



**NEMO|etc.**

Certificate of Authorization #32455  
353 Christian Street, Unit #13  
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ENGINEER

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**EVALUATION REPORT**

**Sabre Metals of Florida, LLC**  
1100 Charles Street  
Longwood, FL 32750  
**(407) 598-0811**

**Evaluation Report 1-SMF-18-001.08.18**  
**FL27707**  
**Date of Issuance: 08/10/2018**

**SCOPE:**

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

**DESCRIPTION: Sabre Metal Roof Systems**

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

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

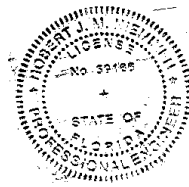
**ADVERTISEMENT:** The Evaluation Report number preceded by the words "NEMO ETC, LLC Evaluated" may be displayed in advertising literature. If any portion of the Evaluation Report is displayed, then it shall be done in its entirety.

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

This Evaluation Report consists of pages 1 through 3, plus Appendix 1 and 2 (9-pages).

**Prepared by:**

**Robert J.M. Nieminen, P.E.**  
Florida Registration No. 59166, Florida DCA ANE1983



The facsimile seal appearing was authorized by Robert Nieminen, P.E. on 08/10/2018. This does not serve as an electronically signed document.

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

**ROOFING SYSTEMS EVALUATION:**
**1. SCOPE:**

**Product Category:** Roofing  
**Sub-Category:** Non-Structural Metal Roofing  
**Compliance Statement:** Sabre Metal Roof Systems, as produced by Sabre Metals of Florida, LLC, have demonstrated compliance with the following sections of the 6<sup>th</sup> Edition (2017) Florida Building Code through testing in accordance with the following Standards. Compliance is subject to the Installation Requirements and Limitations / Conditions of Use set forth herein.

**2. STANDARDS:**

Section	Property	Standard	Year
1504.3.1	Wind	UL 1897	2012
1507.4.3	Material standards	ASTM A792	2010
1507.4.3	Material standards	ASTM B209	2010

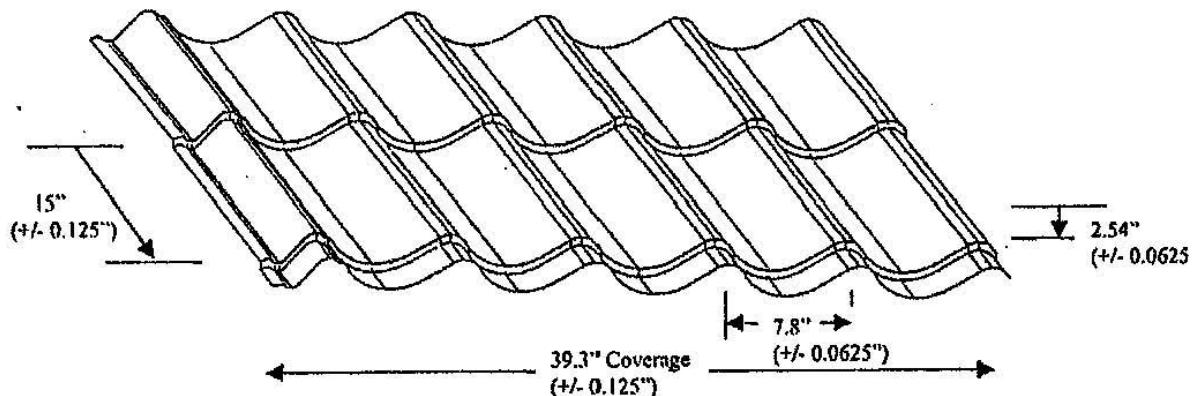
**3. REFERENCES:**

Entity	Examination	Reference	Date
ITS (TST 1509)	Fastener Withdrawal	3056818-4	04/18/2005
ITS (TST 1509)	UL 1897	3188880COQ-001	10/21/2009
Metal supplier	Material standards	Mill certificate	05/18/2018
Metal supplier	Material standards	Mill certificate	06/11/2018
UL LLC (QUA 9625)	Quality Assurance	Service Confirmation	07/31/2018

**4. PRODUCT DESCRIPTION:**

4.1 The following Sabre Metals non-structural metal roof panels are mechanically attached to Approved substrate, as outlined in the Limitations / Conditions of Use herein.

