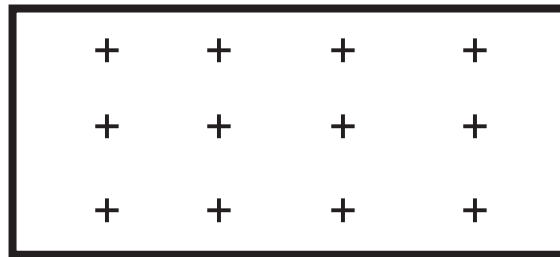
LEED INFORMATION

May help contribute to LEED credits:

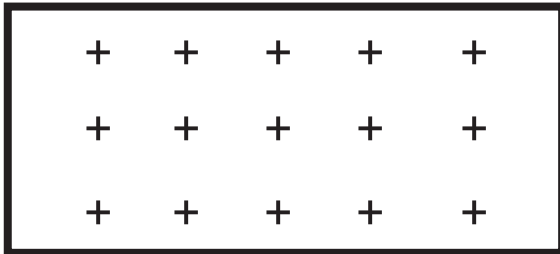
- MR Credit 2: Construction Waste Management
- MR Credit 4: Recycled Content
- MR Credit 5: Regional Materials
- MR Credit 6: Rapidly Renewable Materials
- IEQ Credit 4.4: Low-Emitting Materials – Composite Wood and Agrifiber Products



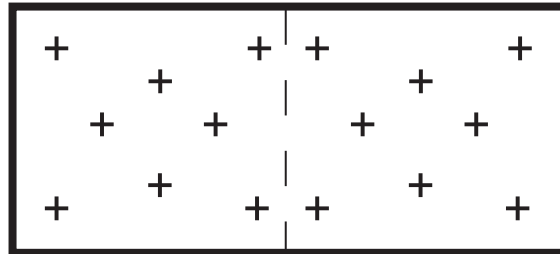
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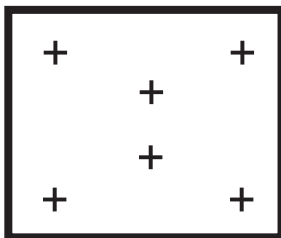
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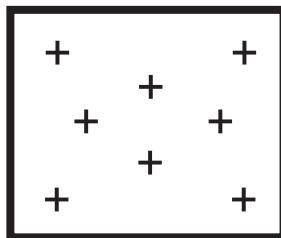
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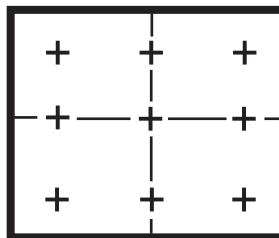
16 FASTS/BD.



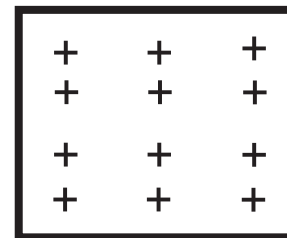
6 FASTS/BD.



8 FASTS/BD.



9 FASTS/BD.



12 FASTS/BD.

Typical FM fastening patterns for 1-60 & 1-90. Actual fastening patterns will vary based upon specific membrane manufacturer's FM system assembly, please refer to membrane manufactures specific fastening requirements as listed in FM's RoofNav system.

Limited Warranty: BLUE RIDGE FIBERBOARD, INC. warrants at the time and place we make shipment, our material will be of good quality and will conform with our published specifications in force on the date of acceptance of the order. Read complete warranty. Copy furnished upon request.

Disclaimer: The information contained herein is included for illustrative purpose only, and to the best of our knowledge, is accurate and reliable. BLUE RIDE FIBERBOARD, INC. cannot however under any circumstance make any guarantee of results or assume any obligation or liability in connection with the use of this information. As BLUE RIDGE FIBERBOARD, INC. has no control over the use to which others may put its product, it is recommended that the products be tested to determine if suitable for specific application and/or our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor and owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products for specific application and assume all responsibilities in connection therewith.

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Technical Bulletin

No. 1304

Revised LTTR Values For Polyisocyanurate Roof insulation (Long Term Thermal Resistance)

October 2013

On January 1, 2014 a new test method for predicting Long Term Thermal R (LTTR) values for Polyisocyanurate roofing products will go into effect. The net effect is that the published LTTR values for polyiso roof insulation will be decreased. All other physical properties will remain the same. The new test method is an attempt to predict the R value of polyiso after 15 years of use.

Q: What is the effective date of the changes?

A: The new test method goes into effect January 1, 2014.

Q: Will any other physical properties change?

A: No. This is merely a different method of determining the LTTR of the product.

Q: Will all Polyiso products and manufacturers be affected?

A: This change will affect all polyiso material and all manufacturers who are members of PIMA.

Q: Does this mean that all Polyiso LTTR values will decrease?

A: Yes, based on the new test method, LTTR values will go down.

Q: How do I price a project that will ship in 2014?

A: If the quote is based on R value then the new LTTR values should be used. Note that the NRCA recommends that designers specify Polyiso by thickness. If the quote is based on thickness then no change is needed.

Q: What if I have already quoted a project for 2014?

A: You should ask to be re-quoted if the quote was based on R value.

Q: How will this affect tapered polyiso insulation?

A: These R values will also decrease beginning in 2014.

Q: What if I have a project that shipped in 2013 and now needs additional material?

A: You should clarify with the designer whether or not they wish to have the new material quoted based on the 2014 LTTR values. Keep in mind that the thickness will change.

Q: What do I do with existing inventory?

A: Inventory purchased prior to January 1, 2014 can be sold with the 2013 R-Values displayed. For instance, if you have bundles of 1.5" ISO with a 2013 label, they can be sold as meeting the 2014 LTTR of 8.5 for 1.5" ISO.

Q: How do the new R Values compare to the present ones?

A: Please see R value comparison on next page.

Nominal Thickness***		Poly ISO 1		Metal Deck Max. Flute Spanability (Inches)
(Inches)	(mm)	2013 LTTR*	2014 LTTR**	
1.0	25	6.0	5.6	2 ⁵ / ₈
1.5	38	9.0	8.5	4 ³ / ₈
1.6	41	9.6	9.1	4 ³ / ₈
1.7	43	10.3	9.6	4 ³ / ₈
2.0	51	12.1	11.4	4 ³ / ₈
2.5	64	15.3	14.4	4 ³ / ₈
2.7	69	16.6	15.6	4 ³ / ₈
3.0	76	18.5	17.4	4 ³ / ₈
3.3	84	20.4	19.2	4 ³ / ₈
3.5	89	21.7	20.5	4 ³ / ₈
3.6	91	22.4	21.1	4 ³ / ₈
4.0	102	25.0	23.6	4 ³ / ₈

*Long Term Thermal Resistance Values are based on ASTM C1289 and CAN/ULC S770 which provides for a 15-year time weighted average.
 **LTTR (Long Term Thermal Resistance) determined in accordance with *updated* 2014 ASTM C1289 Standard.
 ***Other thicknesses available upon special request.

Nominal Thickness***		Poly ISO 2™		Metal Deck Max. Flute Spanability (Inches)
(Inches)	(mm)	2013 LTTR*	2014 LTTR**	
1.0	25.4	6.0	5.6	2 ⁵ / ₈
1.5	38.1	9.0	8.5	4 ³ / ₈
2.0	50.8	12.1	11.4	4 ³ / ₈
2.5	63.5	15.3	14.4	4 ³ / ₈
3.0	76.2	18.5	17.4	4 ³ / ₈
3.1	78.8	19.1	18.0	4 ³ / ₈
3.3	83.8	20.4	19.2	4 ³ / ₈
4.0	101.6	25.0	23.6	4 ³ / ₈

*LTTR (Long Term Thermal Resistance) values were determined in accordance with CAN/ULC-S770 and ASTM C1289, Annex A1. All test samples were third-party selected and tested by an accredited material testing laboratory. The LTTR results were reviewed and authorized by FM Approvals and certified by the PIMA Quality Mark Program.
 **LTTR (Long Term Thermal Resistance) determined in accordance with *updated* 2014 ASTM C1289 Standard.
 ***Other thicknesses available upon special request.

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SECTION 8

MULE-HIDE PRODUCTS CO., INC.

EPDM
Standard Details

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MULE-HIDE PRODUCTS CO., INC. EPDM STANDARD DETAILS

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All Purpose Bar *	MHE-103	Roof Drain W/Sump	MHE-132
Ballasted Retainer *	MHE-104	Drain Insert	MHE-133
Gravel Stop (Snap Lock) *	MHE-105	Through Wall Scupper	MHE-134B
Gravel Stop *	MHE-106	Through Wall Overflow	MHE-135
Gravel Stop (Scupper)	MHE-107		
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3" Seam-Adhesive	MHE-110	Premolded Pipe Boot-M/A-Adhesive	MHE-140
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3" Seam- Cover Tape *	MHE-111A	Premolded Pipe Boot-Adhesive	MHE-140B
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* Approved for use in 20-Year warranted Systems.

MULE-HIDE PRODUCTS CO., INC. EPDM STANDARD DETAILS

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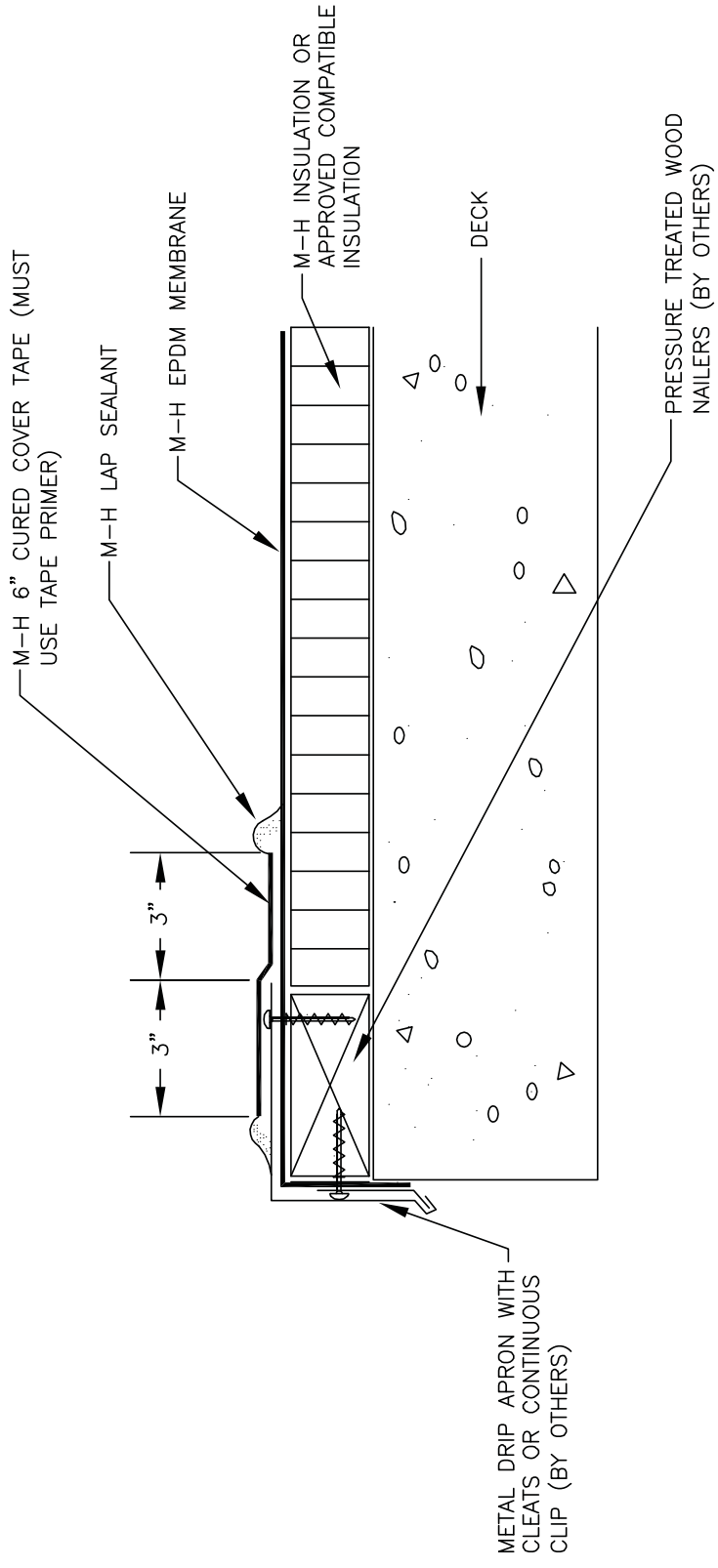
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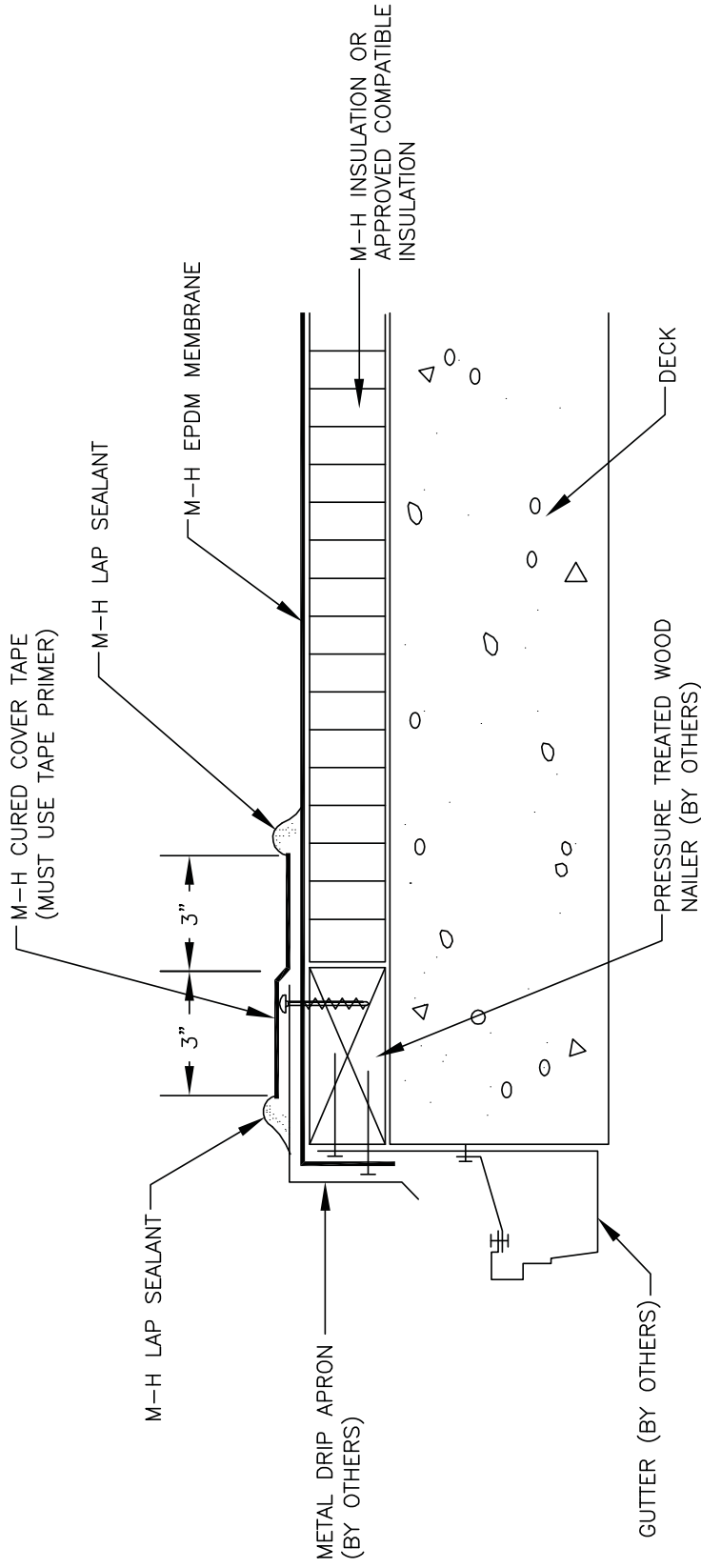
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***PLEASE CONSULT THE MULE-HIDE WEBSITE FOR THE MOST
CURRENT INFORMATION AT WWW.MULEHIDE.COM***



NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

<p>DETAIL NO.: MHE-101</p>	<p>DRIP APRON TERMINATION SYSTEMS: ADHERED & MECHANICALLY ATTACHED</p>	<p>MULE-HIDE PRODUCTS CO., INC. 12/01/2008</p>
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NOTE:

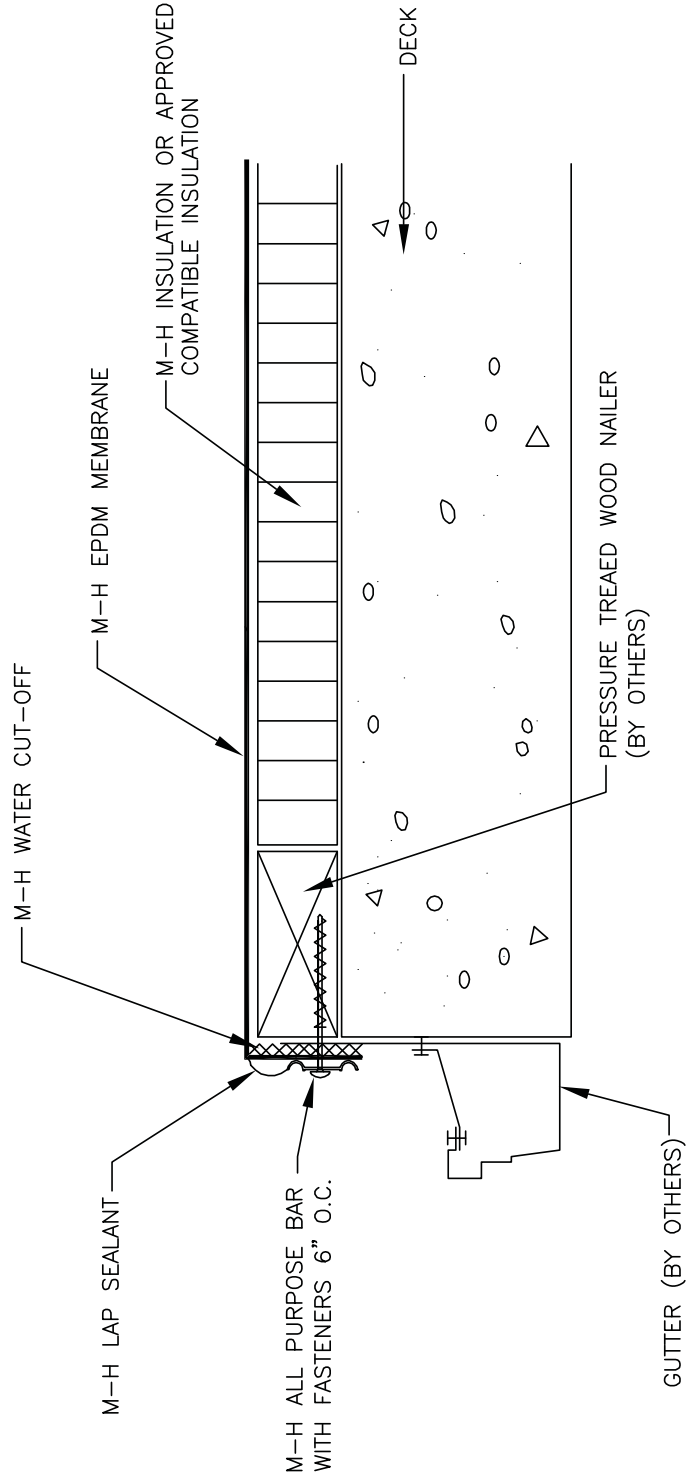
WOOD NAILERS ARE NOT REQUIRED TO BE PRESSURE TREATED ON NEW CONSTRUCTION

THIS DETAIL IS NOT APPROVED FOR USE IN A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

**DRIP APRON/GUTTER
TERMINATION
SYSTEMS:
ADHERED &
MECHANICALLY ATTACHED**

DETAIL NO.:
MHE-102

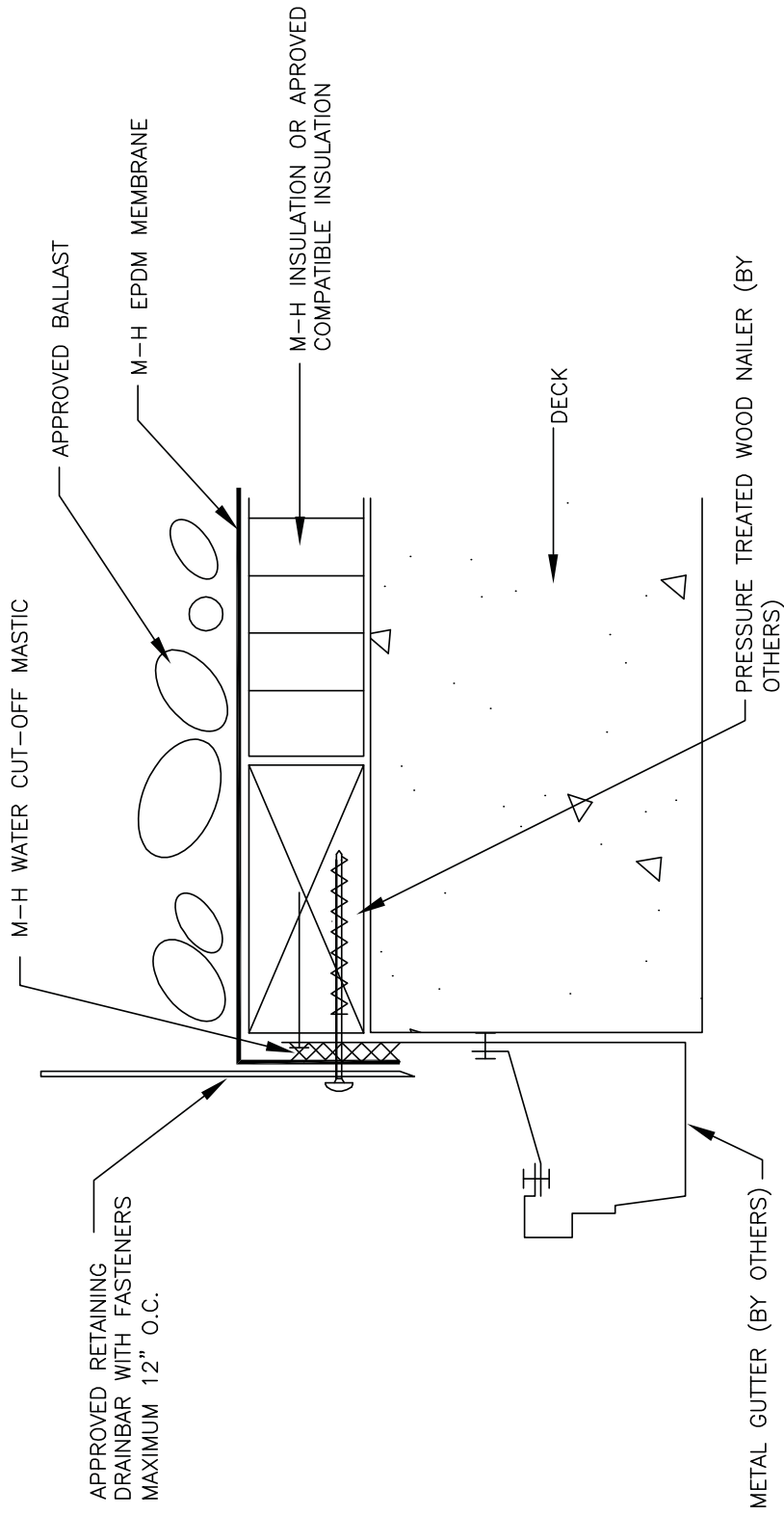


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**ALL PURPOSE BAR
 TERMINATION
 SYSTEMS:
 SDHERED &
 MECHANICALLY ATTACHED**

DETAIL NO.:
MHE-103



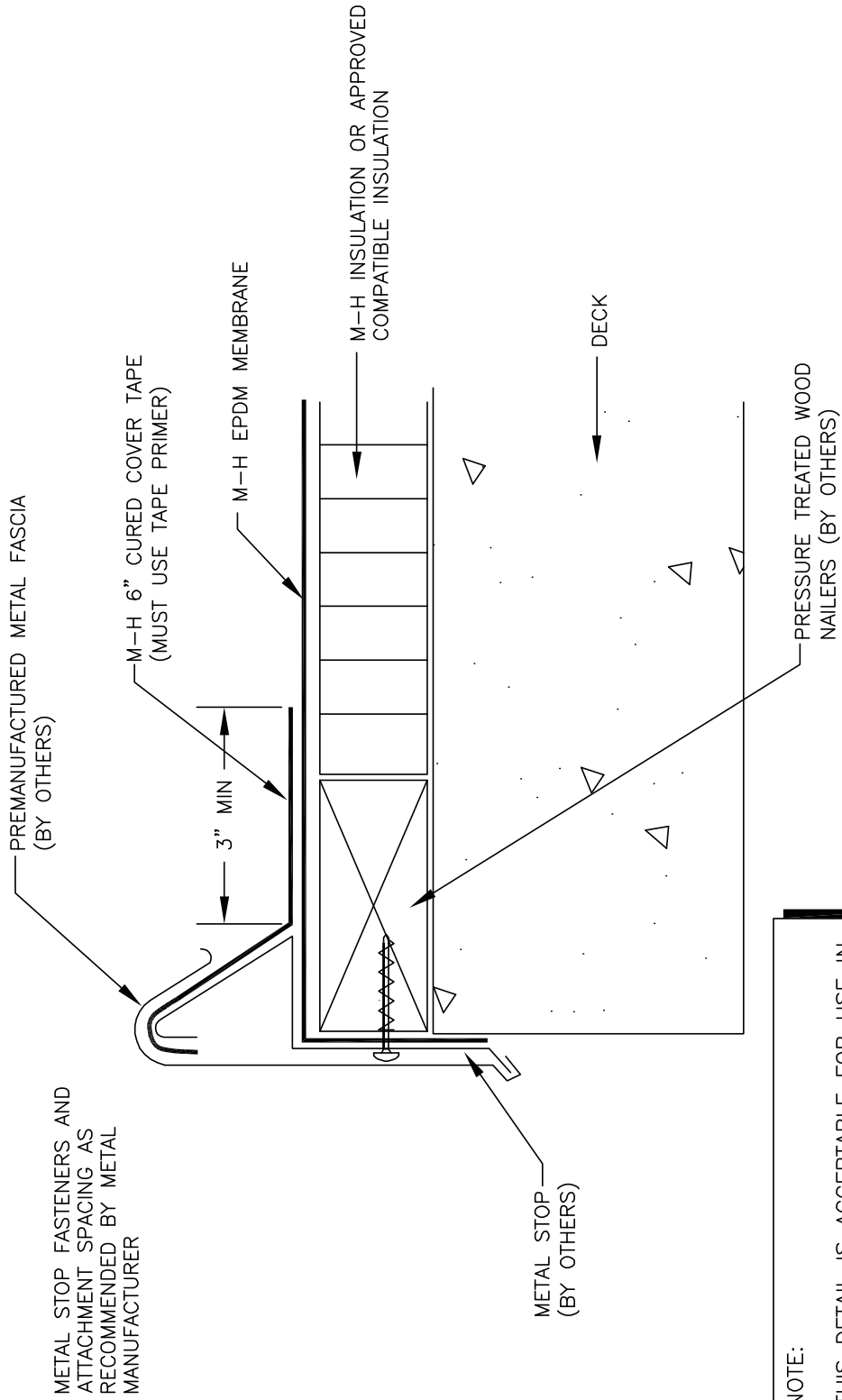
NOTE:

THIS DETAIL IS ACCEPTABLE FOR USE IN
A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

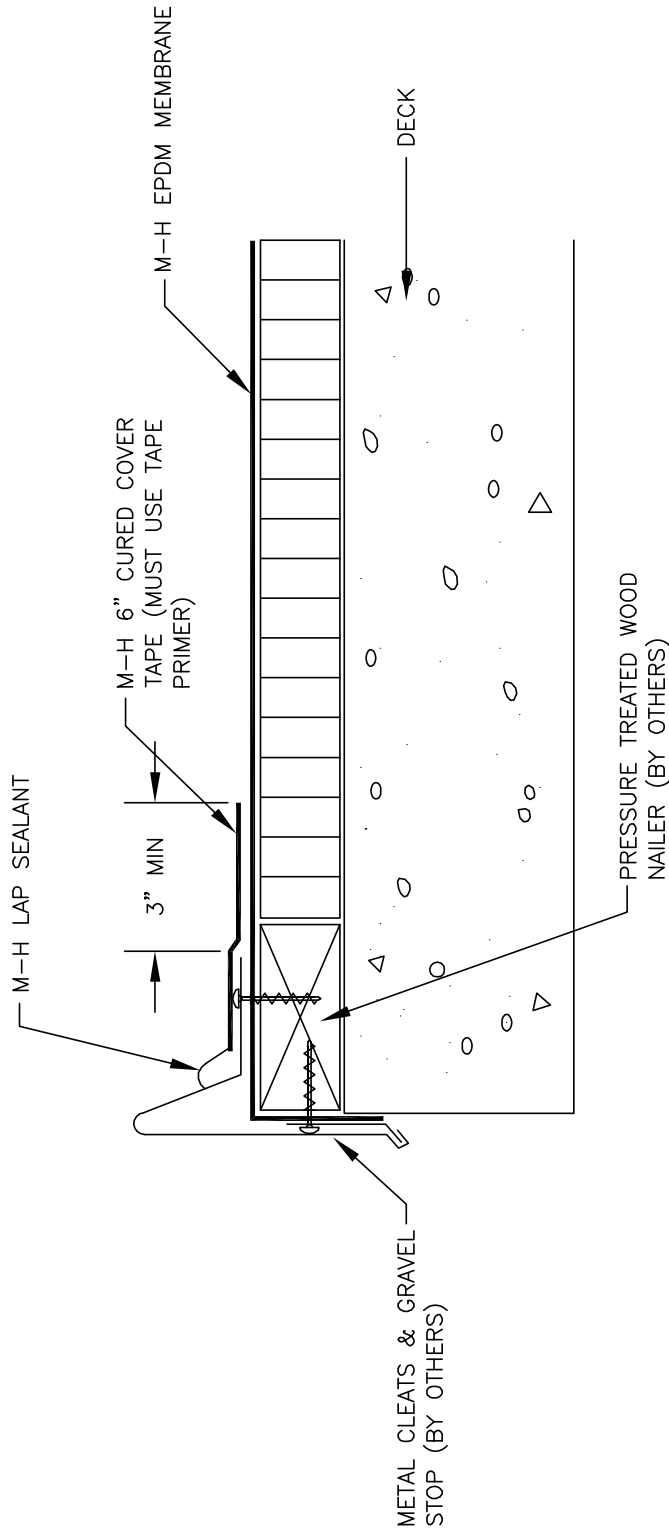
**BALLAST
RETAINER BAR
SYSTEMS:
BALLAST ONLY**

DETAIL NO.:
MHE-104



NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

<p>MULE-HIDE PRODUCTS CO., INC. 12/01/2008</p>	<p>GRAVEL STOP WITH SNAP LOCK FASCIA SYSTEMS: ALL</p>	<p>DETAIL NO.: MHE-105</p>
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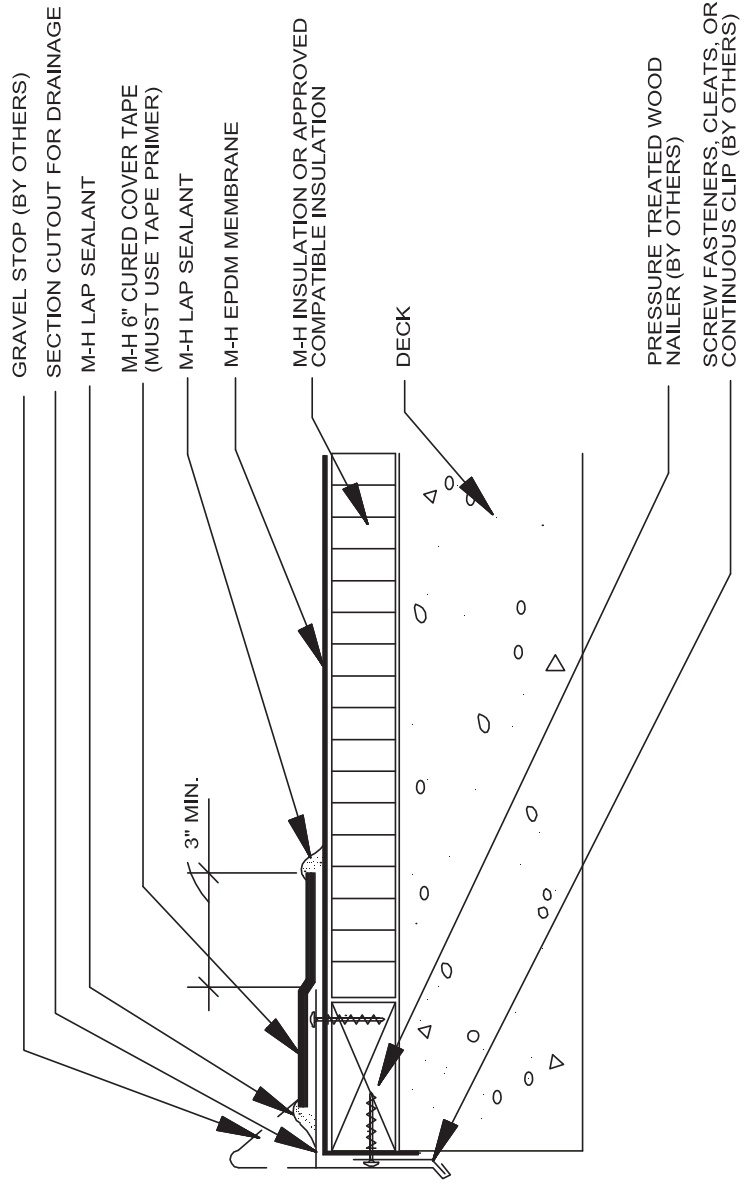


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**GRAVEL STOP
 TERMINATION
 SYSTEMS:
 ALL**

DETAIL NO.:
MHE-106



GRAVEL STOP (BY OTHERS)

SECTION CUTOUT FOR DRAINAGE

M-H LAP SEALANT

M-H 6" CURED COVER TAPE
(MUST USE TAPE PRIMER)

M-H LAP SEALANT

M-H EPDM MEMBRANE

M-H INSULATION OR APPROVED
COMPATIBLE INSULATION

DECK

PRESSURE TREATED WOOD
NAILER (BY OTHERS)

SCREW FASTENERS, CLEATS, OR
CONTINUOUS CLIP (BY OTHERS)

3" MIN.

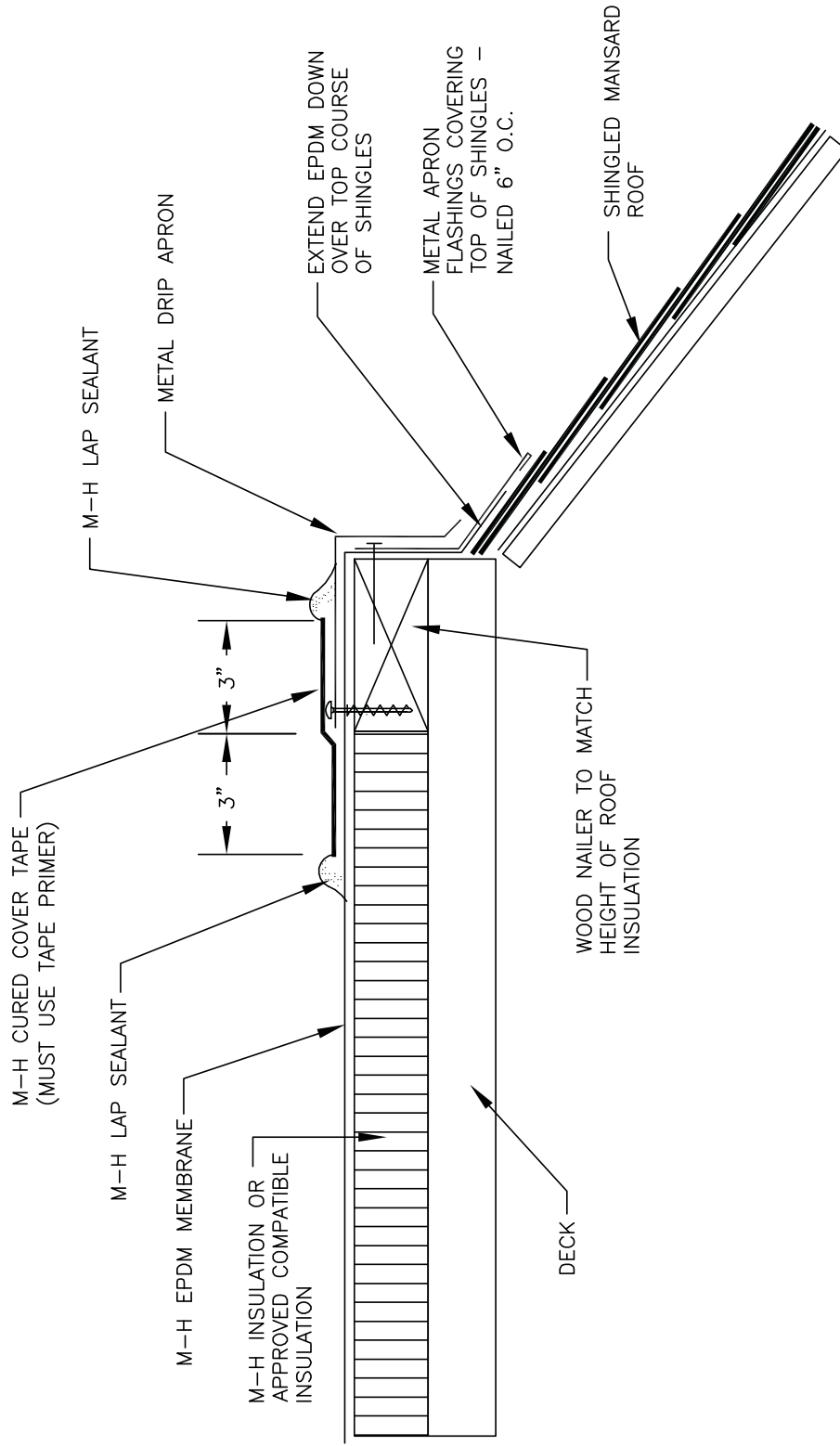
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

GRAVEL STOP
WITH SCUPPER

SYSTEMS:
ALL

DETAIL NO.:

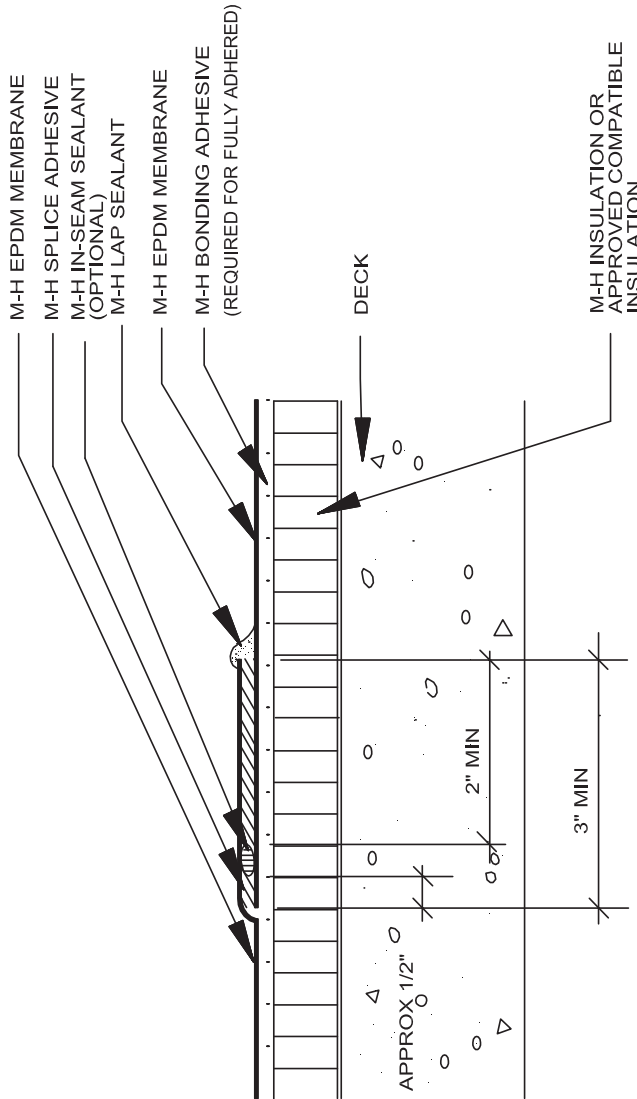
MHE-107



**MULE-HIDE
PRODUCTS CO., INC.
03/11/2011**

**DRIP EDGE AT MANSARD
SYSTEMS:
FULLY ADHERED**

**DETAIL NO.:
MHE-108**

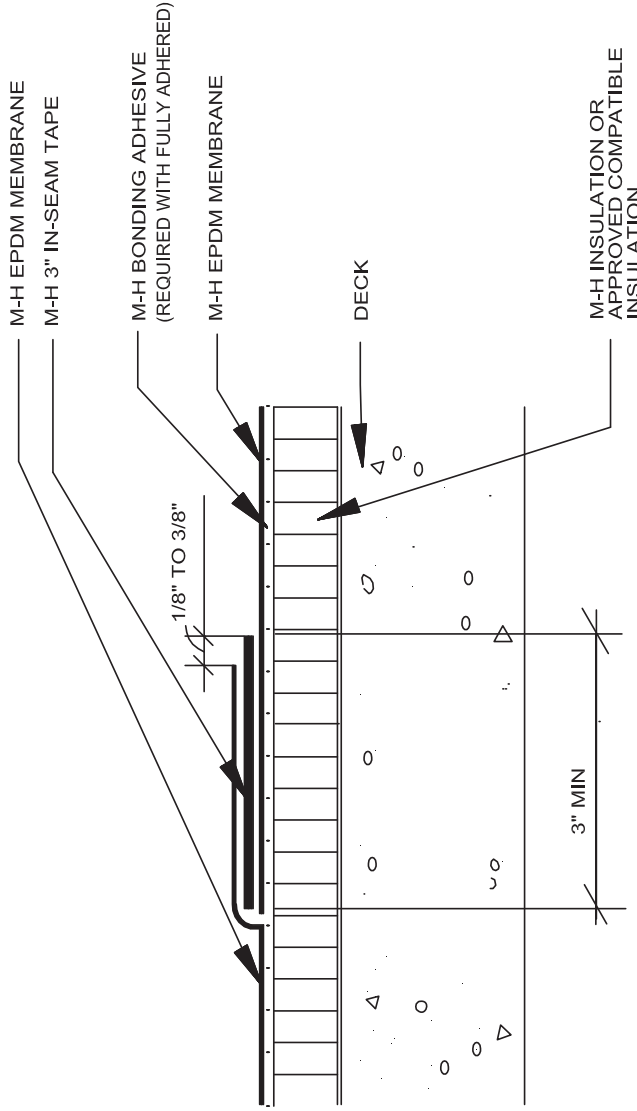


NOTE: MULE HIDE SEAM CLEANER MUST BE USED PRIOR TO APPLICATION OF ADHESIVE AND LAP SEALANT. FOLLOW PROCEDURE IN MANUAL

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

**MEMBRANE SPlice
WITH SPlice ADHESIVE -
3" SEAM
SYSTEMS:
ALL**

**DETAIL NO.:
MHE-110**



NOTE: MULE-HIDE TAPE PRIMER MUST BE USED PRIOR TO APPLICATION OF IN-SEAM TAPE. FOLLOW PROCEDURE IN MANUAL.

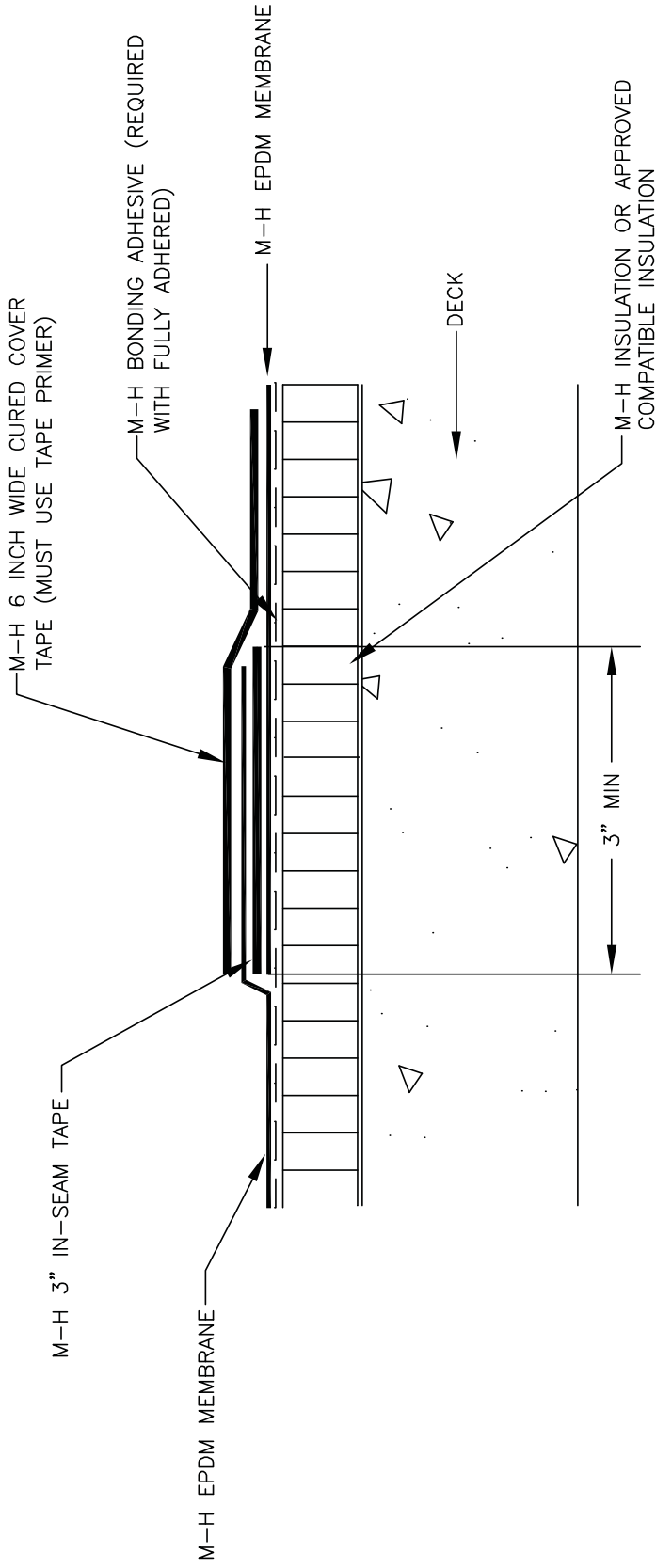
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

MEMBRANE SPLICE
W/ 3" IN-SEAM TAPE

SYSTEMS:
ALL

DETAIL NO.:

MHE-111



NOTE:

MULE-HIDE TAPE PRIMER MUST BE USED PRIOR TO APPLICATION OF IN-SEAM TAPE. FOLLOW PROCEDURE IN MANUAL.

THIS DETAIL IS ACCEPTABLE FOR USE IN A 20-YEAR WARRANTED SYSTEM IN BALLASTED OR FULLY ADHERED SYSTEMS.

**MULE-HIDE
PRODUCTS CO., INC.**

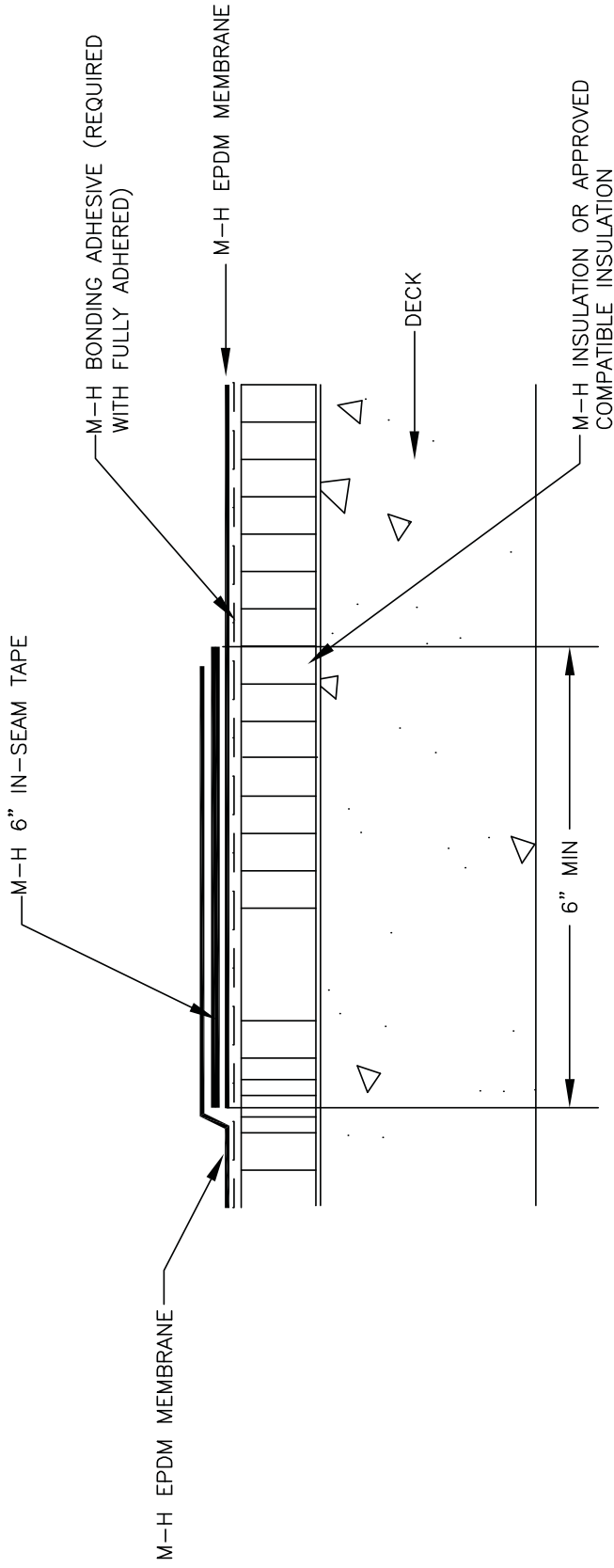
12/01/2008

**MEMBRANE SPLICE
W/3" IN-SEAM TAPE**

**SYSTEMS:
BALLASTED, FULLY ADHERED
LIVING ROOF**

DETAIL NO.:

MHE-111A



NOTE:

MULE-HIDE TAPE PRIMER MUST BE USED PRIOR TO APPLICATION OF IN-SEAM TAPE. FOLLOW PROCEDURE IN MANUAL.

THIS DETAIL IS ACCEPTABLE FOR USE IN A 20-YEAR WARRANTED SYSTEM.

**MULE-HIDE
PRODUCTS CO., INC.**

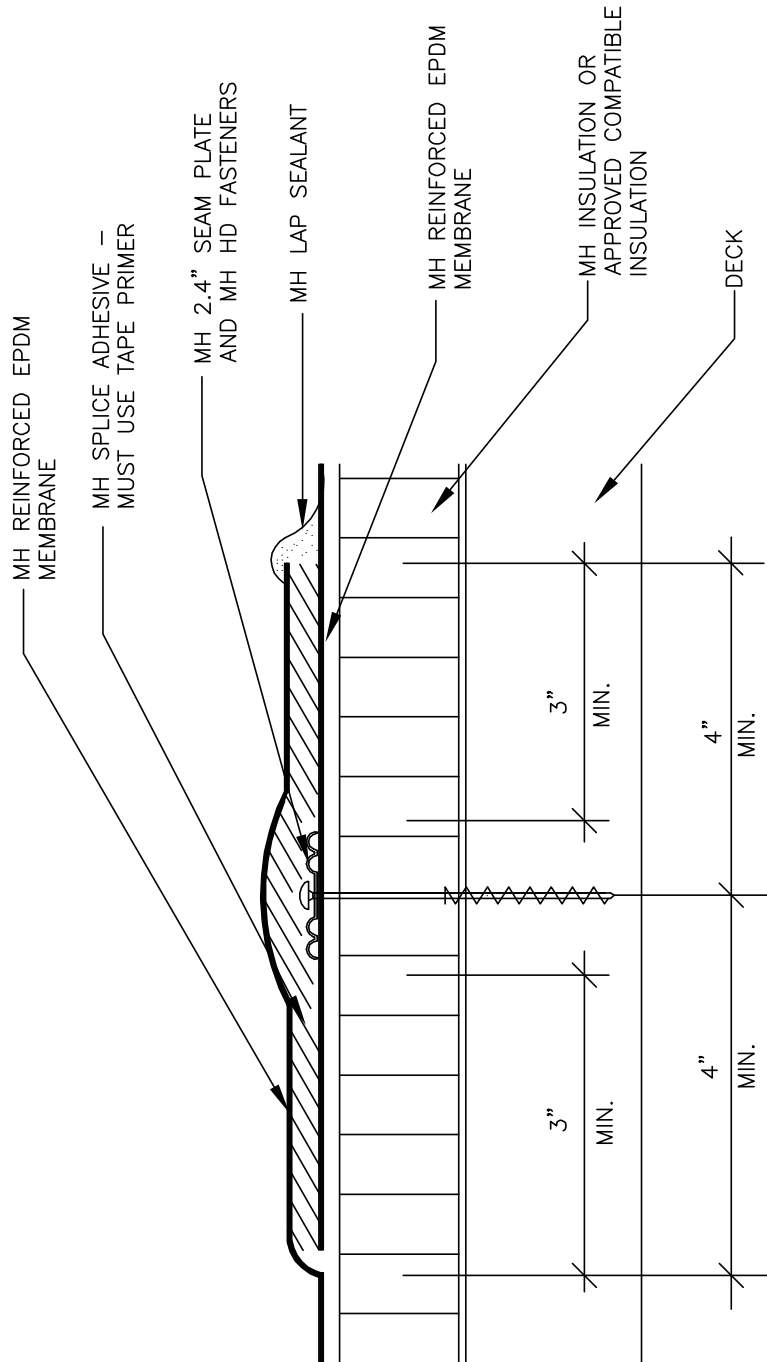
12/01/2008

**MEMBRANE SPLICE
W/6" IN-SEAM TAPE**

**SYSTEMS:
ALL**

DETAIL NO.:

MHE-111B



NOTE:

MULE-HIDE TAPE PRIMER MUST BE USED PRIOR TO APPLICATION OF SPLICE ADHESIVE. FOLLOW PROCEDURE IN MANUAL.

THIS DETAIL IS NOT ACCEPTABLE FOR A 15 OR 20 YEAR WARRANTY.

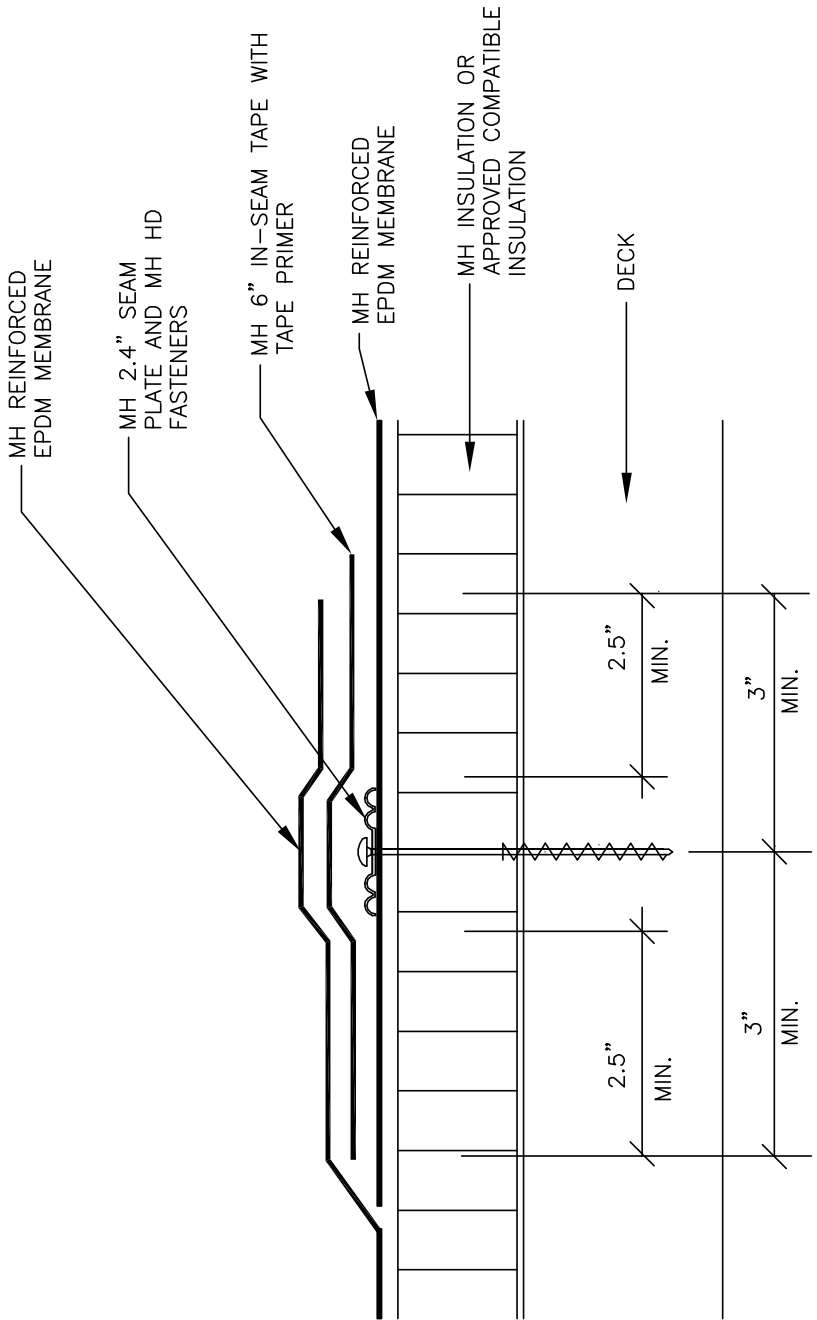
MULE-HIDE PRODUCTS CO., INC.
2010

**MEMBRANE SPLICE W/2.4" SEAM PLATE
8" SEAM**

**SYSTEMS:
MECHANICALLY ATTACHED
REINFORCED EPDM**

DETAIL NO.:

MHE-112



NOTE:

MULE-HIDE TAPE PRIMER MUST BE USED PRIOR TO APPLICATION OF IN-SEAM TAPE. FOLLOW PROCEDURE IN MANUAL.

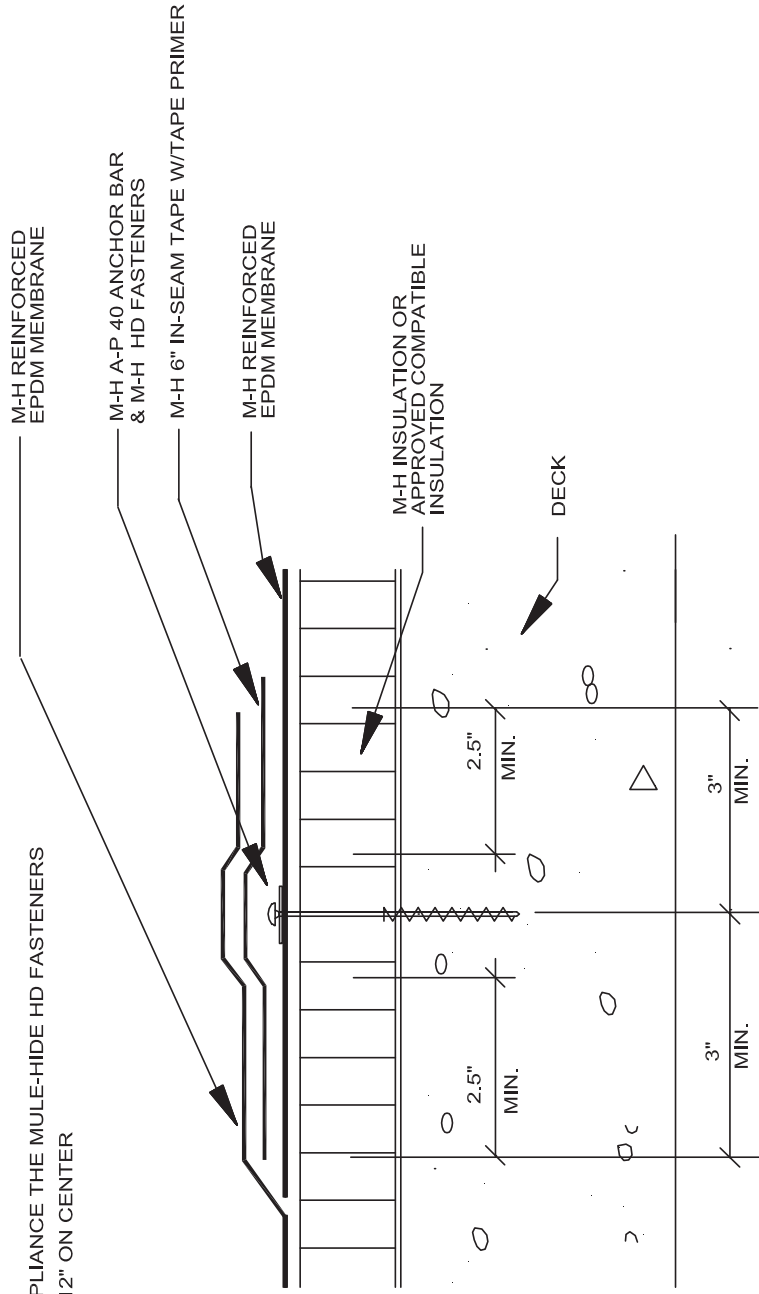
THIS DETAIL IS ACCEPTABLE FOR USE IN A 20-YEAR WARRANTED SYSTEM.

MULE-HIDE PRODUCTS CO., INC.
2010

MEMBRANE SPLICE W/6" TAPE AND 2.4" SEAM PLATE - 6" WIDE SEAM SYSTEMS: MECHANICALLY ATTACHED REINFORCED EPDM

DETAIL NO.:
MHE-112A

FOR FM 1-135 COMPLIANCE THE MULE-HIDE HD FASTENERS
MUST BE SPACED 12" ON CENTER



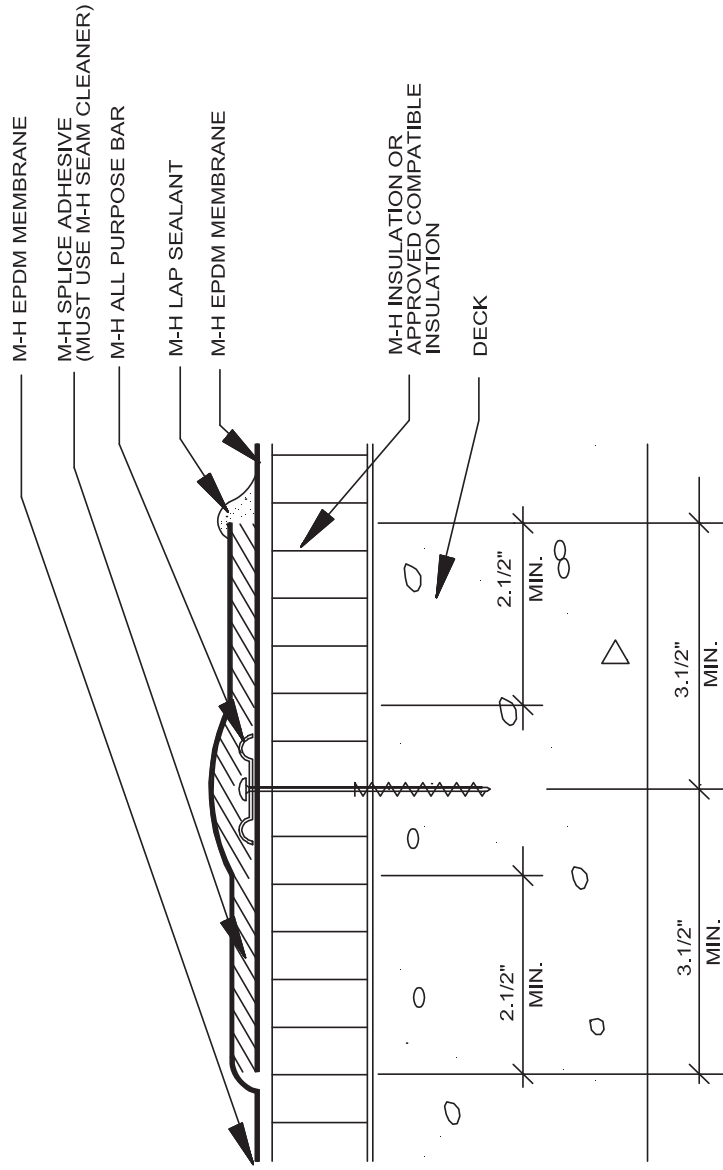
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

MEMBRANE SPLICE W/ 6" TAPE
A-P 40 ANCHOR BAR
6" WIDE SEAM

SYSTEMS: MECHANICALLY
ATTACHED REINFORCED
MEMBRANE ONLY

DETAIL NO.:

MHE-112B

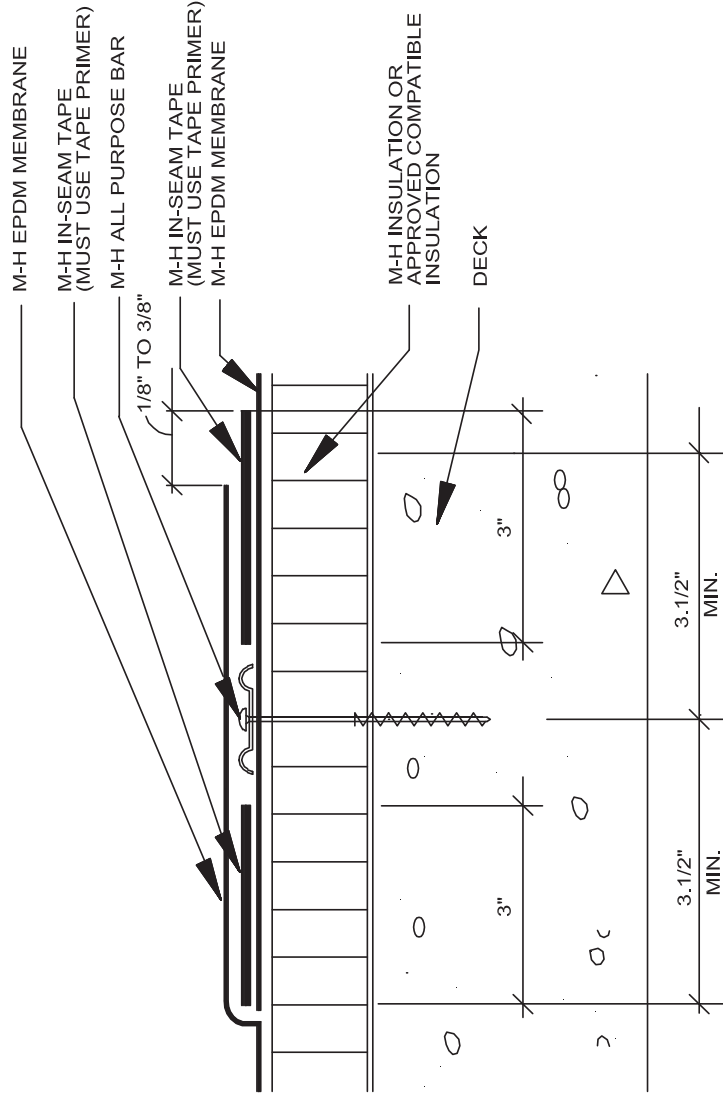


MULE-HIDE
PRODUCTS CO., INC.
04/01/2004

MEMBRANE SPLICE, ALL-
 PURPOSE BAR WITH
 ADHESIVE - 7" SEAM
 SYSTEMS:
 MECHANICALLY ATTACHED

DETAIL NO.:

MHE-113

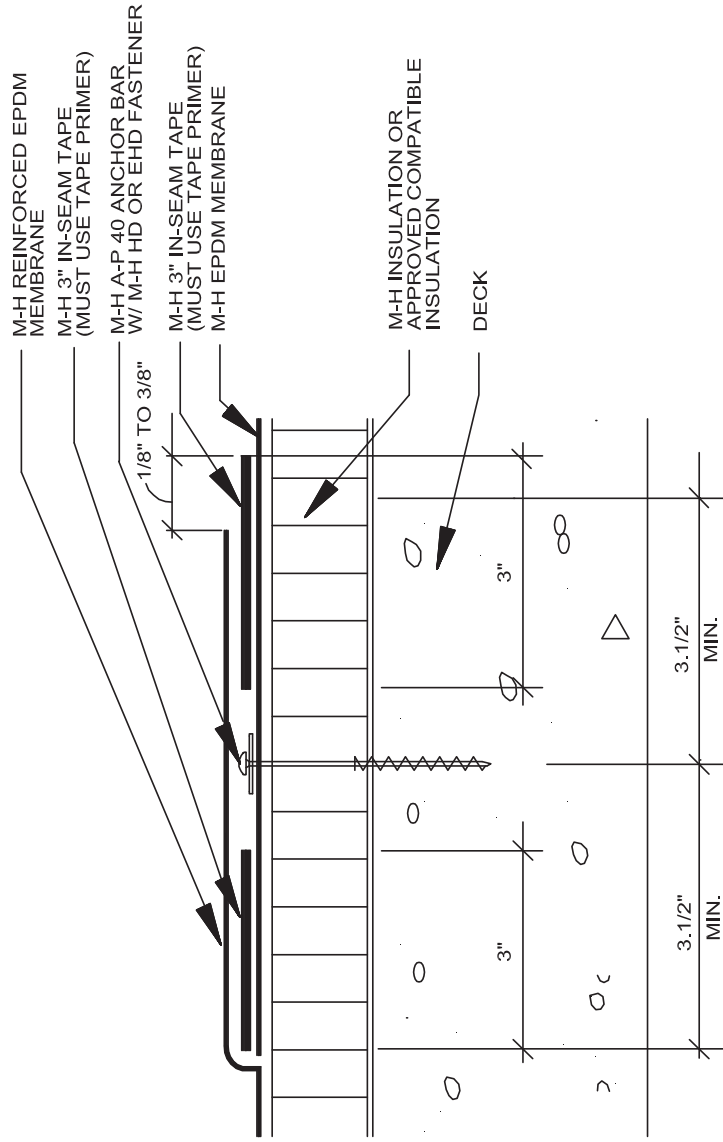


**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

MEMBRANE SPLICE, ALL-
PURPOSE BAR WITH
IN-SEAM TAPE - 7" SEAM
SYSTEMS:
MECHANICALLY ATTACHED

DETAIL NO.:

MHE-114



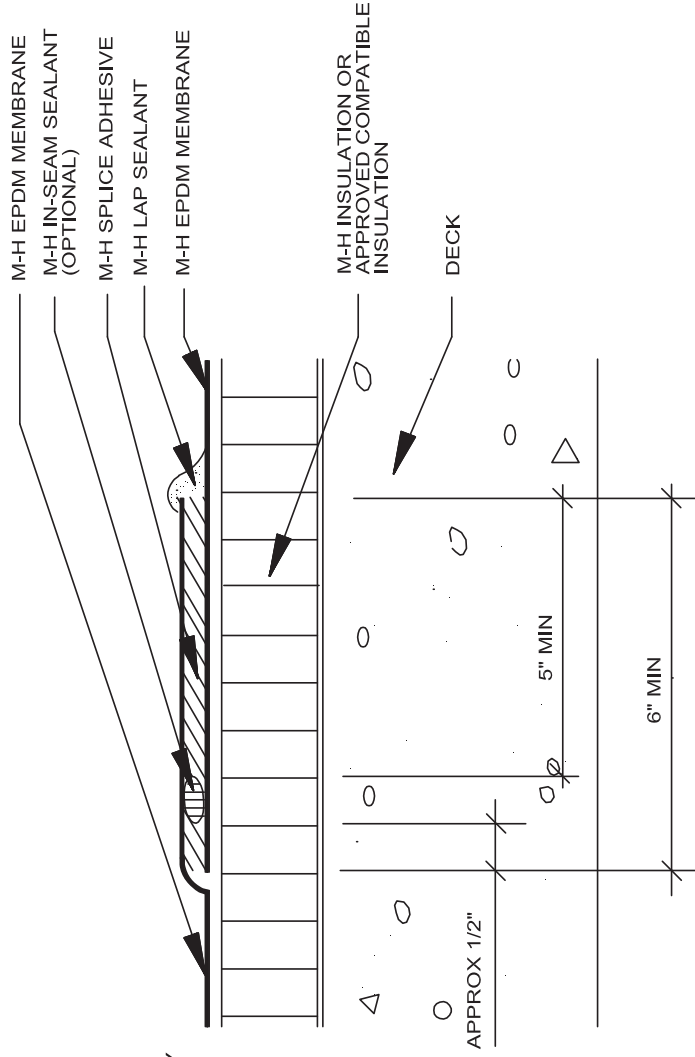
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

**MEMBRANE SPLICE, A-P 40
ANCHOR BAR WITH
IN-SEAM TAPE - 7" SEAM**
SYSTEMS:
MECHANICALLY ATTACHED

DETAIL NO.:

MHE-114a

NOTE: MUST USE SEAM
CLEANER PRIOR TO
APPLICATION OF SPLICE
ADHESIVE - TAPE PRIMER MAY
BE USED AS A SUBSTITUTE
FOR SEAM CLEANER



