Firestone
BUILDING PRODUCTS

Firestone Building Products

Platinum EPDM Design Guide

March 2013

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1.01 GENERAL DESIGN CRITERIA

A. APPLICABILITY:

1. Parameters of this manual outline the **minimum** requirements for a Firestone Platinum warranty. Local code and insurance requirements may require specific enhancements.

2. Statements in this design guide are provided in good faith with the expectation that a design professional be consulted prior to any job decisions being made.

3. All components of the Firestone Platinum roof system must be roofing system materials furnished by Firestone. The Platinum roof system shall consist of Firestone: .090" Platinum EPDM membrane, fully adhered to HailGard, ISOGARD HD, min.¼" DensDeck, min ¼" SECUROCK Gypsum-Fiber or ISO 95+ Polyiso Insulation attached to an acceptable substrate combined with other Firestone roof system accessories as indicated in the following text and tables.

4. Firestone roof systems may or may not be applicable, without special consideration, if subject to local, regional, or national building code requirements or testing agency restrictions.

a) It is the building owner's or the design professional's responsibility to consult with the controlling code agency official(s) to determine the specific requirements of each project and each system.

b) The Firestone Roof System Advisors should be contacted when local or controlling codes are in conflict with Firestone recommendations. Contacts: 800.428.4511 or RoofSolutiions@firestonebp.com .

Certain situations may arise where Firestone specifications and/or roofing requirements cannot be applied. It may not be possible for Firestone to issue the desired warranty for projects that deviate from current Firestone requirements and standards, unless a written request for approval has been received, reviewed and approved by the Firestone Technical Services prior to application of the proposed system.

5. The following conditions require special consideration and may not be warrantable. Contact the Firestone Technical Services at Firestone Building Products if any of the following conditions are present:

- Roofs that exceed the maximum slope and height limits for the Firestone Platinum Roof system assembly see Table 1.01-1
- Projects that require special wind coverage greater than 55 mph
- Roofs located where localized wind phenomenon may occur, reference ASCE-7 wind maps
- Roofs located down slope or foothills of mountain ranges
- Geographical areas susceptible to hurricanes
- Roofs subject to chemical or process byproduct discharge
- Roofs with non-linear slopes such as arches, domes and barrels, etc
- Buildings with large openings in a wall (greater than 10% of the wall surface) that could be left open in a storm
- Roofs subject to heavy traffic
- Roofs subject to positive pressure situations such as: pressurized buildings, air infiltrating decks, canopies, overhangs, airplane hangars, distribution centers, etc
- Buildings with high interior humidity such as swimming pools
- Roof decks that do not provide adequate fastener pullout resistance

6. Cold storage and freezer facilities constitute a special condition. A design professional familiar with cold storage construction and vapor migration should be consulted in the design of the roof system.

Unlimited slope in the following chart only refers to the potential maximum installation slope. When using installation equipment there may be practical limitations to the slope that can be done. Safety is the first order to consider when doing any job. Consult with the equipment manufacturer on the performance of the individual items.

TABLE 1.01-1
CHART OF ROOF SYSTEM APPLICABILITY

System	Slope	Barrel, Arch, etc.	Maximum Height	Maximum Warranty Term
EPDM Adhered	Unlimited (See note below)	OK	250' (76.2 m)	Platinum 30 Year

TABLE 1.01-2
PLATINUM WARRANTY PHW
PUNCTURE-HAIL-WIND (100 MPH)

Membrane:	Insulation:	
.090" (2.2 mm) EPDM	HailGard, min 11/2" (38.1 mm.)	
	Only approved Insulation for Puncture-Hail-Wind Warranty	
Type of Decking	**Attachment**	**Minimum Penetration**
Steel min. 22 Gauge (0.76 mm)	Firestone HailGard Fastener	3/4" (19.0 mm) through deck
Structural Concrete or Pre-cast min. 3000 psi (20684 kPa)	Firestone HailGard Fastener	1" (25.4 mm) into deck
	Firestone Concrete Drive and Plate	11/4" (31.7 mm) into deck
Plywood or Oriented Strand Board min. 7/16"(12.7mm)	Firestone HailGard Fastener	1" (25.4 mm) through deck
Wood Planking – min. 3/4" (19.1mm)	Firestone HailGard Fastener	1" (25.4 mm) into deck
Poured or Pre-cast Gypsum and Cementitious Wood Fiber, min. 2" (51 mm)	Firestone Polymer Fastener and Plate	11/2" (38.1 mm) into deck
Lightweight Concrete Decks and Fills **(see 1.06-I)**	Firestone HailGard Fastener	3/4" (19.0 mm) through the metal pan
	Firestone HailGard Fastener	1" (25.4mm) into structural concrete deck
	Firestone Concrete Drive and Plate	11/4" (31.7mm) into structural concrete deck

Notes:

- All insulation must be fastened at a rate of no less than 20 in the field, 30 in the perimeter and 35 in the corners with Firestone HailGard Fasteners per 4' x 8' (1.22 m x 4.44 m) board.
- Contact Firestone Technical Services for the proper fastener attachment pattern for other extended wind speed warranties or code requirements.
- If more than one layer of insulation is required, Firestone ISO 95+ must be used beneath the Firestone HailGard in multiple, staggered layers.
- Insulation thickness requirements may vary for code compliance. Consult Firestone Technical Services and the local code official.
- HailGard Insulation must be fastened. (adhesives are not acceptable)
- **AcryliTop, white coating option available**

TABLE 1.01-3
PLATINUM WARRANTY PW
PUNCTURE-WIND (100 MPH)

Membrane:	Insulation:	
.090" (2.2 mm) EPDM	HailGard, min 1.5" (38.1 mm.)	
	Only approved Insulation for Puncture-Wind Warranty	
Type of Decking	**Attachment**	**Minimum Penetration**
Steel min. 22 Gauge (0.76 mm)	Firestone HailGard Fastener	3/4" (19.0 mm) through deck
Structural Concrete or Pre-cast min. 3000 psi (20684 kPa)	Firestone HailGard Fastener	1" (25.4 mm) into deck
	Firestone Concrete Drive and Plate	11/4" (31.7 mm) into deck
Plywood or Oriented Strand Board min. 7/16" (12.7 mm)	Firestone HailGard Fastener	1" (25.4 mm)through deck
Wood Planking – min. 3/4" (19.1mm)	Firestone HailGard Fastener	1" (25.4 mm) into deck
Poured or Pre-cast Gypsum and Cementitious Wood Fiber min. 2" (51 mm)	Firestone Polymer Fastener and Plate	11/2" (38.1 mm) into deck
Lightweight Concrete Decks and Fills **(see 1.06-I)**	Firestone HailGard Fastener	3/4" (19.0 mm) through the metal pan
	Firestone HailGard Fastener	1" (25.4mm) into structural concrete deck
	Firestone Concrete Drive and Plate	11/4" (31.7mm) into structural concrete deck

Notes:

- All insulation must be fastened at a rate of no less than 20 in the field, 30 in the perimeter and 35 in the corners with Firestone HailGard Fasteners per 4' x 8' (1.22 m x 4.44 m) board.
- Contact Firestone Roof Technical Services for the proper fastener attachment pattern for other extended wind speed warranties or code requirements.
- If more than one layer of insulation is required, Firestone ISO 95+ must be used beneath the Firestone HailGard in multiple, staggered layers.
- Insulation thickness requirements may vary for code compliance. Consult Firestone Technical Services and the local code official.
- HailGard Insulation must be fastened. (adhesives are not acceptable)
- **AcryliTop, white coating option available**

TABLE 1.01-4
PLATINUM WARRANTY PH
PUNCTURE-HAIL

Membrane:	Insulation:	
.090" (2.2 mm) EPDM	**Each are approved for Puncture-Hail Warranty**	HailGard, min 1.5" (38.1 mm.) **OR** Min ¼" (6.4 mm) DensDeck Prime or SECUROCK Gypsum-Fiber, Over ISO 95+ min. 1.0" (25.4 mm)
Type of Decking	**Attachment** (I.S.O.TwinPack I.S.O. FIX or I.S.O. SPRAY S may require pull tests, consult Table 1.08-2	**Minimum Penetration**
Steel, min. 22 Gauge (0.76 mm)	Firestone HailGard Fastener (Must use on HailGard Insulation)	3/4" (19.0 mm) through deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners, Minimum
Structural Concrete or Pre-cast min. 3000 psi (20684 kPa)	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (25.4 mm) into deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone Concrete Drive and Plate	11/4" (31.7 mm) into deck
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners, Minimum
Plywood or Oriented Strand Board min. 7/16" (12.7 mm)	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (25.4 mm) through deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners, Minimum
Wood Planking – min. 3/4" (19.1mm)	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (25.4 mm) into deck
	Firestone Heavy Duty Fastener and Plate	
Poured or Pre-cast Gypsum and Cementitious Wood Fiber, min. 2" (51 mm)	Firestone Polymer Fastener and Plate (Predrilling may be required)	1.5" (38.1 mm) into deck
Lightweight Concrete Decks and Fills **(see 1.06-I)**	Firestone HailGard Fastener (Must use on HailGard Insulation)	3/4" (19.0 mm) through the metal pan.
	Firestone Heavy Duty Fastener and Plate	
	Firestone HailGard Fastener (Must use on HailGard Insulation)	11/4"(31.7mm) into structural concrete deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone Concrete Drive and Plate	11/4" (31.7mm) into structural concrete deck

Notes: Table 1.01-4

- All insulation must be fastened in the field of the roof at a rate of no less than 16 Firestone HailGard Fasteners for HailGard Insulation and Firestone Heavy Duty fasteners and insulation plates per 4' x8' (1.22 m x 4.44 m) ISO 95+, DensDeck or SECUROCK Gypsum-Fiber board.
- I.S.O. SPRAY S, I.S.O. TwinPack, and I.S.O. Fix must use 4' x 4' (1.2m x 1.2m) boards.
- Contact Firestone Technical Services for the proper fastener attachment pattern for other extended wind speed, greater than 55 mph but less than 100 mph, warranties.
- If more than one layer of insulation is required, Firestone ISO 95+ must be used beneath the Firestone HailGard in multiple, staggered layers.

