DIVISION: 06 00 0U0—WOOD, PLASTICS AND COMPOSITES
SECTION: 07 12 00—STRUCTURAL PANELS

REPORT HOLDER:

AFM CORPORATION
17645 JUNIPER PATH, SUITE 260
LAKEVILLE, MINNESOTA 55044

EVALUATION SUBJECT:

R-CONTROL® STRUCTURAL INSULATED PANELS (SIPS)

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”
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 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).

3.2 Materials:

3.2.1 Expanded Polystyrene: The EPS foam plastic core is Foam-Control EPS with Perform Guard, which is recognized in ESR-1006 and complies with ASTM C578, Type I. EPS core nominal thickness is 3\(\frac{5}{8}\), 5\(\frac{5}{8}\), 7\(\frac{3}{8}\), 9\(\frac{3}{8}\), or 11\(\frac{3}{8}\) inches.

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-1/16-inch-thick (76 mm by 1.1 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.

Lumber block 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 9/16 and 11/16 inches (235 and 286 mm) with minimum 1 1/2-inch-by-2 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 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 (826 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 combined stresses, the sum of the ratios of actual load over allowable load must be less than 1.0.

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 1/2 inches (38 mm) or 3 1/4 inches (89 mm) from the bottom and top panel edges. The recesses receive either nominally 2-by 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 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 minimum 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: One-half-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 1/2-inch-long (31.7 mm), Type 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 1/16-inch-thick (76 mm) wood-based structural shear 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 1/10-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 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-6 or 2-by-8 wood plates 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 8d box nails spaced 6 inches (152 mm) on center and staggered. R-Control Low VOC Do-All-Ply is applied to the SIPs 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 5/16-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, 5/8 inches (15.88 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 psf (32 kN/m²).

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 1/4 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 5/16-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 1½-inch-long (31.7 mm), Type S, bugle-head steel screws complying with ASTM C1002, spaced 8 inches (203 mm) on center along the joists 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.

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

1. Open web steel joist must be Type 10K1, minimum size, and must be designed, constructed and installed in accordance with the Steel Joist Institute (SJI) specifications for open web joist and joist girders, as referenced in Section 2206 of the IBC.

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 4½ inches to 12½ inches (114 mm to 286 mm) thick.

4. Splines must be OSB surface splines complying with Section 3.2.2.2 of this report, and must be connected to the SIPs 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-wide wood blocking installed in the recessed SIP core and connected to the SIP by fastening through the OSB facing with 8d common nails spaced 6 inches (152 mm) on center.

6. Diamond mesh expanded galvanized steel lath weighing 3.4 pounds per square yard (1.3 kg/m²) with 3½-inch (9.5 mm) ribs must comply with ASTM C847. Lath must be secured to one side of the joist using No. 20 SWG steel tie wire located at the mid-height of every other web member. Additional lath must be installed on the underside of the SIPs and must be secured by means of 1-inch-wide-by-1½-inch-long (25.4 mm by 38 mm), No. 14 gage staples spaced 7 inches (178 mm) on center laterally and longitudinally to the SIP facings.

7. CAFCO BLAZE-SHIELD Type DC-F spray-applied fire-resistant material, recognized in ESR-1649, must be applied to both the open-web steel joists and the underside of the SIP. Steel joists, SIPs, and metal lath must be free of dirt, oil and loose scale. The surfaces to receive the fireproofing material must be wetted first by spraying with water. The minimum average thickness of the Type DC/F material must be 2⅛ inches (57 mm). The minimum average thickness of the Type DC/F material applied to the open-web steel joists is 2½ inches (57 mm), but the size of the steel joist members may require a different thickness that must be determined in accordance with ESR-1649. The measured individual and average minimum in-place, dry densities must be 11pcf and 12pcf (176 and 192 kg/m³), respectively.

4.3 Special Inspections:

4.3.1 Spray-applied Fire-resistant Material: Special inspection and tests must be provided in accordance with Section 1705.13 of the 2012 IBC, Section 1704.12 of the 209 IBC, or Section 1704.11 of the 2006 IBC for the spray-applied fire-resistant material described in Section 4.2.6.4, item 7.