4.1.1 **Sabre Metals Tile** are formed of 0.018-inch thick ASTM A792, Grade 50 AZ55 aluminum-zinc alloy coated steel or 0.029-inch thick ASTM B209, 25-ksi 3105-H24 coated aluminum alloy panels that are mechanically attached to approved decks. Sabre Metals Tile measures 43.5-inches wide with installed horizontal exposure of 39.3 inches and panel lengths up to 30 feet. The panels overlap on the side and ends.



## 5. LIMITATIONS:

- 5.1 This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
- 5.2 This evaluation report is not for use in FBC HVHZ jurisdictions.
- 5.3 Fire Classification is not part of this Evaluation Report; refer to current Approved Roofing Materials Directory for fire ratings of this product.
- 5.4 Slope shall not be less than 3:12 [Reference: **FBC 1507.4.2(1)**].
- 5.5 Sheet materials used to produce the shingles and panels shall comply with **FBC 1507.4.3**.
- 5.6 The roof system evaluation herein 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. Load resistance of the roof deck shall be documented through proper codified and/or FBC Approval documentation.
- 5.7 Appendix 1 outlines attachment requirements for design wind pressure resistance. "MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads. Refer to **FBC 1609** for determination of design wind pressures. Appendix 2 outlines roof cladding design wind pressure requirements for gabled/hipped roofs in accordance with **ASCE 7-10**, multiplied by 0.6 for allowable loads ( $P_{asd}$ ). The MDP for the selected assembly shall meet or exceed the design wind pressure requirements for the project for each pressure zone of the roof.
- 5.8 For existing roof decks, fasteners shall be tested in the existing deck for withdrawal resistance in accordance with **ANSI/SPRI FX-1** or **Testing Application Standard TAS 105**. A qualified design professional shall review the data for comparison to the minimum requirements for the system.
- 5.9 Perimeter and ridge details shall be designed and installed to resist the wind load requirements of **FBC Chapter 16**.
- 5.10 All products in the roof assembly shall have quality assurance audit in accordance with **F.A.C. Rule 61G20-3**.

## 6. INSTALLATION:

- 6.1 **Sabre Metal Roof Systems** shall be installed in accordance with **Sabre Metals of Florida, LLC** published installation instructions, subject to the Limitations / Conditions of Use noted herein.
- 6.2 System components, including the panels and fasteners shall be as supplied by **Sabre Metals of Florida, LLC**.
- 6.3 System attachment requirements for wind load resistance are set forth in Appendix 1. "MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads, and reflects the ultimate passing pressure divided by 2 (the 2 to 1 margin of safety per **FBC 1504.9** has already been applied). Refer to **FBC 1609** for determination of design wind loads.

## 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:

Longwood, FL

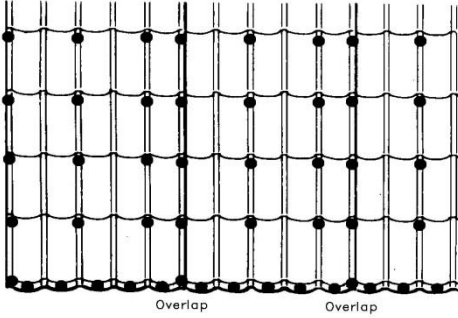
## 9. QUALITY ASSURANCE ENTITY:

UL LLC – QUA9625; (414) 248-6409; karen.buchmann@us.ul.com

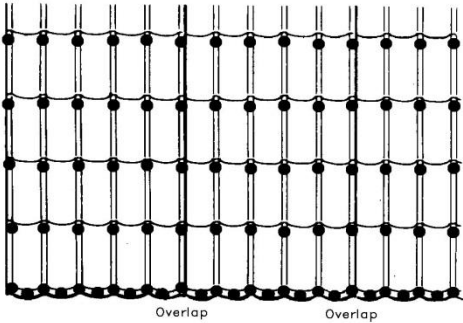
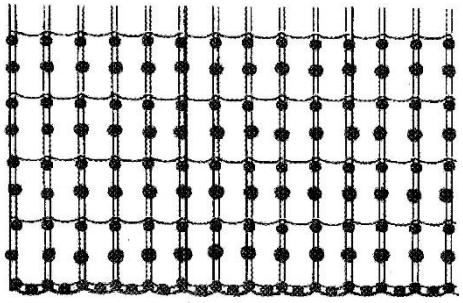
**- THE NINE (9) PAGES THAT FOLLOW FORM PART OF THIS EVALUATION REPORT -**

