

FIRESTONE RUBBERGARD EPDM
APPLICATION GUIDE

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2.01 GENERAL

This section of Firestone's Technical Database provides instructions for the installation of Firestone's RubberGard 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.

15, 20, 25 and 30 year warranties and wind warranties in excess of 55 mph, may require special considerations with regards to fasteners, plates, insulations, membrane gauge, and attachment requirements. Refer to the System Design Guide of this Technical Database for specific requirements.

NOTE: IF A PROPOSED APPLICATION FALLS OUTSIDE OF THIS SPECIFICATION, CONTACT FIRESTONE ROOF SYSTEM SOLUTIONS GROUP 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 RubberGard 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 RubberGard 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.

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 80F (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. No-fold or single fold panels are easier to apply in cold weather and are recommended for fully adhered systems.
5. When the outside temperature is below 40 F (4.4 C), installation of the Firestone RubberGard 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.
 - Use of heat guns to warm flashing material should be considered to increase flashing flexibility if flashing material is difficult to form.
6. 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.
7. When ambient temperature is below 60° F (16° C), Firestone EcoWhite EPDM membrane must be washed with Firestone Splice Wash SW-100 prior to the application of Single-Ply QuickPrime Primer and the installation of EcoWhite Flashings.

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 RubberGard EPDM Roofing System.

C. PREPARE SURFACE:

1. Acceptable substrates to which the RubberGard 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 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 A153, Class D 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 the Firestone warranty

B. SIZE OF NAILER

1. Nailers shall be a minimum thickness of 2" x 4" nominal (1-1/2" (38 mm) x 3-1/2" (89 mm)) and exceed the width of any metal flange attached to it by a minimum of 1/2" (13 mm).

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 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" (305 mm) 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." This Technical Bulletin is also posted on the Firestone website at

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.

2.06 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 BASE SHEETS

1. General
 - a) Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing to relax, adhere or attach to the substrate with appropriate materials as indicated below.
 - b) Roofing base ply shall never touch roofing single ply, even at roof edges, laps, tapered edge strips, and cants. Cut out fish-mouths/side laps, which are not completely sealed; patch. Fully adhered base sheets which are not fully and continuously bonded shall be replaced.
2. Hot Asphalt Attachment of Base Sheet
 - a) The Firestone base sheet may be attached using a solid mopping of Firestone SEBS mopping asphalt or ASTM D 312 Type III or IV hot steep asphalt. Priming of substrate may be required with ASTM D 41 and is determined by specification.
 - b) The substrate must be suitable for asphalt attachment (structural concrete, base sheet, coverboard, etc.). Refer to the Firestone EPDM Design section of this manual for suitable substrates and the Technical Information Sheets for additional information on specific Firestone base sheets.
 - c) The asphalt shall be at the manufacturer's stated EVT at point of installation.
 - d) Align subsequent rolls, shingling the laps with or along the flow of water, maintaining a minimum 2" (51 mm) side lap and minimum 6" (152 mm) end lap and repeat the application.
 - e) Firestone recommends that a half sheet be used as the first roll to ensure that the base sheet laps and the cap sheet laps are not aligned. Half length sheets may be required, depending on the roof slope
 - f) Refer to the Design section for slope limitations.
 - g) Starting at the low point of the roof, align the Firestone base sheet and unroll into a solid mopping of hot asphalt.

- h) With a stiff push broom, immediately broom the Firestone base sheet to ensure full contact with the asphalt.

3. Mechanical Attachment

- a) Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing 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 mm) side lap and minimum 6" (152 mm) end lap and repeat the application. Stagger all end laps.
- b) Fasten Base Sheet Using Firestone Insulation Plates and Fasteners: Structural Concrete, Plywood or OSB
- c) Using Firestone Insulation Plates and Fasteners, base sheets may be attached directly to poured in place concrete, wood, or through a smooth surfaced built-up or modified bitumen roof system. Refer to the Design Guide Section of this manual for information on fasteners for a particular deck type.
 - 1. Firestone compatible base and cap sheets used as base sheets must be mechanically attached 12" (305 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 13" (330 mm) (approx.) in from the sides of the sheet. See Attachment Guide for diagrams.
 - 2. 36" (914 mm) wide Firestone compatible base sheets must be mechanically attached 18" (457 mm) o.c. in the side and end laps and 36" (914 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet. See Attachment Guide for diagrams.
- d) Fasten Base Sheet Using Firestone LWC Fasteners: Gypsum, Tectum and LWC
 - 1. Using Firestone LWC fasteners, base sheets may be attached to Gypsum, Tectum and LWC. The base sheet must be mechanically attached with Firestone LWC's at 9" (229 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet.
- e) Fasten Firestone base sheets using cap nails: plywood, OSB and wood plank decks
 - 1. 1" (25 mm) diameter cap nails with steel heads shall be used to attaché base sheets to plywood, wood plank, and oriented strand board decks. The base sheet must be mechanically attached with cap nails at 9" (229 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet. Cap nails cannot be used to attach insulation, attach a base sheet through an existing insulated roof, attach a base sheet over a gravel surfaced built-up roof, or through a smooth surfaced un-insulated built up roof over 1/2" (13 mm) thick. The fasteners used to attach base sheet must be manufactured for the particular deck type and be Factory Mutual Approved.
 - 2. This attachment pattern applies to all 36" (914 mm) and 1 meter (39.4") wide Firestone compatible base sheets and cap sheets used as base sheets.

