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# ICC-ES Evaluation Report

# ESR-1387

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**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**

**POST OFFICE BOX 6049  
FEDERAL WAY, WASHINGTON 98063**

**EVALUATION SUBJECT:**

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



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**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**

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**BURLINGTON, WASHINGTON 98233**

## EVALUATION SUBJECT:

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

## 1.0 EVALUATION SCOPE

### Compliance with the following codes:

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the 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 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 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.

### 3.5 TJ<sup>®</sup> Rim Board and Weyerhaeuser Rim Board:

TJ<sup>®</sup> 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<sup>®</sup> 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 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<sup>®</sup> 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<sup>®</sup> LVL, Parallam<sup>®</sup> PSL, TimberStrand<sup>®</sup> LSL, TJ<sup>®</sup> Rim Board, and Weyerhaeuser Rim Board are given in Table 1.

### 4.2 Connections:

The design of mechanical connections for Microllam<sup>®</sup> LVL, Parallam<sup>®</sup> PSL, TimberStrand<sup>®</sup> LSL, TJ<sup>®</sup> 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 Fireblocking:

**4.3.1 TimberStand<sup>®</sup> LSL, Microllam<sup>®</sup> LVL and Parallam<sup>®</sup> PSL:** For applications under the 2015, 2012 and 2009 IBC, the fire resistance of exposed Microllam LVL and Parallam PSL members may be calculated in accordance with Chapter 16 of the ANSI/AWC/AF&PA NDS.

**4.3.2 TimberStrand<sup>®</sup> LSL:** TimberStrand LSL of equivalent sizes to that of sawn lumber may be substituted for sawn lumber in fire-resistance-rated floor and roof assemblies, as specified in Table 721.1(3) of the 2015 and 2012 IBC and Table 720.1(3) of the 2009 IBC. TimberStrand LSL wall studs without finger joints may be used in the one-hour fire-resistance-rated wall assemblies specified in Table 721.1(2) of the 2015 and 2012 IBC and Table 720.1(2) of the 2009 IBC as direct replacements for non-fire-retardant-treated 2-by-6 sawn lumber studs, subject to the following conditions:

1. The studs must have minimum cross-sectional dimensions of 1.5 inches (38 mm) by 5.5 inches (140 mm).
2. Tape and joint compound must be applied to all fastener heads and gypsum wallboard joints on exposed surfaces.
3. The design axial compressive stress within the TimberStrand LSL studs must not exceed the least of the following:
  - a. 435 psi (2998 kPa).
  - b.  $0.30F_c'$ , where  $F_c'$  is the compression design value parallel-to-grain for the LSL, adjusted by all applicable adjustment factors in accordance with the NDS, including the column stability factor,  $C_p$ .
  - c.  $0.30F_c'$ , where  $F_c'$  is calculated in accordance with the NDS, assuming a slenderness ratio  $L_e/d$  of 21.

TimberStrand LSL having a minimum net thickness of 1.25 inches (31.7 mm) may be used in fireblocking applications, as an alternative to the nominal 2-inch-thick (51 mm) sawn lumber noted in Section 718.2.1(1) of the 2015 and 2012 IBC, Section 717.2.1(1) of the 2009 IBC and Section R302.11.1(1) of the IRC.

**4.3.3 TJ<sup>®</sup> Rim Board and Weyerhaeuser Rim Board:** TJ<sup>®</sup> Rim Board and Weyerhaeuser Rim Board may be used in lieu of sawn lumber for fire blocking.

**4.3.4 TimberStrand® LSL with Flak Jacket® FRT Protection:** TimberStrand® LSL with Flak Jacket® FRT protection applied to both wide faces and used in continuously supported rim board applications is an alternative to the fire-retardant-treated wood in Section 2303.2 of the IBC.

Missing and damaged Flak Jacket® FRT protection is permitted to an area less than and equal to 3.5-inch-wide (88.9 mm) by the height up to 24 inches (305 mm) of rim board, occurring once in 5 feet (1524 mm) of length. Exposed end grain does not require Flak Jacket® FRT protection.

Holes and notches in the rim board shall comply with applicable codes and 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 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. 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 4. 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 Studs:

TimberStrand LSL may be used as wall stud material in accordance with the prescriptive requirements of the applicable code. Cutting, notching and boring of nominally 2-by-4 and 2-by-6 TimberStrand LSL studs is permitted in accordance with Sections 2308.5.9 and 2308.5.10 of the 2015 IBC, 2308.9.10 and 2308.9.11 of the IBC, and Section R602.6 of the IRC.

The allowable shear values for nailed wood structural panel shear walls utilizing TimberStrand LSL framing must be determined using Table 4.3A of the ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS) or Table 2306.3 of the 2009 IBC, subject to the following:

1. TimberStrand LSL having a grade of 1.5E or lower is considered to be equivalent to sawn lumber studs with a specific gravity of 0.42, with the exception that the minimum boundary nail spacing permitted for grades lower than 1.5E must be 6 inches (152 mm) on center. TimberStrand LSL of grades 1.5E or higher, may be used with boundary nail spacings from 2 inches (51 mm) to 6 inches (152 mm) on center.

2. TimberStrand LSL having a grade of 1.6E or higher is considered to be equivalent to sawn lumber studs with a specific gravity of 0.50.

#### 5.0 CONDITIONS OF USE

The structural composite lumber [TimberStrand® Laminated Strand Lumber (LSL), Parallam® Parallel Strand Lumber (PSL), and Microllam® Laminated Veneer Lumber (LVL)]; TimberStrand® 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 and TimberStrand LSL may be cut to a minimum of 1.75 inches (45 mm). Microllam LVL 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). For TimberStrand® LSL with Flak Jacket® FRT protection, the Flak Jacket® FRT protection is applied in accordance with approved manufacturing standard and quality-control program with 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 Structurlam Products, Ltd., 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). Additionally, 1.9E, 2.0E and 2.2E Microllam LVL are manufactured at the Pacific Woodtech manufacturing plant located in Burlington, Washington, with quality-control inspections by ICC-ES and APA—The Engineered Wood Association (AA-649).
- 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 plant located in Elkin, North Carolina; 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 June 2017.
- 6.2** Data in accordance with the ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated October 2016.
- 6.3** Data in accordance with the ICC-ES Acceptance Criteria for Zinc Borate (ZB) Preservative Treatment of Structural Composite Wood by Non-pressure Processes (AC203), dated August 2017.
- 6.4** Data in accordance with the ICC-ES Acceptance Criteria for Wood-Based Studs (AC202), dated June 2009 (editorially revised July 2016).
- 6.5** Reports of fire tests conducted in accordance with ASTM E119.

## 7.0 IDENTIFICATION

### 7.1 General:

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 and/or logo, the name or logo of the inspection agency (PFS Corporation, Intertek Testing Services, or APA EWS), as applicable, and the evaluation report number (ESR-1387).

### 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 with the designations "ZB" and "AWPA UC2."
3. The stamps on rim board products also indicate the rim board thickness.
4. TimberStrand® LSL with Flak Jacket® FRT protection is identified by a Flak Jacket® protection stamp placed on the wide face.

