

# Joint Evaluation Report



**ESR-4759**

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**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**

**Section: 06 17 13—Laminated Veneer Lumber**

**REPORT HOLDER:**

**FRERES LUMBER CO., INC.**

**EVALUATION SUBJECT:**

**FRERES SINGLE PLY LAMINATED VENEER LUMBER**

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-4759 LABC and LARC Supplement](#).

**Property evaluated:**

- Structural

## 2.0 USES

Freres Single Ply Laminated Veneer Lumber (LVL) is used in structural applications such as beams, headers, joists, rafters, roof and floor panels, and lamellas of Mass Ply Panels (MPP) and Mass Ply Lams (MPL) beams and columns. Freres Single Ply LVL is also used in rim board applications as described in this report.

## 3.0 DESCRIPTION

Freres Single Ply LVL complies with ASTM D5456 and additional performance requirements specified in the ICC-ES Acceptance Criteria for Structural Wood-based Products (AC47) and the Acceptance Criteria for Rim Board Products (AC124). Qualified exterior-type structural adhesive, veneer species and grades, manufacturing parameters and finished product dimensions and tolerances are as specified in the approved quality control manual. The veneers are laminated with the grain primarily parallel to the length of the Freres Single Ply LVL member. Freres Single Ply LVL is available in three grades of 1.6E, 1.55E and 1.0E. Freres Single Ply LVL is made with nominal thicknesses of 1 inch (25.4 mm), widths from 1½ inches (38.1 mm) to 24 inches (610 mm), and lengths up to 60 feet (18.3 m), except that Freres Single Ply LVL rim boards are available in 1.55E with nominal thicknesses of 1 inch (25.4 mm) to 1¼ inches (31.8 mm).

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

**4.1.1 General:** The design provisions for structural composite lumber in the ANSI/AWC *National Design Specification*® (NDS) for Wood Construction, as referenced in the applicable code, are applicable to Freres Single Ply LVL, unless otherwise noted in this report. Reference design values for Freres Single Ply LVL and Freres 1.55E Single Ply LVL Rim Boards are provided in Tables 1 and 2, respectively.

**4.1.2 Connections:** Reference lateral and withdrawal design values for nail, screw, bolt and lag screw connections in Freres Single Ply LVL are as specified in the NDS for structural composite lumber having equivalent specific gravities as given in Table 3. Minimum required spacing, edge distances and end distances for fasteners are as given in Table 4. Bolt and lag screw connections are not allowed in member edges. Connections, other than the nail, screw, bolt and lag screw connections described herein, are outside the scope of this report.

**4.1.3 Rim Boards:** Allowable loads for Freres Single Ply LVL rim boards are given in Table 2. Toe-nailed connections of rim boards are not limited by the 150 plf (2189 N/m) lateral load capacity noted for Seismic Design Categories D, E, and F in Section 4.1.10 of the 2021 ANSI/AWC *Special Design Provisions for Wind and Seismic* (SDPWS), or Section 4.1.7 of the 2015 and 2008 SDPWS.

**4.1.4 Calculated Fire Resistance:** For applications under the IBC, the fire resistance of exposed Freres Single Ply LVL members is permitted to be calculated in accordance with Chapter 16 of the NDS.

### 4.2 Installation:

**4.2.1 General:** Installation of Freres Single Ply LVL and Freres Single Ply LVL Rim Boards must comply with this report and with the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

**4.2.2 Rim Boards:** Freres 1.55E Single Ply LVL Rim Boards must be installed as a continuously supported structural element located at the joist elevation in an end bearing wall or parallel to the joist framing. It must be the full depth of the joist framing and be used for any combination of the following: (1) transfer of vertical loads, from above to below, at the rim board location; (2) diaphragm attachment (e.g., sheathing to top edge of rim board); (3) transfer of in-plane lateral loads from the diaphragm to the wall plate below; (4) to provide lateral support to the joist (i.e., resistance against rotation) through attachment to the joist

or rafter; (5) to provide closure for ends of joists of rafters; or (6) as an attachment base for siding and/or exterior deck ledgers. Freres 1.55E Single Ply LVL Rim Boards are permitted to span over openings, utilizing the design properties provided in Table 1

