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DIVISION: 06—WOOD AND PLASTIC
Section: 06120—Structural Panels

REPORT HOLDER:

PRECISION PANEL STRUCTURES, INC.
1447 EAST STATE STREET
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EVALUATION SUBJECT:

PRECISION PANEL BUILDING PANELS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- BOCA® *National Building Code*/1999 (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Structural
- Fire resistance

2.0 USES

Precision Panel Building Panels are used as exterior or interior load-bearing or nonload-bearing wall, roof and floor panels. The panels are limited to use in Type V construction with floor panels further limited to Group R-1 and R-3 Occupancies (IBC); Type 5 construction with floor panels further limited to Group R-1 and R-3 Occupancies (BNBC); Type VI Unprotected construction with floor panels further limited to Group R Occupancies (SBC); Type V construction with floor panels further limited to Group R-1 and R-3 Occupancies (UBC); or construction in accordance with the IRC. When installed in accordance with Section 4.5, the panels may be used as components of a one-hour fire-resistance-rated wall assembly.

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

3.0 DESCRIPTION

3.1 General:

Precision Panel Building Panels are factory-assembled, laminated sandwich panels consisting of oriented strand board (OSB) facings with an expanded polystyrene (EPS) foam plastic core. The panels are 4 feet (1219 mm) and 8 feet

(2438 mm) wide and vary in thickness from 4¹/₂ to 12¹/₄ inches (114 mm to 311 mm). The panels vary in length from 8 feet to 20 feet (2.4 m to 6.09 m). Wire chases (voids) with diameters of 1¹/₂ inches (38 mm) are provided in the EPS core of wall panels for electrical wiring in the panels. The wire chases are placed at 1-foot and 4-foot (305 mm to 1219 mm) elevations (up from the floor) horizontally and are at 4 feet (1219 mm) on center vertically.

3.2 Materials:

3.2.1 Panel Core: The core material is EPS foam plastic having a thickness ranging from 3⁵/₈ to 11³/₈ inches (92 to 289 mm). The EPS core has a nominal density of 1.0 pcf (16.02 kg/m³), and is recognized in an ICC-ES evaluation report as complying with ASTM C 578, Type I, as specified in the quality control manual. The EPS core has a flame-spread index of 75 or less and a smoke-developed index of 450 or less when tested at a maximum thickness of 4 inches (102 mm) in accordance with ASTM E 84, and the EPS core with a maximum thickness of 11³/₈ inches (289 mm) satisfactorily passed large-scale tests specified in IBC Section 2603.9.

3.2.2 Panel Facings: The facing material of the panels is 7¹/₁₆-inch-thick (11.1 mm), OSB rated sheathing, Exposure 1, having a span rating of 24/16 and conforming with the performance-rated panel requirements specified in U.S. DOC PS 2-92 (UBC Standard 23-3) and the requirements in the approved quality control documentation.

3.2.3 Adhesive: The facing material is factory-bonded to the foam plastic core using an adhesive complying with ASTM D 2559 and recognized in an ICC-ES evaluation report as specified in the Precision Panel Structures, Inc., quality control documentation.

3.2.4 Splines: Splines are either nominally 2-inch-thick (51 mm), sawn, stud-grade, Douglas fir–larch or equivalent lumber having a minimum specific gravity of 0.50 and a depth equal to the panel core thickness; or surface splines consisting of 3-inch-wide (76 mm), 7¹/₁₆-inch-thick (11.1 mm), OSB rated sheathing, Exposure 1. Splines for panels used as shearwalls must be sawn lumber splines.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The allowable spans and transverse loads for wall panels are noted in Table 1. The allowable spans and transverse loads for floor and roof panels are noted in Table 2. The allowable axial load for 6¹/₂-inch-thick (165 mm) and thicker panels used as load-bearing walls is noted in Table 3. The strength axis of the panels is defined by the orientation of the face and back OSB facings, which must be parallel to the panel span. The panel span of the roof and floor panels is the distance between vertical supports. The panel span of the wall panels is the height of the panel between top and bottom supports (such as top and bottom plates).

The allowable racking shear load is noted in Table 4. Under the IBC and IRC, the values in Table 4 are limited to use in Seismic Design Categories A, B, and C only.

The allowable loads are also applicable to panels installed with shorter spans or heights than those noted in the tables. Extrapolation is not permitted. Where loading conditions result in panels resisting combined stresses, the sum of the ratios of actual loads to allowable loads must be less than or equal to 1.

Openings must have headers and supporting framing of conventional construction material designed in accordance with the applicable code, and the design and installation requirements of framing around openings are beyond the scope of this report. Structural calculations justifying the adequacy of framing around openings and load transfer connections must be provided to the code official for approval.

All floor-to-wall and roof-to-wall connection details must be designed such that gravity loads, including concentrated loads from roof and floor framing, are concentrically applied to the wall panels over the entire wall panel thickness, including OSB facings. The floor system must be designed for the loads applied to the floor systems by the sandwich panels used as load-bearing walls, with the analysis using the assumption that the loads from the sandwich panels are imposed on the floor system through the facings of the sandwich panels.

