

### 9.1 General Information

**9.1.1** Flashings are used to make watertight any roof area where the roof membrane terminates, is interrupted, or intersects an area or projection having a marked change in slope or direction. This condition can occur at gravel stops, curbs, parapets, walls, built-in gutters, expansion joints, skylights, vents, drains, pipes, and other penetrations.

**9.1.2** Flashings are generally divided into two categories: base flashings and counterflashings. Base flashings are, in a sense, a continuation of the membrane, turned up onto a surface that is in a different plane from the field of the roof, and installed as a separate operation. They are usually fabricated using a non-metallic material, such as an asphalt-coated felt. Counterflashings, or cap flashings, can be of metal, coated felt, or other materials. They shield and seal the exposed edges of the base flashing.

**9.1.3** The combined use of non-metallic materials for base flashings and metal for counterflashings brings out the best in each material. Bituminous base flashing materials have the same coefficient of expansion and contraction as the roof membrane, and they work together as a unit. They are the only type of material acceptable for use in constructing base flashings.

**9.1.4** Because of the rigidity of metal and its extreme movement with temperature changes, its use is not acceptable for base flashings. Cap flashings or counterflashings made of metal, removed from any area of possible standing water, are acceptable, provided they are properly installed in accordance with industry-accepted sheet metal details, in conjunction with an approved JM base flashing specification. Bituminous base flashings must extend at least 8" (203 mm) above the surface of the roof.

**9.1.5** In some instances, it is necessary to provide wall coverings on the area of the wall above the base flashing. This section includes specifications for two general constructions, however, JM does not typically include these wall coverings in the guarantees offered for built-up and modified bitumen systems.

**9.1.6 All health, safety, and environmental procedures involving the storage, use, and disposal of roofing materials should be followed. These precautions are outlined in the "Introduction" section of the current Johns Manville Commercial/Industrial Roofing Systems Manual.**

### 9.2 Principles of Flashing Design

**9.2.1** The following considerations should be given to all bituminous flashing systems:

- A. Allow for differential movement in the flashing system, particularly when the deck and wall are not directly tied to each other (non-load-bearing construction). Differential movement between the roof deck and the wall is usually evidenced by diagonal wrinkles in the base flashing. Continued movement can cause tears in the flashing, particularly at the most restricted areas, usually in corners. If the movement cannot be handled by standard base flashing systems, roof-to-wall expansion joint details should be used to accommodate this movement. See Specifications FE-1 (NLB) and DFE-1 (NLB).

- B. Locate flashed metal joints above the highest water level on the roof. Good roofing practice dictates that roof edges should be raised above the roof level, if possible. If problems do occur, the edges will be out of the area of standing water. The top edge of all base flashings must be carried a minimum of 8" (203 mm) above the roof.
- C. Avoid sharp bends in built-up and modified bitumen base flashings. Right angle bends in bituminous flashings create high stress areas and can result in premature aging of the flashing material. To alleviate this condition and to provide solid backing, the use of cant strips is necessary. Cant strips are made either of perlite board, wood fiber board, wood, or other materials, and their 45° (0.79 rad.) angle face modifies the sharp angle between horizontal and vertical. They also reduce the danger of damage from foot traffic at these vulnerable areas.
- D. Connect metal solidly. Sheet metal sections should be well attached. The solid securement of all flashing accessories to wood nailers is mandatory. The wood nailers must extend horizontally beyond the metal flange. Movement due to poor securement will result in abnormal stress on the membrane and flashing, which can cause leaks.
- E. Secure all base flashings at the top edge with appropriate mechanical fasteners, spaced 6" (152 mm) o.c. maximum, or with some other positive means to prevent sliding or sagging.

### 9.3 Inspection and Preparation of the Flashing Substrate

**9.3.1** All surfaces to be flashed should be inspected before any flashing work is started, since the success of the flashing system greatly depends on a properly constructed base.

**9.3.2 Masonry Construction:** Walls should be built with hard burned brick, sound reinforced concrete, or waterproof concrete block construction. Common faults encountered are:

1. Soft or scaling brick or concrete.
2. Poor mortar or faulty pointing of joints.
3. Broken copings and inadequate pointing of joints between copings.

Walls of ordinary hollow tile, or other materials which in themselves are not waterproof, should not be accepted as suitable to receive flashings unless they are properly waterproofed, to prevent moisture infiltration into the flashing system.

