ICC-ES Evaluation Report

ESR-2182

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES Section: 06 12 00—Structural Panels	REPORT HOLDER: sPanels Idaho LLC	EVALUATION SUBJECT: STRUCTURAL PANELS	

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.

Property evaluated:

- Structural

1.2 Evaluation to the following green code(s) and/or standards:

- 2025 *California Green Building Standards Code (CALGreen)*, Title 24, Part 11
- 2025, 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2025, ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

- See Section 2.0

2.0 USES

The sPanels Idaho LLC., Structural Panels are used as structural roof and floor panels, and load-bearing and nonload-bearing wall panels, of Type V-B construction.

When panels are installed under the IRC, an engineered design is required in accordance with IRC Section R301.1.3.

The attributes of the sandwich panels have been verified as conforming to the provisions of (i) CALGreen Sections A4.404.3.3 for premanufactured building systems; (ii) ICC 700-2020, ICC 700-2015 and ICC 700-2012 Section 601.5 and 11.601.5 for prefabricated components; and (iii) ICC 700-2008 Section 601.5 for prefabricated components. 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.

3.0 DESCRIPTION

3.1 General:

The panels are factory-assembled, laminated sandwich panels consisting of oriented strand board (OSB) facings with an expanded polystyrene (EPS) core. The panels are produced in total thicknesses of $6^1/_2$ and $12^3/_4$ inches(165 and 324 mm), lengths up to 24 feet (7315 mm) and a width of 4 feet (1219 mm).

3.2 Wall Panels:

The $6^1/_2$-inch-thick (165 mm) panels are used as wall panels. The core is recessed at the edges of the panels to allow for jobsite installation of OSB splines, and the core at the panel ends is recessed to receive solid sawn lumber wall plates.

3.3 Roof and Floor Panels:

The $12^3/_4$-inch-thick (324 mm) panels are used as roof and floor panels. The core of the panels is recessed along both panel edges to receive a lumber spline. The spline is factory-installed in one panel edge. The panel facings are attached to the spline with No. 16 gage by $1^1/_2$-inch-long (38 mm) by $^7/_{16}$-inch-wide-crown (11.1 mm) staples spaced 3 inches (76 mm) on center. The core of the panels is recessed at the panel ends to receive rim joists. The panels may be manufactured with one core butt splice that is orientated perpendicular to the panel span, located 12 inches (305 mm) from the support. The core butt splice location in the panel is identified by a paint marking on the panel.

3.4 Materials:

3.4.1 Panel Core: The panel core is EPS with a thickness of $5^5/_8$ or $11^7/_8$ inches (127 or 302 mm). The EPS specified in the approved quality control documentation complies with ASTM C578 as Type I, has a nominal density of 1.0 pcf (16 kg/m^3) and has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84.

3.4.2 Facing: Facing material is $^7/_{16}$-inch-thick (11 mm), Exposure 1, Rated Sheathing, OSB sheathing complying with U.S. Department of Commerce PS-2-92 and requirements noted in the approved quality documentation.

3.4.3 Adhesive: The facing material is factory-bonded to the panel core material with a Type II, Class 2, adhesive specified in the approved quality control documentation.

3.4.4 Splines:

3.4.4.1 Lumber Splines: Lumber splines, factory-installed into one longitudinal edge of the roof and floor panels, are $1^1/_4$-inch-thick (31.7 mm), 1.3E Timberstrand LSL rim board structural composite lumber manufactured by Weyerhauser and recognized in evaluation reportESR-1387. The splines' depth is sized to match the panels' core thickness. Both panel facings are fastened to the splines with No. 16 gage, $^7/_{16}$-inch-crown-width (9.5 mm), $1^1/_2$-inch-long (38 mm) staples spaced at 3 inches (76 mm) on center, with the staple crown oriented at an approximate 45-degree angle from the panel length.

3.4.4.2 OSB Splines: OSB splines, factory-installed into one longitudinal edge of the wall panels, are 4-inch-wide (102 mm) strips of the same OSB as described in Section 3.4.2. Both panel facings are fastened to the splines with No. 16 gage, $^7/_{16}$-inch-crown-width (9.5 mm), $1^1/_2$-inch-long (38 mm) staples spaced at 3 inches (76 mm) on center, with the staple crown perpendicular to the panel edge.

