

**FIRESTONE APP
ROOFING SYSTEMS
APPLICATION GUIDE
TABLE OF CONTENTS**

[2.01.1 GENERAL.....2](#)

[2.02.1 JOB SITE CONSIDERATIONS \(CAUTION AND WARNINGS\)2](#)

[2.03.1 ROOF SUBSTRATE PREPARATION.....2](#)

[2.04.1 WOOD NAILER LOCATION AND INSTALLATION3](#)

[2.05.1 INSULATION INSTALLATION.....4](#)

[2.06.1 CANT STRIP INSTALLATION.....5](#)

[2.07.1 BASE SHEET INSTALLATION.....5](#)

[2.08.1 CAP SHEET INSTALLATION.....8](#)

[2.09.1 MEMBRANE SEAMING8](#)

[2.10.1 MINIMIZE ROOFTOP TRAFFIC.....9](#)

[2.11.1 FLASHING.....10](#)

[2.12.1 FLASHING - PENETRATIONS.....11](#)

[2.13.1 SURFACINGS AND COATINGS.....12](#)

[2.14.1 MEMBRANE REPAIR.....14](#)

[2.15.1 TEMPORARY CLOSURE.....14](#)

[2.16.1 ROOF WALKWAYS.....15](#)

[2.17.1 SHEET METAL WORK.....15](#)

2.01.1 GENERAL

This section of Firestone's Technical Manual provides instructions for the installation of Firestone APP Roof Systems. Reference to the Design Guide, Technical Information Sheets (T.I.S.), and other sections of Firestone's Technical Specifications is necessary to ensure that the finished roof system is installed in compliance with Firestone requirements.

Extended warranties of 15, 20 and 25 years, may require special considerations with regards to fasteners, insulations, flashing, and attachment requirements. Refer to the System Design Guide of this Technical Manual for specific requirements.

NOTE: IF A PROPOSED APPLICATION FALLS OUTSIDE OF THIS SPECIFICATION, CONTACT FIRESTONE ROOF SOLUTIONS FOR ADDITIONAL INFORMATION.

2.02.1 JOB SITE CONSIDERATIONS (CAUTION AND WARNINGS)

- A. Keep all adhesives, sealants and cleaning materials away from ALL ignition sources (i.e. flames, fire, sparks, etc.). Do not smoke while using these materials.
- B. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety instructions for all products used on the project.
- C. Care must be used when installing fasteners to avoid conduits and other piping in and under the deck.
- D. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Refer to Firestone's Technical Information Sheet "Recommended Guidelines for Application of Roofing Materials to an Occupied Building".
- E. Store Firestone APP rolls on end to protect it from becoming damaged. Do not stack rolls.
- F. Insulation must be properly stored and protected from ignition sources, moisture and damage.
- G. Cold weather:
 - 1. When the outside temperature is below 40 °F (4.4 °C), certain combinations of temperature and humidity may cause condensation on the surface of solvent-based adhesives and primers. If this condition occurs, discontinue the application until condensation no longer occurs.
 - 2. The consistency of sealants, adhesives and primers will thicken as the ambient temperature drops. Membranes stiffen as they cool. To minimize the following procedures are recommended to mitigate problems:
 - a. Store sealants, adhesives, primers and APP roll goods between 60 °F (15.5 °C) and 80 °F (26.7 °C). Heated, insulated boxes can be helpful.
 - b. Conduct small test applications to determine if ambient conditions will cause problems.
 - c. Stop the application or change to a warm container when material becomes too thick or stiff to properly apply.
 - 3. Do not use heat guns or open flames to dry adhesives and primers.
- H. Follow all OSHA and NRCA provisions for fire protection, including but not limited to those in OSHA 1926. 150, 151, 153, 1191-110 which apply to torch application.

2.03.1 ROOF SUBSTRATE PREPARATION

A. Correct Substrate Defects:

- 1. Defects that need to be corrected before work can commence should be brought to the attention of the General Contractor or Owner in writing and addressed by them.
- 2. For re-roofing applications, remove existing roof system components as specified by the project designer. If components are discovered during installation that could be detrimental to the performance of the new roof system, they should be brought to the attention of the project designer for corrective action.
- 3. Good roofing practice requires a complete tear-off to the structural deck if soundness and integrity of the existing roof system cannot be verified. Recovering an existing roof system is an alternative to removing existing roof components. However, non-destructive testing, in conjunction with core cuts, must be completed to determine the condition of the existing roof system and decking.

4. The building owner or project designer is responsible for assuring that all wet insulation and/or wet substrate materials are removed in a re-roofing application. The best diagnostic technique is taking and evaluating a series of roof cuts. There are three other techniques that are currently available to make this determination by indirect means:

These are:

- nuclear moisture detection
- infrared thermography
- electric capacitance.

5. These techniques provide measurement of factors that can be associated with the presence of moisture, which can then be correlated to the roofing cuts to verify the results of the non-destructive testing.