All masonry surfaces which are to receive hot bitumen or bituminous-based cement shall be primed with JM Concrete Primer. The primer must be allowed to dry thoroughly prior to application of flashing.

**9.3.3 Frame Construction:** Frame walls are not acceptable to receive flashing unless suitable solid backing for the flashing is provided. Walls of gypsum wall board are not acceptable as a substrate for bituminous flashings. Suitable stops should be provided at the top of the flashing in stucco construction, to ensure a watertight seal for the base flashing.

**9.3.4 Cants:** Prior to application of base flashings, a cant strip shall be installed to modify the sharp angle between the roof deck and the vertical element of the structure. Minimum size of the cant shall be 2¼" (70 mm), as measured on the diagonal face of the cant.

**9.3.5 Roof Edging Nailers:** Wood nailing strips (pressure treated with a salt preservative) must be provided to serve as a base for attaching the flanges of metal edgings. Treatment of the nailers with creosote or asphaltic preservatives is not acceptable. The wood nailers must extend horizontally beyond the flanges of the metal edgings.

**9.3.6 Roof Membrane:** All felts comprising the roof membrane shall be installed before the flashing is applied and shall be turned up the wall or parapet as called for in the flashing specification. Roofing felts should not be carried all the way up a wall to act as a base flashing.

#### 9.4 Application of BUR Materials ("FE" Specifications)

##### 9.4.1 Hot Bitumen Application: GlasTite Flexible(e.g., FE-1)

GlasTite Flexible is an asphalt-coated flashing sheet with a fiber glass scrim/polyester mat composite reinforcement. The fiber glass in the reinforcement provides strength and dimensional stability, while the polyester provides conformability and resistance to puncture and tearing.

Base flashing materials of this type are typically applied in a mopping of hot bitumen. The advantage of hot-applied flashings is speed, economy, and convenience. The quality of bitumen used is crucial to the overall success of the flashing system. JM maintains a list of qualified asphalt sources throughout the United States. These asphalts meet or exceed the requirements of ASTM D 312, "Standard Specification for Asphalt Used in Roofing". All bitumens utilized in the construction of guaranteed flashing systems must have an Asphalt Confirmation Number indicating that the bitumen was registered with an approved source.

ASTM D 312, Type III and Type IV asphalts are the only bitumens acceptable for application of bituminous base flashings. Coal tar and low softening point asphalts must not be used, since flashings placed in these bitumens will sag.

It is crucial that the flashing be firmly and uniformly set in a full mopping of hot bitumen, without voids and with all edges well sealed. To ensure that full contact is made, the mechanic must "work-in" the flashing sheet by applying pressure across the entire sheet while the bitumen is still hot. If the material is installed with little or no pressure applied, there is a risk of disbonding, voids, and openings at the laps.

The temperature of the bitumen at the point of application is also very important. The bitumen must be at or slightly above the EVT when the sheet is set into it. This will cause the back coating of the flashing sheet to remelt or "flux", assuring a proper bond to the substrate.

All hot-applied flashings must be secured at the top edge with appropriate mechanical fasteners, spaced 6" (152 mm) o.c. maximum, or with some other positive means to prevent sliding or sagging.

The use of short lengths of flashing material (approximately 6' - 8' [1.83 m - 2.44 m]) is strongly recommended. This will improve handleability of the flashing material and reduce the possibility of the bitumen cooling too much before the flashing is laid into it.

During installation of hot-applied base flashing, the surface to which the flashing will be applied is mopped with the hot bitumen. The sheet is then laid into place and "worked-in" to assure that it is firmly and uniformly bonded. In cool or cold weather, the back of the flashing sheet should also be mopped with the hot bitumen. This "double mopping" has two benefits. First, it heats up the substrate to which the material will be applied. Second, it assures "fluxing" of the back coating on the sheet, which results in a superior bond.

In cold weather, maintaining the desired bitumen temperature can be difficult. Improper bitumen temperature can result in adhesion problems. If conditions require that the application of the flashing continue at temperatures below 40°F (4°C) additional precautions must be taken. Very short lengths of flashing (3' - 6' [0.92 - 1.83 m]) should be used. In addition, all of the bitumen application equipment should be insulated to ensure that the bitumen is delivered to the flashing area at the appropriate temperature.