TABLE 1—REFERENCE DESIGN VALUES FOR MICROLLAM® LVL, PARALLAM® PSL AND TIMBERSTRAND® LSL<sup>1,2,5</sup>

GRADE <sup>(3)</sup>	BILLET MATERIAL THICKNESS (in.)	Modulus of Elasticity <sup>(6)</sup>		JOIST / BEAM ORIENTATION <sup>(4)</sup>			FACE / PLANK ORIENTATION <sup>(4)</sup>			AXIAL		
				Bending F <sub>b</sub> <sup>(7)</sup> (psi)	Shear F <sub>v</sub> (psi)	Compression Perp-to-Grain F <sub>c⊥</sub> (psi)	Bending F <sub>b</sub> <sup>(7)</sup> (psi)	Shear F <sub>v</sub> (psi)	Compression Perp-to-Grain <sup>(15)</sup> F <sub>c⊥</sub> (psi)	Tension F <sub>t</sub> <sup>(9)</sup> (psi)	Compression F <sub>c</sub> (psi)	
		E x10 <sup>6</sup> (psi)	E <sub>min</sub> <sup>(6)</sup> x10 <sup>6</sup> (psi)									
<b>Microllam® LVL</b>												
1.6E WS	0.75 to 3.50	1.6	0.813	2140	285 <sup>(11)</sup>	750	2420	190	480	1240	2100	
1.8E WS		1.8	0.915	2445	285 <sup>(11)</sup>	750	2600	190	480	1450	2375	
1.9E WS		1.9	0.966	2600	285 <sup>(11)</sup>	750	2690	190 <sup>(12)</sup>	480	1555	2510	
2.0E-2600F <sub>b</sub> WS		2.0	1.017	2600	285 <sup>(11)</sup>	750	2690	190 <sup>(12)</sup>	480	1555	2510	
2.0E-2750F <sub>b</sub> WS		2.0	1.017	2750	285 <sup>(11)</sup>	750	2775	190	480	1660	2635	
2.0E-2900F <sub>b</sub> WS <sup>(10)</sup>		2.0	1.017	2900	285 <sup>(11)</sup>	750	2865	190 <sup>(12)</sup>	480	1660	2635	
2.2E WS		2.2	1.118	3060	285 <sup>(11)</sup>	750	2955	190 <sup>(12)</sup>	480	1865	2870	
2.4E WS		2.4	1.220	3365	285 <sup>(11)</sup>	750	3135	190	480	2075	3080	
2.6E WS		2.6	1.312	3675	285 <sup>(11)</sup>	750	3315	190	480	2285	3270	
1.6E ES		0.75 to 1.75	1.6	0.813	2140	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2420	190	525 <sup>(21)</sup>	1350	2100
1.8E ES			1.8	0.915	2445	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2600	190	525 <sup>(21)</sup>	1575	2375
1.9E ES			1.9	0.966	2600	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2690	190	525 <sup>(21)</sup>	1690	2510
2.0E-2600F <sub>b</sub> ES			2.0	1.017	2600	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2690	190	525 <sup>(21)</sup>	1555	2510
2.0E ES			2.0	1.017	2750	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2775	190	525 <sup>(21)</sup>	1805	2635
2.0E-2900F <sub>b</sub> ES	2.0		1.017	2900	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2865	190	525 <sup>(21)</sup>	1660	2635	
2.0E-2925F <sub>b</sub> ES	2.0		1.017	2925	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2880	190	525 <sup>(21)</sup>	1805	3030	
2.0E-3100F <sub>b</sub> ES	2.0		1.017	3100	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2980	190	525 <sup>(21)</sup>	1805	2635	
2.2E ES	2.2		1.118	3060	285 <sup>(11)</sup>	800 <sup>(20)</sup>	2955	190	525 <sup>(21)</sup>	2030	2870	
2.4E ES	2.4		1.220	3365	285 <sup>(11)</sup>	800 <sup>(20)</sup>	3135	190	525 <sup>(21)</sup>	2260	3080	
2.6E ES	2.6		1.312	3675	285 <sup>(11)</sup>	800 <sup>(20)</sup>	3315	190	525 <sup>(21)</sup>	2485	3270	
<b>Parallam® PSL<sup>(13)</sup></b>												
1.8E WS	Up to 11.0		1.8	0.915	2500 <sup>(8)</sup>	230	545	2400	190	545	1755	2500
1.9E WS			1.9	0.966	2700 <sup>(8)</sup>	260	580	2525	200	585	1890	2700 <sup>(14)</sup>
2.0E WS		2.0	1.017	2900 <sup>(8)</sup>	290	625	2650	210	635	2025	2900 <sup>(14)</sup>	
2.1E WS		2.1	1.067	2900 <sup>(8)</sup>	290	625	2650	210	635	2025	2900 <sup>(14)</sup>	
2.2E WS		2.2	1.118	2900 <sup>(8)</sup>	290	625	2650	210	635	2025	2900 <sup>(14)</sup>	
1.8E ES		1.8	0.915	2500 <sup>(8)</sup>	230	600	2400	190	595 <sup>(19)</sup>	1755	2500	
1.9E ES		1.9	0.966	2700 <sup>(8)</sup>	260	675	2600	200	665 <sup>(19)</sup>	1890	2700 <sup>(14)</sup>	
2.0E ES		2.0	1.017	2900 <sup>(8)</sup>	290	750	2800	210	735 <sup>(19)</sup>	2025	2900 <sup>(14)</sup>	
2.1E ES		2.1	1.067	3100 <sup>(8)</sup>	320	825	3000	220	805 <sup>(19)</sup>	2160	3100 <sup>(14)</sup>	
2.2E ES		2.2	1.118	2900 <sup>(8)</sup>	290	750	2800	210	735 <sup>(19)</sup>	2025	2900 <sup>(14)</sup>	
<b>TimberStrand® LSL</b>												
1.3E		1.25 to 5.50	1.3	0.661	1700	425	710	1900	150	635 <sup>(16)</sup>	1075	1835
1.35E			1.35	0.686	1840	445	750	2055	150	665	1180	1905
1.4E			1.4	0.712	1975	465	785	2215	150	690	1290	1970
1.45E	1.45		0.737	2115	485	825	2370	150	720	1395	2035	
1.5E	1.5		0.762	2250	505	860	2525	150	750	1500	2105	
1.55E	1.55		0.788	2325	525	900	2615	150	775	1600	2170	
1.6E	1.6		0.813	2425	545	935	2700	150	800	1700	2235	
1.65E	1.65		0.839	2500	565	975	2800	150	835	1765	2305	
1.7E	1.7		0.864	2600	585	1010	2900	150	860	1825 <sup>(17)</sup>	2370	
1.75E	1.75		0.889	2720	605	1050	3040	150	890	1905	2435	
1.8E	1.8		0.915	2840	625	1090	3175	150	920	1990	2505	
1.85E	1.85		0.940	2955	625	1090	3315	150	945	2070	2505	
1.9E	1.9		0.966	3075	625	1090	3450	150	975	2150	2505	
1.95E	1.95		0.991	3180	625	1090	3570	150	1005	2240	2505	
2.0E	2.0		1.017	3290	625	1090	3690	150	1030	2325	2505	
2.05E	2.05		1.042	3395	625	1090	3805	150	1060	2410	2505	
2.1E	2.1		1.067	3500	625	1090	3925	150	1090	2500	2505	
<b>TJ® Rim Board and Weyerhaeuser Rim Board</b>												
0.6E OSB	1.125	0.6	0.305	700 <sup>(18)</sup>	395	660	-	-	--	-	-	
1.0E TimberStrand® LSL		1.0	0.508	1300 <sup>(18)</sup>	395	660	-	-	--	-	-	

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

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

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

<sup>3</sup>Eastern 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.

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

<sup>5</sup>Applies 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:

$$\Delta = \frac{270WL^4}{Ebd^3} + \frac{28.8WL^2}{Ebd}$$

Where:  
 Δ = Deflection, inches                      d = Beam depth, inches                      b = Beam thickness, inches  
 L = Span, feet                                      W = Uniform load, plf                      E = Modulus of Elasticity, psi

<sup>6</sup>E<sub>min</sub> is the reference modulus of elasticity for beam and column stability calculations, per the NDS.

<sup>7</sup>Reference bending design values, F<sub>b</sub>, for the applicable orientation, must be adjusted by the appropriate factor (C<sub>v</sub>) 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 <sub>v</sub> 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 <sub>v</sub> 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 <sub>v</sub> = 1.00)				

<sup>8</sup>For Parallam® PSL, the tabulated reference edgewise design bending, F<sub>b</sub>, values must additionally be multiplied by 0.93, when the cross-sectional thickness is less than 2.69 inches.

<sup>9</sup>Tabulated reference tension design values, F<sub>t</sub>, have been reduced to reflect the volume effects of length, depth and thickness for a range of common application conditions.

<sup>10</sup>The 2.0E-2900F<sub>b</sub> WS grade Microllam LVL is used in header or beam applications only.

<sup>11</sup>For depths greater than 24 inches, the reference design value, F<sub>v</sub>, for joist/beam orientation for Microllam LVL is 260 psi.

<sup>12</sup>For product labeled with plant number 1047, F<sub>v</sub>(plank) is 150 psi.

<sup>13</sup>The 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.

<sup>14</sup>For column applications, F<sub>c</sub> = 500 psi. Alternatively, column capacity can be determined using the provisions of Chapter 15 of the NDS in conjunction with the published F<sub>c</sub> value above and a minimum eccentricity, e<sub>2</sub>, applied parallel to the narrow face of the column. See Figure 2 for an illustration.

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

Where:

e<sub>2</sub> = 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.

<sup>15</sup>The bearing area factor, C<sub>b</sub>, shall be in accordance with the NDS Section 3.10.4 for plank orientation compression perpendicular-to-grain reference design values.

<sup>16</sup>The compression Pperpendicular-to-grain value, F<sub>c⊥</sub>, for 1.3E TimberStrand® LSL with thicknesses less than 1.75 inches is 670 psi.

<sup>17</sup>When 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.

<sup>18</sup>The 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).

