



PUBLISHED:
EXPIRATION:

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PRODUCT: Unified Steel Stone Coated Roofing

REPORT HOLDER: Westlake Royal Roofing LLC

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CSI DIVISION: 07 00 00 - Thermal and Moisture Protection

CSI SECTION: 07 31 16 – Metal Shingles
07 41 13 – Metal Roof Panels

APPLICABLE CODES: 2021, 2018, 2015 International Building Code (IBC)
2021, 2018, 2015 International Residential Code (IRC)

EVALUATED: Weather Resistance
Wind Resistance
Roof Fire-Classification
Hail-Impact Resistance



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CODE EVALUATION REPORT

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1.0 APPROVED FOR FOLLOWING:

APPROVED TYPES OF CONSTRUCTION:	Type IAB, Type IIAB, Type IIIAB, Type IV, Type VAB
APPROVED USE:	Roofing panels for use in Class A roof assemblies on new and over existing roofs in Types I-V construction.
APPROVED INSTALLATIONS:	Roofs including fire-classified roof assemblies.

2.0 DESCRIPTION:

2.1 General:

Unified Steel™ Stone Coated Roofing panels are roof coverings formed from sheet steel complying with ASTM A792, Grade 33, with an AZ 50 class hot-dipped aluminum-zinc alloy coating. The coated metal thickness is 0.017-inch (0.43 mm) thickness. On the exposed surface, colored stone granules are embedded in an acrylic resin base coating, with an application finish coating of a clear acrylic glaze.

See Table 1 below for recognized models of Unified Steel™ Stone Coated Roofing's products. See Figures 1-5 in Section 9.0 Product Details of this report for drawings of the panel profiles listed in Table 1.

Table 1. UNIFIED STEEL™ STONE COATED ROOFING DIMENSIONS

PRODUCT	LENGTH		WIDTH		INSTALLED EXPOSURE	
	inches	mm	inches	mm	inches	mm
PINE-CREST Shake	52	1320	16	406	14.5 x 50	368 x 1270
PACIFIC Tile	52	1320	16	406	14.5 x 50	368 x 1270
COTTAGE Shingle	51	1296	15.5	394	14.25 x 47.5	362 x 1207
BARREL-VAULT Tile	45.13	1114	15.58	396	14 x 43.625	356 x 1108
GRANITE-RIDGE Shingle	46.0625	1170	15.625	397	13.6875 x 44	348 x 1118

Unified Steel™ has various accessory elements available for gables, trim and ridges.



2.2 PRODUCTS

Unified Steel™ Stone Coated Roofing panels are formed to simulate different tile profiles, or wood shakes and shingles.

2.2.1 PINE-CREST SHAKE and PACIFIC TILE:

PINE-CREST Shake panel profiles are supplied with dimensions of 18 inches x 52.5 inches (457 mm x 1334 mm) with a product weight of 1.5 psf (7.3 kg/m²). PACIFIC Tile panel profiles are supplied with dimensions of 18.063 inches x 54.125 inches (459 mm x 1375 mm) with a product weight of 1.5 psf (7.3 kg/m²). Panel side laps are approximately 2 inches (51 mm) in width. The panels are available in a variety of colors.

When installed in accordance with Section 4.4 of this report, the noted roof coverings provide a Class A roof assembly fire classification in accordance with 2021 / 2018 / 2015 IBC Section 1505.1 and 2021 / 2018 / 2015 IRC Section R902.1.

Where installed in areas classified as hail-prone, installation shall be in accordance with Table 3 of this report for the hail-classification levels noted.

2.2.2 COTTAGE SHINGLE:

COTTAGE Shingle panel profiles are supplied with dimensions of 17.25 inches x 52.5 inches (438 mm x 457 mm) with a product weight of 1.5 psf (7.3 kg/m²). Panel side laps are approximately 3.5 inches (89 mm) in width. The panels are supplied in a variety of colors.

When installed in accordance with Section 4.4 of this report, the noted roof coverings provide a Class A roof assembly fire classification in accordance with 2021 / 2018 / 2015 IBC Section 1505.1 and 2021 / 2018 / 2015 IRC Section R902.1.

Where installed in areas classified as hail-prone, installation shall be in accordance with Table 3 of this report for the hail-classification levels noted.