- Insulation thickness requirements may vary for code compliance. Consult Firestone Technical Services and the local code official.
- HailGard Insulation must be fastened. (adhesives are not acceptable)
- **AcryliTop, white coating option available**

TABLE 1.01-5
PLATINUM WARRANTY P / PLATINUM WARRANTY B
PUNCTURE / BASIC

Membrane:	Insulation:	
.090" (2.2 mm) EPDM	**All Three are approved for Puncture Warranty**	HailGard, min 1.5" (38.1 mm.) OR ISOGARD HD, min 1/2" (12.7 mm) over ISO 95+ min. 1.0" (25.4 mm) OR Min ¼"(6.4 mm) DensDeck Prime or SECUROCK Gypsum-Fiber over ISO 95+ min. 1.0" (25.4 mm) OR ISO 95+ min. 1.0" (25.4 mm)
Type of Decking	**Attachment**	**Minimum Penetration**
Steel min. 22 Gauge (0.76 mm)	Firestone HailGard Fastener Firestone Heavy Duty Fastener and Plate	3/4" (19.0 mm) through deck
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners
Structural Concrete or Pre-cast min. 3000 psi (20684 kPa)	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (25.4 mm) into deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone Concrete Drive and Plate	11/4" (31.7 mm) into deck
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners
Plywood or Oriented Strand Board min. 7/16" (12.7 mm)	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (25.4 mm) into deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners
Wood Planking min. 3/4" (19.1mm)	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (25.4 mm) into deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners
Poured or Pre-cast Gypsum and Cementitious Wood Fiber min. 2" (51 mm)	Firestone Polymer Fastener and Plate (Predrilling may be required)	1.5" (38.1 mm) into deck
	Firestone I.S.O. SPRAY S	Full coverage
	Firestone I.S.O. Fix Firestone I.S.O. Twin Pack	Bead spacing: 12" field, 6" perimeter, 4" corners
Lightweight Concrete Decks and Fills **(see 1.06-I)**	Firestone HailGard Fastener (Must use on HailGard Insulation)	3/4" (19.0 mm) through the metal pan.
	Firestone Heavy Duty Fastener and Plate	
	Firestone HailGard Fastener (Must use on HailGard Insulation)	1" (24.5mm) into structural concrete deck
	Firestone Heavy Duty Fastener and Plate	
	Firestone Concrete Drive and Plate	11/4" (31.7mm) into structural concrete deck

Notes: For table 1.01-5

- All insulation must be fastened in the field at a rate of no less than 16 Firestone HailGard Fasteners for HailGard Insulation and Firestone Heavy Duty fasteners and insulation plates per 4' x8' (1.22 m x 4.44 m) ISO 95+, SECUROCK Gypsum-Fiber or DensDeck board.
- I.S.O. SPRAY S, I.S.O. TwinPack, and I.S.O. Fix must us 4' x 4' (1.2m x 1.2m) boards.
- Contact Firestone Technical Services for the proper fastener attachment pattern for other extended wind speed, greater than 55 mph but less than 100 mph, warranties.
- If more than one layer of insulation is required, Firestone ISO 95+ must be used beneath the Firestone HailGard in multiple, staggered layers.
- Insulation thickness requirements may vary for code compliance. Consult Firestone Technical Services and the local code official.
- HailGard Insulation must be fastened. (adhesives are not acceptable)
- **AcryliTop, white coating option available**

B. CONSULTATION:

1. Firestone recommends that a design professional be involved in the design process. For additional assistance, Firestone Technical Services is available for consultation with respect to any necessary deviations from current Firestone requirements and standards.
2. For recommendations on any specific project, about the applicability, or appropriateness, of any material's suitability for use or use of products in conjunction with any other specific material, follow these steps:
   - **a)** Consult Firestone Building Products Website: www.firestonebpco.com
   - **b)** Consult this Technical Database, the Firestone EPDM Application Guide and the specific Technical Information Sheet (T.I.S.).
   - **c)** Consult with the building owner or his design professional.
   - **d)** Consult with the Firestone Technical Services at Firestone Building Products.
3. Statements in this design guide are provided in good faith with the expectation that a design professional be consulted prior to any job decisions being made.

C. DESIGN:

1. Firestone does not perform engineering or design functions and does not approve or make comments regarding them.
2. Firestone recommends that a design professional be consulted to assure proper design, (i.e. roof system selection) installation, and conformance to building codes, insurance requirements, etc.

The following are just a few of the conditions, which may influence the need for a design professional:

- Structural conditions that might not be sufficient to support the anticipated load of the completed roof installation.
- Structural conditions to support the dynamic loading of the roof system
- The need to review the proposed system assembly for its applicability on specific projects
- The requirements of local building codes for the need of a thermal barrier
- The requirements of local building codes for the need of a vapor retarder
- The requirements of local building codes for the need of an air barrier
- When considering the effect of loads on the structure/decking due to the loading/staging of materials as a part of system installation. The building owner or his design professional should specify the load limitations to be observed by the Firestone licensed applicator

WARRANTY:

3. Where a Firestone Platinum EPDM warranty is required:

   a) Submit an Electronic Pre-Installation Notice (P.I.N.) along with an approved roof drawing, 14 days prior to project start and receive an acknowledgement of acceptance or required enhancements to meet Firestone requirements to receive a warranty.

   b) The roof must be installed according to the current Firestone requirements appropriate to the project conditions and design requirements.

   c) The Firestone roof system must be installed by a current Firestone Red Shield licensed applicator.

   d) The Firestone roof system must be inspected by a Firestone Technical Representative.

   e) Upon inspection and acceptance of the installed roof system by a Firestone Technical Representative, the warranty will be issued and dated based on the completion date of the roof by the roofing contractor.

4. Firestone's inspection is not intended as an inspection for benefit of the building owner or the design professional with respect to contract, building codes or compliance with specifications other than Firestone's.

Firestone roof systems cannot receive a Platinum EPDM warranty if any of the following conditions exist:

- **Non-roofing applications such as plaza deck construction, waterproofing, pond liners, etc.**
- **Roofing applications for single-family residences**

Certain situations may arise where Firestone specifications and/or roofing requirements cannot be applied. It may not be possible for Firestone to issue the desired warranty for projects that deviate from current Firestone requirements and standards, unless a written request for approval has been received, reviewed and approved by the Firestone Roof System Solutions Group prior to application of the proposed system.

5. At a minimum, the Platinum EPDM roof system shall consist of a .090 inch (2.2 mm) Platinum EPDM membrane, fully adhered to one of the following Firestone Insulations, which has been installed over an acceptable substrate:

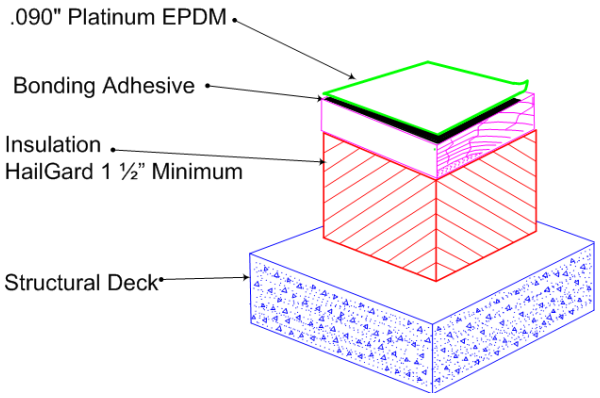
   - HailGard, min. 1.5" (38.1 mm)
   - ISOGARD HD min. ½" (12.7mm)
   - DensDeck, min. 1/4" (6.4 mm)
   - ISO 95+ Polyiso Insulation, min. 1.0" (25.4 mm)
   - SECUROCK Gypsum-Fiber, min ¼" (6.4 mm)

   Consult the appropriate warranty table of the Platinum systems for the needed assembly.

6. An air barrier is required for projects with large wall openings that are greater than 10% of the total wall area that can be left open in a storm. Criteria to be determined based upon Firestone's Review.

Diagram 1.01.1

Typical Roof Assembly Layers



Not all inter layer attachment methods are shown for clarity.

See the Firestone Glossary for terms commonly used in this manual.

