

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**
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www.iLevel.com**ADDITIONAL LISTEE:****REDBUILT™ LLC**
200 EAST MALLARD DRIVE
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POST OFFICE BOX 465
BURLINGTON, WASHINGTON 98233**MURPHY ENGINEERED WOOD PRODUCTS DIVISION**
412 WEST CENTRAL
SUTHERLIN, OREGON 97479**EVALUATION SUBJECT:****STRUCTURAL COMPOSITE LUMBER: TIMBERSTRAND®
LAMINATED STRAND LUMBER (LSL), PARALLAM®
PARALLEL STRAND LUMBER (PSL), AND MICROLLAM®
LAMINATED VENEER LUMBER (LVL); TIMBERSTRAND®
LSL RIM BOARD; TJ-STRAND® RIM BOARD; e-RIM®
BOARD; AND iLevel™ RIM BOARD****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- BOCA® *National Building Code* 1999 (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Structural
- Fire resistance

2.0 USES

The structural composite lumber (SCL) 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.

3.0 DESCRIPTION**3.1 General:**

The structural composite lumber (SCL) described in this report is an alternative material to that described in Chapter 23 of the IBC, BNBC, SBC, and the UBC, and complies with the requirements noted in Section 2303.1.9 of the IBC, Section 2301.2(1) of the IBC for allowable stress design, and Section 2303.4 of the BNBC. The TimberStrand LSL Rim Board, TJ-Strand Rim Board, e-Rim Board, and iLevel Rim Board comply with Section 104.11 of the IBC, Section 106.4 of the BNBC, Section 103.7 of the SBC and Section 104.2.8 of the UBC as alternative materials and methods of construction. Section 2308 of the IBC, Section 2305 of the BNBC and Chapters 5, 6 and 8 of the IRC are applicable to the SCL, TimberStrand LSL Rim Board, TJ-Strand Rim Board, e-Rim Board, and iLevel Rim Board described in this report.

3.2 Rim Board:

Each rim board product described in this evaluation report is a continuously supported 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. The rim boards may be used for any combination of the following:

- a. To transfer, from above to below, all vertical loads at the rim board location. Allowable vertical loads are noted in Tables 3, 6, 9 and 15.
- b. To provide diaphragm attachment (sheathing to top edge of rim board).
- c. To transfer in-plane lateral loads from the diaphragm to the wall plate below.
- d. To provide lateral support to the joist or rafter (resistance against rotation) through attachment to the joist or rafter.
- e. To provide closure for ends of joists or rafters.

- f. To provide an attachment base for siding or an exterior deck ledger.

The rim board properties and species, adhesive, manufacturing parameters, and finished product thickness, width and length meet the requirements noted in the approved quality control manual that contains the manufacturing standard.

3.3 TimberStrand LSL and TimberStrand LSL Rim Board:

3.3.1 TimberStrand LSL: TimberStrand LSL is manufactured from strands of a single wood species or a combination of wood species blended with an isocyanate-based adhesive. The wood species, species combinations and adhesive used to manufacture TimberStrand LSL are specified in the approved TimberStrand LSL quality control manual and manufacturing standard prepared by Weyerhaeuser. TimberStrand LSL is produced with the wood strands oriented in a direction parallel to the length of the structural composite lumber, and has finished lengths up to 64 feet (19 500 mm), thicknesses up to 5¹/₂ inches (140 mm), and depths up to 48 inches (1219 mm). TimberStrand LSL having a grade of 1.6E or lower may contain finger joints. TimberStrand LSL treated with zinc borate (ZB), in accordance with the TimberStrand LSL quality control manual and manufacturing standard prepared by Weyerhaeuser, 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 Preservers' 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.

3.3.2 TimberStrand LSL Rim Board: TimberStrand LSL rim board may be used in rim board applications, as defined in Section 3.2.

3.4 Parallam PSL:

Parallam PSL is manufactured from strands of a single wood species, or species combinations that are oriented parallel to the length of the member and coated with a phenol-formaldehyde adhesive. The wood species or species combinations and adhesive used in the manufacture of Parallam PSL are specified in the approved quality control manual and manufacturing standard prepared by Weyerhaeuser. Parallam PSL is available in rectangular cross sections having a maximum width of 11 inches (279 mm), a maximum depth of 19 inches (483 mm), and lengths up to 66 feet (20 120 mm). Cross sections up to 7 inches by 54 inches (178 mm by 1372 mm) are available through secondary lamination. See Footnote 9 to Table 4.

3.5 Microllam LVL:

Microllam LVL is manufactured from veneers of a single wood species, or species combinations and adhesives meeting the requirements specified in the approved quality control manual and manufacturing standard prepared by Weyerhaeuser. During manufacture, the veneers are placed in a continuous-feed press, with all grain oriented parallel to the length of the member, and the veneers are bonded together with the approved adhesives. Microllam LVL is available in thicknesses from ³/₄ inch (19.1 mm) to 3¹/₂ inches (89 mm), depths from 2¹/₂ inches (63.5 mm) to 48 inches (1219 mm), and lengths up to 80 feet (24 380 mm).

3.6 TJ-Strand Rim Board and e-Rim Board:

TJ-Strand Rim Board and e-Rim Board are oriented strand board (OSB) materials manufactured by Weyerhaeuser or J. M. Huber Corporation, and may be used in rim board applications as defined in Section 3.2. The OSB material is an alternative material qualified under Section 104.2.8 of the UBC, Section 104.11 of the IRC, Section R104.11 of the IRC, Section 106.4 of the BNBC and Section 103.7 of the SBC. TJ-Strand Rim Board is available in a thickness of 1¹/₄ inches (31.7 mm), depths up to 16 inches (406 mm), and lengths up to 24 feet (7315 mm). e-Rim Board is available in thicknesses of 1 inch or 1¹/₈ inches (25.4 or 28.6 mm), depths up to 11⁷/₈ inches (302 mm), and lengths up to 24 feet (7315 mm).

3.7 iLevel Rim Board:

iLevel Rim Board consists of either laminated strand lumber (LSL) or oriented strand board (OSB) material manufactured by Weyerhaeuser. It must be used only in rim board applications, as defined in Section 3.2. The LSL is an alternative material qualified under Section 104.11 of the IRC, Section R104.11 of the IRC, Section 104.2.8 of the UBC, Section 106.4 of the BNBC and Section 103.7 of the SBC. iLevel Rim Board is 1¹/₈ inches (28.6 mm) thick, and is available in depths ranging from 9¹/₂ to 16 inches (241 to 406 mm). It is available in lengths ranging from 8 to 24 feet (2440 to 7315 mm).

4.0 DESIGN AND INSTALLATION

4.1 General:

The design and installation of Weyerhaeuser structural composite lumber must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. Design of the structural composite lumber products described in this report is governed by the applicable code and the ANSI/AF&PA National Design Specification for Wood Construction (NDS). This report governs if there are conflicts between the manufacturer's published installation instructions and this report.

4.2 TimberStrand LSL and TimberStrand LSL Rim Board:

4.2.1 Prescriptive Code Applications: 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 2308.9.10 and 2308.9.11 of the IRC, Section R602.6 of the IRC, Section 2305.5.1 of the BNBC, Section 2308.7 of the SBC, and Sections 2326.11.9 and 2326.11.10 of the UBC.

The allowable shear values for nailed wood structural panel shear walls utilizing TimberStrand LSL framing must be determined using Table 2306.3 of the IRC, Table 23-II-I-1 of the UBC, Table 2310.2B of the SBC and Table 2306.4.6.2 of the BNBC, subject to the following:

TimberStrand LSL having a grade of 1.55E 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.

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.

4.2.2 Design and Allowable Stresses: The design provisions for wood construction noted in Chapter 23 of the BNBC, SBC, and UBC, Section 2301.2(1) of the IBC (for allowable stress design) and Section R301.1.3 of the IRC, are applicable to TimberStrand LSL unless otherwise noted in this report. Allowable unit stresses for dry conditions of use, and details of edge loading (joist/beam) and face loading (plank), are noted in Table 1. Unless otherwise noted, adjustment to the design stresses for duration of load must be in accordance with the applicable code.

Allowable lateral loads for nails installed perpendicular or parallel to the wide face of strands of TimberStrand LSL are as prescribed in the applicable code for sawn lumber having a minimum specific gravity of 0.50, such as for Douglas fir–larch, as noted in Table 2. Allowable withdrawal loads for nails installed perpendicular or parallel to the wide face of strands of TimberStrand LSL are noted in Table 2 of this report. Minimum nail spacing for nails installed parallel to the wide face of strands (installed in the edge of TimberStrand LSL) is limited to the values noted in Table 2. Minimum nail spacing for nails installed perpendicular to the wide face of strands (installed in the face of TimberStrand LSL) is as prescribed in the applicable code for sawn lumber. Other nail spacings for specific applications, such as prefabricated steel components or hangers, may be used as detailed for TimberStrand LSL in a current ICC-ES evaluation report.

