

# Mule-Hide Products Co., Inc.

## Self-Adhering Modified Bitumen Specification

### SECTION 07536

#### PART 1 GENERAL

Mule-Hide's acceptance of the structural roof deck refers solely to the condition of the deck surface to receive the Mule-Hide Roofing System. The proper design and structural integrity of the roof deck system and relationship to other building components is solely the responsibility of the design professional, be it an architect, roof consultant, engineer or building owner/owner's representative. Mule-Hide is strictly a manufacturer of roofing systems and has no experience, training or expertise in the areas of architecture or engineering. This specification is provided as a general guide for the use of Mule-Hide products based on typical building conditions and standard roofing practices.

Preceding the start up of the project, the contractor shall decide, to his satisfaction, that all specifications are workable as specified, that there is nothing that would deter the contractor's required warranty and that no existing conditions at the site prevent the contractor from performing the work in a professional and safe manner. When the contractor commences work, it will be assumed that the contractor accepts the existing conditions and the specifications.

#### 1.01 SUMMARY

- A. The work involves providing an SBS or APP self-adhering membrane system 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) may be directly adhered to an approved substrate or may be adhered to the mechanically attached Mule-Hide Nail Base.
- B. Systems may be attached directly to certain approved deck types or may be installed over an approved insulation or coverboard/overlay. Work includes installation of self-adhering flashing material to roof edges, parapet walls, curbs, pipes, drains and scuppers and other various penetrations and terminations necessary to provide a watertight roofing system.
- C. This section includes the following:
  - 1. Self-Adhering Modified Bitumen Roofing System
  - 2. Accessory Membrane Materials
  - 3. Insulation
  - 4. Roof Walkways

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

The following work may be covered in other sections of the project specifications.

- A. Section 06100: Rough Carpentry
- B. Section ( ): Roof Decks
- C. Section 07220: Insulation
- D. Section 07600: Sheet Metal
- E. Section 07721: Manufactured Curbs: Curbs for roof penetrations

- F. Section 07724: Roof Hatches
- G. Section 15430: Plumbing Specialties

### 1.03 DEFINITIONS

- A. Roofing Terminology: Refer to the following publications for terms related to roofing work not otherwise defined in this section:
  1. ASTM D 1079: Definitions of Terms Relating to Roofing, Waterproofing and Bituminous Materials.
  2. NRCA Roofing and Waterproofing Manual, 5th Edition.

### 1.04 REFERENCES

References in these specifications to standards, test methods, codes etc., are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies that may be used as references throughout these specifications.

- A. ASTM American Society for Testing and Materials  
Philadelphia, PA
  1. ASTM D 6163 Type 1, Grades S
  2. ASTM D 6164 Type 1, Grade G
  3. ASTM D 6222 Type 1 Grade S and Grade G
  4. ASTM D 1970
- B. BOCA Building Officials and Code Administrators International, Inc.  
Country Club Hills, IL
- C. FM Factory Mutual Engineering and Research  
Norwood, MA
- D. ICBO International Conference of Building Officials  
Whittier, CA
- E. NRCA National Roofing Contractors Association  
Rosemont, IL
- F. OSHA Occupational Safety and Health Administration  
Washington, DC
- G. SBCCI Southern Building Code Congress International  
Birmingham, AL
- H. SMACNA Sheet Metal and Air Conditioning Contractors National Association  
Chantilly, VA
- I. UL Underwriters Laboratories  
Northbrook, IL
- J. ITS Intertek Testing Services  
Cortlon, NY

- K. Miami-Dade    Miami-Dade County Building Code  
                         Miami, FL
- L. MEA    City of New York, Dept of Buildings, Material and Equipment Acceptance  
                 New York, NY
- M. TDI    Texas Department of Insurance, Roof Covering Evaluation  
                 Austin, TX
- N. FRSA FL Roofing Sheetmetal & Air Conditioning, Construction Association  
                 Winterpark, FL
- O. \*SFBC South Florida Building Code  
                 \* Dade  
                 Miami, FL
- P. FBC    Florida Building Code
- Q. IBC    International Building Code

