


[DBPR HOME](#) / [ABOUT DBPR](#) / [DBPR DIVISIONS](#) / [CONTACT DBPR](#)
[BCIS Home](#) | [Log In](#) | [User Registration](#) | [Hot Topics](#) | [Submit Surcharge](#) | [Stats & Facts](#) | [Publications](#) | [Contact Us](#) | [BCIS Site Map](#) | [Links](#) | [Search](#)


Product Approval

USER: Public User

[Product Approval Menu](#) > [Product or Application Search](#) > [Application List](#) > **Application Detail**

OFFICE OF THE
SECRETARY

FL #	FL15216-R13
Application Type	Revision
Code Version	2023
Application Status	Approved
Comments	
Archived	☐
Product Manufacturer	Owens Corning Roofing and Asphalt, LLC
Address/Phone/Email	One Owens Corning Parkway Toledo, OH 43645 (740) 321-6345 Greg.Keeler@owenscorning.com
Authorized Signature	Keeler Greg Greg.Keeler@owenscorning.com
Technical Representative	Greg Keeler
Address/Phone/Email	2790 Columbus Road Granville, OH 43023 (740) 321-6345 greg.keeler@owenscorning.com
Quality Assurance Representative	
Address/Phone/Email	
Category	Roofing
Subcategory	Underlayments
Compliance Method	Evaluation Report from a Florida Registered Architect or a Licensed Florida Professional Engineer ☐ Evaluation Report - Hardcopy Received
Florida Engineer or Architect Name who developed the Evaluation Report	Robert Nieminen
Florida License	PE-59166
Quality Assurance Entity	Intertek Testing Services NA, Inc. - QA Entity
Quality Assurance Contract Expiration Date	12/31/2026
Validated By	John W. Knezevich, PE ☒ Validation Checklist - Hardcopy Received
Certificate of Independence	FL15216_R13_COI_2023_07_COI_NIEMINEN.pdf
Referenced Standard and Year (of Standard)	Standard ASTM D8257
	Year 2020
Equivalence of Product Standards Certified By	
Sections from the Code	

Product Approval Method

Method 1 Option D

Date Submitted

10/23/2023

Date Validated

10/23/2023

Date Pending FBC Approval

10/30/2023

Date Approved

12/12/2023

Summary of Products

FL #	Model, Number or Name	Description
15216.1	RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 Roof Underlayments	Synthetic roof underlayments
Limits of Use Approved for use in HVHZ: Yes Approved for use outside HVHZ: Yes Impact Resistant: N/A Design Pressure: N/A Other: Refer to PEER Section 5 for Limits of Use.		Installation Instructions FL15216_R13_II_2023_10_23_FINAL_PEER-OC-003.A_FL15216-R13.pdf Verified By: Robert Nieminen PE-59166 Created by Independent Third Party: Yes Evaluation Reports FL15216_R13_AE_2023_10_23_FINAL_PEER-OC-003.A_FL15216-R13.pdf Created by Independent Third Party: Yes

[Back](#)[Next](#)

[Contact Us](#) :: [2601 Blair Stone Road, Tallahassee FL 32399](#) Phone: 850-487-1824

The State of Florida is an AA/EEO employer. [Copyright 2007-2013 State of Florida](#). :: [Privacy Statement](#) :: [Accessibility Statement](#) :: [Refund Statement](#)

Under Florida law, email addresses are public records. If you do not want your e-mail address released in response to a public-records request, do not send electronic mail to this entity. Instead, contact the office by phone or by traditional mail. If you have any questions, please contact 850.487.1395. *Pursuant to Section 455.275(1), Florida Statutes, effective October 1, 2012, licensees licensed under Chapter 455, F.S. must provide the Department with an email address if they have one. The emails provided may be used for official communication with the licensee. However email addresses are public record. If you do not wish to supply a personal address, please provide the Department with an email address which can be made available to the public. To determine if you are a licensee under Chapter 455, F.S., please click [here](#).

Product Approval Accepts:



NEMO|etc.

Certificate of Authorization #32455
353 Christian Street, Unit #13
Oxford, CT 06478
(203) 262-9245

ENGINEER

EVALUATE

TEST

CONSULT

P.E. EVALUATION REPORT (PEER)

Owens Corning Roofing and Asphalt, LLC

One Owens Corning Parkway
Toledo, OH 43659
(740) 321-6345

PEER-OC-003.A.R14

FL15216-R13

Date of Issuance: 02/17/2012

Revision 14: 10/23/2023

SCOPE:

This P.E. Evaluation Report (henceforth 'PEER') is issued under **F.A.C. 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. The products described herein have been evaluated for compliance with the **8th Edition (2023) Florida Building Code** [sections noted herein](#).

DESCRIPTION: RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 Roof Underlayments

LABELING: Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein and [FBC 1507.1.1](#) and [FBC HVHZ 1518.2](#).

CONTINUED COMPLIANCE: This PEER is valid until such time as the named product(s) changes, the referenced Quality Assurance or production facility location(s) changes, or Code provisions that relate to the product(s) change. Acceptance of our PEERs by the named client constitutes agreement to notify NEMO ETC, LLC of any changes to the product(s), the Quality Assurance, or the production facility location(s). NEMO ETC, LLC requires a complete review of its PEER relative to updated Code requirements with each Code Cycle.

ADVERTISEMENT: The Florida Product Approval Number (FL#) preceded by the words "NEMO P.E. Evaluated" may be displayed in advertising literature. If any portion of the PEER is displayed, then it shall be done in its entirety.

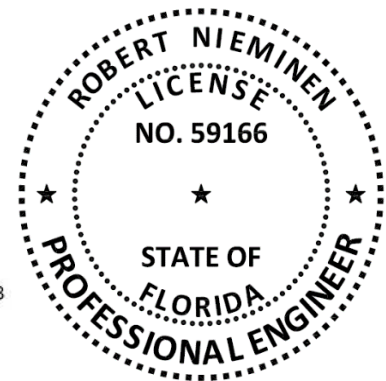
INSPECTION: Upon request, a copy of this entire PEER shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This PEER consists of pages 1 through 4.

Prepared by:

Digitally signed by
Robert Nieminen
Date: 2023.10.23
'13:53:23 -04'00

This item has been digitally signed and sealed by Robert Nieminen, P.E.
Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.
Robert Nieminen, Florida P.E. 59166, FBC ANE1983
NEMO ETC, LLC, Florida CA #32455



CERTIFICATION OF INDEPENDENCE:

1. NEMO ETC, LLC 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. NEMO ETC, LLC 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 PEERs 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 NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this PEER, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.

©2019 NEMO ETC, LLC

ROOFING COMPONENT EVALUATION:
1. SCOPE:

Product Category: Roofing
Sub-Category: Underlayment
Product Approval Method: Method 1, Option D – Codified Material, Evaluation by Engineer
Compliance Statement: RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 Roof Underlayments, as produced by Owens Corning Roofing and Asphalt, LLC, have demonstrated compliance with the following sections of the 8th Edition (2023) Florida Building Code through testing in accordance with applicable sections of the following Standards. Compliance is subject to the [Installation Requirements](#) and [Limitations of Use](#) set forth herein.

2. STANDARDS:

SECTION	PROPERTIES	STANDARD
1507.1.1, R905.1.1, 1518.2	Material standard	ASTM D8257

3. REFERENCES:

ENTITY	EXAMINATION	REFERENCE	DATE
PRI (TST5878)	ASTM D8257-20	1378T0138	02/25/2021
PRI (TST5878)	ASTM D8257-20	1378T0139	03/23/2021
PRI (TST5878)	ASTM D8257-20	1378T0141	05/18/2021
PRI (TST5878)	ASTM D8257-20	1378T0273	10/25/2022
ITS (QUA1673)	ITS Audit Manual	3144566COQ-006A	09/10/2020
ITS (QUA1673)	Quality Control	Service Confirmation	08/13/2021
ITS (QUA1673)	Quality Control	Florida BCIS	Current

4. PRODUCT DESCRIPTION:

TABLE 1: EVALUATED UNDERLAYMENTS			
PRODUCT	SPECIFICATION	PLANT(S)	DESCRIPTION
RhinoRoof U10	ASTM D8257 ¹	Qingdao, China Silvassa, India	Multilayered polymer woven coated synthetic roof underlayment
RhinoRoof U20	ASTM D8257 ¹	Qingdao, China Silvassa, India	Multilayered polymer woven coated synthetic roof underlayment
ABC Pro Guard 20	ASTM D8257 ¹	Silvassa, India	Multilayered polymer woven coated synthetic roof underlayment
SRS TopShield TS20	ASTM D8257 ¹	Silvassa, India	Multilayered polymer woven coated synthetic 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 PEER, or previous versions thereof, is/was used for permitting or design guidance. PEERs are not to be construed as representing any attributes not specifically listed, nor are PEERs to be construed as an endorsement of the subject, or a recommendation for its use. There is no warranty by NEMO ETC, LLC or Robert Nieminen, P.E., express or implied, as to any finding or other matter in this PEER, or as to any product covered by the PEER.
- 5.2 This PEER pertains to above-deck roof components. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction.
- 5.3 This PEER does not include evaluation of fire classification. Refer to **FBC 1505** or **FBC HVHZ 1516** for requirements and limitations regarding roof assembly fire classification. Refer to **FBC 2603** for requirements and limitations concerning the use of foam plastic insulation.