Allowable lateral loads for machine bolts and lag bolts installed perpendicular to the wide face of TimberStrand LSL, with loads applied parallel or perpendicular to the grain of the wood strands, are as prescribed in the applicable code for sawn lumber having a specific gravity specified in Table 2.

4.2.3 TimberStrand LSL Rim Board: Toenailed connections are not limited by the 150 plf (2189 N/m) lateral load capacity noted for Seismic Zones 3 and 4 in Section 2318.3.1 of the UBC, or Seismic Design Categories D, E and F in Section 4.1.7 of the ANSI/AF&PA Special Design Provisions for Wind and Seismic (SDPWS). The ability of TimberStrand LSL rim board to transfer shear is as described in Footnote 1 to Table 3 of this report.

4.2.4 Fire-resistance: TimberStrand LSL of equivalent sizes to that of sawn lumber may be used in fire-resistance-rated floor and roof assemblies, as specified in Table 7-C of the UBC and Table 720.1(3) of the IBC. TimberStrand LSL may be substituted for sawn lumber in code-described fire-resistance-rated floor-ceiling and roof-ceiling assemblies. The use of TimberStrand LSL studs in fire-resistance-rated wall assemblies is beyond the scope of this report. TimberStrand LSL may be used as fire blocking in a minimum net thickness of 1.25 inches (31.7 mm), as an alternative to the nominal 2-inch (51 mm) lumber noted in Section 721.2 of the BNBC, Section 705.3 of the SBC, Section 708.2 of the UBC, Section 717.2.1(1) of the IBC and Section R302.11.1 (1) of the IRC.

4.3 Parallam PSL:

4.3.1 Design and Allowable Stresses: The design provisions for wood construction noted in Chapter 23 of the BNBC, SBC, and UBC, Section 2301.2(1) of the IBC (for allowable stress design) and Section R301.1.3 of the IRC, are applicable to Parallam PSL unless otherwise noted in this report. Allowable unit stresses for dry conditions of use, and details of edge loading (joist/beam) and face loading (plank), are noted in Table 4. Unless otherwise noted, adjustment to the design stresses for duration of load are permitted in accordance with the applicable code.

Allowable withdrawal and lateral loads for nails installed perpendicular or parallel to the wide face of strands of Parallam PSL are as prescribed in the applicable code for sawn lumber having a minimum specific gravity of 0.50, such as for Douglas fir–larch. Nails installed parallel to the wide face of strands (installed in the edge of Parallam PSL) must be spaced a minimum of 3 inches (76 mm) on center for 8d common nails, a minimum of 4 inches (102 mm) on center for 10d and 12d common nails, and a minimum of 6 inches (152 mm) on center for 16d common nails. Spacing of nails installed perpendicular to the wide face of strands (installed in the face of Parallam PSL) is the same as that permitted in the applicable code for sawn lumber. Other nail spacings for specific applications, such as prefabricated steel components or hangers, may be used as detailed for Parallam PSL in a current ICC-ES evaluation report.

Allowable lateral loads for machine bolts installed perpendicular to the wide face of strands of Parallam PSL, with loads applied parallel or perpendicular to the grain of the wood strands, are as prescribed in the applicable code for sawn lumber having a minimum specific gravity of 0.50, such as for Douglas fir–larch.

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

4.3.2 Fire-resistance: The provisions of IBC Section 721.6.3, design of fire-resistant exposed wood members, are applicable to Parallam PSL, provided the PSL members have minimum cross-sectional dimensions of 5.5 inches by 5.5 inches (140 mm by 140 mm).

4.4 Microllam LVL:

4.4.1 Design and Allowable Stresses: The design provisions for wood construction noted in Chapter 23 of the BNBC, SBC, and UBC, Section 2301.2(1) of the IBC (for allowable stress design) and Section R301.1.3 of the IRC, are applicable to Microllam LVL, unless otherwise noted in this report. Allowable unit stresses, sizes and veneer species for Microllam LVL for dry conditions of use are specified in Table 5 of this report. Plank-wise allowable bending stress, F_b , and shear stress, F_v , for Microllam LVL stamped with the plant number 1047 or 1089 must be limited in accordance with footnotes 11 and 12 of Table 5.

Unless otherwise noted, adjustment of the design stresses for duration of load must be in accordance with the applicable code.

Allowable withdrawal and lateral loads for nails installed perpendicular or parallel to the wide face of Microllam LVL are as prescribed in the applicable code for sawn lumber having a minimum specific gravity of 0.50, such as for Douglas fir–larch. Minimum spacings, edge distances and end distances of nails installed perpendicular to the glue lines on the wide face of Microllam LVL must be as prescribed in Section 2318.3 of the UBC and Part 11 of the ANSI/AF&PA National Design Specification for Wood Construction (NDS), for sawn lumber. Minimum spacings, edge distances and end distances of nails and staples installed parallel to the glue lines on the narrow face of the material must be as prescribed in Table 9 of this report. Other nail spacings for specific applications, such as prefabricated steel components or hangers, may be used as detailed for Microllam LVL in a current ICC-ES evaluation report.

Allowable lateral loads for machine bolts installed perpendicular to the wide face of Microllam LVL (perpendicular to the glue lines), with loads applied parallel

or perpendicular to the grain of the wood veneers, are as prescribed in the applicable code for sawn lumber having a minimum specific gravity of 0.50, such as for Douglas fir–larch.

4.4.2 Fire-Resistance: The provisions of IBC Section 721.6.3, design of fire-resistant exposed wood members, are applicable to Microllam LVL, provided the LVL members have minimum cross-sectional dimensions of 5.5 inches by 5.5 inches (140 mm by 140 mm).

4.5 TJ-Strand Rim Board and e-Rim Board:

4.5.1 Design and Allowable Stresses: Allowable stress design stresses and vertical load capacities for TJ-Strand Rim Board and e-Rim Board are as shown in Table 6; allowable fastener details are as shown in Table 7; and minimum nail spacing must be as shown in Table 8.

Toenailed connections are not limited by the 150 plf (2189 N/m) lateral load capacity noted for Seismic Zones 3 and 4 in Section 2318.3.1 of the UBC, or Seismic Design Categories D, E and F in Section 4.1.7 of the ANSI/AF&PA SDPWS. The ability of TJ-Strand Rim Board to transfer shear is as described in Footnote 1 to Table 7 of this report. The ability of e-Rim Board to transfer shear is as described in Footnote 2 to Table 7.

4.5.2 Fire-Blocking: TJ-Strand Rim Board and e-Rim Board may be used in lieu of sawn lumber for fire blocking.

4.6 iLevel Rim Board:

4.6.1 Installation: iLevel Rim Board must be laterally supported by floor sheathing at the top and continuously supported by a sill plate at the bottom. iLevel Rim Board must be installed using the nailing schedule given in Table 10. Holes or notches are not permitted in iLevel Rim Board.

4.6.2 Design and Allowable Stresses: Allowable lateral and vertical load capacities for iLevel Rim Board are given in Table 11. Toe nailed connections between the rim board and sill plate, as required in Section 4.6.1 and Table 10, are not limited by the 150 plf (2189 N/m) lateral load capacity noted for Seismic Design Categories D, E and F in Section 4.1.7 of the ANSI/AF&PA SDPWS, or Seismic Zones 3 and 4 in Section 2318.3.1 of the UBC. The ability of iLevel Rim Board to transfer shear is as described in Footnote 2 to Table 11.

4.6.3 Fastener Design Values: For design of connections other than those required in Section 4.6.1, mechanical connections in iLevel Rim Board have allowable lateral design values as provided by the NDS for lumber having equivalent specific gravities as given in Table 12. Minimum allowable nail spacing values are given in Table 13. Adjustment factors in accordance with the NDS must be applied as applicable.

Exception: Lag screw connections between iLevel Rim Board and deck ledgers have an allowable lateral load of 400 pounds (1.78 kN) per lag screw, under the following conditions:

Lag screws must have a minimum diameter of $\frac{1}{2}$ inch (12.7 mm), and sufficient length to penetrate through the iLevel Rim Board, not including tips.

Deck ledgers must consist of minimum nominally 2-by-6 lumber having a minimum assigned specific gravity of 0.42.

Sheathing between the iLevel 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.

One flat washer must be used between the deck ledger and the lag screw head.

Adjustment factors in accordance with the NDS must be applied as applicable.

