DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 12 00—Structural Panels

REPORT HOLDER:

AFM CORPORATION

EVALUATION SUBJECT:

R-CONTROL® STRUCTURAL INSULATED PANELS (SIPs)

ADDITIONAL LISTEES:

BIG SKY INSULATIONS, INC.
BRANCH RIVER PLASTICS, INC.
THERMAFOAM ARKANSAS, LLC
PREMIER BUILDING SYSTEMS, LLC

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:


For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-2233 LABC and LARC Supplement.

Properties evaluated:

- Structural
- Thermal barrier
- Fire resistance

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

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11

Attributes verified:

- See Section 3.1

2.0 USES

R-Control Structural Insulated Panels (SIPs) are used as load-bearing wall, floor, and roof panels in fire-resistive and non-fire-resistive construction. The SIPs are alternatives to walls, floors, and roofs designed and constructed in accordance with IBC Section 2306; and walls, floors, and roofs installed in accordance with IBC Section 2308 or IRC Sections R502, R602, and R802. When R-Control SIPs are installed under the IRC, an engineered design is required in accordance with IRC Section R301.1.3 and Section 4.1.1 of this report. Use of the panels under 2018 and 2015 IRC Section R610 or 2012 and 2009 IRC Section R613 is outside scope of this evaluation report.

3.0 DESCRIPTION

3.1 General:

R-Control SIPs are factory-laminated sandwich panels consisting of oriented strand board (OSB) facings with an expanded polystyrene (EPS) foam plastic core. R-Control SIPs vary in width from 4 to 8 feet (1.2 m to 2.4 m) and in length from 8 to 24 feet (2.4 m to 7.2 m).

The attributes of the sandwich panels have been verified as conforming to the provisions of CALGreen Sections A4.404.3.3 for premanufactured building systems. 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.

3.2 Materials:

3.2.1 Expanded Polystyrene: The EPS foam plastic core complies with ASTM C578, Type I. The EPS foam plastic has a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84. The core is supplied by manufacturers listed in the approved quality documentation. EPS core nominal thickness is 35/8, 55/8, 73/8, 93/8, or 113/8 inches (92, 143, 187, 238 and 289 mm).

3.2.2 Facing: The facing material is nominally 7/16-inch-thick, Exposure 1 OSB rated sheathing with a 24/16 span rating, which complies with U.S. DOC PS2 and additional requirements as specified in the approved quality control manual. The OSB facings are continuous for each SIP. The OSB may be Blazeguard FR Deck Panel A, recognized in ESR-1365. The OSB facings are supplied by manufacturers listed in the approved quality documentation.

3.2.3 Adhesive: Adhesives comply with Type II, Class 2, performance requirements set forth in the ICC-ES Acceptance Criteria for Sandwich Panel Adhesives (AC05). The adhesives are supplied by manufacturers listed in the approved quality documentation.
3.2.4 Splines: Splines are identified as surface, block, lumber block, lumber, or I-beam type splines. Spline thickness equals the EPS core thickness of the SIPs to be joined, except for surface splines, which have a thickness of $7/16$ inch (11.1 mm).

Surface splines are 4-inch-wide-by-$7/16$-inch-thick (102 mm by 11.1 mm) OSB as described in Section 3.2.2.

Block splines consist of two 3-inch-wide-by-$7/16$-inch-thick (76 mm by 11.1 mm) OSB facings as described in Section 3.2.2, laminated to an EPS core. Block splines are manufactured in depths of $3\frac{1}{2}$, $5\frac{1}{2}$, $7\frac{3}{4}$, $9\frac{1}{4}$, and $11\frac{1}{4}$ inches (89, 133, 184, 235, and 286 mm) as specified in the approved quality control manual.

Lumber block splines consist of two nominally 1-by-4 spruce-pine-fir No. 2 grade or better wood members laminated to an EPS core. Lumber block splines are manufactured in depths of $3\frac{1}{2}$, $5\frac{1}{2}$, $7\frac{3}{4}$, $9\frac{1}{4}$, and $11\frac{1}{4}$ inches (89, 133, 184, 235, and 286 mm) as specified in the approved quality control manual.

Lumber splines consist of solid sawn lumber, nominally 2-by or 4-by spruce-pine-fir No. 2 or better wood members, or, when justified by the structural design professional, equivalent engineered wood material.

I-beam splines are single-web I-joists manufactured in depths of $9\frac{1}{4}$ and $11\frac{1}{4}$ inches (235 and 286 mm) with minimum $1\frac{1}{2}$-inch-by-$2\frac{1}{2}$-inch (38 mm by 63.5 mm) laminated veneer flanges, as specified in the approved quantity control manual.

3.2.5 R-Control SIP Screws: R-Control SIP screws are used to fasten R-Control SIPs to underlying supports for horizontal diaphragms. R-Control SIP screws are corrosion-resistant steel screws having a minimum shank diameter of 0.188 inch (4.7 mm) and a minimum head diameter of 0.620 inch (15.5 mm). Screws are available in lengths from 3 inches to 18 inches (76.2 mm to 457.2 mm). The thread length for all screws is 2$\frac{1}{4}$ inches (70 mm) measured from the tip. R-Control SIP Screws are manufactured as specified in the approved quality control manual.

3.2.6 R-Control Low VOC Do-All-Ply: R-Control Low VOC Do-All-Ply is specified as a sealant during installation of R-Control SIPs. R-Control Do-All-Ply is applied to the splines as indicated in the figures of this report. R-Control Low VOC Do-All-Ply is manufactured as specified in the approved quality control manual. Packaged in 20-ounce (582 ml) sausages, the sealant has a nine-month shelf life.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 R-Control SIP Walls, Floors, and Roofs: R-Control SIPs are limited to the allowable loads and loading conditions indicated in Tables 3 through 9 of this report. The allowable loads shown in these tables are the allowable loads of the R-Control SIPs only and do not include consideration of the elements supporting the SIPs, which must be designed, detailed and constructed to comply with the requirements of the IBC or IRC, as applicable.

The seismic-force-resisting system of structures consisting of the panels as shear walls, in whole or in part, must be designed and detailed in accordance with IBC Sections 2305 and 2306.

