



Evaluation Report CCMC 13011-R MetalWorks® StoneCrest® and MetalWorks® AstonWood® Steel Shingles

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “MetalWorks® StoneCrest® and MetalWorks® AstonWood® Steel Shingles”, when used as metal roofing systems in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2010:

- Clause 1.2.1.1.(1)(a), Division A, using the following acceptable solutions from Division B:
 - Subsection 9.26.2., Roofing Materials

This opinion is based on CCMC’s evaluation of the technical evidence in Section 4 provided by the Report Holder.

Ruling No. 08-05-190 (13011-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 2008-09-12 pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

2. Description

The products are sheet-metal roofing systems consisting of a basic panel that is pressure-formed from 0.35-mm zinc alloy sheet steel that is finished with a fluoropolymer coating. The underside is finished with a corrosion-resistant coating.

The products have a nominal measurement of 1 010 mm × 320.5 mm. The panels are constructed with a four-way locking system and installed with a concealed nailing clip.

The longitudinal cross section of the “MetalWorks® AstonWood® Steel Shingle” consists of six modules, each with a wood-embossed profile.

The longitudinal cross section of the “MetalWorks® StoneCrest® Steel Shingle” consists of five modules, each with a stone-embossed profile.

Both systems include accessory strips for hip and ridge cap, valley pan, gable and flashing.

Typical installation details and nailing clip for the products are shown in Figures 1, 2, 3 and 4 respectively.

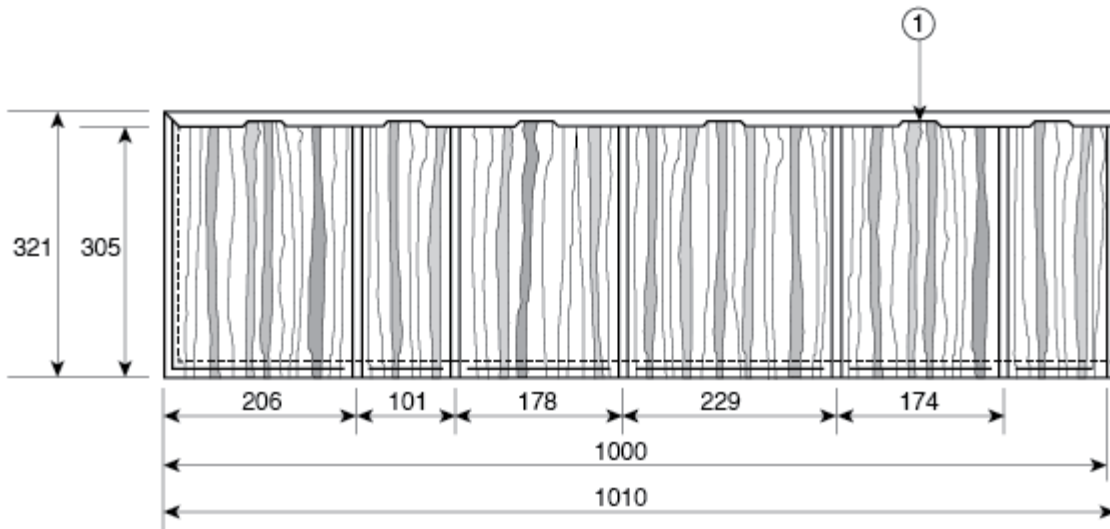


Figure 1. “MetalWorks® -AstonWood® Steel Shingles”*

- 1. potential clip location
- * measurements in mm.