4.6.4 Fire-Blocking: iLevel Rim Board may be used in lieu of sawn lumber for fire blocking.

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-Strand® Rim Board; e-Rim® Board; and iLevel™ 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** Design stresses must comply with the values noted in this report.
- 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** TimberStrand LSL, Parallam PSL, Microllam LVL, and all Rim Board products described in this report are limited to covered end-use installations with dry conditions of use. Dry conditions of use are those environmental conditions represented by sawn lumber in which the equilibrium moisture content is equal to or less than 16 percent. The use of these products in covered installations, where the moisture content exceeds 16 percent, has not been reviewed and is beyond the scope of this evaluation report.
- 5.4** Increases for duration of load, as provided for wood members and their connections, must be in accordance with the limitations specified in the applicable code and as set forth in this report, unless specifically prohibited by this report.
- 5.5** Where flexural bending members qualify as repetitive members, as defined in the NDS, an increase of 4 percent is permitted in allowable bending stresses.
- 5.6** Length and depth dimensions of TimberStrand LSL, the Parallam PSL and Microllam LVL may be cut to size for required application. Depth must not be cut to less than $3\frac{1}{2}$ inches (89 mm). Thickness dimension of Parallam PSL and TimberStrand LSL may be cut to a minimum of $1\frac{3}{4}$ 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 and Microllam LVL may be notched, drilled, or tapered end cut provided design is by a design professional.
- 5.7** Installation, fabrication, identification, and connection details must be in accordance with this report, the manufacturer's published installation instructions and the applicable code.
- 5.8** TimberStrand LSL is produced at the Weyerhaeuser manufacturing plants located in Deerwood, Minnesota; Chavies, Kentucky; and Kenora, Ontario, Canada; with quality control inspections by PFS Corporation (AA-652).

- 5.9** Parallam PSL is produced at the Weyerhaeuser manufacturing plants located in Annacis Island, British Columbia, Canada; Buckhannon, West Virginia; and Colbert, Georgia; with quality control inspections by PFS Corporation (AA-652).
- 5.10** Parallam PSL is secondary laminated for Weyerhaeuser at Structurlam Products, Ltd., Okanagan Falls, British Columbia, Canada, with quality control inspections by PFS Corporation (AA-652) or Intertek Testing Services (AA-691).
- 5.11** Microllam LVL is produced at the Weyerhaeuser manufacturing plants located in Albany, Oregon; Buckhannon, West Virginia; Eugene, Oregon; Junction City, Oregon; Natchitoches, Louisiana; Valdosta, Georgia; Castleberry, Alabama; and Simsboro, Louisiana; and at the RedBuilt™ LLC plant in Stayton, Oregon; with quality control inspections by PFS Corporation (AA-652). Additionally, 1.9E and 2.2E Microllam LVL are also manufactured at the Pacific Woodtech manufacturing plant located in Burlington, Washington; and at the Murphy Engineered Wood Products Division manufacturing plant located in Sutherlin, Oregon, with quality control inspections by APA—The Engineered Wood Association (AA-649).
- 5.12** TJ-Strand Rim Board is produced at the Weyerhaeuser manufacturing plants located in Elkin, North Carolina, and Drayton Valley, Alberta, Canada; and by J. M. Huber Corporation at their manufacturing plant in Spring City, Tennessee; with quality control inspections by PFS Corporation (AA-652).
- 5.13** e-Rim Board is produced at the Weyerhaeuser manufacturing plants located in Elkin, North Carolina, and Drayton Valley, Alberta, Canada; with quality control inspections by PFS Corporation (AA-652).
- 5.14** iLevel Rim Board is produced at the Weyerhaeuser manufacturing plant located in Elkin, North Carolina; with inspections by NAHB Research Center (AA-663) or PFS Corporation (AA-652); and at Weyerhaeuser manufacturing plants located in Deerwood, Minnesota, Chavies, Kentucky, and Kenora, Ontario, Canada; with quality control inspections by 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 October 2010.
- 6.2** Data in accordance with the ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated October 2004 (editorially revised July 2010).
- 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 February 2010.

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

6.5 Reports of fire tests conducted in accordance with ASTM E 119.

7.0 IDENTIFICATION

7.1 General:

The structural composite lumber (SCL) products described in this report are identified with a stamp bearing the manufacturer's name (Weyerhaeuser) and/or logo (see Figure 1), the name or logo of the inspection agency (PFS Corporation, Intertek Testing Services, APA EWS, or NAHB), as applicable, and the evaluation report number (ESR-1387).

7.2 TimberStrand LSL and Timberstrand LSL Rim Board:

In addition to the requirements given in Section 7.1, TimberStrand LSL is identified with the plant number, the product designation or type, the production date and the grade. TimberStrand LSL treated with zinc borate, as described in Section 3.2 of this report, is identified with the designations "StrandGuard" and "AWPA UC2." TimberStrand LSL rim board is also identified by the thickness, and the designation "1.3E TimberStrand LSL Rim Board."

7.3 Parallam PSL:

In addition to the requirements given in Section 7.1, Parallam PSL is identified with the plant number, the product designation or type, the production date, the grade, and the species or species group designation.

7.4 Microllam LVL:

In addition to the requirements given in Section 7.1, Microllam LVL is identified with the plant number, the product designation or type, the production date, the grade, and the species or species group designation. Microllam LVL is also identified with the marking "AGS" following the grade designation, if the advanced grading system specified in the approved quality control manual was used in the manufacturing process.

7.5 TJ-Strand Rim Board and e-Rim Board:

In addition to the requirements given in Section 7.1, TJ-Strand Rim Board and e-Rim Board are identified with the production date and shift, the plant number and the product designations "TJ-Strand" and "1.25 0.8E Rim Board" for TJ-Strand Rim Board and "e-Rim" and "Rim Board" for e-Rim Board.

7.6 iLevel Rim Board:

In addition to the requirements given in Section 7.1, iLevel Rim Board is identified with the production date and shift, the plant number, the thickness, and the product designation "iLevel Rim Board."

TABLE 1—TIMBERSTRAND® LSL STRUCTURAL FRAMING LUMBER DESIGN STRESSES^{1, 2, 3}
(pounds per square inch)

GRADE MOE (x 10 ⁶)	AXIAL		JOIST/BEAM (EDGE LOADING)			PLANK (FACE LOADING)		
	Ft ⁵	Fc	Fb ^{6, 7}	Fv	Fc _⊥ ⁸	Fb ⁴	Fv	Fc _⊥ ⁸
1.3	1075	1400	1700	400	680	1900	150	435 ¹⁰
1.5	1500	1950	2250	400	775	2525	150	475
1.55	1600	2050	2325	400	800	2615	150	485
1.6	1700	2150	2400	400	825	2700	150	490
1.7	1825 ⁹	2380	2600	400	880	2900	150	510
1.9	2150	2850	3075	400	880	3450	150	510
2.1	2500	3275	3500	400	880	3925	150	510

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

¹See figure below for description of strand orientation.

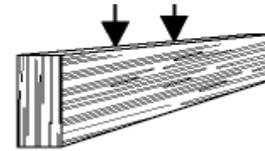
²Allowable stresses are based on covered, dry conditions of use, defined as those environmental conditions represented by sawn lumber with equilibrium moisture content less than or equal to 16%.

³For uniformly loaded simple span beams, deflection is calculated as follows:

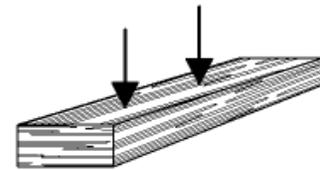
$$\Delta = \frac{270WL^4}{Ebd^3} + \frac{28.8WL^2}{Ebd}$$

Where:

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



EDGE LOADING - parallel to wide face of strands (WFS)



FACE LOADING - perpendicular to wide face of strands (WFS)

⁴Values shown are for thicknesses up to 3.5 inches.

⁵The Ft values in the table are reduced to reflect the volume effects of length, width and thickness for a range of common application conditions. The Ft values for TimberStrand LSL may be higher when approved by Weyerhaeuser for use as a component of engineered products, which are manufactured under a recognized quality control program.

⁶For depths other than 12 inches regardless of thickness, table values must be multiplied by (12/d)^{0.092}. Adjustments for common depths are shown below. For depths less than 3.5 inches, the factor for the 3.5 inch depth must be used.

Depth (inches)	3.5	5.5	7.25	9.25	12.0	16.0	20.0	24.0
Multiplier	1.12	1.07	1.05	1.02	1.00	0.97	0.95	0.94

⁷When structural members qualify as repetitive members in accordance with the applicable code, a four percent increase in accordance with NDS is permitted for Fb, in addition to the increases permitted in Footnote 6, above.

⁸Compression perpendicular to grain values (Fc_⊥) may not be increased for duration of load.

⁹When 1.7E grade TimberStrand LSL is used as truss chords and webs of engineered wood trusses the design axial tension 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 a recognized quality control program. The plate tooth-holding values for TimberStrand LSL web and chord members are as recognized in ICC-ES evaluation reports.

¹⁰The allowable compression perpendicular-to-grain, plank orientation, for zinc borate, (ZB) treated 1.3E TimberStrand LSL is 625 psi, for plate applications.

