CCMC CANADIAN CODE COMPLIANCE EVALUATION

CCMC EVALUATION

CCMC 14112-R

CCMC Canadian code compliance evaluation

CCMC number:	14112-R
Status:	Active
Issue date:	2018-11-30
Modified date:	2023-11-08
Evaluation holder:	**Westlake Royal Roofing LLC.** 3093 Industry Street Oceanside CA 92054 United States Website: WestlakeRoyalRoofing.com Telephone: 760-435-9842
Product names:	• Unified Steel Stone Coated Roofing - BARREL-VAULT Tile • Unified Steel Stone Coated Roofing - COTTAGE Shingle • Unified Steel Stone Coated Roofing - PACIFIC Tile • Unified Steel Stone Coated Roofing - PINE-CREST Shake
Compliance:	NBC 2015
Criteria:	CCMC-TG-074113-15A, "CCMC Technical Guide for Metal Roof Panels"

In most jurisdictions this document is sufficient evidence for approval by Canadian authorities.
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Compliance opinion

It is the opinion of the Canadian Construction Materials Centre that the evaluated products, when used as a metal roofing system in accordance with the conditions and limitations stated in this evaluation, comply with the following code:

National Building Code of Canada 2015

Code provision	Solution type
9.3.3.2. Galvanized Sheet Steel	Acceptable
9.26.1.2.(1) Roofs shall be protected with roofing, i ...	Acceptable
9.26.2. Roofing Materials	Alternative
9.26.13.1. Thickness	Acceptable

The above opinion(s) is/are based on the evaluation by the CCMC of technical evidence provided by the evaluation holder, and is bound by the stated conditions and limitations. For the benefit of the user, a summary of the technical information that forms the basis of this evaluation has been included.

Product information

Product names

- Unified Steel Stone Coated Roofing - BARREL-VAULT Tile
- Unified Steel Stone Coated Roofing - COTTAGE Shingle
- Unified Steel Stone Coated Roofing - PACIFIC Tile
- Unified Steel Stone Coated Roofing - PINE-CREST Shake

Product description

The panels are formed from 0.42-mm-thick aluminum zinc alloy steel sheet metal. The underside of the panels is finished with a corrosion- resistant coating. The upper surface of the panels is finished with an acrylic resin base coat onto which crushed natural stone chips are spread and then covered with an acrylic overglaze (see Figure 1). The panels are overlapped at both horizontal and vertical joints when installed.

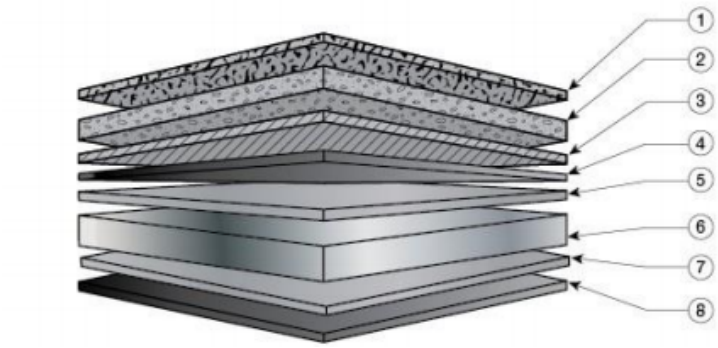

Figure 1. Material layers in the products

1. Pure acrylic overglaze
2. Crushed natural stone chips
3. Acrylic resin base coat
4. Acrylic film
5. Aluminum zinc coating
6. Base steel
7. Aluminum zinc coating
8. Acrylic film

The Unified Steel Stone Coated Roofing - BARREL-VAULT Tile panel is 1 113 mm in overall length of which 1 099 mm is exposed and 356 mm in exposed width (course cover). The panel is installed with or without battens. The Unified Steel Stone Coated Roofing - BARREL-VAULT Tile panel is shown in Figure 2.

