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ESR-1754

Reissued 11/2016
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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 31 16—METAL SHINGLES
SECTION: 07 32 19—METAL ROOF TILES

REPORT HOLDER:

DECRA ROOFING SYSTEMS, INC.

**1230 RAILROAD STREET
CORONA, CALIFORNIA 92882**

EVALUATION SUBJECT:

STEEL ROOFING PANELS:

TILE PROFILE: DECRA VILLA TILE

SHAKE PROFILE: DECRA SHAKE XD™

SHINGLE PROFILE: DECRA SHINGLE XD™



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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 31 16—Metal Shingles

Section: 07 32 19—Metal Roof Tiles

REPORT HOLDER:

DECRA ROOFING SYSTEMS, INC.

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EVALUATION SUBJECT:

STEEL ROOFING PANELS:

TILE PROFILE: DECRA VILLA TILE

SHAKE PROFILE: DECRA
SHAKE XD™

SHINGLE PROFILE: DECRA
SHINGLE XD™

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]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:

- 2013 California Green Building Standards Code (CALGreen), Title 24, Part 11

Attributes verified:

- See Section 3.0

2.0 USES

The DECRA steel roofing panels are metal roof shingles complying with IBC Section 1507.5 and IRC Section R905.4 and are recognized for use as Class A or Class C roof coverings on new 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, with an AZ50 class hot-dip aluminum-zinc alloy coating. The thickness of the coated steel is 0.017 inch (0.43 mm).

The installed weight of the steel roofing panels is 1.3 psf (6.3 kg/m²). See Figure 1 for typical panel profiles.

Both sides of the steel roofing panels are treated with a corrosion-inhibiting coating. An opaque base coat of acrylic resin is applied to the top exposed surfaces, followed by embedment of colored stone granules. A clear acrylic glaze is then applied.

The attributes of the steel roofing panels have been verified as conforming to the requirements of 2013 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. The code may provide supplemental information as guidance.

3.1.1 DECRA Villa Tile: The overall panel size of the Villa Tile profile is 17 inches (432 mm) by 44¹/₄ inches (1124 mm), with an installed exposure of 14¹/₂ inches (368 mm) by 39¹/₂ inches (1003 mm). The panel has alternating concave pans and convex crowns forming a Spanish clay tile appearance. The panel leading edge is bent down ⁷/₈ inch (22.2 mm) with a ³/₈-inch (9.5 mm) return for weather protection, interlocking and fastening purposes. The top back edge is bent vertically up ⁷/₈ inch (22.2 mm), then lipped horizontally back 2¹/₄ inches (57 mm).

3.1.2 DECRA Shake XD™ and Shingle XD™: The overall panel size of the Shake XD™ and Shingle XD™ profiles is 14¹/₈ inches (359 mm) by 52¹/₈ inches (1324 mm), with an installed exposure of 12³/₈ inches (314 mm) by 49⁷/₈ inches (1267 mm). Side panel laps are 2⁵/₈ inches (67 mm). The Shake XD™ panel has impressions forming individual irregular shake shapes across the panel with alternating heights and lengths. The Shingle XD™ panel has a step that forms two courses of raised and lowered sections that form a series of rectangular shingle shapes. The panel leading edges are bent to form a front clip which locks into the clip formed at the top back edge of each panel.

3.2 Underlayment:

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

3.3 Battens and Counterbattens:

Wood battens must be nominally 1-by-4 standard or utility-grade Douglas fir–larch or better, having a specific gravity of 0.50 or greater. Wood battens are attached to framing members spaced 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, having a specific gravity of 0.50 or greater.

3.4 Roof Slope:

3.4.1 The Villa Tile and Shake XD™ panels must be installed on roofs with minimum slopes of at least 3:12 (25 percent). For roof slopes between 2:12 (16 percent) and less than 3:12 (25 percent), the panels are considered decorative and must be installed over a roof-covering system complying with the applicable code, subject to code official approval.

3.4.2 Shingle XD™ must be installed on roofs with minimum slopes of at least 4:12 (33 percent). For roof slopes between 2:12 (16 percent) and less than 4:12 (25 percent), the panels are considered decorative and must be installed over a roof-covering system complying with the applicable code, subject to code official approval.

