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EVALUATION SUBJECT: Quality Edge Matterhorn Metal Roofing

REPORT HOLDER:

Quality Edge, Inc.
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CSI Division: 07 THERMAL AND MOISTURE PROTECTION

CSI Section: 07 41 13 Metal Roof Panels

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:

- 2012 International Building Code® (IBC)
- 2012 International Residential Code® (IRC)
- 2009 International Building Code® (IBC)
- 2009 International Residential Code® (IRC)

1.2 Evaluated in accordance with:

- ICC-ES AC166 approved October 2012, with modified wind uplift resistance determination

1.3 Properties assessed:

- Fire Classification
- Wind Uplift Resistance

2.0 PRODUCT USE

The Matterhorn Metal Roofing - Standing Seam, Spanish Tile, and Slate and Shake Profiles described in this report are used as metal roof panels in accordance with IBC Section 1507.4 and IRC Section R905.10. The roof coverings are used on new roofs and over existing roofs, when installed in accordance with this report.

3.0 PRODUCT DESCRIPTION

3.1 Standing Seam Profile: The Standing Seam Profile roof panels are roll-formed from CS Type B sheet steel complying with ASTM A653, with a minimum G90 galvanized coating. The panel nominal painted thickness, post production, is 0.022 ± 0.002 inch (0.556 ± 0.051 mm). The Standing Seam panel width is 12 or 16 inches (305 mm or 406 mm) from rib to rib. The height of the hidden, inner rib is 0.75 inch (19.1 mm) and the height of the outer rib that locks over the inner rib is 1.5 inches (38.1 mm). Figure 1 provides illustrative details. The Standing Seam panels are available in lengths of 6 feet and 12 feet (1.83 m and 3.66 m). The installed weight is approximately 1.3 lbf/ft² (62 N/m²).

3.2 Spanish Tile Profile: The Spanish Tile Profile roof panels are pressure-formed from DDS (Type A or C) sheet steel complying with ASTM A653, with a minimum G90 galvanized coating. The panel nominal painted thickness, post production, is 0.020 ± 0.002 inch (0.508 ± 0.051 mm). The Spanish Tile profile simulates barrel tile shapes. The overall panel size of the Spanish Tile panel is 20.89 inches (531 mm) wide by 49.12 inches (1248 mm) high, and has single course tile heights of 11.81 inches (300 mm). Figure 2 provides illustrative details. The installed weight is approximately 0.9 lbf/ft² (43 N/m²).

3.3 Slate and Shake Profiles: Slate and Shake Profile roof panels are pressure-formed from DDS (Type A or C) sheet steel complying with ASTM A653, with a minimum G90 galvanized coating. The Slate panel nominal painted thickness, post production, is 0.019 ± 0.002 inch (0.483 ± 0.051 mm). The Shake panel nominal painted thickness, post production, is 0.020 ± 0.002 inch (0.508 ± 0.051 mm). The Slate and Shake profiles simulate, respectively, slate roof tiles and wooden shakes with nominal 7-inch (178 mm) exposure. The overall panel size of the Slate and Shake panels is 48 inches (1219 mm) wide by 22 inches (559 mm) high, each simulating 3 course heights. Figure 3 provides illustrative details. The installed weight is approximately 0.9 lbf/ft² (43 N/m²).

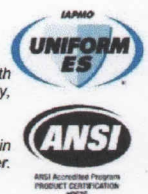
4.0 DESIGN AND INSTALLATION

4.1 Design: Matterhorn Metal Roofing profiles may be used under the 2012 IBC on roofs in conditions where the maximum ultimate design wind speed is 130 mph (209 km/h) in Exposure B areas on structures a maximum of 40 feet (12 192 mm) in height. Under the 2012 IRC, 2009 IBC, and 2009 IRC, the panels may be used on roofs in conditions where the maximum basic wind speed is 100 mph (161 km/h) in Exposure B areas on structures a maximum of 40 feet (12 192 mm) in height. For wind loads resulting from wind conditions other than those prescribed, the allowable wind uplift resistance loads for the Standing Seam, Spanish Tile, and Slate and Shake profiles, installed in accordance with the manufacturer's installation instructions, are shown in Table 1. The profiles and accessories may be used on roofs where the Allowable Stress Design (ASD) uplift pressures determined in accordance with the codes and referenced standards do not exceed the tabulated allowable negative uplift wind loads. The allowable positive (downward) wind loads are limited to the capacity of the roof framing and sheathing of the roof on which the Matterhorn Metal Roofing profiles are installed.