2.2.3 BARREL-VAULT TILE:

BARREL-VAULT Tile panel profiles are supplied with dimensions of 17.125 inches x 45.125 inches (435 mm x 1146 mm) with a product weight of 1.5 psf (7.3 kg/m²). Panel side laps are approximately 9/16-inches (14mm) in width. The panels are supplied in a variety of colors.

When installed in accordance with Section 4.4 of this report, the noted roof coverings provide a Class A roof assembly fire classification in accordance with 2021 / 2018 / 2015 IBC Section 1505.1 and 2021 / 2018 / 2015 IRC Section R902.1.

Where installed in areas classified as hail-prone, installation shall be in accordance with Table 3 of this report for the hail-impact classification levels noted.



2.2.4 GRANITE-RIDGE SHINGLE:

GRANITE-RIDGE Shingle panel profiles are supplied with dimensions of 15.875 inches x 46 inches (403 mm x 1168 mm) with a product weight of 1.5 psf (7.3 kg/m²). Panel side laps are approximately 2 inches (51mm) in width. The panels are supplied in a variety of colors.

When installed in accordance with Section 4.4 of this report, the noted roof coverings provide a Class A roof assembly fire classification in accordance with 2021 / 2018 / 2015 IBC Section 1505.1 and 2021 / 2018 / 2015 IRC Section R902.1.

Where installed in areas classified as hail-prone, installation shall be in accordance with Table 3 of this report for the hail-classification levels noted.

3.0 DESIGN:

Unified Steel™ Stone Coated Roofing panel products outlined in this report comply for use as metal roof shingles in accordance with Section 1507.5 of the 2021 / 2018 / 2015 IBC and Section R905.4 of the 2021 / 2018 / 2015 IRC. PINE-CREST Shakes, COTTAGE Shingles, BARREL-VAULT Tile and PACIFIC Tile are designed to be installed on roofs with minimum slopes of 3:12 (25% slope). Where PINE-CREST Shakes, COTTAGE Shingles, BARREL-VAULT Tiles or PACIFIC Tiles are installed on slopes below the designed minimum, the roof coverings are considered decorative and must be installed over a roof-covering system complying with the applicable code, subject to approval of the authority having jurisdiction. GRANITE-RIDGE Shingle shall be installed at a minimum slope of 4:12 (33.3%).

Unified Steel™ Stone Coated Roofing panel products are intended for use as the finished roof covering on new, and over existing construction.

When used in applications requiring roof fire classified assemblies, installation shall conform to Section 4.4 and Table 2 of this report.

Winds to be resisted by Unified Steel™ Stone Coated Roofing panel products shall be determined in accordance with the applicable codes. Wind pressures to be resisted by Unified Steel™ Stone Coated Roofing panel products shall not exceed allowable wind uplift pressures outlined in Table 4 and Table 5 of this report for installations described.

When installed in areas defined as hail-prone, installation shall be in accordance with Table 3 of this report for the hail-impact classification levels described.

4.0 INSTALLATIONS:

4.1 General:

Installation of Unified Steel™ Stone Coated Roofing panels must comply with the manufacturer's published installation instructions, this report, and the applicable code(s). Where conflicts exist, this report and the applicable building code shall govern. Valley flashings must comply with 2021 / 2018 / 2015 IBC Section 1507.5.7 or 2021 / 2018 / 2015 IRC Section R905.4.6, as applicable. All other flashings must be in accordance with 2021 / 2018 / 2015 IBC Section 1503.2 or 2021 / 2018 / 2015 IRC Section R903.2.

4.1.1 Underlayment:

Underlayment must comply with and be installed in accordance with 2021 / 2018 / 2015 IBC Sections 1507.1.1 and 1507.5.3 and 2021 / 2018 / 2015 IRC Sections R905.1.1 and R905.4.3 as applicable. For fire-classified roof assemblies, one layer of Sol-R-Skin® BLUE underlayment or GAF VersaShield® underlayment shall be installed in accordance with Section 4.4 of this report.



4.2 New Construction:

4.2.1 Direct to Deck: PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile and BARREL-VAULT Tile

The above noted panels must be installed directly on solid or closely fitted minimum 15/32-inch (112 mm) thickness plywood, on solid or closely fitted wood structural panel sheathing or on spaced structural sheathing boards complying with the applicable code. Additional structural sheathing boards must be attached to the roof framing as required to accommodate all panel fastening locations.

