

ICC-ES Evaluation Report

ESR-1599

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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
Section: 07 41 13—Metal Roof Panels
Section: 07 42 13—Metal Wall Panels
REPORT HOLDER:
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EVALUATION SUBJECT:
ELITE COMPOSITE STRUCTURAL PANELS
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2006 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Structural
- Surface-burning characteristics
- Roof classification

2.0 USES

Elite Composite Structural Panels are intended for use as load-bearing and nonload-bearing walls and roofs for patio covers complying with Appendix H of the IRC and UBC Appendix Chapter 31, Division III.

3.0 DESCRIPTION
3.1 General:

Elite Composite Structural Panels are factory-assembled laminated sandwich panels comprised of coated aluminum facings with expanded polystyrene (EPS) foam plastic cores. Panels are 3, 3¹/₂, 4 or 6 inches (76, 89, 102 or 152 mm) thick, 48 inches (1219 mm) wide, and available in various lengths. The longitudinal edges of the panels are designed to interlock with each other as shown in Figure 1.

3.2 Materials:

3.2.1 Panel Facings: The materials on both faces of the panels are aluminum alloy 3105-H154, complying with the specifications for aluminum alloy 3105-H14 in ASTM B 209 H14, with base-metal thicknesses noted in Table 1. The minimum tensile and yield strengths of the panel facings are 22 ksi and 18 ksi (151.68 and 124.10 MPa),

respectively. The aluminum has a 10-mil-thick (0.25 mm) polyester dry film base coat and a surface coating of baked acrylic enamel on the exterior and interior facings. The finished facing has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 (IRC) or UBC Standard 8-1.

3.2.2 Panel Core: The foam plastic core of the panels is expanded polystyrene (EPS) with a nominal density of 2 pounds per cubic foot (32 kg/m³). The foam plastic core has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 (IRC) or UBC Standard 8-1 (UBC). The foam plastic complies as Type IX in accordance with ASTM C 578, and is described in Elite's quality documentation.

3.2.3 Adhesives:

3.2.3.1 Panel Laminating Adhesive: The facings are factory-laminated to the panel core with an adhesive as described in Elite's quality documentation. The adhesive is classified as Type II, Class 2, complying with the ICC-ES Acceptance Criteria for Sandwich Panel Adhesives (AC05).

3.2.3.2 Gypsum Wallboard Attachment Adhesive: Liquid Nails Projects Construction (Model No. LN 601 or LNP 601) adhesive is jobsite-applied and is used to bond the gypsum wallboard to the interior face of the wall panels. The adhesive is a solvent elastomeric adhesive manufactured by the Glidden Company. The weight of the adhesive is 9.4 lbs/gallon (1.13 kg/L). Shelf life is one year when the adhesive is stored in original, unopened containers at a temperature between 40°F and 100°F (4°C and 38°C).

4.0 DESIGN AND INSTALLATION
4.1 Allowable Loads:

Allowable transverse loads for roof and wall panels are noted in Table 1. The roof panels must be selected based on a minimum allowable transverse live load of 10 psf (478.8 Pa) as permitted for patio covers under Appendix H of the IRC and UBC Appendix Chapter 31, Division III, or the actual snow load, whichever is greater. The wall panels must be selected based on a minimum allowable transverse wind load of 10 psf (478.8 Pa), as defined in Chapter 6 of ASCE 7, or the designed wind pressure as determined in Chapter 6 of ASCE 7, whichever is greater.

Calculations demonstrating adequacy of the roof and wall panel supports and connections for the imposed loads must be furnished to the code official for approval.

The allowable axial load for wall panels used as bearing walls and measuring at least 3 inches (76 mm) thick and up to 8 feet (2438 mm) high is 1,120 pounds per linear foot (16 345 N/m) applied uniformly along the top of the wall equally to both panel facers. The interaction between axial and transverse loads must satisfy the following equation:

$$\frac{W_{ap}}{W} + \frac{P_{ap}}{1120} \leq 1$$

For SI:

$$\frac{W_{ap}}{W} + \frac{P_{ap}}{16345} \leq 1$$

where:

- W_{ap} = Applied transverse load, psf (Pa).
 W = Allowable transverse load from Table 1 based on maximum L/180 deflection, psf (Pa).
 P_{ap} = Applied axial load, pounds per foot (N/m).

Use of wall and roof panels as bracing against lateral wind or earthquake forces is outside the scope of this evaluation report.