Where loading conditions result in the panels resisting combined stresses, the sum of the ratios of actual load over allowable load must be less than 1.0.
4.2.5.3 Roof Exterior: R-Control SIPs must be protected by a roof covering, underlayment, and flashing installed in accordance with the IBC or IRC, as applicable, as indicated for 1/2-inch-thick (11 mm) solidly sheathed decks.

4.2.5.4 Wall Exterior: R-Control SIPs must be protected on the exterior by weather protection consisting of a water-resistive barrier and wall covering as required by the IBC or IRC, as applicable.

4.2.6 Fire-resistance-rated Assemblies:

4.2.6.1 One-hour Limited Load-bearing Wall Assembly: R-Control SIPs with thicknesses of 4 1/2, 6 1/2, or 8 1/4 inches (114, 165, or 210 mm) are used to construct a one-hour fire-resistance rated wall assembly. The SIP core is recessed 1/2 inches (38 mm) from the bottom SIP edge and 1 1/2 inches (38 mm) from the top SIP edge. The recesses receive nominally 2-by spruce-pine-fir No. 2 or better lumber bottom and top plates with a depth to match the core thickness. The plates must be connected to the SIPs by fastening through the SIP OSB facing with 8d box nails spaced 6 inches (152 mm) on center, on each side of the SIP.

The SIP core is recessed on the vertical sides to receive surface or block splines in accordance with Section 3.2.2 of this report. R-Control Low VOC Do-All-Ply is applied to the splines as indicated in the figures of this report. The splines must be connected to the SIPs by fastening through the SIP OSB facing with 1 5/8-inch-long (41.3 mm), Type W, self-piercing tapping screws (ASTM C1002) spaced 6 inches (152 mm) on center.

The SIPs must be covered with two layers of 5/8-inch-thick (15.9 mm) Type X gypsum wallboard, complying with ASTM C1396, on each side. Where the panels are exposed to the exterior, the exterior layers of gypsum boards must be 5/8-inch-thick (15.9 mm), Type X gypsum sheathing complying with ASTM C1396. The vertical joints of the first layer of gypsum board must be offset a minimum of 16 inches (406 mm) from the spline joint. The first layer of gypsum board must be fastened to the panel facing with 1 3/4-inch-long (41.28 mm), Type W, self-piercing tapping screws complying with ASTM C1002, spaced 24 inches (610 mm) on center vertically and 16 inches (406 mm) on center horizontally. The second layer of gypsum board must be installed with 2-inch-long (50.8 mm), Type W, self-piercing tapping screws complying with ASTM C1002, spaced 12 inches (305 mm) on center vertically, in rows offset 12 inches (305 mm) from screws securing the first layer of gypsum board, and 16 inches (406 mm) on center horizontally, in rows offset 8 inches (203 mm) from screws securing the first layer of gypsum board. The vertical joints in the second layer of gypsum board must be offset a minimum of 16 inches (406 mm) from vertical joints of the first layer of gypsum board.

Exposed gypsum board joints must be covered with joint tape and joint compound and the exposed screw heads covered with joint compound in accordance with ASTM C840.

This fire-resistance-rated wall assembly is limited to 9 feet (2.7 m) in height and a maximum superimposed allowable axial compression load of 1,800 plf (26 kN/m).

4.2.6.2 One-hour Limited Load-bearing Wall Assembly: R-Control SIPs with a 6 1/2 or 8 1/4-inch thickness (165 or 210 mm) may be used to construct a one-hour fire-resistance-rated wall assembly. The SIPs have a maximum width of 4 feet (2.4 m). The SIP core is recessed 1 1/2 inches (38 mm) from the bottom panel edge and 3 inches (76 mm) from the top panel edge. The recesses receive nominally 2-by-6 or 2-by-8 wood plates with a minimum 0.43 specific gravity, such as hem-fir, Grade No. 2. The SIP core is recessed 1 1/2 inches (38 mm) on the vertical sides to receive nominally 2-by-6 or 2-by-8 wood splines.

The bottom plate must be connected to the SIPs by fastening through the SIP OSB facing with 8d box nails spaced 6 inches (152 mm) on center, on each side of the SIP. Two nominally 2-by-6 or 2-by-8 wood splines must be fastened together with 16d coated sinker nails, spaced 24 inches (609.6 mm) on center and staggered. R-Control Low VOC Do-All-Ply is applied to the splines as indicated in the figures of this report. The 2-by-6 or 2-by-8 wood splines must be connected to the SIPs by fastening through the SIP OSB facing with 8d box nails, spaced 6 inches (152 mm) on center.

The top plate must be two nominally 2-by-6 or 2-by-8 wood plates fastened together with 16d coated sinker nails, spaced 16 inches (406.4 mm) on center and staggered. R-Control Low VOC Do-All-Ply is applied to the splines as indicated in the figures of this report. The top plate must be connected to the SIPs by fastening through the SIP OSB facing with 8d box nails spaced 6 inches (152 mm) on center placed through the SIP facing.

Electrical chases, 1 1/2 inches (38.1 mm) in diameter, are permitted to be located horizontally in the core of the SIP, 16 inches (406.4 mm) and 45 inches (1142 mm) above the bottom of the wall.

The SIP must be covered with one layer of 5/8-inch-thick (15.88 mm) Temple-Inland Type TG-C gypsum board applied vertically on each side and fastened with phosphate-coated, cupped-head drywall nails, 1 3/8 inches (41.28 mm) long, spaced 8 inches (203 mm) on center along the perimeter of the wallboard and 12 inches (305 mm) on center vertically and 16 inches (406.4 mm) on center horizontally in the field of the board. The exposed joints of the gypsum board must be covered with joint tape and compound, and the exposed nails must be covered with joint compound in accordance with ASTM C840.

The fire-resistance-rated wall assembly is limited to 10 feet (3 m) in height and a superimposed allowable axial compression load of 2,200 plf (32 kN/m).

4.2.6.3 One-hour Roof-ceiling Assembly: The one-hour fire-resistance-rated roof-ceiling assembly must comply with the following requirements.