The first course of panels is attached at the eave using a starter wood battens. Full panels are placed over the approved underlayment, starting at the eave. The batten must be fastened through the sheathing to the supporting members spaced at a maximum of 24 inches on center (610 mm), with minimum 16d, corrosion-resistant, ring shank nails of sufficient length to penetrate the framing at least ¾ inch (19 mm). Battens are nominally 1-by-4 standard grade Spruce-Pine-Fir or better. Alternative to using wood battens as the first course of panels, a starter metal flashing with a formed raised rib may be fastened through the sheathing to the supporting members spaced at a maximum of 24 inches (610 mm) on center with minimum 0.120-inch-diameter (3 mm), ring shank, corrosion-resistant nails or wood screws of sufficient length to penetrate the framing at least ¾-inch (19 mm) depth. Panels placed at the first course are attached through the top surface of the panel to the starter batten at each lap and at evenly spaced intermediate points, with a number and size of corrosion-resistant, No.10 hex head screws or ring shank nails as detailed in Table 5 of this report. Following the roof panels are installed over the approved underlayment with fasteners following the appropriate schedule outlined in Table 5 of this report.

4.2.2 Direct to Deck: GRANITE-RIDGE Shingle

The above noted panels must be installed directly on solid or closely fitted sheathing complying with the applicable code. A starter strip is installed at the eave. Full panels are placed over the approved underlayment, starting at the eave. The bottom edge of the panel must interlock with the starter strip. The side laps must be overlapped from left to right. Following which, product is installed over the approved underlayment with fasteners and scheduled as outlined in Table 5 of this report. All successive courses of panels are attached by interlocking the bottom edge to the fold at the top edge of the preceding panel and fastening in accordance with Table 5 of this report.

4.2.3 Installed on Battens: PINE-CREST Shake, PACIFIC Tile and BARREL-VAULT Tile

The above noted panels may be installed on wood or steel battens, spaced per panel profile, over minimum 15/32-inch (12 mm) thickness plywood, on wood structural panel sheathing or on spaced structural sheathing boards complying with the applicable code. Wood battens are to be a minimum nominally 2-by-2 (51 mm x 51 mm) in size. Wood battens must be fastened to the supporting framing members with minimum 16d corrosion-resistant nails of sufficient length to penetrate the framing at least 1-inch (25 mm) depth. Additional structural sheathing boards must be attached to the roof framing as required to accommodate all panel fastening locations.

A starter metal flashing with a raised rib may be used in place or a wood batten for the first course of panels. The starter metal flashing must be fastened through the sheathing to the supporting members spaced at a maximum of 24 inches (610 mm) on center, with the minimum 8d, corrosion-resistant ring shank nails of sufficient length to penetrate the framing at least 1-inch (25 mm) depth. When steel battens are used, they must be attached to



supporting framing members with two No. 10 by 1-1/2 inches (38 mm) length wood screws. All successive courses of panels are attached by interlocking the bottom edge to the fold at the top edge of the preceding panel and fastening in accordance with Table 4 of this report.

4.3 Reroofing Applications:

With the old roof covering completely removed, all installation conditions noted in Section 4.1 and 4.2 shall apply.

The panels may also be installed over existing asphalt shingles, wood shingles, wood shakes or built-up roofing, and the panels may be installed direct-to-deck, on battens, or with batten and counter-batten systems. See manufacturer's installation guide for directions and subject to the conditions set forth here, provided the roof slope complies with Section 3.0 of this report and the requirements of Section 1512 of the 2021 IBC, Section 1511 of the 2018 / 2015 IBC and Section R908 of the 2021 / 2018 / 2015 IRC. The roof deck should be clean, free of obstacles and debris. All products are to be anchored through the existing roof into the underlying sheathing in accordance with Table 4 or Table 5 of this report, as applicable.

When used in applications requiring a fire-classified roof assembly, installation shall follow Section 4.4.2 and Table 2 of this report.

4.4. Roof Fire Classified Assemblies:

4.4.1 New Construction:

Where Unified Steel™ Stone Coated Roofing panels are used in new construction requiring a fire-classified roof assembly, installation shall be in accordance with Table 2 of this report.

4.4.2 Reroofing Installations:

4.4.2.1 Class A Fire Classification on Battens: Where Unified Steel™ Stone Coated Roofing panels are used in reroofing installations requiring Class A roof-fire classified assembly including installation over battens, installation shall be in accordance with Table 2 of this report.

