Evaluation Report CCMC 11518-R
LP® SolidStart® LVL

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that "LP® SolidStart® LVL", when used as structural composite lumber (SCL) in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2010:

- Clause 1.2.1.1.(1)(a), Division A, using the following acceptable solutions from Division B:
  - Sentence 4.3.1.1.(1), Design Basis for Wood (CSA O86-09, "Engineering Design in Wood" for SCL qualification)

- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
  - Sentence 9.23.4.2.(3), Spans for Joists, Rafters and Beams

This opinion is based on CCMC's evaluation of the technical evidence in Section 4 provided by the Report Holder.

Ruling No. 05-14-138 (11518-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 2005-12-15 (revised on 2012-06-21) pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

2. Description

The product is a laminated veneer lumber (LVL), which is a type of SCL that is manufactured by laminating veneer sheets of wood coated with an exterior-type structural adhesive conforming to CSA O112.6-M1977, "Phenol and Phenol-Resorcinol Resin Adhesives for Wood (High-Temperature Curing)" (see CCMC 13192-L, CCMC 13322-L and CCMC 13019-L). The wood veneer properties, species, adhesive, manufacturing parameters, and finished product thickness, width and length are as specified in the quality control manual that contains the manufacturing standard. See Figure 1 for veneer orientation and details. Larger sections of the product are available through secondary lamination.

The manufacturing quality assurance program and records are verified by APA-The Engineered Wood Association as part of the product certification.

The permitted design values are outlined in Tables 4.1.1 to 4.1.4.

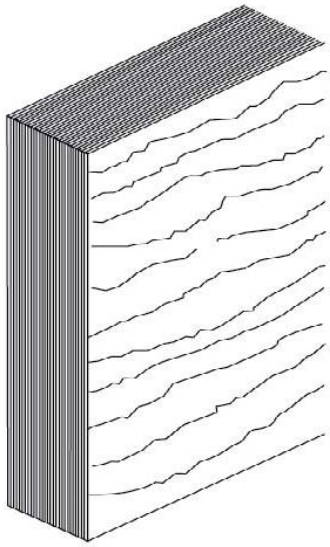

Figure 1. Typical LVL profile

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the "LP® SolidStart® LVL" being used in accordance with the conditions and limitations set out below.

- The product, as with all SCL, is intended for dry service applications only.[1]
- The product is intended for use in construction as an alternative material to lumber. Proprietary design values presented for the product are to be used by professional engineers for design in accordance with CSA O86, for structural applications such as beams, headers, joists, rafters, and columns as intended by the product manufacturer. The specific application must be qualified through testing and validated by the manufacturer. Applications such as I-joist flanges, studs and metal-plated truss chords are beyond the scope of this evaluation.
- Structural applications:

  i. Louisiana-Pacific Corporation's Pre-engineered Tables[2,3]
  The pre-engineered tables in the literature outlined below have been provided to CCMC by the manufacturer to demonstrate compliance with Part 9 buildings of Division B of the NBC 2010 for acceptance by the local authority having jurisdiction (AHJ):

  When the product is used as beams, headers and rim boards to support uniform loads only, the installation must be in accordance with the tables and installation details published by Louisiana-Pacific Corp. entitled:
  - "LP® SolidStart® LVL Technical Guide 2900Fb-2.0E and 2250Fb-1.5E -Limit States Design," dated August 2014;
  - "LP® SolidStart® Technical Guide for Light-Frame Commercial and Multifamily Construction -Limit States Design," dated September 2014; and
  - "LP® SolidStart® OSB, LVL & LSL Rim Board - Limit States Design," dated August 2014.

