NEMO|etc.
Certificate of Authorization #32455
353 Christian Street, Unit #13
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ENGINEER **TEST** **CONSULT**

P.E. EVALUATION REPORT (PEER)

Tarco Roofing
One Information Way, Suite 225
Little Rock, AR 72202
(254) 913-7750

PEER-TAR-001.B.R2
FL10450-R22 (HVHZ)
Date of Issuance: 02/20/2024
Revision 2: 04/09/2025

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, High Velocity Hurricane Zone** sections noted herein.

DESCRIPTION: Tarco Roof Underlayments (HVHZ)

LABELING: Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein and **FBC 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: "NEMO P.E. Evaluated" may be displayed in advertising literature. If any portion of the PEER is displayed, then it shall be in its entirety.

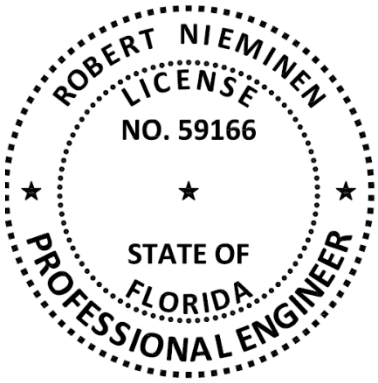
INSPECTION: Upon request, a copy of this entire PEER shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This PEER consists of pages 1 through 13.

Prepared by:

Digitally signed by Robert Nieminen
Date: 2025.04.09 '11:13:56 -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.

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: **Tarco Roof Underlayments**, as produced by **Tarco Roofing**, have demonstrated compliance with the following sections of the **8th Edition (2023) Florida Building Code, High Velocity Hurricane Zone** through testing in accordance with the following Standards. Compliance is subject to the Installation Requirements and Limitations of Use set forth herein.

2. STANDARDS:

SECTION	PROPERTY	STANDARD
1515.2.4	Impact Resistance	ASTM D3746
TAS 110	Material standard	ASTM D226
TAS 110	Material standard	ASTM D1970
TAS 110	Accelerated Weathering	ASTM D4798
TAS 110	Material standard	ASTM D6380
TAS 110	Material standard	TAS 103

3. REFERENCES:

ENTITY	EXAMINATION	REFERENCE	DATE
ERD (TST6049)	FM 4474	T37610.07.11	06/29/11
NEMO (TST6049)	TAS 103	TAR-SC8020.06.18	06/05/18
NEMO (TST6049)	ASTM D4798	4j-TAR-19-SSUDL.01.A	08/27/19
NEMO (TST6049)	ASTM D1970	4j-TAR-20-SSUDL-02.A	03/29/21
NEMO (TST6049)	ASTM D1623/D4798	4j-TAR-20-SSUDL-03.A	05/04/21
NEMO (TST6049)	TAS 103	4j-TAR-21-SSUDL-01.C	11/05/21
NEMO (TST6049)	ASTM D226, Type II	4j-TAR-21-SSUDL-01.B	12/21/21
NEMO (TST6049)	TA/LTA, TAS 103	4j-TAR-21-SSUDL-03.A	06/02/22
NEMO (TST6049)	ASTM D6380	4j-TAR-22-SSUDL-01.A	07/25/22
NEMO (TST6049)	ASTM D4798/D1623	4j-TAR-22-SSUDL-03.A	11/15/22
NEMO (TST6049)	FM 4474	4a-TAR-22-LSWUS-01.A	12/12/22
NEMO (TST6049)	TAS 103 (Tile Slip)	4j-TAR-23-SSUDL-03.A	03/13/23
NEMO (TST6049)	UL1897	4a-TAR-23-LSWUS-01.A	05/10/23
NEMO (TST6049)	ASTM D1970	4j-TAR-21-SSUDL-04.B	05/24/23
NEMO (TST6049)	TA/LTA, TAS 103	4j-TAR-23-SSUDL-01.A	06/14/23
NEMO (TST6049)	TA/LTA, TAS 103	4j-TAR-23-SSUDL-04.A	10/06/23
NEMO (TST6049)	Extended Weathering	4j-TAR-23-SSUDL-05.A	11/16/23
NEMO (TST6049)	ASTM D1970/TAS 110	4j-TAR-23-SSUDL-10.A	11/27/23
NEMO (TST6049)	UL1897	4a-TAR-23-LSWUS-03.A	12/20/23
NEMO (TST6049)	UL1897	4a-TAR-23-LSWUS-02.A	01/03/24
NEMO (TST6049)	UL1897	4a-TAR-LSWUS-001.A	05/14/24
NEMO (TST6049)	UL1897	4a-TAR-LSWUS-002.A	05/29/24
NEMO (TST6049)	UL1897	4a-TAR-LSWUS-004.A	06/18/24
NEMO (TST6049)	UL1897	4a-TAR-LSWUS-006.A	07/29/24
NEMO (TST6049)	UL1897	4a-TAR-LSWUS-008.A.R1	12/09/24
NEMO (TST6049)	UL1897	4a-TAR-LSWUS-010.A	04/08/25
NEMO	Traceability	FBC CLA	02/14/25
UL (QUA9625)	QA	Service Confirm	04/03/25
UL (QUA9625)	QA	Florida BCIS	Current