<sup>19</sup>When produced as YP or YP/red maple (RM), the following compression perpendicular-to-grain for face/plank orientation, F<sub>c⊥</sub>(plank) apply: for

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

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

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

$$F_{c\perp}(\text{plank}) = 1050 \text{ psi for 2.1E ES}$$

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

<sup>20</sup>When produced as SP the compression perpendicular-to-grain for joist/beam orientation, F<sub>c⊥</sub>(joist/beam), is 880 psi.

<sup>21</sup>When produced as YP or YP/RM the compression perpendicular-to-grain for face/plank orientation, F<sub>c⊥</sub>(plank), is 670 psi.

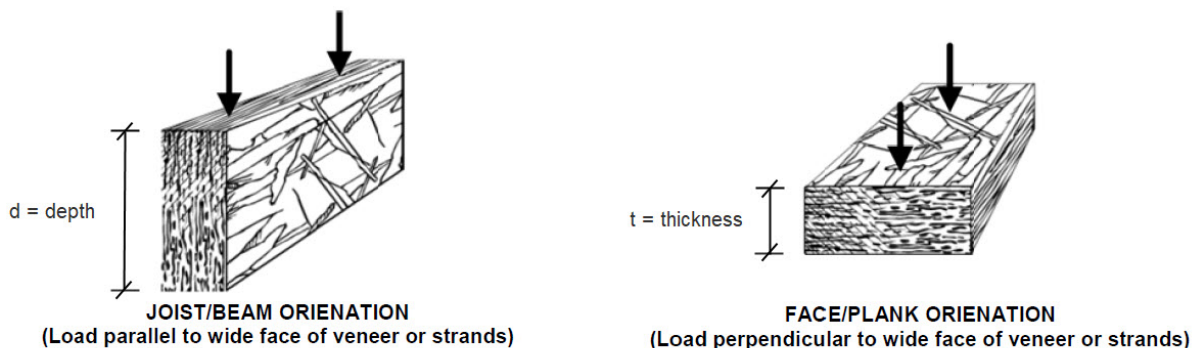


FIGURE 1—MEMBER ORIENTATION WITH RESPECT TO LOAD DIRECTION

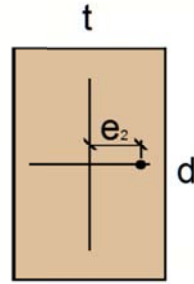


FIGURE 2—ILLUSTRATION OF ECCENTRICITY,  $e_2$ , USED FOR PARALLAM® PSL COLUMN DESIGN

TABLE 2—EQUIVALENT SPECIFIC GRAVITIES FOR FASTENER DESIGN<sup>1,2,3</sup>

PRODUCT	EQUIVALENT SPECIFIC GRAVITY							
	Nails and Screws				Bolts		Lag Screws	
	Withdrawal		Dowel Bearing		Dowel Bearing (Installed in Face) <sup>4</sup>		Dowel Bearing (Installed in Face) <sup>4</sup>	
	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	0.42	0.50	0.50	0.50	0.50	0.58	0.50	0.55 <sup>(5)</sup>
TJ® Rim Board and Weyerhaeuser Rim Board	–	0.38	–	0.50	0.38	0.50	–	( <sup>5</sup> )

<sup>1</sup>Connection design values must be calculated in accordance with NDS Chapters 10 and 11, using the tabulated equivalent specific gravities given above, and must be adjusted by the applicable factors specified in the NDS.

<sup>2</sup>See Figure 3 for an illustration depicting face and edge nailing.

<sup>3</sup>Minimum 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.

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

<sup>5</sup>The 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.

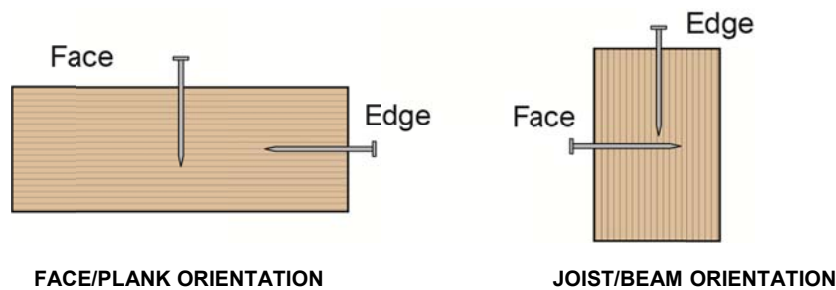


FIGURE 3—FACE AND EDGE NAILING EXAMPLES



TABLE 3—MINIMUM NAIL AND STAPLE SPACING ALONG THE EDGE OF THE MEMBER<sup>1,2,3</sup>

NAIL TYPE AND SIZE		MINIMUM NAIL AND STAPLE SPACING (in.)						
Penny Weight	Diameter x Length (in.)	Microllam LVL <sup>(4)</sup>	Parallam PSL <sup>(4)</sup>	TJ Rim Board and Weyerhaeuser Rim Board	TimberStrand LSL <sup>(4)</sup> and TimberStrand 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 <sup>(6)</sup>	4	3	3
12d Common	0.148 x 3.25	5	5	4	6 <sup>(6)</sup>	4	3	3
16d Box	0.135 x 3.5	—	5	4	16 <sup>(7)</sup>	4	3	3
16d Common	0.162 x 3.5	—	8 <sup>(7)</sup>	6	16 <sup>(7)</sup>	6 <sup>(6)</sup>	6 <sup>(6)</sup>	6 <sup>(5)</sup>
16d Sinker	0.148 x 3.25	—	5	4	16 <sup>(7)</sup>	4	3	3
No. 14 gage staple	—	4	4	—	—	—	—	—

For SI: 1 inch = 25.4 mm

<sup>1</sup>Tabulated 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.

<sup>2</sup>To 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.

<sup>3</sup>Maximum 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.

<sup>4</sup>Other nail spacings for specific applications, such as prefabricated steel components or hangers, may be used as detailed for Microllam<sup>®</sup> LVL, Parallam<sup>®</sup> PSL and TimberStrand<sup>®</sup> LSL in a current ICC-ES evaluation report.

<sup>5</sup>When 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.

<sup>6</sup>When 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.

<sup>7</sup>When 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 5 inches.

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

Rim Board Product:		TimberStrand® LSL RedBuilt LSL									TJ® Rim Board and Weyerhaeuser Rim Board	
Rim 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	
<b>Uniform Vertical Load (lbs/ft)<sup>(1)</sup></b>												
Depth (in.)	≤9.5	5400 <sup>(2)</sup>	6480 <sup>(2)</sup>	7560 <sup>(2)</sup>	5400 <sup>(2)</sup>	6480 <sup>(2)</sup>	7560 <sup>(2)</sup>	5400 <sup>(2)</sup>	6480 <sup>(2)</sup>	7560 <sup>(2)</sup>	4860 <sup>(2)</sup>	
	11.875										4570	
	14	4000										
	16	5000										
	18	4340	6380	4960	5120	3690	5980					
	20	3700	5740	4210	4340							
	22	3160	5070	7130	3580			5800				
	24	2710	4440	6470	3070	5060	7430	3160	5210	(3)		
<b>Lateral Load (lbs/ft)<sup>(4,5,6)</sup></b>												
Depth (in.)	9.5-24 <sup>(3)</sup>	(7)									220 <sup>(3,8)</sup>	
<b>Concentrated Vertical Load (lbs)<sup>(9)</sup></b>												
Depth (in.)	9.5-24 <sup>(3)</sup>	3760	4520	4520	4520	4520	4520	4520	4520	7470	3400 <sup>(3)</sup>	
<b>Deck Ledger Capacity (lbs/bolt)<sup>(10)</sup></b>												
Fastener Type	0.50 in. Lag	610	675						725	480		
	0.50 in. Bolt	725									695	
	0.50 in. Bolt w/ air space	615 <sup>(11)</sup>										
<b>Axial Stiffness<sup>(12)</sup></b>												
Axial Stiffness		147000					166000			170000		145000

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

<sup>1</sup>Tabulated uniform vertical load values shall not be increased for duration of load.

<sup>2</sup>The capacity for this product is limited by a maximum of 360 psi per ASTM D7672.

<sup>3</sup>TJ® Rim Board and Weyerhaeuser Rim Board are limited to a depth of 16 inch or less.

<sup>4</sup>The maximum lateral load transfer capacities are for seismic design applications. They may be increased by a factor of 1.4 for wind design applications.

<sup>5</sup>Additional hardware, blocking, overlapped sheathing, or other attachment details may be designed to transfer loads into, and out of, the product's wide face.

<sup>6</sup>Toe-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.

<sup>7</sup>Subject 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.

<sup>8</sup>The 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
- 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.

<sup>9</sup>The 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.

