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# ICC-ES Evaluation Report

# ESR-2134

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Reissued 12/2017  
This report is subject to renewal 12/2018.

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**

**SECTION: 07 31 16—METAL SHINGLES**

**SECTION: 07 32 19—METAL ROOF TILES**

**SECTION: 07 41 13—METAL ROOF PANELS**

**REPORT HOLDER:**

**RARE MANUFACTURING INC.**

**19154-95A AVENUE  
SURREY, BRITISH COLUMBIA V4N 4P2  
CANADA**

**EVALUATION SUBJECT:**

**IRONWOOD SHAKE**



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## DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 31 16—Metal Shingles

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Section: 07 41 13—Metal Roof Panels

### REPORT HOLDER:

**RARE MANUFACTURING INC.**  
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### EVALUATION SUBJECT:

#### IRONWOOD SHAKE

#### 1.0 EVALUATION SCOPE

##### 1.1 Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

##### Properties evaluated:

- Wind uplift 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 3.1.1

#### 2.0 USES

Ironwood Shakes are steel roof panels complying with IBC Section 1507.4.3 and IRC Section R905.10.3 that are installed as metal roof shingles in accordance with IBC Section 1507.5 and IRC Section R905.4. The panels are recognized as nonclassified roof coverings on new and over existing roofs, when installed in accordance with this report.

#### 3.0 DESCRIPTION

##### 3.1 Roofing Panels:

**3.1.1 Ironwood Shake:** The Ironwood Shake steel roofing panels are cold-press-formed from sheet steel complying with ASTM A653, CS, Type A, and having a G90 galvanized coating, or from steel complying with

ASTM A792 and having an AZ50 aluminum-zinc alloy coating. The total thickness of the galvanized steel is 0.015 inch (0.383 mm). The galvanized panels are coated with a polyvinylidene fluoride (PVDF) based paint to a minimum coating thickness of 0.95 mil (0.024 mm) on the exposed surface and to a minimum coating thickness of 0.2 mil (0.005 mm) on the unexposed surface. The overall panel size is 13<sup>1</sup>/<sub>2</sub> inches high by 51 inches wide (343 mm by 1295 mm), and the installed exposure is 12 inches high by 48 inches wide (305 mm by 1219 mm). The panels incorporate a 1<sup>1</sup>/<sub>2</sub>-inch (38 mm) headlap and a 3-inch-wide (76 mm) side lap on the right side of each panel. The panels' leading front edge is bent down to form a front lip that locks into the up-facing lip formed at the top back edge of each panel. The installed weight of the steel roofing panels is approximately 1.0 psf (4.88 kg/m<sup>2</sup>). See Figure 1 for panel and flashing profiles.

The attributes of the steel roof 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.

**3.1.2 Accessories:** Ridge and hip caps are manufactured of the same steel material and with the same thicknesses and finishes as described above. Drip, gable and wall flashing components are manufactured of the same steel material and finish as described above in a thickness not less than 0.019 inch (0.483 mm) (No. 26 galvanized sheet).

##### 3.2 Fasteners:

Fasteners for the steel panels must be galvanized steel, minimum 1<sup>1</sup>/<sub>2</sub>-inch-long, No. 8 wood screws, with nominally 0.315-inch-diameter (8.0 mm) pan heads.

##### 3.3 Underlayment:

Underlayment must comply with IBC Section 1507.5.3 or IRC Section R905.4.3, as applicable, except the underlayment must conform to ASTM D226, Type II, instead of ASTM D226, Type I. In areas where the average daily temperature in January is 25 F (-4 C) or less or where there is a possibility of ice forming along the eaves, causing a backup of water, an ice barrier must be installed in accordance with IBC Section 1507.5.3 or IRC Section R905.4.3, as applicable, except that when underlayment is used to form the ice barrier, the underlayment must conform to ASTM D226, Type II, instead of ASTM D226,

Type I. On construction permitted to be nonclassified roofing, an underlayment may be used that is recognized in an ICC-ES evaluation report as an alternate to the ASTM D226, Type II, underlayment specified in Chapter 15 of the IBC and Chapter 9 of the IRC.

**4.0 INSTALLATION**

**4.1 Roof Slope:**

The panels must be installed on minimum 3:12 (25 percent-slope) roof slopes.