TABLE 2—EQUIVALENT SPECIFIC GRAVITIES AND MINIMUM NAIL SPACING FOR DESIGN OF MECHANICAL CONNECTIONS IN TIMBERSTRAND® LSL¹

FASTENER	FASTENER AXIS ORIENTATION ²	LOAD DIRECTION	EQUIVALENT SPECIFIC GRAVITY
Nails and Screws	Perpendicular to edge or perpendicular to face	Lateral (parallel or perpendicular to grain)	0.50 (Douglas-fir-larch).
Nails	Perpendicular to edge	Withdrawal	0.42 (Spruce-pine-fir)
	Perpendicular to face	Withdrawal	0.50 (Douglas-fir-larch)
Bolts ³	Perpendicular to face	Lateral (parallel to grain)	0.50 (Douglas-fir-larch)
		Lateral (perpendicular to grain)	0.58 (Red maple)
Lag screws	Perpendicular to face	Lateral (parallel to grain)	0.50 (Douglas-fir-larch)
		Lateral (perpendicular to grain)	0.55 (Southern pine); See footnote 4 for deck ledger connections in TimberStrand LSL Rim Board

CLOSEST PERMITTED ON-CENTER SPACING FOR NAILS INSTALLED PERPENDICULAR TO EDGE^{5, 6, 7} (inches)
(For TimberStrand LSL stud nail spacing limitation in shearwall applications, see Section 4.2.1)

MEMBER THICKNESS (inches)									
Common Nail Size	1 ¹ / ₄		1 ¹ / ₂ and 1 ³ / ₄		2 ¹ / ₂		3 ¹ / ₂		
	1 row	1 row	1 row	2 rows	1 row	2 rows	1 row	2 rows	3 rows
8d	4	3	3	3	3	3 ¹ / ₂	3	3	3
10d	4	4	4	4	3	3 ¹ / ₂	3	3	3
16d	6	6	6	6	3 ¹ / ₂	--			

For SI: 1 inch = 25.4 mm, 1 lbf. = 4.448 N.

¹Allowable connection design values are as provided by the NDS for lumber having equivalent specific gravities as shown.

²The term “edge” refers to the side on which the strand edges are exposed. The term “face” refers to the side on which the wide faces of the strands are exposed.

³When loading at an angle to grain, the lateral capacity is calculated using the Hankinson formula using an equivalent specific gravity of 0.50 for load parallel to grain and equivalent specific gravity of 0.58 for load perpendicular to grain.

⁴The allowable perpendicular-to-grain lateral load capacity for a 1/2-inch-diameter lag screw connection with full penetration into TimberStrand LSL Rim Board, supporting a 1 1/2-inch-thick side member (ledger board) having a minimum specific gravity of 0.50, is 475 pounds. For other lag screw sizes and conditions, the allowable perpendicular-to-grain lateral load value must be determined in accordance with the NDS, using an equivalent specific gravity of 0.50 for load parallel to grain and equivalent specific gravity of 0.55 for load perpendicular to grain.

⁵The closest permitted on center spacing for nails installed perpendicular to face is the same as permitted by the code for sawn lumber.

⁶Multiple rows must be staggered and the minimum spacing between rows must be 1/2 inch.

⁷Multiple rows must be equally spaced from the centerline of the narrow face axis.

TABLE 3—1.3E TIMBERSTRAND® LSL RIM BOARD^{1, 2, 3}

THICKNESS (inches)	ALLOWABLE VERTICAL LOAD (PLF) ⁴	DEPTH RANGE (inches)
1.25 ⁵	4250	16 and less
1.25 ⁵	3450	over 16 up to 20
1.50 and 1.75	4140	up to 24

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

¹The allowable shear values in pounds per foot for horizontal wood structural panel diaphragms with framing of nominal 2 inch thick Douglas fir-larch or southern pine are applicable to: (1) 1.25 inch thick TimberStrand LSL Rim Board, unblocked diaphragms only, and (2) 1.50 and 1.75 inch thick TimberStrand LSL Rim Board, unblocked and blocked diaphragms.

²TimberStrand LSL Rim Board must be laterally supported at the top and continuously supported at the bottom, and the gravity loads must be uniformly applied along the top, in lieu of design by a design professional for other conditions.

³Fastener capacities for TimberStrand LSL Rim Board are as given in Table 2, except as provided in Footnote 5, below.

⁴Compression perpendicular-to-grain capacities of the sill plate and floor sheathing must be checked.

⁵The allowable perpendicular-to-grain lateral load capacity for a 1/2-inch-diameter lag screw connection with full penetration into the TimberStrand LSL Rim Board, supporting a 1 1/2-inch-thick side member (ledger board) having a minimum specific gravity of 0.50, is 475 pounds.

TABLE 4—PARALLAM® PSL ALLOWABLE FRAMING LUMBER DESIGN STRESSES^{1,2,3} (pounds per square inch)

SPECIES / GRADE	AXIAL		LOAD To WFS (Joist)			LOAD ⊥ To WFS (Plank)			MOE (x10 ⁶)
	Ft ⁴	Fc	Fb ^{5,6}	Fv	F c⊥ ⁷	Fb ^{5,6}	Fv	F c⊥ ⁷	
DF 1.8E	1755	2500	2500	230	600	2400	190	425	1.80
	1890	2700	2700	260	675	2600	200	450	
	2025	2900	2900	290	750	2800	210	475	
	2160	3100	3100	320	775	3000	220	500	
SP 1.8E	1755	2500	2500	230	600	2400	190	425	1.80
	1890	2700	2700	260	675	2600	200	475	
	2025	2900	2900	290	750	2800	210	525	
	2160	3100	3100	320	825	3000	220	575	
WH 1.8E	1755	2500	2500	230	500	2400	190	380	1.80
	1890	2700	2700	260	575	2600	200	415	
	2025	2900	2900	290	650	2800	210	450	
	2160	3100	3100	320	700	3000	220	475	
YP 1.8E or 1.9E YP/RM 2.0E 2.1E	1755	2500	2500	230	600	2400	190	525	1.80
	1890	2700	2700	260	675	2600	200	600	
	2025	2900	2900	290	750	2800	210	675	
	2160	3100	3100	320	825	3000	220	750	

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

¹WFS - Wide face of strand. See figure below for details on strand orientation. DF = Douglas fir-larch, SP = southern pine, WH = western hemlock, YP = yellow poplar, RM = red maple. DF and WH are permitted to be combined as Western Species (WS). SP, YP and YP/RM are permitted to be combined as Eastern Species (ES). When using the species group designations WS or ES, the allowable stress is the lower value for the species in the group.

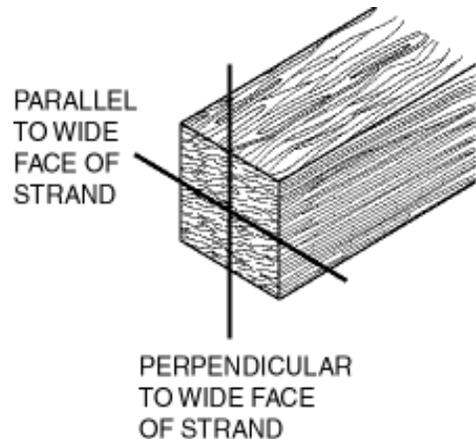
²Allowable stresses are based on covered, dry conditions of use. Dry conditions of use are those environmental conditions represented by sawn lumber at which the moisture content is less than or equal to 16%.

³For uniformly loaded simple span beams, the deflection is calculated as follows:

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

Where,

- Δ = Deflection, inches
- W = Uniform load, plf
- L = Span, feet
- b = Beam width, inches
- h = Beam depth, inches
- E = Modulus of Elasticity, psi



⁴The Ft values in the table are reduced to reflect the volume effects of length, width and thickness for a range of common application conditions.

⁵For 12 inch depth; for other depths, table value must be multiplied by (12/d)^{0.111}. Adjustments for common depths are shown below. For depths less than 3.5 inches, the factor for the 3.5 inch depth must be used.

Depth (inches)	3.5	5.5	7.25	9.25	12.0	16.0	20.0	24.0
Multiplier	1.15	1.09	1.06	1.03	1.00	0.97	0.96	0.93

⁶When members qualify as repetitive members in accordance with the applicable code, a 4 percent increase in accordance with NDS is permitted, for Fb, in addition to the increases permitted in Footnote 4, above.

⁷Compression perpendicular to grain values (Fc⊥) may not be increased for duration of load.

⁸When used in cross-sections with depths of 20 inches or greater, through approved secondary lamination, the MOE is 2.20 x 10⁶ psi. The allowable design stresses shown in this table are applicable to Parallam PSL, when secondary laminated in accordance with the approved Weyerhaeuser quality control manuals for secondary laminated Parallam PSL.

