

Joint Evaluation Report

ESR-2725

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This report remains under an active [continuous compliance program](#) through the end of February 2027.

This report also contains:

- [City of LA Supplement](#)
- [CA Supplement](#)
- [FL Supplement](#)

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DIVISION: 06 00 00— WOOD, PLASTICS AND COMPOSITES Section: 06 17 13— Laminated Veneer Lumber Section: 06 17 25— Laminated Strand Lumber	REPORT HOLDER: TOLKO INDUSTRIES LTD.	EVALUATION SUBJECT: T-TEC® LAMINATED STRAND LUMBER (LSL), T-TEC® ZB TREATED LSL, AND T-TEC® LAMINATED VENEER LUMBER (LVL)	
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1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2024, 2021, 2018 and 2015 [International Building Code® \(IBC\)](#)
- 2024, 2021, 2018 and 2015 [International Residential Code® \(IRC\)](#)

Properties evaluated:

- Structural
- Fire resistance
- Preservative Treatment

1.2 Evaluation to the following green code(s) and/or standards:

- 2025 [California Green Building Standards Code \(CALGreen\)](#), Title 24, Part 11
- 2020, 2015, 2012 and 2008 [ICC 700 National Green Building Standard™](#) (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.0.

2.0 USES

Tolko T-TEC® laminated strand lumber (LSL), T-TEC® ZB Treated LSL, and T-TEC® laminated veneer lumber (LVL) are used for structural applications, such as beams, headers, joists, rafters, columns, wall studs, and rim board. It is also used as components in built-up structural members, such as flanges for I-joists and chords for trusses. Tolko ZB Treated LSL may be used as sill plates.

3.0 DESCRIPTION

3.1 General:

Tolko LSL, ZB Treated LSL and LVL described in this report comply with the requirements noted in Section 2303.1.10 of the 2024, 2021, 2018 and 2015 IBC, for allowable stress design in accordance with the 2024, 2021 and 2018 IBC Section 2302.1(1) and 2015 IBC Section 2301.2(1). They may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

The attributes of the Tolko LSL, ZB treated LSL, and LVL have been verified as conforming to the provisions of (i) CALGreen Section A4.404.3 for efficient framing techniques; (ii) ICC 700-2020 Sections 608.1(2), 11.608.1(2) and 13.104.1(4) and ICC 700-2015 and ICC 700-2012 Section 608.1(2), 11.608.1(2) and 12(A).608.1 for resource-efficient materials; and (iii) ICC 700-2008 Section 607.1(2) for resource-efficient materials. Note that decisions on compliance for those areas rest with the user of this report. 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. These codes or standards often provide supplemental information as guidance.

3.2 Tolko LSL:

Tolko LSL consists of wood strands bonded together using an exterior-type structural adhesive. The wood strand properties and species, adhesive, manufacturing parameters and finished product dimensions and tolerances are as specified in the approved quality documentation and manufacturing standard.

3.3 Tolko ZB Treated LSL:

Tolko ZB Treated LSL are treated with zinc borate (ZB) for protection against decay and termites, and is limited to interior locations, continuously protected from the weather and not in contact with the ground, but may be subject to dampness (such as in sill plates over concrete footings and slabs) as defined by the American Wood Protection Association (AWPA) Use Category UC2 as defined in AWPA U1. Unless noted otherwise within this report, all design provisions for Tolko LSL apply also to ZB Treated LSL.

3.4 Tolko LVL:

Tolko LVL consists of layers of wood veneers laminated together using an exterior-type structural adhesive. The wood veneer properties and species, adhesive, manufacturing parameters and finished product dimensions and tolerances are specified in the approved quality documentation and manufacturing standard.

4.0 DESIGN AND INSTALLATION

4.1 General:

Design and installation of Tolko LSL, ZB Treated LSL, and LVL must be in accordance with this report, the applicable code provisions and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. The requirements specified for allowable stress design in accordance with the 2024, 2021 and 2018 IBC Section 2302.1(1) and 2015 IBC Section 2301.2(1), and the design provisions for structural composite lumber in the *ANSI/AWC National Design Specification (NDS) for Wood Construction* are applicable to Tolko LSL, ZB treated LSL, and LVL except as modified within this report. Reference design values for each grade of Tolko LSL, ZB Treated LSL, and LVL are provided in [Table 1](#).

4.2 Connections:

The design of mechanical connections in Tolko LSL, ZB Treated LSL, and LVL must be in accordance with the NDS. Equivalent specific gravities for the design of nail, bolt and lag screw connections under dry use conditions are provided in [Table 2](#). Minimum nail spacing and end distance requirements are provided in [Table 3](#). Nailing requirements for the attachment of wall sheathing are given in Section 4.3.3.