**4.2 Installation—New Construction:**

The panels must be installed on solid, minimum <sup>15</sup>/<sub>32</sub>-inch-thick (11.9 mm), plywood sheathing complying with the applicable code or on filled-in spaced sheathing as described in Section 4.3. Underlayment, as described in Section 3.3, must be applied in accordance with the requirements of the applicable code. Full roof panels are placed over the underlayment starting at the eave. The front of the panels in the first course must be hooked into the lip of the drip cap flashing. The panels overlap on the right side of each panel by 3 inches (76 mm). The rear of each panel is fastened to the sheathing with fasteners as described in Table 1. Four fasteners must be equally spaced along the panel at a maximum spacing of 12 inches (305 mm) on center. The fasteners must be as specified in Section 3.2 and must be of sufficient length to penetrate a minimum of <sup>3</sup>/<sub>4</sub> inch (19.1 mm) into the roof sheathing or through the roof sheathing, whichever is less. The front of each panel must be attached to the rear of the panel beneath by inserting and locking the front lip into the rear lip on the lower panel. At valleys, additional fastening details apply, as shown in Figure 2.

A Rare Manufacturing-supplied valley flashing, as illustrated in Figures 1 and 2, must be installed and the panels must be cut and formed into either side of the open valley flashing. The valley flashings comply with IBC Section 1507.5.6 and IRC Section R905.4.6. Other flashing must comply with IBC Section 1503.2.1 or IRC Section R903.2.1, as applicable.

Penetrations through the roof covering must be flashed in accordance with the manufacturer’s published installation instructions and the applicable code. The panels containing the penetration must be cut out to allow water drainage from the flashing to the top of the panel below, as noted in Figure 2.

**4.3 Installation—Reroofing:**

The existing roof covering must be completely removed and the panels and new underlayment installed in accordance with Section 4.2, except over asphalt shingle roofs as described in this section. For existing wood shake roofs, following the removal of the wood shakes, 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. The Ironwood Shake roofing panels may be installed over existing asphalt shingle roofs, provided the roof slope complies with Section 4.1 of this report and the requirements of IBC Section 1510 or IRC Section R907 are met. The panels must be fastened through the existing asphalt shingle roof covering to the roof sheathing in the same manner as described in Section 4.2, with screws (described in Section 3.2) of sufficient length to penetrate into the sheathing <sup>3</sup>/<sub>4</sub> inch (19.1 mm) or through the sheathing, whichever is less. New flashing must be installed over and around all existing flashing, vents, valleys and chimneys in accordance with this report and the applicable code. Raised perimeters must be covered by the Ironwood Shake roofing panels.

**4.4 Fire Classification:**

Ironwood Shake steel roofing panels installed in accordance with Section 4.2 or 4.3 are recognized as nonclassified roof assemblies in accordance with IBC Section 1505.2 and under IRC Section R902.1.

**4.5 Wind Resistance:**

Ironwood Shake steel roofing panels, installed in accordance with this report, have the maximum allowable uplift load specified in Table 1. The design wind pressure must be determined in accordance with IBC Section 1609.5 and IRC Section R301.2.1.

Positive (gravity) loads are limited to the adequacy of the supporting structural framing and sheathing.

**5.0 CONDITIONS OF USE**

The Ironwood Shake 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 published installation instructions. In the event of a conflict between the manufacturer’s published installation instructions and this report, this report governs

**5.2** The panels are manufactured in Surrey, British Columbia, Canada, 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**

Applied to each pallet or bundle is a label bearing the manufacturer’s name (Rare Manufacturing Inc.) and address, the product name, the production batch number and the evaluation report number (ESR-2134).

