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

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

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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

ADDITIONAL LISTEES:  
REDBUILT™ LLC  
PACIFIC WOODTECH CORPORATION

 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:
- 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 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 (1,219 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® 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 Fireblocking:

4.3.1 TimberStrand® LSL, Microllam® LVL and Parallam® PSL: For applications under the 2018, 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® 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 2018, 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 2018, 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 2018, 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® Rim Board and Weyerhaeuser Rim Board:

TJ® 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 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 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 2009 IBC, subject to the following:

- Design values for rim board applications are provided in Table 4.
- TimberStrand LSL 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.
- 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.

5.0 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 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.

5.5 TimberStrand LSL is produced at the Weyerhaeuser manufacturing plants 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; 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.
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 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 June 2017 (editorially revised March 2018).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated October 2016 (editorially revised March 2018).

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 (editorially revised November 2018).

6.4 Data in accordance with the ICC-ES Acceptance Criteria for Wood-Based Studs (AC202), dated June 2009 (editorially revised March 2018).

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 (Weyerhaeuser or RedBuilt) or report holder’s or listee’s registered trademark 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). An example label is shown in Figure 4 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 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.

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

WEYERHAEUSER
POST OFFICE BOX 6049
FEDERAL WAY, WASHINGTON 98063
(888) 453-8358
www.woodbywy.com
wood@weyerhaeuser.com

7.4 The Additional Listees’ contact information is the following:

REDBUILT™ LLC
200 EAST MALLARD DRIVE
BOISE, IDAHO 83706

PACIFIC WOODTECH CORPORATION
1850 PARK LANE
POST OFFICE BOX 465
BURLINGTON, WASHINGTON 98233
### TABLE 1—REFERENCE DESIGN VALUES FOR MICROLLAM® LVL, PARALLAM® PSL AND TIMBERSTRAND® LSL 1,2,5

<table>
<thead>
<tr>
<th>GRADE (1)</th>
<th>BILLET MATERIAL THICKNESS (In.)</th>
<th>Modulus of Elasticity (2)</th>
<th>JOIST / BEAM ORIENTATION (3)</th>
<th>FACE / PLANK ORIENTATION (4)</th>
<th>AXIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E (x10^6 psi)</td>
<td>E_b (x10^6 psi)</td>
<td>Fb (psi)</td>
<td>Fc (psi)</td>
<td>Fb (psi)</td>
</tr>
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<td>Ebd</td>
<td>Emin</td>
<td>Emin</td>
<td>2Ebd</td>
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<tr>
<td>1.6E WS</td>
<td>0.75 to 3.50</td>
<td>1.6 0.813 2140 285(11)</td>
<td>750</td>
<td>2420</td>
<td>190</td>
</tr>
<tr>
<td>1.8E WS</td>
<td>1.8 0.915 2445 285(11)</td>
<td>750</td>
<td>2600</td>
<td>190</td>
<td>480</td>
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<tr>
<td>1.9E WS</td>
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<tr>
<td>2.0E–2900F WS</td>
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<td>480</td>
</tr>
<tr>
<td>2.0E–2900F WS(5)</td>
<td>2.0 1.017 2900 285(11)</td>
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<td>480</td>
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<td>2.4E WS</td>
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<td>800(13)</td>
<td>2025</td>
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<td>480</td>
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<td>3270</td>
<td>190</td>
<td>480</td>
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</table>

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

1. 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).
2. Reference design values must be adjusted, as applicable, in accordance with Section 8.3 of the NDS.
3. Eastern Species grades (ES) for Parallam PSL and Microllam LVL are produced primarily with southern pine (SP) and/or yellow poplar (YP). Western Species (WS) products are produced primarily with Douglas fir larch (DF) for Parallam PSL, and DF and/or lodgepole pine (LP) for Microllam LVL.
4. Reference bending design values, Fb, for the applicable orientation, must be adjusted by the appropriate factor (CV) in the following tables:
5. 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:

\[
\Delta = \Delta_1 + \Delta_2
\]

where:

- \( \Delta_1 \) = Deflection, inches
- \( \Delta_2 \) = Deflection, inches
- \( d \) = Beam depth, inches
- \( W \) = Uniform load, plf
- \( E \) = Modulus of Elasticity, psi