**5.0 CONDITIONS OF USE**

The Freres Single Ply LVL described in this report complies with, or is suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Design and installation must comply with this report, the manufacturer’s published installation instructions, and the applicable code. In the event of a conflict between this report and the manufacturer’s published installation instructions, this report governs.
- 5.2 Design calculations and/or drawings, demonstrating compliance with this report, must be provided to the code official upon request. These documents must be sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.3 Properties shown in this report are limited to 1 inch (25.4 mm) thick Freres Single Ply LVL up to 24 inches (609.6 mm) in depth, except for Freres 1.55E Single Ply LVL Rim Boards, which have thicknesses of 1 inch (25.4 mm) through 1¼ inches (31.8 mm).
- 5.4 Applications in unprotected, wet service conditions, where the moisture content of the Freres Single LVL will reach 16 percent or greater, are beyond the scope of this report.

5.5 Freres Single Ply LVL is produced at the Freres manufacturing plant located in Lyons, Oregon, under a quality-control program with inspections by ICC-ES and APA—The Engineered Wood Association (AA-649).

**6.0 EVIDENCE SUBMITTED**

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Structural Wood-based Products (AC47), dated June 2017 (Editorially revised February 2021).
- 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated June 2019 (Editorially revised February 2021).

**7.0 IDENTIFICATION**

7.1 Freres Single Ply LVL and 1.55E Single Ply LVL Rim Boards are identified by a stamp bearing the manufacturer’s name (Freres Lumber Co., Inc.), product trade name, grade, production date, evaluation report number (ESR-4759), qualified inspection agency name or logo (APA), and manufacturer’s APA mill number (1122).

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

**FRERES LUMBER CO., INC.**  
**POST OFFICE BOX 276**  
**141 N. 14<sup>th</sup> STREET**  
**LYONS, OREGON 97358**  
**(503) 859-2121**  
[www.frereslumber.com](http://www.frereslumber.com)

**TABLE 1—FRERES SINGLE PLY LVL REFERENCE DESIGN VALUES (psi)<sup>1, 2</sup>**

Grade	Beam <sup>3</sup>				Plank <sup>4</sup>				Axial	
	MOE (10 <sup>6</sup> psi) <sup>5</sup>	F <sub>b</sub> (psi) <sup>6, 7</sup>	F <sub>v</sub> (psi)	F <sub>c⊥</sub> (psi)	MOE (10 <sup>6</sup> psi) <sup>5</sup>	F <sub>b</sub> (psi) <sup>6</sup>	F <sub>v</sub> (psi)	F <sub>c⊥</sub> (psi)	F <sub>t</sub> (psi) <sup>8</sup>	F <sub>c</sub> (psi)
1.6E	1.60	1,900	255	750	1.40	2,400	90	600	1,300	2,400
1.55E	1.55	1,700	255	750	1.40	2,200	90	600	950	2,100
1.0E	0.90	950	255	750	0.95	1,200	40	600	200	1,750

For SI: 1 psi = 6.895 kPa, 1 inch = 25.4 mm.

<sup>1</sup>Reference design values are for Freres Single Ply LVL under the normal duration of load. All values, except for E and F<sub>c⊥</sub>, are permitted to be adjusted for other load durations as permitted by the code.

<sup>2</sup>Reference design values are based on dry conditions of use, in which the environmental conditions (temperature and relative humidity) will result in an average equilibrium moisture content (EMC) of sawn lumber of less than 16 percent. Applications where the EMC will equal or exceed 16 percent are outside the scope of this report.

<sup>3</sup>Beam values apply to members loaded and supported on faces showing the narrow edge of all veneers, typically the narrow faces of the member.

<sup>4</sup>Plank values apply to members loaded and supported on faces showing the wide face of one veneer, typically the wide faces of the member.

<sup>5</sup>The tabulated values are the apparent modulus of elasticity.

<sup>6</sup>The tabulated bending stress (F<sub>b</sub>) may be increased by 4 percent when the member qualifies as a repetitive member as defined in the NDS.