4.0 INSTALLATION

4.1 Installation—New Construction:

The panels must be installed directly on minimum $1\frac{5}{32}$ -inch-thick (11.9 mm) plywood or on solid sheathing complying with the applicable code. Full panels must be placed and fastened starting at the eave.

Valleys must be flashed in accordance with 2012 IBC Section 1507.5.7, 2009 IBC Section 1507.5.7, 2006 IBC Section 1507.5.6 or IRC Section R905.4.6, as applicable. Other flashings must be in accordance with IBC Section 1503.2 or IRC Section R903.2, as applicable.

4.1.1 DECRA Villa Tile:

4.1.1.1 System 1: Bird stop eave flashing is installed along the eave with corrosion-resistant No. 9 screws, $1\frac{1}{2}$ inches (38 mm) long. The starter panel is installed by aligning panes of panel with valley of bird stop flashing and attaching panel to the fascia with one corrosion-resistant No. 9 screw, $1\frac{1}{2}$ inches (38 mm) long, per pan flange. See System 1 in Table 1 for panel fastening to deck.

Panels must be secured at hips and ridges after they have been mitered to match the framing lines. Panels must be cut and fit into valley flashing leaving an open valley. Trim pieces must be overlapped and fastened along the ridges, gable rakes, and hips with minimum No. 9, $1\frac{1}{2}$ -inch-long (38 mm), corrosion-resistant screws.

4.1.1.2 System 2: At perimeter areas, such as eaves, rakes and ridges, defined as the end and corner zones of the roof in Figure 30.5-1 of ASCE 7-10 (2012 IBC and IRC) [Figure 6-3 of ASCE 7-05 (2009 and 2006 IBC and IRC)], nominally 1-by-4 battens are installed running perpendicular to the roof slope. The first batten is placed $1\frac{1}{2}$ inches (38 mm) up the slope from the roof eave. Battens are placed at a maximum spacing of $14\frac{1}{2}$ inches (368 mm) on center. Wood battens are attached through wood deck to framing members with two No. 9 by $2\frac{1}{2}$ -inch-long (64 mm), coated, all-purpose, exterior wood screws per intersection. Also, wood battens are attached to plywood deck with two No. 9 by $2\frac{1}{2}$ -inch-long (64 mm), coated, all-purpose, exterior wood screws placed approximately 8 inches (203 mm) on center between framing member supports.

Bird stop eave flashing is installed along the eave with corrosion-resistant No. 9 screws, $1\frac{1}{2}$ inches (38 mm) long. The starter panel is installed by aligning pan of panel with the valley of bird stop flashing and attaching the panel to the fascia with two corrosion-resistant No. 9 screws, $1\frac{1}{2}$ inches (38 mm) long, per pan flange. See System 2 in Table 1 for panel fastening to deck and battens.

4.1.2 DECRA Shake XD™ and Shingle XD™:

4.1.2.1 System 3: A starter clip with drip edge is installed along the eave with corrosion-resistant minimum No. 9 screws, $1\frac{1}{2}$ inches (38 mm) long. The panel is fastened at the back flange with five corrosion-resistant minimum No. 8 screws per panel into the prepunched holes. At perimeter areas, such as eaves, rakes and gables, defined as the end and corner zones of the roof in Figure 30.5-1 of ASCE 7-10 (2012 IBC and IRC) [Figure 6-3 of ASCE 7-05 (2009 and 2006 IBC and IRC)], five corrosion-resistant minimum No. 9 screws, $1\frac{1}{2}$ inches (38 mm) long, are added evenly spaced between the ends of the shingle for a total of 10 fasteners per shingle length.

On rakes and in roof-to-wall areas, panels are fitted into the gable or roof-to-wall channel. DECRA Roofing Systems valley flashing is installed and the panels are cut and slotted into either side of the valley flashing. Trim pieces must be overlapped and fastened along the ridges and hips with corrosion-resistant minimum No. 9 screws, $1\frac{1}{2}$ inches (38 mm) long.