4. Base Sheet Laps

- a) Hot steep asphalt applied Base sheets must be lapped a minimum of 2" (51 mm) for side laps
- b) End laps must be minimum 6" (152 mm).

- c) In all cases, an offset of 12" (305 mm) minimum must be maintained between the side and end laps of the base sheet and the cap sheet.
- d) Seal all base sheet laps with hot asphalt or hot air welded.

B. INSULATION INSTALLATION:

Ballasted systems are not allowed when the membrane is installed directly over or onto a hard surface, such as HailGard, ISOGard HD, DensDeck, OSB or concrete.

Ballasted systems are not allowed when the membrane is installed directly to a layer of insulation, which has been mechanically attached.

Adhesive attachment of insulation is acceptable for Ballasted systems, if required.

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 mm).
 - c) When installing multiple layers of insulation, all joints between layers should be staggered 6" (152 mm) 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 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 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. A properly adjusted clutch or a depth sensing drill attachment should be used to prevent over-driving or under-driving fasteners.
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. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m) panels.
3. 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. RESISTA and ISOGard HD cannot be attached with hot asphalt.
4. Top insulation board shall be installed without displacing asphalt to the top of the seam where it can contact the RubberGard membrane.
5. 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 ft² (1.2 – 1.4 kg/m²)) to ensure that complete adhesion is achieved.
6. It is necessary to "walk" boards in to ensure complete adhesion to the substrate.
7. Additional layers of insulation may be installed in the same fashion.

c) Adhesive Attachment:

1. Insulation may be attached using I.S.O.Stick™, I.S.O. Twin Pack™, I.S.O.FIX™, I.S.O.SPRAY™ or Hot Asphalt. RESISTA and ISOGard HD cannot be attached with hot asphalt.
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 Technical 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). DensDeck products may be 4' x 8' (1.2 m x 2.4 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 RubberGard™ membranes systems. Read all of the information to ensure that it is the correct system and application. For RubberGard Platinum™ systems refer to Platinum Application Guide.

QuickSeam RPF Strip

Membrane installations may require the use of a QuickSeam™ Reinforced

Perimeter Fastening Strip (QSRPFS) 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 slope change greater than 1" (25 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.) And other areas as details indicate. See additional information in Section 2.12.A.

RubberGard™ LSFR PT (Pre Taped) and RubberGard Max PT Panels

Firestone RubberGard and RubberGard Max PT Panels method of installation requires that the rolls be staged correctly for unrolling in order for the laps to shed water correctly.

A. FULLY ADHERED SYSTEM

1. Membrane Placement:
 - a) The RubberGard EPDM Adhered Systems 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 membrane to relax for a minimum of 30 minutes before attaching or splicing. During cold weather application, it is recommended that the smallest panels be used to minimize folds (larger panels have factory folds which may take longer to relax during cold weather).
 - 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 Bonding Adhesive:
 - a) Apply bonding adhesive with either a 9" (229 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.

Stop Bonding Adhesive Short of membrane Seam Area

Care must be taken not to apply bonding adhesive over an area that is to be later spliced to another sheet or flashing. All bonding adhesives must be completely removed from the seam area.

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 a QuickPrime™ Plus product and QuickSeam™ Splice Tape. Refer to Lap Splice Details.
 - b) Apply "T" patches at all 3-way sheet intersections and at all factory laps that intersect another sheet. Refer to Lap Splice detail series. Apply Seam Edge Treatment as required.

B. MECHANICALLY ATTACHED SYSTEMS (B.I.T.S. WITH RUBBERGARD AND RUBBERGARD MAX USING BATTEN STRIPS)

Firestone recommends that when installing mechanically attached membranes over steel decks, the field attachment should run perpendicular to the deck panels. If a project is Factory Mutual insured or specified, per FM 1-29 for Global Loss Prevention Data Sheets, attachment must run perpendicular.

