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EVALUATION REPORT

GAF

1Campus Drive
Parsippany, NJ 07054
(800) 766-3411

Evaluation Report 01506.04.08-R16

FL10626-R16

Date of Issuance: 04/25/2008

Revision 16: 10/17/2019

SCOPE:

This Evaluation Report is issued under **Rule 61G20-3** and the applicable rules and regulations governing the use of construction materials in the State of Florida. The documentation submitted has been reviewed by Robert Nieminen, P.E. for use of the product under the Florida Building Code and Florida Building Code, Residential Volume. The products described herein have been evaluated for compliance with the **6th Edition (2017) Florida Building Code** sections noted herein.

DESCRIPTION: GAF Roof Underlayments

LABELING: Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein.

CONTINUED COMPLIANCE: This Evaluation Report is valid until the named product(s) changes, the referenced Quality Assurance documentation changes, or provisions of the Code that relate to the product change. Acceptance of this Evaluation Report by the named client constitutes agreement to notify Robert Nieminen, P.E. of any changes to the product(s), the Quality Assurance or the production facility location(s). NEMO|etc. requires a complete review of this Evaluation Report relative to updated Code requirements with each Code Cycle.

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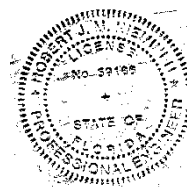
INSPECTION: Upon request, a copy of this entire Evaluation Report shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This Evaluation Report consists of pages 1 through 11.

Prepared by:

Robert J.M. Nieminen, P.E.

Florida Registration No. 59166, Florida DCA ANE1983



The facsimile seal appearing was authorized by Robert Nieminen, P.E. on 10/17/2019. This does not serve as an electronically signed document.

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4. Robert Nieminen, P.E. does not have, nor will acquire, a financial interest in any other entity involved in the approval process of the product.
5. This is a building code evaluation. Neither NEMO|etc. nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.

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ROOFING COMPONENT EVALUATION:
1. SCOPE:

Product Category: Roofing

Sub-Category: Underlayment

Compliance Statement: GAF Roof Underlayments, as produced by GAF, have demonstrated compliance with the following sections of the Florida Building Code through testing in accordance with the following Standards. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

2. STANDARDS:

<u>Section</u>	<u>Property</u>	<u>Standard</u>	<u>Year</u>
1504.3.1	Wind Uplift	FM 4474	2011
1507.1.1, R905.1.1 Exception	Unrolling, Breaking Strength, Pliability	ASTM D226	2009
1507.1.1, R905.1.1 Exception	Tear Strength	ASTM D4533	2015
1507.2.3 / 1507.1.1	Physical Properties	ASTM D6757	2016
1507.2.4 / 1507.1.1, 1507.2.9.2	Physical Properties	ASTM D1970	2015
1507.3.3, R905.3.3	Physical properties	FRSA/TRI April 2012 (04-12)	2012
1507.11.2	Physical Properties	ASTM D6164	2011

