**EVALUATOR**
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**MANUFACTURING LOCATION**
**The Murus Company**
**3234 Route 549**
**Mansfield, PA 16933**

GARY T. HARTMAN LICENSE No. 73227 STATE OF FLORIDA PROFESSIONAL ENGINEER

## 1. SUBJECT

**1.1 *Murus EPS Structural Insulated Panels*. Wall Panels 8-ft to 24-ft long, 4-5/8-in. to 12-1/4-in. thick**

## 2. SCOPE

The Evaluator has evaluated the above product(s) for compliance with the applicable sections of the following codes:

**2.1** Florida Building Code Seventh Edition (2020) Building

**2.2** State of Florida Rule 61 G 20-3, FAC, Product Approval

**2.3** Compliance Method: Evaluation Report from a Licensed Florida Professional Engineer

**2.4** The Evaluator has evaluated the above product for structural performance under axial, transverse, and in-plant shear loads.

## 3. USES

**3.1 General.** Murus *Structural Insulated Panels* are used as structural insulated wall panels capable of resisting transverse, axial and in-plane shear loads.

**3.2 Construction Types.** *Structural Insulated Panels* shall be considered combustible building elements when determining the Type of Construction in accordance with the Florida Building Code Seventh Edition (2020) Building Chapter 6.

**3.3 High Velocity Hurricane Zone**. Panels 6-1/2 in. and thicker have been evaluated for use in the High Velocity Hurricane Zone (HVHZ). 4-5/8-in. thick panels have not been evaluated for impact resistance and are limited to use outside of the HVHZ.

**3.4 Fire Resistive Assemblies.** *Structural Insulated Panels* shall not be used as part of a fire-rated assembly unless suitable evidence and details are submitted and approved by the authority having jurisdiction.

## 4. DESCRIPTION

**4.1 General.** *Structural Insulated Panels* are factory-assembled, engineered-wood-faced, structural insulated panels (SIPs) with an expanded polystyrene (EPS) foam core. The product is intended for use as load-bearing or non-load bearing wall panels. *Structural Insulated Panels* are available in 4-5/8-in. through 12-1/4-in. overall thicknesses and are custom made to the specifications for each use. The maximum product size is 8-ft wide and up to 24-ft in length.

**4.2 Materials.**

**4.2.1 Facing.** The facing consists of two single-ply oriented strand board (OSB) facings a minimum of 7/16-in. thick conforming to DOC PS 2-10, Exposure 1, Rated Sheathing with a span index of 24/16. Panels may be manufactured with the facing strength axis oriented in either direction with respect to the direction of product bending provided the appropriate design values are used.

**4.2.2 Core.** The core material is EPS foam plastic insulation conforming to ASTM C578, Type I. The foam core, up to 4-in. thickness, has a flame spread rating not exceeding 25 and a smoke-developed rating not exceeding 450 when tested in accordance with ASTM E84.

**4.2.3 Adhesive.** Facing materials are adhered to the core material using a thin-film adhesive. The adhesive is applied during the lamination process in accordance with the in-plant quality system documentation.

**4.2.4 Material Sources.** The facing, core and adhesive used in the construction of *Structural Insulated Panels* must be materials from approved sources as identified in the in-plant quality system documentation.

**4.2.5 Splines.** *Structural Insulated Panels* are interconnected with surface splines or block splines (Fig. 1). Connections using dimensional lumber splines or engineered structural splines are not specifically addressed in this report and must be designed in accordance with accepted engineering practice to meet applicable code requirements.

**4.2.5.1 Surface Splines.** Surface splines (Figure 1) consist of 3-in. wide by 7/16-in. thick or thicker OSB. At each panel joint, one surface spline is inserted into each of two tight-fitting slots in the core. The slots in the core are located just inside the facing.

**4.2.5.2 Block Splines.** Block splines (Figure 1) are manufactured in the same manner as the SIP except with an overall thickness that is 1 in. less than the overall thickness of the panels to be joined.

## 5. DESIGN

**5.1 Overall Structural System.** The scope of this report is limited to the evaluation of the SIP component. Panel connections and other details related to incorporation of the product into the overall structural system of a building are beyond the scope of this report.

**5.2 Design Approval.** Where required by the authority having jurisdiction, structures using *Structural Insulated Panels* shall be designed by a registered design professional. Construction documents, including engineering calculations and drawings providing floor plans, window details, door details and connector details, shall be submitted to the code official when application is made for a permit. The individual preparing such documents shall possess the necessary qualifications as required by the applicable code and the professional registration laws of the state where the construction is undertaken. Approved construction documents shall be available at all times on the jobsite during installation.

