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Legacy report on the 1997 *Uniform Building Code*™

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07310—Shingles

METRO, STEELROCK AND STONEHENGE COATED STEEL ROOFING PANELS

METRO ROOF PRODUCTS
3093 "A" INDUSTRY STREET
OCEANSIDE, CALIFORNIA 92054

1.0 SUBJECT

Metro, SteelRock and Stonehenge Coated Steel Roofing Panels.

2.0 DESCRIPTION

2.1 General:

The corrugated roofing panels are pressure-formed from structural-quality sheet steel complying with ASTM A 792-95, with an AZ-50 aluminum-zinc alloy coating. The base metal thickness is No. 26 gage [0.0162 inch (0.41 mm)]. The steel has a minimum yield strength of 37,000 psi (255 MPa). The overall size of each panel is 16 inches (406 mm) wide by 52 inches (1320 mm) long, with an installed exposure of 14¹/₂ inches (368 mm) by 50 inches (1270 mm). The panel consists of a series of stamped modules simulating a tile or wood shake profile, each having a vertical lap interlock and nail face created by a ⁷/₈-inch (22 mm) downturned front flange and a 1-inch (25.4 mm) upturned rear flange. A 2-inch (51 mm) side lap at both ends allows the panels to interlock with adjacent panels. Each panel weighs 6 pounds (2.7 kg). The installed weight of the system is approximately 1.4 pounds per square foot (6.8 kg/m²). The panels are coated with a baked-on primer on both sides. On the exposed surface, crushed stone chips are embedded in an acrylic resin adhesive on the panels. The stone surface is finished with a clear acrylic overglaze. The roofing panels are available in these profiles illustrated in Figure 1: Shake Panel, Tile Panel A and Tile Panel B. Accessory gable, ridge, hip and trim are produced in a similar manner.

2.2 Battens and Counterbattens:

Battens are nominal 2-by-2-inch and counterbattens are nominal 1-by-4-inch construction grade Douglas fir, larch or better. Battens may also be steel hat-shaped sections with a 1¹/₂-inch (38 mm) minimum height, fabricated from No. 28 gage (0.0149 inch) (0.38 mm) galvanized steel.

2.3 Roof Slopes:

The panels shall be installed on roofs with solid or spaced sheathing and a minimum slope of 2¹/₂:12 (21% slope). For

roof slopes less than 2¹/₂:12 (21% slope), the panels are considered decorative and must be installed over a roof-covering system complying with the 1997 *Uniform Building Code*™ (UBC), subject to building official approval.

2.4 Underlayment:

Underlayment shall be two layers of Type 15, one layer of Type 30 organic-fiber felt or one layer of ELK Corporation's Versashield. Type 15, Type 30 and Versashield underlayments must be listed with an agency accredited by International Accreditation Service (IAS). For use in areas subject to wind-driven snow, ice buildup, or wind-driven dust or sand, both of the following are required:

1. Solid sheathing, with two layers of Type 15 felt or one layer of Type 30 felt, for the field of the roof.
2. Solid sheathing with two layers of Type 15 felt applied shingle-fashion, solidly cemented together with approved cementing material between the plies, and extending from the eave up the roof to a point 36 inches (914 mm) inside the exterior wall line of the building.

2.5 Installation—New Roofing:

The panels are designed to be installed on wood or steel battens placed 14¹/₂ inches (368 mm) on center over spaced or solid sheathing. The battens are attached to the supporting framing members spaced at 24 inches (610 mm) on center, maximum, with 16d common nails which must be of sufficient length to penetrate at least 1 inch (25.4 mm) into the framing member. When nominal 1-inch-by-4-inch counterbattens are used, battens are attached with 8d common nails spaced 12 inches (305 mm) on center. When steel battens are used, placed 14¹/₂ inches (368 mm) on center in lieu of wood battens, battens are attached to supporting framing members spaced at 24 inches (610 mm) on center, maximum, with two No. 10 by 1¹/₂-inch (38 mm) screws spaced 24 inches (610 mm) on center, as shown in Figure 1. Panels adjacent to the ridge are adjusted by cutting and bending vertically in the field. Valleys are framed using nominal 2-by-2-inch wood battens or steel hat sections spaced 3 inches (76 mm) apart, fastened on both sides of the valley. Valleys are framed to receive No. 28 gage [0.016 inch (0.41 mm)] corrosion-resistant metal flashing extending at least 8 inches (203 mm) from the center line each way. Valley flashing end laps are 4 inches (102 mm), minimum. Metal valley flashing must have one layer of Type 15 felt underlayment, 36 inches (914 mm) wide, directly under the full flashing length.