- 5.4 **RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 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 2: ROOF COVER OPTIONS					
FBC NON-HVHZ:	1507.2	1507.3	1507.4 & 1507.5	1507.7	1507.8 & 1507.9
FBC HVHZ:	RAS 115, 1518.2.1	RAS 118, 119 & 120	RAS 133, 1518.2.1	1518.2.1	RAS 130, 1518.10
UNDERLAYMENT	ASPHALT SHINGLES	ROOF TILE	METAL	SLATE OR SLATE-TYPE SHINGLES	WOOD
RhinoRoof U10	Yes	No	Yes	No	NON-HVHZ: No HVHZ: Yes
RhinoRoof U20	Yes	No	Yes	No	NON-HVHZ: No HVHZ: Yes
ABC Pro Guard 20	Yes	No	Yes	No	NON-HVHZ: No HVHZ: Yes
SRS TopShield TS20	Yes	No	Yes	No	NON-HVHZ: No HVHZ: Yes

5.6 **Exposure Limitations:**

TABLE 3: EXPOSURE LIMITATIONS	
UNDERLAYMENT	MAXIMUM EXPOSURE (DAYS)
RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 or SRS TopShield TS20	90

6. INSTALLATION:

- 6.1 **RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 Roof Underlayments** shall be installed in accordance with the manufacturer's published installation instructions subject to the [Limitations of Use](#) 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.

6.3 **RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 Roof Underlayments:**

6.3.1 **NON-HVHZ JURISDICTIONS:**

Shall be installed in compliance with requirements for a synthetic underlayment (ASTM D8257) in **FBC 1507.1.1.1** or **FBC Residential R905.1.1.1** for the type of prepared roof covering to be installed, and the manufacturer's installation instructions. FBC requirements take precedence over the manufacturer's installation instructions. FBC requirements take precedence over the manufacturer's installation instructions.

6.3.2	HVHZ JURISDICTIONS:	
6.3.2.1	DECK TYPE 1:	Wood, Non-Insulated
	DECK DESCRIPTION:	Min. 19/32-inch plywood or wood plank
	SYSTEM TYPE E-1:	Underlayment mechanically fastened to deck
	UNDERLAYMENT:	Two (2) layers of RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 in accordance with FBC HVHZ 1518.2.1(3).
	FASTENING:	Grid pattern of 12-inches between the overlaps, with 6-inch spacing at the overlaps, in accordance with FBC HVHZ 1518.2.1(3).
	SURFACING:	FBC HVHZ Approved asphalt shingles, metal roof panels or metal shingles, slate or slate type shingles.
6.3.2.2	DECK TYPE 1:	Wood, Non-Insulated
	DECK DESCRIPTION:	Min. 19/32-inch plywood
	SYSTEM TYPE E-1:	Self-adhering strips to plywood joints; underlayment mechanically fastened to deck
	SECONDARY WATER BARRIER:	Min. 3¾-inch wide strips of FBC HVHZ Approved self-adhering underlayment over joints of the plywood roof deck prior to installation of subsequent layer(s) in accordance with FBC HVHZ 1518.2.1(2). Do not overlap end-joints or T-joints. All end-joints and T-joints shall be butted firmly side by side, flush with each other but not overlapped.
	UNDERLAYMENT:	RhinoRoof U10, RhinoRoof U20, ABC Pro Guard 20 and SRS TopShield TS20 in accordance with FBC HVHZ Table 1518.2.1.
	FASTENING:	Grid pattern of 12-inches between the overlaps, with 6-inch spacing at the overlaps, in accordance with FBC HVHZ Table 1518.2.1.
	SURFACING:	FBC HVHZ Approved metal shingles, slate, slate type shingles, wood shingles or wood shakes.

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 named QA entity for manufacturing facilities covered by **F.A.C. Rule 61G20-3** QA requirements. Refer to [Section 4](#) herein for products and production locations having met codified material standards.

9. QUALITY ASSURANCE ENTITY:

[Intertek Testing Services NA Inc. – QUA1673](#); (312) 906-7779; maura.norlander@intertek.com

- END OF PEER -

ⁱ Agreement between purchaser and seller, as set forth in Section 4.3, Note 1 of ASTM D8257-20, should be established as to slip resistance.



[BCIS Home](#) |
 [Log In](#) |
 [User Registration](#) |
 [Hot Topics](#) |
 [Submit Surcharge](#) |
 [Stats & Facts](#) |
 [Publications](#) |
 [Contact Us](#) |
 [BCIS Site Map](#) |
 [Links](#) |
 [Search](#)



Product Approval
USER: Public User

[Product Approval Menu](#) >
 [Product or Application Search](#) >
 [Application List](#) >
 Application Detail

OFFICE OF THE
SECRETARY

FL #	FL18355-R11								
Application Type	Revision								
Code Version	2023								
Application Status	Approved								
	*Approved by DBPR. Approvals by DBPR shall be reviewed and ratified by the POC and/or the Commission if necessary.								
Comments									
Archived	☐								
Product Manufacturer	TAMKO Building Products LLC								
Address/Phone/Email	PO Box 97 Galena, KS 66739 (417) 624-6644 Ext 2305 kerri_eden@tamko.com								
Authorized Signature	Kerri Eden kerri_eden@tamko.com								
Technical Representative	Kerri Eden								
Address/Phone/Email	PO Box 1404 Joplin, MO 64802 (417) 624-6644 Ext 2305 kerri_eden@tamko.com								
Quality Assurance Representative									
Address/Phone/Email									
Category	Roofing								
Subcategory	Asphalt Shingles								
Compliance Method	Evaluation Report from a Product Evaluation Entity								
Evaluation Entity	UL LLC								
Quality Assurance Entity	UL LLC								
Quality Assurance Contract Expiration Date	06/01/2026								
Validated By	NEMO ETC, LLC								
Certificate of Independence	FL18355_R11_COI_UL_Standards of Business Conduct - Independence.pdf								
Referenced Standard and Year (of Standard)	<table> <thead> <tr> <th>Standard</th><th>Year</th></tr> </thead> <tbody> <tr> <td>ASTM D3161</td><td>2016</td></tr> <tr> <td>ASTM D3462</td><td>2016</td></tr> <tr> <td>ASTMD D7158</td><td>2019</td></tr> </tbody> </table>	Standard	Year	ASTM D3161	2016	ASTM D3462	2016	ASTMD D7158	2019
Standard	Year								
ASTM D3161	2016								
ASTM D3462	2016								
ASTMD D7158	2019								
Equivalence of Product Standards									
Certified By									
Sections from the Code									

Product Approval Method

Method 1 Option C

Date Submitted

12/13/2023

Date Validated

12/18/2023

Date Pending FBC Approval

Date Approved

12/30/2023

Summary of Products

FL #	Model, Number or Name	Description
18355.1	TAMKO Asphalt Shingles	ASTM D3462 asphalt shingles and hip and ridge shingles
Limits of Use Approved for use in HVHZ: No Approved for use outside HVHZ: Yes Impact Resistant: N/A Design Pressure: N/A Other: See evaluation report for limits of use.		Installation Instructions FL18355_R11_II_UL_ER2919-01 - 11-29-2023.pdf Verified By: UL LLC Created by Independent Third Party: Evaluation Reports FL18355_R11_AE_UL_ER2919-01 - 11-29-2023.pdf

[Back](#)[Next](#)

Contact Us :: 2601 Blair Stone Road, Tallahassee FL 32399 Phone: 850-487-1824

The State of Florida is an AA/EEO employer. [Copyright 2007-2013 State of Florida.](#) :: [Privacy Statement](#) :: [Accessibility Statement](#) :: [Refund Statement](#)

Under Florida law, email addresses are public records. If you do not want your e-mail address released in response to a public-records request, do not send electronic mail to this entity. Instead, contact the office by phone or by traditional mail. If you have any questions, please contact 850.487.1395. *Pursuant to Section 455.275(1), Florida Statutes, effective October 1, 2012, licensees licensed under Chapter 455, F.S. must provide the Department with an email address if they have one. The emails provided may be used for official communication with the licensee. However email addresses are public record. If you do not wish to supply a personal address, please provide the Department with an email address which can be made available to the public. To determine if you are a licensee under Chapter 455, F.S., please click [here](#).

Product Approval Accepts:

UL Solutions Evaluation Report

UL ER2919-01

Issued: May 21, 2013

Revised: November 29, 2023

Visit the UL Solutions [Product iQ® database](#) for current status of report.