4.1.2.2 System 4: A starter clip with drip edge is installed along the eave with corrosion-resistant, 0.120-inch-diameter (3 mm), ring shank roofing nails, $1\frac{1}{4}$ inches (32 mm) long with $\frac{3}{8}$ -inch-diameter heads. The panel is fastened at the back flange with five corrosion-resistant, 0.120-inch-diameter (3 mm), ring shank roofing nails, $1\frac{1}{4}$ inches long (32 mm) with $\frac{3}{8}$ -inch-diameter heads per panel into the prepunched holes. At perimeter areas, such as eaves, rakes and gables, defined as the end and corner zones of the roof in Figure 30.5-1 of ASCE 7-10 (2012 IBC and IRC) [Figure 6-3 of ASCE 7-05 (2009 and 2006 IBC and IRC)], five corrosion-resistant, 0.120-inch-diameter (3 mm), ring shank roofing nails, $1\frac{1}{4}$ inches (32 mm) long with $\frac{3}{8}$ -inch-diameter heads are spaced evenly between the ends of the shingle for a total of 10 fasteners per shingle length.

On rakes and in roof-to-wall areas, panels are fitted into the gable or roof-to-wall channel. DECRA Roofing Systems valley flashing is installed and the panels are cut and slotted into either side of the valley flashing. Trim pieces must be overlapped and fastened along the ridges and hips with corrosion-resistant, 0.120-inch-diameter (3 mm), ring shank roofing nails, $1\frac{1}{4}$ inches (32 mm) long.

4.2 Installation—Reroofing:

General: When the existing roof covering must be completely removed, the panels must be installed in accordance with Section 4.1. The panels may be installed over existing spaced sheathing provided the space between boards is filled with lumber as necessary to provide a base for fastening. The fill lumber must be of the same thickness as the existing spaced sheathing. New flashing must be installed over and around all existing flashing, vents, valleys and chimneys in accordance with this report and the applicable code. The system may be installed over integral gutters, provided there is a fascia board (nailed to the rafters) installed outside the gutter.

4.2.1 DECRA Villa Tile: DECRA Villa steel roofing panels may be installed over existing asphalt shingle, built-up, wood shake or wood shingle roofs, provided the roof

slope complies with Section 3.4 and the requirements of IBC Section 1510 or IRC Section R907 are met.

For installation over existing asphalt shingle roofs and built-up roofs, the panels must be fastened through the existing roof to the roof deck in the same manner as described in Section 4.1.1 and as for Systems 1 and 2 in Table 1, with screws of sufficient length to penetrate the deck a minimum of $15/32$ inch (11.9 mm). Over existing built-up roofs, 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 with the DECRA Villa Tile roofing system.

When installation is over wood shake or wood shingle roofs, the entire existing roof surface must be covered with material in accordance with IBC Section 1510.4 or IRC Section R907.4 prior to installation of counterbattens. Counterbattens must be securely fastened through the gypsum board or other approved material required by IBC Section 1510.4 or IRC Section R907.4, through the existing roof, and into the framing members or the sheathing as noted in System 1A or 2A in Table 1. Nails and screws must be of sufficient length to penetrate at least 1 inch (25.4 mm) into the framing member below the existing wood roof system.

Battens are installed at a typical spacing of $14\frac{1}{2}$ inches on center and secured to counterbattens as noted in System 1A or 2A in Table 1. Panels must be fastened to wood battens as described in System 1A or 2A.

4.2.2 DECRA Shake XD™ and Shingle XD™: DECRA Shake XD™ and Shingle XD™ roofing panels may be installed over existing asphalt shingle and built-up roofs, provided the roof slope complies with Section 3.4 and the requirements of IBC Section 1510 or IRC Section R907 are met.

The panels must be fastened through the existing roof to the roof deck in the same manner as described in Section 4.1.2 and for System 3 or 4 in Table 1, with nails or screws of sufficient length to penetrate the decking a minimum of $15/32$ inch (11.9 mm). Over existing built-up roofs, 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 with the DECRA Shake XD™ and Shingle XD™ roofing system.

