

MULE-HIDE PRODUCTS CO., INC.
SELF-ADHERING MODIFIED BITUMEN SYSTEM SPECIFICATION

075200/MUL

PART 1 – GENERAL

1.01 Description

A. Scope:

1. Furnish and install a Self-Adhering Modified Bitumen Roofing Membrane with flashings and accessories necessary to comprise a roofing system. The Mule-Hide Self-Adhering Modified Bitumen 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 Self-Adhering Modified Bitumen Roofing System utilizes an SBS or APP self-adhering membrane with a finished surface consisting of granules, a smooth surface or a smooth surface with a coating. The systems consisting of the self-adhering membranes (cap sheets and base sheets) that may be directly adhered to an approved substrate or may be adhered to the mechanically attached Mule-Hide Nail Base.

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. Fasteners
5. Roof Membrane
6. Roof Membrane Flashings
7. Metal Flashings
8. Sealants
9. Walkways

1.02 Quality Assurance

- A. Installer Qualifications: A qualified contractor that is registered with the roofing system manufacturer and able to install manufacturer's products and is eligible to obtain manufacturer's system warranties.
- B. Manufacturer Qualifications: A qualified manufacturer that has a roofing membrane assembly that has been tested and meets or exceeds the UL listing and FM approval requirements identical to that listed in the project specification.
 1. Exterior Fire Testing: UL Class A, B or C; testing in compliance with ASTM E 108 or equivalent
 2. Factory Mutual Research Corporation: Uplift testing equal to FM 1-60 or FM 1-90 as indicated in the project specification.
- C. Obtain only those components that comprise the roofing system as supplied or approved by the roofing system manufacturer for the warranty requested in the project specifications.

- D. Should details in the project specification not meet the requirements of the manufacturer, then the manufacturer shall submit details to replace the original documents.
- E. No deviations to this specification and accompanying details are permitted without the prior written approval of the roofing system manufacturer.
- F. Pre-roofing conference: Prior to the roof construction, a conference among the Owner, Owner's Architect, project supervisor, roofing contractor, third party inspectors and any other representatives of any trades affected by the roof installation should be held to review methods of installations and scheduling.
 - 1. Pre-roofing conference should include a review of the roofing specification, construction details and coordination of work required of other trades necessary to complete the roofing system.
 - 2. Review deck substrate conditions and structural loading limitations for purposes of storing the roofing materials.
 - 3. Review scheduling of work and temporary protection requirements for the materials stored on the roof and the roofing system. Temporary protection from damages by other trades should be reviewed.
- G. Prior to obtaining the warranty, an inspection of the roof system shall be performed by a representative of the manufacturer. It shall be the manufacturer's representative's responsibility to inspect the roof system and complete the inspection report/punch list noting deficiencies and recommended repairs. It shall be the responsibility of the roofing contractor to complete any and all punch list items found during the inspection.
- H. 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 Warranty 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, primer and sealant shall be stored at temperatures between 60°F and 80°F. The workability and performance of these products may be affected when exposed to lower temperatures. Products shall be restored to proper 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. 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.
- B. Only as much new roofing as can be made watertight each day shall be installed each day. This includes all flashing work.
- C. 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.
- D. Prior to and during application, all dirt, debris and dust shall be removed from surfaces to be roofed for both new and reroofing substrates.
- E. 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 Warranty Department for review.
- F. 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.

- G. 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 Warranty Department in writing.
- H. 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.
- I. Do not install the Mule-Hide Self-Adhering Membrane in direct contact with any product containing coal tar pitch, creosote or penta-based materials. Consult the Mule-Hide Customer Service Department for special installation requirements.
- J. 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 Customer Service Department for recommendations if such conditions exist.
- K. 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.
- L. 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.
- M. 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.
- N. Any unusual or concealed conditions discovered during the course of the work are 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.
- O. 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.
- P. 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.

1.06 Warranties

Mule-Hide offers a material only limited warranty or more comprehensive system warranties.

A. Mule-Hide's Roofing Membrane Limited Warranty

Mule-Hide offers a 10, 12 to 15-year Roofing Membrane Limited Warranty. The Warranty covers only the Mule-Hide Self-Adhering Modified membrane (or portion thereof) determined by Mule-Hide to be defective and resulting in roof leaks. This Warranty does not cover workmanship or accessories and Mule-Hide does not inspect the installation before issuing this Limited Warranty. Mule-Hide promises to supply replacement material to replace the affected area of Membrane or to provide a credit towards the purchase of new Membrane.