B. Remove Moisture:

Ponded water, snow, frost and/or ice, present in more than trace amounts must be removed from the work surface(s) prior to installing the Firestone APP Roofing System.

C. Prepare Surface:

Acceptable substrates to which a Firestone APP Roofing System can be installed must be properly prepared prior to membrane installation. The surface must be relatively even, clean, dry, smooth, free of sharp edges, fins, loose or foreign materials, oil, grease and other materials that may damage the membrane. Rough surfaces that could cause damage to the membrane must be overlaid with insulation.

D. Prime substrates as necessary:

Prime the substrate with ASTM D 41 asphalt primer at a rate of 1-1/2 to 2 gallons per 100 square feet (0.6 to 0.8 L/sq. m) or as specified by the supplier.

E. Fill Voids:

All surface voids of the immediate substrate greater than 1/4" (6.35 mm) wide must be filled with insulation or other appropriate material.

F. Install Vapor Retarder (When Specified):

Install a vapor retarder as specified by the project designer.

2.04.1 WOOD NAILER LOCATION AND INSTALLATION

Wood nailers must be installed as specified by the project designer or as noted in Firestone Details and the System Design Guide. Install wood nailers as follows:

A. Position Wood Nailer

Total wood nailer height must match the total thickness of insulation being used and should be installed with a 1/8" (3.2 mm) gap between each length and each change of direction.

B. Secure Wood Nailer

Wood nailers must be firmly fastened to the deck or building. Mechanically fasten wood nailers to resist a force of 200 lbf (890 N) in any direction, typically 12"(304.8 mm) o.c. Refer to attachment requirements as specified by the project designer.

C. Taper Wood Nailer

The wood nailer must be tapered (if applicable) so that it will always be flush at the point of contact with the insulation (refer to Firestone Details).

D. Chemically Treated Wood

Chemically treated lumber may affect the performance of the Firestone APP membrane and accessories including fasteners. Submit MSDS sheets for any chemically treated lumber that comes in contact with the APP Membrane, with active ingredients listed, to Firestone Technical Services for acceptance.

E. Installation of Wood Nailers by Others

Make these specifications and details available when nailers are to be installed by others. Work that compromises the integrity of the roof system may jeopardize the warranty for the entire project.

2.05.1 INSULATION INSTALLATION

A. Install Insulation:

Install only as much insulation as can be covered with roofing membrane and completed before the end of the day's work or before the onset of inclement weather.

B. Fit Insulation:

Neatly fit insulation to all penetrations, projections, and nailers. Insulation should be loosely fitted, with gaps greater than 1/4" (6.4 mm) filled with acceptable insulation. On metal decks, the edge of the board parallel with the roof deck should be completely supported. The membrane should not be left unsupported over a space greater than 1/4" (6.4 mm). Firestone recommends that tapered insulation with acceptable facers for bonding be installed around roof drains so as to provide proper slope for drainage as shown in Firestone Details.

C. Stagger Insulation Joints:

When installing multiple layers of insulation, all joints between layers shall be staggered.

2.05.1.1 Insulation Attachment

A. Mechanical Attachment:

Insulation must be attached using Firestone Insulation Plates and Fasteners.

1. Refer to the Firestone Technical Information Sheets for insulation attachment patterns and fastening rates.
2. When installing a multi-layer insulation assembly, the fastening pattern is determined by the type and thickness of the top layer of insulation.
3. For proper performance, fasteners must be fully seated, but not overdriven. The insulation plates may cup if the fasteners are overdriven.
4. Multiple layers may be installed using a common fastener.

B. Asphalt Attachment:

Insulation may be attached using a solid mopping of ASTM D 312 Type III or Type IV asphalt or Firestone SEBS Asphalt (as required by warranty term).

1. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m).
2. The substrate may require priming prior to installing the insulation. Refer to the Firestone Asphalt Design Guide for specific information.
3. The asphalt shall be applied at a rate sufficient to visually cover the surface area being bonded. The insulation is embedded in the asphalt while the asphalt is still hot and fluid.
4. Insulation boards must be walked in to ensure complete adhesion to the substrate.
5. Additional layers of insulation may be installed in the same fashion.

C. Adhesive Attachment:

1. Insulation may be attached using I.S.O. Fix, I.S.O. SPRAY, or I.S.O. Twin Pack.
 - a. Apply the adhesive in strict accordance with the instructions provided with the product and the Firestone Technical Information Sheets.
 - b. It may be necessary to prime the substrate prior to installing the insulation in adhesive.
 - c. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck must be completely supported.
 - d. Insulation boards must be no larger than 4' X 4' (1.2 m X 1.2 m).
 - e. Insulation boards must be walked-in to ensure complete adhesion to the substrate.
 - f. Additional layers of insulation may be installed in the same fashion.