6. Reference bending design values, Fb, for the applicable orientation, must be adjusted by the appropriate factor (CV) in the following tables:

(footnotes to Table 1 continued on following page)
### MATERIAL IN JOIST/BEAM ORIENTATION

<table>
<thead>
<tr>
<th>EQUATION</th>
<th>Member Depth, d (in.) (See Figure 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 3.5</td>
</tr>
<tr>
<td>Microllam® LVL</td>
<td>$C_v = (12/d)^{0.136}$</td>
</tr>
<tr>
<td>Parallam® PSL</td>
<td>$C_v = (12/d)^{0.111}$</td>
</tr>
<tr>
<td>TimberStrand® LSL</td>
<td>$C_v = (12/d)^{0.092}$</td>
</tr>
</tbody>
</table>

### MATERIAL IN FACE/PLANK ORIENTATION

<table>
<thead>
<tr>
<th>EQUATION</th>
<th>Member Thickness, t (in.) (See Figure 1)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>≤ 1.75</td>
</tr>
<tr>
<td>Microllam® LVL</td>
<td>$C_v = (1.75/t)^{0.136}$</td>
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<tr>
<td>Parallam® PSL</td>
<td>$C_v = (12/t)^{0.111}$</td>
</tr>
<tr>
<td>TimberStrand® LSL</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

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9For 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.

10Reference design values are based on a standard length of 4 feet. For lengths longer than 4 feet, multiply F_b 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.

11The 2.0E-2900F_b WS grade Microllam LVL is used in header or beam applications only.

12Reference tension design values are based on a standard length of 4 feet. For lengths longer than 4 feet, multiply Ft 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.

13For column applications, Fc = 500 psi. Alternatively, column capacity can be determined using the provisions of Chapter 15 of the NDS in conjunction with the published Fc 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:
- \( e_2 \) = 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, $F_{c \perp}$, is 870 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 inches (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, $F_{c \perp}$ (plank), apply: for $F_{c \perp}$ (plank) = 735 psi for 1.8E ES
- $F_{c \perp}$ (plank) = 735 psi for 1.9E ES
- $F_{c \perp}$ (plank) = 840 psi for 2.0E ES
- $F_{c \perp}$ (plank) = 945 psi for 2.1E ES
- $F_{c \perp}$ (plank) = 1050 psi for 2.2E ES

20When produced as SP the compression perpendicular-to-grain for joist/beam orientation, $F_{c \perp}$ (joist/beam), is 880 psi.

21When produced as YP or YP/RM the compression perpendicular-to-grain for face/plank orientation, $F_{c \perp}$ (plank), is 670 psi.

22The compression-perpendicular-to-grain design value, $F_{c \perp}$, for 1.6E TimberStrand LSL with thicknesses less than 2.5 inches is 900 psi.
TABLE 2—EQUIVALENT SPECIFIC GRAVITIES FOR FASTENER DESIGN\textsuperscript{1,2,3}

| PRODUCT | Nails and Screws | | Bolts | | Lag Screws |
|---------|------------------|------------------|------------------|------------------|
|         | Equivalent Specific Gravity | 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\textsuperscript{©} LVL | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 |
| Parallam\textsuperscript{®} PSL | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 |
| TimberStrand\textsuperscript{®} LSL, TimberStrand\textsuperscript{®} LSL Rim Board and RedBuilt LSL Rim Board | 0.42 0.50 | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 | 0.50 0.50 |
| TJ\textsuperscript{®} Rim Board and Weyerhaeuser Rim Board | – 0.42 | – 0.50 | 0.38 0.50 | – | \textsuperscript{[5]} |

\textsuperscript{1}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.

\textsuperscript{2}See Figure 3 for an illustration depicting face and edge nailing.

\textsuperscript{3}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.