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

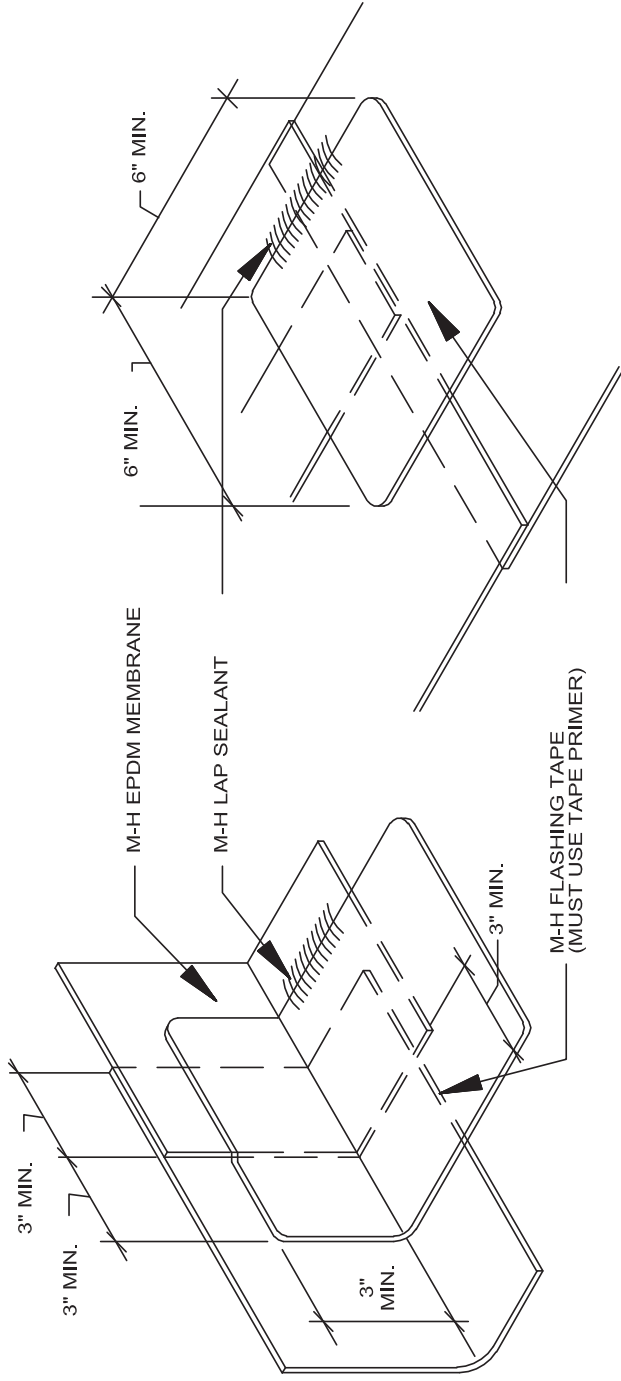
MEMBRANE SPLICE W/
SPLICE ADHESIVE - 6" SEAM

SYSTEMS:
ALL

DETAIL NO.:

MHE-115

NOTE: LAP SEALANT MUST BE APPLIED
ALONG ALL EDGES OF PATCH



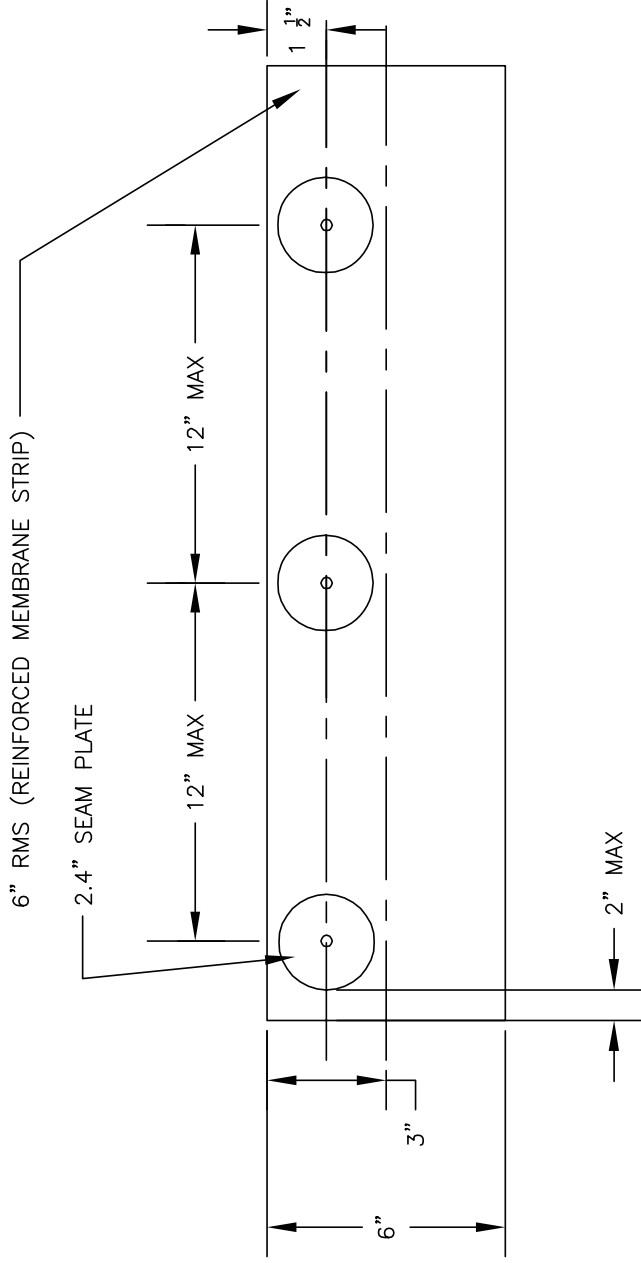
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

END LAP & T-JOINT DETAIL

SYSTEMS:
ALL

DETAIL NO.:

MHE-118



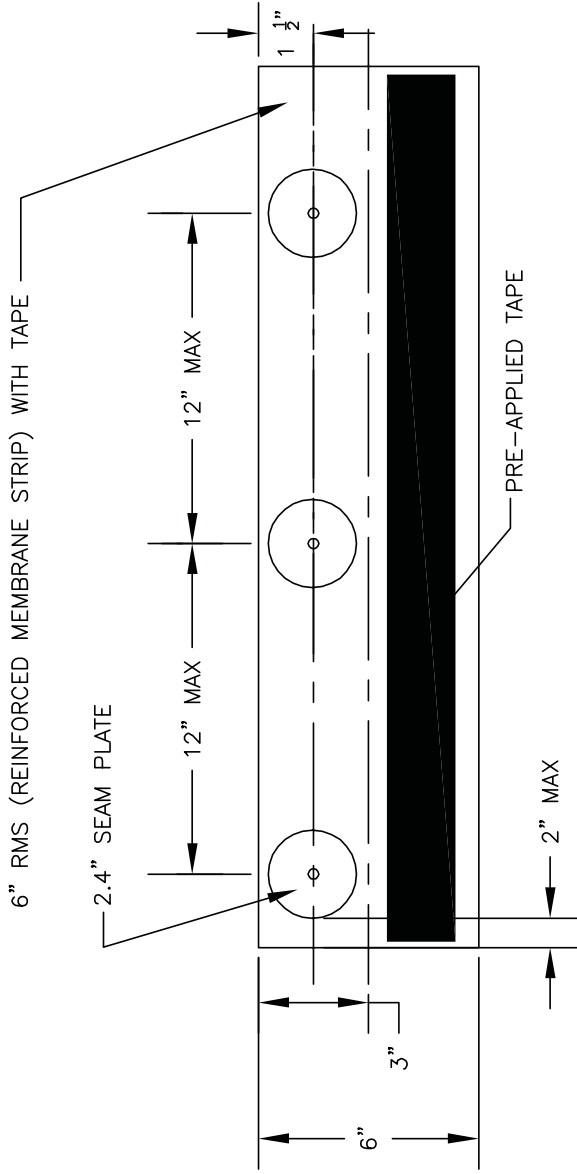
NOTE: NOT TO SCALE. FOR ILLUSTRATION PURPOSES ONLY

**MULE-HIDE
PRODUCTS CO., INC.**
2010

6" RMS ATTACHMENT STRIP

**SYSTEMS:
ALL**

DETAIL NO.:
MHE-119



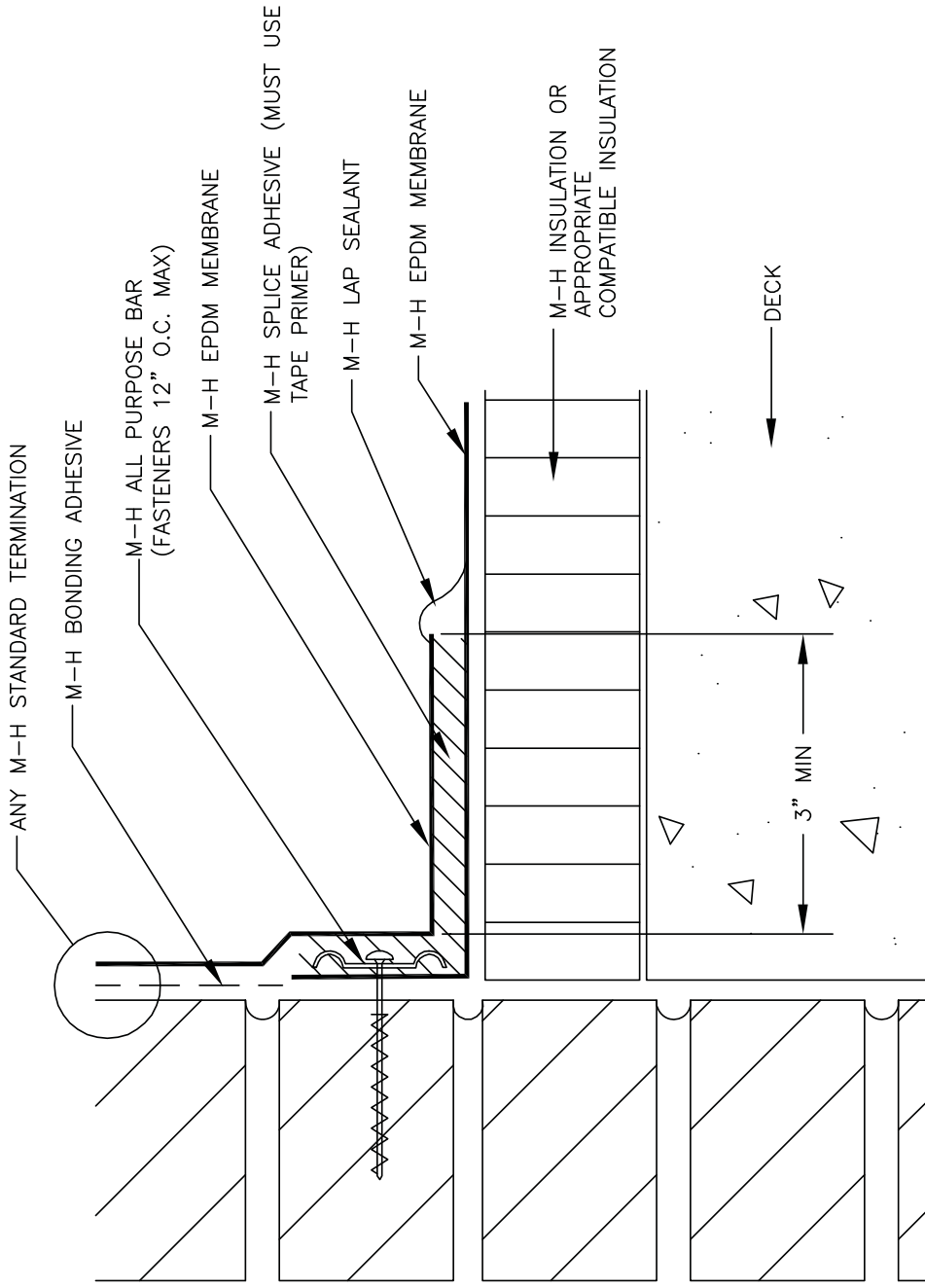
NOTE: NOT TO SCALE. FOR ILLUSTRATION PURPOSES ONLY

**MULE-HIDE
PRODUCTS CO., INC.**
2010

6" RMS WITH TAPE

**SYSTEMS:
ALL**

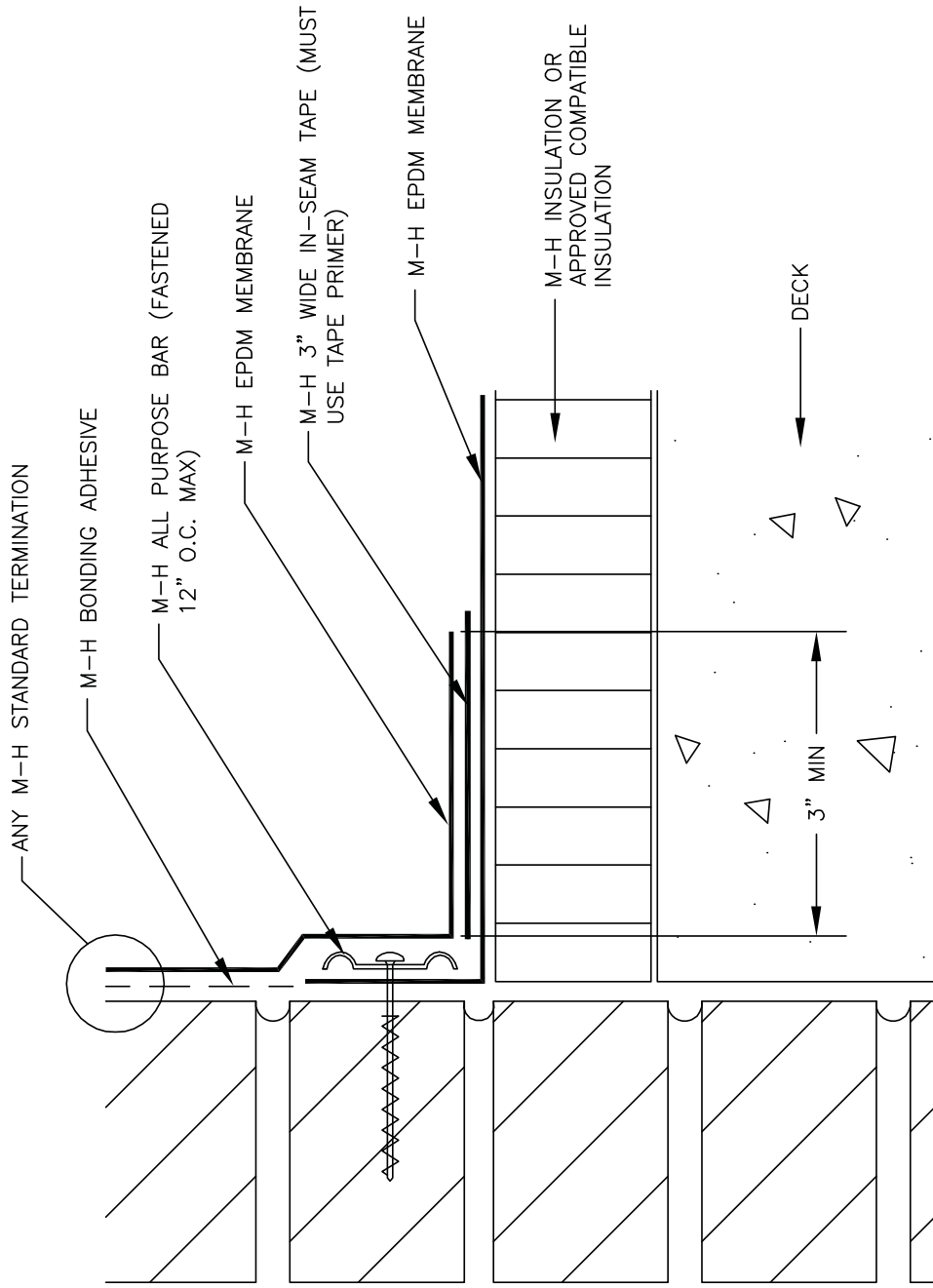
DETAIL NO.:
MHE-119A



**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

**PARAPET/CURB FLASHING A-P BAR
VERTICAL ATTACHMENT**
SYSTEMS:
ALL

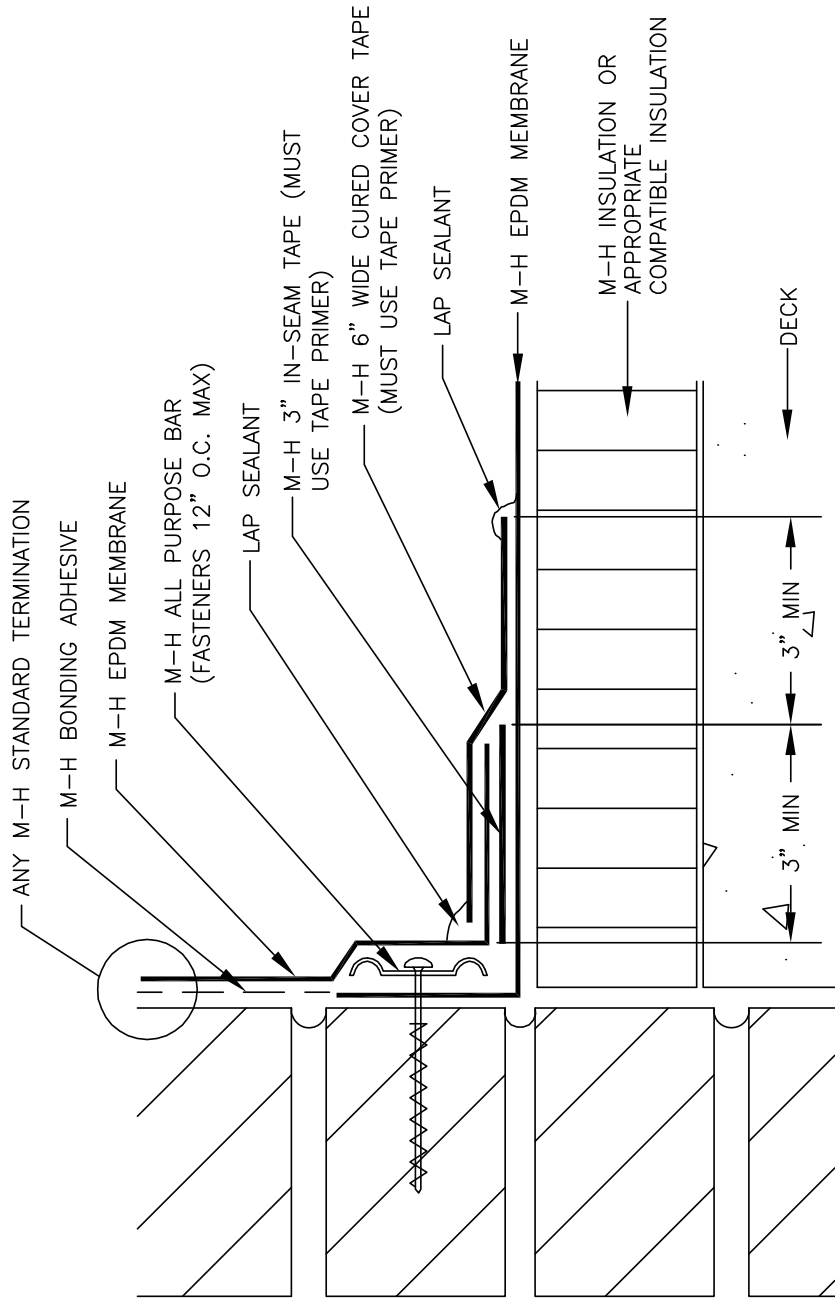
DETAIL NO.:
MHE-120



**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

**PARAPET/CURB FLASHING A-P BAR
VERTICAL ATTACHMENT**
SYSTEMS:
ALL

DETAIL NO.:
MHE-120A

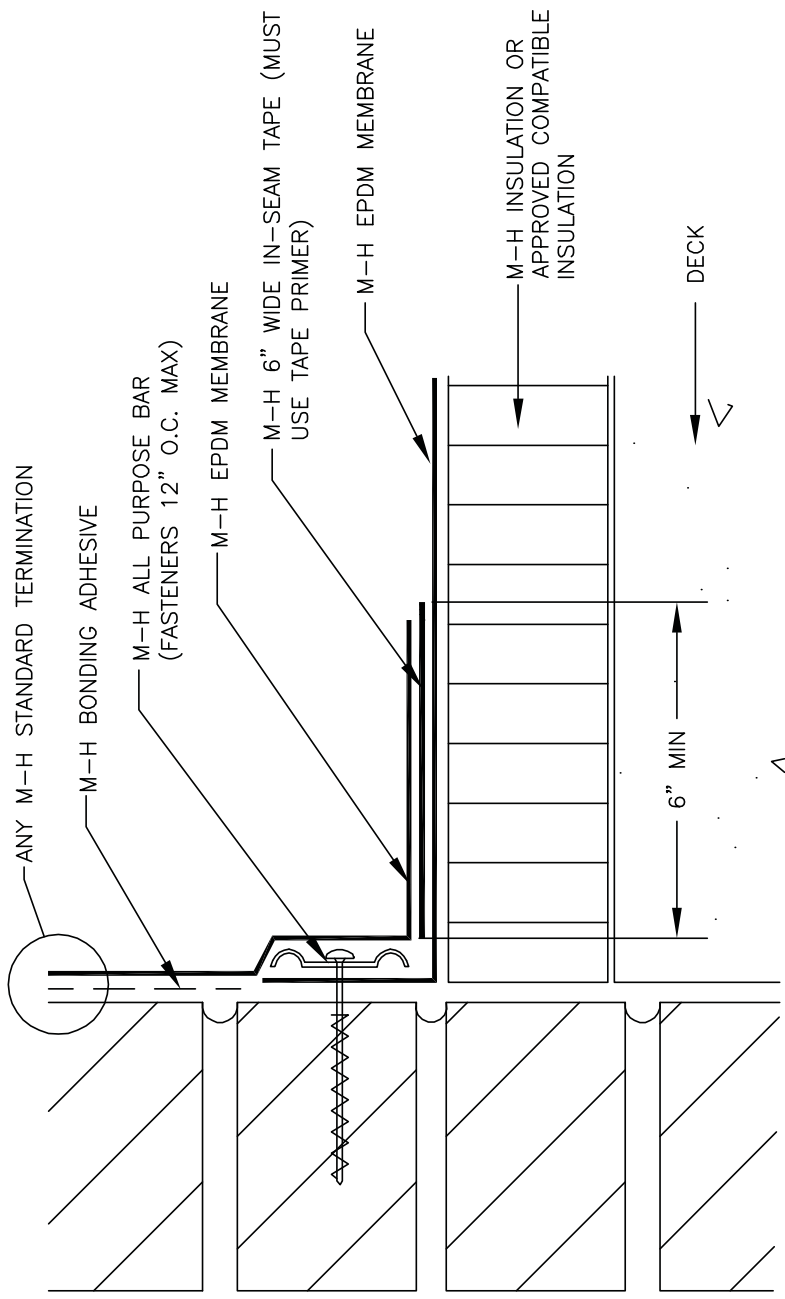


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET/CURB FLASHING A-P BAR
 VERTICAL ATTACHMENT
 SYSTEMS:
 BALLASTED, FULLY ADHERED, LIVING ROOF**

DETAIL NO.:
MHE-120B

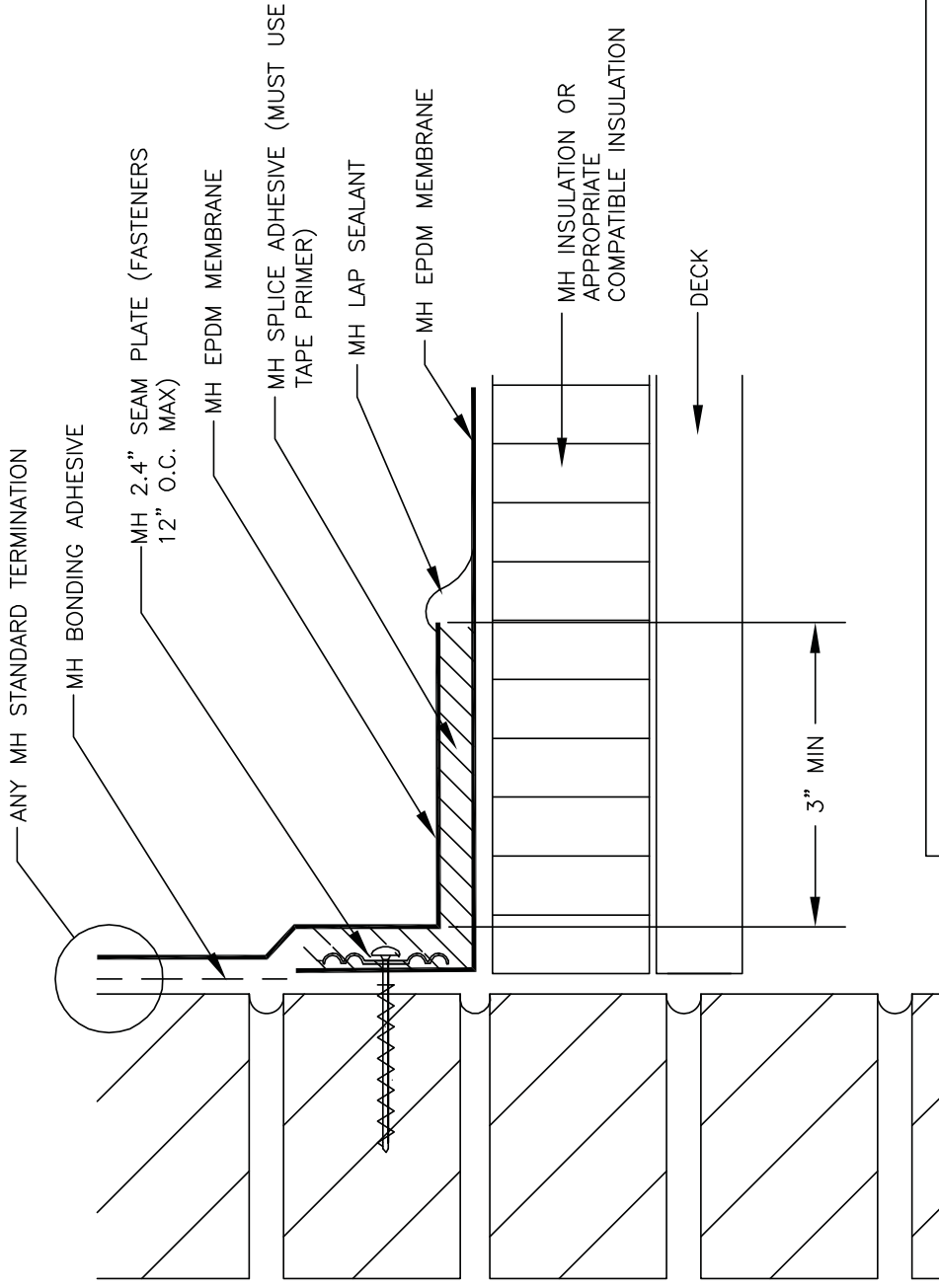


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET/CURB FLASHING A-P BAR
 VERTICAL ATTACHMENT
 SYSTEMS:
 ALL**

DETAIL NO.:
MHE-120C



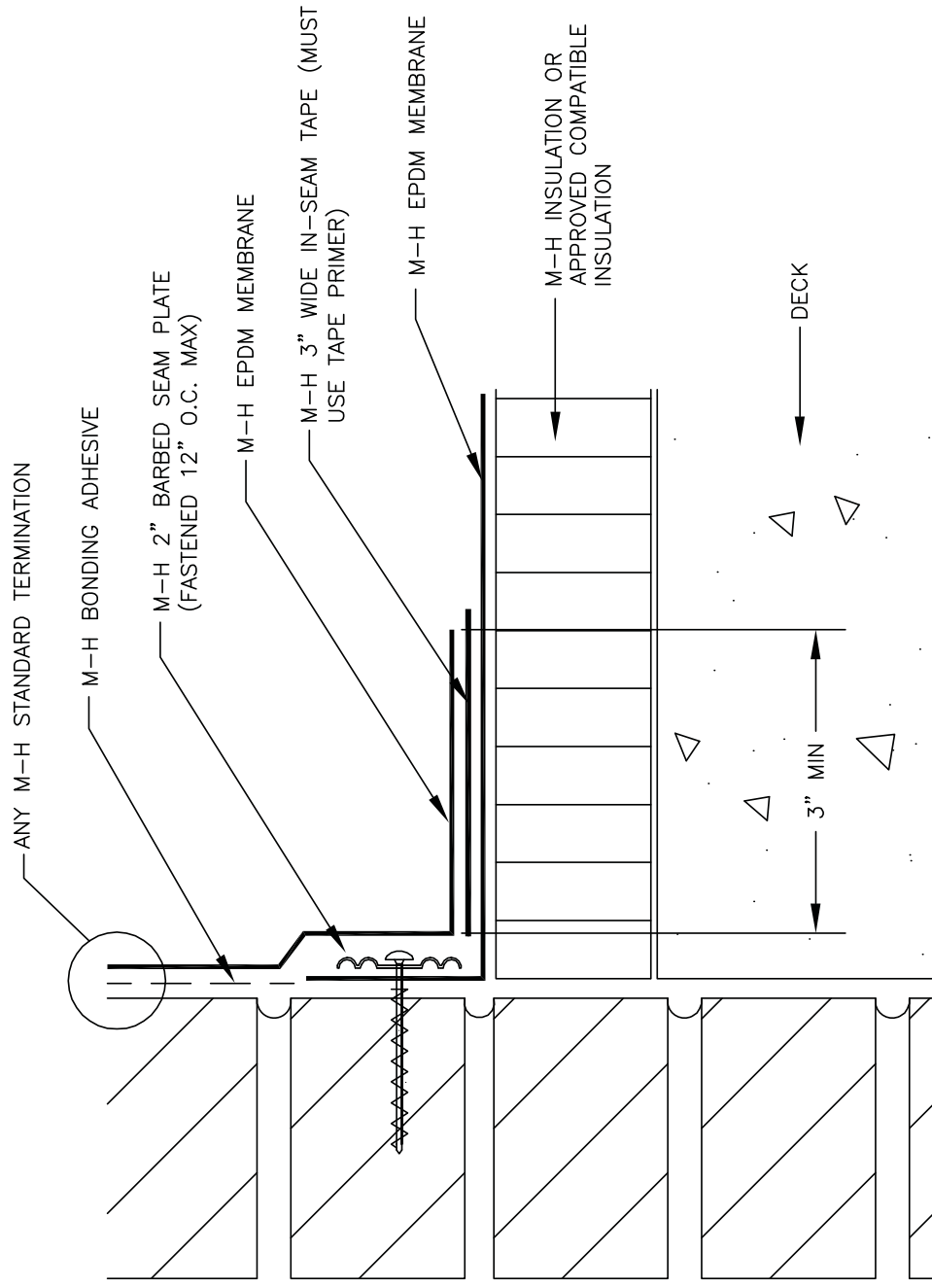
NOTE:

THIS DETAIL IS NOT ACCEPTABLE FOR A 15 OR 20 YEAR WARRANTY.

**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

**PARAPET / CURB FLASHING W/
2.4" SEAM PLATES / VERTICAL ATTACHMENT
SYSTEMS:
REINFORCED MEMBRANES ONLY**

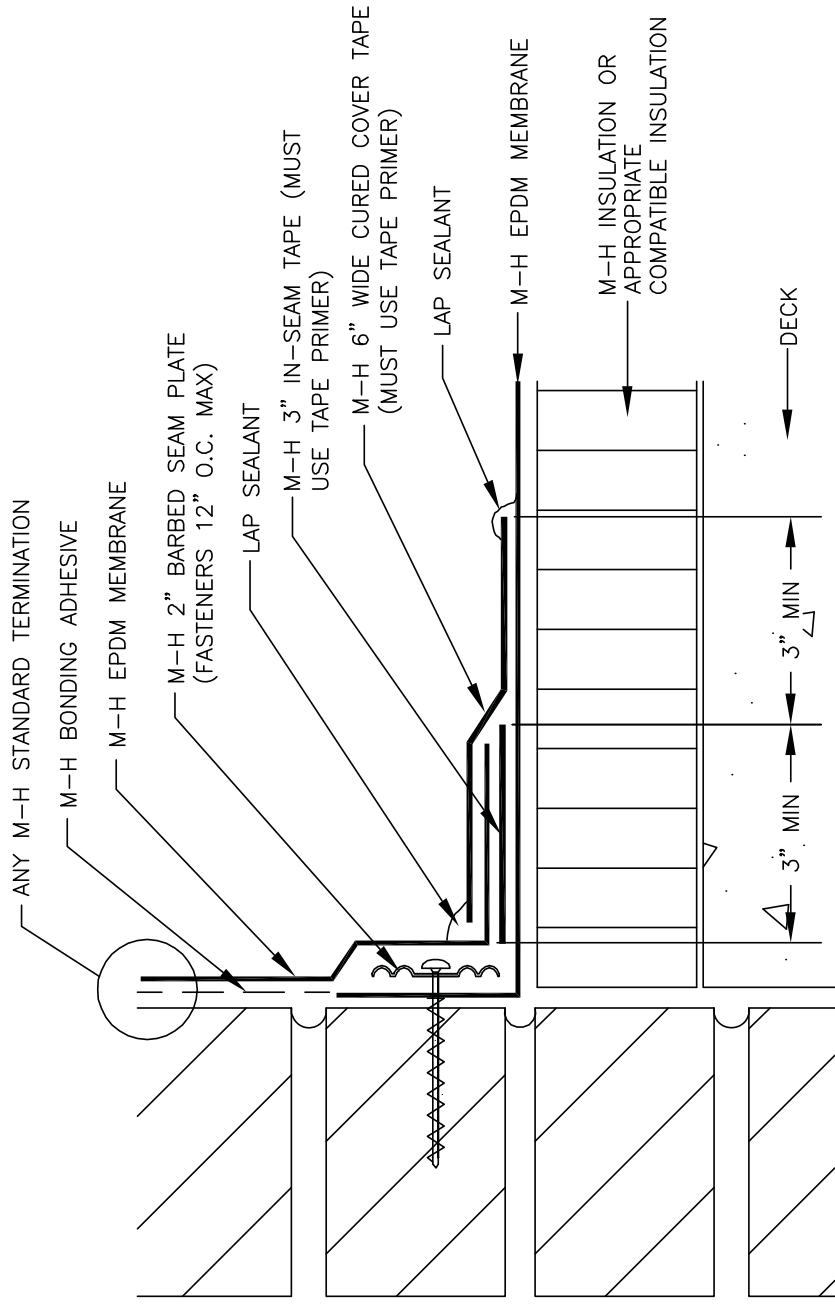
DETAIL NO.:
MHE-121



**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

**PARAPET/CURB FLASHING 2" BARBED
SEAM PLATES/VERTICAL ATTACHMENT
SYSTEMS:
REINFORCED MEMBRANES ONLY**

DETAIL NO.:
MHE-121A

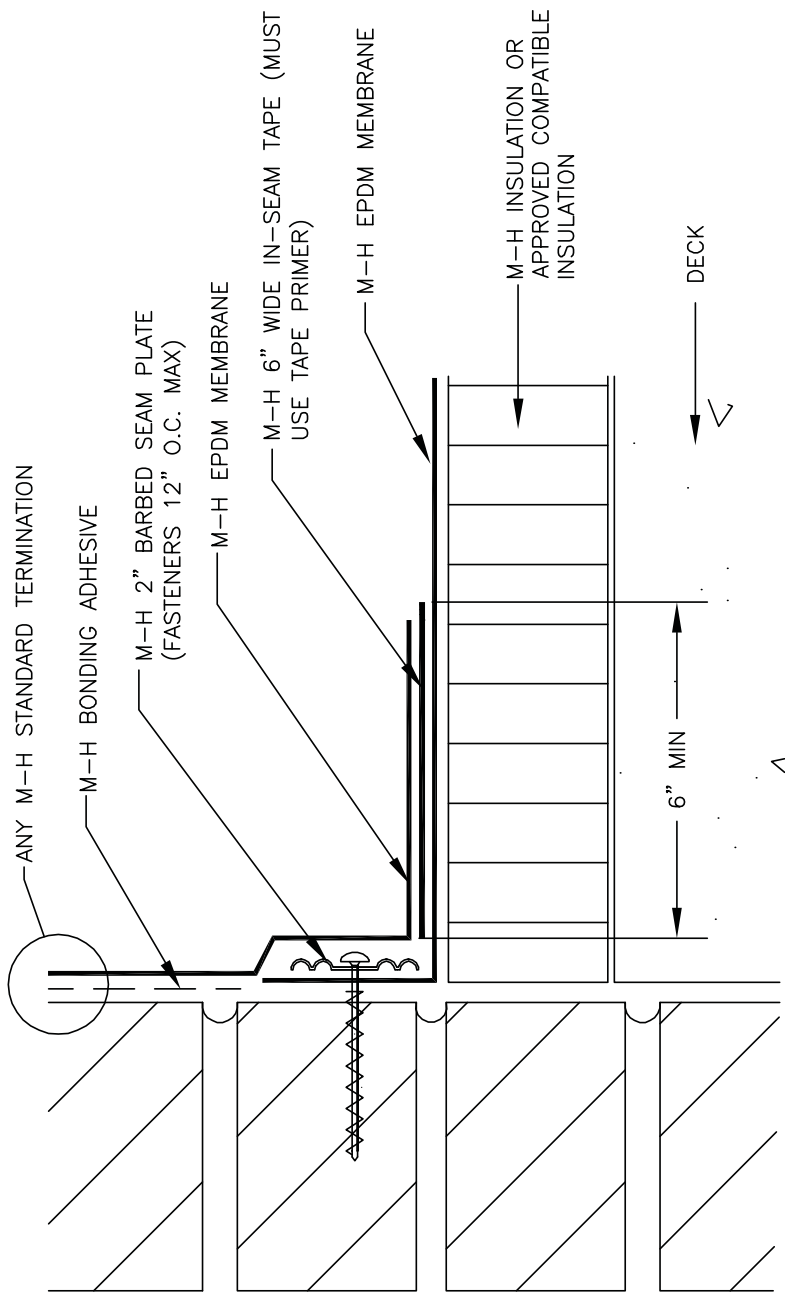


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET/CURB FLASHING 2" BARBED
 SEAM PLATES/VERTICAL ATTACHMENT
 SYSTEMS:
 REINFORCED MEMBRANES ONLY**

DETAIL NO.:
MHE-121B

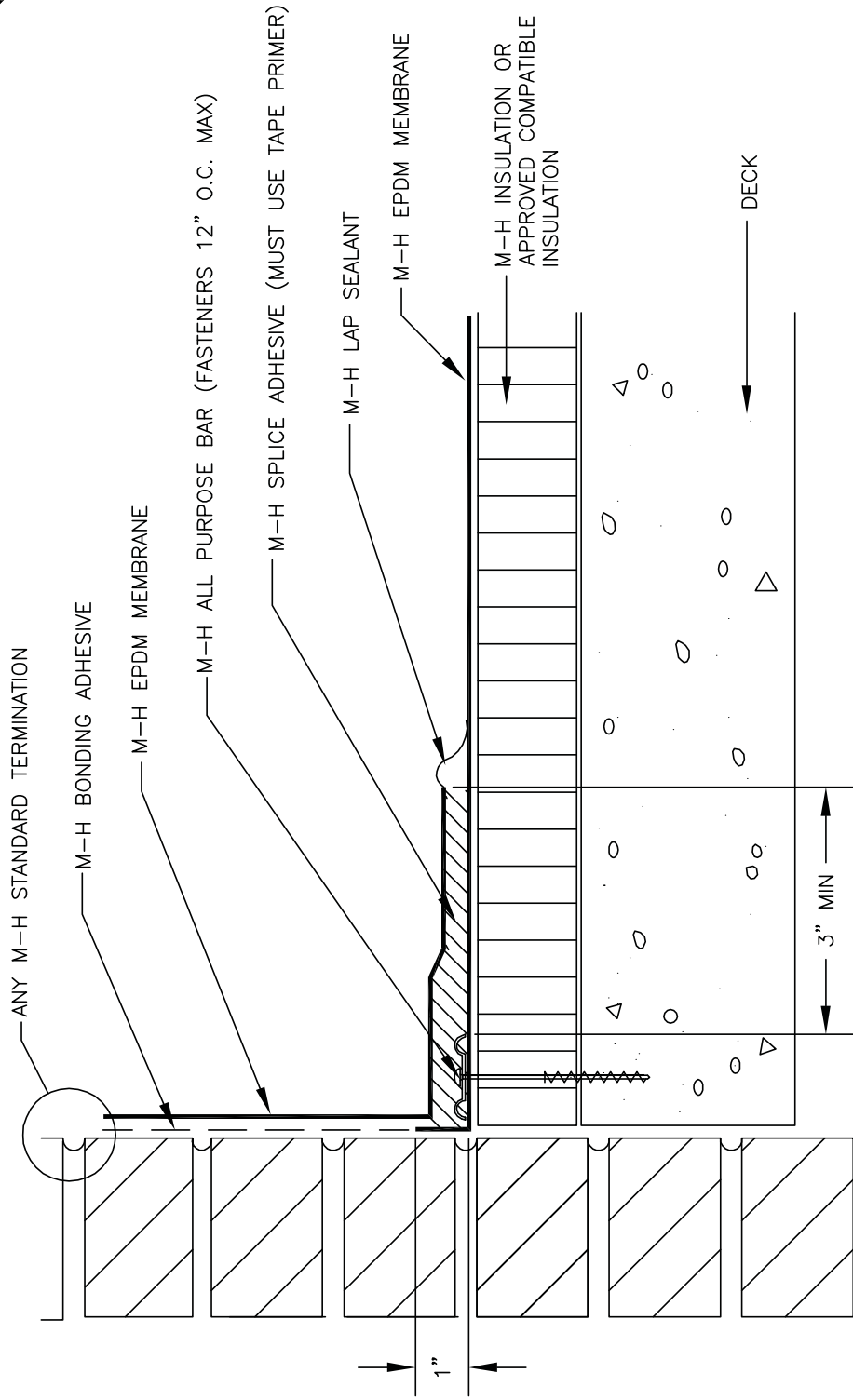


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET/CURB FLASHING 2" BARBED
 SEAM PLATES/VERTICAL ATTACHMENT
 SYSTEMS:
 REINFORCED MEMBRANES ONLY**

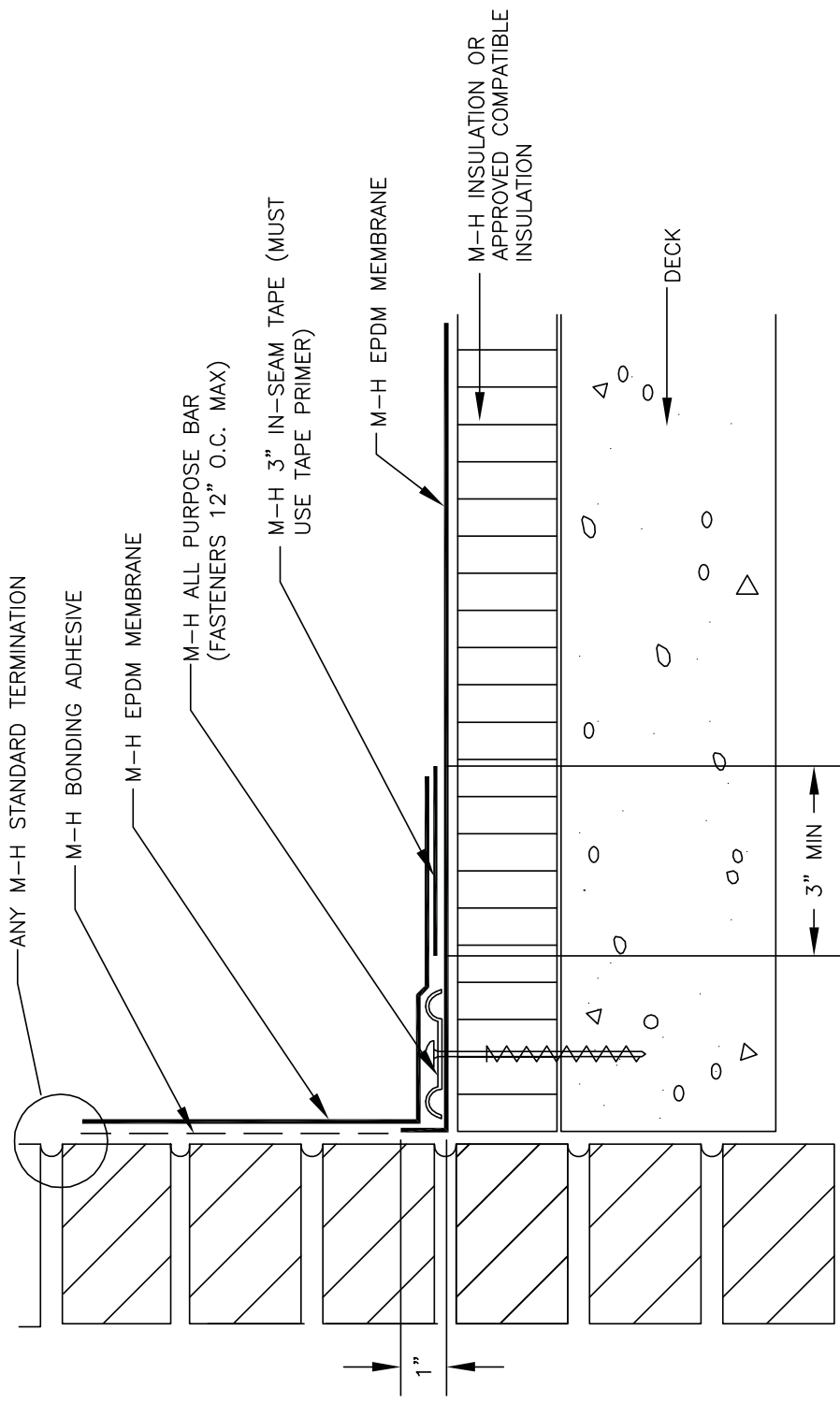
DETAIL NO.:
MHE-121C



**MULE-HIDE
PRODUCTS CO., INC.**
12/01/2008

**PARAPET/CURB FLASHING W/A-P BAR
HORIZONTAL
SYSTEMS:
FULLY ADHERED & BALLASTED
ONLY**

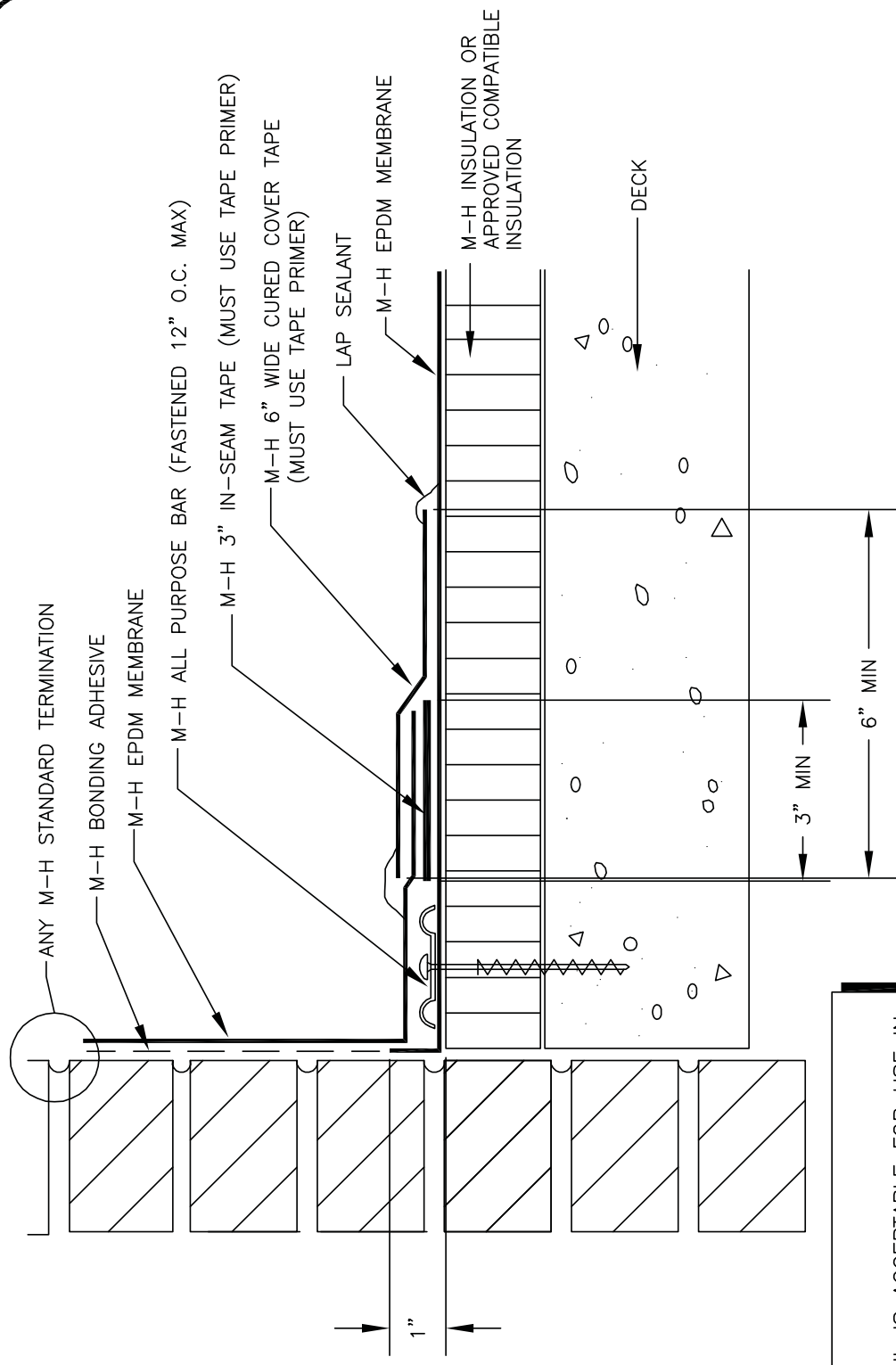
DETAIL NO.:
MHE-122



**MULE-HIDE
PRODUCTS CO., INC.**
12/1/2008

**PARAPET/CURB FLASHING W/A-P BAR
HORIZONTAL
SYSTEMS:
ALL**

DETAIL NO.:
MHE-122A

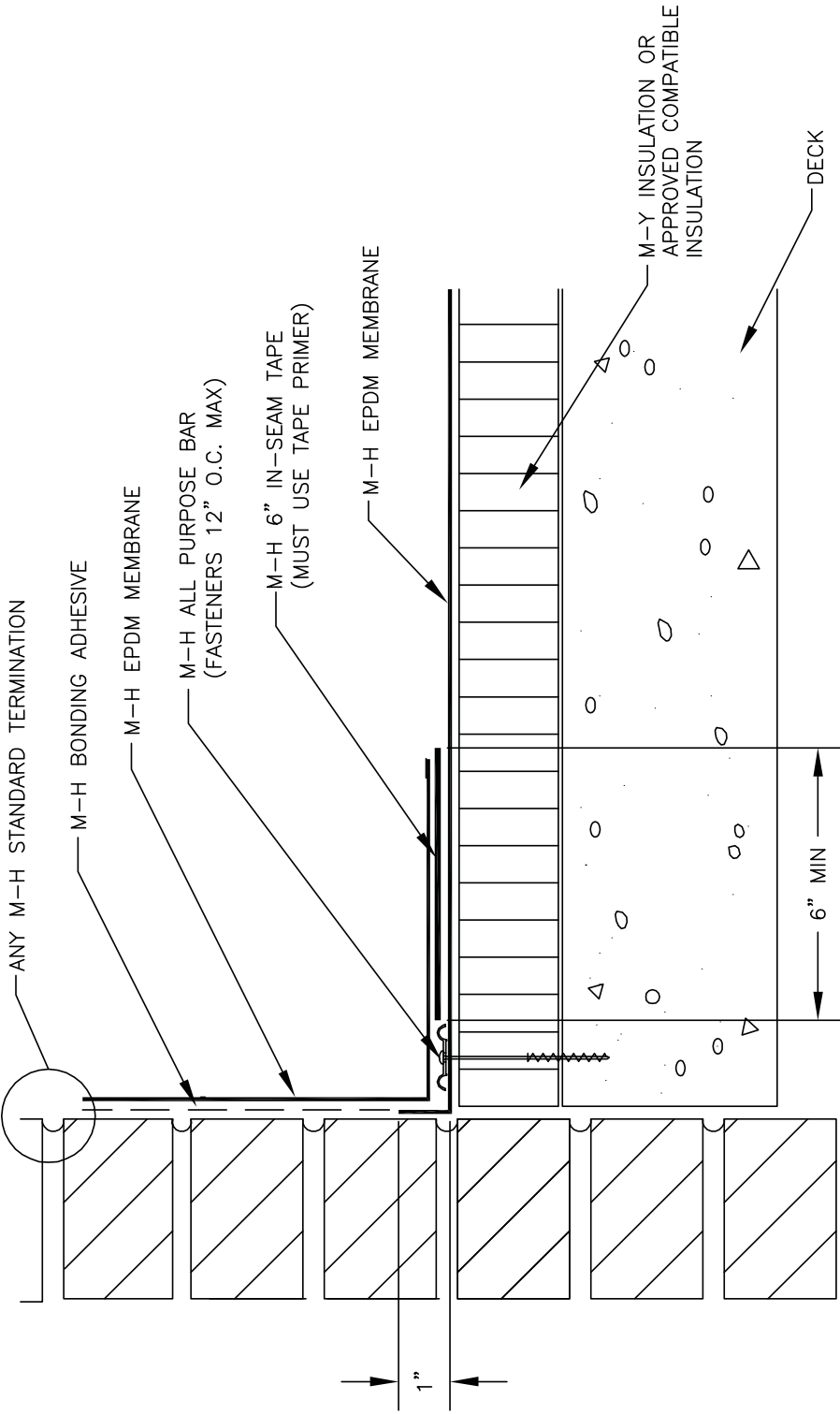


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

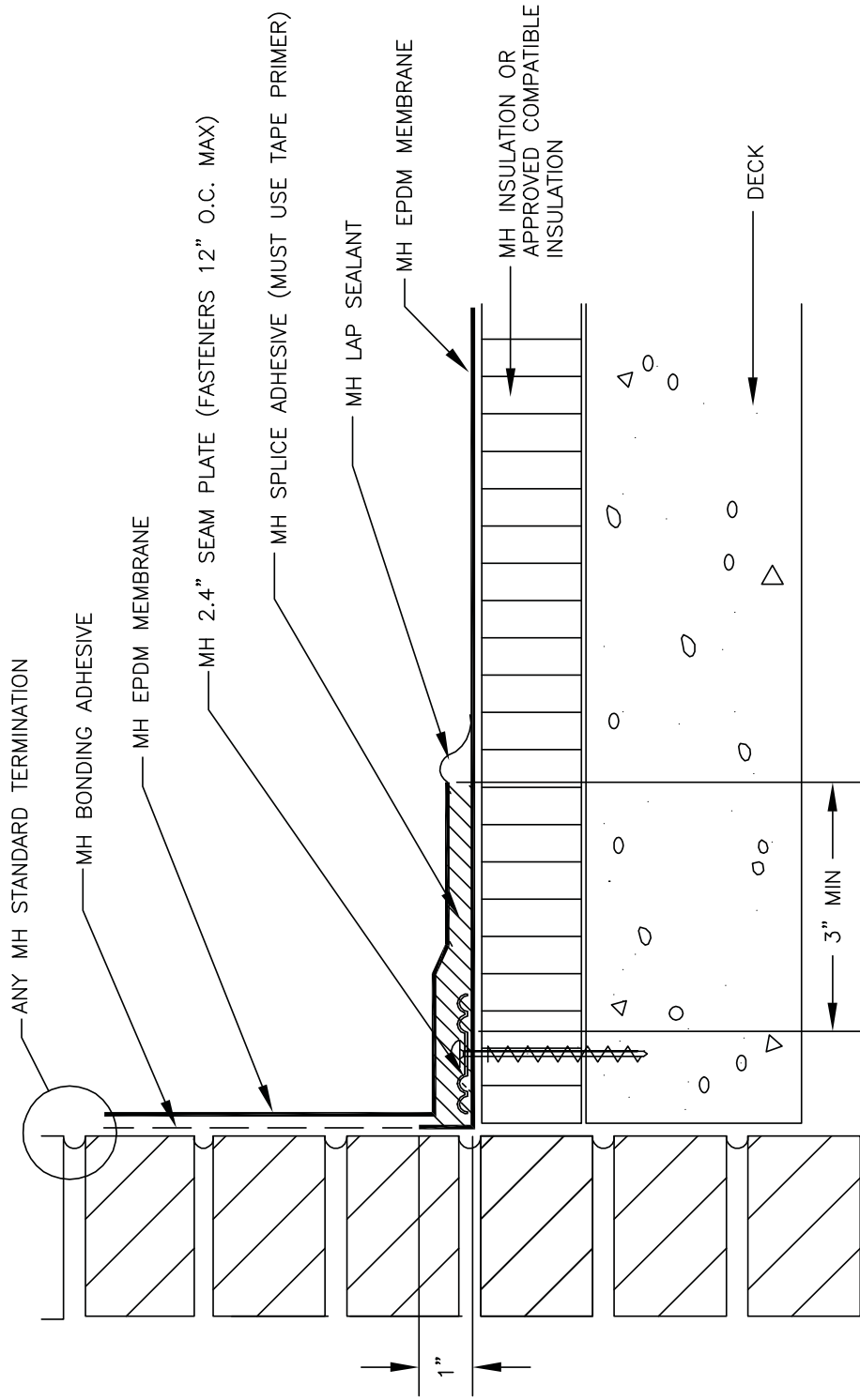
**PARAPET/CURB FLASHING W/A-P BAR
 HORIZONTAL
 SYSTEMS:
 ALL**

DETAIL NO.:
MHE-122B



NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

<p>MULE-HIDE PRODUCTS CO., INC. 12/01/2008</p>	<p>PARAPET/CURB FLASHING W/A-P BAR - HORIZONTAL</p>	<p>DETAIL NO.: MHE-122C</p>
<p>SYSTEMS: ALL</p>		

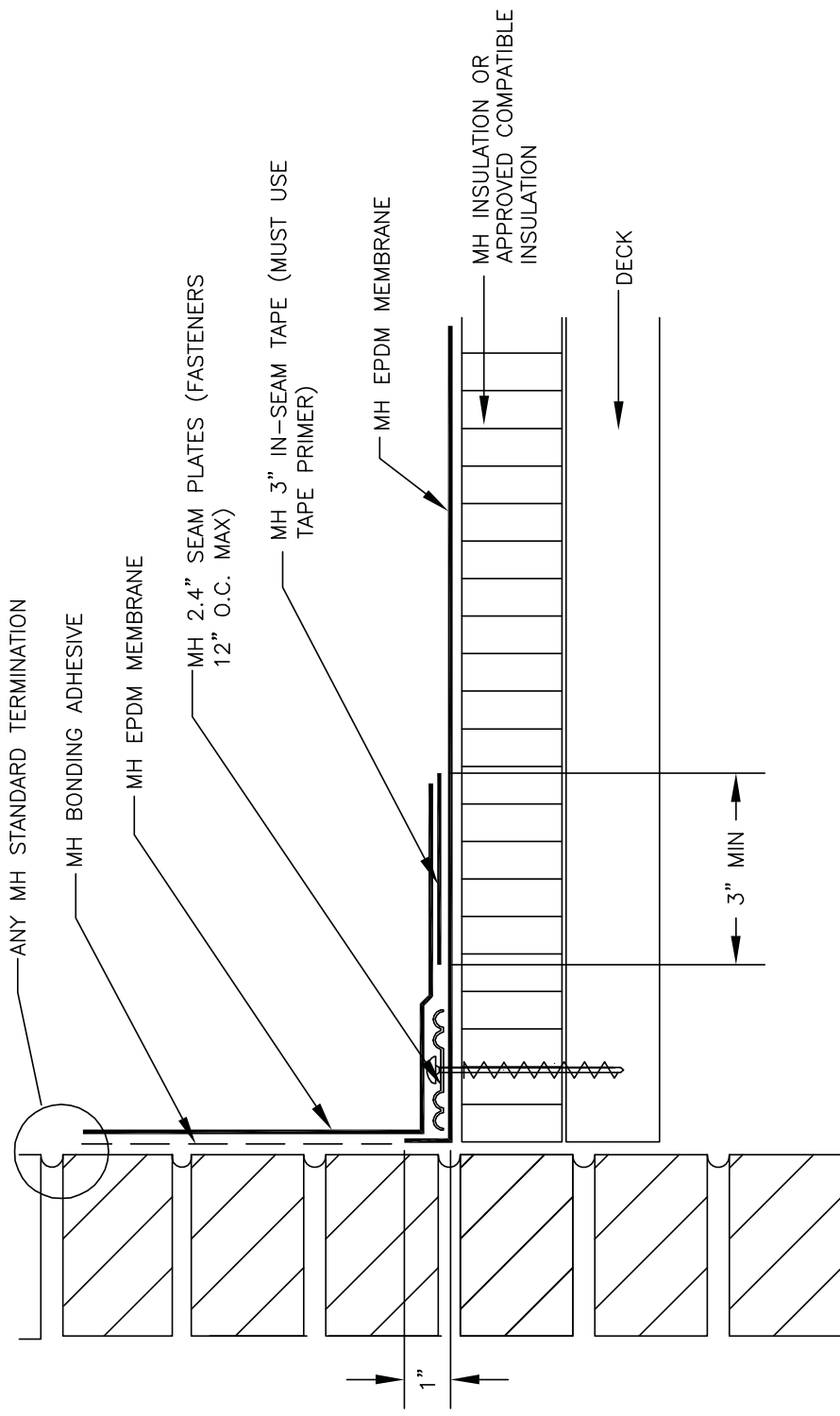


NOTE:
 THIS DETAIL IS NOI ACCEPTABLE FOR A 15 OR 20 YEAR WARRANTY.

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET / CURB FLASHING W/
 2.4" SEAM PLATES / HORIZONTAL
 SYSTEMS:
 REINFORCED MEMBRANES ONLY**

DETAIL NO.:
MHE-123

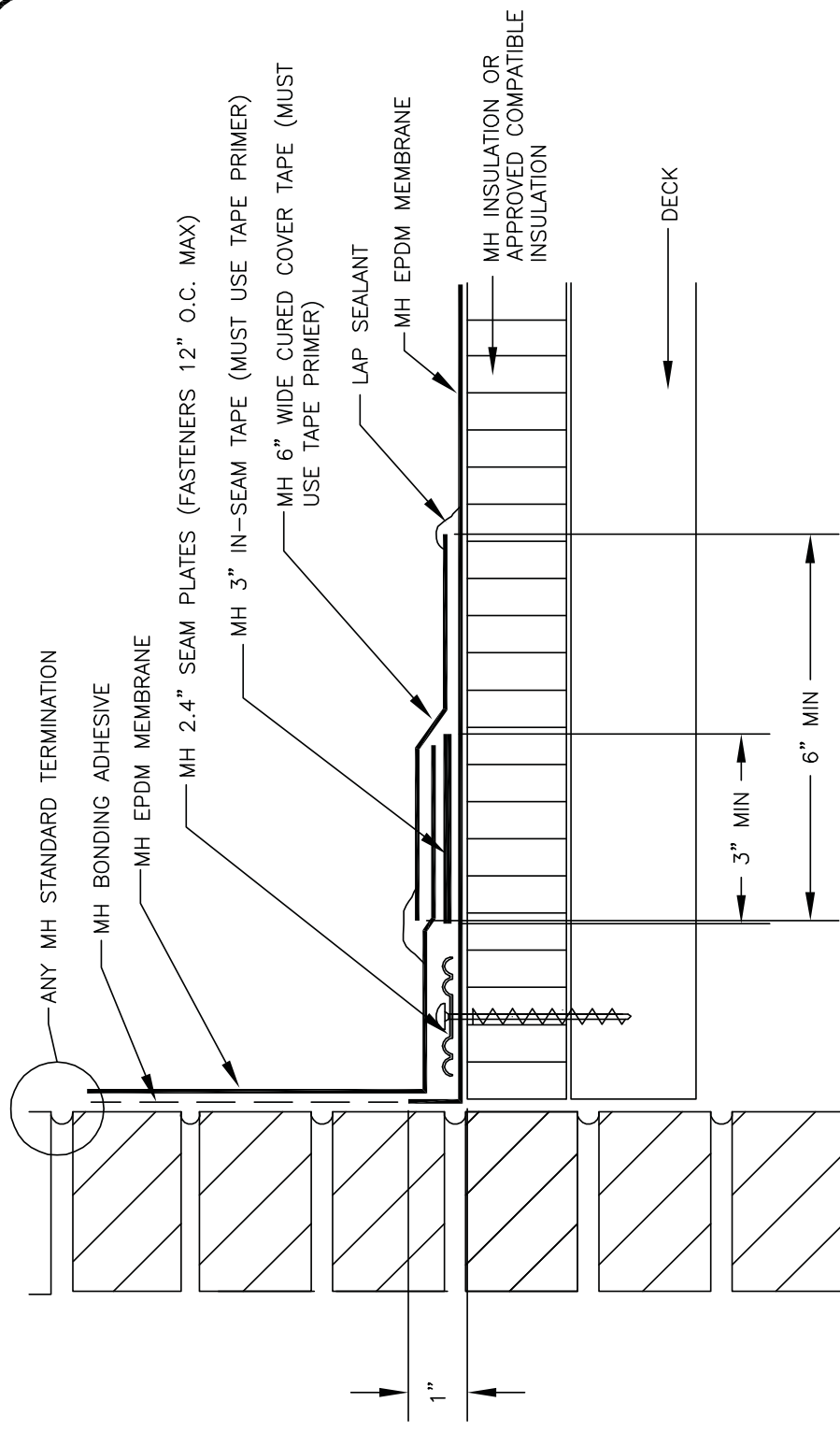


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR A 10 OR 15 YEAR WARRANTY.

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/1/2008

**PARAPET / CURB FLASHING W
 2.4" SEAM PLATES - HORIZONTAL
 SYSTEMS:
 REINFORCED MEMBRANES ONLY**

DETAIL NO.:
MHE-123A

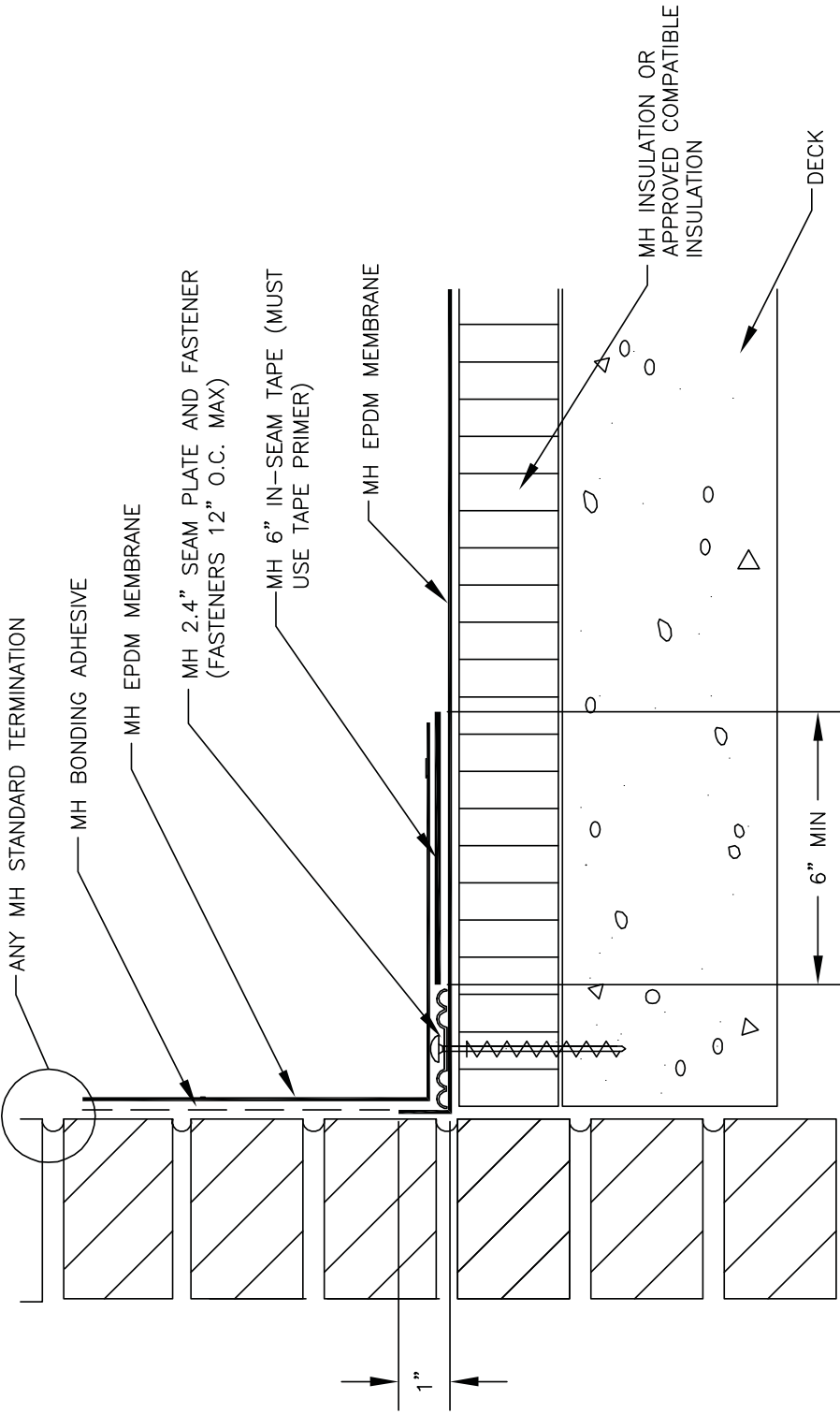


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET / CURB FLASHING W/
 2.4" SEAM PLATES - HORIZONTAL
 SYSTEMS:
 REINFORCED MEMBRANES ONLY**

DETAIL NO.:
MHE-123B

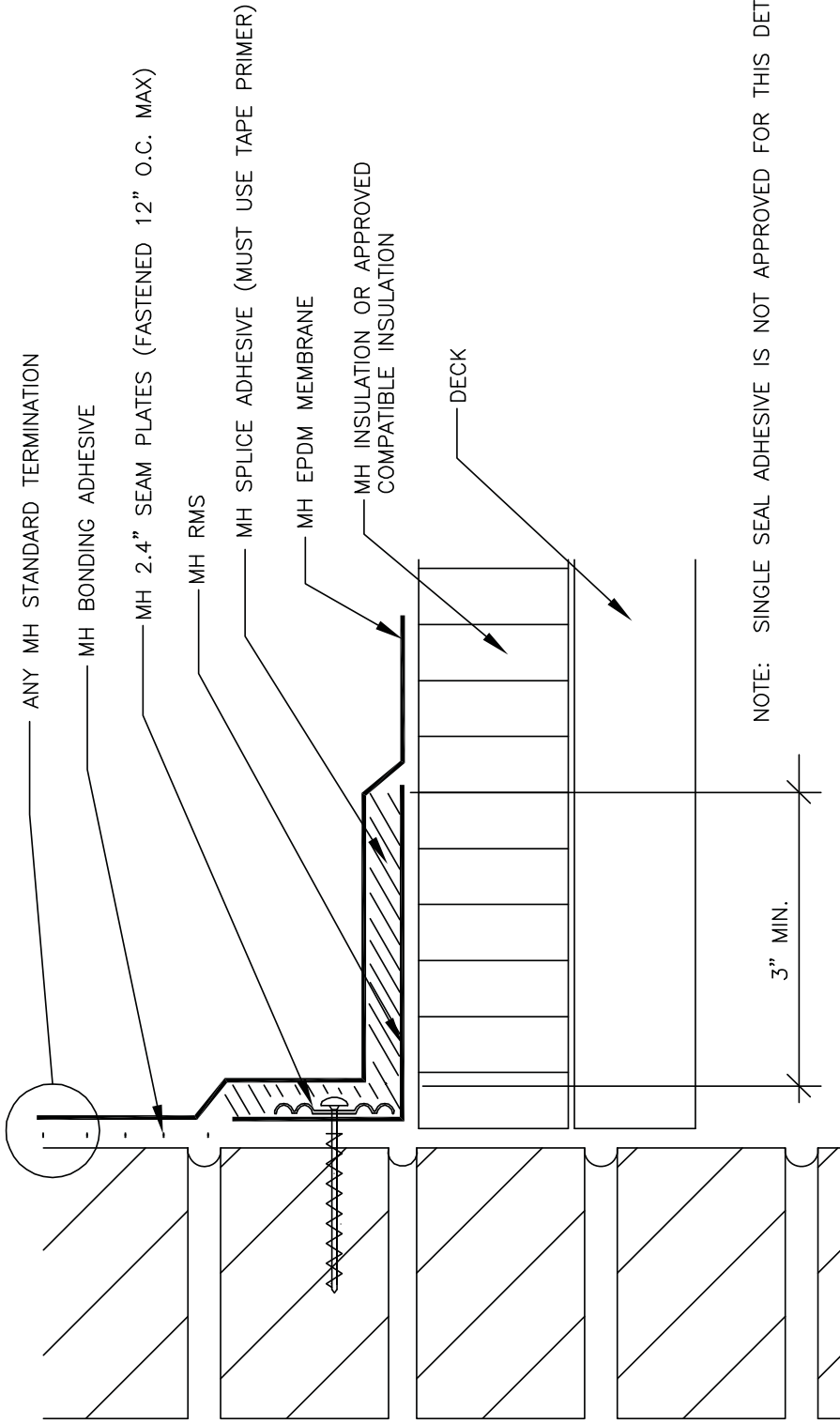


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 12/01/2008

**PARAPET / CURB FLASHING W / 2.4" SEAM
 PLATES - HORIZONTAL
 SYSTEMS:
 REINFORCED MEMBRANES ONLY**

DETAIL NO.:
MHE-123C



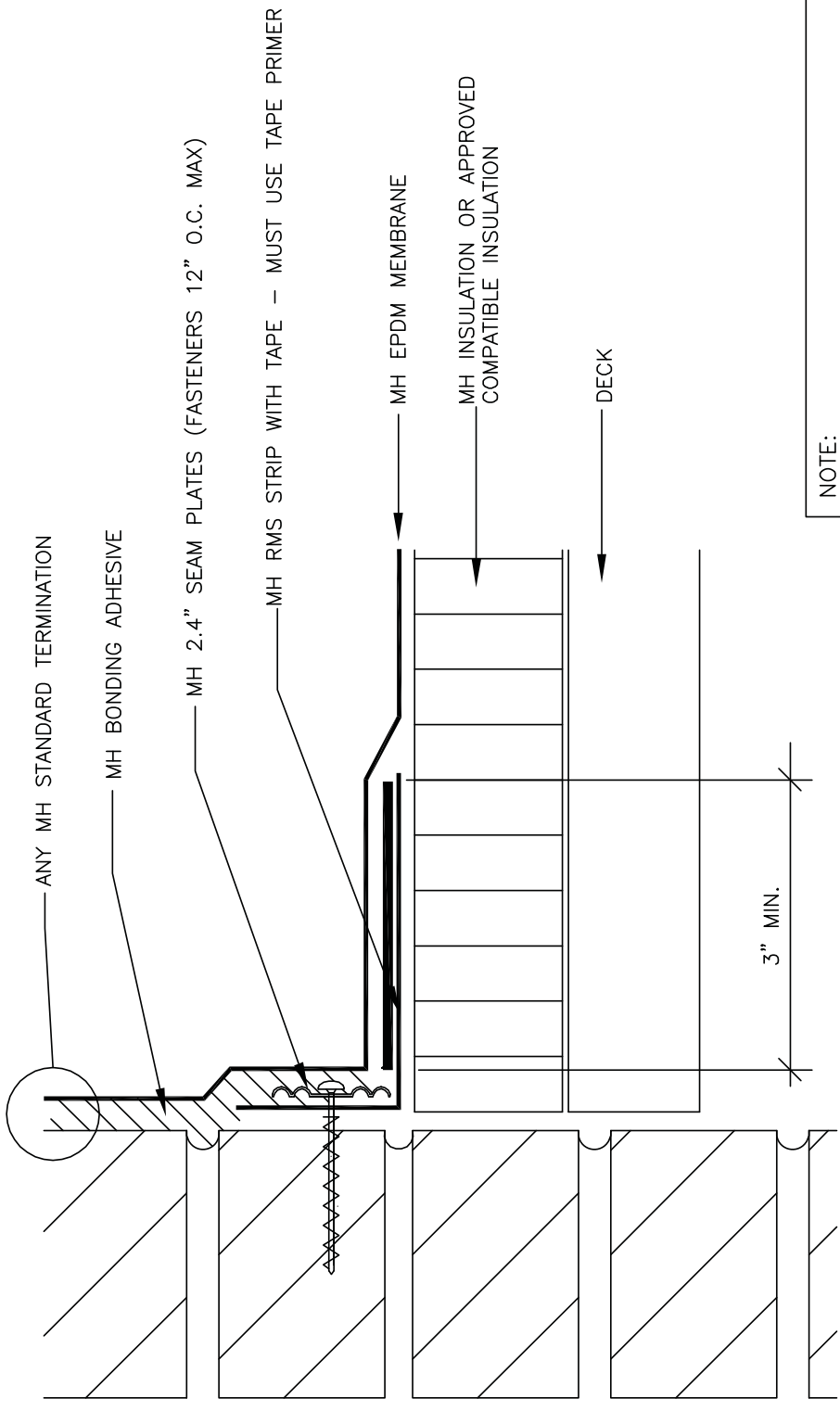
NOTE: SINGLE SEAL ADHESIVE IS NOT APPROVED FOR THIS DETAIL

3" MIN.