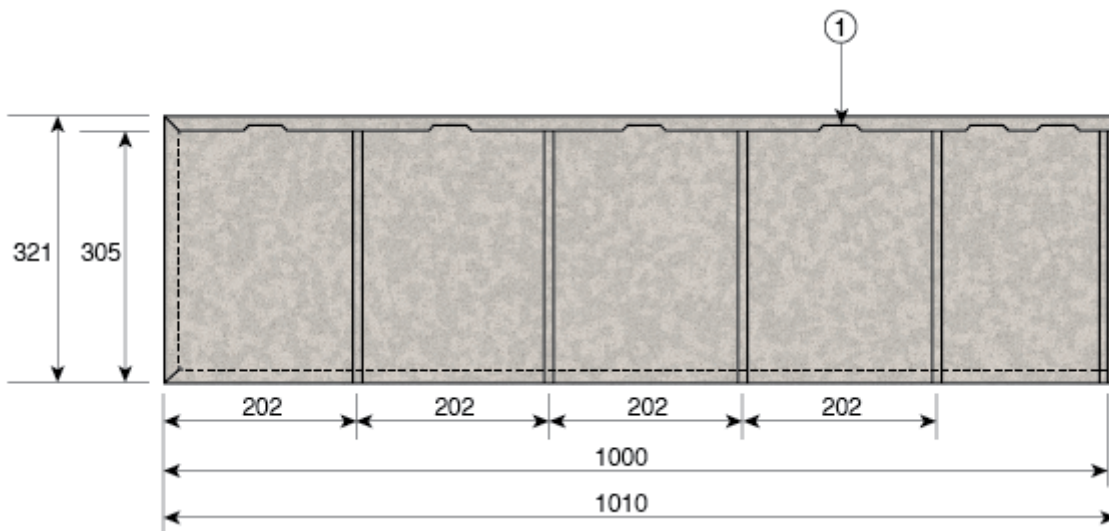


Figure 2. “MetalWorks® StoneCrest® Steel Shingles”*

- 1. potential clip location
- * measurements in mm.

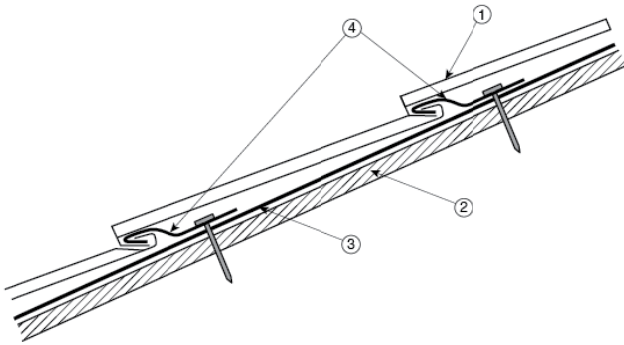


Figure 3. Installation detail for the products

1. “StoneCrest®” or “AstonWood®” shingle
2. roof sheathing
3. #30 felt or equivalent
4. nail clip

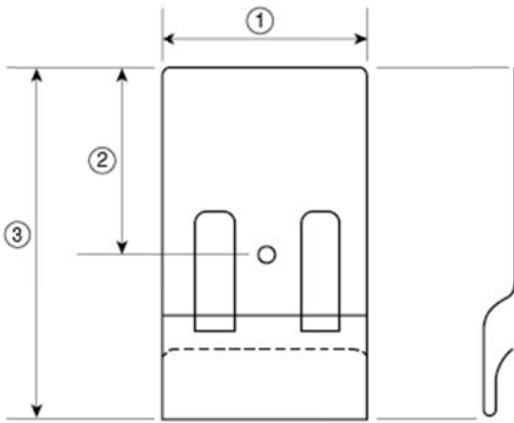


Figure 4. Fastening clip for the products

1. 32.7 mm
2. 28 mm
3. 54.4 mm

3. Conditions and Limitations

CCMC’s compliance opinion in Section 1 is bound by the “MetalWorks® StoneCrest® and MetalWorks® AstonWood® Steel Shingles” 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 4.
- 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 2010.
- An underlay consisting of one layer of type 30 organic felt must be used in conjunction with the panels.
- 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 2010.
- Flashing must be installed in compliance with the requirements of Subsection 9.26.4., Flashing at Intersections, of Division B of the NBC 2010.
- Only fasteners and accessories supplied by the manufacturer must be used with the product. The fasteners and accessories must be compatible with the base metal of the panels.
- When access to the roof is needed, temporary walkways or roof boards are recommended to avoid any permanent damage to the panels.
- The roofing system must be installed in strict conformance to the manufacturer’s instructions.
- The product is limited to installations where Class C fire rating is required.

