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# ICC-ES Evaluation Report ESR-2119

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION Section: 07 32 26—Plastic Roof Tiles

**REPORT HOLDER:** 

WESTLAKE DaVINCI ROOFSCAPES, LLC

# **EVALUATION SUBJECT:**

### DAVINCI SLATE, DAVINCI SHAKE, DAVINCI SELECT SHAKE, BELLAFORTÉ SHAKE, BELLAFORTÉ SLATE AND PROVINCE SLATE ROOF SHINGLES

# **1.0 EVALUATION SCOPE**

# 1.1 Compliance with the following codes:

- 2021, 2018 and 2015 International Building Code® (IBC)
- 2021, 2018 and 2015 International Residential Code<sup>®</sup> (IRC)
- 2013 Abu Dhabi International Building Code (ADIBC)<sup>†</sup>

 $^{\dagger}\text{The ADIBC}$  is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

# Properties evaluated:

- Weather resistance
- Fire classification
- Wind resistance

# 1.2 Evaluation to the following green code:

2022 California Green Building Standards Code (CALGreen), Title 24, Part 11

# Attributes verified:

See Section 3.1

# 2.0 USES

The DaVinci Slate, DaVinci Shake, DaVinci Select Shake, Bellaforté Shake, Bellaforté Slate and Province Slate roof shingles are used as roof covering materials and are classified as a Class A or B roof covering when installed in accordance with Table 1 of this report.

# 3.0 DESCRIPTION

# 3.1 General:

The DaVinci Slate, DaVinci Shake, DaVinci Select Shake, Bellaforté Shake, Bellaforté Slate and Province Slate roof shingles are engineered polymeric-based roof shingles designed to provide the look of natural slate or shake, A Subsidiary of the International Code Council®

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respectively. The shingles are manufactured with a proprietary formulation using both high-density and low-density polyethylene polymers and other additives.

The attributes of the roof tiles have been verified as conforming to the provisions of CALGreen Section A5.406.1.2 for reduced maintenance. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

# 3.2 DaVinci Slate Roof Shingle:

The DaVinci Slate roof shingle is available in various colors and in widths of 6, 7, 9, 10 and 12 inches (152, 178, 229, 254 and 305 mm) with a length of 18 inches (457 mm). Exposure is 6 to 8 inches (152 to 203 mm), resulting in an installed weight of 351 to 264 pounds, respectively, per 100 square feet (17.1 to 12.9 kg/m<sup>2</sup>). See Figure 1.

# 3.3 DaVinci Shake and DaVinci Select Shake Roof Shingle:

The DaVinci Shake roof shingle is available in various colors and in widths of 4, 6, 7, 8, 9 and 10 inches (102, 152, 178, 203, 229 and 254 mm) with a length of 22 inches (559 mm). Exposure is 9 to 10 inches (229 to 254 mm), resulting in an installed weight of 377 to 300 pounds, respectively, per 100 square feet (18.4 to 14.6 kg/m<sup>2</sup>). See Figure 1.

# 3.4 Bellaforté Shake:

The Bellaforté Shake roof shingle is available in various colors and in a width of  $12^{3}/_{4}$  inches (324 mm) and a length of  $16^{1}/_{4}$  inches (413 mm). Exposure is 12 inches (305 mm), resulting in an installed weight of 194 pounds per 100 square feet (9.5 kg/m<sup>2</sup>). See Figure 2.

# 3.5 Bellaforté Slate:

The Bellaforté Slate roof shingle is available in various colors and in a width of  $12^{3}/_{4}$  inches (324mm) and a length of  $15^{1}/_{2}$  inches (394 mm). Exposure is 12 inches (305 mm), resulting in an installed weight of 162 pounds per 100 square feet (8.0 kg/m<sup>2</sup>). See Figure 3.

# 3.6 Province Slate:

The Province Slate roof shingle is available in various colors and in a width of  $12^{1/2}$  inches (318 mm) and a length of  $11^{1/2}$  inches (292 mm). Exposure is 8 inches (203 mm), resulting in an installed weight of 194 pounds per 100 square feet (9.5 kg/m<sup>2</sup>). See Figure 4.

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# 3.7 Underlayment:

Underlayment must be a minimum of two layers of ASTM D226 Type I (No. 15) asphalt-saturated organic felt, one layer of ASTM D226 Type II (No. 30) asphalt-saturated organic felt or one layer of ASTM D1970 self-adhered roof underlayment, unless otherwise noted in Table 1 of this report. Where an ice barrier is required, the membrane must be as noted in the second paragraph of Section 4.2 of this report.

#### 3.8 Flashing:

Flashing must be minimum 16-oz/ft<sup>2</sup> (No. 23 gage) copper or other corrosion-resistant metal with a thickness of not less than 0.019 inch (0.483 mm). See Section 4.5 for valley flashing.

#### 3.9 Fasteners:

Fasteners used to secure DaVinci roof shingles to the sheathing must be  $^{1}/_{8}$ -inch-diameter-shank (3.18 mm) hotdipped galvanized roofing nails complying with ASTM F1667, with  $^{3}/_{8}$ -inch-diameter (9.5 mm) heads, unless otherwise noted in Table 2. Fasteners must be of sufficient length to penetrate through the sheathing a minimum of  $^{3}/_{16}$  inch (12.7 mm).

#### 4.0 INSTALLATION

#### 4.1 General:

The roof shingles must be installed in accordance with this report, the applicable code and the manufacturer's published installation instructions. The manufacturer's installation instructions must be available at the jobsite at all times during installation.

The shingles must be installed on roofs with solid sheathing and a minimum slope of 3:12 (25 percent slope). Solid sheathing must be minimum <sup>15</sup>/<sub>32</sub>-inch-thick (11.9 mm) exterior-grade plywood, <sup>7</sup>/<sub>16</sub>-inch-thick (11.1 mm) oriented strand board (OSB), or nominally 1-inch-thick (25.4 mm) lumber. The sheathing must be structurally adequate and fastened to resist the wind loads as specified by IBC Section 1609, or IRC Section R301.2, for components and cladding.

#### 4.2 Underlayment:

Underlayment as described in Section 3.6 and Table 1, must be installed in accordance with IBC Section 1507.7.3 or IRC Section R905.6.3, as applicable. The underlayment must be installed parallel to the roof eave with a 6-inch (152 mm) lap on the ends, a 6-inch (152.4 mm) side lap and a minimum 6-inch (152 mm) lap over eaves. The underlayment is fastened, only as necessary to hold in place.

In areas where the average daily temperature in January is 25°F (-4°C) or less, or where there is a possibility of ice forming along the eaves and causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together, or a self-adhering underlayment complying with ASTM D1970 or currently recognized in an ICC-ES evaluation report as complying with the ICC-ES Acceptance Criteria for Self-adhered Underlayments for Use as Ice Barriers (AC48), must extend from the eave's edge to a point 24 inches (610 mm) inside the exterior wall line of the building.

# 4.3 Roof Shingles:

**4.3.1 DaVinci Slate, DaVinci Shake and DaVinci Select Shake Roof Shingles:** Starting with a row of 12-inch-wide (305 mm) DaVinci Starter Slates or Shakes, the shingles must extend approximately 1 inch (25.4 mm) over the eaves and  $^{3}/_{4}$  inch (19 mm) over the rakes. The shingles are secured to the sheathing using two or four fasteners, driven through the premolded nail markers. The field shingles must be installed flush with the starter slate or shake shingles on the outer and lower edges. A maximum gap of  ${}^{3}/_{8}$  inch (9.5 mm) is recommended between shingles, with a minimum  ${}^{1}/_{4}$ -inch (6.4 mm) gap required. The gaps between shakes at adjacent courses must be offset a minimum of  $1{}^{1}/_{2}$  inches (38 mm). The maximum allowable exposure is 8 inches (203 mm) for DaVinci Slate roof shingles, and 10 inches (254 mm) for DaVinci Shake and DaVinci Select Shake roof shingles.

**4.3.2 Bellaforté Shake and Bellaforté Slate Roof Shingles:** Bellaforté Shake or Bellaforté Slate (12<sup>3</sup>/<sub>4</sub> inches wide [324 mm]) must be installed on top of starter tiles and must extend approximately 1 inch (25.4 mm) over the eaves. The shingles are secured to the sheathing using three fasteners, two through the premolded nail markers and one through the tab; or five fasteners, four through the premolded nail markers are as described in Section 3.8. See Table 2 for additional fastening details.

The field shingles must be installed flush with the starter slate or shake shingles on the lower edges.

**4.3.3 Province Slate Roof Shingles:** Province Slate  $(12^{1}/_{2} \text{ inches wide } [318 \text{ mm}])$  must be installed on top of starter tiles and must extend approximately 1 inch (25.4 mm) over the eaves. The shingles are secured to the sheathing using two or four fasteners driven through the premolded nail makers. Fasteners are as described in Section 3.9. See Table 2 for additional fastening details

The field shingles must be installed flush with the starter slate or shake shingles on the lower edges.

#### 4.4 Hips and Ridges:

**4.4.1 General:** The top of hips and ridges must be covered with a minimum 6-inch-wide (152 mm) flashing as noted in Section 3.7. Flashing must be attached to the sheathing using No. 12 gage, ring-shank, corrosion-resistant nails. Nails must be compatible with the flashing material, and have sufficient length to penetrate the sheathing  $^{3}/_{4}$  inch (19 mm) or through the sheathing, whichever is less.

**4.4.2 DaVinci Slate Roof Shingles:** On top of the flashing, 6-inch-wide (1930 mm) or 7-inch-wide (178 mm) DaVinci Slate roof shingles are installed on each side of hips and ridges, with the shingles butting at the top. Both hip and ridge shingles must be installed with a 6-inch (152 mm) exposure. Shingles must be secured with the fasteners described in Section 3.8.

