



ICC-ES Evaluation Report

ESR-1387

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This report is subject to renewal February 2025.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 13—Laminated Veneer Lumber

Section: 06 17 23—Parallel Strand Lumber

Section: 06 17 25—Laminated Strand Lumber

REPORT HOLDER:

WEYERHAEUSER

ADDITIONAL LISTEE:

REDBUILT™ LLC

EVALUATION SUBJECT:

STRUCTURAL COMPOSITE LUMBER AND ORIENTED STRAND BOARD: TIMBERSTRAND® LAMINATED STRAND LUMBER (LSL); PARALLAM® PARALLEL STRAND LUMBER (PSL); MICROLLAM® LAMINATED VENEER LUMBER (LVL); TIMBERSTRAND® LSL RIM BOARD; REDBUILT LSL RIM BOARD; TJ® RIM BOARD; AND WEYERHAEUSER RIM BOARD

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, and 2015 *International Building Code*® (IBC)
- 2021, 2018, and 2015 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-1387 LABC and LARC Supplement](#).

Properties evaluated:

- Structural
- Fire resistance

2.0 USES

The structural composite lumber and oriented strand board products described in this evaluation report are used as alternatives to sawn lumber for wall, floor and roof structural members. These structural applications include use as beams, headers, joists, rafters, columns, wall studs, and rim boards. The products are also used as components of built-up structural members, such as flanges for I-joists and chords for trusses, as detailed in a current ICC-ES

evaluation report. TJ® Rim Board and Weyerhaeuser Rim Board are used for rim board applications only.

3.0 DESCRIPTION

3.1 General:

The structural composite lumber and oriented strand board products described in this report comply with ASTM D5456 (PS-2, AC124 and ASTM D7672, where applicable), and are described in Sections 3.2, 3.3, 3.4 and 3.5.

3.2 Microllam LVL:

Microllam laminated veneer lumber (LVL) is manufactured from wood veneers laminated together using an exterior-type structural adhesive. All veneers are oriented with the wood grain parallel to the length of the member. The wood species, properties, adhesives, manufacturing parameters and finished product tolerances are as specified in the approved quality documentation and manufacturing standard. Microllam LVL is available in various grades and thicknesses as indicated in Table 1, with depths ranging from 2.50 inches (63.5 mm) to 48 inches (1219 mm), and lengths up to 80 feet (24 380 mm).

3.3 Parallam PSL:

Parallam parallel strand lumber (PSL) is manufactured from wood strands that are oriented parallel to the length of the member and bonded together using an exterior-type structural adhesive. The wood species, properties, adhesives, manufacturing parameters and finished product tolerances are as specified in the approved quality documentation and manufacturing standard. Parallam PSL is available in various grades as indicated in Table 1, with rectangular cross sections having a maximum thickness of 11 inches (279 mm), a maximum depth of 19 inches (483 mm), and lengths up to 66 feet (20 120 mm). Cross sections with depths up to 54 inches (1372 mm) are available through secondary lamination. See Footnote 13 to Table 1.

3.4 TimberStrand LSL, TimberStrand LSL Rim Boards and RedBuilt LSL Rim Boards:

TimberStrand laminated strand lumber (LSL), TimberStrand LSL Rim Boards and RedBuilt LSL Rim Boards are manufactured from wood strands that are oriented in a direction parallel to the length of the member and bonded together using an exterior-type structural adhesive. The wood species, properties, adhesives, manufacturing parameters and finished product tolerances are as specified in the approved quality documentation and manufacturing

standard. TimberStrand LSL is available in various grades as indicated in Table 1, with lengths up to 64 feet (19 500 mm), thicknesses of 1.25 to 5.50 inches (31.8 mm to 140 mm), and depths up to 48 inches (1219 mm). TimberStrand LSL Rim Board and RedBuilt LSL Rim Board are available in a 1.3E grade, with lengths up to 48 feet (14 630 mm), thicknesses of 1.25 to 1.50 inches (31.8 mm to 38.1 mm), and depths up to 24 inches (610 mm), as indicated in Table 4. TimberStrand LSL having a grade of 1.6E or lower may contain finger joints. TimberStrand LSL may be treated with zinc borate (ZB), as specified in the approved quality documentation and manufacturing standard and is additionally identified with a StrandGuard® stamp (see Figure 5). For TimberStrand LSL product identified with a StrandGuard® stamp, the design guidelines and properties for TimberStrand LSL noted in Section 4, Section 5 and Tables 1-4 of this report shall be used.

3.5 TJ® Rim Board and Weyerhaeuser Rim Board:

TJ® Rim Board and Weyerhaeuser Rim Board consist of either laminated strand lumber (LSL) (described in Section 3.4) or oriented strand board (OSB). The OSB consists of wood strands that are oriented at varying angles with respect to the length of the member, and bonded together using an exterior-type structural adhesive. The wood species, properties, adhesives, manufacturing parameters and finished product tolerances are as specified in the approved quality documentation and manufacturing standard. TJ® Rim Board and Weyerhaeuser Rim Board are 1.125 inches (28.6 mm) thick, and are available in depths ranging from 9.50 to 16 inches (241 to 406 mm). They are available in lengths ranging from 8 to 24 feet (2440 to 7315 mm), as indicated in Table 4.

4.0 DESIGN AND INSTALLATION

4.1 General:

The design and installation of Weyerhaeuser structural composite lumber and oriented strand board products must comply with this report and the report holder's published installation instructions. Design of the structural composite lumber products described in this report is governed by the applicable code and the ANSI/AWC *National Design Specification® for Wood Construction* (NDS). In the event of a conflict between the report holder's published installation instructions and this report, the more restrictive governs. Reference design values for Microllam® LVL, Parallam® PSL, TimberStrand® LSL, TimberStrand® LSL, Rim Board, RedBuilt LSL Rim Board, TJ® Rim Board, and Weyerhaeuser Rim Board are given in Table 1.