<sup>7</sup>The tabulated values are based on a reference depth of 12 inches. For other depths, when loaded edgewise, the allowable bending stress (F<sub>b</sub>) shall be modified by (12/d)<sup>1/6</sup>, where d is the member depth in inches. For depths less than 3-1/2 inches, the factor for the 3-1/2-inch depth shall be used.

<sup>8</sup>The tabulated values are based on a reference length of 4 feet. For member lengths greater than 4 feet, the allowable tensile stress (F<sub>t</sub>) shall be multiplied by (4/L)<sup>1/7</sup>, where L is the length of the member, in feet.

**TABLE 2—FRERES SINGLE PLY LVL RIM BOARD ALLOWABLE LOADS<sup>1, 2, 3, 4</sup>**

Grade	Thickness, t (in.)	Lateral Load <sup>2, 3, 4</sup> (lb/ft)	Vertical Load Capacity <sup>5</sup>				Lateral Resistance for ½-inch-dia. Lag Screws <sup>6</sup> (lb)
			Uniform (lb/ft)		Concentrated (lb)		
			Depth ≤ 16 in.	16 in. < Depth ≤ 24 in.	Depth ≤ 16 in.	16 in. < Depth ≤ 24 in.	
1.55E	1¼	240	5,400	4,000	3,800	3,800	500
	1⅝	220	4,860	4,000	3,500	3,500	475
	1	190	4,000	2,500	3,500	2,000	450

For SI: 1 plf = 14.59 N/m, 1 lb = 4.448 N.

<sup>1</sup>The tabulated design values are applicable to the normal load duration (10 years) for wood products, except for the lateral load capacity, which is based on the short-term load duration (10 minutes). Design values shall be adjusted for other load durations in accordance with the applicable building code except that the vertical uniform load capacity and vertical concentrated load capacity are not permitted to be increased for any load durations shorter than the normal load duration (10 years).

<sup>2</sup>The lateral load capacity is for seismic design and is permitted to be multiplied by 1.4 for wind load applications. For shear loads of normal or permanent load duration as defined by the NDS, the values in the table shall be multiplied by 0.63 or 0.56, respectively.

<sup>3</sup>Toe-nailed connections are not limited by the 150 lb/ft lateral load capacity noted for Seismic Design Categories D, E, and F in Section 4.1.10 of the 2021 SDPWS or Section 4.1.7 of the 2015 and 2008 SDPWS.

<sup>4</sup>The nailing schedule for sheathing-to-rim and rim-to-sill plate (toe-nailed) is based on minimum 8d box nails (0.113 in. x 2-1/2 in.) at 6 inches on center. Commercial framing connectors fastened to the face of the rim board and wall plates may be used to achieve lateral load capacities exceeding values in this table. Calculations must be based on equivalent specific gravity listed in Table 3, and the nail spacing must be at least 6 inches on center.

<sup>5</sup>Allowable vertical load capacities cannot be increased for load duration.

<sup>6</sup>The lag screw shall be inserted with a washer in a lead hole in accordance with the NDS by turning with a wrench, not by driving with a hammer.

**TABLE 3—EQUIVALENT SPECIFIC GRAVITY FOR CONNECTION DESIGN<sup>1, 2</sup>**

Grade	Equivalent Specific Gravity (ESG)					
	Nails and Screws				Bolts and Lag Screws	
	Withdrawal Load		Lateral Load		Lateral Load	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Installed in Face	
Parallel to Grain					Perpendicular to Grain	
1.6E & 1.55E	0.42	0.41	0.41	0.60	0.42	0.63
1.0E	0.42	0.41	0.34	0.58	0.41	0.63

<sup>1</sup>Reference lateral and withdrawal design values for nail, screw, bolt and lag screw connections in Freres Single Ply LVL are as specified in the NDS for structural composite lumber having equivalent specific gravities as indicated in the table above.