All full-size panels are fastened in place on the roof prior to the cutting of tiles for placement at hips, ridges or valleys. The panels are staggered a minimum of one module, and are fastened to battens with four 6d common nails, 1¹/₂ inches (38

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mm) long, or No. 10 by 1 $\frac{1}{2}$ -inch (38 mm) screws. Fasteners are positioned 1 $\frac{1}{2}$ inches (38 mm) from the center of the concave and along the downturned edge of the panel. Care must be exercised in nailing to avoid striking the finished surface of the panel. Trim tiles are provided with a continuous cap piece or barge cover, with the exposed surface treated the same as for regular panels. Ridge and hip board must have a minimum 1-inch (25.4 mm) thickness and project a minimum of 4 inches (102 mm) above the rafters on existing roof surfaces. The tiles are fastened to the side of hip or ridge boards after mitering, cutting and bending, and are then capped with appropriate trim to match the panel finish. Panels are cut and bent down into the valley pan, forming an open or closed valley. Openings in the roof are flashed with No. 28 gage [0.016 inch (0.040 mm)] corrosion-resistant metal flashing as required by Sections 1508 and 1509 of the UBC. Openings through the tile for vents must be adequately weatherproofed as previously described, and supported by additional blocking or roof framing as necessary.

2.6 Reroofing Application:

2.6.1 General: With the old roof covering completely removed, all conditions noted in Sections 2.1 through 2.5 apply. The Shake Panel and Tile Panel A profiles panels may also be installed over existing wood shake, wood shingle, asphalt shingle or gravel-surfaced roofing, subject to the conditions set forth here and providing the roof slope complies with Section 2.3. The entire existing surface of existing wood shingle or wood shake roofs shall be covered with gypsum board, mineral fiber, glass fiber or other approved materials, securely fastened in place in accordance with Section 1516.3 Appendix Chapter 15 of the UBC. Battens and counterbattens shall be installed over the cover board. The existing structure must be inspected as set forth in Appendix Chapter 15 of the UBC.

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

2.6.2 Class B: Ridge and hip caps must be removed and the existing roof covering cut back flush with the fascia or barge cover. Nominal 1-by-4 wood counterbattens are installed parallel to the framing members at 24 inches (610 mm) on center, maximum. Counterbattens are fastened at 12 inches (305 mm) on center with nails penetrating completely through the roof sheathing or at least 1 inch (25.4 mm) into the roof framing member. One layer of Type G3 mineral-surfaced cap sheet, complying with ASTM D 3909 and weighing a minimum of 76 pounds per 100 square feet (34.5 kg per 9.29 m²), is fastened to the counterbattens. Nominal 2-by-2-inch battens, spaced 14 $\frac{1}{2}$ inches (368 mm) on center, are nailed to the counterbattens with 16d common corrosion-resistant nails at each batten intersection. The panels are fastened to the battens using not fewer than four 6d corrosion-resistant common nails or the equivalent, in the same manner as described in Section 2.5. Panels overlap each other by 1 inch (25.4 mm). New flashing shall be installed over and around all existing flashing, vents and chimneys in accordance with this report and the code. The valley used in reroofing must be as shown in Figure 2. The system may be installed over integral gutters provided there is a fascia board nailed to the rafters and installed outside the gutter.

2.7 Fire Classification:

The steel roofing panels installed in accordance with Section 2.5 of this report are recognized as noncombustible roof coverings in accordance with Section 1504.2 of the UBC.

Noncombustible roof coverings as defined in Section 1504.2 are permitted in Section 1503 of the UBC to be applied in lieu of a Class A fire-retardant roofing assembly, when installation is in accordance with the manufacturer's requirements and this report.

Metro steel roofing panels installed in accordance with Section 2.6 of this report are classified as Class B roof assemblies in accordance with Section 1504.1 of the UBC.

2.8 Structural Diaphragm:

Steel roofing panel systems incorporating the Shake Panel and Tile Panel A profiles may be used as structural roof diaphragms when constructed as indicated in Sections 2.5 and 2.6 of this report, but with counterbatten nailing as indicated in Section 2.8. The 1-by-4 counterbattens, aligned over framing spaced at 24 inches (610 mm) on center (maximum), must be fastened with minimum 16d common nails or equivalent, nailed at 10 inches (254 mm) on center. Counterbattens must be fastened through to framing members or completely through existing spaced sheathing, with one nail per intersection with spaced sheathing.

The nails must be long enough to penetrate 1 inch (25.4 mm) into framing or for the diamond point to penetrate through the sheathing. Nails must be within 6 inches (152 mm) of counterbatten ends.

To support the panels, nominal 2-by-2 battens are placed across the counterbattens at 14 $\frac{1}{2}$ inches (368 mm) on center. The battens are attached with one 16d common nail at each framing intersection. The panels must be installed in accordance with Section 2.5 of this report.