**MULE-HIDE
PRODUCTS CO., INC.**
2010

**PARAPET / CURB FLASHING
W / RMS - VERTICAL
SYSTEMS:
ALL**

DETAIL NO.:
MHE-124

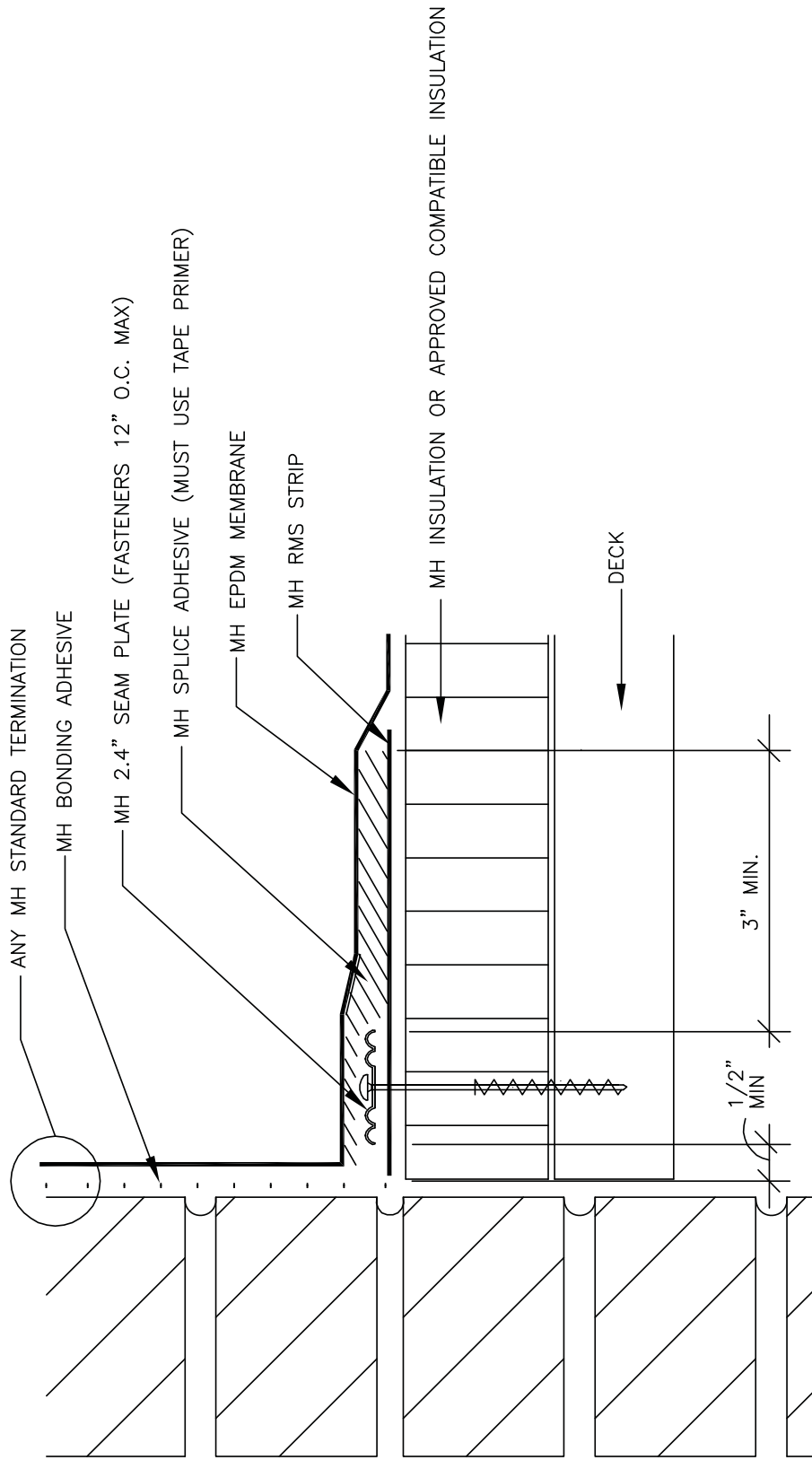


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 2010

**PARAPET / CURB FLASHING
 RMS W / TAPE - VERTICAL
 SYSTEMS:
 ALL**

DETAIL NO.:
MHE-124A

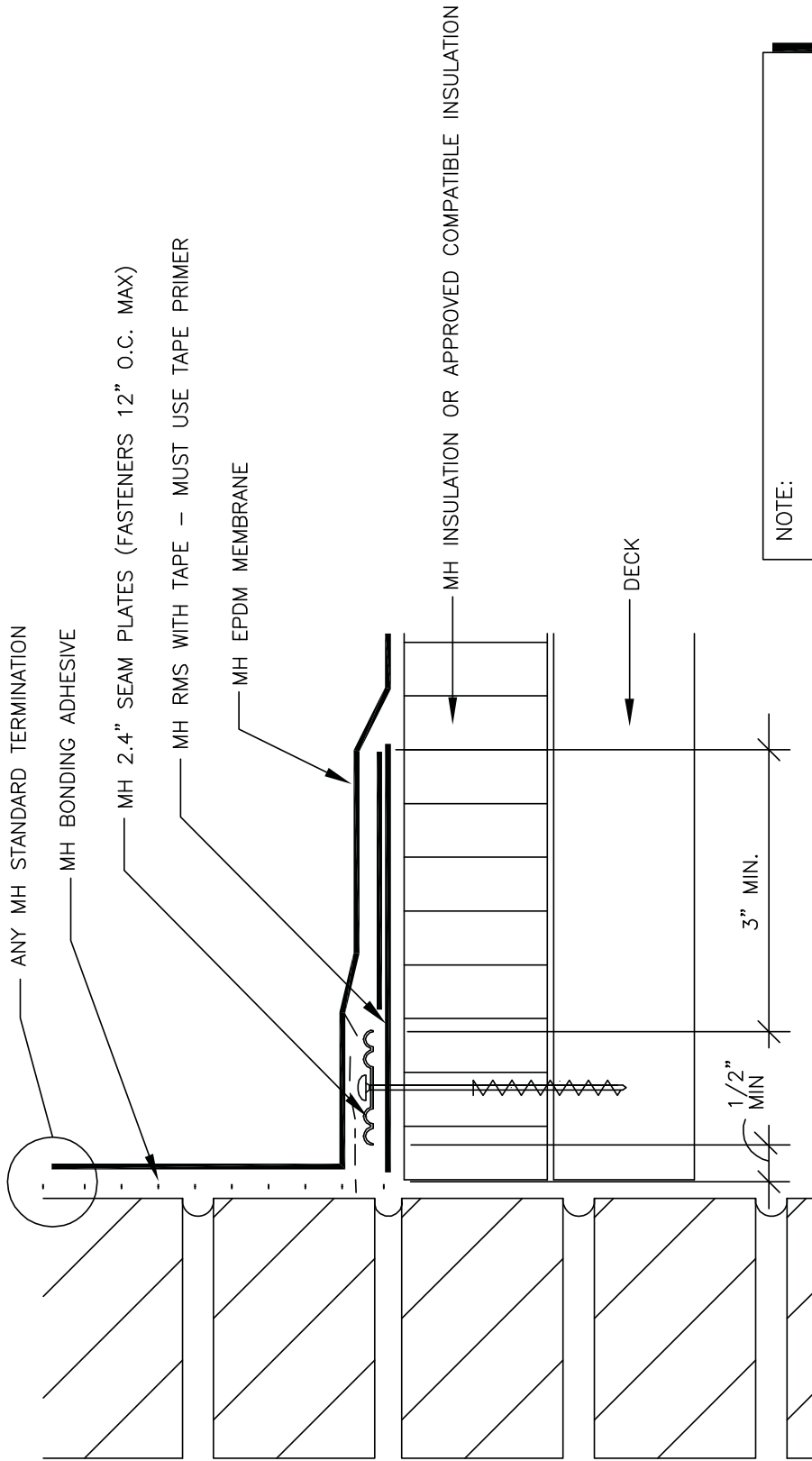


NOTE: SINGLE SEAL ADHESIVE IS NOT APPROVED FOR THIS DETAIL

**MULE-HIDE
PRODUCTS CO., INC.**
2010

**PARAPET / CURB FLASHING
W / RMS - HORIZONTAL
SYSTEMS:
ALL**

DETAIL NO.:
MHE-125



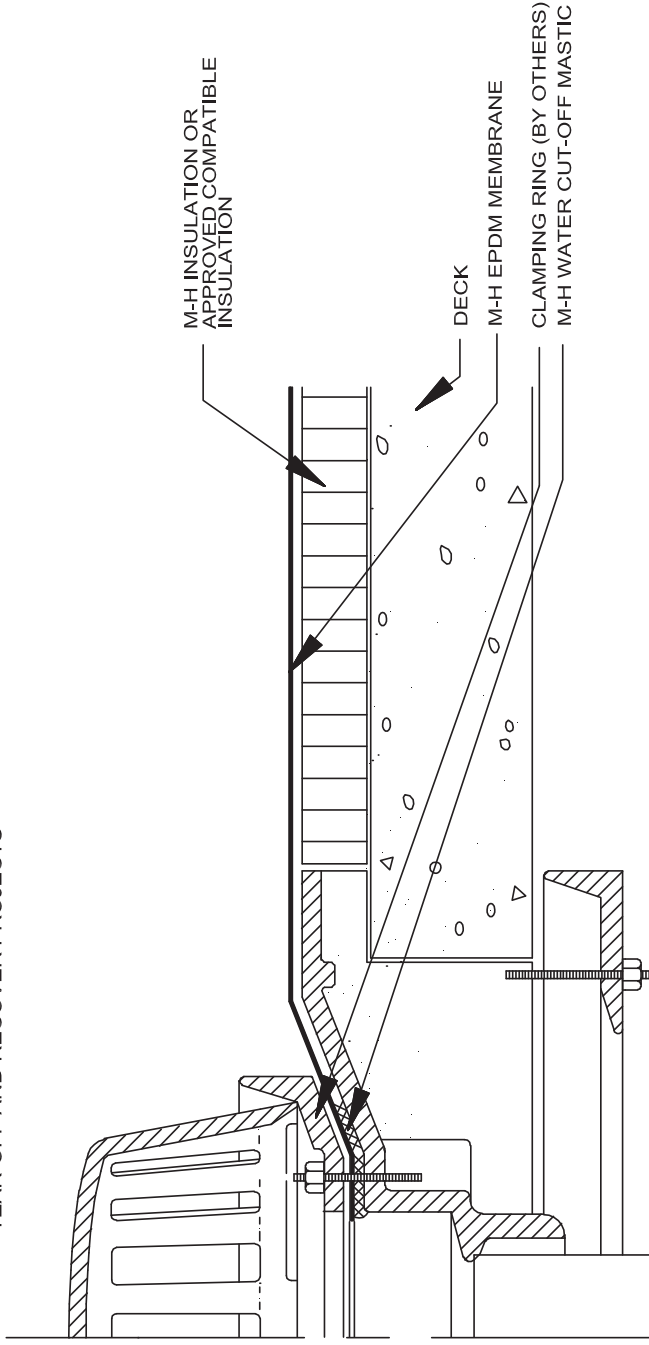
NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

MULE-HIDE
PRODUCTS CO., INC.
 2010

PARAPET / CURB FLASHING
RMS W / TAPE - HORIZONTAL
SYSTEMS:
ALL

DETAIL NO.:
MHE-125A

NOTE: ALL LEAD AND OTHER FLASHING MATERIAL MUST BE REMOVED ON
TEAR-OFF AND RECOVER PROJECTS

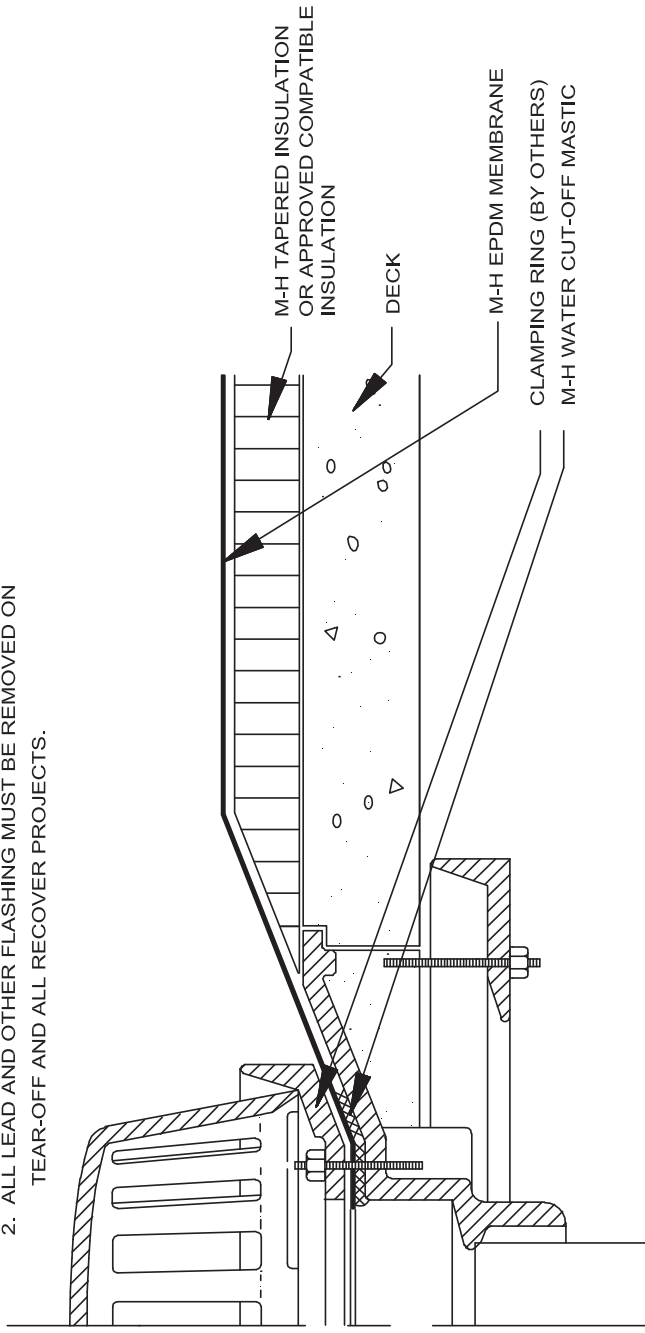


**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

ROOF DRAIN
SYSTEMS:
ALL

DETAIL NO.:
MHE-130

- NOTE: 1. FOR ROOF DRAIN SUMPS LESS THAN 2 INCHES INCLINE.
 2. ALL LEAD AND OTHER FLASHING MUST BE REMOVED ON
 TEAR-OFF AND ALL RECOVER PROJECTS.



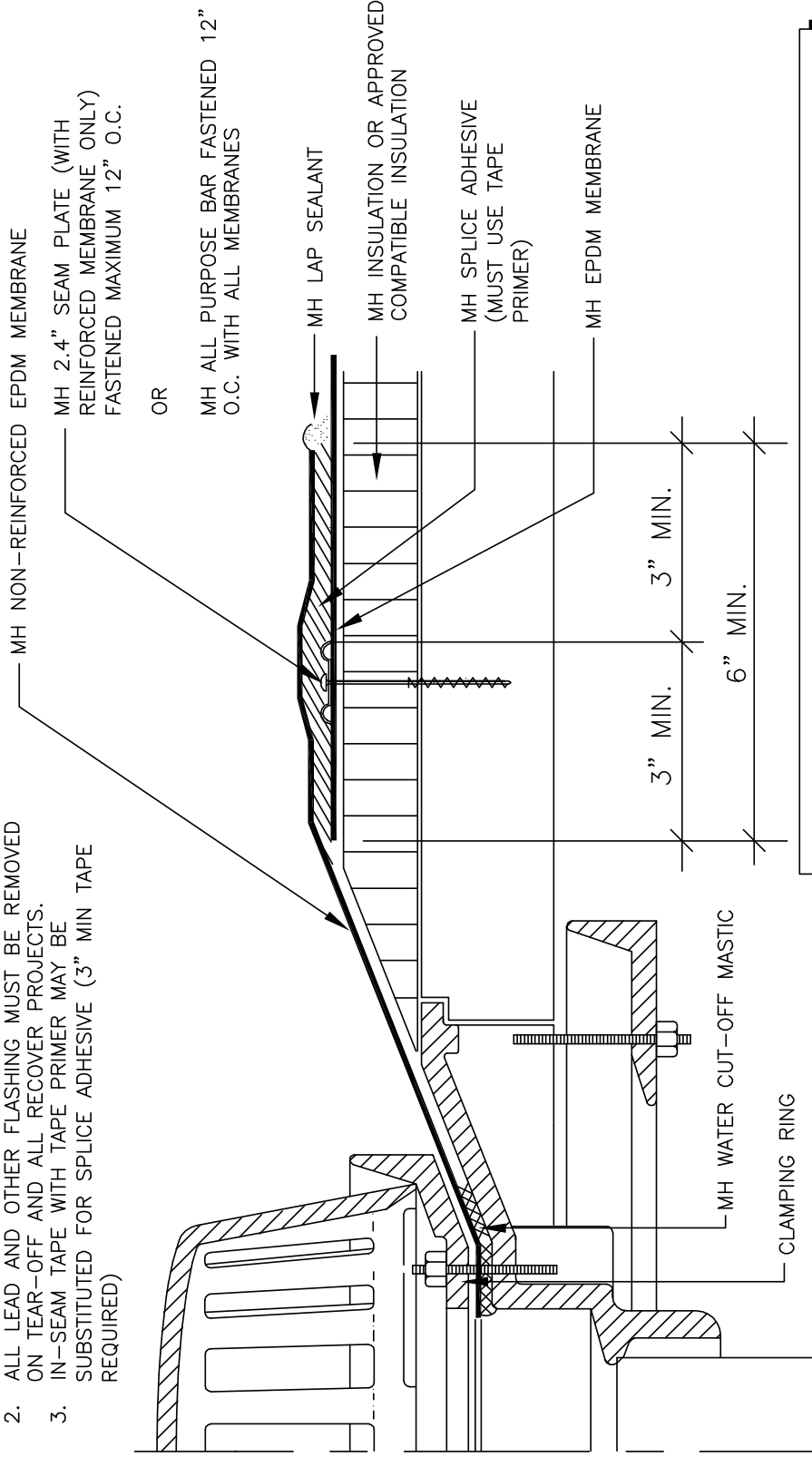
**MULE-HIDE
 PRODUCTS CO., INC.
 04/01/2004**

ROOF DRAIN
 W/ TAPERED INSULATION
 SYSTEMS:
 ALL

DETAIL NO.:
MHE-131

NOTE:

1. FOR ROOF DRAIN SUMPS LESS THAN 2" INCLINE.
2. ALL LEAD AND OTHER FLASHING MUST BE REMOVED ON TEAR-OFF AND ALL RECOVER PROJECTS.
3. IN-SEAM TAPE WITH TAPE PRIMER MAY BE SUBSTITUTED FOR SPLICE ADHESIVE (3" MIN TAPE REQUIRED)



NOTE:

THIS DETAIL IS NOT ACCEPTABLE FOR A 15 OR 20 YEAR WARRANTY.

**MULE-HIDE
PRODUCTS CO., INC.**

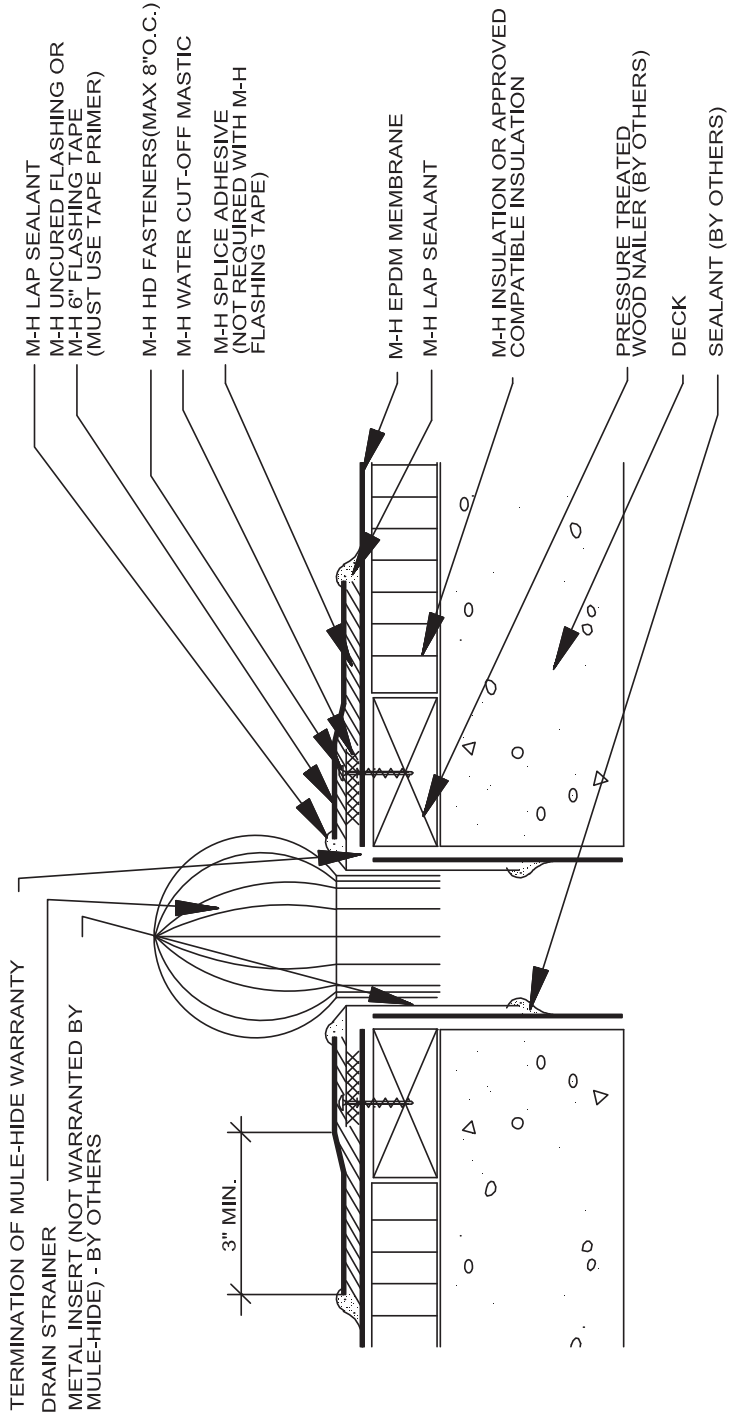
2010

**ROOF DRAIN
WITH SUMP
SYSTEMS:**

ALL

DETAIL NO.:

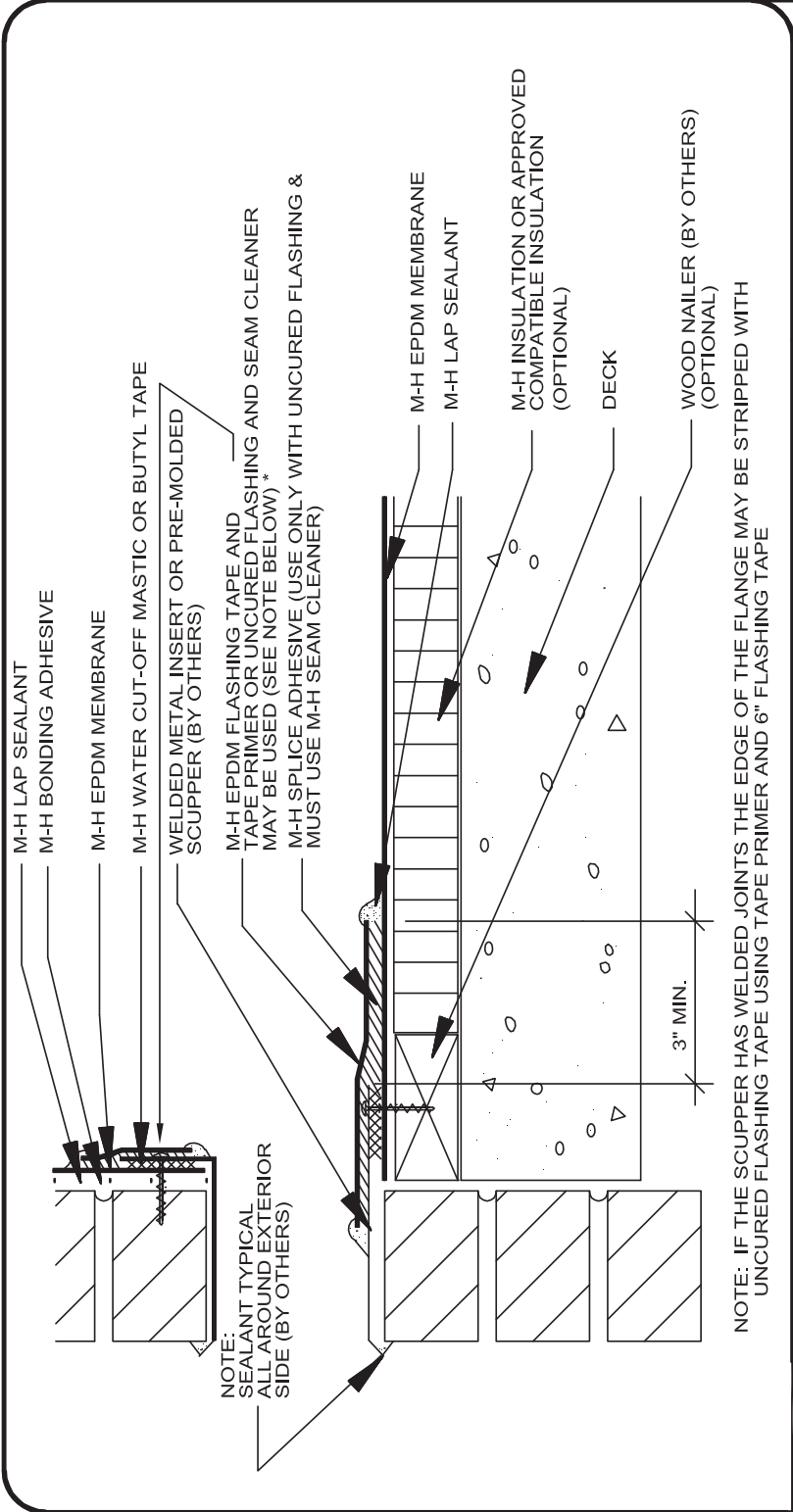
MHE-132



**MULE-HIDE
 PRODUCTS CO., INC.
 04/01/2004**

DRAIN INSERT
 SYSTEMS:
 ALL

DETAIL NO.:
MHE-133

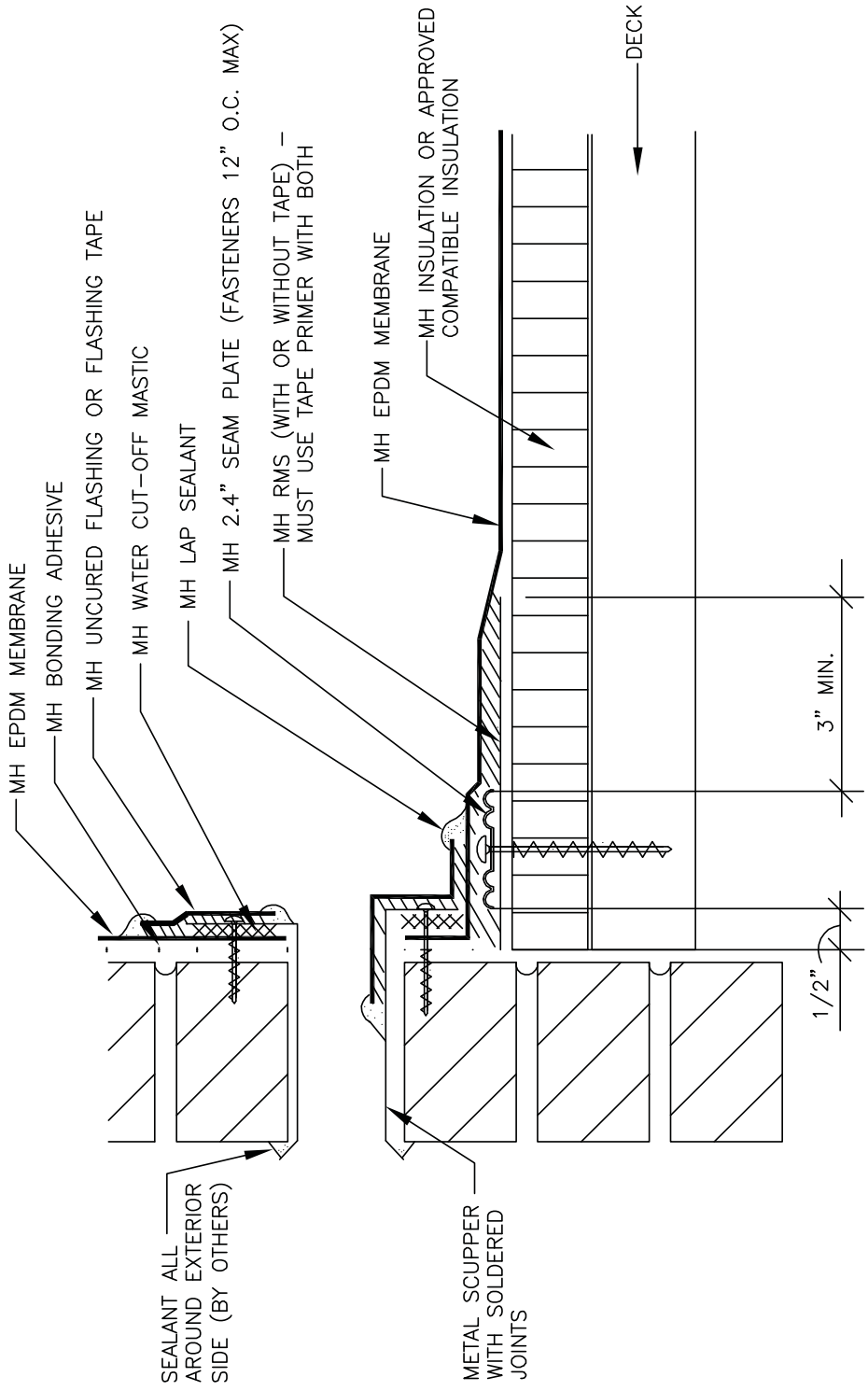


**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

**THROUGH WALL SCUPPER
WITH METAL INSERT**

SYSTEMS:
ALL

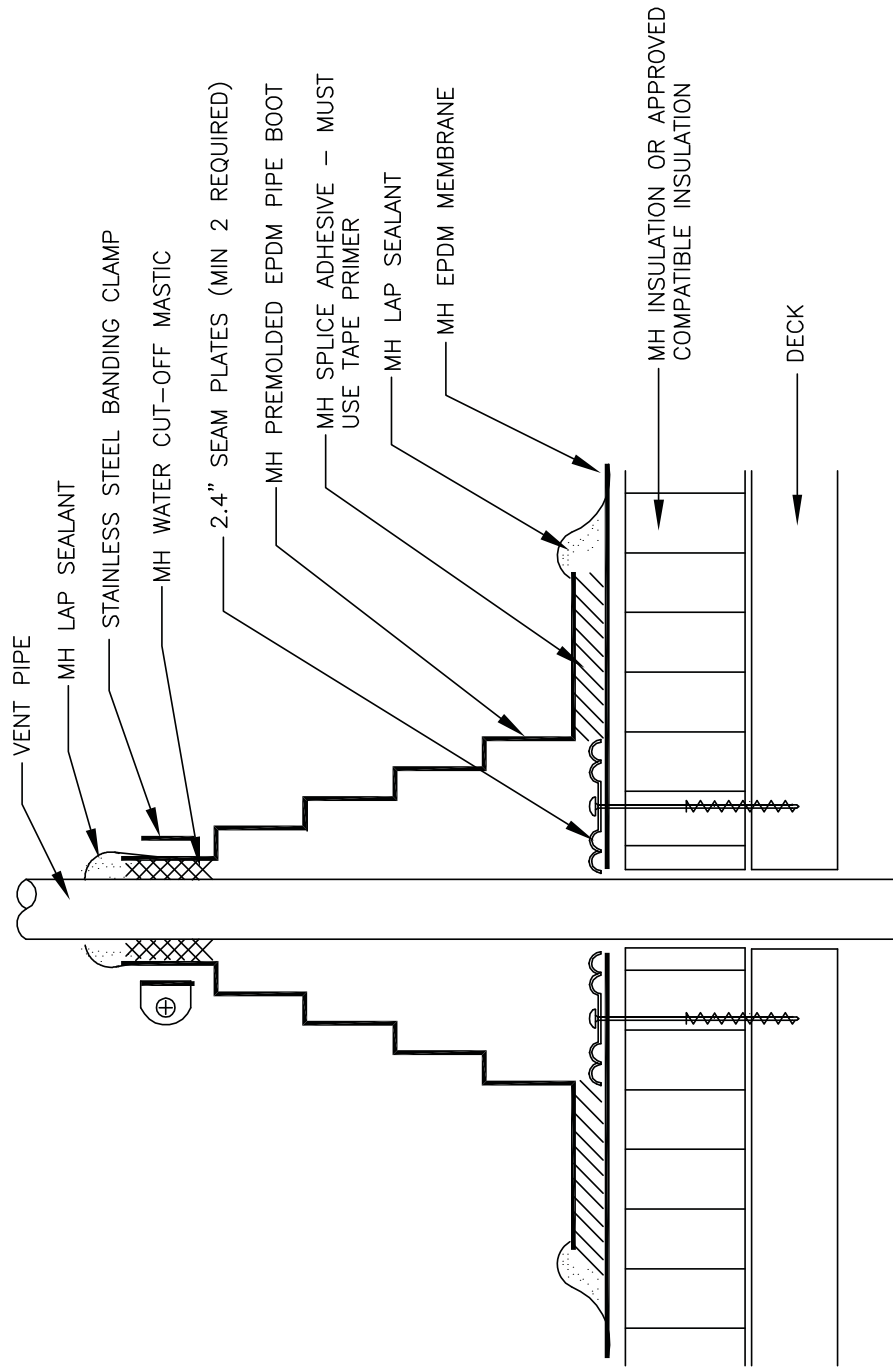
DETAIL NO.:
**MHE-134
B**



MULE-HIDE
PRODUCTS CO., INC.
 2010

THROUGH WALL OVERFLOW SCUPPER
WITH METAL INSERT
SYSTEMS:
ALL

DETAIL NO.:
MHE-135

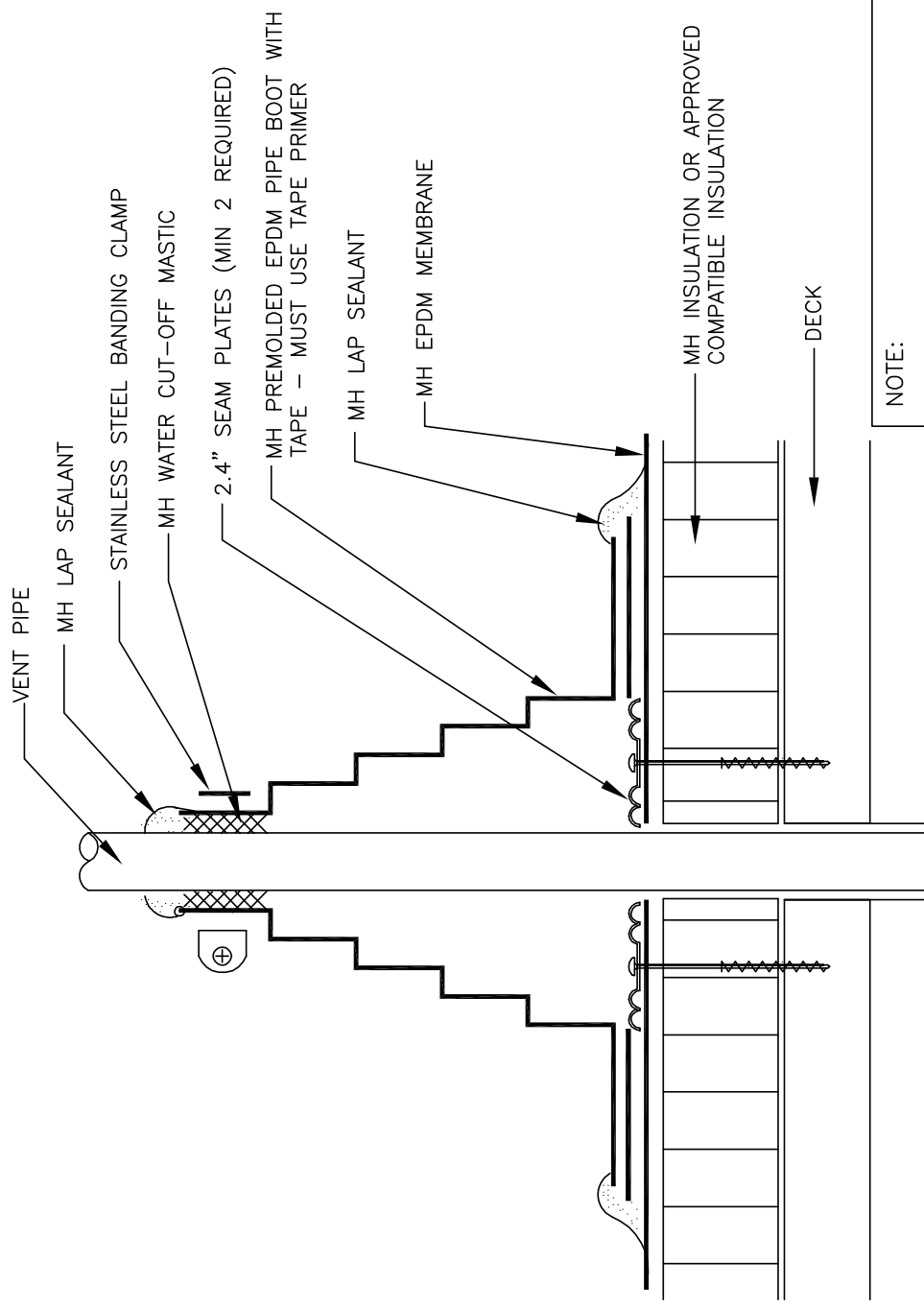


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR A 10 OR 15 YEAR WARRANTY.

**MULE-HIDE
 PRODUCTS CO., INC.**
 2010

**PREMOLDED EPDM PIPE BOOT
 SYSTEMS:
 MECHANICALLY ATTACHED**

DETAIL NO.:
MHE-140

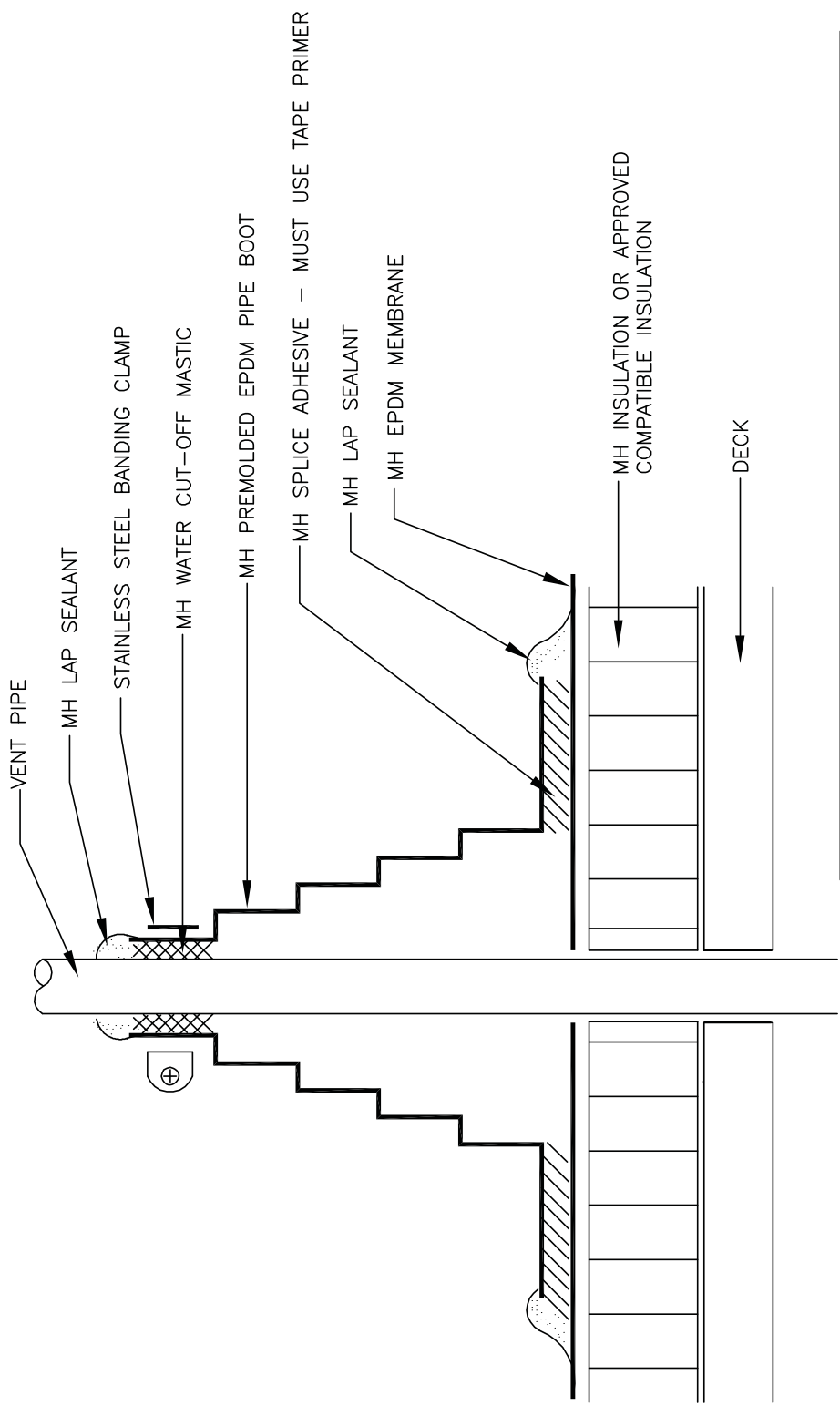


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 2010

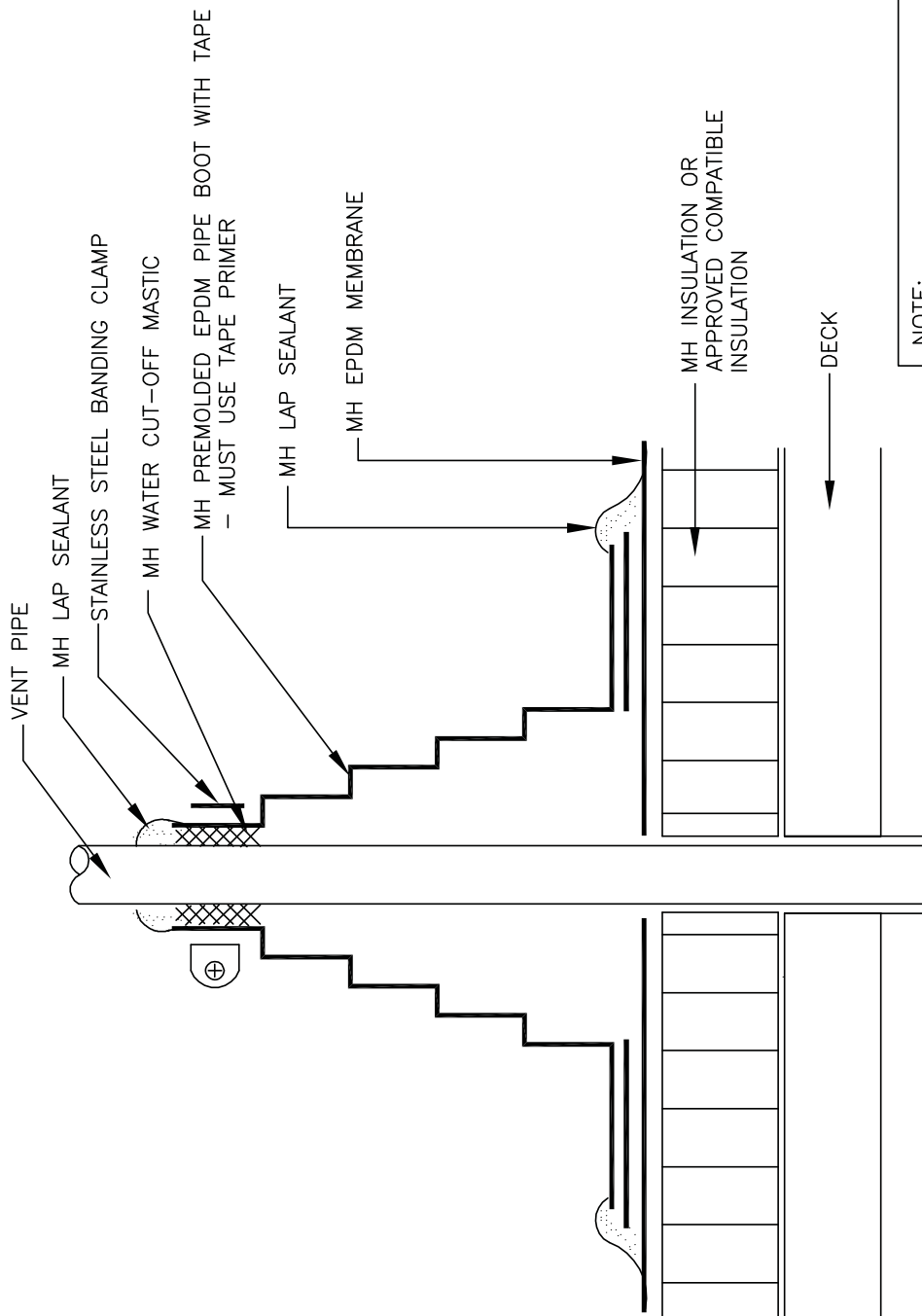
**PREMOLDED EPDM PIPE BOOT
 WITH TAPE
 SYSTEMS:
 MECHANICALLY FASTENED**

DETAIL NO.:
MHE-140A



NOTE:
 THIS DETAIL IS NOI ACCEPTABLE FOR A 15 OR 20 YEAR WARRANTY.

<p>MULE-HIDE PRODUCTS CO., INC. 2010</p>	<p>PREFORMED EPDM PIPE BOOT</p>	<p>DETAIL NO.: MHE-140B</p>
<p>SYSTEMS: BALLASTED AND FULLY ADHERED</p>		

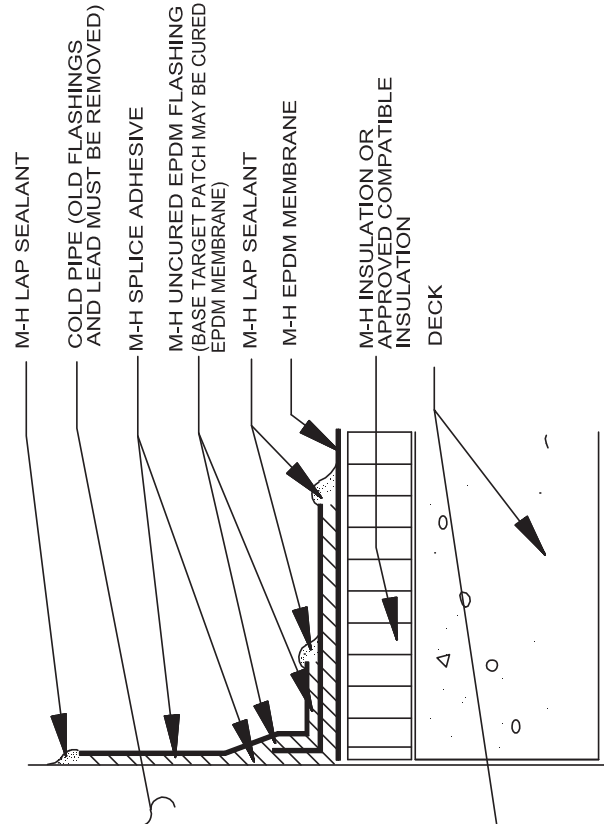


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 2010

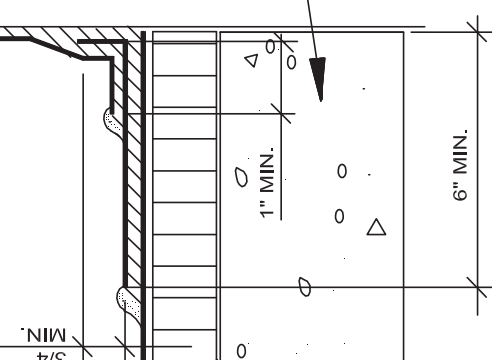
**PREMOLDED EPDM PIPE BOOT
 WITH TAPE
 SYSTEMS:
 BALLASTED AND FULLY ADHERED**

DETAIL NO.:
MHE-140C



M-H LAP SEALANT
 COLD PIPE (OLD FLASHINGS AND LEAD MUST BE REMOVED)
 M-H SPLICE ADHESIVE
 M-H UNCURED EPDM FLASHING (BASE TARGET PATCH MAY BE CURED EPDM MEMBRANE)
 M-H LAP SEALANT
 M-H EPDM MEMBRANE
 M-H INSULATION OR APPROVED COMPATIBLE INSULATION
 DECK

NOTE:
 1. FLASHING TAPES MAY BE SUBSTITUTED FOR UNCURED EPDM FLASHING
 2. MINIMUM FLASHING HEIGHT TO BE 8" WHERE POSSIBLE



NOTE: IF USING UNCURED FLASHING, PREP EPDM MEMBRANE AND PIPE WITH SEAM CLEANER PRIOR TO APPLYING SPLICE ADHESIVE. IF USING FLASHING TAPE, PREP WITH TAPE PRIMER.

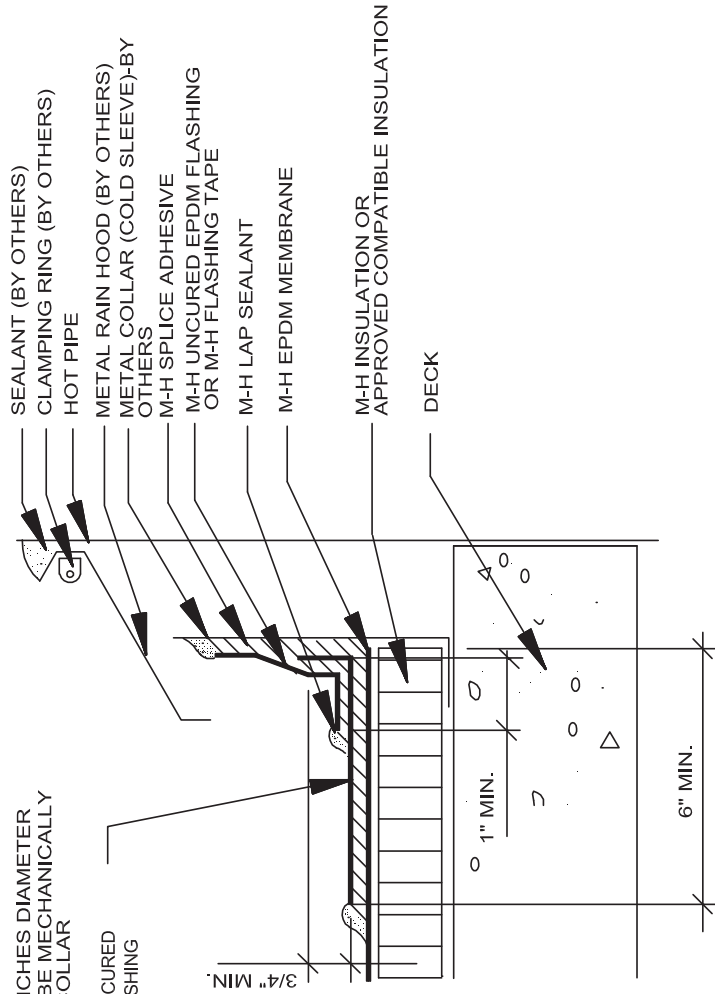
**MULE-HIDE
 PRODUCTS CO., INC.
 04/01/2004**

FIELD FABRICATED
 PIPE FLASHING
 SYSTEMS:
 ALL

DETAIL NO.:
MHE-141

NOTE:
FOR ALL PIPES OVER 6 INCHES DIAMETER
FIELD MEMBRANE MUST BE MECHANICALLY
ATTACHED AT BASE OF COLLAR

BASE TARGET PATCH MAY BE CURED
MEMBRANE OR UNCURED FLASHING



NOTE: IF USING UNCURED FLASHING, PREP EPDM MEMBRANE AND PIPE WITH SEAM CLEANER PRIOR TO
APPLYING SPLICE ADHESIVE. IF USING FLASHING TAPE, PREP WITH TAPE PRIMER.

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

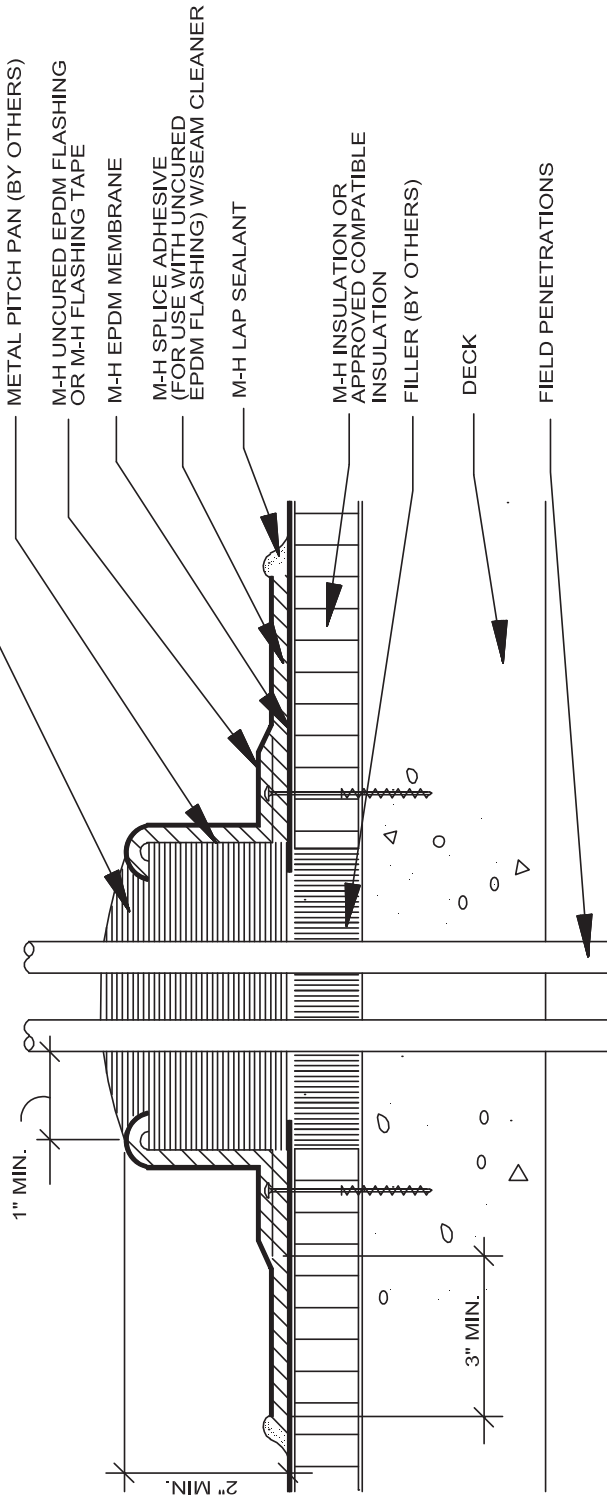
FIELD FABRICATED
HOT PIPE

SYSTEMS:
ALL

DETAIL NO.:

MHE-142

NOTE: WOOD NAILER MAY BE REQUIRED UNDER PITCH PAN FLANGE WHEN PITCH PANS ARE GREATER THAN 12" X 12"



NOTE: IF USING FLASHING TAPE, APPLY TAPE PRIMER TO BOTH EPDM MEMBRANE, TOP SURFACES OF FLASHING TAPE (FOR OVERLAPS) AND METAL PRIOR TO APPLYING FLASHING TAPE.

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

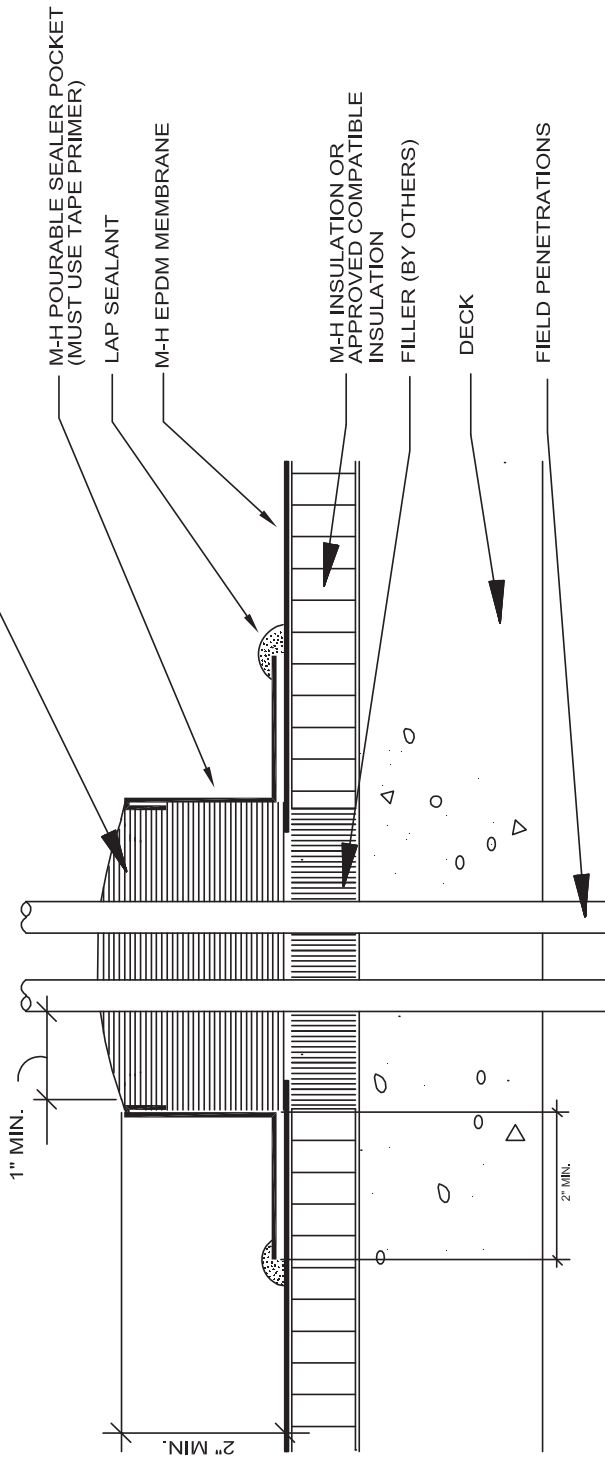
FIELD FABRICATED
PITCH PAN

SYSTEMS:
ALL

DETAIL NO.:

MHE-143

NOTE: ALL POURABLE SEALER POCKETS GREATER THAN 12 INCHES IN DIAMETER WILL REQUIRE MEMBRANE SECUREMENT



DO NOT INSTALL AGAINST A HOT PIPE OF 180 DEGREES FAHRENHEIT OR HIGHER.
 POURABLE SEALER MUST CONTACT BARE SURFACE OF THE PENETRATION.