Exception: Lag screw connections between Tolko LSL and ZB Treated LSL rim board and lumber deck ledgers have allowable lateral loads as specified in [Table 4](#), provided all of the following conditions are met:

1. Lag screws must have a minimum diameter of 1/2 inch (12.7 mm), and sufficient length such that the lag screw shank penetrates through the rim board (not including the length of the tapered tip).
2. Deck ledgers must consist of lumber having a minimum thickness of 1 1/2 inches (38 mm) and a minimum assigned specific gravity of 0.42.
3. The sheathing between the rim board and the deck ledger must consist of wood structural panels meeting U.S. DOC 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. Edge distances from the center of the lag screw to the edges of the rim board and deck ledger must be 2 inches (51 mm) or greater. End distances must be 4 inches (102 mm) or greater.
6. Adjustment factors in accordance with the NDS must be applied as applicable.
7. Rim board and deck ledgers must be checked for load-carrying capacity at connections in accordance with Section 11.1.2 of the 2024, 2018 and 2015 NDS (Section 10.1.2 of the 2012 NDS).

4.3 Wall Studs (LSL Only):

4.3.1 Prescriptive Wall Framing: Tolko LSL and ZB Treated LSL are considered equivalent to sawn lumber studs for prescriptive wall framing applications in accordance with Section 2308.9 of the 2024 IBC, Section 2308.5 of the 2021, 2018 and 2015 IBC and Section R602 of the IRC, subject to the following conditions:

1. Tolko LSL and ZB Treated LSL studs must have a thickness of 1½ inches (38 mm) or greater.
2. Cutting, notching, and boring of 3.5-inch-deep (89 mm) and 5.5-inch-deep (140 mm) Tolko LSL and ZB Treated LSL studs used in prescriptive wall framing is permitted in accordance with Section 2308.6 of the 2024 IBC, Sections 2308.5.9 and 2308.5.10 of the 2021, 2018 and 2015 IBC, and Section R602.6 of the IRC.
3. Connections between wall sheathing and Tolko LSL or Tolko ZB Treated LSL framing must meet the requirements of Section 4.3.2.

4.3.2 Engineered Wall Framing: Tolko LSL and ZB Treated LSL may be used in engineered wall framing applications, subject to the following conditions:

1. Tolko LSL and ZB Treated LSL studs are equivalent to sawn lumber studs with a maximum specific gravity of 0.50.
2. Tolko LSL and ZB Treated LSL studs must have a thickness of 1½ inches (38 mm) or greater.
3. Notching and boring of Tolko LSL and ZB Treated LSL studs is permitted in engineered wall assemblies. The design must be based on net-section analysis in accordance with the NDS, and is subject to the following additional conditions and allowable stress reductions:
 - a. Holes up to 40 percent of the depth of the stud are permitted anywhere along the stud length, except that a hole must not be placed within 6 inches (152 mm) of the end of the stud. A minimum edge distance, measured from the edge of the hole to the edge of the member, must be maintained for all holes as follows (see [Figure 2](#)):
 - (1) ⅝ inch (16 mm) for studs 5.5 inches deep (140 mm) or less, or
 - (2) 12 percent of the stud depth for studs more than 5.5 inches deep (140 mm).
 - b. Notches up to 20 percent of the depth of the stud are permitted anywhere along the stud length, except that a notch must not be placed within 6 inches (152 mm) of the end of the stud. The notch length must not exceed 8 inches (203 mm).
 - c. Holes and notches must not be cut in the same cross section and must be separated by a clear, vertical distance of two times the larger of the hole diameter or the notch height, whichever is greater.
 - d. The reference design stresses for bending, axial compression, and axial tension must be multiplied by a stress reduction factor to account for stress concentrations at notches and holes, as given in [Table 5](#).
4. Connections between wall sheathing and Tolko LSL and ZB Treated LSL framing must meet the requirements of Section 4.3.2.

4.3.3 Nailing Requirements: When Tolko LSL and ZB Treated LSL members are used as wall studs, the sheathing-to-stud and stud-to-stud connections must meet the following requirements:

1. A single 1½-inch-thick (38 mm) stud may be used for framing at adjoining panel edges for wall sheathing attached as follows:
 - a. 10d common nails [3 inches (76 mm) by 0.148 inch (3.76 mm) in diameter] spaced no closer than 6 inches (152 mm) on center, or 8d common nails [2½ inches (64 mm) by 0.131 inch (3.33 mm) in diameter] spaced no closer than 4 inches (102 mm) on center.
2. A minimum 2½-inch-thick (64 mm) single stud or a double 1½-inch (38 mm) or thicker stud is required for framing at adjoining panel edges for wall sheathing attached as follows:
 - a. 10d common or 8d common nails spaced no closer than 3 inches (76 mm) on center and staggered a minimum of ¼ inch (6.4 mm) horizontally.
3. Where double studs are required at adjoining panel edges, they must be connected together as follows:
 - a. For stud wall applications in accordance with the IRC and the conventional light-frame provisions of the Section 2308 of the IBC and Table 2304.10.2 of the 2024 IBC, Table 2304.10.1 of the 2021, 2018 and 2015 IBC, double Tolko LSL and ZB Treated LSL studs must be stitch-nailed together with a minimum of two staggered rows of 10d nails [2⅞ inches (73 mm) by 0.120 inch (3.05 mm) in diameter] spaced 8 inches (203 mm) on center in each row.