The resulting diaphragm has an allowable shear equivalent to $\frac{15}{32}$ -inch-thick (12 mm) structural wood panel sheathing installed in accordance with Table 23-II-H of the UBC using 8d nails over nominal 2-inch wood framing members in an unblocked diaphragm. The maximum aspect ratio is 4:1. Diaphragm deflections may be estimated using the equations in Section 23.222 of UBC Standard 23-2, using values for $\frac{15}{32}$ -inch-thick (12 mm) wood structural panels.

2.9 Wind Uplift:

The roofing panels installed in accordance with this report are acceptable on any portion of a roof having a maximum height of 40 feet (12 192 mm) in areas identified as Exposure B as set forth in Table 16-G of the code, with a maximum basic wind speed of 80 miles per hour (129 km/h).

2.10 Identification:

A label bearing the manufacturer's name (Metro Roof Products), address, product name, and evaluation report number (ER-5218) is affixed to each pallet or bundle.

3.0 EVIDENCE SUBMITTED

Data in accordance with the Acceptance Criteria for Metal Roof Coverings (AC166), dated November 2001; reports of load tests on structural diaphragms; and a quality control manual.

4.0 FINDINGS

That the Metro, SteelRock and Stonehenge coated steel roofing panels described in this report comply with the 1997 Uniform Building Code™, subject to the following conditions:

4.1 They are manufactured, identified and installed in accordance with this report and the manufacturer's instructions.

4.2 Installation is by installers approved by the manufacturer.

4.3 The roofing panels may be used as a structural roof diaphragm when installed in accordance with Section 2.8.

This report is subject to re-examination in one year.