**5.3 Design Loads.** Design loads to be resisted by the product shall be as required under the applicable code. Loads on the panels shall not exceed the loads noted in this report. Where loading conditions result in superimposed stresses, the sum of the ratio of actual loads over allowable loads shall not exceed one. Calculations demonstrating that the loads applied are less than the allowable loads described in this report shall be submitted to the code official for approval.

**5.4 Allowable Loads.** Allowable axial, transverse, and in-plane shear loads may be calculated using the panel properties provided in Tables 1 and 2 or selected from Tables 3 through 7. For loading conditions not specifically addressed herein, structural members designed in accordance with accepted engineering practice shall be provided to meet applicable code requirements.

**5.5 Concentrated Loads.** Axial loads shall be applied to the product through continuous members such as structural insulated roof or floor panels or repetitive members such as joists, trusses or rafters spaced at regular intervals of 24 in. on center or less. Such members shall be fastened to a rim board or similar member to distribute the load to the product. For other loading conditions, reinforcement shall be provided. This reinforcement shall be designed in accordance with accepted engineering practice.

**5.6 Eccentric and Side Loads.** Axial loads shall be applied concentrically to the top of the product. Loads shall not be applied eccentrically or through framing attached to one side of the panel (such as balloon framing) except where additional engineering documentation is provided.

**5.7 Openings.** Openings in panels are permitted when the header depth is at least 12 in., the interior opening is reinforced with lumber or steel and the panels are not used to resist in-plane shear loads. Joints between SIPs are not permitted within 6 in. of the end of the header and are not permitted within the header. Allowable loads for maximum header spans of 36 in. may be selected from Tables 6 and 8. Allowable loads for maximum header spans of 72 in. may be selected from Tables 7 and 9. Openings in panels beyond the scope of this report shall be reinforced with wood or steel designed in accordance with accepted engineering practice to resist all loads applied to the opening as required by the adopted code. Details for door and window openings shall be provided to clarify the manner of supporting axial, transverse and/or in-plane shear loads at openings. Such details shall be subject to approval by the local authority having jurisdiction.

**5.8 In-Plane Shear Design.** Shear walls utilizing block or surface splines shall be sized to resist all code required wind and seismic loads without exceeding the allowable loads provided herein. Shear wall chords, hold-downs and connections to transfer shear forces between the wall and surrounding structure shall be designed in accordance with accepted engineering practice. Allowable strengths for SIP shear walls with structural splines along each panel edge shall be designed in accordance with accepted engineering practice and are subject to the limitations for wood sheathed shear walls.

**5.8.1 Seismic Design Categories A, B and C.** Use of the shear wall configurations in Table 10 is limited to structures in Seismic Design Categories A, B and C. Where SIPs are used to resist seismic forces the following factors shall be used for design: Response Modification Coefficient, $R$ = 2.0; System Overstrength Factor, $\Omega_0$ = 2.5; Deflection Amplification Factor, $C_d$ = 2.0. The maximum panel height-to-width ratio shall be 2:1.

**5.8.2 Seismic Design Categories D, E, and F.** Use of the shear wall configurations in Table 11 are permitted in Seismic Design Categories D, E and F. Such walls shall be designed using the seismic design coefficients and limitations provided in ASCE 7-16 for light-framed walls sheathed with wood structural panels rated for shear resistance and the following factors for design: Response Modification Coefficient, $R$ = 6.5; System Overstrength Factor, $\Omega_0$ = 3.0; Deflection Amplification Factor, $C_d$ = 4.0. The maximum panel height-to-width ratio shall be 1:1.

**5.8.3 Adhesives and Sealants.** Adhesives and sealants shall not be applied at wood-to-wood or spline-to-facing interfaces in shear walls in Seismic Design Categories D, E and F. Adhesives and sealants may be applied to wood-to-foam or facing-to-foam interfaces. Flexible SIP tape may be applied over panel joints.

**5.9 Combined Loads**. Panels subjected to any combination of transverse, axial or in-plane shear loads shall be analyzed utilizing a straight line interaction.

## 6. INSTALLATION

**6.1 General.** *Murus Structural Insulated Panels* shall be fabricated, identified and erected in accordance with this report, the approved construction documents and the applicable codes. In the event of a conflict between the manufacturer's published installation instructions and this report, this report shall govern. Approved construction documents shall be always available on the jobsite during installation.

