1. EVALUATION SCOPE
Compliance with the following codes:
- 2018, 2015, and 2012 International Residential Code® (IRC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-4780 LABC and LARC Supplement.

Properties evaluated:
- Structural
- Thermal barrier
- Fire resistance

2. 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. 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).

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 3 5/8, 5 5/8, 7 3/8, 9 3/8, or 11 1/8 inches (92, 143, 187, 238 and 289 mm).

3.2.2 Facing: The facing material is nominally 7/16-inch-thick (11.1 mm), 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 l-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 1/2, 5 1/2, 7 1/4, 9 1/4, and 11 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 1/2, 5 1/2, 7 1/4, 9 1/4, and 11 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.
l-beam splines are single-web l-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 lumber 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 (526 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.

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.

4.1.2 R-Control SIP Headers: Openings in R-Control SIP walls are limited to sizes, spans and the allowable loads specified in Table 10. Openings not covered by Table 10 must be framed to comply with requirements in the IBC or IRC, as applicable.

4.2 Installation:

4.2.1 General: R-Control SIPs must be installed in accordance with the manufacturer’s published installation instructions, this evaluation report and the plans and specifications approved by the code official. The manufacturer’s published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available at all times on the jobsite during installation.

Panels must be connected to each other along their edges with splines described in Section 3.2.4. Splines must be connected to the SIPs by fastening through the SIP OSB facing as specified by the applicable tables in this report.

4.2.2 Walls: The SIP core is typically recessed either 1\(\frac{1}{2}\) inches (38 mm) or 3\(\frac{3}{8}\) inches (89 mm) from the bottom and top panel edges. The recesses receive either nominally 2-by-4 or 4-by spruce-pine-fir No. 2 or better bottom and top plates in a width matching the core thickness. R-Control Low VOC Do-All-Ply is applied to the plates as indicated in the figures of this report. Bottom and top plates must be fastened to the facings with 8d box nails at 6 inches (152 mm) on center as indicated in the tables, or in an equivalent, approved fashion.

The SIP core is recessed on the vertical sides to receive splines or vertical boundary members. R-Control Low VOC Do-All-Ply is applied to the splines as indicated in the figures of this report.

The SIP may have factory-cut, 1\(\frac{1}{2}\)-inch-diameter (38 mm) wiring chases centered within the core: a horizontal chase at receptacles height, a horizontal chase at switch height, and vertical chases spaced a maximum of 48 inches (1219 mm) from one another.

4.2.3 Floors and Roofs: R-Control SIPs used for floors or roofs are a maximum of 8 feet (2.4 m) wide when joined with surface splines, block splines, or lumber block splines, and are a maximum of 4 feet (1.2 m) wide when joined with other splines described in Section 3.2.4 of this report. The SIP core is recessed to receive splines. R-Control Low VOC Do-All-Ply is applied to the splines as indicated in the figures of this report.

4.2.4 Headers: R-Control SIP headers must be constructed as described in Table 10 and the figures of this report.

4.2.5 SIP Protection:

4.2.5.1 Thermal Barrier at Wall, Roof and Floor: 1\(\frac{3}{4}\)-inch-thick (12.7 mm), regular 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 having occupied space below the floor panel. The wallboard must be fastened to the face of the panels with minimum 1\(\frac{1}{2}\)-inch-long (31.7 mm). No. 6, Type W drywall screws spaced in accordance with ASTM C840 for use under the IBC, or Table R702.3.5 of the IRC, using 16-inch-on-center (406.4 mm) framing spacing guidelines. Alternatively, the interior of the R-Control SIP must be Blazeguard FR Deck Panel A in accordance with Section 3.2.2 of this report.

4.2.5.2 Thermal Barrier at Floor Surface: An approved thermal barrier must be installed over the top surface of the floor panels, such as minimum 1\(\frac{3}{4}\)-inch-thick (76 mm) wood-based structural use sheathing installed in accordance with the applicable code.