1. Structural wood beams must be a minimum of 4 1/2 inches wide by 9 1/2 inches deep (114 mm by 241 mm) and must be spaced in accordance with the IBC or IRC, as applicable.
2. The roof covering material must comply with the IBC. The roof construction must comply as a Class A, B or C roof assembly.
3. R-Control SIPs must be 4 1/2 inches to 12 3/4 inches (114 mm to 286 mm) thick.
4. R-Control SIPs must be connected with nominally 2-inch lumber splines installed in the recessed core. The lumber depth must be sized to match the core and must be connected to the SIP by fastening through the OSB facing with 8d common nails spaced 6 inches (152 mm) on center.
5. Each exposed SIP edge must be covered with nominally 2-inch wood blocking installed in the
recessed core and connected to the SIP by fastening through the OSB facing with 8d common nails spaced 6 inches (152 mm) on center.

6. Minimum 5/8-inch-thick (15.9 mm) gypsum board complying with ASTM C1396 must be installed in two layers on the underside of the SIPs and wood beams. The gypsum board’s long dimension must be installed perpendicular to the wood beams. The first layer must be connected using 1 1/4-inch-long (31.7 mm), Type S, bugle-head steel screws complying with ASTM C1002, spaced 8 inches (203 mm) on center along the joints and in rows spaced 16 inches (406 mm) on center in the field. The joints of the first layer of gypsum board must be staggered from the joints of the SIPs. The second layer of gypsum board must be fastened using 2-inch-long (51 mm), bugle-head, Type W, self-piercing steel screws complying with ASTM C1002, spaced 8 inches (203 mm) on center along the board edges and in rows 12 inches (305 mm) on center in the field. The joints of the gypsum board second layer must be staggered from the joints of the gypsum board first layer.

7. Exposed gypsum board joints must be covered with paper tape and joint compound. Screw heads must be covered with joint compound in accordance with ASTM C840.

4.3 Special Inspections:

4.3.1 Where R-Control SIP shear walls are installed in buildings in IBC Seismic Design Categories C, D, E and F; Seismic Design Categories D0, D1, D2 and E for townhouses under the IRC; or Seismic Design Categories D0, D1, D2 and E for detached one- and two-family dwellings under the IRC, periodic inspections of the fastening and anchoring of the shear wall assembly within the seismic-force-resisting system must be provided. Inspection must include connections of the assemblies to drag struts and hold-downs, in accordance with 2018 and 2015 IBC Section 1705.11.1 or 1705.12.2, 2012 IBC Section 1705.10.1 or 1705.11.2, 2009 IBC Section 1706.2 or 1707.3, or 2006 IBC Section 1707.3, as applicable, unless these are exempted by IBC Section 1704.1.

5.0 CONDITIONS OF USE

The R-Control SIPs as 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 SIPs are fabricated, identified, and erected in accordance with this report and the manufacturer’s published installation instructions. If there is a conflict between this report and the manufacturer’s instructions, the more restrictive governs.

5.2 Design loads to be resisted by the SIPs must be determined in accordance with the IBC or IRC, as applicable, and must not exceed the allowable loads noted in this report.

5.3 All construction documents specifying the SIPs must comply with the design limitations of this report. Design calculations and details for the specific applications must be furnished to the code official, verifying compliance with this report and applicable codes. Connections and attachments of the SIPs are outside the scope of this report and must be addressed in the design calculations and details. The transfer of vertical and lateral loads from the roof or floor diaphragm into the shear wall and from the shear wall to the foundation must be addressed in the calculations. When R-Control SIP shear walls are used in buildings that are more than one story tall, calculations and details must be submitted to the code official showing the load path for the transfer of lateral and overturning forces from the upper-story shear walls to the foundation. The documents 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 R-Control SIPs and other wood elements must be installed as set forth in 2018 and 2015 IBC Section 2304.12.1; or 2012, 2009 and 2006 IBC Section 2304.11.2; 2018, 2015, 2012 or 2009 IRC Section R317.1; or 2006 IRC Section R319.1.

5.5 R-Control SIPs with thicknesses of 10¾ and 12¾ inches (260 and 311 mm) must be used only as roof or floor panels.

5.6 R-Control SIPs may be used as one-hour fire resistance-rated assemblies when constructed in accordance with Section 4.2.6.

5.7 The SIPs must be limited to use in buildings of Type V construction.

5.8 Wood-based materials, including SIP facings, must be protected from decay and termite damage in accordance with 2018 and 2015 IBC Sections 2304.12.1.2 and 2304.12.1.5; or 2012, 2009 or 2006 IBC Sections 2304.11.2 and 2304.11.2.6; or 2018, 2015, 2012 and 2009 IRC Sections R317 and R318 or 2006 IRC Sections R319 and R320, as applicable.

5.9 When used as shear walls, the SIPs are recognized for use in Seismic Design Categories as provided for in Table 4 of this report. Use of the panels as shear walls for buildings in Seismic Design Categories D through F, in combination with other types of lateral-force-resisting systems, is outside the scope of this report.

5.10 The SIPs and their attachments are subject to inspection by the code official prior to covering with an approved water-resistant barrier or approved roof covering.

5.11 Shear walls constructed of SIPs, used in buildings in Seismic Design Categories C through F, must be subject to special inspection in accordance with Section 4.3.2.

5.12 Justification must be submitted to the code official demonstrating that the R-Control SIPs with the roof covering comply as a Class A, B or C roof assembly as required by IBC Sections 1505 and 2603.6 or IRC Section R902.

5.13 Use of the panels in occupancies that require concentrated floor live loads under IBC Section 1607.4 is outside scope of this report.

5.14 The SIPs are manufactured by the listees noted in this report, at the locations specified in Table 1, under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Sandwich Panels (AC04), dated June 2019, including Appendix A of AC04.

6.2 Reports of fire-resistance tests of wall and roof-ceiling assemblies in accordance with ASTM E119.

6.3 Report of room corner tests in accordance with UL 1715.

6.4 Reports of diaphragm load tests in accordance with ASTM E455.
6.5 Reports of cyclic racking shear load testing in accordance with Appendix A of AC04.

7.0 IDENTIFICATION

7.1 Each R-Control SIP is marked with the report holder’s name (AFM); plant identification number (see Table 1); the product name (R-Control® SIPs); and the evaluation report number (ESR-2233).