4.2 Installation:

4.2.1 General: The panels must be installed in accordance with the manufacturer's published installation instructions and this report. A copy of the installation instructions must be available at all times on the jobsite during installation. The panels must be connected to each other at their longitudinal (edge) joints with sawn wood splines or with surface splines. Unless otherwise noted in this report, double top and single bottom wall plates of wall panels must be nominally 2-inch-thick dimensional lumber of minimum stud-grade Douglas fir-larch, sized to match the core thickness, and fastened to the panel facings with 8d common nails spaced at a maximum of 4 inches (102 mm) on center. See figures in this report for typical installation details.

Sill plates must be preservative-treated for decay resistance in accordance with Section 2304.11.2.3 of the IBC, Section R319 of the IRC, Section 2311.4.3 of the BNBC, Section 2304.4.1 of the SBC, and Section 2306.4 of the UBC, as applicable.

Fasteners in preservative-treated wood must comply with Section 2304.9.5 of the IBC, Section 2311.3.3 of the BNBC, Section 2306.3 of the SBC or Section 2304.3 of the UBC, as applicable.

4.2.2 Shearwall: Panels used as shear walls must have sawn lumber splines, as described in Section 3.2.4 of this report, at vertical splice locations. Each OSB facing vertical edge must be fastened to the sawn lumber spline with 8d common nails spaced at 4 inches (102 mm) on center. Nails on opposite sides of the panels must be staggered to preclude splitting of the sawn spline. The double top and single bottom plates must be dimensional lumber of minimum No. 2 Douglas fir-larch, sized to match the core thickness, and fastened to the panel facings with 8d common nails spaced at a maximum of 4 inches (152 mm) on center at each face. Minimum edge and end distances of nails must be $\frac{3}{4}$ inch (19.1 mm).

4.3 Thermal Barrier:

4.3.1 Wall and Ceiling: The interior of the building must be protected from the foam plastic core of the sandwich panels with an approved thermal barrier, such as $\frac{1}{2}$ -inch-thick (12.7 mm) regular gypsum wallboard complying with ASTM C 36 or C 1396. The gypsum wallboard must be installed on the interior face of the wall, roof panels and bottom side of floor

panels over occupied space. The gypsum wallboard must be installed with the longitudinal edge of the wallboard perpendicular to the longitudinal edges of the panels, and attached to the OSB facings of the panels with No. 6, Type S, $1\frac{1}{2}$ -inch-long (31.7 mm) bugle head screws spaced 8 inches (203 mm) on center along the perimeter of the gypsum wallboard into the splines and plates; and spaced 12 inches (305 mm) on center vertically and horizontally in the field of the gypsum wallboard. The installation of gypsum wallboard for a one-hour fire-resistance-rated wall assembly must be in accordance with Section 4.5 of this report.

4.3.2 Floor: Under the IBC, IRC and SBC, an approved thermal barrier, such as $\frac{19}{32}$ -inch-thick (15.1 mm) plywood, must separate the top of the floor panels from the interior of the building. The thermal barrier must be attached to the panel facings in accordance with the applicable code.

4.4 Panel Cladding:

4.4.1 Roof Covering: The roof covering must comply with Chapter 15 of the IBC, Chapter 9 of the IRC, Chapter 15 of the BNBC, Chapter 15 of the SBC, or Chapter 15 of the UBC. Underlayment and flashing must be installed in accordance with the applicable code. Roof coverings with hot-asphalt or hot-coal-tar pitch are prohibited.

4.4.2 Exterior Wall Covering: Exterior wall coverings may be any recognized in the applicable code or a current ICC-ES evaluation report. A water-resistive barrier must be installed over the exterior panel face in accordance with Section 1404.2 of the IBC, Section R703.2 of the IRC, Section 1406.3.6 of the BNBC, ASTM D 226 (SBC), and Section 1402 of the UBC, as applicable, prior to application of the wall covering. Where portland cement plaster is used, compliance with Sections 2510 and 2512 of the IBC, Section R703.6 of the IRC, Section 2506 of the BNBC, Section 2504.2 of the SBC, or Section 2508 of the UBC, as applicable, is necessary.

4.5 One-hour Fire-resistance-rated Limited Load-bearing Wall Assembly:

The $6\frac{1}{2}$ -inch-thick (165 mm) wall panel, with a maximum applied allowable axial load of 1,700 pounds per linear foot (24 820 N/m) and a maximum wall height of 8 feet (2438 mm), as indicated in Table 3, has a one-hour fire-resistance rating when constructed in accordance with this section. The panel consists of $5\frac{5}{8}$ -inch-thick (143 mm) EPS foam plastic core laminated between $\frac{7}{16}$ -inch-thick (11.1 mm) OSB facings. Approximately $1\frac{1}{2}$ -inch-wide (38 mm) portions of the EPS foam plastic core are removed along the bottom and vertical edge of the panel to allow for the installation of nominally 2-inch-by-6-inch, Douglas fir-larch, No. 2 sawn lumber splines and bottom plate. For the installation of double 2-inch-by-6-inch, Douglas fir-larch, No. 2 top plates, a minimum 3-inch-deep (76 mm) portion of the EPS foam plastic core must be removed. The first top plate must be installed into the recess along the top of the wall and must be secured to each wood lumber spline by two 16d sinker end-nails. The second top plate must be installed over the first top plate and must be secured to the first top plate with 16d sinker nails spaced 12 inches (305 mm) on center along the centerline of the top plates. The top and bottom plates must be fastened to the OSB facings with 8d common nails spaced 4 inches (102 mm) on center at each panel face. Double 2-inch-by-6-inch, Douglas fir-larch, No. 2 sawn lumber splines must be stitch-nailed together with two rows of 16d sinker nails spaced at 12 inches (305 mm) on center at both sides and staggered along the spline length. See Figure 5. The double sawn lumber splines must then be installed in the recess between adjoining panels, and must be fastened to each panel facing with 8d common nails spaced 4 inches (102 mm) on center. Both faces of panels must be covered with two layers of $\frac{1}{2}$ -inch-

