Roofing System Application Guide

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2.01 GENERAL

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

Wind warranties in excess of 55 mph, may require special considerations with regards to fasteners, plates, insulations, membrane gauge, and attachment requirements.

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

2.02 JOB SITE CONSIDERATIONS (CAUTION AND WARNINGS)

A. SAFETY:

1. Comply with all applicable regulatory safety regulations.
2. 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.
3. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety instructions for all products used on the project.
4. Care must be used when installing fasteners to avoid possible conduits and other piping in and under the deck.
5. 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".
6. Do not use heat guns or open flames to dry adhesives and primers.

B. CAUTIONS:

1. Store Firestone EcoWhite EPDM membranes in the original undisturbed plastic wrap in a manner to protect it from becoming damaged. Insulation must be properly stored and protected from ignition sources, moisture and damage. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety, use and storage instructions for all products used on the project.
2. Do not use oil-base or bituminous-base roof cement with Firestone EcoWhite EPDM membrane.
3. Store Firestone Insulations properly protected from ignition sources, moisture and damage.

C. 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. When the ambient air conditions no longer cause condensation on adhesive surfaces and

the membrane is clean and dry then re-apply additional adhesive or primer and proceed.

2. The consistency of sealants, adhesives and primers will begin to thicken as the temperature drops. To minimize this, the following is recommended:

   a) Start work with sealants, adhesives and primers that have been stored between 60° F
   and 80° F (15.5 C and 26.7 C). Insulated and heated boxes may be helpful.

   b) Complete test areas to determine if conditions will cause problems such as condensation with the application of the material.

   c) Stop the operation or change to another warm container when material becomes too thick to properly apply.

3. Do not use heat guns or open flames to dry adhesives and primers.

4. When the outside temperature is below 40° F (4.4 C), installation of the Firestone EcoWhite
   EPDM System requires additional application procedures:

   ☐ Ensure that the roof surface is dry. Moisture may cause poor adhesion, and may lead to moisture entrapment within the roofing system.
   ☐ Use of temporary roofs should be considered when roof applications must occur in cold or potentially wet weather to permit continued interior construction or roof-top work to proceed.

5. If using Water-Based Bonding Adhesive (WBBA), temperatures and substrate must be at least 40° F (4.4 °C) and rising for the material to be applied and perform as designed. Longer drying times should be expected for lower temperatures and higher humidity.

2.03 ROOF SUBSTRATE PREPARATION

It is the roofing contractor's responsibility for ensuring that the substrate is acceptable for the Firestone roof system.

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. If soundness and integrity of the existing roof system cannot be verified, good roofing practice requires a complete tear-off to the structural deck. However, recovering an existing roof system is an alternative to removing existing roof components. 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 thermograph
- ☐ electric capacitance.

These techniques provide measurement of factors that can be associated with the presence of moisture, which can then be verified with the use of roof core cuts to confirm the results of the non-destructive testing.

5. In the absence of a design professional, the roofer should coordinate with the building owner to assure conditions are satisfactory to commence with the project as designed.

B. REMOVE MOISTURE:

1. 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 EcoWhite EPDM Roofing System.

C. PREPARE SURFACE:

1. Acceptable substrates to which the Firestone EcoWhite EPDM Roofing System is installed must be properly prepared prior to roof system 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 roof system. Rough surfaces that could cause damage to the membrane must be overlaid with insulation.

D. FILL VOIDS:

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

2.04 WOOD NAILER LOCATION AND INSTALLATION

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

Firestone Building Products no longer requires the use of treated wood nailers. This is due to the new EPA requirements that have caused treated lumber to have more corrosive properties than the previous generation of wood treatments.

If architectural specifications require the use of treated wood nailers, the following Firestone requirements apply:

- ☐ Refer to the Firestone Design Guide for the appropriate Firestone fastener to be used for securing membrane into wood nailers.
- ☐ Nails penetrating treated wood nailers must be hot-dipped galvanized, meeting ASTM A653, Class G185 or as currently recommended by industry associations.
- ☐ Aluminum fasteners, flashings and accessory products must not make direct contact with treated wood nailers.
- ☐ Uncoated metal and painted metal flashing and accessories, except for 300-series stainless steel, must not make direct contact with treated wood nailers.
- ☐ When in doubt of the type of treatment of the wood nailer or its compatibility with a metal component, use EPDM membrane as a separator.

Because of recent EPA regulations regarding treated wood, new treatments for lumber may be highly corrosive to fasteners. Contact the fastener manufacturer for their recommendations on fasteners if attaching nailers that have been treated with corrosive materials.

A. WOOD NAILER GRADE:

1. When wood nailers are used, Firestone specifications require the use of wood that is kiln- dried (Southern Pine, Douglas Fir) structural grade #2 or better, unless otherwise noted. While being stored on the roof, properly elevate and cover non-treated wood to protect from the weather and keep dry. Nailers must be properly anchored to provide secure attachment through the warranty term. Nailers are not covered by any Firestone warranty.

B. SIZE OF NAILER

1. Nailers shall be a minimum thickness of 2" x 4" nominal (1-1/2" (37.1mm) x 3-1/2" (89mm)) and exceed the width of any metal flange attached to it by a minimum of ½" (12.7mm).

C. POSITION WOOD NAILER

1. 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. When more than one nailer thickness is used end joints should be staggered a minimum of 12" from the prior layer in straight runs.