TABLE 5—Microllam® LVL ALLOWABLE FRAMING LUMBER DESIGN STRESSES^{1,2} (pounds per square inch)

BILLET MATERIAL THICKNESS	GRADE SPECIES	AXIAL		JOIST/BEAM				PLANK		
		F _t ⁴	F _c	F _b ^{5,6}	F _v ⁷	MOE (x10 ⁶)	F _{c⊥} ⁸	F _b ⁹	F _v	F _{c⊥} ⁸
3/4 inch To	1.6 DF/LP/WH	1240	2100	2140	285	1.6	750	2530	190	480
	1.8 DF/LP/WH	1450	2375	2445	285	1.8	750	2890	190	480
3 1/2 inch	1.9 DF/LP/WH	1555	2510	2600	285	1.9	750	3075	190 ¹¹	480
	2.0 DF/LP/WH	1660	2635	2750	285	2.0	750	3255	190	480
	2.0 DF/LP/WH ¹⁰	1660	2635	2900	285	2.0	750	3430	190	480
	2.2 DF/LP/WH	1865	2870	3060	285	2.2	750	3615 ¹²	190 ¹¹	480
	2.4 DF/LP/WH	2075	3080	3365	285	2.4	750	3980	190	480
2.6 DF/LP/WH	2285	3270	3675	285	2.6	750	4345	190	480	
3/4 inch To	1.8 SP/EUC	1575	2375	2445	285	1.8	880	2890	190	525
	1.9 SP/EUC	1690	2510	2600	285	1.9	880	3075	190	525
3 1/2 inch	2.0 SP/EUC	1805	2635	2750	285	2.0	880	3255	190	525
	2.2 SP/EUC	2030	2870	3060	285	2.2	880	3615	190	525
	2.4 SP/EUC	2260	3080	3365	285	2.4	880	3980	190	525
	2.6 SP/EUC	2485	3270	3675	285	2.6	880	4345	190	525
3/4 inch To	1.6 YP	1350	2100	2140	285	1.6	880	2530	190	670
	1.8 YP	1575	2375	2445	285	1.8	880	2890	190	670
3 1/2 inch	1.9 YP	1690	2510	2600	285	1.9	880	3075	190	670
	2.0 YP	1805	2635	2750	285	2.0	880	3255	190	670
	2.2 YP	2030	2870	3060	285	2.2	880	3615	190	670
3/4 inch to 1 3/4 inch	2.0E-2925Fb SP	1805	3030	2925	285	2.0	880	3455	190	525

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

¹Allowable stresses are based on covered, dry conditions of use. Dry conditions of use are those environmental conditions represented by sawn lumber at which the moisture content is less than or equal to 16%.

²For uniformly loaded simple span beams, deflection is calculated as follows:

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

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

³DF = Douglas fir-larch; LP = lodgepole pine; WH = western hemlock; SP = southern pine; YP = yellow poplar; EUC = Eucalyptus. DF, LP and WH are permitted to be combined as Western Species (WS). SP and YP, or SP and EUC are permitted to be combined as Eastern Species (ES). When using the species group designations WS or ES, the allowable stress is the lower value for the species in the group.

⁴The F_t values in the table are reduced to reflect the volume effects of length, width and thickness for a range of common application conditions. Therefore the F_t values in the Table do not apply to Microllam LVL when used as a component of engineered products manufactured by Weyerhaeuser which are listed in ICC-ES evaluation reports.

⁵F_b includes allowances for variations in span to depth ratio and method of loading and must be used without further adjustment except as noted below. For depths other than 12 inches, regardless of thickness, table values must be multiplied by (12/d)^{0.136}. Adjustments for Common depths are shown below. For depths less than 3.5 inches, the factor for the 3.5 inch depth must be used.

Depth	3.5	5.5	7.25	9.25	12	16	20	24
Multiplier	1.18	1.11	1.07	1.04	1.00	0.96	0.93	0.91

⁶When structural members qualify as repetitive members in accordance with the applicable code, a four percent increase in accordance with NDS is permitted, in addition to the increases permitted in Footnote 5, above. This increase does not apply to field assembled multi-member beams.

⁷For simplicity, use 285 psi for depths up to 24 inches and 260 psi for depths greater than 24 inches. When a more accurate analysis is desired, the allowable horizontal shear for all depths greater than 12 inches is F_v = 285 (12/d)^{0.065}.

⁸Compression perpendicular to grain values (F_{c⊥}) may not be increased for duration of load.

⁹Values shown are for thicknesses up to 3.5 inches, with the exception of Microllam LVL stamped with plant numbers 1047 and 1089, which have thicknesses up to 1.75 inches.

¹⁰Used in header or beam applications only.

¹¹Microllam LVL stamped with plant numbers of 1047 and 1089 has a plank-wise F_v of 150 pounds per square inch, and is available in either a 1.75-inch or 1.375-inch thickness.

¹²The plank-wise F_b is limited to 3100 pounds per square inch for 2.2E Microllam LVL stamped with plant numbers 1047 or 1089.

TABLE 6—TJ-Strand® RIM BOARD¹ and e-Rim® Board CAPACITIES

RIM BOARD MATERIAL	THICKNESS (inches)	DESIGN STRESSES (pounds per square inch)				ALLOWABLE VERTICAL LOAD (plf) ^{3,4}	DEPTH RANGE (inches)
		MOE x 10 ⁶	Fb ¹	Fv	Fc⊥ ²		
TJ-Strand	1.25	0.80	1200	400	1000	4250	16 and less
e-Rim	1.125	0.71	1000	400	1000	4250	11 ⁷ / ₈ and less
	1.0	0.71	1000	400	1000	4250	11 ⁷ / ₈ and less

For SI: 1 inch = 25.4 mm, 1 psi = 0.00689 MPa, 1 plf = 14.59 N/m.

¹No depth modification applies for depths of 16 inches and less.

²Compression perpendicular to grain value may not be increased for duration of load.

³J-Strand Rim Board and e-Rim Board must be laterally supported at the top and continuously supported at the bottom, and the gravity loads must be uniformly applied along the top, in lieu of design by a design professional for other conditions.

⁴Compression perpendicular-to-grain capacities of the sill plate and floor sheathing must be checked.

TABLE 7—EQUIVALENT SPECIFIC GRAVITIES FOR DESIGN OF LATERALLY-LOADED¹ MECHANICAL CONNECTIONS IN TJ-Strand® RIM BOARD² and e-Rim® BOARD³

FASTENER	FASTENER AXIS ORIENTATION ⁵	LOAD DIRECTION	EQUIVALENT SPECIFIC GRAVITY ⁴
Nails and Screws	Perpendicular to edge	Parallel or perpendicular to grain	0.50 (Douglas fir-larch) for TJ-Strand Rim Board 0.42 (S-P-F) for e-Rim Board
	Perpendicular to face	Parallel or perpendicular to grain	0.50 (Douglas fir-larch)
Bolts	Perpendicular to face	Perpendicular to grain	0.50 (Douglas fir-larch)
Lag Screws	Perpendicular to face	Perpendicular to grain	See footnote 6 for deck ledger connections in TJ-Strand Rim Board; See footnote 7 for deck ledger connections in e-Rim Board

For SI: 1 lbf. = 4.448 N, 1 inch = 25.4 mm.

¹Capacities in withdrawal have not been evaluated.

²The allowable shear values in pounds per foot for unblocked horizontal wood structural panel diaphragms with framing of nominal 2 inch thick Douglas fir-larch or southern pine noted in Table 23-II-H of the UBC; Table 2306.4.1 of the NBC; Table 2310.2A of the SBC; and Table 2306.2.1(1) of the IBC are applicable to TJ-Strand Rim Board only.

³e-Rim Board is permitted for use in structures complying with conventional construction requirements as defined in IBC Section 2308, BNBC Section 2305.0, SBC Section 2301.1.2, and UBC Section 2320, and with light-framed construction requirements as defined in IRC Section R301.

⁴Allowable connection design values are as provided by the NDS for lumber having equivalent specific gravities as shown.

⁵The term “edge” refers to the side on which the strand edges are exposed. The term “face” refers to the side on which the wide faces of the strands are exposed.

⁶The allowable perpendicular-to-grain lateral load value for a 1/2-inch-diameter lag screw connection with full penetration into TJ-Strand Rim Board, supporting a 1 1/2-inch-thick side member (ledger board) having a minimum specific gravity of 0.50, is 475 pounds.

⁷The allowable perpendicular-to-grain lateral load value for a 1/2-inch-diameter lag screw connection with full penetration into e-Rim Board, supporting a 1 1/2-inch-thick side member (ledger board) having a minimum specific gravity of 0.50, is 325 pounds.