4.2 Installation:

Installation must be in accordance with Elite's installation instructions and this report. This report and Elite's installation instructions must be available at the jobsite at all times during installation. The minimum bearing width of supports for roof and wall panels subjected to transverse loads is 3 1/2 inches (89 mm). As an alternate to restraining the roof panels subjected to wind uplift loads with a 3 1/2-inch-wide (89 mm) continuous support, the panels must be fastened in accordance with Footnote 6 of Table 1. Base channels must be attached to structural supports using fasteners recognized for use with the receiving material. Base channels must be designed to resist the applicable forces in accordance with the code. The fastener spacing for the channel-to-panel connection must be designed and constructed in accordance with the applicable code. Wall panels must be supported by, and connected to, foundations designed and constructed in accordance with the applicable code. The connection of the wall panels to the roof panels must be designed to resist applicable loads in accordance with the code.

Roof panels must be installed at a minimum slope of 1/4 inch (6.4 mm) per foot (2.08%). The wall and roof panels must be interlocked. Openings in wall panels are outside the scope of this report.

4.3 Thermal Barrier:

A thermal barrier consisting of 1/2-inch-thick (12.7 mm) gypsum wallboard complying with ASTM C 36 or ASTM C 1396 must be attached to the interior face of the wall panels using 1/4-inch-wide (6.4 mm) beads of the Liquid Nails adhesive, applied to the gypsum wallboard in a zigzag pattern in rows 24 inches (610 mm) on center and 1 inch (25.4 mm) from edges. The gypsum board must also be fastened onto the aluminum facing of the panels with No. 6 by 1-inch-long (25.4 mm), Type S gypsum wallboard screws spaced 12 inches (305 mm) on center in rows along the perimeter of the gypsum wallboard and intermediate rows at 24 inches (610 mm) on center. A thermal barrier, as required by the applicable code, is not required on the interior side of the roof panels. The

distance from the panel seam of the roof panels to the interior face of the wall parallel to the seam must be a minimum of 31.5 inches (800 mm).

4.4 Fire Classification:

The roof panels have a Class B roof classification when tested in accordance with ASTM E 108 (IRC), UL 790 or UBC Standard 15-2 (UBC). The maximum installed roof slope for the Class B roof classification is 3:12 (25 percent).

5.0 CONDITIONS OF USE

The Elite Composite Structural 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 must be installed in accordance with the manufacturer's published installation instructions and this report. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 5.2 The panels are limited to use in buildings where combustible construction is permitted.
- 5.3 Panels must be limited to use as patio covers under Appendix H of the IRC and Appendix Chapter 31, Division III, of the UBC.
- 5.4 Structural calculations demonstrating that applied loads are less than the allowable loads must be furnished to the code official for approval. The calculations shall be signed and sealed by a registered design professional where required by the statutes of jurisdiction in which the project is to be constructed.
- 5.5 Use of wall and roof panels as bracing against lateral wind or earthquake forces is outside the scope of this report, and must be approved by the code official.
- 5.6 The wall panels must be separated from the patio cover structure interior by an approved thermal barrier, such as minimum 1/2-inch-thick (12.7 mm) gypsum wallboard installed as described in Section 4.3 of this report.
- 5.7 Panels are manufactured in Coconut Creek, Florida, under a quality control program with inspections by CI Professional Services (AA-656).
- 5.8 EPS foam plastic cores are manufactured at the Ormond Beach, Florida, facility of Imperial Foam and Insulation, with inspections by RADCO, Inc. (AA-650).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Sandwich Panels (AC04), dated June 2007 (editorially revised April 2008).
- 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2009.

7.0 IDENTIFICATION

Each panel is labeled with the Elite Aluminum Corporation name and address, the product name, the production date, the evaluation report number (ESR-1599), the name of the inspection agency (CI Professional Services), and a statement indicating "For Use in One- and Two-Family Dwellings Only."