1. Place Membrane and Allow to Relax:
 - a) Place membrane panel and unroll without stretching, over the acceptable substrate leaving sufficient membrane for tie-ins, roof edges and seaming. Allow to relax for a minimum of 30 minutes before attaching or splicing.
 - b) Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" (76 mm) and side laps a minimum of 6" (152 mm).
 - c) Perimeter and Field Panel widths are determined by using the Wind Design attachment Guide section of the Firestone Technical Database.
2. Layout Firestone Batten Strips:
 - a) Install Firestone batten strips continuously within the 6" (152 mm) side lap area. Center the batten strip 3" (76 mm) in from the edge of the lower panel. Refer to Firestone Lap Splice Details for specifics.
3. Secure Batten Strips:

- a) Place the Firestone fastener starting 1" (25 mm) in from the end of the Firestone Batten Strip, then every 12" (305 mm) o.c. maximum (unless a more frequent fastener spacing is required per wind/application design guide) using the pre-punched holes in the battens. Round the end of each batten and remove all burrs created by cutting, when required. Where field drilling of battens is necessary, use a 1/4" (6.35 mm) diameter drill bit.
 - b) Start fastening the Firestone batten strip from one end only. Install 2" (51 mm) diameter EPDM pads beneath the battens at batten terminations as shown in Firestone Details. Refer to EPDM system specific details.
 - c) Install fasteners so that it is properly engaged in the deck and seat the head flush with the batten strip surface. Use caution not to overdrive the fastener as this will cause the batten strip to buckle between the fasteners.
 - d) Use a common fastener to anchor overlapping Firestone Batten Strips using a common hole.
 - e) Do not lap corners and "T" joints. Do not overlap the Firestone Batten Strips at corners or "T" joints. Keep battens from the edge of intersecting splices as shown in Firestone Details.
4. Splice the Lap:
- a) Splice the outside edge of the top sheet as specified in Section 2.09 QuickSeam Splice Tape. Refer to Lap Splice Details located in the technical database.

C. MECHANICALLY ATTACHED SYSTEMS (RUBBERGARD MAX USING V PLATES)

RubberGard MAX Mechanically Attached Systems.

1. Place Membrane and Allow to Relax:
- a) Place the membrane panels without stretching, over the acceptable substrate, and allow membrane to relax for a minimum of 30 minutes prior to attachment.
 - b) Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" (76 mm) and side laps a minimum of 6" (152 mm).
 - c) Perimeter and Field Panel attachment is determined by using the Wind Design attachment Guide section of the Firestone Technical Database.
2. Layout Firestone V-Plates:
- a) Install Firestone V-Plate every 12" (305 mm) o.c. min. or as required by the specification within side lap area. Center of the V-Plate 3" (76 mm) in from the edge of the lower panel. Refer to Firestone Details for specifics.
 - b) Secure V-Plates: Install each fastener so that it is properly engaged in the deck and the head is seated in the V-Plate. Use caution not to overdrive the fastener.
3. Splice the Lap:
- a) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Refer to Lap Splice Details.

D. MECHANICALLY ATTACHED SYSTEM (MAS USING BATTEN STRIPS)

1. Place Membrane and Allow to Relax: Place the membrane, without stretching, over the acceptable substrate, and allow it to relax for a minimum of 30 minutes prior to attachment. Position subsequent membrane sheets in the same manner, overlapping a minimum of 4" (102 mm).

2. Splice the Lap: Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickPrime and QuickSeam Splice Tape. Refer to Lap Splice Details.
3. Layout Firestone Batten Strips: Place the batten strips over the membrane in the designated pattern as outlined in the Wind Design Guide in the Firestone Technical Database.
4. Place the Firestone fastener starting 1" (25 mm) in from the end of the Firestone Batten Strip, then every 12" (305 mm) (unless an smaller fastener spacing is required) using the pre-punched holes in the battens.
 - a) Start fastening the Firestone Batten Strip from one end only. Do not start from both ends as this will buckle the batten.
 - b) Install Fasteners: install each fastener so that it is properly engaged in the deck and the bottom of the head is flush with the batten strip surface. Use caution not to overdrive the fastener as this will cause the batten strip to buckle between the fasteners.
 - c) Lap Field Runs of Firestone Batten Strips: Use a common fastener to anchor overlapping Firestone Batten Strips using a common hole.