In certain circumstances, GlasTite Flexible may also be applied using cold flashing cement. Refer to the individual flashing specifications for guidance.

A fiber glass ply felt can be used with reinforced base flashing as a backer felt. This backer felt is applied to the primed masonry surface in a mopping of hot bitumen. The use of a backer felt may be a requirement for the issuance of a guarantee.

##### 9.4.2 Cold Application: Ply felt and Flashing Cement (e.g., FE-2)

This system consists of alternating layers of ply felt, set in and covered over with layers of flashing cement. The ply felt provides reinforcement to the system, as well as stabilizes the flashing cement.

The flashing cement serves as an adhesive for the flashing plies, and provides the interply waterproofing.

**Bestile Industrial Roof Cement:** This cold application flashing cement is a blend of selected asphalts, non-asbestos fibers, selected fillers and petroleum solvents. It is supplied in a smooth, easy working consistency which adheres to wet and dry surfaces, resists slumping and remains plastic. Bestile Industrial Roof Cement may be used on horizontal as well as vertical surfaces and where differential movement is expected. It provides excellent durability against the stresses and wear to which flashing adhesives are normally exposed.

**9.4.3 Surfacing:** JM recommends that GlasTite Flexible flashing sheet be coated with an approved JM roof coating such as Topgard Type A, Type B, or Fibrated Aluminum Roof Coating. Hot asphalt is not an acceptable coating.

### 9.5 Application of SBS Modified Bitumen Materials (“DFE-” Specifications)

**9.5.1** DynaFlex is a durable, flexible, modified bitumen flashing sheet incorporating a fiber glass scrim/polyester mat composite reinforcement. This composite reinforcement provides strength and dimensional stability, as well as conformability, puncture and tear resistance. DynaFlex can be installed using hot asphalt, JM MBR Flashing Cement or MBR Utility Cement. It is not acceptable to heat-weld DynaFlex. Conventional cut-back cements should not be used to adhere DynaFlex to the surface being flashed.

**9.5.2** A base sheet may be required under the DynaFlex in some flashing specifications. Typically, this is necessary when the flashing materials are installed over wood or plywood substrates.

#### 9.5.3 Hot Bitumen Application

The advantage of hot-applied flashings is speed, economy, and convenience. The quality of asphalt used is crucial to the overall success of the flashing system. JM maintains a list of qualified asphalt sources throughout the United States. These asphalts meet or exceed the requirements of ASTM D 312, “Standard Specification for Asphalt Used in Roofing”. All asphalts utilized in the construction of guaranteed flashing systems must have an Asphalt Confirmation Number indicating that the asphalt was registered with an approved source.

**9.5.4** ASTM D 312, Type III and Type IV asphalts are the only asphalts acceptable for application of bituminous base flashings. Low softening point asphalts must not be used, since flashings placed in these bitumens will sag. PermaMop is not to be used.

**9.5.5** It is crucial that the flashing be firmly and uniformly set in a full mopping of hot asphalt, without voids and with all edges well sealed. To ensure that full contact is made, the mechanic must “work-in” the DynaFlex sheet by applying pressure across the entire sheet while the asphalt is still hot. If the material is installed with little or no pressure applied, there is a risk of disbonding, voids, and openings at the laps.

**9.5.6** The temperature of the asphalt at the point of application is also very important. The asphalt must have a minimum temperature of 400°F (204°C) or be at the EVT, whichever is higher, when the sheet is set into it. This will cause the back coating to remelt or “flux”, assuring a proper bond to the substrate.

**9.5.7** All hot-applied flashings must be secured at the top edge with appropriate mechanical fasteners, spaced 6" (152 mm) o.c. maximum, or with some other positive means to prevent sliding or sagging.

**9.5.8** The use of short lengths of flashing material (approximately 6' -8' [1.83 m - 2.44 m]) is strongly recommended. This will improve handleability of the flashing material and reduce the possibility of the asphalt cooling too much before the flashing is laid into it.

**9.5.9** During installation of hot-applied base flashing, the surface to which the flashing will be applied is mopped with the hot asphalt. The sheet is then laid into place, and “worked-in” to ensure that it is firmly and uniformly bonded. In cool or cold weather, the back of the flashing sheet should also be mopped with the hot asphalt. This “double mopping” has two benefits. First, it heats up the substrate to which the material will be applied. Second, it ensures “fluxing” of the back coating on the sheet which results in a superior bond.