<sup>10</sup>These deck ledger attachment details correspond with those described by Section R507.2 of the 2015 and 2012 IRC and Section R502.2.2.1 of the 2009 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 2015 IRC, R507.2.2 of the 2012 IRC and Section R502.2.2.2 of the 2009 IRC.

<sup>11</sup>Maximum 0.50 inch (13 mm) shimmed air space.

<sup>12</sup>Axial stiffness is in the cross-grain orientation and is measured in accordance with ASTM D7672 for vertical rim applications.

## ICC-ES Evaluation Report

## ESR-1387 LABC and LARC Supplement

Issued March 2018

Revised May 30, 2018

This report is subject to renewal February 2019.

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**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:

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**(253) 924-4231**

[www.woodbywy.com](http://www.woodbywy.com)

[wood@weyerhaeuser.com](mailto:wood@weyerhaeuser.com)

### EVALUATION SUBJECT:

**STRUCTURAL COMPOSITE LUMBER: TIMBERSTRAND® LAMINATED STRAND LUMBER (LSL); PARALLAM® PARALLEL STRAND LUMBER (PSL); AND MICROLAM® LAMINATED VENEER LUMBER (LVL); TIMBERSTRAND® LSL RIM BOARD; REDBUILT LSL RIM BOARD; TJ® RIM BOARD; 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 master 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:

- 2017 *City of Los Angeles Building Code* (LABC)
- 2017 *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 master 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 master evaluation report [ESR-1387](#).
- The design, installation, conditions of use and identification are in accordance with the 2015 *International Building Code*® (IBC) provisions noted in the master evaluation report [ESR-1387](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the master report, reissued February 2017 and revised May 30, 2018.



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# ICC-ES VAR Environmental Report™

# VAR-1008

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Reissued 08/2017  
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**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**

**POST OFFICE BOX 6049  
FEDERAL WAY, WASHINGTON 98063**

## EVALUATION SUBJECT:

### STRUCTURAL WOOD PRODUCTS:

Trus Joist® TJI® Joist, Trus Joist® TimberStrand® LSL, Trus Joist® TimberStrand® LSL with Flak Jacket™ FRT Protection, Trus Joist® Parallam® PSL, Trus Joist® Parallam® Plus PSL, Trus Joist® Microllam® LVL, Trus Joist® StrandGuard® TimberStrand® LSL, Weyerhaeuser Framer Series® Lumber, Weyerhaeuser Pro Series™ Lumber, Weyerhaeuser Lumber, Weyerhaeuser Green Stud, Weyerhaeuser Edge™ Floor Panels, Weyerhaeuser Edge Gold™ Floor Panels, Weyerhaeuser Diamond™ Floor Panels, Weyerhaeuser Hardwood Edge™ Floor Panels, Weyerhaeuser Radiant Barrier Sheathing, Weyerhaeuser Sheathing, Weyerhaeuser Plywood

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# ICC-ES VAR Environmental Report

**VAR-1008**

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**ANTHONY-DOMTAR INC.**  
1195 PEOPLES ROAD  
SAULT STE MARIE  
ONTARIO P6C 3W7  
CANADA

**EVALUATION SUBJECT:**

**STRUCTURAL WOOD PRODUCTS:**

Trus Joist® TJI® Joist  
Trus Joist® TimberStrand® LSL  
Trus Joist® TimberStrand® LSL with Flak Jacket™ FRT Protection  
Trus Joist® Parallam® PSL  
Trus Joist® Parallam® Plus PSL  
Trus Joist® Microllam® LVL  
Trus Joist® StrandGuard® TimberStrand® LSL  
Weyerhaeuser Framer Series® Lumber  
Weyerhaeuser Pro Series™ Lumber  
Weyerhaeuser Lumber  
Weyerhaeuser Green Stud  
Weyerhaeuser Edge™ Floor Panels  
Weyerhaeuser Edge Gold™ Floor Panels  
Weyerhaeuser Diamond™ Floor Panels  
Weyerhaeuser Hardwood Edge™ Floor Panels  
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**1.0 EVALUATION SCOPE**

**Compliance with the following evaluation guidelines:**

- ICC-ES Environmental Criteria for Determination of Bio-based Material Content (EC102), dated March 2012
- ICC-ES Environmental Criteria for Determination of Source of Recovery, Extraction, Harvest and Manufacture for Materials or Products (EC114), dated March 2012
- ICC-ES Environmental Criteria for Determination of Formaldehyde Emissions of Composite Wood Products (EC108), dated March 2012
- ICC-ES Environmental Criteria for Determination of Certified Wood and Certified Wood Content in Products (EC109), dated March 2012

**Compliance eligibility with the applicable sections of the following codes, standards and green building rating systems:**

- 2015 International Green Construction Code (IgCC) (see Table 2 for details)
- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11 (see Table 3 for details)
- National Green Building Standard (ICC 700-2015) (see Table 4 for details)
- LEED v4 for Homes Design and Construction (see Table 5 for details)
- LEED v4 for Building Design and Construction (BD+C) (See Table 6 for details)
- ANSI/GBI 01-2010 – Green Building Assessment Protocol for Commercial Buildings Construction (see Table 7 for details)
- ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 – Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings (see Table 8 for details)

**2.0 USES**

Weyerhaeuser and Trus Joist® structural wood products are used for a variety of interior and exterior framing and sheathing applications.

Javelin® software and NextPhase® Site Solutions are building optimization solutions consisting of a coordinated package of services, software, and fabrication equipment



used for customized design and detailing of structural building products for individual projects, including complete framing plans and precut framing package options.

### 3.0 DESCRIPTION

Weyerhaeuser and Trus Joist® structural wood products are manufactured from various wood species bonded with structural adhesives (where applicable) complying with applicable ICC-ES reports as indicated in Table 1.

Javelin® software specifies optimized combinations of residential engineered wood products and dimension lumber in layouts for floor, wall, and roof systems with detailed framing plan and material list outputs. NextPhase® Site Solutions combine products, integrated design and fabrication software, fabrication equipment, support and training to enable precut or panelized framing packages to be delivered directly to a jobsite.

### 4.0 CONDITIONS

#### 4.1 Code Compliance:

The Weyerhaeuser and Trus Joist® structural products that have been evaluated for compliance with or otherwise deemed to comply with, the requirements of the International Building Code® (IBC) and/or International Residential Code® (IRC) are listed in Table 1 of this report.

The evaluation of the Javelin® software and NextPhase® Site Solutions building optimization solutions for compliance with the requirements of the IBC and/or IRC is outside the scope of this evaluation report. Compliance with all applicable code requirements must be demonstrated to the Authority Having Jurisdiction (AHJ).

#### 4.2 Green Codes, Standards and Rating Systems Eligibility:

The information presented in Tables 2 through 8 of this report provides a matrix of areas of evaluation and corresponding limitations and/or additional project-specific requirements, and offer benefit to individuals who are assessing eligibility for credits or points.

The information on Life Cycle Assessment (LCA) is limited to the boundary conditions, the Life Cycle Inventory (LCI) inputs that consist of aggregated data and the methodology contained in the documentation noted in Sections 5.10 and 5.11 of this report. The acceptance of this LCA information rests with the end-user. See Appendix A of this report for additional discussion on LCA.

The final interpretation of the specific requirements of the respective green building rating system and/or standard rests with the developer of that specific rating system or standard or the AHJ, as applicable.

Decisions on compliance for those items noted as “Eligible for Points” in Tables 2 through 8 rests with the user of this report, and those items are subject to the conditions noted. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. Rating systems or standards often provide supplemental information as guidance. Compliance for items noted as “Verified Attribute” is also subject to any conditions noted in the tables.