  The product must be installed in accordance with the manufacturer's installation guidelines noted in the above-mentioned documents for those applications falling within the scope of these documents. Applications outside the scope of these installation guidelines require engineering on a case-by-case basis.

  ii. Louisiana-Pacific Corporation's Installation Details
  Louisiana-Pacific's pre-engineered details within the documents outlined in (i) above are limited in scope to building designs where the anticipated loads on the following structural details will not be exceeded:
  - beams supporting floor loads (pages 5 and 13 of (1));
  - beams supporting roof loads (pages 8, 9, 16 and 17 of (1));
  - beams supporting floor and roof loads (pages 6, 7, 14 and 15 of (1));
  - floor or roof PLF tables (pages 10-11 and 18-19 of (1) and pages 28-29 and 30-31 of (2));
  - bearing length details (pages 4 and 12 of (1) and page 27 of (2));
  - allowable holes (page 21 of (1) and page 33 of (2));
  - support column details (page 21 of (1) and page 33 of (2));
  - multiple member connections (page 22 of (1) and page 34 of (2));
  - nail spacing (pages 23 of (1) and pages 35 of (2)); and
  - rim board details (page 38 of (2) and pages 1-4 of (3)).

iii. Engineering Required

For structural applications beyond the scope/limitations of the above-referenced publications or when required by the AHJ, the drawings or related documents must bear the authorized seal of a professional engineer skilled in wood design and licensed to practice under the appropriate provincial or territorial legislation. Installations beyond the scope/limitations of (i) and (ii) above imply, but are not limited to, the following:

- higher loads/longer spans than the manufacturer's pre-engineered details;
- concentrated loads;
- areas of high wind or high seismicity;
- design of supporting members/columns when the total beam/header load exceeds the NBC 2010 pre-engineered beam/lintel tables; and
- design of supporting foundation footings when the total load exceeds the NBC 2010 pre-engineered floor/roof joist tables.

The engineer must design in accordance with CSA O86, and may use as a guide, the "Engineering Guide for Wood Frame Construction," published by the Canadian Wood Council.

The specified strengths for the product must not exceed the values set forth in Table 4.1.1. See Figure 1 for details about veneer orientation.

Basic nail, bolt and lag screw capacities must be as shown in Table 4.1.2. Nail spacing of the product must conform to Table 4.1.3.

The ends of all beams must be restrained to prevent rollover. This is normally achieved by attaching a diaphragm sheathing either to the top or compression edge, and an end wall or shear transfer panel capable of transferring a minimum unfactored load of 730 N/m or required shear forces due to wind or seismic conditions. Blocking or cross-bracing with equivalent strength may be used. The compression edges of all beams must be laterally supported at least every 610 mm, except where design is done in accordance with CSA O86.

iv. Engineering Support Provided by Manufacturer

Louisiana-Pacific Corp. provides engineering support through either distribution or a professional engineer skilled in wood design and licensed to practice under the appropriate provincial or territorial legislation. Louisiana-Pacific Corp. may also be consulted in the use of the product.

Louisiana-Pacific Corp. (tech. support):
1 888 820 0325
customer.support@lpcorp.com

- Damaged or defective products must not be used, unless repaired in accordance with written instructions from the manufacturer.
- This product must be identified with the phrase "CCMC 11518-R" along the side or top of the SCL member. This CCMC number is only valid when it appears in conjunction with the APA-EWS certification mark.

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1 All lumber, wood-based panels and proprietary engineered wood products are intended for dry service conditions. "Dry service" is defined as the in-service environment under which the equilibrium moisture content (MC) of lumber is 15% or less over a year and does not exceed 19% at any time. Wood contained within the interior of dry, heated or unheated buildings has generally been found to have a MC between 6% and 14% depending on season and location. During construction, all wood-based products should be protected from the weather to ensure that the 19% MC is not exceeded in accordance with Article 9.3.2.5., Moisture Content, of Division B of the NBC 2010.

2 The pre-engineered tables present the pre-engineered factored resistance of the beam. The AHJ may require further engineering to determine the factored load in accordance with Part 4 of Division B of the NBC 2010.

3 As per Section 9.4., Structural Requirements, of Division B of the NBC 2010, particularly in areas of high wind or high seismicity, the adequacy of the rim board to transfer loads from shear walls and the diaphragm must be verified.