4.3.2 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 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 IBC Section 2304.11.2, 2012 or 2009 IRC Section R317.1, or 2006 IRC Section R319.1.

5.5 R-Control SIPs with thicknesses of 10¼ 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 IBC Sections 2304.11.2.2 and 2304.11.2.6, or 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-resistive barrier or approved roof covering.

5.11 Special inspection for the spray-applied fire-resistant material must be provided in accordance with Section 4.3.1.

5.12 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.

5.13 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.

5.14 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 February 2012 (editorially revised August 2013).

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

**TABLE 1—MANUFACTURING LOCATIONS**

<table>
<thead>
<tr>
<th>LISTEE</th>
<th>LOCATION</th>
<th>PLANT ID NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACH Foam Technologies, LLC</td>
<td>5250 North Sherman Street Denver, Colorado 80216</td>
<td>U-01</td>
</tr>
<tr>
<td>Big Sky Insulations, Inc.</td>
<td>15 Arden Drive Belgrade, Montana 59714</td>
<td>U-30</td>
</tr>
<tr>
<td>Branch River Plastics, Inc.</td>
<td>15 Thurber Boulevard Smithfield, Rhode Island 02917</td>
<td>U-06</td>
</tr>
<tr>
<td>GeoFaze, LLC</td>
<td>5275 Highway 27 Kerrville, TX 78028</td>
<td>U-66</td>
</tr>
<tr>
<td>Noark Enterprises, Inc.</td>
<td>10101 Highway 70 East North Little Rock, Arkansas 72117</td>
<td>U-24</td>
</tr>
<tr>
<td>Thermal Foams, Inc.</td>
<td>2101 Kenmore Ave Buffalo, New York 14207</td>
<td>U-26</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.
F with the seismic design coefficients of $R = 6.5$, $\Omega_0 = 3.0$, and $C_d = 4.0$ under the following provisions:

- Nails must comply with ASTM F1667 and have a minimum bending yield strength of 100 ksi (689 MPa).
- The maximum allowable axial load is limited to 71 percent of the reported allowable axial load when used as shear walls.
- This installation is recognized for use in Seismic Design Categories A through C. The maximum shear wall height-to-width ratio is 2:1.
- The minimum fastener edge distance is $\frac{3}{8}$-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. Eccentric axial loading to one face of the SIP is outside the scope of this report.
- For nails installed into the shearwall perimeter (top plate, bottom plate and end posts), the first row of nails must be $\frac{3}{4}$-inch from the sandwich panel face.
- Top-of-wall horizontal in-plane drift (deflection) of R-Control SIP shear wall assemblies is $\frac{1}{8}$ inch at the tabulated allowable lateral load.
- See details SIP-101c, 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.

### Table 3—Allowable Axial Load for R-Control SIP Walls

<table>
<thead>
<tr>
<th>SIP HEIGHT (ft.)</th>
<th>4½ INCH THICK</th>
<th>6½ INCH THICK</th>
<th>8½ INCH THICK</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 WAB*</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. The maximum allowable axial load is limited to 71 percent of the reported allowable axial load when used as shear walls.
6. 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.
7. Tabulated values for 8 foot high weak axis bearing (WAB) are applicable to SIPs installed with the strong axis of the OSB facings parallel to the wall height.