4.0 DESIGN AND INSTALLATION

4.1 Design:

General: Combined axial and transverse loads on the wall panels must comply with the following equation:

$$\frac{\text{Actual Transverse Load [psf (kg/m}^2\text{)]}}{\text{Allowable Transverse Load [psf (kg/m}^2\text{)]}} + \frac{\text{Actual Axial Load [plf (kg/m)]}}{\text{Allowable Axial Load [plf(kg/m)]}} \le 1.0$$

The allowable transverse loads for the panels are shown in Table 1. The use of the floor or roof panels to resist any other load conditions (such as a roof diaphragm resisting seismic or horizontal-wind loads) is outside the scope of this report. The allowable uniform axial compression loads on the $6^1/_2$-inch-thick (165 mm) panels used as bearing walls with an 18-foot (5486 mm) maximum wall height is 2,028 plf (296 kN/m). The allowable racking shear loads for the $6^1/_2$-inch-thick (165 mm) wall panels installed in accordance with this report with a maximum shear wall height-to-length ratio of 1-to-1 is 93 plf (1358 N/m).

4.2 Installation:

4.2.1 General: The panels must be installed in accordance with the manufacturer's published installation instructions and this evaluation report. A copy of the instructions must be available at all times on the jobsite during installation.

The longitudinal edges of the panels must be connected to each other with the factory-installed splines. The roof and floor panels are installed with the timber splines and the wall panels are installed with the OSB splines. Both panel facings must be fastened to the splines with No. 16 gage, $^{7}/_{16}$-inch-crown (9.5 mm), $1^{1}/_{2}$-inch-long (38 mm) staples spaced 3 inches (76 mm) on center, with the staple crown oriented at an approximate 45-degree angle from the panel length and with an edge distance of $^{3}/_{16}$ inch (4.8 mm). Both panel facers must also be attached to solid sawn lumber framing at each side of wall openings, at wall corners and at each end of shear walls with the same staples and staple spacing as noted for attachment at panel splines.

Top and bottom plates installed into the recessed core of the wall panels must be nominally 2-inch Douglas fir–larch solid sawn lumber, sized to match the panel's core thickness. Both the panel facings of the wall panels must be fastened to the top and bottom plates with the same fasteners, fastener orientation (crown width perpendicular to the panel end) and fastener spacing as described above for attachment of the splines to the panel facing. Figure 1 shows typical installation details. The wall panels must be installed in a manner such that the panel facers are in full contact and sufficiently supported by the underlying structure; and the loads applied at the top of the panel are uniform loads applied to both panel facers.

4.2.2 Wall Openings: Wall openings for doors and windows must be framed with conventional materials, and designed in accordance with the applicable code, to the satisfaction of the code official.

4.2.3 Thermal Barrier:

4.2.3.1 Wall, Floor and Roof: A layer of $^{1}/_{2}$-inch-thick (12.7 mm) gypsum wallboard, complying with ASTM C36 or ASTM C1396, must be installed on the interior surface of wall and roof panels and the bottom side of floor panels with occupied space below the floor panel. The gypsum wallboard must be fastened with No. 6 by $1^{1}/_{4}$-inch-long (31.7 mm) Type W wallboard screws spaced at 16 inches (406 mm) on center at the perimeter of each gypsum wallboard and at 12 inches (305 mm) on center in rows spaced at 24 inches (610 mm) on center, in the field of the gypsum wallboard. The gypsum wallboard is also attached to the panels with OSI Formula No. 38 Drywall Adhesive, applied in $^{3}/_{8}$-inch-diameter (9.5mm) beads spaced at $4^{1}/_{2}$ inches (114mm) on center. Wallboard joints must be taped and filled with joint compound in accordance with GA-216 or ASTM C840.

4.2.3.2 Floor Panels: An approved thermal barrier, such as $^{3}/_{4}$-inch-thick (19.1 mm) plywood, must be installed on the top of floor panels to separate the panels from the interior of the building. The thermal barrier must be attached to the OSB facings of the sandwich panels in accordance with the applicable code.