4.4.2.2 Class B Fire Classification on Battens: Where Unified Steel™ Stone Coated Roofing panels are used in reroofing installations requiring Class B roof-fire classified assembly including installation over battens, installation shall be in accordance with Table 2 of this report.

4.4.2.3 Class C Fire Classification on Battens: Where Unified Steel™ Stone Coated Roofing panels are used in reroofing installations requiring Class C roof-fire classified assembly including installation over battens, installation shall be in accordance with Table 2 of this report.

4.4.2.4 General Fire Classification on Battens: Where Unified Steel™ Stone Coated Roofing panels are used in reroofing installations over existing classified roof assemblies the roof assembly will maintain its originally fire classification when installed in accordance with Table 2 of this report.

4.5 Wind Resistance:

Allowable wind pressures of assemblies outlined in Table 4 and Table 5 of this report can be used in conjunction with ASCE 7-16 to determine the maximum wind speeds for use in accordance with the 2021 / 2018 / 2015 IBC Figures 1609.3(1), 1609.3(2), 1609.3(3) and 1609.3(4).



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4.6 Live Loads:

The PACIFIC Tile, COTTAGE Shingle, BARREL-VAULT Tile and PINE-CREST Shake panels have an allowable live load of 28 psf (137 kg/m²) when applied to 1-inch x 4-inch nominal wood batten installed on approved spaced sheathing at 14 ½ inches (369mm) on center.

4.7 Hail-Impact Resistance:

PACIFIC Tile, COTTAGE Shingle, BARREL-VAULT Tile, GRANITE-RIDGE Shingle, and PINE-CREST Shake panels are eligible for use in hail-prone areas classified as Very Severe Hail (VSH) when installed in accordance with Table 3 of this report.

5.0 LIMITATIONS

- Installation of the Unified Steel™ Stone Coated Roofing panels are to comply with the applicable codes, this report and the manufacturer's installation instructions.
- The Unified Steel™ Stone Coated coverings described in this report when installed on spaced sheathing must not be used in applications subject to 300-pound (1.3 kN) concentrated loads specified in 2021 / 2018 / 2015 IBC Sections 1607.4, 1607.12 and Table 1607.1, Item 26.
- Unified Steel™ Stone Coated panels are manufactured in Oceanside, CA with inspections by QAI Laboratories.
- Use in fire classified roof assemblies are to be installed in accordance with Table 2 of this report.
- Wind resistance shall not exceed values with an appropriate factor of safety applied, as outlined in Table 4 and Table 5 of this report for the respective installations.
- Where used in applications requiring impact resistance, impact shall not exceed classifications outlined in Table 3 of this report for the installations and products described.

6.0 SUPPORTING INFORMATION:

The following data has been evaluated for Unified Steel™ Stone Coated Metal Panels, PINE-CREST Shake, PACIFIC Tile, COTTAGE Shingle, GRANITE-RIDGE Shingle and BARREL-VAULT Tile:

- Data for use in roof fire classified assemblies determined in accordance with ASTM E108 *Fire Tests of Roof Coverings*.
- Data outlining compliance with 2021 / 2018 / 2015 IBC Section 1507.4 and 2021 / 2018 / 2015 IRC Section R905.4.
- Data outlining resistance to salt exposure per ASTM B117 *Standard Practice for Operating Salt Spray (Fog) Apparatus*.
- Data for Wind Uplift evaluated in accordance with UL 580 *Test for Uplift Resistance of Roof Assemblies*.
- Data for ultra-violet / weathering resistance per ASTM G155 *Practice for Operations Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials*.
- Data for impact testing for Very Severe Hail classification per FM 4475 *Class 1 Steep Slope Roof Covers* and FM 4473 *Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls*.