B. Mule-Hide Standard System Warranty For Commercial Buildings

Mule-Hide also offers a Standard System Warranty for Commercial Buildings. This 10, 15 or 20-year labor and material Warranty covers Mule-Hide labeled membrane and accessories installed by a Mule-Hide Warranty Eligible contractor. This Warranty does not cover insulation or its attachment system and it is not available for residential projects. Metal flashing components are not covered under this Warranty. Mule-Hide promises to repair leaks in the Mule-Hide membrane or other components supplied by Mule-Hide that occur during the Warranty term solely as a result of deteriorated or defective Mule-Hide products or related workmanship.

C. Mule-Hide Premium System Warranty For Commercial Buildings

Mule-Hide also offers a Premium System Warranty for Commercial Buildings. This 10, 15 or 20-year labor and material Warranty covers Mule-Hide labeled membrane, insulation, and fasteners installed by a Mule-Hide Warranty Eligible contractor. Metal Era's Anchor-Tite metal edge systems may be included under this Warranty if installed according to Mule-Hide specifications. Insulation materials not labeled by Mule-Hide may be used only after obtaining Mule-Hide's prior written approval. Additional fees may be required. This Warranty is not available for recover applications or residential projects. Mule-Hide promises to repair those leaks in the Mule-Hide membrane or other components supplied by Mule-Hide that occur during the Warranty term solely as a result of deteriorated or defective Mule-Hide products or related workmanship.

D. 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.

E. Tie-ins to other type of roof system are not covered by Mule-Hide warranties.

PART 2 - PRODUCTS

2.01 General

- A. Mule-Hide self-adhering membranes are premium elastomeric roofing products manufactured via patented **Adeso®** dual compound technology, whereby the membrane consists of either an APP compound or SBS compound on the top layer and a self-adhesive compound on the bottom layer.
- B. Mule-Hide self-adhering modified bitumen membranes are reinforced with a strong fiberglass or polyester mat to guarantee excellent dimensional stability.
- C. Mule-Hide **SA-SBS Cap Sheets** and **SA-APP Cap Sheets** have side laps that have a patented **SEALLap®** feature and a patented roll end featuring **FASTLap®**. Cap sheets have a split release film on the bottom surface.

2.02 Roofing Membrane

- A. Mule-Hide Self-Adhering Modified Bitumen is available in APP and SBS. The membrane is manufactured to meet or exceed the minimum physical properties conforming to ASTM D 6222 Type I, Grade S and Grade G for APP and ASTM D 6164 Type I, Grade G for SBS. Both membranes meet or exceed the minimum physical properties conforming to ASTM D1970.
- B. Refer to the individual Product Data Sheets for additional information and physical properties.

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 SA Base Sheet – is a premium elastomeric roofing product, manufactured via patented **Adeso®** dual compound technology, whereby the membrane consists of an SBS compound on the top and a pressure-sensitive adhesive compound on the bottom. It is reinforced with a strong, flexible fiberglass mat to guarantee excellent dimensional stability and provide pliability at low temperature conditions.
- B. Mule-Hide # 121 Asphalt Primer - a cutback asphalt primer that meets ASTM D 41 specification. Used for substrates requiring a primer to improve adhesion. Available in 5-gallon pails.
- C. Mule-Hide SA-MB Water Base Vertical Primer – an acrylic latex-base primer used on vertical substrates. This primer contains no V.O.C.'s and improves the vertical adhesion of the Self-Adhering Modified membranes. Available in 3-1/2 and 5-gallon pails.
- D. Mule-Hide Mod Bit Flashing Adhesive - an asbestos free, fiberated, trowel grade, rubberized flashing adhesive with bonding strength designed for vertical surfaces, seaming, and detail completion on roofing systems utilizing the Mule-Hide self-adhering modified bitumen membranes.
- E. Mule-Hide Mod Bit Sealant - an asbestos free, cartridge grade rubberized flashing adhesive designed for seaming and detail completion on roofing systems utilizing the Mule-Hide self-adhering modified bitumen membranes.
- F. 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.
- G. Mule-Hide Pourable Sealer - a two-component, liquid (100% solids) polyurethane elastomer used as filler for pitch pockets.
- H. 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.
- I. 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.
- J. 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.
- K. 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. 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.
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 Self-Adhering Modified Bitumen Membranes, adhesives, primer and other Mule-Hide Accessories.
3. The following insulations are acceptable for use in a Mule-Hide Self-Adhering Modified Bitumen 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. 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. **Requires overlayment.**
 - c. Extruded Polystyrene must be a minimum of 3/4" thick (1/2" min. over smooth surfaced BUR). **Requires overlayment.**