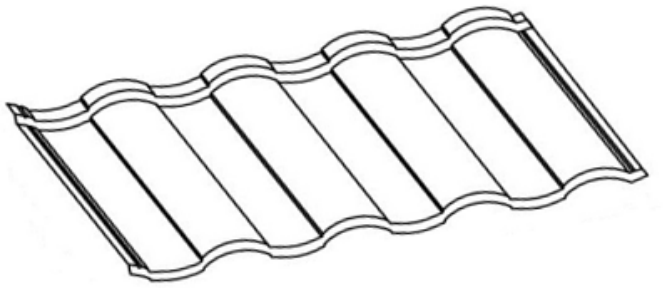

Figure 2. Unified Steel Stone Coated Roofing - BARREL-VAULT Tile panel

The Unified Steel Stone Coated Roofing - PINE-CREST Shake and Unified Steel Stone Coated Roofing - PACIFIC Tile panels are 1 321 mm in overall length of which 1 270 mm is exposed and 368 mm in exposed width (course cover). The panels are installed with or without battens. The Unified Steel Stone Coated Roofing - PINE-CREST Shake and Unified Steel Stone Coated Roofing - PACIFIC Tile panels are shown in Figures 3 and 4, respectively.

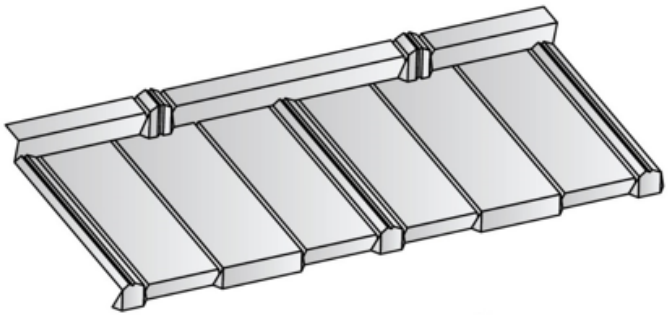

Figure 3. Unified Steel Stone Coated Roofing - PINE-CREST Shake panel

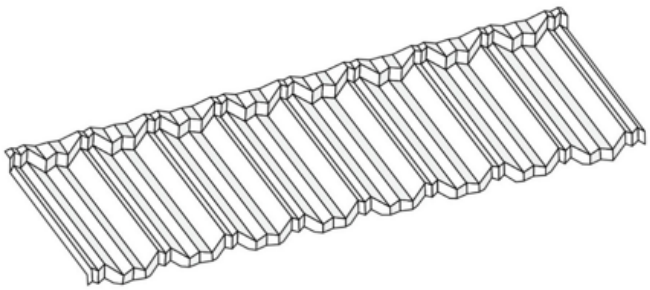

Figure 4. Unified Steel Stone Coated Roofing - PACIFIC Tile panel

The Unified Steel Stone Coated Roofing - COTTAGE Shingle panel is 1 295 mm in overall length of which 1 206 mm is exposed and 356 mm in exposed width (course cover). The panel is installed without battens. The Unified Steel Stone Coated Roofing - COTTAGE Shingle panel is shown in Figure 5.

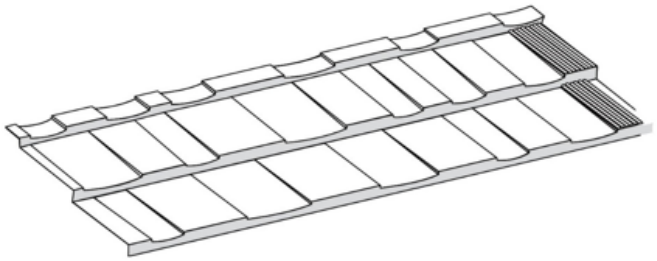

Figure 5. Unified Steel Stone Coated Roofing - COTTAGE Shingle panel

The complete roofing system includes accessories such as trim, cap, rake cover, fascia, drip-edge, valley and Z-bar. Details of a typical batten installation are shown in Figure 6.

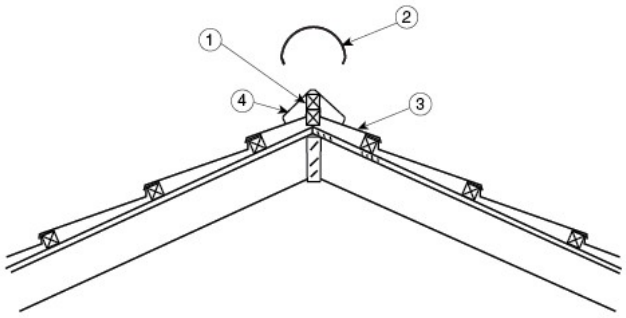

Figure 6. Typical installation of the products with battens

1. two 50 mm × 50 mm battens stacked for ridge build-up (cut-bent to fit)
2. mission trim or shake cap depending on profile
3. fill row (cut-bent to fit)
4. shake cap

A typical installation without battens is shown in Figure 7.