TABLE 8—TJ-Strand® RIM BOARD and e-Rim® BOARD CLOSEST ON CENTER NAIL SPACING PARALLEL TO WFS ORIENTATION¹ (inches)

Nail Size	BOX		COMMON	
	TJ-Strand Rim Board	e-Rim Board	TJ-Strand Rim Board	e-Rim Board
8d (2 1/2")	4	6	4	6
10d (3")	4	6	4	6
12d ² (3 1/4")	4	6	4	6
16d sinker (3 1/4")	4	16 ³	4	16 ³
16d (3 1/2")	4	16 ³	6 ²	16 ³

For SI: 1 inch = 25.4 mm.

¹The closest on center spacing for nails perpendicular to WFS is the same as permitted by the code for sawn lumber.

²When nailing through the wall sill plate and floor sheathing, the closest on center nail spacing is 4 inches (1 3/8-inch maximum penetration).

³When nailing through the wall sill plate and floor sheathing, the closest on center nail spacing is 5 inches (1 3/8-inch maximum penetration).

TABLE 9—SPACING OF NAILS AND STAPLES IN Microllam® LVL¹

MICROLLAM LVL DIMENSIONS	FASTENER (Installed parallel to glue lines on the narrow face of the material)	MINIMUM SPACING (inches)
Minimum 3/4-inch thick and 3 1/2 inches deep	8d nail	3
	10d nail	4
	12d nail	4
	No. 14 gage staple	4
Minimum 1 1/2 inches thick and 3 1/2 inches deep	10d nail	4
	12d nail	4
	16d nail	8
	No. 14 gage staple	4

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

¹Minimum edge and end distances must be sufficient to prevent splitting of the LVL. Additionally, maximum nail penetration into the LVL must be limited as necessary to prevent splitting.

TABLE 10—NAILING SCHEDULE FOR INSTALLATION OF iLevel™ Rim Board

SHEATHING TO RIM BOARD OR JOIST	RIM BOARD TO SILL PLATES (Toe Nail)	JOIST TO SILL PLATE (Slanted)	RIM BOARD TO JOIST
8d Sinker nails (0.113 x 2 3/8 inches) or equivalent at 6 inches on center	Nails with minimum dimensions of 0.131 x 3.0 inches at 6 inches on center	2 nails with minimum dimensions of 0.131 x 3.0 inches; on opposing sides of bottom flange	2 nails with minimum dimensions of 0.131 x 3.0 inches; one into top flange, one into bottom flange

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

TABLE 11—ALLOWABLE LATERAL AND VERTICAL LOAD CAPACITIES FOR iLevel™ Rim Board^{1, 2, 3, 4}

THICKNESS (Inches)	ALLOWABLE VERTICAL LOAD (plf)	ALLOWABLE LATERAL LOAD (plf) ⁵	DEPTH RANGE (Inches)
1 1/8	4000	180	9 1/2 to 16

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

¹iLevel Rim Board must be installed in accordance with Section 4.6.1.

²iLevel Rim Board is permitted for use in structures complying with conventional construction requirements as defined in IBC Section 2308, BNBC Section 2305.0, SBC Section 2301.1.2, and UBC Section 2320, and with light-framed construction requirements as defined in IRC Section R301.

³Compression perpendicular-to-grain capacities of the sill plate and floor sheathing must be checked.

⁴Values in this table may not be increased for duration of load.

⁵Allowable lateral load values are based on the condition that the rim board is supported by a sill plate or top plate consisting of minimum nominal 2x4 lumber having a minimum assigned specific gravity of 0.42, as determined by Table 11.3.2A of the National Design Specification for Wood Construction (NDS).

TABLE 12—EQUIVALENT SPECIFIC GRAVITIES FOR DESIGN OF iLevel RIM BOARD MECHANICAL CONNECTIONS^{1, 2}

FASTENER	FASTENER AXIS ORIENTATION	LOAD DIRECTION	EQUIVALENT SPECIFIC GRAVITY
Nails and Screws	Perpendicular to face	Lateral (parallel or perpendicular to grain)	0.50 (Douglas fir-larch)
Nails	Perpendicular to face	Withdrawal	0.38
Bolts	Perpendicular to face	Lateral (parallel or perpendicular to grain)	0.50 (Douglas fir-larch)
Lag Screws	Perpendicular to face	Lateral (perpendicular to long axis of rim board)	(See footnote 3)

¹Allowable connection design values are as provided by the NDS for lumber having equivalent specific gravities as shown.

²When loading at an angle to grain, the lateral capacity is calculated using the Hankinson formula in Appendix J of the NDS.

³The allowable lateral load for lag screw connections complying with the Exception to Section 4.6.3 is 400 lb (1.78 kN).

TABLE 13—MINIMUM ALLOWABLE NAIL SPACING ON NARROW EDGE OF iLevel™ Rim Board¹ (Inches)

PENNEYWEIGHT	BOX	COMMON	SINKER
8d	6	6	—
10d	6	6	—
12d	6 ²	6 ²	—
16d	16 ³	16 ³	16 ³

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

¹The minimum allowable on center spacing for nails perpendicular to the face of the rim board is the same as permitted by the applicable code for sawn lumber.

²When nailing through the wall sill plate and floor sheathing, such that the maximum penetration into the rim board is $1\frac{3}{8}$ inches (35 mm), the minimum allowable on center spacing is 4 inches (102 mm).

³When nailing through the wall sill plate and floor sheathing, such that the maximum penetration into the rim board is $1\frac{3}{8}$ inches (35 mm), the minimum allowable on center spacing is 5 inches (127 mm).



FIGURE 1—MANUFACTURER LOGO

ICC-ES SAVE: Verification of Attributes Report™**VAR-1008**

Reissued September 1, 2010

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iLevel® Trus Joist® TJI® Joist

iLevel® Trus Joist® TimberStrand® LSL

iLevel® Trus Joist® Parallam® PSL

iLevel® Trus Joist® Parallam® Plus PSL

iLevel® Trus Joist® Microllam® LVL

iLevel® Shear Brace

iLevel® Trus Joist® StrandGuard® TimberStrand® LSL

iLevel® Framers Series® Lumber

Weyerhaeuser® Pro Series™ Lumber

Weyerhaeuser® Lumber

Weyerhaeuser® Green Stud

iLevel® Edge™ Engineered Wood Panels

iLevel® Edge Gold™ Engineered Wood Panels

iLevel® Radiant Barrier Sheathing

Weyerhaeuser® Sheathing

Weyerhaeuser® Plywood

Building Optimization Software:

iLevel® Javelin® Design Software

TJ-Xpert® Software

iLevel NextPhase® Site Solutions

1.0 EVALUATION SCOPE**Compliance with the following evaluation guidelines:**

- ICC-ES Evaluation Guideline for Determination of Biobased Material Content (EG102), dated October 2008
- ICC-ES Evaluation Guideline for Determination of Regionally Extracted, Harvested or Manufactured Materials or Products (EG104), dated October 2008
- ICC-ES Evaluation Guideline for Determination of Formaldehyde Emissions of Composite Wood and Engineered Wood Products (EG108), dated October 2008
- ICC-ES Evaluation Guideline for Determination of Certified Wood and Certified Wood Content in Products (EG109), dated October 2008

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

- National Green Building Standard (ICC 700-2008) (see Table 2 for details)
- LEED for Homes 2008 (see Table 3 for details)
- LEED 2009 for New Construction and Major Renovations (see Table 4 for details)
- LEED 2009 for Schools New Construction and Major Renovations (see Table 5 for details)
- LEED 2009 for Core and Shell Development (see Table 6 for details)

iLevel®, Microllam®, Parallam®, TimberStrand®, StrandGuard®, Trus Joist®, TJI®, Framers Series®, Javelin®, TJ-Xpert® and NextPhase® are registered trademarks, and Edgē™, Edgē Gold™ and Pro Series™ are trademarks of Weyerhaeuser NR Company.

- LEED 2009 for Commercial Interiors (see Table 7 for details)
- LEED for Existing Buildings 2008 (see Table 8 for details)
- 2010 California Green Building Standards Code (CALGreen), Title 24, Part 11 (see Table 9 for details)
- ANSI/GBI 01-2010 - Green Building Assessment Protocol for Commercial Buildings Construction (see Table 10 for details)
- ANSI/ASHRAE/USGBC/IES Standard 189.1-2009 – Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings (see Table 11 for details)

2.0 USES

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

iLevel Javelin, TJ-Xpert and iLevel 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

iLevel and Weyerhaeuser 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.

iLevel structural design software (Javelin and TJ-Xpert) 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. iLevel 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 iLevel and Weyerhaeuser structural products that have been evaluated for compliance with, or otherwise deemed to comply with, the requirements of the International Codes are listed in Table 1 of this report.