7.2 R-Control SIPs with a Blazeguard FR Deckpanel A facer are also identified according to evaluation report ESR-1365.

7.3 I-beam splines are labeled with the words “for use with R-Control SIPs (ESR-2233).”

7.4 R-Control SIP Screws are labeled with the words “for use with R-Control SIPs (ESR-2233).”

7.5 The report holder’s contact information is the following:

AFM CORPORATION
17645 JUNIPER PATH, SUITE 260
LAKEVILLE, MINNESOTA  55044
www.r-control.com

7.6 The Additional Listees’ contact information is the following:

BIG SKY INSULATIONS, INC.
15 ARDEN DRIVE
BELGRADE, MONTANA  59714

BRANCH RIVER PLASTICS, INC.
15 THURBER BOULEVARD
SMITHEFIELD, RHODE ISLAND  02917

THERMAFOAM ARKANSAS, LLC
203 SOUTH REDMOND ROAD
JACKSONVILLE, ARKANSAS  72076

PREMIER BUILDING SYSTEMS, LLC
18504 CANYON ROAD EAST
PUYALLUP, WASHINGTON  98375

TABLE 1—MANUFACTURING LOCATIONS

<table>
<thead>
<tr>
<th>LISTEE</th>
<th>LOCATION</th>
<th>PLANT ID NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Sky Insulations, Inc.</td>
<td>15 Arden Drive</td>
<td>U-30</td>
</tr>
<tr>
<td></td>
<td>Belgrade, Montana</td>
<td></td>
</tr>
<tr>
<td></td>
<td>59714</td>
<td></td>
</tr>
<tr>
<td>Branch River Plastics, Inc.</td>
<td>15 Thurber Boulevard</td>
<td>U-06</td>
</tr>
<tr>
<td></td>
<td>Smithfield, Rhode Island</td>
<td></td>
</tr>
<tr>
<td></td>
<td>02917</td>
<td></td>
</tr>
<tr>
<td>Premier Building Systems, LLC</td>
<td>18504 Canyon Road East</td>
<td>U-70</td>
</tr>
<tr>
<td></td>
<td>Puyallup, Washington</td>
<td></td>
</tr>
<tr>
<td></td>
<td>98375</td>
<td></td>
</tr>
<tr>
<td>ThermaFoam Arkansas, LLC</td>
<td>203 South Redmond Road</td>
<td>U-72</td>
</tr>
<tr>
<td></td>
<td>Jacksonville, Arkansas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>72076</td>
<td></td>
</tr>
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</table>

TABLE 2—R-CONTROL SIP Weight (psf)

<table>
<thead>
<tr>
<th>SIP Thickness (in.)</th>
<th>4 1/2</th>
<th>6 1/2</th>
<th>8 1/4</th>
<th>10 1/4</th>
<th>12 1/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (psf)</td>
<td>3.2</td>
<td>3.4</td>
<td>3.6</td>
<td>3.8</td>
<td>4.0</td>
</tr>
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</table>

For SI: 1 inch = 25.4 mm, 1 psf = 4.8 kg/m².

TABLE 3—ALLOWABLE AXIAL LOAD FOR R-CONTROL SIP WALLS¹,²,³,⁴,⁵,⁶ (plf) (See Detail SIP-101c)

<table>
<thead>
<tr>
<th>SIP HEIGHT (ft.)</th>
<th>4 1/2 INCH THICK</th>
<th>6 1/2 INCH THICK</th>
<th>8 1/4 INCH THICK</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 WAB³</td>
<td>2,300</td>
<td>2,400</td>
<td>2,400</td>
</tr>
<tr>
<td>8</td>
<td>2,750</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>10</td>
<td>2,500</td>
<td>3,500</td>
<td>3,500</td>
</tr>
<tr>
<td>12</td>
<td>2,000</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>2,750</td>
<td>2,750</td>
</tr>
<tr>
<td>16</td>
<td>-</td>
<td>2,500</td>
<td>2,500</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 ft. = 304.8 mm, 1 plf = 1.49 kg/m.

¹See detail SIP-101c, as shown in Figure 1.
²Tabulated allowable axial load is the maximum uniform load (pounds per linear foot) applied concentrically to the full thickness of the SIPs, including facings, to the top. Eccentric axial loading to one face of the SIP is outside the scope of this report. The base of the SIPs must be fully bearing, including facings, on structural supports.
³Tabulated allowable axial load is based on a SIP with a maximum height to width ratio of 4:1.
⁴For fire-resistance-rated wall assemblies, axial load limitations in Section 4.2.6 must be observed.
⁵For combined loading, the requirements in Section 4.1 must be applied.
⁶The maximum allowable axial load is limited to 71 percent of the reported allowable axial load when used as shear walls.
⁷Tabulated values for 8 foot high weak axis bearing (WAB) are applicable to SIPs installed with the strong axis of the OSB facings perpendicular to the SIP height.
TABLE 4—ALLOWABLE LATERAL IN-PLANE RACKING SHEAR LOAD FOR SHEAR WALL ASSEMBLIES CONSISTING OF R-CONTROL SIPs JOINED WITH SPLINES1,2,3,4

<table>
<thead>
<tr>
<th>SPLINE TYPE5</th>
<th>Bottom Plate</th>
<th>Top Plate</th>
<th>End Posts</th>
<th>NAIL TYPE4 (Length x Shank Dia. x Head Dia., in.)</th>
<th>NAIL SPACING</th>
<th>ALLOWABLE LOADS4 (plf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURFACE or BLOCK7,8</td>
<td>Single 2-by</td>
<td>Single 2-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d box (2(\frac{3}{4})&quot; x 0.113&quot; Φ x 0.281&quot; Φ)</td>
<td>Single row at 6&quot; o.c.</td>
<td>335 plf</td>
</tr>
<tr>
<td>4X LUMBER7,8</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler (2(\frac{3}{4})&quot; x 0.113&quot; Φ x 0.281&quot; Φ)</td>
<td>Two staggered rows, 6&quot; o.c. (12&quot; o.c. each row).</td>
<td>360 plf</td>
</tr>
<tr>
<td>LUMBER BLOCK7</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler (2(\frac{3}{4})&quot; x 0.113&quot; Φ x 0.281&quot; Φ)</td>
<td>Two staggered rows, 4&quot; o.c. (8&quot; o.c. each row).</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X LUMBER7</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler (2(\frac{3}{4})&quot; x 0.113&quot; Φ x 0.281&quot; Φ)</td>
<td>Two staggered rows, 4&quot; o.c. (8&quot; o.c. each row).</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X LUMBER7</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler (2(\frac{3}{4})&quot; x 0.113&quot; Φ x 0.281&quot; Φ)</td>
<td>Two staggered rows, 3&quot; o.c. (6&quot; o.c. each row).</td>
<td>720 plf</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 plf = 14.59 N/m.