thick (12.7 mm) regular gypsum wallboard complying with ASTM C 36 or C 1396, installed horizontally with joints between adjacent layers offset 24 inches (610 mm). The first layer of gypsum wallboard must be fastened with cuphead wallboard nails with nominal dimensions of No. 13 gage shank diameter by $1\frac{9}{64}$ inch (7.5 mm) head diameter by $1\frac{5}{8}$ inches (41.3 mm) long, spaced at 24 inches (610 mm) on center vertically and 16 inches (406 mm) on center horizontally along the perimeter of each gypsum wallboard panel. Minimum edge and end distances of nails must be $\frac{3}{4}$ inch (19.1 mm). For the second layer, the gypsum wallboard must be fastened into the OSB using cuphead wallboard nails with minimum dimensions of No. 13 gage shank diameter by $1\frac{9}{64}$ inch (7.5 mm) head diameter by $1\frac{7}{8}$ inches (48 mm) long, spaced 12 inches (305 mm) on center vertically and 16 inches (406 mm) on center horizontally along the perimeter of each gypsum wallboard panel. The second layer must be offset 8 inches (203 mm) horizontally from the first layer. All gypsum wallboard joints on the second layer of each surface must be covered with paper tape and gypsum compound. Nail heads must also be covered with gypsum compound. Gypsum wallboard finishing must comply with Section 22.6.3 of ASTM C 840 or GA 216. Where the panels are applied to the exterior walls, the gypsum wallboard must be replaced by gypsum sheathing complying with ASTM C 79 or C 1396, and the exterior wall covering and water-resistive barrier required in Section 4.4.2 of this report must be installed over the gypsum sheathing.

5.0 CONDITIONS OF USE

The Precision Panel Building 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 this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 5.2 The strength axis of the panel facings must be parallel to the panel span. Refer to Section 4.1 for additional requirements.
- 5.3 Remaining portions of the structure, other than Precision Panel Building Panels, must be designed and constructed in accordance with the applicable code.
- 5.4 All construction documents specifying the building panels described in this report must comply with the design limitations of this report. Drawings and design details demonstrating that the Precision Panel Building Panels comply with this report must be submitted to the code official at the time of permit application. The drawings and design 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.
- 5.5 Calculations and details for the connection and attachment of the Precision Panel Building Panels to the supporting structural elements of the building, the design of framing around openings and adequacy of structural supports, must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed, and submitted to the code official for approval.
- 5.6 Panel connections, other than longitudinal joints at panel splines, are beyond the scope of this report and must be addressed in the design calculations and construction details.

- 5.7 Design loads to be resisted by the panels must be determined using basic load combinations based on allowable stress design in accordance with the applicable code, and must be less than the allowable values noted in this report.
- 5.8 Floor framing and sheathing beneath the panels used as load-bearing walls must be designed to transfer the gravity load and in-plane seismic or wind load from the sandwich wall panels above to the support below.
- 5.9 Panel cores must be separated from the building interior by a thermal barrier in accordance with Section 4.3 of this evaluation report.
- 5.10 Justification must be submitted to the code official demonstrating that the Precision Panel Building Panels with the roof covering comply as a Class A, B or C roof assembly with the classification complying with the minimum classification requirements for the building.
- 5.11 For structures required to comply with the IBC and IRC, use of foam plastic insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with IBC Section 2603.8 and IRC Section R320.5.
- 5.12 For structures regulated under the SBC, the panels must not be placed within 6 inches (152mm) of earth where the hazard of termite damage is "very heavy," in accordance with SBC Figure 2304.1.4, without an approved method of protecting the foam plastic and structure from subterranean termite damage.
- 5.13 The panels must be installed such that panel facings are protected against decay and termites in accordance with IBC Sections 2304.11.2.2 and 2304.11.2.6, IRC sections R319 and R320, BNBC Section 2311.4.2, SBC Section 2304 and UBC Section 2306.8, as applicable.
- 5.14 The panels are limited to use in Type V construction with floor panels further limited to Group R-1 and R-3 Occupancies (IBC); Type 5 construction with floor panels further limited to Group R-1 and R-3 Occupancies (BNBC); Type VI Unprotected construction with floor panels further limited to Group R Occupancies (SBC); Type V construction with floor panels further limited to Group R-1 and R-3 Occupancies (UBC); or construction in accordance with the IRC.
- 5.15 The panels and their connections must be inspected and approved by the code official prior to being covered.
- 5.16 The panels used as shearwalls are limited to Seismic Design Category A, B or C under the IBC and IRC.
- 5.17 The panels are fabricated by Precision Panel Structures, Inc., in Eagle, Idaho, under a quality control program with inspections conducted 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 July 2007.
- 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated May 2008.
- 6.3 Report of fire endurance tests in accordance with ASTM E 119.