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4. Technical Evidence

The Report Holder has submitted technical documentation for CCMC's evaluation. Testing was conducted at laboratories recognized by CCMC. The corresponding technical evidence for this product is summarized below.

4.1 Design Requirements

Table 4.1.1 Product Specified Strengths (MPa) [4] [5] [6]

Grade	Bending, F_b MPa (psi)		Tension Parallel to Grain F_t [3] MPa (psi)	Compression Parallel to grain, $F_{c\parallel}$ MPa (psi)	Compression Perpendicular to grain, $F_{c\perp}$ MPa (psi)		Horizontal Shear, F_v MPa (psi)		Modulus of Elasticity [7] MPa (x 10^6 psi)	
	Beam	Plank			Beam	Plank	Beam	Plank	Beam	Plank
1 400F_b-1.1E (cross-ply)	17.84 [1] (2 587)	17.84 (2 587)	12.38 (1 796)	18.71 (2 713)	8.53 (1 238)	5.66 (820)	3.20 (465)	0.784 (114)	7 580 (1.10)	6 900 (1.00)
1 650F_b-1.3E (cross-ply)	21.02 [1] (3 049)	21.02 (3 049)	12.38 (1 796)	18.71 (2 713)	8.53 (1 238)	5.66 (820)	3.20 (465)	1.79 (260)	8 960 (1.30)	7 580 (1.10)
1 750F_b-1.3E (cross-ply)	22.30 [1] (3 234)	22.30 (3 234)	12.38 (1 796)	18.71 (2 713)	8.53 (1 238)	5.66 (820)	3.20 (465)	1.79 (260)	8 960 (1.30)	8.960 (1.30)
2 250F_b-1.5E	28.67 [2] (4 158)	28.03 (4 066)	13.93 (2 021)	25.86 (3 751)	9.41 (1 365)	5.66 (820)	3.65 (530)	1.79 (260)	10 340 (1.50)	9 650 (1.40)
2 400F_b-1.7E	30.58 [2] (4 435)	29.31 (4 250)	13.93 (2 021)	25.86 (3 751)	9.41 (1 365)	5.66 (820)	3.65 (530)	1.79 (260)	11.720 (1.70)	11 720 (1.70)
2 650F_b-1.9E	33.77 [2] (4 897)	33.13 (4 805)	16.51 (2 395)	25.86 (3 751)	9.41 (1 365)	6.90 (1 001)	3.65 (530)	1.79 (260)	13 100 [8] (1.90)	12 410 [8] (1.80)
2 900F_b-2.0E	36.95 [2] (5 359)	37.59 (5 452)	18.58 (2 694)	35.21 (5 107)	9.41 (1 365)	6.90 (1 001)	3.65 (530)	1.79 (260)	13 790 (2.00)	13 790 (2.00)
2 950F_b-2.0E	37.59 [2] (5 452)	37.59 (5 452)	18.58 (2 694)	35.21 (5 107)	9.41 (1 365)	6.90 (1 001)	3.72 (540)	1.79 (260)	13 790 [8] (2.00)	13 790 [8] (2.00)
3 100F_b-2.1E	39.50 [2] (5 729)	39.50 (5 729)	18.58 (2 694)	35.21 (5 107)	9.41 (1 365)	6.90 (1 001)	3.72 (540)	1.79 (260)	14 480 (2.10)	13 790 (2.00)
3 100F_b-2.2E	39.50 [2] (5 729)	37.59 (5 452)	18.58 (2 694)	35.21 (5 107)	9.41 (1 365)	6.90 (1 001)	3.72 (540)	1.79 (260)	15 170 (2.20)	15 170 (2.20)

Notes to Table 4.1.1:

1 The specified bending strength, F_b, is assigned for a standard depth of 305 mm (12 in.). For other product depths, multiply F_b as follows:

- For thicknesses < 32 mm (1 ¼ in.): multiply F_b by (305/depth in mm)$^{0.323}$ [(12/depth in in.)$^{0.323}$]. For depths < 89 mm (3 ½ in.), multiply F_b by 1.488.
- For thicknesses ≥ 32 mm (1 ¼ in.): multiply F_b by (305/depth in mm)$^{0.261}$ [(12/depth in in.)$^{0.261}$]. For depths < 89 mm (3 ½ in.), multiply F_b by 1.379.