**9.5.10** In cold weather, maintaining the desired asphalt temperature can be difficult. Improper asphalt temperature can result in adhesion problems. If conditions require that the application of the modified bitumen continue at temperatures below 40°F (4°C) additional precautions must be taken. Very short lengths of flashing (3' - 6' [0.92 - 1.83 m]) should be used. In addition, the asphalt application equipment should be insulated to ensure that the asphalt is delivered to the flashing area at the appropriate temperature.

### 9.6 Heat Weld Application of SBS Modified Bitumen Flashings (“WFE-” Specifications)

**9.6.1** The advantage of heat welded flashings is the speed at which they can be applied and their ability to conform to irregular surfaces. FesCant Plus Cant Strips are required at the junction between the roof deck and the vertical surface to be flashed. These cant strips are made of fire-retardant material and are suitable for use in heat weld applications. Wood nailers shall be installed at all eaves and openings in the roof so that roofing plies, edging and gravel stops may be properly secured. When roof insulation is specified, wood nailers shall be of the same thickness as the insulation.

**9.6.2** Flashing strips shall be of sufficient size to extend a minimum of 6" (152 mm) onto the roof surface.

**9.6.3** The minimum height for flashing is 8" (203 mm) above the surface of the roof membrane. All flashing must be secured at the top edge with appropriate mechanical fasteners, spaced 6" (152 mm) o.c. maximum, or with some other positive means to prevent sliding or sagging. Suitable metal counterflashing shall be provided to cover the top edge of the base flashing by a minimum of 4" (102 mm).

**9.6.4** It is crucial that flashing be firmly and uniformly set, without voids and with all edges well sealed. All laps and edges should be rolled with a rounded edge roller. Check all laps for adhesion. Lift up any unbonded areas, reheat the area and press down.

**9.6.5 Safety is of primary importance and it is the contractor's responsibility to ensure that all relevant safety precautions are adhered to. (See section 7A.31).** Never heat weld to an area where the flame or heat can be pulled in. Never heat weld directly to a combustible surface or to an area that cannot be seen. If there is a question as to the safety of the area being heat welded, then the heat should be applied to the flashing material away from the area

of application. When the flashing material is ready for application, press into place so that the material is firmly and uniformly set.

**9.6.6** For heat weld application, all safety procedures must be reviewed prior to application. **All contractors must understand, review and adhere to the information contained in the following sources:**

- Johns Manville Safety Guidelines for Heat Weld Application
- ARMA Guide to Torch Safety
- ARMA Torch Safety Video

### **9.7 Cold Adhesive Application of SBS Modified Bitumen Flashings**

**9.7.1** Cold adhesive flashing systems are very similar in construction to hot-applied systems. JM has developed two adhesives, MBR Flashing Cement and MBR Utility Cement, that are compatible with both BUR and modified bitumens. When cured, these adhesives form a durable, elastomeric and watertight film. Unlike conventional cut-back mastics, and most other “modified bitumen cold-process adhesives”, MBR Flashing Cement and MBR Utility Cement will not damage the SBS blend in the modified bitumen sheet.

**9.7.2** MBR Flashing Cement and MBR Utility Cement can be used as a substitute for asphalt in modified bitumen flashing specifications. They can also be used as a general purpose mastic on most built-up roofing and modified bitumen flashing details, or to strip-in the laps of modified bitumen base flashing.

**9.7.3** The major benefit derived from the use of these adhesives is that they provide the mechanic with an alternative means of terminating the roof membrane when hot asphalt is not desired, not practical, or is prohibited. In addition, these adhesives offer exceptionally good weathering properties and can be used as a utility mastic in other applications such as counterflashing.

**9.7.4** MBR Flashing Cement is a two component, modified bitumen adhesive. It must be prepared on site by mixing the MBR Flashing Cement Base and MBR Cement Activator. The mixing and application instructions must be strictly followed in order for the material to work as intended.