4.2.4 Exterior Wall Covering: The exterior face of the wall panels must be covered with an approved exterior wall covering, and a water-resistive barrier as required by IBC Section 1404.2 or IRC Section R703.2, as applicable. Where portland cement plaster is used, compliance with IBC Sections 2510 and 2512 or IRC Section R703.6.3, as applicable, is required. Flashing must be installed in accordance with the applicable code.

4.2.5 Roof Covering: The roof covering must comply with IBC Chapter 15 or IRC Section R901, as applicable Roofs with hot-asphalt or hot coal-tar pitch require mechanical attachment of a base ply prior to the application of the roof covering materials. Fasteners must have sufficient length to penetrate through the top panel skin. Underlayments and flashing must be installed in accordance with the applicable code or a current ICC-ES evaluation report.

5.0 CONDITIONS OF USE:

The panels described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

5.1 The panels must be fabricated, identified and erected in accordance with this report and the manufacturer's published installation instructions. If there is a conflict between the manufacturer's instructions and this report, this report governs.

5.2 Design loads to be resisted by the panels must be determined in accordance with the code, and must be less than the allowable panel loads noted in this report.

5.3 Construction documents, including engineering calculations and drawings providing floor plans, window opening details, door opening details, and connection details, must be submitted to the code official when application is made for a permit, to verify compliance with this report and the applicable code. The design calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 All roof-to-wall and wall-to-floor construction joint details must be designed such that gravity loads are applied to the wall panels as a uniform concentric axial load over the entire wall panel thickness.

5.5 When used as shear walls (racking shear), the panels are recognized for use in Seismic Design Categories A, B and C.

5.6 The panels are limited to use in structures of Type V-B construction.

5.7 The floor panels are limited to use in Group R occupancies.

5.8 The foam plastic core must be separated from the building interior by a thermal barrier installed in accordance with Section 4.2.3 of this report.

5.9 The panels must be installed a minimum of 6 inches (152 mm) above finish grade.

5.10 For use of the foam plastic in areas subject to damage from termites, installation must be in accordance with 2012 IBC Section 2603.9; 2009 and 2006 IBC Section 2603.8; 2012 and 2009 IRC Section R318.4; or 2006 IRC Section R320.5, as applicable.

5.11 The panels and their attachments are subject to inspection by the code official prior to their being covered with an approved water-resistive barrier or roof covering.

5.12 For roof panel installations, justification must be submitted to the code official demonstrating that the panels with the roof covering comply as a Class A, B or C roof assembly as required by IBC Section 2603.6 or IRC Section R902.1, as applicable, with the classification also complying with the minimum classification requirements for the building.

5.13 Under the IRC, the panels are limited to an engineered design under IRC Section R301.1.3, with engineering performed in accordance with this evaluation report.

5.14 The panels are fabricated in Idaho Falls, Idaho, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Sandwich Panels (AC04), dated February 2012.

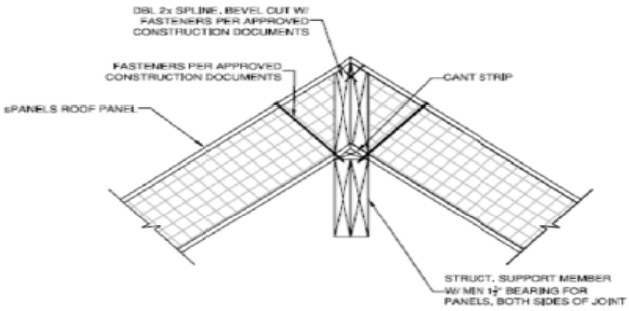
7.0 IDENTIFICATION

7.1 Each sandwich panel must be labeled with the product name, name of the manufacturer (sPanels Idaho LLC), the evaluation report number (ESR-2182).