D. SECURE WOOD NAILER

1. Wood nailers must be firmly fastened to the deck or building. Mechanically fasten wood nailers to resist a minimum force of 200 lb/f (890 N) in any direction. Defer to attachment requirements of the roofing system as specified by the project designer if greater than 200 lbf (890 N).

E. TAPER WOOD NAILER

1. 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).

F. POURED-IN-PLACE DECKS

1. For new construction over poured-in-place decks or fill, and all recover projects, a waterproof separator membrane shall be placed between the non-treated lumber and the deck.

G. INSTALLATION OF WOOD NAILERS BY OTHERS

1. 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 roof warranty.

H. FOR ADDITIONAL INFORMATION

1. Please consult the NRCA Special Report, "Use of Treated Wood in Roof Assemblies."

2.05 AIR OR VAPOR BARRIER INSTALLATION

A. INSTALL VAPOR RETARDER (WHEN SPECIFIED):

1. Install a vapor retarder as specified by the project designer or as required by Firestone.

B. INSTALL AIR BARRIER (WHEN SPECIFIED)

1. Install an air barrier as specified by the project designer or as required by Firestone.

1.06 INSULATION INSTALLATION

Where a Base sheet is required prior to insulation installation, use the following guidelines and refer to the Design section of Firestone specifications for suitable substrates and Technical Information Sheets for product information.

A. INSULATION INSTALLATION:

1. Install Insulation

a) 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) Form continuous insulation joints over deck flange. Do not cantilever insulation edges over deck ribs. Minimum bearing surface: 1" (25.4 mm).

c) When installing multiple layers of insulation, all joints between layers should be staggered 6" minimum.

2. Fit Insulation:

a) Neatly fit insulation to all penetrations, projections, and nailers. Insulation should be loosely fitted, with no gaps greater than 1/4" (6.4 mm) filled with acceptable insulation.

b) On metal decks, the edge of the board parallel with the roof deck flutes should be completely supported by the flute. The membrane should not be left unsupported over a space greater than 1/4" (6.4 mm).

c) Tapered insulation with acceptable facers for bonding must be installed around roof drains so as to provide proper slope for drainage as shown in Firestone Details.

3. Attach Insulation

a) Mechanical Attachment:

1. Insulation must be attached using Firestone Insulation Plates and Fasteners. HailGard Fasteners can be used to attach HailGard insulation without insulation plates.

2. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck should be completely supported and fasteners must penetrate the top rib of the deck the required depth.

3. When installing fasteners, care should be taken to avoid penetration of conduits and other piping below or encased in the deck.

4. For attachment, refer to the Technical Information Sheets that references the specific insulation being used. Attachment patterns and fastening rates of that insulation will vary depending on performance required.

5. For specific deck penetration requirements refer to the Technical Information Sheet that references the specific fastener being used.

6. When installing a multi-layer insulation assembly, the fastening rate and pattern is determined by the type and thickness of the top layer of insulation.

7. Ensure that the fasteners are fully seated, but not overdriven. Use a properly adjusted clutch or depth sensing type of drill. Do not use a standard drill.

8. Multiple layers may be installed using a common fastener.

b) Asphalt Attachment:

1. The substrate may require priming prior to installing the insulation. Refer to the Design Guide for specific information.

2. RESISTA and ISOGARD HD cannot be hot asphalt attached.

3. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m) boards.

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

5. Top insulation board shall be installed without displacing asphalt to the top of the seam where it can contact the RubberGard EPDM membrane. Should it happen, contact a Technical Coordinator at 1-800-428-4511.

6. The asphalt shall be at the manufacturer's stated EVT less ~ 25 F at the point of installation. Enough asphalt must be installed (approximately 25-30# /100 sq. ft (1.2 –1.4 k/sq. m)) to ensure that complete adhesion is achieved.

7. It is necessary to "walk" boards in to ensure complete adhesion to the substrate.

8. Additional layers of insulation may be installed in the same fashion.

c) Adhesive Attachment:

1. Insulation may be attached using I.S.O. Twin Pack, I.S.O.FIX II, I.S.O.SPRAY S, I.S.O. Stick or Hot Asphalt. RESISTA and ISOGARD HD cannot be hot asphalt attached.

2. Apply the adhesive in strict accordance with the instructions provided with the product and the Technical Information Sheets that are a part of the Firestone Technical Database and Manual.

3. It may be necessary to prime the substrate prior to installing the insulation adhesive. Consult the specific TIS of the Adhesive selected.

4. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck flutes must be completely supported.

5. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m).

6. It is necessary to "walk" boards in and weight down to ensure complete adhesion to the insulation and substrate.

2.07 MEMBRANE INSTALLATION

This section contains information for Firestone EcoWhite EPDM membranes systems. Read all of the information to ensure that it is the correct system and application

Firestone EcoWhite EPDM systems must be fully adhered.