- d. State and local building codes should be reviewed regarding the installation of expanded or extruded polystyrene insulation directly over a steel deck.
4. Following is a list of acceptable materials that may be used as an overlay when using non-acceptable insulations:
- a. Mule-Hide Nail Base mechanically fastened over non-acceptable substrate/insulation. Refer to 3.03 and details #MH-MB-MB FM 1-60 and MH-MB-NB FM 1-90 for fastening pattern.
 - b. High density wood fiberboard (**coated six-sides**) 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. Dens-Deck Primed (primed with Mule-Hide #121 Asphalt Primer) may be used as an overlay over non-compatible insulation, over existing roof system (recover application) or as a fire barrier board. Contact Mule-Hide Customer Service for acceptable thicknesses and fastening patterns.
 - d. New Plywood (as a deck or overlay) minimum thickness of 15/32"
 - e. New OSB – Oriented Strand Board- (as a deck or overlay) minimum thickness of 1/2" as a deck, minimum of 7/16" as an overlay. Rough side of the board must be placed up.
5. 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 Customer Service Department for specific requirements. Premium warranties are not available for recover applications without an independent moisture survey.

D. Insulation Adhesive

- 1. Insta-Stik™ - A single component polyurethane, construction grade, low-rise expanding foam adhesive used for attaching approved insulations to concrete, cellular lightweight insulating concrete, gypsum or cementitious wood fiber decks.
- 2. PLIODECK® – A one part urethane low-rise adhesive. Used for attaching approved insulations to concrete, cellular lightweight insulating concrete, gypsum or cementitious wood fiber decks.
- 3. OlyBond™ - A dual-component, low-rise, reaction-cure, polyurethane foam spray adhesive system. Used for attaching approved insulations to concrete, cellular lightweight insulating concrete, gypsum or cementitious wood fiber decks.

E. 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 Customer Service 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, primers, sealants and adhesives. Use with adequate ventilation. Avoid prolonged contact of solvents, sealants, primers and adhesives with skin. Solvent resistant rubber gloves should always be worn during use.
- C. 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 Mule-Hide Modified membranes. Contact Mule-Hide's Customer Service Department for recommendations for compatible color coatings.
- E. Do not allow muriatic acid (masonry cleaner) to come in direct contact with the Mule-Hide Modified membranes, flashings or accessories.
- F. Do not allow Mule-Hide Modified 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 Self-Adhering Modified Bitumen Roof System should be installed when weather is dry, fair and the material interface temperatures (air, roof deck, membrane) are 40°F (5°C) and rising. Membrane must be maintained at a minimum of 60°F prior to installation.

PART 3 - EXECUTION

3.01 General

Mule-Hide Self-Adhering Modified Bitumen membranes should not be installed in temperatures below 40°F (5°C). The Self-Adhering Modified roofing system should be installed in dry fair weather where the material interface temperatures (air, roof deck, membrane) are 40°F (5°C) and rising.

3.02 Substrate Conditions

The following general conditions apply to the substrate that will receive a Mule-Hide Self-Adhering Modified Bitumen 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 Self-Adhering Modified Bitumen 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 Customer Service 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 Self-Adhering Modified Bitumen Roofing System over the following deck substrates provided that an acceptable insulation or overlay 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 psi. 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 shall be removed before installing the Mule-Hide Self-Adhering Modified System. Do not roof over moisture in any form.
- D. Recover Projects
 1. When installing a new roof system over 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 Self-Adhering Modified 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 Self-Adhering Modified roof system and must be removed.
4. Existing smooth surfaced built-up roof systems and smooth surfaced modified roof systems may be adhered directly to, after being primed with Mule-Hide #121 Asphalt Primer, or must have an acceptable insulation or overlay prior to installing the Mule-Hide Self-Adhering Modified 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. Wood nailers shall be installed as specified by the project specifier and shall be in compliance with the Mule-Hide Standard Details.
- C. 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.
- D. 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.
- E. 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. Each row of insulation shall be offset against the previous row by a minimum of 8 inches. 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 staggered.
- 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 Self-Adhering Modified Roofing System.

- D. Determine the insulation fastening patterns that will be used for the perimeter, corners and field of the roof. 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. For acceptable deviations to this requirement contact Mule-Hide Customer Service.
- 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 Self-Adhering Modified 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 an approved low-rise foam adhesive 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. Approved Low-rise foam must be installed in compliance with the recommendations of the adhesive manufacturer.
- I. If no insulation is required over a structural concrete deck, Mule-Hide Self-Adhering Modified Roofing System can be adhered to the primed concrete surface.
- J. 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 Customer Service 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. Commence the installation of the roofing system at the lowest point of the roof (or work area), proceeding up the slope toward the highest. Lap all sheets shingle fashion so as all seams shed water. Apply only when the weather is dry and material interface temperatures (air, roof deck, membranes) are 40° F (5° C) and rising. Membranes must be maintained at a minimum of 60° F prior to installation.
- B. Follow the guidelines for the specific type of material and layer as outlined in the following sections.
- C. Base Sheet Installation

Mule-Hide offers two base sheets for use with the modified bitumen cap sheets.