**MULE-HIDE
 PRODUCTS CO., INC.
 04/01/2004**

POURABLE SEALER
 POCKET

SYSTEMS:
 ALL

DETAIL NO.:

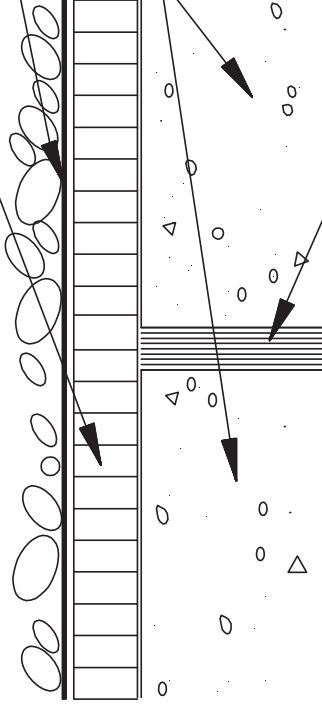
MHE-144

M-H INSULATION OR
APPROVED COMPATIBLE
INSULATION

M-H EPDM MEMBRANE

DECK

EXPANSION JOINT
FILLER (BY OTHERS)



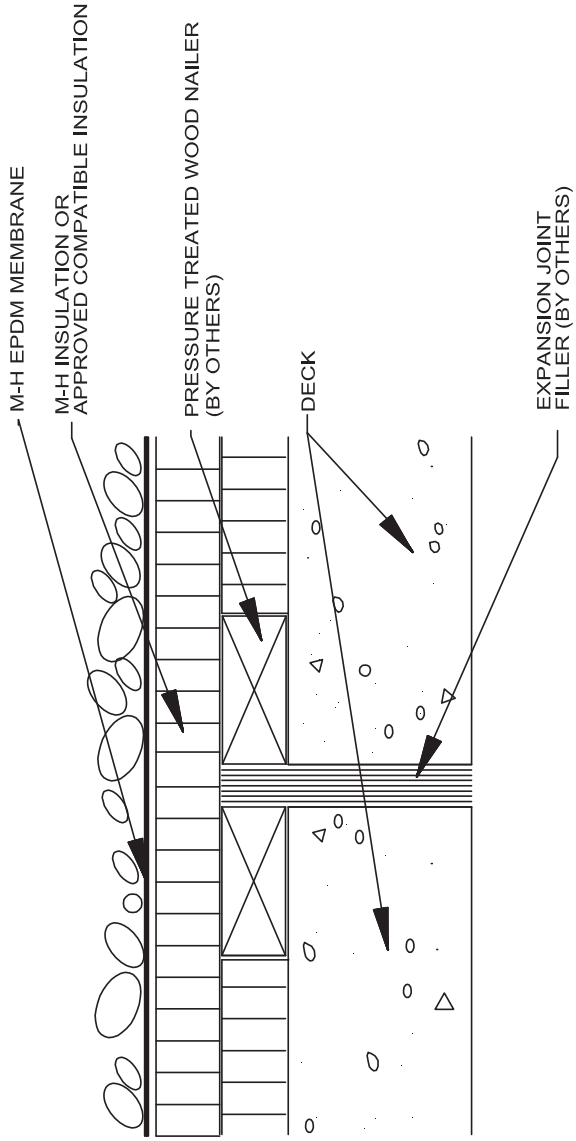
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EXPANSION JOINT
FIELD JOINT

SYSTEMS:
BALLAST ONLY

DETAIL NO.:

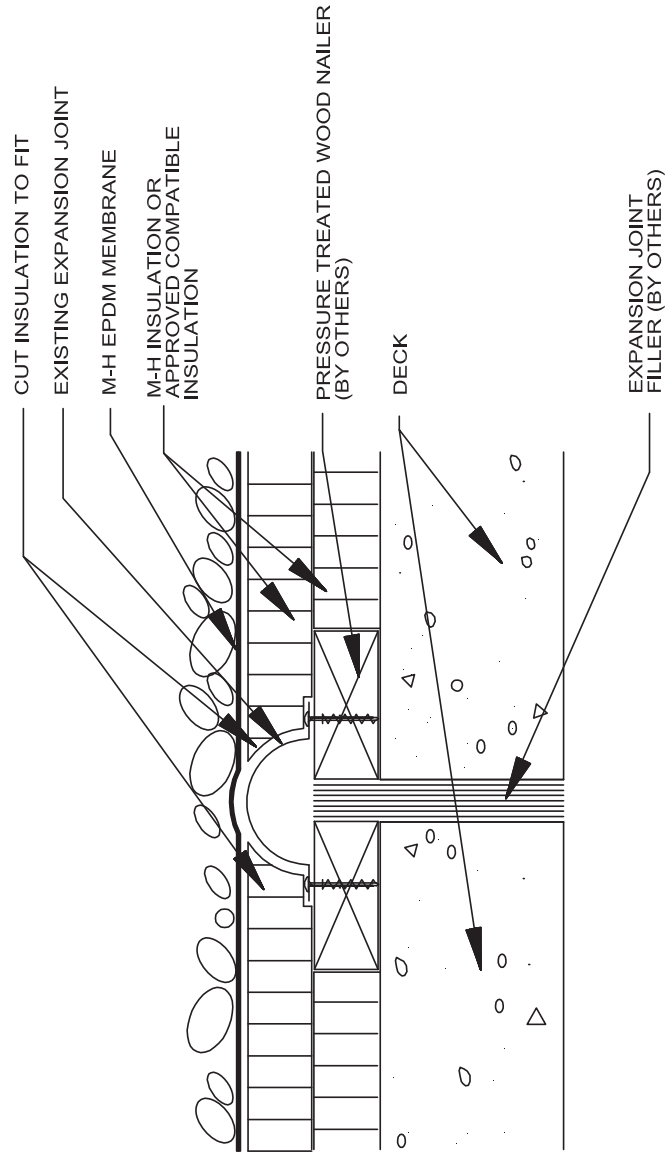
MHE-150



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EXPANSION JOINT
EXISTING FIELD JOINT "A"
SYSTEMS:
BALLAST ONLY

DETAIL NO.:
MHE-151



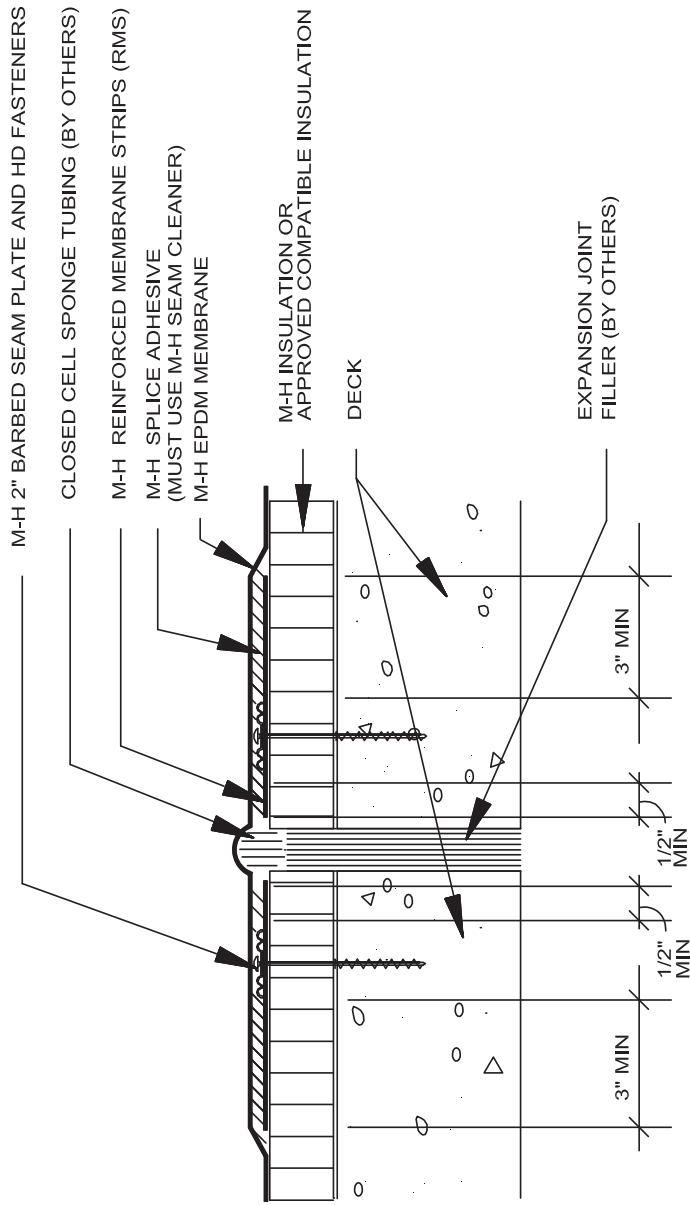
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EXPANSION JOINT
EXISTING FIELD JOINT "B"

SYSTEMS:
BALLAST ONLY

DETAIL NO.:

MHE-152



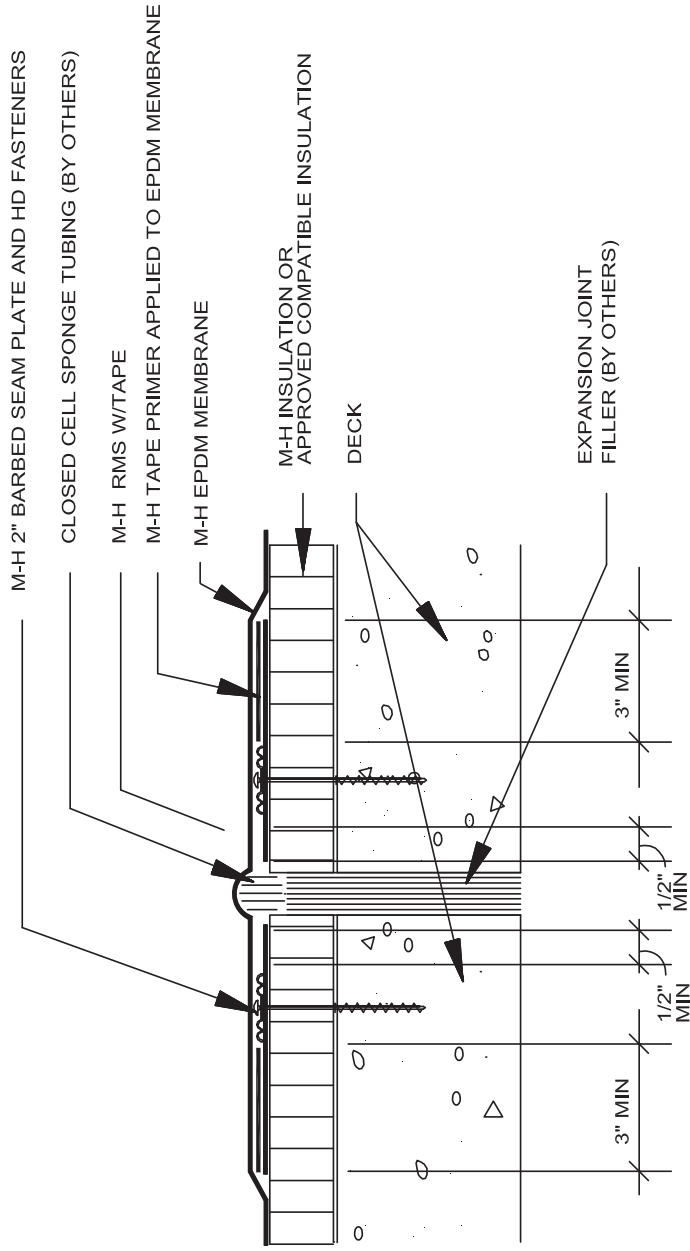
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

**EXPANSION JOINT
FIELD JOINT**

SYSTEMS:
ADHERED &
MECHANICAL ATTACHED

DETAIL NO.:

MHE-153A



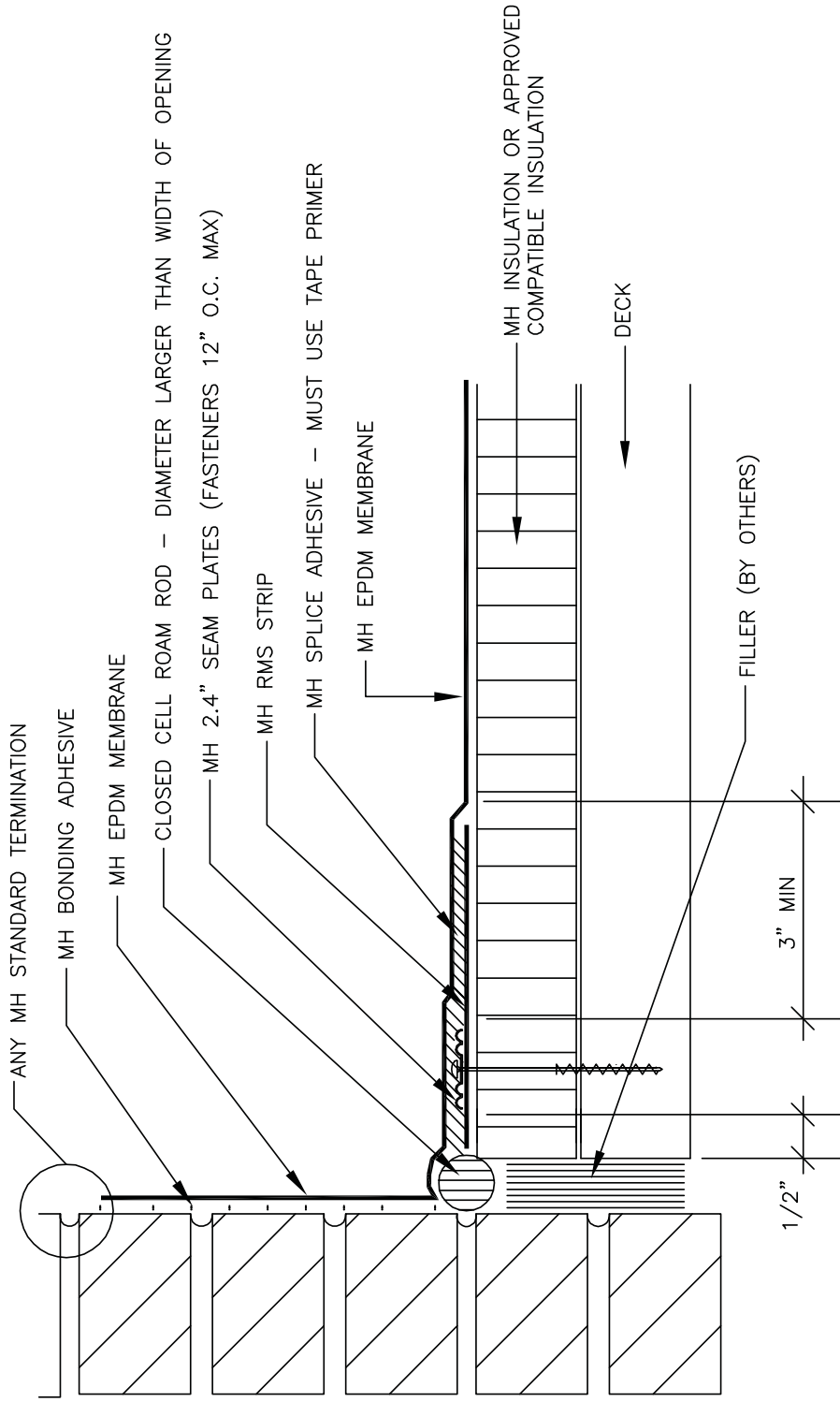
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

**EXPANSION JOINT
FIELD JOINT**

**SYSTEMS:
ADHERED &
MECHANICAL ATTACHED**

DETAIL NO.:

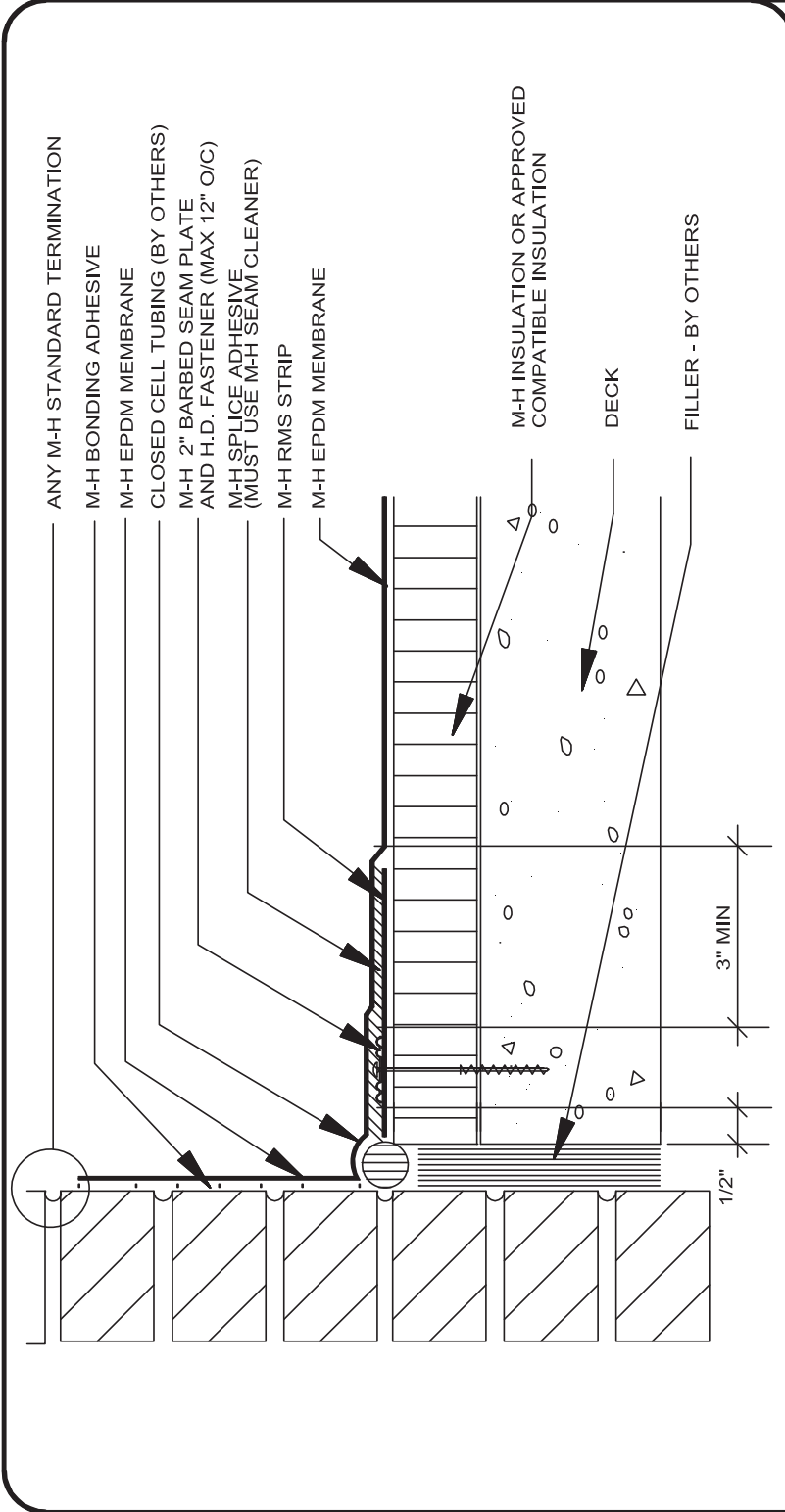
MHE-153B



**MULE-HIDE
PRODUCTS CO., INC.**
2010

**EXPANSION JOINT
DECK TO WALL JOINT
SYSTEMS:
ALL**

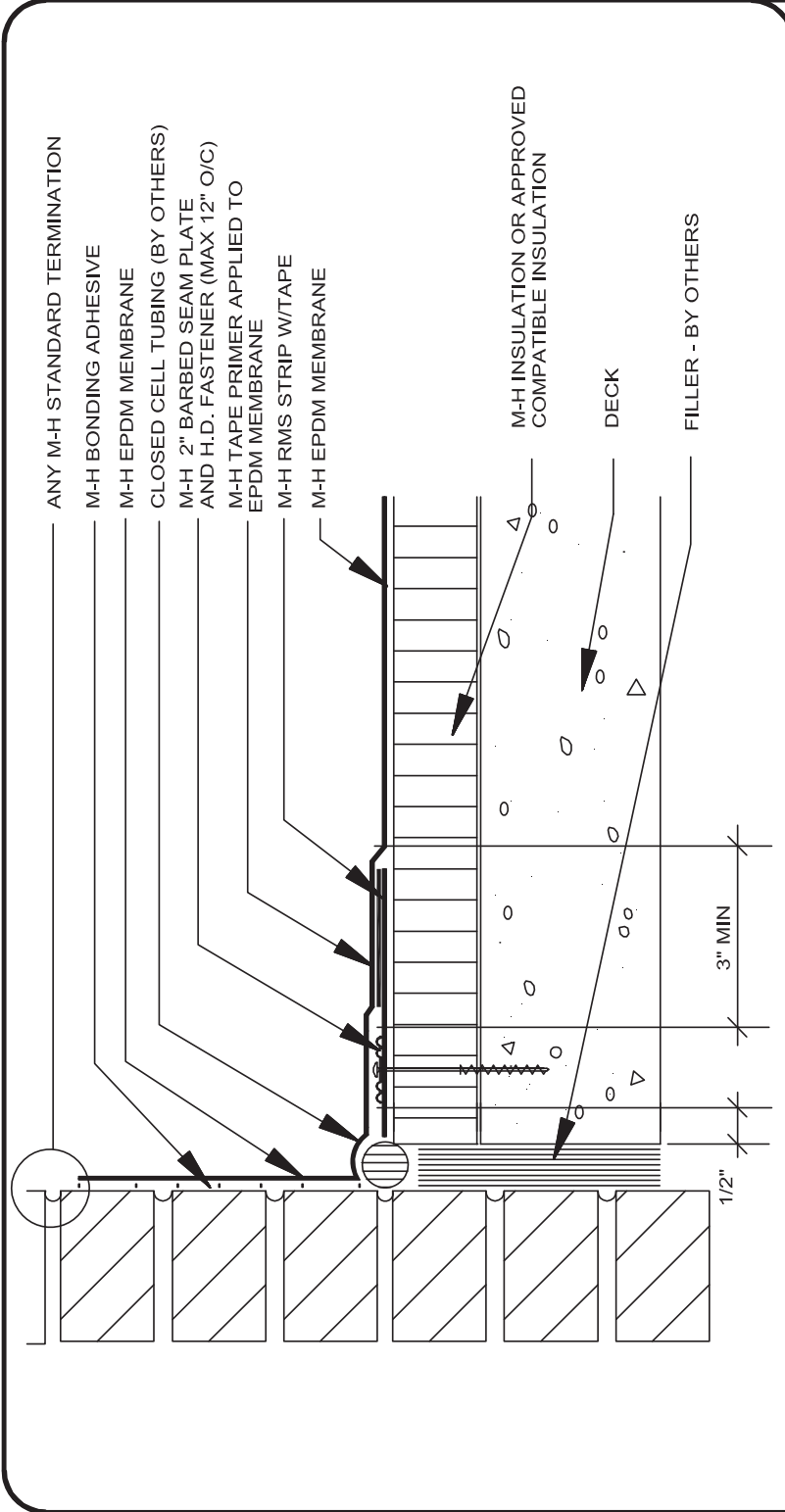
DETAIL NO.:
MHE-154



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EXPANSION JOINT
DECK TO WALL JOINT - "A"
SYSTEMS:
ALL

DETAIL NO.:
MHE-154A



- ANY M-H STANDARD TERMINATION
- M-H BONDING ADHESIVE
- M-H EPDM MEMBRANE
- CLOSED CELL TUBING (BY OTHERS)
- M-H 2" BARBED SEAM PLATE AND H.D. FASTENER (MAX 12" O/C)
- M-H TAPE PRIMER APPLIED TO EPDM MEMBRANE
- M-H RMS STRIP W/TAPE
- M-H EPDM MEMBRANE

M-H INSULATION OR APPROVED COMPATIBLE INSULATION

DECK

FILLER - BY OTHERS

1/2"

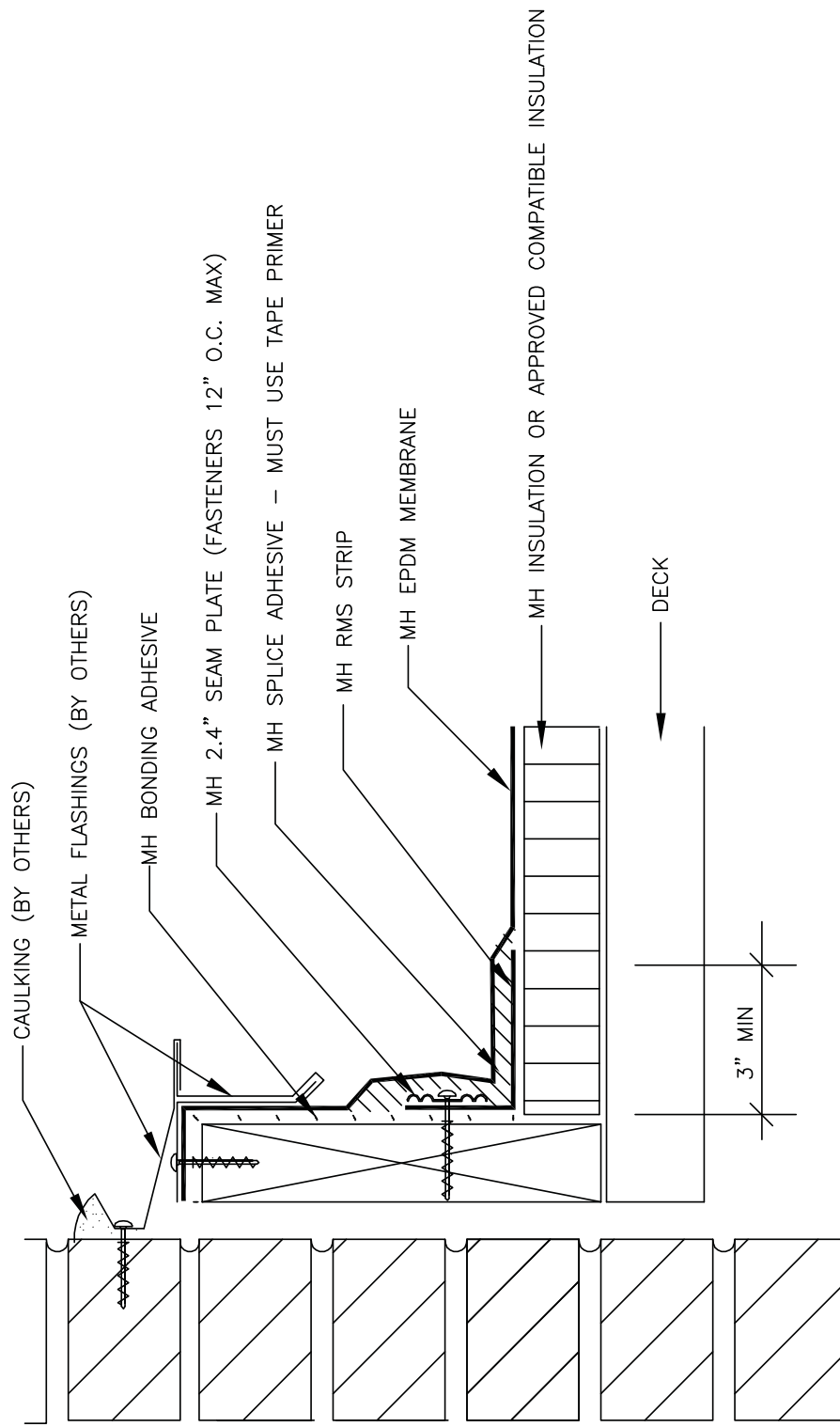
3" MIN

MULE-HIDE PRODUCTS CO., INC.
04/01/2004

EXPANSION JOINT
 DECK TO WALL JOINT - "A"
 SYSTEMS:
 ALL

DETAIL NO.:

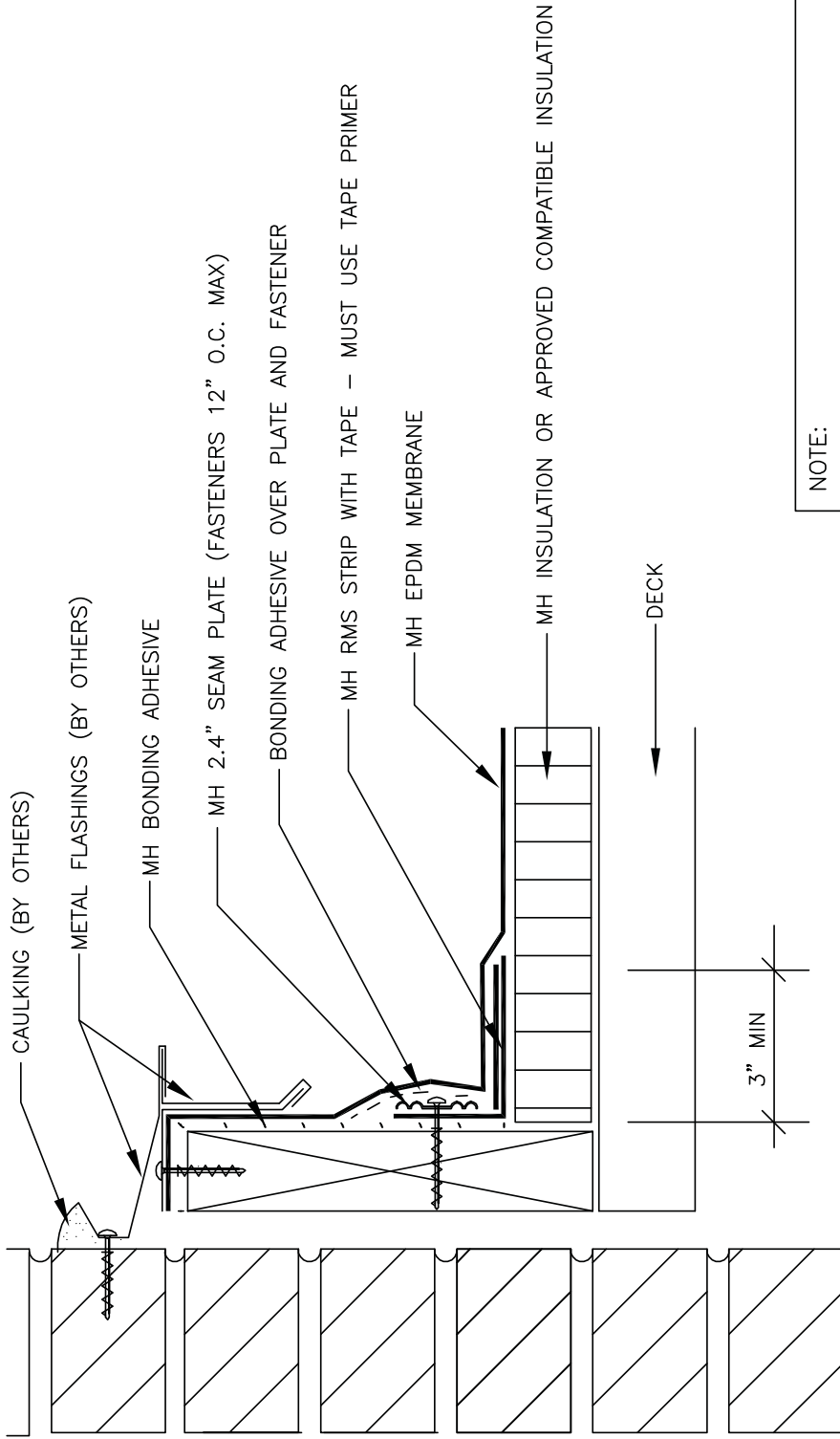
MHE-154B



**MULE-HIDE
PRODUCTS CO., INC.**
2010

**EXPANSION JOINT
DECK TO WALL JOINT
SYSTEMS:
ALL**

DETAIL NO.:
MHE-155

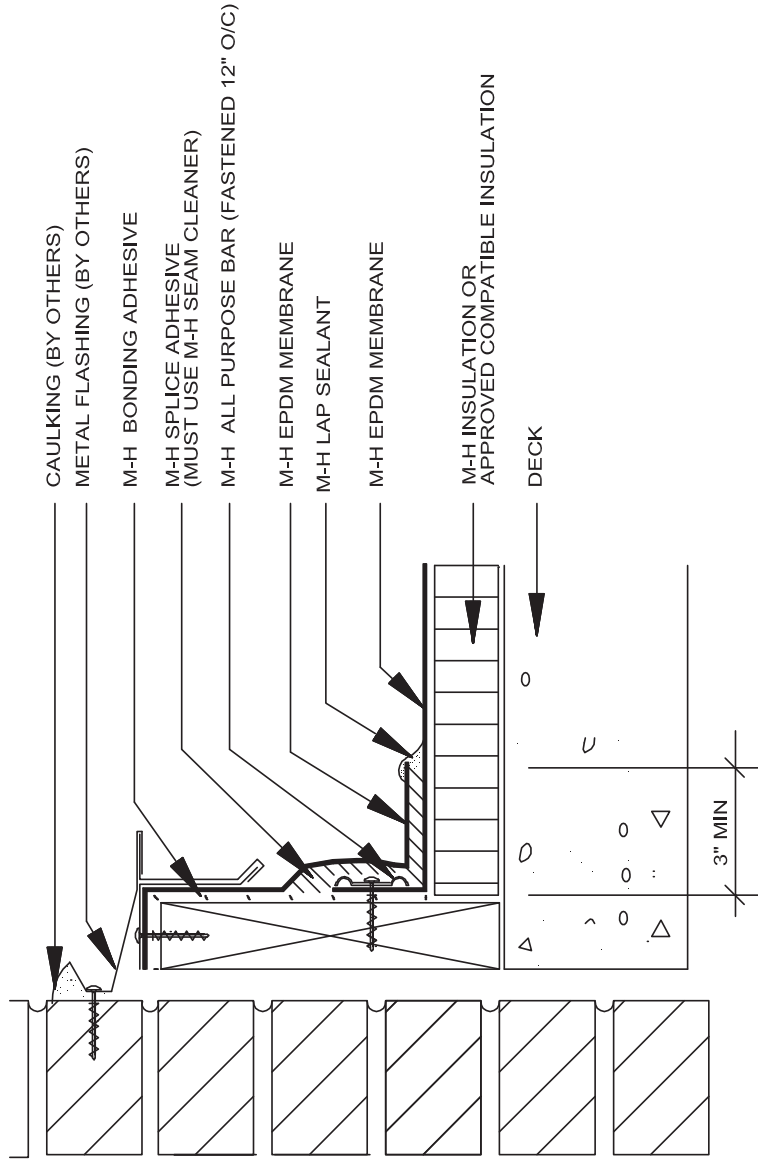


NOTE:
 THIS DETAIL IS ACCEPTABLE FOR USE IN
 A 20-YEAR WARRANTED SYSTEM

**MULE-HIDE
 PRODUCTS CO., INC.**
 2010

**EXPANSION JOINT
 DECK TO WALL JOINT
 SYSTEMS:
 ALL**

DETAIL NO.:
MHE-155A



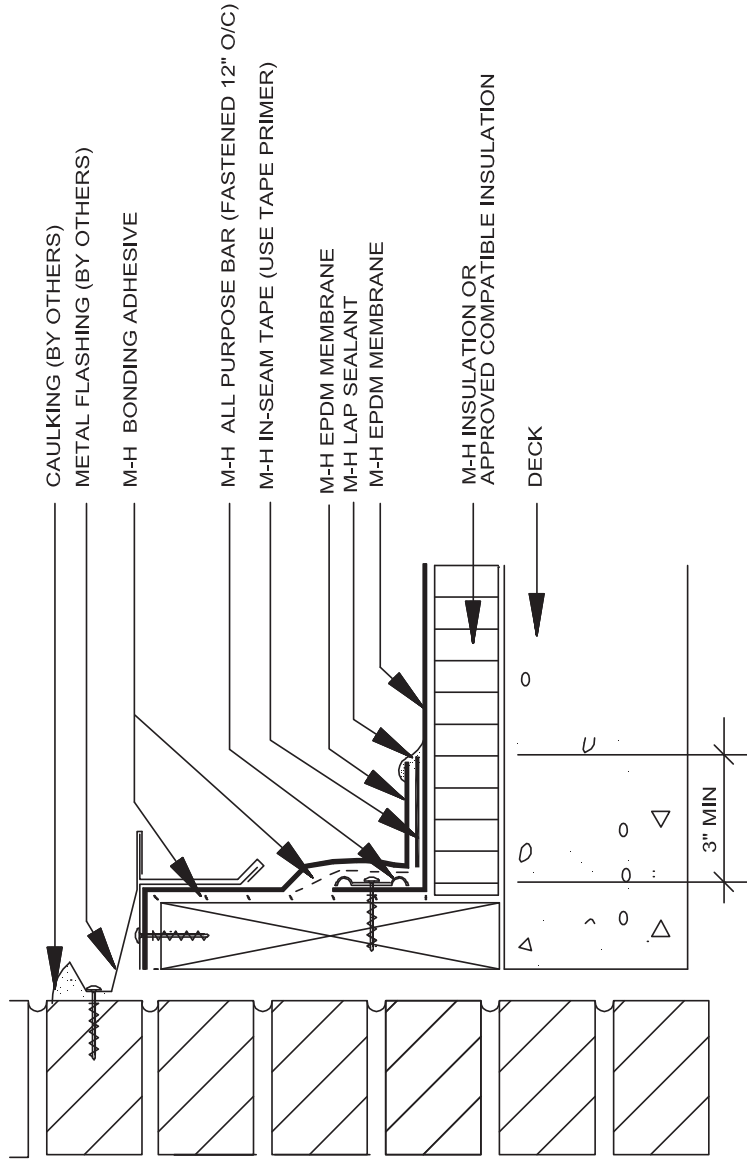
MULE-HIDE
PRODUCTS CO., INC.
04/01/2004

EXPANSION JOINT
 DECK TO WALL JOINT - "C"

SYSTEMS:
 ALL

DETAIL NO.:

MHE-156A



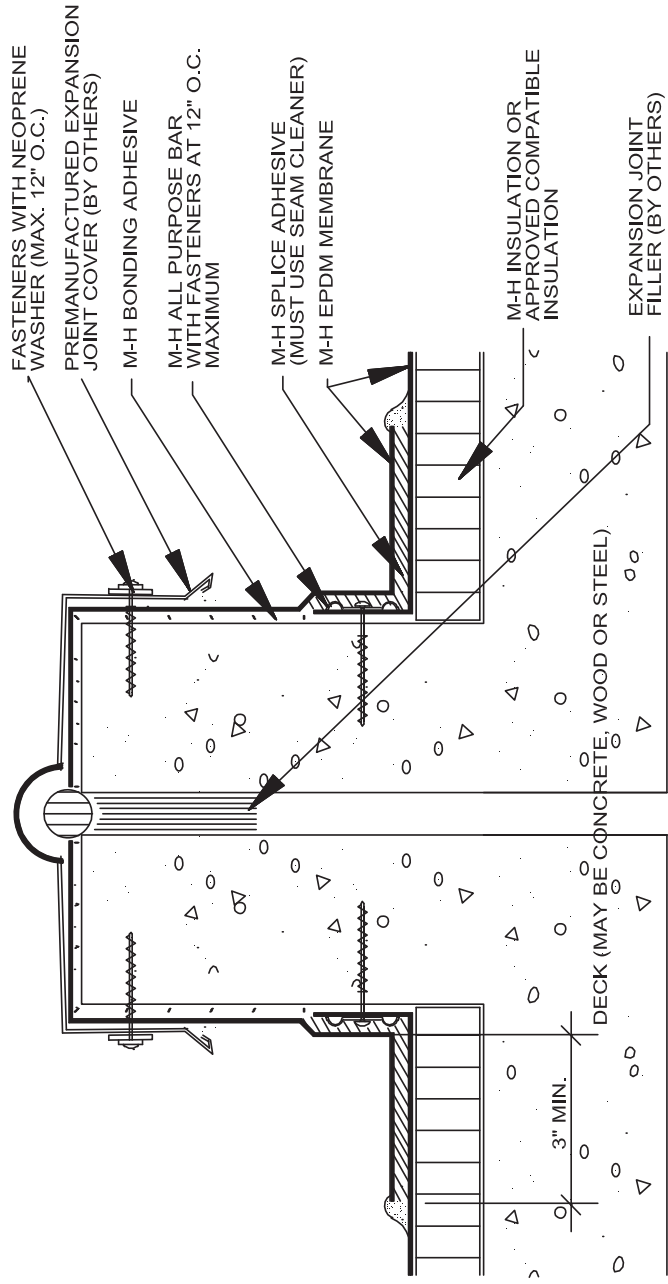
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EXPANSION JOINT
DECK TO WALL JOINT - "C"

SYSTEMS:
ALL

DETAIL NO.:

MHE-156B



NOTE: DECK AND CURB MAY BE CONCRETE, STEEL OR WOOD.

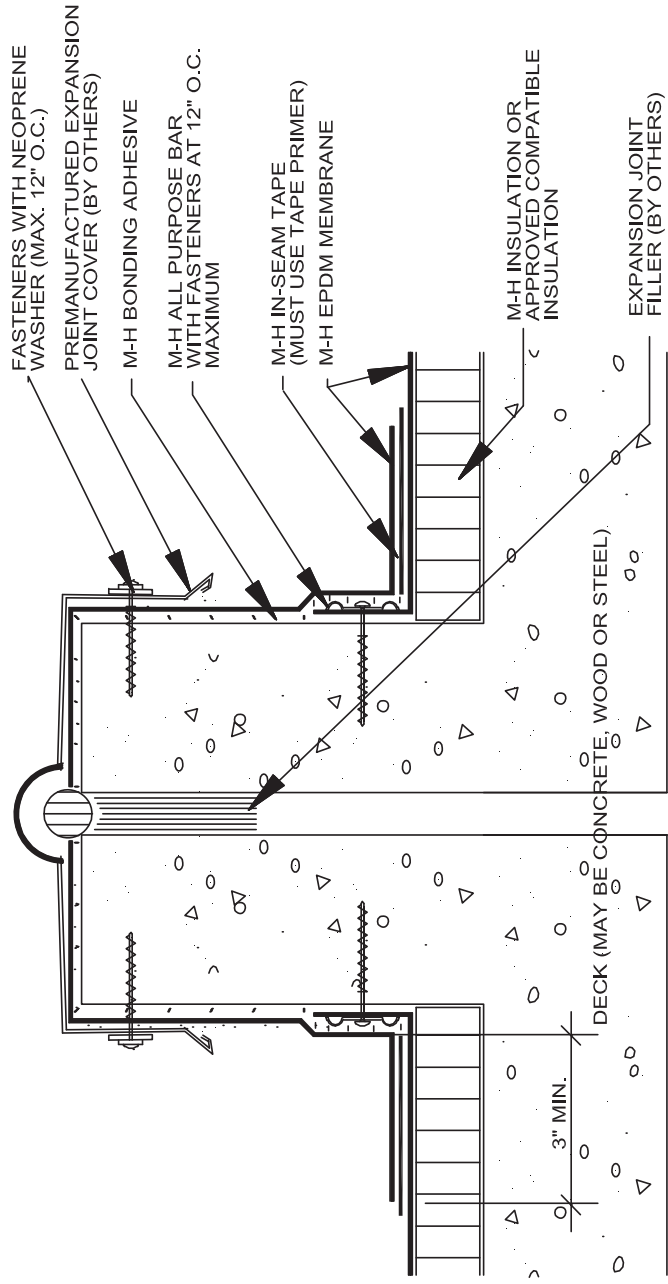
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EXPANSION JOINT
CURB/FIREWALL

SYSTEMS:
ALL

DETAIL NO.:

MHE-157A



NOTE: DECK AND CURB MAY BE CONCRETE, STEEL OR WOOD.

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

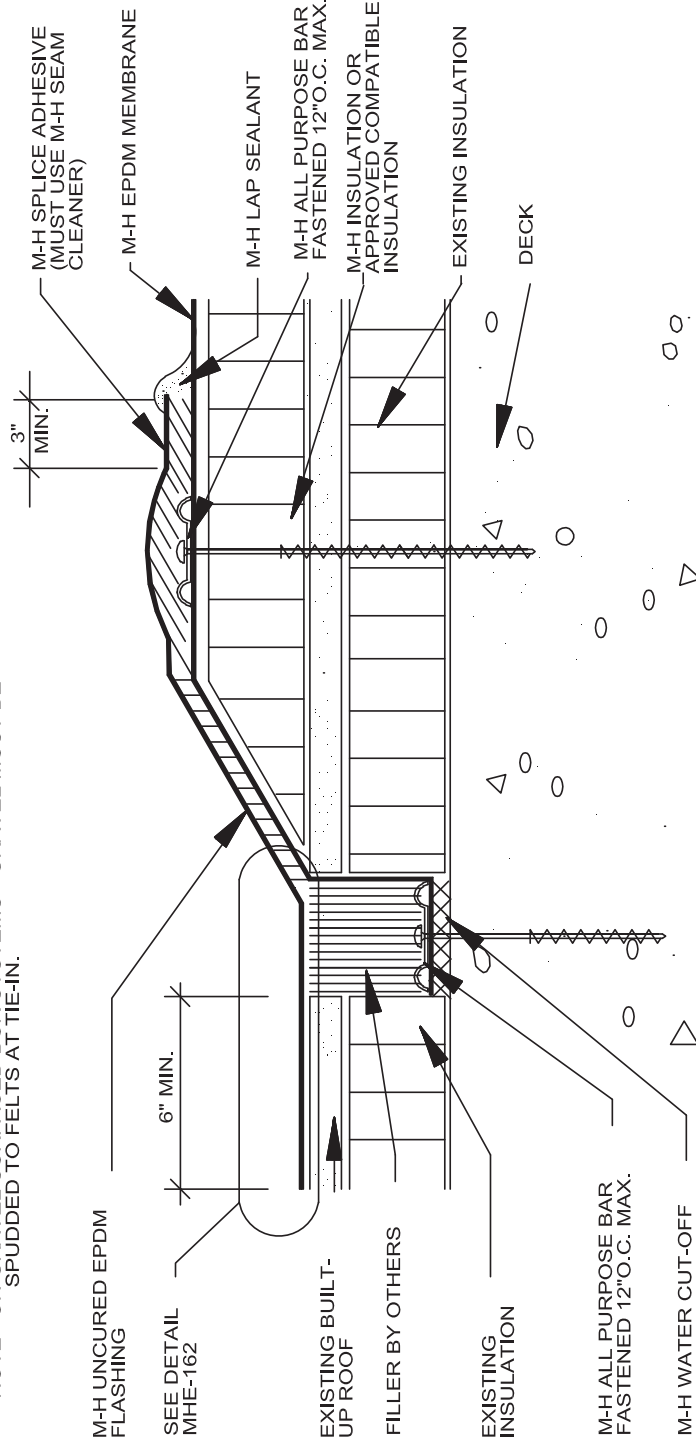
EXPANSION JOINT
CURB/FIREWALL

SYSTEMS:
ALL

DETAIL NO.:

MHE-157B

NOTE: ON GRAVEL SURFACED BUR SYSTEMS - GRAVEL MUST BE
SPUDDED TO FELTS AT TIE-IN.



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

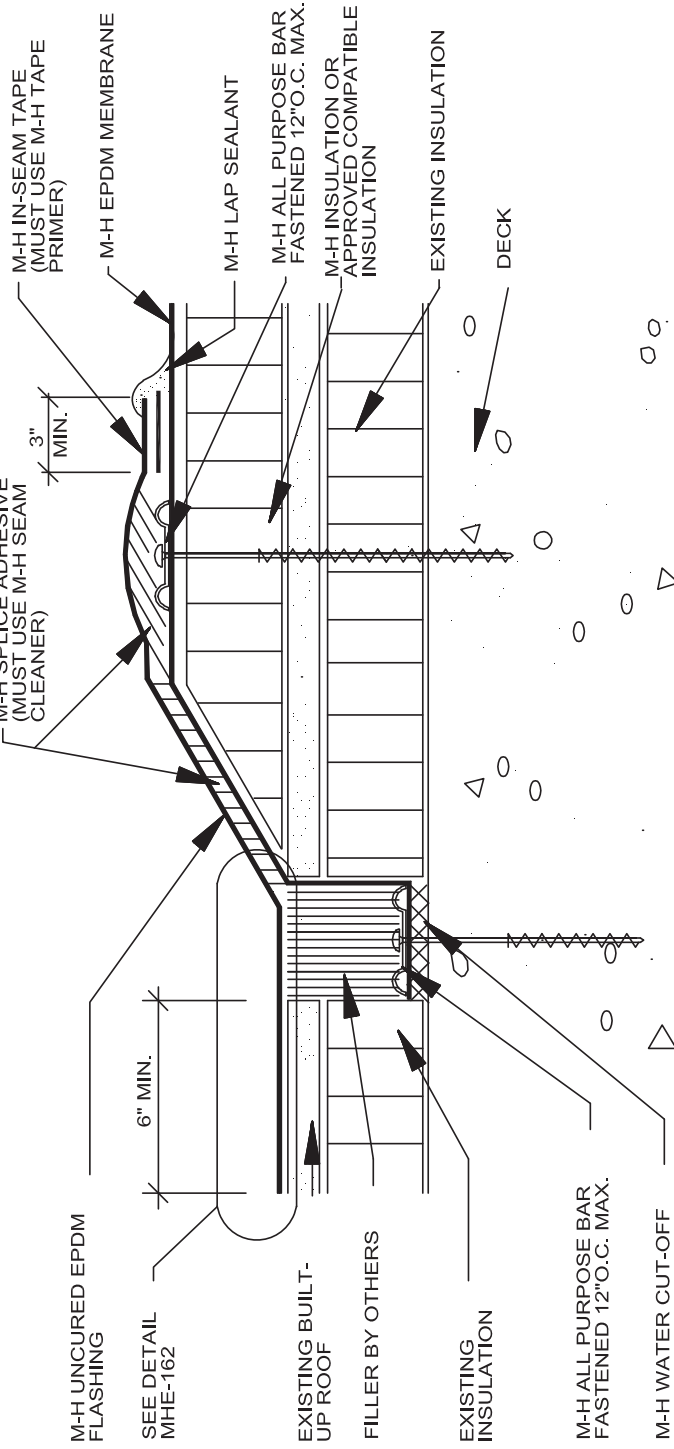
EPDM TIE-IN TO
BUILT-UP ROOF

SYSTEMS:
ALL

DETAIL NO.:

MHE-160A

NOTE: ON GRAVEL SURFACED BUR SYSTEMS - GRAVEL MUST BE
SPRUDDLED TO FELTS AT TIE-IN.

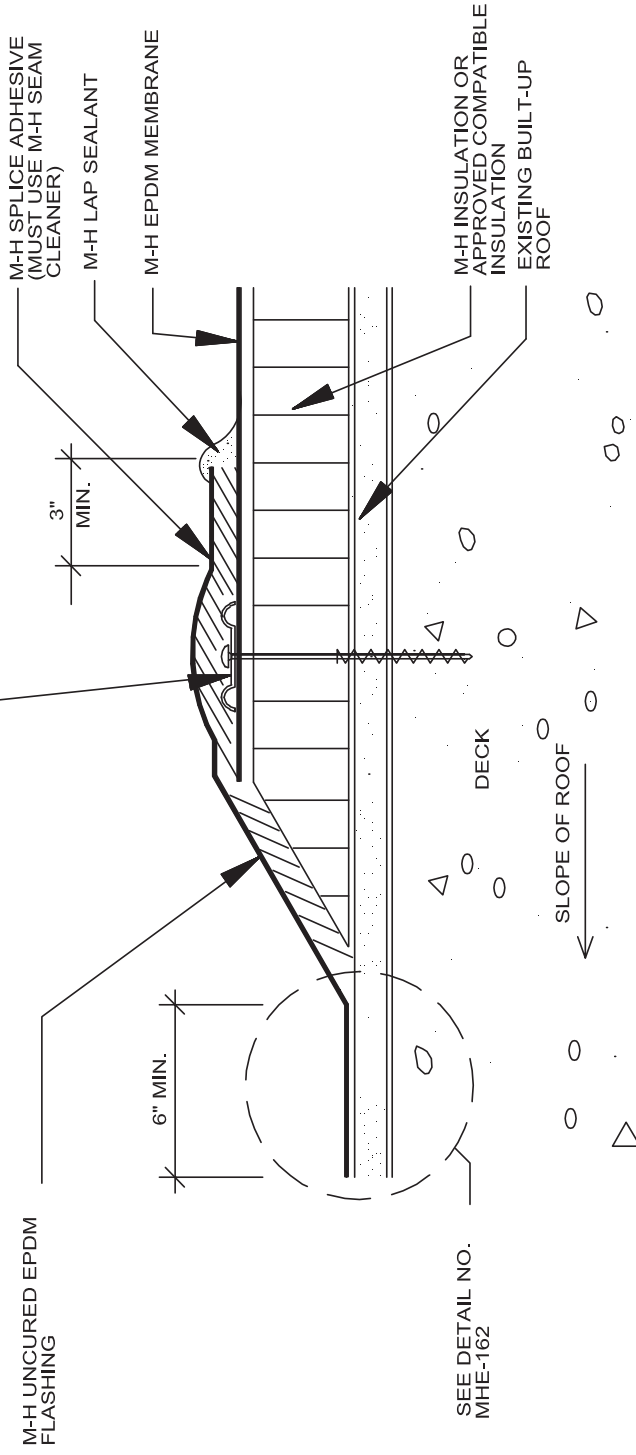


**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EPDM TIE-IN TO
BUILT-UP ROOF
SYSTEMS:
ALL

DETAIL NO.:
MHE-160B

NOTE:
ON GRAVEL SURFACED BUR SYSTEMS - GRAVEL
MUST BE SPURRED TO FELTS AT TIE-IN.



SEE DETAIL NO.
MHE-162

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

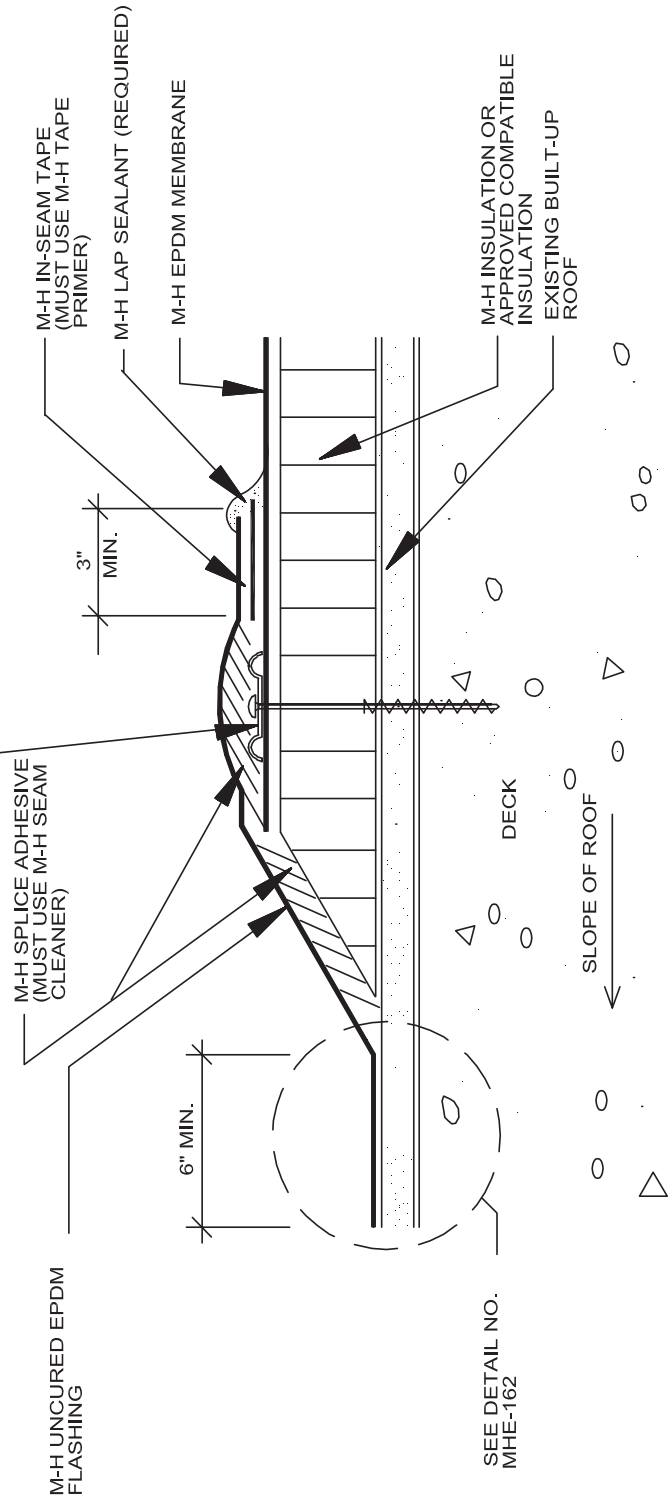
EPDM TIE-IN TO
BUILT-UP ROOF

SYSTEMS:
ALL

DETAIL NO.:

MHE-161A

NOTE:
ON GRAVEL SURFACED BUR SYSTEMS - GRAVEL
MUST BE SPURRED TO FELTS AT TIE-IN.



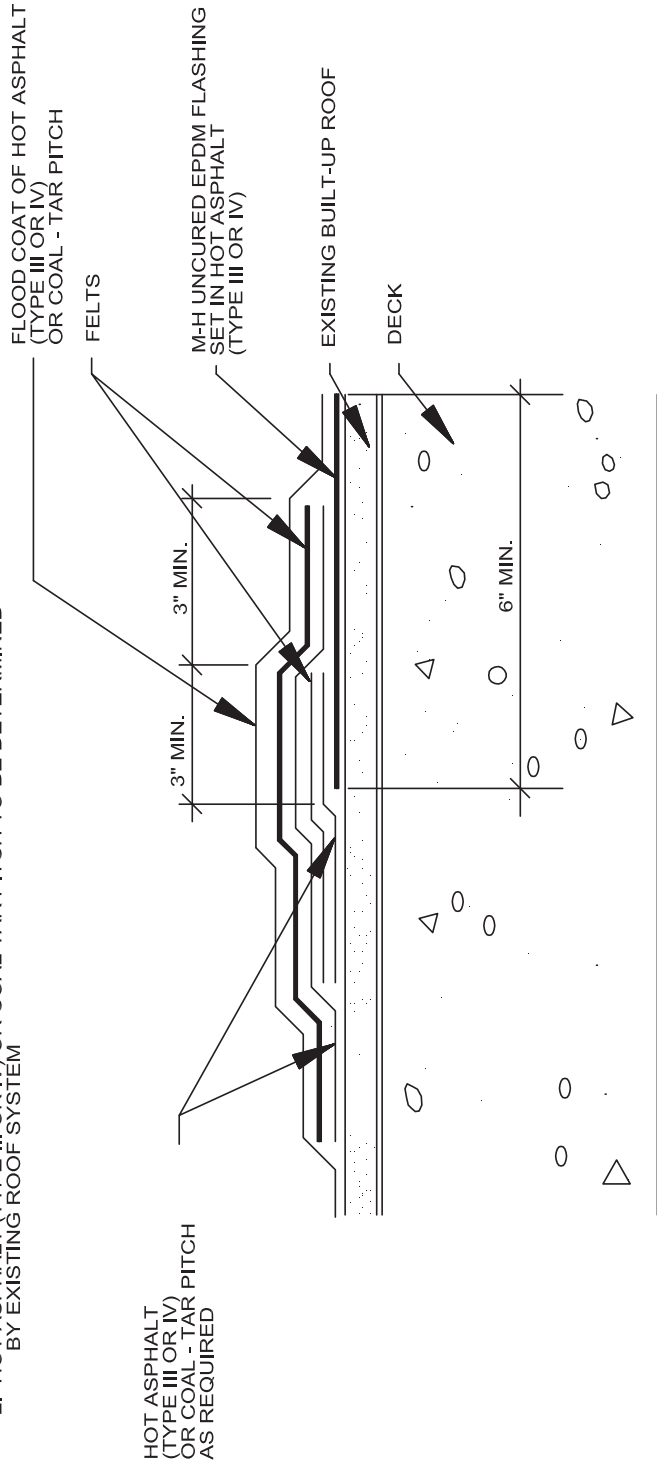
SEE DETAIL NO.
MHE-162

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EPDM TIE-IN TO
BUILT-UP ROOF
SYSTEMS:
ALL

DETAIL NO.:
MHE-161B

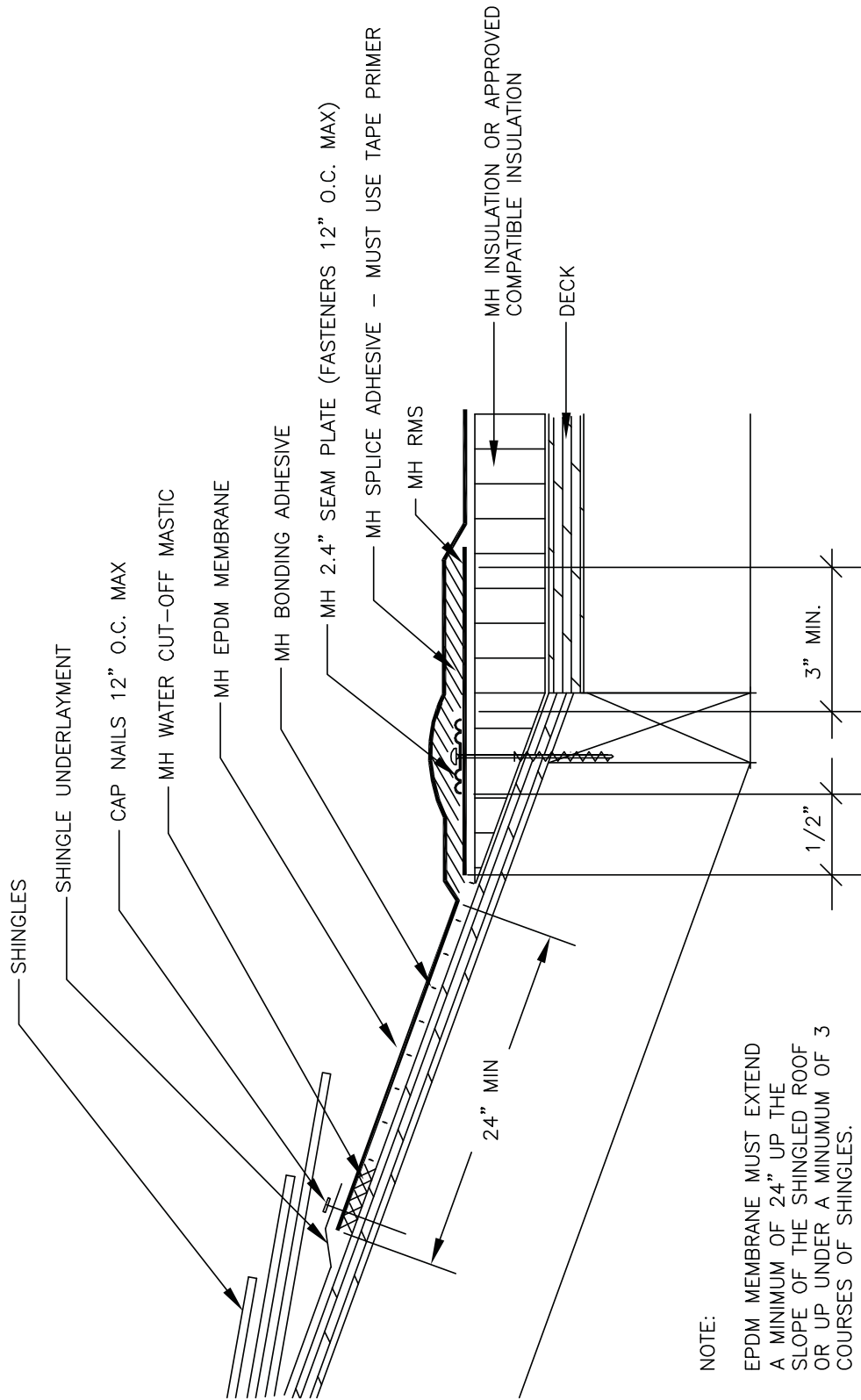
NOTE:
 1. ON GRAVEL SURFACED BUILT-UP SYSTEMS - GRAVEL MUST BE SPUNNED TO FELTS AT TIE-IN.
 2. HOT ASPHALT (TYPE III OR IV) OR COAL TAR PITCH TO BE DETERMINED BY EXISTING ROOF SYSTEM



**MULE-HIDE
 PRODUCTS CO., INC.
 04/01/2004**

EPDM TIE-IN
 HOT STRIPPING
 SYSTEMS:
 ALL

DETAIL NO.:
MHE-162

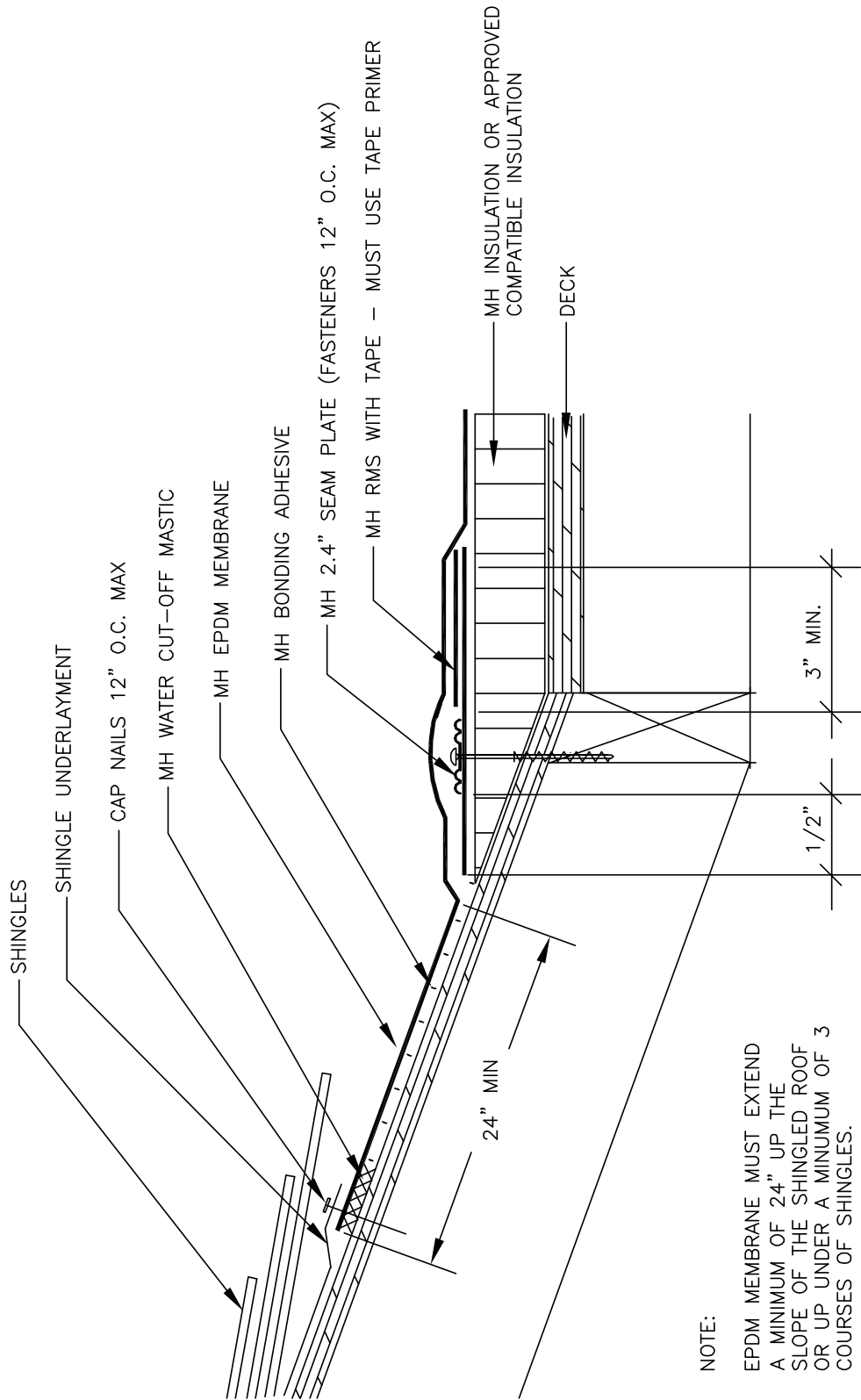


NOTE:
 EPDM MEMBRANE MUST EXTEND
 A MINIMUM OF 24" UP THE
 SLOPE OF THE SHINGLED ROOF
 OR UP UNDER A MINIMUM OF 3
 COURSES OF SHINGLES.

DETAIL NO.:
MHE-163

**EPDM BASE TIE-IN TO SHINGLE ROOF
 RMS ATTACHMENT
 SYSTEMS:**
ALL

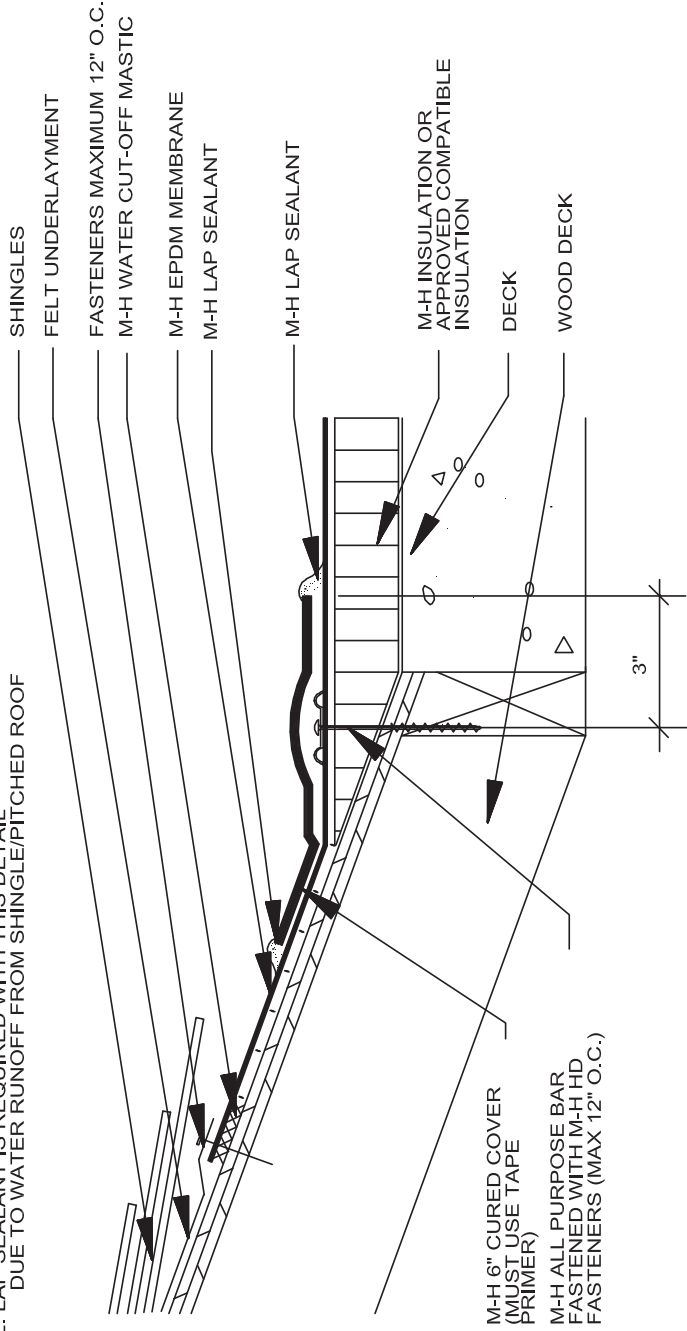
**MULE-HIDE
 PRODUCTS CO., INC.**
 2010



NOTE:
 EPDM MEMBRANE MUST EXTEND
 A MINIMUM OF 24" UP THE
 SLOPE OF THE SHINGLED ROOF
 OR UP UNDER A MINIMUM OF 3
 COURSES OF SHINGLES.

MULE-HIDE PRODUCTS CO., INC. 2010	EPDM BASE TIE-IN TO SHINGLE ROOF RMS WITH TAPE ATTACHMENT		DETAIL NO.: MHE-163A
	SYSTEMS: ALL		

NOTE: LAP SEALANT IS REQUIRED WITH THIS DETAIL
DUE TO WATER RUNOFF FROM SHINGLE/PITCHED ROOF



NOTE: EPDM MEMBRANE MUST EXTEND UP SLOPE A MINIMUM OF 24" OR UP UNDER A MINIMUM OF 3 COURSES OF SHINGLES.

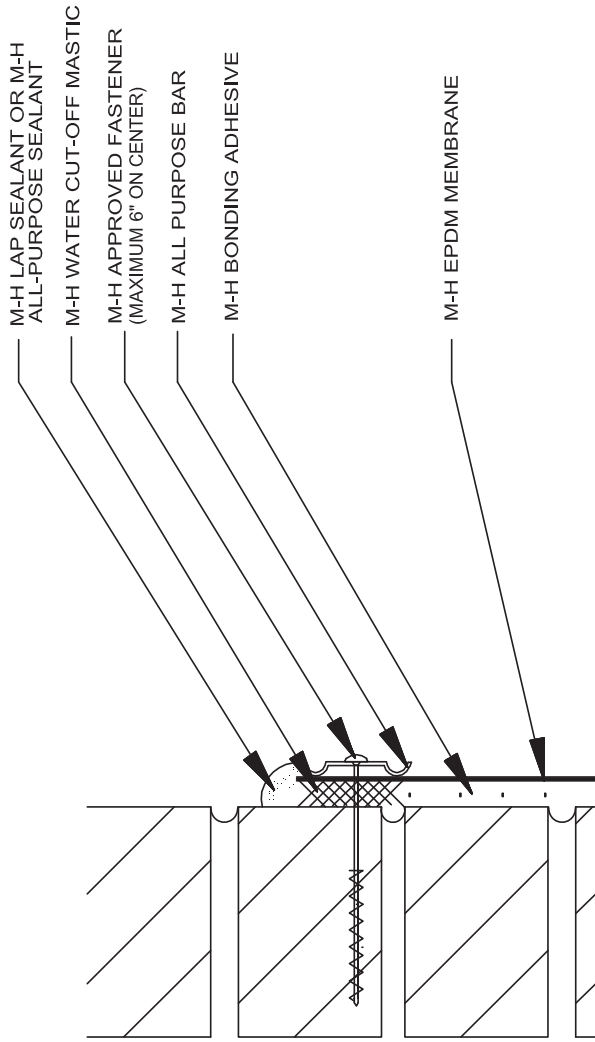
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

EPDM BASE TIE-IN TO
SHINGLE ROOF
A-P BAR ATTACHMENT

SYSTEMS:
ALL

DETAIL NO.:

MHE-164

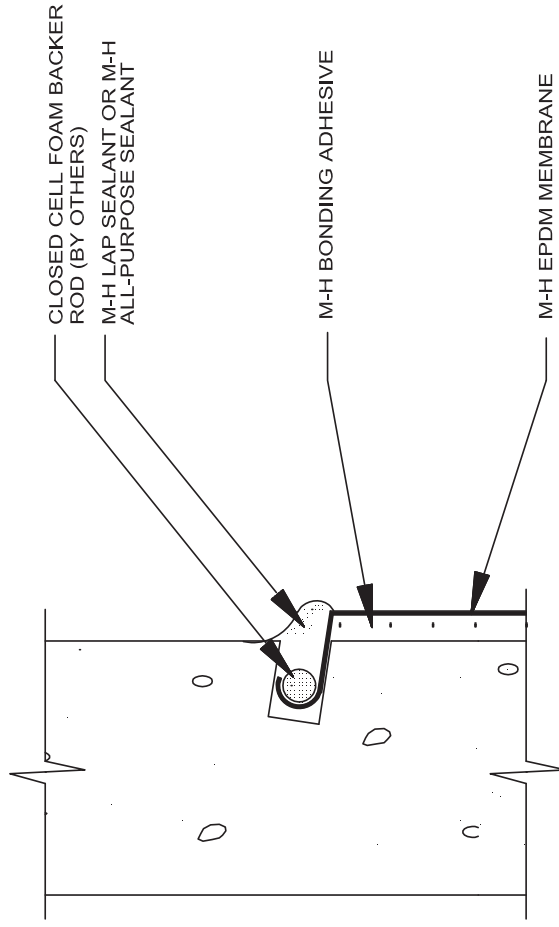


**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

VERTICAL TERMINATION
WITH A-P BAR
SYSTEMS:
ALL

DETAIL NO.:
MHE-170

NOTE: THE DIAMETER OF BACKER ROD MUST BE LARGER THAN REGLET OPENING.



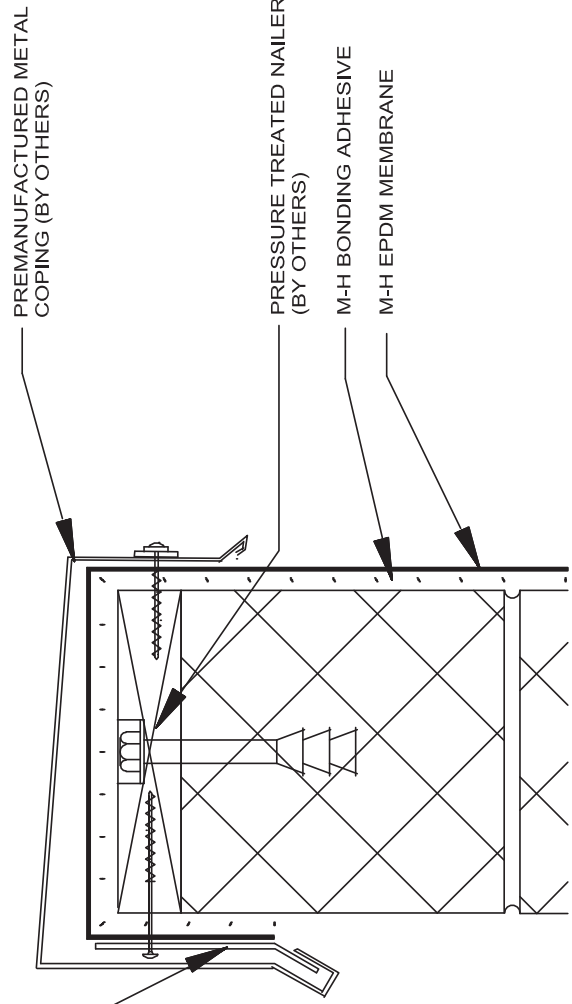
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

VERTICAL TERMINATION
REGLET

SYSTEMS:
ALL

DETAIL NO.:

MHE-171



PREMANUFACTURED METAL
COPING (BY OTHERS)

PRESSURE TREATED NAILER
(BY OTHERS)

M-H BONDING ADHESIVE

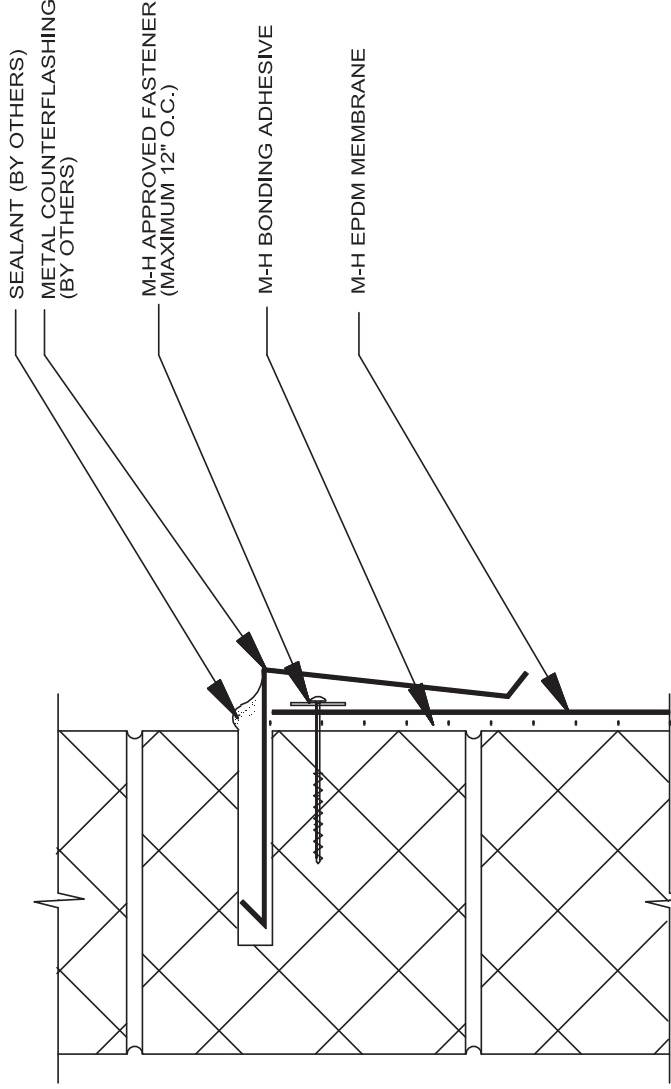
M-H EPDM MEMBRANE

CLIPS OR CONTINUOUS
CLEATS AS REQUIRED
BY COPING MANUFACTURER

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

VERTICAL TERMINATION
METAL COPING
SYSTEMS:
ALL

DETAIL NO.:
MHE-172



SEALANT (BY OTHERS)
METAL COUNTERFLASHING
(BY OTHERS)

M-H APPROVED FASTENER
(MAXIMUM 12" O.C.)

M-H BONDING ADHESIVE

M-H EPDM MEMBRANE

NOTE: 1. MEMBRANE MUST BE FASTENED UNDER COUNTERFLASHING, DO NOT FASTEN THROUGH COUNTERFLASHING.
2. ATTACHMENT OF COUNTERFLASHING AS DETERMINED BY SPECIFIER.

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

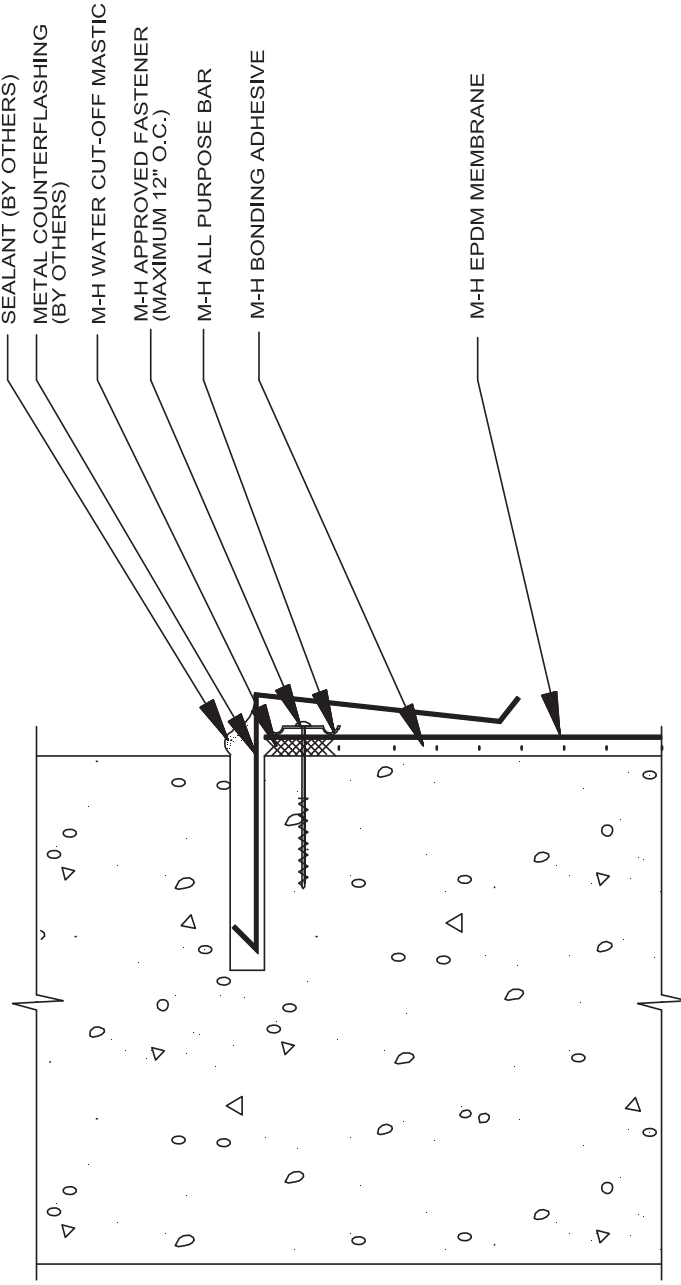
VERTICAL TERMINATION
COUNTERFLASHING

SYSTEMS:
ALL

DETAIL NO.:

MHE-173

NOTE: ATTACHMENT OF COUNTERFLASHING AS DETERMINED BY SPECIFIER.