**9.7.5** MBR Utility Cement is a one component, trowel grade, modified bitumen adhesive designed for use with SBS modified bitumen flashing products. Its formulation contains very low levels of a mild petroleum solvent, which make it compatible with all of the JM SBS modified bitumen and built-up roofing products. It is available in both a “winter” and “summer” grade. Both formulas contain the same basic ingredients, but the consistency is adjusted to accommodate the weather conditions during application.

**9.7.6** SBS modified bitumen sheets are heavy. To prevent slippage when installed on a vertical surface, the sheets must be secured with nails or mechanical fasteners. If the surface to which the flashing material will be attached cannot accommodate nails or other fasteners, MBR Flashing Cement must be used in lieu of MBR Utility Cement, since it “sets up” more quickly, and will not slip once cured.

**Note: Do not use conventional cut-back asphalt cements to bond any JM modified bitumen roofing product to any substrate.**

**9.7.7** Although JM does not recommend the use of conventional solvent-based roofing mastics or flashing cements for bonding modified bitumen materials, they can be used to strip in laps and other terminations using the same techniques used for built-up roofing. Typically, a 4" - 6" (102 mm - 152mm) wide bed of mastic is laid down over the lap, a strip of glass fabric or ply felt is embedded into it, then coated with a layer of roof mastic.

### **9.8 Two-Part Cold Adhesive Equipment**

**9.8.1** The following equipment is necessary for the safe and efficient preparation and application of JM MBR Flashing Cement.

**9.8.2** Safety and Personal Hygiene Equipment: The following items should be available for, and used by, every worker:

- A. Impervious gloves, 1 pair for each worker.
- B. Rubber or plastic apron, 1 for every person mixing.
- C. Organic cartridge respirator mask. Air-supplied respirators may be required for some applications.
- D. Chemical safety goggles, 1 for each person mixing or spraying.
- E. Soap and water.
- F. Hand cleaner.
- G. Supply of clean rags.
- H. Solvent: paint thinner, or mineral spirits.
- I. Portable fire extinguisher.
- J. Squeeze bottle filled with clean water for use as an eye wash.

**9.8.3** The following items may be required at the job site to protect the installation and surrounding areas during application.

- A. Heavy wrapping paper or suitable protective sheeting.
- B. 2" (51 mm) wide masking tape.

#### **9.8.4 Mixing Equipment:**

- A. Jiffy Mixer Model PS, or equivalent.
- B. ½" (13 mm) electric drill motor and power source.
- C. Plastic graduated container for measuring activator and base material.

#### **9.8.5 Application Equipment:**

- A. Clean 5 gallon (18.9 liter) metal pails.
- B. Solvent: paint thinner or mineral spirits.
- C. All tools normally used in the application of built-up roofing materials.

**9.8.6 Adhesive Preparation:** MBR Flashing Cement is prepared on site by adding specific amounts of MBR Cement Activator to MBR Flashing Cement Base and mixing thoroughly. The adhesive is prepared in the MBR Flashing Cement Base shipping container, a 5½ gallon (20.8 liter) pail, using a Jiffy Mixer mounted on a ½" (13 mm) drill motor. The container of MBR Cement Activator is packaged to provide exactly the correct amount of material necessary to react with the contents of the MBR Flashing Cement Base pail (4 gallons [15.1 liters]). The Activator is heavier and has a lower viscosity than the base material. To ensure a complete mix, the MBR Cement Activator must be poured slowly into the vortex caused by the rotating mixer. **THE ACTIVATOR MUST NOT BE DUMPED INTO THE PAIL IN ONE MOTION.** The mixer should be constantly moved about the pail in an up-and-down and side-to-side motion. The mixing is complete in about 3 minutes. Do not overmix!

**9.8.7** The mixed adhesive has a pot life that is dependent on its temperature. The mechanic will have to use the material in approximately:

20 minutes at 50°F (10°C)	30 minutes at 80°F (27°C)
25 minutes at 60°F (16°C)	30 minutes at 90°F (32°C)
30 minutes at 70°F (21°C)	25 minutes at 100°F (38°C)

**9.8.8** The mixing of individual pails of adhesive should be timed so that one can of freshly mixed adhesive is ready for the application crew. Mixed adhesive must not be stockpiled, since the material may cure to an unworkable viscosity before the application crew can use it. In cold weather, the material must be stored and mixed at room temperature.

**Important:** The MBR Cement Activator must be stored indoors in an area maintained above 60°F (16°C) or crystallization will occur. Refer to the package label on how to correct this situation, if it occurs.