- A. Nail Base - This sheet is used when mechanical attachment of the base sheet is the preferred method of attachment. The sheet has the polyolefin film on the top surface (with lay lines) and a sand finish on the bottom.

1. Nail Base is typically attached with the appropriate fasteners using the following patterns:
 2. FM 1-60 = 12" on center on the seams, one row 18" on center down the center of the sheet.
 3. FM 1-90 = 12" on center on the seams, two rows 18" on center down the sheet, each row being positioned 12" in for the edge of the sheet with fasteners staggered 9" between rows.
 4. Fasteners used must be specifically designed for the deck type and must meet FM Approval for the specific fastening pattern. Attachment of the Nail Base at the base of all vertical surfaces (walls, parapets and curbs) and angle changes (valleys, saddles and crickets) shall be 12" on center with either the Mule-Hide Insulation Plates or Barbed Seam Plates and Mule-Hide deck Fasteners. If nailing directly to a wood deck, attachment with cap nails is 8" o.c.
 5. Nail Base seams are overlapped 3" for FM 1-60 attachment and overlapped 4" for FM 1-90 attachment. End laps are overlapped 6".
 6. Nail Base end laps should be staggered at least three feet between courses of sheets.
 7. Nail Base will shed water but seams are not sealed so it is important to install the cap sheet or inter-ply membranes as soon as possible to make the roof watertight.
 8. Nail Base is also recommended over plywood decks when the ventilation of the air space below the deck is questionable. If installing the self-adhering membranes over a plywood or OSB deck and it cannot be confirmed that the airspace below the deck is properly vented, then the Nail Base should be mechanically attached to the deck prior to the application of the SA Base Sheet or the SA Cap Sheet.
- B. SA Base Sheet - This is a fiberglass mat reinforced modified bitumen membrane consisting of an SBS compound on the top layer and a self-adhesive compound on the bottom layer. The SA Base Sheet is finished with a polyolefin film (with lay lines) on the top surface and a split release film on the bottom surface.
1. Unroll the SA Base Sheet and position the membrane in the desired location on the substrate (starting at the lowest point on the roof) and proceed as follows.
 2. When installing a multi-ply system it is always good to start the installation of the SA Base Sheet with a half width sheet as the bottom course followed by full sheets working up the roof to the high point. By installing the first sheet as a half sheet, the seams in the cap sheet will not stack directly on top of the seams in the SA Base Sheet. While the sheet is open, slit the sheet down the middle the entire length of the sheet creating two 18" wide sheets. Position the first half sheet in the desired location. The second half of the sheet may be used as the next adjoining sheet to be installed along the low point (or edge) of the roof.
 3. After positioning the first sheet of material, fold the material back onto itself (lengthwise), remove the split back release paper from the exposed side and gradually push the material into place.
 4. Apply even pressure along the entire length of the sheet (from the center to the outer edges) to avoid air inclusions or wrinkles. Roll edges firmly with a silicon

rubber or other suitable roller to ensure 100% adhesion. Thoroughly roll the sheet to ensure full contact to the substrate.