7.0 IDENTIFICATION

The panels must bear a stamp on the panel facings noting the product name; the name and address of the report holder (Precision Panel Structures, Inc., Eagle, Idaho); the job number; the evaluation report number (ESR-1138); and the name of the inspection agency (RADCO, Inc.).

TABLE 1—ALLOWABLE TRANSVERSE LOADS OF WALL PANELS ^{1,2,3} (psf)

PANEL HEIGHT ⁴ (feet)	PANEL THICKNESS (inches)					
	4.50		6.50		8.25	
	L/180 ⁵	L/240 ⁶	L/180 ⁵	L/240 ⁶	L/180 ⁵	L/240 ⁶
7.875	43	38	43	43	43	43
8.875	38	34	38	38	38	38
9.875	35	28	35	35	35	35
10.875	31	24	31	31	31	31
11.875	26	20	29	29	29	29
12.875	22	17	27	27	27	27
13.875	19	14	25	25	25	25

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 6.894 kPa.

¹Allowable loads for the wall panels are based on simple span conditions.

²Interpolation of intermediate values is not acceptable under this report.

³Allowable transverse loads shall be the total loads (such as wind loads) perpendicular to wall panel height.

⁴Panel height is based on the distance between top of top plates and bottom of bottom plate where the wall panels are laterally supported.

⁵Allowable loads are based on test results using the lesser of deflection at $1/180$ of the span and the average peak load divided by 3.

⁶Allowable loads are based on test results using the lesser of deflection at $1/240$ of the span and the average peak load divided by 3.

TABLE 2—ALLOWABLE TRANSVERSE LOADS OF ROOF AND FLOOR PANELS ^{1,2,3,8,9,10} (psf)

PANEL SPAN ⁴ (feet)	PANEL THICKNESS (inches)														
	4.50			6.50			8.25			10.25			12.25		
	L/180	L/240 ⁶	L/360 ⁷	L/180 ⁵	L/240 ⁶	L/360 ⁷	L/180 ⁵	L/240 ⁶	L/360 ⁷	L/180 ⁵	L/240 ⁶	L/360 ⁷	L/180 ⁵	L/240 ⁶	L/360 ⁷
7.875	43	38	25	79	64	43	82	82	59	106	106	77	106	106	96
8.875	38	34	23	76	57	38	73	73	52	94	94	69	106	106	85
9.875	34	28	19	64	48	32	65	65	45	84	84	59	106	106	74
10.875	31	24	16	55	41	27	59	58	38	76	76	51	106	97	65
11.875	26	20	13	47	35	24	54	50	33	70	67	45	106	85	57
12.875	22	17	11	41	31	20	49	44	29	64	59	39	94	75	50
13.875	19	14	10	35	26	18	46	38	25	59	52	35	81	67	45
14.875	NP	NP	NP	30	23	15	43	34	22	55	46	31	70	60	40
15.875	NP	NP	NP	27	20	13	39	30	20	52	41	27	61	53	36
16.875	NP	NP	NP	24	18	12	35	26	17	49	37	24	54	48	32
17.875	NP	NP	NP	21	16	10	31	23	16	44	33	22	48	43	29
18.875	NP	NP	NP	19	14	NP	28	21	14	39	30	20	43	39	26
19.875	NP	NP	NP	17	12	NP	25	19	12	35	27	18	39	35	23

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 6.894 kPa.

¹Allowable loads for the roof and floor panels are based on simple span conditions where ends of panels have a minimum $1\frac{1}{2}$ -inch (38 mm) bearing length.

²Interpolation of intermediate values is not allowed.

³Allowable transverse loads shall be the total uniform dead and uniform live load exclusive of the panel self weight.

⁴Panel span is based on center-to-center distance of supports.

⁵Allowable loads are based on test results using the lesser of deflection at $1/180$ of the span and the average peak load divided by 3.

⁶Allowable loads are based on test results using the lesser of deflection at $1/240$ of the span and the average peak load divided by 3.

⁷Allowable loads are based on test results using the lesser of deflection at $1/360$ of the span and the average peak load divided by 3.

⁸For roof panels supporting 300 lbf concentrated maintenance worker live load as per Section 1607.4 and Table 1607.1 of the IBC, the available allowable uniform dead load shall be limited to the total allowable loads listed in Table 2-above-multiplied by reduction factors. The reduction factors are as follows: 0.27 for 4.5-inch-thick panel, 0.46 for 6.5-inch-thick panel, 0.72 for 8.25-inch-thick panel, 0.88 for 10.25-inch-thick panel, and 0.64 for 12.25-inch-thick panel.

⁹The allowable loads are not applicable to floor panels supporting concentrated loads.

¹⁰NP = Not permitted.