4.3 Fire Classification:

4.3.1 New Construction: Roof covering systems, described in Table 2, when installed in accordance with Section 4.1 of this report, are classified as a Class A or Class C roof covering system in accordance with ASTM E108 or UL 790.

4.3.2 Existing Construction: Reroofing systems, when installed in accordance with Section 4.2 of this report with

the barrier board and/or underlayment specified in Table 2, are classified as a Class A or Class C roof covering system in accordance with ASTM E108 or UL 790.

4.4 Wind Resistance:

DECRA steel roofing panels installed as described in this report are acceptable for the maximum allowable uplift loads specified in Table 1. Positive loads must be limited to the adequacy of the structural framing and sheathing.

The sheathing, battens and counterbattens, and their attachment to framing, must be designed for the applied wind loads.

5.0 CONDITIONS OF USE

The DECRA Roofing Systems, Inc., 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 Panels must be manufactured, identified and installed in accordance with this report and the manufacturer's published installation instructions. In the event of conflict between this report and the manufacturer's installation instructions, this report governs.

5.2 The roof sheathing must be designed for the appropriate loads determined in accordance with the applicable code, subject to the approval of the code official. The design of the roof sheathing must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is located.

5.3 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-1754) is affixed to each pallet or bundle.

TABLE 1—MAXIMUM ALLOWABLE WIND UPLIFT PRESSURES ON DECRA ROOFING PANELS

SYSTEM NO.	COUNTERBATTEN FASTENING ¹		BATTEN FASTENING ¹	ROOFING PANEL	PANEL FASTENING ¹		ALLOWABLE WIND UPLIFT PRESSURE (psf)
1 (New construction or reroofing on existing asphalt shingles or built-up roofs - See Section 4.1.1.1)	—		—	Villa Tile	Field ² and perimeter ³	One #9 sheet metal screw per panel tab.	52
1A (Reroofing on existing wood shake or wood shingle only)	16d box nails, 7 inches on center		One #9 by 2½-inch-long wood screw, per intersection with framing at 24 inches on center	Villa Tile	Field ² and perimeter ³	One #9 sheet metal screw per panel tab.	52
2 (New construction or reroofing on existing asphalt shingles or built-up roofs - See Section 4.1.1.2)	—		See Section 4.1.1.2 for battens at perimeter areas only.	Villa Tile	Field ²	One #12 sheet metal screw per panel tab.	64
					Perimeter ³	Three #12 sheet metal screws per panel tab and two #8 by ¾-inch-long sheet metal screws through bent leading edge into bent rear edge of preceding course.	146
2A (Reroofing on existing wood shake or wood shingle only)	Field ²	16d box nails, 7 inches on center	One #9 by 2½-inch-long wood screw, per intersection with framing at 24 inches on center	Villa Tile	Field ²	One #12 sheet metal screw per panel tab;	64
	Perimeter ³	#9 by 4-inch-long wood screws, 7 inches on center	Two #9 by 2½-inch-long wood screws, per intersection with framing at 24 inches on center		Perimeter ³	Three #12 sheet metal screws per panel tab and two #8 by ¾-inch long sheet metal screws through bent leading edge into bent rear edge of preceding course.	82
3 (New construction or reroofing on existing asphalt shingles or built-up roofs – See Section 4.1.2.1)	---		---	Shake XD™ or Shingle XD™	Field	Five #9 sheet metal screws into pre-punched holes.	78
					Perimeter	Five #9 sheet metal screws into pre-punched holes plus 5 #8 sheet metal screws evenly spaced between the ends of the shingle (10 screws total per shingle length).	154
4 (New construction or reroofing on existing asphalt shingles or built-up roofs – See Section 4.1.2.2)	---		---	Shake XD™ or Shingle XD™	Field	Five corrosion-resistant, 0.120-inch-diameter, ring shank roofing nails, 1¼-inch-long with ⅜-inch-diameter heads into pre-punched holes.	45
					Perimeter	Five corrosion-resistant, 0.120-inch-diameter, ring shank roofing nails, 1¼-inch-long with ⅜-inch-diameter heads into pre-punched holes plus five corrosion-resistant, 0.120-inch-diameter, ring shank roofing nails, 1¼-inch-long with ⅜-inch-diameter heads spaced evenly between the ends of the shingle (10 nails total per shingle length).	75

For SI: 1 inch = 25.4 mm; 1 psf = 48 Pa.