4. PRODUCT DESCRIPTION:

TABLE 1: EVALUATED UNDERLAYMENTS

PRODUCT	MATERIAL STANDARD	PLANT(S)	DESCRIPTION
#30 ASTM Specification Felt	ASTM D226, Type II	Greencastle, PA	asphalt-saturated organic felt
LeakBarrier® PS200HT Ice and Water Armor	ASTM D1970, FRSA/TRI and TAS 103	Greencastle, PA	self-adhering, glass mat reinforced, fabric surfaced, SBS modified roof underlayment
LeakBarrier® PS200MU Ice and Water Armor	ASTM D1970	Greencastle, PA	self-adhering, glass mat reinforced, smooth poly film surfaced, SBS modified roof underlayment
LeakBarrier® NR600 Ultra Ice and Water Armor	FRSA/TRI and TAS 103	Greencastle, PA	self-adhering, polyester-fabric surfaced, SBS modified roof underlayment
SRS Distribution TopShield TS600 Ice & Water	FRSA/TRI and TAS 103	Greencastle, PA	self-adhering, polyester-fabric surfaced, SBS modified roof underlayment
LeakBarrier® Self-Adhering Quick Roll Shingle Starter	ASTM D1970	Belton, TX Greencastle, PA	self-adhering, glass mat reinforced, mineral surfaced, SBS modified shingle starter roll
ASTM Organic Mineral Surface Tile Underlayment	ASTM D6380, Class M	Greencastle, PA	asphalt-saturated organic roll roofing sheet

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 is exclusively for use in FBC High Velocity Hurricane Zone jurisdictions, as defined in FBC Chapter 2 (Broward and Miami-Dade Counties).

5.3 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.

5.4 This PEER does not include evaluation of fire classification. Refer to **FBC 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.

5.5 **Tarco 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 PEER combined with supporting data for the prepared roof covering.

5.6 **Allowable Roof Covers:**

TABLE 2: ROOF COVER OPTIONS

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	CLAY AND CONCRETE TILE		METAL PANELS OR SHINGLES	SLATE OR SLATE-TYPE SHINGLES	WOOD SHINGLES OR SHAKES
		MECHANICAL ATTACH	ADHESIVE- OR MORTAR-SET			
#30 ASTM Specification Felt	Yes	Yes (Base Sheet per Table 4B)	Yes (Base Sheet per Table 4B)	Yes	Yes	Yes
LeakBarrier PS200HT	Yes	Yes	Yes (Table 2A)	Yes *(No copper or zinc)*	Yes	Yes (Valley Liner)
LeakBarrier PS200MU	Yes	No	No	Yes *(No copper or zinc)*	Yes	Yes (Valley Liner)

TABLE 2: ROOF COVER OPTIONS						
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	CLAY AND CONCRETE TILE		METAL PANELS OR SHINGLES	SLATE OR SLATE-TYPE SHINGLES	WOOD SHINGLES OR SHAKES
		MECHANICAL ATTACH	ADHESIVE- OR MORTAR-SET			
LeakBarrier NR600 Ultra	Yes	Yes	Yes (Table 2A)	Yes	Yes	Yes (Valley Liner)
TopShield TS600 Ice & Water	Yes	Yes	Yes (Table 2A)	Yes	Yes	Yes (Valley Liner)
LeakBarrier® Self-Adhering Quick Roll Shingle Starter	Yes (shingle starter only)	No	No	No	No	No
ASTM Organic Mineral Surface Tile Underlayment	Yes (Valley Liner)	Yes	Yes	No	No	No

5.6.1 **Allowable Tile Adhesives:**

TABLE 2A: ALLOWABLE UNDERLAYMENT / TILE-ADHESIVE COMBINATIONS[1]						
	TILE-ADHESIVE OPTIONS AND MIAMI-DADE NOA					
	DAP PRODUCTS		DUPONT	ICP CONSTRUCTION		MORTAR HOLDING FBC HVHZ APPROVAL OR NOA
	23-0327.12	22-0512.02	FL22525 & 22-0614.05	23-0614.01	22-0614.08	
UNDERLAYMENT	STORMBOND	STORMBOND 2	TILE BOND	APOC POLYSET AH-160	APOC POLYSET RTA-1	
LeakBarrier NR600 Ultra	Yes	Yes	Yes	Yes	Yes	No
TopShield TS600 Ice & Water	Yes	Yes	Yes	Yes	Yes	No
LeakBarrier PS200^{HT}	No	No	Yes	Yes	Yes	No
ASTM Organic Mineral Surface Tile Underlayment	Yes	Yes	Yes	Yes	Yes	Yes