3. REFERENCES:

<u>Entity</u>	<u>Examination</u>	<u>Reference</u>	<u>Date</u>
ERD (TST 6049)	Physical Properties	R3360.02.07-2-R1	03/13/2007
ERD (TST 6049)	Physical Properties	G12110.12.08	12/02/2008
ERD (TST 6049)	FRSA/TRI April 2012 (Slippage)	G34150.08.11	11/14/2011
ERD (TST 6049)	ASTM D6164	G40630.01.14-2B	01/07/2014
ERD (TST 6049)	ASTM D6164	G46160.09.14-3A	09/09/2014
ERD (TST 6049)	ASTM D1970	GAF-SC13285.03.17-3	03/01/2017
ERD (TST 6049)	ASTM D1970	GAF-SC13285.03.17-4	03/01/2017
PRI (TST 5878)	Physical properties	BRY-003-02-01	03/19/2002
PRI (TST 5878)	ASTM D1970	GAF-026-02-01	03/26/2002
PRI (TST 5878)	ASTM D1970	GAF-027-02-01	03/26/2002
PRI (TST 5878)	Physical properties	GAF-042-02-01	06/03/2005
PRI (TST 5878)	Physical properties	GAF-224-02-01	07/27/2009
PRI (TST 5878)	ASTM D1970	GAF-238-02-01	03/03/2010
PRI (TST 5878)	ASTM D1970	GAF-275-02-01	11/11/2010
PRI (TST 5878)	Physical properties	GAF-349-02-01	07/03/2012
PRI (TST 5878)	Wind Uplift	GAF-434-02-01	09/16/2013
PRI (TST 5878)	Wind Uplift	GAF-434-02-03	09/16/2013
PRI (TST 5878)	Wind Uplift	GAF-434-02-04	09/16/2013
PRI (TST 5878)	FBC 1507.1.1 (Exception)	GAF-818-02-01	12/05/2017
PRI (TST 5878)	FBC 1507.1.1 (Exception)	GAF-826-02-01	06/04/2018
PRI (TST 5878)	FBC 1507.1.1 (Exception)	GAF-847-02-01	06/04/2018
PRI (TST 5878)	FBC 1507.1.1 (Exception)	GAF-914-02-01	04/10/2019
PRI (TST 5878)	FBC 1507.1.1 (Exception)	376T0012	07/15/2019
PRI (TST 5878)	FBC 1507.1.1 (Exception)	376T0018 x 2	07/31/2019
UL (TST 1740)	Physical properties	02NK22569	06/04/2002
UL (TST 1740)	ASTM D6757	10NK11990	05/18/2011
Miami-Dade (CER 1592)	HVHZ compliance	16-1216.02	02/02/2017
Miami-Dade (CER 1592)	HVHZ compliance	18-0119.15	02/22/2018
ICC-ES (EVL2396)	IBC/IRC compliance	ESR-2053	07/01/2017
ICC-ES (EVL2396)	IBC/IRC compliance	ESR-2808	07/01/2017
ICC-ES (EVL2396)	IBC/IRC compliance	ESR-1322	01/01/2018
ICC-ES (EVL2396)	IBC/IRC compliance	ESR-3286	02/01/2018
UL, LLC (QUA 9625)	Quality Control	Service Confirmation	12/17/2018

4. PRODUCT DESCRIPTION:				
	Product	Specification	Plant(s)	Description
4.1	Liberty™ SBS Self-Adhering Base/Ply Sheet	ASTM D1970	Mt. Vernon, IN	smooth-surfaced, fiberglass-reinforced, self-adhering SBS modified bitumen roof underlayment
4.2	StormGuard® Film Surfaced Leak Barrier	ASTM D1970	Mt. Vernon, IN Savannah, GA	film-surfaced, fiberglass-reinforced, self-adhering SBS modified bitumen roof underlayment; also used as a secondary water barrier to seal roof decks
4.3	WeatherWatch® Mineral Surfaced Leak Barrier	ASTM D1970	Mt. Vernon, IN Savannah, GA	mineral-surfaced, fiberglass-reinforced, self-adhering SBS modified bitumen roof underlayment; also used as a secondary water barrier to seal roof decks
4.4	Deck-Armor™ Premium Breathable Roof Deck Protection	FBC 1507.1.1 & R905.1.1 (Exception)	North Bay, ON Dadra, India	non-woven, spun-bonded polypropylene laminated polyethylene scrim sheet roof underlayment
4.5	FeltBuster® High-Traction Synthetic Roofing Felt	FBC 1507.1.1 & R905.1.1 (Exception)	Richmond, VA	non-asphaltic, polypropylene roofing underlayment
4.6	Shingle-Mate® Roof Deck Protection	FBC 1507.1.1 & R905.1.1 (Exception)	Pryor, OK	fiberglass reinforced, asphaltic roof underlayment
4.7	StormSafe™ Anchor Sheet	FBC 1507.1.1 & R905.1.1 (Exception)	North Bay, ON	polypropylene woven fabric which serves as an anchor sheet in two-ply roof underlayment systems
4.8	Tiger Paw™ Roof Deck Protection	FBC 1507.1.1 & R905.1.1 (Exception)	Dadra, India North Bay, ON Parzai, India Umerkui Kilvani, India	non-woven, polypropylene reinforced, polymer coated roof underlayment
4.9	RoofPro™ SBS-Modified All-Purpose Underlayment	AC165	Fontana, CA	fiberglass-reinforced, SBS modified bitumen roof underlayment
4.10	VersaShield® Fire-Resistant Roof Deck Protection	ASTM D6757 (physicals)	Conover, NC	non-asphaltic, fiberglass-based roof underlayment and/or fire barrier
4.11	Ruberoid® Mop Granule	ASTM D6164	Savannah, GA	granule-surfaced, polyester-reinforced, asphalt-applied SBS modified bitumen roof underlayment
4.12	Ruberoid® Mop Granule FR	ASTM D6164	Savannah, GA	granule-surfaced, polyester-reinforced, asphalt-applied SBS modified bitumen roof underlayment

5. LIMITATIONS:

- 5.1 This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
- 5.2 This Evaluation Report is not for use in FBC HVHZ jurisdictions.
- 5.3 Fire Classification is not part of this Evaluation Report; refer to current Approved Roofing Materials Directory or test report from accredited testing agency for fire ratings of this product.
- 5.4 GAF Roof Underlayments may be used with any prepared roof cover where the product is specifically referenced within FBC approval documents. If not listed, a request may be made to the Authority Having Jurisdiction for approval based on this evaluation combined with supporting data for the prepared roof covering.