5. Repeat the procedure for the other side of the sheet.
6. After adhering the sheet, it is required that uniform pressure be applied to the entire roll area by using a minimum 75 lb linoleum roller, water filled lawn roller or similar weighted roller. Care must be taken to prevent injury when rolling membrane, especially on sloped surfaces.
7. Position the next sheet by overlapping seams and line up the overlap of the top sheet edge with the inside of the bottom sheet's factory selvage edge (3" overlap). Overlap end laps a minimum of 6". Lay lines are provided on the SA Base Sheet 3" in from the edges of the sheet for aligning the overlap of the side seams.
8. When completing end laps, cut the top corner of the top sheet on a 45-degree angle (start the cut approximately 3 inches in from the top edge and finishing down 3 inches from the top edge). Press the top sheet down and roll thoroughly with a silicone roller. When installing the next row of sheets, prior to pressing down the seam, apply a bead of Mule-Hide Mod Bit Sealant along the cut edge. This will seal any void along the cut edge when the next sheet is installed over the end lap. End laps should be staggered approximately 3 feet apart.
 - a. The SA Base Sheet is specifically designed to apply direct to approved substrates (insulation, deck materials, underlayments, overlay materials).
Note: Some substrates may require priming with Mule-Hide # 121 Asphalt Primer.
 - b. When applying to wood decks with slopes greater than 2" per foot, backnailing along the high side of the membrane (in the 3" wide seam) with fasteners spaced a maximum of 12" on center is required. When applying the self-adhered membranes over insulated decks with slopes greater than 2" per foot, it is recommended that the sheets be installed running with the direction of the slope. Backnailing will then be done in the end laps with Mule-Hide 2" barbed seam plates or 3" dia. insulation plates and Mule-Hide deck fasteners. Contact Mule-Hide if attachment to decks other than wood concrete or steel is necessary.
 - c. Application direct to structural concrete, aged wood (plywood, OSB), metal, metallic surfaces, smooth BUR, smooth Modified Bitumen and Dens-Deck Prime require the application of Mule-Hide # 121 Asphalt Primer prior to application of the SA Base Sheet. Primer must be allowed to dry thoroughly.
 - d. SA Base Sheet should be turned up vertical surfaces a minimum of 3" to provide a watertight seal.
 - e. Details are completed with the use of hot-air welding equipment or with **Mule-Hide Mod Bit Flashing Adhesive** in combination with the **SA Base Sheet** membranes and cap sheets.
 - f. The SA Base Sheet may be installed in multiple layers to meet extended warranty requirements.
 - g. The SA Base Sheet may be left exposed for up to 90 days before the installation of the cap sheets.

C. Cap Sheet Installation

Mule-Hide offers both APP and SBS self-adhering cap sheets. Both products are installed in a similar manner.

1. Unroll the self-adhering cap sheet and position the membrane in the desired location on the substrate (starting at the lowest point on the roof) and proceed as follows.
2. When installing a multi-ply system it is always good to start the installation of the base sheets with a half width sheet as the bottom course followed by full sheets working up the roof to the high point. By installing the first base sheet as a half sheet, the seams in the cap sheets will not stack directly on top of the seams in the base sheets. If full sheets of base sheet were used to start, then the cap sheet will have to be cut so the seams in the cap sheets don't stack on top of the seams in the base sheets. If cutting the cap sheet, while the cap sheet is open, slit the sheet down the middle the entire length of the sheet creating two 18" wide sheets. Position the first half sheet in the desired location. The second half of the sheet may be used as the next adjoining sheet to be installed along the low point (or edge) of the roof. Remember to offset the end laps at least 3'. (Note if using the second half of the sheet, seaming shall be required by hot air welding or by using the Mule-Hide Mod Bit Flashing Adhesive as there will not be a selvage edge on the remaining material.)
3. After positioning the first sheet of material, fold the material back onto itself (lengthwise), remove the split back release paper from the exposed side and gradually push the material into place.
4. Apply even pressure along the entire length of the sheet (from the center to the outer edges) to avoid air inclusions or wrinkles. Roll edges firmly with a silicon rubber or other suitable roller to ensure 100% adhesion. Thoroughly roll the sheet to ensure full contact to the substrate.
5. Repeat the procedure for the other side of the sheet.
6. After adhering the sheet, it is required that uniform pressure be applied to the entire roll area by using a minimum 75 lb linoleum roller, water filled lawn roller or similar weighted roller. Care must be taken to prevent injury when rolling membrane, especially on sloped surfaces.
7. Position the next sheet by overlapping seams and line up the overlap of the top sheet edge with the inside of the bottom sheet's factory selvage edge (3" overlap). Overlap end laps a minimum of 6". The end of each roll is provided with the patented, granule-free, **FASTLap®**.
8. When completing end laps, cut the top corner of the top sheet on a 45-degree angle (start the cut approximately 3 inches in from the top edge and finishing down 3 inches from the top edge). Align the next sheet so the end of the sheet covers the **FASTLap®**. Remove the protective release film from the **FASTLap®** and apply firm even pressure to the seam area. Thoroughly roll the end lap with a silicone roller. End laps should be staggered approximately 3 feet apart. When installing the next row (course) of sheets, prior to pressing down the side seam, remove the protective release film from the **SEALLap®**, apply a bead of Mule-Hide Mod Bit Sealant along the 45-degree cut edge. This will seal any void along the cut edge when the next sheet is installed over the end lap. Press the top sheet down and roll the side laps thoroughly with a silicone roller.

Note: Options to complete end laps when the cap sheets must be cut and the **FASTLap®** is not available, may be completed with the use of hot air welding

equipment or by using the Mule-Hide Mod Bit Flashing Adhesive. In each case, a minimum 6" wide lap is required.

9. Details are completed with the use of hot air welding equipment or with Mule-Hide Mod Bit Flashing Adhesive in combination with the Mule-Hide self-adhering membranes.