**9.8.9 Application:** Mixed material is spread on the substrate to be flashed with a trowel to obtain a full, uniform coverage coating, without voids, to an approximate thickness of  $\frac{1}{8}$ " (1.6 mm). As the coating process proceeds, the DynaFlex flashing is laid into the bed of cement. Specifications that require nailing shall be fastened immediately in order to prevent slippage. Side laps shall be a minimum of 4" (102 mm), and should be sealed with the same flashing cement.

**Note:** When flashing to sheet metal, JM Metal Primer is required and shall be applied as prescribed on the primer label, prior to the application of any MBR Cement.

**9.8.10** All exposed nail heads must be covered with a layer of MBR Flashing Cement. The side laps of the SBS sheet may be coated with a film of MBR Flashing Cement for added protection. Fiber glass fabric may also be embedded in the cement.

**9.8.11** All masonry surfaces shall be primed with JM Concrete Primer. Concrete soiled with oil, grease, or form release agents must be thoroughly cleaned and then coated with JM Concrete Primer.

**9.8.12 Clean Up:** Mineral spirits should be used to clean tools immediately after completion of work. Tools should also be periodically placed in a pail containing mineral spirits to prevent build up of cement. Impervious gloves must be worn during all applications and clean up procedures.

## 9.9 Two-Part Adhesive Disposal Information

**9.9.1** MBR Flashing Cement Base that has been fully reacted with MBR Cement Activator can usually be disposed of at a licensed landfill.

**9.9.2** MBR Flashing Cement Base is considered a hazardous waste. Disposal must be in accordance with local, state, and federal regulations. If possible, react any remaining material with MBR Cement Activator. The resulting waste can usually be disposed of at a licensed landfill.

**9.9.3** MBR Cement Activator is also considered a hazardous waste. Disposal must be in accordance with local, state, and federal regulations. If the material is reacted with one of the MBR Cement Bases, disposal can be as recommended for MBR Flashing Cement. If this is not the case, the material can be neutralized using a 90% water, 8% ammonia and 2% detergent solution. Containers must be left open for at least 48 hours to allow any CO<sub>2</sub> gas evolved to escape. The resulting solidified waste can then usually be disposed of at a licensed landfill.

## 9.10 Two-Part Adhesive Empty Containers

**9.10.1** MBR Flashing Cement Base containers, when "empty", contain combustible and harmful vapors and residue. Do not reuse the container or remove the labels. Follow all of the label warnings even when the container is empty. Disposal of the container shall be in accordance with applicable regulations. If the residue is of fully reacted material, the container can usually be disposed of at a licensed landfill.

**9.10.2** MBR Cement Activator containers shall be neutralized with the solution described in the disposal portion of this section. Decontaminated containers must be left open for at least 48 hours to allow any CO<sub>2</sub> gas evolved to escape. Containers can then be disposed of at a licensed landfill.

## 9.11 One-Part Cold Adhesive Application

**9.11.1** The material is ready to use as shipped and is not to be thinned. It can be installed in temperatures between 40°F (4°C) and 100°F (38°C). However, when the temperature is below 50°F (10°C), the adhesive must be stored in a warm area, approximately 70°F (21°C), for 24 hours prior to application. To minimize installation difficulties associated with cold weather applications, use the less viscous winter grade material. Also, completely unroll the modified bitumen sheets and allow them to relax at least 15 minutes prior to installation. Turning light-colored sheets upside down (dark side up) helps accelerate the relaxation process.

**9.11.2** For best results, make certain the surface to which the cement will be applied is clean, dry and free of loose material. All masonry surfaces which are to receive MBR Utility Cement must be primed with JM Concrete Primer. The primer must be allowed to dry thoroughly before application of the cement.

**9.11.3** For large areas, use a notched trowel. Spread the MBR Utility Cement evenly, about  $\frac{1}{8}$ " (3 mm) thick (no greater than  $\frac{1}{4}$ " [6 mm]), working down firmly to ensure good adhesion to the substrate. JM DynaFlex is then embedded into the cement and brushed or rubbed to make full contact and to ensure adhesion.

**9.11.4 Coverage:** The average coverage is approximately 8 gallons per 100 sq. ft. (3.3 liters/m<sup>2</sup>), per ply.