### Table 4—Allowable Lateral In-Plane Racking Shear Load for Shear Wall Assemblies Consisting of R-Control SIPs Joined with Splines

<table>
<thead>
<tr>
<th>SPLINE TYPE*</th>
<th>Bottom Plate</th>
<th>Top Plate</th>
<th>End Posts</th>
<th>NAIL TYPE* (Length x Shank Dia. x Head Dia., in.)</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 $(\frac{3}{4})\times 0.113\times 0.281\times \Phi$</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 $(\frac{3}{4})\times 0.113\times 0.281\times \Phi$</td>
<td>Two staggered rows, 6&quot; o.c. (12&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 $(\frac{3}{4})\times 0.113\times 0.281\times \Phi$</td>
<td>Two staggered rows, 4&quot; o.c. (8&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 $(\frac{3}{4})\times 0.113\times 0.281\times \Phi$</td>
<td>Two staggered rows, 4&quot; o.c. (8&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 $(\frac{3}{4})\times 0.113\times 0.281\times \Phi$</td>
<td>Two staggered rows, 3&quot; o.c. (6&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 $(\frac{3}{4})\times 0.113\times 0.281\times \Phi$</td>
<td>Two staggered rows, 2&quot; o.c. (4&quot; o.c. each row).</td>
<td>920 plf</td>
</tr>
</tbody>
</table>

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

1. See details SIP-101c, 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.
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. Top-of-wall horizontal in-plane drift (deflection) of R-Control SIP shear wall assemblies is $\frac{1}{8}$ inch at the tabulated allowable lateral load.
4. The tabulated allowable racking shear loads are for panels installed with the strong axis of the OSB panel facings parallel to the wall height.
5. Splines must be as described in Section 3.2.4 of this report.
6. The minimum fastener edge distance is $\frac{3}{8}$-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 $\frac{3}{8}$-inch from the sandwich panel edges and the second row must be $\frac{1}{2}$ 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.
7. This installation is recognized for use in Seismic Design Categories A through C. The maximum shear wall height-to-width ratio is 2:1.
8. 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 $R = 6.5$, $\Omega_0 = 3.0$, 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.
Tabulated 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.

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.

Connection specifications, design and installation must be in accordance with the IBC and applicable ESRs.

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

### TABLE 5—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP WALLS WITH SURFACE, BLOCK, OR LUMBER BLOCK SPLINES \(^{1,2,3,4}\) (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>DEFLECTION LIMITS (^{4})</th>
<th>SIP HEIGHT (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(L_{3/80})</td>
<td>8</td>
</tr>
<tr>
<td>4(\frac{1}{2})</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td>Strength</td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td>6(\frac{1}{2})</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td>Strength</td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td>8(\frac{1}{4})</td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>40</td>
</tr>
<tr>
<td>Strength</td>
<td>56</td>
<td>40</td>
</tr>
</tbody>
</table>

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

\(^{1}\)See details SIP-101c, SIP-102, SIP-102g, and SIP-102m, as shown in Figures 1, 3, 6 and 8, respectively.

\(^{2}\)At panel ends, each OSB facing must be fastened to solid lumber sills and plates (minimum specific gravity of 0.42) end 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.

\(^{3}\)Tabulated 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.

\(^{4}\)Values apply to short duration seismic or wind loads only.

\(^{5}\)Deflection limit must be selected by building designer based on the serviceability (deflection) requirements of the structure (IBC Section 1604.3).

\(^{6}\)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.

### TABLE 6—ALLOWABLE TRANSVERSE LOAD FOR R-CONTROL SIP FLOORS AND ROOFS WITH SURFACE, BLOCK, OR LUMBER BLOCK SPLINES \(^{1,2,3,4}\) (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>DEFLECTION LIMITS (^{4})</th>
<th>SIP SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(L_{3/80})</td>
<td>4</td>
</tr>
<tr>
<td>4(\frac{1}{2})</td>
<td>69</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>104</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>127</td>
<td>85</td>
</tr>
<tr>
<td>Strength</td>
<td>127</td>
<td>85</td>
</tr>
<tr>
<td>6(\frac{1}{2})</td>
<td>105</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>131</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>131</td>
<td>88</td>
</tr>
<tr>
<td>Strength</td>
<td>131</td>
<td>88</td>
</tr>
<tr>
<td>8(\frac{1}{4})</td>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td>Strength</td>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td>10(\frac{1}{4})</td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td>Strength</td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td>12(\frac{1}{4})</td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td>Strength</td>
<td>138</td>
<td>92</td>
</tr>
</tbody>
</table>

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

\(^{1}\)See details SIP-102, SIP-102g, or SIP-102m, as shown in Figures 3, 6 and 8, respectively.