**4.4.3 DaVinci Shake and DaVinci Select Shake Roof Shingles:** On top of the flashing, 6-inch-wide (152 mm) DaVinci Shake and DaVinci Select Shake roof shingles are installed on each side of hips and ridges, with the shingles butting at the top. Both hip and ridge shingles must be installed with a 10-inch (254 mm) exposure. Shingles must be secured with the fasteners described in Section 3.8.

**4.4.4 Bellaforté Shake, Bellaforté Slate and Province Slate:** Bellaforté Shake, Bellaforté Slate or Province Slate one-piece hip and ridge tiles are installed at a 12-inch (305 mm) exposure. The tiles are nailed once on each side approximately  $^{3}/_{4}$  inch (19 mm) from the outside edge and  $12^{1}/_{2}$  inches (305 mm) from the butt of the tile. Shingles must be secured with the fasteners described in Section 3.8.

# 4.5 Valleys:

Valleys must be flashed in accordance with 2015 IBC Section 1507.7.7 or IRC Section R905.6.6, as applicable, and the manufacturer's published installation instructions, using the flashing described in Section 3.7.

#### 4.6 Fire Classification:

The DaVinci roof shingles, when installed as a system described in Table 1, comply with IBC Section 1505.2 and IRC Section R902.1 as a classified Class A or B roof covering.

#### 4.7 Wind Resistance:

The allowable wind uplift pressures for the DaVinci roof shingles described in this report are as noted in Table 2. The allowable design wind uplift pressures must be determined in accordance with the requirements of Chapter 16 of the IBC or Section R301.2.1, as applicable, by a registered design professional and must not exceed the allowable wind uplift pressures in Table 2.

Tables 3 and 4 provide maximum design wind speeds on low-rise buildings with a mean roof height of 60 feet or less based on ASCE 7. If the building does not meet the criteria in Tables 3 and 4, or is constructed on an isolated hill, ridge, or escarpment constituting an abrupt change in the general topography (K<sub>zt</sub> > 1.0), the maximum design wind speeds and mean roof height must be determined in accordance with the Chapter 16 of the IBC or Section R301.2.1, as applicable.

#### 4.8 Reroofing:

Prior to application of the shingles, the existing roof covering and underlayment must be completely removed. Any damaged sheathing must be replaced. The installation of the shingles must then proceed as described in Sections 4.1 through 4.5. An existing self-adhered ice barrier membrane may remain in place if covered with a new ice barrier membrane in accordance with the applicable code. The roof classification is as noted in Section 4.6 and Table 1.

# 5.0 CONDITIONS OF USE

The DaVinci Slate, DaVinci Shake, DaVinci Select Shake, Bellaforté Shake, Bellaforté Slate and Province Slate roof shingles described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- **5.1** Installation must comply with the applicable code, the manufacturer's published installation instructions and this report. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- **5.2** The roof shingles are manufactured in Lenexa, Kansas, under a quality-control program with inspections by ICC-ES.

### 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Special Roofing Systems (AC07), dated February 2014 (editorially revised January 2021).

# 7.0 IDENTIFICATION

- **7.1** Each roof shingle is labeled with the report holder's name (Westlake DaVinci Roofscapes, LLC) and address, the product name, the shingle width, a production date code, and the ICC-ES evaluation report number (ESR-2119).
- 7.2 The report holder's contact information is the following:

WESTLAKE DaVINCI ROOFSCAPES, LLC 13890 WEST 101<sup>ST</sup> STREET LENEXA, KANSAS 66215 (800) 328-4264 www.davinciroofscapes.com

SYSTEM ROOF		ROOF	MIN.		DaVINCI ROOF SHINGLE				
NO.			SLOPE	UNDERLAYMENT <sup>1</sup>	Roof Shingle	Exposure (in.)			
1	A	Min. <sup>15</sup> / <sub>32</sub> - inch plywood	3:12	One layer ASTM D226 Type II (No. 30) or two layers of ASTM D226 Type I (No. 15) asphalt-saturated organic felt <sup>2</sup>	DaVinci Slate	6			
2	A	Min. <sup>15</sup> / <sub>32</sub> - inch plywood	3:12	One layer GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection ( <u>ESR-2053</u> ) <sup>2</sup>	DaVinci Slate DaVinci Shake DaVinci Select Shake	6 to 7 <sup>1</sup> / <sub>2</sub> 9 to 10 9 to 10			
3	A	Min. <sup>15</sup> / <sub>32</sub> - inch plywood	3:12	One layer ASTM D226 Type II (No. 30) asphalt- saturated organic felt plus one layer of ASTM D3909 mineral-surfaced cap sheet <sup>2</sup>	DaVinci Slate DaVinci Shake DaVinci Select Shake Bellaforté Shake Province Slate	6 to 8 9 to 10 9 to 10 12 8			
4	В	Min. <sup>15</sup> / <sub>32</sub> - inch plywood	3:12	Two layers ASTM D226 Type II (No. 30) asphalt- coated glass-fiber-mat <sup>2</sup>	DaVinci Slate DaVinci Shake DaVinci Select Shake Bellaforté Shake Bellaforté Slate Province Slate	6 to 8 9 to 10 9 to 10 12 12 8			
5	A	Min. <sup>15</sup> / <sub>32</sub> - inch plywood	3:12	One layer Eco Chief Products SolarHide™-SRW ( <u>ESR-4035</u> )	DaVinci Slate DaVinci Shake DaVinci Select Shake Bellaforté Shake Bellaforté Slate Province Slate	6 to 8 9 to 10 9 to 10 12 12 8			
6	A	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	3:12	One layer Eco Chief Products SolarHide™-SRW ( <u>ESR-4035</u> )	DaVinci Slate	6 to 8			
7	В	Min. <sup>7/</sup> 16-inch OSB	3:12	One layer Eco Chief Products SolarHide™-SRW ( <u>ESR-4035</u> )	DaVinci Slate DaVinci Shake DaVinci Select Shake Bellaforté Shake Bellaforte Slate Province Slate	6 to 8 9 to 10 9 to 10 12 12 8			
8	A	Min. <sup>15</sup> / <sub>32</sub> - inch plywood	3:12	Two layers of MB Technology Layfast TU35 ( <u>ESR-2799</u> )	DaVinci Slate DaVinci Shake DaVinci Select Shake	6 to 7 9 to 10 9 to 10			
9	A	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	3:12	Two layers of Polyglass XFR ( <u>ESR-1697</u> )	DaVinci Slate DaVinci Shake DaVinci Select Shake	6 to 8 9 to 10 9 to 10			

#### **TABLE 1—FIRE CLASSIFICATIONS**

For **SI**: 1-inch =25.4 mm; 1ft = 0.305m

<sup>1</sup>ASTM D226 Type I (No. 15), ASTM D226 Type II (No. 30) underlayment and ASTM D3909 cap sheet must be installed in accordance with the applicable building code. GAF Versashield<sup>®</sup> Fire-Resistant Roof Deck Protection underlayment must be installed in accordance with <u>ESR-2053</u>. Eco Chief Products SolarHide<sup>™</sup>-SRW underlayment must be installed in accordance with <u>ESR-2799</u>. Polystick XFR must be installed in accordance with <u>ESR-1697</u>.

<sup>2</sup>One layer of self-adhered roofing underlayment, specified in an ICC-ES evaluation report as complying with AC48 and AC188, may be installed directly over the plywood and beneath the ASTM D226 complying underlayment in System Nos. 1, 3 and 4 or over the plywood and beneath the GAF VersaShield<sup>®</sup> Fire-Resistance Roof Deck Protection (<u>ESR-2053</u>) in System No. 2.

OVOTEN		DaVINICI ROOF SHINGLE											
SYSTEM NO.	ROOF DECK <sup>3</sup>	Roofing Shingle	Exposure (inches)	Shingle Fastening⁴	UPLIFT PRESSURE (ASD) <sup>1,2</sup> (psf)								
1	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Shake	10	Four per shingle, Fastener Type 1, into premolded nail markers	169								
2	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Shake	9	Two per shingle, Fastener Type 1, into premolded nail markers	93.5								
3	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Shake	10	Two per shingle, Fastener Type 1, into premolded nail markers	86								
4	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	DaVinci Shake	9	Two per shingle, Fastener Type 1, into premolded nail markers	70								
5	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	DaVinci Shake	10	Two per shingle, Fastener Type 1,1 into premolded nail markers	64.5								
6	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Select Shake	10	Four per shingle, Fastener Type 1, into premolded nail markers	150								
7	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Select Shake	10	Two per shingle, Fastener Type 1, into premolded nail markers	80								
8	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	DaVinci Select Shake	10	Two per shingle, Fastener Type 1, premolded nail markers	60								
9	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Slate	8	Four per shingle, Fastener Type 1, into premolded nail markers	146								
10	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Slate	6	Two per shingle, Fastener Type 1, into premolded nail markers	118.5								
11	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	DaVinci Slate	8	Two per shingle, Fastener Type 1, into premolded nail markers	71								
12	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	DaVinci Slate	8	Two per shingle, Fastener Type 1, into premolded nail markers	53								
13	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	Bellaforte Slate Bellaforte Shake	12	Three per shingle, Fastener Type 3 two through premolded nail markers and one through the tab	121								
14	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	Bellaforte Slate Bellaforte Shake	12	Three per shingle, Fastener Type 2, two through premolded nail markers and one through the tab	73								
15	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	Bellaforte Slate Bellaforte Shake	12	Three per shingle, Fastener Type 2, two through premolded nail markers and one through the tab	55								
16	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	Province Slate	8	Four per shingle, Fastener Type 2, into premolded nail markers	155								
17	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	Province Slate	8	Two per shingle, Fastener Type 3, into premolded nail markers	126								
18	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	Province Slate	8	Four per shingle, Fastener Type 2, into premolded nail markers	116								
19	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	Province Slate	8	Two per shingle, Fastener Type 3, into premolded nail markers	94.5								
20	Min. <sup>15</sup> / <sub>32</sub> -inch plywood	Province Slate	8	Two per shingle, Fastener Type 2, into premolded nail markers	83								
21	Min. <sup>7</sup> / <sub>16</sub> -inch OSB	Province Slate	8	Two per shingle, Fastener Type 2, into premolded nail markers	62								

TABLE 2—ALLOWABLE WIND UPLIFT PRESSURE VALUES

For SI: 1-inch = 25.4 mm; 1 ft = 0.305 m; 1 psf = 47.88 Pa

<sup>1</sup>To convert to Factored Design Resistance Pressure (psf) (LRFD), multiply Allowable Pressure (psf) (ASD) by 1.67.