**9.11.5** Nail or mechanically fasten the modified bitumen sheet as prescribed in the appropriate flashing specification.

**9.11.6** All exposed nail heads must be covered with a layer of MBR Utility Cement. The side laps of the SBS sheet may be coated with a

film of MBR Utility Cement for added protection. Fiber glass fabric may also be embedded in the cement.

**9.11.7** Tools and equipment can be cleaned with mineral spirits.

### 9.12 Surfacing

**9.12.1** JM recommends that GlasTite Flexible flashing sheet be coated with an approved JM Roof Coating such as TopGard Type A, Type B, or Fibrated Aluminum Roof Coating. Hot bitumen is not an acceptable coating.

**9.12.2** It is not necessary to apply any surfacing over DynaFlex flashing. DynaFlex is manufactured with integral ceramic granules that protect the underlying bitumen from the elements.

### 9.13 Application of APP Modified Bitumen Flashings ("WFE" Specifications)

**9.13.1** JM APP products are durable, flexible, modified bitumen products that can be utilized for flashing. The sheets incorporate either composite reinforcements (glass and polyester) or single reinforcements incorporating polyester or glass. These reinforcements offer strength, puncture and tear resistance as well as conformability. APP products that have polyethylene burn off release films can only be heat welded. APP products that utilize a fine mineral as a release agent can be heat welded or applied in JM MBR® Utility Cement. (See section 8.10 for cold application instructions.) It is not acceptable to install any APP product in hot asphalt. Conventional cut back cements should **not** be used to adhere any APP product to the surface being flashed. The JM line of products can be installed using hot bitumen, cold adhesive or heat welding (see section 8.5 for hot bitumen instructions and section 8.13 for cold adhesive installation instructions).

**9.13.2** **Safety is of primary importance and it is the contractor's responsibility to ensure that all relevant safety precautions are adhered to. (See section 8A.7).** Never heat weld to an area where the flame or heat can be pulled in. Never heat weld directly to a combustible surface or to an area that cannot be seen. If there is a question as to the safety of the area being heat welded then the heat should be applied to the flashing material away from the area of application. When the flashing material is ready for application press into place so that the material is firmly and uniformly set.

**9.13.3** A fiber glass base sheet is required under the APP and Classic flashing material in all flashing specifications where the material is to be heat welded over wood, plywood, or any other combustible substrates.

### 9.14 Heat Weld Application

**9.14.1** The advantage of heat welded flashings is the speed at which they can be applied and their ability to conform to irregular surfaces. FesCant Plus strips are required at the junction between the roof deck and the vertical surface to be flashed. These cant strips are made of fire retardant material and are suitable for use in heat weld applications. Wood nailers shall be installed at all eaves,

and openings in the roof so that roofing plies, edging and gravel stops may be properly secured. When roof insulation is specified, wood nailers shall be of the same thickness.

**9.14.2** Flashing strips shall be of sufficient length to extend a minimum of 4" (102 mm) onto the roof surface. When a two ply flashing system is used for maximum protection at vertical surfaces, the individual plies shall be installed separately and the second ply shall extend beyond the first ply by a minimum of 2" (51 mm) at both the top edge and on the roof surface.

**9.14.3** The minimum height for flashing is 8" (203 mm) above the surface of the roof membrane. All flashing must be secured at the top edge with appropriate mechanical fasteners, spaced 6" (152 mm) o.c. maximum, or with some other positive means to prevent sliding or sagging. Suitable metal counter flashing shall be provided to cover the top edge of the base flashing by a minimum of 4" (101 mm).

**9.14.4** It is crucial that flashing be firmly and uniformly set, without voids and with all edges well sealed. All laps and edges should be rolled with a rounded edge roller and a ¼" (7 mm) bead of compound should extend beyond the finished lap. Check all laps for adhesion. Lift up any unbonded areas, reheat the area and press down, forcing the bitumen from the lap (a minimum bead ¼" [7 mm]).

**9.14.5** Take special care when applying any APP or Classic membrane flashing material in cold weather (below 40°F [4°C]). All rolls must be stored on end and in a heated trailer or building. Only rolls needed for immediate application should be exposed to ambient conditions. Never throw or drop rolls of APP material in cold weather, sudden shocks can cause cracking of the APP coating asphalt.