2.06.1 CANT STRIP INSTALLATION

Install non-combustible cant strips at all walls and curbs as required by the appropriate design specifications and details using hot asphalt or Firestone Multi-Purpose MB Flashing Cement. Refer to the Design Guide and Details section of this manual for additional information.

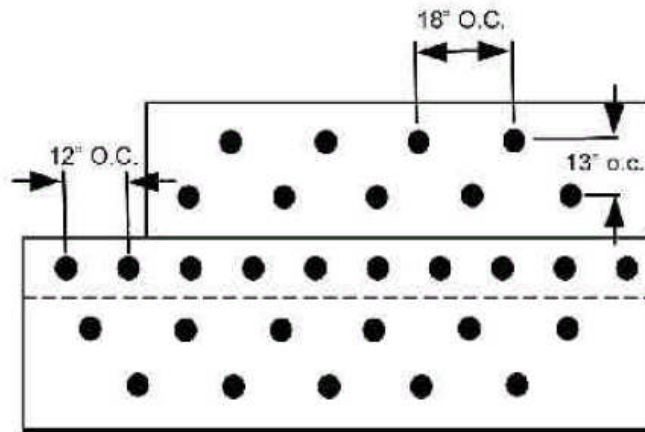
2.07.1 BASE SHEET INSTALLATION

2.07.1.1 Mechanical Attachment

Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing the sheet to relax, begin attachment at one end and work towards the other end, keeping the roll tight and wrinkle free. Align subsequent rolls, shingling the laps, maintaining a minimum 3" (76.2 mm) side lap and minimum 6" (152.4 mm) end lap and repeat the application. Stagger all end laps.

2.07.1.1.1 Fasten Base Sheet Using Firestone Insulation Plates and Fasteners

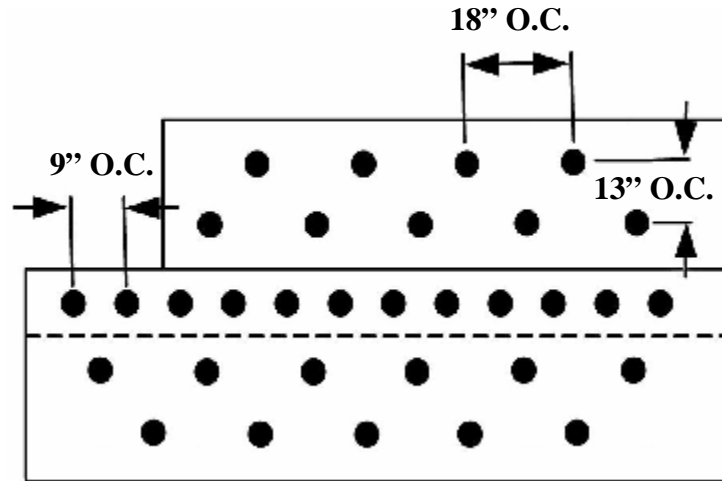
Using Firestone Insulation Plates and Fasteners, base sheets may be attached through insulation into the deck, or directly to poured-in-place concrete, wood, gypsum, or cementitious wood fiber. For lightweight concrete decks, refer to the Design Guide Section of this manual for information on the proper fasteners to be used with a particular deck type. Firestone MB Base M sheet must be mechanically attached 12" (304.8 mm) o.c. in the side and end laps and 18" (457.2 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 13" (330.2 mm) in from the sides of the base sheet. See diagram below.



The attachment pattern below applies to all 1 meter wide (39.4") Firestone APP compatible base sheets and cap sheets used as base sheets. The Firestone MB Base sheet must be mechanically attached 18" (457.2 mm) o.c. in the side and end laps and 36" (914.4 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (304.8 mm) in from the sides of the base sheet. See diagram below.

2.07.1.1.2 Fasten Base Sheet Using Cap Nails

Using cap nails with minimum 1" (25.4 mm) diameter steel heads, base sheets may be attached to plywood, wood plank, and oriented strand board decks. Base sheets must be mechanically attached with cap nails specified by the project designer at 9" (228.6 mm) o.c. in the side and end laps and 18" (457.2 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (304.8 mm) in from the sides of the base sheet. Cap nails can **not** be used to attach a base sheet through an existing roof membrane. The fasteners used to attach base sheet must be manufactured for the particular deck type and be Factory Mutual Approved. See the diagram below.



This attachment pattern applies to all 1 meter (39.4") wide Firestone APP compatible base sheets and cap sheets used as base sheets.

2.07.1.2.3 Fasten Base Sheet Using Specialty Fasteners

Using approved fasteners and plates, base sheets may be attached to gypsum, cementitious wood fiber or lightweight insulating concrete decks. The base sheet must be mechanically attached with fasteners as specified by the project designer and the fastener manufacturer. Nail-in fasteners cannot be used to attach insulation, or to attach a base sheet through an existing roof membrane. The fasteners used to attach base sheet must be Factory Mutual Approved and manufactured for the type of deck in use.