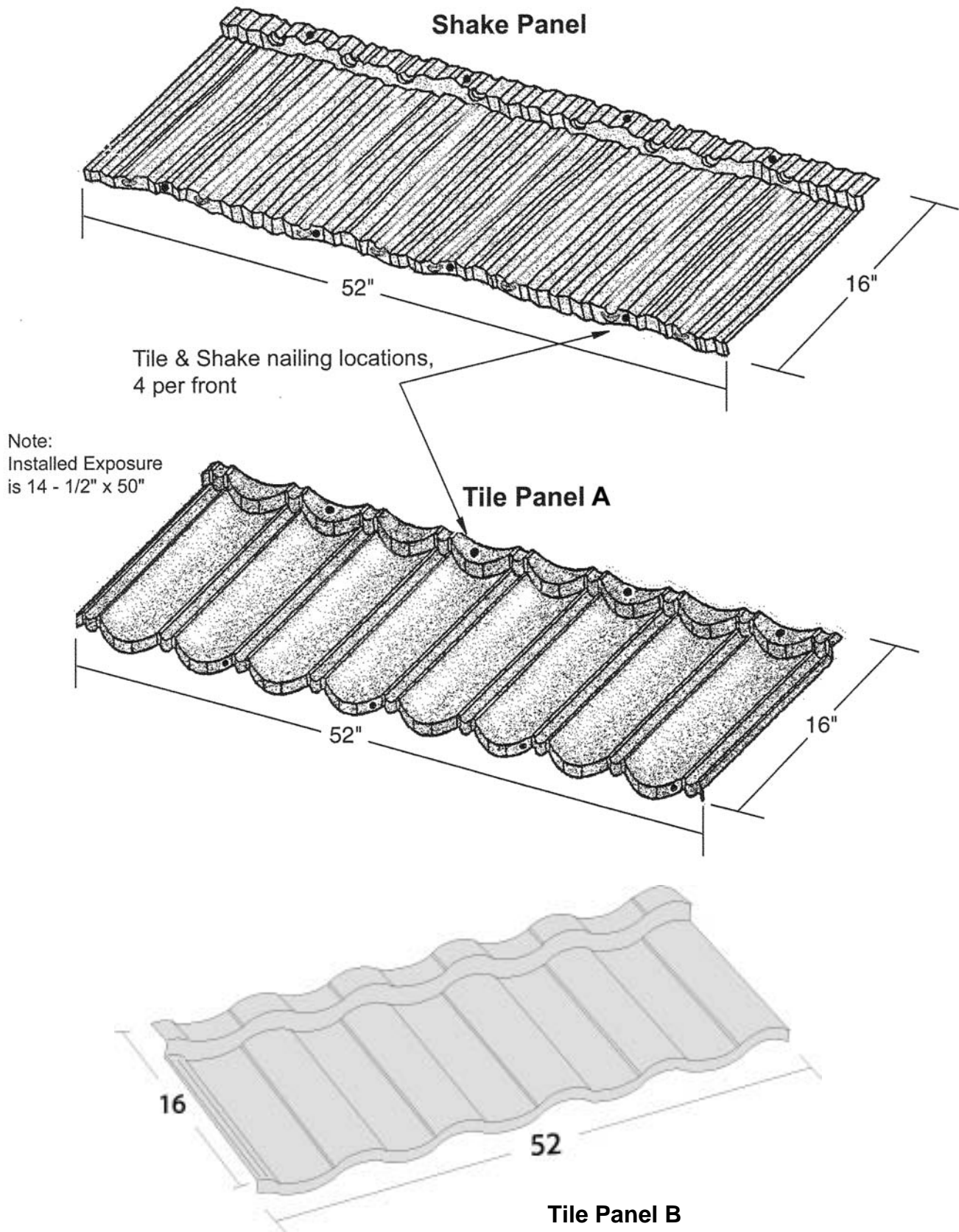


FIGURE 1—PANEL PROFILES

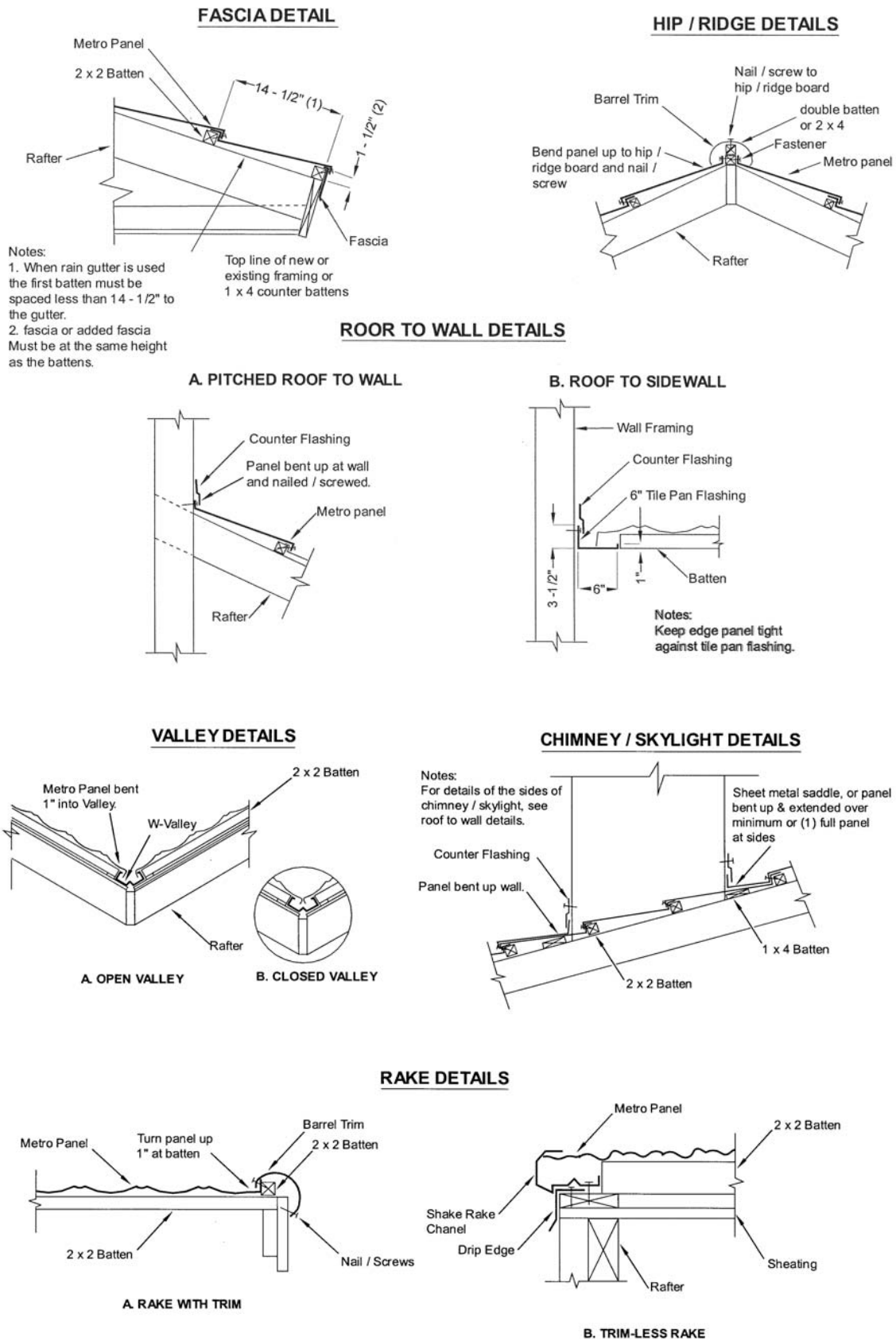


FIGURE 2—TYPICAL INSTALLATION DETAILS