5.5 Allowable Roof Covers:

TABLE 1: ROOF COVER OPTIONS						
Underlayment	Asphalt Shingles	Nail-On Tile	Foam-On Tile	Metal	Wood Shakes & Shingles	Slate or Simulated Slate
Liberty™ SBS Self-Adhering Base/Ply Sheet	Yes	No	No	No	No	No
StormGuard® Film Surfaced Leak Barrier	Yes	No	No	Yes	No	No
WeatherWatch® Mineral Surfaced Leak Barrier	Yes	No	No	No	No	No
Deck-Armor™ Premium Breathable Roof Deck Protection	Yes	No	No	Contact GAF	Contact GAF	Contact GAF
FeltBuster® High-Traction Synthetic Roofing Felt	Yes	No	No	No	No	No
Shingle-Mate® Roof Deck Protection	Yes	No	No	No	No	No
Tiger Paw™ Roof Deck Protection	Yes	No	No	Contact GAF	Contact GAF	Contact GAF
RoofPro™ SBS-Modified All-Purpose Underlayment	Yes	No	No	No	Yes	Yes
VersaShield® Fire-Resistant Roof Deck Protection	Yes	No	No	No	No	No
Ruberoid® Mop Granule	Yes	Yes	Yes See 5.5.1	No	Yes	Yes
Ruberoid® Mop Granule FR	Yes	Yes	Yes See 5.5.1	No	Yes	Yes

- 5.5.1 "Foam-On Tile" is limited to use of the following Approved tile adhesives / underlayment combinations.

TABLE 1A: ALLOWABLE TILE ADHESIVE / UNDERLAYMENT COMBINATIONS ¹		
Adhesive	Florida Product Approval	Underlayments
DuPont TileBond™	FL22525	Ruberoid® Mop Granule; Ruberoid® Mop Granule FR

¹ Refer to Tile Manufacturer's or Adhesive Manufacturer's Florida Product Approval for Overturning Moment Resistance Performance.

5.6 Allowable Substrates:

TABLE 2: SUBSTRATE OPTIONS FOR ADHERED UNDERLAYMENTS			
Underlayment	Application	Primer	Substrates
Liberty™ SBS Self-Adhering Base/Ply Sheet	self-adhering	(Optional) ASTM D41	plywood
StormGuard® Film Surfaced Leak Barrier			
Weather Watch® Mineral Surfaced Leak Barrier			
Liberty™ SBS Self-Adhering Base/Ply Sheet	self-adhering	None	ASTM D226 felt
StormGuard® Film Surfaced Leak Barrier			
Weather Watch® Mineral Surfaced Leak Barrier			
Liberty™ SBS Self-Adhering Base/Ply Sheet	self-adhering	ASTM D41	metal (flashing metal, valley metal, etc.)
StormGuard® Film Surfaced Leak Barrier			
Weather Watch® Mineral Surfaced Leak Barrier			
Ruberoid® Mop Granule	hot asphalt	ASTM D41	structural concrete
Ruberoid® Mop Granule FR			
Ruberoid® Mop Granule	hot asphalt	None	GAFGlas® #80 Ultima™ Base Sheet or Ruberoid® 20 Smooth
Ruberoid® Mop Granule FR			

5.6.1 Wind Resistance for Underlayment Systems in Foam-On Tile Applications:

The following wind uplift limitations apply to underlayment systems that are not prescriptively addressed in FRSA/TRI April 2012 (04-12) and are used in foam-on or mortar-set tile applications. Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads and reflects the ultimate passing pressure divided by 2 (the 2 to 1 margin of safety per FBC 1504.9 has already been applied). Refer to FRSA/TRI April 2012 (04-12), Appendix A, Table 1A or FBC 1609 for determination of design wind loads.

#1 Maximum Design Pressure = -45 psf.

Deck: Min. 19/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.