A. FULLY ADHERED SYSTEM

1. Membrane Placement:

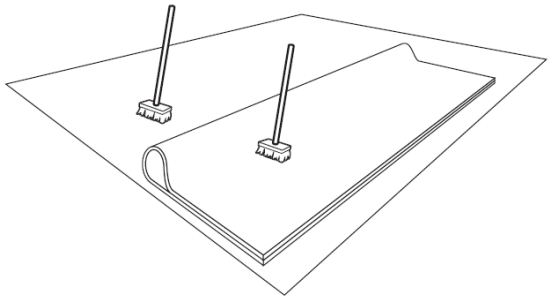
   a) The Firestone EcoWhite EPDM Adhered System must be installed so that the seams shed or run parallel to the flow of water.

   b) Place membrane panel, unroll without stretching, over the acceptable substrate leaving sufficient membrane for tie-ins, roof edges and seaming, allow relaxing for a minimum of
   30 minutes before attaching or splicing.

   c) Placement of additional rolls of membrane shall provide for sufficient overlaps for seaming of membranes. See standard lap splice details.

2. Fold the Membrane Back:

   a) After making sure the sheet is placed in its final position allowing for the minimum lap width per Firestone specifications, fold it back evenly onto itself without wrinkles to expose the underside mating surface of the sheet.



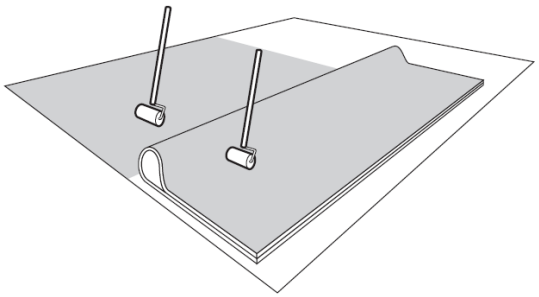
3. Remove Dusting Agent and Dirt:

   a) Sweep the mating surfaces with a stiff broom to remove any dusting agent or dirt that may have accumulated.

4. Apply the BA-2004 (T) Bonding Adhesive:

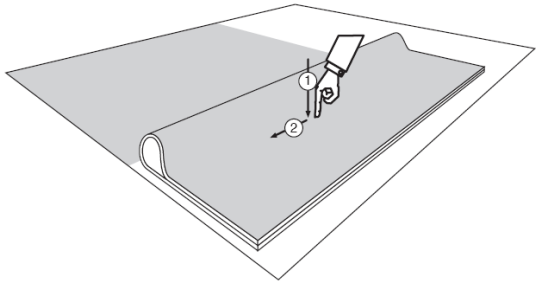
   a) Apply bonding adhesive with either a 9" (228 mm) wide solvent-resistant: paint roller, power roller or a commercial-grade adhesive sprayer. Adhesive must be applied in a relatively uniform thickness to both surfaces at approximately the same time. If adhesive is spray-applied, it must be back-rolled with a paint roller to assure proper contact and uniform coverage. Refer to Firestone Technical Information Sheets and container labels for specific application instructions and information on spray equipment.

   b) Apply bonding adhesive at specified coverage rate refer to the container label and Technical Information Sheet for specific application requirements and coverage rates.



5. Test Bonding Adhesive for Readiness (Touch-Push Test)

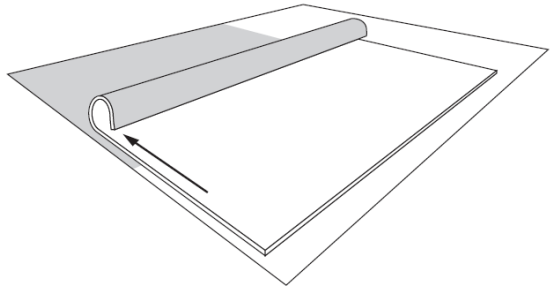
   a) Allow the bonding adhesive to flash-off. Touch the adhesive surface in several places with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, the adhesive is not ready for mating. Flash-off time will vary depending on ambient conditions of temperature and humidity.



6. Bond the Membrane to the Substrate:

   a) Starting at the fold, roll the previously coated portion of the membrane into the coated substrate slowly and evenly to prevent wrinkles.

   b) Broom the membrane to assure proper contact, compress the bonded half of the membrane to the substrate with a stiff push broom.



7. Repeat Procedure:

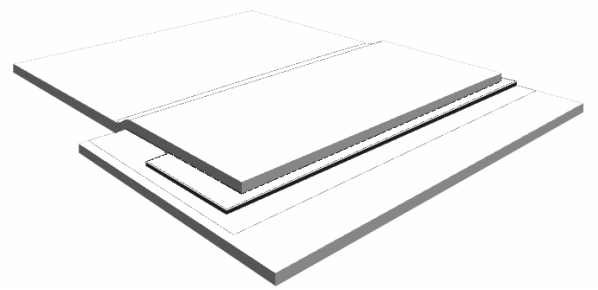
   a) Complete the membrane installation fold the un-adhered half of the membrane back onto itself, and repeat the procedure.

8. Splice the Laps

   a) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickPrime
   Plus product and EcoWhite QuickSeam Splice Tape.

   b) T-Patches at 3 way laps: Apply EcoWhite "T" Joint Covers at all 3-way sheet intersections and at all factory laps that intersect another sheet.