UL Solutions Category Code: ULEZ

CSI MasterFormat®

DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION

Sub-level 2: 07 30 00 – Steep Slope Roofing

Sub-level 3: 07 31 00 – Shingles and Shakes

Sub-level 4: 07 31 13 – Asphalt Shingles

COMPANY:

TAMKO BUILDING PRODUCTS LLC
198 FOUR STATES DRIVE
GALENA, KANSAS 66739
(417) 624-6644
www.tamko.com

1. SUBJECT:

ELITE GLASS-SEAL,

HERITAGE, HERITAGE IR, HERITAGE PREMIUM, HERITAGE WOODGATE, HERITAGE VINTAGE, HERITAGE PROLINE STORMFIGHTER IR, HERITAGE PROLINE TITAN XT, STORMFIGHTER FLEX 3, AND STORMFIGHTER FLEX 4

HERITAGE VINTAGE 12 X 12 HIP AND RIDGE, 12-1/4 X 12 HIP AND RIDGE, AND PROLINE 12-1/4 X 12 HIP AND RIDGE

HERITAGE VINTAGE STARTER, TAMKO 10-INCH STARTER, TAMKO PERFORATED STARTER, TAMKO SHINGLE STARTER

UL Solutions
333 Pfingsten Road
Northbrook, IL 60062
USA

T +1.847.272.8800

UL.com/Solutions

2. SCOPE OF EVALUATION

- 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015, and 2012 *International Residential Code*® (IRC)
- 2023 Florida Building Code – Building
- 2023 Florida Building Code – Residential
- ICC ES Acceptance Criteria for Quality Documentation (AC10)

The products underwent evaluation for the following properties:

- Exterior Fire Exposure (UL 790)
- Wind Resistance (ASTM D3161; ASTM D7158)
- Physical Properties (ASTM D3462)
- Impact Resistance (UL 2218)

3. REFERENCED DOCUMENTS

- UL 790, Standard Test Methods for Fire Tests of Roof Coverings
- UL 2218, Standard Test Methods for Impact Resistance of Prepared Roof Covering Materials
- ASTM D3161, Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method)
- ASTM D7158, Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method)
- ASTM D3462, Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules
- UL Subject 2375 Issue No. 2, Outline of Investigation for Hip and Ridge Shingles (UL Fire and Wind Tests)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10)

4. USES

TAMKO asphalt shingles are used as roof coverings for new and existing roofs.

5. PRODUCT DESCRIPTION

5.1 General:

TAMKO asphalt shingles are roof covering materials complying with the following properties when installed as described in this report. The products are three-tab shingles, laminated shingles, starter shingles, and hip & ridge shingles.

Fire Classification: TAMKO asphalt shingles covered under this Report have been tested for fire classification Class A in accordance with UL 790. Shingles tested in accordance with UL 790 qualify for use under Section 1505.1 of the 2023 Florida Building Code - Building, IBC, Section R902.1 of the IRC and 2023 Florida Building Code - Residential.

Wind Resistance: TAMKO asphalt shingles covered under this Report have been tested for wind resistance in accordance with ASTM D3161 or ASTM D7158.

Shingles tested in accordance with ASTM D3161 are classified as Class F and qualify for use under the exception to Section 1504.2 of the 2021 IBC, Section 1504.1.1 of the 2018 and 2015 IBC, Section 1507.2.7.1 of the 2012 IBC and 2023 Florida Building Code - Building, the exception to Section R905.2.4.1 of the IRC, and Section R905.2.6.1 of 2023 Florida Building Code – Residential.

Shingles tested in accordance with ASTM D7158 are classified as Class H and qualify for use in locations as shown in Table 1504.2 of the 2021 IBC, Table 1504.1.1 of 2018 and 2015 IBC, Table 1507.2.7.1 of the 2012 IBC and 2023 Florida Building Code - Building, Table R905.2.4.1 of the IRC, or Table R905.2.6.1 of the 2023 Florida Building Code - Residential, where the maximum basic wind speed is 150 mph (67 m/s) or less with exposure category of B or C (ASCE 7) and a maximum building height of 60 feet (18.3 m). Installation must be in accordance with Section 1507.2 of the 2021 and 2018 IBC, 2023 Florida Building Code - Building, and Section 1507.2.7 of the 2015, and 2012 IBC, or Section R905.2 of the IRC and 2023 Florida Building Code - Residential, as applicable.

Physical Properties: TAMKO asphalt shingles covered under this Report have been tested for physical properties in accordance with ASTM D3462. Shingles tested in accordance with ASTM D3462 qualify for use under Section 1507.2.4 of the 2021 and 2018 IBC, Section 1507.2.5 of the 2015 and 2012 IBC, Section 1507.2.5 of the 2023 Florida Building Code - Building, or Section R905.2.4 of the IRC and 2023 Florida Building Code - Residential. When installed on new construction in accordance with this report and the TAMKO Building Products LLC installation instructions, the shingles are a Class A roof covering. When the shingles are installed over existing roof coverings, the Class A fire classification is maintained.

5.2 Three-Tab Shingles – Elite Glass-Seal:

Elite Glass-Seal shingles are three-tab shingles manufactured with a single fiberglass mat, coated on both sides with asphalt, and surfaced on the weather-exposed side with mineral granules. The shingles are self-sealing and have beads of thermal-tab sealing adhesive above the shingle butt on the weather side. See [Table 2](#) for product dimensions and manufacturing locations.

5.3 Laminated Shingles – Heritage, Heritage IR, Heritage Premium, Heritage Woodgate, Heritage Vintage, Heritage Proline Stormfighter IR, Heritage Proline Titan XT, Stormfighter Flex 3, and Stormfighter Flex 4:

Heritage, Heritage IR, Heritage Premium, Heritage Woodgate, Heritage Vintage, Heritage Proline Stormfighter IR, Heritage Proline Titan XT, Stormfighter Flex 3, and Stormfighter Flex 4 shingles are laminated shingles manufactured with a double layer of fiberglass mats coated with asphalt on all sides and surfaced on the weather-exposed side with mineral granules. See [Table 3](#), [Table 4](#), [Table 5](#), [Table 6](#), [Table 7](#), [Table 10](#), [Table 13](#), [Table 13A](#), and Table 17 for product dimensions and manufacturing locations.

5.4 Hip & Ridge Shingles – 12-¼ X 12 Hip and Ridge, Heritage Vintage 12 X 12 Hip and Ridge, 12-¼ X 12 Heritage Hip and Ridge IR, and Proline 12-¼ X 12 Hip and Ridge:

Hip and Ridge are prefabricated hip and ridge shingles available as 12-¼ X 12 Hip and Ridge, 12-¼ x 12 Heritage Hip and Ridge IR, and Proline 12-¼ x 12 Hip and Ridge. Heritage Vintage Hip and Ridge are prefabricated hip and ridge shingles available as 12 X 12 Hip and Ridge. As an alternative, Elite Glass-Seal shingles are cut into three 12-¼ inch by 12-inch (305 mm by 305 mm) hip and ridge shingles. See [Table 8](#), [Table 9](#), and [Table 11](#) for product dimensions and manufacturing locations.

6. INSTALLATION

6.1 General:

TAMKO asphalt shingles must be installed in accordance with the applicable code, this report and the manufacturer's published installation instructions. The shingles must be installed in accordance with Section 1507.2 of the IBC and 2023 Florida Building Code - Building, or Section R905.2 of the IRC and 2023 Florida Building Code - Residential, as applicable, except as noted in this report.

The manufacturer's published installation instructions must be available at all times on the jobsite during installation.

Minimum roof slopes must be 2:12 (16.67% slope) for the three-tab shingles described under 5.2 of this Report and for the laminated shingles described under 5.3 of this Report.

6.2 Underlayment and Ice Barriers:

For roof slopes 4:12 and greater, the roof deck must be covered with a minimum of one layer of underlayment as described in Sections 7.2 and 7.3 of this Report. Underlayment application must be in accordance with Table 1507.1.1 of the 2021 and 2018 IBC, 2023 Florida Building Code - Building, and Section 1507.2.8 of the 2015 and 2012 IBC or Table R905.1.1(2) of the 2021 IRC, Section R905.2.7 of the 2018, 2015, and 2012 IRC, and Section 905.2.3 of the 2020 Florida Building Code - Residential, as applicable.

For roof slopes 2:12 and up to but less than 4:12, two layers of the underlayment described in Section 7.2 or one layer of the self-adhering polymer modified bitumen sheet in described in Section 7.3 of this Report are required. Underlayment application must be in accordance with Section 1507.1.1 of the 2021 and 2018 IBC, 2020 Florida Building Code - Building, and Section 1507.2.8 of the 2015 and 2012 IBC, Section R905.1.1 of the IRC, and 2023 Florida Building Code - Residential, as applicable.

In areas where there has been a history of ice forming along the eaves, causing a backup of water, an ice barrier must be provided in accordance with Section 1507.1.2 of the 2021 and 2018 IBC and Section 1507.2.8.2 of the 2023 Florida Building Code - Building, 2015 and 2012 IBC or Section R905.1.2 of the 2021 and 2018 IRC, 2023 Florida Building Code - Residential, Section R905.16.4.1 of the 2015 IRC, and Section R905.2.7.1 of the 2012 IRC, as applicable.