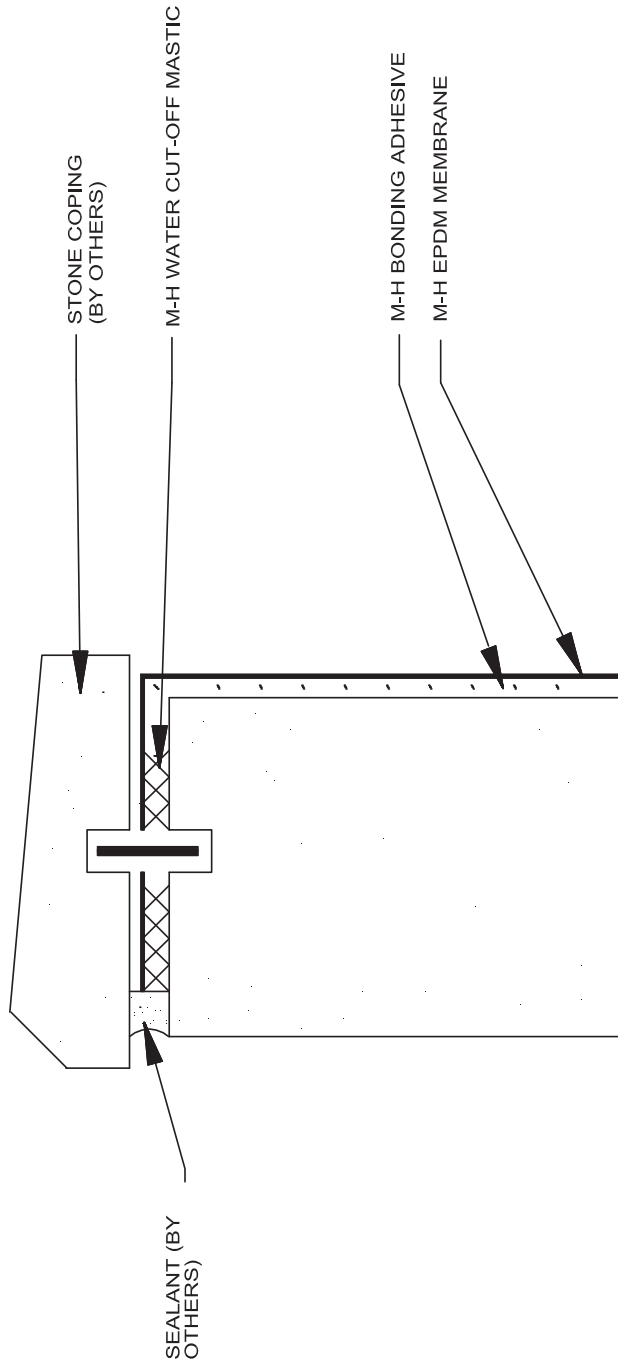
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

VERTICAL TERMINATION
COUNTERFLASHING W/
A-P BAR

SYSTEMS:
ALL

DETAIL NO.:

MHE-174



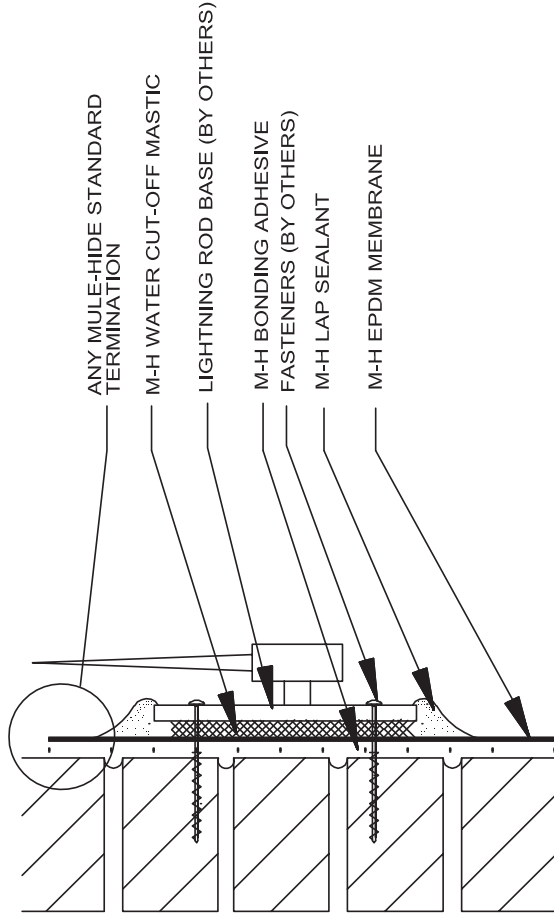
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

VERTICAL TERMINATION
STONE COPING

SYSTEMS:
ALL

DETAIL NO.:

MHE-175



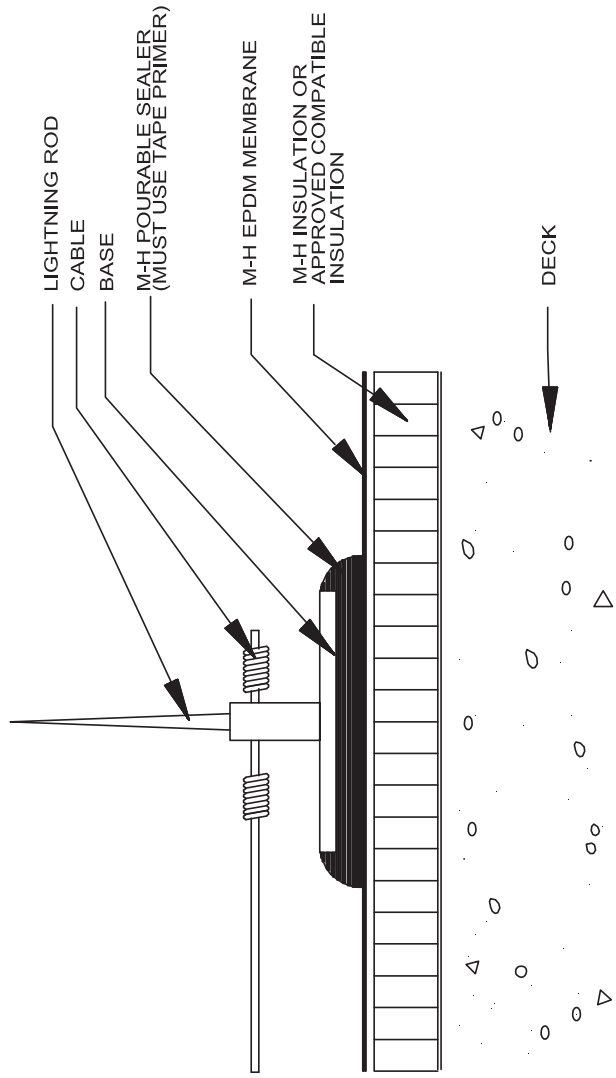
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

LIGHTNING ROD
VERTICAL ATTACHMENT

SYSTEMS:
ALL

DETAIL NO.:

MHE-180



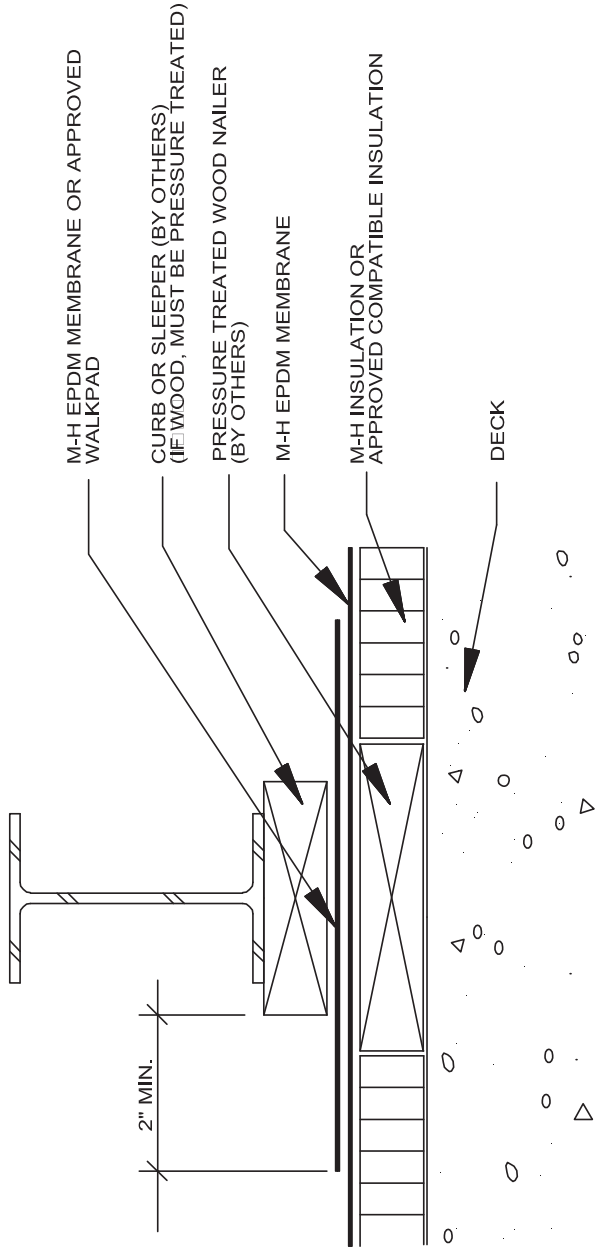
MULE-HIDE
PRODUCTS CO., INC.
04/01/2004

LIGHTNING ROD
 HORIZONTAL ATTACHMENT

SYSTEMS:
 ALL

DETAIL NO.:

MHE-181



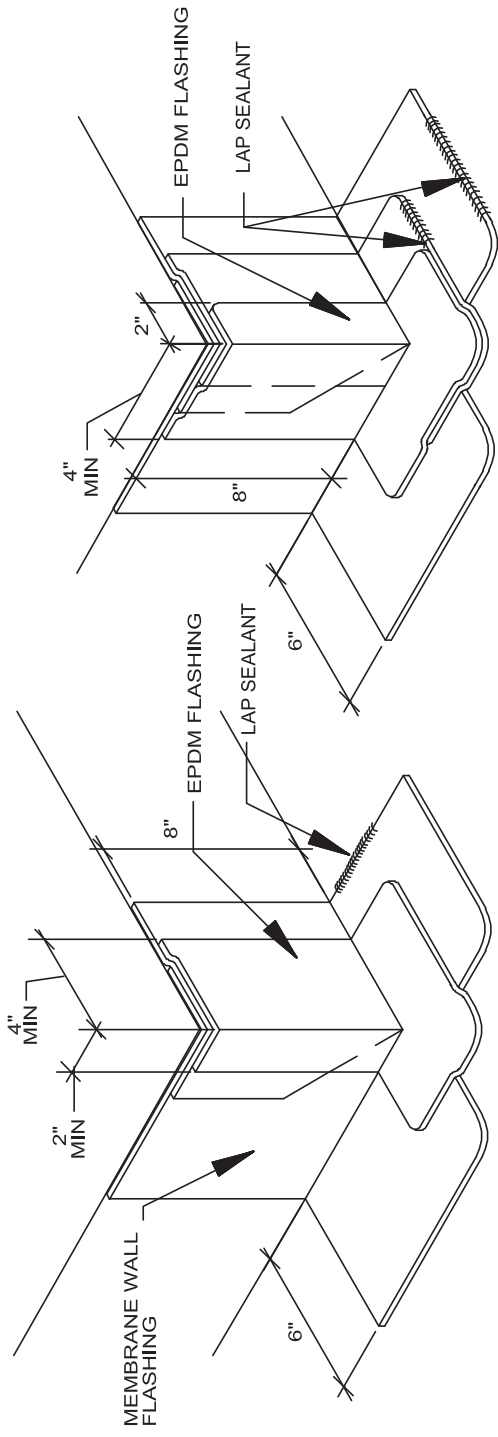
MULE-HIDE
PRODUCTS CO., INC.
04/01/2004

SLEEPER

SYSTEMS:
ALL

DETAIL NO.:

MHE-182



STEP NO. 1

NOTE: WHEN USING UNCURED EPDM FLASHING, SPLICE ADHESIVE AND SEAM CLEANER ARE REQUIRED.
 WHEN USING FLASHING TAPE, TAPE PRIMER IS REQUIRED TO PREP ALL SURFACES TO WHICH THE FLASHING TAPE WILL BE APPLIED.

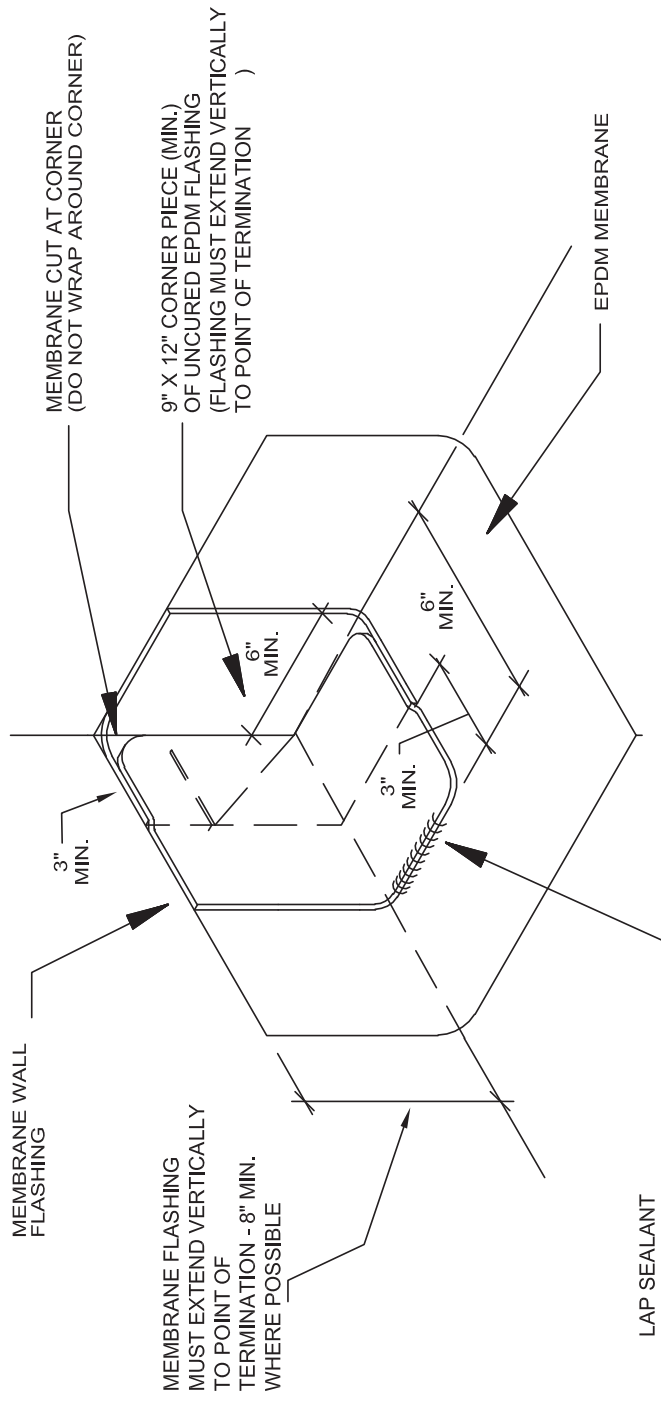
STEP NO. 2

**MULE-HIDE
 PRODUCTS CO., INC.
 04/01/2004**

**EPDM
 OUTSIDE CORNER
 SYSTEMS:
 ALL**

DETAIL NO.:

MHE-183



MEMBRANE WALL FLASHING

MEMBRANE CUT AT CORNER (DO NOT WRAP AROUND CORNER)

MEMBRANE FLASHING MUST EXTEND VERTICALLY TO POINT OF TERMINATION - 8" MIN. WHERE POSSIBLE

9" X 12" CORNER PIECE (MIN.) OF UNCURED EPDM FLASHING (FLASHING MUST EXTEND VERTICALLY TO POINT OF TERMINATION)

EPDM MEMBRANE

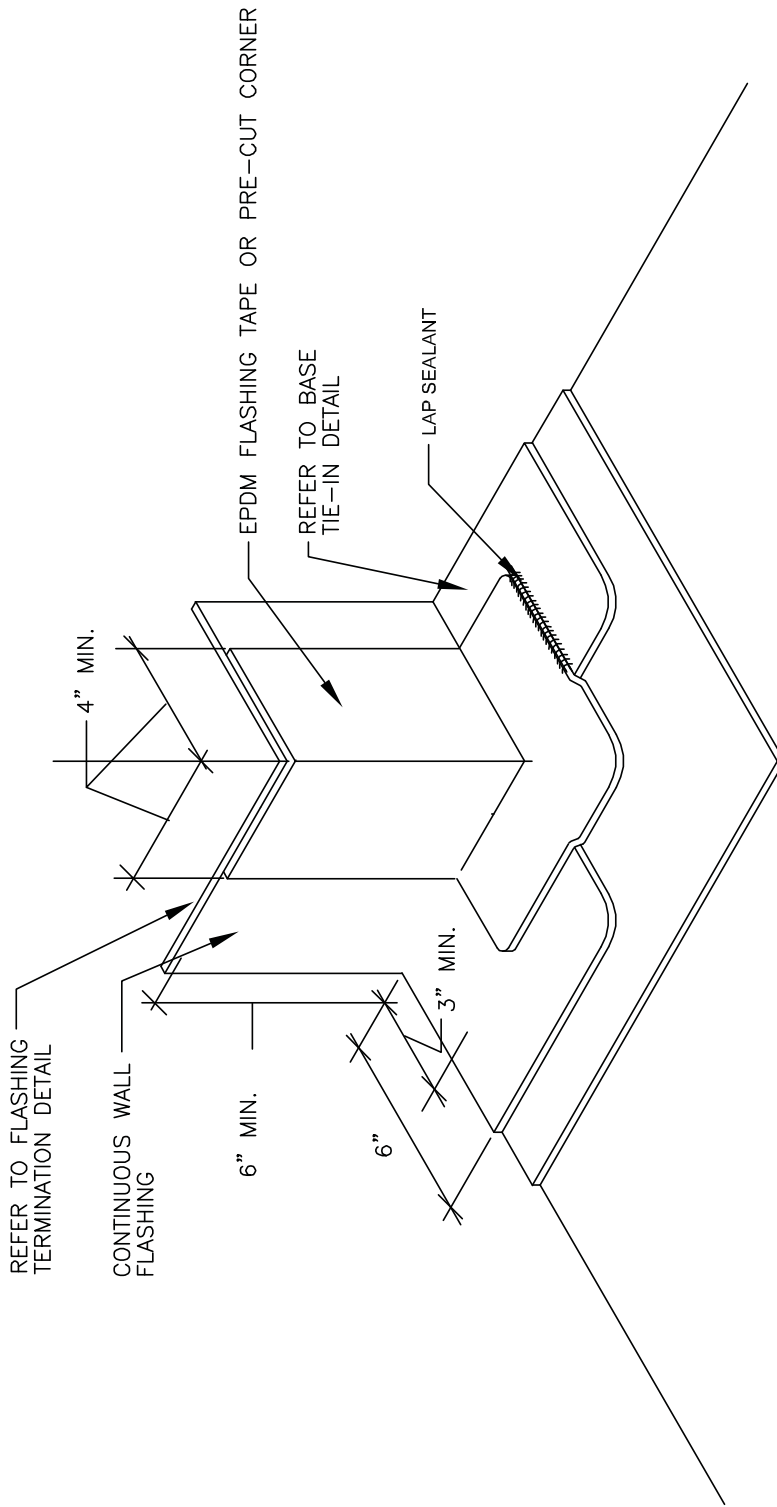
LAP SEALANT APPLIED AROUND ENTIRE PERIMETER OF FLASHING

NOTE: WHEN USING UNCURED EPDM FLASHING, SPLICE ADHESIVE AND SEAM CLEANER ARE REQUIRED. WHEN USING FLASHING TAPE, TAPE PRIMER IS REQUIRED TO PREP ALL SURFACES TO WHICH THE FLASHING TAPE WILL BE APPLIED. SPLICE ADHESIVE IS REQUIRED TO ADHERE THE "PIG EAR".

MULE-HIDE PRODUCTS CO., INC.
04/01/2004

2 PIECE INSIDE CORNER
 EPDM WALL FLASHING
 SYSTEMS:
 ALL

DETAIL NO.:
MHE-184



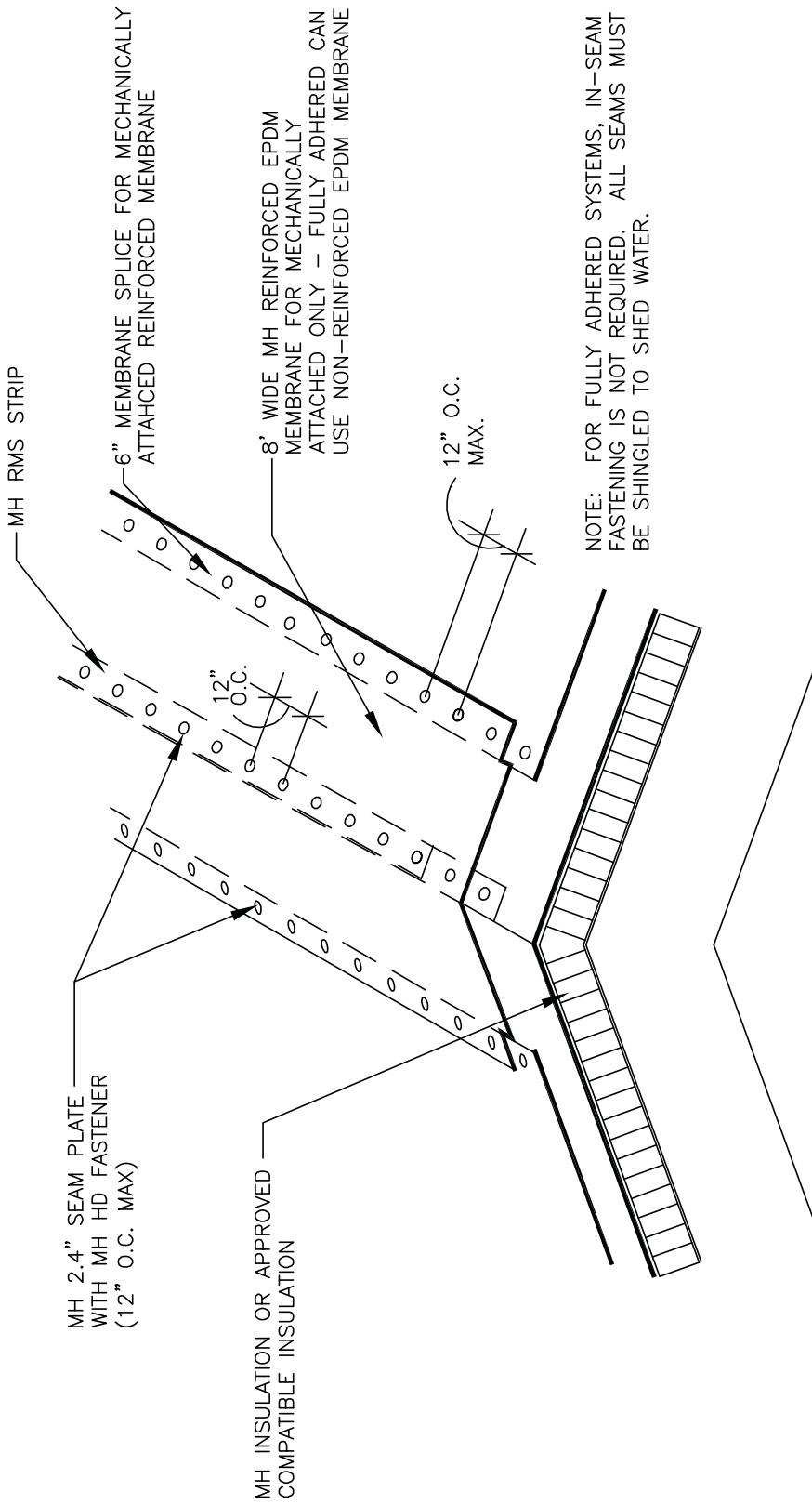
WHEN USING FLASHING TAPES, TAPE PRIMER MUST BE USED

**MULE-HIDE
PRODUCTS CO., INC.**
2010

**EPDM OUTSIDE CORNER
ONE PIECE WRAP**

**SYSTEMS:
ALL**

DETAIL NO.:
MHE-186



NOTE: 6" WIDE SEAM WHEN USING REINFORCED EPDM MEMBRANE, MAY BE COMPLETED WITH EITHER SPLICE ADHESIVE AND TAPE PRIMER OR 6" WIDE IN-SEAM TAPE AND TAPE PRIMER.

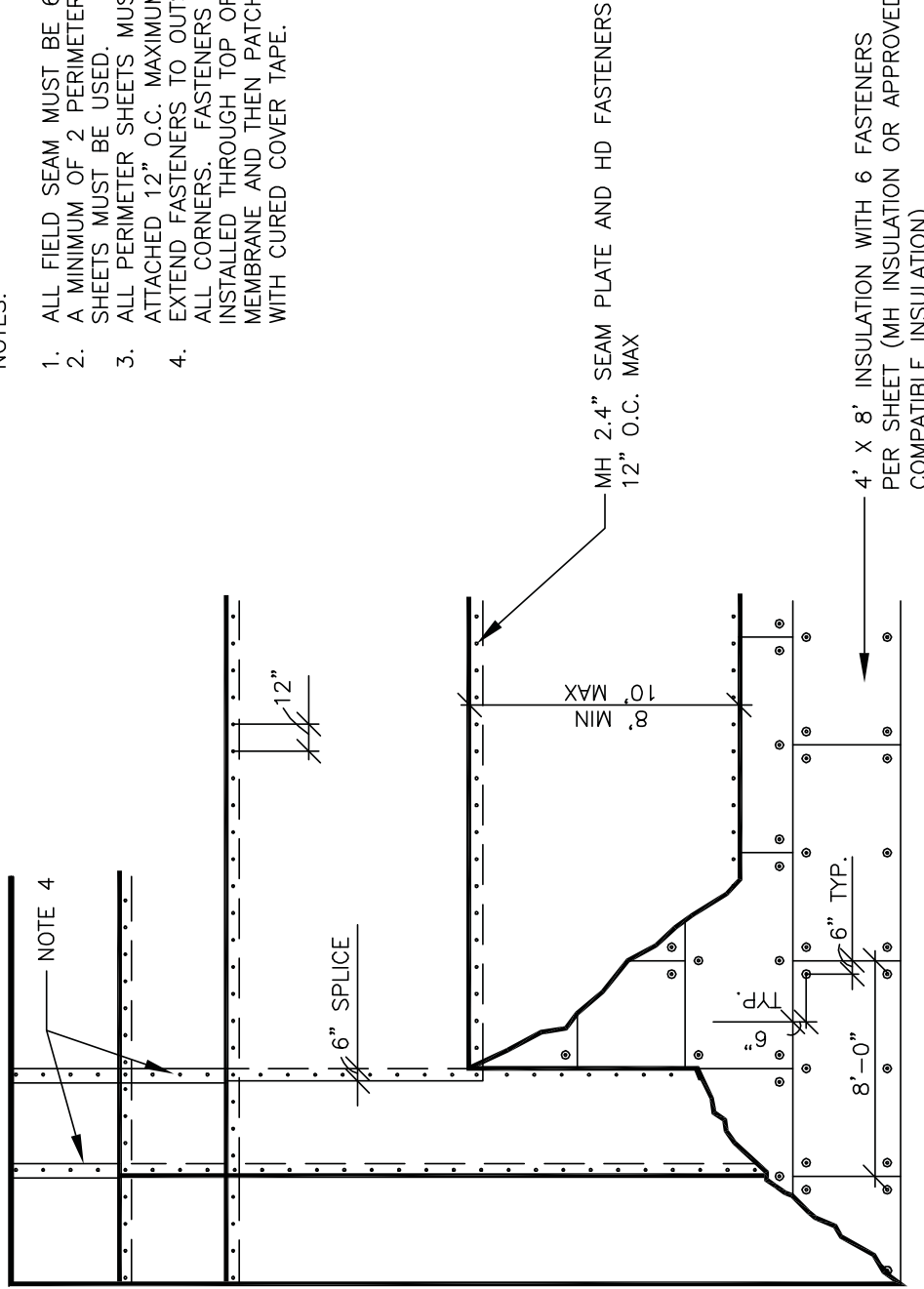
MULE-HIDE PRODUCTS CO., INC.
2010

RIDGE ATTACHEMENT WITH RMS
SYSTEMS:
MECHANICALLY ATTACHED AND FULLY ADHERED

DETAIL NO.:
MHE-190

NOTES:

1. ALL FIELD SEAM MUST BE 6" WIDE.
2. A MINIMUM OF 2 PERIMETER SHEETS MUST BE USED.
3. ALL PERIMETER SHEETS MUST BE ATTACHED 12" O.C. MAXIMUM.
4. EXTEND FASTENERS TO OUTSIDE AT ALL CORNERS. FASTENERS MAY BE INSTALLED THROUGH TOP OF MEMBRANE AND THEN PATCHED WITH CURED COVER TAPE.



**MULE-HIDE
PRODUCTS CO., INC.**
2010

PERIMETER SHEET ATTACHMENT

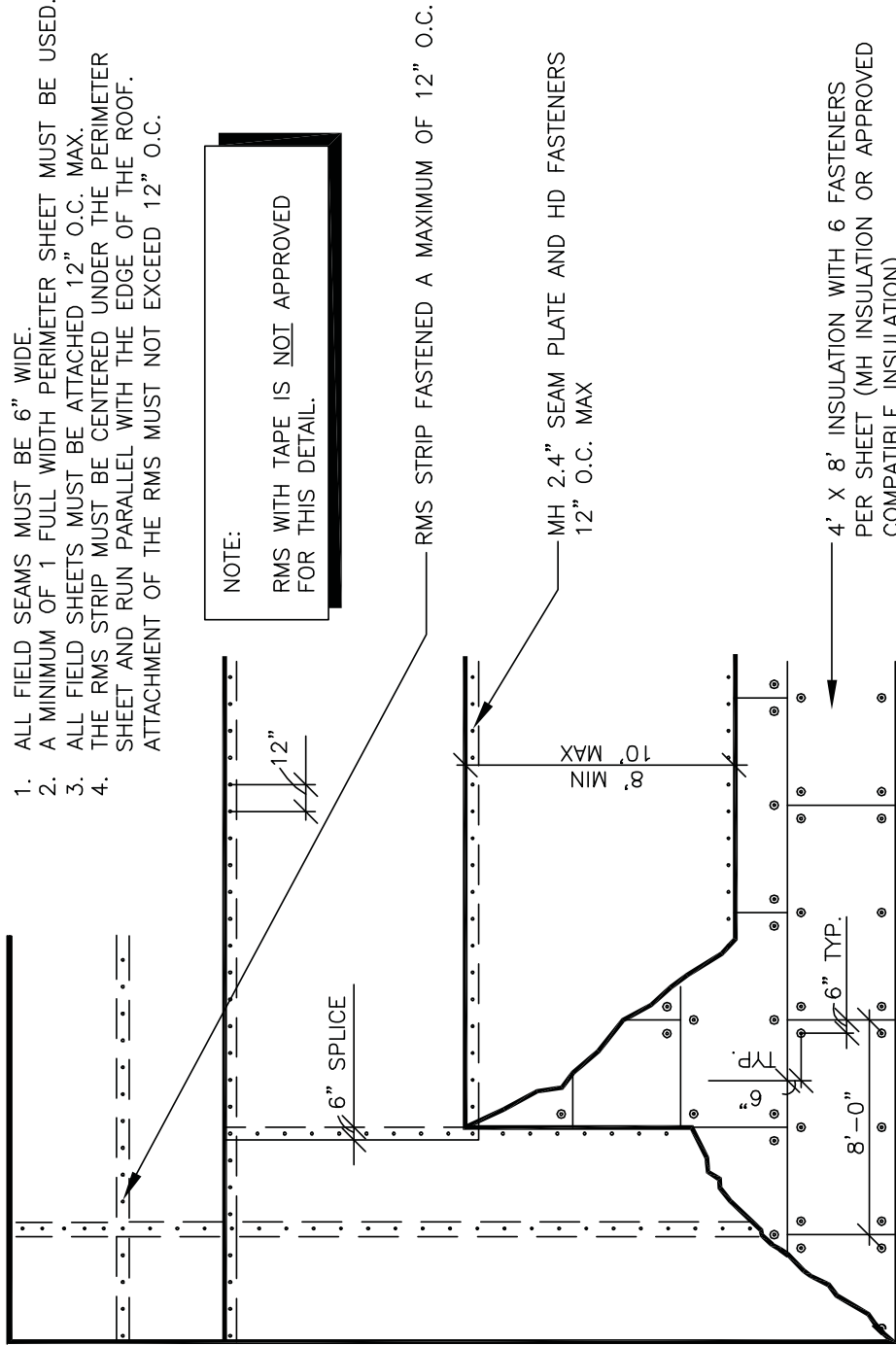
**SYSTEMS:
MECHANICALLY ATTACHED**

DETAIL NO.:

MHE-191

NOTES:

1. ALL FIELD SEAMS MUST BE 6" WIDE.
2. A MINIMUM OF 1 FULL WIDTH PERIMETER SHEET MUST BE USED.
3. ALL FIELD SHEETS MUST BE ATTACHED 12" O.C. MAX.
4. THE RMS STRIP MUST BE CENTERED UNDER THE PERIMETER SHEET AND RUN PARALLEL WITH THE EDGE OF THE ROOF. ATTACHMENT OF THE RMS MUST NOT EXCEED 12" O.C.



**MULE-HIDE
PRODUCTS CO., INC.**

2010

**PERIMETER SHEET ATTACHMENT
FULL SHEET WITH RMS STRIP**

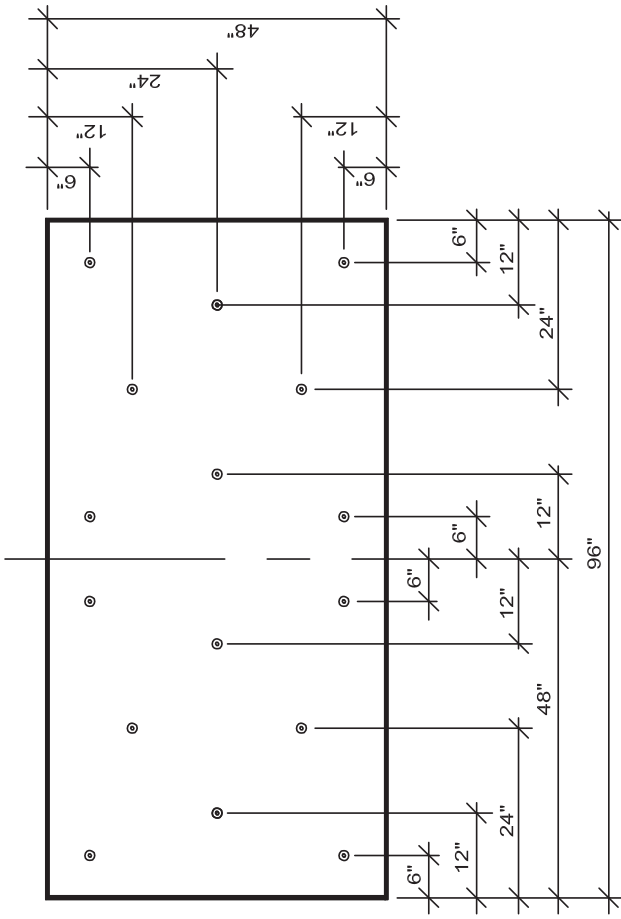
SYSTEMS:

MECHANICALLY FASTENED

DETAIL NO.:

MHE-192

NOTE: THE ATTACHMENT PATTERN SHOWN MUST BE USED WHEN A FACTORY MUTUAL RATING IS REQUIRED. CONTACT MULE-HIDE FOR PERIMETER AND CORNER ATTACHMENT AND ACCEPTABLE ALTERNATIVE ATTACHMENT PATTERNS.



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

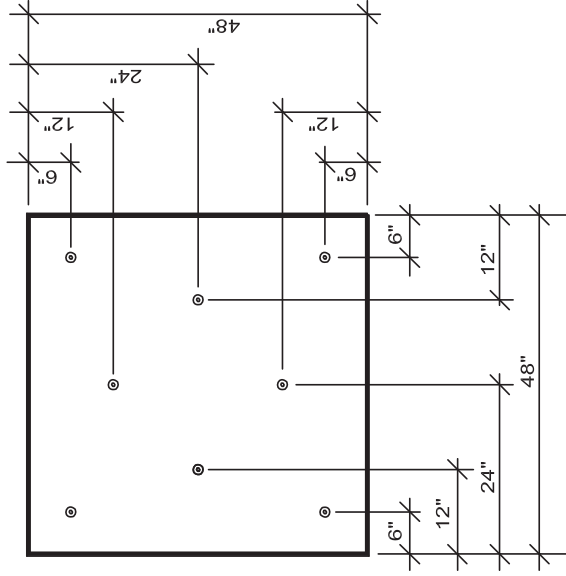
**4'X8' INSULATION
ATTACHMENT (1 PER 2 SQ.FT)
STANDARD ATTACHMENT
(FIELD ONLY)**

SYSTEMS: FULLY ADHERED

DETAIL NO.:

MHE-200

NOTE: THE ATTACHMENT PATTERN SHOWN MUST BE USED WHEN A FACTORY MUTUAL RATING IS REQUIRED. CONTACT MULE-HIDE FOR PERIMETER AND CORNER ATTACHMENT AND ACCEPTABLE ALTERNATIVE ATTACHMENT PATTERNS.



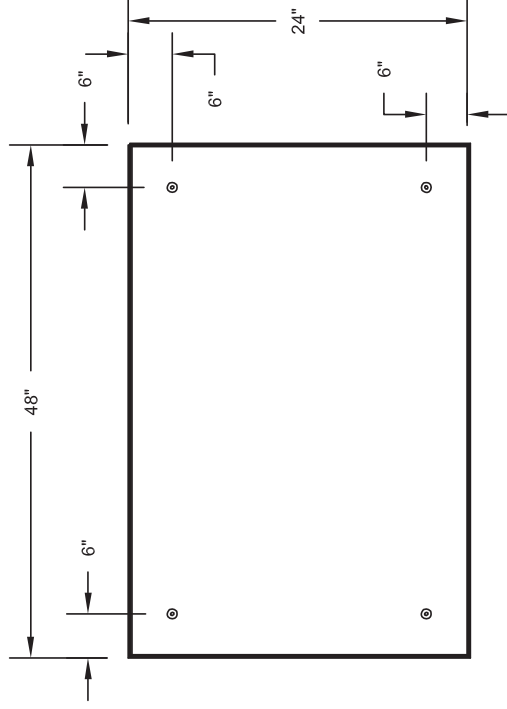
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

4'X4' INSULATION
ATTACHMENT (1 PER 2 SQ FT)
STANDARD ATTACHMENT
(FIELD ONLY)

SYSTEMS: FULLY ADHERED

DETAIL NO.:
MHE-201

NOTE: THE ATTACHMENT PATTERN SHOWN MUST BE USED WHEN A FACTORY MUTUAL RATING IS REQUIRED. CONTACT MULE-HIDE FOR PERIMETER AND CORNER ATTACHMENT AND ACCEPTABLE ALTERNATIVE ATTACHMENT PATTERNS.



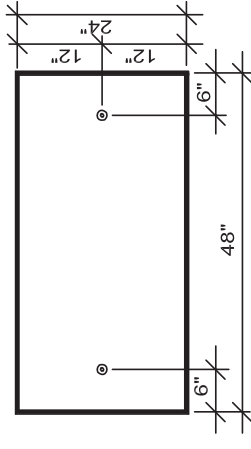
NOTE: DRAWING NOT TO SCALE

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

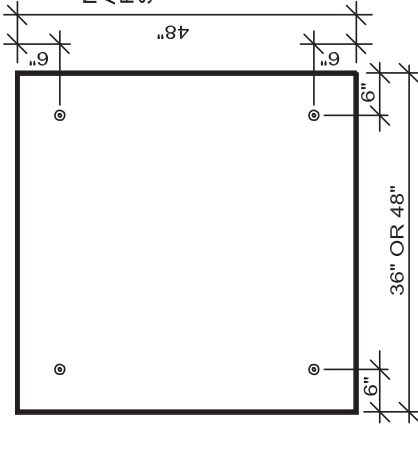
**2'x4' INSULATION
ATTACHMENT (1 PER 2 SQ.FT)
STANDARD ATTACHMENT
(FIELD ONLY)**

SYSTEMS: FULLY ADHERED

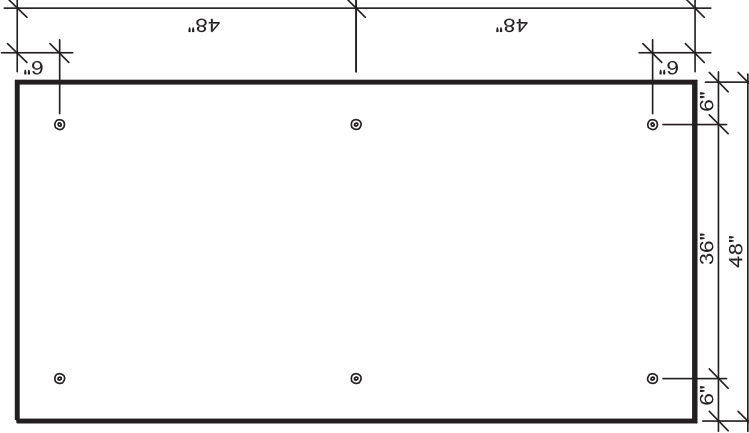
DETAIL NO.:
MHE-202



2'X4' INSULATION BOARDS



3'X4' INSULATION BOARDS
4'X4' INSULATION BOARDS



4'X8' INSULATION BOARDS

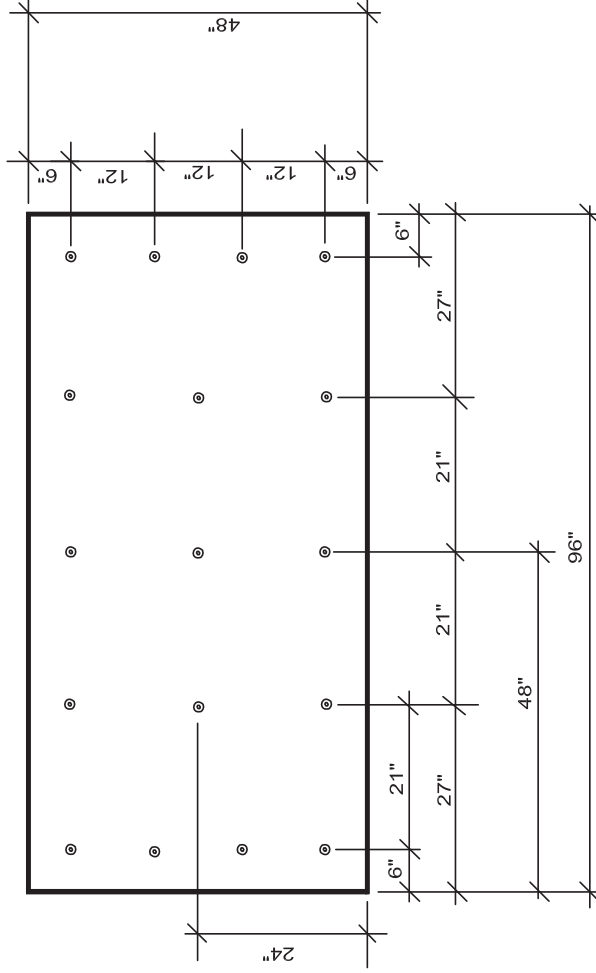
MULE-HIDE MINIMUM
ATTACHMENT PATTERNS
FOR MECHANICALLY ATTACHED
SYSTEMS

**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

INSULATION
ATTACHMENT
SYSTEMS:
MECHANICALLY ATTACHED

DETAIL NO.:
MHE-203

NOTE: THE ATTACHMENT PATTERN SHOWN MUST BE USED WHEN A FACTORY MUTUAL RATING IS REQUIRED. CONTACT MULE-HIDE FOR PERIMETER AND CORNER ATTACHMENT AND ACCEPTABLE ALTERNATIVE ATTACHMENT PATTERNS.



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

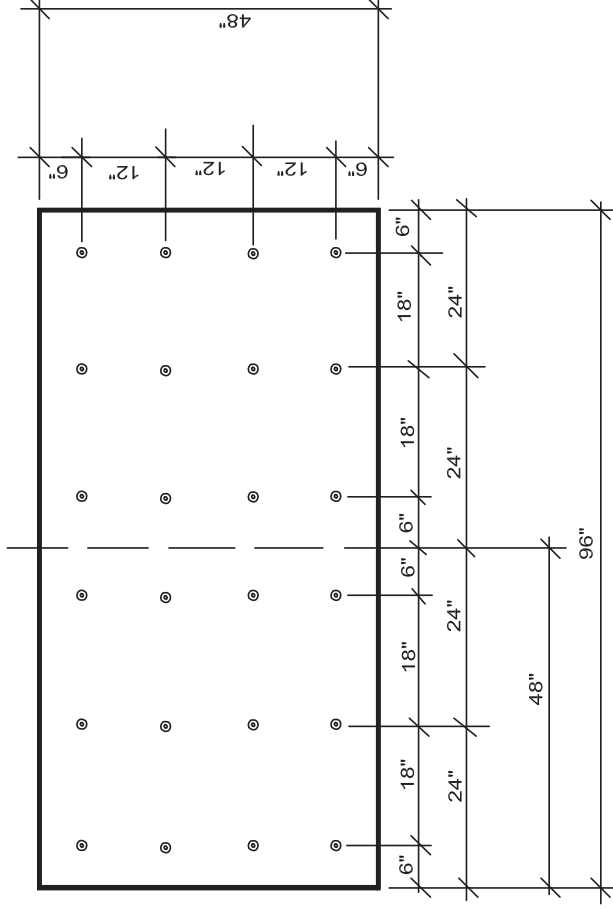
4'X8' OSB (17 per board)
ATTACHMENT (1 PER 1.88 SQ FT)
STANDARD ATTACHMENT
(FIELD ONLY)

SYSTEMS: FULLY ADHERED

DETAIL NO.:

MHE-204

NOTE: THE ATTACHMENT PATTERN SHOWN MUST BE USED WHEN A FACTORY MUTUAL RATING IS REQUIRED. CONTACT MULE-HIDE FOR PERIMETER AND CORNER ATTACHMENT AND ACCEPTABLE ALTERNATIVE ATTACHMENT PATTERNS.



**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

4'X8' (24 per board)

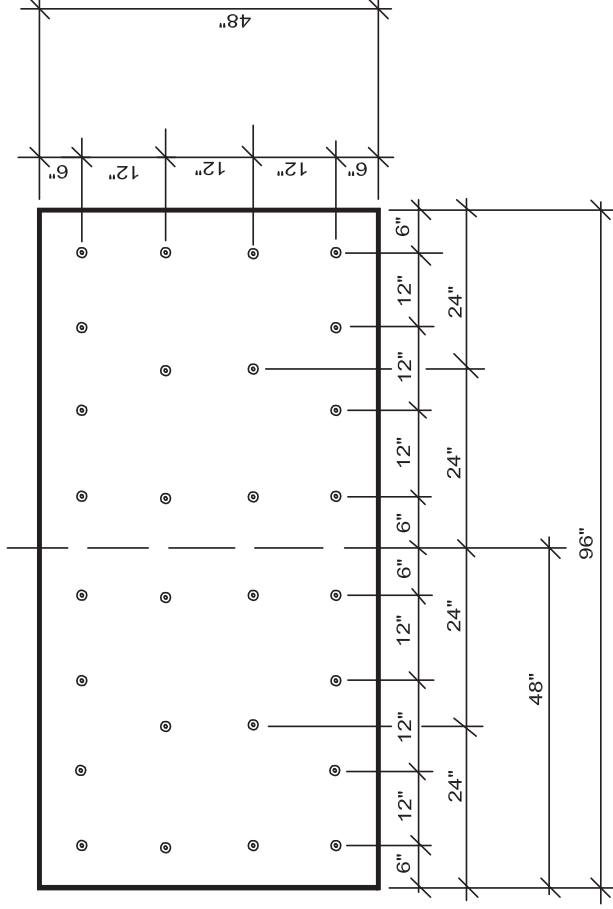
ATTACHMENT (1 PER 1.33 SQ FT)

SYSTEMS: FULLY ADHERED

DETAIL NO.:

MHE-205

NOTE: THE ATTACHMENT PATTERN SHOWN MUST BE USED WHEN A FACTORY MUTUAL RATING IS REQUIRED. CONTACT MULE-HIDE FOR PERIMETER AND CORNER ATTACHMENT AND ACCEPTABLE ALTERNATIVE ATTACHMENT PATTERNS.



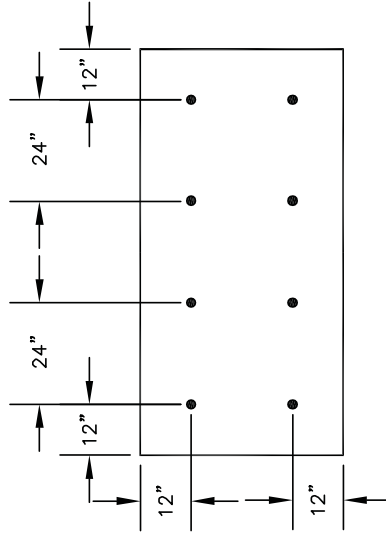
**MULE-HIDE
PRODUCTS CO., INC.
04/01/2004**

4'X8' (28 per board)
ATTACHMENT (1 PER 1.14 SQ FT)
SYSTEMS: FULLY ADHERED

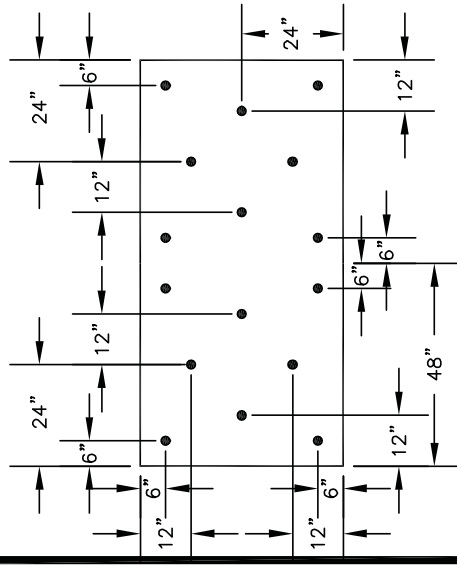
DETAIL NO.:
MHE-206

NOTES:

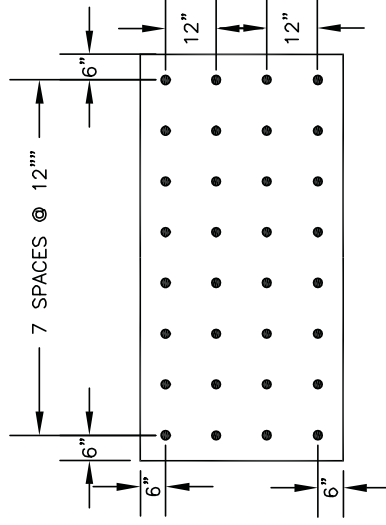
1. DETAILS TO BE USED IN CONJUNCTION WITH STANDARD GUIDE SPECIFICATIONS CONTAINING REQUIREMENTS FOR NAILERS, INSULATION, SLIPSHEETS, ETC.
2. MULE-HIDE INSULATION FASTENERS AND 3" DIAMETER PLATES MUST BE USED FOR INSULATION ATTACHMENT.
3. REFER TO MULE-HIDE WIND UPLIFT RATINGS FOR APPROPRIATE FASTENER DENSITY REQUIRED.
4. FASTENER DENSITY INCREASES BASED ON THE FOLLOWING:
 - 50% FOR PERIMETERS WITH A MINIMUM OF 1 FASTENER EVERY 2 SQUARE FEET NOT TO EXCEED 1 FASTENER EVERY 1 SQUARE FEET
 - CONSTANT DENSITY OF 1 FASTENER EVERY 1 SQUARE FEET FOR CORNERS.



FIELD (8)
1 FASTENER PER EVERY 4 SQ. FT.



PERIMETERS (16)
1 FASTENER PER EVERY 2 SQ. FT.



CORNERS (32)
1 FASTENER PER EVERY 1 SQ. FT.

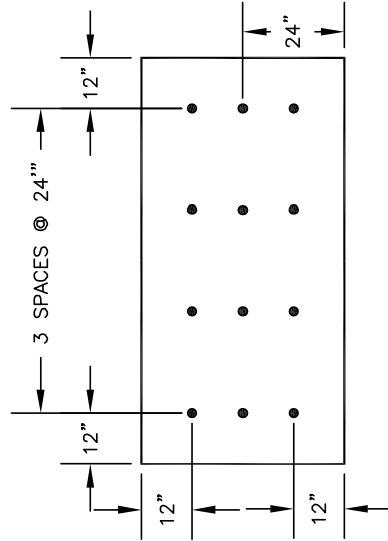
**MULE-HIDE
PRODUCTS CO., INC.
05/01/2007**

**FM - 8 FIELD FASTENERS
PER 4' X 8' BOARD PATTERN LAYOUT
SYSTEMS:
ALL SYSTEMS**

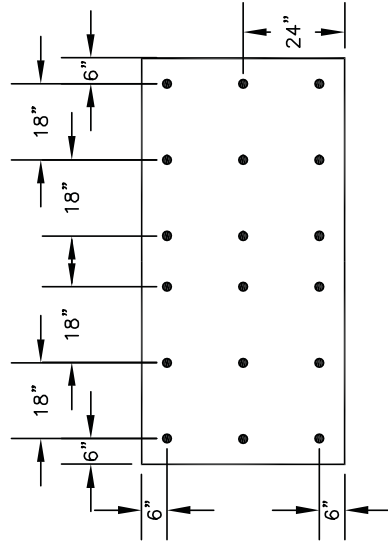
**DETAIL NO:
MHFM-208**

NOTES:

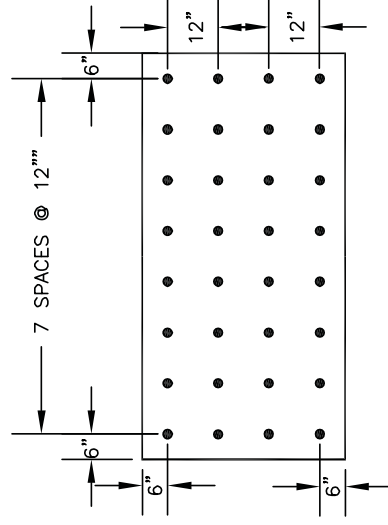
1. DETAILS TO BE USED IN CONJUNCTION WITH STANDARD GUIDE SPECIFICATIONS CONTAINING REQUIREMENTS FOR NAILERS, INSULATION, SLIPSHEETS, ETC.
2. MULE-HIDE INSULATION FASTENERS AND 3" DIAMETER PLATES MUST BE USED FOR INSULATION ATTACHMENT.
3. REFER TO MULE-HIDE WIND UPLIFT RATINGS FOR APPROPRIATE FASTENER DENSITY REQUIRED.
4. FASTENER DENSITY INCREASES BASED ON THE FOLLOWING:
 - 50% FOR PERIMETERS WITH A MINIMUM OF 1 FASTENER EVERY 2 SQUARE FEET NOT TO EXCEED 1 FASTENER EVERY 1 SQUARE FOOT
 - CONSTANT DENSITY OF 1 FASTENER EVERY 1 SQUARE FOOT FOR CORNERS.



FIELD (12)
1 FASTENER PER EVERY 2.66 SQ. FT.



PERIMETERS (18)
1 FASTENER PER EVERY 1.77 SQ. FT.



CORNERS (32)
1 FASTENER PER EVERY 1 SQ. FT.

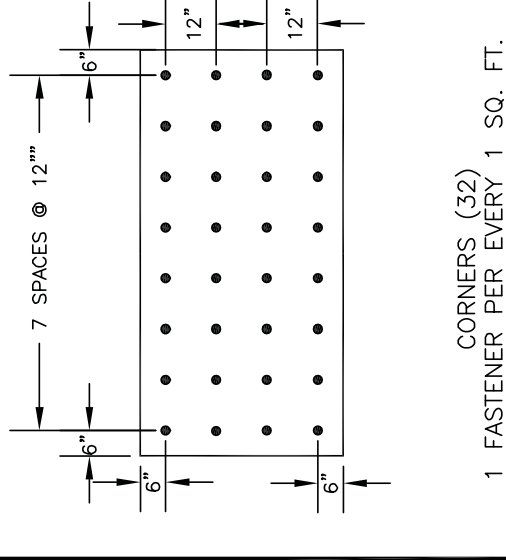
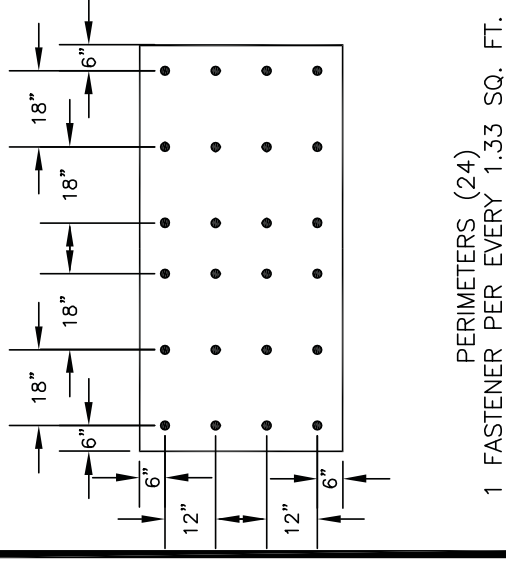
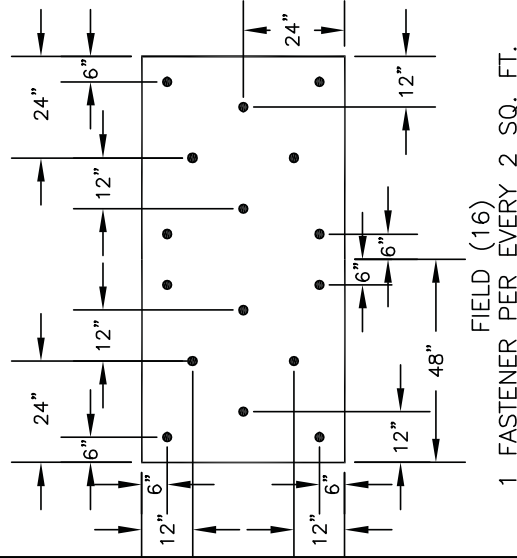
**MULE-HIDE
PRODUCTS CO., INC.
05/01/2007**

**FM - 12 FIELD FASTENERS
PER 4' X 8' BOARD PATTERN LAYOUT
SYSTEMS:
ALL SYSTEMS**

**DETAIL NO:
MHFM-212**

NOTES:

1. DETAILS TO BE USED IN CONJUNCTION WITH STANDARD GUIDE SPECIFICATIONS CONTAINING REQUIREMENTS FOR NAILERS, INSULATION, SLIPSHEETS, ETC.
2. MULE-HIDE INSULATION FASTENERS AND 3" DIAMETER PLATES MUST BE USED FOR INSULATION ATTACHMENT.
3. REFER TO MULE-HIDE WIND UPLIFT RATINGS FOR APPROPRIATE FASTENER DENSITY REQUIRED.
4. FASTENER DENSITY INCREASES BASED ON THE FOLLOWING:
 - 50% FOR PERIMETERS WITH A MINIMUM OF 1 FASTENER EVERY 2 SQUARE FEET NOT TO EXCEED 1 FASTENER EVERY 1 SQUARE FOOT
 - CONSTANT DENSITY OF 1 FASTENER EVERY 1 SQUARE FOOT FOR CORNERS.



**MULE-HIDE
PRODUCTS CO., INC.
05/01/2007**

**FM - 16 FIELD FASTENERS
PER 4' X 8' BOARD PATTERN LAYOUT
SYSTEMS:
ALL SYSTEMS**

**DETAIL NO:
MHFM-216**

SECTION 9

MULE-HIDE PRODUCTS CO., INC.

EPDM PRODUCT DATA SHEETS (PDS)

**Please consult the Mule-Hide website for the most current information at
www.mulehide.com**

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MULE-HIDE EPDM PRODUCT DATA SHEETS (PDS)

TABLE OF CONTENTS

Membrane

Mule-Hide Standard Black EPDM Membrane.....	PDS 09-1305
Mule-Hide FR 60 and 90 mil EPDM Membrane (Pre-cleaned)	PDS 09-1310
Mule-Hide Standard and Fire Retardant Reinforced EPDM Membrane	PDS 09-1320
Mule-Hide White-On-Black EPDM Membrane	PDS 09-1330
Mule-Hide Polyepichlorohydrin (ECO/CO).....	PDS 09-1350

Adhesives and Sealants

Mule-Hide Universal Single Ply Sealant	PDS 09-2105
Mule-Hide EPDM Water Cut-Off.....	PDS 09-2110
Mule-Hide Thermoplastic Pourable Sealer (<i>white</i>).....	PDS-09-2205
Mule-Hide Pourable Sealer (<i>black</i>).....	PDS 09-2210
Black One-Part Pourable Sealer.....	PDS 09-2220
Mule-Hide All Purpose Single Seal Adhesive (<i>not for warranties</i>).....	PDS 09-2305
Mule-Hide Bonding Adhesive	PDS 09-2320
Low VOC Bonding Adhesive	PDS 09-2405
Low VOC Bonding Adhesive 1168 (for California).....	PDS 09-2415
Mule-Hide WBBA-2000 bonding adhesive.....	PDS 09-2505
Mule-Hide Acrylic Water Base Bonding Adhesive	PDS 09-2510

Seaming

Mule-Hide Weathered Membrane Cleaner	PDS 09-3105
Mule-Hide Tape Primer	PDS 09-3205
Low VOC Tape Primer	PDS 09-3210
Mule-Hide Black Splice Adhesive	PDS 09-3305
Mule-Hide White Splice Adhesive.....	PDS 09-3310
Mule-Hide EPDM In-Seam Tape	PDS 09-3315
Mule-Hide EPDM Black Lap Sealant	PDS 09-3415

Flashings

Mule-Hide Cured EPDM Cover Tape	PDS 09-4130
Mule-Hide Reinforced EPDM Membrane Strips (RMS)	PDS 09-4140
Mule-Hide Uncured EPDM Flashing Membrane	PDS 09-4150
Mule-Hide Uncured EPDM Flashing Tape Black	PDS 09-4160
Mule-Hide Uncured EPDM Flashing Tape White.....	PDS 09-4162
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Mule-Hide White Pourable Sealer Pockets.....	PDS 09-4217
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Mule-Hide Pre-Cut Inside/Outside Corners	PDS 09-4530

Fasteners

Mule-Hide 2.4" Seam Plates.....	PDS 09-5110
Mule-Hide 3" Metal Stress Plates	PDS 09-5115
Mule-Hide Drill Point Fasteners.....	PDS 09-5220
Mule-Hide HD-14 Heavy Duty Fasteners.....	PDS 09-5225
Mule-Hide HD-15 Heavy Duty Fasteners	PDS 09-5230

MULE-HIDE EPDM PRODUCT DATA SHEETS (PDS)

TABLE OF CONTENTS

Accessories

Mule-Hide All Purpose Bar	PDS 09-6105
Mule-Hide Poly ISO 1 Roof Insulation	PDS 09-6210
Mule-Hide Poly ISO 2™ Roof Insulation	PDS 09-6215
Mule-Hide Poly ISO1-HD Cover Board	PDS 09-6220
Georgia-Pacific Dens Deck Prime	PDS 09-6290
USG Securock Gypsum-Fiber Roof Board	PDS 09-6292
Mule-Hide Walkway Pads	PDS 09-6415
Mule-Hide Rubber Paver Blocks	PDS 09-6450
Mule-Hide Yellow Warning Strip	PDS 09-6490
HP Protection Mat	PDS 90-6505

**Please consult the Mule-Hide website for the most
current information at www.mulehide.com**

MULE-HIDE .045" and .060" STANDARD BLACK EPDM MEMBRANE

PRODUCT DESCRIPTION

Mule-Hide Standard Black EPDM membranes are high performance non-reinforced membranes that stand up to tearing, impacts, punctures and normal roof traffic. The elastomeric properties of the EPDM membranes compensate for thermal shock and building movement. EPDM membranes provide excellent resistance to ozone and aging. The EPDM membranes are manufactured in accordance with the guidelines established by the RMA (Rubber Manufacturers Association) and meet or exceed the ASTM Standard Specification D 4637, Type I. **Mule-Hide Standard Black EPDM membranes are Fire Retardant (FR) membranes specially formulated to inhibit spread of flame and meet or exceed code body testing criteria for fire retardant roofing membranes.**

Mule-Hide Standard Black EPDM membranes are available with in-seam tape that is pre-applied to the sheet

BASIC USES

Can be used as a elastomeric single-ply roofing membrane for new construction and re-roofing applications. May be installed in Ballasted and Fully Adhered roofing systems.

SPECIFICATIONS – Mule-Hide .045" and .060" thick Standard Black EPDM Membranes.

Physical Properties	Test Method	Standards	Typical Values	
			.045	.060
Tolerance on Nominal Thickness, %	ASTM D 412	± 10	± 10	± 10
Weight, lbf/ft ² (kg/m ²)			0.29 (1.4)	0.39 (1.9)
Tensile Strength, min, psi(Mpa)	ASTM D 412	1305 (9)	1600 (11.0)	1600 (11.0)
Elongation, Ultimate, min, %	ASTM D 412	300	480	465
Tear Strength, min, lbf/in (kN/m) - (Die C)	ASTM D 624	150 (26.3)	200 (35.0)	200 (35.0)
Factory Seam Strength, min.	ASTM D 816 (Modified)	Membrane Rupture	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging* Properties after 4 weeks @ 240°F(116°C)	ASTM D 573			
Tensile Strength, min, psi(MPa)	ASTM D 412	1205(8.3)	1500(10.3)	1450(10.0)
Elongation, Ultimate, min, %	ASTM D 412	200	225	280
Tear Resistance, min, lbf/in(kN/m)	ASTM D 624	125(21.9)	215 (37.6)	215 (37.6)
Linear Dimensional Change, max, %	ASTM D 1204	± 1.0	-0.4	-0.5
Ozone Resistance* Conditions after exposure 100 pphm Ozone in air for 168 hrs @ 104°F(40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg.C)	ASTM D 746	-49 (-45)	-49 (-45)	-49 (-45)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+8, -2	+2.0	+2.0
Water Vapor Permeability* MAX. perm mils	ASTM E 96 (Proc. B or BW)	0.10	0.05	0.03
Resistance to Outdoor (Ultraviolet) Weathering - Xenon-Arc, exposure, 0.70 W/m ² irradiance, 176°F (80°C) black panel temperature	ASTM G 155	No Cracks No Cracking 7,560 kJ/m ² 3,000 hours	No Cracks No Cracking 41,580 kJ/m ² 16,500 hours	No Cracks No Cracking 41,580 kJ/m ² 16,500 hours
At 0.35 W/m ² irradiance, 176°F (80°C) black panel temperature		6,000 hours	33,000 hours	33,000 hours
*Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests run on a statistical basis to ensure overall long-term performance of the sheeting.				
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.				

MULE-HIDE .045" and .060" STANDARD BLACK EPDM MEMBRANE

LEED Information

Recycle Content – Pre-consumer	5%
Recycle Content – Post-consumer	0%
Manufacturing Location	Carlisle, PA Greenville, IL
Solar Reflectance Index	9

PACKAGING

Standard Black EPDM (with and with-out tape) are available in a variety of sizes with widths up to 50' and lengths up to 150' long. Contact Mule-Hide Products for specific rolls sizes available.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Can be installed over a variety of roof decks
- Outstanding weatherability
- Sheets can be pre-taped
- Requires no special equipment to install
- Available as a lightweight system
- Full line of pre-taped accessories available

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings, Underwriters Laboratories Classifications and Miami-Dade Approvals are available. Contact Mule-Hide Warranty Department for additional information. Meets or exceeds requirements of ASTM D 4637, Type I for non-reinforced EPDM single-ply roofing membranes.

INSTALLATION INSTRUCTIONS

- 1) Fully Adhered Roofing System
 - a) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates.
 - b) The field of the roof is fully adhered to the substrate with Mule-Hide Bonding Adhesive.
- 2) Ballasted Roofing System
 - a) Approved insulation to be loosely laid to the deck.
 - b) Roofing membrane is loosely laid over insulation and ballasted with washed river rock or pavers.
- 3) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes greater than 2:12.
- 4) All seams are to be constructed with seam tape and tape primer, and checked for voids.
- 5) All details will be done in accordance with Mule-Hide details.
- 6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. The Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

STORAGE & HANDLING

- Use proper stacking procedures to ensure sufficient stability of the materials.
- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Exercise care when working near edge of roof.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light colored, breathable, waterproof tarpaulins.
- Pre-Taped membranes should not be exposed to prolonged jobsite storage temperatures in excess of 90°F (32°C), otherwise the shelf life of the Pre-Tape may be affected.
- When using pre-taped membranes in warm, sunny weather, shade the tape end of the rolls until ready to use.

MULE-HIDE .045" and .060" STANDARD BLACK EPDM MEMBRANE

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

The information given on this PDS is subject to change without notice. Always check the Mule-Hide website at www.mulehide.com for the latest information, changes and updates or contact Mule-Hide Products Company at 800-786-1492.

DISCLAIMER

The statements provided concerning the material shown are intended as a guide for material usage and are believed to be true and accurate at the time of printing. No statement made by anyone may supersede this information, except when done in writing by Mule-Hide Products Co., Inc. Since the manner of use is beyond our control, Mule-Hide does not authorize anyone to make any warranty of merchantability or fitness for any particular purpose or any other warranty, guarantee or representation, expressed or implied, concerning this material. This product may be eligible for a Mule-Hide warranty, please check the Mule-Hide website at www.mulehide.com or contact Mule-Hide directly at 800-786-1492 for details. Buyer and user accept the product under these conditions and assume the risk of any failure, any injury person or property (including that of the user), loss or liability resulting from the handling, storage or use of the product whether or not it is handled, stored or used in accordance with the directions or specifications. Mule-Hide must be notified in writing of any claims and be given the opportunity to inspect the alleged failure before repairs are made.

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MULE-HIDE 0.060” and 0.090” FR EPDM MEMBRANE (Pre-Cleaned)

PRODUCT DESCRIPTION

Mule-Hide 60 and 90 mil thick FR EPDM membranes (Pre-Cleaned) are high performance non-reinforced membrane that stands up to tearing, impacts, punctures and normal roof traffic. The elastomeric properties of the EPDM membrane compensate for thermal shock and building movement. EPDM membranes provide excellent resistance to ozone and aging. The membrane is manufactured in accordance with the guidelines established by the RMA (Rubber Manufacturers Association) and meets or exceeds the ASTM Standard Specification D 4637. Fire Retardant (FR) EPDM membranes are specially formulated to inhibit spread of flame and meet or exceed code body testing criteria for fire retardant roofing membranes.

Mule-Hide EPDM (Pre-Cleaned) membranes are available with in-seam tape that is pre-applied to the sheet

BASIC USES

Can be used as a elastomeric single-ply roofing membrane for new construction and re-roofing applications. Pre-Cleaned 60 and 90 mil membranes are used primarily in Fully Adhered roofing systems, but can also be Ballasted.

SPECIFICATIONS Mule-Hide 60-mil and 90-mil Thick FR EPDM Membranes (Pre-Cleaned)

Physical Properties	Test Method	Specification	Typical
Tolerance on Nominal Thickness, %	ASTM D 412	+ 10	+ 10
Weight, lbm/ft ² (kg/m ²) .060 .090			0.35 (1.7) 0.59 (2.9)
Tensile Strength, min, psi(Mpa)	ASTM D 412	1305 (9)	1600 (11.0)
Elongation, Ultimate, min, %	ASTM D 412	300	465
Tear Strength, min, lbf/in (kN/m) - (Die C)	ASTM D 624	150 (26.3)	200 (35.0)
Factory Seam Strength, min.	ASTM D 816 (Modified)	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging* Properties after 4 weeks @ 240°F(116°C)	ASTM D 573		
Tensile Strength, min, psi(MPa)	ASTM D 412	1205(8.3)	1450(10.0)
Elongation, Ultimate, min, %	ASTM D 412	200	280
Tear Resistance, min, lbf/in(kN/m)	ASTM D 624	125(21.9)	215 (37.6)
Linear Dimensional Change, max, %	ASTM D 1204	+ 1.0	-0.5
Ozone Resistance* Conditions after exposure 100 pphm Ozone in air for 168 hrs @ 104°F(40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg.C)	ASTM D 746	-49 (-45)	-49 (-45)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+8, -2	+2.0
Water Vapor Permeability* MAX. perm mils	ASTM E 96 (Proc. B or BW)	0.10	0.03
Flexibility / Torsion DMA @ -40°F	ASTM D5279	N/A	225 MPa
Resistance to Outdoor (Ultraviolet) Weathering Xenon-Arc, total irradiate exposure at 0.70 W/m ² irradiance, 176°F (80°C) black panel temperature	ASTM G 155	No Cracks No Cracking 7,560 kJ/m ² 3,000 hours	No Cracks No Cracking 41,580 kJ/m ² 16,500 hours
At 0.35 W/m ² irradiance, 176°F (80°C) black panel temperature		6,000 hours	33,000 hours

--See continued on next page--

MULE-HIDE 0.060" and 0.090" FR EPDM MEMBRANE (Pre-Cleaned)

SPECIFICATIONS (Continued)

*Not a Quality Control Test due to the time required for the test or complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED Information

Recycle Content – Pre-consumer	5%
Recycle Content – Post-consumer	0%
Manufacturing Locations	Carlisle, PA Greenville, IL
Solar Reflectance Index	9

PACKAGING

Mule-Hide 0.060" and 0.090" FR EPDM Membranes (with and with-out tape) are available in a variety of sheet sizes with widths up to 40' and lengths up to 100' long. Contact Mule-Hide Products for specific sheet sizes.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Can be installed over a variety of roof decks
- Outstanding weatherability
- Sheets can be pre-taped
- Requires no special equipment to install
- Available as a lightweight system
- Full line of pre-taped accessories available

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings, Underwriters Laboratories Classifications and Miami-Dade Approvals are available. Contact Mule-Hide Warranty Department for additional information. Meets or exceeds requirements of ASTM D 4637 for Type 1 non-reinforced EPDM single-ply roofing membranes.