<sup>2</sup>Allowable pressure (psf) (ASD) represents tested assembly ultimate pressure divided by safety factor of 2.

<sup>3</sup>Solid plywood structural sheathing complying with DOC PS-1 or Exposure 1 oriented strand board (OSB) sheathing complying with DOC PS-2 having a minimum specific gravity of 0.42. In lieu of wood sheathing, may be substituted with thicker profile of up to the roof deck may be nominal 1-inch-thick lumber.

<sup>4</sup>**Fastener Type 1**: 1<sup>3</sup>/<sub>4</sub>-inch-long by <sup>1</sup>/<sub>8</sub>-inch diameter ring-shank hot-dipped galvanized roofing nails with <sup>3</sup>/<sub>8</sub>-inch nominal diameter heads. **Fastener Type 2**: 1<sup>1</sup>/<sub>2</sub>-inch long by <sup>1</sup>/<sub>8</sub>-inch diameter ring-shank hot-dipped galvanized roofing nails with <sup>3</sup>/<sub>8</sub>-inch nominal diameter heads. **Fastener Type 3**: No. 10 by 2-inch-long wafer-head galvanized screws.

#### TABLE 3-2021 and 2018 IBC and IRC WIND SPEED & MAXIMUM MEAN ROOF HEIGHT<sup>1</sup>

	Gab	ole Roo	fs (Sloi	pe 3:12	- 4.4:1	2)				Hi	p Roofs	s (Slope	ə 3:12 -	4.5:12	)		
•							l <sub>ult</sub> (mp	h) <sup>3,6</sup>				ult (mp	h) <sup>3,6</sup>				
System No. <sup>2</sup>	Exposure Category	Maximum Basic Wind Speed, V <sub>ult</sub> (mph) <sup>3,6</sup> Mean Roof Height (ft) <sup>5</sup>						System No. <sup>2</sup>	Exposure	Maximum Basic Wind Speed, Vult (mph) <sup>3,6</sup> Mean Roof Height (ft)⁵							
-	Category	15	20	25	30	40	50	60		No. <sup>2</sup> Category	15	20	25	30	40	50	60
1, 6, 9,	В	203	195	189	183	176	170	166	1, 6, 9,	В	210	210	210	210	205	199	194
10, 13, 16, 17	С	166	162	158	155	150	147	145	10, 13, 16, 17 &	С	194	188	184	181	175	171	169
& 18	D	151	148	145	142	139	136	134	18	D	176	172	169	166	162	159	156
	В	182	175	169	165	158	153	149		В	210	204	198	192	184	178	174
2 & 19	С	149	145	142	139	135	132	130	2 & 19	С	174	169	166	162	157	154	152
	D	136	132	130	128	125	122	120		D	158	154	152	149	145	142	140
	В	169	162	157	152	146	141	138		В	197	189	183	177	170	165	161
3, 7 & 20	С	138	134	131	129	125	122	120	3, 7 &	С	161	156	153	150	146	142	140
20	D	125	123	120	118	115	113	111	20	D	146	143	140	138	134	132	130
	В	158	151	147	142	137	132	129		В	184	176	171	166	159	154	151
4, 11 &	С	129	126	123	120	117	114	113	4, 11 &	С	151	146	143	140	136	133	131
14	D	117	115	113	111	108	106	104	14	D	137	134	131	129	126	123	121
	B	151	145	141	137	131	127	124		B	177	169	164	159	153	148	145
5	C	124	121	118	115	112	110	108	5	C	145	141	137	135	131	128	126
Ū.	D	113	110	108	106	NA	NA	NA		D	131	128	126	124	121	118	116
	B	146	140	136	132	126	123	120		B	170	163	158	154	147	143	139
8 & 21	C	120	116	114	111	108	106	104	8 & 21	C	139	136	133	130	126	123	121
0421	D	109	106	104	NA	NA	NA	NA	0 0 2 1	D	127	124	121	119	116	114	112
	B	137	132	128	124	119	115	112		B	160	153	149	144	139	134	131
	Ь			120	105	NA	NA	NA	12 8 15	C	131	127	149	122	118	116	114
128 15	C					INA	INA	INA	12 & 15	C	131	121	125	122	110	110	114
12 & 15	C	112 NA	109 NA				NIA	ΝΑ		D	110	116	111	110	100	107	106
12 & 15	C D	112 NA	NA	NA	NA	NA	NA	NA		D	119	116	114	112	109	107	106
12 & 15	D	NA	NA	NA	NA	NA	NA	NA								107	106
	D Gabl	NA e Roofs	NA s (Slope	NA e 4.5:12	NA 2 – 6.1:	NA 12)	ļ			Hip	Roofs	(Slope	4.5:12	- 6.1:12	2)	-	
System	D Gabl Exposure	NA e Roofs	NA s (Slope ximum	NA	NA 2 – 6.1: Wind S	NA 12) peed V	/ <sub>ult</sub> (mpl		System	Hip Exposure	Roofs	(Slope	4.5:12 Basic	- 6.1:12	2) peed V	ult (mph	
System No. <sup>2</sup>	D Gabl	NA e Roofs	NA s (Slope ximum	NA e 4.5:12 Basic	NA 2 – 6.1: Wind S	NA 12) peed V	/ <sub>ult</sub> (mpl		No. <sup>2</sup>	Hip	Roofs	(Slope	4.5:12 Basic	– 6.1:1: Wind S	2) peed V	ult (mph	
<b>System</b> <b>No.</b> <sup>2</sup> 1, 6, 9,	D Gabl Exposure Category B	NA e Roofs Ma	NA s (Slope ximum	NA e 4.5:12 Basic Vean R	NA 2 – 6.1: Wind S oof Hei	NA 12) peed V ight (ft)	/ <sub>ult</sub> (mpl	1) <sup>3,6</sup>	<b>No.</b> <sup>2</sup> 1, 6, 9,	Hip Exposure	Roofs Ma	(Slope iximum	4.5:12 Basic Mean R	– 6.1:12 Wind S oof Hei	2) peed V ght (ft)	ult (mph	) <sup>3,6</sup>
<b>System</b> <b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13,	D Gabl Exposure Category	NA e Roofs Ma 15	NA s (Slope ximum 20	NA e 4.5:12 Basic Vean R 25	NA 2 – 6.1: Wind S oof Hei 30	NA 12) peed V ight (ft) 40	7 <sub>uit</sub> (mpl 5 50	1) <sup>3,6</sup> 60	<b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13,	Hip Exposure Category	Roofs Ma 15	(Slope ximum 1 20	4.5:12 Basic Mean R 25	– 6.1:12 Wind S oof Hei 30	2) peed V ght (ft) 40	uit (mph 5 50	) <sup>3,6</sup> 60
<b>System</b> <b>No.</b> <sup>2</sup> 1, 6, 9,	D Gabl Exposure Category B	NA e Roofs Ma 15 210	NA s (Slope ximum 20 210	NA e 4.5:12 Basic Vean R 25 210	NA 2 – 6.1: Wind S oof Hei 30 209	NA 12) peed V ght (ft) 40 201	7 <sub>ult</sub> (mpl ₅ 50 194	1) <sup>3,6</sup> 60 190	<b>No.</b> <sup>2</sup> 1, 6, 9,	Hip Exposure Category B	<b>Roofs</b> Ma <b>15</b> 210	(Slope ximum 20 210	<b>4.5:12</b> Basic Mean R 25 210	– 6.1:12 Wind S oof Hei 30 210	2) peed V ght (ft) 40 210	ult (mph 5 <b>50</b> 210	) <sup>3,6</sup> 60 210
<b>System</b> No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17	D Gabl Exposure Category B C	NA e Roofs Ma 15 210 190	NA s (Slope ximum 20 210 184	NA e 4.5:12 Basic Mean R 25 210 180	NA 2 – 6.1: Wind S oof Hei 30 209 177	NA 12) peed V ght (ft) 201 171	7 <sub>ult</sub> (mpl ⁵ 194 168	<b>60</b> 190 165	<b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17	Hip Exposure Category B C	Roofs Ma 15 210 210	(Slope ximum 20 210 210	4.5:12 Basic Mean R 25 210 208	- 6.1:12 Wind S oof Hei 30 210 204	2) peed V ght (ft) 40 210 198	ult (mph 5 50 210 193	<b>60</b> 210 191
<b>System</b> No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17	D Gabl Exposure Category B C D	NA e Roofs 15 210 190 172	NA s (Slope ximum 20 210 184 168	NA e 4.5:12 Basic Mean R 25 210 180 165	NA 2 – 6.1: Wind S oof Hei 30 209 177 162	NA 12) peed V ght (ft) 40 201 171 158	v <sub>ult</sub> (mpl ₅ 50 194 168 155	<b>60</b> 190 165 153	<b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17	Hip Exposure Category B C D	<b>Roofs</b> Ma 15 210 210 199	(Slope ximum 20 210 210 194	4.5:12 Basic Mean R 25 210 208 191	- 6.1:12 Wind S oof Hei 30 210 204 187	2) peed V ght (ft) 40 210 198 183	<mark>uit (mph</mark> 5 210 193 179	) <sup>3,6</sup> 60 210 191 176
<b>System</b> <b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18	D Gabl Exposure Category B C D B	NA e Roofs Ma 15 210 190 172 208	NA s (Slope ximum 20 210 184 168 199	NA e 4.5:12 Basic Mean R 25 210 180 165 193	NA 2 – 6.1: Wind S oof Hei 30 209 177 162 188	NA <b>12)</b> <b>peed V</b> <b>ght (ft)</b> <b>40</b> 201 171 158 180	<sup>7</sup> ult (mpl 5 194 168 155 174	<b>60</b> 190 165 153 170	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18	Hip Exposure Category B C D B	<b>Roofs</b> <b>Ma</b> <b>15</b> 210 210 199 210	(Slope ximum 20 210 210 194 210	4.5:12 Basic Mean R 25 210 208 191 210	- 6.1:12 Wind S oof Hei 30 210 204 187 210	2) peed V ght (ft) 40 210 198 183 208	uit (mph 5 5 210 193 179 201	) <sup>3,6</sup> 60 210 191 176 197
<b>System</b> <b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19	D Gabl Exposure Category B C D B C	NA e Roofs 15 210 190 172 208 170	NA s (Slope ximum 210 184 168 199 166	NA e 4.5:12 Basic 210 180 165 193 162	NA 2 – 6.1: Wind S oof Hei 30 209 177 162 188 159	NA 12) peed V ght (ft) 201 171 158 180 154	<sup>r<sub>ult</sub></sup> (mpl 5 194 168 155 174 150	<b>60</b> 190 165 153 170 148	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19	Hip Exposure Category B C D B C	Roofs Ma 15 210 210 199 210 197	(Slope eximum 210 210 194 210 191	<b>4.5:12</b> Basic Mean R 25 210 208 191 210 187	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183	2) peed V ght (ft) 40 210 198 183 208 178	ult (mph 5 50 210 193 179 201 174	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 &	D Gabl Exposure Category B C D B C C D D	NA e Roofs 15 210 190 172 208 170 155	NA <b>s (Slope</b> <b>ximum</b> <b>20</b> 210 184 168 199 166 151	NA e 4.5:12 Basic V Mean R 25 210 180 165 193 162 148	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146	NA 12) peed V ght (ft) 40 201 171 158 180 154 142	<sup>v<sub>ult</sub></sup> (mpl 5 194 168 155 174 150 139	<b>60</b> 190 165 153 170 148 137	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 &	Hip Exposure Category B C D B C C D D	Roofs Ma 210 210 199 210 197 179	(Slope ximum 20 210 210 194 210 191 174	4.5:12 Basic Mean R 25 210 208 191 210 187 171	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168	2) peed V ght (ft) 210 198 183 208 178 164	uit (mph 5 50 210 193 179 201 174 161	) <sup>3,6</sup> 60 210 191 176 197 171 158
<b>System</b> <b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19	D Gabl Exposure Category B C D B C D B C D B B	NA e Roofs 15 210 190 172 208 170 155 192	NA s (Slope ximum 20 210 184 168 199 166 151 184	NA e 4.5:12 Basic Mean R 25 210 180 165 193 165 193 162 148 179	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167	/ <sub>ult</sub> (mpl 5 194 168 155 174 150 139 161	<b>60</b> 190 165 153 170 148 137 158	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19	Hip Exposure Category B C D B C D B B B	Roofs Ma 15 210 210 199 210 197 179 210	(Slope eximum 20 210 210 194 210 191 174 210	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200	2) peed V ght (ft) 40 210 198 183 208 178 164 192	uit (mph 50 210 193 179 201 174 161 186	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20	D Gabl Exposure Category B C D B C D B C D B C	NA e Roofs 15 210 190 172 208 170 155 192 158	NA s (Slope ximum 20 210 184 168 199 166 151 184 153	NA <b>Basic</b> <b>Mean R</b> <b>25</b> 210 180 165 193 162 148 179 150	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142	<sup>7</sup> ult (mpl 5 194 168 155 174 150 139 161 139	<b>60</b> 190 165 153 170 148 137 158 137	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20	Hip Exposure Category B C D B C D B C C	Roofs Ma 15 210 210 199 210 197 179 210 182	(Slope xximum 20 210 210 194 210 191 174 210 177	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164	ut (mph 50 210 193 179 201 174 161 186 161	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	D Gabl Exposure Category B C D B C D B C D B C D D D	NA e Roofs 210 190 172 208 170 155 192 158 143	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140	NA e 4.5:12 Basic Mean R 25 210 180 165 193 162 148 179 150 137	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 131	/ <sub>ult</sub> (mpl <sup>5</sup> 50 194 168 155 174 150 139 161 139 129	60 190 165 153 170 148 137 158 137 127	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Hip Exposure Category B C D B C D B C D B C C D D D D C D D	Roofs Ma 15 210 210 199 210 197 179 210 182 165	(Slope eximum 20 210 210 194 210 191 174 210 177 161	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158	- 6.1:12 Wind S oof Hei 210 204 187 210 183 168 200 169 156	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152	ut (mph 50 210 193 179 201 174 161 186 161 149	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20	D Gabl Exposure Category B C D B C D B C D B C D B B C D B B C D B B C C D B B C C D B B C C D B C C C C	NA e Roofs 15 210 190 172 208 170 155 192 155 192 158 143 180	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 131 156	/ <sub>ult</sub> (mpl <sup>5</sup> 50 194 168 155 174 150 139 161 139 129 151	<b>60</b> 190 165 153 170 148 137 158 137 127 147	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20	Hip Exposure Category B C D B C D B C D B C D B B C B B C B B C B B C B B C B B C C B B C B B C C B C C B C	Roofs Ma 210 210 199 210 197 179 210 182 165 208	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180	<b>50</b> 210 193 179 201 174 161 186 161 149 174	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	D Gabl Exposure Category B C D B C D B C D B C C D B C C	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140	NA 2 – 6.1: Wind S oof He 30 209 177 162 188 159 146 174 147 135 162 137	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 167 142 131 156 133	7 <sub>ult</sub> (mpl 5 50 194 168 155 174 150 139 161 139 129 151 130	<b>60</b> 190 165 153 170 148 137 158 137 127 147 128	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Hip Exposure Category B C D B C D B C C D B C C D B C C	Roofs Ma 210 210 199 210 197 179 210 182 165 208 170	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162	6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180 154	utt (mph 5 210 193 179 201 174 161 186 161 149 174 150	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	D Gabl Exposure Category B C D B C D B C C D B C C D B C C D D B C C D D C D D D C D D D C D D D C	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147 134	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 131	NA e 4.5:12 Basic Mean R 25 210 180 165 193 162 148 179 150 137 167 140 128	NA 2 – 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 131 156 133 123	<sup>ruit</sup> (mpl 5 50 194 168 155 174 150 139 161 139 161 139 129 151 130 121	<b>60</b> 190 165 153 170 148 137 158 137 127 147 128 119	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Hip Exposure Category B C D B C D B C C D B C C D B C C D D B C C D D D D	Roofs Ma 15 210 210 199 210 197 179 210 182 165 208 170 155	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165 151	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162 148	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180 154 142	ut (mph 5 50 210 193 179 201 174 161 186 161 149 174 150 139	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148 137