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7.0 MARKING:



Figure 1. Representative Example of Unified Steel™ Stone Coated Metal Panels Labels



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8.0 RATINGS:

Table 2 – Classified Roofing Assemblies

System	Substrate	Approved Underlayment	Roofing Panel	Installation Guidelines	Roof Classification
New Construction Or Reroof when existing roof is removed	Minimum 15/32-inch-thick plywood	One layer of Sol-R-Skin® BLUE Thermal Underlayment or One layer of GAF VersaShield® Fire-Resistant Roof Deck Protection	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile, GRANITE RIDGE Shingle or BARREL-VAULT Tile	See Section 4.1 and 4.2	A
Reroofing - Existing wood shakes, wood shingles or built-up roofing	Existing Substrate	One layer of Sol-R-Skin® BLUE Thermal Underlayment Or One layer of ½-inch thick (12.7mm) gypsum board Or One layer of ¼-inch-thick (6.3mm) GP DensDeck Roof Board Or Two layers of GAF VersaShield™ Fire-Resistant Roof Deck Protection	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile, GRANITE RIDGE Shingle or BARREL-VAULT Tile	See Section 4.3	A
Reroofing	Minimum 15/32-inch-thick plywood	One layer of Sol-R-Skin® BLUE Thermal Underlayment Or One layer of Type G3 mineral-surfaced cap sheet, complying with the ASTM D3909 and weighing a minimum of 76 pounds per 100 square feet (34.5 kg per 9.29 m2) Or One layer of GAF VersaShield™ Fire-Resistant Roof Deck Protection	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile, GRANITE RIDGE Shingle or BARREL-VAULT Tile	See Section 4.3	B
Existing Classified Roof Assemblies	Existing Substrate	Optional	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile, GRANITE RIDGE Shingle or BARREL-VAULT Tile	See Section 4.3	A, B or C ¹

Note 1: Installation of the Unified Steel Stone Coated Metal Panels over an existing classified roof assembly will retain the rating of the existing assembly.



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Table 3 – Impact Rated Assemblies

Substrate	Approved Underlayment	Roofing Panel	Installation Guidelines	Hail-Impact Classification
Minimum 15/32-inch-thick plywood	Unrestricted	PINE-CREST Shake	See Section 4.1, 4.2 and 4.3	Class 4 And VSH
Minimum 15/32-inch-thick plywood	Unrestricted	PACIFIC Tile	See Section 4.1, 4.2 and 4.3	Class 4 And VSH
Minimum 15/32-inch-thick plywood	Unrestricted	GRANITE-RIDGE Shingle	See Section 4.1 and 4.2	Class 4 And VSH
Minimum 15/32-inch-thick plywood	Unrestricted	COTTAGE Shingle	See Section 4.1 and 4.2	Class 4 And VSH
Minimum 15/32-inch-thick plywood	Unrestricted	BARREL-VAULT Tile	See Section 4.1 and 4.2	Class 4 And VSH

Table 4 – Maximum Allowable Wind Uplift Pressures on Roofing Panels, Batten Assemblies

System No.	Substrate	Battens on Rafters ²	Fastening of Battens or Battens and Rafters ²	Roofing Panel	Panel Fastening to Batten ²	Allowable Wind Uplift Pressure (psf) ¹
1	Minimum 15/32-inch-thick plywood	2 x 2 wood battens perpendicular to rafters	Battens fastened with on No. 8-11 x 3-inch-long bugle head wood screw at the intersection of each batten and rafter.	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile or BARREL-VAULT Tile	Five No. 10-16 x 2-inch-long HWH wood screws spaced between 8.5 and 12 inches o.c. through the vertical leg at the headlap beginning at the center of the side lap	83
2	Minimum 15/32-inch-thick plywood	2 x 2 wood battens perpendicular to rafters	Battens fastened with one No. 8-11 x 3-inch-long bugle head wood screw at the intersection of each batten and rafter and one No. 8-11 x 3-inch-long bugle head wood screw positioned 12 inches o.c. between each rafter.	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile or BARREL-VAULT Tile	Ten No. 10-16 x 2-inch-long HWH wood screws spaced between 2 ¾ and 5 ¾ inches o.c. through the vertical leg at the center of the side lap.	150

1. Allowable wind uplift pressure based on a factor of safety of 2.
2. Fasteners must fully penetrate through sheathing into underlying framing members.