### 5.0 BASIS OF EVALUATION

The information in this report, including the “Verified Attribute,” is based upon the following supporting documentation:

- 5.1 ICC-ES EC102. [Evaluation applies to IgCC Section 505.2.4; CALGreen Section A4.405.4 and A5.405.2; ICC 700 Sections 606.1, 11.606.1, 12.1(A).606.1; ANSI/GBI 01 Section 10.2.1.1; ASHRAE 189.1 Section 9.4.1.3.]
- 5.2 ICC-ES EC114. [Evaluation applies to IgCC Section 505.2.5; CALGreen Section A5.405.1; ICC 700 Sections 609.1, 11.609.1, 12.1(A).609.1; LEED v4 Homes MRc3; LEED v4 BD+C MRc3; ANSI/GBI 01 Section 10.1.4.1; ASHRAE 189.1 Section 9.4.1.2.]
- 5.3 ICC-ES EC108. [Evaluation applies to IgCC Section 806.1; ICC 700 Sections 901.4(6), 11.901.4(6); LEED v4 Homes EQc2; LEED v4 BD+C EQc2; ASHRAE 189.1 Section 8.4.2.4.]
- 5.4 ICC-ES EC109. [Evaluation applies to ICC 700-2015 Sections 606.2(2), 11.606.2(2); 12.1(A).606.2; ANSI/GBI 01 Section 10.3.2.1; ASHRAE 189.1 Section 9.4.1.3.1.]
- 5.5 Documentation demonstrating conformance with HUD PATH and DOE recommendations for advanced framing techniques, as summarized in Table 9 of this report. [Evaluation applies to ICC 700 Sections 601.2(1), 11.601.2.1(1); 12.601.2.1(1); LEED v4 Homes MRc2; CALGreen Section A5.404.1.]
- 5.6 Software output of the Javelin® software with detailed framing or structural plans, material quantity lists and on-site cut lists for framing, structural materials, and sheathing materials, to assist with waste minimization. [Evaluation applies to ICC 700 Sections 601.4, 11.601.4; CALGreen Section A4.404.1.]
- 5.7 Software output of the NextPhase® Site Solutions software with detailed framing or structural plans, material quantity lists and precut framing packages to assist in waste minimization. [Evaluation applies to ICC 700 Sections 601.5(1), 11.601.5.1(1); CALGreen A4.404.1.]
- 5.8 Evidence of compliance with AWPA Standard T1-09, Table 3. [Evaluation applies to ICC 700 Sections 602.1.6, 11.602.1.6.]
- 5.9 Documentation establishing and documenting all major sources of primary manufacturing energy. [Evaluation applies to ICC 700 Sections 606.3, 11.606.3.]
- 5.10 Consortium for Research on Renewable Industrial Materials (CORRIM) Phase 1 report, containing an LCA analysis performed in accordance with ISO 14044. [Evaluation applies to ICC 700 Sections 610.1, 11.610.1, 12.1(A).610.1; CALGreen Section A5.409.3; ASHRAE 189.1 Section 9.5.1.]
- 5.11 Environmental Product Declarations for North American Softwood, Plywood, Wood I-Joists and Laminated Veneer Lumber (LVL) prepared in accordance with the FP Innovations: 2011 Product Category Rules (PCR) for preparing an Environmental Product Declaration for North American Structural and Architectural Wood Products, Version 1, (UN CPC 31, NAICS 321), November 8, 2011, containing an LCA analysis performed in accordance with ISO 14044. [Evaluation applies to ICC 700 Section 610.1, 11.610.1, 12.1(A).610.1; LEED BD+C MRc2; CALGreen Section A5.409.3; ASHRAE 189.1 Section 9.5.1.]
- 5.12 Documentation establishing that the environmental management system conforms to the requirements of

ISO 14001 or equivalent. [Evaluation applies to ICC 700 Sections 611.1, 11.611.1, 12.1(A).611.1.]

## 6.0 IDENTIFICATION

Weyerhaeuser and Trus Joist® structural wood products are identified with a stamp noting the name or logo of the manufacturer (Weyerhaeuser), the plant number, the

product trade name and the ICC-ES evaluation report number (if applicable), and the name or logo of the inspection or grading agency. The report subjects are also identified on the product and/or packaging with the VAR Environmental Report number (VAR-1008) and the ICC-ES SAVE Mark, as applicable.

**TABLE 1—REFERENCE STANDARD OR EVALUATION REPORT NUMBER FOR WEYERHAEUSER AND TRUS JOIST® STRUCTURAL WOOD PRODUCTS**

PRODUCT	REPORT NUMBER/ REFERENCE STANDARD
TJI® Joist	<a href="#">ESR-1153</a>
TimberStrand® LSL	<a href="#">ESR-1387</a>
TimberStrand® LSL with Flak Jacket™ Protection	<a href="#">ESR-1387</a>
Parallam® PSL <sup>1</sup>	<a href="#">ESR-1387</a>
Microllam® LVL	<a href="#">ESR-1387</a>
StrandGuard® TimberStrand® LSL	<a href="#">ESR-1387</a>
Framer Series® Lumber	USDOC PS20
Pro Series™ Lumber	USDOC PS20
Weyerhaeuser Lumber	USDOC PS20
Weyerhaeuser Green Stud	USDOC PS20
Weyerhaeuser Edge™ panels	USDOC PS2
Weyerhaeuser Edge Gold™	USDOC PS2
Weyerhaeuser Diamond™	<a href="#">ESR-4133</a>
Weyerhaeuser Hardwood Edge™	USDOC PS2
Weyerhaeuser RBS	USDOC PS2
Weyerhaeuser Sheathing	USDOC PS2
Weyerhaeuser Plywood	USDOC PS1

<sup>1</sup> Parallam Plus PSL is treated in accordance with AWPA standards.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge	Hardwood Edge	Edge Gold	Diamond	Radiant Barrier	Sheathing	Sheathing Plywood	Lumber	Framer Series Lumber	Green Stud	Pro Series Lumber	T/J Joist	Timber Strand LSL	Timber Strand LSL with Flak Jacket	Parallam PSL	Microllam LVL	Strand Guard	Timber Strand LSL	Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
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**TABLE 2—SUMMARY OF AREAS OF ELIGIBILITY WITH THE 2015 INTERNATIONAL GREEN CONSTRUCTION CODE (IGCC)**

505.2.4	Bio-based materials	N/A	Wood & wood products, other than salvaged or reused wood products, shall be labeled in accordance with the SFI Standard, FSC STD-40-004 V2-1 EN, PEFC Council Technical Document or equivalent fiber procurement system (ASTM D7612 Responsible or Certified Sources).	● <sup>9</sup>							● <sup>9</sup>				● <sup>9</sup>										
505.2.5	Indigenous materials	N/A	Products shall be recovered, harvested, extracted & manufactured within a 500 mile (800 km) radius of the building site. Where only a portion of a material or product is recovered, harvested, extracted and manufactured within 500 miles (800 km), only that portion shall be included. Where resources are transported by water or rail, the distance to the building site shall be determined by multiplying the distance that the resources are transported by water or rail by 0.25, & adding that number to the distance transported by means other than water or rail. <sup>2</sup>	○							○				○										
806.1	Formaldehyde emissions	N/A	Weyerhaeuser structural plywood & structural panel products comply with US DOC PS-1 & PS-2, respectively (see Table 1 of this report) & are exempt from formaldehyde emissions testing.	●																					
		N/A	Weyerhaeuser I-joists comply with ASTM D5055 (see Table 1 of this report) & are exempt from formaldehyde emissions testing.											●											
		N/A	Weyerhaeuser LSL, PSL & LVL products comply with ASTM D5456 (see Table 1 of this report) & are exempt from formaldehyde emissions testing.														●				●				

**TABLE 3—SUMMARY OF AREAS OF ELIGIBILITY WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN)**

4.504.5 5.504.4.5	Composite wood product emissions	Mandatory	EWP & lumber products do not apply to the composite wood product definition. <sup>6</sup>																					
4.505	Moisture content of building materials	Mandatory	Moisture content of lumber may be measured with an appropriate handheld moisture meter. <sup>7</sup>								○													
A4.404.1	Proper beam, header and trimmer design	Elective	Beams, headers & trimmers are the minimum size to adequately support the load.								○		○		○					○				
A4.404.3	Products containing fewer materials are used to achieve the same end-use requirements as conventional products.	Elective	Use premanufactured building systems as a substitute for solid lumber.												●		●			●				

- = Eligible for points
- = Verified attribute
- = This provision does not apply to this product/service

