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# ICC-ES Evaluation Report

# ESR-2901

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Reissued 09/2017  
This report is subject to renewal 09/2018.

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**SECTION: 07 41 13—METAL ROOF PANELS**

**REPORT HOLDER:**

**DECRA ROOFING SYSTEMS, INC.**

**1230 RAILROAD STREET  
CORONA, CALIFORNIA 92882**

**EVALUATION SUBJECT:**

**STEEL ROOFING PANELS: TILE PROFILE: DECRA TILESHAKE PROFILE: DECRA  
SHAKESHINGLE PROFILE: DECRA SHINGLE PLUS**



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**Section: 07 41 13—Metal Roof Panels**

**REPORT HOLDER:**

**DECRA ROOFING SYSTEMS, INC.**

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**EVALUATION SUBJECT:**

**STEEL ROOFING PANELS:**

**TILE PROFILE: DECRA TILE**

**SHAKE PROFILE: DECRA SHAKE**

**SHINGLE PROFILE: DECRA SHINGLE PLUS**

## 1.0 EVALUATION SCOPE

### 1.1 Compliance with the following codes:

- 2009 and 2006 *International Building Code*® (IBC)
- 2009 and 2006 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)<sup>†</sup>

<sup>†</sup>The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

### Properties Evaluated:

- Fire classification
- Wind resistance
- Weather resistance

### 1.2 Evaluation to the following green code:

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11

### Attributes verified:

- See Section 3.1

## 2.0 USES

The DECRA Steel Roofing Panels described in this report are used as roof coverings on new roofs and over existing roofs, when installed in accordance with this report.

## 3.0 DESCRIPTION

### 3.1 General:

The steel roofing panels are pressure-formed from structural-quality sheet steel complying with ASTM A792, Grade 37, with an AZ50 class hot-dip aluminum-zinc alloy coating. The thickness of the coated steel is 0.017 inch (0.43 mm). The overall panel size of the tile and shingle profiles is 16<sup>1</sup>/<sub>2</sub> inches by 52 inches (419 mm by 1321 mm), with an installed exposure of 14<sup>1</sup>/<sub>2</sub> inches by 50 inches (368 mm by 1270 mm). The overall panel size of the shake profiles is 14<sup>5</sup>/<sub>8</sub> inches by 53 inches (371 mm by 1346 mm), with an installed exposure of 12<sup>5</sup>/<sub>8</sub> inches by 51 inches (321 mm by 1295 mm). Side panel laps are 2 inches (51 mm). The Tile profile has pan sections that form tile shapes. The Shake profile has impressions forming irregular shake shapes across the panels. The Shingle Plus profile consists of raised and lowered sections that form a series of rectangular shingle shapes. The panel leading edges are bent down 1 inch (25.4 mm) to provide an overlap for weather protection and nailing purposes. The top back edge of each panel is bent vertically up 1 inch (25.4 mm), then lipped horizontally back from 1 inch (25.4 mm) to 1<sup>1</sup>/<sub>2</sub> inches (38 mm). Each panel weighs approximately 6.5 pounds (3 kg). The installed weight of these steel roofing panel systems is approximately 1.5 psf (7.3 kg/m<sup>2</sup>).

Both sides of the panels are treated with a corrosion-inhibiting coating. An opaque base coat of acrylic resin is applied to exposed surfaces, and this is followed by embedment of colored stone granules. The surface is then spray-finished with clear acrylic glaze.

The attributes of the steel roofing panels have been verified as conforming to the provisions of CALGreen Section A5.406.1.2 for reduced maintenance. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

### 3.2 Roof Slope and Standard Underlayment:

Except as required in Section 3.3, the steel panels described in this report may be installed on roof slopes of 3:12 (25%) and greater, without an underlayment. For roof slopes of less than 3:12 (25%), the panels must be installed over a roof covering system installed in accordance with the applicable code.

### 3.3 Underlayment:

Underlayment must comply with Section 1507.5.3 of the IBC or Section R905.4.3 of the IRC, as applicable.

### 3.4 Battens and Counterbattens:

Wood battens must be nominally 2-by-2 standard-grade Douglas fir–larch or better. Steel battens must be hat-, C-, J- or U-shaped sections with a 1<sup>1</sup>/<sub>2</sub>-inch (38 mm) minimum height, formed from minimum 0.017-inch-thick (0.43 mm) galvanized steel. Wood battens are limited to supports spaced at a maximum of 24 inches (610 mm) on center, and steel battens must be designed to resist the design loads. Counterbattens must be nominally 1-by-4 standard-grade Douglas fir–larch or better.