2.07.1.3 Cold Adhesive Attachment of APP Cool Sheets

Starting at the low point of the roof, install an approved base sheet in a uniform application of Firestone Multi-Purpose MB Cold Adhesive at a rate of 1-1/2 to 2 1/2 gallons per 100 square feet (0.6 to 1.0 L/sq. m). Align subsequent rolls, shingling the laps, maintaining a minimum 3" (76.2 mm) side lap and minimum 6" (152.4 mm) end lap and repeat the application.

1. Lay out the first base sheet by unrolling and aligning into final position.
2. Re-roll the sheet halfway and apply MB Cold Adhesive to the substrate with an airless sprayer or a 1/4" (6.4 mm) notched squeegee at a rate of 1-1/2 to 2 1/2 gallons per 100 square feet (0.6 to 1.0 L/sq. m). **SOME SUBSTRATES MAY TAKE MORE ADHESIVE DEPENDING UPON THE ABSORBENCY AND TEXTURE OF THE SURFACE.**
3. Roll the base sheet into the adhesive and broom into place.
4. Re-roll the other half of the sheet and install using the same process.
5. Install additional base sheets in the same fashion, assuring that the application of the Multi-Purpose MB Cold Adhesive is applied fully in the lap areas as well.

2.07.1.4 Attachment by Heat Welding

1. Starting at the low point of the roof remove the roll tape and unroll the first roll of APP Base sheet. Align the sheet and allow them to relax.
2. Re-roll one end approximately half way.
3. Unroll remaining rolls as much as necessary to properly align the side laps and ensure the required end laps are maintained.
4. Using a "hook" or "cane" tool to pull the roll, heat weld the re-rolled portion of the Base Sheet. **DO NOT STEP ON FRESHLY HEAT WELDED SHEETS!** Be alert to insure the lap area of the installed sheet is heated,

as well as the bottom of the sheet being applied. The welding temperature is correct when a 1/8 to ¼ inch (3.2 – 6.3 mm) wide flow of bitumen is extruding from the side lap.

5. Re-roll the unadhered portion of the base sheet and repeat the above procedure to complete the installation of the roll.

Note:

Base Sheets must **never** be heat fused directly to any insulation. Base sheets must be attached to insulation in accordance with Firestone requirements. An approved coverboard may be installed over Firestone polyiso insulation before the base sheet is installed.

2.07.1.5 Attachment of Self-Adhered Base

Starting at the low point of the roof, unroll Firestone MB Base SA and allow the sheet to relax. Align the Firestone SA Base sheet so that it lies flat, with no wrinkles. Align subsequent rolls, shingling the laps, and maintaining a minimum 3" (76.2 mm) side lap and a minimum 6" (152.4 mm) end lap and repeat the application.

1. Begin the attachment by removing the first 12" (304.8 mm) wide release paper backing from the membrane.
2. Apply pressure to the top side of the exposed area, starting at the center and working out to the edges, to ensure continuous attachment to the substrate.
3. Remove the remaining release-backing from the Firestone SA Base, keeping the membrane in contact with substrate and applying continuous pressure to the top of the sheet, from the center out to the edges.
4. Install subsequent sheets in the same manner. Note: ALL Firestone SA Base Systems **require** a heat fused (torched) cap sheet or insulation adhered in I.S.O. Twin Pack, to be installed over the top. When MB Base SA is used as a vapor retarder in the Firestone Non-Penetrating Vapor Retarder System, MB Base SA must be installed in SA Primer, with all laps (side and end) primed with SA Primer prior to sealing.

2.07.1.6 Base Sheet Laps

Base sheets must be lapped a minimum of 2" (50.8 mm) for side laps when hot asphalt applied and 3" (76.2 mm) for side laps when mechanically attached, applied in Firestone MB Cold Adhesive or torch applied. End laps must be minimum 6" (152.4 mm). In all cases, an offset of 12" (304.8 mm) minimum must be maintained between the side and end laps of the base sheet and the cap sheet.

2.08.1 CAP SHEET INSTALLATION

2.08.1.1 Attachment by Heat Welding (Torching)

1. Completely remove all of the roll tape before membrane installation.
2. Starting at the low point of the roof, then unroll the first roll of APP Cap sheet. Align the sheets and allow them to relax.
3. Re-roll one end approximately half way.
4. Unroll remaining rolls as much as necessary to properly align the side laps and ensure the required end laps are maintained.
5. Using a "hook" or "cane" tool to pull the roll, heat weld the re-rolled portion of the Base Sheet. **DO NOT STEP ON FRESHLY HEAT WELDED SHEETS!** Be alert to insure the lap area of the installed sheet is heated, as well as the bottom of the sheet being applied. The welding temperature is correct when a 1/8 to ¼ inch (3.2 – 6.3 mm) wide flow of bitumen is extruding from the side lap. Cut bottom sheet laps at a 45° angle according to Detail MB-LS-1.
6. Re-roll the unadhered half of the base sheet and repeat the above procedure to complete the installation of the roll. Embed granules on the receiving surface by heating the surface and troweling-in all granules until a uniform black surface coated with compound is achieved. To maintain warranty coverage, code compliance and aesthetics, any area of the sheet not protected with a granule surface must be covered, either by additional granules or with a piece of granule surfaced APP.