- b. For engineered stud wall applications, double Tolko LSL and ZB Treated LSL studs must be stitch-nailed together with a connection designed to transfer the required lateral shear, using an assumed equivalent specific gravity of 0.50. When stitch-nailing two 1³/₄-inch-thick (44 mm) studs, 3-inch (76 mm) or longer nails are required.
- c. The stitch nails must be driven in two lines spaced approximately 1 inch (25 mm) from each stud edge.
4. Where double studs are required at adjoining panel edges, the panel-edge nails must be installed with a minimum 1/2-inch (12.7 mm) edge distance from the panel edges, and staggered a minimum of 1/4 inch (6.4 mm) horizontally within each line of nails. The minimum edge distance for panel-edge nails may be reduced to 3/8 inch (9.5 mm).
5. Nails between sheathing and wall framing must not be spaced closer than as specified in Sections 4.3.2(1) and 4.3.2(2). Nails must also be staggered where required in Sections 4.3.2(1) and 4.3.2(2).
6. The maximum allowable nail size for attaching wall sheathing to the edge of a stud is 10d common [3 inches (76 mm) by 0.148 inch (3.76 mm) in diameter].

4.3.4 Wall Plates: Tolko LSL and ZB Treated LSL may be used as bottom (sole) plates and top plates, except where preservative-treated wood is required by Section 2304.12 of the 2024, 2021, 2018 and 2015 IBC and Sections R304 and R305 of the 2024 IRC, Sections R317 and R318 of the 2021, 2018, and 2015 IRC. Tolko ZB Treated LSL may be used as sill plates where preservative-treated wood is required but is limited to AWPA Use Category UC2 (Interior/Damp) as defined in AWPA U1. Stresses resulting from applied loads must not exceed the adjusted design values determined in accordance with Section 4.1 of this report.

4.4 Rim Board and Blocking:

When used as rim board, Tolko LSL and ZB Treated LSL must be continuously supported across the full width (except as noted in Section 4.3.2), and must be located at the joist elevation either perpendicular to, or parallel to, the joist framing. It must be the full depth of the joist space and be used for any combination of the following:

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

4.4.1 Tolko LSL and ZB treated LSL rim board must be installed in accordance with the prescriptive provisions of the applicable code, and design loads must not exceed those given in [Table 4](#).

4.4.2 Installation of Tolko LSL and ZB Treated LSL rim board over wall openings is permitted, provided the rim board is designed for all applicable stresses in accordance with Sections 4.1 and 4.2 adjusted by the applicable adjustment factors. Joints in the rim board are not allowed within 12 inches (305 mm) of the opening.

4.4.3 Tolko LSL and ZB Treated LSL having minimum thicknesses as given in [Table 4](#) may be used as direct replacements for the nominally 2-inch-thick solid blocking specified in Section 2308.8.2.3 of the 2024 IBC, Section 2308.4.2.3 of the 2021, 2018 and 2015 IBC and Section R502.7 of the IRC.

4.5 Fire Resistance and Fire Blocking:

4.5.1 Calculated Fire Resistance: The fire resistance of exposed Tolko LSL, ZB Treated LSL, and LVL may be calculated in accordance with Chapter 16 of the NDS.

4.5.2 Fire-resistance-rated Floor and Roof Systems: Tolko LSL, ZB Treated LSL, and LVL may be used as direct replacements for non-fire-retardant-treated sawn lumber, of equivalent size, in the prescriptive fire-resistance-rated floor and roof assemblies listed in Table 721.1(3) of the 2024, 2021, 2018, and 2015 IBC.

4.5.3 Fire Protection of Floors: Tolko LSL, ZB Treated LSL, and LVL having a minimum thickness of 1¹/₂ inches (38 mm) and a minimum depth of 9¹/₄ inches (235 mm), are considered equivalent to lumber joists in accordance with Exception 4 to Section R302.13 of the 2024, 2021, 2018 and 2015 IRC.