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\(\frac{3}{4}\)-inch-thick (11.1 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\(\frac{1}{2}\), 6\(\frac{1}{2}\), or 8\(\frac{1}{4}\) inches (114, 165, or 210 mm) are used to construct a one-hour fire-resistance rated wall assembly. The SIP core is recessed 1\(\frac{1}{2}\) inches (38 mm) from the bottom SIP edge and 1\(\frac{1}{2}\) 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 15/8-inch-long (41.28 mm), Type W, self-piercing tapping screws (ASTM C1002) spaced 8 inches (203 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 15/8-inch-long (41.28 mm), Type W, self-piercing tapping screws complying with ASTM C1002, spaced 12 inches (305 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 24 inches (610 mm) on center vertically and 16 inches (406 mm) on center horizontally. The SIPs have a minimum width of 4 feet (2.4 m) and must be spaced in accordance with the IBC or IRC, as applicable.

Exposed gypsum board joints must be covered with joint tape and joint compound and the exposed nail heads must be 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 psf (26 kN/m).

4.2.6.2 One-hour Limited Load-bearing Wall Assembly: R-Control SIPs with a 61/2- or 81/4-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 11/2 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 spaced 6 inches (152 mm) on center vertically and 12 inches (305 mm) horizontally in the field of the board. The exposed joints of the SIPs must be covered with joint tape and joint compound. Screw heads must be covered with joint compound in accordance with ASTM C840.

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 41/2 inches wide by 91/2 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 41/2 inches to 121/4 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 11/4-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 spaced 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 C, 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, 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 IBC Section 2304.11.2; or 2015, or 2012 IRC Section R317.1, as applicable.

5.5 R-Control SIPs with thicknesses of 10½ and 12¼ 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 IBC Sections 2304.11.2.2 and 2304.11.2.6; or 2018, 2015, or 2012 Section 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-resistive 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 listee 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 (ThermaFoam R-Control, LLC), and/or the listee’s name (Branch River Plastics, Inc.), plant identification numbers (see Table 1); the product name (R-Control® SIPs); and/or the evaluation report number (ESR-4780).

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-4780).”

7.4 R-Control SIP Screws are labeled with the words “for use with R-Control SIPs (ESR-4780).”

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

THERMAFOAM R-CONTROL, LLC.
203 SOUTH REDMOND ROAD
JACKSONVILLE, ARKANSAS 72076
www.thermafoamark.com

7.6 The Additional Listee’s contact information is the following:

BRANCH RIVER PLASTICS, INC.
15 THURBER BOULEVARD
SMITHTFIELD, RHODE ISLAND 02917
TABLE 1—MANUFACTURING LOCATIONS

<table>
<thead>
<tr>
<th>LISTEE</th>
<th>LOCATION</th>
<th>PLANT ID NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThermaFoam R-Control, LLC</td>
<td>203 South Redmond Road</td>
<td>TF-3</td>
</tr>
<tr>
<td></td>
<td>Jacksonville, Arkansas 72076</td>
<td></td>
</tr>
<tr>
<td>Branch River Plastics, Inc.</td>
<td>15 Thurber Boulevard</td>
<td>TF-6</td>
</tr>
<tr>
<td></td>
<td>Smithfield, Rhode Island 02917</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 2—R-CONTROL SIP Weight (psf)

<table>
<thead>
<tr>
<th>SIP Thickness (in.)</th>
<th>4(\frac{1}{2})</th>
<th>6(\frac{1}{2})</th>
<th>8(\frac{1}{4})</th>
<th>10(\frac{1}{4})</th>
<th>12(\frac{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>
</tbody>
</table>

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

TABLE 3—ALLOWABLE AXIAL LOAD FOR R-CONTROL SIP WALLS\(^{1,2,3,4,6}\) (plf) (See Detail SIP-101c)

<table>
<thead>
<tr>
<th>SIP HEIGHT (ft.)</th>
<th>4(\frac{1}{2}) INCH THICK</th>
<th>6(\frac{1}{2}) INCH THICK</th>
<th>8(\frac{1}{4}) INCH THICK</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 WAB(^7)</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.