**APPENDIX 1: ATTACHMENT REQUIREMENTS FOR DESIGN WIND PRESSURE RESISTANCE:**

1. This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
2. The roof system evaluation herein 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. Load resistance of the roof deck shall be documented through proper codified and/or FBC Approval documentation.
3. Unless otherwise noted herein, fire barrier and/or underlayment materials may be any that meets FBC Table 1507.1.1, Sabre Metals of Florida, LLC minimum requirements, the QA requirements of F.A.C. Rule 61G20-3 and FBC 1505 when installed with the roof cover.
4. "MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads. Refer to FBC 1609 for determination of design wind pressures. Appendix 2 outlines roof cladding design wind pressure requirements for gabled/hipped roofs in accordance with ASCE 7-10, multiplied by 0.6 for allowable loads ( $P_{asd}$ ). The MDP for the selected assembly shall meet or exceed the design wind pressure requirements for the project for each pressure zone of the roof.
5. For existing decks, fasteners shall be tested in the existing deck for withdrawal resistance in accordance with ANSI/SPRI FX-1 or Testing Application Standard TAS 105. A qualified design professional shall review the data for comparison to the minimum requirements for the system.
6. For installation over a fire barrier and/or existing asphalt shingles, panel fasteners that engage the roof deck shall be of sufficient length to penetrate the underside of the roof deck by not less than ½-inch.
7. Panel fasteners shall be corrosion resistant.

TABLE 1: SABRE METALS TILE						
WOOD DECKS - NEW CONSTRUCTION, REROOF (Tear-Off), or RECOVER (over existing asphalt shingles or wood shake/shingle)						
System No.	Deck (Note 2)	Fire Barrier / Underlay	Panel	Panel Attachment		MDP (psf)
				Fasteners	Fastener Placement	
1.	Min. 15/32" APA rated plywood	See Note 2	Aluminum or Steel	<u>Aluminum:</u> Min. 3" x No. 10 S/S wood screws with ¼-inch hex head and 0.59" S/S washer with butyl rubber gasket <u>Steel:</u> Min. 3" x No. 10 galvanized wood screws with ¼-inch hex head and 0.47" galvanized steel washer with butyl rubber gasket		-52.5

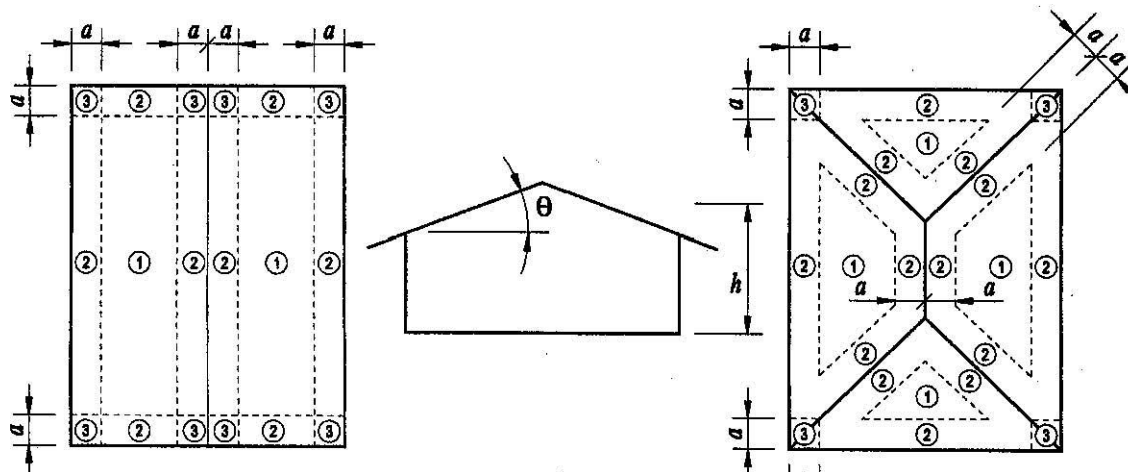
**TABLE 1: SABRE METALS TILE**
**WOOD DECKS - NEW CONSTRUCTION, REROOF (Tear-Off), or RECOVER (over existing asphalt shingles or wood shake/shingle)**