4.2 Connections:

The design of mechanical connections for Microllam® LVL, Parallam® PSL, TimberStrand® LSL, TimberStrand® LSL Rim Board, RedBuilt LSL Rim Board, TJ® Rim Board, and Weyerhaeuser Rim Board must be in accordance with the NDS. Equivalent specific gravities for nailed, screwed, bolted and lag screwed connections are given in Table 2. Minimum nail spacing, and end and edge distance requirements, are given in Table 3. Nailing requirements for the attachment of wall sheathing are given in Section 4.5.

Exception: Lag screw connections between rim board products and deck ledgers have allowable lateral loads as specified in Table 4, under the following conditions:

1. Lag screws must have a minimum diameter of 0.50 inch (12.7 mm), and sufficient length to penetrate through the rim board, not including tips.
2. Deck ledgers must consist of minimum nominally 2-by-6 lumber having a minimum assigned specific gravity of 0.42.

3. Sheathing between the rim board and deck ledger must consist of wood structural panels meeting PS-1 or PS-2, and be attached to the rim board in accordance with the applicable code.
4. One flat washer must be used between the deck ledger and the lag screw head.
5. Adjustment factors in accordance with the NDS must be applied as applicable.

For nail and bolt connections other than those described in this report, specific approval by the authority having jurisdiction is required.

4.3 Fire Resistance and Fire Blocking:

4.3.1 Fire Resistance: For applications under the IBC, the fire resistance of exposed TimberStrand LSL, Microllam LVL and Parallam PSL members may be calculated in accordance with Chapter 16 of the ANSI/AWC *National Design Specification® for Wood Construction* (NDS). The fire resistance of protected TimberStrand LSL, Microllam LVL and Parallam PSL members may be calculated in accordance with Chapter 3 of the ANSI/AWC *Fire Design Specification® for Wood Construction* (FDS). TimberStrand LSL, Microllam LVL and Parallam PSL of equivalent sizes to that of sawn lumber may be substituted for those of sawn lumber in fire-resistance-rated assemblies, as specified in Tables 721.1(2) and 721.1(3) of the IBC.

4.3.2 Fire Blocking: TimberStrand LSL, Microllam LVL, Parallam PSL, TJ Rim Board, Weyerhaeuser Rim Board and RedBuilt LSL Rim Board, having a minimum net thickness of 1.125 inches (31.7 mm), may be used in fire blocking applications in accordance with Section 2.5.2 of the ANSI/AWC *Fire Design Specification® for Wood Construction* (FDS), as an alternative to the materials listed in Section 718.2.1(1) of the IBC and Section R302.11.1(1) of the IRC.

Holes and notches in the rim board shall comply with applicable codes and the manufacturer's published literature. Penetrations into and through fire-resistance-rated wall assemblies must also be detailed and constructed in accordance with Section 714 of the IBC.

4.4 Rim Board:

Each rim board product described in this evaluation report is used as a structural rim board element located at the joist elevation in an end bearing wall or parallel to the joist framing that is the full depth of the joist space and manufactured in minimum continuous 8-foot-long (2.44 m) segments for the length of the wall. Design values for rim board applications are provided in Table 4. Rim board products in this report are not required to be continuously supported provided they are designed as flexural members using the reference design values shown in Table 1. The rim boards may be used for any combination of the following:

1. To transfer, from above to below, all vertical loads at the rim board location. Allowable vertical loads are given in Table 4.
2. To provide diaphragm attachment (sheathing to top edge of rim board).
3. To transfer in-plane lateral loads from the diaphragm to the wall plate below. Allowable lateral loads are given in Table 4.
4. To provide lateral support to the joist or rafter (resistance against rotation) through attachment to the joist or rafter.
5. To provide closure for ends of joists or rafters.
6. To provide an attachment base for siding or an exterior deck ledger.

4.5 Wall Framing:

Subject to the limitations of Table 5, TimberStrand® LSL and Microllam® LVL may be used as wall framing material in accordance with engineered and prescriptive requirements of the applicable code for sawn lumber wall framing. Cutting, notching and boring is permitted in accordance with Sections 2308.5.9 and 2308.5.10 of the IBC, and Section R602.6 of the IRC.

The allowable shear values for nailed wood structural panel shear walls utilizing TimberStrand® LSL and Microllam® LVL framing must be determined using Table 4.3A of the ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS) subject to the limitations in Table 5. All other shear wall design and detailing provisions shall follow the normal requirements applicable to sawn lumber framing.

5.0 CONDITIONS OF USE

The structural composite lumber and oriented strand board [TimberStrand® Laminated Strand Lumber (LSL), Parallam® Parallel Strand Lumber (PSL), and Microllam® Laminated Veneer Lumber (LVL)]; TimberStrand® LSL Rim Board; RedBuilt LSL Rim Board; TJ® Rim Board; and Weyerhaeuser Rim Board products described in this report comply with, or are suitable alternatives to what is specified, in those codes listed in Section 1.0, subject to the following conditions:

- 5.1 Installation, fabrication, identification, and connection details must be in accordance with this report, the manufacturer's published installation instructions and the applicable code.
- 5.2 Design calculations and details must be furnished to the code official, verifying that the material is used in compliance with this report. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.3 The products described in this report must be limited to covered end-use installations with dry conditions of use in which the in-service equilibrium moisture content is less than 16 percent.
- 5.4 Length and depth dimensions of TimberStrand LSL, Parallam PSL and Microllam LVL may be cut to size for required application. Depth must not be cut to less than 3.50 inches (89 mm). Thickness dimension of Parallam PSL may be cut to a minimum of 1.75 inches (45 mm). Microllam LVL and TimberStrand LSL must not be cut in thickness. For all material used in structural applications, the product identification described in Section 7.0 must be maintained on all material, or the material must be re-stamped with the appropriate identification only under the approval and direction of PFS Corporation, Intertek Testing Services, or APA—The Engineered Wood Association. Additionally, TimberStrand LSL, Parallam PSL, Microllam LVL, TJ Rim Board, and Weyerhaeuser Rim Board may be notched, drilled, or tapered end cut provided design is by a design professional.
- 5.5 TimberStrand LSL that has been treated with zinc borate (ZB) may be used within the building envelope, such as for sill plates supported by masonry or concrete footings, foundations or slabs (including where preservative-treated lumber is required within the building envelope) in accordance with the American Wood Protection Association (AWPA) "Use Category UC2". When used under these conditions, the corrosion rate of carbon steel and/or galvanized

steel in contact with ZB-treated TimberStrand LSL is not increased by the ZB treatment. TimberStrand LSL treated with ZB must not be used in exposed exterior or ground-contact applications.