When batten strips must be field cut, round the cut end. Assure that all burrs created by cutting are removed. Where field drilling of metal battens is necessary, use a 1/4" (6.35 mm) diameter drill bit. Refer to Detail LS-3

- d) Do not lap corners and "T" joints: do not overlap the Firestone Batten Strips at corners or "T" joints. Keep battens from the edge of intersecting splices as shown in Firestone Install 2" (51 mm) diameter EPDM pads beneath the battens at batten termination's and where two battens are joined to form a corner as shown in Firestone Details.
- e) Install QuickSeam Batten Cover Strips: All batten strips must be covered prior to the end of the workday. Should inclement weather strike before the batten cover strip is installed, ensure that the batten bar and the membrane surface beneath the bar is dry. As an option in unpredictable climates, a 3/8" (10 mm) bead of Lap Sealant may be installed beneath the batten bar at the fastener to reduce moisture migration into the roof system in the event of inclement weather before the batten cover is installed. After applying Firestone Single-Ply QuickPrime Primer to the membrane, apply the QuickSeam Batten Cover per Firestone Detail Lap Splice-3.

E. BALLASTED SYSTEM

1. Place Membrane and Allow to relax:
 - a) Place membrane panel, without stretching, over the acceptable substrate and allow membrane to relax for a minimum of 30 minutes before splicing or attaching. The RubberGard EPDM Ballasted System must be installed so that the splices shed the flow of water.
2. Move Membrane to its Final Position:
 - a) Move the membrane panel to its final position allowing for a minimum 4" (102 mm) field seam onto adjacent panels and sufficient membrane for proper membrane terminations.
3. Splice the Lap:
 - A) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Refer to Lap Splice Details.
4. Ballast installation:

A) Firestone Ballast Paver System

1. Install all Firestone Ballast Paver System Accessories, Paver Clips, AP Sealant, Metal Termination Bars and Protection Mat, as required in proper sequence for Paver system performance.
2. Place Firestone Ballast Paver System in accordance with Firestone Ballast Paver Installation Guide for the appropriate system requirement as determined by the design professional.

B) Stone Ballast

1. Spread Ballast: The ballast shall be spread over the completed Firestone System at the rate specified by the project designer but never less than 10 lb (4.5 kg)/sq. ft. using ASTM #4 stone. Refer to the system Design Guide of this Database for Ballast type and size requirements. Ballast must be spread over the membrane using soft rubber tired ballast buggies. Spread ballast around penetrations by hand.
2. Protect Membrane and Insulation at Ballast Loading Areas: At staging areas where ballast is loaded, protect the membrane and underlying insulation using insulation and/or plywood over an additional layer of Firestone protective membrane. Remove and replace all materials damaged from ballasting operation.
3. Distribute Ballast Around Walkway Pads: Any ballast displaced by a walkway should be distributed around the pad to maintain the specified average ballast rate.
4. Do not place a walkway and pads within 10' (3.0 m) of a roof edge. If needed around mechanical equipment, use appropriate ballast pavers.

2.08 MEMBRANE ATTACHMENT AT PERIMETERS FOR MAS SYSTEMS

Perimeters may be adhered or mechanically attached. When mechanically attaching a perimeter, the batten layout must be as specified in the Firestone Wind Design Guide as a minimum, or as required by the designer or local building codes. Should a fully adhered perimeter be chosen, the area of the adhered perimeter is the same as if the perimeter were mechanically attached.

A. ADHERED PERIMETER:

1. Follow Fully Adhered, Section 2.07.A for this method as required for perimeter plus the following added steps.
2. Terminate the Membrane at the Perimeter: After the perimeter sheets are adhered to the substrate, they must be terminated along the roof edge using an appropriate Firestone roof edge detail or base tie-in detail which is included as part of this specification.
3. Install Perimeter Isolation Batten Strip: Install Firestone Batten Strips continuously along the inside edge of the adhered perimeter sheet.
4. Splice the Lap and do detail work: Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Complete required detail work such as transition and T-patches per Firestone details.

B. MECHANICALLY ATTACHED PERIMETER - BATTEN STRIPS OR V-PLATES:

As an alternative to the adhered membrane perimeter, Firestone's Reinforced Mechanically Attached, and Mechanically Anchored Systems may be installed using Firestone batten

strips or V-Plates as shown in Firestone's Wind Design Guide.

1. Batten Strips:

- a) Proceed to install as outlined in Section 2.07.D

2. V-Plates:

- a) Proceed to install V-Plates as outlined in Section 2.07.C.