System No.	Deck (Note 2)	Fire Barrier / Underlay	Panel	Panel Attachment		MDP (psf)
				Fasteners	Fastener Placement	
2.	Min. 15/32" APA rated plywood	See Note 2	Aluminum or Steel	<u>Aluminum:</u> Min. 3" x No. 10 S/S wood screws with ¼-inch hex head and 0.59" S/S washer with butyl rubber gasket <u>Steel:</u> Min. 3" x No. 10 galvanized wood screws with ¼-inch hex head and 0.47" galvanized steel washer with butyl rubber gasket		-104.5
3.	Min. 15/32" APA rated plywood	See Note 2	Aluminum or Steel	<u>Aluminum:</u> Min. 3" x No. 10 S/S wood screws with ¼-inch hex head and 0.59" S/S washer with butyl rubber gasket <u>Steel:</u> Min. 3" x No. 10 galvanized wood screws with ¼-inch hex head and 0.47" galvanized steel washer with butyl rubber gasket		-157.5

**APPENDIX 2: DESIGN WIND PRESSURE REQUIREMENTS, ASCE 7-10 PER 6<sup>TH</sup> EDITION (2017) FBC CHAPTER 16:**

TABLE	EXPOSURE	SLOPE RANGE
1A	B	$7^\circ < \text{slope} \leq 27^\circ$ (1.5:12 < pitch $\leq$ 6.1:12)
1B	B	$27^\circ < \text{slope} \leq 45^\circ$ (6.1:12 < pitch $\leq$ 12:12)
2A	C	$7^\circ < \text{slope} \leq 27^\circ$ (1.5:12 < pitch $\leq$ 6.1:12)
2B	C	$27^\circ < \text{slope} \leq 45^\circ$ (6.1:12 < pitch $\leq$ 12:12)
3A	D	$7^\circ < \text{slope} \leq 27^\circ$ (1.5:12 < pitch $\leq$ 6.1:12)
3B	D	$27^\circ < \text{slope} \leq 45^\circ$ (6.1:12 < pitch $\leq$ 12:12)

1. This is a building code evaluation. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this Evaluation Report, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.
2. Roof cladding design wind pressure requirements are for gabled/hipped roofs in accordance with ASCE 7-10, multiplied by 0.6 for allowable loads ( $P_{asd}$ ).
3. Tables are limited to projects having gable or hip roofs with a mean roof height between 0 and 60 feet, slopes between  $7^\circ$  and  $45^\circ$  (1.5:12 to 12:12 pitch), enclosed buildings (Internal Pressure Coefficient,  $GCP_i = \pm 0.18$ ), no load combinations ( $K_d = 1$ ) and site conditions and location of the structure do not meet all of the conditions specified in Section 26.8.1 of ASCE 7-10 ( $K_{zt} = 1.0$ ). Analysis for buildings falling outside these constraints shall be on a project-by-project basis by a Florida Registered PE.
4. The dimension of Zones 2 and 3 (perimeters and corners) shall be defined as 10% of the least horizontal plan-view dimension or 40% of the mean roof height, whichever is smaller, but not less than either 4% of the least horizontal plan-view dimension or 3 feet, as outlined in Figures 30.4-2B and 30.4-2C of ASCE 7-10.



**Table 1A: Roof Cladding Design Wind Pressures (psf) – SEE NOTE 1**  
**Exposure B for Slope Range 7° < slope ≤ 27° (1.5:12 < pitch ≤ 6.1:12)**

Mean Roof Height (ft)	Zone	Basic Wind Speed (mph)								
		110	115	120	130	140	150	160	180	200
0 < h ≤ 30	1	14	15	17	20	23	26	30	38	46
	2	24	27	29	34	40	45	52	65	81
	3	36	40	43	51	59	67	77	97	120
	2 Overhang	29	31	34	40	46	53	61	77	95
	3 Overhang	48	53	57	67	78	90	102	129	159
30 < h ≤ 40	1	15	17	18	21	25	28	32	41	51
	2	27	29	32	37	43	50	56	71	88
	3	39	43	47	55	64	73	83	106	130
	2 Overhang	31	34	37	44	51	58	66	84	103
	3 Overhang	52	57	62	73	85	98	111	140	173
40 < h ≤ 50	1	16	18	19	23	26	30	34	44	54
	2	28	31	34	40	46	53	60	76	94
	3	42	46	50	59	68	78	89	112	139
	2 Overhang	33	36	40	46	54	62	70	89	110
	3 Overhang	56	61	66	78	90	104	118	150	185
50 < h ≤ 60	1	17	19	20	24	28	32	36	46	57
	2	30	33	36	42	48	55	63	80	99
	3	44	48	53	62	71	82	93	118	146
	2 Overhang	35	38	42	49	57	65	74	94	115
	3 Overhang	59	64	70	82	95	109	124	157	194



