



**NEMO | etc.**

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ENGINEER

EVALUATE

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## Laboratory Report 4c-HRT-23-LSOTM-01.A.R2

**Uplift Resistance Testing**  
*of*  
**Lap Ridge and V Ridge Tiles**  
*in accordance with*  
**SSTD 11-97**

**Prepared for: Hecker Ridge Tile, LLC**

47177 Conrad Anderson Rd.

Hammond, LA 70401

c/o: John Hecker

**Test Lab: NEMO | etc.**

10 Mauney Court

Columbia, SC 29201

**Date of Issuance: 2023-09-14**

**Revision 2: 2023-10-10**

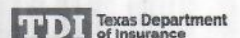
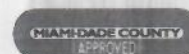
NEMO ETC, LLC  
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TL-199



TL-689





**LABORATORY REPORT**

**CLIENT OBJECTIVE**

Establish wind uplift resistance performance of proprietary hip and ridge tile configurations.

**TESTING SCOPE**

Uplift resistance testing of Lap Ridge and V Ridge tiles in accordance with SBCCI-SSTD 11-99.

**SAMPLES**

INSULATION / COVERBOARDS	BY
V Ridge Tiles	Hecker Ridge Tiles
Lap Ridge Tiles	Hecker Ridge Tiles
ADHESIVE / PRIMERS	BY
MasterSeal NP 1	MBCC Group
APOC 705 Polyset RTA-1 Roof Tile Adhesive	APOC / ICP Construction
SAKRETE® Portland Cement Type I-II	SAKRETE
FASTENERS / PLATES	BY
#12 x 4-in. Stainless Steel wood screws	Generic
3-in. Stainless Steel ring shank nails	Generic

**TEST PROGRAM**

PROJECT	DURATION	PERSONNEL
NUMBER: 4a-HRT-23-LSOTM-01	PSA SIGNED: 2023-04-18	NEMO: C. Phillips
CLIENT REFERENCE: N/A	MATERIALS RECEIVED: 2023-06-16	
MD NOTIFICATION: N/A	TEST START: 2023-07-28	CLIENT (BUILDS): M. Miller
TRACEABILITY	TEST END: 2023-08-10	
VIA: Product Labels		CLIENT (TEST): M. Miller
BY: Client		
DATE: N/A		

**APPENDICES**

- Appendix 1 Statement of Limitation
- Appendix 2 Decision Rule 1
- Appendix 3 Traceability
- Appendix 4 Tests, Standards, Equipment and Outsourced Log
- Appendix 5 Standard References

1. UPLIFT RESISTANCE:

1.1 Specimen Preparation:

Six (6) specimens are constructed by client-representatives for each build combination and witnessed by NEMO|etc. and client personnel. The panels are allowed a maximum cure-time of 28-days.

**Build #1:  
Lap Ridge Tile with MasterSeal NP  
1 Adhesive**

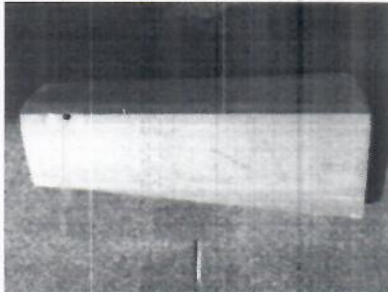


Fig. 1a. #12 x 4"-screw installed at tail (backmost hole) of Lap Ridge Tile



Fig. 1b. Two 6-in. long 0.25-in. wide beads of MasterSeal NP 1 at fastened tail of Lap Ridge Tile



Fig. 1c. Lap Ridge Tile finished installation

**Build #2:  
Lap Ridge Tile with APOC 705 Polyset  
RTA-1 Roof Tile Adhesive**

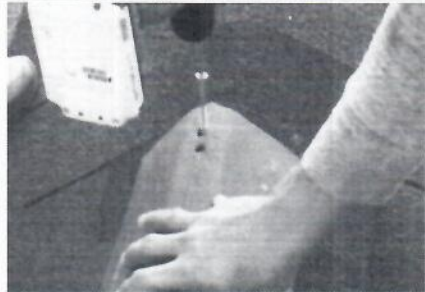


Fig. 2a. #12 x 4"-screw installed at tail (backmost hole) of Lap Ridge Tile

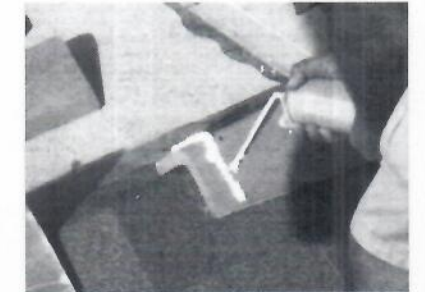


Fig. 2b. APOC 705 Polyset RTA-1 Roof Tile Adhesive applied to fastened tail of Lap Ridge Tile