2.08.1.2 Application of APP Cool in Firestone Multi-Purpose MB Cold Adhesive

- A. Remove all roll wrapping tape and labels from APP Cool prior to installation.
- B. Un-roll and relax all APP sheets prior to installation.
- C. Align cap sheets in their final position, assuring that the minimum side and end laps are maintained. More than one sheet can be positioned in this step. This could be at the edge of the roof or through the drain lines. Cap Sheet laps must not fall on top of base sheet laps. Cut bottom sheet laps at a 45° angle according to Detail MB-LS-1 prior to completing an end lap.
- D. Fold back over roll cores or re-roll the cap sheet in half exposing the substrate.
- E. Apply Firestone Multi-Purpose MB Cold Adhesive to the substrate using a 1/4" (6.4 mm) notched squeegee or airless sprayer at a rate of 1-1/2 to 2-1/2 gallons per 100 ft² (0.6 to 1.0 L/m²).
- F. Fold back the cap sheet into the adhesive and broom into place. The adhesive may be left open no more than 10-15 minutes prior to installing base sheet.
- G. Repeat the process for the other half of the sheet.
- H. Complete the side and end laps of the base sheet by heat fusing with a propane torch, an automatic heat welder, or by sealing with Firestone Multi-Purpose MB Flashing Cement. Side laps can be sealed with Multi-Purpose MB Cold Adhesive.
- I. Firestone recommends that granules be applied to areas of adhesive bleed-out as the installation progresses. Areas of adhesive bleed-out at inside and outside corners require the application of granules to protect them from UV exposure.

2.09.1 APP LAP SPLICE REQUIREMENTS

All laps of torch grade APP products must be sealed by heat welding with a hot air welder or a propane torch. When granule surfaced APP cap sheets are used, the granules must be embedded in all lap areas prior to welding the lap as in Firestone Details MB-LS-1 and MB-LS-3.

2.09.1.1 Hot Air Welded Laps

1. Using hot air to weld modified bitumen laps is not recommended as it requires different welding speeds and temperatures depending upon ambient conditions.
2. An automatic heat welder and nozzle intended for heat welding APP modified bitumen membranes works best if heat welding must be used.
3. Each time laps are welded, a test of the lap integrity should be completed to determine proper speed and temperature.

2.09.1.2 Liquid Petroleum Gas-Heat Welded Laps

1. Using a round-tipped trowel, open the membrane lap and insert a small torch burner head into the lap.
2. Heat the membrane with the torch until it develops a sheen or glossy appearance, assuring that the bitumen is heated on both the top and bottom surfaces and the burn-off film is removed.
3. The welding temperature is correct when a flow of modified bitumen, approximately 1/4" (6.3 mm) wide, is extruded from the side lap. If the bitumen starts to flow excessively during application (more than 1/2" (12.6 mm)), excess heat is being applied and the membrane is being damaged.

2.10.1 MINIMIZE ROOFTOP TRAFFIC

During installation, keep rooftop traffic to a minimum until the membrane cools to ambient temperature, in order to minimize damage.

2.10.1.1 PHASED CONSTRUCTION

The NRCA defines phased construction to be: "The installation of a roof system in two or more separate time intervals". Firestone does not condone phased construction. However, we recognize that some amount of phased construction may be necessary on some projects.

2.10.1.2 Two-ply APP Systems

The first layer of membrane may be exposed for two weeks before the installation of the cap sheet. Preparing the surface to receive the cap sheets is critical to the finished performance of the system. The contractor is responsible for the preparation of the existing membrane prior to installation of the cap sheet.

1. Adhesion:

The roof system must be smooth, clean, dry and free of debris prior to installation of the cap sheet.

2. Insulation:

During the visual inspection above, verify that no insulation boards are wet. Curling boards may be an indication of this phenomenon.

B. The roof must not have been exposed to precipitation for a minimum of 12 hours prior to installing the cap sheet, excluding dew. Dew must be allowed to dry thoroughly before attempting to install the cap sheet.

C. Using a rooftop blower, clean the APP base layer to remove all accumulated loose dirt and other loose material. Areas that appear to have excessive accumulations of contaminants must be cleaned and primed or torched to activate the surface. These areas are typically found around saddles, drains, curbs etc.

D. If any noticeable bubbling occurs or steam is noticed coming off the membrane, discontinue installation and prepare the surface again, removing all evidence of debris, moisture and contaminants.