The allowable gravity loads are limited to the capacity of the roof framing and sheathing of the roof on which the Matterhorn Metal Roofing profiles are installed.

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11.

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4.2 Installation: The Matterhorn Metal Roofing Standing Seam, Spanish Tile, and Slate and Shake Profile metal roofing panels shall be installed in accordance with the manufacturer's published installation instructions. The panels shall be installed on solid decking of minimum nominally 1/2-inch-thick wood structural panels and at a minimum slope of 2 units vertical in 12 units horizontal (16.67 percent). When Matterhorn Metal Roofing is used in reroofing, the existing roof coverings shall be removed to expose the roof sheathing, which shall be undamaged 1/2-inch-thick wood structural panels, or equivalent. Reroofing shall comply with IBC Section 1510 or IRC R907, as applicable. Flashing shall comply with IBC Sections 1503.2 and 1503.3.

4.2.1 Roof Slope and Underlayment: Underlayment shall be used under the Spanish Tile, and Slate and Shake profile metal roofing panels when installed on roof slopes between 2:12 (17 percent) and 3:12 (25 percent). Underlayment shall comply with Section 1507.4.5 of the IBC or Section R905.10.5 of the IRC, as applicable.

4.2.3 Fasteners: The fasteners used to fasten the Matterhorn Metal Roofing Panel Profiles shall be No. 10 by 1 1/4-inch zinc-coated panhead screws. The Standing Seam profile panels shall be fastened at maximum 12 inches on center, into the center of the slots along the fastening edge of the panels. The Spanish Tile profiles shall be installed using a fastener in each of the 5 holes along the fastening edge of the panels. The Slate and Shake profiles shall be installed using fasteners at a nominal 7 inches (178 mm) on center, and a clip at the seams, along the top edge of the panels. No. 10 by 1 1/4-inch zinc-coated painted hex-head screws shall be used when fastening on the surface of the panels.

4.3 Fire Classification: Matterhorn Metal Roofing - Standing Seam, Spanish Tile, and Slate and Shake Profiles may be used as Class A roof coverings when listed in accordance with IBC Section 1505.2 and installed in accordance with the following assembly specifications. The roof shall be sheathed with minimum nominally 1/2-inch-thick wood structural panels fastened as prescribed by the code. The sheathing shall be covered with minimum 1/2-inch-thick Georgia Pacific DensDeck Roof Boards fastened in accordance with the DensDeck installation instructions. Tigerpaw Roof Deck Protection Underlayment shall be installed in accordance with the manufacturer's instructions over the DensDeck panels. The profiles shall be installed in accordance with the manufacturer's installation instructions using the fasteners and spacing described in Section 4.2.3.

5.0 LIMITATIONS

Use of the Matterhorn Metal Roofing Profiles described in this report shall be limited to the following conditions:

5.1 Use of Matterhorn Metal Roofing shall comply with this report and the applicable code.

5.2 Calculations demonstrating compliance with this report shall be submitted to the code official for approval. The calculations shall be prepared by a licensed design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3 Matterhorn Metal Roofing shall not be used on roof slopes less than 2:12 (16.67 percent).

5.4 Use of Matterhorn Metal Roofing as a substitute for roof sheathing diaphragms to resist lateral loads in main wind force resisting systems has not been investigated.

5.5 The Matterhorn Metal Roofing panels are manufactured in Walker, Michigan, under a quality control program with inspections by Quality Control Consultants (QCC).

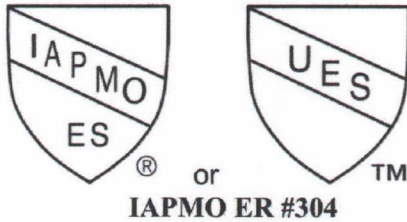
6.0 SUBSTANTIATING DATA

Data in accordance with the ICC-ES Acceptance Criteria for Metal Roof Coverings (AC166), approved February 2012, including reports of testing in accordance with ASTM E108 for roof covering classification and test reports of modified wind uplift resistance testing.



7.0 IDENTIFICATION

The Matterhorn Metal Roofing products are identified with a label on the carton or box identifying the company name (Quality Edge, Inc.), the profile name and model number, the name of the inspection agency (QCC), the IAPMO UES Mark of Conformity and the Evaluation Report Number (ER-304).