#### 1.05 PERFORMANCE REQUIREMENTS

- A. General - Install a watertight, self-adhering, modified bitumen membrane roofing and flashing system with compatible components that will not permit the passage of liquid water and will withstand wind loads and exposure to weather without failure.
- B. The proposed roof system shall conform to the following codes and test requirements:
  - 1. Underwriters Laboratories or ITS (Warnock Hersey) classified for external fire classification.
    - a. UL 790 Tests For Fire Resistance of Roof Covering Materials
  - 2. Factory Mutual Research Corporation:
    - a. Approval Standard 4470 listing for proposed membrane system.
    - b. Loss Prevention Data Bulletins 1-28, 1-28R, 1-29, 1-29R, 1-49.
    - c. Factory Mutual Approval Guide: Roof Coverings.

#### 1.06 SUBMITTALS

- A. Provide copies of Product Data Sheets and Material Safety Data Sheets for each type of roofing product specified.
- B. Provide shop drawings of roof plan designating the appropriate details and locations on the roof plan where such details shall be installed.
- C. Provide manufacturer's detail drawings to include:
  - 1. Base flashings, cants, curbs, pipes, other penetrations and terminations.
  - 2. Insulation manufacturer's tapered insulation layout, tapered edge strips, crickets and saddles including slope and direction of slope.

- D. Provide the following samples for verification:
1. 12" by 12" (300 by 300 mm) square of self-adhering modified bituminous, granulated cap sheet (SA-SBS Cap Sheet or SA-APP Cap Sheet).
  2. 12" by 12" (300 by 300 mm) square of self-adhering modified bituminous, base sheet (SA Base Sheet).
  3. 12" by 12" (300 by 300 mm) square of modified bituminous base sheet (Nail Base).
  4. 12" by 12" (300 by 300 mm) square of roofing insulation.
  6. 6 insulation plates and fasteners of each type necessary to complete the installation.
- E. Provide copies of manufacturer's current published installation instructions and flashing details.
- F. Provide copies of the manufacturer's approval listings or reports from code agencies and independent testing facilities confirming compliance with the project specifications.
- G. Contractor Certification: Signed by the roofing system manufacturer confirming that the contractor installing the roofing system is registered with the manufacturer and may apply for and is eligible to receive the manufacturer's standard system warranty.
- H. Manufacturer Certification: Signed by the roofing system manufacturer confirming that the roofing system complies with requirements specified in the project specification.
- I. Insulation manufacturer's certification that the insulation provided for the project is compatible with the roofing system proposed and meets the project specification requirements.
- J. Insulation manufacturer/membrane manufacturer to provide fastening patterns for the insulation for the field, perimeter and corner areas of the roof.
- K. Warranty Documents: Provide sample copy of manufacturer's standard roofing system warranty defining obligations, remedies, limitations and exclusions.
- L. Product Test /Research Evaluation Reports: Provide copies of UL, FM and other reports confirming the products and assemblies have been tested and meet the requirements of the project specification.

#### **1.07 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.
- F. 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.

## 1.08 PROJECT CONDITIONS

- A. Proceed with installation only when existing and forecasted weather conditions permit.
- B. During roofing construction, all exposed surfaces shall be protected from the elements to protect from damage. All wet or damaged materials shall be removed from the roof and replaced. The contractor shall assume full responsibility for any damage to materials and building interior.
- C. It is the contractor's responsibility to ensure that work being performed is in compliance with all local, state and federal codes and OSHA requirements.

## 1.09 WARRANTY

- A. Upon completion of the roof installation, completion of all punch list items determined during the roof inspection performed by a representative of Mule-Hide and compliance with Mule-Hide's warranty procedures and requirements, furnish to the Building Owner a Mule-Hide roofing system warranty.
- B. Contractor shall provide a warranty for his workmanship for a period of two years following final acceptance of the roofing installation.