**Table 1B: Roof Cladding Design Wind Pressures (psf) – SEE NOTE 1**  
**Exposure B for Slope Range 27° < slope < 45° (6.1:12 < pitch ≤ 12:12)**

Mean Roof Height (ft)	Zone	Basic Wind Speed (mph)								
		110	115	120	130	140	150	160	180	200
0 < h ≤ 30	1	15	17	18	21	25	29	32	41	51
	2 & 3	18	20	21	25	29	33	38	48	59
	2 & 3 Overhang	26	28	31	36	42	48	55	70	86
30 < h ≤ 40	1	17	18	20	23	27	31	35	45	55
	2 & 3	20	21	23	27	32	36	41	52	65
	2 & 3 Overhang	28	31	34	40	46	53	60	76	94
40 < h ≤ 50	1	18	19	21	25	29	33	38	48	59
	2 & 3	21	23	25	29	34	39	44	56	69
	2 & 3 Overhang	30	33	36	42	49	56	64	81	100
50 < h ≤ 60	1	19	20	22	26	30	35	40	50	62
	2 & 3	22	24	26	31	35	41	46	59	72
	2 & 3 Overhang	32	35	38	44	51	59	67	85	105



**Table 2A: Roof Cladding Design Wind Pressures (psf) – SEE NOTE 1**  
**Exposure C for Slope Range 7° < slope < 27° (1.5:12 < pitch ≤ 6.1:12)**

Mean Roof Height (ft)	Zone	Basic Wind Speed (mph)								
		110	115	120	130	140	150	160	180	200
0 < h ≤ 15	1	17	19	20	24	28	32	36	46	56
	2	30	32	35	41	48	55	63	79	98
	3	44	48	52	61	71	81	93	117	145
	2 Overhang	35	38	41	48	56	64	73	93	114
	3 Overhang	58	64	69	81	94	108	123	156	193
15 < h ≤ 20	1	18	20	22	25	29	34	38	49	60
	2	32	34	38	44	51	59	67	84	104
	3	47	51	56	65	76	87	99	125	154
	2 Overhang	37	40	44	52	60	69	78	99	122
	3 Overhang	62	68	74	87	101	115	131	166	205
20 < h ≤ 30	1	20	21	23	27	32	37	42	53	65
	2	34	37	41	48	55	64	72	92	113
	3	51	55	60	71	82	94	107	136	167
	2 Overhang	40	44	48	56	65	75	85	107	132
	3 Overhang	67	74	80	94	109	125	143	180	223
30 < h ≤ 40	1	21	23	25	29	34	39	44	56	69
	2	36	40	43	51	59	68	77	98	120
	3	54	59	64	75	87	100	114	144	178
	2 Overhang	43	47	51	60	69	79	90	114	141
	3 Overhang	72	78	85	100	116	133	152	192	237
40 < h ≤ 50	1	22	24	26	31	36	41	46	59	72
	2	38	42	45	53	62	71	81	102	126
	3	56	62	67	79	91	105	119	151	187
	2 Overhang	45	49	53	62	72	83	94	120	148
	3 Overhang	75	82	89	105	122	140	159	201	248
50 < h ≤ 60	1	23	25	27	32	37	42	48	61	75
	2	40	43	47	55	64	74	84	106	131
	3	59	64	70	82	95	109	124	157	194
	2 Overhang	46	51	55	65	75	86	98	124	153
	3 Overhang	78	85	93	109	126	145	165	209	258

**Table 2B: Roof Cladding Design Wind Pressures (psf) – SEE NOTE 1  
Exposure C for Slope Range 27° < slope < 45° (6.1:12 < pitch ≤ 12:12)**

Mean Roof Height (ft)	Zone	Basic Wind Speed (mph)								
		110	115	120	130	140	150	160	180	200
0 < h ≤ 15	1	19	20	22	26	30	35	39	50	61
	2 & 3	22	24	26	30	35	40	46	58	72
	2 & 3 Overhang	31	34	37	44	51	59	67	84	104
15 < h ≤ 20	1	20	22	24	28	32	37	42	53	65
	2 & 3	23	25	28	32	38	43	49	62	77
	2 & 3 Overhang	34	37	40	47	54	62	71	90	111
20 < h ≤ 30	1	21	23	26	30	35	40	45	58	71
	2 & 3	25	27	30	35	41	47	53	67	83
	2 & 3 Overhang	36	40	43	51	59	68	77	98	120
30 < h ≤ 40	1	23	25	27	32	37	43	48	61	76
	2 & 3	27	29	32	37	43	50	57	72	88
	2 & 3 Overhang	39	42	46	54	63	72	82	104	128
40 < h ≤ 50	1	24	26	29	33	39	45	51	64	79
	2 & 3	28	31	33	39	45	52	59	75	93
	2 & 3 Overhang	41	44	48	57	66	75	86	109	134
50 < h ≤ 60	1	25	27	30	35	40	46	53	67	82
	2 & 3	29	32	35	41	47	54	62	78	96
	2 & 3 Overhang	42	46	50	59	68	78	89	113	139

