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EVALUATION REPORT

TRI-BUILT Materials Group, LLC
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Evaluation Report A42960.10.12-R6
FL16048-R6
Date of Issuance: 10/25/2012
Revision 6: 09/25/2017

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: TRI-BUILT Roof Underlayments

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

CONTINUED COMPLIANCE: This Evaluation Report is valid until such time as 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. if the product changes or the referenced Quality Assurance documentation changes. Trinity|ERD requires a complete review of this Evaluation Report relative to updated Code requirements with each Code Cycle.

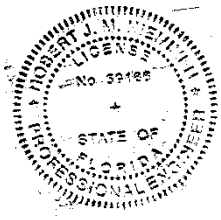
ADVERTISEMENT: The Evaluation Report number preceded by the words "Trinity|ERD Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

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 6.

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 09/25/2017. This does not serve as an electronically signed document.

CERTIFICATION OF INDEPENDENCE:
1. Trinity|ERD does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products it evaluates.
2. Trinity|ERD is not owned, operated or controlled by any company manufacturing or distributing products it evaluates.
3. Robert Nieminen, P.E. does not have nor will acquire, a financial interest in any company manufacturing or distributing products for which the evaluation reports are being issued.
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 Trinity|ERD 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.

ROOFING COMPONENT EVALUATION:

1. SCOPE:

Product Category: Roofing
Sub-Category: Underlayment
Compliance Statement: **TRI-BUILT Roof Underlayments**, as produced by **TRI-BUILT Materials Group, LLC**, have demonstrated compliance with the following sections of the **6th Edition (2017) 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:

Section	Property	Standard	Year
1504.3.1	Wind Resistance	FM 4474	2011
1504.3.1	Wind Uplift	UL 1897	2012
1504.6	Accelerated Weathering	ASTM G155	2005
1507.2.4 / 1507.1.1, 1507.2.9.2	Physical Properties	ASTM D1970	2015
1507.3.3	Physical Properties	FRSA/TRI April 2012 (04-12)	2012

3. REFERENCES:

Entity	Examination	Reference	Date
ERD (TST6049)	Physical Properties	S40540.02.13-1	02/19/2013
ERD (TST6049)	Physical Properties	S40540.11.13	11/19/2013
ERD (TST6049)	Physical Properties	S40540.03.14	03/26/2014
ERD (TST6049)	Physical Properties	S44870.04.14-2	04/02/2014
ERD (TST6049)	Physical Properties	S44870.04.14-3	04/02/2014
ERD (TST6049)	Physical Properties	S44870.04.14-1	04/10/2014
ERD (TST6049)	Physical Properties	S44870.04.14-4	04/10/2014
ERD (TST6049)	Physical Properties	S43530.02.14-1-R1	05/14/2014
ERD (TST6049)	Physical Properties	S43530.05.14	05/28/2014
ERD (TST6049)	Physical Properties	S40540.10.14	10/31/2014
ERD (TST6049)	Physical Properties	SC7645.02.15	02/13/2015
ERD (TST6049)	Accelerated Weathering	SC8520.04.15	05/27/2015
ERD (TST6049)	Wind Resistance	SC14045.05.17-R1	06/07/2017
UL, LLC. (QUA9625)	Quality Control	Multiple-Listing R16814	12/10/2015
UL, LLC. (QUA9625)	Quality Control	Service Confirmation	Exp. 07/18/2020

4. PRODUCT DESCRIPTION:

4.1 **Tri-Built Sand-R SA Shingle Underlayment** is a self-adhering, glass-mat reinforced, sand-surfaced, SBS modified bitumen roof underlayment, with a 36-inch sheet width; meets ASTM D1970.

4.2 **Tri-Built S/A HT TU Underlayment** is a self-adhering, non-woven polyester fabric surfaced, SBS modified bitumen roof underlayment; meets ASTM D1970 and FRSA/TRI April 2012.

4.3 **Tri-Built Smooth HT S/A Underlayment** is a self-adhering, glass-mat reinforced, film-surfaced, SBS modified bitumen roof underlayment; meets ASTM D1970.

5. LIMITATIONS:

5.1 This is a building code evaluation. Neither Trinity|ERD 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 for fire ratings of this product.