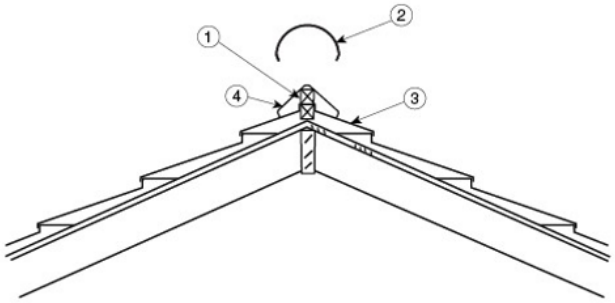

Figure 7. Typical installation of the products without battens

1. two 50 mm × 50 mm battens stacked for ridge build-up (cut-bent to fit)
2. mission trim or shake cap depending on profile
3. fill row (cut-bent to fit)
4. shake cap

Manufacturing plant

This evaluation is valid only for products produced at the following plant:

Product names	Manufacturing plant
	Oceanside, CA, US
Unified Steel Stone Coated Roofing - BARREL-VAULT Tile	✓
Unified Steel Stone Coated Roofing - COTTAGE Shingle	✓
Unified Steel Stone Coated Roofing - PACIFIC Tile	✓
Unified Steel Stone Coated Roofing - PINE-CREST Shake	✓

✓ Indicates that the product from this manufacturing facility has been evaluated by the CCMC

Conditions and limitations

The CCMC's compliance opinion is bound by this product being used in accordance with the conditions and limitations set out below.

- The panels must be installed on roofs having a minimum slope of 1 in 3.
- The panels must be installed over solid sheathing complying with the requirements of Subsection 9.23.16., Roof Sheathing, of Division B of the NBC 2015.
- Flashing must be installed in compliance with the requirements of Subsection 9.26.4., Flashing at Intersections, of Division B of the NBC 2015.
- The panels must be installed with eave protection as indicated in Subsection 9.26.5., Eave Protection for Shingles and Shakes, of Division B of the NBC 2015.
- The panels must be installed with an underlay consisting of 2 layers of Type 15 organic felt or 1 layer of Type 30 organic felt complying with the requirements of Subsection 9.26.6., Underlay beneath Shingles, of Division B of the NBC 2015.
- Only fasteners and accessories supplied by the manufacturer may be used in conjunction with the products. The fasteners and accessories must be compatible with the base metal of the panels.
- The panels must be installed in strict conformance with the manufacturer's instructions.
- The roofing systems are for use in locations where access is limited for maintenance or repair purposes. When access is needed, temporary walkways or roof boards are recommended to avoid any permanent damage to the panels.
- The product or its packaging must be clearly identified with the phrase "CCMC 14112-R."

Technical information

This evaluation is based on demonstrated conformance with the following criteria:

Criteria number	Criteria name
CCMC-TG-074113-15A	CCMC Technical Guide for Metal Roof Panels

Material requirements

Table 1. Galvanized and aluminum-zinc allow coated steel base material requirements and performance data

Property	Requirement	Result
Thickness (mm)	≥ 0.33	Pass
Thickness of aluminum-zinc coating (g/m2)	≥ 150	Pass
Flexibility	No flaking or micro-cracking	Pass
Humidity resistance	No formation of blisters	Pass
Salt spray resistance	≥ 7 rating	Pass
Durability	Slight colour change; not greater than No. 8 degree of chalking; no flaking or cracking	Pass

Performance requirements

Traffic load test

Under an applied load of 890 N, the panels withstood the force without excessive permanent deformation.

Uniform load test

The panels withstood an applied external load up to 5 000 N without failure and with negligible deformation.