1.02 QUALITY ASSURANCE

A. JOB SITE CONSIDERATIONS:

1. During the construction process, the roofing contractor is responsible for ensuring that all components of the Firestone roof system are protected from damage, including the finished areas of the Firestone roof system. This includes:
    - Damage that may result from the continued construction process
    - Discharges from such as petroleum products, greases, oils (mineral and vegetable), animal fats and other byproducts
    - Direct contact with continuous steam or heat sources when the in-service temperature is in excess of 180F (82C)
    - Asphalt, coal tar, oil base or plastic roof cements, and re-saturated roof products are not to be used in direct contact with the waterproofing components of the Firestone Platinum EPDM roof system
2. All safety regulations required by OSHA and other agencies having jurisdiction must be followed.
3. Refer to the Firestone Technical Information Sheet (T. I. S.) "Recommended Guidelines for Working on an Occupied Building" for specific guidelines when installing adhesives or asphalt products on an occupied building.
4. Cold weather application considerations.:
    a) When the outside temperature is below 40 F (4.4C), installation of Firestone roof system may require additional application precautions:
        - For a minimum of 24 hours before installation, adhesives and sealants should remain in an environment between 60F and 80F (15.5C and 26.6C)
        - Materials should be used within four hours of removal from a heated storage area. If materials are not used within that time period, they should be returned to the heated storage area until the temperature of the material returns to the temperature of the heated storage area. Typically, this is 24 hours. Check product for quality prior to continued as the cold may affect the integrity of materials.

    b) For additional information and guidelines, see the Firestone EPDM Application Guide and the NRCA Roofing and Waterproofing Manual.

B. PHASED CONSTRUCTION is not allowed when constructing a Firestone Platinum EPDM roof system.

C. TEMPORARY ROOFING:

1. If installation of the roof system is required during unsuitable weather, or before completion of wood blocking, curbs, penetrations, or the erection of walls, a temporary roof may need to be installed.
2. If a temporary roof is needed due to construction requirements, Firestone recommends installing a modified asphalt base sheet or two fiberglass roofing plies in an appropriate adhesive over an approved substrate, to be used as the temporary roof. This temporary roof can serve to protect the interior of the building during the early stages of construction. It may then be removed or repaired, if necessary, and can be left as a vapor retarder prior to the installation of the finished Firestone roof system.
3. If roof insulation is installed under the temporary roof, the insulation shall be inspected for wet or damaged areas, so that such areas may be removed and replaced prior to installation of the Firestone roof system.
4. When a temporary roof is specified as a vapor retarder, precaution shall be exercised in protecting the temporary roof from other construction tradesmen. Damage to the temporary roof may impair its effectiveness as a vapor retarder. If the vapor retarder is installed as a temporary roof during construction, the vapor retarder shall be examined, and if necessary, repaired to ensure watertight integrity prior to installation of the remainder of the roof system.
5. For additional information regarding temporary roofs, refer to the NRCA's Roofing and Waterproofing Manual or contact Firestone Roof System Solutions Group.

1.03 VAPOR RETARDERS / AIR BARRIERS

The determination of the necessity and location for a vapor retarder or an air barrier are project specific requirements, which is the responsibility building owner or his design professional. The proper assessment of the building, the need for and the proper design of the air barrier and vapor retarder are critical to the long-term operation of the roof system.

Firestone does not review or calculate dew point analyses and therefore, does not accept responsibility for damage due to recurrence rate or location of the dew point. Although not all projects require a vapor retarder, a design review should be considered for all projects.

The inclusion of an air barrier or vapor retarder may affect the Underwriter Laboratories or Factory Mutual rating of the roof system.

The inclusion of an air barrier or vapor retarder may affect the Firestone system requirements and consequently the Firestone warranty. Contact the Roof System Solutions Group at Firestone Building Products prior to application of the proposed system.

A. VAPOR RETARDER:

1. To control moisture, a vapor retarder may be necessary to protect certain roofing components when high interior humidity is of concern. Some examples are:

- High interior relative humidity is present
- When a vapor drive may be expected to form a dew point under the roof membrane or in the insulation. (Building usages with high humidity interiors where vapor drive may occur) such as swimming pools, laundry facilities, paper mills, and bottling plants

a) In these types of environments, there is substantial upward vapor drive, and the potential exists for extreme amounts of moisture accumulation within the roof assembly. If an effective vapor retarder is not included at the proper location in the roof assembly, so that the retarder is warmer than the dew point, condensation will cause damage from the moisture retained in the roof assembly.

b) This movement is reversed in some air-conditioned buildings in humid summer conditions. This is especially true in southern states.

2. Vapor retarders are installed because water vapor causes several types of roof assembly failures such as:

- Reduced R-value, since wet insulation becomes a conductor of heat rather than an insulator
- Deterioration of the roof membrane, insulation, structural decks, and associated building components
- Delamination of roof components from trapped moisture, which freezes and thaws, eventually evaporating under solar heat with the resulting vapor pressure causing blisters and delamination of the roof assembly components

3. The following is a partial listing which might influence the need for a vapor retarder:

- Building usage as related to vapor drive
- External temperature in relation to internal temperature
- The humidity of the interior and/or exterior air
- Building code requirements
- Construction moisture, particularly during winter when temporary propane heat is required

4. A vapor retarder's effectiveness generally depends upon the following factors:

- The vapor retarder's perm (permeance) rating shall be as close to zero as possible
- The adequacy design of the vapor retarder membrane
- The integrity of the vapor retarder's seals at perimeters and penetrations
- The integrity of the vapor retarder's membrane after other tradesmen finish their projects
- The vapor retarder's location within the insulated roof assembly

a) Construction roof traffic shall be restricted to prevent damage to the vapor retarder. In the event damage does occur, repair the vapor retarder damage with the same roof components and quantities as specified for the vapor retarder installation.

5. There are four generally accepted methods for determining the need for a vapor retarder. They are:

- National Roofing Contractors Association (NRCA) guidelines
- U. S. Army Corp of Engineering Cold Regions Research and Engineering Laboratory (CRREL) guidelines
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) method
- Oak Ridge National Laboratory (ORNL) method

6. Vapor Retarder properties:

a) A vapor retarder is defined as a building envelope element that limits diffusion of moisture into an assembly. Diffusion is water vapor migration in a material. Its rate depends on two factors:

- Water vapor pressure difference across the roof assembly
- Resistance of materials along the migration path

Some materials have more resistance than others. Placing a high-resistance material in a roof assembly may help control moisture migration.

b) Vapor retarders are intended to limit moisture diffusion. Therefore, the main property requirement of a vapor retarder is low water vapor permeance. Water vapor permeance is defined as:

> *"The time of water vapor transmission through a unit area of flat materials or construction induced by a unit vapor pressure difference between two specified surfaces, under specified temperature and humidity conditions".* (NRCA)

7. Vapor Retarder Design:

a) The roof system designer is generally responsible for the design requirements of the roof deck, vapor retarder, and rigid insulation. The need for a vapor retarder, as well as the type, placement and location of a vapor retarder should be determined by a professional architect or engineer. The list below, are examples of common vapor retarder applications.

- Firestone V-Force Vapor Barrier
- Mopped Firestone Type IV (4) M or VI Ply Sheet over a nailed Firestone MB Base Sheet
- Mechanically attached fiberglass or polyester venting base sheet with 18" (457 mm) side and end laps mopped with hot asphalt
- Existing dry and sound uninsulated built-up roof system (all splits and blisters repaired)
- Mopped Firestone Type IV (4) M or VI Ply Sheet over an existing dry and sound uninsulated built-up roof system. If gravel surfaced, then gravel shall be removed by power brooming, vacuuming and spudding
- 2 plies of Mopped Firestone Type IV (4) M or VI Ply Sheet set in hot asphalt over an acceptable mechanically attached barrier board
- 2 plies of Mopped Firestone Type IV (4) M or VI Ply Sheet set in hot asphalt directly on a properly prepared structural concrete deck
- Fully adhered Firestone SBS Base Sheet, Heat Welded or set in hot asphalt, over an acceptable mechanically attached barrier board
- Fully adhered Firestone SBS Base Sheet, Heat Welded or set in hot asphalt directly on a properly prepared structural concrete deck
- Six (6) mil polyethylene sheeting taped at laps and to penetrations and perimeters

b) The roof system designer must:

- Assure that the methods of attachment of the roof system to the vapor retarder selected are compatible
- Assure that the vapor retarder will extend continuously and evenly throughout the roof plane to provide a complete seal against the intrusion of moist air from the building interior. Integration of the wall and roof air retarder systems is essential
- Consider the effect of construction moisture on a new roof system, particularly during winter, when temporary propane heat is required

B. AIR BARRIERS

1. While some Firestone roof systems may require an air barrier to receive a Firestone warranty, the need for an air barrier, as well as the type, placement and location of the air barrier must be determined by a professional architect or engineer.
2. Air barriers systems are a component of building envelope systems that control the movement of air into and out of buildings. If one is required, consult Firestone Roof Systems Solutions Group to confirm asselbly requirements.
3. An air barrier may consist of a single material or of two or more materials which, when installed as a system, make up an air impermeable, structurally adequate barrier.
4. Air barrier systems are generally comprised of building components and materials that have an air permeability not exceeding 0.004 cfm/sf under a pressure differential of .3 in. water.
5. No single component or material has the capability to provide a complete air barrier system for a building; therefore, air barrier systems include many components and materials that must work in a coordinated effort to be effective. . Firestone recommends that the individual manufacturers of these products provide written certification confirming that their products, when used together, meet this requirement.
6. If the air barrier is to perform its intended role, it must meet a number of requirements:
    - **Continuity:** the assemblies must be linked together to ensure that there is no break in the air tightness of the envelope
    - **Structural Integrity:** The air barrier must be capable of resisting the imposed load or must be supported by one that can. It must be capable of resisting the strongest wind load acting as either a positive or a negative pressure without rupturing or breaking away from its intended seal or support. The air barrier and its support must be sufficiently rigid to resist displacement
    - **Air Impermeability:** A major requirement of an air barrier is that it offers a high resistance to airflow
    - **Durability:** Durability depends largely on how a material reacts to a specific environment such as moisture, temperature, ultra-violet radiation, and to the presence of other materials (incompatibility)

1.04 SUBSTRATE AND SUBSTRATE REQUIREMENTS

A. GENERAL:

1. The Firestone Platinum EPDM roof system depends on a suitable substrate to perform its intended function of weatherproofing the building.