The evaluation of the iLevel Javelin, TJ-Xpert and NextPhase Site Solutions building optimization solutions for compliance with the requirements of the International Codes 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 Rating Systems, Standards and Code Eligibility:

The information presented in Tables 2 through 11 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 Section 5.10 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 11 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” are 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 EG102. [Evaluation applies to ICC 700 Section 606.1(2); CALGreen Section A5.405.2; ANSI/GBI 01-2010 Section 10.2.1.1; ASHRAE 189.1 Section 9.4.1.3.]
- 5.2 ICC-ES EG104. [Evaluation applies to ICC 700 Section 608.1; LEED Homes MR2.2(c); LEED NC MR 5; LEED Schools MR 5; LEED C&S MR 5; LEED CI MR5; LEED EB MR 3; CALGreen Section A5.405.1; ANSI/GBI 01-2010 Section 10.1.4.1; ASHRAE 189.1 Section 9.4.1.2.]
- 5.3 ICC-ES EG108. [Evaluation applies to ICC 700 Section 901.4(6); LEED NC Credit EQ 4.4; LEED Schools EQ 4.4; LEED C&S EQ 4.4; LEED CI EQ 4.4; LEED EB Credit MR3; ASHRAE 189.1 Section 8.4.2.4.]
- 5.4 ICC-ES EG109. [Evaluation applies to ICC 700 Section 606.2(2); ANSI/GBI 01-2010 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 12 of this report. Note that the iLevel Shear Brace may be eligible when used to achieve a target reduction of 50 percent or more in square footage of wall bracing constructed on site. [Evaluation applies to ICC 700 Section 601.2; LEED Homes MR 1.4; CALGreen Section A5.404.1.]
- 5.6 Software output of the iLevel Javelin and TJ-Xpert 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 Section 601.4; LEED Homes MR 1.2, 1.3 & 1.5, CALGreen Section A4.404.1]
- 5.7 Software output of the iLevel 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 Section 601.5(1); LEED Homes MR 1.2, 1.3 & 1.5, CALGreen A4.404.1.]
- 5.8 Evidence of compliance with AWPA Standard T1-09, Table 3. [Evaluation applies to ICC 700 Section 602.8.]

- 5.9** Documentation establishing and documenting all major sources of primary manufacturing energy. [Evaluation applies to ICC 700 Section 606.3.]
- 5.10** Consortium for Research on Renewable Industrial Materials (CORRIM) Phase 1 report (available at http://www.corrim.org/reports/2006/final_phase_1/index.htm), containing an LCA analysis performed in accordance with ISO 14044. [Evaluation applies to ICC 700 Section 609.1; CALGreen Section A5.409.1; ASHRAE 189.1 Section 9.5.1.]
- 5.11** Documentation establishing that the environmental management system conforms to the requirements of ISO 14001 or equivalent. [Evaluation applies to ICC 700 Section 610.1.]

6.0 IDENTIFICATION

iLevel and Weyerhaeuser structural wood products are identified with a stamp noting the name or logo of the manufacturer (iLevel, 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 number (VAR-1008) and the ICC-ES SAVE Mark, as applicable.

TABLE 1—REFERENCE STANDARD OR EVALUATION REPORT NUMBER FOR iLEVEL AND WEYERHAEUSER STRUCTURAL WOOD PRODUCTS

PRODUCT	REPORT NUMBER/ REFERENCE STANDARD
iLevel Trus Joist TJI Joist	ESR-1153
iLevel Trus Joist TimberStrand LSL	ESR-1387
iLevel Trus Joist Parallam PSL	ESR-1387
iLevel Trus Joist Microllam LVL	ESR-1387
iLevel Shear Brace	ESR-2652
iLevel Trus Joist StrandGuard TimberStrand LSL	ESR-1387
iLevel Framer Series Lumber	USDOC PS20
Weyerhaeuser Pro Series Lumber	USDOC PS20
Weyerhaeuser Lumber	USDOC PS20
iLevel Green Stud	USDOC PS20
iLevel Edge	USDOC PS2
iLevel Edge Gold	USDOC PS2
iLevel Radiant Barrier Sheathing	USDOC PS2
Weyerhaeuser Sheathing	USDOC PS2
Weyerhaeuser Plywood	USDOC PS1

TABLES 2 THROUGH 11

Section #	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Edge Edge Gold Radiant Barrier Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	TJI Joist	TimberStrand LSL Parallam PSL Microlam LVL	Strandguard TimberStrand LSL Parallam Plus PSL	Shear Brace	Javelin Software TJ-Expert Software	NextPhase Site Solutions
TABLE 2—SUMMARY OF AREAS OF ELEGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700—2008)											
601.2	Building-code-compliant structural systems or advanced framing techniques are implemented that optimize material usage	3 each 9 max	To earn 3 points the framing methods listed in Table 12 must be used for floor, wall or roof framing. To earn 9 points they must be used for all floor, wall and roof framing	○	○	○	○	○	○ ⁸		
601.4	Detailed framing or structural plans, material quantity lists and on-site cut lists for framing, structural materials, and 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 utilized for a minimum of 90 percent of the floor system	4	To earn 4 points the precut package must be used for 90% or more of the floor system								○
602.8	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					●			
606.1(2)	Two types of biobased materials are used, each for more than 1 percent 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 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 ¹	● ¹⁰	● ¹⁰	● ¹⁰	● ¹⁰	● ¹⁰	● ¹⁰		
606.3	Materials are used for major components of the building that are manufactured using a minimum of 33 percent of the 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	●	● ⁹		●	●	●		
607.1	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 iLevel products	●		●	●	●	●		
○	= Eligible for points										
●	= Verified attribute										
	= This provision does not apply to this product/service										

Note: Footnotes are located after Table 11.

TABLES 2 THROUGH 11 (Continued)

Section #	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Edge Edge Gold Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	T-JI Joist	TimberStrand LSL Parallam PSL Microllam LVL	Strandguard TimberStrand LSL Parallam Plus PSL	Shear Brace	Javelin Software T-J-Expert Software	NextPhase Site Solutions
TABLE 2 (Continued)											
608.1	Indigenous materials	2 each 10 max	To earn 2 points verify local products that are originated, produced, grow naturally or occur naturally within 500 miles (805 km) of the job site. This can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
609.1	A more environmentally preferable product or assembly is selected for an application based upon the use of a Life Cycle Assessment (LCA) tool complying with ISO 14044 or other recognized standards that compare 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, such as that contained in the CORRIM report at www.corrim.org . 3 points may be earned where comparative LCA is done for individual products or systems	●	●	●	●	●	●		
610.1	Product manufacturer's operations and business practices include environmental management system concepts, and 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 and points adjusted to reflect actual percentage of all products from ISO 14001 facilities	●	●	● ⁹	● ⁹	●	●		
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 and 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 iLevel or Weyerhaeuser products	●							
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 iLevel products	●		●	●	●	●		
903.4.1(3)	The moisture content of lumber is sampled to ensure it does not exceed 19 percent 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 ⁷		○						
○ = Eligible for points											
● = Verified attribute											
■ = This provision does not apply to this product/service											

Note: Footnotes are located after Table 11.

TABLES 2 THROUGH 11 (Continued)

Section #	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Edge Edge Gold Radiant Barrier Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	T-JI Joist	TimberStrand LSL Parallam PSL Microllam LVL	Strandguard TimberStrand LSL Parallam Plus PSL	Shear Brace	Javelin Software T-J-Expert Software	NextPhase Site Solutions
TABLE 3—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED FOR HOMES 2008											
MR 1.2	Detailed framing documents	1	Visually verify detailed framing plans and/or scopes of work							○	○
MR 1.3	Detailed cut list and lumber order	1	To earn 1 point verify that detailed framing cut list and lumber order are used							○	○
MR 1.4	Framing efficiencies	3 max	To earn 1 point verify that advanced framing measures in Table 12 are used for floors, walls OR roof framing	○	○	○	○	○	○ ⁸		○
MR 1.5	Off-site fabrication	4	To earn 4 points use off-site panelized or modular, prefabricated construction ³								○ ³
MR 2.1	FSC certified tropical wood	0.5 each 8 max	To earn 0.5 point per component use FSC-certified tropical wood ⁴	4	4	4	4	4	4		
MR 2.2(c)	Environmentally preferable products for roof, wall and floors; interior and exterior framing and sheathing	0.5 each 8 max	To earn points 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. Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
TABLE 4—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED 2009 FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS											
MR 5 (MR 5.1)	Regional materials (10% of content)	1	To earn 1 point use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 10% (by cost) of total materials value. To earn 2 points use a minimum of 20%. Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
MR 5 (MR 5.2)	Regional materials (20% of content)	2		○	○	○	○	○	○		
MR 7	Certified wood	1	To earn 1 point use a minimum 50% (based on cost) of wood-based materials/products certified to FSC requirements ⁴	4	4	4	4	4	4		
EQ 4.4	Low emitting materials	1	To earn 1 point use wood composite wood products containing no-added urea-formaldehyde resins	●		●	●	●	●		
TABLE 5—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED 2009 FOR SCHOOLS NEW CONSTRUCTION AND MAJOR RENOVATIONS											
MR 5 (MR 5.1)	Regional materials (10% of content)	1	To earn 1 point use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 10% (by cost) of total materials value. To earn 2 points use a minimum of 20%. Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
MR 5 (MR 5.2)	Regional materials (20% of content)	2		○	○	○	○	○	○		
MR 7	Certified wood	1	To earn 1 point use a minimum 50% (based on cost) of wood-based materials/products certified to FSC requirements ⁴	4	4	4	4	4	4		
EQ 4.4	Low emitting materials	1	Based on the LEED for Schools PIECAP, it is permissible to substitute LEED 2009 for New Construction EQ 4 Low-Emitting Materials credits in place of corresponding LEED 2009 for Schools EQ 4 Low-Emitting Materials credits.	●		●	●	●	●		
○	= Eligible for points										
●	= Verified attribute										
	= This provision does not apply to this product/service										

Note: Footnotes are located after Table 11.