\(^1\)See detail SIP-101c, as shown in Figure 1.
\(^2\)Tabulated 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.
\(^3\)Tabulated allowable axial load is based on a SIP with a maximum height to width ratio of 4:1.
\(^4\)For fire-resistance-rated wall assemblies, axial load limitations in Section 4.2.6 must be observed.
\(^5\)For combined loading, the requirements in Section 4.1 must be applied.
\(^6\)The maximum allowable axial load is limited to 71 percent of the reported allowable axial load when used as shear walls.
\(^7\)Tabulated 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.
The minimum fastener edge distance is ¼-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 ¾-inch from the sandwich panel edges and the second row must be 1½ 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.

The installation is recognized for use in Seismic Design Categories A through C. The maximum shear wall height-to-width ratio is 2:1.

This 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 $R = 6.5$, $Q_o = 3.0$, and $C_D = 4.0$ and have a maximum shear wall height-to-length ratio of 3:8.1

The following provisions must be considered when R-Control SIPs are used as both load-bearing and nonload-bearing shear walls panels in Seismic Design Categories A, B, C, D, E and F with the seismic design coefficients of $R = 6.5$, $Q_o = 3.0$, and $C_D = 4.0$ and have a maximum shear wall height-to-length ratio of 3:8.1:

<table>
<thead>
<tr>
<th>SPLINE TYPE</th>
<th>Bottom Plate</th>
<th>Top Plate</th>
<th>End Posts</th>
<th>NAIL TYPE</th>
<th>NAIL SPACING</th>
<th>ALLOWABLE LOADS (plf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface or Block</td>
<td>Single 2-by</td>
<td>Single 2-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d box</td>
<td>Single row at 6&quot; o.c.</td>
<td>335 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 6&quot; o.c. each row</td>
<td>360 plf</td>
</tr>
<tr>
<td>Lumber Block</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 4&quot; o.c. each row</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 4&quot; o.c. each row</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 3&quot; o.c. each row</td>
<td>720 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 2&quot; o.c. each row</td>
<td>920 plf</td>
</tr>
</tbody>
</table>

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

1. See details SIP-101c, SIP101f, 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.
2. End 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.
3. The tabulated allowable racking shear loads are for panels installed with the strong axis of the OSB panel facings parallel to the wall height.
4. Splines must be as described in Section 3.2.4 of this report.
5. The tabulated allowable lateral drift of R-Control SIP shear wall assemblies is ¼ inch at the tabulated allowable lateral load.
6. The maximum shear wall height is 96 inches. Wall heights greater than 96 inches are outside the scope of this report.

<table>
<thead>
<tr>
<th>SPLINE TYPE</th>
<th>Bottom Plate</th>
<th>Top Plate</th>
<th>End Posts</th>
<th>NAIL TYPE</th>
<th>NAIL SPACING</th>
<th>ALLOWABLE LOADS (plf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface or Block</td>
<td>Single 2-by</td>
<td>Single 2-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d box</td>
<td>Single row at 6&quot; o.c.</td>
<td>335 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 6&quot; o.c. each row</td>
<td>360 plf</td>
</tr>
<tr>
<td>Lumber Block</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 4&quot; o.c. each row</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 4&quot; o.c. each row</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 3&quot; o.c. each row</td>
<td>720 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 2&quot; o.c. each row</td>
<td>920 plf</td>
</tr>
</tbody>
</table>

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

1. See details SIP-101c, SIP101f, 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.
2. End 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.
3. The tabulated allowable racking shear loads are for panels installed with the strong axis of the OSB panel facings parallel to the wall height.
4. Splines must be as described in Section 3.2.4 of this report.
5. The minimum fastener edge distance is ¼-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 ¾-inch from the sandwich panel edges and the second row must be 1½ 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.

This installation is recognized for use in Seismic Design Categories A through C. The maximum shear wall height-to-width ratio is 2:1.

This 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 $R = 6.5$, $Q_o = 3.0$, and $C_D = 4.0$ 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. When used as load-bearing panels, the allowable axial load must be determined in accordance with Table 3 of this report.

The following provisions must be considered when R-Control SIPs are used as both load-bearing and nonload-bearing shear wall panels in Seismic Design Categories A, B, C, D, E and F with the seismic design coefficients of $R = 6.5$, $Q_o = 3.0$, and $C_D = 4.0$ and have a maximum shear wall height-to-length ratio of 3:8.1:

a. The maximum shear wall height is 96 inches. Wall heights greater than 96 inches are outside the scope of this report.

b. The shear walls are supported by a rigid support, such as a concrete foundation.

c. The shear walls must be installed in a manner such that both facings of the shear wall panels are equally and uniformly restrained at the top and bottom of the shear wall panels. The member, element or structure supporting the shear wall panels and the vertical restraint provided to the facers of the SIPs at the top and bottom of the shear wall panels must be designed and detailed by a registered design professional.

d. No splines permitted in shear wall assembly.