2.11.1 FLASHING

2.11.1.1 General

A. All flashing must be completed using Firestone APP Membranes and any additional membrane layers as required by Firestone Details.

B. Remove existing flashings (i.e. metal, bituminous, mastic, etc.).

C. Flash penetrations in accordance with the appropriate Firestone Details (MB-P-1 through MB-P-6).

D. A flashing seal must be made directly to the penetration (except as shown in details with metal sleeves).

2.11.1.2 FLASHING - Walls, Parapets, Mechanical Equipment Curbs, Skylights, Gravel Stops, or Roof Edge Materials

A. Flashing shall be installed in accordance with Firestone Details using Firestone APP Cool Membrane and Firestone Multi-Purpose MB Flashing Cement or APP Torch Grade products.

B. The following substrates require an overlayment of 1/2" (12.7 mm) exterior grade plywood mechanically fastened in accordance with the project designer's Requirements and Firestone Details.

Gypsum board (except 1/2" (12.7 mm) DensDeck Prime)

Stucco

Textured masonry

Corrugated metal panels

Other uneven substrates

C. Install base sheets and prepare substrates as shown in Firestone Details.

D. After the base sheet and field membrane have been installed, using a hook blade knife, cut flashing sections from the appropriate Firestone APP Cap Sheet as necessary. Flashing sections shall be of a size that will not allow cooling before they can be placed into final position. Flashing must extend a minimum of 6" (152.4 mm) onto the field membrane.

Note:

When torching to a granule surfaced sheet granules must be embedded before the lap is made. Granule embedment is required prior to constructing end laps, base flashings, base tie-ins and membrane repairs. Granule embedment, on the receiving surface can be accomplished by heating the surface and troweling-in all granules until a uniform black surface coated with compound is achieved in the lap area. Any

area of the sheet not protected by a granule surface must be dressed with additional granules or repaired with an additional piece of granule surfaced SBS. Specialty tools are available that aid in the embedding of the granules. Contact Firestone Roof Solutions Department for information.

2.11.1.3 Flashing Membrane Installation

- A. All APP flashing pieces must be properly heated before they are positioned.
- B. The area of the flashing that will cover from the top of the cant and above must also be properly heated and installed.
- C. The flashing portion that extends into the roof surface must be heated and adhered to the field membrane. Granules must be embedded in the area where flashing extends on to the field sheet when heat welding.
- D. Previously installed field membrane and wall flashing must be protected so that it is not damaged when additional flashing pieces are installed.
- E. Refer to Firestone Details for specific installation requirements of installing flashing.

2.11.1.4 Special Consideration for Copper/Lead Coated Copper Edging

Special cleaning techniques must be used to prepare the metal surface to which the Firestone APP membrane will be adhered. Firestone requires the cleaning with acetone or lacquer thinner, using clean cotton cloths. After the surface has dried, apply ASTM D-41 asphalt primer or Firestone SA Primer at a rate of approximately one (1) gallon per 100 square feet (0.4 l/m²). Allow the primer to dry before installing the Firestone APP membrane.

2.12.1 PENETRATION FLASHINGS

2.12.1.1 General

- A. Remove all existing flashings (i.e. metal, bituminous, mastic, etc.).
- B. Flash all penetrations which pass through the membrane in accordance with Firestone Details MB-P-1 through MB-P-6.
- C. The flashing seal must be made directly to the penetration (except as shown in details with metal sleeves).

2.12.1.2 Roof Drains

These guidelines apply for installation of cast iron drains only. For acceptability of other drain types contact Firestone Roof Solutions Department and Firestone Details MB-D-1 and MB-D-2.

- A. Remove existing flashings (including metal flashings), roofing materials and cement from the existing drain in preparation for new membrane.
- B. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
- C. Install tapered insulation around the drain to provide a smooth transition from the roof surface to the drain. Slope should not exceed 1" per foot (8.3%).
- D. Install the base sheet. Cut an opening in the base sheet so that it stops short of the clamping ring area.
- E. Extend the Field Base Sheet down the bowl into the clamping ring. Do not allow base sheet laps into the clamping ring.
- F. Fully adhere the lead flashing in a continuous layer of Firestone Multi-Purpose MB Flashing Cement, and prime the top surface with ASTM D 41 asphalt primer.
- G. Install interply sheet(s) appropriate to the desired warranty.
- H. Extend the field membrane down the drain sump and into the drain bowl.
- I. Make round holes in the membranes and align with clamping bolts.
- J. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve continuous compression.

2.12.1.3 Pipe Clusters and Unusual Shaped Penetrations

Fabricate and secure penetration pockets in accordance with Firestone Details.

2.12.1.4 Pipes

A. Pipes:

Many pipe penetrations can be flashed with a Firestone QuickSeam Pipe Boot Assembly. Complete application instructions are enclosed in every box of Firestone QuickSeam Pipe Boots.