**TABLE 1—ALLOWABLE UPLIFT LOAD CONDITIONS**

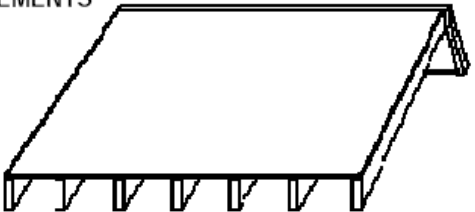
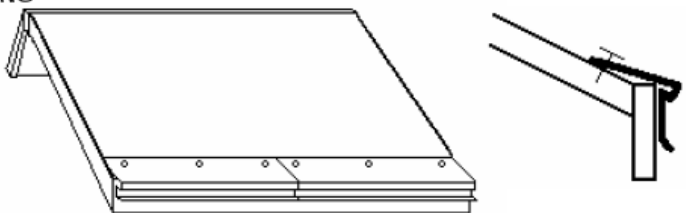
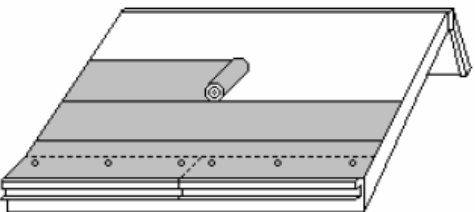
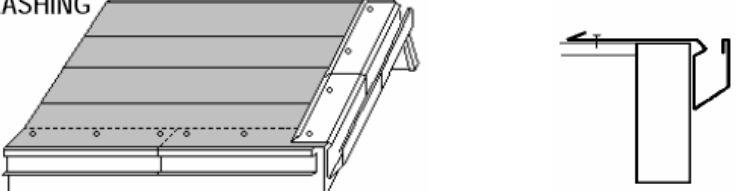
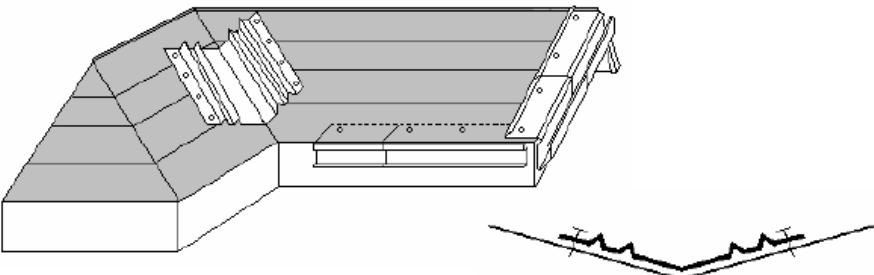
PANEL TYPE	FASTENER TYPE <sup>1</sup>	NUMBER OF FASTENERS PER PANEL	ALLOWABLE UPLIFT LOAD, psf (kPa)
Steel	Galvanized steel No. 8 wood screw	4	72.5 (3.47)

For SI: 1 psf = 0.04788 kPa.

<sup>1</sup>Fasteners are as specified in Section 3.2 of this report. For reroofing, the length of the fasteners must be increased to penetrate into the sheathing <sup>3</sup>/<sub>4</sub> inch (19.1 mm) or through the sheathing, whichever is less.

	<p><b>IRONWOOD SHAKE</b></p> <p>Overall Length 51"                  Length of Coverage 48"                  Width of Coverage 12"                  Total Shake Coverage 4 sq. ft.                  Weight 4.01 lbs                  Shakes per box (52" x 16" x 6") 20 pcs                  Shakes per square 25 pcs                  Shakes per pallet (24 boxes) 480 (19.2 sq.)                  Weight of full pallet (48" x 45" x 57") 1975 lbs</p>
	<p><b>IRONWOOD SHAKE CAP</b></p> <p>Overall Length 14"                  Length of Coverage 12"                  Weight 0.55 lb                  Shake Caps per box (18" x 14.5" x 21") 50 pcs                  Shake Caps per pallet (12 boxes) 600 pcs</p>
	<p><b>IRONWOOD DRIP 1.5" &amp; RE-ROOF DRIP</b></p> <p>Overall Length 96"                  Length of Coverage 93"                  A) Drip 1.5" - Weight (6") 3.62 lbs                  B) Re-roof Drip - Weight (8") 4.83 lbs</p>
	<p><b>IRONWOOD GABLE</b></p> <p>Overall Length 96"                  Length of Coverage 93"                  Weight (8") 4.83 lbs</p>
	<p><b>IRONWOOD WALL</b></p> <p>Overall Length 96"                  Length of Coverage 93"                  Weight (8") 4.83 lbs</p>
	<p><b>IRONWOOD 20" VALLEY</b></p> <p>Overall Length 96"                  Length of Coverage 93"                  Weight (20") 12.08 lbs</p>

FIGURE 1—IRONWOOD SHAKE PANEL AND FLASHING PROFILES

<p><b>DECK REQUIREMENTS</b></p>  <p>SOLID SHEETED DECK REQUIRED</p>	<p><u>New Construction:</u> Requires solid sheathed deck</p> <p><u>Asphalt Re-Roof:</u> Per local building code. Okay to install over asphalt</p> <p><u>Cedar Re-Roof:</u> Tear-off cedar, fill in deck as necessary – max. spacing 4" gap.</p>
<p><b>DRIP CAP FLASHING</b></p> 	<p><u>Drip Cap:</u> Drip cap to be installed prior to underlayment. Install drip cap to hang over fascia board</p>
<p><b>UNDERLAYMENT</b></p>  <p>APPLY UNDERLAYMENT OVER PREPARED DECK</p>	<p><u>New Construction:</u> Requires min. ASTM D226 Type II</p> <p><u>Asphalt Re-Roof:</u> Per local building code. If no underlayment required, must ensure existing roof is water tight (i.e. spot repair with ice &amp; water shield) prior to installation of metal panels</p> <p><u>Cedar Re-Roof:</u> Requires min. ASTM D226 Type II</p>
<p><b>GABLE FLASHING</b></p> 	<p><u>Gable:</u> Install gable flashing to hang over fascia board</p>
<p><b>VALLEY FLASHING</b></p> 	<p><u>Valley Flashing:</u> Install valley flashing, fastened as shown (<u>Do not</u> fasten inside the ridges of valley flashing)</p>