**6.2 Splines.** *Murus Structural Insulated Panels* are interconnected at the panel edges through the use of a spline. The spline type may be of any configuration listed in Section 4.2.5 as required by the specific design. The spline shall be secured in place with not less than 0.131-in. x 2-1/2-in. nails, spaced 6 in. on center on both sides of the panel, or an approved equivalent fastener. All joints shall be sealed in accordance with the SIP manufacturer's installation instructions. Alternate spline connections may be required for panels subjected to in-plane shear forces. Such panels shall be interconnected exactly as required in Tables 10 or 11 or as directed by the designer.

**6.3 Plates.** The top and bottom plates of the panels shall be dimensional or engineered lumber sized to match the core thickness of the panel. The plates shall be secured using not less than 0.131-in. x 2-1/2-in. nails, spaced 6 in. on center on both sides of the panel or an approved equivalent fastener. A second top plate of 1-1/8-in. minimum thickness dimensional or engineered lumber with a specific gravity of 0.42 that is cut to the full thickness of the panel shall be secured to the first top plate using 0.131-in. x 3-in. nails or an approved equivalent fastener.

**6.4 Cutting and Notching.** No field cutting or routing of the panels shall be permitted except as shown on approved construction documents.

**6.5 Protection from Decay.** SIPs that rest on exterior foundation walls shall not be located within 8 in. of exposed earth. SIPs supported by concrete or masonry that is in direct contact with earth shall be protected from the concrete or masonry by a moisture barrier.

**6.6 Protection from Termites.** In areas subject to damage from termites, SIPs shall be protected from termites using an approved method. Panels shall not be installed below grade or in contact with earth.

**6.7 Heat-Producing Fixtures.** Heat-producing fixtures shall not be installed in the panels unless protected by a method approved by the code official or documented in test reports. This limitation shall not be interpreted to prohibit heat-producing elements with suitable protection.

**6.8 Plumbing Installation Restrictions.** Plumbing and waste lines may extend at right angles through the wall panels but are not permitted vertically within the core. Lines shall not interrupt splines or panel plates unless approved by a registered design professional.

**6.9 Voids and Holes**

**6.9.1 Voids in Core**. In lieu of openings designed in accordance with section 5.7, the following voids are permitted. Voids may be provided in the panel core during fabrication at predetermined locations only. Voids parallel to the panel span shall be limited to a single 1-1/2-in. maximum diameter hole. Such voids shall be spaced a minimum of 4 ft on center measured perpendicular to the panel span. Two 1/2-in. diameter holes may be substituted for the single 1-1/2-in. hole provided they are maintained parallel and within 2 in. of each other. Voids perpendicular to the panel span shall be limited to a single 1-1/2 in. maximum diameter hole placed not closer than 16 in. from the support. Additional voids in the same direction shall be spaced not less than 28 in. on center.

**6.9.2 Holes in Panels**. Holes may be placed in panels during fabrication at predetermined locations only. Holes shall be limited to 4 in. by 4 in. square. The minimum distance between holes shall not be less than 4 ft on center measured perpendicular to the panel span and 24 in. on center measured parallel to the panel span. Not more than three holes shall be permitted in a single line parallel to the panel span. The holes may intersect voids permitted elsewhere in this report.

**6.10 Panel Cladding**

**6.10.1 Exterior Wall Covering.** Panels shall be covered on the exterior by a water-resistive barrier as required by the applicable code. The water-resistive barrier shall be attached with flashing in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer. The exterior facing of the SIP wall shall be covered with weather protection as required by the adopted building code or other approved materials.

**6.11 Interior Finish.** The SIP foam plastic core shall be separated from the interior of the building by an approved thermal barrier of 1/2-in. gypsum wallboard or equivalent thermal barrier where required by Florida Building Code Seventh Edition (2020) Building, Section 2603.4.

## 8. CONDITIONS OF USE

**8.1** *Murus Structural Insulated Panels* as described in this report comply with the codes listed in Section 2 above, subject to the following conditions:

**8.2** Installation complies with this report and the approved construction documents.

**8.3** This report applies only to the panel thicknesses specifically listed herein.

**8.4** In-use panel heights/spans shall not exceed the values listed herein. Extrapolation beyond the values listed herein is not permitted.