B. Hot Pipes:

Protect the roofing components from direct contact with steam or heat sources when the in-service temperature is in excess of 180 °F (82.2 °C). In all such cases, flash to an intermediate "cool" sleeve in accordance with Firestone Detail MB-P-1.

2.12.1.5 Scuppers

- A. Remove existing scupper and provide a new welded watertight scupper.
- B. Flash wall in accordance with Firestone Specification Detail MB-S-1.
- C. Set welded watertight scupper in Firestone Multi-Purpose MB Flashing Cement and secure to the structure.
- D. Flash in accordance with Firestone Details.

2.12.1.6 Expansion Joints/Area Dividers

Install expansion joints and roof dividers in accordance with Firestone Specification Details MB-E-1 through 4.

2.12.1.7 Sheet Metal Work

Install all sheet metal work as detailed by the project designer or Firestone specifications, whichever is more stringent.

2.13.1 SURFACINGS AND COATINGS

2.13.1.1 Application of Firestone Aluminum Fibered Roof Coating

A. Aluminum Fibered Roof Coating is an item that must be maintained to provide continuous protection to the roof membrane.

B. If the system is to be coated, Firestone Aluminum Fibered Roof Coating may be applied immediately or from 30 to 90 days after the application of the cap sheet. Note that if the APP is coated immediately, there may be some staining of the coating but this should disappear with aging.

C. Substrate must be clean, dry and free of foreign materials such as oil, grease, and contaminants. If coating an existing weathered surface, the surface should be cleaned with pressure washers to remove loose dirt and allowed to dry.

D. Mix contents thoroughly to insure complete dispersion of aluminum pigments. For best results apply on a warm, sunny day, 60 °F (15.5 °C) or above, with no forecast of rain for 24 hours. Use directly from the container and DO NOT THIN. Pour Firestone Aluminum Fibered Roof Coating out of the container in small amounts and brush in parallel strokes to form an even layer. Over-brushing causes some of the aluminum sheen to lessen, reducing reflective qualities. Repeat as necessary to insure complete coverage. The coverage needed for smooth APP is 1.3 to 2 gal per 100 sq. ft (0.5 to 0.6 L/sq. m). Coverage varies depending on the surface texture. Secure the cover when not in use.

E. The Firestone Aluminum Fibered Roof Coating must be regularly maintained to ensure continuing warranty coverage and may be required to ensure continuing fire and code approvals.

Precautionary Information:

1. Combustible, keep away from fire and other sources of ignition during storage. Always keep ample fire extinguishing equipment near any area of application.
2. Avoid skin contact and inhalation of vapors. Always work in well-ventilated areas with proper clothing and safety equipment.
3. Prevent fumes from entering rooftop air handling units.
4. Do not thin Firestone Aluminum Fibered Roof Coating.
5. Review all Material Safety Data Sheets prior to using Firestone Aluminum Fibered Roof Coating.

6. Store all unopened containers at room temperature, 60 °F (15.5 °C) to 80 °F (26.6 °C), until ready for use.

2.13.1.2 Application of Firestone Acrylic Coating System for Asphalt

The Firestone Acrylic Coating System for Asphalt is a two-coat system consisting of a first coat of Firestone Acrylic Base Coat for Asphalt followed by a second coat of Firestone AcryliTop PC-100 top coat. It is essential that the Base Coat be applied on APP surfaces as it is this coat that ensures good adhesion to asphaltic substrates and long-term performance of the two-coat system. Substrates must be clean, dry and free of foreign material and contaminants. Install the Firestone Asphalt Roof System in accordance with all current Firestone specifications. Roof inspection by Firestone (with subsequent repairs and re-inspection, if necessary) is required prior to application of the Firestone Acrylic Coating System for Asphalt if a warranty is required. The membrane surfaces must be clean, dry, and free of foreign material and contaminants prior to the Acrylic Base Coat for Asphalt application. The membrane surface will require additional cleaning in the areas where dirt has accumulated due to ponding water. Best results may be obtained by cleaning soiled areas with a mild detergent and water. Rinse the area thoroughly and allow it to dry before the application of the coating.

A. Firestone Acrylic Base Coat for Asphalt

1. Spray apply the Acrylic Base Coat for Asphalt in a one-coat application to achieve a minimum coverage rate of approximately 1 gallon per hundred (100) square feet (0.4 m²/L) on APP 160 and APP 170 membranes and approximately 1 1/2 gallons per hundred (100) square feet (0.6 m²/L) on APP granule surfaced membranes, using a spray unit with an attached air compressor capable of delivering 100 psi (689.5 kPa). Check with manufacturers for their recommendations.

OR

2. Roller apply Acrylic Base Coat for Asphalt to achieve a coverage rate of approximately 1 gallon per hundred (100) square feet (0.4 m²/L) on smooth surfaced membranes and 1 1/2 gallons per hundred (100) square feet (0.6 m²/L) on granule surfaced membranes.