Note: Footnotes are located after Table 8.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge	Hardwood Edge	Edge Gold	Diamond	Radiant Barrier	Sheathing	Sheathing	Plywood	Lumber	Framer Series Lumber	Green Stud	Pro Series Lumber	T JI Joist	TimberStrand LSL	TimberStrand LSL with	Flak Jacket	Parallam PSL	Microllam LVL	StrandGuard	TimberStrand LSL	Parallam Plus PSL	Javelin Software	NextPhase Site Solutions		
				Edge	Hardwood Edge	Edge Gold	Diamond	Radiant Barrier	Sheathing	Sheathing	Plywood	Lumber	Framer Series Lumber	Green Stud	Pro Series Lumber	T JI Joist	TimberStrand LSL	TimberStrand LSL with	Flak Jacket	Parallam PSL	Microllam LVL	StrandGuard	TimberStrand LSL	Parallam Plus PSL	Javelin Software	NextPhase Site Solutions		
<b>TABLE 3—SUMMARY OF AREAS OF ELIGIBILITY WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN) (Continued)</b>																												
A4.404.4	Detailed cut list and material order	Elective	Material lists are included in the plans which specify material quantity and provide direction for on-site cuts.																									
A4.405.4(3) A4.405.4(5)	Renewable sources	Elective	Materials from renewable sources (such as engineered wood and solid wood products).		●								●															
A5.404.1	Advanced wood framing techniques	Elective	Advanced framing methods shall not conflict with structural framing methods or fire-rated assemblies required by the California Building Code (See Table 9 of this report).		○								○															
A5.405.1	Regional materials	Elective	Verify local products are extracted, processed or manufactured within California or 500 miles (805 km) of the job site. <sup>2</sup>		○								○															
A5.405.2	Bio-based materials	Elective	All Weyerhaeuser & Trus Joist wood products qualify as bio-based.		●								●															
A5.405.2.1	Certified wood	Elective	Under review by California Building Standards Commission. <sup>5</sup>		N/A								N/A															
A5.409.1	Life cycle assessment - Material & system assemblies	Elective	Select materials or assemblies based on an LCA done in accordance with ISO 14044.		○								○															
<b>TABLE 4—SUMMARY OF AREAS OF ELIGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700—2015)</b>																												
601.2(1)	Minimum structural member or element sizes necessary for strength & stiffness in accordance with advanced framing techniques that optimize material usage.	3	To earn 3 points, the framing methods listed in Table 9 must be used for floor, wall or roof framing. To earn 9 points they must be used for all floor, wall & roof framing.		○								○															
601.4	Detailed framing or structural plans, material quantity lists & on-site cut lists for framing, structural materials & sheathing materials are provided.	4	To earn 4 points, the software generated plans/lists must be on site.																									
601.5(1)	Precut or preassembled components or panelized or precast assemblies are used for a minimum of 90% of the floor system.	4	To earn 4 points, the precut package must be used for 90% or more of the floor system.																									
602.1.6	Termite-resistant materials are used.	6	To earn 6 points, all structural elements must be termite-resistant in areas of heavy termite infestation. 2 or 4 points are available for areas with lower infestation probability.																									
602.1.7.1(3)	The moisture content of lumber is sampled to ensure it does not exceed 19% prior to the surface and/or wall cavity exposure.	4	To earn 4 points, the moisture content of lumber must be determined to not exceed 19%, such as measuring with a moisture meter, prior to enclosure. <sup>7</sup>										○															

- = Eligible for points
- = Verified attribute
- = This provision does not apply to this product/service

Note: Footnotes are located after Table 8.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge	Hardwood Edge	Edge Gold	Diamond	Radiant Barrier	Sheathing	Sheathing Plywood	Lumber	Framer Series Lumber	Green Stud	Pro Series Lumber	T/J Joist	TimberStrand LSL	TimberStrand LSL with Flak Jacket	Parallam PSL	Microllam LVL	StrandGuard	TimberStrand LSL	Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
<b>TABLE 4—SUMMARY OF AREAS OF ELIGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700—2015) (Continued)</b>																								
606.1(2)	Two types of biobased materials are used, each for more than 1% of the project's projected building material cost.	6	To earn 6 points, products must be at least 1% of the construction material cost & another bio-based product at 1% of material cost must be used. 1 or 3 points are available for greater than 0.5%.				●				●				●					●				
606.2(2)	Two certified wood-based products are used for major elements of the building, such as all walls, floors or roof.	4	To earn 4 points, a second certified wood product must also be used as a major element. <sup>1</sup>				● <sup>9</sup>				● <sup>9</sup>				● <sup>9</sup>					● <sup>9</sup>				
606.3	Materials used for major components of the building are manufactured using a minimum of 33% of primary manufacturing process energy derived from renewable sources, combustible waste sources, or renewable energy credits.	2 each 6 max	To earn 6 points, the products must be used for at least 3 major components of the building. 2 points may be earned when used for each major component.				●				● <sup>8</sup>									●				
608.1	Products containing fewer materials are used to achieve the same end-use requirements as conventional products.	3 each 9 max	To earn 3 points at least 80% of framing products used in the building are Weyerhaeuser or Trus Joist products.				●								●					●				
609.1	Regional materials	2 each 10 max	For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally. <sup>2</sup>				○				○				○					○				
611.1	Product manufacturer's operations & business practices include environmental management system concepts & the production facility is ISO 14001 certified or equivalent.	1 per % 10 max	1 point may be earned for each building products used that equals 1 percent or more of the estimated total building materials cost. Material cost breakdown to be verified & points adjusted to reflect actual percentage of all products from ISO 14001 facilities.				●				●				● <sup>9</sup>					● <sup>9</sup>				
901.4(1)	Structural plywood for floor, wall, and/or roof sheathing complies with DOC PS 1 and/or DOC PS 2. OSB for floor, wall, and/or roof sheathing complies with DOC PS 2. The panels are made with moisture-resistant adhesives & the trademark indicates the adhesives are Exposure 1 or Exterior (plywood) & Exposure 1 (OSB)	Mandatory	To meet this, a minimum of 85% of OSB or plywood, in the building, must consist of Weyerhaeuser or Trus Joist products.				●																	
610.1	A Life Cycle Assessment (LCA) tool complying with ISO 14044 or other recognized standards is used to select environmentally preferable products or assemblies based on comparison of the environmental impact of building materials, assemblies or the whole building.	3 each 15 max	To gain 15 points, an ISO 14044-complaint LCA must be done on a whole building basis. 3 points may be earned where comparative LCA is done for individual products or systems using 5 impact measures and show improvement on the environmental impact measures by an average of 15%.				●				●				●					●				
○	= Eligible for points																							
●	= Verified attribute																							
	= This provision does not apply to this product/service																							



SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge Hardwood Edge Edge Gold Diamond Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	T/J Joist	TimberStrand LSL TimberStrand LSL with Flak Jacket Parallam PSL Microllam LVL	StrandGuard TimberStrand LSL Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
<b>TABLE 4—SUMMARY OF AREAS OF ELIGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700—2015) (Continued)</b>										
901.4(6)	Non-emitting products, which can include structural wood framing.	4	A minimum of 85% of product in the building are the identified Weyerhaeuser or Trus Joist products.	●		●	●	●		
11 601.2.1(1)	Minimum structural member or element sizes necessary for strength & stiffness in accordance with advanced framing techniques that optimize material usage.	3	To earn 3 points, the framing methods listed in Table 9 must be used for floor, wall or roof framing. To earn 9 points they must be used for all floor, wall and roof framing.	○	○	○	○	○		
11 601.4	Detailed framing or structural plans, material quantity lists & on-site cut lists for framing, structural materials, & sheathing materials are provided.	4	To earn 4 points, the software generated plans/lists must be on site.						○	○
11.601.5.1(1)	Precut or preassembled components or panelized or precast assemblies are used for a minimum of 90% of the floor system.	4	To earn 4 points, the precut package must be used for 90% or more of the floor system.							○
11.602.1.6	Termite-resistant materials are used.	6	To earn 6 points, all structural elements must be termite resistant in areas of heavy termite infestation. 2 or 4 points are available for areas with lower infestation probability.					●		
11.602.1.7.1(3)	The moisture content of lumber is sampled to ensure it does not exceed 19% prior to the surface and/or wall cavity exposure.	4	To earn 4 points, the moisture content of lumber must be determined to not exceed 19%, such as measuring with a moisture meter, prior to enclosure. <sup>7</sup>		○					
11.606.1(b)	Two types of biobased materials are used, each for more than 1% of the project's projected building material cost.	6	To earn 6 points, products must be at least 1% of the construction material cost AND another bio-based product at 1% of material cost must be used. 1 or 3 points are available for more than 0.5%.	●	●	●	●	●		
11.606.2(2)	Two certified wood-based products are used for major elements of the building, such as all walls, floors or roof	4	To earn 4 points, a second certified wood product must also be used as a major element. <sup>1</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>		
11.606.3	Materials used for major components of the building are manufactured using a minimum of 33% of primary manufacturing process energy derived from renewable sources, combustible waste sources, or renewable energy credits.	2 each 6 max	To earn 6 points, the products must be used for at least 3 major components of the building. 2 points may be earned when used for each major component.	●	● <sup>8</sup>		●	●		
11.608.1	Products containing fewer materials are used to achieve the same end-use requirements as conventional products	3 each 9 max	To earn 3 points, at least 80% of framing products used in the building are Weyerhaeuser or Trus Joist products.	●		●	●	●		
○	= Eligible for points									
●	= Verified attribute									
	= This provision does not apply to this product/service									