This Evaluation Report is applicable only to products identified on the packaging with the phrase “CCMC 13011-R.”

4. Technical Evidence

The Report Holder has submitted technical documentation for CCMC's evaluation. Testing was conducted at laboratories recognized by CCMC. The corresponding technical evidence for this product is summarized below.

4.1 Material Requirements

Table 4.1.1 Material Properties of the Products

Property		Requirement	Result
Thickness (mm)		≥ 0.33	0.62
Thickness of zinc coating (g/m^2)		≥ 275	315
Coating quality		Smooth and uniform, free of pinholes, cracks, blisters and flaking	Pass
Flexibility		No flaking or microcracking	Pass
Humidity resistance		No formation of blisters	Pass
Durability		No sign of any change	Pass
Total dry film thickness (μm)	AstonWood®	≥ 25	25
	StoneCrest® Tile	≥ 25	27
	StoneCrest® Slate	≥ 25	28
Dry film hardness		No rupture	Pass
Adhesion	dry	No removal of film	Pass
	wet	No removal of film	Pass
Impact resistance		No removal of film	Pass
Abrasion resistance	AstonWood®	Coefficient value ≥ 40	44.4
	StoneCrest® Tile/Slate	Coefficient value ≥ 40	41.7
Acid resistance	10% sulphuric acid	No loss of integrity or appreciable change	Pass
	10% hydrochloric acid	No loss of integrity or appreciable change	Pass
	10% nitric acid	No loss of integrity or appreciable change	Pass
Salt spray resistance	AstonWood®	≥ 7 rating	7
	StoneCrest® Tile/Slate	≥ 7 rating	10

4.2 Performance Requirements

4.2.1 Traffic Load

Under an applied load of 900 N over five different impact locations, there were no signs of any plastic deformation or permanent openings at the lap that would adversely affect the function of the roofing system.

4.2.2 Wind Uplift

Table 4.2.2 Results of Testing of Wind Uplift for the Products

Pressure (kPa)	Time (s)	Requirement	Result ⁽¹⁾
0.5	10	No evidence of deformation, permanent damage or failure	Pass
1.0	10		Pass
1.4	10		Pass
1.9	10		Pass
2.9	10		Pass
3.8	10		Pass
4.3	10		Shingle unclipped
4.8	10		–

Note to Table 4.2.2:

- ⁽¹⁾ The panels were fastened onto a test frame measuring 1 220 mm × 2 440 mm using #10 – 25.4-mm galvanized steel zip screws. The test frame was constructed with 12.7-mm-thick plywood that was fastened to 50 mm × 100 mm SPF lumber spaced at 600 mm o.c. using 76-mm 10d common nails.

4.2.3 Dynamic Pressure Water Infiltration

Table 4.2.3 Results of Testing of Dynamic Pressure Water Infiltration for the Products

Wind Speed (km/h)	Simulated Rainfall (L/m ² ·min)	Time (s)	Requirement	Result ⁽¹⁾
34-59	3.4	5	No leakage or damage	Pass
84-96	3.4	5		Pass
104-117	3.4	5		Pass
117-144	3.4	5		Pass
154-170	3.4	5		Pass

Note to Table 4.2.3:

- ⁽¹⁾ The panels were fastened to a test frame with a 1 in 3 slope and a valley. The 11-mm-thick OSB sheathing was fastened onto 50 mm × 150 mm SPF lumber rafters spaced at 600 mm o.c using 50-mm 6d common nails. The entire roof was covered with one layer of Type 30 organic felt fastened with staples.

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