5.7 **Allowable Substrates:**

TABLE 3: ALLOWABLE SUBSTRATE OPTIONS FOR ADHERED UNDERLAYMENTS				
UNDERLAYMENT	APPLICATION	SUBSTRATES (DESIGNED TO MEET CODE)		
		TYPE	PRIMER	MATERIAL(S)
LeakBarrier PS200^{HT}, LeakBarrier PS200^{MU}, LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water	self-adhering	Deck / sheathing	(Optional) ASTM D41	Plywood
		Deck	ASTM D41	structural concrete
		Base Sheet	None	ASTM D226 Type II felt
		Flashing / Valley	ASTM D41	aluminum, galvanized steel
ASTM Organic Mineral Surface Tile Underlayment	hot asphalt	Deck	ASTM D41	structural concrete
		Base Sheet	None	ASTM D226 Type II felt, ASTM D4601 base sheet

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

5.8 **Attachment Limitations:**

5.8.1 Refer to Section 6 for codified prescriptive systems.

5.8.2 Refer to Table 4A and Table 4B for underlayment systems which have documented compliance with Section 7 of TAS 103. The 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 has already been applied).

5.8.3 Unless otherwise noted, referenced back-nailing shall utilize corrosion resistant "nails and tin caps" meeting the specifications set forth in **FBC HVHZ 1517.5**.

TABLE 4A: ALLOWABLE DESIGN PRESSURES, ADHERED, DIRECT-TO-DECK UNDERLAYMENT SYSTEMS

SYSTEM NO.	DECK	PRIMER	JOINT TREATMENT	BASE PLY	CAP PLY	MDP (PSF)
UDL-1.	**New:** Plywood, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category **Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	(Optional) ASTM D41	None	(Optional) LeakBarrier PS200^{MU}, self-adhered and back-nailed max. 12-inch o.c.	LeakBarrier PS200^{HT}, LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-75.0
UDL-2.	**New:** Plywood, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category **Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	(Optional) ASTM D41	None	(Optional) LeakBarrier PS200^{MU}, self-adhered and back-nailed max. 12-inch o.c.	LeakBarrier PS200^{HT}, self-adhered and back-nailed max. 12-inch o.c.	-82.5
UDL-3.	**Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	None	None	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-105.0
UDL-4.	**New:** Plywood, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category **Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	(Optional) ASTM D41	Min. 4-inch wide strips of LeakBarrier PS200^{MU}	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-120.0
UDL-5.	**New:** Plywood, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category **Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	(Optional) ASTM D41	Min. 4-inch wide strips of LeakBarrier PS200^{MU}	(Optional) LeakBarrier PS200^{MU}, self-adhered and back-nailed max. 12-inch o.c.	LeakBarrier PS200^{HT}, self-adhered and back-nailed max. 12-inch o.c.	-120.0
UDL-6.	Nominal 1-inch, SYP, T&G **wood plank**	(Optional) ASTM D41	None	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-135.0
UDL-7.	**Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	ASTM D41	None	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-142.5
UDL-8.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS2, 19/32 category	None	None	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-142.5
UDL-9.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS2, 19/32 category	ASTM D41	None	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-150.0

TABLE 4A: ALLOWABLE DESIGN PRESSURES, ADHERED, DIRECT-TO-DECK UNDERLAYMENT SYSTEMS						
SYSTEM NO.	DECK	PRIMER	JOINT TREATMENT	BASE PLY	CAP PLY	MDP (PSF)
UDL-10.	Structural concrete	(Optional) ASTM D41	N/A	(Optional) LeakBarrier PS200^{MU}, self-adhered and back-nailed using FBC HVHZ Approved fasteners and plates, max. 12-inch o.c.	LeakBarrier PS200^{HT}, LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed using FBC HVHZ Approved fasteners and plates, max. 12-inch o.c.	-217.5
UDL-11.	Structural concrete	ASTM D41	N/A	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed using FBC HVHZ Approved fasteners and plates, max. 12-inch o.c.	-340.0

TABLE 4B: ALLOWABLE DESIGN PRESSURES, MECHANICALLY ATTACHED, MULTI-PLY UNDERLAYMENT SYSTEMS							
*Nails shall be corrosion resistant and be of sufficient length to penetrate through the sheathing by min. 3/16-inch.							
SYSTEM NO.	DECK	BASE SHEET			BASE PLY	CAP PLY	MDP (PSF)
		TYPE	FASTENERS	ATTACH			
UDL-12.	**New:** Plywood, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category **Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	#30 ASTM Specification Felt	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	6-inch o.c. at the 4-inch wide side laps and 6-inch o.c. at four (4) equally spaced, staggered center rows	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-45.0
UDL-13.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category	#30 ASTM Specification Felt	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	6-inch o.c. at the 4-inch wide side laps and 9-inch o.c. at two (2) equally spaced, staggered center rows	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed max. 12-inch o.c.	-45.0
UDL-14.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category	#30 ASTM Specification Felt	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	6-inch o.c. at the 4-inch wide side laps and 6-inch o.c. at three (3) equally spaced, staggered center rows	None	LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water, self-adhered and back-nailed max. 12-inch o.c.	-52.5
UDL-15.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category	#30 ASTM Specification Felt	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	6-inch o.c. at the 4-inch wide side laps and 6-inch o.c. at two (2) equally spaced, staggered center rows	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed max. 12-inch o.c.	-52.5