- 5.6 TimberStrand LSL, TimberStrand LSL Rim Board and RedBuilt LSL Rim Board are produced at the Weyerhaeuser manufacturing plant located in Kenora, Ontario, Canada; with quality-control inspections by ICC-ES and PFS Corporation (AA-652).
 - 5.7 Parallam PSL is produced at the Weyerhaeuser manufacturing plants located in Annacis Island, British Columbia, Canada; and Buckhannon, West Virginia; with quality-control inspections by ICC-ES and PFS Corporation (AA-652).
 - 5.8 Parallam PSL is secondary laminated for Weyerhaeuser at American Laminators, Drain, Oregon, OK Laminators, Okanagan Falls, British Columbia, Canada, with quality-control inspections by ICC-ES and PFS Corporation (AA-652) or Intertek Testing Services (AA-691).
 - 5.9 Microllam LVL is produced at the Weyerhaeuser manufacturing plants located in Buckhannon, West Virginia; Eugene, Oregon; Natchitoches, Louisiana; and Castleberry, Alabama; and at the RedBuilt™ LLC plant in Stayton, Oregon; with quality-control inspections by ICC-ES and PFS Corporation (AA-652).
 - 5.10 TJ® Rim Board is produced at the Weyerhaeuser manufacturing plant located in Elkin, North Carolina; with inspections by ICC-ES and APA—The Engineered Wood Association (AA-649) or PFS Corporation (AA-652); and at the Weyerhaeuser manufacturing plant located in Kenora, Ontario, Canada; with quality-control inspections by ICC-ES and PFS Corporation (AA-652).
 - 5.11 Weyerhaeuser Rim Board is produced at the Weyerhaeuser manufacturing plants located in Elkin, North Carolina and Kenora, Ontario, Canada; with inspections by ICC-ES and APA—The Engineered Wood Association (AA-649) or PFS Corporation (AA-652).
- #### 6.0 EVIDENCE SUBMITTED
- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Structural Wood-based Products (AC47), dated May 2023.
 - 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated June 2019 (editorially revised February 2021).
 - 6.3 Data in accordance with the ICC-ES Acceptance Criteria for Zinc Borate (ZB) Preservative Treatment of Structural Composite Wood Products by Non-pressure Processes (AC203), dated August 2017 (editorially revised August 2021).
 - 6.4 Data in accordance with the ICC-ES Acceptance Criteria for Wood-Based Studs (AC202), dated June 2009 (editorially revised February 2021).
 - 6.5 Reports of fire tests conducted in accordance with ASTM E119.

7.0 IDENTIFICATION

7.1 General:

Product labeling shall include the name of the report holder or listee, and the ICC-ES mark of conformity. The listing or evaluation report number (ICC-ES ESR-1387) may be used

in lieu of the mark of conformity. The structural composite lumber and rim board products described in this report are identified with a stamp bearing the plant number, the product designation or type, the production date, the grade, the report holder's or listee's name (Weyerhaeuser or RedBuilt) or report holder's or listee's registered tradename or trademark (Weyerhaeuser, TrusJoist or RedBuilt), the name or logo of the inspection agency (PFS Corporation, Intertek Testing Services or APA EWS), and the evaluation report number (ESR-1387). Example labels are shown in Figures and 5 at the end of this report.

7.2 Additional Identification for Specific Products:

In addition to the information noted in Section 7.1, specific products are further identified with the following information:

1. The stamps on Microllam[®] LVL and Parallam[®] PSL also identify the species or species group, as listed in Table 1.
2. TimberStrand LSL treated with zinc borate (ZB), as described in Section 3.4 of this report, is identified by a StrandGuard[®] stamp with the designations "ZB" and "AWPA UC2" (see Figure 5).
3. The stamps on rim board products also indicate the rim board thickness.

7.3 The report holder's contact information is the following:

WEYERHAEUSER
32901 WEYERHAEUSER WAY SOUTH
SUITE 102
FEDERAL WAY, WASHINGTON 98001
(888) 453-8358
www.woodbywy.com
wood@weyerhaeuser.com