**AT THIS POINT ALL DRIP CAP, GABLE AND VALLEY FLASHING SHOULD BE INSTALLED BEFORE PROCEEDING WITH THE SHAKE PANEL INSTALLATION**

**FIGURE 2—TYPICAL INSTALLATION DETAILS OF IRONWOOD SHAKE PANEL AND FLASHINGS**

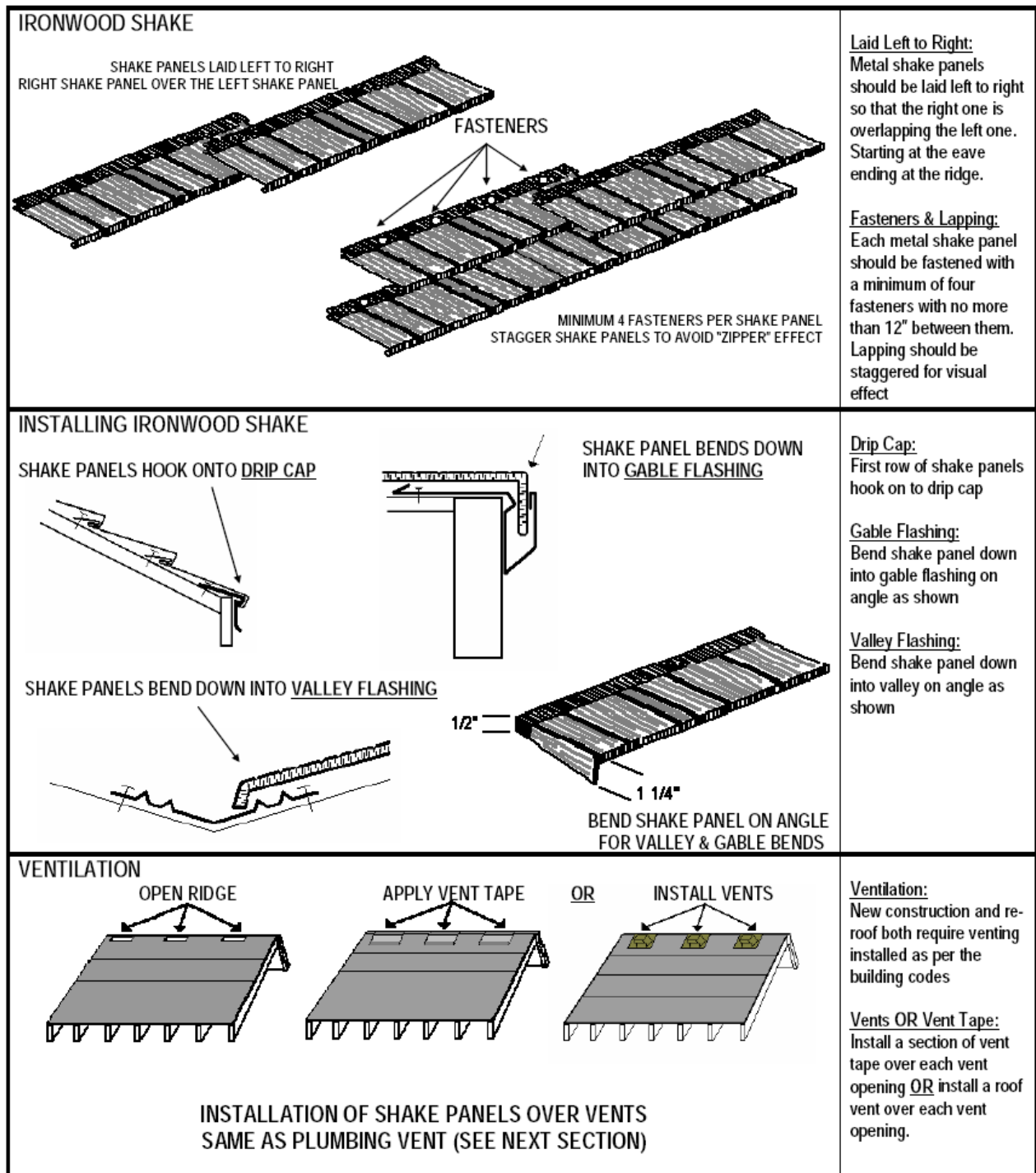


FIGURE 2—TYPICAL INSTALLATION DETAILS OF IRONWOOD SHAKE PANEL AND FLASHINGS (Continued)