1See details SIP- T101c, SIP101f, SIP-102, SIP-102k, and SIP-102m, as shown in Figures 1, 2, 3, 7 and 8, respectively. Framing lumber must be minimum Spruce-pine-fir No. 2 or better.
2End posts and splines must be framed to provide full end bearing in accordance with IBC Section 2304.9.7. OSB facings must be fully bearing on structural supports. A hold-down device must be attached to the vertical studs at each end of the shear wall assembly. Installation of the hold-down devices must be in accordance with the hold-down device manufacturer’s instructions and as designed by the registered design professional.
3Top-of-wall horizontal in-plane drift (deflection) of R-Control SIP shear wall assemblies is 1/8 inch at the tabulated allowable lateral load.
4The tabulated allowable racking shear loads are for panels installed with the strong axis of the OSB panel facings parallel to the wall height.
5Splines must be as described in Section 3.2.4 of this report.
6The minimum fastener edge distance is 3/4-inch. Nails shall be installed on both sides of spline joint, bottom plate, top plate, and vertical boundary members (end posts) of the SIP shearwall. Nails must comply with ASTM F1667 and have a minimum bending yield strength of 100 ksi (689 MPa). For nails installed into the shearwall perimeter (top plate, bottom plate and end posts), the first row of nails must be 1/4-inch from the sandwich panel edges and the second row must be 1 1/2 inches from the first row. For nails installed into the vertical splines, the rows of nails must be installed as shown in Figure 7 of this report.
7This installation configuration is also recognized for use in Seismic Design Categories A through C. The maximum shear wall height-to-length ratio is 2:1.
8This installation configuration is also recognized for use as both load-bearing and nonload-bearing shearwalls in Seismic Design Categories D, E and F with the seismic design coefficients of R = 6.5, Ω = 3.0, and Cv = 4.0 under the following provisions:
   a. The maximum shear wall height-to-width ratio is 1:1.
   b. The shear walls are supported by a rigid support, such as a concrete foundation.
   c. The wall panels must be installed in a manner such that both facings of the wall panels are equally and uniformly restrained at the top and bottom of the panels. The member, element or structure supporting the shear wall and the vertical restraint provided to the facers of the SIPs at the top and bottom of the wall panel must be designed and detailed by a registered design professional.
   d. No splines permitted in shear wall assembly.
TABLE 5—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP WALLS
WITH SURFACE, BLOCK, OR LUMBER BLOCK SPLINES¹,²,³,⁴,⁵ (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>DEFLECTION LIMITS⁶</th>
<th>SIP HEIGHT (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L₃₀₀</td>
<td>8</td>
</tr>
<tr>
<td>4¹/₂</td>
<td>L₃₀₀</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>56</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td>6¹/₂</td>
<td>L₃₀₀</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>56</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td>8¹/₄</td>
<td>L₃₀₀</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>56</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>56</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 4.88 kg/m²

¹See details SIP-101c, SIP-102, SIP-102g, and SIP-102m, as shown in Figures 1, 3, 6 and 8, respectively.
²At panel ends, each OSB facing must be fastened to solid lumber sills and plates (minimum specific gravity of 0.42) end with 2.5 inch long (8d box) nails spaced at 6 inches on center on both faces of the panels. The sills and plates must be connected to structural supports. Connection specifications, design and installation must be in accordance with the IBC and applicable ESRs.
³Tabulated values are uniformly applied loads and are based on the strong-axis of the facing material oriented parallel to the span direction, except as stated in footnote 6.
⁴Values apply to short duration seismic or wind loads only.
⁵Deflection limit must be selected by building designer based on the serviceability (deflection) requirements of the structure (IBC Section 1604.3).
⁶Tabulated values for 8 foot height weak axis bearing (WAB) are applicable to SIPs installed with the strong axis of the OSB facings perpendicular to the SIP height.

TABLE 6—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP FLOORS AND ROOFS
WITH SURFACE, BLOCK, OR LUMBER BLOCK SPLINES¹,²,³,⁴,⁵,⁶,⁷ (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>DEFLECTION LIMITS⁴</th>
<th>SIP SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L₃₀₀</td>
<td>4</td>
</tr>
<tr>
<td>4¹/₂</td>
<td>L₃₀₀</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>127</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>127</td>
</tr>
<tr>
<td>6¹/₂</td>
<td>L₃₀₀</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>131</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>131</td>
</tr>
<tr>
<td>8¹/₄</td>
<td>L₃₀₀</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>135</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>135</td>
</tr>
<tr>
<td>10¹/₄</td>
<td>L₃₀₀</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>140</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>12¹/₄</td>
<td>L₃₀₀</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>L₂₄₀</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>L₁₈₀</td>
<td>138</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>138</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 4.88 kg/m²