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Table 5 – Maximum Allowable Wind Uplift Pressures on Roofing Panels, Direct to Deck Assemblies

System No.	Substrate	Roofing Panel	Panel Fastening Direct to Deck ²	Allowable Wind Uplift Pressure (psf) ¹
1	Minimum 15/32-inch-thick plywood	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile or BARREL-VAULT Tile	Four No. 10-16 x 2-inch-long HWH wood screws spaced at 13 inches o.c. through the vertical leg at the headlap beginning at the center of the side lap and four No. 10-16 x 2-inch-long HWH wood screws spaced 12 3/8 inches o.c. through the horizontal leg at the back of the panel beginning at the side lap.	53
2	Minimum 15/32-inch-thick plywood	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile or BARREL-VAULT Tile	Eight No. 10-16 x 2.5-inch-long HWH wood screws spaced 7.5 inches o.c. through the vertical leg at the headlap beginning at the center of the side lap and eight No. 10-16x2-inch-long HWH wood screws spaced 6 1/4 inches o.c. through the horizontal leg at the back of the panel beginning at the side lap.	128
3	Minimum 15/32-inch-thick plywood	PINE-CREST Shake, COTTAGE Shingle, PACIFIC Tile or BARREL-VAULT Tile	Four No. 10-16 x 2.5-inch-long HWH wood screws spaced 13 inches o.c. through the vertical leg at the headlap beginning at the center of the side lap and four No. 10-16 x 2.5-inch-long HWH wood screws spaced 12 3/8 inches o.c. through the horizontal leg at the back of the panel beginning at the side lap	113
4	Minimum 15/32-inch-thick plywood	GRANITE-RIDGE Shingle	Seven, No. 9 x 1 1/2-inch HWH wood screws per panel spaced 6" o.c. along each course at the back flange and with the Pittsburgh lock secure at the front interlock.	110

1. Allowable wind uplift pressure based on a factor of safety of 2.

2. Fasteners must fully penetrate through sheathing into underlying framing members.

9.0 PRODUCT DETAILS:

9.1 Panel Diagrams

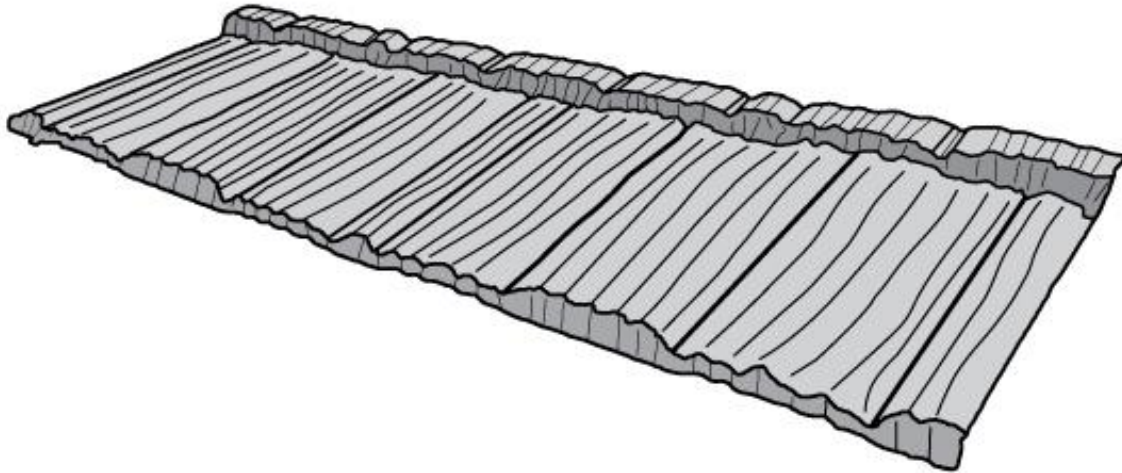


Figure 1 – PINE-CREST SHAKE

PRODUCT	LENGTH		WIDTH		INSTALLED EXPOSURE	
	inches	mm	inches	mm	inches	mm
PINE-CREST Shake	52	1320	16	406	14.5 x 50	368 x 1270