TABLE 3—ALLOWABLE AXIAL LOADS OF WALL PANELS^{1,2,3,4,5}

PANEL HEIGHT (feet)	MINIMUM PANEL THICKNESS 6 ¹ / ₂ inches	
	Uniform Load	Concentrated Load
8	2,090 plf	1,050 lbf

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 plf = 14.6 N/m, 1 lbf = 4.45 N.

¹Allowable uniform loads shall be concentric uniformly applied axial loads (such as by sandwich roof/floor panels) with the full bearing on both wall panel facings. Allowable loads are based on test results using the lesser of a net axial deformation of 0.125 inch (3.18 mm) and the average peak load divided by 3.

²Allowable concentrated loads are based on the roof/floor framing (such as trusses and joists) that are spaced at a minimum of 24 inches (610 mm) on center, and with full bearing on top plates and facings of sandwich wall panels, and with a minimum 1¹/₂-inch (38 mm) bearing length. Allowable loads are based on test results using the lesser of a net axial deformation of 0.125 inch (3.18 mm) and the average peak load divided by 3.

³OSB strength axis must be parallel to the height of wall panel.

⁴Allowable axial loads on wall panels must be limited to the lesser of allowable uniform load and allowable concentrated load.

⁵See Section 4.1 of this report for load transfer requirements.

TABLE 4—ALLOWABLE IN-PLANE RACKING SHEAR SHEARWALL LOADS^{1,2,3} (plf)

MINIMUM PANEL THICKNESS (feet)	ALLOWABLE RACKING LOAD (plf)		
	Maximum Panel height		
	8 feet	9 feet	10 feet
6.5	170 plf	151 plf	136 plf

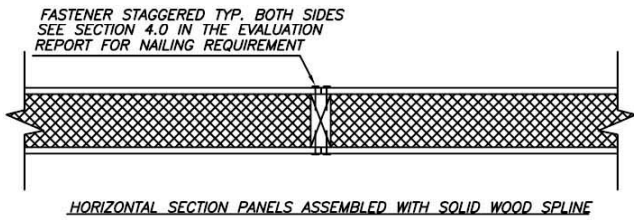
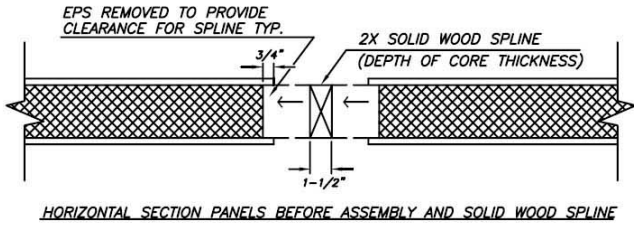
For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 plf = 14.6 N/m.

¹Maximum panel height-to-width ratio shall be 1:1.

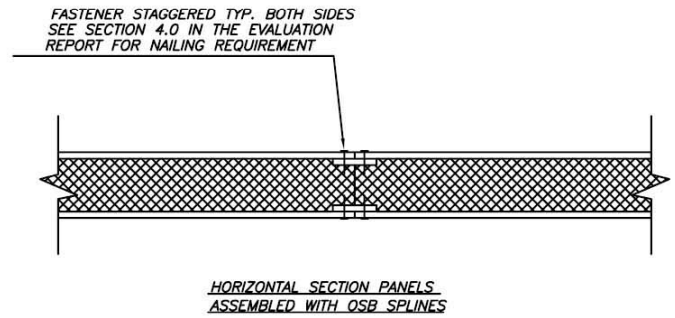
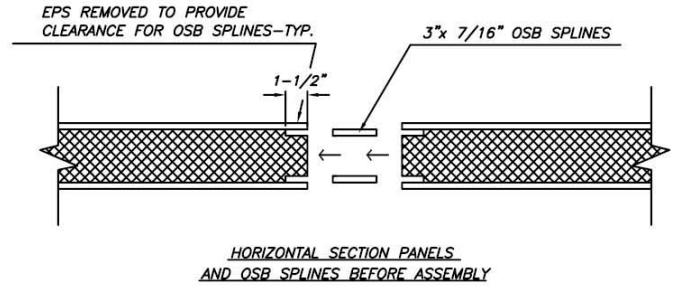
²Values shall be applicable to panels installed in accordance with Section 4.2.2 of this report.

³Under IBC and IRC, the allowable shear values are limited to use in Seismic Design Categories A, B and C. Refer to Sections 4.1 and 5.0 of this report for additional requirements.