3. Allow the Acrylic Base Coat for Asphalt to dry to the touch before applying the AcryliTop PC-100 top coat. Dry time is approximately 24 hours depending on ambient air conditions.

4. Inspect the application to assure that complete coverage of the membrane is achieved. Apply additional Acrylic Base Coat for Asphalt to areas with incomplete coverage.

B. Firestone AcryliTop PC-100

1. A top coat of AcryliTop PC-100 is applied in exactly the same manner as the Base Coat, at a minimum coverage rate of one gallon per 100 square feet (0.4 m²/L). Inspect the application to assure complete coverage of the membrane. Apply additional AcryliTop PC-100 top coat to areas where complete coverage has not been achieved. This should be visually obvious as the AcryliTop PC-100 top coat is white, tan, or gray and covering the yellow tint of the Acrylic Base Coat for Asphalt. Allow the AcryliTop PC-100 top coat to dry to the touch before allowing traffic on the roof. Dry time is approximately 24 hours depending on ambient conditions.

2. The coating must be regularly maintained to ensure any continuing warranty coverage and may be required to ensure continuing fire or all other code approvals.

Precautionary Information:

1. Do not contaminate AcryliTop coating products with foreign materials.
2. DO NOT apply the acrylic products when ambient air temperatures will be below 45 °F (7.2 °C) within a 24-hour period after application.

3. Do not apply acrylic products when inclement weather is expected within 24 hours.
4. Do not expose acrylic products to temperatures greater than 140 °F (60 °C) or lower than 35 °F (1.7°C).
5. Do not thin Firestone acrylic products.
6. Recommended cleaner is water.
7. It is recommended that periodic inspections of the roof system be conducted by the owner, with the subsequent re-application of Firestone White Acrylic Coating System to areas that may need touch-ups. Where the asphalt surface is exposed, it is necessary to re-apply a coat of Acrylic Base Coat for Asphalt before re-applying the AcryliTop PC-100 top coat.
8. Review Material Safety Data Sheets prior to using Acrylic Base Coat for Asphalt and AcryliTop PC-100 top coat.

2.14.1 MEMBRANE REPAIR

When it is necessary to repair the membrane, use the following criteria:

- A. A wrinkle or fishmouth must be cut and laid flat and repaired with a section of Firestone Granule surfaced APP Membrane.
- B. Firestone APP Membrane repair materials must be heat fused to the existing membrane. (When a repair is performed on a granule-surfaced sheet, the granules must be embedded prior to adhering the repair material.)
- C. All repair pieces must extend a minimum of 4" (101.6 mm) past the boundary of the affected area in all directions. It is recommended that all corners of repair material be rounded.
- D. Laps not showing the required bitumen flow must be repaired by lifting the membrane with the end of a round tipped trowel and heating both surfaces. When a slight puddling occurs, push down the seam area with the trowel so flow out is observed. Ensure that the reinforcement in the Firestone APP Membrane is not exposed during this process. Should the reinforcement be exposed, the area shall be repaired by installing a new Firestone APP piece over the affected area in the same manner described in C above.

2.15.1 TEMPORARY CLOSURE

A. Temporary closures must be used to prevent water from flowing beneath the roofing system during inclement weather.

1. The roof membrane must extend at least two (2) feet (609.6 mm) over the last row of insulation (where applicable). Apply a continuous layer of asphalt or roofing cement onto the substrate and the membrane edge. Mating surfaces must be smooth, clean, dry and free of any loose foreign material and gravel.
 2. If the membrane is APP Cool, firmly embed roof membrane into the roofing cement and provide continuous pressure over the length of the cut-off by using sufficient weight.
 3. If the membrane is APP, the membrane may be torched directly to a suitable substrate.
- B. The closure described in "A" above is an overnight tie-in only and is not intended for long-term use. If temporary tie-in must remain for more than one day's time, it must be checked on a daily basis to assure the tie-in remains sealed and reworked if necessary.
- C. Refer to Firestone's acceptable tie-in detail when long-term tie-ins are necessary.
- D. Temporary tie-ins must be completely removed providing a clean surface for the new roofing system.
- E. Tie-ins, either temporary or permanent, are not warranted by Firestone.

2.16.1 ROOF WALKWAYS

- A. Walkways help protect the roof system from damage due to necessary rooftop service traffic.
- B. Walkways are required at all access points (ladders, hatches, doorways, etc.) to the roof and on all roofs where foot traffic is expected to be more than once a month.
- C. Install an additional layer of Firestone APP granule surfaced membrane to the finished Firestone APP system using standard application techniques.
- D. Identify walkway areas as specified by the project designer or by using material with a different colored granule if available.

2.17.1 SHEET METAL WORK

A For specific installation instructions for Firestone Sheet Metal, refer to the System Design Guide and Technical Information Section of this manual.

B For sheet metal work not supplied by Firestone, refer to fabrication and installation requirements specified by the project designer as well as industry standards.

END OF SECTION