2 The specified bending strength, F_b, is assigned for a standard depth of 305 mm (12 in.). For depths greater than 305 mm (12 in.), multiply Fb by (305/depth in mm)$^{0.143}$ [(12/depth in in.)$^{0.143}$]. For depths less than 305 mm (12 in.), multiply F_b by (305/depth in mm)$^{0.111}$ [(12/depth in in.)$^{0.111}$]. For depths less than 89 mm (3 ½ in.), multiply F_b by 1.147.

3 The specified tension strength, F_t, is assigned for a standard length of 6 096 mm (20 ft.). For lengths other than 6 096 mm (20 ft.), multiply F_t by (6 096/length in mm)$^{0.111}$ [(20/length in ft.)$^{0.111}$]. For lengths less than 914 mm (3 ft.), use the value adjusted for 914 mm (3 ft.).

4 Specified design stresses in Table 4.1.1 are for standard term load duration and must be adjusted (with the exception of modulus of elasticity) using load duration factors as per CSA O86.

5 Specified design stresses in Table 4.1.1 apply to product installation conditions that are dry, well-ventilated and covered. Dry conditions are product installation conditions where ambient moisture content is 15% or less.

6 All specified strengths are in accordance with CSA O86.

7 The modulus of elasticity for all except the $2650F_b$-1.9E and $2950F_b$-2.0E grades is shear-free, therefore, when calculating deflection, both bending and shear deformation must be included. The following equation may be used for a simple supported loading condition under a uniform load:

$$\Delta = \frac{5wL^4}{384EI} + \frac{2.4wL^2}{Ebd}$$

where:
Δ = deflection (mm)
w = specified uniform load (N/mm)
L = span (mm)
E = modulus of elasticity (shear-free) (MPa)
I = moment of inertia (mm^4)
b = beam width (mm)
d = beam depth (mm)

8 The modulus of elasticity for the $2650F_b$-1.9E and $2950F_b$-2.0E grades is the apparent MOE which includes the effects of shear deformation, therefore, when calculating the deflection, only the bending deformation has to be included. The second term of the equation in Note 7 may be ignored.

Table 4.1.2 Equivalent Specific Gravity for the Product Fastener Design[1,2]

Grade	Equivalent Specific Gravity					
	Nails				Bolts and Lag Screws Installed in Face [3]	
	Withdrawal Load		Lateral Load		Lateral Load	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Load Applied ∥ to Grain	Load Applied ⊥ to Grain
$1400F_b$-1.1E (cross-ply)	0.42	0.48	0.49	0.50	0.41	0.48
$1750F_b$-1.3E (cross-ply); $2250F_b$-1.5E & better	0.46	0.50	0.50	0.50	0.46	0.50

Notes to Table 4.1.2:

1 Fastener sizes and orientation not specifically described in Table 4.1.2 are beyond the scope of this Report. See Table A10.1 in CSA O86 for equivalent species based on relative density (specific gravity).

2 Fastener values based on the equivalent specific gravities in Table 4.1.2 are for standard term load duration and may be adjusted using load duration factors as per the NBC 2010.

3 The edge distance for bolts and lag screws when loaded parallel and perpendicular to the grain must be a minimum of four times the bolt diameter.