4.5.4 Fire-resistance-rated Wall Assemblies (1-Hour): Tolko LSL and ZB Treated LSL wall studs described in Section 4.3 are permitted to be used in 1-hour fire-resistance-rated wall assemblies as follows:

1. For conventional light-frame construction, Tolko LSL and ZB Treated LSL may be used as direct replacements for non-fire-retardant-treated sawn lumber studs, of equivalent-sized No. 2 or lower grade, in the prescriptive fire-resistance-rated wall assemblies 15-1.12, 15-1.13, 15-1.14 and 15-1.15 in Table 721.1(2) of the 2024, 2021, 2018, and 2015 IBC, with the exception of the following conditions:
 - a. Minimum 2.5 pcf (40 kg/m³) mineral wool insulation must be placed in each stud cavity.
 - b. Tape and joint compound must be applied to fastener heads and gypsum wallboard joints on exposed surfaces.
2. For engineered, load-bearing wall construction, Tolko LSL and ZB Treated LSL are permitted to be used in 1-hour fire-resistance-rated wall assemblies meeting the following conditions:
 - a. The minimum stud size must be 1½ inches (38 mm) by 3½ inches (89 mm) or greater.
 - b. Studs must be spaced no more than 24 inches (610 mm) on center.
 - c. Minimum 5/8-inch (15.9 mm) Type X gypsum wallboard conforming to ASTM C36 or ASTM C1396 must be attached with 2¼-inch-long (57 mm) Type S drywall screws spaced 7 inches (178 mm) on center along each stud.
 - d. Minimum 2.5 pcf (40 kg/m³) mineral wool insulation must be filled each stud cavity.
 - e. Tape and joint compound must be applied to fastener heads and gypsum wallboard joints on the exposed surface(s) in accordance with ASTM C840 or GA-216.
 - f. The design axial compressive stress within the studs must not exceed the least of the following:
 - i. 435 psi (2999 kPa).
 - ii. When the slenderness ratio exceeds 33, $0.78F_c'$ for 1.35E LSL or $0.76 F_c'$ for 1.55E LSL, where F_c' is the compression design value parallel-to-grain, adjusted for all applicable adjustment factors in accordance with the NDS, including the column stability factor, C_P .

4.5.5 Fire Blocking: Tolko LSL, ZB Treated LSL, and LVL are permitted to be used as fire blocking in accordance with Section 718.2.1 of the 2024, 2021, 2018, and 2015 IBC and Section R602.8 of the IRC as follows:

1. Tolko LSL, ZB Treated LSL, and LVL having a minimum thickness of 1¼ inches (31.8 mm) are permitted to be used as an alternate to nominally 2-inch lumber fire blocking.
2. Tolko LSL, ZB Treated LSL, and LVL having a minimum thickness of 1 inch (25.4 mm) are permitted to be used as an alternate to 23/32 inch (18.3 mm) wood structural panel fire blocking, provided the joints are backed accordingly.

4.5.6 Roof and Ceiling Framing: Tolko LSL, ZB Treated LSL, and LVL may be used as ceiling joists and rafter framing in conventional light-frame construction in accordance with Section 2308.11 of the 2024 IBC, Section 2308.7 of the 2021, 2018 and 2015 IBC and Section R802 of the IRC.

5.0 CONDITIONS OF USE:

Tolko T-TEC[®] LSL, T-TEC[®] ZB Treated LSL and T-TEC[®] LVL described in this report comply with, or are suitable alternatives to what is specified in, those codes specifically listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Fabrication, design, installation, and connection restrictions must comply with this report and the manufacturer's published installation instructions. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2** Use of Tolko LSL, ZB Treated LSL, and LVL must be limited to dry, well-ventilated interior applications in which the in-service average moisture content of lumber is less than 16 percent. Use of Tolko LSL, ZB Treated LSL, and LVL must be limited to interior locations, continuously protected from the weather, and cannot be in contact with the ground, but may be subject to dampness, as defined by the American Wood Protection Association (AWPA) Use Category UC2. Applications of ZB treated LSL within the building envelop are to be in accordance with 2024, 2021, 2018 and 2015 IBC Section 2304.12, 2024 IRC Section R304, and 2021, 2018 and 2015 IRC Section R317.1.

- 5.3 Calculations and drawings demonstrating compliance with this report must be submitted to the code official. The calculations and drawings must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.4 Tolko LSL, ZB Treated LSL, and LVL are produced by the Tolko Industries, Ltd. facilities in Slave Lake, Alberta, Canada and Heffley Creek, Kamloops, British Columbia, Canada, respectively, under a quality control program with inspections by ICC-ES and APA—The Engineered Wood Association (AA-649). The ZB treatment is under a quality control program with inspections by ICC-ES and Timber Products Inspection, Inc. (AA-696).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the [ICC-ES Acceptance Criteria for Structural Wood-based Products \(AC47\)](#), dated June 2023 (editorially revised January 2025).
- 6.2 Data in accordance with the [ICC-ES Acceptance Criteria for Wood-based Studs \(AC202\)](#), dated June 2009 (editorially revised January 2025), including reports of ASTM E119 testing.
- 6.3 Data in accordance with the [ICC-ES Acceptance Criteria for Rim Board Products \(AC124\)](#), dated June 2019 (editorially revised January 2025).
- 6.4 Data in accordance with the [ICC-ES Acceptance Criteria for Zinc Borate \(ZB\) Preservative Treatment of Structural Composite Wood Products by Non-pressure Processes \(AC203\)](#), dated August 2017 (editorially revised February 2025).