2.08 MEMBRANE SEAMING



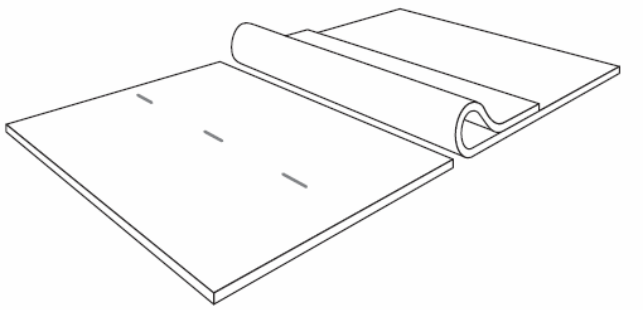
A. SEAMING PROCEDURES

   1. Position and Fold Back the Lap Edge:

      a) Position the membrane at the seam area by overlapping the membrane 4" (102 mm) for the 3" (76mm) EcoWhite EPDM QuickSeam Tape. Once the membrane is in place, mark the bottom membrane 1/2" (12.7 mm) to 3/4" (19 mm) from the edge of the top membrane every 4' (1.2 m) to 6' (1.8 m).

      b) Tack the membrane back with Single-Ply QuickPrime Primer as necessary to

hold back the membrane at the splicing area.



2. Apply Firestone Single-Ply QuickPrime Primer to Seam Area:

   a) Remove excess amounts of dusting agent on the membrane and at factory splices using a stiff push broom. In the case of adhered systems make sure there is no contamination of bonding adhesive in the tape area.

   b) Stir Single-Ply QuickPrime Primer thoroughly before and frequently during use. Dip the QuickScrubber or QuickScrubber Plus into the bucket of Single-Ply QuickPrime Primer, keeping the pad flat.

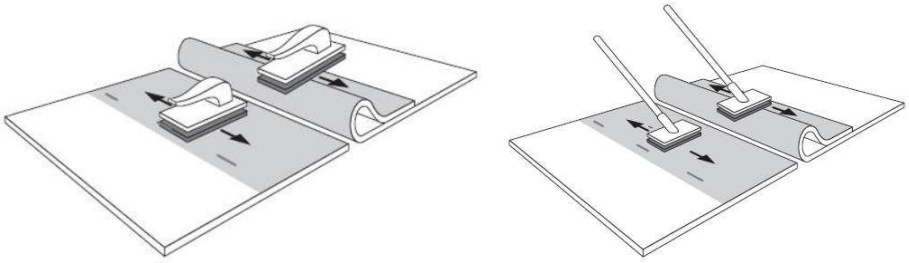
   c) Apply the White Single-Ply QuickPrime Primer uniformly; at least 1" wider than EcoWhite QuickSeam Tape application area, using long back and forth type strokes with pressure along the length of the splicing area until surfaces become dark gray in color. Do not over-work the Single-Ply QuickPrime Primer.

      1. Apply Single-Ply QuickPrime Primer to both sheet surfaces alternating between sheets while working down the seam area.

   d) Change the QuickScrubber Plus pad:

      1. When the pad will no longer hold the proper amount of Single-Ply QuickPrime Primer, whichever is less.

   e) Additional scrubbing is required at all factory seams and at areas that may have become contaminated or have excess amounts of dusting agent in the creases. Allow QuickPrime to dry, check using the Touch-Push test.

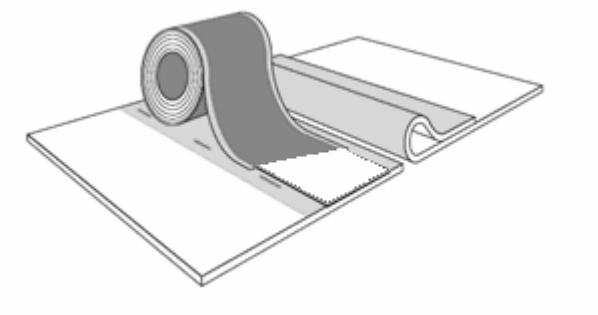


3. Apply the EcoWhite EPDM QuickSeam Splice Tape:

   a) After allowing the Single-Ply QuickPrime Primer to dry properly using the Touch-Push Test.

      1. Apply the EcoWhite EPDM QuickSeam Splice Tape. Taper to the bottom membrane, aligning the edge of the release paper with the markings.

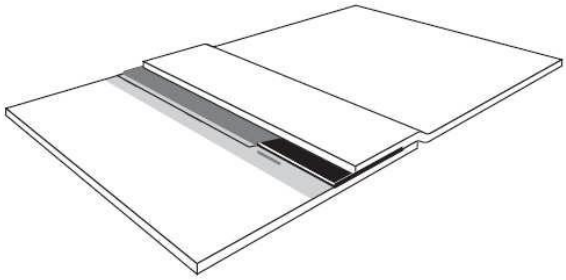
   b) Immediately roll the splice tape with a 3" to 4" (76 mm to 102 mm) wide silicone hand roller, a short nap 3" (76 mm) paint roller, or a clean QuickScrubber or QuickScrubber Plus pad and handle.



4. Position the membranes, check the Splice Tape Alignment:

   a) Place the top membrane to rest on bottom membrane with the tape's release backing still in place.

      1. Trim the top panel as necessary to assure that 1/8" to 1/2" (3.1mm to 12.7 mm) of the EcoWhite QuickSeam Seam Tape will be exposed on the finished seam. Confirm the tape will be in full contact with Single-Ply QuickPrime Primer treated membrane.