¹See details SIP-102, SIP-102g, or SIP-102m, as shown in Figures 1, 3, 6, and 8, respectively.
²SIPs must be single span, simply supported and have a minimum 1½-inch wide continuous bearing support at each end.
³Tabulated allowable transverse load is the maximum load (pounds per square foot) applied uniformly.
⁴The tabulated allowable transverse load is the lesser of the allowable load based on the applicable serviceability (deflection) limit (IBC Section 1604.3) or the strength limit (IBC Section 1604.2) using a factor of safety of three.
⁵Roofs must be designed to support a 300 lb. concentrated load according to IBC Section 1607.4 when the roof has access to maintenance workers.
⁶Values do not include dead weight of panels. Permanent loads, such as dead load, must not exceed 0.5 of the tabulated load.
⁷Tabulated values for 8 foot spans are applicable to SIPs installed with the strong axis of the OSB facings parallel or perpendicular to the SIP span.
### TABLE 7—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP, FLOORS AND ROOFS WITH DOUBLE 2x WOOD MEMBER SPLINES\textsuperscript{1,2,3,4,5,6} (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>LIMITS</th>
<th>PANEL SPAN (ft.)</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6\frac{1}{2})</td>
<td></td>
<td></td>
<td>79</td>
<td>59</td>
<td>45</td>
<td>35</td>
<td>28</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2})</td>
<td></td>
<td>105</td>
<td>79</td>
<td>60</td>
<td>47</td>
<td>37</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td>105</td>
<td>88</td>
<td>75</td>
<td>66</td>
<td>59</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8\frac{1}{4})</td>
<td></td>
<td></td>
<td>89</td>
<td>65</td>
<td>48</td>
<td>37</td>
<td>28</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2})</td>
<td></td>
<td>109</td>
<td>91</td>
<td>72</td>
<td>55</td>
<td>42</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})</td>
<td></td>
<td>109</td>
<td>91</td>
<td>78</td>
<td>68</td>
<td>57</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td>109</td>
<td>91</td>
<td>78</td>
<td>68</td>
<td>60</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10\frac{1}{4})</td>
<td></td>
<td></td>
<td>174</td>
<td>145</td>
<td>124</td>
<td>98</td>
<td>77</td>
<td>61</td>
<td>49</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2})</td>
<td></td>
<td>174</td>
<td>145</td>
<td>124</td>
<td>109</td>
<td>87</td>
<td>82</td>
<td>66</td>
<td>54</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td>174</td>
<td>145</td>
<td>124</td>
<td>109</td>
<td>87</td>
<td>87</td>
<td>79</td>
<td>73</td>
</tr>
<tr>
<td>(12\frac{1}{4})</td>
<td></td>
<td></td>
<td>177</td>
<td>148</td>
<td>127</td>
<td>111</td>
<td>99</td>
<td>84</td>
<td>68</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2})</td>
<td></td>
<td>177</td>
<td>148</td>
<td>127</td>
<td>111</td>
<td>99</td>
<td>89</td>
<td>81</td>
<td>74</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td>177</td>
<td>148</td>
<td>127</td>
<td>111</td>
<td>99</td>
<td>89</td>
<td>81</td>
<td>74</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 4.88 kg/m\(^2\).

\(^{1}\)See detail SIP-102d, as shown in Figure 5.
\(^{2}\)Double 2x lumber splines must be continuous full length minimum spruce-pine-fir, minimum No. 2 grade, except the lumber must be Douglas fir–larch, minimum No. 2 grade, for 12\(\frac{1}{4}\)-inch thick SIPs for all spans and 10\(\frac{1}{4}\)-inch-thick SIP panels spanning greater than 22 ft.
\(^{3}\)SIPs must be single span, simply supported and have a minimum 1\(\frac{1}{2}\)-inch wide continuous bearing support at each end.
\(^{4}\)Tabulated allowable transverse load is the maximum load (pounds per square foot) applied uniformly.
\(^{5}\)The tabulated allowable transverse load is the lesser of the allowable load based on the applicable serviceability (deflection) limit (IBC Section 1604.3) or the strength limit (IBC Section 1604.2) using a factor of safety of 3.
\(^{6}\)Roofs must be designed to support a 300 lb. concentrated load according to IBC Section 1607.4 when the roof has access to maintenance workers.

### TABLE 8—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP, FLOORS AND ROOFS WITH I-BEAM SPLINES\textsuperscript{1,2,3,4,5,6} (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>LIMITS</th>
<th>SIP SPAN (ft.)</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>(10\frac{1}{4})</td>
<td></td>
<td></td>
<td>118</td>
<td>98</td>
<td>73</td>
<td>55</td>
<td>42</td>
<td>33</td>
<td>26</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2})</td>
<td></td>
<td>118</td>
<td>98</td>
<td>84</td>
<td>74</td>
<td>63</td>
<td>49</td>
<td>39</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})</td>
<td></td>
<td>118</td>
<td>98</td>
<td>84</td>
<td>74</td>
<td>65</td>
<td>59</td>
<td>49</td>
<td>41</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td>118</td>
<td>98</td>
<td>84</td>
<td>74</td>
<td>65</td>
<td>59</td>
<td>49</td>
<td>42</td>
</tr>
<tr>
<td>(12\frac{1}{4})</td>
<td></td>
<td></td>
<td>131</td>
<td>109</td>
<td>87</td>
<td>69</td>
<td>55</td>
<td>45</td>
<td>37</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2})</td>
<td></td>
<td>131</td>
<td>109</td>
<td>93</td>
<td>82</td>
<td>72</td>
<td>65</td>
<td>55</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})</td>
<td></td>
<td>131</td>
<td>109</td>
<td>93</td>
<td>82</td>
<td>72</td>
<td>65</td>
<td>57</td>
<td>48</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td>131</td>
<td>109</td>
<td>93</td>
<td>82</td>
<td>72</td>
<td>65</td>
<td>57</td>
<td>48</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 4.88 kg/m\(^2\).

\(^{1}\)See detail SIP-102b, as shown in Figure 4.
\(^{2}\)I-beam splines must be continuous full length.
\(^{3}\)SIPs must be single span, simply supported and have a minimum 1\(\frac{1}{2}\)-inch wide continuous bearing support at each end.
\(^{4}\)Tabulated allowable transverse load is the maximum load (pounds per square foot) applied uniformly.
\(^{5}\)The tabulated allowable transverse load is the lesser of the allowable load based on the applicable serviceability (deflection) limit (IBC Section 1604.3) or the strength limit (IBC Section 1604.2) using a factor of safety of three.
\(^{6}\)Roofs must be designed to support a 300 lb. concentrated load according to IBC Section 1607.4 when the roof has access to maintenance workers.
**TABLE 9—ALLOWABLE SHEAR LOAD FOR R-CONTROL SIPs ROOF AND FLOOR PANEL DIAPHRAGM ASSEMBLIES WITH SUPPORT FRAMING OF DOUGLAS FIR–LARCH OR SOUTHERN PINE FOR WIND OR SEISMIC LOADING**†, ‡, §, ¶, ††, †‡, †§