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-2725) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2 In addition, Tolko LSL, ZB Treated LSL, and LVL are identified with stamps noting the Tolko Industries, Ltd name or logo, plant number, product designation, grade, production date and shift, evaluation report number (ESR-2725), and the third-party inspection agency (APA—The Engineered Wood Association). Tolko ZB Treated LSL is identified with the designation of “AWPA UC2” with the third-party inspection agency (Timber Products Inspection, Inc.).
- 7.3 The report holder’s contact information is the following:

TOLKO INDUSTRIES LTD.
3000 28TH STREET
VERNON, BRITISH COLUMBIA V1T 9W9
CANADA
(236) 984-4094
www.tolko.com

TABLE 1—REFERENCE DESIGN VALUES FOR TOLKO LSL, ZB TREATED LSL, AND LVL^{1,2,3,4}

GRADE	BEAM ORIENTATION					PLANK ORIENTATION					AXIAL	
	Modulus of Elasticity		Bending F _b ^{7,8} (psi)	Shear F _v (psi)	Compr. Perp-to-Grain F _{c⊥} ⁹ (psi)	Modulus of Elasticity		Bending F _b (psi)	Shear F _v (psi)	Compr. Perp-to-Grain F _{c⊥} ⁹ (psi)	Compr. F _c (psi)	Tension F _t ¹⁰ (psi)
	E ⁵ (x10 ⁶ psi)	E _{min} ⁶ (x10 ⁶ psi)				E ⁵ (x10 ⁶ psi)	E _{min} ⁶ (x10 ⁶ psi)					
LSL and ZB Treated LSL												
1.35E-1850F _b	1.4	0.70	1,850	445	750	1.4	0.70	2,060	150	690	1,915	1,430
1.4E-1850F _b	1.4	0.70	1,850	445	750	1.4	0.70	2,060	150	690	1,915	1,430
1.55E-2360F _b	1.6	0.81	2,360	525	900	1.6	0.81	2,620	155	775	2,175	1,935
1.6E-2360F _b	1.6	0.81	2,360	525	900	1.6	0.81	2,620	155	775	2,175	1,935
LVL												
1.6E-2250F _b	1.6	0.81	2,250	290	750	1.6	0.81	2,250	150	550	2,350	1,500
1.8E-2750F _b	1.8	0.91	2,750	290	750	1.8	0.91	2,750	150	550	2,400	1,700
2.1E-2950F _b	2.1	1.06	2,950	290	750	2.1	1.06	2,950	150	650	3,200	1,950

For **SI**: 1 psi = 6.89 kPa, 1 inch = 25.4 mm.

¹Reference design values apply only to dry, well-ventilated interior applications where the equivalent moisture content in lumber is less than 16 percent.

²Reference design values are for normal load duration. Tabulated values must be adjusted by the applicable adjustment factors in accordance with the NDS. Modulus of elasticity and compression perpendicular-to-grain must not be adjusted for duration of load.

³Reference design values given for Beam Orientation refer to loads applied parallel to the wide face of the strands or veneers (applied to the edge of the member). Plank Orientation refers to loads applied perpendicular to the wide face of the strands or veneers (applied to the face of the member). See Figure 1.

⁴Reference design values for bending, axial compression and axial tension for LSL and ZB Treated LSL studs with notches or holes in engineered wall framing must be multiplied by the strength reduction factors in Table 5.

⁵The reference E values are the shear-free modulus of elasticities. When calculating deflection, both bending and shear deformations must be included. Equations for various span and loading conditions are available in engineering references. For example, the deflection equation for a simply-supported beam under uniform load is:

$$\delta = \frac{270 \omega L^4}{Ebd^3} + \frac{28.8 \omega L^2}{Ebd}$$

where δ = calculated deflection (in.), ω = uniform load (lb/ft), L = design span (ft), b = beam width (in.), d = beam depth (in.), and E = shear-free modulus of elasticity (psi).

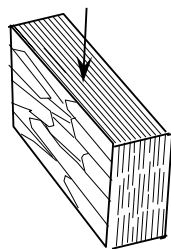
⁶E_{min} is the reference modulus of elasticity for beam stability and column stability calculations.

⁷Reference bending design values in the beam orientation, F_b, may be increased by 4% when the member qualifies as a repetitive member, in accordance with Section 8.3.7 of the NDS.