5.4 **TRI-BUILT 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
Tri-Built Sand-R SA Shingle Underlayment	Yes	No	No	No	Yes	Yes
Tri-Built S/A HT TU Underlayment	Yes	Yes	Yes See 5.5.1	Yes	Yes	Yes
Tri-Built Smooth HT S/A Underlayment	Yes	No	No	Yes	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
ICP Adhesives Polyset® AH-160	FL6332	Tri-Built S/A HT TU Underlayment
Dow TileBond™	FL22525	Tri-Built S/A HT TU Underlayment

5.6 Allowable Substrates:

5.6.1 Direct-Bond to Deck:

Tri-Built Sand-R SA Shingle Underlayment, **Tri-Built S/A HT TU Underlayment** or **Tri-Built Smooth HT S/A Underlayment** applied to:

- Plywood; ASTM D41 primed plywood; OSB; ASTM D41 primed OSB; Southern Yellow Pine; ASTM D41 primed Southern Yellow Pine; ASTM D41 primed structural concrete.

While not required over plywood, OSB or Southern Yellow Pine substrates, **TRI-BUILT Materials Group, LLC** recommends priming the deck if the final roof cover is not slated for installation within 24 hours. Note: **TRI-BUILT Materials Group, LLC** requires tongue-and-groove board decking be covered with plywood or OSB prior to installation of the self-adhering underlayment.

5.6.2 Bond-to-Insulation:

Tri-Built Sand-R SA Shingle Underlayment, **Tri-Built S/A HT TU Underlayment** or **Tri-Built Smooth HT S/A Underlayment** applied to:

- Dens Deck Prime; SECUROCK Gypsum-Fiber Roof Board.

For installation under mechanically attached prepared roof coverings, insulation shall be attached per minimum requirements of the prepared roof covering manufacturer's Product Approval. For installations under foam-on tile systems (**Tri-Built S/A HT TU Underlayment** only), insulation attachment shall be designed by a qualified design professional and installed based on testing of the insulation/underlayment system in accordance with FM 4474, Appendix D or TAS 114, Appendix J.

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

5.6.3 Bond to Mechanically Attached Base Layer:

Tri-Built Sand-R SA Shingle Underlayment, **Tri-Built S/A HT TU Underlayment** or **Tri-Built Smooth HT S/A Underlayment** applied to:

- ASTM D226, Type I or II felt.

For installations under mechanically attached prepared roof coverings, base layer shall be attached per minimum codified requirements. For installations under foam-on tile systems (**Tri-Built S/A HT TU Underlayment** only), base layer shall be attached per minimum requirements of **FRSA/TRI April 2012 (04-12)**.

5.6.4 Wind Resistance for Underlayment Systems in Foam-On Tile Applications: **FRSA/TRI April 2012 (04-12)** does not address wind uplift resistance of all underlayment systems beneath foam-on tile systems, where the underlayment forms part of the load-path. The following wind uplift limitations apply to direct-deck underlayment systems that are not addressed in **FRSA/TRI April 2012 (04-12)** and are used in foam-on 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 pressures.

#1 Maximum Design Pressure = **-45.0 psf**:

Deck: Min. 15/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.
Primer: (Optional) ASTM D41 or RESISTO EXTERIOR PRIMER
Underlayment: **Tri-Built S/A HT TU Underlayment**, self-adhered.

#2 Maximum Design Pressure = **-67.5 psf**:

Deck: Structural concrete to meet project requirements to satisfaction of Authority Having Jurisdiction.
Primer: Soprema Elastocol 600c
Underlayment: **Tri-Built S/A HT TU Underlayment**, self-adhered.

#3 Maximum Design Pressure = **-150.0 psf**:

Deck: Min. 15/32-inch APA-rated BCX plywood (may be installed C-side up) to meet project requirements to satisfaction of Authority Having Jurisdiction.
Deck Preparation: Plywood shall be thoroughly cleaned to remove dust and debris that may inhibit adhesion. All sheathing fasteners shall be driven flush with the surface. All sharp splinters and wood projections shall be removed/sanded.
Primer: (Optional) RESISTO EXTERIOR PRIMER
Underlayment: **Tri-Built S/A HT TU Underlayment**, self-adhered, shall be thoroughly roll using hand roller and/or weighted roller to ensure there are no voids, and ensure there are no voids/bridging at side and end-laps.