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

\textsuperscript{5}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.
### TABLE 3—MINIMUM NAIL AND STAPLE SPACING ALONG THE EDGE OF THE MEMBER\(^{1,2,3}\)

<table>
<thead>
<tr>
<th>NAIL TYPE AND SIZE</th>
<th>Minimum Nail and Staple Spacing (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penny Weight</td>
<td>Microllam LVL(^{(4)})</td>
</tr>
<tr>
<td></td>
<td>Minimum Member Thickness (in.)</td>
</tr>
<tr>
<td>Penny Weight</td>
<td></td>
</tr>
<tr>
<td>8d Box</td>
<td>0.113 x 2.5</td>
</tr>
<tr>
<td>8d Common</td>
<td>0.131 x 2.5</td>
</tr>
<tr>
<td>10d Box</td>
<td>0.128 x 3.0</td>
</tr>
<tr>
<td>10d Common</td>
<td>0.148 x 3.0</td>
</tr>
<tr>
<td>12d Box</td>
<td>0.128 x 3.25</td>
</tr>
<tr>
<td>12d Common</td>
<td>0.148 x 3.25</td>
</tr>
<tr>
<td>16d Box</td>
<td>0.135 x 3.5</td>
</tr>
<tr>
<td>16d Common</td>
<td>0.162 x 3.5</td>
</tr>
<tr>
<td>16d Sinker</td>
<td>0.148 x 3.25</td>
</tr>
<tr>
<td>No. 14 gage staple</td>
<td>–</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

1 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.

2 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.

3 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.

4 Other nail spacings for specific applications, such as prefabricated steel components or hangers, may be used as detailed for Microllam\(^{8}\) LVL, Parallam\(^{8}\) PSL and TimberStrand\(^{2}\) LSL in a current ICC-ES evaluation report.

5 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.

6 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.

7 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 TIMBERSTRAND® LSL RIM BOARD, REDBUILT LSL RIM BOARD, TJ® RIM BOARD, AND WEYERHÄUEGER RIM BOARD PRODUCTS

<table>
<thead>
<tr>
<th>Rim Board Product:</th>
<th>TimberStrand® LSL, TimberStrand® LSL Rim Board, and RedBuilt LSL Rim Board</th>
<th>TJ® Rim Board and Weyerhaeuser Rim Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rim Board Grade:</td>
<td>≥1.3E 1.5E ≥1.75E ≥1.25E 1.5E ≥1.75E ≥1.25E 1.5E ≥1.75E ≥1.25E 1.5E ≥1.75E</td>
<td>0.60E/1.0E</td>
</tr>
<tr>
<td>Rim Thickness (in.):</td>
<td>≥1.25 1.5 ≥1.75 ≥1.25 1.5 ≥1.75 ≥1.25 1.5 ≥1.75 ≥1.25 1.5 ≥1.75</td>
<td>1.25</td>
</tr>
</tbody>
</table>

**Uniform Vertical Load (lbs/ft)** (1)

<table>
<thead>
<tr>
<th>Depth (in.)</th>
<th>0.5</th>
<th>11.875</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5400</td>
<td>6480</td>
<td>7560</td>
<td>5400</td>
<td>6480</td>
<td>7560</td>
<td>5400</td>
<td>6480</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
</tr>
</tbody>
</table>

**Lateral Load (lbs/ft)** (4,5,6)

<table>
<thead>
<tr>
<th>Depth (in.)</th>
<th>9.5-24</th>
<th>220</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Concentrated Vertical Load (lbs)** (9)

<table>
<thead>
<tr>
<th>Depth (in.)</th>
<th>9.5-24</th>
<th>3760</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4520</td>
</tr>
<tr>
<td></td>
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<td>4520</td>
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<td></td>
<td></td>
<td>4520</td>
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<tr>
<td></td>
<td></td>
<td>4520</td>
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<tr>
<td></td>
<td></td>
<td>4520</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7470</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3400</td>
</tr>
</tbody>
</table>

**Deck Ledger Capacity (lbs/bolt)** (10)

<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Axial Stiffness (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 in. Lag</td>
<td>610</td>
</tr>
<tr>
<td>0.50 in. Bolt</td>
<td>725</td>
</tr>
<tr>
<td>0.50 in. Bolt w/ air space</td>
<td>615(11)</td>
</tr>
</tbody>
</table>

For SI: 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) each into the top and bottom flanges.

9The 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 2018 IRC, R507.2 of the 2015 and 2012 IRC and Section R502.2.2 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 2018 and 2015 IRC, R507.2.2 of the 2012 IRC and Section R502.2.2.2 of the 2009 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.
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 2019.