TOP VIEW



TOP VIEW



*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

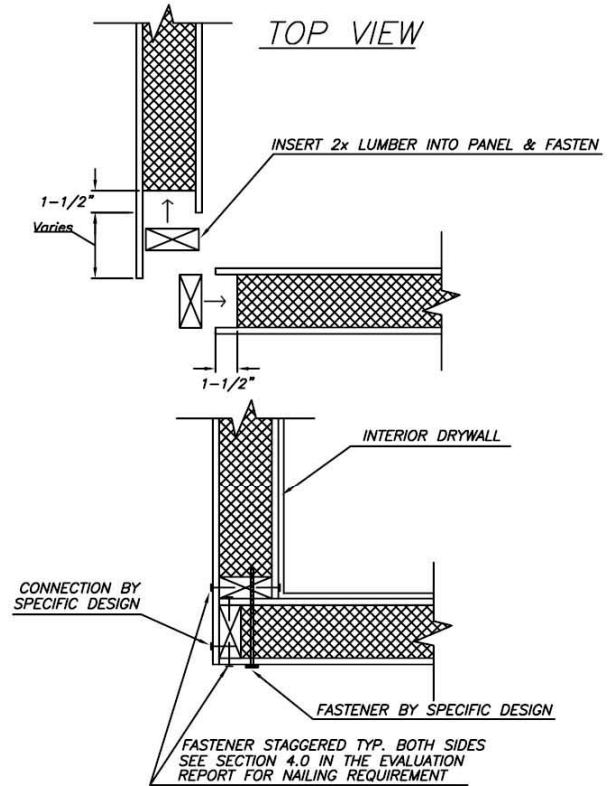
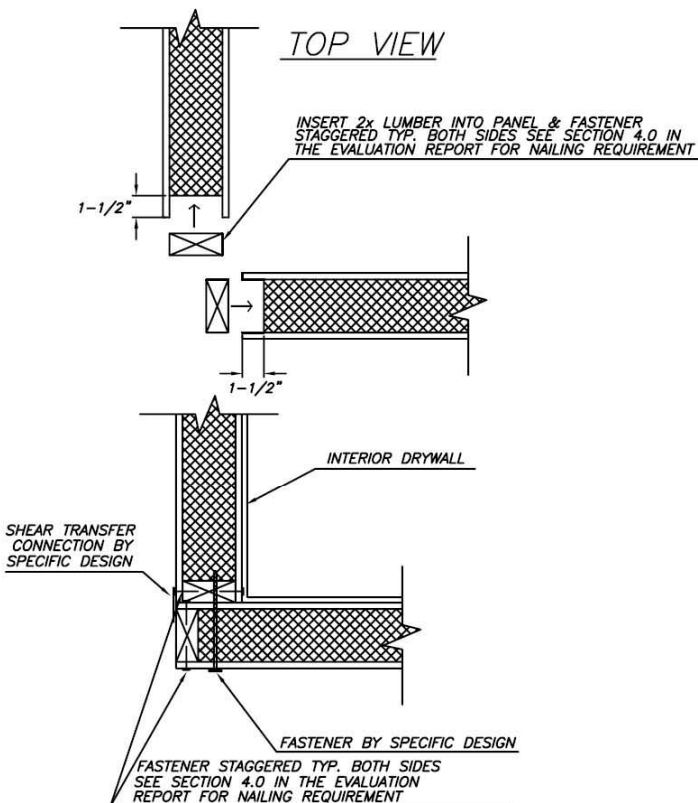
*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

FIGURE 1

FIGURE 2

PANEL-TO-PANEL CONNECTION WITH 2x LUMBER

PANEL-TO-PANEL CONNECTION WITH SURFACE SPLINES



*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

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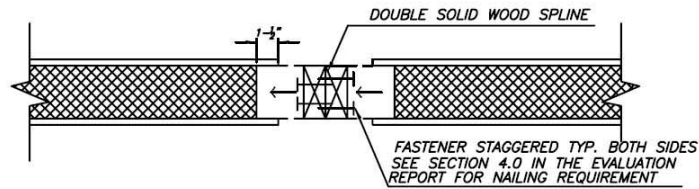
FIGURE 3

FIGURE 4

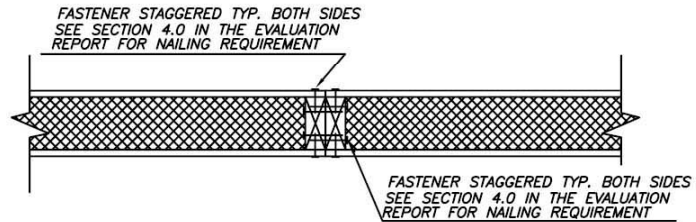
PANEL-TO-PANEL CORNER CONNECTION (BUTT JOINT)

PANEL-TO-PANEL CORNER CONNECTION (FLY BY)

TOP VIEW

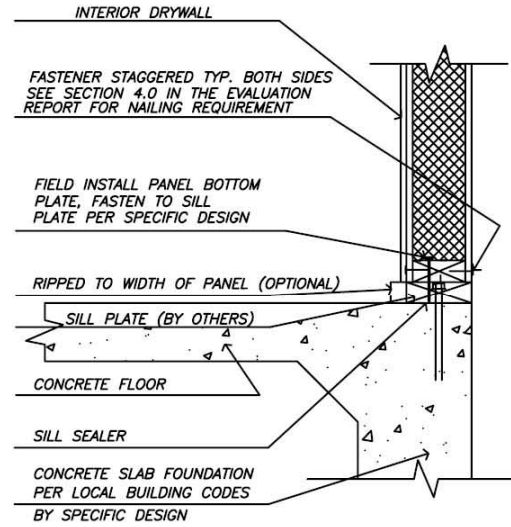


HORIZONTAL SECTION OF PANELS AND DOUBLE SOLID WOOD SPLINE BEFORE ASSEMBLY



HORIZONTAL SECTION OF PANELS ASSEMBLED WITH DOUBLE SOLID WOOD SPLINE

*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.