C. QUICKSEAM R.M.A. STRIP (QSRMA STRIP):

- a) Secure the QSRMA Strip, center the fastening system (Firestone Batten Strips, 2" Seam Plates or V Plates) on the QSRMA Strip, a maximum of 4" (102 mm) from the end of the QSRMA Strip and fasten a maximum of 12 inches (305 mm) O.C. (unless a more frequent fastener spacing is required). If using battens, place the first fastener 1" (25 mm) in from the end of the batten strip, using the pre-punched holes in the battens.

b) QSRMA Strip Intersections:

1. Do not intersect QSRMA Strips at "T" intersections or corner intersections. Do not overlap QSRMA Strips. A fastener and batten strip or plate must be placed starting and ending a maximum of 4 inches (102 mm) from the end of each QSRMA Strip.
2. Start Fastening Batten Strips From One End Only:
3. When fastening batten strips, start at one end and work towards the other. Fastening the two ends of the batten strip at the same time may cause buckling between fasteners.
4. Install Fastener.

When using batten strips, Firestone AP Sealant must be applied over the fastener heads per Firestone details.

Do not remove the release paper from the tape until all cleaning and priming has been completed and the membrane is in place

5. Use caution not to overdrive the fasteners as this will cause the batten strip to buckle between the fasteners or may cause the QSRMA Strip to wrinkle.

2. Membrane Installation (QSRMA Strip)

- a) Place membrane panel, without stretching, over the installed QSRMA Strip and allow to relax for a minimum of 30 minutes before splicing or attaching

Note: Do not allow field seams to be centered over the QSRMA Strip.

- b) 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.

Note: It will assist in the application if the area of the membrane that will be mated to the QSRMA Strip is marked as the membrane is folded back.

- c) Apply Firestone Single-Ply QuickPrime Primer to the center of the QSRMA Strip, over the plates and fasteners, and the membrane where it will mate with the QuickSeam Tape on the QSRMA Strip using the Firestone QuickScrubber Plus. Allow Single-Ply QuickPrime Primer to dry.
- d) After the surfaces have dried properly, as determined by using the touch-push test, remove the release paper from the QSRMA Strip and roll the membrane into place and broom with a stiff push broom.
- e) Roll the membrane over the QSRMA Strip with:
 - 1. A 1-1/2"- 2" (38 mm – 51 mm) wide silicone roller or across the tape and then along its length covering the width in several passes.
 - or
 - Starting in the center of the strip, roll the QSRMA Strip with the Firestone QuickRoller in a back and forth motion along the length of the QSRMA Strip, not to exceed 3 feet (0.9 meter) maximum at a time.
 - 2. Do not use metal rollers or power rollers over the QSRMA Strip

2.09 MEMBRANE SEAMING

When using RubberGard Max membrane, Firestone Seam Edge Treatment must be applied to all splice or detail edges where reinforcing scrim is exposed. Refer to Detail LS-9 using seaming using SA-1065 adhesive and Lap Sealant.

A. SEAMING PROCEDURES

Firestone RubberGard LSFR PT (Pre Taped) and RubberGard MAX PT need to be positioned with the rolls in the correct location and orientation to unroll and have the tape located for the seaming of the laps.

PT rolls are marked with the tape location and direction of unroll. Panels need only to be marked to guide the application of QuickPrime Products to one sheet for side laps. Roll end laps require standard application of QuickPrime and QuickSeam Tapes.

1. Position and Fold Back the Lap Edge:
 - a) Position the membrane at the seam area by overlapping membrane 4" (102 mm) for 3" (76 mm) QuickSeam Tape, 7" (178 mm) for 6"(152 mm) QuickSeam Tape. Once the membrane is in place, mark the bottom membrane 1/2" (13 mm) to 3/4" (19 mm) from the edge of the top membrane every 4' (1.2 m) to 6' (1.8 m) using the marking crayon provided with the QuickSeam Tape.
 - b) Tack the membrane back with Single-Ply QuickPrime Primer as necessary to hold back the membrane at the splicing area.
2. Apply 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 Single-Ply QuickPrime Primer uniformly at least 1" (25 mm) wider than 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. PT panels only require QuickPrime applied to the non-taped, bottom sheet, panel mating surface for the side seams. End seams require two sided application of Single-Ply QuickPrime Primer.
 2. Non-taped panels will need to have Single-Ply QuickPrime Primer applied to both sheet surfaces alternating between sheets while working down the seam area.
 - d)** Change the QuickScrubber Plus pad:
 1. PT panel side laps are one side application and will result in 400 feet (121.9 m) of usage or
 2. Other panels and PT ends are two sided application and will result in 200 feet (61.0 m) of seam or
 3. When the pad will no longer holds 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 QuickSeam Splice Tape:
- a)** After allowing the Single-Ply QuickPrime Primer to dry properly, using the Touch-Push Test to verify.
 1. PT products require end laps be done, for side laps skip to 4
 2. On other panels, apply the QuickSeam Splice Tape to the bottom membrane, aligning the edge of the release paper with the markings. Refer to Lap Splice detail appropriate for system being installed.
 - b)** Immediately roll the splice tape with a 1 ½" to 2" (39 mm to 51 mm) wide silicone hand 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. PT panels: Confirm the tape will be in full contact with Single-Ply QuickPrime Primer treated membrane on side laps. End laps should follow instruction 2 given below.
 2. Other panels: trim the top panel as necessary to assure that 1/8" to 1/2" (3 mm to 13 mm) of the QuickSeam Seam Tape will be exposed on the finished seam. Confirm the tape will be in full contact with Single-Ply QuickPrime Primer primed 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 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.
 - d)** The QuickRoller may not be used to set the seams on any system that has mechanical attachments in the seam area such as battens or plates. It may only be used with fully adhered, ballasted, QuickSeam RMA and QuickSeam RPF assemblies.
- 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" (39 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 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 QuickSeam Flashing or QuickSeam Joint Cover over the "T" joint area per LS Detail.
- d) Use of 6" or 7" QuickSeam Splice Tape with Cured EPDM as Flashing - If cured EPDM is used as flashing, apply a 9" (229 mm) long section of QuickSeam Splice Tape and cover with primed Membrane or a 9" (229 mm) section of QuickSeam Joint Cover over the intersection of the flashing and field seams per LS Details.
- e) When using RubberGard Max membrane, Firestone Seam Edge Treatment must be applied to all splice edges where reinforcing scrim is exposed. Refer to detail Is-9.