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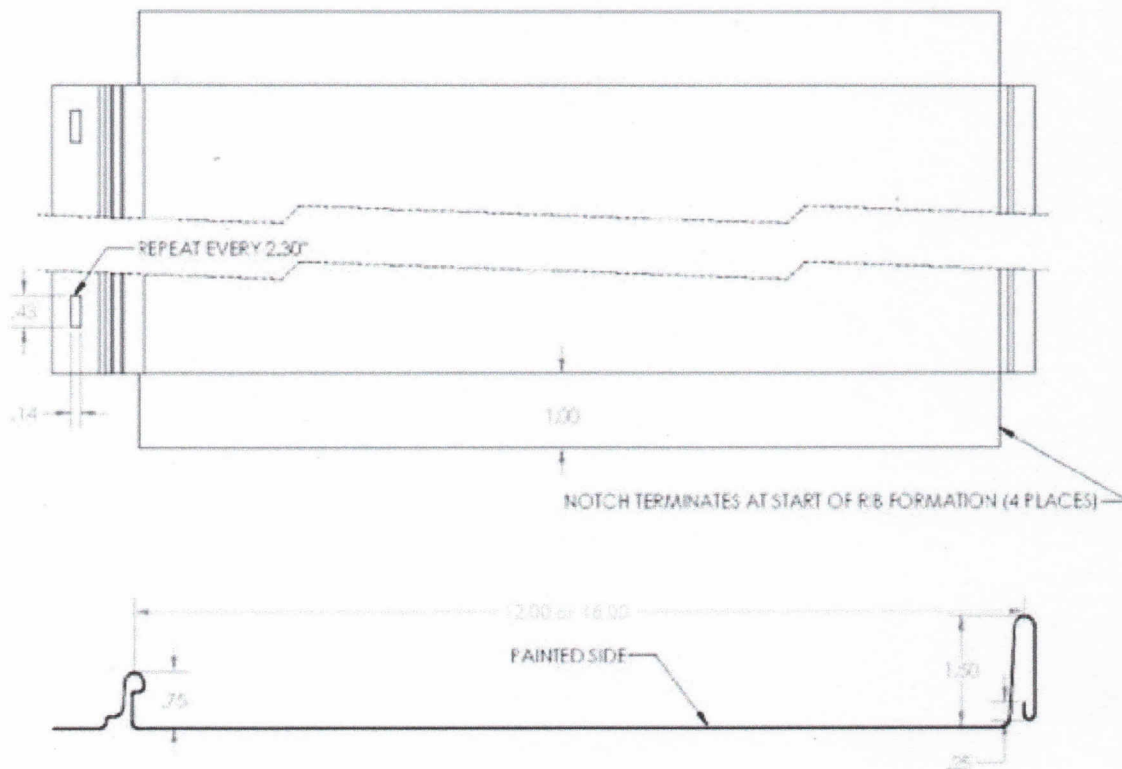


TABLE 1 – WIND RESISTANCE OF MATTERHORN METAL ROOF PANELS¹

METAL PANEL PROFILE	FASTENING ³	MAXIMUM ALLOWABLE UPLIFT LOADS, psf
Standing Seam	No. 10 by 1 ¼-inch zinc-coated panhead screws 12 inches on center (max) along the panel fastening edge	52 psf ²
Spanish Tile	No. 10 by 1 ¼-inch zinc-coated panhead screws one in each of the 5 holes along the panel fastening edge	87 psf ²
Slate and Shake	No. 10 by 1 ¼-inch zinc-coated panhead screws 7 inches on center along the top fastening edge	42 psf ²