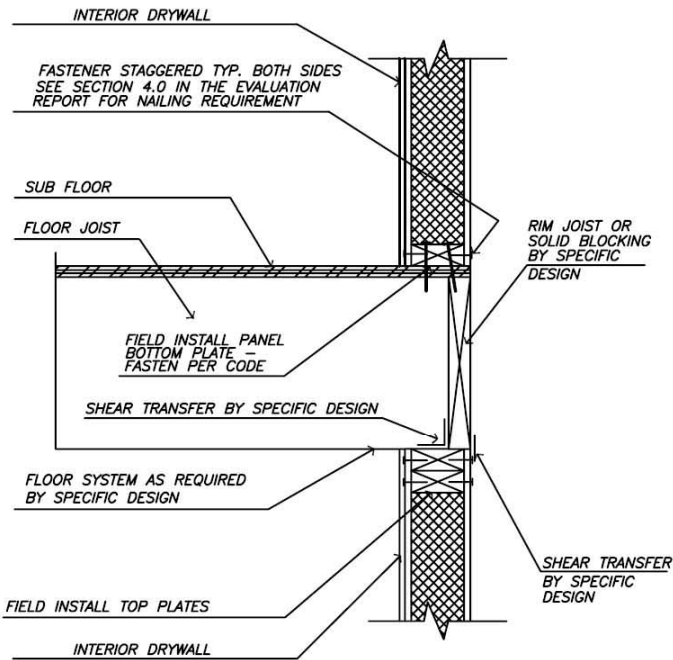
*OVERTURNING RESISTANCE BY SPECIFIC DESIGN.
*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

FIGURE 5

FIGURE 6

PANEL-TO-PANEL CONNECTION WITH (2) 2x LUMBER

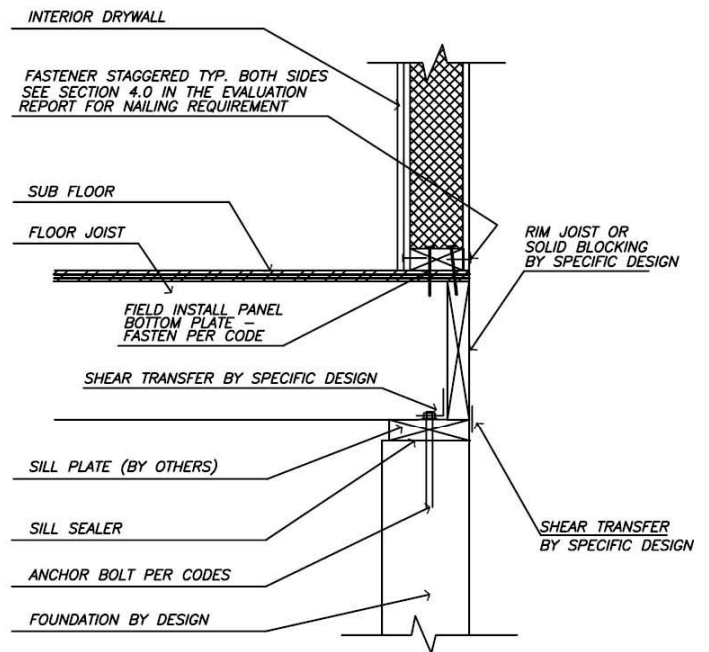
WALL PANEL CONNECTION TO SILL PLATE



*OVERTURNING RESISTANCE BY SPECIFIC DESIGN.
*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

CONNECTION OF RIM JOIST OR SOLID BLOCKING TO TOP PLATE OF WALL BELOW

FIGURE 7



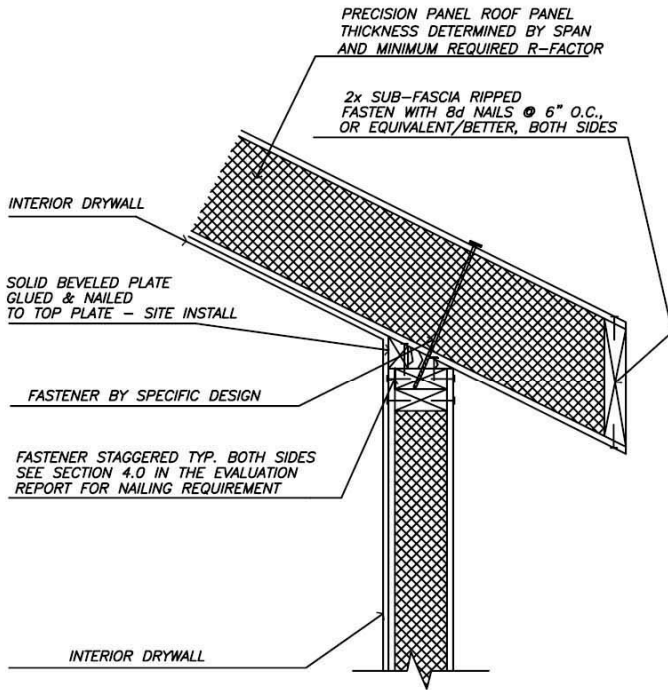
*OVERTURNING RESISTANCE BY SPECIFIC DESIGN.
*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