7.4 The Additional Listee's contact information is the following:

REDBUILT™ LLC
200 EAST MALLARD DRIVE
BOISE, IDAHO 83706

TABLE 1—REFERENCE DESIGN VALUES FOR MICROLLAM® LVL, PARALLAM® PSL AND TIMBERSTRAND® LSL^{1,2,5}

GRADE ⁽³⁾	BILLET MATERIAL THICKNESS (in.)	Modulus of Elasticity ⁽⁵⁾		JOIST / BEAM ORIENTATION ⁽⁴⁾			FACE / PLANK ORIENTATION ⁽⁴⁾			AXIAL			
		E x10 ⁶ (psi)	E _{min} ⁽⁶⁾ x10 ⁶ (psi)	Bending F _b ⁽⁷⁾ (psi)	Shear F _v (psi)	Compression Perp-to-Grain F _{c⊥} (psi)	Bending F _b ⁽⁷⁾ (psi)	Shear F _v (psi)	Compression Perp-to-Grain ⁽⁴⁾ , F _{c⊥} (psi)	Tension F _t ⁽⁹⁾ (psi)	Compression F _c (psi)		
Microllam® LVL⁽²²⁾													
1.6E WS	0.75 to 3.50	1.6	0.813	2140	285 ⁽¹¹⁾	750	2420	190	680	1510	2100		
1.8E WS		1.8	0.915	2445	285 ⁽¹¹⁾	750	2600	190	680	1765	2375		
1.9E WS		1.9	0.966	2600	285 ⁽¹¹⁾	750	2690	190	680	1895	2510		
2.0E-2600F _b WS		2.0	1.017	2600	285 ⁽¹¹⁾	750	2690	190	680	1895	2510		
2.0E-2750F _b WS		2.0	1.017	2750	285 ⁽¹¹⁾	750	2775	190	680	2025	2635		
2.0E-2900F _b WS ⁽¹⁰⁾		2.0	1.017	2900	285 ⁽¹¹⁾	750	2865	190	680	2025	2635		
2.2E WS		2.2	1.118	3060	285 ⁽¹¹⁾	750	2955	190	680	2275	2870		
2.4E WS		2.4	1.220	3365	285 ⁽¹¹⁾	750	3135	190	680	2530	3080		
2.6E WS		2.6	1.312	3675	285 ⁽¹¹⁾	750	3315	190	680	2785	3270		
1.6E ES		0.75 to 1.75	1.6	0.813	2140	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2420	190	715 ⁽²⁰⁾	1645	2100	
1.8E ES			1.8	0.915	2445	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2600	190	715 ⁽²⁰⁾	1920	2375	
1.9E ES			1.9	0.966	2600	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2690	190	715 ⁽²⁰⁾	2060	2510	
2.0E-2600F _b ES			2.0	1.017	2600	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2690	190	715 ⁽²⁰⁾	1895	2510	
2.0E ES			2.0	1.017	2750	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2775	190	715 ⁽²⁰⁾	2200	2635	
2.0E-2900F _b ES			2.0	1.017	2900	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2865	190	715 ⁽²⁰⁾	2025	2635	
2.0E-2925F _b ES			2.0	1.017	2925	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2880	190	715 ⁽²⁰⁾	2200	2635	
2.0E-3100F _b ES			2.0	1.017	3100	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2980	190	715 ⁽²⁰⁾	2200	2635	
2.2E ES			0.75 to 3.50	2.2	1.118	3060	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	2955	190	715 ⁽²⁰⁾	2475	2870
2.4E ES	2.4			1.220	3365	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	3135	190	715 ⁽²⁰⁾	2755	3080	
2.6E ES	2.6			1.312	3675	285 ⁽¹¹⁾	800 ⁽¹⁹⁾	3315	190	715 ⁽²⁰⁾	3030	3270	
Parallam® PSL⁽¹²⁾													
1.8E WS	Up to 11.0			1.8	0.915	2500 ⁽⁸⁾	230	545	2400	190	545	1995	2500
1.9E WS				1.9	0.966	2700 ⁽⁸⁾	260	580	2525	200	585	2150	2700 ⁽¹³⁾
2.0E WS			2.0	1.017	2900 ⁽⁸⁾	290	625	2650	210	635	2300	2900 ⁽¹³⁾	
2.1E WS			2.1	1.067	2900 ⁽⁸⁾	290	625	2650	210	635	2300	2900 ⁽¹³⁾	
2.2E WS			2.2	1.118	2900 ⁽⁸⁾	290	625	2650	210	635	2300	2900 ⁽¹³⁾	
1.8E ES			1.8	0.915	2500 ⁽⁸⁾	230	600	2400	190	595 ⁽¹⁸⁾	1995	2500	
1.9E ES		1.9	0.966	2700 ⁽⁸⁾	260	675	2600	200	665 ⁽¹⁸⁾	2150	2700 ⁽¹³⁾		
2.0E ES		2.0	1.017	2900 ⁽⁸⁾	290	750	2800	210	735 ⁽¹⁸⁾	2300	2900 ⁽¹³⁾		
2.1E ES		2.1	1.067	2900 ⁽⁸⁾	290	750	2800	210	735 ⁽¹⁸⁾	2300	2900 ⁽¹³⁾		
2.2E ES		2.2	1.118	2900 ⁽⁸⁾	290	750	2800	210	735 ⁽¹⁸⁾	2300	2900 ⁽¹³⁾		
TimberStrand® LSL, TimberStrand® LSL Rim Board and RedBuilt LSL Rim Board													
1.3E	1.25 to 5.50	1.3	0.661	1700	425	710	1900	150	635 ⁽¹⁵⁾	1300	1835		
1.35E		1.35	0.686	1840	445	750	2055	150	665	1430	1905		
1.4E		1.4	0.712	1975	465	785	2215	150	690	1560	1970		
1.45E		1.45	0.737	2115	485	825	2370	150	720	1690	2035		
1.5E		1.5	0.762	2250	505	860	2525	150	750	1815	2105		
1.55E		1.55	0.788	2325	525	900	2615	150	775	1935	2170		
1.6E		1.6	0.813	2425	545	935	2700	150	805 ⁽²¹⁾	2060	2235		
1.65E		1.65	0.839	2500	565	975	2800	150	835	2135	2305		
1.7E		1.7	0.864	2600	585	1010	2900	150	860	2210 ⁽¹⁶⁾	2370		
1.75E		1.75	0.889	2720	605	1050	3040	150	890	2305	2435		
1.8E		1.8	0.915	2840	625	1090	3175	150	920	2410	2505		
1.85E		1.85	0.940	2955	625	1090	3315	150	945	2505	2505		
1.9E		1.9	0.966	3075	625	1090	3450	150	975	2605	2505		
1.95E		1.95	0.991	3180	625	1090	3570	150	1005	2710	2505		
2.0E		2.0	1.017	3290	625	1090	3690	150	1030	2815	2505		
2.05E		2.05	1.042	3395	625	1090	3805	150	1060	2920	2505		
2.1E		2.1	1.067	3500	625	1090	3925	150	1090	3025	2505		
TJ® Rim Board													
0.6E OSB	1.125	0.6	0.305	700 ⁽¹⁷⁾	425	710	-	-	--	-	-		
1.0E TimberStrand® LSL		1.0	0.508	1300 ⁽¹⁷⁾	425	710	-	-	--	-	-		
Weyerhaeuser Rim Board													
0.6E	1.125	0.6	0.305	700 ⁽¹⁷⁾	425	710							

For SI: 1 psi = 0.00689 MPa, 1 inch = 25.4 mm.