Note: Footnotes are located after Table 8.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge Hardwood Edge Edge Gold Diamond Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	T/J Joist	TimberStrand LSL TimberStrand LSL with Flak Jacket Parallam PSL Microllam LVL	StrandGuard TimberStrand LSL Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
<b>TABLE 4—SUMMARY OF AREAS OF ELIGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700—2015) (Continued)</b>										
11.609.1	Regional materials	2 each 10 max	For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally. <sup>2</sup>	○	○	○	○	○		
11.610.1	A Life Cycle Assessment (LCA) tool complying with ISO 14044 or other recognized standards is used to select environmentally preferable products or assemblies based on comparison of the environmental impact of building materials, assemblies or the whole building.	3 each 15 max	To gain 15 points, an ISO 14044-complaint LCA must be done on a whole building basis. 3 points may be earned where comparative LCA is done for individual products or systems using 5 impact measures and show improvement on the environmental impact measures by an average of 15%.	●	●	●	●	●		
11.611.1	Product manufacturer's operations & business practices include environmental management system concepts & the production facility is ISO 14001 certified or equivalent.	1 per % 10 max	1 point may be earned for each building products used that equals 1 percent or more of the estimated total building materials cost. Material cost breakdown to be verified & points adjusted to reflect actual percentage of all products from ISO 14001 facilities.	●	●	● <sup>9</sup>	● <sup>9</sup>	●		
11.901.4(1)	Structural plywood used for floor, wall, and/or roof sheathing complies with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing complies with DOC PS 2. The panels are made with moisture-resistant adhesives & the trademark indicates the adhesives are Exposure 1 or Exterior (plywood) and Exposure 1 (OSB).	Mandatory	To meet this, a minimum of 85% of OSB or plywood in the building must consist of Weyerhaeuser or Trus Joist products.	●						
11.901.4(6)	Non-emitting products, which can include structural wood framing.	4	A minimum of 85% of product in the building are the identified Weyerhaeuser or Trus Joist products.	●		●	●	●		
12.601.2.1(1)	Minimum structural member or element sizes necessary for strength & stiffness in accordance with advanced framing techniques that optimize material usage.	Mandatory	To earn 3 points the framing methods listed in Table 9 must be used for floor, wall or roof framing. To earn 9 points they must be used for all floor, wall and roof framing.	○	○	○	○	○		
12.1(A).606.1	Two types of biobased materials are used, each for more than 1% of the project's projected building material cost.		To earn 6 points products must be at least 1% of the construction material cost & another bio-based product at 1% of material cost must be used. 1 or 3 points are available for more than 0.5%.	●	●	●	●	●		
12.1(A).606.2	Two certified wood-based products are used for major elements of the building, such as all walls, floors or roof.		To earn 4 points a second certified wood product must also be used as a major element. <sup>1</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	
○	= Eligible for points									
●	= Verified attribute									
	= This provision does not apply to this product/service									

Note: Footnotes are located after Table 8.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge Hardwood Edge Edge Gold Diamond Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	T/J Joist	TimberStrand LSL TimberStrand LSL with Flak Jacket Parallam PSL Microllam LVL	StrandGuard TimberStrand LSL Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
<b>TABLE 4—SUMMARY OF AREAS OF ELIGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700—2015) (Continued)</b>										
12.1(A).608.1	Products containing fewer materials are used to achieve the same end-use requirements as conventional products.	Mandatory	To earn 3 points, at least 80% of framing products used in the building are Weyerhaeuser or Trus Joist products.	●		●	●	●		
12.1(A).609.1	Regional materials		For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally. <sup>2</sup>	○	○	○	○	○		
12.1(A).610.1	A Life Cycle Assessment (LCA) tool complying with ISO 14044 or other recognized standards is used to select environmentally preferable products or assemblies based on comparison of the environmental impact of building materials, assemblies or the whole building.		To gain 15 points an ISO 14044-complaint LCA must be done on a whole building basis. 3 points may be earned where comparative LCA is done for individual products or systems using 5 impact measures and show improvement on the environmental impact measures by an average of 15%.	●	●	●	●	●		
12.1(A).611.1	Product manufacturer's operations & business practices include environmental management system concepts & the production facility is ISO 14001 certified or equivalent.		1 point may be earned for each building products used that equals 1 percent or more of the estimated total building materials cost. Material cost breakdown to be verified & points adjusted to reflect actual percentage of all products from ISO 14001 facilities.	●	●	● <sup>8</sup>	● <sup>8</sup>	●		
12.1.901.4(1)	Structural plywood for floor, wall, and/or roof sheathing complies with DOC PS 1 and/or DOC PS 2. OSB for floor, wall, and/or roof sheathing complies with DOC PS 2. The panels are made with moisture-resistant adhesives & the trademark indicates the adhesives are Exposure 1 or Exterior (plywood) and Exposure 1 (OSB).		To meet this, a minimum of 85% of OSB or plywood in the building must consist of Weyerhaeuser or Trus Joist products.	●						

**TABLE 5—SUMMARY OF AREAS OF ELIGIBILITY WITH USGBC'S LEED v4 FOR HOMES DESIGN AND CONSTRUCTION**

MR	FSC certified tropical wood	Prerequisite	All wood must be nontropical or certified by FSC or USGBC-approved equivalent. <sup>4</sup>	4	4	4	4	4		
MRc2	Material-efficient framing	0.5 min 2 max	To earn points verify that advanced framing measures in Table 9 are used for floors, walls and/or roof framing for at least 90% of each component. To earn points, off-site panelized or modular, prefabricated construction must comply with the requirements of this credit. <sup>3</sup>	○	○	○	○	○		○

- = Eligible for points
- = Verified attribute
- = This provision does not apply to this product/service

Note: Footnotes are located after Table 8.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge Hardwood Edge Edge Gold Diamond Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	T/J Joist	TimberStrand LSL TimberStrand LSL with Flak Jacket Parallam PSL Microllam LVL	StrandGuard TimberStrand LSL Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
<b>TABLE 5—SUMMARY OF AREAS OF ELIGIBILITY WITH USGBC'S LEED v4 FOR HOMES DESIGN AND CONSTRUCTION (Continued)</b>										
MRc3	Environmentally preferable products for roof, wall & floors; interior & exterior framing & sheathing.	0.5 each 4 max	Option 1: To earn points use framing that is extracted, processed and manufactured within 100 miles (160 km) of the site for a minimum of 50% (by weight or volume) of the component. <sup>2</sup>	○	○	○	○	○		
			Option 2: Use wood products certified by FSC or USGBC-approved equivalent. <sup>4</sup>	●	●	●	●	●		
EQc2	Low emitting materials	1	To earn 1 point use wood composite wood products containing no-added urea-formaldehyde resins.	●		●	●	●		
<b>TABLE 6—SUMMARY OF AREAS OF ELIGIBILITY WITH USGBC'S LEED V4 FOR BUILDING DESIGN AND CONSTRUCTION (BC+C)</b>										
MRc2	Environmental product declarations	1	Option 1: Get 1 point for using at least 20 permanently installed products, sourced from 5 or more manufacturers, that meet one of the four disclosure requirements cited.	○	○	○	○	○		
MRc3	Sourcing of raw materials	1/2	Option 1: Use at least 20 different permanently installed products from at least 5 different manufacturers. Weyerhaeuser has self-declared reports for their products and are eligible for 1/2 of a product credit.	○	○	○	○	○		
	Sourcing of raw materials - certification of new wood products	1	Option 2: Use wood products certified by FSC or USGBC-approved equivalent. <sup>4</sup>	●	●	●	●	●		
MRc3	Sourcing of raw materials - source location	N/A	Products meeting the requirements of Option 2 may be eligible for additional credit based on source location (extraction, manufacture and purchase point) based on location relative to project site. <sup>2,4</sup>	○	○	○	○	○		
EQc2	Low emitting interiors	N/A	EWP and lumber products do not apply to the composite wood product definition. <sup>6</sup>							
<b>TABLE 7—SUMMARY OF AREAS OF ELIGIBILITY WITH ANSI/GBI 01-2010—GREEN BUILDING ASSESSMENT PROTOCOL FOR COMMERCIAL BUILDINGS</b>										
10.1.2.2	Biobased Products – building assemblies	7 max	All Weyerhaeuser and Trus Joist wood products are qualified as biobased.	●	●	●	●	●		
10.1.4.1	Regional Materials – building assemblies	5 max	To earn credits use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 90% (by weight or volume of the component). <sup>2</sup>	○	○	○	○	○		
10.3.2.1	Certified wood	6	Between 10% and 60% or more of wood-based products used in the building are third party certified.	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>	● <sup>9</sup>		
10.1.1.1	Life cycle impact - building assemblies	33 max	Use Green Globes LCA Credit Calculator	○	○	○	○	○		
○	= Eligible for points									
●	= Verified attribute									
	= This provision does not apply to this product/service									

Note: Footnotes are located after Table 8.