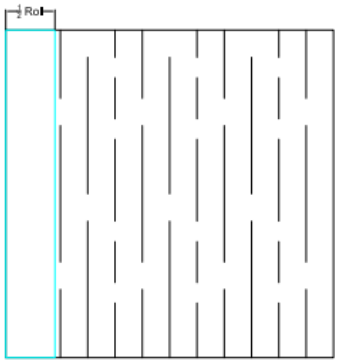
TABLE 4B: ALLOWABLE DESIGN PRESSURES, MECHANICALLY ATTACHED, MULTI-PLY UNDERLAYMENT SYSTEMS

*Nails shall be corrosion resistant and be of sufficient length to penetrate through the sheathing by min. 3/16-inch.

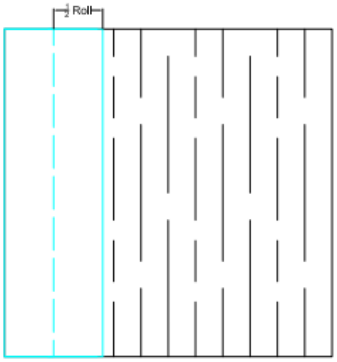
SYSTEM NO.	DECK	BASE SHEET			BASE PLY	CAP PLY	MDP (PSF)
		TYPE	FASTENERS	ATTACH			
UDL-16.	**Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	Double-layer application, #30 ASTM Specification Felt**	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	6x8-inch grid; start 6-inch o.c. with centerline 1-inch from starting edge, followed by rows spaced 8-inch o.c. with fasteners spaced 6-inch o.c. within each row.	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed max. 12-inch o.c.	-82.5

** Base sheet applied in double-layer application:

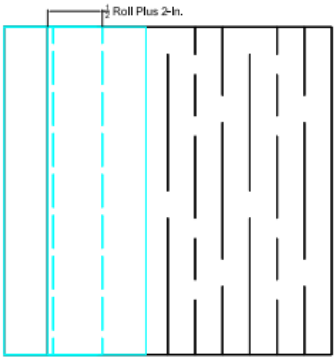
Apply a strip of base sheet for the first course that is half the width of a full sheet, fastened sufficiently to hold in place.



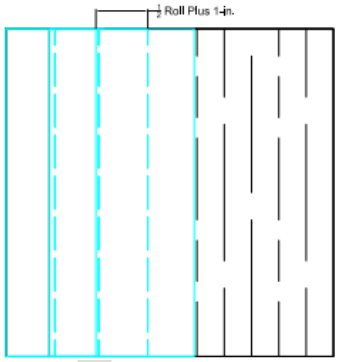
Apply a full sheet of a base sheet for the second course, fully overlapping the first half-width course.



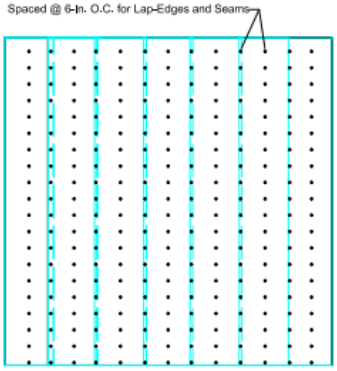
Apply the third course of base sheet overlapping the second course half the width of a full sheet plus 2 inches.



Overlap all successive courses half the width of a full sheet plus 1 inch.



Fastening: 12 ga. x 1.5-inch long x 3/8-inch head diameter annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, 6x8-inch grid; start 6-inch o.c. with centerline 1-inch from start-edge, followed by rows spaced at the 8-inch o.c. with fasteners spaced 6-inch o.c. within each row.



ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed using 12 ga. annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, max 12-inch o.c.

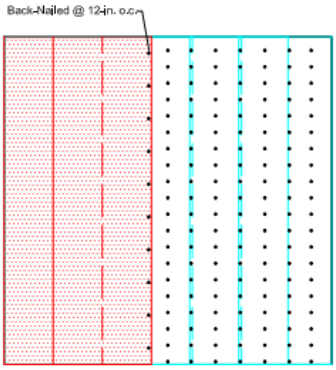


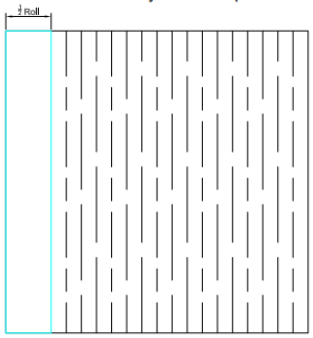
TABLE 4B: ALLOWABLE DESIGN PRESSURES, MECHANICALLY ATTACHED, MULTI-PLY UNDERLAYMENT SYSTEMS

*Nails shall be corrosion resistant and be of sufficient length to penetrate through the sheathing by min. 3/16-inch.