\(^{2}\)SIPs must be single span, simply supported and have a minimum 1\(\frac{1}{2}\)-inch wide continuous bearing support at each end.

\(^{3}\)Tabulated allowable transverse load is the maximum load (pounds per square foot) applied uniformly.

\(^{4}\)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.

\(^{5}\)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.

\(^{6}\)Values do not include dead weight of panels. Permanent loads, such as dead load, must not exceed 0.5 of the tabulated load.

\(^{7}\)Tabulated 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 SPLINES1,2,3,4,5,6 (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>LIMITS</th>
<th>PANEL SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>6 1/2</td>
<td>53</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>79</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>88</td>
</tr>
<tr>
<td>Strength</td>
<td>105</td>
<td>88</td>
</tr>
<tr>
<td>8 1/4</td>
<td>89</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>109</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>109</td>
<td>91</td>
</tr>
<tr>
<td>Strength</td>
<td>109</td>
<td>91</td>
</tr>
<tr>
<td>10 1/4</td>
<td>150</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>174</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>174</td>
<td>145</td>
</tr>
<tr>
<td>Strength</td>
<td>174</td>
<td>145</td>
</tr>
<tr>
<td>12 1/4</td>
<td>177</td>
<td>148</td>
</tr>
<tr>
<td></td>
<td>177</td>
<td>148</td>
</tr>
<tr>
<td></td>
<td>177</td>
<td>148</td>
</tr>
<tr>
<td>Strength</td>
<td>177</td>
<td>148</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 4.88 kg/m².
1See detail SIP-102d, as shown in Figure 5.
2Double 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 1/4 inch thick SIPs for all spans and 10 1/4-inch-thick SIP panels spanning greater than 22 ft.
3SIPs must be single span, simply supported and have a minimum 1 1/2-inch wide continuous bearing support at each end.
4Tabulated allowable transverse load is the maximum load (pounds per square foot) applied uniformly.
5The 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.
6Roofs 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 SPLINES1,2,3,4,5,6 (psf)

<table>
<thead>
<tr>
<th>SIP THICKNESS (in.)</th>
<th>LIMITS</th>
<th>SIP SPAN (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>10 1/4</td>
<td>118</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>98</td>
</tr>
<tr>
<td>Strength</td>
<td>118</td>
<td>98</td>
</tr>
<tr>
<td>12 1/4</td>
<td>131</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>131</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>131</td>
<td>109</td>
</tr>
<tr>
<td>Strength</td>
<td>131</td>
<td>109</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 4.88 kg/m².
1See detail SIP-102b, as shown in Figure 4.
2I-beam splines must be continuous full length.
3SIPs must be single span, simply supported and have a minimum 1 1/2-inch wide continuous bearing support at each end.
4Tabulated allowable transverse load is the maximum load (pounds per square foot) applied uniformly.
5The 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.
6Roofs 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 R-Control screws at the tabulated spacing and a minimum 1 1/8 inch penetration into the receiving member.

\[ \Delta_c = \frac{x^2}{2E \cdot A W} + \frac{0.25 \cdot v L}{1000 \cdot G_a} + \frac{\Sigma x \Delta_x}{2W} \]

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)
- \( \Delta_x \) = Diaphragm chord splice slip at the induced unit shear in diaphragm, in. (mm)
- \( \delta \) = 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 1 1/8 inch penetration into the receiving member.

SIP ends perpendicular to spans must be staggered from adjacent panels.