**Table 3A: Roof Cladding Design Wind Pressures (psf) – SEE NOTE 1**  
**Exposure D for Slope Range 7° < slope < 27° (1.5:12 < pitch ≤ 6.1:12)**

Mean Roof Height (ft)	Zone	Basic Wind Speed (mph)								
		110	115	120	130	140	150	160	180	200
0 < h ≤ 15	1	21	23	25	29	33	38	44	55	68
	2	36	39	43	50	58	67	76	96	119
	3	53	58	63	74	86	99	112	142	176
	2 Overhang	42	46	50	59	68	78	89	113	139
	3 Overhang	71	77	84	99	115	132	150	189	234
15 < h ≤ 20	1	22	24	26	30	35	40	46	58	72
	2	38	41	45	53	61	70	80	102	125
	3	56	61	67	78	91	104	119	150	185
	2 Overhang	44	48	53	62	72	82	94	119	147
	3 Overhang	75	82	89	104	121	139	158	200	247
20 < h ≤ 30	1	23	25	28	33	38	43	49	62	77
	2	41	44	48	57	66	75	86	109	134
	3	60	66	71	84	97	112	127	161	198
	2 Overhang	48	52	57	66	77	88	101	127	157
	3 Overhang	80	87	95	112	129	149	169	214	264
30 < h ≤ 40	1	24	27	29	34	40	45	52	65	81
	2	43	47	51	59	69	79	90	114	141
	3	63	69	75	88	102	117	133	169	208
	2 Overhang	50	54	59	70	81	93	105	133	165
	3 Overhang	84	92	100	117	136	156	177	224	277
40 < h ≤ 50	1	25	28	30	36	41	47	54	68	84
	2	44	48	53	62	72	82	94	119	146
	3	65	72	78	91	106	122	139	175	216
	2 Overhang	52	57	62	72	84	96	110	139	171
	3 Overhang	87	95	104	122	141	162	184	233	288
50 < h ≤ 60	1	26	29	31	37	43	49	56	70	87
	2	46	50	54	64	74	85	97	122	151
	3	68	74	80	94	110	126	143	181	224
	2 Overhang	54	58	64	75	87	100	113	143	177
	3 Overhang	90	98	107	126	146	167	190	241	298

**Table 3B: Roof Cladding Design Wind Pressures (psf) – SEE NOTE 1**  
**Exposure D for Slope Range 27° < slope < 45° (6.1:12 < pitch ≤ 12:12)**

Mean Roof Height (ft)	Zone	Basic Wind Speed (mph)								
		110	115	120	130	140	150	160	180	200
0 < h ≤ 15	1	23	25	27	32	37	42	48	60	75
	2 & 3	26	29	31	37	43	49	56	71	87
	2 & 3 Overhang	38	42	46	53	62	71	81	102	126
15 < h ≤ 20	1	24	26	28	33	39	44	50	64	79
	2 & 3	28	30	33	39	45	52	59	75	92
	2 & 3 Overhang	40	44	48	56	65	75	85	108	133
20 < h ≤ 30	1	25	28	30	36	41	47	54	68	84
	2 & 3	30	33	35	42	48	55	63	80	99
	2 & 3 Overhang	43	47	51	60	70	80	91	116	143
30 < h ≤ 40	1	27	29	32	37	43	50	57	72	88
	2 & 3	31	34	37	44	51	58	66	84	103
	2 & 3 Overhang	45	49	54	63	73	84	96	121	150
40 < h ≤ 50	1	28	30	33	39	45	52	59	74	92
	2 & 3	32	36	39	45	53	60	69	87	107
	2 & 3 Overhang	47	51	56	66	76	88	100	126	156
50 < h ≤ 60	1	29	31	34	40	47	53	61	77	95
	2 & 3	34	37	40	47	54	62	71	90	111
	2 & 3 Overhang	49	53	58	68	79	90	103	130	161