INSTALLATION INSTRUCTIONS

- 1) Fully Adhered Roofing System
 - a) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates.
 - b) The field of the roof is fully adhered to the substrate with Mule-Hide Bonding Adhesive.
- 2) Ballasted Roofing System
 - a) Approved insulation to be loosely laid to the deck.
 - b) Roofing membrane is loosely laid over insulation and ballasted with washed river rock or pavers.
- 3) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes greater than 2:12.
- 4) All seams are to be constructed with seam tape and tape primer, and checked for voids.
- 5) All details will be done in accordance with Mule-Hide details.
- 6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. The Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

MULE-HIDE 0.060" and 0.090" FR EPDM MEMBRANE (Pre-Cleaned)

STORAGE & HANDLING

- Use proper stacking procedures to ensure sufficient stability of the materials.
- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Exercise care when working near edge of roof.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light colored, breathable, waterproof tarpaulins.
- Pre-Taped membranes should not be exposed to prolonged jobsite storage temperatures in excess of 90°F (32°C), otherwise the shelf life of the Pre-Tape may be affected.
- When using pre-taped membranes in warm, sunny weather, shade the tape end of the rolls until ready to use.

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

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DISCLAIMER

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MULE-HIDE STANDARD AND FR REINFORCED EPDM MEMBRANES

PRODUCT DESCRIPTION

Mule-Hide Standard Reinforced EPDM is a high performance reinforced membrane that stands up to tearing, impacts, punctures and normal roof traffic. The elastomeric properties of the EPDM membrane compensate for thermal shock and building movement. EPDM membranes provide excellent resistance to ozone and aging. The membrane is manufactured in accordance with the guidelines established by the RMA (Rubber Manufacturers Association) and meets or exceeds the ASTM Standard Specification D 4637, Type II. Fire retardant (FR) membranes are specially formulated to inhibit spread of flame and meet or exceed code body testing criteria for fire retardant roofing membranes.

Mule-Hide STANDARD and FR REINFORCED EPDM membranes are available with in-seam tape that is pre-applied to the sheet. See below for sizes available.

BASIC USES

The Standard and FR Reinforced EPDM membrane is used in mechanically attached and fully adhered roofing systems in new construction, reroofing and recover (retrofit) applications. It may also be used as flexible membrane flashings for walls, curbs, etc, when installing an EPDM membrane roofing systems. The system must be installed over acceptable roof insulation or other suitable substrate. See the Mule-Hide EPDM Specifications Manual for complete specifications and details.

SPECIFICATIONS

Physical Properties	Test Method	SPEC. (Pass)	Typical Standard
Tolerance on Nominal Thickness, %	ASTM D 751	± 10	± 10
Thickness Over Scrim, min, in.(mm) .045 .060 .075	ASTM D 4637 Annex	0.015 (0.381)	0.016 (0.406) 0.020 (0.508) 0.032 (0.810)
Weight, lbm/ft ² (kg/m ²) .045 .060 .075			0.27 (1.3) 0.39 (1.9) 0.48 (2.3)
Elongation, Ultimate, min, % .045 & .060 .075	ASTM D 412 Die C	250**	480** 500**
Tear Strength min, lbf (N) .045, .060 & .075	ASTM D 751 B Tongue Tear	10 (45)	70 (311)
Breaking Strength, min, lbf(N) .045, .060 .075	ASTM D 751 (Grab Method)	90(400)	140(623) 144 (787)
Factory Seam Strength, min.	ASTM D 816 (Modified)	Membrane Rupture	Membrane Rupture
Brittleness point, max, deg.F (deg.C)*	ASTM D 2137	-49(-45)	-49(-45)
Resistance to Heat Aging* Properties after 4 weeks @ 240°F(116°C) Breaking Strength, min, lbf(N) Elongation, Ultimate, min, % Linear Dimensional Change, max, %	ASTM D 573 ASTM D 751 ASTM D 412 Die C ASTM D 1204	 80(355) 200** ± 1.0	 182 (823) 250** -1.0
Ozone Resistance* Conditions after exposure 100 pphm Ozone in air for 168 hrs @ 104°F(40°C) Specimen wrapped around 3 inch mandrel	ASTM D 1149	No Cracks	No Cracks
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+8, -2**	5.5**

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MULE-HIDE STANDARD AND FR REINFORCED EPDM MEMBRANES

SPECIFICATIONS - Continued

Resistance to Outdoor (Ultraviolet) Weathering - Xenon-Arc, exposure, 0.70 W/m ² irradiance, 176°F (80°C) black panel temperature	ASTM G 155	No Cracks No Cracking 7,560 kJ/m ² 3,000 hours	No Cracks No Cracking 33,320 kJ/m ² 14,000 hours
At 0.35 W/m ² irradiance, 176°F (80°C) black panel temperature		6,000 hours	28,000 hours
*Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests run on a statistical basis to ensure overall long-term performance of the sheeting.			
**Specimens to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced product.			
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.			

LEED Information

Recycle Content – Pre-consumer	0%
Recycle Content – Post-consumer	0%
Manufacturing Location	Carlisle, PA
Solar Reflectance Index	9

PACKAGING

Mule-Hide Standard and FR Reinforced EPDM Membranes (with and with-out tape) are available in a variety of sizes with widths up to 10' and lengths up to 100' long. Contact Mule-Hide Products for available roll sizes.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Economical system
- Ease of Installation
- Outstanding Weatherability
- Lightweight
- Can eliminate tear-off of existing roof if appropriate.

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriter Laboratory Classifications are available. Contact Mule-Hide Technical Department for additional information. Meets or exceeds ASTM D4637, Type II for reinforced EPDM single-ply membranes.

INSTALLATION INSTRUCTIONS

- 1) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates. Install insulation with its largest dimension perpendicular to the direction of the membrane seams where possible.
- 2) Mechanically Attached Roofing System
 - a) Perimeter sheets to be installed in an approved pattern along all exterior roof edges.
 - b) Mechanical fasteners and plates are installed in the seams of both the perimeter sheets and field sheets and into the roof deck. Use approved fasteners and maintain proper penetration for specific roof deck.
- 3) Fully Adhered Roofing System
 - a) Perimeter sheets are not required.
 - b) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes.
 - c) The field of the roof is fully adhered to the substrate with Mule-Hide EPDM Bonding Adhesive.
- 4) All seams are made with Mule-Hide Tape Primer and In-Seam Tape.
- 5) All details will be done in accordance with Mule-Hide details.

MULE-HIDE STANDARD AND FR REINFORCED EPDM MEMBRANES

INSTALLATION INSTRUCTIONS - Continued

- 6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

PRECAUTIONS

- Use proper stacking procedures to ensure sufficient stability of the materials.
- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Exercise care when working near edge of roof.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light colored, breathable, waterproof tarpaulins.
- Pre-Taped membranes should not be exposed to prolonged jobsite storage temperatures in excess of 90°F (32°C), otherwise the shelf life of the Pre-Tape may be affected.
- When using pre-taped membranes in warm, sunny weather, shade the tape end of the rolls until ready to use.

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

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MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

PRODUCT DESCRIPTION

Mule-Hide White-on-Black EPDM membranes (60-mil and 90-mil) are high performance non-reinforced products that stand up to tearing, impacts, punctures and normal roof traffic. The elastomeric properties of the EPDM sheet compensates for thermal shock and building movement. EPDM membranes provide excellent resistance to ozone and aging. These membranes are manufactured in accordance with the guidelines established by the RMA (Rubber Manufacturers Association) and meet or exceed ASTM Standard Specification D 4637, Type I.

Mule-Hide White-on-Black EPDM membrane is available with pre-applied in-seam tape. See Packaging section below for available sizes.

BASIC USES

Our White-on-Black 60-mil and 90-mil EPDM membranes are used primarily in fully adhered roofing systems on new construction, reroofing and recover (retrofit) applications. The 60-mil membrane may also be used as flexible membrane flashings for walls, curbs, etc, when installing an EPDM membrane roofing systems. The system must be installed over acceptable roof insulation or other suitable substrate. See our Mule-Hide Specifications Manual for complete specifications and details.

SPECIFICATIONS

Physical Properties	Test Method	SPEC (Pass)	Typical Values
Tolerance on Nominal Thickness, %	ASTM D 412	± 10	± 10
Weight, lbf/ft ² (kg/m ²) 60-mil 90-mil			0.39 (1.9) 0.60 (2.9)
Tensile Strength, min, psi (Mpa)	ASTM D 412	1305 (9)	1465 (10.1)
Elongation, Ultimate, min, %	ASTM D 412	300	540
Tear Strength, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	200 (35.0)
Factory Seam Strength, min. (modified)	ASTM D 816	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging* Properties after 1 weeks @ 240°F(116°C) Tensile Strength, min, psi (MPa) Elongation, Ultimate, min, % Tear Resistance, min,lbf/in (kN/m) Linear Dimensional Change, max, %	ASTM D 573 ASTM D 412 ASTM D 412 ASTM D 624 ASTM D 1204	 1205 (8.3) 200 125 (21.9) ± 1.0	 1345 (9.3) 280 185 (32.4) -0.2
Ozone Resistance* Conditions after exposure to 100 pphm Ozone in air for 168 hrs @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg.C)*	ASTM D 746	-49 (-45)	-67 (-55)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+8, -2	+3.3
Water Vapor Permeability* max, perm-mils	ASTM E 96 (Proc. B or BW)	0.10	0.02
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at 0.70 W/m ² Irradiance,176°F (80°C) black panel temperature	ASTM D 4637 Conditions	No Cracks No Cracking 6560 kJ/m ²	No Cracks No Cracking 25,200 kJ/m ²
*Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests run on a statistical basis to ensure overall long-term performance of the sheeting.			

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

PACKAGING

Roll sizes for Mule-Hide **60-mil** White-on-Black EPDM are 10' x 50', 10' x 100', 16.5' x 100', 20' x 50' and 20' x 100'.
Roll sizes for Mule-Hide **90-mil** White-on-Black EPDM are 10' x 50' and 10' x 100'

Roll sizes for pre-taped White-on-Black EPDM membranes are as follows:

Product	Packaging	Roll Size	Tape Width
.060 White-on-Black, Pre-Taped	2 - Pack	10' x 100'	3"
.060 White-on-Black, Pre-Taped, Wide Roll	1 - Pack	20' x 100'	3"
.090 White-on-Black, Pre-Taped	2 - Pack	10' x 100'	6"

BENEFITS & SUPPLEMENTAL STATEMENTS

- Quality System
- Ease of Installation
- Energy efficiency – white color reflects sunlight
- Low temperature flexibility
- Fully adhered system is lightweight

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriters Laboratories Classifications are available. Contact Mule-Hide Technical Department for additional information. Meets or exceeds requirements of ASTM D4637 for Type I non-reinforced EPDM single-ply roofing membranes.

INSTALLATION INSTRUCTIONS

- 1) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates. Install insulation with its largest dimension perpendicular to the direction of the membrane seams where possible.
- 2) Fully Adhered Roofing System
 - a) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes.
 - b) The field of the roof is fully adhered to the substrate with Mule-Hide EPDM Bonding Adhesive.
- 4) Field seams are made with seam tape and tape primer. Pre-taped seams are available for faster installation.
- 5) All details will be done in accordance with Mule-Hide details.
- 6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. The Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

PRECAUTIONS

- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Mule-Hide White-on-Black EPDM membranes are highly reflective to sunlight. Workers should dress appropriately, wear sunscreen, and wear sunglasses that filter out UV light.
- Exercise care when working near roof edge. Roof edges may not be visible when surrounding area is covered with snow.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light-colored, breathable, waterproof tarpaulins

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

SUPPLEMENTAL APPROVALS, STATEMENTS AND CHARACTERISTICS

- 1) Mule-Hide White-on-Black EPDM meets and exceeds the requirements of **ASTM D4637¹** Type I Standard Specification for non-reinforced EPDM Sheet Used in Single-Ply Roofing
- 2) **Radiative Properties** for ENERGY STAR®, Cool Roof Rating Council (CRRC) and LEED™

DESCRIPTION	TEST METHOD	SURE-WHITE EPDM
ENERGY STAR initial solar reflectance	Solar Spectrum Reflectometer	0.76
ENERGY STAR solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.64
ENERGY STAR initial emissivity	ASTM E408	0.90
CRRC initial solar reflectance	ASTM C1549	0.76
CRRC solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.64
CRRC initial thermal emittance	ASTM C1371	0.90
CRRC thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.87
CRRC SRI (Solar Reflectance Index)	ASTM E1980	94
CRRC SRI (Solar Reflectance Index after 3 yrs)	ASTM E1980	77
CRRC Product ID	N/A	0670-0007
LEED thermal emittance	ASTM E408	0.91

- 3) Mule-Hide White-on-Black EPDM membranes are LEED compliant and are ENERGY STAR® and California Title 24 rated roof products.

An ENERGY STAR qualified low slope roof product must have an initial solar reflectance of at least 0.65 and a 3-year aged solar reflectance of at least 0.50. Cleaning the aged roof surface is not permitted by the ENERGY STAR test protocol. Energy Star is only valid in the United States for Roofing Products.

The Cool Roof Rating Council (CRRC) does not specify minimums for reflectance or emittance but they do require specific protocols for testing and reporting. Cleaning of the aged roof surface is not permitted for determination of radiative properties after 3 years.

A LEED "point" may be earned if a roof material is ENERGY STAR qualified and has a thermal emittance of at least 0.90 as determined by ASTM E408.

Solar Reflectance Index (SRI) is calculated per ASTM E 1980. The SRI is a measure of the roof's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. Materials with the highest SRI values are the coolest choices for roofing. Due to the way SRI is defined, particularly hot materials can even take slightly negative values, and particularly cool materials can even exceed 100.

California Title 24 requires an initial minimum reflectance of 0.70 and emittance of 0.75 as determined by CRRC.

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MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

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MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

PRODUCT DESCRIPTION

Mule-Hide White-on-Black EPDM membranes (60-mil and 90-mil) are high performance non-reinforced products that stand up to tearing, impacts, punctures and normal roof traffic. The elastomeric properties of the EPDM sheet compensates for thermal shock and building movement. EPDM membranes provide excellent resistance to ozone and aging. These membranes are manufactured in accordance with the guidelines established by the RMA (Rubber Manufacturers Association) and meet or exceed ASTM Standard Specification D 4637, Type I.

Mule-Hide White-on-Black EPDM membrane is available with pre-applied in-seam tape. See Packaging section below for available sizes.

BASIC USES

Our White-on-Black 60-mil and 90-mil EPDM membranes are used primarily in fully adhered roofing systems on new construction, reroofing and recover (retrofit) applications. The 60-mil membrane may also be used as flexible membrane flashings for walls, curbs, etc, when installing an EPDM membrane roofing systems. The system must be installed over acceptable roof insulation or other suitable substrate. See our Mule-Hide Specifications Manual for complete specifications and details.

SPECIFICATIONS

Physical Properties	Test Method	SPEC (Pass)	Typical Values
Tolerance on Nominal Thickness, %	ASTM D 412	± 10	± 10
Weight, lbf/ft ² (kg/m ²) 60-mil 90-mil			0.39 (1.9) 0.60 (2.9)
Tensile Strength, min, psi (Mpa)	ASTM D 412	1305 (9)	1465 (10.1)
Elongation, Ultimate, min, %	ASTM D 412	300	540
Tear Strength, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	200 (35.0)
Factory Seam Strength, min. (modified)	ASTM D 816	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging* Properties after 1 weeks @ 240°F(116°C) Tensile Strength, min, psi (MPa) Elongation, Ultimate, min, % Tear Resistance, min,lbf/in (kN/m) Linear Dimensional Change, max, %	ASTM D 573 ASTM D 412 ASTM D 412 ASTM D 624 ASTM D 1204	 1205 (8.3) 200 125 (21.9) ± 1.0	 1345 (9.3) 280 185 (32.4) -0.2
Ozone Resistance* Conditions after exposure to 100 pphm Ozone in air for 168 hrs @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg.C)*	ASTM D 746	-49 (-45)	-67 (-55)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D 471	+8, -2	+3.3
Water Vapor Permeability* max, perm-mils	ASTM E 96 (Proc. B or BW)	0.10	0.02
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, total radiant exposure at 0.70 W/m ² Irradiance,176°F (80°C) black panel temperature	ASTM D 4637 Conditions	No Cracks No Cracking 6560 kJ/m ²	No Cracks No Cracking 25,200 kJ/m ²
*Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests run on a statistical basis to ensure overall long-term performance of the sheeting.			

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

PACKAGING

Roll sizes for Mule-Hide **60-mil** White-on-Black EPDM are 10' x 50', 10' x 100', 16.5' x 100', 20' x 50' and 20' x 100'.
Roll sizes for Mule-Hide **90-mil** White-on-Black EPDM are 10' x 50' and 10' x 100'

Roll sizes for pre-taped White-on-Black EPDM membranes are as follows:

Product	Packaging	Roll Size	Tape Width
.060 White-on-Black, Pre-Taped	2 - Pack	10' x 100'	3"
.060 White-on-Black, Pre-Taped, Wide Roll	1 - Pack	20' x 100'	3"
.090 White-on-Black, Pre-Taped	2 - Pack	10' x 100'	6"

BENEFITS & SUPPLEMENTAL STATEMENTS

- Quality System
- Ease of Installation
- Energy efficiency – white color reflects sunlight
- Low temperature flexibility
- Fully adhered system is lightweight

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriters Laboratories Classifications are available. Contact Mule-Hide Technical Department for additional information. Meets or exceeds requirements of ASTM D4637 for Type I non-reinforced EPDM single-ply roofing membranes.

INSTALLATION INSTRUCTIONS

- 1) Approved insulation shall be attached to the roof deck with an approved insulation adhesive or approved fasteners and plates. Install insulation with its largest dimension perpendicular to the direction of the membrane seams where possible.
- 2) Fully Adhered Roofing System
 - a) The membrane is required to be mechanically attached at the base of all vertical surfaces, roof edges, and angle changes.
 - b) The field of the roof is fully adhered to the substrate with Mule-Hide EPDM Bonding Adhesive.
- 4) Field seams are made with seam tape and tape primer. Pre-taped seams are available for faster installation.
- 5) All details will be done in accordance with Mule-Hide details.
- 6) On projects where a Mule-Hide Standard or Premium Warranty is requested, an authorized Mule-Hide representative shall inspect all completed work. This is only a brief summary and not the complete specification. The Mule-Hide Specifications, Details, Technical Bulletins, and associated documents should be thoroughly reviewed prior to starting any project. Contact Mule-Hide Products for additional information.

PRECAUTIONS

- Surfaces may be slippery when wet, or due to frost and ice build-up. Exercise caution to prevent falls.
- Mule-Hide White-on-Black EPDM membranes are highly reflective to sunlight. Workers should dress appropriately, wear sunscreen, and wear sunglasses that filter out UV light.
- Exercise care when working near roof edge. Roof edges may not be visible when surrounding area is covered with snow.
- Store Mule-Hide membrane in original wrappings in a cool, shaded area. Cover with light-colored, breathable, waterproof tarpaulins

PROTECTION & SAFETY

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MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

SUPPLEMENTAL APPROVALS, STATEMENTS AND CHARACTERISTICS

- 1) Mule-Hide White-on-Black EPDM meets and exceeds the requirements of **ASTM D4637¹** Type I Standard Specification for non-reinforced EPDM Sheet Used in Single-Ply Roofing
- 2) **Radiative Properties** for ENERGY STAR®, Cool Roof Rating Council (CRRC) and LEED™

DESCRIPTION	TEST METHOD	SURE-WHITE EPDM
ENERGY STAR initial solar reflectance	Solar Spectrum Reflectometer	0.76
ENERGY STAR solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.64
ENERGY STAR initial emissivity	ASTM E408	0.90
CRRC initial solar reflectance	ASTM C1549	0.76
CRRC solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.64
CRRC initial thermal emittance	ASTM C1371	0.90
CRRC thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.87
CRRC SRI (Solar Reflectance Index)	ASTM E1980	94
CRRC SRI (Solar Reflectance Index after 3 yrs)	ASTM E1980	77
CRRC Product ID	N/A	0670-0007
LEED thermal emittance	ASTM E408	0.91

- 3) Mule-Hide White-on-Black EPDM membranes are LEED compliant and are ENERGY STAR® and California Title 24 rated roof products.

An ENERGY STAR qualified low slope roof product must have an initial solar reflectance of at least 0.65 and a 3-year aged solar reflectance of at least 0.50. Cleaning the aged roof surface is not permitted by the ENERGY STAR test protocol. Energy Star is only valid in the United States for Roofing Products.

The Cool Roof Rating Council (CRRC) does not specify minimums for reflectance or emittance but they do require specific protocols for testing and reporting. Cleaning of the aged roof surface is not permitted for determination of radiative properties after 3 years.

A LEED "point" may be earned if a roof material is ENERGY STAR qualified and has a thermal emittance of at least 0.90 as determined by ASTM E408.

Solar Reflectance Index (SRI) is calculated per ASTM E 1980. The SRI is a measure of the roof's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. Materials with the highest SRI values are the coolest choices for roofing. Due to the way SRI is defined, particularly hot materials can even take slightly negative values, and particularly cool materials can even exceed 100.

California Title 24 requires an initial minimum reflectance of 0.70 and emittance of 0.75 as determined by CRRC.

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MULE-HIDE WHITE-ON-BLACK EPDM (60-mil and 90-mil)

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MULE-HIDE POLYEPICHLOROHYDRIN (ECO/CO)

PRODUCT DESCRIPTION

Mule-Hide cured, non-reinforced 60-mil thick (1.52 mm) Polyepichlorohydrin roofing membrane is a factory fabricated, Polyepichlorohydrin, ECO/CO, polymer based elastomeric homogenous roof covering which may be used for new single-ply roof construction and reroofing applications where increased resistance to hydrocarbons, aromatic solvents, grease and oil is a design criterion. Membranes are available in widths of 10' (3 m) and lengths of 50' (15 m).

BASIC USES

Used as a protective overlayment on EPDM Roofing Systems having positive drainage.

TYPICAL PROPERTIES AND CHARACTERISTICS

Mule-Hide Polyepichlorohydrin 60-mil ECO/CO			
TYPICAL PROPERTIES AND CHARACTERISTICS			
Physical Property	Test Method	SPEC.(Pass)	Typical
Tolerance on Nominal Thickness, %	ASTM D 412	±10	±10
Tensile Strength, min, psi (MPa)	ASTM D 412	1305 (9.0)	1550 (10.7)
Elongation, Ultimate, min, %	ASTM D 412	200	250
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	225 (39.4)
Resistance to Heat Aging* Properties after 168 hours @ 240°F (116°C) Tensile Strength, min, psi (MPa) Elongation, Ultimate, min, %	ASTM D 412 ASTM D 412	1305 (9.0) 150	1500 (10.3) 182
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg. C)*	ASTM D 746	-20 (-29)	-20 (-29)
Water Vapor Permeance* max, perms (.060" thickness)	ASTM E 96 (Proc. B or BW)	No ASTM Spec.	0.60
Resistance to Oil Aging* Change in mass, max, % after 7 days immersion in diesel fuel #2 at 158°F (70°C)	ASTM D 471	+15	+15

*Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

STORAGE & HANDLING

Use proper stacking procedures to ensure sufficient stability of the materials.
Exercise caution when walking on wet membrane. Membranes are slippery when wet.

PROTECTION & SAFETY

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MULE-HIDE POLYEPICHLOROXYDRIN (ECO/CO)

SYSTEM ACCESSORIES

A full line of accessories is available from Mule-Hide.

INSTALLATION INSTRUCTIONS

Install Mule-Hide products in accordance with the appropriate current printed Mule-Hide specification. Carefully review and follow the installation instructions in the Mule-Hide Specifications Manual. All details are to be installed in accordance with Mule-Hide's current published documents.

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UNIVERSAL SINGLE-PLY SEALANT

PRODUCT DESCRIPTION

A 100% solids, solvent free, one-part, polyether sealant that provides a weather tight seal to a variety of building substrates. Provides excellent adhesive to substrates such as stone, masonry, ceramic, marble, wood, steel, aluminum, most plastics and composites. Not recommended as a glass-glazing sealant.



BASIC USES

Universal Single-Ply Sealant can be used as a:

- Lap-sealant for White-on-Black EPDM roofing systems
- Sealant for All-Purpose Bar on EPDM, TPO, and PVC systems
- Sealant for counter flashings, copings, and scupper details

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Viscosity	850,000 Cps
Tack Free Time	35 minutes depending upon temperature
Cure Time	3-7 days depending upon temperature
Flow, Sag or Sump	None (1/4" bead)
Staining	None
Ozone Resistance	Good
UV Resistance	Excellent
Cured Hardness (Shore A)	17 - 23
Shear Strength	150 PSI
Color	White
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

PACKAGING

Packaging	
Weight per Carton	26 lbs
Packaging	24 tubes, 10.1 fluid oz. each (per carton)
Shelf Life	12 months (unopened tube @ 90° F

BENEFITS & SUPPLEMENTAL STATEMENTS

- Excellent adhesion to various substrates
- VOC free
- Versatile applications

COVERAGE RATES

25 feet (7.6 m) per tube or 600 feet (183 m) using a 0.250 " (6 mm) bead

INSTALLATION TEMPERATURE

Do not install in temperatures below 40° F

UNIVERSAL SINGLE-PLY SEALANT

INSTALLATION INSTRUCTIONS

1. Universal Single-Ply Sealant is a one-component, ready-to-use material that requires no mixing or preparation.
2. Surface Preparation - Surfaces shall be dry, clean and free of all dust, or contamination, which may harmfully affect the adhesion of the sealant. Cleaning with Weathered Membrane Cleaner may be required.
3. A quality caulking gun should be used to ensure ease of application.
4. Universal Single-Ply Sealant typically is tack free in 25 minutes and skins over within 45 minutes. Full cure occurs in 3 to 7 days depending on temperature and humidity.
5. Clean Up - Remove excess sealant adjacent to joint prior to curing with our Weathered Membrane Cleaner. Uncured sealant can also be removed from tools or equipment with our Weathered Membrane Cleaner.

PRECAUTIONS

1. Avoid prolonged contact with skin. Uncured adhesive irritates eyes. In case of contact with eyes, immediately flush with water. Consult a physician if ill effects occur.
2. Store in original unopened containers in a cool, dry area. Protect unopened containers from heat and direct sunlight. Elevated temperatures will reduce shelf life.
3. KEEP OUT OF THE REACH OF CHILDREN.
4. For industrial professional use only. May not be repackaged or resold for other than industrial or professional use.
5. See Material Safety Data Sheet for complete safety information before using product.
6. Do not use Universal Single-Ply Sealant in temperatures below 40 degrees F.

PROTECTION & SAFETY

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MULE-HIDE WATER CUT-OFF

PRODUCT DESCRIPTION

Mule-Hide Water Cut-Off is a one-part, low viscosity, self-wetting, butyl-blend mastic designed for sealing Mule-Hide membranes to wood, concrete, metal, plastic and other substrates. This product is an extremely tacky material and will remain so when used with a compression –type seal.



BASIC USES

Mule-Hide Water Cut-Off can be used to seal roofing membranes to stop water penetration into the roofing system. Common uses are at drain terminations and behind Mule-Hide's All Purpose Bars at wall terminations

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Color	Gray
Solids	80%
Flash Point	40°F (4°C) Closed Cup
Service Temperature	-40°F to 200°F (-40°C to 93°C)
Specific Gravity	1.29
Cold Weather Flexibility	Good
Average Brookfield Viscosity	1,320,000 cps
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

LEED Information	
Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
VOC Content	250 g/L

Packaging
Weight Per Carton – 28 lbs
Packaging – 25 tubes / carton
Shelf Life (un-opened tube) – 1 year

BENEFITS & SUPPLEMENTAL STATEMENTS

Excellent adhesion to various substrates
 Provides a durable compression type seal
 Versatile applications

COVERAGE RATES

Approximately 10 lineal feet per using a ½” diameter bead

INSTALLATION INSTRUCTIONS

1. Mule-Hide Water Cut-Off is a one-component, ready-to-use material that requires no mixing or preparation.
2. Surface Preparation - Surfaces shall be dry, clean and free of all dust, or contamination, which may harmfully affect the adhesion of the sealant. Cleaning with Weathered Membrane Cleaner may be required.
3. A quality caulking gun should be used to ensure ease of application.
4. Apply a ½” diameter bead of Mule-Hide Water Cut-Off between the substrate and the edge of the membrane. The membrane must cover the mastic.
4. Install appropriate termination detail and secure to provide constant compression for the Mule-Hide Water Cut-Off. Follow Mule-Hide's Specification Manual and Details for appropriate methods of termination.

MULE-HIDE WATER CUT-OFF

CLEAN UP

1. Clean Up - Remove excess Water Cut-Off with our Weathered Membrane Cleaner. Water Cut-Off can also be removed from tools or equipment with our Weathered Membrane Cleaner.

PRECAUTIONS

1. See Material Safety Data Sheet for complete safety information before using product.
2. Water Cut-Off is FLAMMABLE – contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.

Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.

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MULE-HIDE THERMOPLASTIC ONE-PART POURABLE SEALER

PRODUCT DESCRIPTION

Thermoplastic One-Part Pourable Sealer is a one-part, moisture curing, elastomeric polyether sealant providing rapid skin time when exposed to atmospheric moisture forming a waterproof rubber surface in less than an hour. Moisture curing continues for fourteen to twenty-eight days, until a two-inch deep solid rubber seal encases the penetration. Complete cure time will vary depending on relative humidity and temperature. Mule-Hide's Tape Primer must be applied to all surfaces that will be in contact with the Thermoplastic One-Part Pourable Sealer. Primer is not used with the PVC Molded Sealant Pocket. Unused sealant remaining in the pouch will remain useable up to 30 days if pouch is resealed with original cap.



BASIC USES

This product is designed for use with our TPO, PVC & EPDM Sealant Pockets. The sealant's one-part, pourable consistency allows for quick pocket filling without mixing

SPECIFICATIONS

Typical Values*	
Color	White
Odor	Mild ester smell (mint) when wet. Odorless when dry
Specific Gravity	1.40 (11.6 lbs/gallon) – 1.44 (12.0 lbs/gallon)
Viscosity (Brookfield RTV), cps	Self leveling 20,000 – 50,000
Hardness (Shore A) ASTM C 0661	25 to 35
Tack Free Time ASTM C 0679	Less than 1 hour @ 70° F (21°C)
Long term weatherability ASTM G 53	No crazing or cracking
Service Temperature ASTM 2453	Minus 40°F to 200°F. (Minus 40°C to 93°C)
Elongation @ Break, % ASTM D 412	450
Long Term Weatherability ASTM G 53 - 98 cycles @ 12 hours/cycle - Condensate exposure: 4 hrs @ 122°F (50°C) - U.V. exposure – 8 hrs @ 158°F (70°C)	No Cracking or crazing
*Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

PACKAGING

Each carton contains: 4 – 0.5 Gallon pouches per bucket (4-2 liter)
 Weight Per Carton: 26 lbs/bucket (11.8 kg)

BENEFITS & SUPPLEMENTAL STATEMENTS

- No mixing required – ready to use
- Resealable pouch using original cap
- Provides a flexible and long-lasting seal around hard to flash projections
- Provides a watertight seal in less than an hour after application

MULE-HIDE THERMOPLASTIC ONE-PART POURABLE SEALER

COVERAGE RATES

One 0.5-gallon pouch (2-liter) will fill 122 cubic inches of volume within a sealant pocket. As an example, one 6" TPO, PVC or EPDM Sealant Pocket will require 0.23 gallons (0.87 liters) to fill completely (with no penetrations). Coverage rates are average and may vary due to jobsite conditions.

INSTALLATION INSTRUCTIONS

Preparation

1. Surfaces must be free of moisture, dirt and any contaminants. Any previously applied asphalt, caulking or sealants must be removed from the penetration.
2. Fill any voids in the roof deck around the penetration(s) to prevent sealant from seeping through the roof. Pourable sealer must be a minimum of 2" (50 mm) deep. All penetrations must be a minimum of 1" (25 mm) from sides of the pitch pan or sealer pocket.

TPO Application

1. Clean all surfaces with TPO Weathered Membrane Cleaner.
2. Mule-Hide Tape Primer is required for prepping the interior surfaces of the pocket. After welding the pocket in place, apply Mule-Hide Tape Primer to all bonding surfaces, including penetration(s), TPO-c membrane, inside wall and rim of TPO Molded Sealant Pocket. Allow primer to dry.

PVC Application

1. Clean all surfaces with PVC Weathered Membrane Cleaner
2. DO NOT PRIME PVC membrane or pocket with Mule-Hide Tape Primer

EPDM Application

1. Clean all surfaces with PVC Weathered Membrane Cleaner
2. Mule-Hide Tape Primer is required for prepping the interior surfaces of the pocket. After welding the pocket in place, apply Mule-Hide Tape Primer to all bonding surfaces, including penetration(s), TPO-c membrane, inside wall and rim of TPO Molded Sealant Pocket. DO NOT apply primer to blue plastic strip that forms inside wall of pourable sealer pocket. Allow primer to dry.

All Applications

1. Remove cap from 0.5-gallon (2-liter) pouch and pour Thermoplastic One-Part Pourable Sealer directly into pocket. Fill pocket completely until rim is covered with Thermoplastic One-Part Pourable Sealer making sure all voids are filled.
2. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
3. If swallowed, DO NOT INDUCE VOMITING! Call a physician immediately
4. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with water for at least 15 minutes. Contact a physician immediately.
5. Avoid contact with skin. Wash hand thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
6. Do not thin. Thinning will affect performance.
7. KEEP OUT OF REACH OF CHILDREN.

MULE-HIDE THERMOPLASTIC ONE-PART POURABLE SEALER

STORAGE & HANDLING

Shelf life is established at 12 months. Shelf life is based on storage in original, unopened or undamaged containers at temperatures ranging from 60oF to 80oF. Should the Pourable Sealer be exposed to lower temperatures, restore to room temperature prior to use.

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

The information given on this PDS is subject to change without notice. Always check the Mule-Hide website at www.mulehide.com for the latest information, changes and updates or contact Mule-Hide Products Company at 800-786-1492.

DISCLAIMER

The statements provided concerning the material shown are intended as a guide for material usage and are believed to be true and accurate at the time of printing. No statement made by anyone may supersede this information, except when done in writing by Mule-Hide Products Co., Inc. Since the manner of use is beyond our control, Mule-Hide does not authorize anyone to make any warranty of merchantability or fitness for any particular purpose or any other warranty, guarantee or representation, expressed or implied, concerning this material. This product may be eligible for a Mule-Hide warranty, please check the Mule-Hide website at www.mulehide.com or contact Mule-Hide directly at 800-786-1492 for details. Buyer and user accept the product under these conditions and assume the risk of any failure, any injury person or property (including that of the user), loss or liability resulting from the handling, storage or use of the product whether or not it is handled, stored or used in accordance with the directions or specifications. Mule-Hide must be notified in writing of any claims and be given the opportunity to inspect the alleged failure before repairs are made.

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MULE-HIDE POURABLE SEALER

PRODUCT DESCRIPTION

Mule-Hide Pourable Sealer is a two component, solvent free, polyurethane based product compatible with Mule-Hide's various EPDM systems. Mule-Hide Pourable Sealer was designed to provide a flexible, yet long lasting seal around hard to flash penetrations through the roof deck.

BASIC USES

Mule-Hide's Pourable Sealer is used primarily as a filler for sealing pitch pans. This product may also be used to provide a permanent tie-in between EPDM membranes and a built-up roof system and for attaching lightning rod bases and ground cable clips to the roofing membrane.



TYPICAL PHYSICAL PROPERTIES

Physical Property	Results
Color	Black
Solids Content	100%
Flash Point	Part A 490°F (254°C) Part B 220°F (104°C)
Average Tensile Strength	210 psi
Average Specific Gravity	1.23
Average Hardness (Shore A)	30
Average Elongation	280%
Low Temperature Brittleness	-50°F (-46°C)
VOC	Part A – Less than 15 grams / liter Part B – Less than 10 grams / liter
Packaging (per carton)	Part A – 2, 1-gallon cans Part B – 2, 1-pint cans
Pot Life	30 minutes @ 75°F
Shelf Life	1year in un-opened container
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

BENEFITS & SUPPLEMENTAL STATEMENTS

- Quick curing time after mixing
- Provides a flexible, long-lasting seal around hard to flash projections

COVERAGE RATES

One gallon of Pourable Sealer contains 231 cubic inches for filling Pitch pans. Due to waste and crowning, 200 cubic inches should be used as a guideline to determine gallons required. One gallon of Pourable Sealer will cover approximately 19 linear feet of cold tie-in 6 inches wide on a smooth surface. Coverage will vary according to surface roughness and thickness of application.

Coverage rates are average and may vary due to jobsite conditions.

MULE-HIDE POURABLE SEALER

MIXING INSTRUCTIONS

Thoroughly mix the Part B (1 pint can) and pour contents into Part A (1 gallon can). Thoroughly stir components together using a variable speed drill and mixing blade for a minimum of 5 minutes. Be sure to scrape the sides of the can to ensure uniform mixing. Note: Part B (1 pint can) may be pressurized - open container slowly.

Note: When mixed, Pourable Sealer has a pot life of approximately 30 minutes.

Note: Part B (1-pint can) may be pressurized – open container slowly.

INSTALLATION INSTRUCTIONS

1. Pitch Pans
 - a. Fit the EPDM membrane as tightly as possible around the penetrating object and seal as necessary to prevent loss of filler.
 - b. Install and flash pitch pans in accordance with the appropriate details. Minimum Pourable Sealer depth required is 2 inches. Minimum distance from object to the side of the pans is 1 inch.
 - c. Clean all mating surfaces with Weathered Membrane Cleaner and allow to dry. Prime all surfaces with Tape Primer, including field membrane, penetration and un-cured flashing that will come in contact with the Pourable Sealer and allow primer to properly flash off. If using Pourable Sealer Pocket do not apply Tape Primer to blue strip that forms inside wall of the Pourable Sealer Pocket.
 - d. Fill pan with properly mixed Pourable Sealer in sufficient quantity to crown the top surface to prevent ponding water.
- A. B. Tie-in to Built-Up Roof Surfaces
 - a. Scrape and clean the built-up surface to remove all gravel, dirt and moisture in the tie-in area to ensure the surface is smooth, clean and dry.
 - b. Properly mix the Pourable Sealer as specified and embed the Uncured EPDM Flashing as indicated in the detail section of the Mule-Hide Manual.

PRECAUTIONS

1. See Material Safety Data Sheet for complete safety information before using product.
2. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
3. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
4. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
5. Do not thin Pourable Sealer as thinning will affect performance.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.

Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
7. Shelf life is based on storage in original, unopened and undamaged containers at temperatures ranging from 60°F to 80°F (15°C to 26°C). Should Pourable Sealer be exposed to lower temperatures, restore to room temperature prior to use.
8. Avoid contact of Pourable Sealer to surfaces other than rubber membranes as staining will occur.
9. KEEP OUT OF REACH OF CHILDREN.

MULE-HIDE POURABLE SEALER

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BLACK ONE-PART POURABLE SEALER

PRODUCT DESCRIPTION

Black One-Part Pourable Sealer is a one-part, moisture curing, elastomeric polyether sealant providing rapid skin time when exposed to atmospheric moisture forming a waterproof rubber surface in less than an hour. Moisture curing continues for fourteen to twenty-eight days, until a two-inch deep solid rubber seal encases the penetration. Complete cure time will vary depending on relative humidity and temperature. Mule-Hide's Tape Primer must be applied to all surfaces that will be in contact with the Black One-Part Pourable Sealer. Unused sealant remaining in the pouch will remain useable up to 30 days if pouch is resealed with original cap.



BASIC USES

This product is designed for use with our EPDM Sealant Pockets. The sealant's one-part, pourable consistency allows for quick pocket filling without mixing

SPECIFICATIONS

Typical Values*	
Color	Black
Odor	Mild ester smell (mint) when wet. Odorless when dry.
Specific Gravity	1.4 (11.6 lbs/gallon) – 1.5 (12.5 lbs/gallon)
Viscosity (Brookfield RTV), cps	Self leveling 20,000 – 50,000
Hardness (Shore A) ASTM C 0661	25 - 35
Tack Free Time ASTM C 0679	Less than 1 hour @ 70 degrees F. (21 degrees C)
Low temperature flex – PASS	Minus 20 degrees F
Service Temperature ASTM 2453	Minus 40 degrees F to 200 degrees F. (Minus 40 degrees C to 93 degrees C)
Shrinkage (14 day cure)	No measurable shrinkage
Elongation @ Break, % ASTM D 412	450
Long Term Weatherability ASTM G 53 - 98 cycles @ 12 hours/cycle - Condensate exposure: 4 hrs @ 122°F (50°C) - U.V. exposure – 8 hrs@ 158°F (70°C)	No Cracking or crazing
*Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

PACKAGING

Each carton contains: 4 – 0.5 Gallon pouches per bucket (4-2 liter)
 Weight Per Carton: 29 lbs/bucket (13.15 kg)

BENEFITS & SUPPLEMENTAL STATEMENTS

- No mixing required – ready to use
- Resealable pouch using original cap
- Provides a flexible and long-lasting seal around hard to flash projections
- Provides a watertight seal in less than one hour after application

BLACK ONE-PART POURABLE SEALER

COVERAGE RATES

One 0.5-gallon pouch (2-liter) will fill 122 cubic inches of volume within a sealant pocket. As an example, one 6" EPDM Sealant Pocket will require 0.23 gallons (0.87 liters) to fill completely (with no penetrations). Coverage rates are average and may vary due to job site conditions.

INSTALLATION INSTRUCTIONS*

Preparation

1. Surfaces must be free of moisture, dirt and any contaminants. Any previously applied asphalt, caulking or sealants must be removed from the penetration.
2. Fill any voids in the roof deck around the penetration(s) to prevent sealant from seeping through the roof. Pourable sealer must be a minimum of 2" (50 mm) deep. All penetrations must be a minimum of 1" (25 mm) from the sides of the pitch pan or sealer pocket.
3. Clean all surfaces with Weathered Membrane Cleaner.
4. Mule-Hide Tape Primer is required for prepping the interior surfaces of the pocket. After welding the pocket in place, apply Mule-Hide Tape Primer to all bonding surfaces, including penetration(s), TPO-c membrane, inside wall and rim of TPO Molded Sealant Pocket. DO NOT apply primer to blue plastic strip that forms inside wall of pourable sealer pocket. Allow primer to dry.
5. Remove cap from 0.5-gallon (2-liter) pouch and pour Thermoplastic One-Part Pourable Sealer directly into pocket. Fill pocket completely until rim is covered with Thermoplastic One-Part Pourable Sealer making sure all voids are filled.
6. To save unused sealant, squeeze air from pouch and replace cap. Unused sealant should be used within 30 days.
7. For results maintain this product at room temperature before use.
8. For cold weather applications remove any frost or moisture from inside pocket using a hand held heat gun.

*Review current Mule-Hide Specifications and Details for specific application requirements.

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
3. If swallowed, DO NOT INDUCE VOMITING! Call a physician immediately.
4. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with water for at least 15 minutes. Contact a physician immediately.
5. Avoid contact with skin. Wash hand thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
6. Do not thin. Thinning will affect performance.
7. Avoid contact with non-rubber surfaces as staining will result.
8. KEEP OUT OF REACH OF CHILDREN.

STORAGE & HANDLING

Shelf life is established at 18 months. Shelf life is based on storage in original, unopened or undamaged containers at temperatures ranging from 60°F to 80°F. Should the Pourable Sealer be exposed to lower temperatures, restore to room temperature prior to use.

BLACK ONE-PART POURABLE SEALER

PROTECTION & SAFETY

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MULE-HIDE ALL PURPOSE SINGLE SEAL ADHESIVE

PRODUCT DESCRIPTION

Mule-Hide All Purpose Single Seal Adhesive is a black synthetic rubber based product designed specifically as a premium grade brush and roller applied contact adhesive for bonding EPDM membrane materials in single ply roofing systems. The resin reinforced rubber in this adhesive produces strong bonds that are resistant to moisture, oil, and grease. Maximum physical and chemical properties are achieved after 2-3 days from time of application.

NOT FOR USE ON WARRANTED SYSTEMS

BASIC USES

Mule-Hide All Purpose Single Seal Adhesive may be used as either a splice or bonding adhesive. This product eliminates the need for two products at the job site. All Purpose Single Seal Adhesive bonds EPDM to metal, wood, concrete, and approved insulation boards.

SPECIFICATIONS

Base:	Polychlorophrene
Viscosity:	2800-3200 cps
Specific Gravity:	0.86
Color:	Black
Odor:	Mild
Bonding Range:	Approximately 2 hours
Coverage:	Approximately 60 sf/gal (2 side application)

Typical Values: Based on material tested in our laboratories but variable from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

PACKAGING AND STORAGE

DOT Label Required: Flammable Liquid

Materials should be stored in a cool dry area away from heat, sparks and open flame.

INSTALLATION INSTRUCTIONS

Bonding Adhesive - Materials to be bonded should be clean, dry and free of contaminates. Stir the adhesive thoroughly before use. Using a standard solvent resistant roller, apply the adhesive to the underside of the membrane, and to the roof deck, at a rate of 60 square feet per gallon on two sided application. Allow to dry approximately 15 to 30 minutes before assembly. Roll membrane onto the coated underlayment. After mating, broom the membrane using adequate pressure to ensure positive contact between the membrane and the underlayment.

Splice Adhesive - Position the membrane to overlap the distance recommended for the application. Clean seams of roofing membrane by using the Mule-Hide Seam Cleaner. Scrub Mule-Hide Seam Cleaner on splice area and allow to dry. Apply a uniform coat of adhesive to both primed surfaces with a clean brush or roller using consistent strokes parallel to the direction of the splice. Allow surfaces to dry approximately 15 to 30 minutes (environmental conditions may affect drying time).

MULE-HIDE PRODUCTS CO., INC.

P.O. Box 1057, Beloit, WI 53512-1057 • 608/365-3111 • Fax: 608/365-7852 • www.mulehide.com

MULE-HIDE ALL PURPOSE SINGLE SEAL ADHESIVE

INSTALLATION INSTRUCTIONS (cont'd)

Assemble seams together. Immediately roll the splice with a 2" wide steel roller with adequate pressure to ensure that intimate contact is made. After splice has been assembled, apply a bead of lap sealant along the exposed edge of the splice.

Note: Mule-Hide Tape Primer or Seam Cleaner must be used when the Mule-Hide All Purpose Single Seal is used as a splice adhesive!

Estimated Coverage Rates*

<u>Splice Width</u>	<u>Coverage (Linear Feet/Gallon)</u>
4"	130-150 lf.
6"	90-110 lf.

*(5 mils thick, dry, both sides)

PRECAUTIONS

Mule-Hide All Purpose Single Seal Adhesive contains ingredients which could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

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TECHNICAL SERVICES

Contact Mule-Hide Products Co., Inc. at 608/365-3111 for additional information.

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MULE-HIDE BONDING ADHESIVE

PRODUCT DESCRIPTION

Mule-Hide Bonding Adhesive is a high strength solvent-based contact adhesive that allows quick bonding of EPDM membrane and cured flashings to various porous and non-porous substrates. May be used on both horizontal and vertical surfaces. Formulated for application with a ½" (13 mm) medium nap roller.

BASIC USES

Mule-Hide Bonding Adhesive is used for bonding cured flashings and membranes to a variety of substrates.

TYPICAL PHYSICAL PROPERTIES

Typical values*	
Base Material	Synthetic Rubber
Color	Yellow
Solids	18 - 22%
VOC:	660 g/l max
Flash Point	-4° F (-20° C) Closed Cup
Brookfield Viscosity	3,200 Centipoises
Avg Net Weight	7.1 lbs. / gallon (0.85 Kg/L)
Packaging	5 Gallon Pails
Shelf Life	1 Year



*General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

PACKAGING

5 Gallon Pails

BENEFITS & SUPPLEMENTAL STATEMENTS

- High strength adhesive with quick bonding characteristics
- Ease of application with a medium nap roller
- Provides excellent adhesion between EPDM membranes and a variety of substrates

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriter Laboratory Classifications are available. Contact Mule-Hide Technical Department for additional information.

COVERAGE RATES

Coverage for Mule-Hide Bonding Adhesive is approximately 60 ft² (5.6 square m) per gallon (finished surface.) This coverage rate is an average and may vary due to conditions on the job site. Porous surfaces and substrates may require more bonding adhesive than the typical coverage rate.

INSTALLATION TEMPERATURE

If adhesive is store at temperatures less than 60° F, restore to room temperature (~70° F) before using.

MULE-HIDE BONDING ADHESIVE

INSTALLATION INSTRUCTIONS

Surface Preparation

1. The surface, on or against which adhesive is to be applied, shall be clean, smooth, dry, free of fins, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" (6 mm) should be feathered; using epoxy, mortar or other approved patching material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.

Application

1. Stir thoroughly until all settle pigments are dispersed and product is uniform in color. After stirring (minimum 5 minutes) apply Mule-Hide Bonding Adhesive to substrate and membrane using a 9" (230 mm) wide, 1/2" (13 mm) medium nap roller. Application shall be continuous and uniform avoiding globs or puddles. Mule-Hide Bonding Adhesive must be allowed to dry until it does not string or stick to a dry finger touch. Any coated area, which has been exposed to rain, should be allowed to dry and then recoated.
Do not apply adhesive to seam areas or use with taped products.
2. Roll the membrane onto the adhesive coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the sheet with a soft bristle push broom or a clean dry roller applicator to achieve maximum contact. In some applications, swelling of the membrane may occur initially, but this will disappear after several days' exposure. Do not re-broom membrane in an attempt to remove swelling.

REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Mule-Hide Bonding Adhesive is **EXTREMELY FLAMMABLE** -It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electrical motors, static discharge, or other ignition sources at locations distant from material handling point and flashback. All containers should be grounded when material is transferred from one container to another. A red caution label is required when shipping. A fire extinguisher should be available. In case of fire, use water spray, foam, dry chemical or carbon dioxide. Do not use a solid stream of water because it can scatter and spread the fire.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
4. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
5. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists. **Note:** Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.

MULE-HIDE BONDING ADHESIVE

Precautions (continued)

6. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
7. Do not thin Mule-Hide Bonding Adhesive. Thinning will affect performance. Excessively thick or gelled material should be discarded.
8. Job site storage in excess of 90°F (32°C) may affect product shelf life. Should the Mule-Hide Bonding Adhesive be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.
9. These materials are sensitive to ambient moisture and heat will accelerate the effect of moisture. Opened containers of Bonding Adhesive should be used within 48 hours. Adhesive will begin to thicken after this point, making it difficult and eventually impossible, to control adhesive thickness. In hot weather, do leave sealed containers on roof for prolonged periods of time. In cold weather, keep material at room temperature until ready to use. Stir adhesive occasionally while using.
10. Coverage rates are an average and may vary due to jobsite conditions.

11. KEEP OUT OF THE REACH OF CHILDREN

STORAGE & HANDLING

Job site storage in excess of 90°F (32°C) may affect product shelf life. Should the Mule-Hide Bonding Adhesive be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.

PROTECTION & SAFETY

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ADDITIONAL INFORMATION

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MULE-HIDE Low VOC BONDING ADHESIVE

PRODUCT DESCRIPTION

Low VOC Bonding Adhesive is a high strength solvent-based contact adhesive that allows bonding of EPDM and TPO membrane to various porous and non-porous substrates. It is specially formulated using a blend of VOC exempt and non-exempt solvents to meet the < 250 gpl VOC content requirements of the OTC Model Rule for Single Ply Roofing Adhesives. Low VOC Bonding Adhesive is easily applied with a 9" (228 mm) medium nap roller to create a strong bond between the membrane and approved substrate.



This product does not comply with the following California counties' VOC regulations: Alameda, Contra Costa, El Dorado, Los Angeles, Marin, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Tehama. These areas require the use of Mule-Hide Low-VOC 1168 Bonding Adhesive.

BASIC USES

Mule-Hide Bonding Adhesive is used for bonding cured flashings and membranes to a variety of substrates.

TYPICAL PHYSICAL PROPERTIES

Typical values*	
Base Material	Synthetic Rubber
Color	Yellow
Solids	22.2%
VOC:	250 g/l max
Flash Point	0° F (-17° C) Closed Cup
Brookfield Viscosity	2,600 Centipoises
Avg Net Weight	8.1 lbs. / gallon (3.7 Kg)
Packaging	5 Gallon Pails
Shelf Life	1 Year

LEED Information	
Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
VOC Content	< 250 g/L

*General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

PACKAGING

Packaged in 5 gallon pails

BENEFITS & SUPPLEMENTAL STATEMENTS

- High strength adhesive with quick bonding characteristics
- Ease of application with a medium nap roller
- Provides excellent adhesion between EPDM membranes and a variety of substrates
- Provides quicker flash-off time in cold weather than other Low Voc Adhesives
- Lower viscosity results in easier application, even in cold weather

MULE-HIDE BONDING ADHESIVE

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriter Laboratory Classifications are available. Contact Mule-Hide Technical Department for additional information.

COVERAGE RATES

Coverage for Mule-Hide Bonding Adhesive is approximately 60 ft² (5.6 square m) per gallon (finished surface.) This coverage rate is an average and may vary due to conditions on the job site. Porous surfaces and substrates may require more bonding adhesive than the typical coverage rate.

INSTALLATION TEMPERATURE

If adhesive is store at temperatures less than 60° F, restore to room temperature (~70° F) before using.

INSTALLATION INSTRUCTIONS

Surface Preparation

1. The surface, on or against which adhesive is to be applied, shall be clean, smooth, dry, free of fins, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" (6 mm) should be feathered; using epoxy, mortar or other approved patching material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.

Mixing

1. **Stir thoroughly until all settled pigments are dispersed and the adhesive is uniform in color. Stir adhesive for a minimum of 5 minutes.**

Application

1. After thorough stirring (minimum 5 minutes), apply Low VOC Bonding Adhesive to substrate and membrane using a 9" (228 mm) wide, 1/2" (13mm) medium nap roller. Application shall be continuous and uniform avoiding globs or puddles. An open time of 5 to 90 minutes, based on drying conditions is recommended before assembly. Low VOC Bonding Adhesive must be allowed to dry until tacky but does not string or stick to a dry finger touch. Any coated area, which has been exposed to rain, should be allowed to dry and then recoated. **Do not apply adhesive to seam areas or use with taped products.**
2. Roll the membrane onto the adhesive coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the sheet with a soft bristle push broom or a clean dry roller applicator to achieve maximum contact. In some applications, swelling of the membrane may occur initially, but this will disappear after several days' exposure. Do not re-broom membrane in an attempt to remove swelling.

REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Low-VOC Bonding Adhesive must be stored in original, unopened containers at temperatures between 60°F (15°C) and 90°F (32°C). Jobsite storage in excess of 90°F (32°C) may affect product shelf life.

MULE-HIDE Low VOC BONDING ADHESIVE

Precautions (continued)

3. Prolonged exposure to below freezing temperatures will cause the adhesive to thicken and solidify in the can. Should the Low-VOC Bonding Adhesive be stored at temperatures lower than 25°F (-4°C), restore to room temperature for a minimum of 24 hours prior to use. Adhesive will perform as intended once it is returned to a liquid state. When temperatures are expected to be consistently below 40°F (4°C), a heated enclosure or hot box is required for storage.
4. Mule-Hide Bonding Adhesive is **EXTREMELY FLAMMABLE** -It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electrical motors, static discharge, or other ignition sources at locations distant from material handling point and flashback. All containers should be grounded when material is transferred from one container to another. A red caution label is required when shipping. A fire extinguisher should be available. In case of fire, use water spray, foam, dry chemical or carbon dioxide. Do not use a solid stream of water because it can scatter and spread the fire.
5. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
6. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
7. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists. **Note:** Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
8. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
9. Do not thin Low-VOC Bonding Adhesive. Thinning will affect performance. Excessively thick or gelled material should be discarded.
10. These materials are sensitive to ambient moisture and heat will accelerate the effect of moisture. Opened containers of Bonding Adhesive should be used within 48 hours. Adhesive will begin to thicken after this point, making it difficult and eventually impossible, to control adhesive thickness. In hot weather, do leave sealed containers on roof for prolonged periods of time. In cold weather, keep material at room temperature until ready to use. Stir adhesive occasionally while using.
11. Adhesive must be allowed to dry thoroughly. If membrane is mated with the substrate prior to the adhesive being dry, blistering will occur.
12. Coverage rates are an average and may vary due to jobsite conditions.
13. **KEEP OUT OF THE REACH OF CHILDREN**

MULE-HIDE BONDING ADHESIVE

STORAGE & HANDLING

Job site storage in excess of 90°F (32°C) may affect product shelf life. Should the Mule-Hide Bonding Adhesive be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.

PROTECTION & SAFETY

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Low VOC BONDING ADHESIVE 1168

PRODUCT DESCRIPTION

Low VOC Bonding Adhesive 1168 is a high strength solvent-based contact adhesive that allows bonding of EPDM and TPO membranes to various porous and non-porous substrates. It is specially formulated using a blend of VOC exempt and non-exempt solvents to meet the < 250 g/l VOC content requirements of the OTC Model Rule for Single Ply Roofing Adhesives.

This product COMPLIES with the following California counties' VOC regulations: Alameda, Contra Costa, El Dorado, Los Angeles, Marin, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Tehama.

BASIC USES

Mule-Hide Bonding Adhesive is used for bonding cured flashings and membranes to a variety of



TYPICAL PHYSICAL PROPERTIES

Typical values*	
Base Material	Synthetic Rubber
Color	Yellow
Solids	21.0%
VOC:	250 g/l max
Flash Point	0° F (-17° C) Closed Cup
Brookfield Viscosity	5,000 Centipoises
Avg Net Weight	10.5 lbs. / gallon (4.76 Kg)
Packaging	5 Gallon Pails
Shelf Life	1 Year

*General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

PACKAGING

5 Gallon Pails

BENEFITS & SUPPLEMENTAL STATEMENTS

- High strength adhesive with quick bonding characteristics
- Ease of application with a medium nap roller
- Provides excellent adhesion between EPDM or TPO membranes and a variety of substrates

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriter Laboratory Classifications are available. Contact Mule-Hide Technical Department for additional information.

Low VOC BONDING ADHESIVE 1168

COVERAGE RATES

Coverage for Low VOC Bonding Adhesive 1168 is approximately 60 ft² (5.6 square m) per gallon (finished surface.) This coverage rate is an average and may vary due to conditions on the job site. Porous surfaces and substrates may require more bonding adhesive than the typical coverage rate.

INSTALLATION TEMPERATURE

If adhesive is store at temperatures less than 60° F, restore to room temperature (~70° F) before using.

INSTALLATION INSTRUCTIONS

Surface Preparation

1. The surface, on or against which adhesive is to be applied, shall be clean, smooth, dry, free of fins, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" (6 mm) should be feathered; using epoxy, mortar or other approved patching material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.

Mixing

MIXING: Stir thoroughly until all settled pigments are dispersed and the cement is uniform in color. Minimum 5 minutes stirring is recommended.

Application

1. After thorough stirring (minimum 5 minutes), apply Low VOC Bonding Adhesive 1168 to substrate and membrane using a 9" (228mm) wide, 1/2" (13 mm) medium nap roller. Application shall be continuous and uniform avoiding globs or puddles. An open time of 5 to 90 minutes, based on drying conditions is recommended before assembly. Low VOC Bonding Adhesive 1168 must be allowed to dry until it does not string or stick to a dry finger touch. Any coated area, which has been exposed to rain, should be allowed to dry and then recoated. **Do not apply adhesive to splice areas to be seamed.**
2. Roll the membrane onto the adhesive coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the sheet with a soft bristle push broom or a clean dry roller applicator to achieve maximum contact. In some applications, swelling of the membrane may occur initially, but this will disappear after several days' exposure. Do not re-broom membrane in an attempt to remove swelling.

Note: This adhesive may be slightly thicker than standard Low-VOC Bonding Adhesive and may require a longer drying time.

REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.

Low VOC BONDING ADHESIVE 1168

Precautions - continued

2. Low-VOC VOC Bonding Adhesive must be stored in original, unopened containers at temperatures between 60°F (15°C) and 90°F (32°C). Jobsite storage in excess of 90°F (32°C) may affect product shelf life. Prolonged exposure to below freezing temperatures will cause the adhesive to thicken and solidify in the can. Should the Low-VOC Bonding Adhesive be stored at temperatures lower than 25°F (-4°C), restore to room temperature for a minimum of 24 hours prior to use. Adhesive will perform as intended once it is returned to a liquid state. When temperatures are expected to be consistently below 40°F (4°C), a heated enclosure or hot box is required for storage.
3. Low VOC Bonding Adhesive 1168 is **EXTREMELY FLAMMABLE** -It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electrical motors, static discharge, or other ignition sources at locations distant from material handling point and flashback. All containers should be grounded when material is transferred from one container to another. A red caution label is required when shipping. A fire extinguisher should be available. In case of fire, use water spray, foam, dry chemical or carbon dioxide. Do not use a solid stream of water because it can scatter and spread the fire.
4. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
5. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists. **Note:** Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
7. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
8. Do not thin Low VOC Bonding Adhesive 1168. Thinning will affect performance. Excessively thick or gelled material should be discarded.
9. Opened containers of Low VOC Bonding Adhesive 1168 should be used within 48 hours. Adhesive will begin to thicken after this point, making it difficult and eventually impossible, to control applied thickness. In hot weather, do not leave sealed containers on roof for prolonged periods of time. In cold weather, keep material at room temperature until ready to use. Stir adhesive occasionally while using.
10. **Adhesive must be allowed to dry thoroughly.** If membrane is mated with the substrate prior to the adhesive being dry, blistering will occur and not subside over time.
11. **KEEP OUT OF THE REACH OF CHILDREN**

STORAGE & HANDLING

Job site storage in excess of 90°F (32°C) may affect product shelf life. Should the Low VOC Bonding Adhesive 1168 be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.

Low VOC BONDING ADHESIVE 1168

PROTECTION & SAFETY

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WBBA 2000

PRODUCT DESCRIPTION

WBBA 2000 is a semi pressure-sensitive water base bonding adhesive that can be used with Mule-Hide fleece back membranes as well as standard (non fleece back) EPDM, TPO, and PVC membranes. WBBA 2000 offers high peel strength with low-VOCs and no strong odors.

BASIC USES

WBBA 2000 bonding adhesive can be used as a single side, wet lay-in adhesive on horizontal surfaces with our Mule-Hide fleece back membranes. It can also be used as a two-sided, contact adhesive with our standard (non-fleece back) EPDM, TPO and PVC roofing membranes on both vertical and horizontal surfaces.

TYPICAL PHYSICAL PROPERTIES

Typical values*	
Base Material	Acrylic
Color	White (translucent when dry)
Solids	62.5%
VOC:	8 g/l max
Flash Point	None
Brookfield Viscosity	16,000 Centipoises
Avg Net Weight	8.8 lbs. / gallon (3.99 Kg)
Packaging	5 Gallon Pails
Shelf Life	1 Year



*General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

PACKAGING

5 Gallon Pails

COVERAGE RATES

Fleece Back Membranes - Single-side, wet lay-in: Coverage rate for WBBA 2000 applied as single side, wet lay-in is approximately 100 to 120 ft² (10.2 square m) of finished surface per gallon

Standard (non-fleece back) Membranes - Double-sided, contact lay-in: Coverage rate for WBBA 2000 applied as double sided, contact lay-in is approximately 50 to 60 ft² (5.1 square m) of finished surface per gallon (membrane and substrate).

These coverage rates are an average and may vary due to conditions on the job site. Porous surfaces and substrates may require more bonding adhesive than the typical coverage rate information shown above.

INSTALLATION TEMPERATURE

Adhesive is designed to be applied when ambient temperature is 40°F (4°C) and rising. Do not apply if ambient temperature will drop below 32°F (0°C) before adhesive completely dries.

DO NOT ALLOW PRODUCT TO FREEZE. Frozen product is un-usable and must be discarded.

WBBA 2000

INSTALLATION INSTRUCTIONS

1. The surface to which adhesive is to be applied must be clean, smooth, dry, free of fins, sharp edges, loose and foreign materials. Depressions or offsets greater than 1/4" should be feathered using epoxy, mortar or other approved material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.
2. WBBA 2000 bonding adhesive is approved for use on (max) 15-year warranties over Polyiso, Dens Deck Prime, High Density Fiberboard, OSB, Plywood, cellular lightweight concrete and structural concrete.
3. Mix adhesive thoroughly scraping the sides and bottom of the can (minimum of 5 minutes is required) until adhesive is uniform in color.
4. Using a 1/4" or 3/8" nap roller apply adhesive in a uniform manner avoiding globs, puddles and holidays (uncoated areas). Avoid accumulation of adhesive between insulation joints. Do not exceed published application rates.

Single Side (wet lay-in) Application with Fleece Back Membranes

1. Apply a smooth even coating of WBBA 2000 bonding adhesive to the substrate at the rate of 100 to 120 square feet per gallon and immediately roll the fleece back membrane into the wet adhesive.
2. Once the membrane has been mated to the substrate, broom the membrane with a stiff bristled push broom to ensure proper contact and 100% adhesion.
4. WBBA 2000 bonding adhesive can be applied with a 1/8" notched squeegee or a medium nap roller.
Note: Adhesive must be wet at time of membrane placement.
5. Do not apply adhesive in seam lap areas that are to be heat welded.

Two-Sided Contact Application with Standard (non- fleece back) Membranes - Horizontal Surfaces

1. Apply a smooth, even coat of WBBA 2000 bonding adhesive to the back side of the membrane and substrate. Do not apply adhesive in area of seam laps.
2. Coverage rate to be approximately:
120 square feet per gallon for one surface (membrane or substrate only) or
60 square feet per gallon per finished surface (membrane and substrate)
3. Allow adhesive to dry until it turns translucent and does not transfer to a dry finger or pull away from the substrate. WBBA 2000 bonding adhesive will take a longer time to dry. Adhesive must be dry but still tacky (but not string) when the sheet is mated to the substrate. Do not allow to over dry.
4. Mate surfaces together avoiding wrinkles. Immediately roll the bonded area of the sheet with a 100 to 150 lbs roller to ensure full contact. It is important to thoroughly roll the membrane over all insulation joints. Repeat this procedure for remaining sheets.
5. Extended drying times can be expected during cool, overcast, humid, shaded, or late day applications. The adhesive must be dry (but still tacky) before mating surfaces to avoid permanent blisters due to trapped moisture or a lack of sufficient adhesion.

WBBA 2000

Standard Membrane (vertical walls two-sided contact application)

1. Apply a smooth, even coat of WBBA 2000 bonding adhesive to the back side of the membrane and substrate. Do not apply adhesive in area of seam laps.
2. Coverage rate to be approximately:
120 square feet per gallon for one surface (membrane or substrate only) or
60 square feet per gallon per finished surface (membrane and substrate)
3. Allow adhesive to dry until it turns translucent and does not transfer to a dry finger or pull away from the substrate. WBBA 2000 bonding adhesive will take a longer time to dry. Adhesive must be dry but still tacky (but not string) when the sheet is mated to the vertical surface. Do not allow to over dry.
4. Mate surfaces together avoiding wrinkles. Immediately roll the bonded area of the sheet with a 2-inch wide rubber hand roller to promote maximum positive contact between the membrane and the substrate. Overlap all adjacent flashing sheets a minimum of 2 inches. The Heat-Weld Membrane Flashings shall extend a minimum of 6 inches onto the field sheet and be securely adhered. There shall be a minimum 2 inches hot-air weld in front of the fastener plates. All side laps are to overlap a minimum of 2 inches.
5. Extended drying times can be expected during cool, overcast, humid, shaded, or late day applications. The adhesive must be dry (but still tacky) before mating surfaces to avoid permanent blisters due to trapped moisture or lack of sufficient adhesion...

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air.
3. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
4. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
6. Do not thin WBBA 2000. Thinning will affect performance and may coagulate the adhesive.
7. Job site storage in excess of 90°F (32°C) may affect product shelf life. **DO NOT ALLOW WBBA 2000 TO FREEZE**. Do not store below 40°F.
8. WBBA 2000 will turn translucent or clear when completely dry. Dry time is dependent upon ambient conditions.
9. WBBA 2000 is to be used when ambient temperatures are 40°F (4°F and rising). Do not apply if ambient temperature will drop below 32°F (0°F) before adhesive completely dries.
10. Open containers of WBBA 2000 should be used within 48 hours. Adhesive will form a thick skin in the container that will not dissolve. Remaining adhesive can be used once the skinned layer has been removed.

WBBA 2000

Precautions (continued)

11. Extended drying times can be expected in cool or humid conditions as well as shaded areas. Not allowing the adhesive to properly dry in a two-sided contact adhesive application will result in poor adhesive strength and/or blisters occurring over time.
12. Keep out of reach of children.

STORAGE & HANDLING

Job site storage in excess of 90°F (32°C) may affect product shelf life. DO NOT ALLOW WBBA 2000 TO FREEZE. Do not store below 40°F.

PROTECTION & SAFETY

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ACRYLIC WATER BASE BONDING ADHESIVE

PRODUCT DESCRIPTION

Acrylic Water Base Bonding Adhesive is an acrylic latex-based adhesive with superior bonding performance used to bond EPDM membranes to approved horizontal substrates. The product is white in color when wet and is clear when dry. The solids content is approximately 60%, and the overall texture is similar to latex paint.

BASIC USES

Used as a single-side (wet lay in) adhesive over porous horizontal surfaces (max slope of 2:12) such as plywood, OSB, wood, high density fiberboard, Dens Deck Prime, Securock Gypsum-Fiber Roof Board, FR Deck Panel (modular use only) or Pry-Guard (modular use only). Adhesive is applied to the acceptable substrate and the sheet is immediately rolled in place into the white, wet adhesive. While the adhesive is still wet; the EPDM membrane may be moved and adjusted to remove any wrinkles. Working time before set-up takes place is approximately 15 to 20 minutes. As this product is water based and contains no solvents, actual drying time is dependent on temperature and humidity.



PACKAGING

Packaged in 1 gallon pails, 5 gallon pails, 55 gallon drums and 330 gallon totes.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Non-flammable and non-toxic
- Once set, will not break down when immersed in water for prolonged periods of time.
- Application temperature performance is satisfactory above 45° F and below 165° F.
- Installs easily and smoothly, which speeds up operations.
- Can be re-sealed in container without set taking place.

CODE APPROVALS/COMPLIANCE

A variety of Factory Mutual Ratings and Underwriter Laboratory Classifications are available. Contact Mule-Hide Technical Department for additional information.

COVERAGE RATES

Approximately 100 ft² to 120 ft² per gallon. This coverage rate is an average and may vary due to job site conditions and the porosity of the surface to which it is being applied.

INSTALLATION TEMPERATURE

Do not use adhesive if ambient temperature is below 45°F or if night time temperatures are expected to fall below 40°F within 48 hours after application.

CAUTION: Product must be stored above 60° F. Product cannot be used once frozen.

Do not let Mule-Hide Water Base Bonding Adhesive freeze

ACRYLIC WATER BASE BONDING ADHESIVE

INSTALLATION INSTRUCTIONS

Surface Preparation

1. The surface on which adhesive is to be applied shall be clean, smooth, dry, free of fins, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" should be feathered; using epoxy, mortar or other approved patching material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.

Application (wet lay-in only to horizontal surfaces)

1. Adhesive can be sprayed, rolled or brushed on to acceptable substrates.
2. Once the EPDM membrane has been positioned and given sufficient time to relax, fold the membrane in half exposing the acceptable substrate to be adhered. Starting at the fold, apply adhesive to substrate only at the rate of 100 to 120 square feet per gallon. As you proceed with the adhesive, immediately roll membrane into **wet**, white adhesive. Lay the membrane into the adhesive as soon as possible. This ensures the wetting of the EPDM surface. Do not apply to a large area that will permit the adhesive to start to tack before you can lay the membrane into it. The membrane must be laid into the adhesive while it is wet. If the adhesive starts to turn clear you must apply more adhesive.
3. Once half of the sheet is in place, use a push broom to sweep the surface, keeping a steady pressure with the broom against the surface of the sheet, mating surfaces and eliminating captured air between the membrane and substrate (deck). If any wrinkles are present, re-position the sheet by using a push broom or by hand to remove the wrinkle. Repeat the procedure for the second half of the sheet.
4. NOTE: Traffic over membrane should be held to a minimum. Footprints will be evident on surface of sheet if foot traffic occurs. Footprints should be immediately broomed and will be less visible once the adhesive cures.

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
3. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists
4. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately
5. Do not thin Mule-Hide Acrylic Water Based Bonding Adhesive. Thinning will affect performance.
6. Do not allow Mule-Hide Acrylic Water Base Bonding Adhesive to freeze. Material that has frozen must be discarded.
7. Coverage rates are an average and may vary due to jobsite conditions.
8. **KEEP OUT OF THE REACH OF CHILDREN**

ACRYLIC WATER BASE BONDING ADHESIVE

CLEAN UP

The adhesive can be removed from hands when wet with water and a light detergent. When dry, use a solvent followed by soap and water.

With spray equipment, use water followed by solvent cleaners, followed by water with detergent. Paint roller covers can be left in material until next usage or cleaned with water when wet.

Material spillage can be removed easily with water when wet. If adhesive has dried, peel off as much surface adhesive as possible and clean area with solvent until removed.