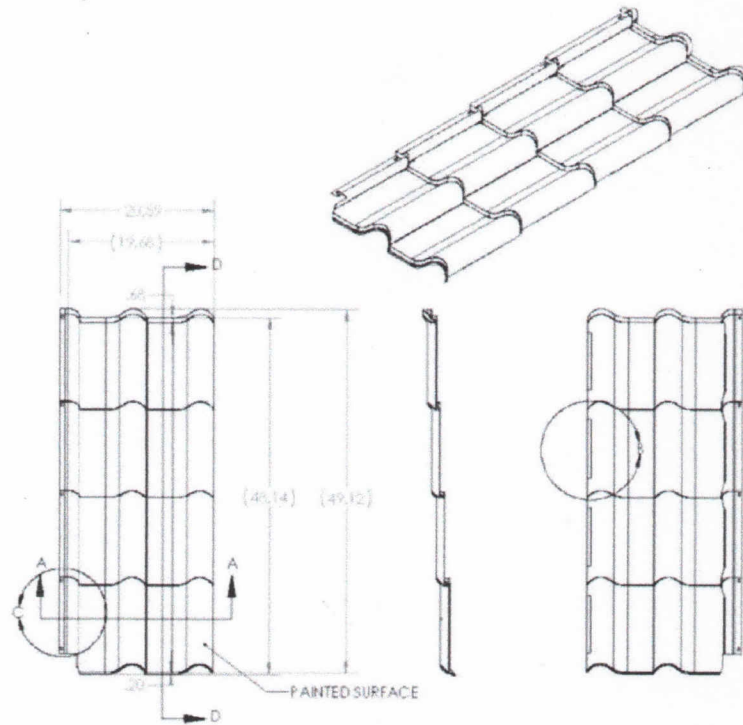
For SI: 1 inch = 25.4 mm, 1 psf (lbf/ft²) = 47.9 N/m²

1. The allowable positive wind loads are limited to the capacity of the roof framing and sheathing of the roof on which the Matterhorn Metal Roofing profiles are installed.
2. In wind uplift resistance testing, the tiles began to deform permanently at pressures exceeding 26 psf.
3. No. 10 by 1 ¼-inch zinc-coated painted hex-head screws are used where fasteners are exposed.



NOTES:
1. MATERIAL: .0217" G90 STEEL
2. BLANK SIZE: 17.25"

FIGURE 1 – STANDING SEAM PROFILE DETAILS



- NOTES:
1. MATERIAL: .019" G90 DDS STEEL
2. BLANK SIZE: 24"

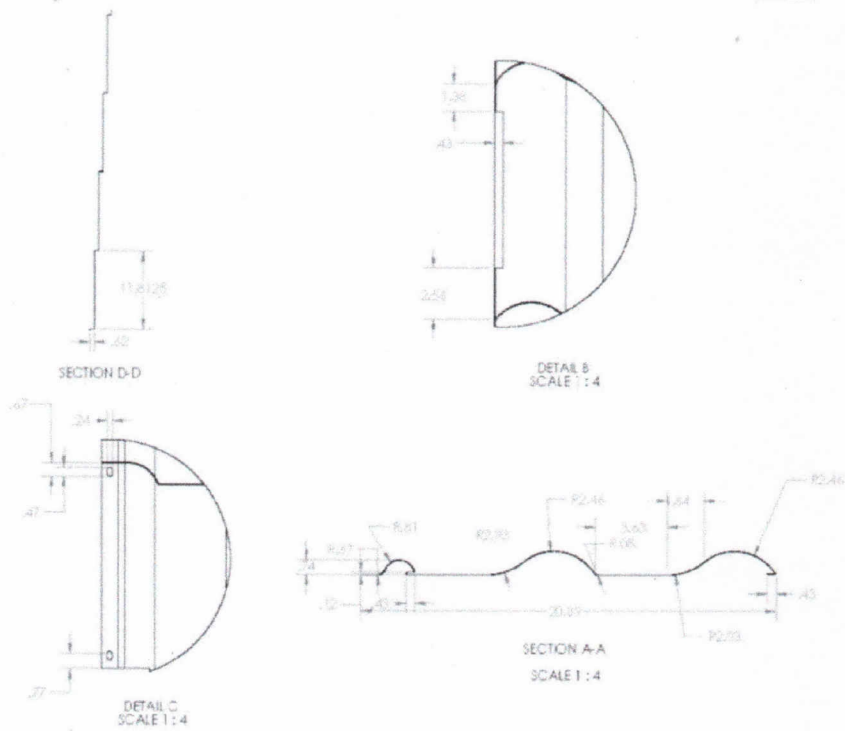
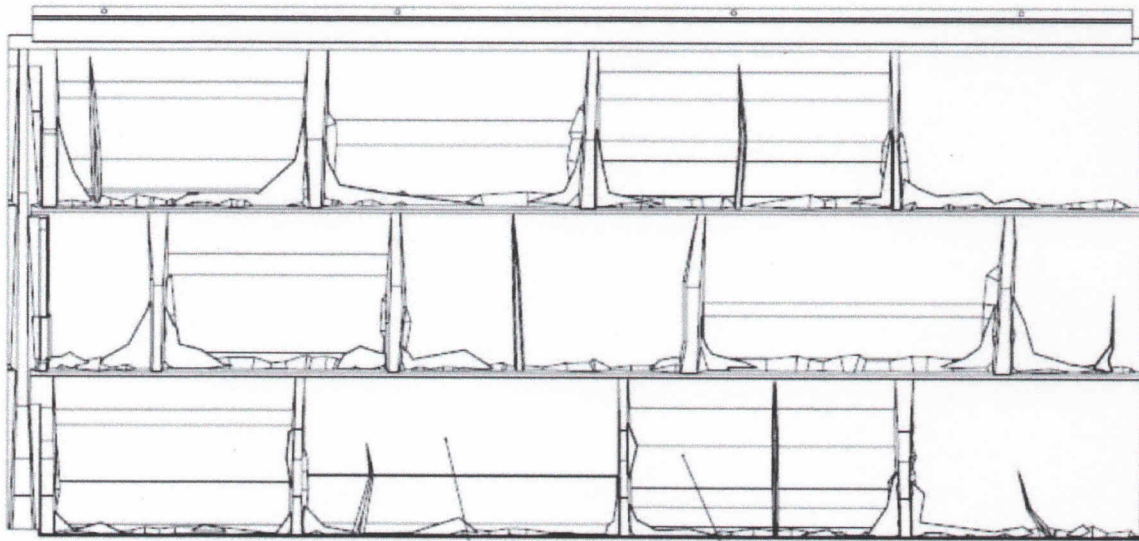