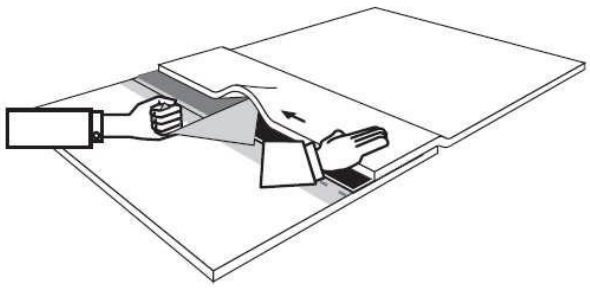


5. Remove Release Backing:

   a) Allow the top membrane to fall freely onto the bottom membrane prior to removal of the release backing.

   b) Start to peel the release backing off the EcoWhite QuickSeam Splice Tape by pulling against the weight of the panel at approximately a 45° angle to the tape and parallel with the roof surface.

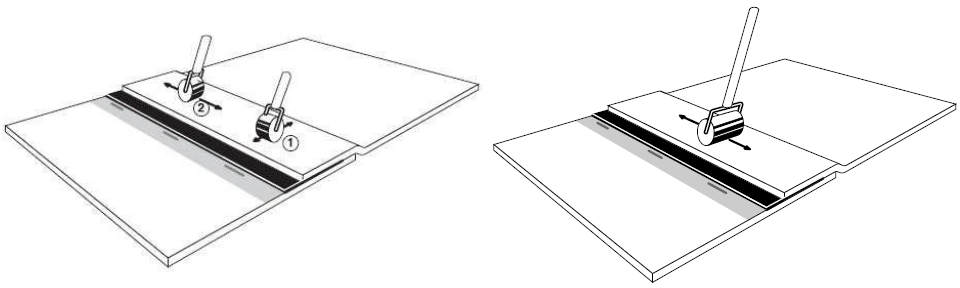
   c) Broom the entire length of the seam at a 45° angle as the release paper is being removed.



6. Roll the Seam

   a) Roll the seam as appropriate, using the Firestone QuickRoller and 2'-3' strokes working from one side of the seam to the other along the seam length, or a 1-1/2" to 2" (38 mm - 51 mm) wide silicone hand roller, first across the width of the

seam and then along the entire length and width of the seam.



7. Special Considerations (Factory laps, End Laps, "T" Joints, transition patches, and others.)

a) End Laps of tape - When the seam is greater in length than the tape, the adjoining QuickSeam Splice Tape must be overlapped a minimum of 1" (25.4 mm) and detailed per LS Details.

b) Trim QuickSeam Splice Tape at "T" Joints - Trim QuickSeam Splice Tape so that the edge of QuickSeam Splice Tape and the edge of the membrane are flush beneath the "T" Joint area. Per LS Details.

c) "T" Joints - Apply a section of Firestone EcoWhite QuickSeam Flashing or EcoWhite QuickSeam Joint Cover over the "T" joint area per LS Detail.

B. FLASHING SPLICES USING ECOWHITE SPLICE ADHESIVE (REPAIRS ONLY)

Where splice adhesive is allowed by Firestone Details, use the following procedure for completing the seams:

1. Clean the flashing and roof membrane area to be seamed using clean natural fiber cloths with Firestone Splice Wash to remove all dusting agent, dirt, and other contaminants that will affect the finished seam and allow drying. Additional cleaning may be required to ensure that the membrane is completely cleaned. Cleaning at factory seams is required to remove accumulations of dusting agent. Natural fiber cloths must be discarded as they become dirty and replaced with clean ones to assure proper cleaning. Proper cleaning has been achieved when the membrane surface is white in color and no streaking is evident.

2. As an option, Single-Ply QuickPrime Primer may be used in lieu of the cleaning procedure described above. Refer to the EcoWhite QuickSeam Splice Tape Section of this specification and Firestone's Technical Information Sheet for proper application techniques of Single-Ply QuickPrime Primer.

3. Thoroughly stir Firestone's EcoWhite Splice Adhesive before and during use. Apply the Splice Adhesive using a Firestone Splice Adhesive Brush or a 3" to 4" (76 mm to 101 mm) wide 1/2" (12.7 mm) thick, solvent-resistant paint brush in a smooth, even coat with long brush strokes, such that brush marks bleed out, yielding a smooth, glossy adhesive surface. Apply Splice Adhesive to both mating surfaces at about the same time.

Do not use circular motions for applying EcoWhite Splice Adhesive. Do not use paint rollers, spray equipment or mechanical equipment for the application of splice adhesive. Do not use long handles on splice adhesive brushes to apply splice adhesive.

4. Test the splice adhesive for readiness by using the Touch-Push Test. Touch the adhesive surface in the thickest area with a clean dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, the adhesive is not ready for mating. Flash-off time will vary depending on ambient conditions.
5. After the splice adhesive has dried properly, mate the flashing to the curb
6. To complete the splice between the flashing and roof membrane, cut the flashing membrane down to each corner of the curb. Work the flashing membrane into the angle change as tightly as possible, and then allow the remainder of the flashing membrane to fall into place.
7. Roll the splice with a 1-1/2" to 2” (38 mm x 51 mm) silicone roller in both directions along the splice edge. Broom the membrane over the curb to assure proper mating of the bonding adhesive.

2.09 ADDITIONAL MEMBRANE SECUREMENT AND BASE TIE-IN FLASHING

QuickSeam RPF Strip

Membrane installations may require the use of a QuickSeam Reinforced Perimeter Fastening Strip (QSRPF) resulting in coordination with the layout and installation of membrane system. This process should be addressed early in the roofing process.