¹Reference design values are based on dry conditions of use where the in-service moisture content is less than 16 percent (See Section 5.3).

²Reference design values must be adjusted, as applicable, in accordance with Section 8.3 of the NDS.

³Eastern Species grades (ES) for Parallam PSL and Microllam LVL are produced primarily with southern pine (SP) and/or yellow poplar (YP). Western Species grade (WS) products are produced primarily with Douglas fir larch (DF) for Parallam PSL, and DF and/or lodgepole pine (LP) for Microllam LVL. Additional species may be included in accordance with approved manufacturing standard.

⁴See Figure 1 for an illustration of member orientations with respect to load direction.

⁵Applies for both joist and plank orientation. Calculated deflection of flexural members must account for combined bending and shear deflection. For example, the deflection of a uniformly loaded simple span beam is calculated as follows:

$$\Delta = \frac{270 WL^4}{E b d^3} + \frac{28.8 WL^2}{E b d}$$

Where:

Δ = Deflection, inches

d = Beam depth, inches

b = Beam thickness, inches

L = Span, feet

W = Uniform load, plf

E = Modulus of Elasticity, psi

⁶E_{min} is the reference modulus of elasticity for beam and column stability calculations, per the NDS.

⁷Reference bending design values, F_b, for the applicable orientation, must be adjusted by the appropriate factor (C_v) in the following tables:

(Footnotes to Table 1 continued on following page)

MATERIAL IN JOIST/BEAM ORIENTATION	EQUATION	Member Depth, d (in.) (See Figure 1)												
		≤ 3.5	5.5	7.25	9.25	9.5	12.0	14.0	16.0	18.0	20.0	24.0	48.0	54.0
		C _v Adjustment Factor												
Microllam® LVL	$C_v = (12/d)^{0.136} \leq 1.18$	1.18	1.11	1.07	1.04	1.03	1.00	0.98	0.96	0.95	0.93	0.91	0.83	-
Parallam® PSL	$C_v = (12/d)^{0.111} \leq 1.15$	1.15	1.09	1.06	1.03	1.03	1.00	0.98	0.97	0.96	0.94	0.93	0.86	0.85
TimberStrand® LSL	$C_v = (12/d)^{0.092} \leq 1.12$	1.12	1.07	1.05	1.02	1.02	1.00	0.99	0.97	0.96	0.95	0.94	0.88	-

MATERIAL IN FACE/PLANK ORIENTATION	EQUATION	Member Thickness, t (in.) (See Figure 1)			
		≤ 1.75	3.5	5.25	7.0
		C _v Adjustment Factor			
Microllam® LVL	$C_v = (1.75/t)^{0.136} \leq 1.0$	1.0	0.91	Not Applicable	
Parallam® PSL	$C_v = (12/t)^{0.111} \leq 1.15$	1.15	1.15	1.1	1.06
TimberStrand® LSL	Not Applicable (C _v = 1.00)				

⁸For Parallam® PSL, the tabulated reference edgewise design bending, F_b, values must additionally be multiplied by 0.93, when the cross-sectional thickness is less than 2.69 inches.

⁹Reference tension design values are based on a standard length of 4 feet. For lengths longer than 4 feet, multiply F_t by the following adjustment:

Microllam LVL: $(4/L)^{0.085}$, where L is length in feet.

Parallam PSL: $(4/L)^{0.056}$, where L is length in feet.

TimberStrand LSL: $(4/L)^{0.083}$, where L is length in feet.

For lengths less than 4 feet, use the tabular reference design value.

¹⁰The 2.0E-2900F_b WS grade Microllam LVL is used in header or beam applications only.

¹¹For depths greater than 24 inches, the reference design value, F_v, for joist/beam orientation for Microllam LVL is 260 psi.

¹²The allowable design stresses given in this table for Parallam PSL are also applicable to Parallam PSL that has been secondary laminated in accordance with the approved Weyerhaeuser quality control manuals for secondary lamination.

¹³For column applications, F_c = 500 psi. Alternatively, column capacity can be determined using the provisions of Chapter 15 of the NDS in conjunction with the published F_c value above and a minimum eccentricity, e₂, applied parallel to the narrow face of the column. See Figure 2 for an illustration.

$$e_2 = t/6 + 5L^2/4608$$

Where:

e₂ = Eccentricity applied parallel to the narrow face of the column, inches

t = Member thickness of the narrow face of the column, inches

L = Unbraced column length about the weak axis, feet.

¹⁴The bearing area factor, C_b, shall be in accordance with the NDS Section 3.10.4 for plank orientation compression perpendicular-to-grain reference design values.

¹⁵Reference design value applies to products labeled "Rim Board". For all other 1.3E TimberStrand® LSL, the compression-perpendicular-to-grain design value, F_{c⊥}, is 670 psi.

¹⁶When 1.7E grade TimberStrand® LSL is used as truss chords and webs of engineered wood trusses, the reference axial tension design value is 2050 psi. This value includes an adjustment for length effect. The TimberStrand LSL material must be marked as "Truss Chord Grade", and the engineered wood trusses must be manufactured under the approved quality control program.

¹⁷The design bending strengths for OSB and TimberStrand LSL based TJ Rim Board and Weyerhaeuser Rim Board are applicable to depths of up to 16 inch (406 mm) and spans up to 8 feet (2438 mm).

¹⁸When produced as YP or YP/red maple (RM), the following compression perpendicular-to-grain for face/plank orientation, F_{c⊥}(plank), applies for

$$F_{c\perp}(\text{plank}) = 735 \text{ psi for 1.8E ES}$$

$$F_{c\perp}(\text{plank}) = 840 \text{ psi for 1.9E ES}$$

$$F_{c\perp}(\text{plank}) = 945 \text{ psi for 2.0E ES}$$

$$F_{c\perp}(\text{plank}) = 945 \text{ psi for 2.1E ES}$$

$$F_{c\perp}(\text{plank}) = 945 \text{ psi for 2.2E ES}$$

¹⁹When produced as SP the compression perpendicular-to-grain for joist/beam orientation, F_{c⊥}(joist/beam), is 880 psi.