# PART 2 - PRODUCTS

## 2.01 GENERAL

- A. Mule-Hide self-adhering membranes are premium elastomeric roofing products manufactured via patent-pending **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 patent-pending **SEALLap®** feature and a patented roll end featuring **FASTLap®**. Cap sheets have a split release film on the bottom surface.

## 2.02 MULE-HIDE SELF-ADHERING MODIFIED BITUMEN MEMBRANES

- A. Following is a list of the membranes and accessories that make up the self-adhering modified bitumen product group:

### 1. SA-APP Cap Sheet

- a. Reinforced with a polyester mat.
- b. Available granulated only.
- c. Fire retardant version available.
- d. Granulated sheet available in select colors.

### 2. SA-SBS Cap Sheet

- a. Reinforced with a polyester mat.
- b. Available granulated only.
- c. Fire retardant version available
- d. Available in select colors.

### 3. SA Base Sheet

- a. Reinforced with a fiberglass mat.
- b. Finished with a polyolefin film (with lay lines) on the top surface.
- c. Split release film on the bottom.
- d. May be used as a base sheet or inter-ply sheet.
- e. May be exposed up to 90 calendar days before being covered.
- f. Fire retardant version available.

### 4. Nail Base

- a. Reinforced with a fiberglass mat.
- b. Designed for use as a nailable base sheet (where mechanical attachment is required) or over non-acceptable insulations/substrates.
- c. Polyolefin film (with lay lines) on the top surface and a sand finish on the bottom surface.

- B. Refer to the individual Product Data Sheets for additional information and physical properties.

### 2.03 ACCESSORIES

- A. **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.
- B. **Mule-Hide Mod Bit Flashing Adhesive** - an asbestos free, fibrated, 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.
- C. **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.
- D. Mule-Hide offers a complete range of FM Approved fasteners and plates for mechanical attachment of membranes and insulation.

### 2.04 MATERIALS - DELIVERY, HANDLING AND STORAGE

- A. Materials shall be delivered in their original, sealed, labeled containers and in sufficient quantities as needed to permit a continuous application.
- B. Materials shall be handled in such a way that damage or contamination with moisture, excessive heat or foreign matter is prevented.
- C. All materials are to be stored in their original, unopened packaging. Roll goods shall be stored on end (selvage edge up) on clean, flat surfaces.
- D. Store all roofing materials in a dry place on raised platforms, out of direct exposure to the elements until time of application. This requirement applies equally to rooftop materials stored temporarily on the roof before installation.
- E. Store membranes at room temperature whenever possible, until just prior to installing the rolls. Materials shall be stored in a tidy and safe manner to avoid exceeding the allowable live load of the storage area. Do not double stack pallets of Mule-Hide self-adhering modified bitumen membrane.

### 2.05 VAPOR RETARDERS

- A. The necessity of a vapor retarder is the responsibility of the architect, engineer, designer or building owner. Statements provided herein are provided in good faith with the expectation that a design professional (as described above) be consulted prior to any project decisions being made. The type, location and attachment method is also to be determined by the design professional. Refer to the NRCA Roofing and Waterproofing Manual for recommendations on vapor retarders. NRCA recommends consideration of use of vapor retarders when:
  - 1. Roofing over a heated interior space where the average January temperatures (external) are 40° F or below and the average winter interior relative humidity of 45% or greater is anticipated.
  - 2. A vapor drive may be expected to form a dew point under the roof membrane or in the insulation (Building usages with high humidity interiors where vapor drive may occur).
  - 3. High interior relative humidity is present.