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

2. The substrate to which the Firestone roof system is installed must:
    - Be structurally sound
    - Be dry, smooth, flat and clean
    - Be free of sharp fins, or foreign materials that could damage the membrane
    - Meet the minimum requirements for the system

B. FASTENER/ PULLOUT/ ADHESIVE REQUIREMENTS:

1. Substrates for insulation attachment are required to provide sufficient pullout resistance for the fasteners, adhesives, and the roof system.
2. In the case where the structural deck does not meet the minimum fastener pullout requirements contact the Roof System Advisors at Firestone Building Products.

Table 1.04-1
The Minimum Fastener Pullout Resistances For Platinum EPDM

System	Minimum Fastener Resistance
Fully Adhered systems with Insulation Mechanically Attached to Deck	300 LBS. (136.1 KG) Pullout Contact the Roof System Solutions Group at Firestone Building Products when the structural deck does not meet the minimum fastener pullout requirements.
Fully Adhered systems with Insulation Adhesively Attached to Deck	When mechanically attaching insulation, cementitious wood fiber decks are required to have a fastener pullout of 300 lb (1.8 kN) for each fastener.

3. See the Firestone Attachment Guide for the minimum adhesive pull test requirements for insulation adhesives.

4. Pullout Tests: Due to the variety of physical conditions that can affect pullout resistance, Firestone recommends that on-site tests be conducted by an independent testing laboratory, the manufacturer's representative or the roofing contractor, to determine actual pullout values. The following deck type are those which may not provide sufficient pullout resistance:

- Steel decks thinner than 22 gauge (0.76 mm)
- Concrete less than 3000 psi (20,684 kPa)
- Plywood or oriented strand board less than 7/16" (11.1 mm) thickness
- Wood plank less than 3/4" (19mm) thickness
- All poured or pre-cast gypsum, cementitious wood fiber and lightweight insulating concrete decks
- Existing masonry or brick
- Any other substrate that does not have a published pullout capacity greater than the minimum required for the applicable roof system

a) The sections of the substrate where integrity is most in question should be used for testing. Test areas should include corners, drain areas, and perimeters. The minimum number of pullout test recommended is as follows:

TABLE 1.04 –2
RECOMMENDED NUMBER OF PULL OUT TESTS

ROOF SIZE		Number of Pull-Out Tests
Less Than 10,000 sf	Less Than 1,000 m^2	6
10,000 sf - 50,000 sf	1,000 m^2 – 5,000 m^2	10
50,000 sf - 100,000 sf	5,000 m^2 – 10,000 m^2	20
Over 100,000 sf	10,000 m^2	1 per 5,000 sf./ 500 m^2

b) When new construction or other conditions prevent preliminary on-site pullout tests, the fastener manufacturer should supply estimated pullout values for design and bid purposes. On-site verification of the pullout capacity must be confirmed prior to system installation. (Consider requesting a unit price bid for potential increased fastening requirement)

C. MOISTURE CONTROL:

1. The roofing contractor is responsible for ensuring that the substrate is suitable to receive a Firestone roof system. All damaged and/or wet substrate must be dried, removed and replaced prior to the application of the Firestone roof system.

2. A moisture survey should be conducted to determine the moisture content of any existing roof system component prior to starting in anticipation of wet areas. All existing roof system must be removed prior to installation of any Platinum system.

3. Failure to remove existing system will result in the Firestone roof system being unwarrantable.

4. The best diagnostic technique is by taking and evaluating a series of roof cores.

5. Three techniques are currently available to evaluate the roof by indirect / non-invasive means. Results of these studies must still be correlated with roof cores. These techniques provide measurements of factors that can be associated with the presence of moisture.

- Nuclear moisture detection
- Infrared thermography
- Electric capacitance

D. DRAINAGE AND SLOPE:

Building codes may require a specific minimum slope for drainage. It is the building owner or his design professional's responsibility to consult with the controlling code agency official(s) to determine the specific requirements of each project and each system.

When interior drains are necessary, they must be installed at the low points of a sloped roof deck and maintained in a working condition.

1. The NRCA and prevailing building codes recommends, and some codes may require, that a minimum roof slope of ¼" (6.4 mm) per foot be obtained to facilitate proper drainage and maximize long-term performance of the roof system. Firestone recommends following the NRCA guidelines. The minimum Firestone requirement is POSITIVE drainage.
2. Ponding water is defined as a condition existing on any area of the roof where water remains more than forty-eight (48) hours after precipitation.
3. Adequacy of drainage provisions, placement, sizing and/or number of drains required is the responsibility of the building owner or his design professional. Drainage conditions should meet the requirements of applicable codes as well as standard industry recommendations.
4. In re-roofing or re-cover situations, analysis of the existing drainage conditions is the responsibility of the building owner or his design professional. Existing deck deflection or ponding water may necessitate upgrading of the drainage provisions, including relocation of existing drains, possible addition of new drains, increased bar joist support etc. Firestone does not design roof drainage systems or assume any liability for the adequacy (or lack of) roof drainage systems or facilities.
5. Proper and adequate drainage of the roof surface is required to assure the long-term performance of the roof system. Drains should be of sufficient number, size, and located to provide satisfactory and rapid drainage of the entire roof surface (within 24 to 48 hours of precipitation). Although, a minimum roof slope of ¼" (6.4 mm) per foot is recommended, other slopes are acceptable to receive a Firestone warranty provided positive drainage is attained.
6. Tapered ISO 95+ provides an effective and economical solution where substrate slope will not permit efficient drainage. When properly installed, it can extend the life of the roof assembly by eliminating problems associated with ponded water. Tapered ISO 95+ is available in slopes from 1/16" to 1/2" per foot. (0.5 %) - (4.2%). Firestone provides a variety of technical support services for the installation of tapered insulation through the Firestone Estimating Services.
7. The following are just some of the reasons why proper roof drainage is important:
   - Standing water can result in deck deflection and possible structural damage
   - Water on the roof can promote vegetation, fungi and bacterial growth
   - In the event of an opening in the roof membrane, standing water can significantly worsen the damage to the roof system, the building itself, and the interior contents
   - It is required by many, if not all, building codes
   - Proper drainage of the roof system prevents premature deterioration of the roof membrane and roof components

E. WOOD NAILERS:

1. For new construction projects, wood nailers must be kiln-dried (Southern Pine, Douglas Fir) structural grade #2 or better.
2. **Wood nailers installed by others:** Make these specifications and details available when others will install nailers. Work that compromises the integrity of the system may jeopardize the warranty.
3. For new construction projects where a poured-in-place deck will be used, wood nailers must be pressure treated for rot resistance, #2 or better lumber. Asphaltic or creosote-treated lumber is not acceptable. Lumber treated with other wood preservatives such as Pentachlorophenol, Copper Naphthenate or Copper 8-quinolinolate will adversely affect the membrane when in direct contact and are, therefore, unacceptable.

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 the more corrosive materials.

Chemical treating for fire resistance or other purposes (other than pressure treating for rot resistance, i.e. CCA, ACZA, CBA, ACQ or other copper treatments) may affect the performance of the Firestone membrane and accessories. Contact the Firestone Technical Services at Firestone Building Products when using chemically treated lumber that will come in contact with the membrane.

4. Firestone requires Wood nailers at the following locations:
    - All roof edges
    - Metal penetration pockets, wood nailer may be deleted when metal flanges are less than 12" on a side
    - Wood nailers must totally support all sheet metal flanges and be at least ½" wider to roof side
    - Refer to Firestone details for other location requirements

5. The wood nailer may be omitted when all metal flanges are more than 12 inches on a side and the metal flanges are placed and secured directly to the deck.

6. The building owner or his design professional must specify a wood nailer attachment system that will resist a minimum force of 200 lb per foot (2.9 N/m) in any direction. Firestone fasteners are required for all roofing applications. For further clarification, please refer to Factory Mutual Loss Prevention Data Sheet 1-49.

F. EXPANSION JOINTS:

1. The determination of the necessity and location for expansion joints is a project specific requirement, which is the responsibility of building owner or his design professional. Typical consideration for selection criteria may be one or more of the following:
    - Where expansion, contraction or deflection joints are provided in the building structural system
    - Roof expansion joints must be located to accommodate movements caused by building structural movement
    - Where structural framing elements such as joists, rafters, purlin, or steel decking change direction
    - Deck material changes (e.g. from steel to concrete deck). Where different types of roof decks such as concrete and steel abut each other
    - Where additions are connected to existing buildings
    - At junctions where interior heating conditions change such as a heated space abutting an unheated space
    - Where movement between vertical walls and the roof deck is anticipated
    - Roof areas greater than 200 feet (61m) on any direction
    - Coordination and sequencing of expansion joint closure systems and their continuity, compatibility and function of seal is the responsibility of the design team

    Note: The conditions above may not be inclusive. Other conditions may exist in which expansion joints should be considered.

2. Expansion joints must not restrict the flow of water.

3. Firestone expansion joint details for single-ply systems are located in the Details of the Technical Database.

1.05 FASTENERS

A. GENERAL:

Refer to the Technical Information Sheet (T. I. S.) that references the specific fastener being used and for the deck penetration requirements of that fastener. All fasteners must be suitable for the existing deck type.