The additional securement details for the membrane (base tie-in) will occur at all locations where the membrane goes through an angle change greater than 1" (25.4 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.) And other areas as details indicate. See additional information in Section 1.12.A.

Secure the membrane at all locations where the membrane goes through an angle change greater than 1" (25.4 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.).

A. USING QUICKSEAM REINFORCED PERIMETER FASTENING STRIP (QSRPF)

1. Attach the QSRPF Strip to the penetration, parapet wall or deck using Firestone 2" (51 mm) Seam Plates or Firestone Batten Strips fastened a maximum of 12" (305 mm) o.c. Roll the membrane into place and then fold back, exposing the underside of the membrane and the QSRPF Strip. When using batten strips, apply Firestone All Purpose Sealant over each fastener head, assuring that the fastener head is completely covered.
2. Apply Single-Ply QuickPrime Primer to the membrane where it will mate with the

QuickSeam Splice Tape and allow to dry. Apply Firestone Bonding Adhesive to the back half of the QSRPF, to the membrane that is to be bonded to the penetration or wall, and to the penetration or wall itself.

3. After the surfaces have dried properly as determined by using the Touch-Push Test, remove the release paper from the QuickSeam Reinforced Perimeter Fastening Strip and roll the membrane into place, assuring a tight fit into the transition between the horizontal and vertical surfaces. Continue to roll the membrane up the wall and broom in place with a stiff push broom. Roll the membrane over the QuickSeam Tape with a 1-1/2" to 2" (38 mm x 51 mm) wide silicone roller across the tape and then along its length or QuickRoller.

4. Complete vertical laps seams as described in the lap splice section of this specification. Install a T-Joint Cover over any vertical lap splices that go through an angle change (Refer to Firestone Details).

B. USING FIRESTONE BATTEN STRIP

1. Install the RubberGard Membrane per Firestone Details and attach to the vertical substrate using Firestone Batten Strips a maximum of 12" (305 mm) o.c. (Polymer Battens may only be used over wood or metal substrates). Apply Firestone All Purpose Sealant over each fastener head, assuring that the fastener head is completely covered.

2. Cut a piece of flashing from RubberGard Membrane or QuickSeam Curb Flashing large enough to completely cover the substrate of the wall or curb and extend onto the roof membrane a minimum of 3" (76 mm). Complete the splice between flashing and the main roof membrane using QuickSeam Splice Tape before adhering flashing to the vertical surface. Provide lap seams in accordance with Firestone Details.

3. Apply bonding adhesive at about the same time to both the flashing and the surface to which it is being bonded so as to allow approximately the same flash-off time. Apply bonding adhesive evenly to avoid globs.

4. After the bonding adhesive has dried properly as determined by the Touch-Push Test, roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles. Broom the flashing to the substrate with a stiff push broom to assure proper contact.

2.10 FLASHING – PENETRATIONS

A. GENERAL:

1. Remove all loose existing flashing (i.e. metal, bituminous materials, mastic, etc.).

2. Flash all penetrations passing through the membrane.

3. The flashing seal must be made directly to the penetration.

B. PIPES, ROUND SUPPORTS, STRUCTURAL STEEL TUBING, ETC.:

1. Flash penetrations with Firestone EcoWhite QuickSeam Pipe Flashing. Do not cut or patch EcoWhite QuickSeam Pipe Flashings to assist in their installation except where noted on instructions.

2. Flash penetrations using EcoWhite FormFlash when the use of EcoWhite Pipe

Flashings is not possible.

3. Refer to Firestone's Technical Information Sheets for minimum and maximum pipe diameters that can be successfully flashed with Pre-Molded EPDM Pipe Flashings.
4. Structural Steel Tubing: Use a field-fabricated pipe flashing detail when the corner radius is greater than 1/4" (6.35 mm) and the longest side of the tube does not exceed 4" (101.6 mm). When the tube exceeds 4" (101.6 mm), use a standard curb detail including base-tie in and suitable termination.

C. ROOF DRAINS:

The following applies for installation of cast iron drains only. For all other drain types contact your Technical Coordinator at 800-428-4511.

1. Remove existing clamping ring. Remove any broken clamping hardware and replace.
2. Remove all existing flashing (including lead flashing), roofing materials and cement from the existing drain in preparation for membrane and Water Block Seal.
3. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
4. Install insulation, flat and tapered, with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain cannot be greater than 4 in 12 for standard membrane and 1 in 12 for reinforced membrane.
5. Position the membrane and cut a hole for the roof drain allowing a 1/2" (12.7 mm) to 3/4" (19.1 mm) of membrane inside the clamping ring. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
6. Install Firestone Water Block Seal on the clamping ring seat flange below the membrane. Use a minimum of one half of a 10 oz. (295 cc) tube for a 10" (254 mm) drain.
7. Install the roof drain clamping ring and all clamping bolts. Tighten the clamping bolts to achieve constant compression

D. INSERT DRAINS

Firestone 3" & 4" Insert Drains are intended for installation when existing drains are deteriorated and not suitable for reuse. For other conditions outside of these, contact Firestone Technical Services.