**2.06 INSULATION**

- A. The selection of the insulation type and thickness is the responsibility of the architect, engineer, designer or building owner. Certain insulations may require an overlay of an acceptable insulation or cover board that is approved for direct adhesion.
- B. Following is a list of acceptable insulations and materials that may be used as an overlay when using non-acceptable insulations:
1. Mule-Hide Poly ISO 2 polyisocyanurate insulation (black facer only) or equal.
  2. High Density Wood Fiberboard –Coated six-sides (this is the only type accepted).
  3. New Plywood (as a deck or overlay) - minimum 15/32" thick.
  4. New OSB (as a deck or overlay) - minimum 1/2" as a deck, minimum 7/16 as an overlay. Rough side of the board must be placed up.
  5. Dens-Deck Prime (as an overlay). Dens-Deck Prime must be primed with Mule-Hide # 121 Asphalt Primer and allowed to thoroughly dry before applying self-adhering membranes. Minimum thickness of the Dens-Deck Prime is dependent on local wind conditions. Contact Mule-Hide Technical Department for details, acceptable thicknesses and fastening patterns.
- C. Following is a list of **Non-Acceptable** insulations/substrate material.
1. Perlite
  2. Foil-faced polyisocyanurate insulation
  3. Extruded and Expanded polystyrene
  4. Cementitious boards
  5. Wood Fiberboard (standard and high density)
  6. Dens-Deck (standard un-primed board)
  7. Light weight Concrete
  8. Sand surfaced base sheets
  9. 15 lb. & 30 lb felts.
- D. When attempting to install the self-adhering modified bitumen membranes to a non-acceptable substrate/insulation, Mule-Hide requires the installation of an acceptable material as an overlay or the installation of the Mule-Hide Nail Base.
- E. The minimum slope requirement is 1/4" per foot. New insulation must be installed in a manner to provide positive drainage over the entire roof surface. Ponding is not acceptable.
- F. In general, Mule-Hide Poly ISO 2 insulation must be installed in compliance with Mule-Hide requirements for installation. In the case of third party manufacturers (providing "equal" products), the insulation shall be installed in strict compliance with the insulation manufacturer's instructions unless Mule-Hide's methods of attachment exceed those of the insulation manufacturer. In those cases, Mule-Hide's requirements shall supersede those of the insulation manufacturer.

## **PART 3 - APPLICATION**

### **3.01 SUBSTRATE PREPARATION**

- A. Before start of roof installation, all surfaces to receive the new roofing materials shall be smooth, clean, dry and free of any debris.
- B. Any repairs to the roof deck must be completed prior to the start of installation of the new roofing materials.
- C. The contractor should inspect the deck with the Owner's representative to confirm the deck and other surfaces to which the roof system shall be applied are acceptable. All defective conditions should be pointed out to the owner's representative and work should not begin until such defects have been corrected.
- D. Commencement of work shall imply that the contractor has accepted the roof deck and other surfaces to receive the roofing system.

### **3.02 INSULATION INSTALLATION**

- A. Proper insulation attachment is dependent on the type of insulation being used and deck type.
- B. All insulation should have boards staggered between courses.
- C. When installing multiple layers of insulation, all joints between layers shall be staggered a minimum of 6" in each direction.
- D. Insulation shall be kept dry at all times. Install only as much insulation as can be covered and made watertight before the end of the working day or prior to the onset of inclement weather.
- E. Edges shall butt tightly together and all cuts shall fit neatly against adjoining surfaces to provide a smooth overall surface. Gaps 1/4" wide or greater shall be filled with compatible insulation.
- F. Install tapered insulation around roof drains and penetrations to provide adequate slope for proper drainage.
- G. Only Factory Mutual Approved fasteners and plates shall be used for mechanical attachment of approved insulations and underlayments/overlays.
- H. Certain deck types may be acceptable for insulation to be fully adhered with ASTM Type III or Type IV hot asphalt either direct to the approved deck or to an acceptable base sheet that has been mechanically attached with fasteners designed specifically for that deck type.
- I. On certain deck types, such as plywood and structural concrete, the installation of insulation may be optional if the decks are properly sloped. Flat decks shall require tapered insulation systems to provide a minimum 1/4" per foot slope or greater.