**8.5** The panels are manufactured in the production facilities listed in this report.

## 9. EVIDENCE SUBMITTED

The Evaluator has examined the following evidence to evaluate this product:

**9.1** Test reports:

**9.1.1** ASTM E72-02 Section 9, Axial Load, NTA Test Laboratory, [FBC:TST3478], 6/30/2008, Test Report Numbers:

**9.1.1.1** PSC030508-2, 48x96x4.625, Horizontal
**9.1.1.2** PSC030508-4, 48x96x8.375, Horizontal
**9.1.1.3** PSC030508-5, 48x96x8.375, Vertical
**9.1.1.4** PSC030508-9, 48x96x4.625, Vertical
**9.1.1.5** PSC041108-26, 48x144x4.625, Vertical
**9.1.1.6** PSC041108-28, 48x240x8.375, Vertical
**9.1.1.7** PSC041108-29, 48x216x6.625, Vertical

**9.1.2** ASTM E72-02 Section 11, Transverse Load, NTA Test Laboratory, [FBC:TST3478], 6/30/2008, Test Report Numbers:

**9.1.2.1** PSC021208-23, 48x96x4.625, Horizontal
**9.1.2.2** PSC031308-4, 48x144x4.625, Vertical
**9.1.2.3** PSC030508-8, 48x96x4.625, Vertical
**9.1.2.4** PSC031208-1, 48x96x12.375, Vertical
**9.1.2.5** PSC031208-2, 48x96x4.625, Horizontal
**9.1.2.6** PSC031208-3, 48x96x12.375, Horizontal
**9.1.2.7** PSC031208-4, 48x240x12.375, Vertical
**9.1.2.8** PSC031208-6, 48x192x10.375, Vertical
**9.1.2.9** PSC031208-7, 48x148x4.625, Vertical

**9.1.3** ASTM E72-05 Section 11, Transverse Load, NTA Test Laboratory, [FBC:TST3478], 6/30/2008, Test Report Numbers:

**9.1.3.1** PSC021208-10, 48x96x8.375, Horizontal
**9.1.3.2** PSC021508-19, 48x96x4.625, Vertical
**9.1.3.3** PSC031308-1, 48x240x8.375, Vertical
**9.1.3.4** PSC031308-2, 48x216x6.625, Vertical
**9.1.3.5** PSC120407-4, 48x96x8.375, Vertical

**9.1.4** ASTM E72-02 Section 1 4, Racking Load, NTA Test Laboratory, [FBC:TST3478], 6/30/2008, Test Report Numbers:

**9.1.4.1** PSC031208-40, (2)48x96x4.625, Horizontal
**9.1.4.2** PSC031708-2, (2)48x96x8.375, Horizontal
**9.1.4.3** PSC042308-13, (2)48x96x8.375, Vertical

**9.1.5** ASTM E72-10 Section 11, Transverse Load, NTA Test Laboratory, [FBC:TST3478], 9/23/11, Test Report Number MUR083109-36.

**9.1.6** ASTM E455-10, Roof Diaphragm Load, NTA Test Laboratory, [FBC:TST3478], 05/11/2011, Test Report Numbers:

**9.1.6.1** EPS040611-27 2-in. O.C. Fastening
**9.1.6.2** EPS041111-13 4-in. O.C. Fastening
**9.1.6.3** EPS040611-26 6-in. O.C. Fastening

**9.1.7** ASTM E72-15 Section 11, Transverse Load with Panel Openings, NTA Test Laboratory, [FBC:TST3478], 08/26/2016, Test Report Numbers:

**9.1.7.1** SIPA020216-36 Trans SAB 12d x 36w
**9.1.7.2** SIPA020216-37 Trans SAB 12d x 72w
**9.1.7.3** SIPA020216-38 Trans SAB 36d x 36w
**9.1.7.4** SIPA020216-39 Trans SAB 36d x 72w
**9.1.7.5** SIPA020216-40 Trans SAB
**9.1.7.6** SIPA020216-18 Trans WAB 12d x 36w
**9.1.7.7** SIPA020216-19 Trans WAB 12d x 72w
**9.1.7.8** SIPA020216-20 Trans WAB 36d x 36w
**9.1.7.9** SIPA020216-21 Trans WAB 36d x 72w
**9.1.7.10** SIPA020216-22 Trans WAB

**9.1.8** ASTM E72-15 Section 9, Axial Load with Panel Openings, NTA Test Laboratory, [FBC:TST3478], 08/26/2016, Test Report Numbers:

**9.1.8.1** SIPA020216-31 Axial SAB 12d x 36w
**9.1.8.2** SIPA020216-32 Axial SAB 12d x 72w
**9.1.8.3** SIPA020216-33 Axial SAB 36d x 36w
**9.1.8.4** SIPA020216-34 Axial SAB 36d x 72w
**9.1.8.5** SIPA020216-35 Axial SAB
**9.1.8.6** SIPA030216-13 Axial WAB 12d x 36w
**9.1.8.7** SIPA030216-14 Axial WAB 12d x 72w
**9.1.8.8** SIPA030216-15 Axial WAB 36d x 36w
**9.1.8.9** SIPA030216-16 Axial WAB 36d x 72w
**9.1.8.10** SIPA030216-17 Axial WAB

**9.1.9** ASTM E2126 Cyclic Wall Testing, APA – The Engineered Wood Association, IAS Lab Certification No. TL-215, Report T2010P-55 11/30/10

**9.1.10** TAS 201-94, TAS 202-94 and TAS 203-94, NTA, Inc., [FBC:TST3478], Test Report Number SIPA091518-1, TAS 201-94, TAS 202-94, TAS 203-94, Florida P.E. Seal, Douglas Berger, FL 84578, 11/09/2018.

**Table 1: Basic Properties[1, 2]**

| Property | Weak-Axis Bending | Strong-Axis Bending |
|---|---|---|
| Allowable Tensile Stress, $F_t$ (psi) | 245 | 495 |
| Allowable Compressive Stress, $F_c$ (psi) | 340 | 580 |
| Elastic Modulus (Bending), $E_b$ (psi) | 738900 | 658800 |
| Shear Modulus, $G$ (psi) | 270 | 405 |
| Allowable Core Shear Stress, $F_v$ (psi) | 4.5 | 5.0 |
| Core Compressive Modulus, $E_c$ (psi) | 360 | 360 |
| Reference Depth, $h_o$ (in.) | 4.625 | 4.625 |
| Shear Depth Factor Exponent, m | 0.84 | 0.86 |

[1] All properties are based on a minimum panel width of 24-in.

**Table 2: Section Properties**

| Panel Thickness, $h$ (in.) | Core Thickness, $c$ (in.) | Dead Weight, $w_d$ (psf) | Facing Area, $A_f$ (in.$^2$/ft) | Shear Area, $A_v$ (in.$^2$/ft) | Moment of Inertia, $I$ (in.$^4$/ft) | Section Modulus, $S$ (in.$^3$/ft) | Radius of Gyration, r (in.) | Centroid -to- Facing Dist., $y_c$ (in.) |
|---|---|---|---|---|---|---|---|---|
| 4.625 | 3.75 | 3.2 | 10.5 | 50.3 | 46.0 | 19.9 | 2.09 | 2.31 |
| 6.50 | 5.625 | 3.3 | 10.5 | 72.8 | 96.5 | 29.7 | 3.03 | 3.25 |
| 8.25 | 7.375 | 3.5 | 10.5 | 93.8 | 160.2 | 38.8 | 3.91 | 4.13 |
| 10.25 | 9.375 | 3.6 | 10.5 | 117.8 | 252.7 | 49.3 | -- | -- |
| 12.25 | 11.375 | 3.8 | 10.5 | 141.8 | 366.3 | 59.8 | -- | -- |