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	D Gabl Exposure Category B C D B C D B C D B C D B C D B C D B C D B C D B B C C D B B C C D B B C C D B B C C D B C C D B C C C C	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147 134 173	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 143 131 166	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140 128 161	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126 156	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 131 156 133 123 150	Juit (mpl)           50           194           168           155           174           150           139           161           139           161           139           121           145	<b>60</b> 190 165 153 170 148 137 158 137 127 147 128 119 141	No. 2           1, 6, 9, 10, 13, 16, 17           & 18           2 & 19           3, 7 & 20           4, 11 & 14	Hip Exposure Category B C D B C D B C C D B C C D B C C D B C C B B C C B B C C B B C C B B C C B B C C B C	Roofs Ma 15 210 210 199 210 197 179 210 182 165 208 170 155 199	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165 151 191	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162 148 185	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146 180	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180 154 142 173	uit (mph 5 50 210 193 179 201 174 161 186 161 149 174 150 139 167	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148 137 163
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	D Gabl Exposure Category B C D B C D B C D B C C D B C C D B C C D B C C C D B C C C C	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147 134 173 141	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 131 166 137	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140 128 161 135	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126 156 132	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 167 142 131 156 133 123 150 128	/ <sub>ult</sub> (mp) 5 50 194 168 155 174 150 139 161 139 129 151 130 121 145 125	60 190 165 153 170 148 137 158 137 127 147 128 119 141 123	No. 2           1, 6, 9, 10, 13, 16, 17           & 18           2 & 19           3, 7 & 20           4, 11 & 14	Hip Exposure Category B C D B C D B C D B C C D B C C D B C C D B C C C D C C C C	Roofs Ma 210 210 199 210 197 179 210 182 165 208 170 155 199 163	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165 151 191 159	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162 148 185 155	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146 180 152	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180 154 142 173 148	Juit (mph           5           50           210           193           179           201           174           161           186           161           149           174           150           139           167           144	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148 137 163 142
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	D Gabl Exposure Category B C D B C D B C D B C C D B C C D B C C D B C C D D B C C D D B C C D D B C C D D C D D C C D D C C D D C C C C	NA e Roofs <u>Ma</u> 210 190 172 208 170 155 192 158 143 180 147 134 173 141 128	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 131 166 137 125	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140 128 161 135 123	NA 2 – 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126 132 121	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 167 142 131 156 133 123 150 128 118	/ <sub>ult</sub> (mpl <sup>5</sup> 50 194 168 155 174 150 139 161 139 161 139 151 130 121 145 125 116	<b>60</b> 190 165 153 170 148 137 158 137 127 147 128 119 141 123 114	No. 2           1, 6, 9, 10, 13, 16, 17           & 18           2 & 19           3, 7 & 20           4, 11 & 14	Hip Exposure Category B C D B C D B C D B C D B C D B C D B C C D D B C C D D C D D C D D C D D C D D C D C	Roofs Ma 210 210 199 210 197 179 210 182 165 208 170 155 199 163 148	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165 151 191 159 145	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162 148 185 155 142	- 6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146 180 152 140	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 192 164 152 180 154 142 173 148 136	<b>50</b> 210 193 179 201 174 161 186 161 149 174 150 139 167 144 134	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148 137 163 142 132
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	D Gabl Exposure Category B C D B C D B C D B C D B C D B C D B C D B C D B C C D B C C D B C C D B B C C D B C C D B C C D B C C D C B C C C C	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147 134 173 141 128 167	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 131 166 137 125 160	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140 128 161 135 123 155	NA 2 – 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126 132 121 150	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 167 142 131 156 133 123 150 128 118 144	Juit (mpl)           50           194           168           155           174           150           139           161           139           161           139           161           139           161           139           161           139           151           130           121           145           125           116           140	<b>60</b> 190 165 153 170 148 137 158 137 127 147 128 119 141 123 114 123	No. 2           1, 6, 9, 10, 13, 16, 17 & 18           2 & 19           3, 7 & 20           4, 11 & 14           5	Hip Exposure Category B C D B C D B C C D B C C D B C C D B C C D B C C D B C C D B C C D B B C C D B B C C D B C C D C C C C	Roofs Ma 210 210 199 210 197 179 210 182 165 208 170 155 199 163 148 192	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165 151 191 159 145 184	4.5:12 Basic Jean R 25 210 208 191 210 187 171 206 173 158 193 162 148 185 155 142 179	6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146 180 152 140 174	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180 154 142 173 148 136 167	Juit (mph           50           210           193           179           201           174           161           186           161           149           174           150           139           167           144           134           161	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148 137 163 142 132 157
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	D Gabl Exposure Category B C D B C D B C D B C D B C D B C D B C D B C C D B C C D B C C D B C C D C B C C C C	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147 134 147 134 173 141 128 167 136	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 143 131 166 137 125 160 133	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140 128 161 135 123 155 130	NA 2 – 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126 137 126 132 121 150 127	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 167 142 167 142 131 156 133 123 150 128 118 144 123	y <sub>ult</sub> (mpl 5 50 194 168 155 174 150 139 161 139 129 151 130 121 145 125 116 140 120	(b) <sup>3,6</sup> 60 190 165 153 170 148 137 158 137 127 147 128 119 141 123 114 123 114 136 119	No. 2           1, 6, 9, 10, 13, 16, 17 & 18           2 & 19           3, 7 & 20           4, 11 & 14           5	Hip Exposure Category B C D B C D B C C D B C C D B C C D B C C D B C C D B C C D B C C D C B C C D C C C C	Roofs           Ma           15           210           210           199           210           197           210           197           210           197           210           197           210           155           199           163           148           192           157	(Slope eximum 20 210 210 194 210 191 174 210 177 161 199 165 151 191 159 145 184 153	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162 148 185 162 148 185 155 142 179 150	6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146 180 152 140 174 147	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 164 152 180 154 154 142 173 148 136 167 142	Juilt (mph           50           210           193           179           201           174           161           186           161           149           174           150           139           167           144           134           161           139	) <sup>3,6</sup> 60 210 191 176 197 1771 158 182 158 146 170 148 137 163 142 132 157 137
System No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	D Gabl Exposure Category B C D B C D B C D B C C D B C C D B C C D B C C D B C C D D B C C D D B C C D D B C C D D B C C D D D B C C D D D B C C D D D C D D D C D D D D	NA e Roofs 15 210 190 172 208 170 155 192 158 143 180 147 134 173 141 128 167 136 124	NA s (Slope ximum 20 210 184 168 199 166 151 184 153 140 173 143 143 131 166 137 125 160 133 121	NA e 4.5:12 Basic 210 180 165 193 162 148 179 150 137 167 140 128 161 135 123 155 130 119	NA 2 - 6.1: Wind S oof Hei 30 209 177 162 188 159 146 174 147 135 162 137 126 156 132 121 150 127 117	NA 12) peed V ght (ft) 40 201 171 158 180 154 142 167 142 131 156 133 123 150 128 118 144 123 114	Juit (mpl)           50           194           168           155           174           150           139           161           139           161           139           121           145           125           116           140           120           112	<b>60</b> 190 165 153 170 148 137 158 137 127 147 128 119 141 123 114 136 119 110	No. 2           1, 6, 9, 10, 13, 16, 17 & 18           2 & 19           3, 7 & 20           4, 11 & 14           5	Hip Exposure Category B C D B C D B C D B C C D B C C D B C C D B C C D B C C D D B C C D D B C C D D B C C D D C D D C C D C D	Roofs           Ma           15           210           210           199           210           199           210           197           210           197           210           197           210           197           210           182           165           208           170           155           199           163           148           192           143	(Slope eximum 20 210 210 194 210 191 174 210 177 161 177 161 199 165 151 191 159 145 184 153 140	4.5:12 Basic Mean R 25 210 208 191 210 187 171 206 173 158 193 162 148 185 155 142 179 150 137	6.1:12 Wind S oof Hei 30 210 204 187 210 183 168 200 169 156 187 158 146 187 158 146 180 152 140 174 147 135	2) peed V ght (ft) 40 210 198 183 208 178 164 192 164 152 180 154 142 173 148 136 167 142 131	utt (mph 5 50 210 193 179 201 174 161 186 161 149 174 150 139 167 144 134 161 139 129	) <sup>3,6</sup> <b>60</b> 210 191 176 197 171 158 182 158 146 170 148 137 163 142 132 157 137 127