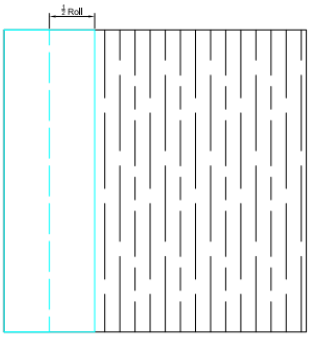
SYSTEM NO.	DECK	BASE SHEET			BASE PLY	CAP PLY	MDP (PSF)
		TYPE	FASTENERS	ATTACH			
UDL-17.	**Reroof:** Plywood, APA rated sheathing, 32/16, Exposure 1, PS1, 15/32 category	Double-layer application, #30 ASTM Specification Felt**	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	4x8-inch grid; start 4-inch o.c. with centerline 1-inch from starting edge, followed by rows spaced 8-inch o.c. with fasteners spaced 4-inch o.c. within each row.	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed max. 12-inch o.c.	-90.0

** Base sheet applied in double-layer application:

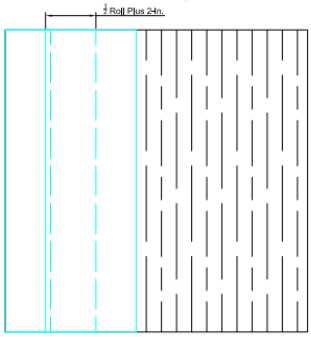
Apply a strip of base sheet for the first course that is half the width of a full sheet, fastened sufficiently to hold in place.



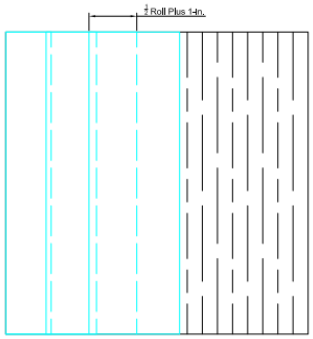
Apply a full sheet of a base sheet for the second course, fully overlapping the first half-width course.



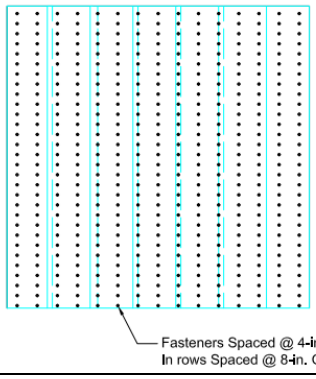
Apply the third course of base sheet overlapping the second course half the width of a full sheet plus 2 inches.



Overlap all successive courses half the width of a full sheet plus 1 inch.



Fastening: 12 ga. x 1.5-inch long x 3/8-inch head diameter annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, 4x8-inch grid; start 4-inch o.c. with centerline 1-inch from starting edge, followed by rows spaced 8-inch o.c. with fasteners spaced 4-inch o.c. within each row.



ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed using 12 ga. annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, max. 12-inch o.c.

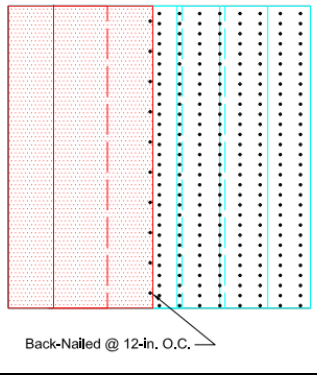


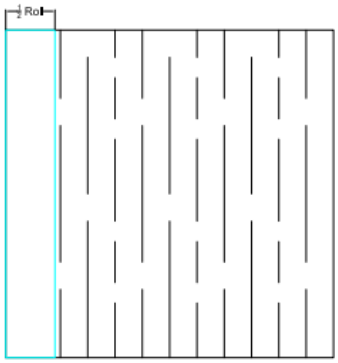
TABLE 4B: ALLOWABLE DESIGN PRESSURES, MECHANICALLY ATTACHED, MULTI-PLY UNDERLAYMENT SYSTEMS

*Nails shall be corrosion resistant and be of sufficient length to penetrate through the sheathing by min. 3/16-inch.

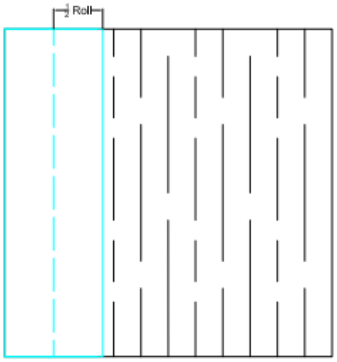
SYSTEM NO.	DECK	BASE SHEET			BASE PLY	CAP PLY	MDP (PSF)
		TYPE	FASTENERS	ATTACH			
UDL-18.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category	Double-layer application, #30 ASTM Specification Felt**	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	6x8-inch grid; start 6-inch o.c. with centerline 1-inch from start-edge, followed by rows spaced at the 8-inch o.c. with fasteners spaced 6-inch o.c. within each row.	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed max. 12-inch o.c.	-90.0

** Base sheet applied in double-layer application:

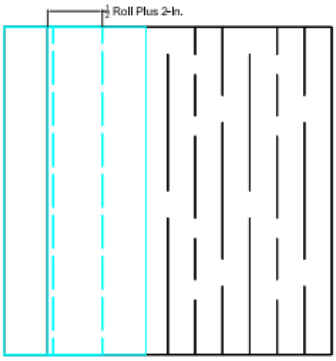
Apply a strip of base sheet for the first course that is half the width of a full sheet, fastened sufficiently to hold in place.