B. FLASHING SPLICES USING SA-1065 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. Additional 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 uniformly black in color and no streaking is evident. FormFlash does not require cleaning unless it has been contaminated.
2. As an option, Single-Ply QuickPrime Primer may be used in lieu of the cleaning procedure described above. Refer to the 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 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" (13 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.
 - a) Do not use circular motions for applying 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 mating area.

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.

2.10 SEAM EDGE TREATMENT

SEAM EDGE TREATMENT (S.E.T.) IS REQUIRED WHEN USING SPLICE ADHESIVE AS SHOWN ON FIRESTONE DETAILS AND AT CUT EDGES OF RUBBERGARD MAX MEMBRANE. See Detail LS-9.

A. APPLY SPLICE ADHESIVE TO SEAM EDGE:

1. Using a Splice Adhesive brush, apply SA-1065 Splice Adhesive a minimum of 1" (25 mm) on either side of the seam edge. Allow the Splice Adhesive to dry. If the seam edge has become contaminated, it will be necessary to clean the edge with Firestone Splice Wash prior to applying the adhesive.

B. APPLY THE LAP SEALANT TO SEAM EDGE:

1. Apply a continuous bead of Lap Sealant, approximately 3/8" x 1/4" (10 mm x 6 mm) 20-22 lineal feet (6 m - 6.7 m) per 10 oz. (295 cc) tube centered over the seam edge using a standard caulking nozzle. Using the Firestone supplied Lap Sealant tool, feather the Lap Sealant immediately, taking care to leave a mound of sealant directly over the seam edge (refer to Lap Splice Details). Alternately, Lap Sealant may be applied using the plastic nozzle applicator supplied by Firestone, assuring the applicator is centered at the seam edge.

2.11 QUICKSEAM BATTEN COVER INSTALLATION FOR M.A.S SYSTEMS

A. CLEAN AND PRIME BATTEN STRIP AREA:

1. Using Firestone QuickScrubber or QuickScrubber Plus, apply Single-Ply QuickPrime Primer to the membrane and batten area so that the prime extends 1/2" to 1" (13 mm to 25 mm) beyond the area to be covered with the Batten Cover Strip. Additional cleaning at factory splices and areas of excessive dusting agent is required. Allow Single-Ply QuickPrime Primer to flash-off.

B. PLACE QUICKSEAM BATTEN COVER ROLL:

1. Place the roll of QuickSeam Batten Cover 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).

C. INSTALL QUICKSEAM BATTEN COVER:

1. Starting a minimum of 4" (102 mm) prior to the start of the EPDM protection pad under the end of the batten strip, center the QuickSeam Batten Cover and apply to the cleaned and primed surface.

D. ADVANCE THE ROLL:

1. Advance the roll along the batten strip, peeling away the release paper as the QuickSeam Batten Cover is applied using the perforations in the release paper as a guide.