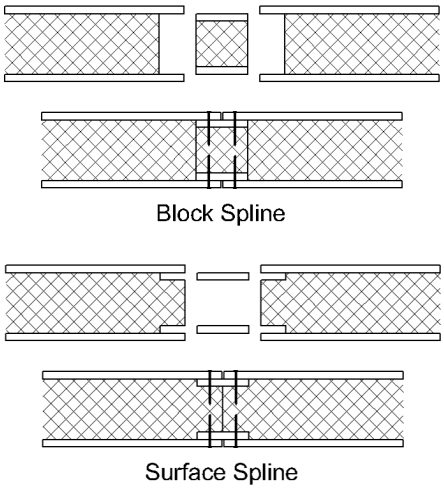


**Figure 1: SIP Spline Types**

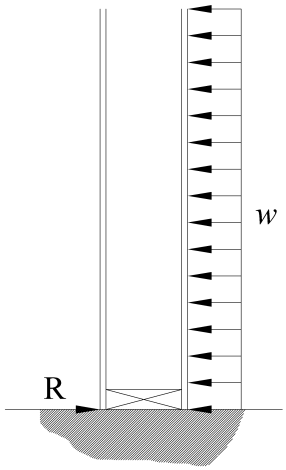


**Figure 2: Zero Bearing Support**

**Table 3: Allowable Uniform Transverse Loads (psf) [1, 4, 5]**

| Panel Length (ft) | 4-5/8-in. SIP thickness | | | 6-1/2-in. SIP thickness | | |
|---|---|---|---|---|---|---|
| | Deflection Limit[2] | | | Deflection Limit[2] | | |
| | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 |
| **8 WAB[3]** | 50.8 | 40.9 | 27.3 | 73.8 | 64.7 | 43.1 |
| **8** | 68.8 | 51.6 | 34.4 | 80.6 | 80.6 | 56.6 |
| **10** | 45.1 | 33.8 | 22.5 | 62.0 | 57.9 | 38.6 |
| **12** | 30.8 | 23.1 | 15.4 | 50.4 | 40.9 | 27.3 |
| **14** | 21.7 | 16.3 | -- | 39.6 | 29.7 | 19.8 |
| **16** | -- | -- | -- | 29.4 | 22.1 | 14.7 |
| **18** | -- | -- | -- | 22.4 | 16.8 | -- |

*See Table 4 for notes.*

**Table 4: Allowable Uniform Transverse Loads (psf) [1, 4, 5]**

| Panel Length (ft) | 8-1/4-in. SIP thickness | | | 10-1/4-in. SIP thickness | | | 12-1/4-in. SIP thickness | | |
|---|---|---|---|---|---|---|---|---|---|
| | Deflection Limit[2] | | | Deflection Limit[2] | | | Deflection Limit[2] | | |
| | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 |
| **8 WAB[3]** | 81 | 81 | 58 | 81 | 81 | 76 | 81 | 81 | 81 |
| **8** | 81 | 81 | 78 | 81 | 81 | 81 | 81 | 81 | 81 |
| **10** | 68 | 68 | 54 | 73 | 73 | 73 | 79 | 79 | 79 |
| **12** | 55 | 55 | 39 | 59 | 59 | 54 | 63 | 63 | 63 |
| **14** | 46 | 43 | 29 | 49 | 49 | 41 | 52 | 52 | 52 |
| **16** | 40 | 33 | 22 | 42 | 42 | 31 | 44 | 44 | 41 |
| **18** | 34 | 25 | 17 | 37 | 36 | 24 | 39 | 39 | 32 |
| **20** | 26 | 20 | 13 | 32 | 29 | 19 | 34 | 34 | 26 |
| **22** | 21 | 15 | -- | 29 | 23 | 15 | 31 | 31 | 21 |
| **24** | 17 | 12 | -- | 25 | 19 | 12 | 28 | 26 | 17 |

[1] Table values assume a simply supported panel with 1-1/2-in. of continuous bearing on facing at supports ($C_v$ = 1.0) with solid wood plates at bearing locations. Values do not include the dead weight of the panel. For wall panel capacities (4-5/8-in., 6-1/2-in. and 8-1/4-in. thickness panels only) utilizing a zero bearing configuration (Figure 2), the allowable load shall be determined using $C_v$ = 0.4.
[2] Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Values are based on loads of short duration only and do not consider the effects of creep.
[3] Tabulated values are based on the strong-axis of the facing material oriented parallel to the direction of panel bending. WAB indicates weak-axis bending of the facing material; the strong-axis of the facing material is oriented perpendicular to the direction of panel bending.
[4] Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
[5] Design wind loads determined in accordance with ASCE 7-16 (strength design).

**Table 5: Allowable Axial Loads (plf) [1,2,3,4]**

| Lateral Brace Spacing (ft) | Panel Thickness | | |
|---|---|---|---|
| | 4-5/8-in. | 6-1/2-in. | 8-1/4-in. |
| **8 WAB[5]** | 2320 | 2470 | 2530 |
| **8** | 3630 | 4070 | 4240 |
| **10** | 3260 | 3890 | 4130 |
| **12** | 2810 | 3660 | 4000 |
| **14** | -- | 3390 | 3830 |
| **16** | -- | 3090 | 3640 |
| **18** | -- | 2790 | 3430 |
| **20** | -- | -- | 3190 |

[1] Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
[2] All values are for normal duration and may not be increased for other durations.
[3] Axial loads shall be applied concentrically to the top of the panel through repetitive members spaced not more than 24 in. on center. Such members shall be fastened to a rim board or similar member to distribute along the top of the SIP.
[4] The ends of both facings must bear on the supporting foundation or structure to achieve the tabulated axial loads.
[5] Tabulated values are based on the strong-axis of the facing material oriented parallel to the direction of panel bending. WAB indicates weak-axis bending of the facing material; the strong-axis of the facing material is oriented perpendicular to the direction of panel bending.