STORAGE & HANDLING

Store in unopened original containers at 60° F - 80° F for maximum storage life. Higher temperatures reduce normal storage life. **DO NOT ALLOW TO FREEZE.** Rotate stock. **Do not double-stack pallets**

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

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DISCLAIMER

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WEATHERED MEMBRANE CLEANER

PRODUCT DESCRIPTION

Weathered Membrane Cleaner is a clear liquid solvent used to clean EPDM and TPO membranes.

BASIC USES

Weathered Membrane Cleaner is used to clean both new and in-service EPDM and TPO membranes prior to the seaming process. This cleaner helps to loosen and remove dirt and other contaminants from the surface of the EPDM and TPO-c membranes and leaves a suitable surface for welding or the subsequent application of Tape Primer.



Not for use over PVC membranes.

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Color	Clear
Solids	0%
Flash Point	65°F (18°C)
Boiling Point	260°F (127°C)
Packaging	5-gallon (18.9 liter) closed top pail Cartons of 2 x 1-gallon (3.8 liter) closed top pail
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

LEED Information	
Pre-consumer recycle content	0%
Post-consumer recycle content	0%
Manufacturing Location	Carlisle, PA
VOC Content*	755 grams/liter
*This product is exempt from VOC regulations.	

BENEFITS & SUPPLEMENTAL STATEMENTS

- Easily removes dirt and other contaminants from EPDM and TPO membranes
- Prepares TPO membranes for welding and application of tapes
- Prepares EPDM membranes for application of primer, adhesives and tapes

COVERAGE RATES

Coverage rate depends on the age of the membrane and amount of dirt/debris on the surface. Coverage is approximately 400 square feet (one surface) per gallon

INSTALLATION INSTRUCTIONS

EPDM

1. Remove as much loose material as possible from the membrane surface where the adhesive or pressure-sensitive product will be applied by brooming or wiping the area with a dry rag. Extreme conditions of accumulated dirt may require a low sudsing detergent and water cleaning (rinse area thoroughly with CLEAN water and allow to dry).

WEATHERED MEMBRANE CLEANER

INSTALLATION INSTRUCTIONS (continued)

2. Saturate a clean rag with Weathered Membrane Cleaner. SCRUB the area in a circular motion. Continue to clean the area, changing rags frequently, until the surface is a consistent color with no streaking. Additional cleaning is required at factory seams (scrub parallel to the seam). Allow to dry.
3. Apply primer according to product instructions and/or roofing system specification.

TPO – New

1. Saturate a clean rag with Weathered Membrane Cleaner.
2. Wipe the area to be cleaned until the membrane is a consistent color with no streaking and allow to dry.
3. Weld the cleaned membrane together with an appropriate hot-air welder.

TPO - Aged

1. Using a Scotch-Brite® pad and Weathered Membrane Cleaner, scrub the area to be welded. (the cleaner will become white with membrane residue during this application step)
2. Clean all residue from the area to be welded using a rag soaked with Weathered Membrane Cleaner. Allow to dry.
3. Weld the cleaned material together using an appropriate hot-air welder. Review Mule-Hide Specifications and Details for additional information.

PRECAUTIONS

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use
2. Weathered Membrane Cleaner is **EXTREMELY FLAMMABLE** -It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electrical motors, static discharge, or other ignition sources at locations distant from material handling point and flashback. All containers should be grounded when material is transferred from one container to another. A red caution label is required when shipping. A fire extinguisher should be available. In case of fire, use water spray, foam, dry chemical or carbon dioxide. Do not use a solid stream of water because it can scatter and spread the fire.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
4. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
5. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists. **Note:** Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
6. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
7. **KEEP OUT OF REACH OF CHILDREN.**

WEATHERED MEMBRANE CLEANER

PROTECTION & SAFETY

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MULE-HIDE EPDM TAPE PRIMER

PRODUCT DESCRIPTION

Mule-Hide EPDM Tape Primer is a solvent-based product designed for one-step cleaning and priming of EPDM surfaces to be bonded with In-Seam Tapes, Uncured Flashing Tapes, Cured Cover Tapes, and Pre-Taped membranes.

BASIC USES

A product designed for one-step cleaning and priming of EPDM surfaces prior to the application of Taped Products. Also used with EPDM for application of In-Seam Tapes.



TYPICAL PHYSICAL PROPERTIES*

Base Material	Synthetic Rubber
Solids	18%
Flash Point	40°F (4.4°C)
VOC	727 grams/liter
Shelf Life	9 months
Average Weight	7.3 lbs./gallon (0.9 kg/liter)

*General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

COLORS

Olive Drab to Dark Gray

PACKAGING

1 gallon (3.8 liter) cans or 16 oz. (0.473 liter) screw top cans

BENEFITS & SUPPLEMENTAL STATEMENTS

Promotes excellent adhesion with Tape Products
One step cleaner and primer

COVERAGE RATES

Approximately 250 square feet / gallon

INSTALLATION TEMPERATURE

If primer is store at temperatures less than 60° F, restore to room temperature (~70° F) before using.

MULE-HIDE EPDM TAPE PRIMER

INSTALLATION INSTRUCTIONS

Surface Preparation

1. Remove all foreign material by brooming or washing with water. If membrane is very dirty, scrubbing with Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks.

Note: Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are required for hand protection when cleaners or primers are being used.

Application

1. Thoroughly stir primer until all settled materials are blended into the solution.
2. Apply the primer with Scotch-Brite® pads or clean rags. Scrub the area of the membrane (where the Pre-Taped Sheet, Taped Product or Splicing Cement is to be applied) in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.
3. Note: The use of excessive amounts of Mule-Hide EPDM Primer will not significantly enhance the adhesion of the Pre-Taped or Taped Product to the EPDM membrane. Use only the amount necessary to obtain 100% coverage of the area where the tape or adhesive will be applied.
4. Allow the Mule-Hide EPDM Primer to dry until it does not transfer to a dry finger touch. Prompt installation of the In-Seam Tape or Taped Product as soon as the primer flashes off minimizes potential dust contamination and promotes adhesion in colder weather.
5. Complete the splice as specified in Mule-Hide's Specifications and Details.

**** REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.**

Precautions

1. This product is **FLAMMABLE**. Precautions must be taken to keep the primer away from heat, flame and sparks during storage and use.
2. Avoid contact with eyes and skin.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
4. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.

MULE-HIDE EPDM TAPE PRIMER

5. Chemically-resistant gloves must be worn with Mule-Hide EPDM Primer to protect hands from staining and irritating ingredients.
6. Thoroughly stir this product until all settled pigment is blended into the solution. Solids suspended in Mule-Hide EPDM Primer tend to settle. Use Mule-Hide EPDM Primer full strength. Do not thin. Thinning will affect performance.
7. Mule-Hide EPDM Primer may cause staining of White-on-Black membrane and other non-black surfaces.
8. Due to solvent flash-off, condensation may form on freshly applied Mule-Hide EPDM Primer when the ambient temperature is near the dew point. If condensation develops, the application of primer must be discontinued (proper adhesion will not be obtained). Allow the surface to dry and apply a thin freshener coat of primer to the previously coated surface when conditions allow.

REVIEW THE MULE-HIDE EPDM PRIMER MATERIAL SAFETY DATA SHEET FOR COMPLETE SAFETY INFORMATION PRIOR TO USE.

KEEP OUT OF REACH OF CHILDREN.

STORAGE & HANDLING

Job site storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the primer be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.

Keep can tightly closed when not in use and protect from moisture contamination. Once exposed to moisture in the air, Mule-Hide EPDM Primer begins to cure and may gel within a few days. A gasket of membrane or sealant can be used to create a positive seal.

PROTECTION & SAFETY

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LOW VOC PRIMER

PRODUCT DESCRIPTION

Low VOC Primer is a solvent-based product designed for one-step cleaning and priming of EPDM and TPO surfaces to be bonded with In-Seam Tapes, Uncured Flashing Tapes, Cured Cover Tapes, and Pre-Taped membranes. It is a Low VOC product that is ideal for use where environmental concerns are an issue.

BASIC USES

A Low VOC product designed for one-step cleaning and priming of EPDM and TPO surfaces prior to the application of In-Seam Tapes and other Taped Products.

TYPICAL PHYSICAL PROPERTIES*

Base Material	Synthetic Rubber
Solids	9%
Flash Point	40°F (4.4°C)
VOC	Less than 250 grams/liter
Shelf Life	9 months
Average Weight	9.55 lbs./gallon (1.14 kg/liter)



*General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

COLORS

Olive Drab to Dark Gray

PACKAGING

(6) 1 gallon (3.8 liter) cans per carton

BENEFITS & SUPPLEMENTAL STATEMENTS

Promotes excellent adhesion with Tape Products
One step cleaner and primer
VOC less than 250 gpl

COVERAGE RATES

Approximately 250 square feet / gallon with Dusted Sheet

INSTALLATION TEMPERATURE

If primer is store at temperatures less than 60° F, restore to room temperature (~70° F) before using.

MIXING

Mixing is not recommended, even when settling has occurred. The Low-VOC Primer contains a non-partitioning agent that may settle to the bottom of the can. Do not attempt to break up or stir back into the primer.

LOW VOC PRIMER

INSTALLATION INSTRUCTIONS

Surface Preparation

1. Remove all foreign material by brooming or washing with water. If membrane is very dirty, scrubbing with Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks.

Note: Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are required for hand protection when cleaners or primers are being used.

Application

1. **Mixing is not recommended, even when settling has occurred.**
2. Apply the primer with Scotch-Brite® pads or clean rags. Scrub the area of the membrane (where the Pre-Taped Sheet, Taped Product or Splicing Cement is to be applied) in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.
3. Note: The use of excessive amounts of Low VOC Primer will not significantly enhance the adhesion of the Pre-Taped or Taped Product to the EPDM or TPO membrane. Use only the amount necessary to obtain 100% coverage of the area where the tape or adhesive will be applied.
4. Allow the Low VOC Primer to dry until it does not transfer to a dry finger touch. Prompt installation of the In-Seam Tape or Taped Product as soon as the primer flashes off minimizes potential dust contamination and promotes adhesion in colder weather.
5. Complete the splice as specified in Mule-Hide's Specifications and Details.

** REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

Precautions

1. Do not allow primer to over dry or lose tack.
2. Install taped products immediately after primer flashes off and while primer is still tacky.
3. This product is **FLAMMABLE**. Precautions must be taken to keep the primer away from heat, flame and sparks during storage and use.
4. Avoid contact with eyes and skin.
5. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
6. If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
7. Chemically-resistant gloves must be worn with Low VOC Primer to protect hands from staining and irritating ingredients.
8. Solids suspended in Low VOC Primer tend to settle and **DO NOT NEED TO BE REMIXED**.. Stirring is not required. Use Low VOC Primer full strength. Do not thin. Thinning will affect performance.
7. Low VOC Primer is not white in color and may cause staining of White-on-Black membrane and other non-black surfaces. For appearance, care should be taken to limit the amount of primer exposed beyond the splice area.

LOW VOC PRIMER

Precautions – continued

8. Due to solvent flash-off, condensation may form on freshly applied Low VOC Primer when the ambient temperature is near the dew point. If condensation develops, the application of primer must be discontinued (proper adhesion will not be obtained). Allow the surface to dry and apply a thin freshener coat of primer to the previously coated surface when conditions allow.

REVIEW THE LOW VOC PRIMER MATERIAL SAFETY DATA SHEET FOR COMPLETE SAFETY INFORMATION PRIOR TO USE.

KEEP OUT OF REACH OF CHILDREN.

STORAGE & HANDLING

Job site storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the primer be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.

Keep can tightly closed when not in use and protect from moisture contamination. Once exposed to moisture in the air, Low VOC Primer begins to cure and may gel within a few days. A gasket of membrane or sealant can be used to create a positive seal.

PROTECTION & SAFETY

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MULE-HIDE BLACK SPLICE ADHESIVE

PRODUCT DESCRIPTION

Mule-Hide Black Splice Adhesive is a black, butyl rubber based product designed for splicing EPDM membranes and uncured EPDM flashings. This product has been formulated to provide fast drying, long open time and high peel strength. When cured, Mule-Hide Splice Adhesive offers good resistance to heat, cold water and moisture. Mule-Hide Splice Adhesive can be easily brushed or roller applied at high or low temperatures.

BASIC USES

Mule-Hide Black Splice Adhesive may be used on EPDM membranes for splicing field sheets. This product may also be used to splice Uncured EPDM Flashing material to cured EPDM membranes. Use Mule-Hide White Splice Adhesive when a white (white-on-black) membrane is required. Either Mule-Hide Seam Cleaner or Mule-Hide Tape Primer must be used to prepare the membrane prior to the application of the adhesive.

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Base Polymer	Synthetic Rubber
Color	Black
Solids	30%
Average Brookfield Viscosity	3800 Centipoise
Average Net Weight	7.4 lbs./gal. (0.89 Kg/l)
Packaging	6 x 1 gallon cans per carton
Flash Point	8°F (-13°F) Closed Cup
Shelf Life	12 months
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

LEED Information	
Pre-Consumer Recycled Content	0%
Post-Consumer Recycled Content	0%
VOC Content	605 g/l
Manufacturing Location	Carlisle, PA

BENEFITS & SUPPLEMENTAL STATEMENTS

- Provides a high performance seam for EPDM membranes and flashings
- High-strength, solvent-based contact adhesive
- Limited to 10-year warranties

COVERAGE RATES

Estimated Coverage Rates	
Splice Width	Coverage (Linear Ft/Gal)
3"	150 ft.
4"	120 ft.
6"	100 ft.
Approximately 5 mils dry thickness each side. Coverage rate equates to 50 square feet of finished seam per gallon on average and may vary due to jobsite conditions.	

MULE-HIDE BLACK SPLICE ADHESIVE

INSTALLATION INSTRUCTIONS

1. Stir Black Splice Adhesive for five minutes, thoroughly scraping the sides and bottom of the can until a solid, uniform consistency is achieved. No heavier material should be remaining on the bottom or sides of the can. Some lots may contain more thick material on the bottom than other lots. Stirring for five minutes will make the cement smooth and homogenous.
2. Clean the dry mating surfaces by scrubbing with a clean rag saturated with Weathered Membrane Cleaner to achieve a solid surface color with no dust streaking. Caution: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are required.
3. Apply Black Splice Adhesive (stirred for 5 minutes) with a ½" (13 mm) medium nap roller to achieve a heavy, smooth and consistent 100% coat without puddles. A small, long-bristle, ½" (13 mm) paint brush must be used in corners and angle changes.
4. Check the dryness of the cement before assembly. The Black Splice Adhesive should be tacky but should not move when pushed with a dry finger (tack and push test). Avoid over-drying! If cement over-dries and is not tacky, recoat with Black Splice Adhesive.
5. Break the membrane edge free and roll (do not flop) the top sheet onto the mating surface. Use care not to stretch or wrinkle the membrane.
6. Use hand pressure to assemble the splice by wiping toward the splice edge.
7. Roll the seam toward the splice edge with a 2" (50 mm) hand roller.
8. Apply Lap Sealant per current specifications and details
REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

PRECAUTIONS

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Black Splice Adhesives are EXTREMELY FLAMMABLE. They contain petroleum distillates that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back. A red caution label is required when shipping.
3. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh-air intake units. When possible, shut down or seal off the closest units. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
7. Do not thin Black Splice Adhesives. Thinning will affect performance.
8. Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. This will eventually thicken the cement and cause the product to become difficult or even impossible to use. When storage temperatures become elevated, Black Splice Adhesives should be stored in a controlled environment. Should Black Splice Adhesive be stored at temperatures below 60°F (15°C), restore to room temperature prior to use. Stir cement occasionally while using.
9. Opened containers of Black Splice Adhesive should be used within 48 hours. Cement will begin to thicken after this time, making it difficult and eventually impossible to control adhesive thickness.
10. KEEP OUT OF THE REACH OF CHILDREN.

MULE-HIDE BLACK SPLICE ADHESIVE

PROTECTION & SAFETY

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ADDITIONAL INFORMATION

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MULE-HIDE WHITE SPLICE ADHESIVE

PRODUCT DESCRIPTION

Mule-Hide White Splice Adhesive is a white butyl rubber based product designed for splicing Mule-Hide White-on-Black EPDM membranes and uncured EPDM flashings. This product has been formulated to provide fast drying, long open time and high peel strength. When cured, Mule-Hide White Splice Adhesive offers good resistance to heat, cold water and moisture. Mule-Hide White Splice Adhesive can be easily brushed or roller applied at high or low temperatures.

BASIC USES

Mule-Hide White Splice Adhesive may be used on EPDM membranes for splicing field sheets. This product may also be used to splice Uncured EPDM Flashing material to cured EPDM membranes. Use Mule-Hide White Splice Adhesive when a white (white-on-black) membrane is required. Either Mule-Hide Seam Cleaner (Clear) or Mule-Hide Tape Primer must be used to prepare the membrane prior to the application of the adhesive.

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Base Polymer	Synthetic Rubber
Color	White
Solids	28%
Average Brookfield Viscosity	3500 Centipoise
Average Net Weight	7.5 lbs./gal. (0.90 Kg/l)
Packaging	6 x 1 gallon cans per carton
Flash Point	8°F (-13°F) Closed Cup
Shelf Life	9 months

LEED Information	
Pre-Consumer Recycled Content	0%
Post-Consumer Recycled Content	0%
VOC Content	637 g/l
Manufacturing Location	Carlisle, PA

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Provides a high performance seam for EPDM membranes and flashings
- High-strength, solvent-based contact adhesive
- Limited to 10-year warranties

COVERAGE RATES

Estimated Coverage Rates	
Splice Width	Coverage (Linear Ft/Gal)
3"	150 ft.
4"	120 ft.
6"	100 ft.
Approximately 5 mils dry thickness each side. Coverage rate equates to 50 square feet of finished seam per gallon on average and may vary due to jobsite conditions.	

MULE-HIDE WHITE SPLICE ADHESIVE

INSTALLATION INSTRUCTIONS

1. Stir White Splice Adhesive for five minutes, thoroughly scraping the sides and bottom of the can until a solid, uniform consistency is achieved. No heavier material should be remaining on the bottom or sides of the can. Some lots may contain more thick material on the bottom than other lots. Stirring for five minutes will make the cement smooth and homogenous.
2. Clean the dry mating surfaces by scrubbing with a clean rag saturated with Weathered Membrane Cleaner to achieve a solid surface color with no dust streaking. Caution: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are required.
3. Apply White Splice Adhesive (stirred for 5 minutes) with a ½" (13 mm) medium nap roller to achieve a heavy, smooth and consistent 100% coat without puddles. A small, long-bristle, ½" (13 mm) paint brush must be used in corners and angle changes.
4. Check the dryness of the cement before assembly. The White Splice Adhesive should be tacky but should not move when pushed with a dry finger (tack and push test). Avoid over-drying! If cement over-dries and is not tacky, recoat with White Splice Adhesive.
5. Break the membrane edge free and roll (do not flop) the top sheet onto the mating surface. Use care not to stretch or wrinkle the membrane.
6. Use hand pressure to assemble the splice by wiping toward the splice edge.
7. Roll the seam toward the splice edge with a 2" (50 mm) hand roller.
8. Apply Lap Sealant per current specifications and details
REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

PRECAUTIONS

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. White Splice Adhesives are EXTREMELY FLAMMABLE. They contain petroleum distillates that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back. A red caution label is required when shipping.
3. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh-air intake units. When possible, shut down or seal off the closest units. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
7. Do not thin White Splice Adhesives. Thinning will affect performance.
8. Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. This will eventually thicken the cement and cause the product to become difficult or even impossible to use. When storage temperatures become elevated, White Splice Adhesives should be stored in a controlled environment. Should White Splice Adhesive be stored at temperatures below 60°F (15°C), restore to room temperature prior to use. Stir cement occasionally while using.
9. Opened containers of White Splice Adhesive should be used within 48 hours. Cement will begin to thicken after this time, making it difficult and eventually impossible to control adhesive thickness.
10. KEEP OUT OF THE REACH OF CHILDREN.

MULE-HIDE WHITE SPLICE ADHESIVE

PROTECTION & SAFETY

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MULE-HIDE EPDM IN-SEAM TAPE

PRODUCT DESCRIPTION

Mule-Hide In-Seam Tape is a black/white, butyl rubber-based adhesive in tape form. The product has been formulated to provide high green strength in both shear and peel. Mule-Hide's In-Seam Tape has a clear, durable poly release film.

BASIC USES

Mule-Hide In-Seam Tape was specifically developed for splicing sheets of EPDM membrane together. The In-Seam Tape may be used on Ballasted, Mechanically Attached and Fully Adhered EPDM Roofing Systems.

PRODUCT BENEFITS

- Contains no solvent
• Labor savings up to 50%
• Superior tack and green strength
• Superior peel and shear strengths
• Ease of installation
• Reduces application problems of adhesives
• Strength improves with age

SPECIFICATIONS

Table with 2 columns: Property and Value. Properties include Base Polymer, Color, Cure State, Tensile Strength, Elongation, Brittleness Temperature, Permeability, and Heat Aging at 300°F.

Typical Values: Based on material tested in our laboratories but variable from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

Sizes

Table with 4 columns: Thickness, Width, Length, and Unit. Lists specifications for black and white tapes in 3" and 6" widths.

Typical Performance

Table with 4 columns: Property, and three Test Temperature columns (15°F, 70°F, 158°F). Properties include Peel (pli) and Shear (psi).

MULE-HIDE PRODUCTS CO., INC.

P.O. Box 1057, Beloit, WI 53512-1057 • 608/365-3111 • Fax: 608/365-7852 • www.mulehide.com

MULE-HIDE EPDM IN-SEAM TAPE

PACKAGING AND STORAGE

Mule-Hide In-Seam tape is a cured product and will not degrade in normal warehouse storage. However, in time the release paper may become difficult to remove. For this reason Mule-Hide recommends the shelf life not exceed 12 months. Stock should be rotated.

INSTALLATION INSTRUCTIONS

After the EPDM membrane sheets have been positioned, fold back the top sheet approximately 12". Using Scotch-Brite® scrub pads or clean rags, clean the seam area thoroughly with Mule-Hide's Tape Primer. Unroll the seam tape onto the seaming area on the bottom sheet, leaving the release paper on. Using firm hand pressure, smooth the tape into place along the length of the seam. Remove the release liner by pulling at a 90° angle. The tape should be positioned so that the tape protrudes from the seam 1/8" to 3/8". As the release liner is being removed, roll the top sheet onto the seam and apply firm hand pressure, then use a 2" steel hand roller and roll the seam starting from the inside of the sheet working outward over the edge of the sheet perpendicular to the direction of the seam. Lap Sealant is required along the seam where the tape is overlapped in the seam (approximately 1.5" in each direction past the overlap).

In warm, sunny weather, the tapes should be stored in the boxes in a shaded area until just prior to use. Prolonged storage temperatures in excess of 90° F(32° C) may affect the product's shelf life. Storage and use of tapes at temperatures below 40° F(4° C) will result in loss of tape tack, and may in extreme cases, result in a loss of bond to the EPDM material. Tapes should be maintained at a minimum temperature of 60° F(15° C) until just prior to installation. Hot boxes may be required for job site storage.

PRECAUTIONS

Mule-Hide In-Seam Tape contains ingredients that could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

TECHNICAL SERVICES

Contact Mule-Hide Products Co., Inc. at 608/365-3111 for additional information.

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MULE-HIDE EPDM IN-SEAM TAPE

PRODUCT DESCRIPTION

Mule-Hide In-Seam Tape is a black or white, butyl rubber-based adhesive in tape form. The product has been formulated to provide high green strength in both shear and peel. Mule-Hide's In-Seam Tape has a clear, durable poly release film for ease of use.

BASIC USES

Mule-Hide In-Seam Tape was specifically developed for splicing sheets of EPDM membrane together. The In-Seam Tape may be used on Ballasted, Mechanically Attached and Fully Adhered EPDM Roofing Systems.

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Color	Black or White
Base	Synthetic Rubber
Roll Size	100' (30 m) long
Thickness	.030" (0.75mm)
Packaging – 3"	4 rolls / carton – 26 lbs (12 Kg)
Packaging – 6"	2 rolls / carton – 26 lbs (12 Kg)
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	



LEED Information

LEED Information	
Pre-consumer Recycled Content	4%
Post-consumer Recycled Content	0%
Manufacturing Location	Greenville, IL
Solar Reflectance Index (SRI)	N/A

BENEFITS & SUPPLEMENTAL STATEMENTS

- Available in 3" or 6" widths x 100 foot long rolls
- Available in Black or White
- Excellent long-term strength
- Manufactured with a clear poly film
- Greater peel and shear strength

INSTALLATION INSTRUCTIONS

1. Overlap the EPDM membranes the appropriate amount. For 3" (75 mm) In-Seam Tape, overlap the membranes 4" (100 mm). For 6" (150 mm) In-Seam Tape, overlap the membranes 7" (175 mm).
2. The entire surface where the In-Seam Tape will be applied must be clean. The In-Seam Tape will not adhere to dusted or dirty surfaces. Any residual contamination will be detrimental to the bond strength of the adhesive.

MULE-HIDE EPDM IN-SEAM TAPE

INSTALLATION INSTRUCTIONS (Continued)

3. If membrane is very dirty, scrubbing with Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks. Allow membrane to dry thoroughly before proceeding.
Note: Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are required for hand protection when cleaners or primers are being used.
4. Mark the bottom sheet with a crayon approximately ¼" (6 mm) at the edge of the top sheet along the entire splice length as a guide to install the In-Seam Tape.
5. Apply tape primer with Scotch-Brite® pads or clean rags. Scrub the area of the membrane where the In-Seam Tape is to be applied, in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.
Note: The use of excessive amounts of Low VOC EPDM Primer will not significantly enhance the adhesion of the Pre-Taped or Taped Product to the EPDM or TPO membrane. Use only the amount necessary to obtain 100% coverage of the area where the tape or adhesive will be applied.
6. Allow the Low VOC EPDM Primer to dry until it does not transfer to a dry finger touch. Prompt installation of the In-Seam Tape or Taped Product as soon as the primer flashes off minimizes potential dust contamination and promotes adhesion in colder weather.
7. Unroll approximately 3' (1 m) of In-Seam Tape. Align the tape with a marked line and press tape down to bottom sheet using firm, even hand pressure. Continue for the length of the splice. Tape roll ends should be overlapped 1" (25 mm). Allow top sheet to rest on poly backing after application. A minimum of 1/8" (3 mm) to a maximum of 1/2" (12 mm) of tape must extend beyond the splice edge. A continuous piece of In-Seam Tape must be used at all field and factory splice intersections.
8. Roll the In-Seam Tape with a 2"-wide hand roller after application to the primed substrate. This will significantly reduce the frequency of air blisters in the completed field seam.
9. Pull the poly backing from the In-Seam Tape beneath the top sheet and allow the top sheet to fall freely onto the exposed tape.
10. Press top sheet onto tape using firm, even hand pressure across the splice towards the splice edge.
11. Immediately roll the splice with a 2"-wide roller using positive pressure. Roll across the splice edge, not parallel to it.
12. The use of Lap Sealant with In-Seam Tape seams is optional except at cut edges of reinforced membrane (exposed scrim reinforcement and tape overlaps), where Lap Sealant must be utilized. Lap Sealant may be applied immediately following the completion of an In-Seam Tape splice for added protection. See Lap Sealant PDS or appropriate detail for more information.
13. Use of In-Seam Tape at temperatures below 40°F will result in reduced adhesion. Review Mule-Hide Specifications and details for complete installation information.

PRECAUTIONS

- Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
- Prolonged jobsite storage temperatures in excess of 90°F (32°C) will shorten product shelf life.
- In warm, sunny weather, keep In-Seam Tape rolls in original box in a shaded area until ready to use.
- Storage and use of In-Seam Tape at temperatures below 40°F (4°C) will result in a loss of tape tack and, in extreme cases, will result in no bond to the substrate. Overnight storage must be available to keep the temperature of the In-Seam Tape at a minimum of 60°F (15°C). Hot boxes for jobsite storage must be provided to maintain a minimum tape temperature of 40°F (4°C).
- In-Seam Tape must be stored in a dry area.
- Due to solvent flash-off, condensation may occur on freshly applied primer when the ambient temperature is near the dew point. If condensation develops, the application of primer and In-Seam Tape must be discontinued as proper adhesion will not be achieved.

MULE-HIDE EPDM IN-SEAM TAPE

PRECAUTIONS (Continued)

- Allow the primer surface to dry and apply a thin freshener coat of primer to the previously coated surface and apply In-Seam Tape when conditions allow.
- KEEP OUT OF REACH OF CHILDREN

PROTECTION & SAFETY

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MULE-HIDE EPDM BLACK LAP SEALANT

PRODUCT DESCRIPTION

Mule-Hide EPDM Lap Sealant is a one-part, black, elastomeric sealant designed for sealing the exposed edge of field fabricated rubber membrane splices and laps.

BASIC USES

Mule-Hide EPDM Lap Sealant is required for sealing EPDM seams and flashings against the effects of weathering when seam with Splice Adhesive or Single Seal Adhesive. Refer to the Mule-Hide EPDM Manual for appropriate use of Lap Sealant when seams and flashings are completed with Mule-Hide Tape Products.

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Color	Black
Solids	63%
Flash Point	40°F (4°C) Tag Open Cup
Service Temp	-60°F to 180°F (-51°C to 82° C)
Specific Gravity	1.03
Cold Weather Flex	Excellent
Resistance to Staining	Excellent
Resistance to General Weathering	Excellent
Ozone Resistance	Excellent
Resistance to Ultraviolet Radiation	Excellent
Resistance to Slump	Very Good
Resistance to Water	Excellent
Resistance to Acid	Good
Resistance to Alkali	Good
VOC	365 g/l
Average Net Weight/gallon	8.58 lbs (1.03 Kg/l)
Packaging	25 tubes per carton, 5-gallon pails
Shelf Life	1 year
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

BENEFITS & SUPPLEMENTAL STATEMENTS

- Can be applied by a variety of application methods – trowel, caulk gun, etc.
- Has consistency of cured rubber
- Expands and contracts with EPDM membrane
- Seals exposed edges of EPDM membrane and provides a durable barrier to weather extremes

COVERAGE RATES

22' (6.7 m) per tube or 256' (78 m) per gallon using a 5/16" (8 mm) diameter bead.
Yield may vary due to job conditions.

MULE-HIDE EPDM BLACK LAP SEALANT

INSTALLATION INSTRUCTIONS

1. All surfaces to be sealed with Black Lap Sealant must be firm, dry and free of oil, talc dust and other foreign materials.
 2. After seams are completed with the proper splicing materials, clean the rubber to remove all foreign materials by wiping with a clean rag dampened with Weathered Membrane Cleaner. Note: Permeation resistant gloves (that meet ANSI/ISEA 105-2005) are recommended while using cleaner
 3. Apply a 5/16" (8 mm) bead of Black Lap Sealant along the exposed edge of the membrane.
 4. Using the feathering tool supplied with the sealant, feather the sealant bead so the high point is above the offset of the splice and the edges are feathered onto the deck.
 5. Black Lap Sealant must be applied and feathered on all splice edges by the end of the working day. [Adhesive membrane splices must be allowed to age at least two hours before Black Lap Sealant is applied. In-Seam Tape splices between cured membrane and Un-Cured Flashing may be sealed immediately.]
- REVIEW CURRENT MULE-HIDE SPECIFICATIONS AND DETAILS FOR SPECIFIC APPLICATION REQUIREMENTS.

PRECAUTIONS

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Black Lap Sealants are FLAMMABLE. They contain petroleum distillates that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back. A red caution label is required when shipping.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If contact with eyes occurs, immediately flush eyes with plenty of water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
Note: Permeation-resistant gloves (that meet ANSI/ISEA 105- 2005) are to be worn when using this product to protect hands from irritating ingredients.
7. Follow Carlisle's recommended splice instructions. DO NOT USE as splice cement between membranes.
8. Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the Lap Sealant be stored at temperatures below 60°F (15°C), restore to room temperature prior to use.
9. By using an excessively wet solvent cloth while cleaning the splice edge, solvent may be left in the offset of the membrane sheets. To avoid causing this problem, use a damp rag and make sure the Weathered Membrane Cleaner is completely flashed off the area before Lap Sealant application.
10. If applied during periods of cold, dampness or high humidity, it is possible that evaporation of solvents will be substantially reduced, resulting in some slight membrane swelling. This would be further aggravated should the sealant be applied in an unusually heavy coat.
11. Coverage rates are average and may vary due to conditions on the jobsite.
12. KEEP OUT OF THE REACH OF CHILDREN.

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MULE-HIDE EPDM BLACK LAP SEALANT

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MULE-HIDE CURED COVER TAPE

PRODUCT DESCRIPTION

Mule-Hide Cured Cover Tape is a nominal 60-mil, cured EPDM membrane strip laminated to nominal 30-mil cured butyl rubber tape and rolled onto a release liner, for a total nominal thickness of 90-mil.

BASIC USES

Mule-Hide Cured Cover Tape was specifically developed for use with EPDM single-ply membrane roofing systems. Mule-Hide's Cured Cover Tapes may be used in conjunction with the Mule-Hide Tape Primer to strip gravel stops, drip aprons, seams or batten bars, and can be used to make repairs to cut membrane.



SPECIFICATIONS

Typical Physical Properties* (Mule-Hide BUTYL Tape)

Base

Membrane	EPDM
Adhesive	Synthetic Rubber
Color	Black
Solids	100%
Tensile Strength	1650 psi (11.3Mpa) minimum
Elongation	480% minimum
Brittleness Temperature	Below -67°F (-55 °C)
Tear Resistance	150 lbs/in (35 nK/m)
Ozone Resistance	No Cracks

Condition after exposure to 100 pphm Ozone in air for 168 hrs @ 104°F (40°C) (Specimen under 50% strain)

Nominal Thickness	90-mil (2.29 mm)
Nominal Width	Membrane - Adhesive
	6" (150 mm) – 6 3/16" (155 mm)
	9" (230 mm) – 9 3/16" (235 mm)
	12" (305 mm) – 12 3/16" (310 mm)

PACKAGING

Roll Size	Net weight per roll	Packaging
6" x 100 feet	30 lbs (14 kg)	2 rolls per carton
9" x 100 feet	45 lbs (21 kg)	1 roll per carton
12" x 50 feet	30 lbs (14 kg)	1 roll per carton

BENEFITS & SUPPLEMENTAL STATEMENTS

- Contains no solvent
- Labor savings up to 50%
- Superior tack and green strength
- Superior peel and shear strengths
- Ease of installation
- Reduces application problems of adhesives
- Strength improves with age

INSTALLATION INSTRUCTIONS

1. Using Scotch-Brite® scrub pads or clean rags, clean the area of the membrane to receive the tape thoroughly with Mule-Hide Tape Primer and allow to dry.
2. Roll out the cover tape and center over the area to be covered.

MULE-HIDE CURED COVER TAPE

INSTALLATION INSTRUCTIONS (Continued)

3. Starting at one end, peel back the release liner approximately 12". Carefully position the tape, center first.
4. Working with two people, lift the cover tape and peel back the release liner approximately 10' at a time without stretching the tape. The second person should smooth the cover tape over the area to be covered.
5. Then, using a 2" steel roller, roll the cover tape running the roller perpendicular to the length of the tape.
6. Lap sealant is only required at the cut ends of the tape and overlaps.

STORAGE & HANDLING

Mule-Hide Cured Cover Tape is a cured product and will not degrade in normal warehouse storage. However, in time the release paper may become difficult to remove. For this reason Mule-Hide recommends the shelf life not exceed 12 months. Stock should be rotated.

PROTECTION & SAFETY

Mule-Hide Cured Cover Tape contains ingredients that could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

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MULE-HIDE REINFORCED EPDM MEMBRANE STRIPS ("RMS")

PRODUCT DESCRIPTION

Mule-Hide Reinforced EPDM Membrane Strips (RMS) are available in 6" and 9" widths. The 6" RMS is typically used to secure the field membrane at the base of parapets and curbs, eliminating the need for a field seam. The 9" strip is used in the field of the roof for membrane securement.



BASIC USES

Mule-Hide 6" RMS strips are used in conjunction with Mule-Hide's 2.4" seam plates and Mule-Hide HDP fasteners as securement of the EPDM membranes at the base of parapet walls and curbs. The Mule-Hide 6" RMS strips are installed beneath the EPDM field sheet and used as an alternate method to using the Mule-Hide All Purpose Bar.

The 6" RMS strip may be installed either horizontally or vertically. The EPDM field sheet is then seamed to the RMS. The non-taped RMS can be seamed using Mule-Hide's Tape Primer, along with either our 3" wide or 6" wide In-Seam Tape, or Butyl Spice Adhesive. The 6" RMS is also available with 3" wide In-seam tape pre-applied to one edge. When using the RMS w/Tape, Tape primer must be used to prime the EPDM membrane.

Mule-Hide's 9" wide RMS strips have two rows of 3" wide In-Seam tape applied to both edges, and is used horizontally for membrane attachment. The EPDM membrane is primed with Tape Primer.

TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics		
Property	6" RMS	9" RMS
Base	Membrane – Reinforced EPDM Adhesive – EPDM	Membrane – Reinforced EPDM Adhesive – EPDM
Roll Size	6" x 100' (152 mm x 30.5m)	9" x 100' (228 mm x 30.5m)
Thickness – EPDM Tape	45-mil (1.14 mm) 30-mil (0.76 mm)	45-mil (1.14 mm) 30-mil (0.76 mm)
Packaging	200 LF/ctn (61 m) 2 rolls	100 LF/ctn (30.5 m) 1 roll
Net Wt per Carton	38 lbs (17.2 kg)	33 lbs (15 kg)
Shelf Life	1 year	1 year
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.		

BENEFITS & SUPPLEMENTAL STATEMENTS

- Ideal for perimeter membrane securement
- Ideal for membrane securement at base of projections
- Available In-Seam Tape pre-applied for easier application
- Can eliminate field seam at roof perimeter

MULE-HIDE REINFORCED EPDM MEMBRANE STRIPS ("RMS")

INSTALLATION INSTRUCTIONS

1. Unroll and position RMS strip
 - a. 6" RMS (w/o In-Seam Tape – Position 6" RMS horizontally or vertically in the angle change with 3" of the RMS laying on the horizontal surface.
 - b. 6" RMS with In-Seam Tape – Position 6" RMS horizontally or vertically in the angle change with the pre-applied tape facing upward and on the horizontal surface. Tape is to be on 'roof' side of RMS.
 - c. 9" RMS – Position 9" RMS in the field of the roof with tape side up.
2. Position 2.4" Seam Plates spaced either 6" (150 mm) or 12" (305 mm) on center and secure with a Mule-Hide fastener. Do not fasten plates over top of release liner, as this will cause liner to tear when removed.
 - a. 6" RMS – Place 2.4" Seam Plates 1/8" to 3/4" from edge of 6" RMS
 - b. 9" RMS – Place 2.4" Seam Plates along center line portion of 9" RMS
3. The entire EPDM membrane surface where the RMS will be applied must be cleaned and primed. Neither the splice adhesive nor the In-Seam Tape will adhere to dusted/dirty surfaces. Remove any dirt or dust by wiping with a clean rag. If there is a heavy layer of dirt present, clean the splice area thoroughly with Weathered Membrane Cleaner. Any residual dust/dirt will be detrimental to the bond strength of the In-Seam Tape or Splice Adhesive. See Product Data Sheet for Tape Primer for installation instructions.
4. RMS Preparation
 - a. 6" RMS with-out In-Seam Tape – After tape primer has flashed off, apply Splice Adhesive to primed EPDM surfaces that are to be mated together and allow to flash off. See Product Data Sheet for Splice Adhesive for installation instructions.
 - b. RMS with In-Seam Tape pre-applied – Remove the release liner(s) from the In-Seam Tape strip(s), pulling it parallel to deck. (do not apply tape primer to In-Seam Tape)
5. Install RMS Strip immediately after primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
6. Roll the field membrane onto the exposed adhesive and apply hand pressure to the splice area.
7. For 6 RMS installation
 - a. Pull the field membrane back to expose the un-adhered portion of the RMS. Apply Mule-Hide Bonding Adhesive to the deck membrane, exposed RMS and parapet wall or curb.
 - b. Once adhesive has dried, roll field membrane into the angle change and crease. Roll membrane up the vertical surface and broom to achieve 100% contact.
8. Roll the entire width of the RMS with a 2" (51 mm) wide roller using positive pressure. Review Mule-Hide Specifications and details for specific application instructions.

PRECAUTIONS

- Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
- Prolonged jobsite storage temperatures in excess of 90°F (32°C) will shorten product shelf life.
- In warm, sunny weather, keep In-Seam Tape rolls in original box in a shaded area until ready to use.
- Storage and use of RMS with In-Seam Tape at temperatures below 40°F (4°C) will result in a loss of tape tack and, in extreme cases, will result in no bond to the substrate. Overnight storage must be available to keep the temperature of the RMS with In-Seam Tape at a minimum of 60°F (15°C). Hot boxes for jobsite storage must be provided to maintain a minimum tape temperature of 40°F (4°C).
- RMS must be stored in a dry area.
- Due to solvent flash-off, condensation may occur on freshly applied primer when the ambient temperature is near the dew point. If condensation develops, the application of primer and In-Seam Tape or Splice Adhesive must be discontinued as proper adhesion will not be achieved.
- Allow the primer surface to dry and apply a thin freshener coat of primer to the previously coated surface and apply In-Seam Tape when conditions allow.
- Mule-Hide 2.4" Seam Plates and Mule-Hide fasteners must be used when installing RMS.

MULE-HIDE REINFORCED EPDM MEMBRANE STRIPS ("RMS")

PRECAUTIONS (Continued)

- RMS is intended to be used with BLACK EPDM membranes. Use with White-on-Black EPDM membranes will result in discoloration of the membrane over time.
- KEEP OUT OF REACH OF CHILDREN

PROTECTION & SAFETY

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MULE-HIDE UNCURED EPDM FLASHING MEMBRANE

PRODUCT DESCRIPTION

Mule-Hide Uncured EPDM Flashing Membrane is a 60-mil thick, self-curing membrane used for flashings in a Mule-Hide EPDM roofing system. Uncured EPDM Flashing Membrane is adhered using Tape Primer and either Splice Adhesive or In-Seam Tape.



BASIC USES

The Mule-Hide Uncured EPDM Flashing is used as a pliable flashing that can be formed to seal pipes, inside and outside corners, and other projections that cannot be sealed with cured EPDM membrane. Consult specification drawings for installation details.

TYPICAL PHYSICAL PROPERTIES

<i>Physical Properties</i>	Test Method	Typical Values
Tolerance on Nominal Thickness, %	ASTM D-412	± 10
Tensile Strength, min, psi(Mpa)	ASTM D-412	1305 (9)
Elongation, Ultimate, min, %	ASTM D-412	300
Tear Resistance, min, lbf/in (kN/m)	ASTM D-624 (Die C)	125 (21.9)
Ozone Resistance* Conditions after exposure 110 pphm Ozone in air for 168 hrs @ 104°F(40°C)	ASTM D-1149	No Cracks
Brittleness point, max, deg.F (deg.C)*	ASTM D-746	-49°F (-45°C)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C), Change in mass, max, %	ASTM D-471	+8, -2
Water Vapor Permeability* max, perm-mils	ASTM E-96 (Proc. B or BW)	0.1
Resistance to Heat Aging, long term Properties after 4 weeks @ 240°F(116°C)	ASTM D-573	
Tensile Strength, min, psi(MPa)	ASTM D-412	1200(8.3)
Elongation, Ultimate, min, %	ASTM D-412	200
Tear Resistance, min,lbf/in(kN/m)	ASTM D-624	125(21.9)
Linear Dimensional Change, max, %	ASTM D-1204	± 2.0
Note: These properties are tested after vulcanization of the flashing for 20 minutes at 320°F.		

COLORS

Color is Black

PACKAGING AND STORAGE

18" x 100' roll – packaged 1 roll per carton – 75 lbs
 24" x 100' roll – packaged 1 roll per carton – 100 lbs

Shelf life is 9 months when stored between 60°F and 80°F

MULE-HIDE UNCURED EPDM FLASHING MEMBRANE

INSTALLATION INSTRUCTIONS

Install the Mule-Hide Uncured EPDM Flashing Membrane in accordance with the appropriate current printed Mule-Hide specification. Carefully review and follow the installation instructions in the Mule-Hide Specifications Manual. All flashing details are to be installed in accordance with Mule-Hide's current published details. Mule-Hide Uncured EPDM Flashing Membrane is adhered using Tape Primer and either Splice Adhesive or In-Seam Tape.

PROTECTION & SAFETY

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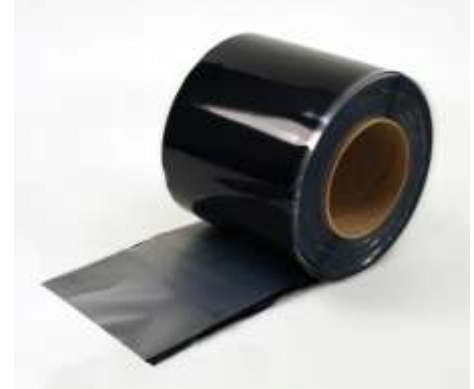
MULE-HIDE UNCURED EPDM FLASHING TAPE

PRODUCT DESCRIPTION

Mule-Hide Uncured EPDM Flashing Tape is an uncured EPDM flashing membrane laminated to cured butyl rubber tape and rolled onto a release liner.

BASIC USES

Mule-Hide Uncured EPDM Flashing Tape was specifically developed for use with EPDM single-ply membrane roofing systems. Mule-Hide's flashing tapes may be used in conjunction with the Mule-Hide Tape Primer to flash inside and outside corners, pipes, pitch pockets or other penetrations that require the flashing to be molded or conform to an irregular shape. Mule-Hide's Uncured EPDM Flashing Tapes are **not permitted** for use in flashing gravel stops, drip aprons or stripping seams or batten bars.



TYPICAL PHYSICAL PROPERTIES

Typical Properties and Characteristics	
Base Polymer	Membrane - EPDM Adhesive - Synthetic Rubber
Color	Black
Ozone Resistance 100 pphm Ozone in air 168 hours @ 104°F @ 50% strain	No cracks
Nominal Thickness	90 mil (2.29 mm)
Brittleness Temperature	-49°F
Nominal Width 6" 12"	Membrane 6" (152 mm) - Adhesive 6-3/16" (157 mm) Membrane 12" (305 mm) - Adhesive 12-3/16" (310 mm)
Typical Values: Based on material tested in our laboratories but variable from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.	

PACKAGING

Typical Packaging			
Width	Length	Unit	Weight
6"	100 lf.	2 per case	38 pounds
6"	25 lf.	8 per case	38 pounds
12"	50 lf.	1 per case	20 pounds

BENEFITS & SUPPLEMENTAL STATEMENTS

- Ideal for flashing irregular pipes, penetrations and other details
- Adaptable to irregular shapes and surfaces
- Self-curing membrane
- Ease of use results in labor and cost savings in field applications

MULE-HIDE UNCURED EPDM FLASHING TAPE

INSTALLATION INSTRUCTIONS

1. The entire EPDM membrane surface where the Uncured EPDM Flashing Tape will be applied must be cleaned and primed. Neither the splice adhesive nor the Uncured EPDM Flashing Tape will adhere to dusted/dirty surfaces. Remove any dirt or dust by wiping with a clean rag. If there is a heavy layer of dirt present, clean the splice area thoroughly with Weathered Membrane Cleaner. Any residual dust/dirt will be detrimental to the bond strength of the Uncured EPDM Flashing Tape or Splice Adhesive. See Product Data Sheet for Tape Primer for installation instructions.
2. Install Uncured EPDM Flashing Tape immediately after primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
3. Position the Uncured EPDM Flashing Tape over the area to be covered and press down the exposed tape portion using firm, even hand pressure across the entire area. Continue this process until the full area to be flashed is completed.
4. Immediately roll the Uncured EPDM Flashing Tape with a 2" (50 mm) wide roller, using positive pressure. Roll across the flashing edge, not parallel to it.
5. Mule-Hide Uncured EPDM Flashing Tape is used to flash many different roofing system structures and penetrations. The specific method of applying the flashing for each individual situation is different. The appropriate Carlisle Specification and/or detail must be consulted prior to application. Review Mule-Hide Specifications and details for specific application instructions.

PRECAUTIONS

- Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
- Prolonged jobsite storage temperatures in excess of 90°F (32°C) will shorten product shelf life.
- In warm, sunny weather, keep Uncured Flashing Tape rolls in original box in a shaded area until ready to use.
- Storage and use of EPDM Uncured Flashing Tape at temperatures below 40°F (4°C) will result in a loss of tape tack and, in extreme cases, will result in no bond to the substrate. Overnight storage must be available to keep the temperature of the EPDM Uncured Flashing Tape at a minimum of 60°F (15°C). Hot boxes for jobsite storage must be provided to maintain a minimum tape temperature of 40°F (4°C).
- Uncured Flashing Tape must be stored in a dry area.
- Due to solvent flash-off, condensation may occur on freshly applied primer when the ambient temperature is near the dew point. If condensation develops, the application of primer must be discontinued as proper adhesion will not be achieved.
- Allow the primer surface to dry and apply a thin freshener coat of primer to the previously coated surface and apply Uncured Flashing Tape when conditions allow.
- Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oil, animal fats, etc.) or direct steam venting to come in contact with the EPDM Uncured Flashing Tape.
- KEEP OUT OF REACH OF CHILDREN

PROTECTION & SAFETY

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MULE-HIDE UNCURED EPDM FLASHING TAPE

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MULE-HIDE UNCURED EPDM FLASHING TAPE - WHITE

PRODUCT DESCRIPTION

Mule-Hide Uncured EPDM Flashing Tape is an uncured EPDM flashing membrane laminated to cured butyl rubber tape and rolled onto a release liner.

BASIC USES

Mule-Hide Uncured EPDM Flashing Tape was specifically developed for use with EPDM single-ply membrane roofing systems. Mule-Hide's flashing tapes may be used in conjunction with the Mule-Hide Tape Primer to flash inside and outside corners, pipes, pitch pockets or other penetrations that require the flashing to be molded or conform to an irregular shape. Mule-Hide's Uncured EPDM Flashing Tapes are **not permitted** for use in flashing gravel stops, drip aprons or stripping seams or batten bars.



SPECIFICATIONS

Base Polymer	Membrane -EPDM Adhesive -Synthetic Rubber
Color	WHITE
Ozone Resistance 100 pphm Ozone in air 168 hours @ 104°F @ 50% strain	No cracks
Nominal Thickness	95 mil (1.91 mm)
Brittleness Temperature	-49°F
Nominal Width	
9"	Membrane 9" (230 mm) -Adhesive 9-3/16" (235 mm)
12"	Membrane 12" (305 mm) -Adhesive 12-3/16" (310 mm)

Typical Values: Based on material tested in our laboratories but variable from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

PACKAGING

Width	Length	Unit	Weight
9"	50 lf.	1 per case	16.5 pounds
12"	50 lf.	1 per case	22 pounds

BENEFITS & SUPPLEMENTAL STATEMENTS

- Contains no solvent
- Labor savings up to 50%
- Superior tack and green strength
- Superior peel and shear strengths
- Ease of installation
- Reduces application problems of adhesives
- Strength improves with age

INSTALLATION

Using Scotch-Brite® scrub pads or clean rags, clean the membrane area thoroughly with Mule-Hide's Tape Primer. Unroll the flashing tape and cut a sufficient amount to flash the detail. Install the Mule-Hide Uncured EPDM Flashing Tape in accordance with the appropriate current printed Mule-Hide specification and details.

MULE-HIDE UNCURED EPDM FLASHING TAPE - WHITE

STORAGE & HANDLING

Mule-Hide Uncured EPDM Flashing Tape is a combination of both cured and uncured product. For this reason Mule-Hide recommends the shelf life not exceed 9 months. Stock should be rotated.

PROTECTION & SAFETY

1. Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
2. Prolonged job site storage temperatures in excess of 90°F (32°C) may affect product shelf life. In warm, sunny weather; keep Product rolls in their box or in a shaded area until ready to use.
3. Storage and use of Product at temperatures below 40°F (4°C) will result in a loss of adhesive tack, and in extreme cases, will result in no bond to the substrate. Overnight storage must be available to keep the temperature of the Product at a minimum of 60°F (15°C). Hot boxes for job site storage must be provided to maintain a minimum product temperature of 40°F (4°C).
4. Product must be stored in a dry area.
5. Due to solvent flash-off, condensation may form on applied Primer when the ambient temperature is near the dew point. If condensation develops, the application of Primer and Product must be discontinued since proper adhesion will not be achieved. Allow the surface to dry and apply Primer to the previously coated surface and apply Product when conditions allow.
6. Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oil, animal fats, etc.) or direct steam venting to come in contact with the Sure-White Product.
7. A heat gun is required when forming Product in colder temperatures as outlined in the specification.
8. KEEP OUT OF THE REACH OF CHILDREN.

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POURABLE SEALER POCKETS

PRODUCT DESCRIPTION

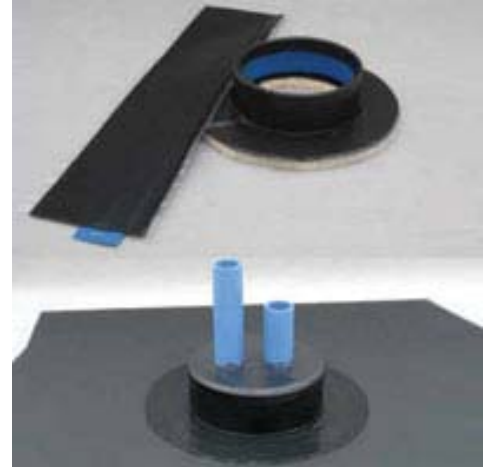
Mule-Hide Pourable Sealer Pockets are prefabricated pockets consisting of a 2" (50 mm) wide plastic support strip with attached Uncured EPDM Flashing Tape.

BASIC USES

Mule-Hide's Pourable Sealer Pockets are ideal for sealing irregular, hard to flash penetrations through the membrane.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Available in 4" (100 mm), 6" (150 mm) and 8" (200 mm) diameters
- Pockets can be combined to create larger pockets as needed
- Pockets can be stacked two high to create taller pockets



SPECIFICATIONS

Color:	Black
Size / Weight:	4" – 12 per carton - 5 lbs (2.25 kg) 6" – 12 per carton – 7 lbs (3.2 kg) 8" – 12 per carton – 9 lbs (4.1 kg)
Shelf Life:	Nine (9) months when stored between 60°F - 80°F (15°C - 26°C)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

INSTALLATION INSTRUCTIONS

1. Clean all mating surfaces with Weathered Membrane Cleaner and allow to dry. **Prime** all surfaces that will contact Pourable Sealer with Tape Primer, including deck membrane, penetration and uncured flashing. Primer should also be applied to blue plastic strip that forms inside wall of sealer pocket.
2. Remove the colored poly from the flashing side of the pocket and save for later. Then remove the clear poly from the blue support ring (plastic strip). Place the clear poly on the flashing side and fold in half with blue support ring on outside.
3. Join the two tabs by inserting the tab into the slot. Tab should be on the inside of the pocket. A more uniform circular shape can be accomplished by rolling the assemble pocket in your hands. Remove the clear poly from the flange of the pocket.
4. Position the sealer pocket to achieve a minimum 1" clearance from the penetration to the side of the pocket.
5. Starting at the overlap, form the flange to the deck membrane without stretching it. Continue forming the flange and stop approximately half way around the pocket.
6. To complete the vertical splice of the sealer pocket, remove the clear poly and apply tape primer to the splice area. Allow the primer to flash off. Set the top edge and roll the flashing into the angle change. Next, roll the flashing down onto the deck without stretching. Pull the corner of the flange to achieve a minimum 3" wide deck splice.
7. Roll the top of the flashing down inside the pocket. Roll the detail with a 2" roller, paying attention to the angle change.
8. Prime the inside of the pocket and projection with tape primer. After the primer has flashed, fill the pocket with pourable sealer.

POURABLE SEALER POCKETS

INSTALLATION INSTRUCTIONS (Continued)

9. Completely fill the pocket and crown the top surface to prevent ponding water. But be sure not to overfill or allow pourable sealer to overflow the pocket. If the pourable sealer overflows the pocket, it must be cleaned up.
10. Pourable sealer must be a minimum of 2" deep.
11. Do not use where the maximum temperature will exceed 180°F (82°C).

STORAGE & HANDLING

Normal shelf life is nine (9) months when stored between 60°F and 80°F (15°C to 26°C). Job site storage temperature over 90°F (32°C) may affect product shelf life.

PROTECTION & SAFETY

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ADDITIONAL INFORMATION

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WHITE POURABLE SEALER POCKETS

PRODUCT DESCRIPTION

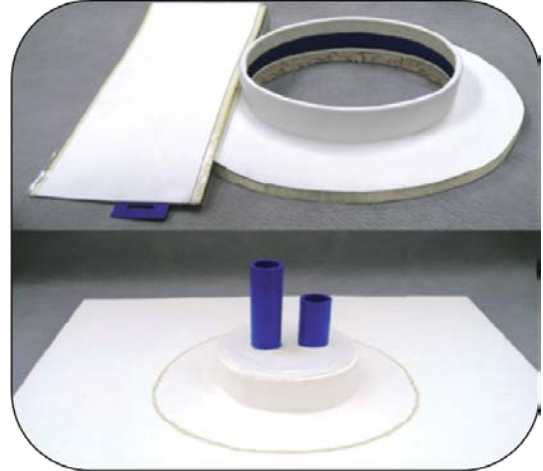
Mule-Hide White Pourable Sealer Pockets are prefabricated pockets consisting of a 2" (50 mm) wide plastic support strip with attached Uncured EPDM Flashing Tape. Use Mule-Hide Thermoplastic One-Part Pourable Sealer for a white filler.

BASIC USES

Mule-Hide's White Pourable Sealer Pockets are ideal for sealing irregular, hard to flash penetrations through the membrane.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Available in 6" (150 mm) diameter
- Pockets can be combined to create larger pockets as needed
- Pockets can be stacked two high to create taller pockets



SPECIFICATIONS

Color: Black

Size / Weight: 6" – 12 per carton – 7 lbs (3.2 kg)

Shelf Life: Six (6) months when stored between 60°F - 80°F (15°C - 26°C)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

INSTALLATION INSTRUCTIONS

1. Clean all mating surfaces with Weathered Membrane Cleaner and allow to dry. **Prime** all surfaces that will contact Thermoplastic One-Part Pourable Sealer (white) with Tape Primer, including deck membrane, penetration and uncured flashing. Primer should also be applied to blue plastic strip that forms inside wall of sealer pocket.
2. Remove the colored poly from the flashing side of the pocket and save for later. Then remove the clear poly from the blue support ring (plastic strip). Place the clear poly on the flashing side and fold in half with blue support ring on outside.
3. Join the two tabs by inserting the tab into the slot. Tab should be on the inside of the pocket. A more uniform circular shape can be accomplished by rolling the assemble pocket in your hands. Remove the clear poly from the flange of the pocket.
4. Position the sealer pocket to achieve a minimum 1" clearance from the penetration to the side of the pocket.
5. Starting at the overlap, form the flange to the deck membrane without stretching it. Continue forming the flange and stop approximately half way around the pocket.
6. To complete the vertical splice of the sealer pocket, remove the clear poly and apply tape primer to the splice area. Allow the primer to flash off. Set the top edge and roll the flashing into the angle change. Next, roll the flashing down onto the deck without stretching. Pull the corner of the flange to achieve a minimum 3" wide deck splice.
7. Roll the top of the flashing down inside the pocket. Roll the detail with a 2" roller, paying attention to the angle change.
8. Prime the inside of the pocket and projection with tape primer. After the primer has flashed, fill the pocket with Thermoplastic One-Part Pourable Sealer (white).

WHITE POURABLE SEALER POCKETS

INSTALLATION INSTRUCTIONS (Continued)

9. Completely fill the pocket and crown the top surface to prevent ponding water. But be sure not to overflow or allow Thermoplastic One-Part Pourable Sealer (white) to overflow the pocket. If the Thermoplastic One-Part Pourable Sealer overflows the pocket, it must be cleaned up.
10. Thermoplastic One-Part Pourable Sealer must be a minimum of 2" deep.
11. Do not use where the maximum temperature will exceed 180°F (82°C).

STORAGE & HANDLING

Normal shelf life is six (6) months when stored between 60°F and 80°F (15°C to 26°C). Job site storage temperature over 90°F (32°C) may affect product shelf life.

PROTECTION & SAFETY

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MULE-HIDE PREMOLDED EPDM PIPE BOOTS

PRODUCT DESCRIPTION

Mule-Hide Premolded EPDM Pipe Boots are economical, pre-fabricated flashings designed for single pipe penetrations on single-ply EPDM roofing systems. The premolded pipe boots are available with or without a butyl tape ring laminated to the bottom side of the three (3) inch base flange.

BASIC USES

Mule-Hide's Premolded EPDM Pipe Boots will accommodate single pipe sizes from 1" to 6" in diameter. With their conical-shaped steps, the pipe boots will securely seal all single pipe penetrations. The large, double-thick, molded rib at the top of each step offers superior tear-resistance and reinforcement, as well as a cutting guide.



TYPICAL PHYSICAL PROPERTIES

Physical Property	½" to 3"	1" to 6"
Material	Molded EPDM	Molded EPDM
Color	White or Black	White or Black
Size	½" to 3" (12 mm to 75 mm) pipe	1" to 6" (25 mm to 150 mm) pipe
Packaging	10 per carton	10 per carton
Weight	7 lbs per carton (3.2 kg)	11 lbs per carton (5 kg)
Shelf Life	1 year	1 year

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

BENEFITS & SUPPLEMENTAL STATEMENTS

- Available in two sizes to flash pipes from ½" to 3" (12mm to 75mm) and from 1" to 6" (25 mm to 150 mm)
- Pipe boots are available with pre-applied butyl tape for easy installation and strong bonding to membrane
- Designed for use with Mule-Hide EPDM roofing membranes

INSTALLATION INSTRUCTIONS

1. Remove all lead and other flashing materials. Remove any pipe insulation.
2. The entire surface where the Pipe Boot will be installed must be clean. The adhesive tape on the back of Pipe Boot will not adhere to dusted or dirty surfaces. Any residual contamination will reduce the bond strength of the adhesive.
3. Remove all foreign material from roofing membrane.
 - a. Remove excess mica dust or talc from membrane surface by brooming or wiping with a clean, dry rag.
 - b. The use of Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks.
 Note: Permeation-resistant gloves (that meet ANSI/ISEA 105- 2005) are required for hand protection when cleaners or primers are being used.
 - c. Allow the membrane to dry thoroughly before proceeding.
4. Cut the Pipe Boot above the raised "ring" that is one size smaller than pipe diameter.
5. Pull Pipe Boot over pipe until base flange is in contact with the membrane.
6. Mark pipe around the top of the Pipe Boot.
7. Pull Pipe Boot upwards on pipe until mark on the pipe is visible.

MULE-HIDE PREMOLDED PIPE BOOTS

INSTALLATION INSTRUCTIONS (continued)

8. Install Water Cut-Off Mastic below the mark, which indicates the top of the installed Pipe Boot.
9. Apply tape primer with a clean Scotch-Brite pad. Scrub the area of the membrane (where the Pipe Boot is to be applied) in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.
Note: The use of excessive amounts of primer will not enhance the adhesion of the Pipe Boot to the EPDM membrane. Use only the amount necessary to obtain 100% coverage of the area where the Pipe Boot will be applied.
10. Allow the tape primer to properly flash off until it does not transfer to a dry finger touch.
11. Pre-taped Pipe Boot
 - a. Install the Pipe Boot as soon as the primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
 - b. Pull the Pipe Boot back down over the pipe and into position.
 - c. Remove release liner from the taped flange and, using hand pressure, press tape into the primed area. Roll seam area with 2" roller.
12. Pipe Boot installed with Black Splice Adhesive
 - a. Thoroughly stir the Splicing Adhesive. Apply an even coating of Splice Adhesive to both primed surfaces (membrane and bottom of Pipe Boot flange) and allow to dry until tacky but will not string, stick or move when touched or pushed with a dry finger (approximate drying time may vary between 15 to 45 minutes).
 - b. Pull the Pipe Boot back down over the pipe and into position.
 - c. Press flange of Pipe Boot into position using hand pressure. Roll seam area with 2" roller.
13. Install a stainless steel clamping ring to the top of the Pipe Boot to provide constant compression of the Water Cut-Off Mastic.
14. When a field seam intersects a Pipe Boot, install a T-Joint patch.
Review Mule-Hide specifications and details for additional installation information.

PRECAUTIONS

- All existing flashings, insulation and debris must be removed (including lead flashings)
- Temperature of projection must not exceed 180°F (82°C)
- Deck flanges of Pipe Boot must not be overlapped, cut or applied over any angle change.
- Ensure that clamping ring is properly sized

LEED Information

Pre-consumer Recycled Content	2%
Post-consumer Recycled Content	0%
Manufacturing Location	Greenville, IL
Solar Reflectance Index (SRI)	N/A

PROTECTION & SAFETY

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MULE-HIDE PREMOLDED EPDM PIPE BOOTS

ADDITIONAL INFORMATION

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MULE-HIDE PRE-CUT INSIDE/OUTSIDE CORNERS

PRODUCT DESCRIPTION

Mule-Hide Pre-Cut Inside/Outside Corners consist of .060 inch (1.5mm) thick uncured EPDM flashing material laminated to cured butyl rubber tape and rolled onto a poly release liner providing .090 mils (2.25mm) of total thickness.



BASIC USES

Mule-Hide Pre-Cut Inside/Outside Corners are ideal for installing inside and outside corners on Mule-Hide EPDM roofing systems.

SPECIFICATIONS

Sizes:	7" x 9" (180 mm x 230 mm)
Packaging:	20 per carton
Weight:	5 lbs. per carton (2.25Kg)
Color:	Black
Shelf Life:	Nine (9) months when stored between 60°F and 80°F (15°C and 26°C)
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.	

BENEFITS & SUPPLEMENTAL STATEMENTS

- Pre-cut corners increase installation speed by eliminating cutting time eliminating
- Pre-applied adhesive eliminates need to apply splice adhesive
- Cleaner appearance as all corners are cut to same size

INSTALLATION INSTRUCTIONS

1. The entire EPDM membrane surface where the Pre Cut Corners will be applied must be cleaned and primed. Neither the splice adhesive nor the Pre Cut Corners will adhere to dusted/dirty surfaces. Remove any dirt or dust by wiping with a clean rag. If there is a heavy layer of dirt present, clean the splice area thoroughly with Weathered Membrane Cleaner. Any residual dust/dirt will be detrimental to the bond strength of the Pre Cut Corners. See Product Data Sheet for Tape Primer for installation instructions.
2. Install Pre Cut Corners immediately after primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
3. Peel off one piece of the release liner and apply corner to the vertical wall. Remove the other piece of liner and work corner onto the deck from the corner out using even hand pressure across the entire area.
4. Immediately roll the Inside/Outside Corner with a 2" (50 mm) wide roller, using positive pressure.
5. Apply Lap Sealant at overlaps in PS Inside/Outside Corners or at joints in the metal edging according to the appropriate detail.
.Review Mule-Hide Specifications and details for specific application instructions.

PRECAUTIONS

- Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
- Prolonged jobsite storage temperatures in excess of 90°F (32°C) will shorten product shelf life.

MULE-HIDE PRE-CUT INSIDE/OUTSIDE CORNERS

PRECAUTIONS (Continued)

- In warm, sunny weather, keep Pre Cut Corners in original box in a shaded area until ready to use.
- Storage and use of Pre Cut Corners at temperatures below 40°F (4°C) will result in a loss of tape tack and, in extreme cases, will result in no bond to the substrate. Overnight storage must be available to keep the temperature of the Pre Cut Corners at a minimum of 60°F (15°C). Hot boxes for jobsite storage must be provided to maintain a minimum tape temperature of 40°F (4°C).
- Pre Cut Corners must be stored in a dry area.
- Due to solvent flash-off, condensation may occur on freshly applied primer when the ambient temperature is near the dew point. If condensation develops, the application of primer must be discontinued as proper adhesion will not be achieved.
- Allow the primer surface to dry and apply a thin freshener coat of primer to the previously coated surface and apply Uncured Flashing Tape when conditions allow.
- Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oil, animal fats, etc.) or direct steam venting to come in contact with the Pre Cut Corners.
- KEEP OUT OF REACH OF CHILDREN

PROTECTION & SAFETY

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MULE-HIDE 2.4" SEAM PLATES

PRODUCT DESCRIPTION

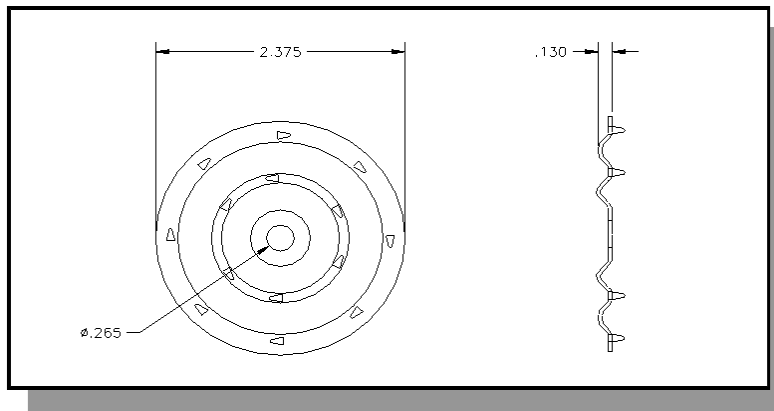
Mule-Hide's 2.4" Seam Plates are round Galvalume coated metal plates with (14) barbed anchors and reinforcing ribs for superior wind uplift resistance

BASIC USES

Mule-Hide's 2.4" Seam Plates are designed for the mechanical attachment of the Mule-Hide Reinforced EPDM, PVC and TPO membranes. The 2.4" Seam Plates are attached with Mule-Hide HDP Fasteners or EHD Fasteners. In addition to securing mechanically attached reinforced membranes, our 2.4" Seam Plates can be used with our reinforced 6" wide RMS, or our 6" wide and 10" wide RUSS™ Strips.

SPECIFICATIONS

Material: 20 ga. Galvalume coated metal
Coating: Galvalume AZ 55 meeting ASTM A 792 Grade 50A
Corrosion: Meets FM corrosion standard 4470
Pull Thru: Flat truss head pulled through the center hole of the plate, minimum pull thru: 800 lbs.



CODE APPROVALS/COMPLIANCE

Mule-Hide HDP Fasteners comply with the requirements of the following specifications, test and code requirements when properly installed.

* FM Standard 4450/4470 Approval * Metro-Dade Approved * Florida Product Approval

PACKAGING

Packaged in cartons of 1,000, approximate weight is 40# per box.

INSTALLATION INSTRUCTIONS

Install Mule-Hide 2.4" Seam Plates with barbs facing toward membrane (see appropriate detail drawing).
Secure 2.4" Seam Plate with Mule-Hide HDP or EHD fasteners in to substrate.
Use eye protection when installing fasteners.

MULE-HIDE 2.4" SEAM PLATES

PROTECTION & SAFETY

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LEED INFORMATION

Recycled Content

Postconsumer (1)	40%
Preconsumer (2)	18%
Total Recycled Content (3)	58%
LEED – Eligible Recycled Content (4)	49%

- (1) Postconsumer material is defined as waste material generated by households or commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purposes.
- (2) Preconsumer material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (i.e. rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it) is excluded.
- (3) Total Recycled Content = Postconsumer Content + Preconsumer Content.
- (4) LEED-Eligible Recycled Content = Postconsumer + ½ Preconsumer Content (per LEED Standard). Recycled content value is determined by weight.

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MULE-HIDE 3" INSULATION PLATES

PRODUCT DESCRIPTION

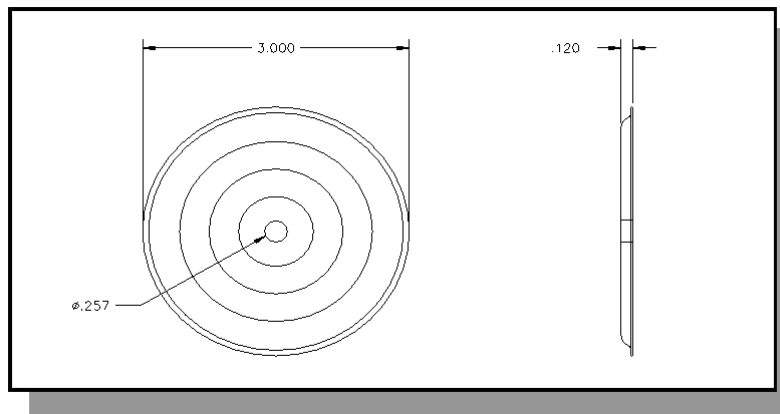
Mule-Hide 's 3" Insulation Plates are round Galvalume coated metal plates with reinforcing ribs for superior wind uplift resistance

BASIC USES

Mule-Hide's 3" Insulation Plates are designed specifically for the mechanical attachment of Mule-Hide's Poly ISO 1 and Poly ISO 2 insulation and other FM Approved insulation / cover boards.

SPECIFICATIONS

Material: 26 ga. Galvalume coated metal
Coating: Galvalume AZ 50 meeting ASTM A 792 Grade 50A
Corrosion: Meets FM corrosion standard 4470



CODE APPROVALS/COMPLIANCE

Mule-Hide HDP Fasteners comply with the requirements of the following specifications, test and code requirements when properly installed.

* FM Standard 4450/4470 Approval * Metro-Dade Approved *Florida Product Approval

PACKAGING

Packaged in cartons of 1,000, approximate weight is 40# per box.

INSTALLATION INSTRUCTIONS

Install Mule-Hide 3" Insulation Plates with head indentation facing upward.
Secure 2.4" Seam Plate with Mule-Hide HDP or EHD fasteners in to substrate.
Use eye protection when installing fasteners.