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>FASTENER SPACING (in.)</th>
<th>Boundaries</th>
<th>Splines</th>
<th>Panels to Supports Parallel to Shear</th>
<th>MAXIMUM ASSEMBLY LENGTH (ft.) AND ASPECT RATIO</th>
<th>ALLOWABLE STRENGTH (plf)</th>
<th>APPARENT SHEAR STIFFNESS, Ga, (lbf/in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R-Control Screws</td>
<td>8d Box Nails</td>
<td>8d Box Nails</td>
<td>R-Control Screws</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6½ to 12³/₄</td>
<td>6</td>
<td>3 @ top and bottom</td>
<td>3, in two rows each side of joint and staggered</td>
<td>12</td>
<td>36, 3:1</td>
<td>500</td>
<td>12,900</td>
</tr>
<tr>
<td>6½ to 12³/₄</td>
<td>4</td>
<td>3 @ top and bottom</td>
<td>3, in two rows each side of joint and staggered</td>
<td>12</td>
<td>36, 3:1</td>
<td>750</td>
<td>9,500</td>
</tr>
<tr>
<td>6½ to 12³/₄</td>
<td>3</td>
<td>3 @ top and bottom</td>
<td>3, in two rows each side of joint and staggered</td>
<td>12</td>
<td>24, 3:1</td>
<td>850</td>
<td>35,100</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 plf = 14.59 N/m, 1 lbf/in = 0.175 N/mm, 1 psi = 6895 Pa.

†See details SIP-139, SIP-140, and SIP-141, as shown in Figures 13, 14 and 15, respectively.
‡Deflections at mid-span of a simply supported diaphragm must be computed in accordance with the following equation:

\[
\delta = \frac{5vl^3}{8EIA} + \frac{0.25vl^3}{1,000G_a} + \frac{\Sigma(x\Delta_c)}{2W^2}
\]

where:

- \( E \) = Modulus of elasticity of diaphragm chords, psi (Pa)
- \( A \) = Area of chord cross-section, in.² (mm²)
- \( G_a \) = Apparent diaphragm shear stiffness from nail slip and panel shear deformation, lbf/in. (N/mm)
- \( L \) = Diaphragm length, ft. (m)
- \( v \) = Induced unit shear in diaphragm, lbf/ft (N/m)
- \( W \) = Diaphragm width, ft. (m)
- \( x \) = Distance from chord splice to nearest support, in. (mm)
- \( \Delta_c \) = Maximum mid-span diaphragm deflection determined by elastic analysis, in. (mm)

§Diaphragm boundary elements must consist of full-depth, solid-sawn lumber, 2-inch minimum nominal width, minimum specific gravity of 0.50, inserted in SIP core, continuous across panel joints. Additionally, the diaphragm boundary elements must be supported by a continuous lumber member having a minimum 4-inch nominal width and minimum 3-inch nominal depth, minimum specific gravity of 0.50, and must be secured to the support member with the R-Control screws at the tabulated spacing and a minimum 1½ inch penetration into the receiving member.

¶Nails connect SIP facings at joints perpendicular to shear to 7/16-in. x 4-in. OSB surface splines located under top face at all panel edges, at the tabulated spacing.

†Diaphragm boundary elements must consist of full-depth, solid-sawn lumber, 2-inch minimum nominal width, minimum specific gravity of 0.50, inserted in SIP core, continuous across panel joints. Additionally, the diaphragm boundary elements must be supported by a continuous lumber member having a minimum 4-inch nominal width and minimum 3-inch nominal depth, minimum specific gravity of 0.50, and must be secured to the support member with the R-Control screws at the tabulated spacing and a minimum 1½ inch penetration into the receiving member.

††Nails connect SIP facings at joints perpendicular to shear to 7/16-in. x 4-in. OSB surface splines located under top face at all panel edges, at the tabulated spacing.

†‡Nails connect SIP facings at joints perpendicular to shear to 7/16-in. x 4-in. OSB surface splines located under top face at all panel edges, at the tabulated spacing.

†§Nails connect SIP facings at joints perpendicular to shear to 7/16-in. x 4-in. OSB surface splines located under top face at all panel edges, at the tabulated spacing.

**TABLE 10—ALLOWABLE VERTICAL LOAD FOR R-CONTROL SIP HEADERS**†, ‡, §, ¶, ††, †‡, †§ (plf)

<table>
<thead>
<tr>
<th>SIP HEADER DEPTH (in.)</th>
<th>LIMITS</th>
<th>HEADER SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>4/120</td>
<td>524</td>
</tr>
<tr>
<td></td>
<td>4/160</td>
<td>703</td>
</tr>
<tr>
<td></td>
<td>4/240</td>
<td>708</td>
</tr>
<tr>
<td></td>
<td>Strength</td>
<td>708</td>
</tr>
<tr>
<td>18</td>
<td>4/120</td>
<td>762</td>
</tr>
<tr>
<td></td>
<td>4/160</td>
<td>773</td>
</tr>
<tr>
<td></td>
<td>4/240</td>
<td>773</td>
</tr>
<tr>
<td></td>
<td>Strength</td>
<td>773</td>
</tr>
<tr>
<td>24</td>
<td>4/120</td>
<td>837</td>
</tr>
<tr>
<td></td>
<td>4/160</td>
<td>837</td>
</tr>
<tr>
<td></td>
<td>4/240</td>
<td>837</td>
</tr>
<tr>
<td></td>
<td>Strength</td>
<td>837</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 plf = 14.59 N/m.

†See details SIP-112, SIP-113 and SIP-114, as shown in Figures 9, 10 and 11, respectively.
‡Tabulated allowable load is the maximum load (pounds per square foot) applied uniformly.
§Headers are permitted to have splines at supported ends. Alternatively, the header may be continuous without splines.
¶Top and bottom plates must have a minimum assigned specific gravity of 0.50, such as Douglas fir–larch, and minimum No. 2 grade. The nominally 2-inch-thick wood top plate must have a width equal to the SIP core thickness and be recessed into the pre-cut channel in the top of the header.
†Concentrated loads superimposed on SIP wall headers must be supported by conventional construction methods or by other methods designed and constructed to support the governing load combination defined in IBC Section 1605.3 without exceeding the appropriate specified allowable stresses for the materials of construction.
††The tabulated allowable vertical load is the lesser of the allowable load based on the applicable serviceability (deflection) limit (IBC Section 1604.3) or the strength limit (IBC Section 1604.2) using a factor of safety of three.
‡†Vertical members supporting each end of the SIP headers must be designed for the tributary vertical (gravity) and transverse (wind) loads carried by SIP headers.
SECTION
Scale: NTS