TABLES 2 THROUGH 11 (Continued)

Section #	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Edge Edge Gold Radiant Barrier Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	TJI Joist	TimberStrand LSL Parallam PSL Microllam LVL	Strandguard TimberStrand LSL Parallam Plus PSL	Shear Brace	Javelin Software T-J-Xpert Software	NextPhase Site Solutions
TABLE 6—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED 2009 FOR CORE AND SHELL DEVELOPMENT											
MR 5 (MR 5.1)	Regional materials (10% of content)	1	To earn 1 point use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 10% (by cost) of total materials value. To earn 2 points use a minimum of 20%. Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
MR 5 (MR 5.2)	Regional materials (20% of content)	2	To earn 1 point use a minimum 50% (based on cost) of wood-based materials/products certified to FSC requirements ⁴	○	○	○	○	○	○		
MR 7	Certified wood	1	To earn 1 point use wood composite wood products containing no-added urea-formaldehyde resins	4	4	4	4	4	4		
EQ 4.4	Low emitting materials	1		●		●	●	●	●		
TABLE 7—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED 2009 FOR COMMERCIAL INTERIORS											
MR 5 (Option 1)	Regional materials (20% of content)	1	To earn 1 point use products that are extracted, processed and manufactured within 500 miles (805 km) of the site for a minimum of 20% (by cost) of total materials value, including furniture. To earn 2 points use a minimum of 20% + 10%. Source distance can be done by use of the regional distance calculator at www.ilevel.com	○	○	○	○	○	○		
MR 5 (Option 2)	Regional materials (Meet Option 1 + 10% of content)	2	To earn 1 point use a minimum 50% (based on cost) of wood-based materials/products certified to FSC requirements ⁴ . Furniture material value is also included in determination of certified wood content	○	○	○	○	○	○		
MR 7	Certified wood	1	To earn 1 point use wood composite wood products containing no-added urea-formaldehyde resins	4	4	4	4	4	4		
EQ 4.4	Low emitting materials	1		●		●	●	●	●		
TABLE 8—SUMMARY OF AREAS OF ELEGIBILITY WITH USGBC'S LEED FOR EXISTING BUILDINGS 2008											
MR 3	Regional materials	1	Maintain a sustainable purchasing program where the purchase of products contain a minimum of 50% materials (by cost) are extracted, processed and manufactured within 500 miles (805 km) of the site. Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
	Certified wood		Maintain a sustainable purchasing program where the purchase of products contain a minimum 50% (by cost) of wood-based materials/products certified to FSC requirements ⁴	4	4	4	4	4	4		
	Low emitting materials		Maintain a sustainable purchasing program where the purchase of wood composite wood products are those that contain no-added urea-formaldehyde resins	●		●	●	●	●		
○	= Eligible for points										
●	= Verified attribute										
	= This provision does not apply to this product/service										

Note: Footnotes are located after Table 11.

TABLES 2 THROUGH 11 (Continued)

Section #	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Edge Edge Gold Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	TJI Joist	TimberStrand LSL Parallam PSL Microllam LVL	Strandguard TimberStrand LSL Parallam Plus PSL	Shear Brace	Javelin Software T-J-Expert Software	NextPhase Site Solutions
TABLE 9—SUMMARY OF AREAS OF ELEGIBILITY WITH 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN)											
4.504.5, 5.504.4.5	Composite wood product emissions	Mandatory	EWP and lumber products do not apply to the composite wood product definition ⁶								
4.505	Moisture content of building materials	Mandatory	Moisture content of lumber may be measured with an appropriate handheld moisture meter ⁷		○						
A4.205.1	Radiant roof barriers	Elective	Radiant barrier sheathing has been tested in accordance with ASTM C-1371	○							
A4.404.1	Proper beam, header and trimmer design	Elective	Beams and headers and 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			●	●	●	●		
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) & (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 12)	○	○	○	○	○	○	○ ⁸	
A5.405.1	Regional materials	Elective	Verify local products that are extracted, processed and manufactured within California or 500 miles (805 km) of the job site. Use regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
A5.405.2	Bio-based materials	Elective	All iLevel wood products are qualified as biobased	●	●	●	●	●	●		
A5.405.2.1	Certified wood	Elective	Under review by California Building Standards Commission ⁵	N/A	N/A	N/A	N/A	N/A	N/A		
A5.409.1	Life cycle assessment	Elective	Select materials or assemblies based on an LCA done in accordance with ISO 14044, such as that contained in the CORRIM report at www.corrim.org	○	○	○	○	○	○		
TABLE 10—SUMMARY OF AREAS OF ELEGIBILITY WITH ANSI/GBI 01-2010—GREEN BUILDING ASSESSMENT PROTOCOL FOR COMMERCIAL BUILDINGS											
10.1.1.1	Life cycle impact - building assemblies	33 max	Use Green Globes LCA Credit Calculator	○	○	○	○	○	○		
10.1.2.2	Biobased Products - building assemblies	7 max	All iLevel 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). Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
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	● ¹⁰	● ¹⁰	● ¹⁰	● ¹⁰	● ¹⁰	● ¹⁰		
○	= Eligible for points										
●	= Verified attribute										
	= This provision does not apply to this product/service										

Note: Footnotes are located after Table 11.

TABLES 2 THROUGH 11 (Continued)

Section #	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Edge Edge Gold Radiant Barrier Sheathing Sheathing Plywood	Lumber Framer Series Lumber Green Stud Pro Series Lumber	TJI Joist	TimberStrand LSL Parallam PSL Microllam LVL	Strandguard TimberStrand LSL Parallam Plus PSL	Shear Brace	Javelin Software TJ-Xpert Software	NextPhase Site Solutions
TABLE 11—SUMMARY OF AREAS OF ELEGIBILITY WITH ASHRAE STANDARD 189.1—2009											
8.4.2.4	Composite wood product emissions	Prescriptive option	EWP and lumber products exempt from the composite wood product emissions requirements ⁶								
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. Source distance can be done by use of the regional distance calculator at www.ilevel.com ²	○	○	○	○	○	○		
9.4.1.3	Biobased products	Prescriptive option	All iLevel 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	○ ¹⁰	○ ¹⁰	○ ¹⁰	○ ¹⁰	○ ¹⁰	○ ¹⁰		
9.5.1	Life cycle assessment	Performance option	Select materials or assemblies based on an LCA done in accordance with ISO 14044, such as that contained in the CORRIM report at www.corrим.org	○	○	○	○	○	○		
○	= Eligible for points										
●	= Verified attribute										
	= This provision does not apply to this product/service										

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

²Distance calculator provides distance from source to mill and mill to site in a straight line.

³Applicable 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.

⁴Forest certification credit currently resources FSC exclusively. Credit of other certification schemes is at the discretion of the verifier.

⁵CGBSC recognizes importance of use of certified forest products however the specific requirements are currently under development.

⁶This area is not 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.

⁷Note 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%.

⁸Per Section 5.5 of this report, Shear Brace may be eligible when used to achieve a target reduction of 50 percent or more in square footage of wall bracing constructed on site.

⁹Additional listees have not been evaluated for renewable energy or ISO 14001 EMS systems

¹⁰Weyerhaeuser, Murphy 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 12—ADVANCED FRAMING TECHNIQUES

	RATING SYSTEM/CODES ¹		
	ICC-700	LEED-HOMES	CALGREEN
PRESCRIPTIVE-BASED COMPLIANCE CRITERIA			
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
PERFORMANCE-BASED COMPLIANCE CRITERIA			
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
Pre-cut framing packages	N/A	✓	See footnote 4

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

¹✓ represents that the criteria is deemed to comply when conditions are met.

²In 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.

³In LEED for Homes Section MR 1.4, Table 23, alternative measures to Table 23 are eligible for points if they save comparable amounts of framing material.

⁴Other 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 609.1 of ICC 700, Section A5.409.1 of the California Green Building Standards Code (CALGreen), Section 9.5.1 of ASHRAE 189.1, and Section 10.1.1 of Green Globes 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 iLevel 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 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) 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 A5.409.1 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 01-2010

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.