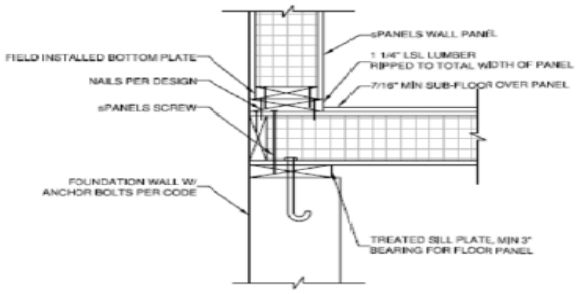
The LSL lumber splines must be labeled in accordance with evaluation report ESR-1387.

7.2 The report holder's contact information is the following:

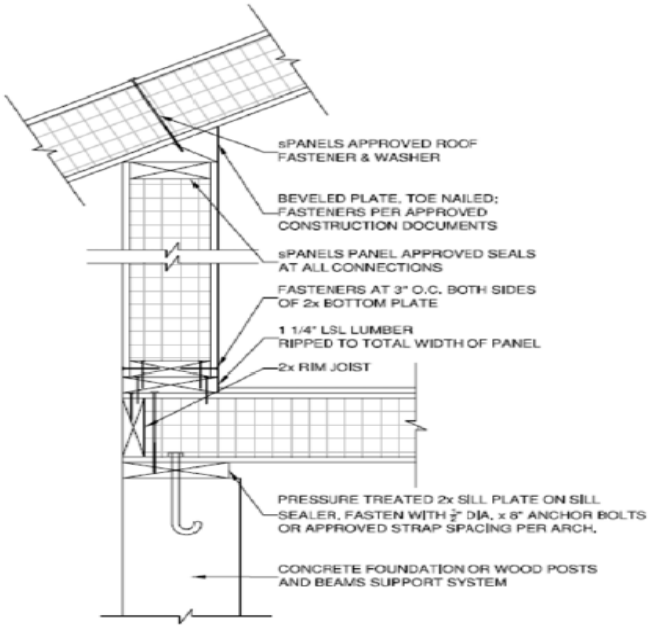
sPANELS IDAHO LLC
2420 HEYREND WAY
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ROOF PANEL ASSEMBLY



PANEL ASSEMBLY



ROOF & WALL ASSEMBLY

FIGURE 1—TYPICAL INSTALLATION DETAILS

TABLE 1—ALLOWABLE TRANSVERSE LOADS (psf)

PANEL SPAN (feet)	DEFLECTION LIMIT	$6^1/_2$-INCH-THICK WALL PANELS: (WIND LOADS)	$12^3/_4$-INCH-THICK ROOF AND FLOOR PANELS[2,3,4]		
			Live Load	Snow Load	Wind Uplift Load
8	L/180	55	158	137	71
	L/240	52	158	103	71
	L/360	35	109	69	71
10	L/180	44	125	108	58
	L/240	38	125	81	58
	L/360	26	83	54	58
12	L/180	37	102	88	50
	L/240	29	102	66	50
	L/360	19	65	44	50
14	L/180	30	86	74	43
	L/240	23	83	55	43
	L/360	15	52	37	43
16	L/180	24	74	63	39
	L/240	18	68	47	39
	L/360	12	42	32	39
18	L/180	19	65	55	35
	L/240	14	56	41	35
	L/360	10	34	27	35
19	L/180	17	—	—	—
	L/240	13	—	—	—
	L/360	9	—	—	—
20	L/180	—	57	48	32
	L/240	—	47	36	32
	L/360	—	28	24	32
22	L/180	—	51	42	30
	L/240	—	39	31	30
	L/360	—	23	21	30
23	L/180	—	49	40	29
	L/240	—	36	30	29
	L/360	—	21	20	29

For **SI:** 1 inch = 25.4 mm, 1 psf = 47.9 Pa.

[1]The maximum spacing of the panel splines is 4 feet.
[2]The allowable transverse load is the total applied load; the self-weight of the panel need not be included within the allowable loads shown.
[3]Panels with a butt splice of the panel core shall be installed with the core butt splice located a minimum of 12 inches from the panel support.
[4]The minimum bearing width for roof and floor panels provided by the panel supports (such as walls and beams) is 1 inch. For wind uplift loads, the roof panel must be restrained by fasteners with 2-inch-diameter washer spaced at a maximum of 12 inches on center.