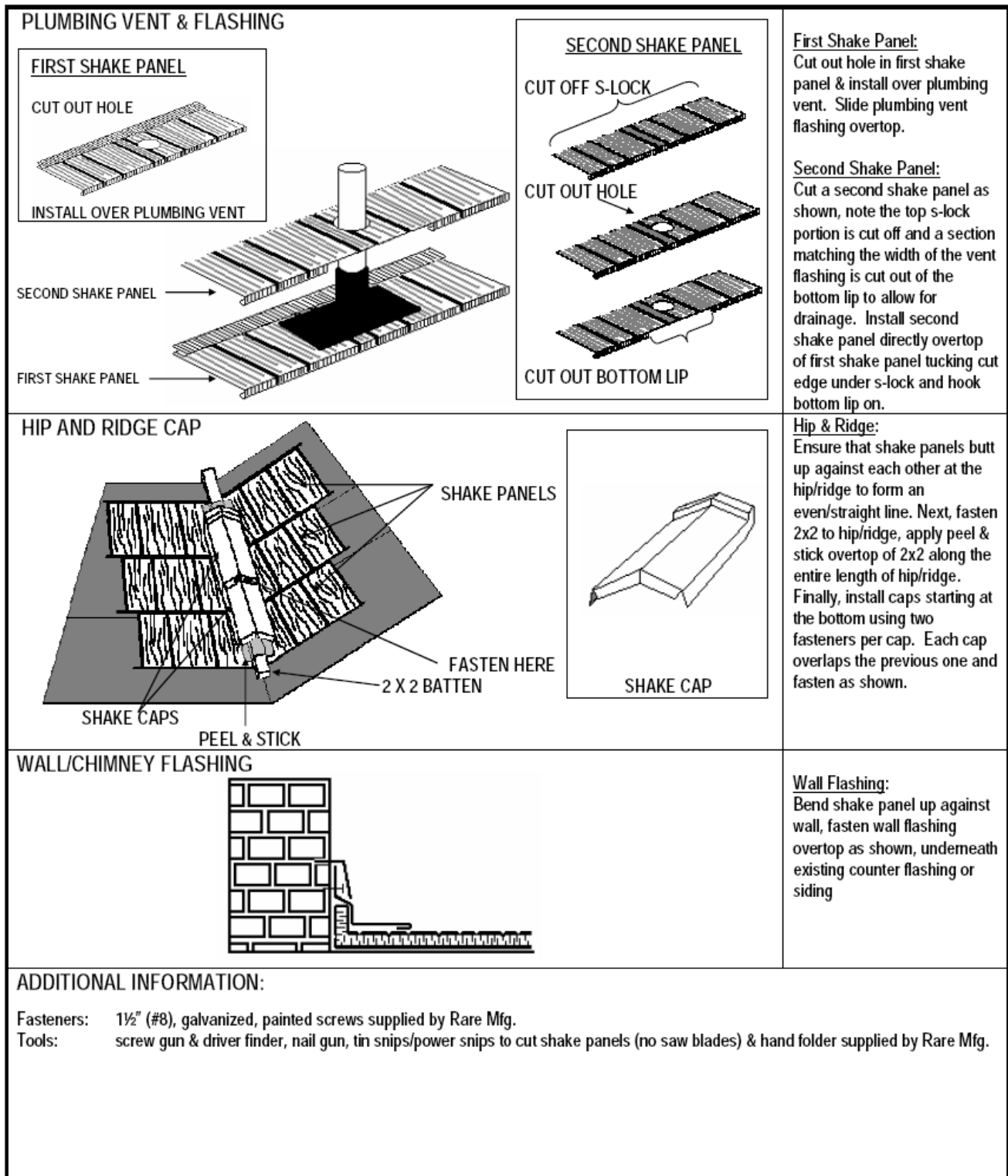


FIGURE 2—TYPICAL INSTALLATION DETAILS OF IRONWOOD SHAKE PANEL AND FLASHINGS (Continued)