1. Roof systems rely on the attachment of the components to the deck substrate to perform its basic functions. Wind creates uplift forces on the roof; therefore, the overall holding power of the fasteners is critical. Firestone recommends that the use of any fastener be investigated should there be concerns about the structural integrity of the deck. Some of the items to be considered include:

- How the fastener(s) might affect the deck
- The capability of the deck to hold the fasteners and roof system in place in a wind related event

2. The structural integrity of the deck may have been weakened over time, thus the choice of fastener and roof attachment methods should be considered in determining the best solution to the given deck and situation.

Firestone All Purpose (AP) fasteners are not acceptable for use with the Platinum EPDM roof system installations.

TABLE 1.05-1
ALLOWABLE FASTENER AND SUBSTRATE CONFIGURATIONS

Firestone Fastener		ADHERED MEMBRANE SYSTEMS	Acceptable for 30-year warranty	Steel Decks	Structural Concrete Decks	Plywood or OSB Decks	Cementitious Wood Fiber Decks	Gypsum Decks	Lightweight Insulating Concrete Decks (See Section 1.06 I for additional requirements)	
T.I.S.	Fastener	Insulation Attachment							Steel Pan	Concrete
1002	Heavy-Duty Fastener and Plate	✔	✔	✔	✔	✔			✔	✔
1005	Concrete Drive Fastener and Plate	✔	✔		✔					✔
1006	Polymer Fastener and Plate	✔	✔				✔	✔		
1014	#15 Belted Fastener	✔	✔	✔		✔				
1016	Firestone HD AccuTrack	✔	✔	✔		✔				
1019	HailGard Fastener	✔	✔	✔	✔	✔			✔	✔

✔ = Acceptable for use

When using fasteners, verify that the substrate has sufficient fastener pullout resistance to meet the system requirements.

TABLE 1.05-2
ACCEPTABLE FASTENER USES FOR PLATINUM EPDM

Firestone Fastener		For the attachment of:		
		Roofing insulation (in combination with Firestone Insulation Plate)	**Termination Bars**	**Other accessories**
T.I.S.	Fastener	See the specific fastener TIS for specific application data		
1002	Heavy-Duty Fastener and Plate	✔	✔	✔
1005	Concrete Drive Fastener and Plate	✔	✔	✔
1006	Polymer Fastener and Plate	✔		
		Firestone Polymer plates required		
1008	Coated Drive Pin Fastener		✔	
1014	#15 Belted Fastener	✔		
		For use with Firestone Insulation to steel (18-24 ga.) and wood. The #15 Belted fasteners must be installed with the IF160 automatic installation tool available from SFS INTEC. When used for insulation, the Firestone 2.75"x 2.75" (70 mm x 70 mm) plate is used.		
1016	Firestone AccuTrac HD	✔		
		For use with Firestone Insulation to steel and wood roof decks with Buildex AccuTrac installation equipment. A kit consists of both fasteners and insulation plates for the AccuTrac tool.		
1019	HailGard Fastener	✔		
		For use with Firestone Hail Gard Insulation and OSB to approved decks. No insulation plate required.		
✔ = Acceptable for use				

Refer to the Firestone Attachment Guide for adhesion pull test requirements for I.S.O. SPRAY S, I.S.O. Fix, and I.S.O. Twin Pack

1.06 DECKS

A. PLATINUM RETROFIT OR RE-COVER APPLICATIONS:

1. The Firestone Platinum roof system cannot receive the Firestone Platinum warranty if the existing roof remains in place. A complete removal of the existing roof system, including the membrane, insulation and flashings is required.

If present, it is required that phenolic insulation be removed. Once removed, a visual inspection of the deck condition and other components is required; all deteriorated components must be replaced as necessary.

It is the building owner or his design professional's responsibility to determine the condition of the deck.

Sprayed In-Place polyurethane foam (PUF) roof systems require a COMPLETE TEAR-OFF of the Sprayed In-Place polyurethane foam system.

B. GENERAL

1. Structural roof decks should be properly designed and constructed to provide sufficient strength to support the anticipated dead and live loads along with the loads anticipated due to the construction traffic, without excessive deflection or movement.

2. Roof replacement usually involves more complexities than new construction roofing. Such contingencies as rusted or deteriorated decks, rotted wood components, rooftop equipment that cannot be moved or shut down, and numerous other conditions are often encountered.

   a) All holes, deformations, depressions, etc., must be reinforced and /or smoothed prior to the roof application.

   b) Determination and acceptance of a deck for re-roofing is the responsibility of the building owner or his design professional.

   c) The deck should provide slope to drain.

C. CLASSIFICATION:

1. Structural decks can be classified as nailable or non-nailable (sometimes both) for purposes of mechanically attaching or nailing insulation or base sheets. Nailable decks include wood and new decks of gypsum and lightweight insulating concrete. These decks are soft enough so that the above-deck components can be secured with fasteners. Cementitious wood fiber and poured or precast structural concrete decks have been referred to as non-nailable. The term non-nailable is misleading. Firestone Building Products has fasteners that are approved for these decks.

2. Structural decks can be classified as combustible or non-combustible for purposes of fire ratings and code requirements.

TABLE 1.06-1
STRUCTURAL DECK CLASSIFICATION

Deck	Nailable or Non-nailable	Combustible or Non-combustible
Steel	Non-nailable	Non-combustible
Concrete	Both	Non-combustible
Wood	Nailable	Combustible
Cementitious Wood Fiber Decks	Both	Non-combustible
Gypsum	Nailable	Non-combustible
Light weight insulated concrete	Nailable	Non-combustible

D. STEEL DECK:

1. Firestone recommends that the steel deck be a minimum 22 Gauge (0.76 mm).

2. Factory Mutual Research-Approved steel decks are currently available in 22 ga. (.0295 in., 0.794 mm), 20 ga. (.0358 in., 0.909 mm) and 18 ga. (0.0474 in., 1.204 mm) thick sheets with 1.5 in. (38 mm) deep corrugations. The corrugations (ribs) are cold rolled in the sheets. The deck has a 6 in. (152 mm) module, that is, the ribs are 6” (152 mm) on center. All fastening Approvals and recommendations are based on this profile. (Approved and recommended spacings are such that the fasteners will engage the top flange of the deck). Another common configuration is 3 in. (76 mm) deep deck, which usually has an 8 in (203 mm) module.

3. When mechanically attaching insulation, steel decks are required to have a fastener pullout of 300 lb per fastener.

4. The Firestone single-ply membrane may not be adhered directly to a steel deck. The single-ply membrane must be adhered to an acceptable insulation or coverboard.

5. On steel decks, the edges of insulation boards running parallel with the deck are required to be supported by the top flange of the metal deck. The board should have a minimum 1” bearing on the steel deck flange. Cantilevering insulation boards over deck flutes can fracture insulation boards, reducing the support for the membrane, making it susceptible to puncture.

6. All deteriorated components must be replaced as necessary.

E. STRUCTURAL CONCRETE ROOF DECKS:

1. Firestone recommends that the concrete deck be a minimum 3000 Psi (20684 Kpa).
2. When mechanically attaching insulation, structural concrete roof decks require a minimum fastener pullout of 300 lb (1.8 kN) per fastener.
3. The Firestone Platinum EPDM single-ply membrane may not be adhered directly to a structural concrete deck. The membrane must be adhered to an acceptable insulation or coverboard.

The suitability of mechanically fastening insulation or membrane to any hollow core, pre-stressed or post-tensioned structural concrete deck assembly is the responsibility of the design professional. Special consideration needs to be given to the relationship between the deck attachment allowances and Firestone mechanical attachment requirements.

4. Verify with the building owner or his design professional about the suitability of mechanical fastening into pre-stressed and post-tensioned structural concrete.
5. Concrete may contain latent amounts of moisture that may affect the insulation and the roof system. To help protect the components, a Firestone Venting Base Sheet or other vapor retarder material may be installed in accordance with the manufacturer's instructions. The installation of a vapor retarder should be considered whether choosing mechanical attachment, hot asphalt or adhesive attachment of insulation or the membrane system.
6. Pre-cast concrete panels may not always be a suitable substrate to receive insulation due to the potential for irregularities, even if the joints are grouted. It may sometimes be necessary to consider pouring a leveling layer of structural concrete over the panels prior to roofing.

F. WOOD DECKS: PLYWOOD AND OSB

1. Firestone recommends that wood plank have a minimum ¾" (19.1mm) thickness.
2. Firestone recommends that plywood and OSB decks have a minimum 7/16" (10.5mm) thickness.

Fire treated plywood may be used provided it has not been treated with ammonium phosphates.

3. When mechanically attaching insulation, wood decks are required to have a fastener pullout of 300 lb (1.8 kN) per fastener.
4. The Firestone Platinum EPDM roof membrane cannot be installed directly to a plywood, OSB, or wood plank roof deck. The membrane must be adhered to an acceptable Firestone insulation or coverboard.

G. CEMENTITIOUS WOOD FIBER DECKS:

1. Firestone recommends that cementitious wood fiber deck have a minimum 2" (51mm) thickness.
2. The Firestone Platinum EPDM single-ply membrane cannot be installed directly to a cementitious wood fiber deck. The membrane must be adhered to an acceptable Firestone insulation or coverboard.

H. GYPSUM ROOF DECKS:

1. Firestone requires that the gypsum roof deck have a minimum 2" (51mm) thickness.
2. When attaching insulation to a gypsum roof deck, a fastener pullout of 300 lb (1.8 kN) per Firestone Polymer Fastener is required.
3. The Firestone Platinum EPDM single-ply membrane cannot be installed directly to a gypsum roof deck. The membrane must be adhered to an acceptable Firestone insulation or coverboard.