¹All 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.

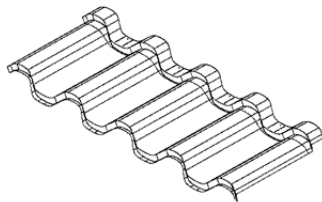
²Field area refers to the interior zone of the roof as defined in Figure 30.5-1 of ASCE 7-10 (2012 IBC and IRC) or Figure 6-3, Chapter 6 of ASCE 7-05 (2009 and 2006 IBC and IRC), Minimum Design Loads for Buildings and Other Structures.

³Perimeter area refers to the end and corner zones of the roof as defined in Figure 30.5-1 of ASCE 7-10 (2012 IBC and IRC) or Figure 6-3, Chapter 6 of ASCE 7-05 (2009 and 2006 IBC and IRC), Minimum Design Loads for Buildings and Other Structures.

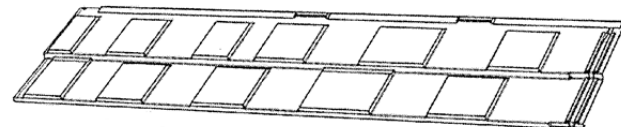
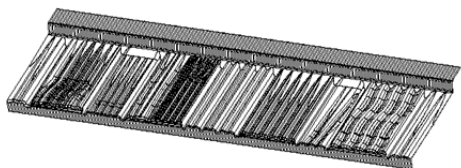
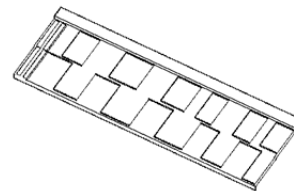
TABLE 2—FIRE CLASSIFICATION ASSEMBLIES

SYSTEM NO.	ROOF CLASS	SUBSTRATE	MAX. ROOF SLOPE	BARRIER BOARD	UNDERLAYMENT	ROOF PANEL
1	A	¹⁵ / ₃₂ -inch plywood	Unlimited	None	GAF VersaShield® Fire Resistant Roof Deck Protection (ESR-2053), mechanically fastened.	DECRA Villa Tile, Shake XD or Shingle XD.
2	A	¹⁵ / ₃₂ -inch plywood	Unlimited	Minimum ½-inch-thick UL Classified gypsum board or minimum ¼-inch-thick G-P Gypsum DensDeck® Roof Board	Any UL-classified underlayment	DECRA Villa Tile, Shake XD or Shingle XD.
3	C	¹⁵ / ₃₂ -inch plywood	Unlimited	None	Any UL-classified underlayment	DECRA Villa Tile, Shake XD or Shingle XD.

For SI: 1 inch = 25.4 mm.



DECRA Villa Tile



DECRA Shingle XD



DECRA Shake XD

FIGURE 1—TYPICAL PANEL PROFILES

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ESR-1754 CBC and CRC Supplement

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SHAKE PROFILE: DECRA SHAKE XD™

SHINGLE PROFILE: DECRA SHINGLE XD™

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that DECRA steel roofing panels recognized in ICC-ES master report ESR-1754 have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2013 *California Building Code* (CBC)
- 2013 *California Residential Code* (CRC)

2.0 CBC

The DECRA steel roofing panels described in the master report, ESR-1754, 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 2012 *International Building Code*® (IBC) provisions in 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 2012 IBC provisions in the master report and the additional requirements of CBC Sections 701A.3 and 705A.

3.0 CRC

The DECRA steel roofing panels described in the master report, ESR-1754, 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 2012 *International Residential Code*® (IRC) provisions master report and the additional requirements of CRC Section R905.4.

The roofing panels may be used in the construction of new buildings located in Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area, provided installation is in accordance with the 2012 IRC provisions in the master report and the additional requirements of CRC Sections R327.1.3.1 and R327.5.

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 November 2016.