### 3.5 Fasteners:

All fasteners must be corrosion-resistant. Nails must comply with ASTM F1667. Wood screws must comply with ANSI/ASME Standard B18.6.1. Sheet metal screws must comply with ANSI/ASME Standard B18.6.4.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Installation—New Construction:

Battens must be installed 14<sup>1</sup>/<sub>2</sub> inches (368 mm) on center for tile and shingle profiles, or 12<sup>5</sup>/<sub>8</sub> inches (321 mm) on center for shake profiles. The battens must be attached to a roof deck consisting of wood structural panels or lumber sheathing complying with the code.

Wood battens must be fastened to the supporting framing members with one 16d, 0.162-inch-diameter (4.12 mm) common nail or equivalent per intersection in the field of the roof, and two corrosion-resistant 16d common nails per intersection on roof perimeter areas. Steel battens must be fastened to framing with one No. 8 by 1.5-inch-long (38 mm), corrosion-resistant wood screw in the field of the roof and two wood screws on the perimeters. The field and perimeter areas of the roof are defined in ASCE 7. Measurements for batten placement must be made from the face of the fascia board up to the face of succeeding battens. The final panel width, adjacent to the ridge board, is adjusted by cutting and bending the panel vertically in the field. All ridges and hips are provided with either two nominally 2-by-2 boards or one nominally 2-by-4 board. Valleys must be flashed in accordance with Section 1507.5.7 of the 2009 IBC, Section 1507.5.6 of the 2006 IBC or IRC Section R905.4.6, as applicable.

Panels are fastened to wood battens with a minimum of four 8d, corrosion-resistant box nails, or equivalent, in the field of the roof, and five nails on the perimeter roof areas. Panels are fastened to steel battens with a minimum of four No. 8, 0.164-inch-diameter-by-1-inch-long (4.16 mm by 25.4 mm), corrosion-resistant steel sheet metal screws or equivalent. One fastener is placed near the bottom on the downturn of the panel, approximately 1 inch (25.4 mm) from the overlapped edge of the adjoining panel. The remaining fasteners must be evenly spaced across the panel at the same location as the first fastener. Gable rakes must be provided with a continuous gable cap piece or barge cover made and finished with the same materials as the roofing panels. Ridges and hips have the panels fastened to the side of the ridge or hip boards after mitering and bending, and must be capped with hip/ridge caps made and finished with the same materials as the roofing panels. Openings in the roof covering must be flashed in accordance with IBC Section 1503.2 or IRC Section R903.2. Openings through the panels for vents, etc., must be adequately weatherproofed and supported by additional blocking or

roof framing as necessary. The manufacturer's published installation recommendations must be followed and a copy must be available upon request.

### 4.2 Installation—Reroofing:

When the old roof covering is completely removed, all conditions noted in Sections 3.1 through 4.1 must apply. If the old roof covering was installed on spaced sheathing, the gaps must be filled to provide closely fitted decking having joints spaced approximately <sup>1</sup>/<sub>8</sub> inch (3.2 mm) for classified roof covering systems. For nonclassified roof covering systems, additional structural sheathing boards must be attached to the roof framing as required to accommodate all batten fastening locations.

DECRA steel roofing panels may also be installed over existing wood shake, wood shingle, asphalt shingle, or built-up roofs, provided the roof slope complies with Section 3.2 and the requirements of IBC Section 1510 or IRC Section R907 are met. When installation is over wood shingle or wood shake roofs, the entire existing roof surface must be covered with material in accordance with IBC Section 1510.4 or IRC Section 907.4 prior to installation of counterbattens.

For installation over existing asphalt shingles, ridge and hip caps must be removed and the existing roof covering cut back flush with the fascia or barge cover. Battens must be spaced 14<sup>1</sup>/<sub>2</sub> inches (368 mm) on center for tile and shingle profiles, or 12<sup>5</sup>/<sub>8</sub> inches (321 mm) on center for shake profiles, and must be fastened to the deck using 16d common nails at 12 inches (305 mm) on center. The panels are fastened to the battens in the same manner as described in Section 4.1.