### **3.03 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

1. 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.
    - c. 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.
    - d. 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.

- e. 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.
- f. 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.
- g. 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.
- h. If installing a full sheet, follow Option 1 or Option 2. If installing a half sheet as the first sheet, follow Option 2.

**Option 1:** If enough people are available to install the full sheet lengthwise.

1. 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.
2. 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.
3. Repeat the procedure for the other side of the sheet.

**Option 2:** If a "one-person" operation.

1. After positioning the sheet, carefully re-roll half of the sheet. Leaving half the sheet unrolled will help keep the sheet in position.
2. Carefully slice the release film with a razor knife across the top of the roll. Great care should be taken so as not to cut into or through the sheet.
3. After slicing the release film, slowly begin to pull off the release film. The sheet will begin to unroll into place. By slowly rolling up the release film with a consistent, even tempo, the sheet will be gently pulled into place, minimizing air pockets that often occur when utilizing other installation techniques.
4. Press the sheet into place with firm even pressure. Roll the edges firmly with a silicon rubber or other suitable roller to ensure 100% adhesion.
5. Re-roll the remaining half of the sheet. Gradually remove the release film from the remaining sheet, repeating the procedure.
6. Press the sheet into place with firm even pressure. Roll the edges firmly with a silicon rubber or other suitable roller to ensure 100% adhesion.

- i. 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.
- j. 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.
- k. 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.
- l. Remember to thoroughly roll each sheet with a weighted roller as soon as the sheet is installed.
- m. SA Base Sheet should be turned up vertical surfaces a minimum of 3" to provide a watertight seal.
- n. 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.
- o. The SA Base Sheet may be installed in multiple layers to meet extended warranty requirements.
- p. The SA Base Sheet may be left exposed for up to 90 days before the installation of the cap sheets.

#### D. 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. If installing a full sheet, follow Option 1 or Option 2. If installing a half sheet as the first sheet, follow Option 2.

**Option 1:** If enough people are available to install the full sheet lengthwise.

- a. 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.
- b. 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.
- c. Repeat the procedure for the other side of the sheet.

**Option 2:** If a "one-person" operation.

- a. After positioning the sheet, carefully re-roll half of the sheet. Leaving half the sheet unrolled will help keep the sheet in position.
  - b. Carefully slice the release film with a razor knife across the top of the roll. Great care should be taken so as not to cut into or through the sheet.
  - c. After slicing the release film, slowly begin to pull off the release film. The sheet will begin to unroll into place. By slowly rolling up the release film with a consistent, even tempo, the sheet will be gently pulled into place, minimizing air pockets that often occur when utilizing other installation techniques.
  - d. Press the sheet into place with firm even pressure. Roll the edges firmly with a silicon rubber or other suitable roller to ensure 100% adhesion.
  - e. Re-roll the remaining half of the sheet. Gradually remove the release film from the remaining sheet, repeating the procedure.
  - f. Press the sheet into place with firm even pressure. Roll the edges firmly with a silicon rubber or other suitable roller to ensure 100% adhesion.
4. 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.
  5. 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®**.
  6. 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.

7. Remember to thoroughly roll each sheet with a weighted roller as soon as the sheet is installed.
8. 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.

### 3.04 FLASHINGS

- 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 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.

### 3.05 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.

### **3.06 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.

### **3.07 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 (Fourth 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.

### 3.08 PIPES AND VENTS

- 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.

**3.09 ROOF WALKWAYS AND PROTECTION**

- 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 Technical Department 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.

**3.10 TEMPORARY TIE-INS (NIGHT SEALS AND WATER CUT-OFFS)**

- A. temporary tie-ins, night seals or water cut-offs are required to prevent water, snow 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.

**3.11 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

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