²⁰When produced as YP or YP/RM the compression perpendicular-to-grain for face/plank orientation, F_{c⊥}(plank), is 910 psi.

²¹The compression-perpendicular-to-grain design value, F_{c⊥}, for 1.6E TimberStrand LSL with thicknesses less than 2.5 inches is 900 psi.

²²When Microllam® LVL labeled as a mixed species, ES/WS, use the lower tabulated design properties between the same grade WS LVL and ES LVL, except that 2.0E-3100F_b ES/WS LVL uses the tabulated design properties for 2.0E-3100F_b ES.

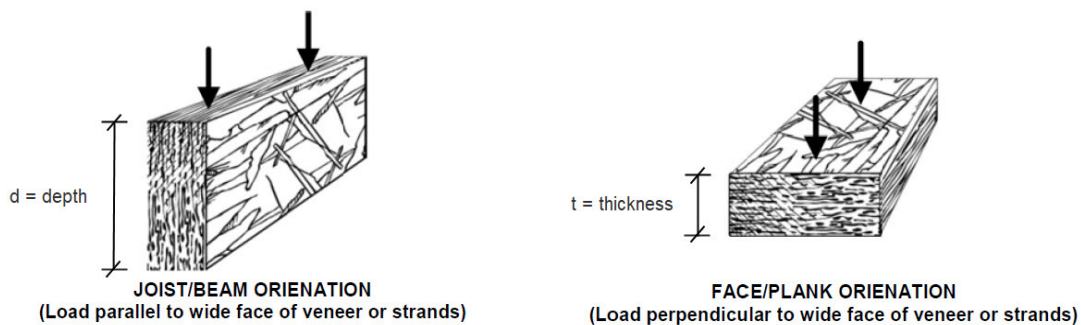


FIGURE 1—MEMBER ORIENTATION WITH RESPECT TO LOAD DIRECTION

TABLE 2—EQUIVALENT SPECIFIC GRAVITIES FOR FASTENER DESIGN^{1,2,3}

PRODUCT	EQUIVALENT SPECIFIC GRAVITY							
	Nails and Screws				Bolts		Lag Screws	
	Withdrawal		Dowel Bearing		Dowel Bearing (Installed in Face) ⁴		Dowel Bearing (Installed in Face) ⁴	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Load Applied Parallel to Grain	Load Applied Perpendicular to Grain	Load Applied Parallel to Grain	Load Applied Perpendicular to Grain
Microllam [®] LVL	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Parallam [®] PSL	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
TimberStrand [®] LSL, TimberStrand [®] LSL Rim Board and RedBuilt LSL Rim Board	0.42	0.50	0.50	0.50	0.50	0.58	0.50	0.55 ⁽⁵⁾
TJ [®] Rim Board and Weyerhaeuser Rim Board	–	0.42	–	0.50	0.32	0.50	–	(5)

¹Connection design values must be calculated in accordance with NDS Chapters 11 and 12, using the tabulated equivalent specific gravities given above, and must be adjusted by the applicable factors specified in the NDS.

²See Figure 3 for an illustration depicting face and edge nailing.

³Minimum nail spacing, and end and edge distances, must be as specified in Table 3. Minimum spacing, end and edge distances for bolts and lag screws must be as specified in the NDS.

⁴Equivalent specific gravity values for bolts and lag screws apply only to bolts and lag screws installed into the face of the member.

⁵The allowable lateral load for lag screws used in deck ledger connections between the rim board products listed in this report and deck ledgers complying with the exceptions in Section 4.2 are given in Table 4.

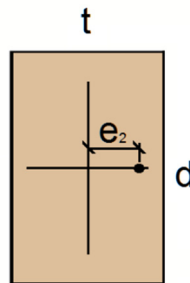


FIGURE 2—ILLUSTRATION OF ECCENTRICITY, e_2 , USED FOR PARALLAM[®] PSL COLUMN DESIGN

TABLE 3—MINIMUM NAIL AND STAPLE SPACING ALONG THE EDGE OF THE MEMBER^{1,2,3,4}

NAIL TYPE AND SIZE		MINIMUM NAIL AND STAPLE SPACING (in.)						
Penny Weight	Diameter x Length (in.)	Microllam LVL ⁽⁵⁾	Parallam PSL ⁽⁵⁾	TJ Rim Board and Weyerhaeuser Rim Board	TimberStrand LSL ⁽⁵⁾ , TimberStrand LSL Rim Board and RedBuilt LSL Rim Board			
		Minimum Member Thickness (in.)						
		0.75	1.5	1.75	1.125	1.25	1.5	1.75-3.5
8d Box	0.113 x 2.5	3	3	3	6	4	3	3
8d Common	0.131 x 2.5	4	4	4	6	4	3	3
10d Box	0.128 x 3.0	4	4	4	6	4	3	3
10d Common	0.148 x 3.0	5	5	4	6	4	3	3
12d Box	0.128 x 3.25	5	5	4	6	4	3	3
12d Common/16d Sinkers	0.148 x 3.25	5	5	4	12 ⁽⁶⁾	4	3	3
16d Box	0.135 x 3.5	–	5	4	12 ⁽⁶⁾	4	3	3
16d Common	0.162 x 3.5	–	8 ⁽⁶⁾	6	16 ⁽⁷⁾	6 ⁽⁸⁾	6 ⁽⁸⁾	6 ⁽⁹⁾
No. 14 gage staple	–	4	4	–	–	–	–	–

For SI: 1 inch = 25.4 mm

¹Tabulated minimum spacing values are for nails and staples in a row driven into the edge of the member. The closest permitted on-center spacing for nails driven into the face is the same as permitted by the code for sawn lumber, and must be sufficient to prevent splitting. See Figure 3 for an illustration depicting face and edge nailing.