3.08 Flashing Installation

- A. Perimeter, protrusions and termination of the field membrane require the application of a flashing system to satisfactorily seal the roofing system. Such areas include but are not limited to walls, curbs, expansion joints, drains and scuppers, pipes, other penetrations and edge details.
- B. Refer to the Mule-Hide published details for information on specific detail assembly and completion.
- C. One ply of the self-adhering modified bitumen membrane is mandatory for completing most details and vertical flashings for material warranties and 10-year system warranties. Additional layers of SA Base Sheet may be required for longer-term warranties. See Flashing details for specific information.
- D. Mule-Hide follows NRCA guidelines and requires a minimum flashing height of at least 8" where possible for completing all vertical details. Refer to each detail for specific guidelines and requirements.
- E. Where a minimum height of 8" cannot be achieved, the architect shall provide acceptable details or agree that the detail is a maintenance item and will not be covered by the warranty. Damages to the roofing system caused by such a detail will not be covered by the Mule-Hide warranty.
- F. Cap sheet used as flashing material shall extend (from the base of the vertical surface) a minimum of 6" out onto the field of the roof. If the field sheets are laid in a manner that does not provide a **SEALLap**® at the base of the vertical surface, the seaming of the flashing to the field sheet may be completed by either hot air welding (entire 6" width must be welded) or by using the Mule-Hide Mod Bit Flashing Adhesive.
 1. If using the Nail Base as the base-ply, the Nail Base is cut flush to the bottom of the vertical surface. The Cap Sheet is turned up the vertical surface a minimum of 4".
 2. If using the SA Base Sheet as the base-ply or as an inter-ply over the Nail Base, the SA Base Sheet is turned up the vertical surface a minimum of 3". The cap sheet is then turned up the vertical surface a minimum of 4".
 3. When installing the flashing material the 4" of cap sheet adhered to the vertical surface is either heated with hot air to raise the asphalt or Mule-Hide Mod Bit Adhesive is applied to this area. This will ensure 100% adhesion of the flashing material to the cap sheet. Refer to Wall/Curb details.
- G. Bare masonry surfaces and aged wood shall be primed with Mule-Hide # 121 Asphalt Primer or Mule-Hide SA-MB Water Base Vertical Primer and allowed to thoroughly dry before applying the self-adhering cap sheet. Block walls may require a second coat.
- H. The maximum height of the vertical flashing without intermittent attachment is 33". Walls higher than 33" will require intermittent attachment in the seams spaced a maximum of 33" apart. Size of the fasteners used may reduce this distance to provide a sufficient seam width. Fasteners with heads 1" diameter or less will require a minimum 3" wide seam. Fasteners utilizing plates 2" or 3" in diameter shall require a 6" seam. End laps shall be a minimum 6" wide. The maximum length of the flashing should not exceed that which can easily be installed with 2 to 3 applicators without wrinkles, loose areas, voids or

fishmouths.

- I. Seams for intermittent attachment, if the **SEALLap®** is not provided, may be completed by hot air welding or with the use of Mule-Hide Mod Bit Adhesive.
- J. Optional method to complete wall flashings is to run the sheets vertically with mechanical attachment in the seams. The material must extend out onto the field a minimum of 6" and shall lap adjoining sheets a minimum of 3". If plates and fasteners are required for mechanical attachment, the side laps must be increased to 6".
- K. Mule-Hide is not responsible for failure of wall flashings to adhere to vertical surfaces where the exterior side of those vertical surfaces has not been properly sealed from wind and moisture.
- L. The top edge of the flashing sheet shall be secured using a termination bar (only when the wall surface above the point of termination is waterproofed), or fastened 8" on center and covered with an approved counterflashing. Termination bar shall be attached at a maximum spacing of 6" on center. The top of the bar shall be caulked with an approved urethane caulking to seal the top edge of the termination.
- M. Do not extend any flashings over "thru-wall" flashings or weep holes.
- N. Exposed Mod Bit Flashing Adhesive and Mod Bit Sealant should be covered with loose granules.