Base Sheet: GAFGlas® #80 Ultima™ Base Sheet or Ruberoid® 20 Smooth mechanically attached with 12 ga., min. 1.25-inch long ring shank nails through 32 ga., 1-5/8-inch diameter tin caps spaced 9-inch o.c. at the min. 4-inch wide side laps and 9-inch o.c. at two (2), equally spaced, staggered center rows in the field of the sheet.

Cap Sheet: Ruberoid® Mop Granule or Ruberoid® Mop Granule FR applied in full mopping of ASTM D312, Type IV hot asphalt at 20 to 25 lbs/square.

#2 Maximum Design Pressure = -75 psf.

Deck: Min. 19/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.

Base Sheet: GAFGlas® #80 Ultima™ Base Sheet or Ruberoid® 20 Smooth mechanically attached with 12 ga., min. 1.25-inch long ring shank nails through 32 ga., 1-5/8-inch diameter tin caps spaced 8-inch o.c. at the min. 4-inch wide side laps and 8-inch o.c. at three (3), equally spaced, staggered center rows in the field of the sheet.

Cap Sheet: Ruberoid® Mop Granule or Ruberoid® Mop Granule FR applied in full mopping of ASTM D312, Type IV hot asphalt at 20 to 25 lbs/square.

#3 Maximum Design Pressure = -97.5 psf.

- Deck:** Min. 19/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.
- Base Sheet:** GAFGLAS® #80 Ultima™ Base Sheet or Ruberoid® 20 Smooth mechanically attached with 11 ga., min. 1.25-inch long ring shank nails through 32 ga., 1-5/8-inch diameter tin caps spaced 4-inch o.c. at the min. 2-inch wide side laps and 4-inch o.c. at four (4), equally spaced center rows in the field of the sheet.
- Cap Sheet:** Ruberoid® Mop Granule or Ruberoid® Mop Granule FR applied in full mopping of ASTM D312, Type IV hot asphalt at 20 to 25 lbs/square.

#4 Maximum Design Pressure = -442.5 psf.

- Deck:** Min. 2,500 psi structural concrete to meet project requirements to satisfaction of Authority Having Jurisdiction
- Base Sheet:** GAFGLAS #75 Base Sheet, Tri-Ply #75 Base Sheet, GAFGLAS #80 Ultima Base Sheet, GAFGLAS Ply 4, Tri-Ply Ply 4 or GAFGLAS Flex Ply 6 applied in full mopping of ASTM D312, Type IV hot asphalt at 20 to 25 lbs/square.
- Cap Sheet:** Ruberoid® Mop Granule or Ruberoid® Mop Granule FR applied in full mopping of ASTM D312, Type IV hot asphalt at 20 to 25 lbs/square.

5.6.1.1 For mechanically attached Base Sheet, the maximum design pressure for the selected assembly shall meet or exceed that required under FRSA/TRI April 2012 (04-12), Appendix A, Table 1A.

Alternatively, the maximum design pressure for the selected assembly shall meet or exceed the Zone 1 design pressure determined in accordance with FBC 1609. In this case, Zones 2 and 3 shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Commonly used methods are ANSI/SPRI WD1, FM Loss Prevention Data Sheet 1-29 and Roofing Application Standard RAS 117. Assemblies marked with an asterisk* carry the limitations set forth in Section 2.2.10.1 of FM Loss Prevention Data Sheet 1-29 (January 2016) for Zone 2/3 enhancements.

5.7 Exposure Limitations:

TABLE 3: EXPOSURE LIMITATIONS	
Underlayment	Maximum Exposure (days)
Deck-Armor™ Premium Breathable Roof Deck Protection, FeltBuster® High-Traction Synthetic Roofing Felt, Shingle-Mate® Roof Deck Protection, StormSafe™ Anchor Sheet, Tiger Paw™ Roof Deck Protection, RoofPro™ SBS-Modified All-Purpose Underlayment, Liberty™ SBS Self-Adhering Base/Ply Sheet, StormGuard® Film Surfaced Leak Barrier and WeatherWatch® Mineral Surfaced Leak Barrier	30
VersaShield® Fire-Resistant Roof Deck Protection, Ruberoid® Mop Granule and Ruberoid® Mop Granule FR	180

5.8 Tile Slippage Limitations (TAS 103 per FRSA/TRI April 2012 (04-12)):

When loading roof tiles on the underlayment in direct-deck tile assemblies, the maximum roof slope shall be as follows. These slope limitations can only be exceeded by using battens during loading of the roof tiles.