Fig. 2c. Lap Ridge Tile finished installation

**Build #3:  
V Ridge Tile with ring shank nails encased  
in SAKRETE Portland Cement Type I-II**

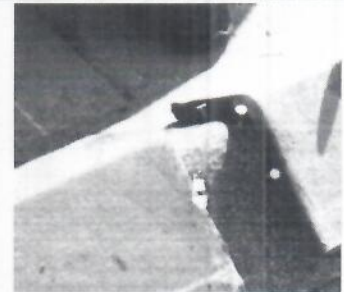


Fig. 3a. V Ridge Tiles with three (3) ring shank nails adjacent to the tail

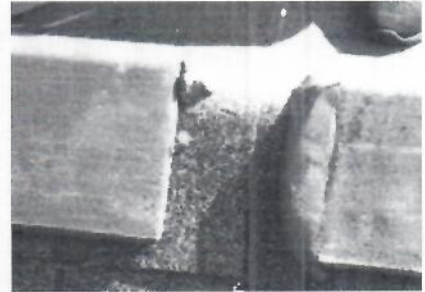


Fig. 3b. SAKRETE Portland Cement Type I-II applied to V Ridge Tiles, encasing the ring shank nails

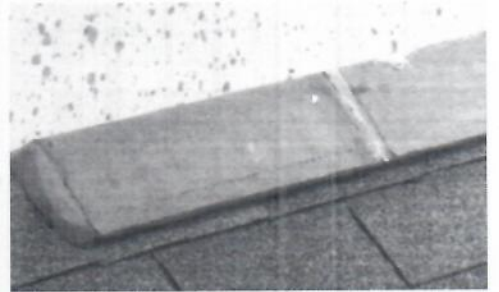


Fig. 3c. V Ridge Tile finished installation

1.2 **Procedure:**

Using a load application frame, load is applied to the epoxy bolt at a rate to cause a deflection of approximately 1-in. per min.

1.3 **Results:**

TABLE 1A: TEST RESULTS, BUILD #1 LAP RIDGE TILE WITH MASTERSEAL NP 1				
<b>ATTACHMENT:</b>	#12 x 4-in. Stainless Steel wood screw at back-most hold of tile, 3-in. head lap, embedded minimum 2 inches into the 2x6 ridge board/structural member.			
<b>ADHESIVE RATES:</b>	MasterSeal NP 1: Two (2) 0.25-in. wide x 6-in. long beads of across tile-width at the 3-in. headlap and one (1) 0.25-in. x 3-in. long bead longitudinally across the fastener location			
<b>CURE TIME (DAYS):</b>	14			
Specimen #	Failing Load, lbf	Mode of Failure	Tile Deflection, in.	Tile Rotation
1	431.5	Fastener Withdrawal	< 0.25	None
2	420.0	Fastener Withdrawal	< 0.25	None
3	350.0	Fastener Withdrawal	< 0.25	None
4	433.0	Fastener Withdrawal	< 0.25	None
5	335.5	Fracture Tile	< 0.25	None
6	357.5	Fracture Tile	< 0.25	None
<b>Tile surface area, sq. ft</b>			<b>1.3</b>	
<b>Fastening system contribution to uplift, lbf</b>			<b>188.9</b>	
<b>Uplift resistance, psf</b>			<b>145.3</b>	
<b>Allowable overturning moment, ft-lbf</b>			<b>239</b>	
<b>Lowest failure overturning moment, ft-lbf</b>			<b>184</b>	

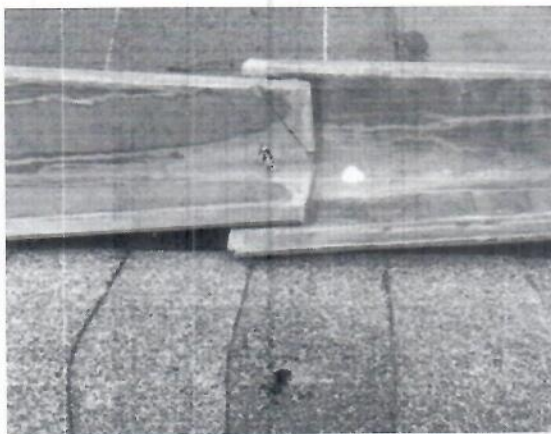


Fig. 4a. MOF, fastener withdrawal (typical)