CONNECTION OF RIM JOIST OR SOLID BLOCKING TO SILL PLATE

FIGURE 8

BEARING WALL TO FLOOR JOIST - MULTI STORY

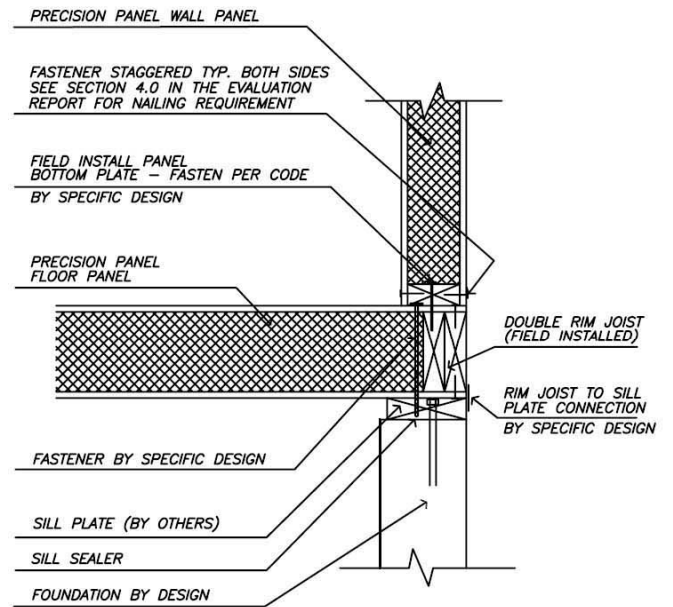
WALL PANEL CONNECTION TO RAISED FLOOR



*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

FIGURE 9

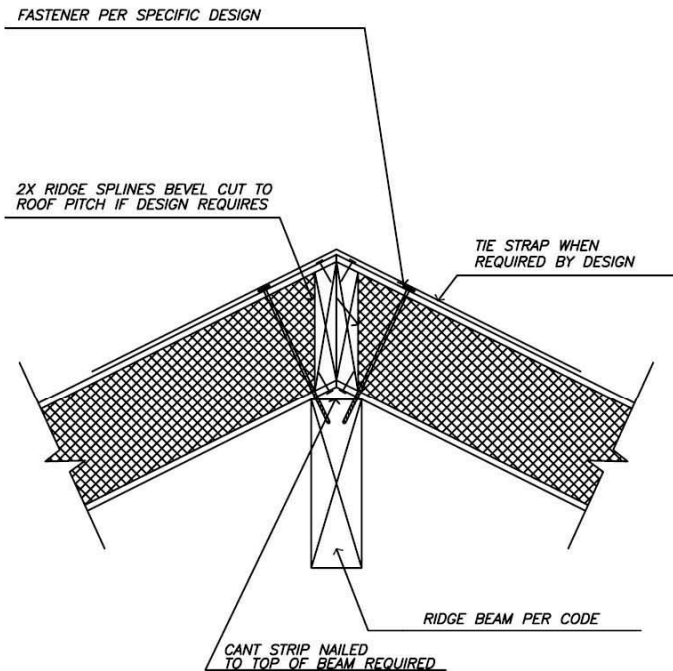
ROOF TO WALL CONNECTION WITH BEVELED SEAT



*OVERTURNING RESISTANCE BY SPECIFIC DESIGN.
*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

FIGURE 10

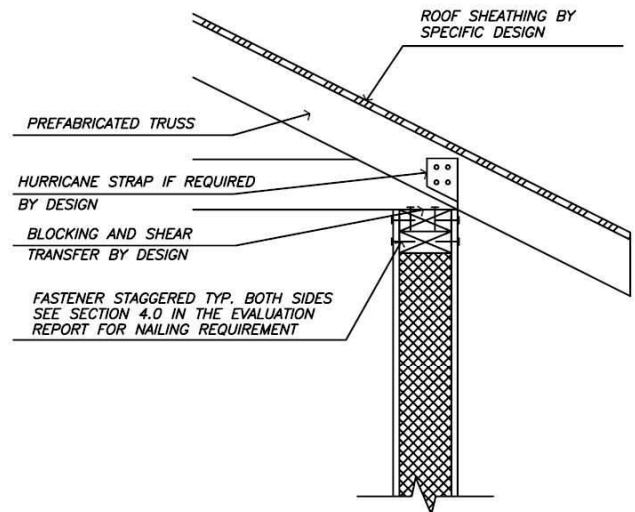
WALL PANEL TO FLOOR PANEL & FLOOR PANEL TO SILL PLATE CONNECTION



*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

FIGURE 11

ROOF RIDGE CONNECTION WITH RIDGE BEAM (WITH SOLID BLOCKING IN PANELS AT RIDGE)



*DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY, SEE SECTION 4.0 IN THE EVALUATION REPORT FOR FASTENER SPACING REQUIREMENTS.

FIGURE 12

ROOF TRUSS TO WALL CONNECTION