TABLE 1—SPAN LENGTHS OF ROOF AND WALL PANELS IN FLATWISE BENDING (feet-inch)

PANEL THICKNESS (inches)	PANEL WEIGHT [(W _D psf)]	BASE METAL THICKNESS (inch)	SPAN LENGTH L (feet-inch) ^{1,5}											
			$\Delta = L/120$ ³				$\Delta = L/180$ ⁴				$\Delta = L/240$ ⁴			
			UNIFORM APPLIED LOAD, W _L ⁵ (psf)				UNIFORM APPLIED LOAD, W _L ⁵ (psf)				UNIFORM APPLIED LOAD, W _L ⁵ (psf)			
			10 ⁶	20	30	40	10	20	30	40	10	20	30	40
3	1.2	0.024	18-0	12-9	10-9	9-3	14-9	11-4	9-7	8-6	13-3	10-0	8-6	7-8
		0.032	-	14-5	12-4	10-7	16-0	12-4	10-4	9-2	14-6	10-11	9-7	8-0
3½	1.3	0.024	-	-	11-6	10-0	-	12-6	10-8	9-6	-	11-7	9-6	8-7
		0.032	-	-	13-4	11-6	-	13-9	12-5	10-8	-	12-4	10-3	9-0
4	1.4	0.024	21-4	15-1	12-4	10-8	17-10	13-10	11-9	10-6	16-0	12-4	10-4	9-6
		0.032	22-0	17-4	14-3	12-3	19-6	15-0	12-10	11-3	17-4	13-4	11-3	9-11
6	1.7	0.024	24-0	18-6	14-2	13-1	23-6	18-7	15-11	14-1	21-6	16-9	14-2	12-6
		0.032	25-0	21-4	17-6	15-1	24-0	20-0	17-0	15-1	22-6	18-0	15-8	13-4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 48 Pa.

¹Tabulated spans are based on simple span conditions and uniform load application. Consideration must be given for nonuniform loading conditions.

²Load bearing wall panels are limited to a maximum 8 foot height.

³The values limited by stress (listed under column L/120) are span lengths measured center-to-center of bearings.

⁴Span length values to the right of the bold vertical line are governed by deflection L/180 or L/240. The values governed by deflection are clear span lengths and are based on the applied load, psf. Add approximately 2 inches to these values to obtain center-to-center bearing span lengths.

⁵The uniform applied (superimposed) loads (W_L) must include dead loads (other than panel weight), live load, wind loads or combinations of these loads that are perpendicular to the plane of the panels.

⁶As an alternate to restraining the roof panels subjected to wind uplift loads with a 3.5-inch wide continuous support, the panels may be installed with fasteners spaced in accordance with Table 2 of this report. The fastener must be ¼-inch diameter with a 1.5-inch diameter washer. The fastener spacing in Table 2 must be selected based on the allowable span determined in Table 1. For example, the fastener spacing for a panel having a 10 foot span at 40 psf uniform load, will be 6 inches.

TABLE 2—FASTENER SPACING

Span (ft)	Screw Spacing (inches)			
	Applied Uplift Load (psf)			
	10	20	30	40
5	12	12	10	8
6	12	12	10	7
7	12	12	9	7
8	12	12	9	6
9	12	12	8	6
10	12	12	8	6
11	12	11	7	5
12	12	11	7	5
13	12	10	7	5
14	12	10	6	5
15	12	9	6	4
16	12	9	6	4
17	12	9	5	4
18	12	8	5	4
19	12	8	5	4
20	12	8	5	3
21	12	7	5	3
22	12	7	4	3
23	12	7	4	3
24	12	6	4	3
25	12	6	4	3

For SI: 1 inch= 25.4 mm; 1 foot= 305 mm; 1 psf= 48 Pa.

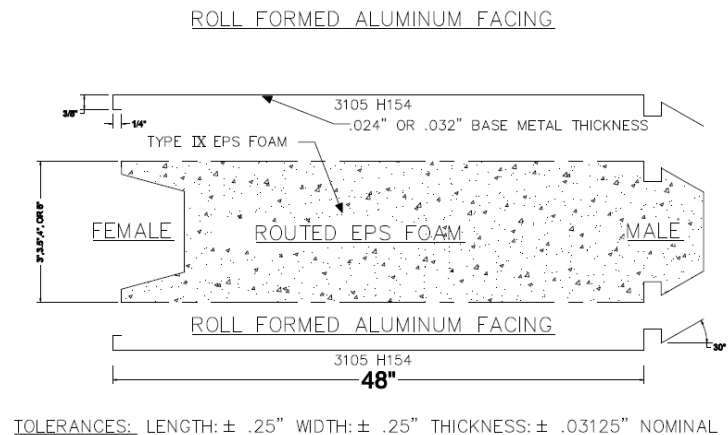


FIGURE 1