### 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>Panels to Supports Parallel to Shear³</th>
<th>MAXIMUM ASSEMBLY LENGTH (ft.) AND ASPECT RATIO</th>
<th>ALLOWABLE STRENGTH (plf)</th>
<th>APPARENT SHEAR STIFFNESS, ( G_a ) (lbf/in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Control Screws</td>
<td>8d Box Nails</td>
<td>8d Box Nails</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 1/2 to 12 1/4</td>
<td>6</td>
<td>3 @ top and bottom</td>
<td>12</td>
<td>36, 3:1</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3, in two rows each side of joint and staggered</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 1/2 to 12 1/4</td>
<td>4</td>
<td>3 @ top and bottom</td>
<td>12</td>
<td>36, 3:1</td>
<td>750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3, in two rows each side of joint and staggered</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 1/2 to 12 1/4</td>
<td>3</td>
<td>3 @ top and bottom</td>
<td>12</td>
<td>24, 3:1</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3, in two rows each side of joint and staggered</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

1See details SIP-139, SIP-140, and SIP-141, as shown in Figures 13, 14 and 15, respectively.
2Deflections at mid-span of a simply supported diaphragm must be computed in accordance with the following equation:
3Screws 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.
4Nails 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.
5SIP edges parallel to applied shear shall be reinforced with solid-sawn lumber, 4-inch minimum nominal width, and minimum specific gravity of 0.50, secured with screws as tabulated above.
6Nails 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 HEADERS¹,²,³,⁴,⁵,⁶,⁷ (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></td>
<td></td>
</tr>
<tr>
<td>1/400</td>
<td>524</td>
<td>319</td>
</tr>
<tr>
<td>1/300</td>
<td>703</td>
<td>374</td>
</tr>
<tr>
<td>1/240</td>
<td>708</td>
<td>374</td>
</tr>
<tr>
<td>Strength</td>
<td>708</td>
<td>374</td>
</tr>
<tr>
<td>1/400</td>
<td>762</td>
<td>466</td>
</tr>
<tr>
<td>1/300</td>
<td>773</td>
<td>466</td>
</tr>
<tr>
<td>1/240</td>
<td>773</td>
<td>466</td>
</tr>
<tr>
<td>Strength</td>
<td>773</td>
<td>466</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/400</td>
<td>837</td>
<td>577</td>
</tr>
<tr>
<td>1/300</td>
<td>837</td>
<td>577</td>
</tr>
<tr>
<td>1/240</td>
<td>837</td>
<td>577</td>
</tr>
<tr>
<td>Strength</td>
<td>837</td>
<td>577</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

1See details SIP-112, SIP-113 and SIP-114, as shown in Figures 9, 10 and 11, respectively.
2Tabulated allowable load is the maximum load (pounds per square foot) applied uniformly.
3Headers are permitted to have splines at supported ends. Alternatively, the header may be continuous without splines.
4Top 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.
5Concentrated 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.
6The 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.
7Vertical 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

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

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

- Bd box (0.113) nails in two staggered rows, 2" o.c. each side of panel.
- Varies
- Factory electrical chase.
- R-Control Do-All-Ply 1/2" diameter bead top & bottom plate, see SIP-101c.
- Bd box (0.113) nails two staggered rows, 2" o.c. each side of panel.

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
FIGURE 3

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

Spline

R-Control Do-Al-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.

FIGURE 4

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.

R-Control Do-Al-Ply 1/2" diameter continuous bead.
FIGURE 5

SECTION/PLAN

R-Control® SIP

TITLE: Spline Connection Double 2X

NO. SIP-102d

FIGURE 6

SECTION/PLAN

R-Control® SIP

TITLE: Spline Connection Block Spline

NO. SIP-102g
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

FIGURE 10

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

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.

R-Control SIP

TITLE: Headers
NO. SIP-112

R-Control® SIP

TITLE: SIP Header Plates
NO. SIP-113

SECTION
Scale: NTS

Updated 1-16-12
Updated 1-16-12
FIGURE 11

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.

FIGURE 12

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.
FIGURE 13

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

R-Control SIP.

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”.

FIGURE 14

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

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.

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

Surface spline (see SIP-102).

Structural support member. Minimum 3” wide.

SECTION

Scale: NTS

Updated 1-15-12

R-Control® SIP

TITLE: Diaphragm Connection  
- Intermediate support  
NO. SIP-141

FIGURE 15