#4 Maximum Design Pressure = **-60.0 psf**:

Deck: Min. 19/32-inch plywood to meet project requirements to satisfaction of Authority Having Jurisdiction.
Base Sheet: Soprema Sopra-G or Modified Sopra-G mechanically attached with nails (FBC 1517.5.1) and tin caps (FBC 1517.5.2) spaced 6-inch o.c. at the 4-inch laps and 6-inch o.c. in three, equally spaced rows in the center of the sheet.
Underlayment: **Tri-Built S/A HT TU Underlayment**, self-adhered.

5.6.4.1 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:

Tri-Built Sand-R SA Shingle Underlayment or **Tri-Built Smooth HT S/A Underlayment** shall not be left exposed for longer than **30-days** after installation

Tri-Built S/A HT TU Underlayment shall not be left exposed for longer than **180-days** after installation.

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 2: TILE SLIPPAGE LIMITATIONS FOR DIRECT-DECK TILE INSTALLATIONS

Underlayment	Tile Profile	Staging Method	Maximum Slope
Tri-Built S/A HT TU Underlayment	Flat	Max. 10-tile stack	6:12
	Lugged	Max. 10-tile stack	5:12
	Lugged	Max. 10-tile stack (bottom 2-tile stack shall be inverted, followed by 8 tiles high on slope, as shown below)	6:12
			

6. INSTALLATION:

6.1 **TRI-BUILT Roof Underlayments** shall be installed in accordance with **TRI-BUILT Materials Group, LLC** published installation requirements 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 Tri-Built Sand-R SA Shingle Underlayment, Tri-Built S/A HT TU Underlayment or Tri-Built Smooth HT S/A Underlayment:

6.3.1 Shall be installed in compliance with the requirements for ASTM D1970 underlayment in **FBC Table 1507.1.1** for the type of prepared roof covering to be installed.

6.3.2 Non-Tile applications:

While priming is optional, **TRI-BUILT Materials Group, LLC** recommends priming the deck if the final roof cover is not slated for installation within 24 hours.

Apply sheet parallel to the roof edge. Roll out approximately 10 ft of membrane and peel back the first 3 ft of release film.

Adhere the exposed part to the substrate and unroll the remaining membrane as far as possible.

Once the entire length of membrane is in place, peel-off the release film diagonally while holding the membrane tight. Firmly roll, broom or hand-press the membrane into place to achieve a bond.

Horizontal seams should be minimum 3-inches, configured to shed water. Vertical seams should be 6-inches and staggered not less than 2-ft from vertical seams in the course below, sealed in accordance with **TRI-BUILT Materials Group, LLC** requirements.

When installing at slopes above 8:12, **TRI-BUILT Materials Group, LLC** recommends back-nailing in the overlap area at the top of the sheet at 12-inch o.c.

For Valleys and Ridges: Cut underlayment into 4 to 6 foot lengths. Peel the release paper and center sheet over valley or ridge. Drape and press sheet into place, working from the center of the valley or ridge in each direction. For valleys, apply the sheet starting at the lowest point and work upward.

6.3.3 Tile Applications (**Tri-Built S/A HT TU Underlayment** only):

Reference is made to **FRSA/TRI April 2012 (04-12)** Installation Manual and Table 1 herein, using the instructions noted above as a guideline.

For foam-on tile applications, reference is made to **Section 5.6.4** herein for wind resistance limitations that fall outside the scope of **FRSA/TRI April 2012 (04-12)**.

Tile shall be loaded and staged in a manner that prevents tile slippage and/or damage to the underlayment. See **Table 2** herein, and **TRI-BUILT Materials Group, LLC** published requirements for tile staging.

7. BUILDING PERMIT REQUIREMENTS:

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

8. MANUFACTURING PLANTS:

Gulfport, MS

9. QUALITY ASSURANCE ENTITY:

UL, LLC – QUA9625; (314) 578-3406; k.chancellor@us.ul.com

- END OF EVALUATION REPORT -