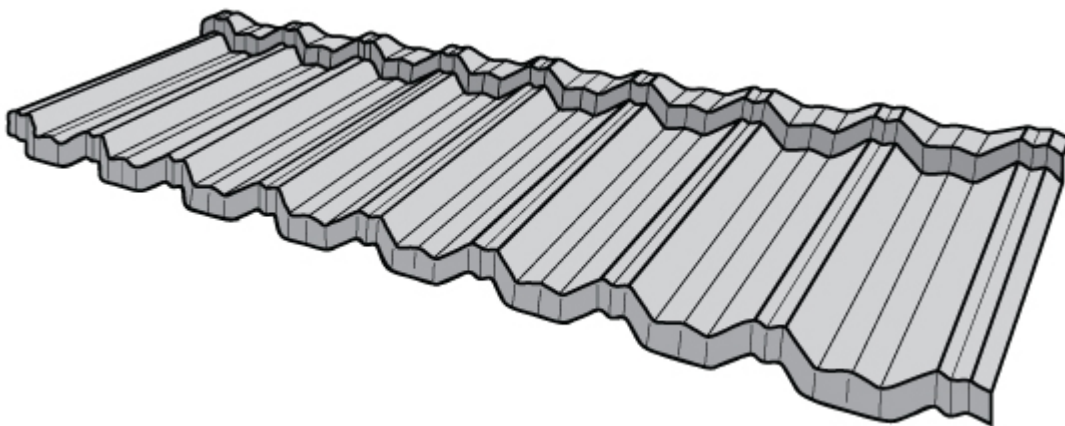


Figure 2 – PACIFIC TILE

PRODUCT	LENGTH		WIDTH		INSTALLED EXPOSURE	
	inches	mm	inches	mm	inches	mm
PACIFIC Tile	52	1320	16	406	14.5 x 50	368 x 1270

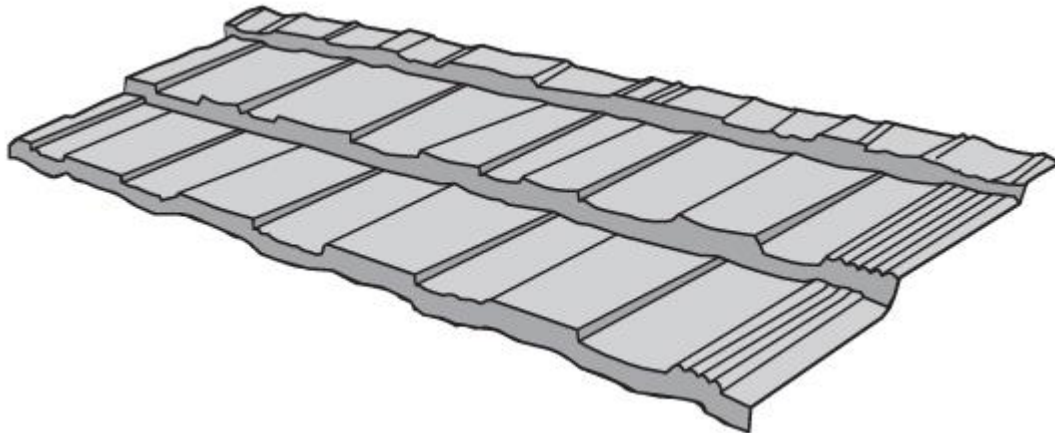


Figure 3 – COTTAGE SHINGLE

PRODUCT	LENGTH		WIDTH		INSTALLED EXPOSURE	
	inches	mm	inches	mm	inches	mm
COTTAGE Shingle	51	1296	15.5	394	14.25 x 47.5	362 x 1207

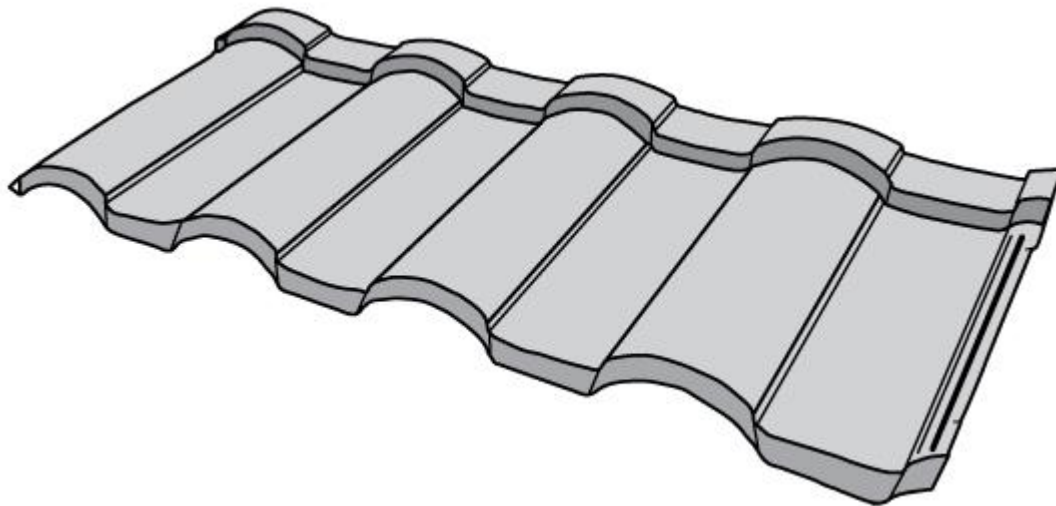


Figure 4 – BARREL VAULT TILE

PRODUCT	LENGTH		WIDTH		INSTALLED EXPOSURE	
	inches	mm	inches	mm	inches	mm
BARREL-VAULT Tile	45.13	1114	15.58	396	14 x 43.625	356 x 1108