I. LIGHTWEIGHT INSULATING CONCRETE ROOF DECKS:

For **Cellular Llightweight inslulating Concrete** decks that are properly prepared and dry, Firestone does not require a vapor retarder, however one is recommended, if insulation is installed with the system. See Technical Bulletin: 10/2005

1. Firestone recommends that the lightweight insulating concrete have a minimum 2" (51mm) thickness.
2. When mechanically attaching insulation through lightweight insulating concrete, into a structural deck, a fastener pullout of 300 lb (1.8 kN) per fastener is required.
3. A vapor retarder is required on all systems installed onto a lightweight insulating concrete roof deck.
4. The Firestone Platinum EPDM single-ply membrane cannot be adhered directly to a lightweight insulating concrete roof deck. The membrane must be adhered to acceptable Firestone insulation or coverboard.

1.07 BASE PLY SHEET

A. Except when used as part of a vapor retarder, base ply sheets may not be used in Platinum EPDM systems and still receive a Firestone Platinum warranty.

B. Depending on the substrate and the base ply sheets, the base ply sheets may be adhered with a full mopping of hot asphalt or heat welded.

1.08 INSULATION

A. GENERAL:

1. Insulation must provide a suitable substrate for the proposed roof system as well as insulation for the building.
2. Insulation thickness requirements may vary for code compliance. Contact the local code or insurance official before contacting Firestone Roof System Solutions Group.
3. Refer to the Firestone Attachment Guide for adhesion pull test requirements for I.S.O. SPRAY S, I.S.O. FIX and I.S.O. Twin Pack.

Only Firestone brand insulation can be used in a Firestone system and receive a Platinum system warranty.

4. Platinum warranted systems require one of the following Firestone Insulations as an immediate substrate for the Firestone roof membrane in Firestone Platinum EPDM warranties. If more than one layer of insulation is required, Firestone ISO 95+ must be used between the immediate substrate insulation and the substrate.
   - HailGard, min. 1.5” (38.1 mm)
   - ISOGARD HD, min. ½” (12.7 mm)
   - DensDeck, min. 1/4” (6.4 mm)
   - ISO 95+ Polyiso Insulation, min. 1.0” (25.4 mm)
   - SECUROCK Gypsum-Fiber, min ¼” (6.2 mm)
5. Insulation thickness requirements may vary for code compliance. Contact the local code or insurance official before contacting the Firestone Roof System Solutions Group.
6. Tapered insulation thickness may be below the 1.0” (38 mm) minimum thickness. In areas where this occurs, the insulation must be fastened at a rate of one (1) fastener and plate per two (2) square foot (0.22 sq. m). If possible, install the tapered insulation first, covered by the flat stock.

B. ATTACHMENT:

1. All insulation must be fastened at a rate of not less than sixteen (16) Firestone Fasteners and Firestone Insulation Plates (as required) per 4’ x8’ (1.22 m x 4.44 m) board. (One (1) per every two (2) square feet)
2. Refer to specific Firestone Technical Information Sheet (T.I.S.) for installation and fastening pattern requirements. When a composite of two insulation layers is installed, the fastening pattern required for the top board thickness must be used. A common fastener may be used to install multiple layers of insulation.
3. Insulation may be installed by various methods including fasteners and adhesives. It is acceptable to combine

fastener and adhesive attachment methods in multi-layer applications.

4. Tapered insulation below the 1.0” (25.4 mm) minimum thickness must be fastened at a rate of one (1) fastener and plate per two (2) square feet (0.22 sq. m). If possible, install the tapered insulation first, covered by the flat stock.

C. Multiple Layers of Insulation:

Insulation may be installed in one or multiple layer applications for the Firestone Platinum warranty. If installed in multiple layers, the joints of each succeeding and adjoining layer should be staggered from the joints of previous layers by a minimum of 6 inches (150 mm) in each direction.

D. Mechanical Attachment of Insulation and Cover Board to Approved Substrates:

1. Insulation must be fastened with appropriate Firestone fasteners and insulation plates (as required).
2. Firestone All Purpose (AP’s) fasteners are not acceptable for use with Platinum warranted systems.
3. All insulation must be fastened at a rate of not less than sixteen (16) Firestone Fasteners and Firestone Insulation Plates per 4’ x8’ (1.22 m x 4.44 m) board. Local building codes and Insurance requirements may require additional fasteners.
4. Extended wind speed warranties may require additional fasteners. Contact Firestone Technical Services for the proper fastener attachment pattern.
5. Fastening rates and patterns may vary for code compliance. Contact the local code or insurance official before contacting Firestone Technical Services.
6. Certain specifications may call for increased densities of fasteners in the perimeters and corners of roofs.

Table 1.08-1
Chart of Insulation Attachment Options
(Mechanical Attachment)

Structural Deck To Which HailGard, min. 1.5” (38.1 mm) ISOGARD HD 1/2” or 1” (12.7 or 25.4mm) DensDeck, min. 1/4” (6.4 mm), SECUROCK Gypsum-Fiber, min 1.4” (6.2 mm) ISO 95+ Polyiso Insulation, min. 1.0” (25.4 mm) **Will Be Mechanically Attached**	**Attachment Method**						
	Heavy Duty (HD) and Plates	Polymer Fasteners and Plates	Concrete Drives and Plates	#15 Belted Fastener and Plates	Firestone AccuTrac HD	HailGard Fastener	Minimum penetration of fastener into/ through deck
	1002	1006	1005	1014	1016	1019	
Steel	✔			✔		✔	¾" (19mm) through deck
Structural Concrete	✔		✔			✔	Heavy Duty (HD) HailGard Fastener: 1" (25.4mm) into deck Concrete Drives: 1¼" (31.7mm) into deck
Plywood or OSB	✔			✔		✔	1" (25.4mm) into or through deck
Wood Plank	✔			✔		✔	1" (25.4mm) into or through deck
Gypsum		✔			✔		1½" (38.1mm) into deck.
Cementitious Wood Fiber		✔					1½" (38.1mm) into deck.
Lightweight insulating concrete over steel deck **See Section 1.06 I for additional requirements**	✔					✔	¾" (19mm) through steel pan
Lightweight insulating concrete over concrete deck **See Section 1.06 I for additional requirements**	✔		✔		✔ ✔	✔	Heavy Duty (HD) and HailGard Fastener 1" (25.4mm) into the structural concrete deck. Concrete Drives 1¼" (31.7mm)) into the structural concrete deck.
✔ = Acceptable for use							

E. MINIMUM NUMBER OF FASTENERS AND PLATES PER INSULATION BOARD

See Firestone T.I.S. 950 Insulation Attachment Patterns for the required patterns for the proper placement of approved fasteners and plates for insulation on Firestone Platinum roof systems. This fastening pattern applies to approved flat or tapered insulations and cover boards. The most common fastener density and pattern requirements are shown. For non-standard fastener densities, contact the Firestone Technical Services at Firestone Building Products.

F. ADHESIVE ATTACHMENT OF INSULATION /COVER BOARD TO SUBSTRATE (NOT APPLICABLE FOR PW OR PHW WARRANTY OR HAILGARD INSULATION:

1. Firestone I.S.O. SPRAY S, Firestone I.S.O. Fix, and Firestone I.S.O. Twin Pack Adhesive:
   - The insulation must be no larger than 4' X 4' (1.2 m X 1.2 m).
   - Stagger all insulation joints from adjoining and adjacent boards and adjacent layers.
   - Refer to the Firestone Attachment Guide for adhesion pull test requirements for I.S.O. SPRAY S, I.S.O. Fix, and I.S.O. Twin Pack.
2. Firestone insulation adhesives must be applied in accordance with the installation instructions and their Technical Information Sheet (TIS).
3. Assure that all safety measures are followed when installing insulation adhesives to protect the installer as well as the occupants of the building.
4. Existing decks containing residual asphalt must be cleaned and scraped smooth as possible.
5. Existing decks shall be smooth, flat, clean, dry, free of sharp fins, or foreign materials

TABLE 1.08-2
ALLOWABLE ADHESIVE ATTACHMENT OF INSULATION /COVER BOARD

Substrate To Which DensDeck, min. 1/4" (6.4 mm), SECUROCK Gypsum-Fiber, min ¼" (6.2 mm) ISO 95+ Polyiso Insulation, min. 1.0" (25.4 mm) **Will Be Adhered**	ISO SPRAY S			ISO Twin Pack and ISO Fix			Notes
	Acceptable	Pull Test Required	Not-Acceptable	Acceptable	Pull Test Required	Not-Acceptable	
Structural Deck							
Steel	✔					✔	New steel decks may require cleaning to remove processing oils
New Structural Concrete	✔			✔			New poured decks must have a minimum 28-day drying time.
Existing Structural Concrete	✔				✔		Existing concrete containing residual asphalt must be cleaned and scraped smooth as possible
Plywood, OSB	✔					✔	
Cementitious Wood Fiber	✔					✔	
Poured Or Pre-Cast Gypsum	✔					✔	
Lightweight Insulating Concrete Decks **(See Section 1.06 I for additional requirements)**			✔			✔	
New Base Layer of Insulation							
Iso 95+	✔			✔			Maximum 4' x 4' (1.22 m x 1.22 m) boards only on approved insulations

1.09 ROOF MEMBRANE

A. MEMBRANE

1. The roof membrane shall consist of a .090 inch (2.2 mm) Platinum EPDM membrane bonded to the approved substrate with Firestone Bonding Adhesive or Water-Based Bonding Adhesive. The following insulations are acceptable substrates, consult tables for correct choice depending on performance level desired, for the Platinum EPDM roof membrane:
    - HailGard, min. 1.5" (38.1 mm)
    - ISOGARD HD ½" or 1" (12.7mm / 25.4mm)
    - DensDeck, min. 1/4" (6.4 mm)
    - SECUROCK Gypsum-Fiber, min ¼" (6.2 mm)
    - ISO 95+ Polyiso Insulation, min. 1.0" (25.4 mm)
2. An Air barrier is required for projects when any one wall has large openings greater than 10% of the one wall area that can be left open in a storm. Criteria to be determined based upon Firestone's review. Enhancement may be required with the addition of an air barrier.