MULE-HIDE 3” INSULATION PLATES

PROTECTION & SAFETY

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MULE-HIDE DRILL POINT FASTENERS

PRODUCT DESCRIPTION

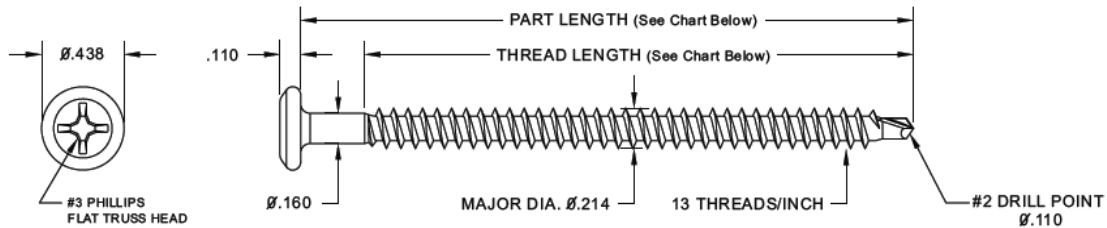
Mule-Hide Drill Point Fasteners are # 12 fasteners manufactured from C-1022 heat treated wire. These fasteners incorporate a No. 3 Phillips recess, flat truss head with a #2 double flute self-drilling point. The drill point has an exclusive tapered entry thread design that allows for fastener penetration into steel roof decks and offers exceptional back-out resistance.

BASIC USES

Mule-Hide's Drill Point Fasteners are designed specifically for the mechanical attachment of Mule-Hide's Poly ISO 1 and Poly ISO 2 roof insulation boards and other FM approved insulation / cover boards into steel and wood decks. The Mule-Hide Drill Point Fasteners may be used in conjunction with the Mule-Hide 3" Insulation Plates. Refer to Mule-Hide's appropriate Single-Ply Manuals for installation instructions and uses.

SPECIFICATIONS

Wire:	---	SAE C-1022, heat treated wire
Coating:	---	TRU-Kote PC-3
Corrosion Resistance	FM 4470, DIN 50018	<15% Red Rust after 30 cycles
Tensile Strength	ASTM F606-10	2500 lb.
Shear Strength	NASM 1312-20	1900 lb. (thread zone)



PACKAGING

Screw Length*	Thread Length*	Pieces/Box	Weight/Box
1-5/8"	1-5/8"	1000	11.8 lbs
2-1/4"	2-1/4"	1000	16.2 lbs
2-7/8"	2-7/8"	1000	19.7 lbs
3-1/4"	2-7/8"	1000	21.5 lbs
3-3/4"	2-7/8"	1000	24.6 lbs
4-1/2"	3-7/8"	1000	28.8 lbs
5"	3-7/8"	1000	31.5 lbs
6"	3-7/8"	1000	37.1 lbs
7"	3-7/8"	500	20.9 lbs
8"	3-7/8"	500	23.9 lbs

Screw Length and Thread Length are $\pm 1/16$ "

PERFORMANCE INFORMATION

Average Ultimate Pullout Values in Corrugated Steel Deck Substrates													
Thickness	24 ga.	22 ga.			20 ga.			18 ga.			16 ga.		
Strength, ksi	36.5	33.0	80.0	102.0	33.0	80.0	102.0	33.0	80.0	102.0	33.0	80.0	102.0
Pullout (lbs)	230	285	410	465	355	505	580	540	715	800	710	1000	1142

MULE-HIDE DRILL POINT FASTENERS

PERFORMANCE INFORMATION (continued)

Average Ultimate Pullout Values in Wood Substrates								
Type	APA Rated OSB				APA Rated Plywood			SPF #2
Thickness	7/16"	15/32"	19/32"	23/32"	15/32"	19/32"	23/32"	
Pullout (lbs)	265	300	325	440	365	475	720	700*

*lbf./in. of thread penetration including tip.

Pull out values are offered only as a guide and are not guaranteed in any way.
 Designated holding powers are dependent upon quality of substrate and accuracy of installation.
 Mule-Hide recommends that fastener pull out testing be performed to verify fastener performance.

CODE APPROVALS/COMPLIANCE

Mule-Hide Drill Point Fasteners comply with the requirements of the following specifications, test and code requirements when properly installed.

* FM Standard 4450/4470 Approval * Metro-Dade Approved *Florida Product Approval

INSTALLATION INSTRUCTIONS

Steel and Wood Decks

Install fasteners with #3 Phillips drive bit provided in box and a variable speed screw gun. Fastener must penetrate the deck a minimum of 3/4" as measured from the underside of the roof deck to the fastener tip. Ensure that fastener is installed perpendicular to surface of roof deck. Care should be taken to not overdrive the fastener causing damage to roof insulation, fastener or roof deck.

Use eye protection when installing fasteners.

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

LEED INFORMATION

Recycled Content

Postconsumer (1)	15%
Preconsumer (2)	10%
Total Recycled Content (3)	25%
LEED – Eligible Recycled Content (4)	20%

- (1) Postconsumer material is defined as waste material generated by households or commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purposes.
- (2) Preconsumer material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (i.e. rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it) is excluded.
- (3) Total Recycled Content = Postconsumer Content + Preconsumer Content.
- (4) LEED-Eligible Recycled Content = Postconsumer + 1/2 Preconsumer Content (per LEED Standard). Recycled content value is determined by weight.

MULE-HIDE DRILL POINT FASTENERS

ADDITIONAL INFORMATION

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DISCLAIMER

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MULE-HIDE HDP FASTENERS

PRODUCT DESCRIPTION

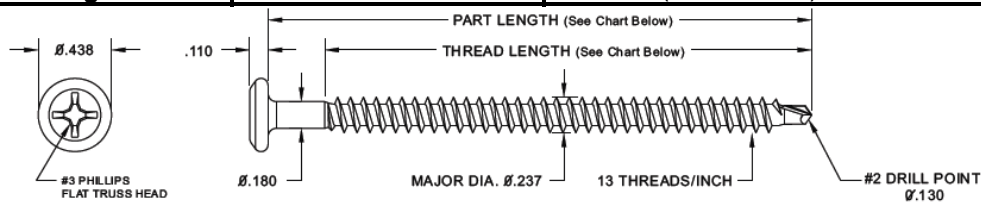
Mule-Hide HDP fasteners (Heavy Duty) are # 14 fasteners manufactured from C-1022 heat treated wire. These fasteners incorporate a No. 3 Phillips recess, flat truss head with a #2 double flute self-drilling point. The drill point has an exclusive tapered entry thread design that allows for fastener penetration into steel roof decks and offers exceptional back-out resistance.

BASIC USES

Mule-Hide's HDP Fasteners are designed specifically for the mechanical attachment of Mule-Hide's reinforced EPDM, TPO and PVC membranes and for the mechanical attachment of Poly ISO 1 and Poly ISO 2 roof insulation boards and other FM approved insulation / cover boards into steel, wood and concrete decks. The Mule-Hide HDP Fasteners may be used in conjunction with the Mule-Hide 2.4" Seam Plates, 3" Insulation Plates and All Purpose Bars. Refer to Mule-Hide's appropriate Single-Ply Manuals for installation instructions and uses.

SPECIFICATIONS

Wire:	---	SAE C-1022, heat treated wire
Coating:	---	TRU-Kote PC-3
Corrosion Resistance	FM 4470, DIN 50018	<15% Red Rust after 30 cycles
Tensile Strength	ASTM F606-10	3200 lb.
Shear Strength	NASM 1312-20	2200 lb. (thread zone)



PACKAGING

Screw Length*	Thread Length*	Pieces/Box	Weight/Box
1-1/2"	1-1/2"	1000	12.9 lbs
2"	2"	1000	15.5 lbs
2-1/2"	2-1/2"	1000	19.4 lbs
3"	2-7/8"	1000	23.7 lbs
3-1/2"	2-7/8"	1000	26.4 lbs
4"	3-7/8"	1000	30.9 lbs
4-1/2"	3-7/8"	1000	33.6 lbs
5"	3-7/8"	1000	37.3 lbs
5-1/2"	3-7/8"	1000	40.8 lbs
6"	3-7/8"	1000	44.0 lbs
7"	3-7/8"	500	25.9 lbs
8"	3-7/8"	500	29.7 lbs
9"	3-7/8"	250	16.6 lbs
10"	3-7/8"	250	18.5 lbs
11"	3-7/8"	250	20.1 lbs
12"	3-7/8"	250	22.0 lbs



Notes: Screw Length is $\pm 1/16$ "
 Thread Length is $\pm 1/16$ "

MULE-HIDE HDP FASTENERS

Performance Information

Average Ultimate Pullout Values in Corrugated Steel Deck Substrates														
Thickness	24 ga.			22 ga.			20 ga.			18 ga.			16 ga.	
Strength, ksi	36.5	33.0	80.0	102.0	33.0	80.0	102.0	33.0	80.0	102.0	33.0	80.0	102.0	
Pullout (lbs)	255	315	480	560	420	615	710	675	885	985	850	1115	1240	

Average Ultimate Pullout Values in Wood Substrates								
Type	APA Rated OSB				APA Rated Plywood			SPF #2
Thickness	7/16"	15/32"	19/32"	23/32"	15/32"	19/32"	23/32"	
Pullout (lbs)	270	290	310	410	360	410	730	795*

*lbf./in. of thread penetration including tip.

Average Ultimate Pullout Values in 3000 psi Concrete	
Pullout (lbf.)	450*

*lbf./in. of thread penetration, including tip.

Pull out values are offered only as a guide and are not guaranteed in any way.
 Designated holding powers are dependent upon quality of substrate and accuracy of installation.
 Mule-Hide recommends that fastener pull out testing be performed to verify fastener performance.

CODE APPROVALS/COMPLIANCE

Mule-Hide HDP Fasteners comply with the requirements of the following specifications, test and code requirements when properly installed.

* FM Standard 4450/4470 Approval * Metro-Dade Approved *Florida Product Approval

INSTALLATION INSTRUCTIONS

Steel and Wood Decks

Install fasteners with #3 Phillips drive bit provided in box and a variable speed screw gun. Fastener must penetrate the deck a minimum of 3/4" as measured from the underside of the roof deck to the fastener tip. Ensure that fastener is installed perpendicular to surface of roof deck. Care should be taken to not overdrive the fastener causing damage to roof insulation, fastener or roof deck.

Concrete Decks

Pre-drill a 3/16" diameter hole using a drill bit that meets ANSI Standard B212.15 requirements and hammer drill. Drill hole a minimum of 1/2" deeper than fastener embedment and clean debris from hole. Using the #3 Phillips drill bit provided and a 0 to 1500 rpm screw gun, install fastener to a minimum embedment of 1" until fastener head is properly seated in bar or plate. Care should be taken to not overdrive the fastener causing damage to roof insulation, fastener or roof deck.

Use eye protection when installing fasteners.

PROTECTION & SAFETY

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MULE-HIDE HDP FASTENERS

LEED INFORMATION

Recycled Content

Postconsumer (1)	15%
Preconsumer (2)	10%
Total Recycled Content (3)	25%
LEED – Eligible Recycled Content (4)	20%

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- (3) Total Recycled Content = Postconsumer Content + Preconsumer Content.
- (4) LEED-Eligible Recycled Content = Postconsumer + ½ Preconsumer Content (per LEED Standard). Recycled content value is determined by weight.

ADDITIONAL INFORMATION

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MULE-HIDE EHD FASTENERS

PRODUCT DESCRIPTION

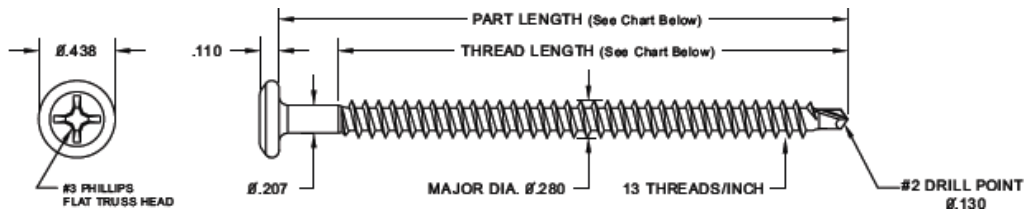
Mule-Hide EHD fasteners (Extra Heavy Duty) are # 15 fasteners manufactured from C-1022 heat treated wire. These fasteners incorporate a No. 3 Phillips recess, flat truss head with a #2 double flute self-drilling point. The drill point has an exclusive tapered entry thread design that allows for fastener penetration into steel roof decks and offers exceptional back-out resistance.

BASIC USES

Mule-Hide's EHD Fasteners are designed specifically for the mechanical attachment of Mule-Hide's reinforced EPDM, TPO and PVC membranes in steel and wood roof decks. Mule-Hide EHD fasteners can also be used for the mechanical attachment of Poly ISO 1 and Poly ISO 2 roof insulation boards and other FM approved insulation / cover boards. The Mule-Hide EHD Fasteners may be used in conjunction with the Mule-Hide 2.4" Seam Plates, 3" Insulation Plates and All Purpose Bars. Refer to Mule-Hide's appropriate Single-Ply Manuals for installation instructions and uses.

SPECIFICATIONS

Wire:	---	SAE C-1022, heat treated wire
Coating:	---	TRU-Kote PC-3
Corrosion Resistance	FM 4470, DIN 50018	<15% Red Rust after 30 cycles
Tensile Strength	ASTM F606-10	4200 lb.
Shear Strength	NASM 1312-20	2400 lb. (thread zone)



PACKAGING

Screw Length*	Thread Length*	Pieces/Box	Weight/Box
1-1/4"	1-1/4"	1000	12.6 lbs
2"	2"	1000	19.5 lbs
3"	3"	1000	28.2 lbs
4"	3"	1000	37.8 lbs
5"	4"	1000	48.1 lbs
6"	4"	500	27.9 lbs
7"	4"	500	33.6 lbs
8"	4"	500	37.3 lbs
9"	4"	250	20.7 lbs
10"	4"	250	23.7 lbs
11"	4"	250	25.3 lbs
12"	4"	250	28.9 lbs
14"	4"	250	33.1 lbs
16"	4"	250	36.9 lbs
18"	4"	250	41.7 lbs
20"	4"	250	46.7 lbs
22"	4"	250	51.1 lbs
24"	4"	250	56.1 lbs

Screw Length and Thread Length is $\pm 1/16"$



MULE-HIDE EHD FASTENERS

Performance Information

Average Ultimate Pullout Values in Corrugated Steel Deck Substrates															
Thickness	24 ga.			22 ga.			20 ga.			18 ga.			16 ga.		
Strength, ksi	36.5	33.0	80.0	102.0	33.0	80.0	102.0	33.0	80.0	102.0	33.0	80.0	102.0		
Pullout (lbs)	390	465	695	805	605	855	970	925	1125	1215	1175	1370	1460		

Average Ultimate Pullout Values in Wood Substrates									
Type	APA Rated OSB				APA Rated Plywood				SPF #2
Thickness	7/16"	15/32"	19/32"	23/32"	15/32"	19/32"	23/32"		
Pullout (lbs)	295	300	310	515	400	525	685	1165*	

*lbf./in. of thread penetration including tip.

Pull out values are offered only as a guide and are not guaranteed in any way.
 Designated holding powers are dependent upon quality of substrate and accuracy of installation.
 Mule-Hide recommends that fastener pull out testing be performed to verify fastener performance.

CODE APPROVALS/COMPLIANCE

Mule-Hide EHD Fasteners comply with the requirements of the following specifications, test and code requirements when properly installed.

* FM Standard 4450/4470 Approval * Metro-Dade Approved *Florida Product Approval

INSTALLATION INSTRUCTIONS

Steel and Wood Decks

Install fasteners with #3 Phillips drive bit provided in box and a variable speed screw gun. Fastener must penetrate the deck a minimum of 3/4" as measured from the underside of the roof deck to the fastener tip. Ensure that fastener is installed perpendicular to surface of roof deck. Care should be taken to not overdrive the fastener causing damage to roof insulation, fastener or roof deck. **Use eye protection when installing fasteners.**

LEED INFORMATION

Recycled Content

Postconsumer (1)	15%
Preconsumer (2)	10%
Total Recycled Content (3)	25%
LEED – Eligible Recycled Content (4)	20%

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- (3) Total Recycled Content = Postconsumer Content + Preconsumer Content.
- (4) LEED-Eligible Recycled Content = Postconsumer + 1/2 Preconsumer Content (per LEED Standard). Recycled content value is determined by weight.

MULE-HIDE EHD FASTENERS

PROTECTION & SAFETY

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MULE-HIDE ALL PURPOSE BAR

PRODUCT DESCRIPTION

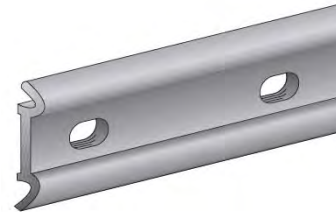
Mule-Hide's All Purpose Bar is a specially extruded aluminum bar without sharp edges.

BASIC USES

Mule-Hide's All Purpose Bar is designed for use as an anchor bar for attachment of the Mule-Hide EPDM membranes. The All Purpose Bar may be installed in the field seam as a batten bar and used at the base of curbs, parapet walls and angle changes as an anchor bar. The All Purpose Bar may also be used with any of the Mule-Hide single-ply membranes as a termination bar. Refer to the Mule-Hide Single-Ply Manuals for specific use and installation instructions.

SPECIFICATIONS

Material: Extruded Aluminum
Dimensions: .050" thick x 1" wide x 10' long per piece.
Holes: 1/4" x 3/8" slotted holes on 6 inch centers.



PACKAGING

Packaged: 50 pieces per tube
Approx. shipping weight: 45 lbs per tube

INSTALLATION INSTRUCTIONS

Position Mule-Hide All Purpose Bar as per detail drawings (ribs facing outward or ribs facing inward)
When used as edge termination, ensure that water block sealant has been installed as per appropriate detail drawing, position bar with ribs facing substrate (to form sealant pocket) and attach with appropriate fastener into substrate. When used for base attachment (see appropriate detail) position All Purpose Bar with ribs facing outward and attach with appropriate fastener into substrate.

LEED INFORMATION

Recycled Content

Postconsumer (1)	12%
Preconsumer (2)	32%
Total Recycled Content (3)	44%
LEED – Eligible Recycled Content (4)	28%

- (1) Postconsumer material is defined as waste material generated by households or commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purposes.
- (2) Preconsumer material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (i.e. rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it) is excluded.
- (3) Total Recycled Content = Postconsumer Content + Preconsumer Content.
- (4) LEED-Eligible Recycled Content = Postconsumer + 1/2 Preconsumer Content (per LEED Standard). Recycled content value is determined by weight.

MULE-HIDE ALL PURPOSE BAR

PROTECTION & SAFETY

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MULE-HIDE POLY ISO 1™ ROOF INSULATION

PRODUCT DESCRIPTION

The Mule-Hide Poly ISO 1™ polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core laminated to (non-asphaltic) glass fiber reinforced felt facers. The Mule-Hide Poly ISO 1 is compatible with all Mule-Hide membranes and accessories. Available in 20 psi and 25 psi.

BASIC USES

The Mule-Hide Poly ISO 1™ insulation board may be used for ballasted, mechanically attached and fully adhered single- ply roofing systems. The Poly ISO 1™ insulation board may be installed over approved decks and substrates on new construction, tearoffs, and recover (retrofit) projects. The Poly ISO 1™ insulation board may be used in UL Class A and FM Class 1 assemblies.

TYPICAL PHYSICAL PROPERTIES

Property	Test Method	Typical Results
Dimensional Stability	ASTM D-2126	2% Linear Change (7 days)
Compressive Strength	ASTM D-1621	20 PSI (Grade 2) 25 PSI (Grade3)
Water Absorption	ASTM D-209	Less than 1% By Volume
Moisture Vapor Transmission	ASTM E-96	Less than One (1) Perm
Service Temperature	---	-100°F to 250°F Max

*The physical properties above are presented as typical average values as determined by accepted ASTM test methods and are subject to change. All information can be confirmed by contacting Mule-Hide Products.

Nominal Thickness** (Inches)	(mm)	<u>Poly ISO 1™</u>		
		LTTTR R-Value (revised Jan-2014)	C-Value	Metal Deck Max. Flute
1.0	25	5.7	.175	2 5/8
1.5	38	8.6	.116	4 3/8
1.8	46	10.3	.097	4 3/8
2.0	51	11.4	.088	4 3/8
2.5	64	14.4	.069	4 3/8
2.6	66	15.0	.067	4 3/8
3.0	76	17.4	.057	4 3/8
3.5	89	20.5	.049	4 3/8
3.8	97	22.3	.045	4 3/8
4.0	102	23.6	.042	4 3/8
4.3	109	25.5	.039	4 3/8
4.5	114	26.8	.037	4 3/8

*Long Term Thermal Resistance Values are based on ASTM C1289 (revised Jan-2014) and CAN/ULC S770 which provides for a 15-year time weighted average.
 **Other thicknesses available upon special request.

MULE-HIDE POLY ISO 1™ ROOF INSULATION

LTRR Value	ASTM C1289-11 (revised Jan-2014)
20	2 layers of 1.8" Poly ISO
25	2 layers of 2.2" Poly ISO
30	2 layers of 2.6" Poly ISO
35	2 layers of 3.1" Poly ISO
40	2 layers of 3.5" Poly ISO

Poly ISO 1 Recycle Content

Between 16% and 43% by weight, depending upon thickness (55% post consumer and 45% post industrial). Refer to LEED Memo for Mule-Hide Products.

PACKAGING

Factory applied packaging is only intended for protection during transit. When stored outside or at the job site, the insulation must be stored at least 4" above ground level and completely covered with a weatherproof covering such as a tarpaulin. **Warning - Do Not Leave Exposed:** This product will burn if exposed to an ignition source of sufficient heat and intensity, or an open flame.

CODE APPROVALS/COMPLIANCE

Poly ISO 1™ complies with the requirements of the following specifications, test and code requirements when properly installed.

- * Federal Specification HH-I-1972/GEN and HH-I-1972/2, Class 1
- * ASTM C 1289-05a, Type II, Class 1, Grade 2 (20 psi), Grade 3 (25 psi)
- * FM Standard 4450/4470 Approval, Class 1
- * UL Standard 1256 Classification
- * UL Standard 790 Classification
- * UL Standard 263 Fire Resistance Classification

Mule-Hide Poly ISO 1™ is manufactured with NexGen Chemistry: Contains no CFCs, HCFCs, is Zero ODP, EPA Compliant and has virtually no GWP

INSTALLATION INSTRUCTIONS

Ballasted Single-Ply Membrane Systems - Mule-Hide Poly ISO 1™ does not require attachment to the deck in this system. All boards must be tightly fitted together to prevent movement, separation or damage during the installation of the membrane system. All gaps greater than 1/4" must be filled. After the membrane is installed, sufficient amounts of ballast must be applied to prevent membrane and insulation movement. Refer to the Mule-Hide Manual and FM Loss Prevention Data Sheet 1-29 for information regarding ballasting guidelines.

Mechanically Attached Single-Ply Membrane Systems - Mule-Hide Poly ISO 1™ should be attached with Mule-Hide fasteners and insulation plates (or FM Approved fasteners) using a minimum of 4 fasteners per 4'x 4' board (1 fastener per 4 square feet) and a minimum of 6 fasteners per 4'x 8' board (1 fastener per 5.33 square feet).

Refer to the Mule-Hide Manual for proper fastener placement.

Fully Adhered Single-Ply Membrane Systems - Mule-Hide Poly ISO 1™ should be installed with the perforated side down. Insulation attachment will vary depending upon insulation thickness and job requirements. If the top layer is less than 2" thick, install a minimum of 8 fasteners per 4'x 4' board (1 fastener per 2 square feet) and a minimum of 16 fasteners per 4'x 8' board (1 fastener per 2 square feet). If the top layer is 2" thick or thicker, install 4 fasteners per 4' x 4' or 8 fasteners per 4' x 8' insulation board. Refer to the Mule-Hide Manual for proper fastener density and placement. Additional fastening may be required for certain job conditions.

MULE-HIDE POLY ISO 1™ ROOF INSULATION

Fully Adhered Single-Ply Membrane Systems - continued

In some instances hot steep asphalt or insulation adhesive may be used to attach the Mule-Hide Poly ISO 1™ to approved concrete decks. Only 4'x 4' boards may be used. Contact Mule-Hide's Technical Department for specific requirements and procedures.

PROTECTION & SAFETY

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MULE-HIDE POLY ISO 1-HD (Cover Board)

PRODUCT DESCRIPTION

Mule-Hide Poly ISO 1-HD is ½” thick, high density polyisocyanurate insulation board that was specifically designed for use as a cover board. This product consists of a closed-cell polyisocyanurate foam core laminated to premium performance coated glass fiber felt facers. Mule-Hide Poly ISO 1-HD is compatible with all Mule-Hide membranes and accessories. In addition to providing a durable underlayment roofing membranes, Poly ISO HD-1 has a R-value of 2.5 which is significantly higher than that of other cover board products such as woodfiber or gypsum.

BASIC USES

Mule-Hide Poly ISO 1-HD is designed for use as a cover board over roof insulation boards or existing membranes. It is compatible with Single-Ply roofing systems (ballasted, mechanically attached and fully adhered) and Modified Bitumen Roofing Systems, on new construction, tearoff, and recover (retrofit) projects. Suitable for use with approved fasteners and plates, and low-rise adhesive. Poly ISO 1-HD can achieve a FM hail resistance rating of SH-1 with certain membranes.

TYPICAL PHYSICAL PROPERTIES (polyisocyanurate foam core only)

Property	Test Method	Typical Results
Dimensional Stability	ASTM D-2126	Less than 0.5% Linear Change
Compressive Strength	ASTM D-1621	>100 psi
Water Absorption	ASTM D-209	Less than 1% By Volume
Resistance to Mold	ASTM D-3273	Passed (10)
Service Temperature	---	260°F or less
Recycled Content	---	>8%
R-Value @ ½” (13 mm)	ASTM C-518	2.5
*The physical properties above are presented as typical average values as determined by accepted ASTM test methods and are subject to change. All information can be confirmed by contacting Mule-Hide Products.		

PACKAGING

PACKAGING & WEIGHT		
Weight	11 lbs. per 4' x 8' panel	0.3431 lbs / sq. ft.
Packaging	96 pieces per bundle	

Factory applied packaging is only intended for protection during transit. When stored outside or at the job site, the insulation must be stored at least 4" above ground level and completely covered with a weatherproof covering such as a tarpaulin. **Warning - Do Not Leave Exposed:** This product will burn if exposed to an ignition source of sufficient heat and intensity, or an open flame.

CODE APPROVALS/COMPLIANCE

Poly ISO 1-hd complies with the requirements of the following specifications, test and code requirements when properly installed.

- * ASTM E-108
- *FM Approved – consult RoofNav for specific assemblies
- *UL Classified 790

Mule-Hide Poly Iso 1 is manufactured with NexGen Chemistry™ – Zero ODP, CFC Free, EPA Compliant.

MULE-HIDE POLY ISO 1-HD (Cover Board)

INSTALLATION INSTRUCTIONS

General

All boards must be tightly fitted together to prevent movement, separation or damage during the installation of the membrane system. All gaps greater than 1/4" must be filled.

Ballasted Single-Ply Membrane Systems - Mule-Hide Poly ISO 1-HD does not require attachment to the deck in this system. Sufficient amounts of ballast must be applied to prevent membrane and insulation movement. Refer to the Mule-Hide Manual and FM Loss Prevention Data Sheet 1-29 for information regarding ballasting guidelines.

Mechanically Attached Single-Ply Membrane Systems - Mule-Hide Poly ISO 1-HD should be attached with Mule-Hide fasteners and insulation plates (or FM Approved fasteners) using a minimum of 4 fasteners per 4'x 4' board (1 fastener per 4 square feet) and a minimum of 6 fasteners per 4'x 8' board (1 fastener per 5.33 square feet). Refer to the Mule-Hide Manual for proper fastener placement.

Fully Adhered Single-Ply Membrane Systems - Mule-Hide Poly ISO 1-HD should be attached using a minimum of 8 fasteners per 4'x 4' board (1 fastener per 2 square feet) and a minimum of 16 fasteners per 4'x 8' board (1 fastener per 2 square feet). Refer to the Mule-Hide Manual for proper fastener placement.

Attachment - In some instances insulation adhesive may be used to attach the Mule-Hide Poly ISO 1-HD to approved substrates. Only 4'x 4' boards may be used. Contact Mule-Hide's Technical Department for specific requirements and procedures.

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

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DISCLAIMER

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MULE-HIDE POLY ISO 1™-CG ROOF INSULATION

PRODUCT DESCRIPTION

Mule-Hide Poly ISO™-CG 1 polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core laminated to *premium* glass fiber reinforced felt facers. Mule-Hide Poly ISO™-CG 1 is compatible with Single-Ply membranes (Ballasted, Mechanically Attached and Fully Adhered), BUR, Coal-Tar and Modified Bitumen. Available in 20 psi and 25 psi.

BASIC USES

Mule-Hide Poly ISO™-CG 1 insulation board may be used for ballasted, mechanically attached and fully adhered single-ply roofing systems, as well as BUR, Coal-Tar and Modified Bitumen. Mule-Hide Poly ISO™-CG 1 insulation board may be installed over approved decks and substrates on new construction, tearoffs, and recover (retrofit) projects. Poly ISO™-CG 1 insulation board may be used in UL Class A and FM Class 1 assemblies.

Achieves UL Class A and Class B fire ratings over combustible (i.e. wood) decks without the need for a fire rated slip sheet or gypsum cover board.

UL Class A fire rating when installed as a min 3” thick layer over a combustible deck.

UL Class B fire rating when installed as a min 1.9” thick layer over a combustible deck

TYPICAL PHYSICAL PROPERTIES

Property	Test Method	Typical Results
Dimensional Stability	ASTM D-2126	2% Linear Change (7 days)
Compressive Strength	ASTM D-1621	20 PSI (Grade 2) 25 PSI (Grade3)
Water Absorption	ASTM D-209	Less than 1% By Volume
Moisture Vapor Transmission	ASTM E-96	Less than One (1) Perm
Resistance to Mold	ASTM D-3273	Passed (10)
Service Temperature	---	-100°F to 250°F Max
*The physical properties above are presented as typical average values as determined by accepted ASTM test methods and are subject to change. All information can be confirmed by contacting Mule-Hide Products.		

Poly ISO™-CG 1				
Nominal Thickness** (Inches)	(mm)	LTTR R-Value (revised Jan-2014)	C-Value	Metal Deck Max. Flute
1.0	25	5.6	.178	2 5/8
1.5	38	8.5	.118	4 3/8
1.6	41	9.1	.110	4 3/8
1.7	43	9.6	.104	4 3/8
2.0	51	11.4	.088	4 3/8
2.5	64	14.4	.069	4 3/8
2.6	66	15.0	.066	4 3/8
3.0	76	17.4	.057	4 3/8
3.5	89	20.5	.049	4 3/8
3.8	97	22.3	.045	4 3/8
4.0	102	23.6	.042	4 3/8
4.5	114	26.8	.037	4 3/8
*Long Term Thermal Resistance Values are based on ASTM C1289 (revised Jan-2014) and CAN/ULC S770 which provides for a 15-year time weighted average. **Other thicknesses available upon special request.				

MULE-HIDE POLY ISO 1™-CG ROOF INSULATION

LTR Value	ASTM C1289-11 (revised Jan-2014)
20	2 layers of 1.8" Poly ISO
25	2 layers of 2.2" Poly ISO
30	2 layers of 2.6" Poly ISO
35	2 layers of 3.1" Poly ISO
40	2 layers of 3.5" Poly ISO

Poly ISO™-CG 1 Recycle Content

Between 16% and 43% by weight, depending upon **thickness** (55% post consumer and 45% post industrial). Refer to LEED Memo for Mule-Hide Products.

PACKAGING

Factory applied packaging is only intended for protection during transit. When stored outside or at the job site, the insulation must be stored at least 4" above ground level and completely covered with a weatherproof covering such as a tarpaulin. **Warning - Do Not Leave Exposed:** This product will burn if exposed to an ignition source of sufficient heat and intensity, or an open flame.

CODE APPROVALS/COMPLIANCE

Poly ISO™-CG 1 complies with the requirements of the following specifications, test and code requirements when properly installed.

- * ASTM C 1289-05a, Type II, Class 1, Grade 2 (20 psi), Grade 3 (25 psi)
- * FM Standard 4450/4470 Approval, Class 1
- * UL Standard 1256 Classification
- * UL Standard 790 Classification
- * UL Standard 263 Fire Resistance Classification
- * International Building Code (IBC) Chapter 26

Mule-Hide Poly ISO™-CG 1 is manufactured with NexGen Chemistry™: Contains no CFCs, HCFCs is Zero ODP, EPA Compliant, and has virtually no GWP.

INSTALLATION INSTRUCTIONS

Ballasted Single-Ply Membrane Systems - Mule-Hide Poly ISO™-CG 1 does not require attachment to the deck in this system. All boards must be tightly fitted together to prevent movement, separation or damage during the installation of the membrane system. All gaps greater than 1/4" must be filled. After the membrane is installed, sufficient amounts of ballast must be applied to prevent membrane and insulation movement. Refer to the Mule-Hide Manual and FM Loss Prevention Data Sheet 1-29 for information regarding ballasting guidelines.

Mechanically Attached Single-Ply Membrane Systems - Mule-Hide Poly ISO™-CG 1 should be attached with Mule-Hide fasteners and insulation plates (or FM Approved fasteners) using a minimum of 4 fasteners per 4' x 4' board (1 fastener per 4 square feet) and a minimum of 6 fasteners per 4' x 8' board (1 fastener per 5.33 square feet). Refer to the Mule-Hide Manual for proper fastener placement.

Fully Adhered Single-Ply Membrane Systems - Mule-Hide Poly ISO™-CG 1 should be installed with the perforated side down. Insulation attachment will vary depending upon insulation thickness and job requirements. If the top layer is less than 2" thick, install a minimum of 8 fasteners per 4' x 4' board (1 fastener per 2 square feet) and a minimum of 16 fasteners per 4' x 8' board (1 fastener per 2 square feet). If the top layer is 2" thick or thicker, install 4 fasteners per 4' x 4' or 8 fasteners per 4' x 8' insulation board. Refer to the Mule-Hide Manual for proper fastener density and placement. Additional fastening may be required for certain job conditions.

MULE-HIDE POLY ISO 1™-CG ROOF INSULATION

Fully Adhered Single-Ply Membrane Systems - continued

In some instances hot steep asphalt or insulation adhesive may be used to attach the Mule-Hide Poly ISO™-CG 1 to approved concrete decks. Only 4'x 4' boards may be used. Contact Mule-Hide's Technical Department for specific requirements and procedures.

Built Up, Coal Tar and Modified Bitumen

Mule-Hide Poly ISO™-CG 1 is to be secured to the roof deck with fasteners and plates. Insulation may also be adhered to a prepared concrete roof deck or subsequent layers of insulation with a full moping of hot steep asphalt, insulation adhesive or cold applied adhesive using maximum 4' x 4' board sizes. Install the roof cover according to the manufacturer's specifications.

PROTECTION & SAFETY

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ADDITIONAL INFORMATION

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MULE-HIDE Poly ISO 2-GF ROOF INSULATION

PRODUCT DESCRIPTION

Mule-Hide Poly ISO 2-GF polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core bonded to inorganic coated glass facers. The Mule-Hide Poly ISO 2-GF insulation is compatible with all Mule-Hide membranes and accessories. Available in 20 and 25 psi densities.

BASIC USES

Mule-Hide Poly ISO 2™ insulation board may be used for ballasted, mechanically attached and fully adhered single-ply roofing systems. Poly ISO 2-GF insulation board may be installed over approved decks and substrates on new construction, tearoffs, and recover (retrofit) projects.

TYPICAL PHYSICAL PROPERTIES

Property	Test Method	Typical Results
Dimensional Stability	ASTM D-2126	Less than 2% Linear Change
Compressive Strength	ASTM D-1621 (10% deformation)	20 PSI or 25 PSI
Water Absorption	ASTM C-209, ASTM D-2842	< 1.5%, < 3.5%
Moisture Vapor Transmission	ASTM E-96	Less than 4.0 Perm
Product Density	ASTM D-1622	Nominal 2.0 lbs per cubic foot
Flame Spread (foam core)	ASTM E-84 (full 10 min. test)	40 to 60*
Smoke Developed	ASTM E-84 (full 10 min. test)	50 to 170*
Service Temperature	---	-100°F to +250°F Max**
Tensile Strength	ASTM D-1623	>730 psf (35 kPa)

* The numerical ratings are not intended to reflect performance under actual fire conditions. A flame spread index of 75 or less and smoke development of 450 or less meet code requirements regarding flame spread and smoke development for foam plastic roof insulation. However, the codes exempt foam plastic insulation when used in roof deck constructions that comply as an assembly with FM 4450 or UL 1256.

**ASTM C1289 Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation. The physical properties above are presented as typical average values as determined by accepted ASTM test methods and are subject normal manufacturing variation.

LTTR R-Value ¹ (Revised Jan-2014)	Thickness ²		RSI ⁴	Flute Spanability	
	Inches	mm		Inches	mm
5.7	1.0	25.4	1.00	2.625	66.68
8.6	1.5	38.1	1.51	4.375	111.13
11.4	2.0	50.8	2.01	4.375	111.13
14.4	2.5	63.5	2.53	4.375	111.13
17.4	3.0 ³	76.2	3.06	4.375	111.13
20.5	3.5 ³	88.9	3.61	4.375	111.13
23.6	4.0 ³	101.6	4.16	4.375	111.13

1. LTTR (Long Term Thermal Resistance) values were determined in accordance with CAN/ULC-S770 and ASTM C1289 (Revised Jan-2014), Annex A1. All test samples were third-party selected and tested by an accredited material testing laboratory. The LTTR results were reviewed and authorized by FM Approvals and certified by the PIMA Quality Mark Program

2. Other thicknesses available upon special request

3. Multi-layer application is suggested when the total insulation thickness exceeds 2.7".

4. RSI is the metric expression of R-value (m² * K/W)

MULE-HIDE Poly ISO 2-GF ROOF INSULATION

LTTR Value	ASTM C1289-11 (revised Jan-2014)
20	2 layers of 1.8" Poly ISO 2
25	2 layers of 2.2" Poly ISO 2
30	2 layers of 2.6" Poly ISO 2
35	2 layers of 3.1" Poly ISO 2
40	2 layers of 3.5" Poly ISO 2

Poly ISO 2-GF Recycle Content
Between 11.2% and 6.2% recycled materials by weight.
Refer to LEED Memo for Mule-Hide Products.

PACKAGING

Factory applied packaging is only intended for protection during transit. When stored outside or at the job site, the insulation must be stored at least 4" above ground level and completely covered with a weatherproof covering such as a tarpaulin. **Warning - Do Not Leave Exposed:** This product will burn if exposed to an ignition source of sufficient heat and intensity, or an open flame.

CODE APPROVALS/COMPLIANCE

Poly ISO 2-GF complies with the requirements of the following specifications, test and code requirements when properly installed.

- * ASTM C 1289, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi)
- * CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3

Mule-Hide Poly ISO 2-GF is manufactured using CFC-, HCFC-, and HFC-free foam blowing technology with zero ozone depletion potential (ODP) and virtually no (negligible) global warming potential (GWP).

INSTALLATION INSTRUCTIONS

Ballasted Single-Ply Membrane Systems - Mule-Hide Poly ISO 2-GF does not require attachment to the deck in this system. All boards must be tightly fitted together to prevent movement, separation or damage during the installation of the membrane system. All gaps greater than 1/4" must be filled. After the membrane is installed, sufficient amounts of ballast must be applied to prevent membrane and insulation movement. Refer to the Mule-Hide Manual and FM Loss Prevention Data Sheet 1-29 for information regarding ballasting guidelines.

Mechanically Attached Single-Ply Membrane Systems - Mule-Hide Poly ISO 2-GF should be attached with Mule-Hide fasteners and insulation plates (or FM Approved fasteners) using a minimum of 4 fasteners per 4' x 4' board (1 fastener per 4 square feet) and a minimum of 6 fasteners per 4' x 8' board (1 fastener per 5.33 square feet). Refer to the Mule-Hide Manual for proper fastener placement.

Fully Adhered Single-Ply Membrane Systems - Mule-Hide Poly ISO 2-GF should be installed with the perforated side down. Insulation attachment will vary depending upon insulation thickness and job requirements. If the top layer is less than 2" thick, install a minimum of 8 fasteners per 4' x 4' board (1 fastener per 2 square feet) and a minimum of 16 fasteners per 4' x 8' board (1 fastener per 2 square feet). If the top layer is 2" thick or thicker, install 4 fasteners per 4' x 4' or 8 fasteners per 4' x 8' insulation board. Refer to the Mule-Hide Manual for proper fastener density and placement. Additional fastening may be required for certain job conditions.

In some instances hot steep asphalt or insulation adhesive may be used to attach the Mule-Hide Poly ISO 2-GF to approved concrete decks. Only 4' x 4' boards may be used. Contact Mule-Hide's Technical Department for specific requirements and procedures.

MULE-HIDE Poly ISO 2-GF ROOF INSULATION

PROTECTION & SAFETY

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Manufacturer

Georgia-Pacific Gypsum Georgia-Pacific Canada
133 Peachtree Street 2180 Meadowvale Boulevard, Suite 200
Atlanta, GA 30303 Mississauga, ON L5N 5S3
Technical Service Hotline: 1-800-225-6119

Description

DensDeck® Prime Roof Board has been enhanced to provide a broader compatibility and higher performance with roofing adhesives. Face mat enhancements allow adhesives to be applied more uniformly and consistently. In adhered, single ply membrane testing, enhanced DensDeck Prime demonstrated an average of 24% better bond than the original products, when using solvent based adhesives. (Average based on 60 sq.ft./gal coverage rates.)* Choose DensDeck Prime Roof Boards for adhered and self-adhered “peel & stick” roofing systems, as well as hot mopped, cold mastic and torch-applied modified bitumen roofs. Enhanced DensDeck Prime Roof Boards create a stronger and more economical installation by reducing the amounts of mastic or adhesive used and potentially eliminates the field primer. Consult with membrane manufacturer for actual priming requirements.

DensDeck Prime Roof Boards are the first and only fiberglass mat gypsum roof boards with a 90-day weather exposure limited warranty when applied vertically on a parapet wall. ** (Limited to 1/2” and 5/8” products only.)

Primary Uses

Roof system manufacturers and designers have found DensDeck Prime Roof Board to be compatible with many types of roofing systems, including: modified asphalt, single-ply, metal systems, recover board, as well as an overlayment for polyisocyanurate and polystyrene insulation. DensDeck Prime Roof Board can also be used as a form board for poured gypsum concrete deck in roof applications as well as a substrate for spray foam roofing systems. 1/2” (12.7 mm) and 5/8” (15.9 mm) DensDeck Prime Roof Board may also be used in vertical applications as a backer board or liner for the roof side of parapet walls.

DensDeck Prime Roof Board may allow the bonding of cold mastic modified bitumen and torching directly to the surface. *Consult with the system manufacturer for recommendations on this application.*

DensDeck Prime Roof Board is the preferred substrate for vapor retarders.

Standards and Code Approvals

DensDeck Prime Roof Boards are manufactured to meet ASTM C1177 and have the following approvals:

- Florida Product Approved
- Miami-Dade County Product Control Approved

Recommendations and Limitations

DensDeck Prime Roof Boards are manufactured to act with a properly designed roof system following good roofing practices. The actual use of DensDeck Prime Roof Board as a roofing component in any system or assembly is the responsibility of the roofing system’s design authority. Consult with the appropriate system manufacturer and/or design authority for system and assembly specifications and instructions on applying other products to DensDeck Prime Roof Board. Georgia-Pacific does not warrant and is not responsible for any systems or assemblies utilizing DensDeck Prime Roof Board or any component in such systems or assemblies other than DensDeck Prime Roof Board.

The need for a separator sheet between the DensDeck Prime Roof Board and the roofing membrane must be determined by the roof membrane manufacturer or roofing system designer.

* Testing was done in accordance with FM approvals 4470, Appendix C: Small Scale Tests, Membrane Delamination Tests for Roofing Membranes and Substrates Using Tensile Loading.

** For complete warranty details, visit www.DensDeck.com. (Limited to 1/2” and 5/8” products only.)

Confirm any priming requirements with the membrane manufacturer. When applying solvent-based adhesives or primers, allow sufficient time for the solvent to flash off to avoid damage to roofing components.

DensDeck Prime Roof Boards should not be subjected to abnormal or excessive loads or foot traffic, such as, but not limited to, use on plaza decks or under steel-wheeled equipment that may fracture or damage the panels. Provide suitable roofing system protection when required.

When using DensDeck Prime Roof Boards for hot-mopped applications, Georgia-Pacific recommends maximum asphalt application temperatures for Type III asphalt of 425°F (218°C) to 450°F (232°C). Application temperatures above these recommended temperatures may adversely affect roof system performance. For application temperatures in excess of 450°F (232°C) and for mopping of type IV asphalt, ribbon or spot mopping or the installation of a perforated base sheet are recommended methods of bonding asphalt in lieu of full mopping. Consult and follow the roofing system manufacturer’s specifications for full mopping applications and temperature requirements.

When using DensDeck Prime Roof Board as a substrate for torch applications, ensure that the product is dry and that the proper torching technique is used. Limit the heat to the DensDeck Prime Roof Board. Maintain a majority of the torch flame directly on the roll.

Conditions beyond the control of Georgia-Pacific, such as weather conditions, dew, leaks, application temperatures and techniques may cause adverse effects with roofing systems.

Handling and Use—CAUTION

This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas.

Moisture Management

DensDeck Prime Roof Boards, like other components used in roofing systems, must be protected from exposure to moisture before, during and after installation.

Remove the plastic packaging from all DensDeck Prime Roof Board immediately upon receipt of delivery. Failure to remove the plastic packaging may result in entrapment of condensation or moisture. DensDeck Prime Roof Board stored outside must be stored level and off the ground and protected by a breathable waterproof covering. Provide means for air circulation around and under stored bundles of DensDeck Prime Roof Board. DensDeck Prime Roof Board must be covered the same day as installed.

Avoid application of DensDeck Prime Roof Boards during rain, heavy fog and any other conditions that may deposit moisture on the surface, and avoid the overuse of non-vented, direct-fired heaters during winter months. When roofing systems are installed on new poured concrete or light weight concrete decks or when re-roofing over an existing concrete deck, a vapor barrier should be installed above the concrete to retard the migration of water from the concrete into the roof assembly. Always consult the roofing system manufacturer or design authority for specific instructions for applying other products to DensDeck Prime Roof Boards.

Moisture vapor movement by convection must be eliminated, and the flow of water by gravity through imperfections in the roof system must be controlled. After a leak has occurred, no condensation on the upper surface of the system should be tolerated, and the water introduced by the leak must be dissipated to the building interior in a minimum amount of time.

Although DensDeck Prime Roof Boards are engineered with fiberglass facings and high density gypsum cores, the presence of free moisture can have a detrimental

Submittal Approvals

Job Name _____

continued →

Contractor _____

Date _____

effect on the performance of the product and the installation of roofing membranes. For example, hot asphalt applications can blister; torched modified bitumen may not properly bond; and adhesives for single ply membranes may not dry properly. Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DensDeck[®] Prime Roof Boards containing excessive free moisture content may need to be evaluated for structural stability to assure wind uplift performance.

Fire Resistance Classifications

DensDeck Prime Roof Boards are excellent fire barriers over combustible and noncombustible roof decks, including steel decks.

UL 790 Classification. DensDeck Prime Roof Boards have been classified by Underwriters Laboratories LLC (UL) for use as a fire barrier over combustible and noncombustible decks in accordance with the ANSI/UL 790 test standard. The UL classification includes a comprehensive Class A, B or C rating. For additional information concerning the UL 790 classification, consult the UL Certification Directory.

UL 1256 Classification. DensDeck Prime Roof Boards have also been classified by UL in roof deck constructions for internal (under deck) fire exposure in accordance with the ANSI/UL 1256 Steiner Tunnel test. For additional information concerning the UL 1256 classification, consult the UL Certification Directory.

FM Class 1 Approvals. DensDeck Prime Roof Boards are included in numerous roofing assemblies with a Factory Mutual (FM) Class 1 fire rating. 1/4" (6.4 mm) DensDeck

Prime Roof Boards have passed testing under the FM Calorimeter Standard 4450 and have been approved by FM as such for insulated steel deck roofs when installed according to the conditions identified by FM. For more information concerning FM Approvals and FM Class 1 assemblies with DensDeck Prime Roof Boards, consult FM or RoofNav[®].

Type X. 5/8" (15.9 mm) DensDeck[®] Prime Fireguard[®] Roof Boards are manufactured to meet the "Type X" requirements of ASTM C1177 for increased fire resistance beyond regular gypsum board.

UL Fire Resistance Ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards are designated as **Type DD** by UL and included in assembly designs investigated by UL for hourly fire resistance ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards may also replace any unclassified 5/8" (15.9 mm) gypsum board in an assembly in the UL Fire Resistance Directory under the prefix "P".

Flame Spread and Smoke Developed. When tested in accordance with ASTM E84, DensDeck Prime Roof Boards had Flame Spread 0, Smoke Developed 0.

Wind Uplift

DensDeck Prime Roof Boards are included in numerous assemblies evaluated by FM or other independent laboratories for wind uplift performance. For information concerning such assemblies, please visit www.roofnav.com.

Physical Properties

Properties	1/4" (6.4 mm)	1/2" (12.7mm)	5/8" (15.9 mm)
Thickness, nominal	1/4" (6.4 mm) ± 1/16" (1.6 mm)	1/2" (12.7 mm) ± 1/32" (.8 mm)	5/8" (15.9 mm) ± 1/32" (.8 mm)
Width, standard	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)
Length, standard	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)
Weight, nominal, lbs./sq. ft. (Kg/m ²)	1.2 (5.9)	2.0 (9.8)	2.5 (12.2)
Surfacing	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating
Flexural Strength ¹ , parallel, lbf. min. (N)	≥40 (178)	≥80 (356)	≥100 (444)
Flute Spanability ²	2-5/8" (66.7 mm)	5" (127 mm)	8" (203 mm)
Permeance ³ , Perms (ng/Pa•S•m ²)	>30 (>1710)	>23 (>1300)	>17 (>970)
R Value ⁴ , ft ² •°F•hr/BTU (m ² •K/W)	.28	.56	.67
Linear Variation with Change in Temp., in/in °F (mm/mm/C°)	8.5 x 10 ⁻⁶ (15.3 x 10 ⁻⁶)	8.5 x 10 ⁻⁶ (15.3 x 10 ⁻⁶)	8.5 x 10 ⁻⁶ (15.3 x 10 ⁻⁶)
Linear Variation with Change in Moisture	6.25 x 10 ⁻⁶	6.25 x 10 ⁻⁶	6.25 x 10 ⁻⁶
Water Absorption ⁵ , % max	<10	<10	<10
Compressive Strength ⁶ , psi nominal	900	900	900
Surface Water Absorption, grams, nominal	<2.0	<2.0	<2.0
Flame Spread, Smoke Developed (ASTM E84)	0/0	0/0	0/0
Bending Radius	4' (1219 mm)	6' (1829 mm)	8' (2438 mm)

1. Tested in accordance with ASTM C473 method B.
 2. Tested in accordance with ASTM E661.
 3. Tested in accordance with ASTM E96 (dry cup method).

4. Tested in accordance with ASTM C518 (heat flow meter).
 5. Specified values per ASTM C1177.
 6. Tested in accordance with ASTM C473.



U.S.A. Georgia-Pacific Gypsum LLC
 Georgia-Pacific Gypsum II LLC
 Canada Georgia-Pacific Canada LP

SALES INFORMATION AND ORDER PLACEMENT

U.S.A. West: 1-800-824-7503
 Midwest: 1-800-876-4746
 South Central: 1-800-231-6060
 Southeast: 1-800-327-2344
 Northeast: 1-800-947-4497

CANADA Canada Toll Free: 1-800-387-6823
 Quebec Toll Free: 1-800-361-0486

TECHNICAL INFORMATION

U.S.A. and Canada: 1-800-225-6119, www.gpgypsum.com

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UPDATES AND CURRENT INFORMATION The information in this document may change without notice. Visit our website at www.gpgypsum.com for updates and current information.

CAUTION For product fire, safety and use information, go to www.buildgp.com/safetyinfo or call 1-800-225-6119.

FIRE SAFETY CAUTION Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.

USG Securock® Brand Gypsum-Fiber Roof Board



High-performance gypsum-fiber roof board for use in low-slope commercial roofing systems

- Exceptional bond and low absorption in adhered systems
- Moisture and mold resistant
- Excellent wind-uplift performance
- Manufactured from 97% recycled material

Description

USG Securock® Gypsum-Fiber Roof Board is a high-performance roof board for use in low-slope roofing systems. Its unique, fiber-reinforced, homogenous composition gives the panel strength and water resistance through to the core. USG Securock Gypsum-Fiber Roof Board provides exceptional bond and low absorption in adhered systems and with its homogenous composition achieves high wind-uplift ratings with no risk of facer delamination. Made from 97% recycled material, USG Securock Gypsum-Fiber Roof Board combines superior performance with sustainable design for all types of roofing systems including single-ply, fluid-applied, built-up, spray foam, metal and modified bitumen roofing.

Advantages

Exceptional Strength Engineered to provide superior wind-uplift performance for a wide variety of roof assemblies. USG Securock Gypsum-Fiber Roof Board has uniform composition providing enhanced bond strength of membrane systems with no risk of facer delamination.

Fire Performance Provides excellent fire performance and demonstrates exceptional surface burning characteristics (ASTM E84 (CAN/ULC-S102) Flame Spread 5, Smoke Developed 0).

Moisture and Mold Uniform water-resistant core ensures excellent moisture and mold resistance. Scored a maximum "10" for mold resistance on ASTM D3273.

Versatile Can be used as a component in single-ply, fluid-applied, built-up, spray foam, metal and modified bitumen roofing.

Sustainability Made from 97% recycled materials and has earned independent certification from Scientific Certification Systems for this achievement.

Limitations

- USG Securock Gypsum-Fiber Roof Board is engineered to perform within a properly designed roof system. The use of USG Securock Gypsum-Fiber Roof Board as a roofing component is the responsibility of the design professional.
- Consult roofing manufacturers for specific instructions on the application of their products to USG Securock Gypsum-Fiber Roof Board
- Weather conditions, dew, application temperature, installation techniques and moisture drive can have adverse effects on the performance of the roof system and are beyond the control of USG.
- Keep USG Securock Gypsum-Fiber Roof Board panels dry before, during and after installation. USG Securock Gypsum-Fiber Roof Board should not be installed during rains, heavy fogs and any other conditions that deposit moisture on the surface of the board. Apply only as much USG Securock Gypsum-Fiber Roof Board that can be covered by final roof membrane system in the same day. Avoid exposure to moisture from leaks or condensation.
- For re-roof or re-cover applications, existing roofing system must be dry throughout prior to application of USG Securock Gypsum-Fiber Roof Board.
- Plastic or poly packaging applied at the plant to protect board during rail or other transit should be removed upon receipt to prevent condensation or trapping of moisture, which may cause application problems.
- USG Securock Gypsum-Fiber Roof Board should be stored flat and off the ground with protection from the weather. If stored outdoors, a breathable waterproof covering should be used.
- When applying solvent-based adhesives or primers, allow sufficient time for the solvent to evaporate to avoid damage to roofing components.
- USG allows the bonding of cold mastic modified bitumen and torching directly to the surface. Consult with the system manufacturer for recommendations on this application.
- USG recommends maximum asphalt application temperature for Type III asphalt of 455 °F when using USG Securock Gypsum-Fiber Roof Board. Application temperatures above these recommended temperatures may adversely affect roof system performance.

Installation

- Refer to roof system manufacturer's written instructions, local code requirements and Factory Mutual Global (FMG) and/or Underwriters Laboratories (UL) requirements for proper installation techniques.
- Use fasteners specified in accordance with above requirements. Install approved fasteners with plates into the USG Securock Gypsum-Fiber Roof Board, flush with the surface. Fasteners should be installed in strict compliance with the roof system manufacturer's installation recommendations and FMG Loss Prevention Data Sheet 1-29. Proper fastener spacing is essential to achieve wind-uplift performance.



- Locate edge joints on, and parallel to, deck ribs. Stagger end joints of adjacent lengths of USG Securock Gypsum-Fiber Roof Board. Butt board edges and ends loosely in typical installations.
- Butt board edges and ends loosely (minimum 1/16" gap on all edges) in typical installations. This gap may need to be larger depending on factors like the roof deck's size, membrane color, ultimate deck surface temperature and time of year the roof assembly is installed. Installations during temperatures below 50°F may require larger spacing. Please refer to USG's published physical properties below to calculate the actual gap needed for your specific project for all thicknesses.
- Roof boards should never be installed frozen.
- See product data table below for maximum flute span when panels are applied directly over metal decking.
- For vertical parapet applications, only 1/2" or 5/8" panels should be used. Maximum framing spacing is 24" o.c.

Fire Performance

- UL Classified as to Surface Burning Characteristics and Non-Combustability in accordance with ASTM E84 (CAN/ULC-S102)
 - Flame Spread 5 and Smoke Developed 0
- 1/4", 3/8", 1/2" and 5/8" Thickness — Class A in accordance with UL790 (CAN/ULC-S107). See the UL Building Materials Directory for more information.
- 5/8" Thickness — Meets requirements of Type X per ASTM C1278 and may be used in P series designs as a thermal barrier.

System Performance

- FM Approved
 - Complies with requirements of FM 4450 and FM 4470
 - Meets FM Class 1

Standards Compliance

USG Securock Gypsum-Fiber Roof Board is manufactured to conform to ASTM C1278, "Standard Specification for Fiber-Reinforced Gypsum Panel."

Physical Properties

	USG Securock Gypsum-Fiber Roof Board			
	1/4" (6.6 mm)	3/8" (9.5 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Width, standard	4' (1220 mm)	4' (1220 mm)	4' (1220 mm)	4' (1220 mm)
Length, standard	4' (1220 mm) and 8' (2440 mm)	4' (1220 mm) and 8' (2440 mm)	4' (1220 mm) and 8' (2440 mm)	4' (1220 mm) and 8' (2440 mm)
Pieces per unit for 4' x 8' sheets	50	40	30	24
Weight, nominal lbs./unit, 4' x 8' sheet	2,575	2,575	2,725	2,525
Weight, nominal lbs./sq. ft.	1.57	1.96	2.76	3.20
Flexural strength, parallel, lbs. min., per ASTM C 473	40	70	110	161
Compressive strength, psi nominal	1800	1800	1800	1800
Flute spanability per ASTM E 661	2-5/8"	5"	8"	10"
Permeance, perms, per ASTM E 96	30	26	26	24
R Value per ASTM C 518	0.2	0.3	0.5	0.6
Coefficient of thermal expansion, inches/inch • °F, per ASTM E 831	8.0 x 10 ⁻⁶	8.0 x 10 ⁻⁶	8.0 x 10 ⁻⁶	8.0 x 10 ⁻⁶
Linear variation with change in moisture, inches/inch • %RH, per ASTM D 1037	8.0 x 10 ⁻⁶	8.0 x 10 ⁻⁶	8.0 x 10 ⁻⁶	8.0 x 10 ⁻⁶
Water absorption, % max, per ASTM C 473	10	10	10	10
Surface water absorption, nominal grams, per ASTM C 473	1.6	1.6	1.6	1.6
Mold resistance per ASTM D 3273*	10	10	10	10
Bending Radius	25'	25'	25'	30'

*ASTMD3273 Mold Resistance Testing - In independent lab tests conducted on USG Securock Gypsum-Fiber Roof Board and USG Securock Glass-Mat Roof Board at the time of manufacture per ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber, both panels scored a 10. The ASTM lab test may not accurately represent the mold performance of building materials in actual use. Given unsuitable project conditions during storage, installation or after completion, any building material can be overwhelmed by mold. To manage the growth of mold, the best and most cost-effective strategy is to protect building products from water exposure during storage and installation and after completion of the building. This can be accomplished by using good design and construction practices.

Submittal Approvals:

Job Name		
Contractor		Date

Product Information

See usg.com for the most up-to-date product information.

Trademarks

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Note

Products described here may not be available in all geographic markets. Consult your U.S. Gypsum Company sales office or representative for information.

Notice

We shall not be liable for incidental or consequential damages, directly or indirectly

sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than their intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from the date it was or reasonably should have been discovered.

Safety First!

Follow good safety and industrial hygiene practices during handling and installation of all products and systems. Take necessary precautions and wear the appropriate personal protective equipment as needed. Read material safety data sheets and related literature on products before specification and/or installation.



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RF5/rev. 10-13
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PRE-TAPED WALKWAY PADS

PRODUCT DESCRIPTION

Mule-Hide Pre-Taped Walkway Pads are designed to protect the membrane in areas exposed to repetitive foot traffic.

BASIC USES

Mule-Hide requires walkways to be installed at all traffic concentration points, such as roof hatches, access door, rooftop ladders, etc. regardless of traffic frequency. Walkways are also required if regular maintenance (once a month or more) is necessary to service rooftop equipment.



SPECIFICATIONS

Typical Properties and Characteristics		
Color		White or Black
Pad Thickness		0.182"(4.6mm) ± 10%
Tensile Strength	ASTM D412 Unaged	500 psi
Tear Resistance	ASTM D624 Unaged	250 lbf/in
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.		

PACKAGING

Pads: 30 inches X 30 inches - 50 per skid (75 cm X 75 cm)

BENEFITS & SUPPLEMENTAL STATEMENTS

- Product has excellent tear, puncture and UV resistance.
- Provides a slip resistant surface.
- Available in both Black and White

INSTALLATION INSTRUCTIONS

1. The entire surface where the Walkway Pad will be applied must be clean. The adhesive on the back of the Walkway Pad will not adhere to dusted or dirty surfaces. Any residual contamination will be detrimental to the bond strength of the adhesive.
2. Remove all foreign material from roofing membrane.
 - a. Remove excess mica dust or talc from membrane surface by brooming or wiping with a clean, dry rag.
 - b. The use of Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks.
Note: Permeation-resistant gloves (that meet ANSI/ISEA 105- 2005) are required for hand protection when cleaners or primers are being used.
 - c. Allow the membrane to dry thoroughly before proceeding.
3. Apply tape primer with a clean Scotch-Brite pad. Scrub the area of the membrane (where the Walkway Pad is to be applied) in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.

PRE-TAPED WALKWAY PADS

INSTALLATION INSTRUCTIONS (continued)

Note: The use of excessive amounts of primer will not enhance the adhesion of the Walkway Pad to the EPDM membrane. Use only the amount necessary to obtain 100% coverage of the area where the Walkway Pad will be applied.

4. Allow the primer to properly flash off until it does not transfer to a dry finger touch. Install the Walkway Pads as soon as the primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
5. Allow a 1" (25 mm) wide break between adjoining Walkway Pads. Do not continue Walkway Pads over field seams. Allow a minimum 1" break (25 mm) over field seams.
Review Mule-Hide specifications and details for additional information.

PRECAUTIONS

This product is to be used as a walkway only and is not designed as a substitute for ballast. Pre-Taped Walkway Pads cannot be installed within 10' (3 m) of the roof perimeter or on projects which exceed 50' (15 m) in height for ballasted systems. Concrete pavers may be used in these areas. When installing pre-taped walkway pads in conjunction with ballast, avoid entrapment of small ballast below walkway pads. Pre-Taped Walkway Pads are a maintenance item and are not covered under the Mule-Hide membrane systems warranty.

PROTECTION & SAFETY

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

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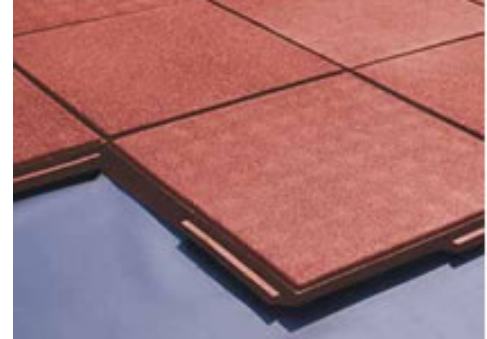
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MULE-HIDE RUBBER PAVER BLOCKS

PRODUCT DESCRIPTION

Mule-Hide Rubber Paver Blocks are an environmentally friendly product that provides superior protection to the underlying membrane. These Rubber Paver Blocks feature a resilient, shock-absorbing, weather-resistant traffic surface. Pavers lock together to provide multi-directional drainage patterns eliminating the need for protective mats. The pavers consist of 90% post-consumer recycled content, providing an environmentally friendly product.



BASIC USES

Used as a paver system for all Mule-Hide Membranes.

TYPICAL PHYSICAL PROPERTIES

Property	Test Method	Typical Characteristics
Dimensions @ 78°F (26°C)	N/A	24" x 24" ± ¼"
Weight	N/A	6 lbs per square foot
Water Surface Density	ASTM D3676	66 lbs per cubic foot
Coefficient of Thermal Expansion	N/A	1.10 x 10 ⁻³ in. / ft. / °F
Tensile Strength	ASTM D412	107 psi
Elongation at Break	ASTM D412	165%
Tear Resistance	ASTM D624	33 lbs / in.
Abrasion Testing, Taber Abrader 1000 g. wt., 2000 cycles, H-21 wheel	ASTM D3389	0.75 g. loss
Resistance to Outdoor Ultraviolet Weathering	Xenon Arc, 500 hrs. exposure, 178°F (81°C), 50% relative humidity	85% tensile retention 100% elongation retention
Burning Pill Test	ASTM D2859	Pass
Freeze / Thaw Cycling	ASTM C67	No Deterioration
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.		

COLORS

Available in BLACK and TERRA COTTA

INSTALLATION INSTRUCTIONS

Mule-Hide Rubber Paver Blocks are installed over a completed roofing membrane. The pavers are loose laid and interlocked, offering superior protection to the membrane while still maintaining accessibility to the membrane. This system can be used over a variety of roofing systems and is ideal for those roofs that are prone to heavy maintenance traffic. The Mule-Hide Rubber Paver Blocks are not recommended for use in areas that are subject to small, narrow point loading, such as chairs with narrow legs or high heeled shoes.

PROTECTION & SAFETY

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MULE-HIDE RUBBER PAVER BLOCKS

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MULE-HIDE YELLOW WARNING STRIP

PRODUCT DESCRIPTION

Mule-Hide Yellow Warning Strip is a Bright Yellow colored, nominal 30-mil (0.76mm) thick non-reinforced TPO membrane laminated to a nominal 30-mil (0.76mm) thick, fully cured synthetic rubber pressure-sensitive adhesive. Yellow Warning Strip is available in 12-inch (305-mm) wide by 100-foot (30 m) long rolls.

BASIC USES

Yellow Warning Strip is intended for use on EPDM, TPO, or Hypalon roofing systems to provide a visual warning of an impending hazard (i.e. roof edge, deep drain sump, skylight, etc.) Meant to be beneficial when maintenance personnel are frequently on the roof.

Yellow Warning Strip cannot be used for flashings or as a coverstrip.



TYPICAL PROPERTIES AND CHARACTERISTICS

Typical Properties and Characteristics	
Tensile Strength, ASTM D412	2,500 psi (17.2 MPa) minimum 2,900 psi (20.0 MPa) typical
Elongation, ASTM D412	600% minimum 750% typical
Hardness, ASTM D2240	Typical 80, Shore A
Color	YELLOW
Base	Membrane - Non-reinforced TPO Adhesive - Synthetic Rubber
Solids	100%
Nominal Thickness	0.060" (1.52mm)
Nominal Width	Membrane - 12" (300mm)
Nominal Length	100 ft. (30.5 m)
Net Weight per Roll	44 lbs (10kg)
Packaging	One Roll/Carton
Shelf Life	1 Year
Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.	

LEED Information

LEED Information	
Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Eugene, OR
Solar Reflectance Index (SRI)	N/A

MULE-HIDE YELLOW WARNING STRIP

INSTALLATION INSTRUCTIONS

1. Clean the existing membrane with Weathered Membrane Cleaner and natural fiber rags. A Scotch-Brite® Pad may be necessary to remove a heavy build-up of dirt. Pour a small amount of Weathered Membrane Cleaner over a primer pad and rub area to receive strip in a circular motion. Wipe away residual dirt with clean rags.
2. Using a clean Scotch-Brite® Pad, apply Tape Primer to the area of the membrane to be overlaid. The properly primed area will be uniform in color without streaks and free of globs or puddles.
3. The entire surface where the flashing will be applied must be clean. The adhesive on the back of the Yellow Warning Strip will not adhere to dusted/dirty surfaces. Any residual surface contamination will be detrimental to the bond strength of the adhesive.
4. Install Yellow Warning Strip immediately after the Tape Primer flashes off to minimize potential dust contamination and to promote adhesion in colder weather.
5. Peel off 10-12" (250-300 mm) of the protective release liner from the Yellow Warning Strip. Position the strip over the area to be overlaid and press down using firm, even hand pressure across the entire area. Continue this process until the full area to be overlaid is completed. (Cut-Edge Sealant is not required on edges of the Yellow Warning Strip).
6. Immediately roll the Yellow Warning Strip with a 2" (50-mm) wide neoprene roller using positive pressure. Roll across the Yellow Warning Strip edge, not parallel to it. **In areas where the Yellow Warning Strip crosses a metal joint, a membrane seam (T-joint) or at an end lap use a hot air gun to heat the top surface of the Yellow Warning Strip and crease the material into the step-off.** This process reduces the possibility of a water channel forming.
8. NOT FOR USE AS FLASHING OR AS A COVERSTRIP.
Review Mule-Hide Specifications and Details for installation information.

PRECAUTIONS

1. Yellow Warning Strip cannot be used for flashing corners, pipes, T-joints, or butt joints on TPO Fleece BACK systems, or any angled metal flanges such as gravel stops or other canted metal edgings.
2. Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
3. Due to solvent flash-off, condensation may form on freshly applied Tape Primer when the ambient temperature is near the dew point. If condensation develops, the application of Tape Primer and Yellow Warning Strip must be discontinued since proper adhesion will not be achieved.
4. Allow the surface to dry and apply a thin freshener coat of Tape Primer to the previously coated surface and apply Yellow Warning Strip when conditions allow.
5. Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oil, animal fats, etc.) or direct steam venting to come in contact with the Yellow Warning Strip.
6. KEEP OUT OF THE REACH OF CHILDREN.

STORAGE & HANDLING

1. Material should be stored in a clean, dry area and protected from extreme temperatures.
2. Prolonged job site storage temperatures in excess of 90°F (32°C) may affect product shelf life. In warm, sunny weather; keep Yellow Warning Strip rolls in their box or in a shaded area until ready to use.
3. Storage and use of Yellow Warning Strip at temperatures below 40°F (4°C) will result in a loss of adhesive tack, and in extreme cases, will result in no bond to the substrate.
4. Overnight storage must be available to keep the temperature of the Yellow Warning Strip at a minimum of 60°F (15°C). Hot boxes for job site storage must be provided to maintain a minimum product temperature of 40°F (4°C).

MULE-HIDE YELLOW WARNING STRIP

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MULE-HIDE HP PROTECTIVE MAT

PRODUCT DESCRIPTION

A nominal 6.0-ounce per square yard (140 grams per square meter) UV resistant polypropylene needle punched fabric.

BASIC USES

Can be used above the membrane as a slipsheet for crushed stone or pavers or below the membrane as a minimum underlayment mat for Mule-Hide's Mechanically-Attached or Ballasted System applications. Consult current specifications for underlayment requirements.

TYPICAL PHYSICAL PROPERTIES

Description	ASTM Test Method	Average Roll Values
Tensile Strength (Grab)	D 4632	160 lbs. (68 Kg)
Burst Strength (Mullen)	D 3786	350 psi (2413 kPa)
Elongation (Ultimate)	D 4632	> 50%
Puncture Strength	D 4833	90 lbs. (41 Kg)
Trapezoidal Tear	D 4533	65 lbs. (30 Kg)
UV Resistance (500 Hr St. Ref)	D 4355	> 70%
Permeability Coefficient	D 4491	0.2 cm/sec
pH Resistance		2 - 13
Thickness		0.65 in (1.65 mm)

PACKAGING

Packaged in rolls 15' x 300' (4.6m x 92m)
Coverage: 4500 SF (405 SM)
Weight per Roll: 210 lbs (83Kg)
Roll Diameter: 18 in (460 mm)

INSTALLATION INSTRUCTIONS

Mechanically Attached Roofing Systems: Install Mule-Hide HP Protective Mat over the substrate with all edges overlapped a minimum of 3" (75 mm). HP Protective Mat must be fastened to the roof deck with a minimum of one insulation fastener and plate per every 4 square feet.

Ballasted Roofing Systems: When specified under Mule-Hide roofing membrane, position the Mule-Hide HP Protective Mat loosely over the substrate with all edges overlapped a minimum of 6" (150 mm). The roofing membrane must be positioned to completely cover the previously installed HP Protective Mat.

The HP Protection Mat can also be installed on top of the Mule-Hide roofing membrane as a protection layer, typically under pavers or crushed stone. After completing all of the membrane and flashing seams, loosely lay the Mule-Hide HP Protective Mat over the membrane with the side laps overlapped a minimum of 6" (150 mm) and end laps overlapped 12" (300 mm). Prior to placement of ballast, extend the HP Protective Mat a minimum of 2" (50 mm) above the anticipated ballast level at the perimeter and penetrations, except at roof drains and scuppers.

The fabric must extend to drain bases and scupper openings but must not cover or restrict flow to the drains. Additional matting must be installed around penetrations to prevent direct contact between crushed stone and flashing.

MULE-HIDE HP PROTECTIVE MAT

INSTALLATION INSTRUCTIONS (Continued)

Note: Following placement of the fabric, install ballast, temporary ballast, or spot adhere with bonding adhesive to prevent the movement or displacement of unballasted fabric.

PROTECTION & SAFETY

This product is not hazardous as defined in CFR 1910.1200.
Dust may be irritating to respiratory tract and eyes.
Material is flammable. Do not expose to flame.

Mule-Hide maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers. Mule-Hide's Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Mule-Hide products in your facilities.

ADDITIONAL INFORMATION

The information given on this PDS is subject to change without notice. Always check the Mule-Hide website at www.mulehide.com for the latest information, changes and updates or contact Mule-Hide Products Company at 800-786-1492.

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