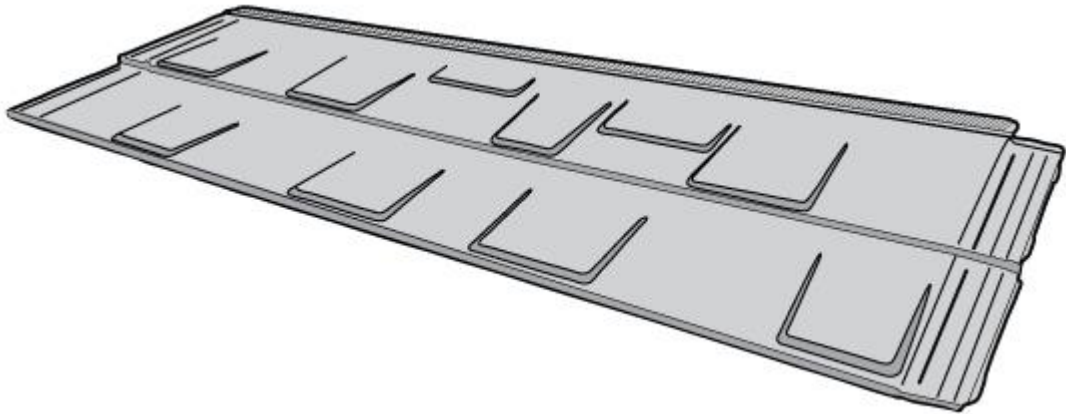


Figure 5 – GRANITE RIDGE SHINGLE

PRODUCT	LENGTH		WIDTH		INSTALLED EXPOSURE	
	inches	mm	inches	mm	inches	mm
GRANITE-RIDGE Shingle	46.0625	1170	15.625	397	13.6875 x 44	348 x 1118

10.0 ELIGIBILITY OF REPORT

QAI's Code Evaluation Report complies with the 2021 / 2018 / 2015 IBC Section 104.11 *Alternative materials, design and methods of construction and equipment* subsection 104.11.1 *Research Reports*. Supporting data has been evaluated by QAI for compliance of the noted materials and assemblies to the applicable code by QAI, and *approved* source as detailed below.

The attached report has been reviewed by a QAI Registered Professional Engineer approved by the specific state Board of Professional Engineers noted on the specific P.E. seal(s).

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118, PCA-119). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1 on Independence, Section 1703.1.2 on Equipment and Section 1703.1 on Personnel.

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118, PCA-119). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1 on Independence, Section 1703.1.2 on Equipment and Section 1703.1 on Personnel.

This Evaluation report has been designed to meet the performance requirements of IBC Section 1703.4 and contains the required information to show the product, material or assembly meets the applicable code requirements.

The product is labeled per section IBC 1703 and subject to follow-up inspection per IBC 1703.6 using QAI IAS accredited ISO 17020 inspection program (see IAS AA-635, AA-723).

For more information regarding QAI Laboratories, please visit www.qai.org.



The above is an example of the QAI registered Listing mark. The Listing mark may only be used by the Report Holder per the QAI service agreement on products defined in this report. The 'us' indicator in the 8 o'clock position indicates the product complies with the properties evaluated with limitations outlined in this report for use in the US market. A 'c' indicator in the 4 o'clock position indicates the product has been evaluated for use in the Canadian market.



11.0 REFERENCED STANDARDS

ASTM E108 *Standard Test Methods for Fire Tests of Roof Coverings.*

ASTM A792 *Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement*

UL 580 *Test for Uplift Resistance of Roof Assemblies*

ASTM B117 *Standard Practice for Operating Salt Spray (Fog) Apparatus*

ASTM G155 *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*

FM 4475 *Examination Standard for Class 1 Steep Slope Roof Covers*

FM 4473 *Specification Test Standard for Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls*