UL Evaluation Report

UL ER39048-01

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UL Category Code: ULEZ

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DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION
Sub-level 2: 07 40 00 - Roofing and Siding Panels
Sub-level 3: 07 41 00 - Roof Panels
Sub-level 4: 07 41 13 – Metal Roof Panels

COMPANY:

WORTHOUSE, INC
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1. SUBJECT:

SUPRE METAL ROOFING PANELS

2. SCOPE OF EVALUATION:

- 2105 *International Building Code* ® (IBC)
- 2105 *International Residential Code* ® (IRC)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014
- ICC-ES Acceptance Criteria for Metal Roof Coverings (AC166), dated October 2012

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The products were evaluated for the following properties:

- Roofing Systems for Exterior Fire Exposure (ANSI/UL790, ASTM E108)
- Roof Deck Construction (ANSI/UL 580)
- Wind Uplift Resistance (ANSI/UL 1897)
- Corrosion Resistance (ASTM B117)
- Weathering Performance (ASTM G155)
- Wind Driven Rain Resistance (TAS 100)

3. REFERENCED DOCUMENTS

- ICC-ES:
  - ICC-ES Acceptance Criteria for Metal Roof Coverings (AC166), dated October 2012
  - ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014
- ANSI/UL:
  - ANSI/UL 580, Fifth Edition, Standard for Tests for Uplift Resistance of Roof Assemblies
  - ANSI/UL 1897, Fourth Edition, Uplift Tests for Roof Covering Systems
  - ANSI/UL790, Seventh Edition (ASTM E108-07a), Standard Test Methods for Fire Tests of Roof Coverings
- ASTM:
  - ASTM A653/A653M-08, *Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process*
  - ASTM B117-11, *Standard Practice for Operating Salt Spray (Fog) Apparatus*
  - ASTM G155-05a, *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*
- Florida Building Code:
  - Test Protocols for the High Velocity Hurricane Zone (HVHZ) Testing Application Standard (TAS) No.100-95: *Test Procedure for Wind and Wind Driven Rain Resistance of Discontinuous Roof Systems*

4. USES

Worthouse Supre metal roofing panels are used as roof covering materials in Class A or Class C roofing systems when installed in accordance with this report and the manufacturer's published installation instructions.

5. PRODUCT DESCRIPTION

The Worthouse, INC metal roofing panels described in this report are either coated or painted metal formed from sheet steel. The panels are manufactured in different profile shapes and have a base metal thickness not less than 26 gauge [0.0179 in. (0.4275 mm)]. The panels are metal roof coverings complying with Section 1507.4 of the 2015 IBC and Section R905.10 of the 2015 IRC. The individual profile descriptions are listed below.

5.4 Supre

Supre metal roofing panels are nominally 46.85 inches wide (1189.99 mm) by 28.98 inches (736.00 mm) long, having and exposure area of 45.28 inches long (1150.11 mm) by 27.56 inches (700.02 mm) wide. Each tile is nominally 8.16 lbs (3.70 kg) with an installed weight of 94.11 lbs per square (4.60 kg/m²). Supre panels may be used in assemblies having a slope of 2:12 and greater. See Detail Sequence 1.

Fire Classification: Worthouse metal roofing panels covered under this report have been tested for fire classifications Class A and Class C in accordance with ANSI/UL790 (ASTM E108) and qualify for use under Section 1505.1 of the 2015 IBC and Section R902.1 of the 2015 IRC. Refer to Table 1.

Wind Resistance: Roofing assemblies shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.5 and Section 1504.3 of the 2015 IBC and Section R905.1 of the 2015 IRC.

Wind Uplift Resistance: Worthouse metal roofing panels covered under this report have been tested for wind uplift resistance in accordance with ANSI/UL 580/1897 complying with Section 1504.3.2 of the 2015 IBC. Refer to Table 1.

Wind Driven Rain Resistance: Worthouse metal roofing panels covered under this report have been tested for wind driven rain resistance in accordance with Test Application Standard (TAS) 100. Table 2 provides additional installation details for roof trim and edge treatments.

Physical Properties: Worthouse metal roofing panels covered under this report have been tested for the following performance requirements for metal panel roof systems:

- **Accelerated Weathering:** Worthouse metal roofing panels covered under this report have passed the criteria for accelerated weathering in accordance with Section 1504.6 of the IBC.
- **Corrosion Resistance:** Worthouse metal roofing panels complying with Section 1507.4.3 of the 2015 IBC and Section 905.10.3 of the 2015 IRC covered under this report have been tested for resistance to corrosion in accordance with ASTM B117.

6. INSTALLATION

6.1 General

Worthouse metal roofing panels must be installed in accordance with Section 1507.4 of the 2015 IBC or Section R905.6 of the 2015 IRC, except as noted in this report, and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at all times on the jobsite during installation. The metal roofing panels must be attached to the decked sheathing in a manner that will secure the panels in place.

6.2 Slope

Products covered in this report are intended for roof decks having greater than 2:12 slope. Installation of Worthouse metal roofing panels covered in this report are to be installed in accordance with Section 1507.4.2 of the 2015 IBC and Section R905.10.2 of the 2015 IRC.

6.3 Roof Deck

Roof decking is to be as described in Section 1507.4.1 of the 2012, 2009, 2006 IBC and Section R905.10.1 of the 2015 IRC. The minimum required sheathing is to be $^{15}/_{32}$ inch plywood decking, or $^{7}/_{16}$ inch OSB. The sheathing must be structurally sound and adequately fastened to resist wind loads for components and cladding as specified in Section 1609 of the 2015 IBC and Section R301.6 of the 2015 IRC.

6.4 Battens and Counter Battens

Wood battens must be nominal 2X2 standard grade Douglas Fir-Larch or better. Steel battens must be minimum 26 gauge [0.0179 in. (0.4275 mm)] hat-shaped sections with a minimum 1-$^{1}/_{2}$inch (38 mm) height. Counter-battens must be nominal 1X4 standard grade Douglas Fir-Larch or better. Battens and Counter Battens must be adequately fastened to resist wind loads.

6.5 Underlayment

An ice barrier must be installed along the eaves in locations prone to ice damming in accordance with Section 1507.7.4 of the 2015 IBC and Section R905.5.3.1 of the 2015 IRC. In addition to the ice barrier, an underlayment must be installed over the entire roof deck in accordance with Section 1507.7.3 of the 2015 IBC and Section R905.6.3 of the 2015 IRC.

Underlayments installed on roofs in locations prone to high winds must be installed in accordance with Section 1507.4.5 of the 2012 IBC.

6.6 Flashing

Flashing materials are to be installed in accordance with Section 1503.2 and Section 1507.7.7 of the 2015 IBC and Section R903.2 and Section R905.6.6 of the 2015, as applicable.

6.7 Roofing Panels

Installation of the metal roofing panels must begin at the eave edge with a starter row. An overlaying offset row is then installed to cover the starter row nail heads. Subsequent courses to be installed in accordance with the manufacturer's instructions.

6.8 Hips and Ridges

Hips and ridges must be installed in accordance with Worthouse, Inc.'s published installation instructions for exposure dimension and fastener type.

6.9 Fasteners

Fasteners supplied by Worthouse are minimum 2.25 inch long ring-shanked nails. The nails have heads of 0.236 inch in diameter with 0.113 inch diameter shanks. Attachment of the roof panels must be in accordance with Section 1507.4.4 of the 2015 IBC.

6.10 Reroofing

Existing roof covering materials are to be completely removed, and any structurally unstable sheathing materials are to be removed and replaced prior to installation of the Worthouse metal roofing panels. Installation is to be performed for new construction as described in Section 6 of this report.

7. CONDITIONS OF USE

7.1 General

The metal roofing panels described in this report comply with, or are suitable alternatives to, what is specified in those codes listed in Section 2 of this report, subject to the following conditions:

7.2 Materials and methods of installation must comply with this report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this report, this report governs.

7.3 Only Worthouse specified fasteners shall be used in the installation of the roof covering system.

7.4 See the UL Online Certification Directory for Prepared Roof Covering Materials, Formed or Molded Metal, Fiber-Cement, Plastic or Fire-retardant-treated Wood (TFXX), and Roof-covering Materials, Impact Resistance (TGAM).

7.5 Wind uplift pressures on any roof area, including edges and corner zones shall not exceed the allowable wind pressure for the roof covering installed in that particular area. The allowable wind uplift pressure for the roof assembly shall be based on a minimum factor of safety of 2.0. A safety factor of 2.0 must be applied to the rating for uplift resistance. The allowable wind uplift pressure is for the roof system only. The deck and framing to which the roofing system is attached shall be designed for the applicable components and cladding wind loads in accordance with the applicable code.

7.6 The metal roofing panels covered under this report are produced under the UL LLC Listing/Classification and Follow-Up Service Program, which includes audits in accordance with quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC10.

8. SUPPORTING EVIDENCE

8.1 Data in accordance with ICC-ES Acceptance Criteria for Metal Roof Coverings (AC166), dated October 2012.

8.2 Manufacturer's product literature, including installation instructions.

8.3 Documentation of quality system elements described in ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014.

8.4 UL Certification reports in accordance with ANSI/UL 790 and UL 2218. See UL Product Certification Categories (TFXX) and (TGAM), respectively.

8.5 Test reports in accordance with ANSI/UL 1897.

9. IDENTIFICATION

Worthouse metal roofing panels described in this evaluation report are identified by a marking bearing the report holder's name (Worthouse, Inc.) and address, the product name, the UL Certification Mark, and the evaluation report number UL ER39048-01. The validity of the evaluation report is contingent upon this identification appearing on the product or UL Classification Mark certificate.

10. USE OF UL EVALUATION REPORT

10.1 The approval of building products, materials, or systems is the responsibility of the applicable authorities having jurisdiction.

10.2 UL Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL.

10.3 The current status of this report, as well as a complete directory of UL Evaluation Reports may be found at UL.com via the On-Line Certifications Directory at www.ul.com/erdirectory.

TABLE 1: COMBUSTIBLE DECK[1, 2] ASSEMBLIES

System Number	Barrier Product Configuration	Panel Attachment		Wind Uplift		Fire Rating (Unlimited Incline)
		Face	Lap	Tested Pressure (psf)	Maximum Design Pressure[4]	
Supre[5]				**ANSI/UL 1897**		**ANSI/UL 790**
1	Minimum $^1/_2$ inch thick gypsum wallboard, $^1/_4$ inch thick G-P Gypsum DensDeck, USG SECUROCK glass mat board, CertainTeed Gypsum GlasRoc, or two or more layers of GAF VersaShield	(10) 4.8 mm X 35 mm HWH screws with 14 mm sealing washers through-fastened into the deck 9 inches o.c. along the midspan of each profile course approximately ½ inch in front of the profile step and ½ inch in front of the lap, as applicable.	4.8 mm X 19 mm HWH screws fasteners at factory preformed locations, stitched into panel nose and through preceding course, vertically and horizontally as applicable.	**-165**	**-82.5**	**Class A**
2		(20) 4.8 mm X 35 mm HWH screws with 14 mm sealing washers through-fastened into the deck, paired 9 inches o.c. along the midspan of each profile course approximately ½ inch in front of the profile step and ½ inch in front of the lap, as applicable.		**-195**	**-97.5**	

[1]APA stamped minimum $^{15}/_{32}$ inch CDX plywood fastened 6 inches oc at perimeter and 12 inches oc at intermediate supports with 2-$^1/_2$ inch #8d annular ring shank nails.

[2]ASTM D226 Type II underlayment attached to deck with 32 GA, 1-$^5/_8$ inch tin caps having 12 GA 1-$^1/_4$ inch nails at 6 inches on center in the laps and two additional field rows spaced 12 inches on center.

[3]Battens are to be minimum nominal 2X2 Douglas Fir-Larch or better, or minimum 26 GA steel, 1-$^1/_2$ inch wide hats.

[4]Maximum design wind uplift pressure utilizes a safety factor of 2 to the maximum tested load achieved without failure.

[5]Adjacent panels installed having 2 inch side lap and 1 inch at the head/nose interface.

TABLE 1: COMBUSTIBLE DECK[1, 2] ASSEMBLIES (CONTINUED)

System Number	Barrier Product Configuration	Batten[3] Attachment	Panel Attachment		Wind Uplift		Fire Rating (Unlimited Incline)
			Face	Lap	Tested Pressure (psi)	Maximum Design Pressure[4]	
Supre[5]					**ANSI/UL 1897**		**ANSI/UL 790**
3	Minimum $^1/_2$ inch gypsum wallboard, $^1/_4$ inch thick G-P Gypsum DensDeck, USG SECUROCK glass mat board, CertainTeed Gypsum GlasRoc, or two or more layers of GAF VersaShield	(2) #10 X 3-$^1/_2$ inch stainless steel deck screws 24 inch oc at each batten/counter-batten[6] intersection.	(5) 4.8 mm X 35 mm HWH screws with 14 mm sealing washers through-fastened into the deck 18 inches o.c. along the midspan of each profile course approximately ½ inch in front of the profile step and ½ inch in front of the lap, as applicable.	4.8 mm X 19 mm HWH screws fasteners at factory preformed locations, stitched into panel nose and through preceding course, vertically and horizontally as applicable.	**-240**	**-120**	**Class A**
4			(10) 4.8 mm X 35 mm HWH screws with 14 mm sealing washers through-fastened into the deck 18 inches o.c. along the midspan of each profile course approximately ½ inch in front of the profile step and ½ inch in front of the lap, as applicable.		**-315**	**-157.5**	

[1]APA stamped minimum $^{15}/_{32}$ inch CDX plywood fastened on all edges and at mid-span to framing 6 inches oc with 2-$^3/_8$ inch #8d annular ring shank nails.
[2]ASTM D226 Type II underlayment attached to deck with 32 GA, 1-$^5/_8$ inch tin caps having 12 GA 1-$^1/_4$ inch nails at 6 inches on center in the laps and two additional field rows spaced 12 inches on center.
[3]Battens are to be minimum nominal 2" X 4" dimensional lumber 14 inches on center perpendicular to counter-battens.
[4]The maximum design wind uplift pressure utilizes a safety factor of 2 to the maximum tested load achieved without failure.
[5]Adjacent panel overlap approximately 2-$^1/_2$ inches.
[6]Counter-battens are to be minimum nominal 1" X 4" dimensional lumber spaced 24 inches on center over deck supports.

TABLE 2: WIND DRIVEN RIAN RESISTANCE[1]

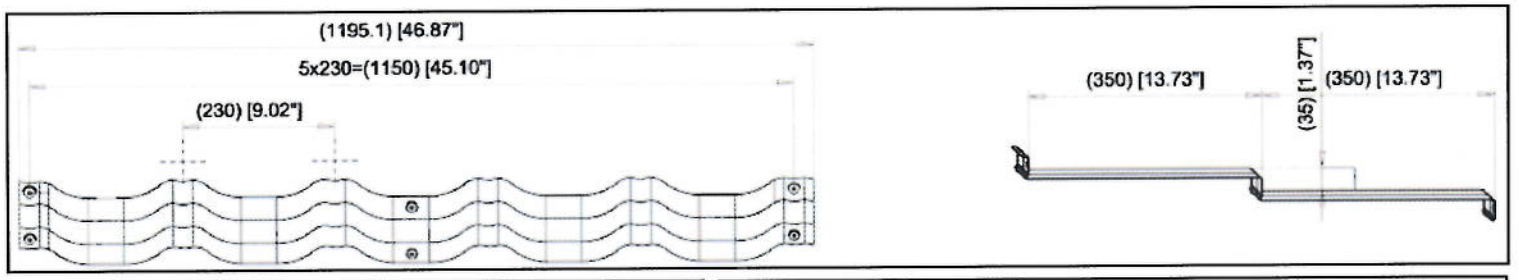
Roof Location/Detail	Detail Description	Component Attachment	Wind Driven Rain Resistance (HVHZ)
Supre[2]			**TAS 100**
Drip Edge[2]	3 inch vertical face and 3 inch fastening flange along eave and rake	12 ga. 1-$^1/_4$ inch ring shank nails 4 inches oc into the deck, and 4.8 mm X 35 mm HWH screws with 14 mm sealing washers into the fascia 12 inches oc	**Pass**
Eave[4]	Underlayment[3] wrapped over eave and down the fascia 6 inches and cut flush with the bottom edge of the drip edge	12 ga. 1-1/4 inch ring shank nails 4 inches oc into the deck, and 4.8 mm X 35 mm HWH screws with 14 mm sealing washers into the fascia 12 inches oc	
	2X2 wood batten topped with a 1X2 was installed over battens	Batten secured through to the deck battens 12 inches oc with 3-½ inch X #10 deck screws	
	Flashing measuring 2-$^3/_4$ x 6 x $^1/_2$ placed over the panel with the 6 inch face extending down the batten and over the drip edge	Roofing panels placed over the flashing and through-fastened into the batten with (2) 4.8 mm X 35 mm HWH screws with 14 mm sealing washers per pan	
Rake[5, 6, 7]	The underlayment was wrapped over the eave and down the fascia 6 inches and cut flush with the bottom edge of the drip edge	12 ga. 1-$^1/_4$ inch ring shank nails 4 inches oc into the deck, and 4.8 mm X 35 mm HWH screws with 14 mm sealing washers into the fascia 12 inches oc	
	A 2x2 wood batten topped with a 1x2 to be installed over battens	Batten secured 14 inches o.c with 3-½ inch x #10 deck screws. A 2" x 3" x ½ inch inside flashing to be set on the inside of batten on the underlayment and secured 14" o.c. with 4.8mm x 35mm HWH screws with 14mm O.D. sealing washers both to the batten along the vertical face and to the deck battens along the inside edge. Supre panels to be installed as described above over the inside flashing. A 4" x 4" outside flashing to be placed over the rake edge and attached 12" o.c. with 4.8mm x 35mm HWH screws with 14mm O.D. sealing washers into the top and side of the batten.	

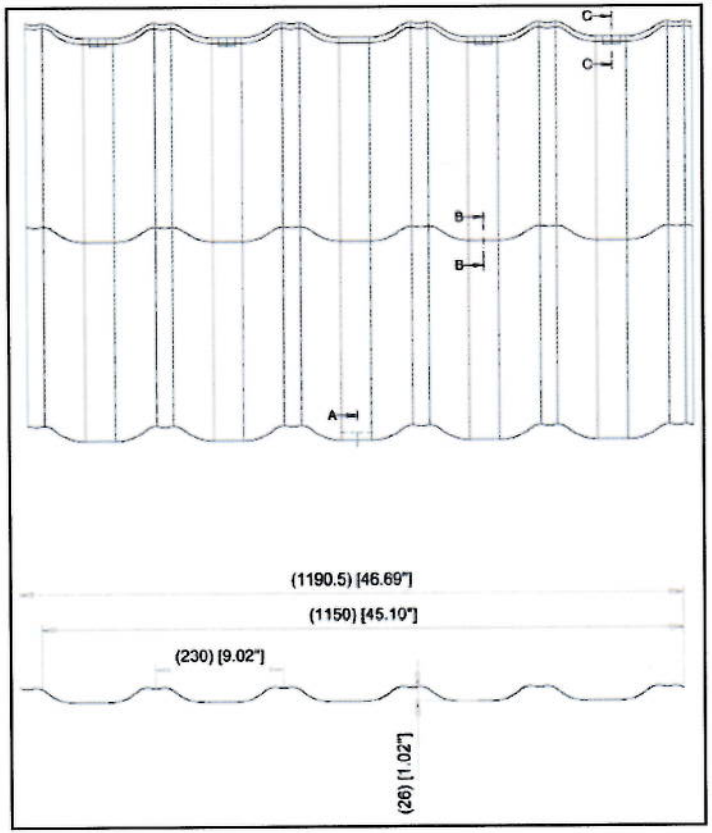
TABLE 2: WIND DRIVEN RIAN RESISTANCE[1] (CONTINUED)