E. CUT THE QUICKSEAM BATTEN COVER:

1. Cut the QuickSeam Batten Cover and release paper to extend 4" (102 mm) beyond the end of the EPDM protection pad.

F. APPLY PRESSURE AND ROLL THE SPLICE:

1. Apply hand pressure along the entire length of the QuickSeam Batten Cover to completely mate the two surfaces. Using a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the entire batten cover with positive pressure towards the outside edge and then along the entire length of the batten cover.

G. INSTALL QUICKSEAM FLASHING AT END LAPS:

1. Apply Single-Ply QuickPrime Primer to the overlap of the QuickSeam Batten Cover as necessary and allow to flash-off. Install a 12" (305 mm) long section of QuickSeam Flashing over the end lap. Roll the QuickSeam Flashing with a 1 1/2" to 2" (38 mm to 51 mm) wide silicone hand roller. Apply Splice Adhesive to edges of the QuickSeam Flashing and apply Lap Sealant as shown in Firestone Details.

Note: Intersections of QuickSeam Batten Covers must be completely covered at the intersecting T-Joints with a 12" (305 mm) long section of QuickSeam Flashing.

2.12 ADDITIONAL MEMBRANE SECUREMENT AND BASE TIE-IN FLASHING

Secure the membrane at all locations where the membrane goes through an angle change greater than 1" (25 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 to 51 mm) wide silicone roller or QuickRoller across the tape and then along its length.
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 puddles.
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.

2.13 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 EPDM Pre-Molded QuickSeam Pipe Flashing, Conduit Flashings or Quick Seam Penetration Pockets wherever possible. Do not cut or patch EPDM Pre-Molded Pipe Flashings to assist in their installation except where noted on instructions.
2. Flash penetrations using FormFlash when the use of Pre-Molded EPDM Pipe Flashings or Penetration Pockets 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 mm) and the longest side of the tube does not exceed 4" (102 mm). When the tube exceeds 4" (102 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 Firestone Roofing Solutions Group.

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" (76 mm and 102 mm) Insert Drains are intended for installation when existing drains are deteriorated and not suitable for reuse. For other conditions outside of these, contact Firestone Roofing Solutions Group.

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" (13 mm) to 3/4" (19 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 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 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 mm) thick around the penetrations.

F. HOT PIPES:

1. Protect the RubberGard 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 weather-tight 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.

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

A. GENERAL:

1. Using the largest pieces of QuickSeam Curb Flashing or RubberGard 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 1/2" (13 mm) Dens-Deck Prime®, 1/2"(13 mm) Dens-Deck® or 5/8" (16 mm) exterior grade or "Wolmanized" plywood mechanically fastened in accordance with project designer's requirements.
 - a) DensGlass Gold®
 - 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 pre-cast 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.

2.15 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 Firestone 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 QuickSeam Flashing:
 - 1. Place the roll of QuickSeam Flashing on the roof a few feet prior to 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' (0.6 m to 0.9 m) of release paper and apply to the metal flange and RubberGard Membrane. Lap adjacent rolls of QuickSeam Flashing a minimum of 1" (25 mm). Refer to Roof Edge Details.
 - c) Roll the QuickSeam Flashing:
 - 1. With a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the 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 mm) length of QuickSeam Flashing, a QuickSeam Joint Cover or 6" x 6" (152 mm x 152 mm) FormFlash to the inside edge of the QuickSeam Flashing at all overlaps. Refer to Roof Edge Details.
 - 2. Apply 6" (152 mm) length of QuickSeam Flashing, a QuickSeam Joint Cover or 6" x 6" (152 mm x 152 mm) FormFlash at all intersections between the QuickSeam Flashing and field-fabricated seams. Refer to Roof Edge Details.
 - 3. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, an additional piece of QuickSeam Flashing must be applied over the metal lap to the top of the gravel stop, after the initial application of QuickSeam

Flashing. Seam Edge Treatment shall be applied at the intersections of the two flashing sections.

C. OPTIMAL APPLICATION:

1. The optimal use of QuickSeam Flashing is where a 3" (76 mm) edge metal flange is being used. This will provide the minimum 2" (51 mm) seam to the RubberGard 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 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 Roof Edge Details.

D. SPECIAL CONSIDERATIONS FOR COPPER EDGING:

1. Copper may be weathered or coated with an anti-tarnish lacquer which makes adhesion difficult. Therefore, cleaning techniques must be used to prepare the copper surface to receive the QuickSeam Flashing. Firestone requires that the copper be scrubbed with acetone or lacquer thinner, using clean cotton cloths. Cleaning before installation is recommended, however, cleaning can take place after metal is attached if care is taken not to allow the solvents to come into contact with the membrane. After the cleaner dries, apply Single-Ply QuickPrime Primer and QuickSeam Flashing per Firestone Specifications.