3.09 Cants and Wood Nailers

- A. Cants, while traditionally necessary with modified bitumen and BUR roofing systems are not required with the Mule-Hide self-adhering membranes but are recommended. Cants are optional.
- B. If the architect, design professional or building owner/owner's representative insists on the installation of cants, then they may be incorporated into the deck installation.
- C. Cants must be mechanically attached with approved fasteners (and plates, if needed).
- D. SA Base Sheets shall extend a minimum of 1" above the top of the cant. SA Cap Sheets shall extend a minimum of 2" above the cant and shall be mechanically attached to the vertical surface with appropriate fasteners spaced 8" on center.
- E. Wood Nailers are required at all roof perimeters and certain penetrations as indicated in the Mule-Hide details.
- F. Wood Nailers should be provided on all prefabricated curbs and hatches for attachment of membrane base flashings
- G. Slope changes and rooftop-mounted equipment should be provided with adequate nailer fastening and support.
- H. Sheet metal details must be fully supported by adequately fastened wood nailers.
- I. Wood Nailers should match the height of any insulation, [providing a smooth and even transition between flashings and insulation.
- J. Wood Nailers must be properly spaced with the minimum gap required for expansion and contraction.
- K. Wood nailers and metal flashings should be fastened in accordance with the most current local building code requirements or following Factory Mutual's "Loss Prevention Data

Sheet 1-49, Perimeter Flashing”.

- L. Wood Nailers shall be designed to be capable of resisting a minimum force of 400 lb/ft in any direction.

3.10 Pipe and Vent Flashings

- A. Pipes may be flashed using one of two typical methods:
 - 1. Using a soft metal flashing (lead)
 - a. A soft metal sleeve (typically lead) with a base flange is set over the pipe with the base set in a bed of Mule-Hide Mod Bit Flashing Adhesive. After pressing firmly in place and rolled with a hand roller a second bed of Mod Bit Flashing Adhesive is applied over the base flange extending at least 4" past the edge of the flange (on all sides).
 - b. A piece of cap sheet is cut to fit tightly over the sleeve and extending 4" out past the edge of the flange. Corners of the cap sheet should be rounded. The cap sheet is set over the sleeve and into the bed of adhesive and then thoroughly rolled to ensure proper contact.
 - c. A bead of adhesive or Mod Bit Sealant is applied around the base of the sleeve. Loose granules should be applied over the bead of sealant and around the edge of the cap sheet where any adhesive is showing.
 - 2. Using Cap Sheet material
 - a. This method requires two pieces of cap sheet. One will be used for the base and one will be used to wrap around the pipe.
 - b. Starting with the piece to wrap the pipe; cut a piece of cap sheet that will be at least 9" long and wide enough to wrap around the pipe with about 1-1/2" overlap. The 9" length is to provide the 8" minimum height requirement for flashings and when cut will extend out onto the base 1". An option is to cut the cap sheet long enough so there is sufficient material to turn out 1" onto the field and the excess at the top of the pipe can be turned down into the pipe 1" to 1-1/2".
 - c. Once the cap sheet is cut to a proper size, make a series of cuts along the end of the sheet that will turn out onto the field. The cuts should be about 1" long and spaced 1/2" to 1" apart. The smaller the diameter of the pipe the closer the spacing of the cuts should be made.
 - d. Remove the release film and set the sheet with the inside of the cuts tight to the base of the pipe. Tightly wrap the sheet and using a hot air welder, seam the overlap to the sheet pressing firmly with a silicone roller. The welder is then used to seam all the little flanges (created by the cuts) to the field cap sheet. This will complete the first piece.
 - e. Cut the second piece (base) of cap sheet so that it extends a minimum of 6" in all directions from the perimeter of the pipe. Round off the corners of the sheet and cut out the center of the sheet to fit tightly over the pipe.
 - f. The base may be placed over the pipe and hot air welded to the field sheet (welding 100%) or the base may be set in a bed of Mod Bit Flashing Adhesive. In either case, roll the base thoroughly to ensure 100% contact. Apply a bead of Mod Bit Flashing Adhesive or Mod Bit Sealant around the base and cover with loose granules to complete the detail. If using Mod Bit Flashing Adhesive to set the base, cover any

exposed adhesive with loose granules.

B. Vents

1. Vents typically have flanges around their base and are set in a bed of Mod Bit Flashing Adhesive.
2. A piece of cap sheet is cut to fit tightly over the vent and extending 4" out past the edge of the flange. Corners of the cap sheet should be rounded. A bed of Mod Bit Flashing Adhesive is applied over the flange of the vent extending at least 4" out on to the field sheet. The cap sheet material should be cut to size to fully cover the bed of Mod Bit Flashing Adhesive. The cap sheet is set over the vent and into the bed of adhesive and then thoroughly rolled to ensure proper contact.
3. A bead of adhesive or Mod Bit Sealant is applied around the base of the sleeve. Loose granules should be applied over the bead of sealant and around the edge of the cap sheet where any adhesive is showing.