Wind uplift

Table 2. Results of wind uplift testing for standard 5-screw installation of Unified Steel Stone Coated Roofing - Pacific Tile [(1)]

Pressure (kPa)	Time (min)	Requirement	Result
0.8	5	No evidence of deformation, permanent damage or failure	Pass
1.2	5	No evidence of deformation, permanent damage or failure	Pass
1.5	5	No evidence of deformation, permanent damage or failure	Pass
1.9	5	No evidence of deformation, permanent damage or failure	Pass

Pressure (kPa)	Time (min)	Requirement	Result
2.7	5	No evidence of deformation, permanent damage or failure	Pass
5.8	1	No evidence of deformation, permanent damage or failure	Pass
6.5	1	No evidence of deformation, permanent damage or failure	Pass
7.2	1	No evidence of deformation, permanent damage or failure	Pass
7.9	1	No evidence of deformation, permanent damage or failure	Pass
8.6 [(2)]	1	-	Fasteners pulled through battens

Notes

1 Unified Steel Stone Coated Roofing - PACIFIC Tile panels were fastened with five #10-16 × 2 in. HWH wood screws spaced between 216 mm and 305 mm on centre (o.c.) through the vertical leg at the head lap beginning at the centre of the side lap onto 50 mm × 50 mm battens. The battens were fastened perpendicular to the wood joists spaced 368 mm o.c. with one #8-11 × 3 in. bugle head wood screw at each batten/joist intersection.

2 The applied pressure exceeded the maximum required pressure (4.8 kPa) and continued to increase until failure.

Table 3. Results of wind uplift testing for high wind 10-screw installation of Unified Steel Stone Coated Roofing - PACIFIC Tile [(1)]

Pressure (kPa)	Time (min)	Requirement	Result
0.8	5	No evidence of deformation, permanent damage or failure	Pass
1.2	5	No evidence of deformation, permanent damage or failure	Pass
1.5	5	No evidence of deformation, permanent damage or failure	Pass
1.9	5	No evidence of deformation, permanent damage or failure	Pass
2.7	5	No evidence of deformation, permanent damage or failure	Pass
5.8	1	No evidence of deformation, permanent damage or failure	Pass
6.5	1	No evidence of deformation, permanent damage or failure	Pass
7.2	1	No evidence of deformation, permanent damage or failure	Pass
7.9	1	No evidence of deformation, permanent damage or failure	Pass
8.6	1	No evidence of deformation, permanent damage or failure	Pass
9.4	1	No evidence of deformation, permanent damage or failure	Pass
10.1	1	No evidence of deformation, permanent damage or failure	Pass
10.8	1	No evidence of deformation, permanent damage or failure	Pass
11.5	1	No evidence of deformation, permanent damage or failure	Pass

Pressure (kPa)	Time (min)	Requirement	Result
12.2	1	No evidence of deformation, permanent damage or failure	Pass
13.0	1	No evidence of deformation, permanent damage or failure	Pass
13.7	1	No evidence of deformation, permanent damage or failure	Pass
14.4	1	No evidence of deformation, permanent damage or failure	Pass
15.1 (2)	1	-	Fasteners pulled through battens

Notes

1 Unified Steel Stone Coated Roofing - PACIFIC Tile panels were fastened with ten #10-16 × 2 in. HWH wood screws spaced between 70 mm and 146 mm o.c. through the vertical leg at the head lap beginning at the centre of the side lap onto 50 mm × 50 mm battens. The battens were fastened perpendicular to the wood joists spaced 304 mm o.c. with one #8-11 × 3 in. bugle head wood screw at each batten/joist intersection.

2 The applied pressure exceeded the maximum required pressure (4.8 kPa) and continued to increase until failure.

Dynamic pressure water infiltration resistance

Table 4. Results of testing the dynamic water infiltration resistance of Unified Steel Stone Coated Roofing - Pacific Tile (1)

Wind speed (km/h) (2)	Simulated rainfall (L/m^2•min)	Duration	Requirement	Result
50	3.7	15	No leakage or damage	Pass
110	3.7	15	No leakage or damage	Pass
140	3.7	15	No leakage or damage	Pass
170	3.7	5	No leakage or damage	Pass

Notes

1 Unified Steel Stone Coated Roofing - PACIFIC Tile panels were fastened with ten #10-14 × 2 in. HWH wood screws with T17 tip spaced between 70 mm and 146 mm o.c. through the vertical leg at the head lap beginning at the centre of the side lap onto 50 mm × 50 mm battens. The battens were fastened perpendicular to the wood joists spaced 304 mm o.c. with one #8-11 × 3 in. deck screw at each batten/joist intersection.