6.3 Starter Shingle:

A starter course, as described in Section 7.4 of this Report, must be attached to the eave edge using fasteners described in Section 7.5 of this Report, located 1-½ to 3 inches (38.1 to 76.2 mm) from the eave edge and spaced 1 inch (25.4 mm) and 12 inches (305 mm) from each end, for a total of four fasteners per shingle. Starter strips must overhang the eave and rake edges ¼ to ¾ inch (6.4 to 19.1 mm) if no drip edge flashing is present. If drip edge flashing is present, install shingles even with the drip edge or overhang the drip edge up to ¾ inch.

6.4 Asphalt Shingles:

The first course of field shingles must be installed over the starter course described in Section 7.4 of this Report.

Shingles must be installed with vertical joints offset a minimum of 4 inches (102 mm) from adjacent courses.

6.4.1 Three-Tab Shingles – Elite Glass-Seal:

For roof slopes 2:12 up to but less than 21:12 (16.67% to 175% slope), each shingle must be fastened to the roof deck using a minimum of four fasteners, spaced as shown in Table 2.

For roof slopes equal to or greater than 21:12 (175% slope), six fasteners must be used, spaced as shown in Table 2.

Fasteners must be in a nail area between 5-⁵/₈ inches and 6-⁷/₈ inches from the butt edge of the shingle.

Maximum exposure to the weather must be 5-¹/₈ inches (130 mm).

In colder climates or wind regions where it is questionable whether the thermal-sealing adhesive will activate to seal the shingles, the shingles can be hand-sealed. A 1-in diameter (25.4 mm) spot of asphalt cement complying with ASTM D4586, Type I, Class I, should be placed under the corner of each tab (two spots per tab).

6.4.2 Laminated Shingles – Heritage, Heritage IR, Heritage Premium, Heritage Woodgate, Heritage Proline Stormfighter IR, Heritage Proline Titan XT, StormFighter Flex 3 and StormFighter Flex 4:

For roof slopes 2:12 up to but less than 21:12 (16.67% to 175% slope), each shingle must be fastened to the roof deck using a minimum of four fasteners, spaced as shown in Tables 3, 4, 5, 6, 10, 13, and 13A.

For roof slopes equal to or greater than 21:12 (175% slope), six fasteners must be used, spaced as shown in Tables 3, 4, 5, 6, 10, 13, and 13A.

Maximum exposure to the weather must be 5-⁵/₈ inches (143 mm).

In colder climates or wind regions where it is questionable whether the thermal-sealing adhesive will activate to seal the shingles, the shingles can be hand-sealed. Four evenly spaced 1-inch diameter (25.4 mm) spots of cement should be placed under the exposed portion of the shingle, approximately 1 inch (76 mm) above the butt edge.

6.4.3 Laminated Shingles – Heritage Vintage:

For roof slopes 2:12 up to but less than 21:12 (16.67% to 175% slope), each shingle must be fastened to the roof deck using a minimum of five fasteners, spaced as shown in Table 7.

For roof slopes equal to or greater than 21:12 (175% slope), nine fasteners must be used, spaced as shown in Table 7.

Fasteners must be located 6 and 11-¹/₂ inches (152 and 292 mm) above the butt edge of the shingles.

Maximum exposure to the weather must be 5 inches (127 mm).

In colder climates or wind regions where it is questionable whether the thermal-sealing adhesive will activate to seal the shingles, the shingles must be hand-sealed. Four evenly spaced 1-inch diameter (25.4 mm) spots of cement should be placed under the exposed portion of the shingle, approximately 1 inch (127 mm) above the butt edge.

6.5 Valley Construction and Other Flashing:

Valleys must consist of woven, open valley or closed-cut construction and must be flashed in accordance with Section 1507.2.8.2 of the 2021 and 2018 IBC, and Section 1507.2.9.2 of the 2023 Florida Building Code - Building, 2015 and 2012 IBC or Section R905.2.8.2 of the IRC and 2023 Florida Building Code - Residential. Other flashings must be in accordance with Sections 1503.2, 2021 and 2018 IBC, and 1507.2.9 of 2023 Florida Building Code – Building, Section 1507.2.9 of the 2015 and 2012 IBC, or Section R905.2.8 of the IRC and 2023 Florida Building Code - Residential, as applicable.

6.6 Hip and Ridge Application:

Hip and ridge shingles must be placed evenly over hips and ridges and must be fastened to the roof deck using two fasteners, one located on either side of the shingle, 5-¹/₂ inches (140 mm) or 5-⁵/₈ inches (143 mm) from the exposed end, and 1 inch (25.4 mm) in from the edge as shown in Tables 8, 9, and 11. Fasteners must be a minimum ¹/₄ inch (6.4 mm) longer than those used in the field of the roof, as specified in Section 7.5 of this report. The 12-¹/₄ X 12 Hip and Ridge and Proline 12-¹/₄ x 12 Hip and Ridge IR prefabricated hip and ridge shingles must be applied with a maximum exposure of 5-¹/₈ inches. (130 mm). Heritage Vintage 12 X 12 Hip and Ridge prefabricated hip and ridge shingles must be installed with a maximum exposure of 5 inches (127 mm). Hip and ridge shingles are installed starting at the bottom of the hip or from the end of the ridge opposite the direction of the prevailing wind.

6.7 Reroofing:

The existing asphalt shingle roof covering must be inspected in accordance with the provisions and limitations of Section 1512 of the 2021 IBC, Section 1511 of the 2018 and 2015 IBC, and Section 1510 of the 2012 IBC, Section 1511.1 of the 2023 Florida Building Code - Building, Section R908 of the IRC, or Section 901.1 of the 2023 Florida Building Code - Residential, as applicable. Prior to the reroofing, hip and ridge coverings must be removed.

Except as noted in this section, the shingles must be installed in accordance with Section 6.3 and 6.5 of this Report. Fasteners must be of sufficient length to penetrate $\frac{3}{4}$ inch (19.1 mm) into the sheathing, or through the sheathing where the sheathing is less than $\frac{3}{4}$ inch (19.1 mm) thick. Flashing and edging must comply with Section 6.4 and with Section 1512.5 of the 2021 IBC, 1511.6 of the 2018 and 2015 IBC and 2023 Florida Building Code - Building, Section 1510.6 of the 2012, IBC and Section R908.6 of the 2021, 2018 and 2015 IRC, 2023 Florida Building Code - Residential, and R907.6 of the 2012 IRC, as applicable.

7. INSTALLATION MATERIALS

7.1 Sheathing:

The roof deck must be code-complying, minimum $\frac{3}{8}$ -inch thick (9.5 mm), exterior plywood complying with DOC PS-1; rated sheathing complying with DOC PS-2; or solid sheathing using minimum nominally 1 by 6 lumber.

7.2 Underlayment:

Under the IBC or IRC, underlayment must comply with ASTM D226, Type I (minimum), ASTM D4869, Type I (minimum), ASTM D1970, or ASTM D6757 as specified in Section 1507.2.3 of the IBC or Section 905.1.1 of the IRC. Under the 2023 Florida Building Code – Building, underlayment must comply with ASTM D226, ASTM D4869, ASTM D1970, ASTM D6757, or D8257 as specified in Section 1507.1.1. Under the IRC and 2023 Florida Building Code – Residential, underlayment must comply with ASTM D226, Type I (minimum), ASTM D4869, Type I (minimum), ASTM D1970, ASTM D6757, or ASTM D8257 as specified in Section R905.1.1.

7.3 Self-adhering Polymer Modified Bitumen Sheet:

The self-adhering polymer modified bitumen sheet must comply with ASTM D1970.

7.4 Starter Shingles:

The starter course shingle consists of either TAMKO 10-inch starter, TAMKO Shingle Starter, TAMKO Perforated Starter, or a self-sealing three-tab shingle. If self-sealing three-tab shingles are used, remove the exposed tab portion and install with factory-applied sealant adjacent to the eaves.

Heritage Vintage requires a Heritage Vintage Starter shown in [Table 12](#) is to be installed over the starter course at the eave edge.

TAMKO Shingles require a TAMKO Shingle Starter as shown as in [Table 14](#), [Table 15](#), or [Table 16](#) which must be installed over the starter course at the eave edge.

7.5 Fasteners:

Fasteners must be minimum No. 12 gage [0.105 inch (2.7 mm)], $\frac{3}{8}$ -inch diameter head (9.5 mm), galvanized, stainless steel, aluminum or copper corrosion-resistance nails. Fasteners must be of sufficient length to penetrate into the sheathing $\frac{3}{4}$ -inch (19.1 mm), or through the sheathing, where the sheathing is less than $\frac{3}{4}$ -inch (19.1 mm) thick. Fasteners must be compliant with ASTM F1667.

7.6 Asphalt Cement:

Asphalt cement must comply with ASTM D4586, Type I, Class I.

8. CONDITIONS OF USE

8.1 General:

The TAMKO Asphalt Shingles described in this Report comply with, or are suitable alternatives to, what is specified in those codes listed in Section 2 of this Report, subject to the following conditions:

- 8.2 Materials and methods of installation shall comply with this Report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this Report, this Report governs.
- 8.3 See UL [Product iQ™ database](#) for Prepared Roof-Covering Materials evaluated for exterior fire exposure in accordance with UL 790 Standard Test Methods for Fire Tests of Roof Coverings ([TFWZ](#)).
- 8.4 The products listed in Table 1 of this Report are manufactured by TAMKO Building Products, located at the manufacturing locations named below, under the UL LLC Classification and Follow-Up Service Program, which includes inspections in accordance with the quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC 10.

Table 1 – Manufacturing Locations

Location	Plant ID (if applicable)
7910 S CENTRAL EXPY DALLAS TX 75216	D
4500 TAMKO DR FREDERICK MD 21704	F
601 N HIGH ST JOPLIN MO 64801	J
1598 HWY 183 PHILLIPSBURG KS 67661	P
KAUL INDUSTRIAL PARK 2300 35TH ST TUSCALOOSA AL 35401	T

9. SUPPORTING EVIDENCE

- 9.1 Manufacturer's descriptive product literature, including installation instructions.
- 9.2 See UL [Product iQ™ database](#) for the following:
 - 9.2.1 UL test reports and Classification in accordance with UL 790, Class A and UL Subject 2375 for Roof-Covering Materials ([TFWZ](#)).
 - 9.2.2 UL test reports and Classification in accordance with ASTM D3462 for Prepared Roof-Covering Materials ([TFWZ](#)).
 - 9.2.3 UL test reports and Classification in accordance with ASTM D7158, Class H for Prepared Roof-Covering Materials ([TGAH](#)).
 - 9.2.4 UL test reports and Classification in accordance with ASTM D3161, Class F Prepared Roof-Covering Materials ([TFWZ](#)).

- 9.2.5** UL test reports and Classification in accordance with UL 2218 Roof-covering Materials, Impact Resistance ([TGAM](#)).

- 9.3** Quality Documentation in accordance with ICC-ES Acceptance Criteria for Quality Documentation, AC10.

10. IDENTIFICATION

The TAMKO asphalt shingles described in this evaluation report are identified by a marking bearing the report holder's name, TAMKO Building Products LLC, the plant identification, the product name, the UL Solutions Classification Mark, and the evaluation report number UL Solutions ER2919-01. The validity of this evaluation report is contingent upon this identification appearing on the product or UL Solutions Classification Mark certificate.

11. USE OF UL SOLUTIONS EVALUATION REPORT

- 11.1** The approval of building products, materials or systems is under the responsibility of the applicable authorities.
- 11.2** UL Solutions Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL Solutions.
- 11.3** The current status of this report, as well as a complete directory of UL Solutions Evaluation Reports, may be found at UL.com/Solutions via Product iQ®.

Table 2 – Elite Glass-Seal

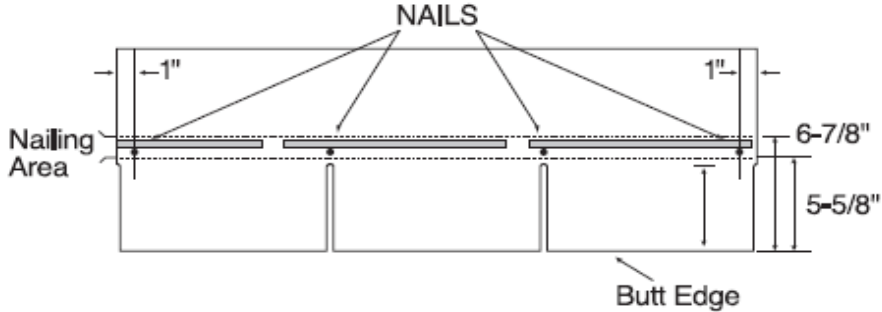
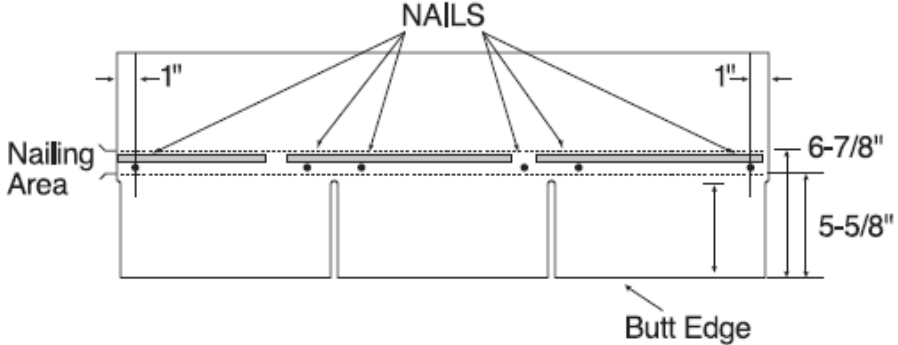
Dimensions:	12-1/4" x 36"
Plant Location(s):	Frederick, Joplin
Fastening Pattern:	For slopes 2:12 up to but less than 21:12 
Fastening Pattern:	For slopes equal to or greater than 21:12 

Table 3 – Heritage

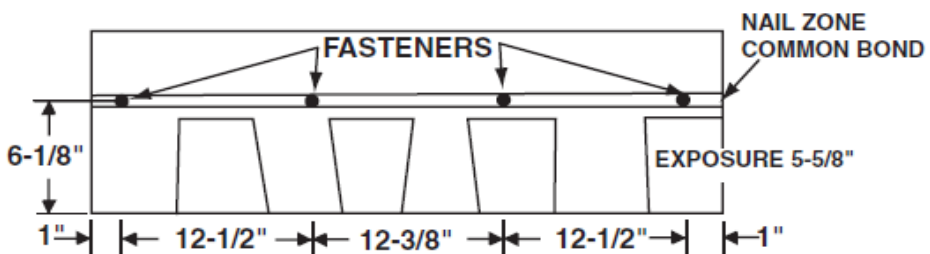
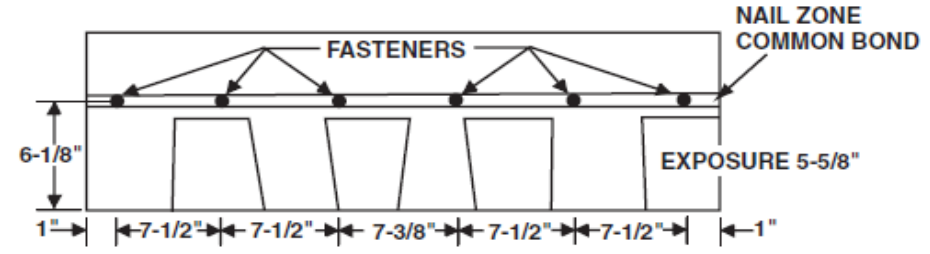
Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Dallas, Frederick, Joplin, Phillipsburg
Fastening Pattern:	For slopes 2:12 up to but less than 21:12 
Fastening Pattern:	For slopes equal to or greater than 21:12 

Table 4 – Heritage

Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Tuscaloosa
Fastening Pattern:	For slopes 2:12 up to but less than 21:12 1" 12-$\frac{1}{2}$" 12-$\frac{3}{8}$" 12-$\frac{1}{2}$" 1" PAINT LINE PREFERRED FASTENER LOCATIONS 7-$\frac{7}{8}$" 6-$\frac{1}{8}$" NAIL ZONE EDGE OF COMMON BOND EXPOSURE 5-$\frac{5}{8}$" ACCEPTABLE FASTENER LOCATION DO NOT FASTEN ALONG EDGE OF COMMON BOND PREFERRED FASTENER LOCATION
Fastening Pattern:	For slopes equal to or greater than 21:12 FASTENERS NAIL ZONE COMMON BOND 6-$\frac{1}{8}$" EXPOSURE 5-$\frac{5}{8}$" 1" 7-$\frac{1}{2}$" 7-$\frac{1}{2}$" 7-$\frac{3}{8}$" 7-$\frac{1}{2}$" 7-$\frac{1}{2}$" 1"

Table 5 – Heritage Premium

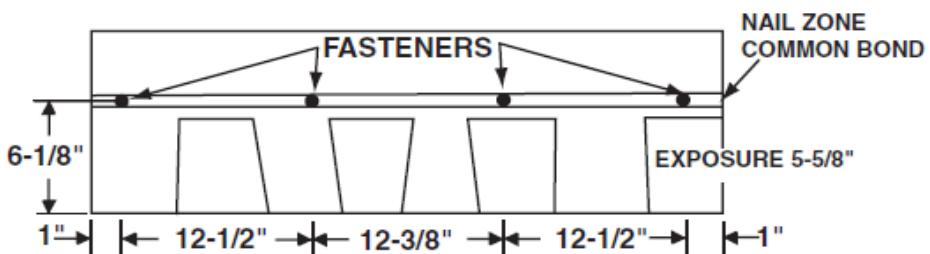
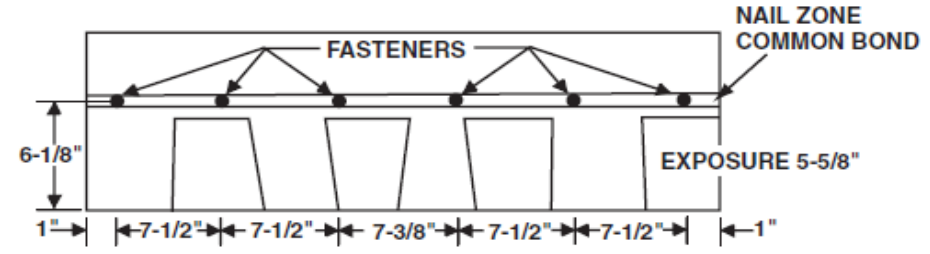
Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Phillipsburg, Frederick
Fastening Pattern:	For slopes 2:12 up to but less than 21:12 
Fastening Pattern:	For slopes equal to or greater than 21:12 

Table 6 – Heritage Woodgate

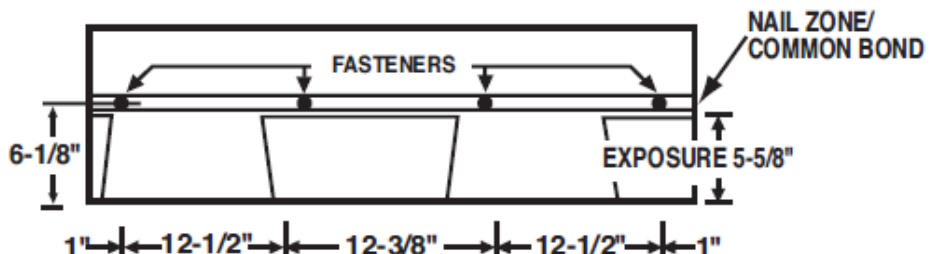
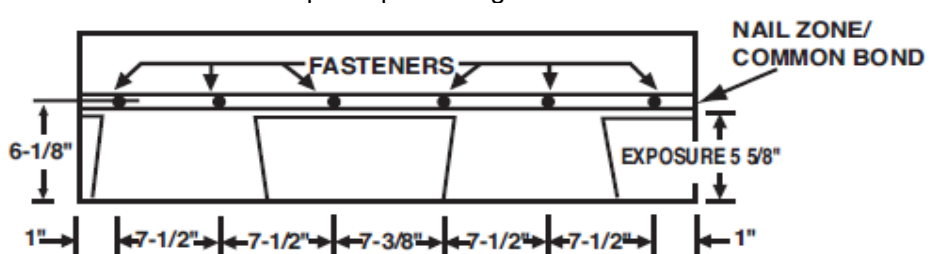
Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Dallas, Frederick
Fastening Pattern:	For slopes 2:12 up to but less than 21:12 
Fastening Pattern:	For slopes equal to or greater than 21:12 

Table 7 – Heritage Vintage

Dimensions:	17-1/2" x 40"
Plant Location(s):	Phillipsburg
Fastening Pattern:	For slopes 2:12 up to but less than 21:12
Fastening Pattern:	For slopes equal to or greater than 21:12 Apply under each tab 1" diameter asphalt adhesive cement.

Table 8 – Heritage Vintage 12 X 12 Hip and Ridge

Dimensions:	12" x 12"
Plant Location(s):	Phillipsburg
Fastening Pattern:	The diagram illustrates the fastening pattern for a 12" x 12" tile. It shows a square tile with a horizontal line near the top edge. Two dots on this line represent the nail locations. The distance from the top edge to the nail line is 5" (labeled 'Exposure'). The distance between the two nails is 5 1/2". The distance from each nail to the side edge is 1 in. The total width of the tile is 12".

Table 9 – 12- $\frac{1}{4}$ X 12 Hip and Ridge

Dimensions:	12- $\frac{1}{4}$ " x 12"
Plant Location(s):	Frederick, Joplin
Fastening Pattern:	12-$\frac{1}{4}$" 5 $\frac{1}{8}$" Exposure 1 in. Nails 5 $\frac{5}{8}$" 1 in. 12"

Table 10 – Heritage IR

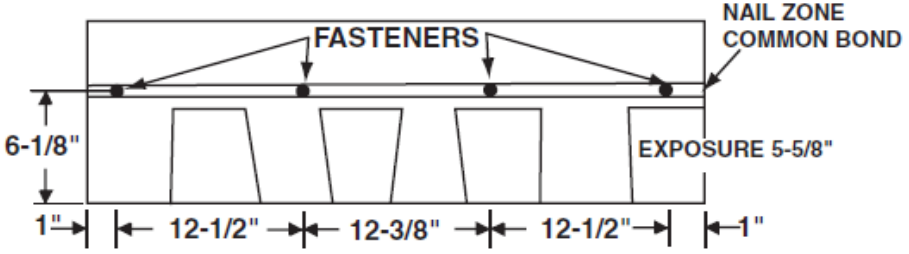
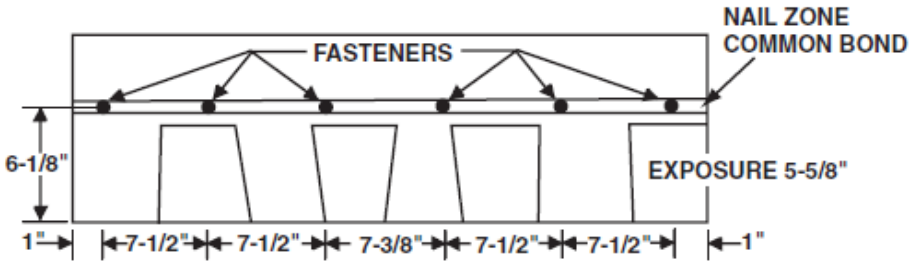
Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Joplin, Philipsburg
Fastening Pattern:	For slopes 2:12 up to but less than 21:12  6-$\frac{1}{8}$" 1" 12-$\frac{1}{2}$" 12-$\frac{3}{8}$" 12-$\frac{1}{2}$" 1" FASTENERS NAIL ZONE COMMON BOND EXPOSURE 5-$\frac{5}{8}$"
Fastening Pattern:	For slopes equal to or greater than 21:12  6-$\frac{1}{8}$" 1" 7-$\frac{1}{2}$" 7-$\frac{1}{2}$" 7-$\frac{3}{8}$" 7-$\frac{1}{2}$" 7-$\frac{1}{2}$" 1" FASTENERS NAIL ZONE COMMON BOND EXPOSURE 5-$\frac{5}{8}$"

Table 11 Heritage Hip and Ridge IR, Proline 12-¹/₄ x 12 Hip and Ridge

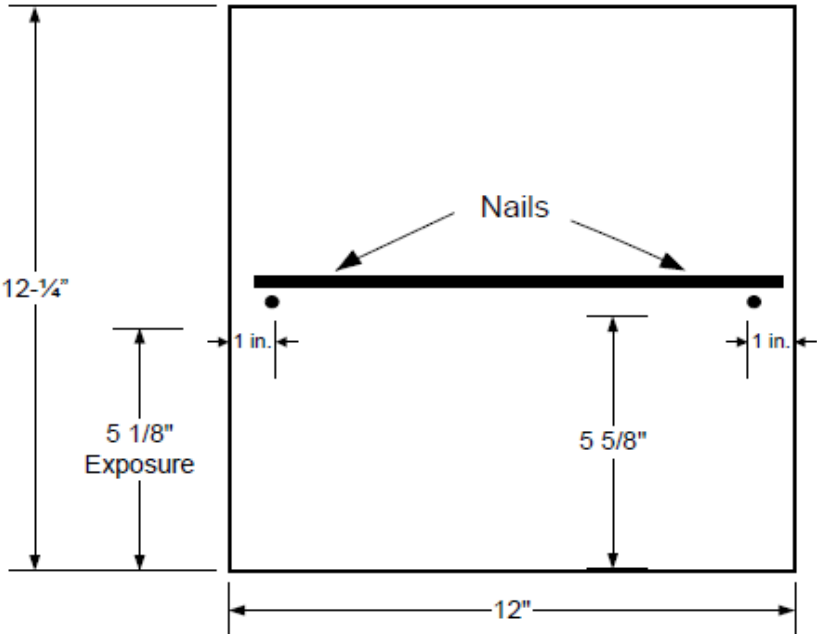
Dimensions:	12- ¹ / ₄ " x 12"
Plant Location(s):	Joplin
Fastening Pattern:	