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 TYPE</th>
<th>Bottom Plate</th>
<th>Top Plate</th>
<th>End Posts</th>
<th>NAIL TYPE</th>
<th>NAIL SPACING</th>
<th>ALLOWABLE LOADS (plf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface or Block</td>
<td>Single 2-by</td>
<td>Single 2-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d box</td>
<td>Single row at 6&quot; o.c.</td>
<td>335 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 6&quot; o.c. each row</td>
<td>360 plf</td>
</tr>
<tr>
<td>Lumber Block</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 4&quot; o.c. each row</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 4&quot; o.c. each row</td>
<td>540 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 3&quot; o.c. each row</td>
<td>720 plf</td>
</tr>
<tr>
<td>4X Lumber</td>
<td>Single 4-by</td>
<td>Single 4-by</td>
<td>Double 2-by or Single 4-by</td>
<td>8d cooler</td>
<td>Two staggered rows, 2&quot; o.c. each row</td>
<td>920 plf</td>
</tr>
</tbody>
</table>
SIPs must be single span, simply supported and have a minimum 1 1/2-inch wide continuous bearing support at each end.

Values do not include dead weight of panels. Permanent loads, such as dead load, must not exceed 0.5 of the tabulated load.

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.

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.

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

SI:

TABLE 5—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP WALLS
WITH SURFACE, BLOCK, OR LUMBER BLOCK SPLINES¹,²,³,⁴,⁵,⁶ (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>8</td>
<td>8 WAB⁵</td>
</tr>
<tr>
<td>4⁵⁄₄</td>
<td>l/360</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>l/180</td>
<td>56</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td>6³⁄₄</td>
<td>l/360</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>l/180</td>
<td>56</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td>8³⁄₄</td>
<td>l/360</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>l/180</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) with 0.113 inch diameter by 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.

³Deflection limit must be selected by building designer based on the serviceability (deflection) requirements of the structure (IBC Section 1604.3).

⁴Tabulated 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.

⁵Values apply to short duration seismic or wind loads only.

⁶Deflection limit must be selected by building designer based on the serviceability (deflection) requirements of the structure (IBC Section 1604.3).

Table 6—Allowable Transverse Load for R-Control SIP Floors and Roofs

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>DEFLECTION LIMITS⁶</th>
<th>SIP SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>4⁵⁄₄</td>
<td>l/360</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>l/180</td>
<td>127</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>127</td>
</tr>
<tr>
<td>6³⁄₄</td>
<td>l/360</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>l/180</td>
<td>131</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>131</td>
</tr>
<tr>
<td>8³⁄₄</td>
<td>l/360</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>l/180</td>
<td>135</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>135</td>
</tr>
<tr>
<td>10³⁄₄</td>
<td>l/360</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>l/180</td>
<td>140</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>12³⁄₄</td>
<td>l/360</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>l/240</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>l/180</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 3, 6, and 8, respectively.

²SIPs must be single span, simply supported and have a minimum 1 1/2-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 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 7—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP, FLOORS AND ROOFS WITH DOUBLE 2x WOOD MEMBER SPLINES\(^1,2,3,4,5,6\) (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>LIMITS</th>
<th>PANEL SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>6\text{1/2}</td>
<td>$\frac{1}{2}_{360}$</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{240}$</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{180}$</td>
<td>105</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>105</td>
</tr>
<tr>
<td>8\text{1/4}</td>
<td>$\frac{1}{2}_{360}$</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{240}$</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{180}$</td>
<td>109</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>109</td>
</tr>
<tr>
<td>10\text{1/4}</td>
<td>$\frac{1}{2}_{360}$</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{240}$</td>
<td>174</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{180}$</td>
<td>174</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>174</td>
</tr>
<tr>
<td>12\text{1/4}</td>
<td>$\frac{1}{2}_{360}$</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{240}$</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{180}$</td>
<td>177</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>177</td>
</tr>
</tbody>
</table>

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

\(^1\)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\text{1/4} inch thick SIPs for all spans and 10\text{1/4}-inch-thick SIP panels spanning greater than 22 ft.