²To minimize splitting, member edge distance and spacing between rows shall be per the NDS Commentary or 0.375 inch, whichever is greater. Where multiple rows are used, fasteners in adjacent rows must be staggered and the rows must be equally spaced from the centerline of the narrow face axis.

³Maximum permissible number of rows is 2 for 1.25- and 1.5-inch thicknesses, 3 for 1.75 inch thickness and 6 for thicknesses greater or equal to 3.5 inches.

⁴Nail and staple spacings are not for shear wall design, see Section 4.5.

⁵Other nail spacings for specific applications, such as prefabricated steel components or hangers, may be used as detailed for Microllam[®] LVL, Parallam[®] PSL and TimberStrand[®] LSL in a current ICC-ES evaluation report.

(Footnotes to Table 3 continued on following page)

⁶When nailing through the wall sill plate and floor sheathing, such that the maximum nailing penetration into the rim board is 1.25 inches, the minimum allowable on-center spacing may be decreased to 5 inches.
⁷When nailing through the wall sill plate and floor sheathing, such that the maximum nail penetration into the rim board is 1.25 inches, the minimum allowable on-center spacing may be decreased to 8 inches.
⁸When nailing through the wall sill plate and floor sheathing, such that the maximum nail penetration into the rim board is 1.25 inches, the minimum allowable on-center spacing may be decreased to 4 inches.
⁹When nailing through the wall sill plate and floor sheathing, such that the maximum nailing penetration into the rim board is 1.25 inches, the minimum allowable on-center spacing may be decreased to 3.5 inches.

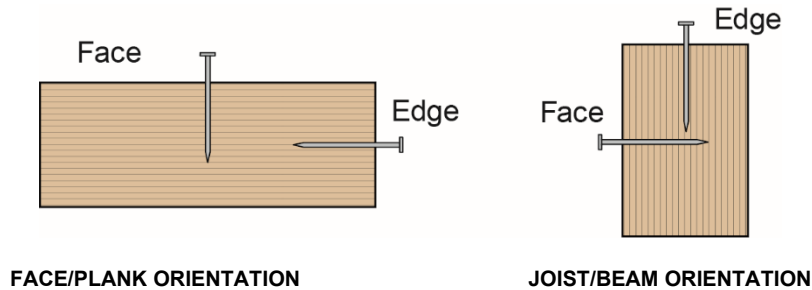


FIGURE 3—FACE AND EDGE NAILING EXAMPLES

TABLE 4—ALLOWABLE DESIGN LOADS FOR TIMBERSTRAND® LSL, TIMBERSTRAND® LSL RIM BOARD, REDBUILT LSL RIM BOARD, TJ® RIM BOARD, AND WEYERHAEUSER RIM BOARD PRODUCTS

Rim Board Product:		TimberStrand® LSL, TimberStrand® LSL Rim Board, and RedBuilt LSL Rim Board								TJ® Rim Board and Weyerhaeuser Rim Board		
Rim Board Grade:		≥1.3E			1.5E			≥1.55E		0.60E/1.0E		
Rim Thickness (in.):		≥1.25	1.5	≥1.75	≥1.25	1.5	≥1.75	≥1.25	1.5	≥1.75	1.125	
Uniform Vertical Load (lbs/ft)⁽¹⁾												
Depth (in.)	≤9.5	5400 ⁽²⁾	6480 ⁽²⁾	7560 ⁽²⁾	5400 ⁽²⁾	6480 ⁽²⁾	7560 ⁽²⁾	5400 ⁽²⁾	6480 ⁽²⁾	7560 ⁽²⁾	4860 ⁽²⁾	
	11.875											
	14											
	16	5000										
	18	4340	6380		4960			5120				
	20	3700	5740		4210			4340			(3)	
	22	3160	5070	7130	3580	5800		3690	5980			
24	2710	4440	6470	3070	5060	7430	3160	5210				
Lateral Load (lbs/ft)^(4,5,6)												
Depth (in.)	9.5-24 ⁽³⁾	See footnote 7									220 ^(3,8)	
Concentrated Vertical Load (lbs)⁽⁹⁾												
Depth (in.)	9.5-24 ⁽³⁾	3760	4520	4520	4520	4520	4520	4520	4520	7470	4150 ⁽³⁾	
Deck Ledger Capacity (lbs/bolt)⁽¹⁰⁾												
Fastener Type	0.50 in. Lag	610	675						725		480	
	0.50 in. Bolt	725										695
	0.50 in. Bolt w/ air space	615 ⁽¹¹⁾										
Axial Stiffness⁽¹²⁾												
Axial Stiffness		147000			166000			170000		220000		

For S1: 1 inch = 25.4 mm; 1 plf = 14.59 N/m.

¹Tabulated uniform vertical load values shall not be increased for duration of load.
²The capacity for this product is limited by a maximum of 360 psi per ASTM D7672.
³TJ® Rim Board and Weyerhaeuser Rim Board are limited to a depth of 16 inch or less.
⁴The maximum lateral load transfer capacities are for seismic design applications. They may be increased by a factor of 1.4 for wind design applications.
⁵Additional hardware, blocking, overlapped sheathing, or other attachment details may be designed to transfer loads into, and out of, the product's wide face.
⁶Toe-nailed connections are not limited by the 150 lb/ft allowable lateral load capacity as noted for Seismic Design Categories D, E, and F in Section 4.1.7 of the SPDWS.
⁷Subject to the nail installation limitations of Table 3, these rim board products may be designed as permitted in the applicable code for wood structural panel diaphragms with framing consisting of Douglas-fir larch or southern pine lumber. Products with a thickness greater than or equal to 1.25 in. may be designed as 2-inch nominal framing. Products with a thickness greater than or equal to 2.5 in. may be designed as 3-inch nominal framing.
⁸The tabulated allowable in-plane lateral load for TJ Rim Board and Weyerhaeuser Rim Board are applicable to installations using the following nailing schedule:
 -Sheathing to rim board: 8d Common nails (0.131 x 2.5 in.) (or equivalent) at 6 inches on center
 -Rim board to sill plate: 10d pneumatic nails (0.131 x 3.0 in.) (or equivalent), toe-nailed at 6 inches on center
 -I-joist to sill plate: 8d Box (0.113 x 2.5 in.) (or equivalent), one slanted nail each side of the bottom flange
 -Rim board to I-joist: 10d pneumatic nails (0.131 x 3.0 in.) (or equivalent) one each into the top and bottom flanges.
⁹The allowable concentrated vertical load capacities require a minimum bearing width of 4.5 in. Tabulated concentrated vertical load values shall not be increased for duration of load.
¹⁰These deck ledger attachment details correspond with those described by Section R507.9 of the 2021 and 2018 IRC, R507.2 of the 2015 and 2012 IRC. These 10-year load duration allowable design loads may be increased per the applicable code for shorter duration loadings and used to design alternative deck ledger connections as permitted by Section R301.1.3 of the 2021, 2018 and 2015 IRC, and R507.2.2 of the 2012 IRC.
¹¹Maximum 0.50 inch (13 mm) shimmed air space.
¹²Axial stiffness is in the cross-grain orientation and is measured in accordance with ASTM D7672 for vertical rim applications.