TABLE 4: TILE SLIPPAGE LIMITATIONS FOR DIRECT-DECK TILE INSTALLATIONS			
Underlayment	Tile Profile	Staging Method	Maximum Slope
Ruberoid® Mop Granule	Flat	Max. 10-tile stack	4:12
	Flat	Max. 6-tile stack (4 over 2)	5:12
	Lugged	Max. 10-tile stack	5:12
Ruberoid® Mop Granule FR	Flat or Lugged	Max. 6-tile stack (4 over 2)	5:12
	Lugged	Max. 10-tile stack	4:12

6. INSTALLATION:

- 6.1 **GAF Roof Underlayments** shall be installed in accordance with **GAF** published installation instructions subject to the Limitations set forth in Section 5 herein and the specifics noted below.
- 6.2 Re-fasten any loose decking panels, and check for protruding nail heads. Sweep the substrate thoroughly to remove any dust and debris prior to application and prime the substrate (if applicable).
- 6.3 Install self-adhering underlayments when ambient temperatures are minimum 45°F and rising.
- 6.4 All metal surfaces shall be primed with **Matrix™ 307 Premium Asphalt Primer** or alternate **GAF** accepted **ASTM D41** primer prior to application of self-adhering membranes.

6.5 **Deck-Armor™ Premium Breathable Roof Deck Protection:**

- 6.5.1 Shall be installed in compliance with the requirements for ASTM D226, Type I or II underlayment in **FBC Table 1507.1.1 or R905.1.1** for the type of prepared roof covering to be installed, considering the wider sheet-width for double-layer applications.

6.5.2 **Fasteners:**

Minimum fasteners shall be 1-inch diameter plastic-capped corrosion resistant nails or 1-inch diameter plastic-capped, corrosion resistant staples, unless restricted by Code.

Code Reference: The Exception statement in FBC 1507.1.1 and FBC R905.1.1 states: “...except metal cap nails shall be required where the ultimate design wind speed, V_{ault} , equals or exceeds 150 mph.”

6.5.3 **Slopes of 4:12 or greater:**

End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 4-inches. End (vertical) laps shall be offset from course to course not less than 6 feet.

Minimum attachment shall be in accordance with FBC Table 1507.1.1 or R905.1.1. Secure end laps 6-inch o.c. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.

6.5.4 **Slopes of 2:12 to less than 4:12:**

End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 28.5-inches (for 54-inch wide rolls) or minimum 25.5-inches (for 48-inch wide rolls). End (vertical) laps shall be offset from course to course not less than 6 feet.

Begin by fastening a full-width along the eaves or install full-width leak barrier. Place a full-width sheet over the starter, completely overlapping the starter course. Continue upslope, maintaining minimum 28.5-inch side laps (for 54-inch wide rolls) or minimum 25.5-inch side laps (for 48-inch wide rolls), resulting in a double-layer application.

Minimum attachment shall be in accordance with FBC Table 1507.1.1 or R905.1.1. Secure end laps 6-inch o.c. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.

- 6.5.3 Optional, or if required by the Authority Having Jurisdiction: Install a leak barrier of Liberty™ SBS Self-Adhering Base/Ply Sheet; StormGuard® Film Surfaced Leak Barrier or WeatherWatch® Mineral Surfaced Leak Barrier at vulnerable leak areas, including but not limited to eaves, valleys, rakes, skylights and dormers. At eaves and valleys, install the leak barrier prior to installation of the underlayment. Along the rake, install the underlayment, leaving 6 to 8-inch of the deck exposed, and then install the leak barrier over the underlayment and exposed decking. At other areas, install the leak barrier over the underlayment.