For installation over existing wood shingle and wood shake roofs, ridge and hip caps must be removed and the existing roof covering cut back flush with the fascia or barge cover. Counterbattens must be installed over the existing roof covering parallel to the framing (perpendicular to the eaves) at a maximum 24-inch (610 mm) spacing. Counterbattens must be securely fastened to the framing members or to spaced sheathing using minimum 16d common nails or equivalent in the field of the roof and No. 10 by 3<sup>1</sup>/<sub>2</sub>-inch-long (89 mm) wood screws on the perimeters. Nails and screws must be of sufficient length to penetrate 1 inch (25.4 mm) into the framing member. Maximum fastener spacing is 7 inches (178 mm) on center, and edge fasteners must be within 6 inches (152 mm) of counterbatten ends. Care must be taken to avoid splitting the battens and counterbattens. Battens are spaced 14<sup>1</sup>/<sub>2</sub> inches (368 mm) on center for tile and shingle profiles, or 12<sup>5</sup>/<sub>8</sub> inches (321 mm) on center for shake profiles, and must be fastened to the counterbattens using two 16d common nails or equivalent per intersection in the field of the roof and two No. 10 by 3<sup>1</sup>/<sub>2</sub>-inch-long (89 mm) wood screws on the roof perimeter areas. The panels are fastened to the battens in the same manner as described in Section 4.1. New flashings must be installed over and around all existing valleys, vents and chimneys in accordance with the applicable code requirements. Valleys must be flashed in accordance with Section 1507.5.7 of the 2009 IBC, Section 1507.5.6 of the 2006 IBC or IRC Section R905.4.6, as applicable.

Over existing built-up roof coverings, all loose gravel and debris must be swept off. Blisters in the plies must be cut and nailed flat. Raised perimeters, such as gravel stops, must be covered by the steel panel roofing system. The system may be installed over integral gutters, provided there is a fascia board, nailed to the rafters, installed outside the gutter. The battens and counterbattens must

be fastened in accordance with this section (Section 4.2).

**4.3 Fire Classification: 2009 and 2006 IBC and IRC:**

The roof covering assemblies described in Table 1, when installed in accordance with this report, have the fire classifications noted in the table.

**4.4 Wind Resistance:**

DECRA steel roofing panels installed on battens as described in this report are acceptable for uplift loads up to 33 psf (1580 N/m<sup>2</sup>) in the field of the roof and 75 psf (3591 N/m<sup>2</sup>) on the roof perimeter areas when the design wind pressure is determined in accordance with ASCE 7 (IBC) or IRC Section R301.2.1, as applicable. Positive loads are limited to the adequacy of the structural framing and sheathing.

Except for installation on roof overhangs under the IBC, and provided installation is in accordance with the conditions given in Section 6.4 of ASCE 7 (IBC) or IRC Section R301, these roof coverings are acceptable on any portion of a roof having a maximum height of 30 feet (9.2 meters) in areas identified as Exposure B according to ASCE 7 Figure 6.3 and IRC Table R301.2(2), and a slope equal to or greater than 3:12 (25%), with a maximum basic wind speed (3-second gust) of 140 miles per hour (61.6 m/s). On overhangs under the IBC, the maximum basic wind speed (3-second gust) is reduced to 110 miles per hour (48.4 m/s) in accordance with ASCE 7 Figure 6.3.

For areas identified as Exposure C, with roof slopes equal to or greater than 3:12 (25%) at a maximum mean roof height of 30 feet (9.2 m), in all areas of the roof except overhangs under the IBC, the maximum basic wind speed (3-second gust) is limited to 120 miles per hour (52.8 m/s) in accordance with ASCE 7, Figure 6.3. On overhangs under the IBC, the maximum basic wind speed (3-second gust) must be reduced to 90 miles per hour (39.6 m/s) in accordance with ASCE 7, Figure 6.3.

Battens and counterbattens (if used) and their attachment to framing must be designed for the applied wind loads.

Special inspections must be conducted when required by Sections 1706.1 and 1706.4 of the 2009 IBC and Sections 1705.4 and 1705.4.2 of the 2006 IBC.

**4.5 Live Loads:**

The DECRA (Tile, Shake and Shingle Plus) Steel Roofing Panels have an allowable load of 100 psf when applied to 2-inch-by-2-inch standard-grade Douglas fir-larch spaced at a maximum of 14<sup>1</sup>/<sub>2</sub> inches (369 mm) on center.

**5.0 CONDITIONS OF USE**

The DECRA Steel Roofing Panels described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The panels are manufactured, identified and installed in accordance with this report, the applicable code and the manufacturer’s installation instructions. In the event of a conflict between this report and the manufacturer’s installation instructions, this report governs.
- 5.2 Printed installation instructions must be provided for the steel roofing panels listed in this report.
- 5.3 Special inspections must be conducted when required by Sections 1706.1 and 1706.4 of the 2009 IBC and Sections 1705.4 and 1705.4.2 of the 2006 IBC, as set forth in Section 4.4 of this report.
- 5.4 The roofing panels are manufactured in Corona, California, under a quality control program with inspections by ICC-ES.

**6.0 EVIDENCE SUBMITTED**

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

**7.0 IDENTIFICATION**

A label bearing the manufacturer’s name (DECRA Roofing Systems, Inc.) and address, the product name and the evaluation report number (ESR-2901) must be affixed to each pallet or bundle.