3.11 Roof Drains and Drainage

- A. The IBC (International Building Code) requires that a minimum roof slope of 1/4" per foot be obtained to promote proper drainage and maximize long-term performance of the roof system. Mule-Hide follows these recommendations. Drains shall be of sufficient number, size and located to provide satisfactory and rapid drainage of the entire roof surface (within 24 to 48 hours of precipitation).
- B. Adequacy of drainage provisions, placement, sizing and number of drains required is the responsibility of the building owner/owner's representative, or its design professional. Drainage should meet the requirements of codes as well as standard industry recommendations.
- C. In re-roofing or re-cover situations, analysis of the existing drainage conditions is also the responsibility of the building owner/owner's representative or its design professional.
- D. Existing deck deflection, or ponding water may necessitate upgrading of the drainage provisions, including possible addition of new drains, increased deck support, etc.
- E. Mule-Hide does not design roof drainage systems or assumes any liability for the adequacy (or lack of) roof drainage systems or facilities.
- F. Refer to Mule-Hide's standard details for information regarding flashing of roof drains.

3.12 Expansion Joints, Area Dividers, Metalwork & Terminations

- A. The determination of necessity for expansion joints or area dividers is a project specific requirement that is the responsibility of the architect, designer, or owner.
- B. For general information on both of these important roof stress relief mechanisms consult the NRCA Roofing and Waterproofing Manual (Fifth Edition). Minimum design requirements and recommendations are covered by the NRCA's document.
- C. Metal Work
 1. Metal work including flashings, counterflashings, parapet coping, etc. is not considered a component of the approved Mule-Hide roof system.
 2. It is recommended that any metal work be installed in accordance with the practices outlined in the SMACNA manual or the NRCA Roofing and Waterproofing Manual.

3. Adequate provisions should be provided for the attachment, securement and embedment of the metal flashings where specified.
 4. Thru-wall flashings must never be covered with roofing membrane or flashing materials. Use and specification of thru-wall flashings are the responsibility of the architect or the building owner/owner's representative or its design professional.
 5. Metal work shall be properly fastened and sealed by the roofing contractor or others. It is the owner's responsibility to maintain sheet metal work in a watertight condition.
 6. Ensure that the membranes are not in contact with sharp edges and corners and that all metal burrs are removed. Refer to Mule-Hide Standard Details for proper flashing methods.
 7. Refer to Mule-Hide details for proper flashing of drip apron and gravel stop.
 8. When flashing to metal surfaces, the metal shall be primed with Mule-Hide # 121 Asphalt Primer or fast drying primer in aerosol cans meeting ASTM D 41 may be used.
- D. A metal termination bar or approved top edge securement is necessary at the point of termination of all flashing sheets, walls or curbs. If using a termination bar, the bar shall be fastened to achieve constant compression (maximum 6" o.c.). Approved caulking is required along the top edge of the termination bar.

3.13 Temporary Night Seals

- A. Temporary night seals or water cut-offs are required to prevent water or other precipitation (moisture of any type) from penetrating beneath the roofing system. Such closures are designed to provide short-term seals only.
- B. The following guidelines should be followed:
 1. Where temporary tie-ins must remain longer than overnight, they are to be checked on a daily basis to ensure the detail remains sealed.
 2. Reseal any unsealed or doubtful sections.
- C. Before proceeding with roofing, temporary tie-ins are to be removed leaving a clean surface for the new roof system.
- D. Mule-Hide can provide details for specific projects.
- E. Review the NRCA Roofing and Waterproofing manual for latest recommendations.

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.

3.14 Walkway Installation

- A. Walkways help protect the membrane from damage due to routine rooftop service traffic. Walkways may consist of an additional layer of similar Mule-Hide membrane of contrasting color granule surface or another approved walkway material. Contact Mule-Hide Customer Service for additional information.
- B. Typical locations for walkways are:
 1. At all access points (ladders, hatches, doorways, etc.) to the roof.

2. In areas subjected to traffic more frequently than once a month.
 3. Roof areas with high pedestrian traffic or subject to frequent maintenance operations.
- C. It is the responsibility of the building owner to place and maintain walkways at all necessary rooftop areas.

3.15 Cold Weather Application

- A. Mule-Hide self-adhering modified bitumen membranes are to be installed when the ambient air temperature is 45° F and rising. Mule-Hide self-adhering membranes are not to be installed when temperatures are below 45 ° F.
- B. When installing Mule-Hide self-adhering membranes in temperatures lower than 60° F, depending on sun and wind conditions, the use of heat may be required to enhance the bond of the material to the substrate. **Do not attempt to torch down the product.**
- C. When working in temperatures below 60° F it is recommended the rolls of self-adhering membrane are kept stored at room temperature (60° and higher) until just prior to use. Remember that wind chill will have an effect on the application temperature.
- D. Cold rolls of material may become difficult to unroll and may exhibit stress cracking. Should the roll become stiff or difficult to install, it should be immediately replaced with a new roll from a heated storage area.

End of Section