- 6.6 FeltBuster® High-Traction Synthetic Roofing Felt or Tiger Paw™ Roof Deck Protection:**
- 6.6.1 Shall be installed in compliance with the requirements for ASTM D226, Type I or II underlayment in **FBC Table 1507.1.1 or R905.1.1** for the type of prepared roof covering to be installed, considering the wider sheet-width for double-layer applications.
- 6.6.2 **Fasteners:**
Minimum fasteners shall be 1-inch diameter plastic-capped corrosion resistant nails or 1-inch diameter plastic-capped, corrosion resistant staples, unless restricted by Code.
Code Reference: The Exception statement in FBC 1507.1.1 and FBC R905.1.1 states: “...except metal cap nails shall be required where the ultimate design wind speed, V_{ult} , equals or exceeds 150 mph.”
- 6.6.3 **Slopes of 4:12 or greater:**
End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 4-inches. End (vertical) laps shall be offset from course to course not less than 6 feet.
Minimum attachment shall be in accordance with FBC Table 1507.1.1 or R905.1.1. Secure end laps 6-inch o.c. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.
- 6.6.4 **Slopes of 2:12 to less than 4:12:**
End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 25.5-inches. End (vertical) laps shall be offset from course to course not less than 6 feet.
Begin by fastening a full-width along the eaves or install full-width leak barrier. Place a full-width sheet over the starter, completely overlapping the starter course. Continue upslope, maintaining minimum 25.5-inch side laps, resulting in a double-layer application.
Minimum attachment shall be in accordance with FBC Table 1507.1.1 or R905.1.1. Secure end laps 6-inch o.c. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.
- 6.6.5 Optional, or if required by the Authority Having Jurisdiction: Install a leak barrier of Liberty™ SBS Self-Adhering Base/Ply Sheet; StormGuard® Film Surfaced Leak Barrier or WeatherWatch® Mineral Surfaced Leak Barrier at vulnerable leak areas, including but not limited to eaves, valleys, rakes, skylights and dormers. At eaves and valleys, install the leak barrier prior to installation of the underlayment. Along the rake, install the underlayment, leaving 6 to 8-inch of the deck exposed, and then install the leak barrier over the underlayment and exposed decking. At other areas, install the leak barrier over the underlayment.
- 6.7 StormSafe™ Anchor Sheet:**
- 6.7.1 StormSafe™ Anchor Sheet is limited to use as a mechanically attached base layer in 2-ply underlayment systems.
- 6.7.2 **Fasteners:**
Minimum fasteners shall be 1-inch diameter plastic- or steel-capped corrosion resistant nails; corrosion-resistant nails & 1-5/8-inch tin-caps; or Drill-Tec screws and plates, unless restricted by Code.
Code Reference: The Exception statement in FBC 1507.1.1 and FBC R905.1.1 states: “...except metal cap nails shall be required where the ultimate design wind speed, V_{ult} , equals or exceeds 150 mph.”
- 6.7.3 Starting at the eave, fasten the eave edge and 6-inch wide end-laps 6-inch o.c. Fasten in the field of the roll 12-inch o.c. in two, equally spaced, staggered center rows.
Continue upslope in a similar manner, maintaining minimum 3-inch side-laps and minimum 6-inch end-laps. Fasten 6-inch o.c. in the laps and 12-inch o.c. in two, equally spaced, staggered center rows in the field. Ensure all end laps are staggered at least 3-feet apart.
One the same day, install Liberty™ SBS Self-Adhering Base/Ply; StormGuard® Film Surfaced Leak Barrier or WeatherWatch® Mineral Surfaced Leak Barrier over the StormSafe™ Anchor Sheet.