B. FIELD AND FLASHING LAP SPLICES:

1. Complete all lap splices using Firestone QuickPrime Plus followed by 3" QuickSeam Splice Tape, followed by the application of QuickPrime Plus and 5" QuickSeam flashing centered over the completed sheet edge splice.
2. Refer to Firestone Platinum EPDM details regarding specific requirements.

1.10 FLASHINGS

A. DESIGN CONSIDERATIONS:

1. Many factors affect the performance of the flashing system for specific detail requirements; refer to the EPDM Application Guide and the Platinum detail drawings.
2. A flashing is a roofing element used to prevent water from penetrating the exterior surface of a roof or to intercept and lead water out of it. Flashings divert the water to the membrane. The membrane then carries it to the roof drains. Typically, flashing intercepts water flowing down parapets, walls of higher adjacent construction, and roof penetrations. There are four typical locations where a flashing is needed:
    - Terminations
    - Junctions
    - Projections
    - Joints
3. In any flashing detail, there are up to three different flashing components:

    a) Base flashing

    An extension of the roofing membrane or a different material that is bonded to the roof to form a waterproof joint. It extends upward along the vertical surface to divert water onto the membrane. The base flashing should reach a higher level than that reached by water on the roof. In some situations, water may have to be temporarily stored on the roof. This may occur during heavy rainfalls, where the drain size is inadequate, where local building regulations require controlled flow drains, or where ice and snow restrict drainage.

    b) Counter-flashing

    Counter-flashing is used, in some situations, to carry water onto the base flashing and the membrane. This may be the case where a wall rises above a roof and masonry or concrete wall cladding is carried down to the roof surface. It covers the vertical face of the base flashing. It provides protection for the base flashing and may serve to shed water. Where required, the counter-flashing is secured to the parapet or wall cladding.

    c) Cap flashing

Cap flashings are horizontal coverings for parapets and expansion joints. Cap flashing should be sloped toward the roof and secured to allow differential movement. Failure to provide for adequate flashing height at the design stage may result in serious problems that cannot be corrected subsequently.

d) Limitations in flashing heights may be encountered.

Existing building features (i.e., door or window locations, weeps or through-wall flashings) may not allow sufficient clearance to provide proper termination above the potential water level. Detailed consideration of this condition is critical to the integrity of the roof system. **Contact the Firestone Technical Services for assistance**.

B. WALL/CURB FLASHING MATERIALS AND REQUIREMENTS:

Platinum EPDM roof systems require one (1) ply of Platinum EPDM, with redundant QuickSeam Flashing on the corners.

TABLE 1.10-1
DETAIL DESCRIPTION FOR FIRESTONE PLATINUM EPDM ROOF SYSTEM

Detail	Requirements (consult details)
Wall Terminations	Firestone Termination Bar with reglet or surface mounted counterflashing
Curbs/Parapets	Curbs and expansion joints longer than eight (8) feet on any side must secure membrane by using QuickSeam RPF Strip. Where this is not practical, curbs may be flashed using 60 mil RubberGard Membrane or QuickSeam Curb Flashing. In either case, the base lap shall be completed with QuickSeam Tape and stripped in with Firestone 5" QuickSeam Flashing.
Corners	Flashed with QuickSeam T-joint cover and 9" QuickSeam Corner Flashing
Roof Edges	Firestone Platinum AnchorGard complete system, Firestone Coping or Firestone Drain Bar or other details as required.
Penetrations	As shown in the Firestone Platinum details. Firestone QS6 or QS10 Penetration Pockets may be used where a penetration pocket is required, with the flange stripped in using 9" QuickSeam Formflash or QuickSeam Pipe Flashing or Conduit Flashing.
Walkways	Constructed using QuickSeam Walkway Pads, Pavers with sacrificial membrane layer or Red Shield Walkways.
Equipment and Pipe supports	Use Firestone Red Shield Pipe Support systems

C. PENETRATIONS (PIPES, CONDUITS, ETC.)

1. Pipe Flashings:

a) Refer to the Platinum Flashing Details.

b) All round rigid pipe penetrations ranging in size from 1" (25.4 mm) outside diameter to 6 1/2" (165.1 mm) outside diameter must be flashed with Firestone QuickSeam Pipe Flashing.

c) All round rigid conduits from 1/2" (12.7 mm) to 2 1/2" (63.5 mm) outside diameter must be flashed with Firestone QuickSeam Conduit Flashing.

d) The flange of the pipe boot or conduit flashing must be flashed with an additional layer of 5" QuickSeam Flashing or 9" QuickSeam FormFlash. Refer to the Platinum roof system details.

e) If pre-molded boots will not work refer to Penetration Pockets in "**D**" Penetration Pockets below.

f) If it is not possible to fit a pre-molded pipe flashing or conduit flashing onto the penetration due to site conditions, the penetration must be covered with a field-fabricated flashing in accordance with Platinum Flashing Details.

g) Under no circumstance can a Firestone QuickSeam Pipe Flashing or Firestone QuickSeam Conduit Flashing be cut and patched to accommodate a penetration.

h) Pre-molded and field-fabricated flashings must not be installed around flexible pipes or conduits. Non-rigid penetrations require the installation of a Firestone QuickSeam Penetration Pocket and storm hood per Platinum Flashing Details.

i) Rigid pipe penetrations with an outside diameter greater than 8" (203.2 mm) must be covered with a field-fabricated flashing in accordance with Platinum Flashing Details.

D. PENETRATION POCKETS:

1. Refer to the Platinum Flashing Details

2. The following types of penetrations require the installation of a Firestone QuickSeam Penetration Pocket and storm hood:

- Rigid pipes with an outside diameter less than 1" (25.4 mm).
- Clusters of pipes.
- Unusual shapes, e.g. structural beams, channels or angles.

3. A minimum clearance of 1" (25.4 mm) between penetrations, pipes, conduits, etc., and on all sides of the penetration pocket, is required to assure adequate space for the application of Firestone Pourable Sealer around each penetration.

4. Use Firestone QS 6 or QS 10 Penetration Pockets for penetrations of up to 4” (101.6mm) and 8” (203.2mm) respectively. These may be split to go around penetrations.

5. Should the penetration exceed 8” (203.2 mm), it must be flashed with a shop fabricated penetration pocket, in accordance with Firestone Platinum Details.

6. Install storm hoods over each penetration pocket to protect the Pourable Sealer.

7. Flexible penetration (electrical and braided cable, etc.) must be installed in a pipe, sheet metal gooseneck or rigid housing with side discharge.

E. CURBS AND TERMINATIONS:

1. Refer to the Platinum Flashing Details.

2. Curb flashings must be completed using Firestone QuickSeam Reinforced Perimeter Fastening (RPF) Strip as the base tie-in. For curbs where this is not practical, the membrane may be attached to the vertical surface using a Firestone metal or polymer batten strip and the appropriate Firestone Fastener.

3. The curb must be flashed and stripped in using one of the following membrane materials:

- Firestone QuickSeam 18” Curb Flashing
- Firestone QuickSeam SA Flashing
- RubberGard .060" (1.5 mm) membrane
- Platinum .090” (2.2 mm) membrane

4. The flashing RubberGard or Platinum membrane must be spliced to the field sheet using 3” QuickSeam Splice Tape followed by the application of 5" QuickSeam flashing over the completed splice.

5. Provide a minimum design height of at least 8" (203.2 mm) for all flashing termination's (except penetration pockets and Pre-Molded EPDM Pipe Flashings). Flashing height must be at least as high as the potential water level that could be reached as a result of a deluging rain. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.

6. Terminations must be made directly to a sound, watertight, rigid, vertical substrate. Existing loose flashing materials must be removed, or overlaid with 5/8” exterior grade plywood. Termination bars are not acceptable directly to gypsum or wooden substrates.

7. When using a surface-mounted termination, (i.e., termination bar, surface-mounted counterflashing) ensure a consistent seal at the wall interface. The surface above the termination must be waterproof.

8. Gypsum board, used as a substrate for flashings, must be moisture resistant exterior grade with laminated fiberglass facers and recommended for this application by the gypsum board manufacturer. Base tie-ins must be made into the deck because gypsum does not provide the required minimum fastener pullout resistance of 200 lbf (0.9 kN).

9. Stucco, cobblestone, textured masonry, corrugated metal panes or any uneven surface is not a suitable substrate to receive flashing. Such surfaces must be prepared to provide an acceptable substrate by attaching minimum 5/8” (15.8 mm) exterior grade or pressure treated plywood. Attach as required for structural integrity.