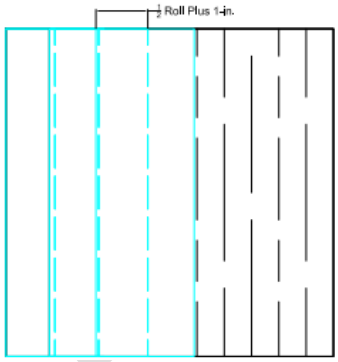
Apply a full sheet of a base sheet for the second course, fully overlapping the first half-width course.



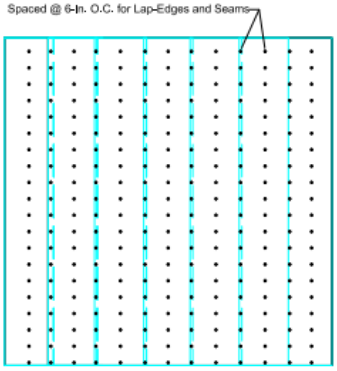
Apply the third course of base sheet overlapping the second course half the width of a full sheet plus 2 inches.



Overlap all successive courses half the width of a full sheet plus 1 inch.



Fastening: 12 ga. x 1.5-inch long x 3/8-inch head diameter annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, 6x8-inch grid; start 6-inch o.c. with centerline 1-inch from start-edge, followed by rows spaced at the 8-inch o.c. with fasteners spaced 6-inch o.c. within each row.



ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed using 12 ga. annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, max 12-inch o.c.

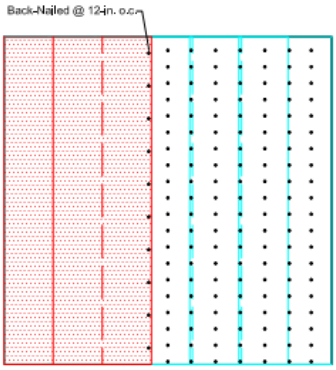


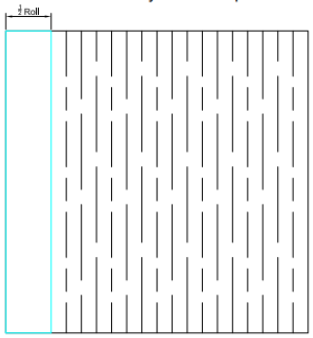
TABLE 4B: ALLOWABLE DESIGN PRESSURES, MECHANICALLY ATTACHED, MULTI-PLY UNDERLAYMENT SYSTEMS

*Nails shall be corrosion resistant and be of sufficient length to penetrate through the sheathing by min. 3/16-inch.

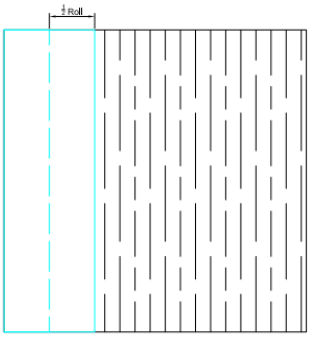
SYSTEM NO.	DECK	BASE SHEET			BASE PLY	CAP PLY	MDP (PSF)
		TYPE	FASTENERS	ATTACH			
UDL-19.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category	#30 ASTM Specification Felt	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	4-inch o.c. at the 4-inch wide side laps and 4-inch o.c. at three (3) equally spaced center rows	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed using nails and tin caps*, max. 12-inch o.c.	-105.0
UDL-20.	**Plywood**, APA rated sheathing, 40/20, Exposure 1, PS1, 19/32 category	Double-layer application, #30 ASTM Specification Felt**	12 ga. x 3/8-inch head diameter annular ring shank roofing nails* through 32 ga. x 1-5/8-inch dia. tin caps	4x8-inch grid; start 4-inch o.c. with centerline 1-inch from start-edge, followed by rows spaced at the 8-inch o.c. with fasteners spaced 4-inch o.c. within each row.	None	ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed max. 12-inch o.c.	-142.5

** Base sheet applied in double-layer application:

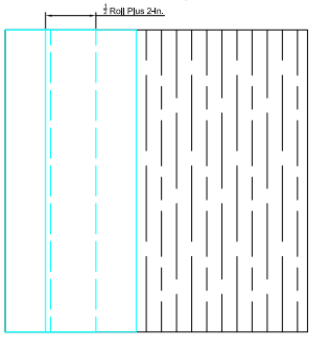
Apply a strip of base sheet for the first course that is half the width of a full sheet, fastened sufficiently to hold in place.