- 6.8 RoofPro™ SBS-Modified All-Purpose Underlayment and Shingle-Mate® Roof Deck Protection:**
- 6.8.1 Shall be installed in compliance with the requirements for ASTM D226, Type I or II underlayment in **FBC Table 1507.1.1 or R905.1.1** for the type of prepared roof covering to be installed.
- 6.8.2 **Fasteners:**
As required in **FBC Table 1507.1.1 or R905.1.1** for the type of prepared roof covering to be installed. No hammer tacks or staples are permitted.
Code Reference: The Exception statement in FBC 1507.1.1 and FBC R905.1.1 states: “...except metal cap nails shall be required where the ultimate design wind speed, V_{ult} , equals or exceeds 150 mph.”
- 6.8.3 Optional, or if required by the Authority Having Jurisdiction: Install a leak barrier of Liberty™ SBS Self-Adhering Base/Ply Sheet; StormGuard® Film Surfaced Leak Barrier or WeatherWatch® Mineral Surfaced Leak Barrier at vulnerable leak areas, including but not limited to eaves, valleys, rakes, skylights and dormers. At eaves and valleys, install the leak barrier prior to installation of the underlayment. Along the rake, install the underlayment, leaving 6 to 8-inch of the deck exposed, and then install the leak barrier over the underlayment and exposed decking. At other areas, install the leak barrier over the underlayment.
- 6.9 VersaShield® Fire-Resistant Roof Deck Protection:**
- 6.9.1 Shall be installed in compliance with the codified requirements for **ASTM D6757** underlayment in **FBC Table 1507.1.1** for the type of prepared roof covering to be installed.
- 6.9.2 **Fasteners:**
Minimum fasteners shall be 1-inch diameter plastic-capped or metal-capped corrosion resistant nails or 1-inch diameter plastic-capped, corrosion resistant staples, unless restricted by Code.
Code Reference: The Exception statement in FBC 1507.1.1 and FBC R905.1.1 states: “...except metal cap nails shall be required where the ultimate design wind speed, V_{ult} , equals or exceeds 150 mph.”
- 6.9.3 **Slopes of 4:12 or greater:**
End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 4-inches. End (vertical) laps shall be offset from course to course not less than 6 feet.
Minimum attachment shall be in accordance with FBC Table 1507.1.1 or R905.1.1. Secure end laps 6-inch o.c. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.
- 6.9.4 **Slopes of 2:12 to less than 4:12:**
End (vertical) laps shall be minimum 6-inches and side (horizontal) laps shall be minimum 22-inches. End (vertical) laps shall be offset from course to course not less than 6 feet.
Begin by fastening a half-width starter strip along the eaves or install full-width leak barrier. Place a full-width sheet over the starter, completely overlapping the starter course. Continue upslope, maintaining minimum 22-inch side laps, resulting in a double-layer application.
Minimum attachment shall be in accordance with FBC Table 1507.1.1 or R905.1.1. Secure end laps 6-inch o.c. When batten systems are to be installed atop the underlayment, the underlayment need only be preliminarily attached pending attachment of the battens.
- 6.9.5 Optional, or if required by the Authority Having Jurisdiction: Install a leak barrier of Liberty™ SBS Self-Adhering Base/Ply Sheet; StormGuard® Film Surfaced Leak Barrier or WeatherWatch® Mineral Surfaced at vulnerable leak areas, including but not limited to eaves, valleys, rakes, skylights and dormers. At eaves and valleys, install the leak barrier prior to installation of the underlayment. Along the rake, install the underlayment, leaving 6 to 8-inch of the deck exposed, and then install the leak barrier over the underlayment and exposed decking. At other areas, install the leak barrier over the underlayment.

6.10 Liberty™ SBS Self-Adhering Base/Ply Sheet:

- 6.10.1 Shall be installed in compliance with the codified requirements for **ASTM D1970** underlayment in **FBC Table 1507.1.1** for the type of prepared roof covering to be installed.
- 6.10.2 The minimum and maximum roof slopes are ½:12 and 6:12, respectively. Back-nailing is required when slope is 1:12 or greater. Back-nailing shall consist of minimum 1-inch square or round cap nails spaced 18" o.c. encapsulated within min. 3-inch side laps.
- 6.10.3 Non-Tile Applications:
 Shall be fully self-adhered to the substrates noted in **Section 5.6**. For direct-bond to deck applications plywood shall be primed with **Matrix™ 307 Premium Asphalt Primer** or alternate **GAF** accepted **ASTM D41** primer at ½ to ¾ gallon per square.
 Prior to removal of release film, align sheets properly starting at the low-point of the roof (eave) with the selvage edge upslope and for minimum 2-inch overhang at eaves and rakes. Roll out sheet and allow to 'relax' for min. 30 minutes. Remove the lower piece of release film and bond to substrate and fold the overhanging 2-inch over the eave and nail into place 12" o.c. Remove the top piece of release film and bond to substrate. Install primed drip edge and fasten to meet **FBC Chapter 16** wind load requirements. Install 1/8-inch troweling of **Matrix™ 201 Premium SBS Flashing Cement** over drip edge.
 Continue upslope in a similar manner, maintaining minimum 3-inch side-laps and minimum 6-inch end-laps. Ensure all end laps are staggered at least 18-inch apart.
 Use a weighted lawn or linoleum roller to ensure complete adhesion to the substrate. Use a hand roller to firmly bond side and end laps.

6.11 StormGuard® Film Surfaced Leak Barrier:

- 6.11.1 Shall be installed in compliance with the codified requirements for **ASTM D1970** underlayment in **FBC Table 1507.1.1** for the type of prepared roof covering to be installed.
- 6.11.2 Back-nailing is required. Back-nailing shall consist of minimum 1-inch square or round cap nails spaced 18" o.c. encapsulated within min. 3-inch side laps.
- 6.11.3 Non-Tile Applications:
 Shall be fully self-adhered to the substrates noted in **Section 5.6**. Prior to removal of release film, align sheets properly starting at the low-point of the roof (eave) with the selvage edge upslope and for minimum 2-inch overhang at eaves and rakes. Remove the lower piece of release film and bond to substrate and fold the overhanging 2-inch over the eave and nail into place 12" o.c. Remove the top piece of release film and bond to substrate. Install primed drip edge and fasten to meet **FBC Chapter 16** wind load requirements. Install 1/8-inch troweling of **Matrix™ 201 Premium SBS Flashing Cement** over drip edge.
 Continue upslope in a similar manner, maintaining minimum 3-inch side-laps and minimum 6-inch end-laps. Ensure all end laps are staggered at least 18-inch apart.
 Use a hand roller to firmly bond side and end laps.