2 The wind speed values presented in the table are unfactored. Local exposure conditions and building heights need to be taken into consideration.

Other technical evidence

Additional performance data requested by the Report Holder

Data in this section do not form part of CCMC's opinion in Section 1.

Granular mineral surfacing

Table 5. Results of testing the granule adhesion of the products

Sample	Average initial weight (g)	Average final weight (g)	Average weight loss (g)
Colour quartz	65.074	64.985	0.096
Roofing granule	63.88	63.71	0.176

Administrative information

Use of Canadian Construction Materials Centre (CCMC) assessments

This assessment must be read in the context of the entire CCMC Registry of Product Assessments, any applicable building code or by-law requirements, and/or any other regulatory requirements (for example, the Canada Consumer Product Safety Act, the Canadian Environmental Protection Act, etc.).

It is the responsibility of the user to confirm that the assessment they are using is current and has not been withdrawn or superseded by a later version on the CCMC Registry of Product Assessments.

Disclaimer

The National Research Council of Canada (NRC) has evaluated only the characteristics of the specific product described herein. The information and opinions in this evaluation are directed to those who have the appropriate degree of experience to use and apply its contents (such as authorities having jurisdiction, design professionals and specifiers). This evaluation is valid when the product is used as part of permitted construction, respecting all conditions and limitations stated in the evaluation, and in accordance with applicable building codes and by-laws.

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First Nations National Building Officers Association (FNNBOA)	(First Nations National Building Officers Association (FNNBOA))
Canadian Home Builders' Association (CHBA)	(Canadian Home Builders' Association (CHBA))
Alberta Building Officials Association (ABOA)	(Alberta Building Officials Associations (ABOA))
Saskatchewan Building Officials Association (SBOA)	(Saskatchewan Building Officials Association (SBOA))
Manitoba Building Officials Association (MBOA)	(Manitoba Building Officials Association (MBOA))
Ontario Building Officials Association (OBOA)	(Ontario Building Officials Association (OBOA))
New Brunswick Building Officials Association (NBBOA)	(New Brunswick Building Officials Association (NBBOA))
Nova Scotia Building Officials Association (NSBOA)	(Nova Scotia Building Officials Association (NSBOA))

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For more information, contact the CCMC by phone at (613) 993-6189 or by email at ccmc@nrc-cnrc.gc.ca

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Code compliance as an acceptable solution

Code Compliance via Acceptable Solutions

> If a building design (e.g. material, component, assembly or system) can be shown to meet all provisions of the applicable **acceptable solutions** in Division B (e.g. it complies with the applicable provisions of a referenced standard), it is deemed to have satisfied the objectives and functional statements linked to those provisions and thus to have complied with that part of the Code.
>
> — **National Building Code of Canada, Sentence A-1.2.1.1.(1)(a)**

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Acceptable Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

All CCMC evaluation reports are opinions of code compliance established in accordance with the National Building Code of Canada, Subsection 1.2.1. "Compliance with this Code," which requires compliance to be achieved by:

- complying with the applicable acceptable solutions in Division B, or
- using an alternative solution that will achieve at least the minimum level of performance required by Division B in the areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

The CCMC assesses compliance with Canadian building, energy and safety codes, and is trusted by over 6,000 regulators across Canada.

Code compliance as an alternative solution

Code Compliance via Alternative Solutions

> Where a design differs from the acceptable solutions in Division B, then it should be treated as an "**alternative solution**." A proponent of an alternative solution must demonstrate that the alternative solution addresses the same issues as the applicable acceptable solutions in Division B and their attributed objectives and functional statements. However, because the objectives and functional statements are entirely qualitative, demonstrating compliance with them in isolation is not possible. Therefore, Clause 1.2.1.1.(1)(b) identifies the principle that Division B establishes the quantitative performance targets that alternative solutions must meet. In many cases, these targets are not defined very precisely by the acceptable solutions [...] Nevertheless, Clause 1.2.1.1.(1)(b) makes it clear that an effort must be made to demonstrate that an alternative solution will perform as well as a design that would satisfy the applicable acceptable solutions in Division B—not “well enough” but “as well as.”
>
> — **National Building Code of Canada, Sentence A-1.2.1.1.(1)(b)**

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Alternative Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

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