Table 12 Heritage Vintage Starter

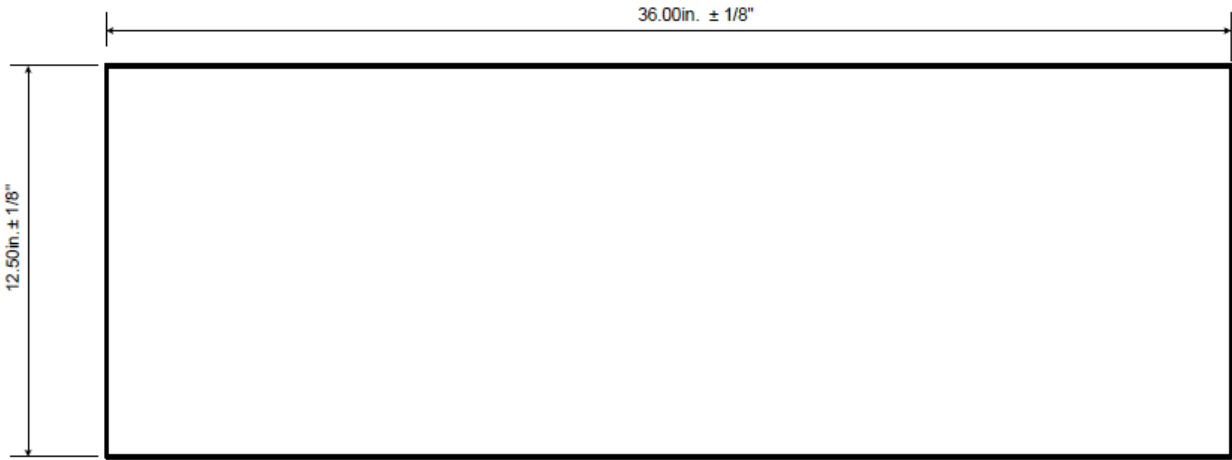


Table 13– Heritage Proline Titan XT

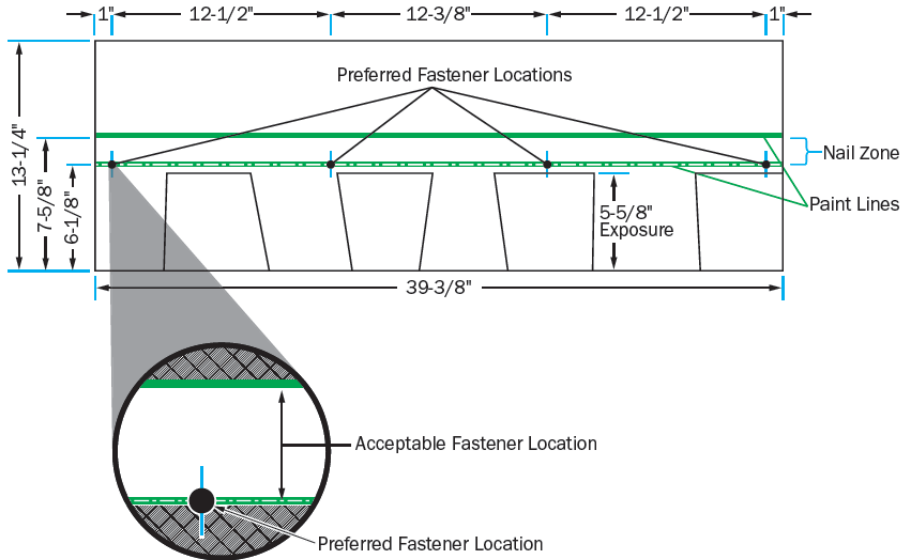
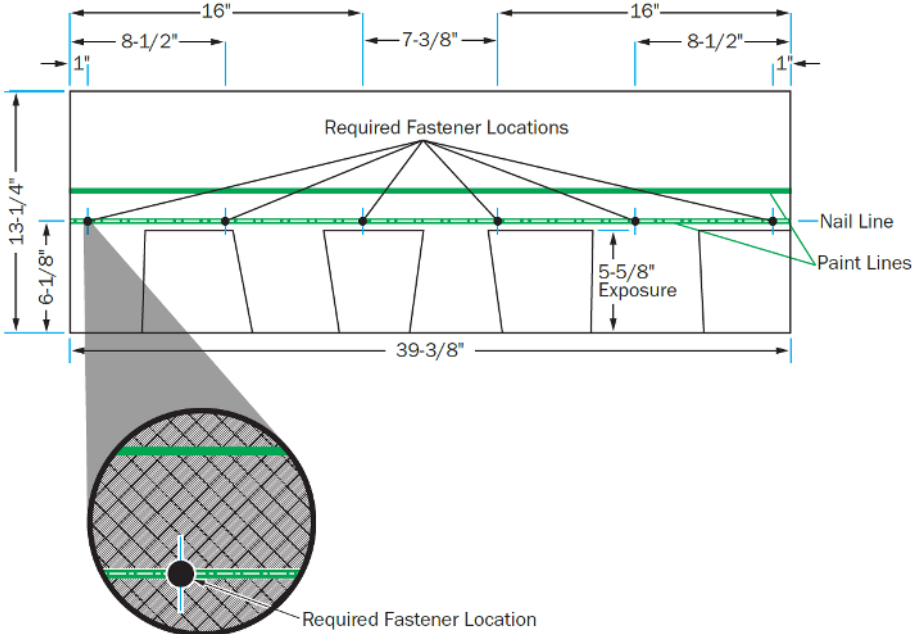
Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Frederick, Joplin, Tuscaloosa, Philipsburg, Dallas
Fastening Pattern:	For slopes 2:12 up to but less than 21:12  For slopes equal to or greater than 21:12 

Table 13A– Heritage Proline Stormfighter IR

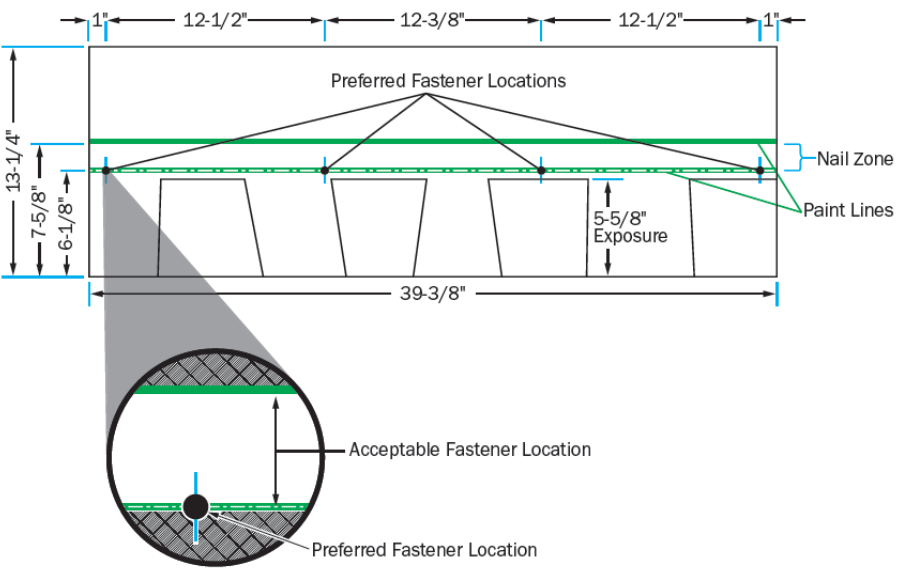
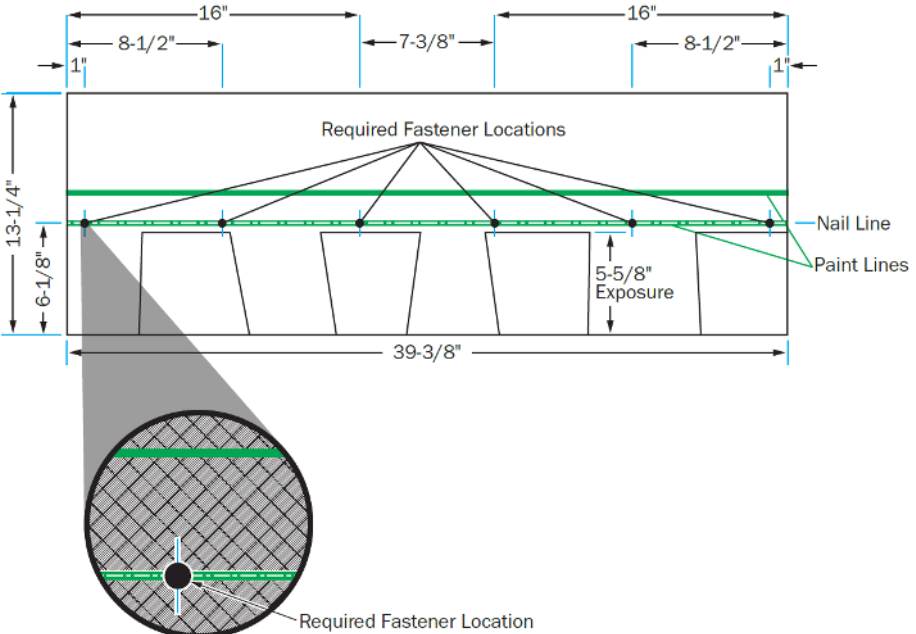
Dimensions:	13- $\frac{1}{4}$ " x 39- $\frac{3}{8}$ "
Plant Location(s):	Joplin, Philipsburg
Fastening Pattern:	For slopes 2:12 up to but less than 21:12  Preferred Fastener Locations Nail Zone Paint Lines 5-5/8" Exposure 39-3/8" 13-1/4" 7-5/8" 6-1/8" 1" 12-1/2" 12-3/8" 12-1/2" 1" Acceptable Fastener Location Preferred Fastener Location
Fastening Pattern:	For slopes equal to or greater than 21:12  Required Fastener Locations Nail Line Paint Lines 5-5/8" Exposure 39-3/8" 13-1/4" 6-1/8" 1" 8-1/2" 7-3/8" 8-1/2" 1" Required Fastener Location