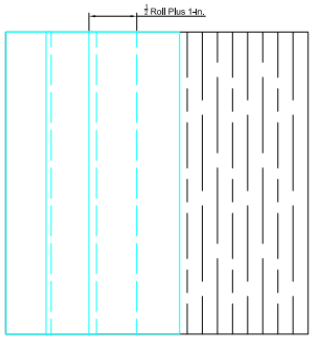
Apply a full sheet of a base sheet for the second course, fully overlapping the first half-width course.



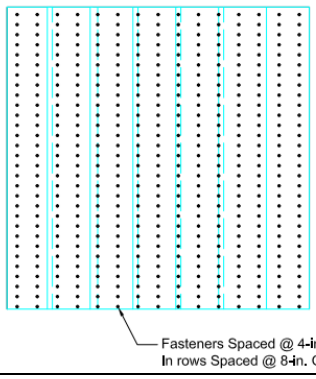
Apply the third course of base sheet overlapping the second course half the width of a full sheet plus 2 inches.



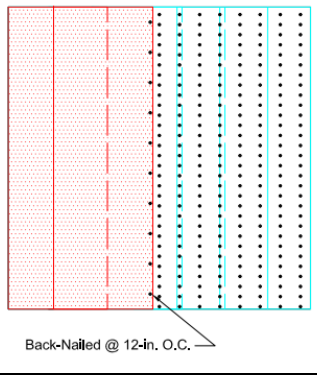
Overlap all successive courses half the width of a full sheet plus 1 inch.



Fastening: 12 ga. x 1.5-inch long x 3/8-inch head diameter annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, 4x8-inch grid; start 4-inch o.c. with centerline 1-inch from starting edge, followed by rows spaced 8-inch o.c. with fasteners spaced 4-inch o.c. within each row.



ASTM Organic Mineral Surface Tile Underlayment, applied in ASTM D312, Type IV hot asphalt and back-nailed using 12 ga. annular ring shank roofing nails and 32 ga., 1-5/8-inch diameter tin caps, max. 12-inch o.c.



5.9 **Exposure Limitations:**

TABLE 5: EXPOSURE LIMITATIONS		
UNDERLAYMENT	PREPARED ROOF COVER INSTALLATION TYPE	MAXIMUM EXPOSURE (DAYS)
LeakBarrier PS200^{MU}	Mechanically attached	30
LeakBarrier Self-Adhering Quick Roll Shingle Starter	Asphalt shingles	30
LeakBarrier PS200^{HT}	Any type (per Table 2)	180
ASTM Organic Mineral Surface Tile Underlayment	Any type (per Table 2)	180
LeakBarrier NR600 Ultra	Any type (per Table 2)	360
TopShield TS600 Ice & Water	Any type (per Table 2)	360

5.10 **Tile Slippage Limitations:** When loading roof tiles on the underlayment, the maximum roof pitch shall be as follows. These pitch limitations can only be exceeded by using battens or loading boards during loading of the roof tiles.

TABLE 6: TILE SLIPPAGE LIMITATIONS			
UNDERLAYMENT*	TILE PROFILE	STAGING METHOD	MAXIMUM STAGING PITCH
LeakBarrier PS200^{HT}	Flat or Lugged	6-tile stack (4 over 2)	6:12
LeakBarrier NR600 Ultra	Flat or Lugged	10-tile stack	6:12
TopShield TS600 Ice & Water	Flat or Lugged	10-tile stack	6:12
2-ply system; LeakBarrier PS200^{MU} followed by LeakBarrier NR600 Ultra or TopShield TS600 Ice & Water	Flat or Lugged	10-tile stack	6:12
ASTM Organic Mineral Surface Tile Underlayment	Flat	6-tile stack (4 over 2)	5:12
	Lugged	6-tile stack (4 over 2)	6:12

*Notes: *Tarco specifies a minimum 48 cure-time after the installation of self-adhering membranes and before loading of roofing tiles.*

6. INSTALLATION:

6.1 **Tarco Roof Underlayments** shall be installed in accordance with **Tarco Roofing** installation instructions subject to the Limitations of Use herein and the specifics noted below.

6.1.1 Consult Tarco requirements for back-nailing at pitch of 2:12 or greater.

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 Refer to Section 6.4 for underlayments having prescriptive codified minimum attachment or Table 4A and 4B for underlayment systems having maximum design pressures established in accordance with Section 7 of TAS 103.