1. Remove existing clamping ring. Remove any broken clamping hardware and debris.
2. Install wood blocking as required to support, level and square drain with new insulation sump.
3. Install Firestone Insert drain, securing to a solid substrate in accordance with instructions, in preparation to receive the roof membrane.
4. Install insulation, flat and tapered, with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain cannot be greater than 4 in 12 for standard membrane and 1 in 12 for reinforced membrane.
5. Position the membrane and cut a hole for the roof drain allowing a 1/2" (12.7 mm) to 3/4" (19.1 mm) of membrane inside the clamping ring. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut

the membrane back to the bolt holes.

6. Install Firestone Water Block Seal on the clamping ring seat flange below the membrane. Use a minimum of one half of a 10 oz. (295 cc) tube for a 10" (254 mm) strainer basket/clamping ring.

7. Install Firestone roof membrane as prescribed and secure with strainer basket and bolt assembly.

E. PIPE CLUSTERS AND UNUSUAL SHAPED PENETRATIONS:

1. Install Firestone molded Penetration Pockets per instructions. Allow a minimum clearance of 1" (25.4 mm) between the penetration(s) and all sides of the Penetration Pocket.

2. Flash detail with shop made penetration pockets to allow a minimum clearance of 1" (25.4 mm) between the penetration(s) and all sides.

3. Secure penetration pockets and flash per Firestone Details.

4. Fill penetration pockets with Firestone Pourable Sealer and mound to shed water. Pourable Sealer must be a minimum of 2" (51 mm) deep and 1" (25.4 mm) thick around the penetrations.

F. HOT PIPES:

1. Protect the Firestone EcoWhite EPDM components from direct contact with steam or heat sources when the in-service temperature is in excess of 180 °F (60 °C). In all such cases flash to an intermediate "cool" sleeve with hood. See penetration details.

G. FLEXIBLE PENETRATIONS

1. Provide a weathertight gooseneck set in Water Block Seal and secured to the deck. Flash in accordance with Firestone Details.

H. SCUPPERS:

1. Provide and install a new welded watertight sleeve.

2. Set welded watertight scupper in Water Block Seal and secure scupper to the structure.

3. Flash in accordance with Firestone Details.

I. EXPANSION JOINTS:

1. Install where specified by the project designer. Install expansion joints in accordance with
Firestone details.

2. Ensure joints are sized to accommodate all anticipated movements and make logical transitions to other joint materials at roof perimeter.

2.11 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, ETC.

A. GENERAL:

1. Using the largest pieces of EcoWhite QuickSeam Flashing or EcoWhite EPDM membrane practical, flash all walls, parapets, curbs, etc., to the height as

specified by the project designer.

B. EVALUATE SUBSTRATE:

1. The following substrates require an overlay of ½" (12.7mm) Dens-Deck Prime®, ½"(12.7mm) Dens-Deck® or 5/8" (15.9 mm) exterior grade or "Wolmanized" plywood mechanically fastened in accordance with project designer's requirements.

   a) DensGlass Gold® or 'like' product

   b) Interior Gypsum board

   c) Stucco

   d) Cobblestone

   e) Textured masonry

   f) Corrugated metal panels

   g) Other uneven substrates

   h) All loose existing flashing must be removed.

2. Install Additional Membrane Securement at Curbs, Penetrations, Walls, etc.:

3. Provide Termination:

   Provide termination directly to the vertical substrate as shown in Firestone Details where indicated.

4. Provide Intermediate Attachment:

   a) Intermediate attachment of membrane is required at 36" (914 mm) intervals in accordance with Firestone Details unless:

      1. The wall surface is smooth, without noticeable high spots or depressions (i.e., plywood, poured or precast concrete, or hollow core block or masonry walls where joints are flush with masonry surface),

         AND

      2. The termination is either a Termination Bar or membrane has been installed underneath a coping or fascia on the outer parapet edge, over the top to the outside edge and turned down to lap any nailer substrate parting line.

2.12 EDGE METALS

A. FIRESTONE FASCIA AND COPING

1. Ensure membrane roof system extends enough to terminate per Firestone details at roof edge condition.

2. Install prefabricated Firestone perimeter metal edge treatment per instructions and details.

B. GRAVEL STOPS OR ROOF EDGE METALS

1. Flash Gravel Stops or shop made Roof Edge Metals using EcoWhite QuickSeam Flashing:

a) Clean the Membrane and Metal Edge:

1. Remove excess amounts of dusting agent by brooming. Apply Single-Ply QuickPrime Primer to the metal edging and membrane as described in Firestone Specifications. Allow the Single-Ply QuickPrime Primer to flash-off.

b) Apply EcoWhite QuickSeam Flashing:

1. Place the roll of EcoWhite QuickSeam Flashing on the roof a few feet ahead of the application starting point, positioned so that it unrolls from the top of the roll (release paper will be on top). Remove approximately 2' to 3' (.6 m to .9 m) of release paper and apply to the metal flange and EcoWhite RubberGard Membrane. Lap adjacent rolls of EcoWhite QuickSeam Flashing a minimum of 1" (25.4 mm). Refer to Roof Edge Details.

c) Roll the EcoWhite QuickSeam Flashing:

1. With a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the EcoWhite QuickSeam Flashing to assure proper adhesion. Additional attention must be given to factory seam intersections and to any change in plane.

d) Special Considerations (End Laps, "T" Joints, etc.):

1. Apply 6" (152.4 mm) length of EcoWhite QuickSeam Flashing, a EcoWhite QuickSeam Joint Cover or EcoWhite 6" x 6" (152.4 mm x 152.4 mm) Flashing to the inside edge of the EcoWhite QuickSeam Flashing at all overlaps. Refer to Roof Edge Details.

2. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, an additional piece of EcoWhite QuickSeam Flashing must be applied over the metal lap to the top of the gravel stop, after the initial application of EcoWhite QuickSeam Flashing. Seam Edge Treatment shall be applied at the intersections of the two flashing sections.

C. OPTIMAL APPLICATION:

1. The optimal use of EcoWhite QuickSeam Flashing is where a 3" (76 mm) edge metal flange is being used. This will provide the minimum 3" (51 mm) seam to the EcoWhite Membrane, with the remaining 3" (76 mm) of the material completely covering the metal flange.

2. If a flange wider than 3" (76 mm) is used, the joints of the sheet metal edge must be flashed using EcoWhite QuickSeam Flashing and Single-Ply QuickPrime Primer, after the primary flashing is complete. In addition, it is recommended that 3" (76 mm) QuickSeam Splice Tape be placed in the sheet metal laps to help seal the metal edge. Refer to Firestone Roof Edge Details.

2.13 MEMBRANE REPAIR

A. REPAIR CUTS/PUNCTURES IN THE MEMBRANE OR WRINKLES WITHIN 18" (458 MM) OF A SEAM:

1. A wrinkle running toward a seam or within 18" (458 mm) of a seam must be repaired.

a) The wrinkle must be cut out so that the membrane lays flat and patched with a piece of EcoWhite EPDM membrane having no factory seams that extends a minimum of 3" (76 mm) beyond the boundaries of the cut in all directions. If the wrinkle occurs through EcoWhite QuickSeam Flashing, like material must

be used for repair. EcoWhite QuickSeam Flashing may not extend onto the roof surface more than 6” (152 mm). If repairing of the same wrinkle must continue, then EcoWhite EPDM membrane must be used. Install the EcoWhite EPDM repair membrane first, and round all corners of the repair piece.

2. Repair a cut or puncture in the EcoWhite EPDM membrane with EPDM membrane. The repair must extend a minimum of 3" (76 mm) beyond the boundary of the affected area in all directions. Round all corners of the repair piece (Example: a pinhole will require a minimum 6" x 6" (152 mm x 152 mm) EPDM patch).

B. CLEAN THE MEMBRANE:

1. When repairing membrane which has been in service, it is necessary to remove accumulated dirt. Proper membrane preparation is made by scrubbing the membrane with a scrub brush and warm soapy water, rinsing with clear water and drying with clean cotton cloths. Clean the area using clean cotton cloths with Firestone Splice Wash. Additional cleaning using Firestone Splice Wash is often necessary.

2. As an alternative, Firestone Membrane PreWash can be used to clean existing membrane. Spray Membrane PreWash on the membrane and allow to stand for approximately an average of ten minutes. Remove PreWash with power washer and allow membrane to dry before any repair activity. Additional applications of PreWash may be required. Refer to Technical Information Sheet for Membrane PreWash for more detailed instructions.

C. INSTALL REPAIR MATERIAL:

1. Repairs must be made with EcoWhite Splice Adhesive. Refer to the Flashing Seam Details of this Database for application requirements of Splice Adhesive.

2.14 TEMPORARY CLOSURE

A. TEMPORARY CLOSURES-TIE INS

a) Temporary closures or tie-ins which assure that moisture does not damage any completed section of the new roofing system are the responsibility of the licensed applicator. Completion of flashings, terminations and temporary closures is required to provide a watertight condition.

b) See Firestone V-Force Membrane for temporary roofing options.

2.15 ROOF WALKWAYS

A. LAY OUT FIRESTONE RUBBERGARD QUICKSEAM WALKWAY PADS:

1. Install walkway pads in locations as specified by the project designer and in accordance with the System Design Guide Section of this Technical Database. Layout Firestone RubberGard QuickSeam Walkway Pads so that the flat surface is over the completed RubberGard Membrane, spacing each pad a minimum of 1" (25.4 mm) and a maximum of 3" (76 mm) from each other to allow for drainage.

2. If Firestone RubberGard Walkway Pads must be installed over field-fabricated seams or within 6" (152 mm) of a seam edge, install QuickSeam Flashing over

the seam edge. The QuickSeam Flashing must extend beyond the walkway pad a minimum of 6" (152 mm) on either side.

B. ATTACH FIRESTONE RUBBERGARD QUICKSEAM WALKWAY PADS TO THE MEMBRANE:

1. Clean the Membrane:

a) Clean the membrane using Firestone Single-Ply QuickPrime Primer where the QuickSeam Splice Tape will contact the membrane.

2. Place Walkpad:

a) Remove the release paper from the QuickSeam Splice Tape. Turn the walkpad over and place it in the Single-Ply QuickPrime Primer.

3. Apply Pressure:

a) Walk on the pad to press in place assuring proper adhesion.

C. RED SHIELD WALKWAY SYSTEMS:

a) Install Red Shield Walkway systems as instructed with supplied materials.

2.16 EQUIPMENT SUPPORTS

A. RED SHIELD PIPE SUPPORTS:

1. Install Firestone Red Shield Pipe and equipment supports systems where specified. Follow manufactures installation instructions.

2.17 SHEET METAL WORK

Refer to the following documents for total systems and included products:

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

☐ 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 -