2.16 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" (457 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 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 QuickSeam Flashing or FormFlash, like material must be used for repair. QuickSeam Flashing or FormFlash may not extend onto the roof surface more than 6" (152 mm). QUICKSEAM FLASHING OR FORMFLASH CANNOT BE USED TO REPAIR CURED MEMBRANE. If repairing of the same wrinkle must continue, then EPDM membrane must be used. Install the EPDM repair membrane first, and round all corners of the repair piece.
2. Repair a cut or puncture in the 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 sit for approximately 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 SA-1065 Splice Adhesive. Refer to the Flashing Seam Details found in the Technical Database for application requirements of Splice Adhesive.

2.17 TEMPORARY CLOSURE

A. TEMPORARY CLOSURES-TIE INS

1. 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. This is not warranted in any Firestone warranty. Completion of flashings, terminations and temporary closures is required to provide a watertight condition.
2. See the V-Force Membrane Technical Information Sheet for more information.

2.18 ACRYLITOP PC-100 COATING

A. ACRYLITOP PC-100 APPLICATION

1. AcryliTop PC-100 can be applied to the RubberGard membrane or flashing to offer a reflective surface, and add to its service life. In addition, AcryliTop PC-100 can be applied to existing RubberGard EPDM roofs under warranty, helping extend the membrane life. Should the coating of an existing roof be considered, the roof system should first be inspected by a Firestone licensed contractor to ensure that the system itself is not in need of repair prior to applying AcryliTop PC-100.

B. REFER TO THE TECHNICAL INFORMATION SHEETS AND MATERIAL SAFETY DATA SHEETS FOR ACRYLITOP

1. PC-100, AcryliTop PC-100 Base Coat and Membrane PreWash for additional information on application, storage and safety.

C. CLEAN MEMBRANE SURFACE:

1. Before applying the AcryliTop PC-100, the RubberGard membrane must be cleaned using Firestone's Membrane PreWash. Clean the roof of debris, as needed, with a broom or leaf air blower. Remove any leaves or large pieces of debris, such as stones, branches, etc.
2. Apply Membrane PreWash at a rate of 300 to 500 square feet of membrane surface (27.8 sq. m to 46.5 sq. m) using a 2 to 3 gallon (7.6 L to 11.4 L) agricultural tank sprayer and allow to dry for 5 to 10 minutes (application rates may vary depending on the cleanliness of the membrane). Ensure that tank sprayer has a pressure relief valve. Do not allow PreWash to come in contact with other surfaces.
3. Using a 3000 to 4000 psi (20.7 mPa to 27.6 mPa) pressure washer that provides a minimum of 4 gallons (15.1 L) per minute, remove the PreWash working first away from the drains or gutters, then back towards them. A 40° fan spray nozzle for pressure washing should be used.
4. Should deposits of dirt and dusting agent remain, additional cleaning with the pressure washer is required. (Caution: Do not allow the spray wand to be closer than 12 inches (305 mm) from the membrane to prevent damage).

D. APPLY ACRYLITOP PC-100 BASE COAT (ONLY REQUIRED WHEN USING A ROLLER

APPLICATION):

1. After the membrane has dried, apply Firestone AcryliTop PC-100 Base Coat at a rate of approximately 200 square feet (18.5 sq. m) per gallon (3.8 L) using a 3/8" (9.5 mm) nap paint roller. At this rate, membrane may be slightly visible through the base coat. Allow Base Coat to dry thoroughly before applying the AcryliTop PC-100 top coat.

E. APPLY ACRYLITOP PC-100:

1. ROLLER APPLICATION:

- a) Using a 3/8" (10 mm) nap paint roller, apply the AcryliTop PC-100 coating at a 90° angle to the AcryliTop PC-100 Base Coat at a rate of approximately 200 square feet (18.5 sq. m) per gallon (3.8 L) or as necessary to assure complete coverage of the AcryliTop PC-100 Base Coat. The finished dry mil thickness shall be a minimum of 10 mils total.

2. SPRAYER APPLICATION:

- a) Once the membrane is properly cleaned, apply AcryliTop PC-100 at a rate of approximately 100 square feet (9.3 sq. m) per gallon (3.8 L), resulting in a minimum 10 mil dry film thickness. The sprayer used for application of the AcryliTop PC-100 shall be a 30:1 ratio pump using a pressure of 90-100 psi (621 kPa to 690 kPa) at a rate of 125 cubic feet (3.5 cu. m) per minute.

2.19 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 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 on the primed membrane.
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.

2.20 EQUIPMENT SUPPORTS

A. RED SHIELD PIPE SUPPORTS:

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

2.21 SHEET METAL WORK

- 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 -