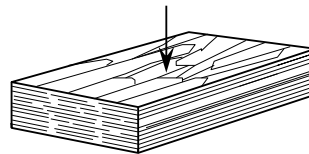
⁸Reference bending design values in the beam orientation, F_b, for LSL, ZB Treated LSL, and LVL are assigned for a standard depth of 12 inches. For other depths greater than 2 1/2 inches, multiply F_b by a volume factor of (12/d)^{0.125}, where d is the depth of the member in inches. For depths 2 1/2 inches or less, the factor for the 2 1/2-inch depth shall be used.

⁹When designing with the tabulated compressive stress perpendicular to grain (F_{c⊥}), the Bearing Area Factor (C_b) stipulated in Section 3.10.4 of the NDS shall be permitted to be applied.

¹⁰Reference tension design values, F_t, for LSL, ZB Treated LSL, and LVL are assigned for a standard length of 4 feet. For other lengths, the allowable tensile stress shall be modified by (4/L)^(1/16), for LSL and ZB Treated LSL, and (4/L)^{0.08} for LVL, where L = length in feet. For lengths less than 4 feet, use the allowable tension stress in Table 1 unadjusted.



Beam Orientation



Plank Orientation

FIGURE 1—BEAM AND PLANK ORIENTATION AS NOTED IN TABLE 1

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

GRADE	EQUIVALENT SPECIFIC GRAVITY					
	NAILS AND SCREWS				BOLTS AND LAG SCREWS ^{4,5}	
	Withdrawal		Dowel Bearing		Dowel Bearing (Installed in Face)	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Load Applied Parallel to Grain	Load Applied Perpendicular to Grain
LSL and ZB Treated LSL						
1.35E and 1.4E	0.42	0.50	0.47	0.50	0.50	0.58
1.55E and 1.6E	0.42	0.50	0.50	0.50	0.50	0.58
LVL						
1.6E, 1.8E, 2.1E	0.50	0.50	0.50	0.50	0.50	0.50

¹Fastener types and orientation not specifically described above are outside the scope of this report.

²Fastener design values calculated using the tabulated equivalent specific gravities given above must be adjusted by the applicable adjustment factors specified in the NDS for connections.

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

⁴Equivalent specific gravity values apply only to bolts and lag screws installed into the face of the LSL, ZB Treated LSL, and LVL such that the bolt axis is perpendicular to the wide faces of the strands or veneers.

⁵The allowable lateral loads for lag screw connections between Tolko LSL or ZB Treated LSL rim board and deck ledgers complying with the exception to Section 4.2 are given in Table 4.

TABLE 3—NAIL SPACING REQUIREMENTS FOR TOLKO LSL, ZB TREATED LSL, AND LVL ¹

MEMBER THICKNESS (in.)	FASTENER ORIENTATION ²	COMMON NAIL SIZE ^{3, 4}	MINIMUM END DISTANCE (in.)	MINIMUM NAIL SPACING (in.)	
				Single Row	Multiple Rows ^{5, 6}
LSL and ZB Treated LSL (All Grades)					
1 ¹ / ₈ ≤ Thickness < 1 ¹ / ₄	Edge ⁷	8d & smaller	2	4	NA ⁹
		10d & 12d	2 ¹ / ₂	5	NA ⁹
		16d	3	6	NA ⁹
	Face ⁸	8d & smaller	⁷ / ₈	1	1
		10d & 12d	⁷ / ₈	1	1
		16d	⁷ / ₈	1 ¹ / ₂	1 ¹ / ₂
1 ¹ / ₄ ≤ Thickness <1 ¹ / ₂	Edge ⁷	8d & smaller	2	4	NA ⁹
		10d & 12d	2	4	NA ⁹
		16d	2 ¹ / ₂	5	NA ⁹
	Face ⁸	8d & smaller	⁷ / ₈	1	1
		10d & 12d	⁷ / ₈	1	1
		16d	⁷ / ₈	1 ¹ / ₂	1 ¹ / ₂
1 ¹ / ₂ ≤ Thickness < 3 ¹ / ₂	Edge ⁷	8d & smaller	1 (or 1 ¹ / ₂) ¹⁰	2	3
		10d & 12d	2	3	4
		16d	2 ¹ / ₂	3	4
	Face ⁸	8d & smaller	¹ / ₂	1	1
		10d & 12d	¹ / ₂	1	1
		16d	⁷ / ₈	1 ¹ / ₂	1 ¹ / ₂
LVL (All Grades)					
1 ³ / ₄	Edge ⁷	8d & smaller	3	4	NA ⁹
		10d & 12d	3	5	NA ⁹
		16d	3	6	NA ⁹
	Face ⁸	8d & smaller	1 ¹ / ₂	3	NA ⁹
		10d & 12d	2	3	NA ⁹
		16d	2	3	NA ⁹

For SI: 1 inch = 25.4 mm.

¹Edge distance must be sufficient to prevent splitting.