**9.14.6** JM requires that smooth surface APP flashing sheets be coated with an approved JM roof coating such as Topgard Type A, Type B, or Fibrated Aluminum Roof Coating. Hot bitumen is not an acceptable coating.

### 9.15 Cold Adhesive Application of APP Modified Bitumen Flashings

**9.15.1** Cold adhesive flashing systems are very similar in construction to hot-applied systems. JM has developed an adhesive, MBR Utility Cement, that is compatible with APP modified bitumen products that incorporate mineral release agents. When cured, this adhesive forms a durable, elastomeric and water-tight film. Unlike conventional cut-back mastics, and most other "modified bitumen cold-process adhesives," MBR Utility Cement will not damage the APP blend in the modified bitumen sheet.

**9.15.2** TRICOR M FR, TRICOR S, BICOR S and Classic products have a mineral release agent and are acceptable products to be installed in cold adhesive. APP products with a burn off film **cannot** be installed in cold adhesive.

**9.15.3** MBR Utility Cement can be used as an adhesive substitute to reduce the amount of heat welding that must be utilized when applying APP membranes in flashing systems. It can also be used as a general purpose mastic on most modified bitumen flashing details, or to strip-in the laps of modified bitumen base flashing.

**9.15.4** MBR Utility Cement is a one component modified bitumen adhesive designed for use with APP modified bitumen flashing products. MBR Utility Cement is a trowel grade adhesive. Its formulation contains low levels of a mild petroleum solvent, which makes it compatible with TRICOR M FR, TRICOR S, BICOR M FR and BICOR S. It is available in both “winter” and “summer” grade. Both formulas contain the same basic ingredients, but the consistency is adjusted to accommodate the weather conditions during application.

**9.15.5** APP modified bitumen sheets are heavy. To prevent slippage when installed on a vertical surface, the sheets must be secured with nails or mechanical fasteners. The fasteners should be spaced a maximum of 6" (152 mm) apart.

**Note: Do not use conventional cut-back asphalt cements to bond any JM modified bitumen roofing product to any substrate.**

**9.15.6** The material is ready to use as shipped and is not to be thinned. It can be installed in temperatures between 40°F (4°C) and 100°F (38°C). However, when the temperature is below 50°F (10°C), the adhesive must be stored in a warm area, approximately 70°F (21°C), for 24 hours prior to application. To minimize installation difficulties associated with cold weather applications, use the less viscous winter grade material. Also, completely unroll the modified bitumen sheets and allow them to relax at least 15 minutes prior to installation. Turning light-colored sheets upside down (dark side up) helps accelerate the relaxation process.

**9.15.7** For best results, make certain the surface to which the cement will be applied is clean, dry, flat and free of loose material. All masonry surfaces which are to receive MBR Utility Cement must be primed with JM Concrete Primer. The primer must be allowed to dry thoroughly before application of the cement.

**9.15.8** For large areas, use a notched trowel. Spread the MBR Utility Cement evenly, about 1/8" (3 mm) thick (no greater than 1/4" [6 mm]), working down firmly to ensure even coverage and good adhesion to the substrate. The JM APP flashing membrane material is then embedded into the cement and brushed or rubbed to make full contact and to ensure adhesion. Take special care not to contaminate the seams with the adhesive. The seams are then heat welded. After heat welding the seams are rolled with a rounded edge roller to create a minimum 1/4" (6 mm) bleed out of the APP compound. Check all seams for adhesion.

**9.15.9** The average coverage is 8 gallons/100 sq. ft. (3.3 liters per square meter), per ply.

**9.15.10** Nail or mechanically fasten the modified bitumen sheet as prescribed in the appropriate flashing specification.

**9.15.11** All exposed nail heads must be covered with a layer of MBR Utility Cement.

**9.15.12** Tools and equipment can be cleaned with mineral spirits.

#### **9.16 Surfacing**

**9.16.1** JM requires that smooth surface APP flashing membrane materials be coated with an approved JM roof coating such as TopGard Type A, TopGard Type B, or Fibrated Aluminum Roof Coating. Hot bitumen is not an acceptable coating.

**9.16.2** It is not necessary to apply a surfacing to a granulated APP flashing membrane material. These materials are manufactured with integral ceramic granules that protect the underlying bitumen from the elements.