<sup>1</sup>Table limiting heights and wind velocity values are for low-rise buildings of maximum 60 ft height, developed in accordance with ASCE 7-16,

Table 30.3-1. Design input values:  $GC_p = ASCE7-16$  Figs 30.3-2A-I,  $GC_{pi} = 0.18$ ,  $K_{zt} = 1$ ,  $K_d = 0.85$ ,  $K_e = 1$ ,  $I_w = 1.0$ .

<sup>2</sup>System numbers as specified in Table 2. See Table 2 for Davinci product, installation parameters and assembly component details.

<sup>3</sup>Wind speed conversion corresponds to the maximum Zone 2/3 pressure with effective area of 10 ft<sup>2</sup>. Table 3 wind speeds are only valid under the design conditions stated. For other site conditions and/or building dimensions, designers can use the published Allowable Uplift Pressure (psf) (ASD) in Table 2 to determine allowable wind speeds with IRC Table R301.2(2) or calculations in accordance with IBC Chapter 16.

<sup>4</sup>Wind exposure categories as defined in ASCE 7-16, Section 26.7.

<sup>5</sup>Interpolation not permitted. For heights in between those specified, use next highest height column.

<sup>6</sup>NA indicates that the installation condition is not acceptable within the design limits of the table.

	Gab			oe 6.2:'						Hip	Roofs							
System	Experies	Maximum Basic Wind Speed, '						h) <sup>3,6</sup>	System	Experies	Maximum Basic Wind Speed, V <sub>ult</sub> (mph) <sup>3,6</sup>							
No. <sup>2</sup>	Exposure Category			Mean F	Roof He	eight (ft	)5		No. <sup>2</sup>	Exposure Category	Mean Roof Height (ft)⁵							
	outegoly	15	20	25	30	40	50	60		outegoly	15	20	25	30	40	50	60	
1, 6, 9,	В	210	210	210	210	209	202	197	1, 6, 9,	В	210	210	210	210	210	204	199	
10, 13, 16, 17	С	197	192	188	184	179	174	172	10, 13, 16, 17 &	С	199	194	190	186	180	176	174	
& 18	D	179	175	172	169	165	162	159	18	D	181	177	174	171	166	163	161	
	В	210	208	201	195	188	182	177		В	210	210	203	197	189	183	179	
2 & 19	С	177	172	169	165	160	157	154	2 & 19	С	179	174	170	167	162	158	156	
	D	161	157	154	152	148	145	143		D	163	159	156	153	149	146	144	
	В	200	192	186	181	173	168	164		В	202	194	188	182	175	170	166	
3, 7 & 20	С	164	159	156	153	148	145	143	3, 7 & 20	С	166	161	157	154	150	146	144	
20	D	149	145	143	140	137	134	132		D	150	147	144	142	138	135	133	
	В	187	180	174	169	162	157	153		В	189	181	176	171	164	159	155	
4, 11 & 14	С	153	149	146	143	139	135	134	4, 11 & 14	С	155	151	147	144	140	137	135	
14	D	139	136	134	131	128	126	124	14	D	141	137	135	133	129	127	125	
	В	180	172	167	162	156	151	147	5	В	182	174	169	164	157	152	149	
5	С	147	143	140	137	133	130	128		С	149	144	141	138	134	131	130	
	D	134	131	128	126	123	120	119		D	135	132	130	127	124	122	120	
	В	173	166	161	157	150	145	142		В	175	168	163	158	152	147	143	
8 & 21	С	142	138	135	132	128	125	124	8 & 21	С	143	139	136	134	130	127	125	
	D	129	126	124	122	119	116	114		D	130	127	125	123	120	117	115	
	В	163	156	151	147	141	137	133		В	165	158	153	148	143	138	135	
12 & 15	С	133	130	127	124	121	118	116	12 & 15	С	135	131	128	125	122	119	117	
	D	121	118	116	114	111	109	108		D	122	120	117	115	112	110	109	

#### TABLE 3—2021 and 2018 IBC and IRC WIND SPEED & MAXIMUM MEAN ROOF HEIGHT<sup>1</sup> (Continued)

For SI: 1ft = 25.4 m, 1mph = 0.44m/s NA – Not Applicable

<sup>1</sup>Table limiting heights and wind velocity values are for low-rise buildings of maximum 60 ft height, developed in accordance with ASCE 7-16,

Table 30.3-1. Design input values:  $GC_p$  = ASCE 7-16 Figures 30.3-2A-I,  $GC_{pi}$  = 0.18,  $K_{zt}$  = 1,  $K_d$  = 0.85,  $K_e$  = 1,  $I_w$  = 1.0.