10. Intermediate attachment of the flashing membrane is required at 36" (914 mm) intervals in accordance with Firestone Detail PT-13 or PT-14, **except when:**

(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 membrane has been installed underneath a coping over to the outside edge of the wall to a point below the nailer wall interface

OR

(3) The membrane has been installed underneath a stone or masonry coping to the outside edge of the wall.

F. SHEET METAL WORK:

1. Firestone: Coping, AnchorGard Fascia, Drain bars and counterflashings etc., must be supplied as complete systems for Platinum roofs. If Firestone is not able to supply a given sheet metal product or design, it must be installed per current Firestone details but will not be included as part of the warranty.

2. All sheet metal work not supplied by Firestone should have a quality weather resistant coating such as Kynar or similar finish, or be fabricated from anodized aluminum, copper or stainless steel that will not corrode or weather to the point of failure, during the 30 year warranty period.

3. Make these specifications available to the sheet metal fabricator/contractor.

4. Attachment

a) Counterflashings, copings, and other perimeter or penetration metal work must be properly fastened and sealed by the roofing contractor or others in accordance with Firestone instructions and details.

b) All sheet metal not supplied by Firestone should be fabricated and installed in accordance with the most stringent requirements of the furnished instructions and or recommendations of:

- Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)
- National Roofing Contractors Association (NRCA)
- ANSI/SPRI ES-1
- Factory Mutual (FM) I-49

Some specific roofing details in Firestone's Technical Specifications may exceed SMACNA recommendations. For such details, the Firestone requirements must be used.

Refer to ANSI/SPRI ES-1 for information on wind design information for metal edge treatments.

Extended wind speed warranties require enhanced edge details. Contact Firestone Roof System Solutions Group at Firestone for specific information.

5. Metal work not in conformance with Firestone specifications and details or which compromises the integrity of the Platinum system may jeopardize issuance of the warranty for the entire project. Firestone does not warrant the performance of products Firestone does not supply**.**

1.11 WALKWAYS

A. ACCEPTABLE WALKWAY MATERIALS:

a) QuickSeam Walkway Pads.

b) Firestone Pavers with underlayment/sacrificial membrane layer.

c) Red Shield support system walkways

B. General

1. Walkways help protect the membrane from damage due to necessary rooftop service traffic. The building owner is responsible for maintaining the walkways in specific areas.

2. Protective walkways must be installed at the following locations:

a) At all access points (ladders, hatches, doorways, etc.) to the roof.

b) As a walkway system on roofs subjected to traffic more frequently than once per month

c) If protection of the insulation system is required, additional measures must be specified (i.e., concrete pavers, pre-fabricated walkways).

d) Around all serviceable rooftop units.

C. Contact Firestone Roof System Solutions Group regarding other materials designated as a walking surface.

1.12 ROOF COATINGS

A. Firestone AcryliTop PC-100 Coating (OPTIONAL):

1. AcryliTop PC-100 Coating may be applied to further protect the Firestone Platinum Membrane or flashing surfaces from the effects of weathering or for aesthetic reasons. Like most coatings, the service life of the AcryliTop PC-100 Coating is uncertain; therefore, it is considered a maintenance item. The building owner should be advised that during the roof membrane service life, periodic re-application of the coating might be required to maintain its aesthetic value.

2. Firestone offers the following warranties for the Firestone AcryliTop PC-100. See Section 1.13 Warranty for further information.

a) White AcryliTop PC-100 Reflectance warranty,

b) AcryliTop PC-100 Coating Limited warranty.

3. While the maintenance of field-applied coatings is not required to keep the Firestone warranty in full force, Firestone recommends that coatings be adequately maintained. However, periodic maintenance and recoating may be required to maintain the Underwriters Laboratories, Factory Mutual or other ratings.

4. If the AcryliTop PC-100 Coating is to be applied to the Firestone Platinum membrane, the inspection and necessary repairs must be completed and accepted by Firestone before application of the coating.

5. Re-application of AcryliTop PC-100 should be performed by a Firestone Licensed Applicator according to Firestone application specifications.

6. Proper preparation of the roof surface is important to assure the best possible adhesion of the roof coating. Refer to the Technical Information Sheet and Material Safety Data Sheets for Firestone Membrane PreWash, AcryliTop PC-100, and AcryliTop PC-100 Base Coat for additional information on application, storage and safety.

1.13 WARRANTY

A. Where a Firestone Platinum Warranty is required:

- The roof must be installed according to the current Firestone requirements appropriate to the project conditions and design requirements as submitted, reviewed (noted/revised) and accepted on the Firestone Pre-Installation Notice (P.I.N.) two weeks prior to job start.
- The Firestone roof system must be installed by a current Firestone Red Shield licensed applicator.
- The Firestone roof system must be inspected and accepted by a Firestone Technical Representative.

B. Upon Firestone's inspection and acceptance of the installed roof system, the requested warranty can be issued. Firestone's inspection is not intended as an inspection for benefit of the owner or design professional with respect to contract, building codes or compliance with specifications other than Firestone's. Warranted Firestone roof systems are to be installed only on commercial, industrial, institutional or multi-family commercial housing buildings in the United States and Canada.

C. Projects outside the US must be submitted to the appropriate Firestone International Office for consideration prior to specifying or bidding. The issuance of a warranty is dependant on this process.

D. Only Firestone-supplied components are eligible to be covered as part of the Firestone warranty.

E. It is the owner's responsibility to expose the membrane in the event that warranty service is required when access is impaired. Such impairment includes, but is not limited to:

- Design features, such as window washer systems, which require the installation of traffic surface units in excess of 80 lb (36.3 kg) per unit.
- Any equipment, ornamentation, building service units and other roof top surfacing materials that are not defined as part of the membrane assembly.
- Rooftop equipment that does not provide Firestone with reasonable access to the membrane.
- Severely ponded water, snow, ice, and other unrelated roofing system materials.

F. LIMITS

1. Firestone Platinum EPDM roof system tie-ins to existing roof systems are not warranted by Firestone
2. Failure of a flashing terminated to an intermediate element (e.g., metal flashing, insulation, surface treatment, etc.), which itself could fail and admit moisture beneath the membrane is beyond the limits of the Firestone Platinum warranty.

G. CONDITIONS:

1. Certain situations may arise where Firestone specifications cannot be applied. It may not be possible for Firestone to issue the desired warranty unless a written request for approval, Pre-Installation Notice (P.I.N.), has been received, reviewed, and accepted by the Firestone Roof System Solutions Group prior to the application of the proposed system.
2. Firestone roof systems cannot receive a Firestone Platinum warranty if any of the following conditions exist:
   - The existing roof system remains in place. A complete removal of the existing roof system is required.
   - Roofs where structural conditions are insufficient to support the load of the completed roof installation and other anticipated loads as identified by the building owner or the design professional.
   - Non-roofing applications such as plaza deck construction, waterproofing, pond liners, etc.
   - Roofing applications for single-family residences.
3. Firestone All Purpose (AP's) fasteners are not acceptable for use with Platinum warranted systems

TABLE 1.13-1
FIRESTONE WARRANTY SUMMARY

WARRANTY NAME	SPECIFICATION	ELIGIBLE CONTRACTOR	COVERAGE
Platinum PHW **P**uncture **H**ail and **W**ind	Firestone 90 mil Platinum membrane, fully adhered to HailGard insulation	Red Shield	Repair leaks in the roof system caused by Firestone-supplied materials or the workmanship used to install them plus damage by puncture, hail, or winds up to 100 mph. No dollar limit to Firestone expenditures to honor the warranty. Warranty term: 30-years
Platinum PW **P**uncture and **W**ind	Firestone 90 mil Platinum membrane, fully adhered to HailGard insulation	Red Shield	Repair leaks in the roof system caused by Firestone-supplied materials or the workmanship used to install them plus damage by puncture or winds up to 100 mph. No dollar limit to Firestone expenditures to honor the warranty. Warranty term: 30-years
Platinum PH **P**uncture and **H**ail	Firestone 90 mil Platinum membrane, fully adhered to Dens-Deck, installed over ISO 95+ insulation	Red Shield	Repair leaks in the roof system caused by Firestone-supplied materials or the workmanship used to install them plus damage by puncture or hail. No dollar limit to Firestone expenditures to honor the warranty. Warranty term: 30-years
Platinum P **P**uncture	Firestone 90 mil Platinum membrane, fully adhered to ISO 95+ insulation, or fully adhered to ISOGARD HD installed over ISO 95+ insulation,	Red Shield	Repair leaks in the roof system caused by Firestone-supplied materials or the workmanship used to install them plus damage by puncture. No dollar limit to Firestone expenditures to honor the warranty. Warranty term: 30-years
Platinum B **B**asic	Firestone 90 mil Platinum membrane, fully adhered to ISO 95+ insulation	Red Shield	Repair leaks in the roof system caused by Firestone-supplied materials or the workmanship used to install them. No dollar limit to Firestone expenditures to honor the warranty. Warranty term: 30-years
White AcryliTop PC-100 Reflectance Warranty	Firestone 90 mil Platinum EPDM, specifications for the term of 5 Year from date of installation	Red Shield	Provide the owner with replacement AcryliTop PC-100 Coating to repair the affected area should the reflectance rating fall below .50
AcryliTop PC-100 Coating Limited Warranty	Firestone 90 mil Platinum EPDM or Thermoplastic specifications for the term requested	Red Shield	Provide the owner with replacement AcryliTop PC-100 Coating to repair the area should the coating come loose. Warranty term: Up to 10-years
This chart is only a summary of the general warranty coverage. Please review each warranty for exact language.			

END OF SECTION