6.4 Underlayment Assemblies with Prescriptive Minimum Attachment for use in NON-TILE applications:

6.4.1

CODE REFERENCE:	**1518.2.1, Option 1:** Underlayment adhered to deck	
DECK DESCRIPTION:	Code-minimum wood or structural concrete deck to the satisfaction of the Authority Having Jurisdiction (refer to Table 3 for specific underlayment/substrate combinations)	
UNDERLAYMENT:	BASE PLY:	(Optional) **LeakBarrier® PS200^{MU}** self-adhered in accordance with FBC Section 1518.2.1(1) and back-nailed max. 12-inch o.c. using FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5) or FBC HVHZ Approved concrete fasteners and plates.
	CAP PLY:	**LeakBarrier® PS200^{MU}, LeakBarrier® PS200^{HT} or LeakBarrier® NR600 Ultra or TopShield TS600 Ice & Water** self-adhered in accordance with FBC Section 1518.2.1(1) and back-nailed max. 12-inch o.c. using FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5) or FBC HVHZ Approved concrete fasteners and plates.
SURFACING:	FBC HVHZ Approved asphalt shingles, metal roof panels or metal shingles, slate or slate type shingles, subject to the allowable roof covers in Table 2 herein.	

6.4.2	**CODE REFERENCE:**	**1518.2.1, Option 2:** Self-adhering strips to deck-joints followed by underlayment mechanically attached to deck
	DECK DESCRIPTION:	Code-minimum wood deck to the satisfaction of the Authority Having Jurisdiction
	SECONDARY WATER BARRIER:	Min. 3 ¾-inch wide strips of **LeakBarrier® PS200^{MU}, LeakBarrier® PS200^{HT}, LeakBarrier® NR600 Ultra or TopShield TS600 Ice & Water** self-adhered over joints of the roof deck prior to installation of subsequent layer(s) in accordance with FBC Section 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:	**#30 ASTM Specification Felt** in accordance with FBC HVHZ Table 1518.2.1, with a minimum 4-inch side lap and 6-inch end lap, mechanically fastened to deck
	FASTENING:	FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5), grid pattern of 12-inches between the overlaps and 6-inch spacing at the overlaps, in accordance with FBC HVHZ Table 1518.2.1.
	SURFACING:	FBC HVHZ Approved asphalt shingles, metal roof panels or metal shingles, slate or slate type shingles, wood shakes or wood shingles, subject to the allowable roof covers in Table 2 herein.
6.4.3	**CODE REFERENCE:**	**1518.2.1, Option 3:** Two-layer underlayment mechanically fastened to deck
	DECK DESCRIPTION:	Code-minimum wood deck to the satisfaction of the Authority Having Jurisdiction
	UNDERLAYMENT:	Two (2) layers of **#30 ASTM Specification Felt** in accordance with FBC HVHZ 1518.2.1(3).
	FASTENING:	FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5) 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, wood shakes or wood shingles, subject to the allowable roof covers in Table 2 herein.
6.4.4	**CODE REFERENCE:**	**1518.2.1, Option 1 combined with Option 2 or 3:** Optional self-adhering strips to deck-joints followed by base sheet mechanically fastened to deck followed by underlayment adhered to base sheet
	DECK DESCRIPTION:	Code-minimum wood deck to the satisfaction of the Authority Having Jurisdiction
	SECONDARY WATER BARRIER:	(Optional) Min. 3 ¾-inch wide strips of **LeakBarrier® PS200^{MU}, LeakBarrier® PS200^{HT}, LeakBarrier® NR600 Ultra or TopShield TS600 Ice & Water** self-adhered over joints of the roof deck prior to installation of subsequent layer(s) in accordance with FBC Section 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.
	BASE SHEET:	One (1) layer of **#30 ASTM Specification Felt** or FBC HVHZ Approved ASTM D226, Type II felt, in accordance with FBC Table 1518.2.1, with a minimum 4-inch side lap and 6-inch end lap or two (2) layers of **#30 ASTM Specification Felt** or FBC HVHZ Approved ASTM D226, Type II felt in accordance with FBC Section 1518.2.1(3), mechanically fastened to deck.
	FASTENING:	FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5), grid pattern of 12-inches between the overlaps and 6-inch spacing at the overlaps, in accordance with FBC Table 1518.2.1 or FBC Section 1518.2.1(3).
	UNDERLAYMENT:	BASE PLY: (Optional) **LeakBarrier® PS200^{MU}** self-adhering and back-nailed max. 12-inch o.c. using FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5). CAP PLY: **LeakBarrier® PS200^{MU}, LeakBarrier® PS200^{HT}, LeakBarrier® NR600 Ultra or TopShield TS600 Ice & Water** self-adhering and back-nailed max. 12-inch o.c. using FBC HVHZ Approved nails and tin caps (FBC HVHZ 1517.5).
	SURFACING:	FBC HVHZ Approved asphalt shingles, metal roof panels or metal shingles, slate or slate type shingles, subject to the allowable roof covers in Table 2 herein.

6.5 Shingle Starters:

LeakBarrier® Self-Adhering Quick Roll Shingle Starter may be used as a starter-course at eaves and/or rakes for asphalt shingle roof installations. Installation shall be in accordance with the manufacturer's instructions.

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:

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:

UL LLC – QUA9625; (360) 817-5512; bsai.inspections@ul.com

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