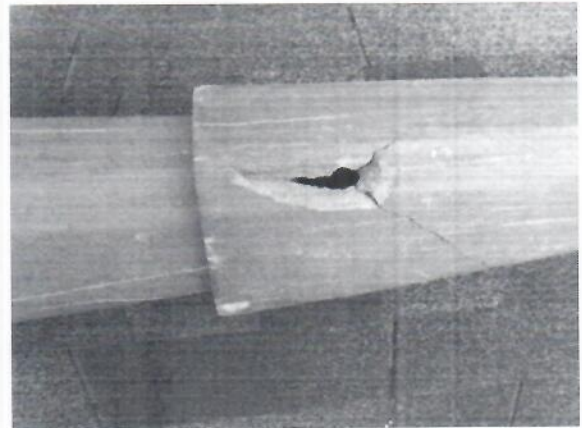


Fig. 4b. MOF, fracture tile (typical)

**TABLE 1B: TEST RESULTS, BUILD #2**  
**LAP RIDGE TILE WITH APOC 705 POLYSET RTA-1 ROOF TILE ADHESIVE**

<b>ATTACHMENT:</b>	#12 x 4-in. Stainless Steel wood screw at back-most hold of tile, embedded minimum 2 inches into the 2x6 ridge board/structural member.			
<b>ADHESIVE RATES:</b>	APOC 705 Polyset RTA-1 Roof Tile Adhesive: One (1) ~1-in. wide x 6-in. long ribbon across tile-width at 3-in. headlap and one (1) ~1-in. wide x 2-in. long ribbon longitudinally over fastener location			
<b>CURE TIME (DAYS):</b>	14			
<b>Specimen #</b>	<b>Failing Load, lbf</b>	<b>Mode of Failure</b>	<b>Tile Deflection, in.</b>	<b>Tile Rotation</b>
1	461.0	Cohesive Foam	< 0.25	None
2	355.0	Fracture Tile	< 0.25	None
3	327.5	Loading Bolt Withdrawal	< 0.25	None
4	566.0	Fracture Tile	< 0.25	None
5	463.5	Cohesive Foam	< 0.25	None
6	379.0	Cohesive Foam	< 0.25	None
<b>Tile surface area, sq. ft</b>			<b>1.3</b>	
<b>Fastening system contribution to uplift, lbf</b>			<b>207.6</b>	
<b>Uplift resistance, psf</b>			<b>159.7</b>	
<b>Allowable overturning moment, ft-lbf</b>			<b>235.0</b>	
<b>Lowest failure overturning moment, ft-lbf</b>			<b>179.6</b>	

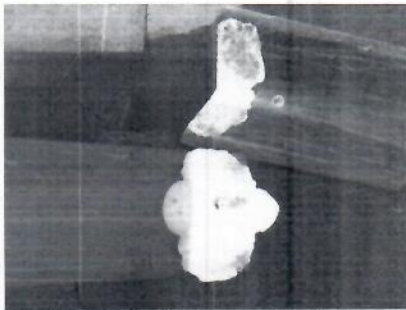


Fig. 5a. MOF, Cohesive foam (typical)

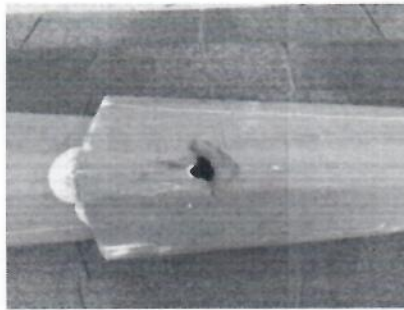


Fig. 5b. MOF, fracture tile (typical)

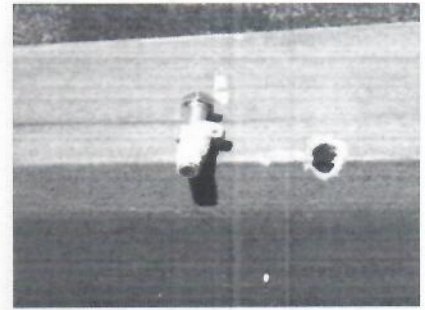
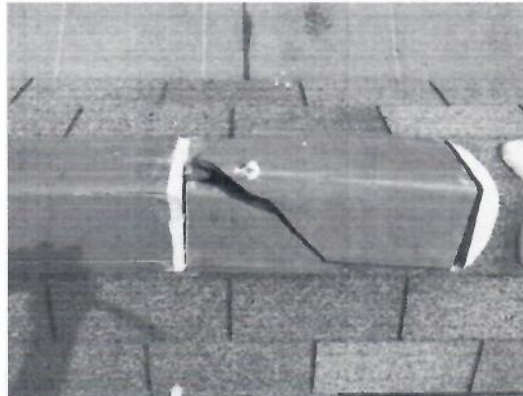