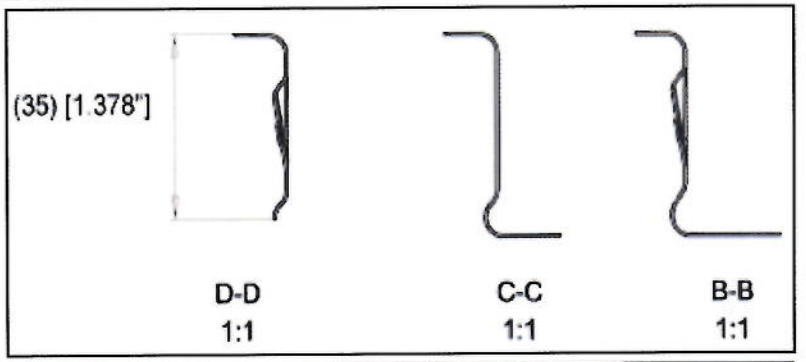
Valley	23 inch wide valley metal attached over the battens, roof panels mitered along the valley to create a 4 inch wide open valley	4.8mm x 35mm HWH screws with 14mm O.D. sealing washers attached 14 inches o.c. along the valley edges. An end lap was created in the valley by overlapping the valley pan 4 inches[8].	**Pass**

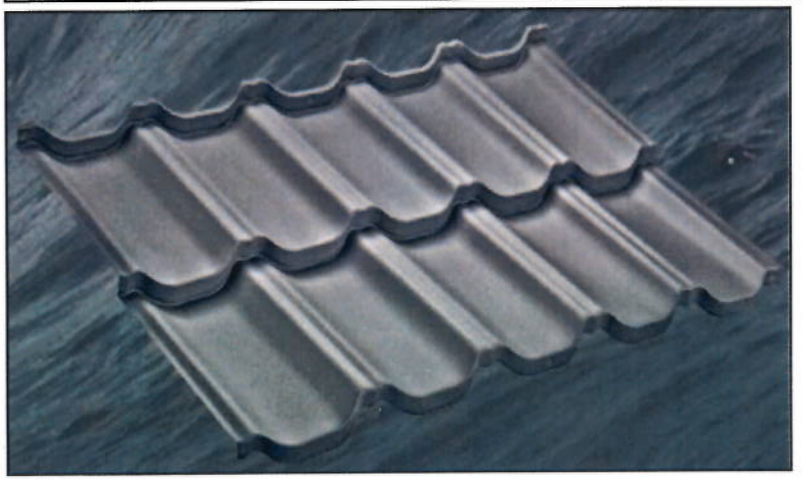
[1]Deck, underlayment, batten, counter-batten, and roof covering materials and attachment methods must comply with Table 1.
[2]Roof panel attachment requires minimum of 10 fasteners per panel as shown in System Number 4.
[3]Drip edge metal is to be installed with 4 inch overlaps at end joints.
[4]ASTM D 226 Type II underlayment was installed with minimum 4 inch side-laps and 6" end-laps
[5]Nominal 2-$^1/_4$ inch square foam closure material used to seal between top side of stone coated trim and roof cover.
[6]Nominal 2X2 wood counter-batten applied parallel to rake edge and atop battens.
[7]Metal roof cover material bent over counter-batten.
[8]Valley pan end lap sealed with two (2) $^1/_2$ inch beads of polyurethane roof sealant, and hem at drip edge sealed with continuous bead.

Detail Sequence 1









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