TABLE 5—TIMBERSTRAND® LSL AND MICROLLAM® LVL WALL FRAMING APPLICATIONS¹

PRODUCT GRADE	PRODUCT THICKNESS (in.)	PERMITTED PANEL EDGE NAIL SPACING (in.)	SHEATHING NAIL TYPE (Common)	EQUIVALENT SPECIFIC GRAVITY
1.3E ≤ TimberStrand® LSL < 1.5E	≥ 1.5	6	6d, 8d, 10d	0.42
1.5E ≤ TimberStrand® LSL < 1.6E	≥ 1.5	2 to 6	6d, 8d, 10d	0.42
1.6E ≤ TimberStrand® LSL < 1.7E	≥ 1.5	2 to 6	6d, 8d, 10d	0.50
2.0E Microllam® LVL ²	1.75	6	6d, 8d	0.50
2.0E Microllam® LVL ²	1.75	6	10d	0.45

For SI: 1 psi = 0.00689 MPa, 1 inch = 25.4 mm.

¹All design and detailing must follow the AWC SDPWS provisions for sawn lumber wall framing with the equivalent specific gravity shown.

²Limited to shear walls sheathed on one side.



FIGURE 4—EXAMPLE LABEL OF PRODUCT PRESENTED IN THIS EVALUATION REPORT



FIGURE 5—EXAMPLE LABEL OF ZINC BORATE TRATED PRODUCT WITH STRANDGUARD® STAMP

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**Section: 06 17 13—Laminated Veneer Lumber****Section: 06 17 23—Parallel Strand Lumber****Section: 06 17 25—Laminated Strand Lumber****REPORT HOLDER:****WEYERHAEUSER****EVALUATION SUBJECT:****STRUCTURAL COMPOSITE LUMBER AND ORIENTED STRAND BOARD: TIMBERSTRAND® LAMINATED STRAND LUMBER (LSL); PARALLAM® PARALLEL STRAND LUMBER (PSL); MICROLLAM® LAMINATED VENEER LUMBER (LVL); TIMBERSTRAND® LSL RIM BOARD; REDBUILT LSL RIM BOARD; TJ® RIM BOARD; AND WEYERHAEUSER RIM BOARD****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Weyerhaeuser structural composite lumber and rim board products, described in ICC-ES evaluation report [ESR-1387](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Weyerhaeuser structural composite lumber and rim board products, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1387](#), comply with the LABC Chapter 23, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Weyerhaeuser structural composite lumber and rim board products described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1387](#).
- The design, installation, conditions of use and identification are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-1387](#).
- 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-1387](#), reissued February 2023 and revised February 2024.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**Section: 06 17 13—Laminated Veneer Lumber****Section: 06 17 23—Parallel Strand Lumber****Section: 06 17 25—Laminated Strand Lumber****REPORT HOLDER:****WEYERHAEUSER****EVALUATION SUBJECT:****STRUCTURAL COMPOSITE LUMBER AND ORIENTED STRAND BOARD: TIMBERSTRAND® LAMINATED STRAND LUMBER (LSL); PARALLAM® PARALLEL STRAND LUMBER (PSL); MICROLLAM® LAMINATED VENEER LUMBER (LVL); TIMBERSTRAND® LSL RIM BOARD; REDBUILT LSL RIM BOARD; TJ® RIM BOARD; AND WEYERHAEUSER RIM BOARD****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Structural Composite Lumber and Oriented Strand Board: TimberStrand® Laminated Strand Lumber (LSL); Parallam® Parallel Strand Lumber (PSL); Microllam® Laminated Veneer Lumber (LVL); TimberStrand® LSL Rim Board; Redbuilt LSL Rim Board; TJ® Rim Board; and Weyerhaeuser Rim Board, described in ICC-ES evaluation report ESR-1387, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 Florida Building Code—Building
- 2023 Florida Building Code—Residential

2.0 CONCLUSIONS

The Structural Composite Lumber and Oriented Strand Board: TimberStrand® Laminated Strand Lumber (LSL); Parallam® Parallel Strand Lumber (PSL); Microllam® Laminated Veneer Lumber (LVL); TimberStrand® LSL Rim Board; Redbuilt LSL Rim Board; TJ® Rim Board; and Weyerhaeuser Rim Board, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-1387, comply with the *Florida Building Code—Building* or the *Florida Building Code—Residential*. The design requirements shall be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-1387 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Structural Composite Lumber and Oriented Strand Board: TimberStrand® Laminated Strand Lumber (LSL); Parallam® Parallel Strand Lumber (PSL); Microllam® Laminated Veneer Lumber (LVL); TimberStrand® LSL Rim Board; Redbuilt LSL Rim Board; TJ® Rim Board; and Weyerhaeuser Rim Board for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* have not been evaluated, and is outside the scope of this supplemental report.

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

This supplement expires concurrently with the evaluation report, reissued February 2023 and revised February 2024.