\(^3\)SIPs must be single span, simply supported and have a minimum 1\text{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\(^1,2,3,4,5,6\) (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>LIMITS</th>
<th>SIP SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>10\text{1/4}</td>
<td>$\frac{1}{2}_{360}$</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{240}$</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{180}$</td>
<td>118</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>118</td>
</tr>
<tr>
<td>12\text{1/4}</td>
<td>$\frac{1}{2}_{360}$</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{240}$</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2}_{180}$</td>
<td>131</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td>131</td>
</tr>
</tbody>
</table>

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

\(^1\)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\text{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\(^1\,^2\,^3\,^4\,^5\,^6\)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>FASTENER SPACING (in.)</th>
<th>Panels to Supports Parallel to Shear(^3)</th>
<th>MAXIMUM ASSEMBLY LENGTH (ft.) AND ASPECT RATIO</th>
<th>ALLOWABLE STRENGTH (plf)</th>
<th>APPARENT SHEAR STIFFNESS, (G_s) (lbf/in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boundaries(^3)</td>
<td>Spines(^4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>6(\frac{1}{2}) to 12(\frac{1}{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>500</td>
</tr>
<tr>
<td>6(\frac{1}{2}) to 12(\frac{1}{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>750</td>
</tr>
<tr>
<td>6(\frac{1}{2}) to 12(\frac{1}{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>850</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.

\(^1\)See details SIP-139, SIP-140, and SIP-141, as shown in Figures 13, 14 and 15, respectively.

\(^2\)Deflections at mid-span of a simply supported diaphragm must be computed in accordance with the following equation:

\[
\delta = \frac{5vL^3}{8EAW} + \frac{0.25vL}{1,000G_s} + \frac{\Sigma(x\Delta_s)}{2W}
\]

where:

\(E\) = Modulus of elasticity of diaphragm chords, psi (Pa)

\(A\) = Area of chord cross-section, in.\(^2\), (mm\(^2\))

\(G_s\) = 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)

\(\Delta_s\) = Distance from chord splice to nearest support, in. (mm)

\(\delta\) = Maximum mid-span diaphragm deflection determined by elastic analysis, in. (mm)

\(^3\)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.

\(^4\)Diaphragm boundary elements 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.

\(^5\)Diaphragm ends perpendicular to spans must be staggered from adjacent panels.

TABLE 10—ALLOWABLE VERTICAL LOAD FOR R-CONTROL SIP HEADERS\(^1\,^2\,^3\,^4\,^5\,^6\,^7\) (plf)

<table>
<thead>
<tr>
<th>SIP HEADER DEPTH (in.)</th>
<th>LIMITS</th>
<th>HEADING SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>(\frac{1}{4})480</td>
<td>524</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})360</td>
<td>703</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})240</td>
<td>708</td>
</tr>
<tr>
<td></td>
<td>Strength</td>
<td>708</td>
</tr>
<tr>
<td>18</td>
<td>(\frac{1}{4})480</td>
<td>762</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})360</td>
<td>773</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})240</td>
<td>773</td>
</tr>
<tr>
<td></td>
<td>Strength</td>
<td>773</td>
</tr>
<tr>
<td>24</td>
<td>(\frac{1}{4})480</td>
<td>837</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4})360</td>
<td>837</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{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.

\(^1\)See details SIP-112, SIP-113 and SIP-114, as shown in Figures 9, 10 and 11, respectively.

\(^2\)Tabulated allowable load is the maximum load (pounds per square foot) applied uniformly.

\(^3\)Headers are permitted to have splines at supported ends. Alternatively, the header may be continuous without splines.

\(^4\)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.

\(^5\)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.

\(^6\)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.

\(^7\)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.
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.

NOTE: OSB facings must be fully supported by foundation system.

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

SECTION
Scale: NTS

Updated 1-16-12

R-Control® SIP
TITLE: Plate Connections
NO. SIP-101c

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.