**Table 6: Allowable Uniform Transverse Loads for SIPs with Openings, 36-in. maximum span (psf) [1,4,5,6]**

| Panel Length (ft) | 4-5/8-in. SIP thickness | | | 6-1/2-in. SIP thickness | | | 8-1/4-in. SIP thickness | | |
|---|---|---|---|---|---|---|---|---|---|
| | Deflection Limit[2] | | | Deflection Limit[2] | | | Deflection Limit[2] | | |
| | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 |
| **8 WAB[3]** | 23.1 | 17.3 | 11.5 | 42.6 | 31.9 | 21.3 | 62.0 | 47.7 | 31.8 |
| **8** | 31.0 | 23.2 | 15.5 | 57.4 | 43.3 | 28.9 | 75.1 | 65.3 | 43.5 |
| **10** | 17.6 | 13.2 | 8.8 | 33.9 | 25.4 | 16.9 | 48.1 | 39.3 | 26.2 |
| **12** | 10.8 | 8.1 | 5.4 | 21.3 | 16.0 | 10.7 | 33.4 | 25.1 | 16.7 |
| **14** | 7.1 | 5.3 | -- | 14.1 | 10.6 | 7.1 | 22.5 | 16.9 | 11.3 |
| **16** | -- | -- | -- | 9.8 | 7.4 | -- | 15.8 | 11.8 | 7.9 |
| **18** | -- | -- | -- | 7.1 | 5.3 | -- | 11.4 | 8.6 | 5.7 |
| **20** | -- | -- | -- | -- | -- | -- | 8.5 | 6.4 | -- |

*See Table 7 for notes.*

**Table 7: Allowable Uniform Transverse Loads for SIPs with Openings, 72-in. maximum span (psf) [1,4,5,6]**

| Panel Length (ft) | 4-5/8-in. SIP thickness | | | 6-1/2-in. SIP thickness | | | 8-1/4-in. SIP thickness | | |
|---|---|---|---|---|---|---|---|---|---|
| | Deflection Limit[2] | | | Deflection Limit[2] | | | Deflection Limit[2] | | |
| | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 |
| **8 WAB[3]** | 16.6 | 12.5 | 8.3 | 29.9 | 23.8 | 15.8 | 39.2 | 36.4 | 24.3 |
| **8** | 23.3 | 17.5 | 11.6 | 37.5 | 33.5 | 22.3 | 49.1 | 49.1 | 34.4 |
| **10** | 12.9 | 9.7 | 6.4 | 24.0 | 19.0 | 12.7 | 31.4 | 29.9 | 19.9 |
| **12** | 7.8 | 5.8 | -- | 15.6 | 11.7 | 7.8 | 21.8 | 18.7 | 12.4 |
| **14** | 5.0 | -- | -- | 10.2 | 7.7 | 5.1 | 16.0 | 12.3 | 8.2 |
| **16** | -- | -- | -- | 7.0 | 5.3 | -- | 11.4 | 8.5 | 5.7 |
| **18** | -- | -- | -- | 5.0 | -- | -- | 8.2 | 6.1 | -- |
| **20** | -- | -- | -- | -- | -- | -- | 6.1 | -- | -- |

[1] Table values assume a simply supported panel with 1-1/2-in. of continuous bearing on facing at supports ($C_v$ = 1.0) with solid wood plates at bearing locations. Values do not include the dead weight of the panel. For wall panel capacities utilizing a zero bearing configuration (Figure 2), the allowable load shall be determined using $C_v$ = 0.4.
[2] Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Values are based on loads of short duration only and do not consider the effects of creep.
[3] Tabulated values are based on the strong-axis of the facing material oriented parallel to the direction of panel bending. WAB indicates weak-axis bending of the facing material; the strong-axis of the facing material is oriented perpendicular to the direction of panel bending.
[4] Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
[5] Tabulated values assume header depths ranging from 12 in. to 36 in.
[6] Design wind loads determined in accordance with ASCE 7-16 (strength design).