**R-Control® SIP**

**TITLE:** Plate Connections

**NO.:** Sip-101c

**NOTE:** Use minimum grade SPF #2 or engineered equivalent for 2X plating.

---

**FIGURE 1**

- 8d box (0.113) nails @ 6” o.c. each side, or equivalent. Typical top & bottom.
- Factory electrical chase.
- R-Control Do-All-Ply 1/2” diameter continuous bead top & bottom plate, see SIp-101a.
- Varies

---

**SECTION**
Scale: NTS

**R-Control® SIP**

**TITLE:** High Load Shear Wall

**NO.:** SIp-101f

**NOTE:** Use minimum grade Douglas-fir larch #2 or equivalent.

---

**FIGURE 2**

- 8d box (0.113) nails in two staggered rows, 2” o.c. each side of panel.
- Factory electrical chase.
- R-Control Do-All-Ply 1/2” diameter bead top & bottom plate, see SIp-101a.
- 3 1/2”
- Varies
Note: Spline to be of material conforming to DOC PS2, min thickness 7/16".

R-Control
Do-All-Ply 1/2" diameter continuous bead.

8d box (0.113) nails @ 6" o.c. both sides of panel joint or equivalent.
Typical each side of panel.

Spline
Factory electrical chase.
R-Control SIP.

FIGURE 3

SECTION/PLAN
Updated 1-16-12
Scale: NTS

R-Control® SIP
TITLE: Spline Connection Surface Spline NO. SIP-102

FIGURE 4

SECTION/PLAN
Updated 1-16-12
Scale: NTS

R-Control® SIP
TITLE: Spline Connection I-Beam Spline NO. SIP-102b
8d box (0.113) nails in two staggered rows, 2" o.c. both sides of joint.

3" 1/2"

3/8"

2"

PLAN
Scale: NTS
R-Control Do-All-Ply 1/2" diameter continuous bead.

Note: Use minimum grade Douglas-fir larch #2 or equivalent.

SECTION
Scale: NTS
SIP Tape or equivalent vapor retarder located interior or exterior per climate conditions or code requirement.

SECTION/PLAN
Scale: NTS
R-Control SIP.

8d box (0.113) nails in two staggered rows, 2" o.c. both sides of joint, top and bottom.

SIP Tape or equivalent vapor retarder located interior or exterior per climate conditions or code requirement.

FIGURE 7

FIGURE 8
FIGURE 9

NOTE: Diagram represents headers in a wall assembly. Refer to detail SIP-112a. Minimum dimensions are not required between openings, but the posts supporting the header must extend to the floor. The bottom plate of the header must extend to the outside of the post.

ISOMETRIC
Scale: NTS
Updated 1–16–12

R-Control® SIP

Headers
SIP-112

FIGURE 10

R-Control SIP used as header.

8d box (0.113) nails @ 6" o.c. each side, top & bottom or equivalent.

R-Control Do–All–Ply 1/2" diameter continuous bead.

See Load Design Chart #5 for allowable depths, spans & capacities of R-Control SIP used as a header.

SECTION
Scale: NTS
Updated 1–16–12

R-Control® SIP

SIP Header Plates
SIP-113
FIGURE 11

**ISOMETRIC**

Scale: NTS

**R-Control® SIP**

**TITLE:** SIP Header  
**NO.:** SIP-114

**FIGURE 11**

---

FIGURE 12

**ISOMETRIC**

Scale: NTS

**R-Control® SIP**

**TITLE:** Chase - Locations In SIP  
**NO.:** SIP-129

**FIGURE 12**

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**Notes:**

1. Factory provided electrical chases must be pre-arranged with the R-Control SIP Manufacturer prior to fabrication of the panels.
2. SIP installer shall provide field drilled holes in top plates, sill/base plates, vertical plates and through floors to access electrical chases.
3. Follow local code requirements for electrical installation.

**NOTE:** Diagram represents headers in a monolithic wall assembly. Splines may occur above & below openings. Minimum panel dimension of 12" must be maintained over openings.

Factory provided electrical chases.
8d box (0.113) nails in two rows 3" o.c. both sides of joint.

Note: roof covering & underlayment as req’d by code.

Note: Spline to be of material conforming to DOC PS2, min thickness 7/16".

R-Control Wood Screw.

R-Control Do-All-Ply 1/2" diameter continuous bead.

Member designed by others.

SIP Tape or equivalent vapor retarder located interior or exterior per climate conditions or code requirement.

min. 1 5/8" penetration.
Note: roof covering & underlayment as req’d by code.

Note: Spline to be of material conforming to DOC PS2, min thickness 7/16”.

8d box (0.113) nails @ 3” o.c. both sides of panel joint or equivalent. (See SIP-139)

R-Control SIP.

R-Control Wood Screw, min. 1-5/8” penetration, see Load Design Charts for spacing requirements.

SIP Tape or equivalent vapor retarder located interior or exterior per climate conditions or code requirement.

Surface spline (see SIP-102).

R-Control Do-All-Ply 1/2” diameter continuous bead.

Structural support member. Minimum 3” wide.

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SECTION

Scale: NTS

R-Control® SIP

TITLE: Diaphragm Connection
- Intermediate support

NO. SIP-141

Updated 1-16-12

FIGURE 15
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that R-Control® Structural Insulated Panels (SIPs), described in ICC-ES evaluation report ESR-2233, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:
- 2017 City of Los Angeles Building Code (LABC)
- 2017 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The R-Control® Structural Insulated Panels (SIPs), described in Sections 2.0 through 7.0 of the evaluation report ESR-2233, comply with the LABC Chapters 7, 23 and 26, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The R-Control® Structural Insulated Panels (SIPs), described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-2233.
- The design, installation, conditions of use and identification are in accordance with the 2015 International Building Code® (2015 IBC) provisions noted in the evaluation report ESR-2233.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The R-Control® Structural Insulated Panels (SIPs) have not been evaluated under LABC Chapter 7A or LARC Section R337 for use in the exterior design and construction of new buildings located in any Fire Hazard Severity Zone within a State Responsibility Areas or any Wildland-Urban Interface Fire Area.

This supplement expires concurrently with the evaluation report, reissued July 2018 and revised March 2020.