Table 4.1.3 Product Nail Spacing Requirements [1]

Thickness (mm (in.))	Orientation	Fastener [2]	Minimum End Distance (mm (in.))	Closest On-Centre Spacing (mm (in))	
				Single Row	Multiple Rows [6 7]
< 38 (< 1 ½)	Edge [3 4]	64 mm (8d 2 ½ in)	64 (2 ½)	102 (4)	N/A
		76 mm (10d 3 in) & 83 mm (12d 3 ¼ in)	64 (2 ½)	102 (4)	
		89 mm (16d 3 ½ in)	89 (3 ½)	127 (5)	
	Face [5]	64 mm (8d 2 ½ in)	38 (1 ½)	76 (3)	76 (3)
		76 mm (10d 3 in) & 83 mm (12d 3 ¼ in)	38 (1 ½)	76 (3)	76 (3)
		89 mm (16d 3 ½ in)	38 (1 ½)	127 (5)	127 (5)
≥ 38 (≥ 1 ½)	Edge [3 4]	64 mm (8d 2 ½ in)	64 (2 ½)	76 (3)	102 [8] (4 [8])
		76 mm (10d 3 in) & 83 mm (12d 3 ¼ in)	64 (2 ½)	102 (4)	127 [8] (5 [8])
		89 mm (16d 3 ½ in)	89 (3 ½)	127 (5)	152 [8 9] (6 [8 9])
	Face [5]	64 mm (8d 2 ½ in)	38 (1 ½)	76 (3)	76 (3)
		76 mm (10d 3 in) & 83 mm (12d 3 ¼ in)	38 (1 ½)	76 (3)	76 (3)
		89 mm (16d 3 ½ in)	38 (1 ½)	127 (5)	127 (5)

Notes to Table 4.1.3:

1 Fastener sizes and closest spacing not specifically described in this Table are beyond the scope of this Report.

2 Fasteners are common wire or common spiral nails.

3 Edge distance must be sufficient to prevent splitting, but not less than permitted in CSA O86.

4 Nail penetration for edge nailing must not exceed 51 mm (2 in.) for 89-mm (16d 3½ in.) nails and 64 mm (2½ in.) for 76-mm (10d 3 in.) and 83-mm (12d 3¼ in.) nails.

5 The tabulated closest on-centre spacing for face orientation is applicable to nails that are installed in rows that are parallel to the direction of the LVL grain (length). For nails that are installed in rows that are perpendicular to the direction of the LVL grain (width/depth), the closest on-centre spacing for face orientation must be as per CSA O86.

6 For multiple rows of nails, the rows must be offset 13 mm (½ in.) or more from each other, and staggered.

7 For multiple rows of nails, rows must be equally spaced from the centre line of the product's edge or face (whichever applies).

8 The minimum nail spacing is tabulated for LVL manufactured from the Sutherlin, Oregon, USA plant (mill number 1089). The minimum nail spacing may be reduced by 25 mm (1 in.) for LVL manufactured from the Golden, BC, and Wilmington, NC, USA plants (mill numbers 1077 and 1066).

9 Minimum nail spacing may be reduced by 25 mm (1 in.) for 44 mm (1 ¾ in.) thick (or greater) LVL manufactured from the Sutherlin, Oregon, USA plant (mill number 1089).

Table 4.1.4 Product Factored Resistances for Rim Board [1][2][3][6]

Minimum Thickness (mm (in.))	Grade	Depth (mm (in.))	Vertical Load		Horizontal Lateral Load Transfer Capacity [4] (kN/m (lbs/ft.))	Lateral Resistance of 13-mm (1/2-in) Lag Screw [5] (Installed in Face) (kN (lbs))
			Uniform (kN/m (lbs/ft.))	Concentrated Load (kN (lbs))		
32 (1 ¼)	1400F_b-1.1E (cross-ply)	≤ 406 (≤ 16)	195 (13 344)	31.2 (7 022)	4.76 (326)	3.34 (751)
		≤ 610 (≤ 24)	123 (8 457)	31.2 (7 022)	4.76 (326)	3.34 (751)
	1750F_b-1.3E (cross-ply)	≤ 406 (≤ 16)	204 (13 970)	31.2 (7 022)	4.76 (326)	3.34 (751)
		≤ 610 (≤ 24)	123 (8 457)	31.2 (7 022)	4.76 (326)	3.34 (751)
38 (1 ½)	2250Fb-1.5E and better	≤ 406 (≤ 16)	97 (6 650)	20.0 (4 500)	4.76 (326)	3.34 (751)
		≤ 610 (≤ 24)	60.6 (4 150)	20.0 (4 500)	4.76 (326)	3.34 (751)
44 (1 ¾)		≤ 406 (≤ 16)	108 (7 400)	23.8 (5 350)	4.76 (326)	3.34 (751)
		≤ 610 (≤ 24)	83.9 (5 750)	23.8 (5 350)	4.76 (326)	3.34 (751)