**Table 8: Allowable Axial Loads for SIPs with Openings, 36-in. maximum span (plf) [1,2,3,4,6]**

| Lateral Brace Spacing (ft) | Panel Thickness | | |
|---|---|---|---|
| | 4-5/8-in. | 6-1/2-in. | 8-1/4-in. |
| **8 WAB[5]** | 770 | 820 | 840 |
| **8** | 1210 | 1355 | 1410 |
| **10** | 1085 | 1295 | 1375 |
| **12** | 935 | 1220 | 1330 |
| **14** | -- | 1130 | 1275 |
| **16** | -- | 1030 | 1210 |
| **18** | -- | 930 | 1140 |
| **20** | -- | -- | 1060 |

*See Table 9 for notes.*

**Table 9: Allowable Axial Loads for SIPs with Openings, 72-in. maximum span (plf) [1,2,3,4,6]**

| Lateral Brace Spacing (ft) | Panel Thickness | | |
|---|---|---|---|
| | 4-5/8-in. | 6-1/2-in. | 8-1/4-in. |
| **8 WAB[5]** | 460 | 490 | 505 |
| **8** | 725 | 810 | 845 |
| **10** | 650 | 775 | 825 |
| **12** | 560 | 730 | 800 |
| **14** | -- | 675 | 765 |
| **16** | -- | 615 | 725 |
| **18** | -- | 555 | 685 |
| **20** | -- | -- | 635 |

[1] Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
[2] All values are for normal duration and may not be increased for other durations.
[3] Axial loads shall be applied concentrically to the top of the panel through repetitive members spaced not more than 24 in. on center. Such members shall be fastened to a rim board or similar member to distribute along the top of the SIP.
[4] The ends of both facings must bear on the supporting foundation or structure to achieve the tabulated axial loads.
[5] Tabulated values are based on the strong-axis of the facing material oriented parallel to the direction of panel bending. WAB indicates weak-axis bending of the facing material; the strong-axis of the facing material is oriented perpendicular to the direction of panel bending.
[6] Tabulated values assume header depths ranging from 12 in. to 36 in.

**Table 10: Allowable In-Plane Shear Strength (Pounds per Foot) for SIP Shear Walls (Wind and Seismic Loads in Seismic Design Categories A, B and C) [1, 3]**

| Spline Type[4] | Minimum Nominal SIP Thickness (in.) | Minimum Facing Connections[3,5] | | | Shear Strength (plf) |
|---|---|---|---|---|---|
| | | Chord[3] | Plate[3] | Spline[4] | |
| Block or Surface Spline | 4-5/8 | 0.131-in. x 2-1/2-in. nails, 6 in. on center | 0.131-in. x 2-1/2-in. nails, 6 in. on center | 0.131-in. x 2-1/2-in. nails, 6 in. on center | 380 |
| | 8-1/4 | 0.131-in. x 2-1/2-in. nails, 6 in. on center | 0.131-in. x 2-1/2-in. nails, 6 in. on center | 0.131-in. x 2-1/2-in. nails, 6 in. on center | 400 |

*See Table 11 for notes.*

**Table 11: Allowable In-Plane Shear Strength (Pounds per Foot) for SIP Shear Walls (Wind and Seismic Loads in Seismic Design Categories D, E and F) [2, 3]**

| Spline Type[4] | Minimum Nominal SIP Thickness (in.) | Minimum Facing Connections[3,5] | | | Shear Strength (plf) |
|---|---|---|---|---|---|
| | | Chord[3] | Plate[3] | Spline[4] | |
| Block or Surface Spline | 6-1/2 | 0.131-in. x 2-1/2-in. nails, 3 in. on center, 3/8-in. edge distance | 0.131-in. x 2-1/2-in. nails, 3 in. on center, 3/8-in. edge distance | 0.131-in. x 2-1/2-in. nails, 3 in. on center (23/32-in. thick, 3-in. wide spline) | 900 |

[1] Maximum shear wall dimensions ratio shall not exceed 2:1 (height: width) for resisting wind or seismic loads.
[2] Maximum shear wall dimension ratio shall not exceed 1:1 (height: width) for resisting wind or seismic loads.
[3] Chords, hold downs and connections to other structural elements must be designed by a registered design professional in accordance with accepted engineering practice.
[4] Spline type at interior panel-to-panel joints only. Solid chord members are required at each end of each shear wall segment.
[5] Required connections must be made on each side of the panel. Dimensional or engineered lumber shall have an equivalent specific gravity of 0.42 or greater.