Fig. 5c. MOF, loading-bolt withdrawal (typical)

**TABLE 1C: TEST RESULTS, BUILD #3  
 V RIDGE TILE WITH SAKRETE PORTLAND CEMENT TYPE I-II**

<b>ATTACHMENT:</b>	Three (3) ring Stainless Steel shank nails adjacent to tile-ends at each butt-joint			
<b>ADHESIVE RATES:</b>	SAKRETE Portland Cement Type I-II mortar joints at each butt-joint, encasing the ring shank nails in mortar			
<b>CURE TIME (DAYS):</b>	28			
<b>Specimen #</b>	<b>Falling Load, lbf</b>	<b>Mode of Failure</b>	<b>Tile Deflection, in.</b>	<b>Tile Rotation</b>
1	439.5	Fracture Tile	< 0.25	None
2	287.0	Fracture Tile	< 0.25	None
3	244.5	Fracture Tile	< 0.25	None
4	404.5	Fracture Tile	< 0.25	None
5	299.5	Fracture Tile	< 0.25	None
6	311.0	Fracture Tile	< 0.25	None
<b>Tile surface area, sq. ft</b>			<b>1.5</b>	
<b>Fastening system contribution to uplift, lbf</b>			<b>160.9</b>	
<b>Uplift resistance, psf</b>			<b>107.2</b>	
<b>Allowable overturning moment, ft-lbf</b>			<b>223.8</b>	
<b>Lowest failure overturning moment, ft-lbf</b>			<b>133.1</b>	



*Fig. 6. MOF, fracture tile (typical)*



**2. SUMMARY:**

NEMO|etc. has conducted uplift resistance testing of Lap Ridge Tile and V Ridge Tile in accordance with SBCCI-SSTD 11-99, resulting in the data presented herein.

Signed: C. E. Phillips  
 Charles Phillips  
 Section Lead, Large-Scale Tests

Signed: Robert Nieminen  
 Robert Nieminen, P.E.  
 President

**REPORT HISTORY:**

DATE	EVENT	NOTES	AUTHORIZATION
2023-08-28	DRAFT 1 issued	For client review	RN
2023-09-12	DRAFT 2 issued	For client review	RN
2023-09-12	DRAFT 3 issued	For client review	RN
2023-09-14	FINAL issued	After client review	RN
2023-09-20	DRAFT REVISION issued	Changed "#12 x 4-in. wood screws" to "#12 x 4-in. Stainless Steel wood screws" on page 2. Changed "3-in. ring shank nails" to "3-in. Stainless Steel ring shank nails"	RN
2023-09-20	REVISION issued	After client review	RN
2023-09-26	DRAFT REVISION2 issued	Added "embedded minimum 2 inches into the 2x6 ridge board/structural member" to build#1 and build#2 attachment details	RN
2023-10-10	FINAL REVISION issued	After client review	RN

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TRPT- 0001

REV H

REVISION DATE: 2023-08-01

RELEASED BY: MDA

**-END OF REPORT-**

**APPENDIX 1: STATEMENT OF LIMITATION**

The results presented are applicable solely to the products tested herein.

**APPENDIX 2: DECISION RULE 1**

All results reported to the client reflect observed values without incorporating measurement uncertainty. Determination of conformity to specifications will depend on acceptance limits, where results will be declared to pass if within the limits, and fail if outside the limits.

**APPENDIX 3: TRACEABILITY**

Product traceability for component tests is facilitated by certification mark, third-party random sampling, or signed Declaration of Manufacturing Location (DML) statement from the client. Third-party random sampling is accepted if undertaken by an ISO/IEC 10720 or ISO/IEC 10725 accredited entity which is independent of the manufacturer and the client. If conducted by NEMO|etc., third-party random sampling is conducted per the sampling plan detailed in SOP-0005, and in accordance with ICC-ES AC85.

**APPENDIX 4: TESTS, STANDARDS, EQUIPMENT AND OUTSOURCED LOG**

PROPERTY	STANDARD	DESCRIPTION	TEST EQUIPMENT	CALIBRATION	
				ASSET #	PRE-TEST
Static uplift/ Overturning moment	SBCCI-SSTD 11-99	Dynalink Load application frame	0606	2023-04-07	2023-04-07
			0667	-	-

**APPENDIX 5: STANDARD REFERENCES**

SBCCI-SSTD 11-99 – SBCCI Test Standard for Determining Wind Resistance of Concrete or Clay Roof Tiles