Notes to Table 4.1.4:

1 The factored resistances are for the rim board only when under standard term and dry service loading; therefore, adjustment is permitted for other load durations in accordance with CSA O86. The compressive resistance of the sill plate and the sheathing also needs to be checked in accordance with CSA O86.

2 The horizontal lateral load transfer resistance is for shear forces parallel to the rim joist under short-term loading and dry service conditions only. The fastening of the floor must meet or exceed Part 9 of Division B of the NBC 2010.

3 See Table 4.1.3 for minimum nail spacing requirements.

4 The nailing schedule for sheathing to rim is based on 51-mm (6d 2 in.) nails at 150 mm (6 in.) o.c., and for rim board to sill plate (toe-nailed) is based on 64-mm (8d 2 ½ in.) nails at 150 mm (6 in.) o.c. Values assume that floor joists or blocking are fastened to the rim board and sill plate at a maximum of 610 mm (24 in.) o.c. as per Part 9 of Division B of the NBC 2010. Commercial framing connectors may be used to achieve lateral load capacities exceeding the values in this table. Calculations must be based on the equivalent specific gravity listed in Table 4.1.2 and must not exceed the nail spacing requirements of Table 4.1.3.

5 Lag screw lateral resistance values are based on a 38-mm- (1 ½ in.) thick side member with full penetration of the lag screw.

6 For use with the limit states design procedures of the NBC 2010 and CSA O86.

Report Holder

Louisiana-Pacific Corporation
414 Union Street, Suite 2000
Nashville, TN 37219
U.S.A.

Telephone: 615-986-5600
Fax: 615-986-5666

Plant(s)

Wilmington, NC, U.S.A.
Golden, BC
Sutherlin, OR, U.S.A.

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Appendix A

The initial design values obtained from testing to ASTM D 5456-01, "Standard Specification for Evaluation of Structural Composite Lumber Products," as specified in CAN/CSA-O86-01, "Engineering Design in Wood," are summarized below. Confirmation from the third-party certification agency with respect to product compliance with ASTM D 5456-07 (as specified in CSA O86-09) was provided, namely in relation to the following aspects (i) durability, (ii) evaluating bond quality, (iii) duration of load and creep effects, and (iv) alternative horizontal shear-stress test procedures.

Table A1 Additional Test Information for "LP® SolidStart® LVL"[1]