²Face orientation applies to nails driven into the face of the LSL or LVL member, such that the long axis of the nail is perpendicular to the wide faces of the strands or veneers. Edge orientation applies to nails driven into the edge of the LSL or LVL member.

³16d sinkers (3¹/₄ in. x 0.148 in. diameter) are considered equivalent to 12d common nails for the purpose of this table.

⁴Nails listed are common wire nails. For box nails, the spacing and end distance requirements of the next shorter common nail may be used (e.g., a 16d box nail may be spaced the same as a 10d and 12d common nail). Larger nail sizes and shank types not specifically described above are outside the scope of this report.

⁵For multiple rows of nails, the rows must be offset ¹/₂ inch or more from each other, and staggered, as shown in Figure 2.

⁶For multiple rows of nails, the rows must be equally spaced about the centerline of the edge or face (whichever applies).

⁷Nail penetration for edge nailing must not exceed 2 inches for 16d common nails (3¹/₂ in. by 0.162 in. diameter) and 2¹/₂ inches for all nails with a smaller shank diameter.

⁸Minimum nail spacing for the face orientation is applicable to nails that are installed in rows that are parallel to the direction of the grain (length) of the LSL or LVL. For nails driven into the face in rows that are perpendicular to the direction of the grain (width/depth) of the LSL or LVL, the minimum spacing must be sufficient to prevent splitting of the wood.

⁹Not available.

¹⁰The multiple end row spacing is 1-1/2-inches.

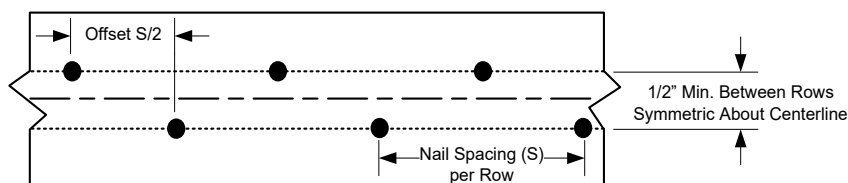


FIGURE 2—SPACING OF MULTIPLE ROWS OF NAILS

TABLE 4—ALLOWABLE DESIGN LOADS FOR TOLKO LSL AND ZB TREATED LSL RIM BOARD^{1,2}

GRADE	THICKNESS (in.)	LATERAL LOAD CAPACITY ^{3, 4, 5} (lb/ft)	VERTICAL LOAD CAPACITY						¹ / ₂ -INCH DIA. LAG SCREW CAPACITY FOR DECK LEDGER ⁷ (lb/ft)
			Uniform Load ⁶ (lb/ft)						
		Depth (d) Limitation							
		d ≤ 24"	d ≤ 16"	18"	20"	22"	24"	d ≤ 24"	d ≤ 24"
1.35E and 1.4E LSL	1 ¹ / ₄	250	5,400	4,650	4,350	4,350	4,350	3,800	610
	1 ¹ / ₂	225	6,480	6,380	5,740	5,740	5,740	5,000	675
	1 ³ / ₄	200	7,560	7,560	7,560	7,130	6,470	7,000	675
1.55E and 1.6E LSL	1 ¹ / ₄	230	5,400	5,400	5,400	5,400	5,400	4,600	675
	1 ¹ / ₂	200	6,480	6,380	5,740	5,740	5,740	4,600	675

For **SL**: 1 inch = 25.4 mm, 1 LB. = 4.45 N, 1 lbf/ft = 14.6 N/m.

¹Allowable design loads in this table cannot be increased for load duration.

²See [Table 3](#) for minimum nail spacing requirements.

³The lateral load capacity is for seismic design and is permitted to be multiplied by 1.4 for wind load applications. For shear loads of normal or permanent load duration as defined by the NDS, the values in the table shall be multiplied by 0.63 or 0.56, respectively.

⁴Toe-nailed connections are not limited by the 150 lbf/ft lateral load capacity noted for Seismic Design Categories D, E, and F in Section 4.1.7 of the ANSI/AWC *Seismic Design Provisions for Wind & Seismic* (SDPWS).

⁵The nailing schedule for sheathing-to-rim and rim-to-sill plate (toe-nailed) is based on minimum 8d box nails (2 1/2 in x 0.113 in. diameter) at 6 inches on center. Commercial framing connectors fastened to the face of the rim board and wall plates may be used to achieve lateral load capacities exceeding values in this table. Calculations must be based on equivalent specific gravity listed in [Table 2](#), and must not exceed the nail spacing requirements of Table 3.

⁶The allowable vertical uniform load capacity is based on the strength of the rim board, and may need to be reduced based on the bearing capacity of the supporting wall plate.

⁷Lag screw connections between Tolko LSL or ZB treated LSL rim board and deck ledgers have allowable lateral loads as specified in this table, provided the conditions under the exception to Section 4.2 are met.