<sup>2</sup>System numbers as specified in Table 2. See Table 2 for Davinci product, installation parameters and assembly component details.

<sup>3</sup>Wind speed conversion corresponds to the maximum Zone 2/3 pressure with effective area of 10 ft<sup>2</sup>. Table 3 wind speeds are only valid under the design conditions stated. For other site conditions and/or building dimensions, designers can use the published Allowable Uplift Pressure (psf) (ASD) in Table 2 to determine allowable wind speeds with IRC Table R301.2(2) or calculations in accordance with IBC Chapter 16.

<sup>4</sup>Wind exposure categories as defined in ASCE 7-16, Section 26.7.

<sup>5</sup>Interpolation not permitted. For heights in between those specified, use next highest height column.

<sup>6</sup>NA indicates that the installation condition is not acceptable within the design limits of the table.

#### TABLE 4-2015 IBC and IRC WIND SPEED & MAXIMUM MEAN ROOF HEIGHT<sup>1</sup>

1	Gab	le Roo	fs (Slo	pe 3:12	- 6.1:	12)				Hip	Roofs	(Slope	3:12 -	5.5:5:1	2)				
Sustam	Eveneeure	Ma	ximum	Basic	Wind S	peed, V	/ <sub>ult</sub> (mpl	n) <sup>3,6</sup>	Sustam	Evenenure	Maximum Basic Wind Speed, V <sub>ult</sub> (mph) <sup>3,6</sup>								
System No. <sup>2</sup>	Exposure Category	,		Mean R	oof He	ight (ft)	5		System No. <sup>2</sup>	Exposure Category	Mean Roof Height (ft)⁵								
	outegoly	15	20	25	30	40	50	60	_	outogoly	15	20	25	30	40	50	60		
1, 6, 9,	В	210	210	210	210	205	199	194	1, 6, 9,	В	210	210	210	210	210	210	210		
10, 13, 16, 17	С	194	188	184	181	175	171	168	10, 13, 16, 17 &	С	210	210	210	210	210	208	205		
& 18	D	176	172	169	166	162	159	156	18	D	210	209	205	202	197	193	190		
	В	192	192	192	192	184	178	174		В	210	210	210	210	210	210	210		
	С	174	169	166	162	157	154	151	2 & 19	С	210	206	201	197	191	187	184		
	D	158	154	152	149	145	142	140		D	192	188	184	181	177	173	171		
	В	177	177	177	177	170	165	161		В	210	210	210	210	207	201	196		
3, 7 & 20	С	161	156	153	150	146	142	140	3, 7 & 20	С	196	190	186	182	177	173	170		
20	D	146	143	140	138	134	132	130	20	D	178	174	171	168	163	160	158		
	В	166	166	166	166	159	154	151		В	202	202	202	202	194	188	183		
4, 11 & 14	С	151	146	143	140	136	133	131	4, 11 & 14	С	183	178	174	171	166	162	159		
14	D	137	134	131	129	126	123	121	14	D	166	162	160	157	153	150	148		
	В	159	159	159	159	153	148	145		В	194	194	194	194	186	180	176		
5	С	145	141	137	135	131	128	125	5	С	176	171	167	164	159	155	152		
	D	131	128	126	124	121	118	116		D	160	156	153	151	147	144	142		
	В	154	154	154	154	147	143	139		В	187	187	187	187	179	174	170		
8 & 21	С	139	136	133	130	126	123	121	8 & 21	С	170	165	161	158	153	150	147		
	D	127	124	121	119	116	114	112		D	154	150	148	145	142	139	137		
	В	144	144	144	144	139	134	131		В	176	176	176	176	169	163	159		
12 & 15	C	131	127	125	122	118	116	114	12 & 15	C	159	155	152	148	144	141	138		
	D	119	116	114	112	109	107	106		D	145	141	139	136	133	130	128		
			-				-				<u> </u>	<u> </u>							
	Gab	le Roof	's (Slop	be 6.2-1	2 - 12:′	12)				Нір	Roofs								
System	<b>F</b>	14-		<b>-</b> ·						Exposure	Maximum Basic Wind Speed V <sub>ult</sub> (mph) <sup>3,6</sup>								
System	Exposure	Ivia				Speed V		1) <sup>3,6</sup>	System	Exposure	Ma				-		) <sup>3,0</sup>		
No. <sup>2</sup>	Exposure Category			Mean R	oof He	ight (ft)	5		System No. <sup>2</sup>	Exposure Category			Mean R	oof He	ight (ft)	5			
	Category	15	20	Mean R 25	oof He	ight (ft) 40	₅ 50	60	No. <sup>2</sup>	Category	15	20	Mean R 25	oof He 30	ight (ft) 40	<sup>5</sup> 50	60		
1, 6, 9,	Category B	<b>15</b> 210	<b>20</b> 210	Mean R 25 210	200f He 30 210	<b>ight (ft)</b> 40 210	5 <b>50</b> 210	<b>60</b> 210		Category B	<b>15</b> 210	<b>20</b> 210	Mean R 25 210	<b>30</b> 210	ight (ft) 40 205	5 50 199	<b>60</b> 194		
1, 6, 9, 10, 13, 16, 17	Category B C	<b>15</b> 210 210	<b>20</b> 210 210	Mean R 25 210 210	<b>30</b> 210 210	<b>ight (ft)</b> <b>40</b> 210 210	5 50 210 210	<b>60</b> 210 210	<b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17	Category B C	<b>15</b> 210 194	<b>20</b> 210 188	Mean R 25 210 184	<b>oof He</b> <b>30</b> 210 181	ight (ft) 40 205 175	₅ <b>50</b> 199 171	<b>60</b> 194 168		
1, 6, 9, 10, 13,	Category B C D	<b>15</b> 210 210 210	<b>20</b> 210 210 210	Mean R 25 210 210 210	<b>30</b> 210 210 210 210	ight (ft) 40 210 210 210	5 50 210 210 210 210	<b>60</b> 210 210 210 210	<b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13,	Category B C D	<b>15</b> 210 194 176	<b>20</b> 210 188 172	Mean R 25 210 184 169	<b>30</b> 210 181 166	ight (ft) 40 205 175 162	<b>50</b> 199 171 159	<b>60</b> 194 168 156		
1, 6, 9, 10, 13, 16, 17 & 18	Category B C D B	<b>15</b> 210 210 210 210	20 210 210 210 210 210	Mean R           25           210           210           210           210           210           210	30           210           210           210           210           210           210	ight (ft)           40           210           210           210           210           210	5 50 210 210 210 210 210 210	60 210 210 210 210 210	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18	Category B C D B	<b>15</b> 210 194 176 192	<b>20</b> 210 188 172 192	Mean R 25 210 184 169 192	<b>30</b> 210 181 166 192	ight (ft) 40 205 175 162 184	<b>5</b> <b>50</b> 199 171 159 178	<b>60</b> 194 168 156 174		
1, 6, 9, 10, 13, 16, 17	Category B C D B C	<b>15</b> 210 210 210 210 210	20 210 210 210 210 210 210	Mean R 25 210 210 210 210 210 210	30           210           210           210           210           210           210           210           210	ight (ft)           40           210           210           210           210           210           210           210           210           210	5 50 210 210 210 210 210 210	<b>60</b> 210 210 210 210 210 210	<b>No.</b> <sup>2</sup> 1, 6, 9, 10, 13, 16, 17	Category B C D B C	<b>15</b> 210 194 176 192 174	<b>20</b> 210 188 172 192 169	Mean R 25 210 184 169 192 166	Soof He           30           210           181           166           192           162	ight (ft) 40 205 175 162 184 157	<b>50</b> 199 171 159 178 154	<b>60</b> 194 168 156 174 151		
1, 6, 9, 10, 13, 16, 17 & 18	Category B C D B C C D	<b>15</b> 210 210 210 210 210 210 210	20 210 210 210 210 210 210 210	Mean R           25           210           210           210           210           210           210           210           210           210	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	5 50 210 210 210 210 210 210 210 202	60 210 210 210 210 210 210 199	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18	Category B C D B C D D	<b>15</b> 210 194 176 192 174 158	<b>20</b> 210 188 172 192 169 154	Mean R 25 210 184 169 192 166 152	oof He           30           210           181           166           192           162           149	ight (ft) 40 205 175 162 184 157 145	5 50 199 171 159 178 154 142	<b>60</b> 194 168 156 174 151 140		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19	Category B C D B C D B B	<b>15</b> 210 210 210 210 210 210 210	20 210 210 210 210 210 210 210	Mean R           25           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	50           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	<b>60</b> 210 210 210 210 210 210	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19	Category B C D B C D B B	<b>15</b> 210 194 176 192 174	<b>20</b> 210 188 172 192 169	Mean R           25           210           184           169           192           166           152           177	oof He           30           210           181           166           192           162           149           177	ight (ft) 40 205 175 162 184 157 145 170	5 50 199 171 159 178 154 142 165	<b>60</b> 194 168 156 174 151 140 161		
1, 6, 9, 10, 13, 16, 17 & 18	Category B C D B C D B B C	<b>15</b> 210 210 210 210 210 210 210 210	20 210 210 210 210 210 210 210 210	Mean R           25           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207	5 50 210 210 210 210 210 210 202 210 202	60           210           210           210           210           210           210           210           210           210           210           210           210           199           210           198	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18	Category B C D B C D B B C	<b>15</b> 210 194 176 192 174 158 177 161	<b>20</b> 210 188 172 192 169 154 177 156	Mean R           25           210           184           169           192           166           152           177           153	oof He           30           210           181           166           192           162           149           177           150	ight (ft)           40           205           175           162           184           157           145           170           146	5 50 199 171 159 178 154 154 142 165 142	60           194           168           156           174           151           140           161           140		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 &	Category B C D B C D B C C D D D	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208	20 210 210 210 210 210 210 210 210 203	Mean R           25           210	30           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191	s 50 210 210 210 210 210 210 202 210 202 187	60           210           210           210           210           210           210           210           210           210           210           210           210           199           210           198           184	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 &	Category B C D B C D B C C D D D	15           210           194           176           192           174           158           177           161           146	20 210 188 172 192 169 154 177 156 143	Mean R           25           210           184           169           192           166           152           177           153           140	oof He           30           210           181           166           192           162           149           177           150           138	ight (ft) 40 205 175 162 184 157 145 170 146 134	5 50 199 171 159 178 154 142 165 142 132	60           194           168           156           174           151           140           161           130		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20	Category B C D B C D B C C D B B B B	15           210	20 210 210 210 210 210 210 210 210 203 210	Mean R           25           210	oof He           30           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210	s 50 210 210 210 210 210 210 202 210 202 210 202 187 210	60           210           210           210           210           210           210           210           210           199           210           198           184           210	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20	Category B C D B C D B C C D B B B B	15           210           194           176           192           174           158           177           161           146           166	20 210 188 172 192 169 154 177 156 143 166	Mean R           25           210           184           169           192           166           152           177           153           140           166	oof He           30           210           181           166           192           162           149           177           150           138           166	ight (ft) 40 205 175 162 184 157 145 170 146 134 159	5 50 199 171 159 178 154 142 165 142 132 154	60           194           168           156           174           151           140           161           130           151		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 &	Category B C D B C D B C C D B C C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208	20 210 210 210 210 210 210 210 210 203	Mean R           25           210	30           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193	<ul> <li>₅</li> <li>50</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>202</li> <li>210</li> <li>202</li> <li>187</li> <li>210</li> <li>189</li> </ul>	60           210           210           210           210           210           210           210           210           210           210           210           210           199           210           198           184	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 &	Category B C D B C D B C C D B C C	15           210           194           176           192           174           158           177           161           146           151	20 210 188 172 192 169 154 177 156 143 166 146	Mean R           25           210           184           169           192           166           152           177           153           140           166           143	oof He           30           210           181           166           192           162           149           177           150           138           166           149	ight (ft) 40 205 175 162 184 157 145 170 146 134 159 136	5 50 199 171 159 178 154 142 165 142 132 154 133	60           194           168           156           174           151           140           161           130		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Category B C D B C D B C C D B C C D D D D	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210	20 210 210 210 210 210 210 210 203 210 208 190	Mean R           25           210           203           186	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           199           183	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178	<ul> <li><sup>5</sup></li> <li>50</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>202</li> <li>210</li> <li>202</li> <li>187</li> <li>210</li> <li>189</li> <li>175</li> </ul>	60           210           210           210           210           210           210           210           210           199           210           198           184           210           185           172	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Category B C D B C D B C C D B C C D D D D	15           210           194           176           192           174           158           177           161           146           151           137	20 210 188 172 192 169 154 177 156 143 166 143 166 146 134	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129	ight (ft) 40 205 175 162 184 157 145 170 146 134 159 136 126	5 50 199 171 159 178 154 142 165 142 132 154 133 123	60           194           168           156           174           151           140           161           140           130           151           131           121		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B B C C D B B C C D B B C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210           210	20 210 210 210 210 210 210 210 203 210 203 210 208 190 210	Mean R           25           210           203           186           210	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210	<ul> <li>50</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>202</li> <li>210</li> <li>202</li> <li>187</li> <li>210</li> <li>189</li> <li>175</li> <li>210</li> </ul>	60           210           210           210           210           210           210           210           199           210           198           184           210           185           172           205	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B B C C D B B C C D B B C C D B C C D C C D C C C C	15           210           194           176           192           174           158           177           161           146           166           151           137           159	20 210 188 172 192 169 154 177 156 143 166 143 166 146 134 159	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159	ight (ft)           40           205           175           162           184           157           145           170           146           134           159           136           126           153	5 50 199 171 159 178 154 142 165 142 132 154 133 123 148	60           194           168           156           174           151           140           161           140           130           151           131           121           145		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Category B C D B C D B C C D B C C D D D D	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210           210           210           210           210           210           