Property	Test Information
Bending	Specimens were tested in edgewise and flatwise bending to establish the characteristic value. Qualification test data were used to establish the applicable coefficient of variation, CV_w, and the reliability normalization factor from CSA O86-09 was used to determine the specified strength.
Shear	Specimens were tested in shear (using block shear and then using structural-size horizontal shear-stress test procedures) to establish the characteristic value. Qualification test data were used to establish the applicable coefficient of variation, CV_w, and the reliability normalization factor from CSA O86-09 was used to determine the specified strength.
Compression parallel to grain	Specimens were tested in compression parallel to grain to establish the characteristic value. Qualification test data were used to establish the applicable coefficient of variation, CV_w, and the reliability normalization factor from CSA O86-09 was used to determine the specified strength.
Compression perpendicular to grain	Specimens were tested in compression perpendicular to grain to establish the characteristic value. The characteristic value was multiplied by 1.09 to establish the specified strength in accordance with CSA O86-09.
Tension parallel to grain	Specimens were tested in tension to establish the characteristic value. Qualification test data were used to establish the applicable coefficient of variation, CV_w, and the reliability normalization factor from CSA O86-09 was used to determine the specified strength.
Nail withdrawal	Nail withdrawal values were established following ASTM D 1761, "Standard Test Methods for Mechanical Fasteners in Wood," for a 6d common nail having a 31.75-mm (1¼ in.) penetration. Specimens were tested and equivalent species capacity was determined in accordance with Annex 2 of ASTM D 5456-07.
Nail bearing	Dowel bearing strength was determined in accordance with ASTM D 5764-95, "Standard Test Method for Evaluating Dowel-Bearing Strength of Wood and Wood-Based Products," with 10d common nails with a nominal diameter of 3.76 mm and a lead hole diameter of 2.77 mm. Specimens were tested and the mean bearing capacity was used to establish the equivalent species capacity as per Annex 2 of ASTM D 5456-07.
Bolt bearing	Bolt bearing capacity was determined in accordance with ASTM D 5764-95, with 13-mm (½ in.) and 19-mm (¾ in.) bolts. Specimens were tested and the mean bolt bearing capacity was used to establish the equivalent species capacity in accordance with Annex 2 of ASTM D 5456-07.
Creep	Twelve (12) specimens of the product were tested in accordance with the CCMC Creep and Recovery Test, resulting in acceptable performance. Long-term (90-day) creep testing was also conducted. It demonstrated equivalency to duration of load behaviour of sawn lumber. See Note 1d below for further information.
Bond Quality	Specimens were tested for shear strength in the L-X plane in accordance with ASTM D 143 and the percentage of wood failure was evaluated and reported in accordance with ASTM D 5456-07.
Edgewise Bending Durability	Specimens were tested for edgewise bending durability in accordance with Annex A4.3 of ASTM D 5456-07. The average strength retention was greater than or equal to 75%.
Adhesive	The adhesives used comply with CSA O112.6-M1977, "Phenol and Phenol-Resorcinol Resin Adhesives for Wood (High-Temperature Curing)." For the Golden plant, see CCMC 13192-L; for the Wilmington plant, see CCMC 13322-L; and for the Sutherlin plant, see CCMC 13019-L.

Note to Table Appendix A:

1 The differences between qualification in accordance with CAN/CSA O86-01 and CSA O86-09 (ASTM D 5456-01 and ASTM D5456-07) as they relate to the qualification of LVL products are summarized as follows:

a. Longitudinal Shear Qualification: Manufacturers may opt to conduct the structural-size horizontal shear tests in accordance with Annex 3 of ASTM D 5456-07 rather than the shear block tests in accordance with ASTM D 143 (with modifications). The structural-size horizontal shear tests are expected to result in higher shear values.

b. Bond Quality: This is a new requirement in ASTM D 5456-07 (compared to ASTM D 5456-01). Manufacturers are required to conduct tests on a minimum 50 samples in accordance with ASTM D 1037 for PSL, LSL and OSL. For LVL, the method used for longitudinal shear must be used in the L-X plane and the percentage of wood failure reported.

c. Edgewise Bending Durability: This is a new requirement in ASTM D 5456-07 (compared to ASTM D 5456-01). Manufacturers are required to conduct tests in accordance with Annex A4.3 of ASTM D 5456-07 and the average strength retention has to be more than 75%.

d. Duration of Load/Creep Effects: Manufacturers are required to conduct a test in accordance with ASTM D 6815. The CCMC Creep and Recovery test that was used in the CCMC Technical Guide applicable at the time of the initial evaluation included this test method, and therefore, this requirement remains unchanged. As a further note, the CCMC Technical Guide requires LSL and OSL products to undergo the creep test in accordance with ASTM D 6815 after a 14-day soak, which remains unchanged.

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