6.12 WeatherWatch® Mineral Surfaced Leak Barrier:

- 6.12.1 Shall be installed in compliance with the codified requirements for **ASTM D1970** underlayment in **FBC Table 1507.1.1** for the type of prepared roof covering to be installed.
- 6.12.2 **WeatherWatch® Mineral Surfaced Leak Barrier** may be installed as a secondary water barrier using minimum 4-inch wide rolls to seal plywood deck joints prior to installation of the primary underlayment system.
- 6.12.3 Back-nailing is required. Back-nailing shall consist of minimum 1-inch square or round cap nails spaced 18" o.c. encapsulated within min. 4-inch side laps.

6.12.4 Non-Tile Applications:

Shall be fully self-adhered to the substrates noted in **Section 5.6**. Prior to removal of release film, align sheets properly starting at the low-point of the roof (eave) with the selvage edge upslope and for minimum 2-inch overhang at eaves and rakes. Remove the lower piece of release film and bond to substrate and fold the overhanging 2-inch over the eave and nail into place 12" o.c. Remove the top piece of release film and bond to substrate. Install primed drip edge and fasten to meet **FBC Chapter 16** wind load requirements. Install 1/8-inch troweling of **Matrix™ 201 Premium SBS Flashing Cement** over drip edge.

Continue upslope in a similar manner, maintaining minimum 3-inch side-laps and minimum 6-inch end-laps. Ensure all end laps are staggered at least 18-feet apart.

Use a hand roller to firmly bond side and end laps.

6.13 Ruberoid® Mop Granule; Ruberoid® Mop Granule FR:

6.13.1 **Ruberoid® Mop Granule or Ruberoid® Mop Granule FR** shall be installed in compliance with current **GAF** published installation requirements.

6.13.2 For use in tile applications, **Ruberoid® Mop Granule** or **Ruberoid® Mop Granule FR** are for use as an alternate to "Mineral Surface Roll Roofing" (ASTM D6380, Class M) in the "Single Ply System" from **FRSA/TRI April 2012 (04-12)** beneath mechanically fastened tile roof systems or the Hot Asphalt applied "Cap Sheet" in the "Two Ply System" from **FRSA/TRI April 2012 (04-12)** beneath mechanically fastened or adhered tile roof systems.

6.13.3 Fully adhere in **ASTM D312**, Type IV hot-asphalt to the substrates noted in **Section 5.6**. Side laps shall be minimum 4-inch and end-laps minimum 6-inch wide, and offset end-laps minimum 3-feet from course to course. Side and end-laps shall be fully adhered in a complete mopping of hot asphalt with asphalt extending approximately 3/8-inch beyond the lap edge.

6.13.4 Consult **GAF** instructions regarding back-nailing requirements.

6.14 Tile Staging (Ruberoid® Mop Granule; Ruberoid® Mop Granule FR):

6.14.1 Tile shall be loaded and staged in a manner that prevents tile slippage and/or damage to the underlayment. Refer to **Table 4** herein, and **GAF** published requirements for tile staging.

6.14.2 Battens and/or Counter-battens, as required by the tile manufacturer and **FRSA/TRI April 2012 (04-12)** must be used on all roof slopes greater than 7:12. Precautions should be taken as needed, such as the use of battens or nail-boards, to prevent tile sliding and/or damage to the underlayment during the loading process.

7. BUILDING PERMIT REQUIREMENTS:

As required by the Building Official or Authority Having Jurisdiction to properly evaluate the installation of this product.

8. MANUFACTURING PLANTS:

Contact the manufacturer or the named QA entity for plants covered under **Rule 61G20-3 QA** requirements. Refer to Section 4 herein for product & production locations having met codified physical properties specifications.

9. QUALITY ASSURANCE ENTITY:

UL, LLC. – QUA9625; (847) 664-3281

- END OF EVALUATION REPORT -