NOTE: OSB facings must be fully supported by foundation system.

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

SECTION
Scale: NTS

Updated 1-16-12

R-Control® SIP
TITLE: High Load Shear Wall
4X Plate Connections
NO. SIP-101f
Note: Spline to be of material conforming to DOC PS2, min thickness 7/16".

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

Factory electrical chase.

R-Control SIP.

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

Typical each side of panel.

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

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

FIGURE 3

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

FIGURE 4

R-Control® SIP
TITLE: Spline Connection
I-Beam Spline
NO. SIP-102b
**FIGURE 7**

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

**SECTION**

Scale: NTS

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

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

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 8**

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

Factory electrical chase.

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

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

**SECTION/PLAN**

Scale: NTS

R-Control® SIP

**TABLE**: Spline Connection

| TITLE: | 4X - 2" o.c. | NO. | SIP-102k |

**R-Control® SIP**

**TABLE**: Spline Connection

| TITLE: | 1X Lumber Block | NO. | SIP-102m |
FIGURE 9

**ISOMETRIC**
Scale: NTS
Updated 1-16-12

R-Control SIP

**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.

R-Control SIP

**headers**

**SIP-112**

---

FIGURE 10

**SECTION**
Scale: NTS
Updated 1-16-12

R-Control SIP

**R-Control SIP**

**Panel Width**

See Load Design Chart #5 for allowable depths, spans & capacities of R-Control SIP used as a 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.
**FIGURE 11**

**R-Control SIP**

**TITLE:** SIP Header

**NO:** SIP-114

**Updated:** 1-18-12

NOTE: Diagram represents headers in monolithic fashion. Minimum panel dimension of 12" must be maintained over openings.

Surfacing spines, continuous top plate, and top plate over openings.

Factory provided electrical chases.

2X plating around window and door openings. Numbers indicate sequencing for installation of 2Xs to OSB facings.

**FIGURE 12**

**R-Control SIP**

**TITLE:** Chases - Locations

**NO:** SIP-129

**Updated:** 1-18-12

**Notes:**

1. Factory provided electrical chases must be pre-arranged with the R-Control SIP manufacturer prior to installation of SIP facings. Vertical plates and through floor plates will provide field drilled holes for electrical conveyance. Follow local code requirements for electrical installation.

2. Drilled holes in top plates, sill/base plates, and through floors to access electrical chases.
FIGURE 13

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

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

FIGURE 14

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

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

R-Control SIP

TITLE: Diaphragm Connection
   - Top Spline Only
NO. SIP-139

R-Control SIP

TITLE: Diaphragm Connection
   - Support Member
NO. SIP-140
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.

SECTION
Scale: NTS

Updated 1-16-12

R-Control® SIP

Title: Diaphragm Connection
    Intermediate support

No. SIP-141

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-4780, 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:
- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The R-Control® SIPs, described in Sections 2.0 through 7.0 of the evaluation report ESR-4780, comply with the LABC Chapters 7, 23 and 26, and the LARC, and are subject to the conditions of use described in this evaluation report supplement.

3.0 CONDITIONS OF USE

The R-Control® SIPs, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-4780.
- The design, installation, conditions of use and identification are in accordance with the 2018 International Building Code® (IBC) provisions noted in the evaluation report ESR-4780.
- 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.

This evaluation report supplement expires concurrently with the evaluation report ESR-4780, reissued February 2023.
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that R-Control Structural Insulated Panels, described in ICC-ES evaluation report ESR-4780, has also been evaluated for compliance with the codes noted below.

Applicable code editions:
- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

2.0 CONCLUSIONS

The R-Control Structural Insulated Panels, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4780, complies with the Florida Building Code—Building or the Florida Building Code—Residential. The design requirements shall be determined in accordance with the Florida Building Code—Building or the Florida Building Code—Residential, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4780 for the 2018 International Building Code® meet the requirements of the Florida Building Code—Building or the Florida Building Code—Residential, as applicable.

Use of the R-Control Structural Insulate Panels has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the Florida Building Code—Building or the Florida Building Code—Residential.

For products falling under Florida Rule 61G20-3, verification that the report holder’s quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued February 2023.