TABLE 5—STRENGTH REDUCTION FACTORS FOR NOTCHES AND HOLES IN TOLKO LSL AND ZB TREATED LSL STUDS^{1,2,3}

Material	Notches			Holes		
	Bending	Compression	Tension	Bending	Compression	Tension
1.35E and 1.4E LSL	0.90	1.00	0.75	1.00	1.00	1.00
1.55E and 1.6E LSL	0.85	0.98	0.70	0.90	0.90	0.90

¹Design of Tolko LSL and ZB Treated LSL studs with notches and holes used in engineered wall framing must be based on a net-section analysis in accordance with the NDS. See Section 4.3 of this report for limitations on the allowed size and placement of notches and holes.

²The reference design values for bending, axial compression and axial tension from [Table 1](#) must be multiplied by the strength reduction factors given above for studs with notches or holes in engineered wall framing.

³See Section 4.3.2 for notching in Tolko LSL and ZB Treated LSL studs used in prescriptive wall framing.

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ICC-ES Evaluation Report

ESR-2725 City of LA Supplement

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A Subsidiary of the International Code Council®

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 13—Laminated Veneer Lumber

Section: 06 17 25—Laminated Strand Lumber

REPORT HOLDER:

TOLKO INDUSTRIES LTD.

EVALUATION SUBJECT:

T-TEC® LAMINATED STRAND LUMBER (LSL), T-TEC® ZB TREATED LSL, AND T-TEC® LAMINATED VENEER LUMBER (LVL)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Tolko T-TEC® laminated strand lumber (LSL), T-TEC® ZB Treated LSL, and T-TEC® laminated veneer lumber (LVL) described in ICC-ES evaluation report [ESR-2725](#), 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:

- 2026* *City of Los Angeles Building Code* ([LABC](#))
- 2026* *City of Los Angeles Residential Code* ([LARC](#))

*For evaluation for compliance with the anticipated requirements of the 2026 LABC and LARC

2.0 CONCLUSIONS

The Tolko T-TEC® LSL, T-TEC® ZB Treated LSL, and T-TEC® LVL described in Sections 2.0 through 7.0 of the evaluation report [ESR-2725](#), 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 Tolko T-TEC® LSL, T-TEC® ZB Treated LSL, and T-TEC® LVL described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-2725](#).
- The design, installation, conditions of use and identification are in accordance with the 2024 *International Building Code*® (IBC) and 2024 *International Residential Code*® (IRC) provisions, as applicable, noted in the evaluation report [ESR-2725](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, 17 and 23, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This evaluation report supplement expires concurrently with the evaluation report, ESR-2725, reissued February 2026 and revised June 29, 2026.

ICC-ES Evaluation Report

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TOLKO INDUSTRIES LTD.

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1.0 REPORT PURPOSE AND SCOPE

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Applicable code editions:

- 2025 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see sections 2.1.1 and 2.1.2 below.

- 2025 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Tolko T-TEC® LSL, T-TEC® ZB Treated LSL and T-TEC® LVL, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report [ESR-2725](#), comply with CBC Chapter 23, provided the design and installation are in accordance with the 2024 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 23, as applicable.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The Tolko T-TEC® LSL, T-TEC® ZB Treated LSL and T-TEC® LVL, described in Sections 2.0 through 7.0 of the evaluation report [ESR-2725](#), comply with the CRC, provided the design and installation are in accordance with the 2024 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 3, as applicable.

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ICC-ES Evaluation Report

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1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Tolko T-TEC® laminated strand lumber (LSL), T-TEC® ZB Treated LSL and T-TEC® laminated veneer lumber (LVL), described in ICC-ES evaluation report [ESR-2725](#), have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2026 and 2023 *Florida Building Code—Building*
- 2026 and 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Tolko T-TEC® LSL, T-TEC® ZB Treated LSL, and T-TEC® LVL described in Sections 2.0 through 7.0 of the evaluation report [ESR-2725](#), comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in the evaluation report [ESR-2725](#) for the 2024 and 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable, with the following condition:

- The requirements specified for allowable stress design in accordance with the *Florida Building Code—Building* Section 2301.2 Item 1 and the design provisions for structural composite lumber in the ANSI/AWC *National Design Specification (NDS) for Wood Construction* are applicable to Tolko T-TEC® LSL, T-TEC® ZB treated LSL, and T-TEC® LVL except as modified within the evaluation report. Reference design values for each grade of Tolko LSL and ZB Treated LSL are provided in Table 1 of the report.

Use of the Tolko T-TEC® LSL, T-TEC® ZB Treated LSL, and T-TEC® LVL for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated and is outside the scope of this evaluation report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission). Florida Rule 61G20-3 is applicable to products and/or systems which comprise the building envelope and structural frame for compliance with the structural requirements of the Florida Building Code.

This evaluation report supplement expires concurrently with the evaluation report, ESR-2725, reissued February 2026 and revised June 29, 2026.