205	20 210 210 210 210 210 210 210 203 210 208 190	Mean R           25           210           203           186           210           195	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           199           183	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210           186	<ul> <li><sup>5</sup></li> <li>50</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>202</li> <li>210</li> <li>202</li> <li>187</li> <li>210</li> <li>189</li> <li>175</li> </ul>	60           210           210           210           210           210           210           210           210           199           210           198           184           210           185           172	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 &	Category B C D B C D B C C D B C C D B C C	15           210           194           176           192           174           158           177           161           146           166           151           137           159           145	20 210 188 172 192 169 154 177 156 143 166 143 166 146 134	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159           135	ight (ft) 40 205 175 162 184 157 145 170 146 134 159 136 126	5 50 199 171 159 178 154 142 165 142 132 154 133 123	60           194           168           156           174           151           140           161           140           130           151           131           121		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B B C C D B B C C D B B C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210           210	20 210 210 210 210 210 210 210 203 210 203 210 208 190 210	Mean R           25           210           203           186           210           195           179	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210	<ul> <li>50</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>202</li> <li>210</li> <li>202</li> <li>187</li> <li>210</li> <li>189</li> <li>175</li> <li>210</li> </ul>	60           210           210           210           210           210           210           210           199           210           198           184           210           185           172           205	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B B C C D B B C C D B B C C D B C C D C C D C C C C	15           210           194           176           192           174           158           177           161           146           166           151           137           159	20 210 188 172 192 169 154 177 156 143 166 146 134 159 141 128	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159           137           126	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159	ight (ft)           40           205           175           162           184           157           145           170           146           134           159           136           126           153	5 50 199 171 159 178 154 142 165 142 132 154 133 123 148	60           194           168           156           174           151           140           161           140           130           151           131           121           145		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B C C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210           210           210           210           210           210           205	20 210 210 210 210 210 210 210 203 210 203 210 208 190 210 199	Mean R           25           210           203           186           210           195	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210           191	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210           186	s 50 210 210 210 210 210 210 202 210 202 187 210 189 175 210 181	60           210           210           210           210           210           210           210           210           199           210           198           184           210           185           172           205           178	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B C C	15           210           194           176           192           174           158           177           161           146           166           151           137           159           145	20 210 188 172 192 169 154 177 156 143 166 143 166 146 134 159 141	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159           137	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159           135	ight (ft)           40           205           175           162           184           157           145           170           146           134           159           136           126           131	5 50 199 171 159 178 154 142 165 142 132 154 133 123 148 128	60           194           168           156           174           151           140           161           140           130           151           131           121           145           125		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B C C D B C C D D C D D C D D C D D C C D C C C C D C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210           210           210           210           210           194           210           205           186	20 210 210 210 210 210 210 210 203 210 203 210 208 190 210 199 182	Mean R           25           210           203           186           210           195           179	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210           191           176	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210           186           171	50           210           210           210           210           210           210           210           210           210           210           210           210           210           210           202           187           210           189           175           210           181           168	60           210           210           210           210           210           210           210           210           210           210           210           210           199           210           198           184           210           185           172           205           178           165	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14	Category B C D B C D B C C D B C C D B C C D D B C C D D C D D D D	15           210           194           176           192           174           158           177           161           146           151           137           159           145           131	20 210 188 172 192 169 154 177 156 143 166 146 134 159 141 128	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159           137           126           154           133	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           135           124	ight (ft)           40           205           175           162           184           157           145           170           146           134           159           136           126           131           121	5 50 199 171 159 178 154 142 165 142 132 154 133 123 148 128 118	60           194           168           174           151           140           161           140           130           151           131           121           145           125           116		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	Category B C D B C D B C C D B C C D B C C D B B C C D B B C C D B B C C D B B C C C C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           210           210           210           210           210           210           210           210           210           210           210           210           205           186           210	20 210 210 210 210 210 210 210 203 210 203 210 208 190 210 199 182 210	Mean R           25           210           203           186           210           195           179           210	Soof He           30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210           191           176           210	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210           186           171           209	50           210           210           210           210           210           210           210           210           210           210           210           210           210           210           202           187           210           189           175           210           181           168           203	60           210           210           210           210           210           210           210           210           199           210           199           210           198           184           210           185           172           205           178           165           198	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	Category B C D B C D B C C D B C C D B C C D B B C C D B B C C D B B C C D B B C C C C	15           210           194           176           192           174           158           177           161           146           166           151           137           159           145           131           154	20 210 188 172 192 169 154 177 156 143 166 146 134 159 141 128 154	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159           137           126           154	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159           135           124           154	ight (ft)           40           205           175           162           184           157           145           170           146           134           159           136           126           153           131           121           147	5 50 199 171 159 178 154 142 165 142 132 154 133 123 148 128 118 143	60           194           168           174           151           140           161           130           151           131           121           145           125           116           139		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	Category B C D B C D B C C D B C C D B C C D B C C D B C C D B C C C D C C C C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           208           210           208           210           194           210           205           186           210           198	20 210 210 210 210 210 210 210 203 210 208 190 210 199 182 210 192	Mean R           25           210           203           186           210           195           179           210           188	30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210           191           176           210           184	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210           186           171           209           179	<ul> <li><sup>5</sup></li> <li>50</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>210</li> <li>202</li> <li>210</li> <li>202</li> <li>187</li> <li>210</li> <li>189</li> <li>175</li> <li>210</li> <li>181</li> <li>168</li> <li>203</li> <li>175</li> </ul>	60           210           210           210           210           210           210           210           210           199           210           199           210           198           184           210           185           172           205           178           165           198           172	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	Category B C D B C D B C C D B C C D B C C D B C C D B C C D B C C C D C C C C	15           210           194           176           192           174           158           177           161           146           166           151           137           159           145           131           154           139	20 210 188 172 192 169 154 177 156 143 166 143 166 146 134 159 141 128 154 136	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159           137           126           154           133	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159           135           124           130	ight (ft) 40 205 175 162 184 157 145 170 146 134 159 136 126 153 131 121 147 126	50           199           171           159           178           154           142           165           142           132           154           132           154           132           154           132           154           133           123           148           128           118           143           123	60           194           168           156           174           151           140           161           140           130           151           131           121           145           125           116           139           121		
1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	Category B C D B C D B C D B C D B C D B C D B C D B C D B C C D B C C D B C C D D B C C D D C D C	15           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           208           210           208           210           208           210           205           186           210           198           180	20 210 210 210 210 210 210 210 203 210 208 190 210 199 182 210 192 176	Mean R           25           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           199           210           199           210           195           179           210           188           172	Soof He           30           210           210           210           210           210           210           210           210           210           210           210           210           210           210           210           196           210           199           183           210           191           176           210           184           169	ight (ft)           40           210           210           210           210           210           210           210           210           210           210           210           206           210           207           191           210           193           178           210           186           171           209           179           165	50           210           210           210           210           210           210           210           210           210           210           210           210           202           187           210           189           175           210           181           168           203           175           162	60           210           210           210           210           210           210           210           199           210           198           184           210           185           172           205           178           165           198           172           159	No. <sup>2</sup> 1, 6, 9, 10, 13, 16, 17 & 18 2 & 19 3, 7 & 20 4, 11 & 14 5	Category B C D B C D B C C D B C C D B C C D B C C D B C C D D B C C D D B C C D D D D	15           210           194           176           192           174           158           177           161           146           166           151           137           159           145           131           154           127	20 210 188 172 192 169 154 177 156 143 166 143 166 146 134 159 141 128 154 136 124	Mean R           25           210           184           169           192           166           152           177           153           140           166           143           131           159           137           126           154           133           121	oof He           30           210           181           166           192           162           149           177           150           138           166           140           129           159           135           124           154           130           119	ight (ft)           40           205           175           162           184           157           145           170           146           134           159           136           126           145           170           145           170           145           170           145           131           121           147           126           116	50           199           171           159           178           154           142           165           142           132           154           132           154           132           154           132           154           133           123           148           128           118           143           123	60           194           168           156           174           151           140           161           140           130           151           131           121           145           125           116           139           121           112		