Table 14– TAMKO 10-Inch Starter

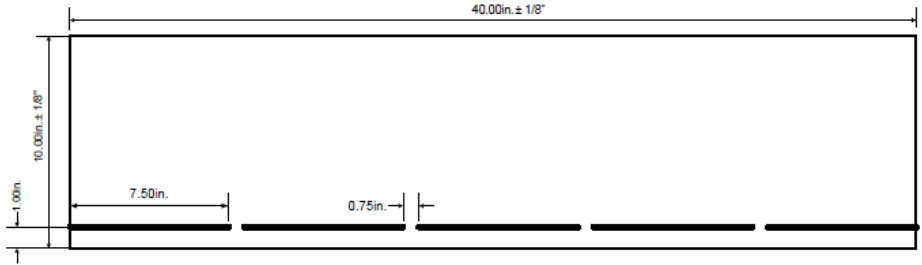
Dimensions:	10" x 40"
Plant Location:	Philipsburg
	For slopes 2:12 and greater  The diagram shows a rectangular starter with a height of 10.00in ± 1/8". The total length is 40.00in ± 1/8". It features a 1.00in wide top flange and a 7.50in wide bottom flange. There is a 0.75in gap between the bottom flange and the main body of the starter.

Table 15– TAMKO Perforated Starter

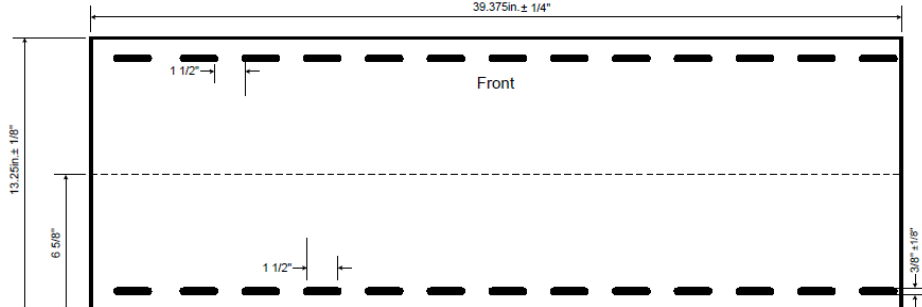
Dimensions:	13-1/4" x 39-3/8"
Plant Location:	Frederick
	For slopes 2:12 and greater  The diagram shows a rectangular perforated starter with a height of 13.25in ± 1/8". The total length is 39.375in ± 1/4". It features a 6 5/8" wide bottom flange and a 3/8" ± 1/8" wide bottom flange. The perforations are spaced at 1 1/2" intervals. The word "Front" is written in the center of the diagram.

Table 16– TAMKO Shingle Starter

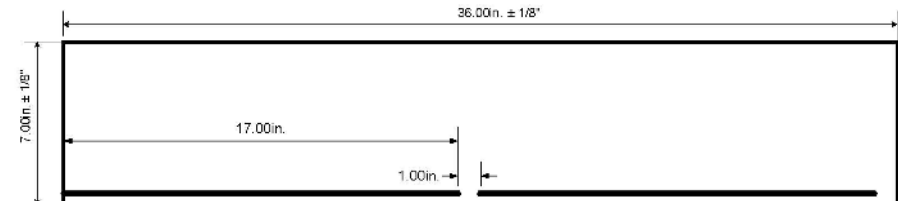
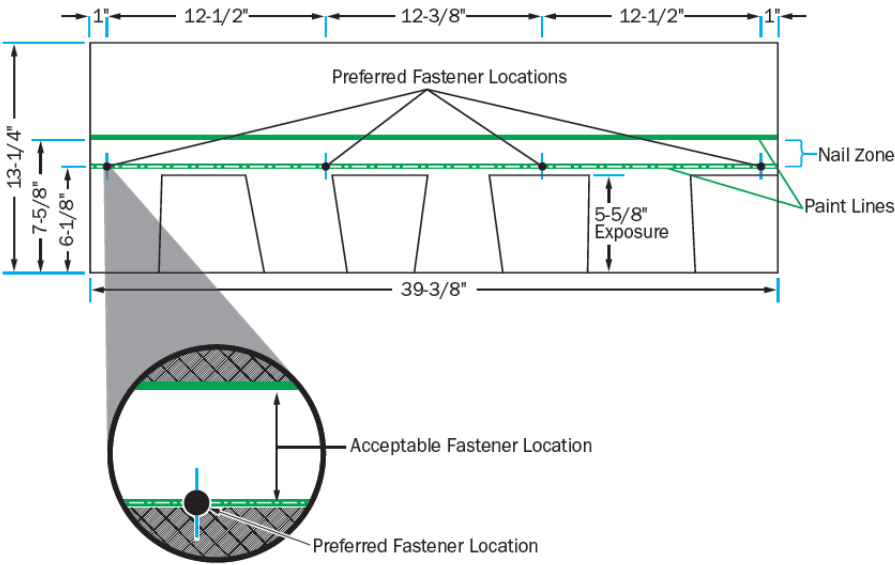
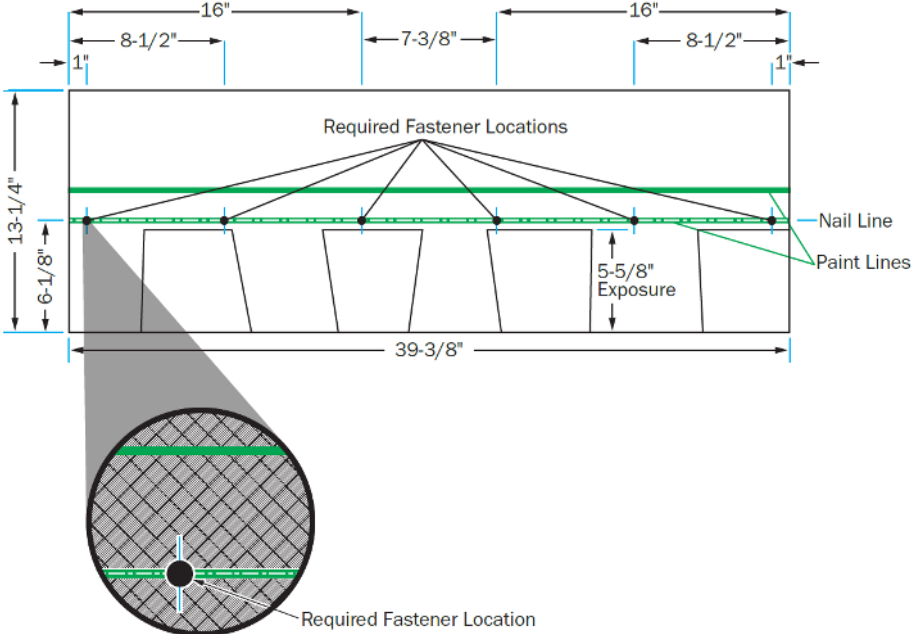
Dimensions:	7" x 36"
Plant Location:	Joplin
	For slopes 2:12 and greater  The diagram shows a rectangular shingle starter with a height of 7.00in ± 1/8". The total length is 36.00in ± 1/8". It features a 17.00in wide top flange and a 1.00in wide bottom flange.

Table 17 – Stormfighter Flex 3, Stormfighter Flex 4

Dimensions:	13-1/4" x 39-3/8"
Plant Location(s):	Frederick, Joplin, Tuscaloosa, Philipsburg, Dallas
Fastening Pattern:	For slopes 2:12 up to but less than 21:12  For slopes equal to or greater than 21:12 

UL Solutions Evaluation Reports

© 2023 UL LLC

This UL Solutions Evaluation Report is not an endorsement or recommendation for use of the subject and/or product described herein. This Report is not the UL Solutions Listing or UL Solutions Classification Report that covers the subject product. The subject product's UL Solutions Listing or UL Solutions Classification is covered under a separate UL Solutions Report. UL Solutions disclaims all representations and warranties whether express or implied, with respect to this Report and the subject or product described herein. Contents of this Report may be based on data that has been generated by laboratories other than UL Solutions that are accredited as complying with ISO/IEC Standard 17025 by the International Accreditation Service (IAS) or by any other accreditation body that is a signatory to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). The scope of the laboratory's accreditation shall include the specific type of testing covered in the test Report. As the accuracy of any non-UL Solutions data is the responsibility of the accredited laboratory, UL Solutions does not accept responsibility for the accuracy of this data.

UL Solutions Headquarters
333 Pfingsten Road
Northbrook, IL 60062-2096 USA
T: 847.272.8800
[UL.com/Solutions](https://www.ul.com/solutions)