SECTION #	SECTION INTENT	POSSIBLE POINTS	CONDITIONS OF USE TO QUALIFY FOR POINTS	Edge Hardwood Edge Edge Gold Diamond Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	TJI Joist	TimberStrand LSL TimberStrand LSL with Flak Jacket Parallam PSL Microllam LVL	StrandGuard TimberStrand LSL Parallam Plus PSL	Javelin Software	NextPhase Site Solutions
<b>TABLE 8—SUMMARY OF AREAS OF ELIGIBILITY WITH ASHRAE STANDARD 189.1—2014</b>										
8.4.2.4	Composite wood product emissions	Prescriptive option	EWP and lumber products exempt from the composite wood product emissions requirements. <sup>6</sup>							
9.3.2	Extracting, harvesting and manufacturing	Mandatory	Wood products containing wood from endangered species shall conform to trade requirement of CITES.	●	●	●	●	●		
9.4.1.2	Regional materials	Prescriptive option	A minimum of 15% of building materials or products used are extracted/harvested/recovered or manufactured within 500 miles (805 km) of the site. <sup>2</sup>	○	○	○	○	○		
9.4.1.3	Biobased products	Prescriptive option	All Trus Joist wood products are qualified as biobased.	●	●	●	●	●		
9.4.1.3.1	Wood Building Components	Prescriptive option	Chain of custody compliance is through one of three available options: 1) an on-product chain of custody label, 2) chain of custody paperwork, or 3) vendors may supply to the AHJ a statement that the annual average amount of certified content of the total annual wood products purchased by the vendor is 60% or greater, for which they have chain of custody verification not older than two years.	○ <sup>9</sup>	○ <sup>9</sup>	○ <sup>9</sup>	○ <sup>9</sup>	○ <sup>9</sup>		
9.5.1	Life cycle assessment	Performance option	Select materials or assemblies based on an LCA done in accordance with ISO 14044.	○	○	○	○	○		
○	= Eligible for points									
●	= Verified attribute									
	= This provision does not apply to this product/service									

**Footnotes:**

<sup>1</sup>Certification is required of the manufacturer only. Vendor Chain of Custody is not required to qualify for this point.

<sup>2</sup>Contact local Weyerhaeuser representative to verify regional sourcing.

<sup>3</sup>Applicable only when a third-party prefabricates the framing package prior to arrival on the site. NextPhase Solutions allows for either prefabrication off-site or assembly on-site using materials labeled and cut to precision-end-trim dimensions off-site.

<sup>4</sup>Forest certification credit for LEED v4 resources either FSC ASTM D7612 Responsible or Certified Sources, or USGBC-approved equivalent. Contact USGBC for a list of approved equivalent programs.

<sup>5</sup>CGBSC recognizes importance of use of certified forest products, however, the specific requirements are currently under development.

<sup>6</sup>This area is not to be confused with the provisions of EQ 4.4 in LEED (Tables 4, 5, 6, 7, and 8) because the California Air Resources Board (CARB) does not regulate engineered wood product emissions and are exempt in ASHRAE 189.1.

<sup>7</sup>Note that PS-20 lumber products with a moisture content >19% are shipped wet with fungicide protection. Engineered wood products and sheathing are shipped dry with MC < 10%.

<sup>8</sup>Additional listees have not been evaluated for renewable energy or ISO 14001 EMS systems.

<sup>9</sup>Weyerhaeuser and Pacific WoodTech locations are certified to either SFI certified sourcing or SFI chain of custody. RedBuilt and Anthony-Domtar locations are certified to FSC chain of custody. TJI joists or Microllam LVL from RedBuilt and Anthony-Domtar are not labeled as SFI certified, but these locations source materials following FSC procurement policies.

N/A = Not applicable



TABLE 9—ADVANCED FRAMING TECHNIQUES

	RATING SYSTEM/CODES <sup>1</sup>		
	ICC-700	LEED HOMES V4)	CALGREEN
<b>PRESCRIPTIVE-BASED COMPLIANCE CRITERIA</b>			
19.2- or 24-inch OC floor framing	✓	✓	✓
19.2- or 24-inch OC bearing walls	✓	✓	✓
24-inch OC roof framing	✓	✓	✓
24-inch OC interior partitions	✓	✓	✓
Single top plate walls	✓	See footnote 3	✓
Right sized or insulated headers (where required)	✓	✓	✓
Eliminate headers in non-bearing walls	✓	✓	✓
Doubling rim joist in lieu of header (2x6 or deeper wall)	✓	See footnote 3	See footnote 4
Ladder blocking at interior wall-to-exterior wall intersections	✓	✓	See footnote 4
Two stud corner framing	✓	✓	✓
Doubling rim joist in lieu of header (2x6 or deeper wall)	✓	See footnote 3	See footnote 4
Other measures that reduce material usage	See footnote 2	See footnote 3	See footnote 4
<b>PERFORMANCE-BASED COMPLIANCE CRITERIA</b>			
Optimized design per Wood Frame Construction Manual	✓	See footnote 3	See footnote 4
Optimized design per National Design Specification for Wood Construction	✓	See footnote 3	See footnote 4
Precut framing packages	N/A	✓	See footnote 4

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

<sup>1</sup>✓ represents that the criteria is deemed to comply when conditions are met.

<sup>2</sup>In ICC 700 Section 601.2, 3 points may be gained for each advanced framing technique that exceeds 80% usage in the building up to 9 points maximum. See references in 601.2, commentary for additional details on prescriptive-based compliance criteria.

<sup>3</sup>In LEED v4 Homes MRc2, alternative measures are eligible for points if they save comparable amounts of framing material.

<sup>4</sup>Other framing techniques as permitted by the U.S. Department of Energy's Office of Building Technology, State and Community Programs, subject to approval by the AHJ.

## Appendix A

### Discussion Related to Life-Cycle Assessment

#### A1.0 GENERAL

The following information is intended to provide some general background on LCA provisions in existing rating systems and standards. Users are advised that the science of LCA is still evolving and there are no standardized procedures for such an analysis. It must be noted that Section 610.1 of ICC 700-2012, Section A5.409.3 of the California Green Building Standards Code (CALGreen), Section 9.5.1 of ASHRAE 189.1, Section 10.1.1 of Green Globes, and LEED v4 BD+C MRc2 encourage the use of comparative LCA as means of selecting preferable materials, systems or building assemblies. However, LCA results should not be interpreted beyond the scope of the boundary limits used in performing the LCA.

This VAR indicates that Trus Joist and Weyerhaeuser products may be eligible for points related to LCA by use of the information contained in the documentation noted in Section 5.10 and 5.11 of this report. This appendix discusses additional information required by the user of this report related to achieving points or demonstrating compliance based on LCA output.

#### A2.0 DISCUSSION RELATED TO ICC 700

As indicated in the ICC 700 Commentary, points can be obtained based on the results of an analysis based on an LCA. For the purpose of compliance with the intent of ICC 700, the following steps (as a minimum) are recommended:

- Fully define the benchmark material, product, assembly, or structure
- Fully define the product or assembly proposed as more environmentally friendly
- Fully define the endpoints or boundaries of the analysis (so-called cradle-to-gate, cradle-to-grave, cradle-to-cradle, gate-to-gate, etc.). For analyses that go beyond cradle-to-gate, a separate report is recommended for each application or use category. Such reports are also recommended to include a discussion of the sensitivity of the analysis to major assumptions for major parameters.
- Employ an LCA method complying with ISO 14044.
- Report all applicable attributes of the benchmark analysis and the proposed product/assembly analysis that are relevant to the LCA.
- The involvement of an individual with experience in the field of LCA and who is knowledgeable in the latest research and standards related to LCA, from the earliest planning stages through completion of the final assessment, is recommended.
- An independent peer review of the entire LCA methodology and its conclusions by an individual knowledgeable in LCA is recommended.

Examples of an LCA that meets these requirements can be found in the series of CORRIM reports ([www.corrim.org](http://www.corrim.org)) that address a broad range of wood-based building materials.

#### A3.0 DISCUSSION RELATED TO CALGREEN AND ASHRAE 189.1

Similar to the requirements of ICC 700, Section A5.409.3 of the CALGreen and Section 9.5.1 of ASHRAE 189.1 allows the use of selected materials or assemblies based on LCA done in accordance with ISO 14044.

#### A4.0 DISCUSSION RELATED TO ANSI/GBI 01

Although life-cycle assessment in its broad sense is too complex for standardization at this time, the use of a specific tool (e.g., Green Globes LCA Credit Calculator) in strict accordance with the rating system intent of comparative analysis of specific components of the building is reasonable. However, users are advised to consult with persons familiar with LCA tools when conducting this analysis. Additional guidance regarding the Green Globes LCA Credit Calculator is provided in Appendix N of the Green Globes document.