For SI: 1ft = 25.4 m, 1mph = 0.44m/s NA – Not Applicable

<sup>1</sup>Table limiting heights and wind velocity values are for low-rise buildings of maximum 60 ft height, developed in accordance with ASCE 7-10,

Table 30.4-1. Design input values:  $GC_p$  = ASCE 7-10 Figures 30.4-2B-2C,  $GC_{pi}$  = 0.18,  $K_{zt}$  = 1.0,  $K_d$  = 0.85,  $K_e$  = 1,  $I_w$  = 1.0.

<sup>2</sup>System numbers as specified in Table 2. See Table 2 for Davinci product, installation parameters and assembly component details.

<sup>3</sup>Wind speed conversion corresponds to the maximum Zone 2/3 pressure with effective area of 10 ft<sup>2</sup>. Table 4 wind speeds are only valid under the design

conditions stated. For other site conditions and/or building dimensions, designers can use the published Allowable Uplift Pressure (psf) (ASD) in

Table 2 to determine allowable wind speeds with IRC Table R301.2(2) or calculations in accordance with IBC Chapter 16.

<sup>4</sup>Wind exposure categories as defined in ASCE 7-10, Section 26.7.

<sup>5</sup>Interpolation not permitted. For heights in between those specified, use next highest height column.

<sup>6</sup>NA indicates that the installation condition is not acceptable within the design limits of the table.

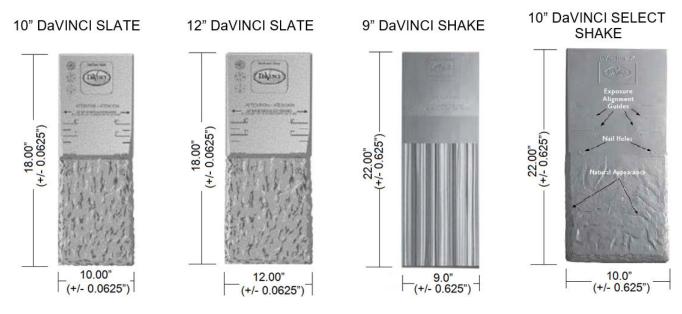
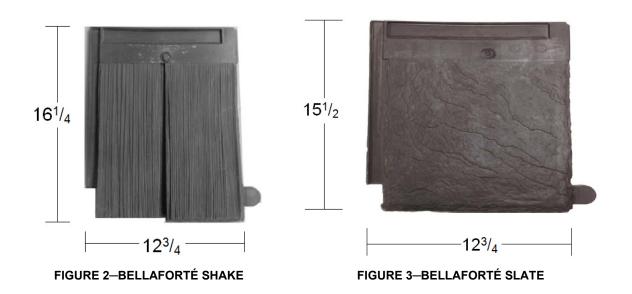
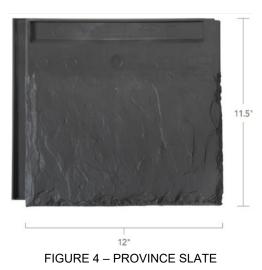


FIGURE 1-DaVINCI SLATE, DaVINCI SHAKE AND DaVINCI SELECT SHAKE SHAKE ROOF SHINGLES







# **ICC-ES Evaluation Report**

# **ESR-2119 CBC and CRC Supplement**

Issued August 2023 This report is subject to renewal August 2024.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION Section: 07 32 26—Plastic Roof Tiles

# **REPORT HOLDER:**

DaVINCI ROOFSCAPES, LLC

# **EVALUATION SUBJECT:**

DAVINCI SLATE, DAVINCI SHAKE, DAVINCI SELECT SHAKE, BELLAFORTÉ SHAKE, BELLAFORTÉ SLATE AND PROVINCE SLATE ROOF SHINGLES

#### 1.0 REPORT PURPOSE AND SCOPE

### Purpose:

The purpose of this evaluation report supplement is to indicate that DaVinci Slate, DaVinci Shake, DaVinci Select Shake, Bellaforté Shake, Bellaforté Slate and Province Slate Roof Shingles, described in ICC-ES evaluation report ESR-2119, have also been evaluated for compliance with the codes noted below.

### Applicable code editions:

■ 2019 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

■ 2019 California Residential Code (CRC)

# 2.0 CONCLUSIONS

# 2.1 CBC:

The DaVinci Slate, DaVinci Shake, DaVinci Select Shake, Bellaforté Shake, Bellaforté Slate and Province Slate Roof Shingles, described in Sections 2.0 through 7.0 of the evaluation report ESR-2119, comply with CBC Chapter 15, provided the design and installation are in accordance with the 2018 *International Building Code*<sup>®</sup> (IBC) provisions noted in the evaluation and the additional requirements of CBC Section 1505.1.1 for a Class A roof covering, Section 1505.1.2 for a Class B roof covering or Section 1505.1.3 for a Class C roof covering, as applicable.

The products have not been evaluated under Chapter 7A for use in the exterior design and construction of new buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

# 2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

# 2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

#### 2.2 CRC:

The DaVinci Slate, DaVinci Shake, DaVinci Select Shake, Bellaforté Shake, Bellaforté Slate and Province Slate Roof Shingles, described in Sections 2.0 through 7.0 of the evaluation report ESR-2119, complies with CRC Chapter 9, provided the design and installation are in accordance with the 2018 *International Residential Code*<sup>®</sup> (IRC) provisions noted in the evaluation report and the additional requirements of CRC Section R902.1.1 for a Class A roof covering, Section R902.1.2 for a Class B roof covering or Section R902.1.3 for a Class C roof covering and Section R905.10.

The products have not been evaluated under CRC Section R337 for use in the exterior design and construction of new buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

This supplement expires concurrently with the evaluation report, reissued August 2023.

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