**TABLE 1—FIRE CLASSIFICATION ASSEMBLIES<sup>1,2,3</sup>**

SYSTEM NO.	ROOF CLASS	SUBSTRATE	MAX. ROOF SLOPE	INSULATION	UNDERLAYMENT	BATTENS AND COUNTERBATTENS	ROOF PANEL
1	A	Minimum <sup>15</sup> / <sub>32</sub> -inch-thick plywood	Unlimited	None	One layer of GAF VersaShield® Fire-Resistant Roof Deck Protection, as recognized in <a href="#">ESR-2053</a>	Wood or steel battens on wood counterbattens	DECRA Shake, DECRA Tile, or DECRA Shingle Plus
2	B	Existing wood shingle or shake	Unlimited	1 <sup>1</sup> / <sub>2</sub> -inch-thick foil-faced fiberglass blanket	---	2-by-2 wood battens on 1-by-4 wood counterbattens	DECRA Shake, DECRA Tile, or DECRA Shingle Plus
3	C	Minimum <sup>15</sup> / <sub>32</sub> -inch-thick plywood	Unlimited	None	Any UL-classified underlayment	Wood or steel battens on wood counterbattens	DECRA Shake, DECRA Tile, or DECRA Shingle Plus

For SI: 1 inch = 25.4 mm.

<sup>1</sup>For Systems 1 and 3, see Section 4.1 for additional installation details.

<sup>2</sup>For System 2, see Section 4.2 for additional installation details.

<sup>3</sup>For Systems 1, 2 and 3, see Section 3.4 for additional details for battens and counterbattens.



DECRA Shingle Plus

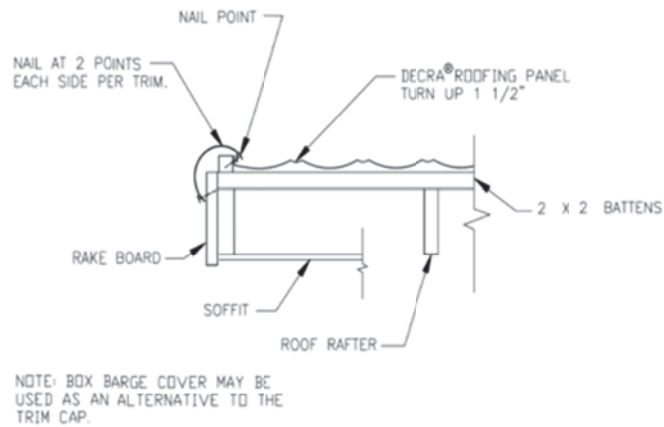


DECRA Shake



DECRA Tile

FIGURE 1—TYPICAL PANEL PROFILES



RAKE DETAIL  
WITH PANEL TURN UP

FIGURE 2-C



## ICC-ES Evaluation Report

## ESR-2901 Supplement

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### EVALUATION SUBJECT:

#### STEEL ROOFING PANELS:

**TILE PROFILE: DECRA TILE**  
**SHAKE PROFILE: DECRA SHAKE**  
**SHINGLE PROFILE: DECRA SHINGLE PLUS**

### 1.0 EVALUATION SCOPE

#### Compliance with the following codes:

- 2010 *California Building Code* (CBC)
- 2010 *California Residential Code* (CRC)

#### Properties evaluated:

- Fire classification
- Weather resistance
- Wind uplift resistance

### 2.0 CBC

The DECRA steel roofing panels described in the master report, ESR-2901, may be used where a Class A roof covering complying with CBC Section 1505.1.1, a Class B roof covering complying with CBC Section 1505.1.2, or a Class C roof covering complying with CBC Section 1505.1.3 is required, provided installation is in accordance with the master report.

The roofing panels may be used in the construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area, provided installation is in accordance with the master report and the additional requirements of Sections 701A.3 and 705A of the CBC.

### 3.0 CRC

The DECRA steel roofing panels described in the master report, ESR-2901, may be used where a Class A roof covering complying with CRC Section R902.1.1, a Class B roof covering complying with CRC Section R902.1.2, or a Class C roof covering complying with CRC Section R902.1.3 is required, provided installation is in accordance with the master report and the additional requirements of Section R905.4 of the CRC.

The roofing panels may be used in the construction of new buildings located in any Wildland–Urban Interface Fire Area, provided installation is in accordance with the master report and the additional requirements of Sections R327.1.3.1 and R327.5 of the CRC.

The products recognized in this supplement have not been evaluated for compliance with the *International Wildland–Urban Interface Code*®.

This supplement expires concurrently with the master report reissued September 2017.