**TABLE 4—MINIMUM NAIL SPACING AND END DISTANCE<sup>1</sup>**

Orientation	Common Nail Size <sup>3, 4</sup>	Minimum End Distance (in.)	Minimum Nail Spacing (in.)	
			Single Row	Multiple Rows
Edge <sup>5</sup>	12d (0.148 in. x 3-1/4 in.) & smaller	1-1/2	3	NR <sup>7</sup>
	16d (0.162 in. x 3-1/2 in.)	NR <sup>7</sup>		
Face <sup>6</sup>	16d (0.162 in. x 3-1/2 in.) & smaller	1	2	2

For **SI**: 1 inch = 25.4 mm.

<sup>1</sup>Edge distance shall be sufficient to prevent splitting.

<sup>2</sup>The tabulated values are limited to Freres Single Ply LVL with a thickness of 1 inch or thicker.

<sup>3</sup>16d sinkers (0.148 in. x 3-1/4 in.) may be spaced the same as a 12d common wire nail (0.148 in. x 3-1/4 in.).

<sup>4</sup>Nails listed are common wire nails. For box nails, the spacing and end distance requirements of the next shorter common nails may be used: e.g., a 16d box (0.135 in. x 3-1/2 in.) nail may be spaced the same as a 12d common (0.148 in. x 3-1/4 in.) nail. Fastener sizes and closest on-center spacing not specifically described above are beyond the scope of this report.

<sup>5</sup>Nail penetration for edge nailing shall not exceed 2-1/2 inches for 12d common nails (0.148 in. x 3-1/4 in.) and 2-1/4 inches for 8d common nails (0.131 in. x 2-1/2 in.).

<sup>6</sup>Tabulated closest on-center spacing for face orientation is applicable to nails that are installed in rows parallel to the grain (length) of the Freres Single Ply LVL. For nails installed in rows perpendicular to the direction of grain (width/depth) of the Freres Single Ply LVL, the closest on-center spacing for face orientation shall be sufficient to prevent splitting of the Freres Single Ply LVL.

<sup>7</sup>Not recommended.

**DISCLAIMER**

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 13—Laminated Veneer Lumber

## REPORT HOLDER:

FRERES LUMBER CO., INC.

## EVALUATION SUBJECT:

FRERES SINGLE PLY LAMINATED VENEER LUMBER

## 1.0 REPORT PURPOSE AND SCOPE

## Purpose:

The purpose of this evaluation report supplement is to indicate that Freres Single Ply Laminated Veneer Lumber (LVL), described in ICC-ES evaluation report [ESR-4759](#), has 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 Freres Single Ply LVL, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4759](#), complies with the LABC Chapter 23, and the LARC, and is subjected to the conditions of use described in this supplement.

## 3.0 CONDITIONS OF USE

The Freres Single Ply LVL, described in this evaluation report supplement, must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4759](#).
- 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-4759](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.

This evaluation report supplement expires concurrently with the evaluation report [ESR-4759](#), issued July 2021 and revised July 21, 2021.

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FRERES LUMBER CO., INC.

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FRERES SINGLE PLY LAMINATED VENEER LUMBER

## 1.0 REPORT PURPOSE AND SCOPE

## Purpose:

The purpose of this evaluation report supplement is to indicate that Freres Single Ply Laminated Veneer Lumber (LVL), described in ICC-ES evaluation report ESR-4759, has also been evaluated for compliance with the code(s) noted below.

## Applicable code editions:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

## 2.0 CONCLUSIONS

## 2.1 CBC:

The Freres Single Ply LVL, described in Sections 2.0 through 7.0 of the evaluation report ESR-4759, complies with CBC Chapter 23, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions, noted in the evaluation report ESR-4759 and the additional requirements of CBC Chapter 16 and 17, as applicable.

**2.1.1 OSHPD:** The applicable OSHPD Sections of the CBC are beyond the scope of this supplement.

**2.1.2 DSA:** The applicable DSA Sections of the CBC are beyond the scope of this supplement.

## 2.2 CRC:

The Freres Single Ply LVL, described in Sections 2.0 through 7.0 of the evaluation report ESR-4759, complies with CRC Chapters 5 and 8, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report ESR-4759.

This evaluation report supplement expires concurrently with the evaluation report ESR-4759, issued July 2021 and revised July 21, 2021.