FIGURE 2 – SPANISH TILE PROFILE DETAIL



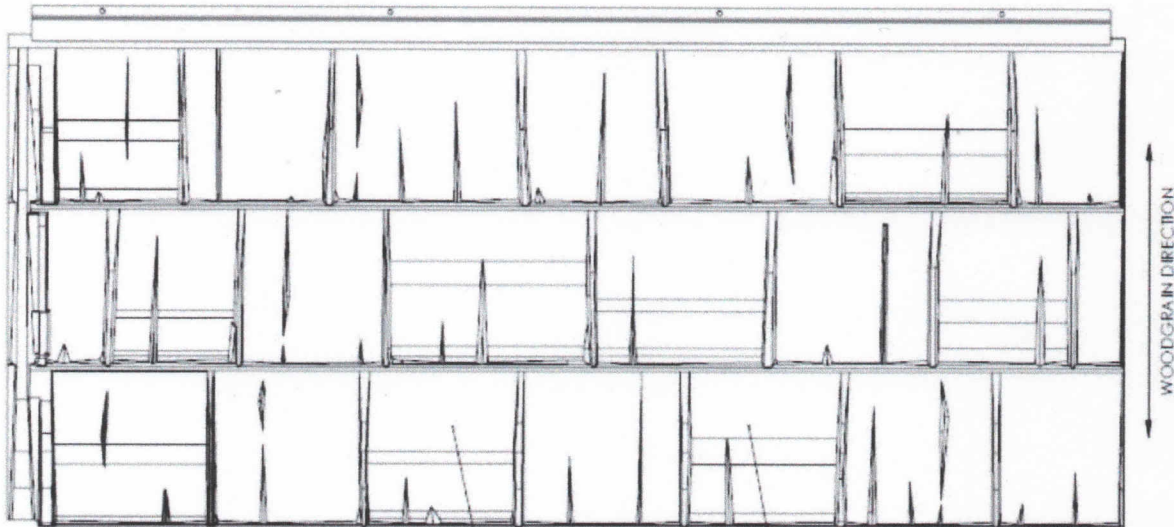
22x48" SLATE PANEL

PAINTED SIDE

SLATE GEOMETRY AND EMOSS

NOTES:

1. REFER TO '22X48 PANEL' FOR NUMERICAL DIMENSIONS



22x48" SHAKE PANEL

PAINTED SIDE

SHAKE GEOMETRY AND EMOSS

WOODGRAIN DIRECTION

NOTES:

1. REFER TO '22X48 PANEL' FOR NUMERICAL DIMENSIONS

FIGURE 3 – SLATE AND SHAKE PROFILE DETAILS