

<p align="center">DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Housing - Federal Housing Commissioner</p> <p>TO: DIRECTORS, SINGLE FAMILY HOCs DIRECTORS, MULTIFAMILY HUBs</p>	<p>Series and Series Number: MATERIALS RELEASE NO: 1241c (Supersedes issue dated January 16, 1997)</p>
	<p>ISSUE DATE April 17, 2019</p>
	<p>REVIEW DATE April 17, 2022</p>
<p>SUBJECT: 1. Product VERSA-LAM® LVL</p> <p>2. Name and address of Manufacturer Boise Cascade Wood Products, LLC P. O. Box 2400 White City, OR 97503-0400</p>	

Data on the nonstandard product described herein have been reviewed by the Department of Housing and Urban Development (HUD) and determination has been made that it is considered suitable from a technical standpoint for the use indicated herein. This Release does not purport to establish a comparative quality or value rating for this product as compared to standard products normally used in the same manner.

This Materials Release cannot be used as an indication of endorsement or approval by HUD of the described product, and any statement or representation, however made, indicating such approval or endorsement by HUD is unauthorized. See Code 18, U.S.C. 709.

Any reproduction of this Release must be in its entirety.

USE: **VERSA-LAM® LVL** is used as structural framing lumber in beams, headers, joists, rafters, wall studs, and rim joists.

DESCRIPTION:

VERSA-LAM® is laminated veneer lumber (LVL). **VERSA-LAM®** laminated veneer lumber has vertical glue lines with wood fibers primarily oriented parallel to the length of the member. Allowed adhesives are identified in the Quality Control Manual for each manufacturing facility.

Veneer used in **VERSA-LAM® LVL** is peeled from logs of approved species into 1/6-1/10 inch thicknesses. Veneer sheets are assembled into panels or billets with all grain parallel, are laid up into various thicknesses in a single-opening, multi-opening or continuous press using a phenol-formaldehyde adhesive which complies with ASTM D 2559 and ASTM D7247. Finished **VERSA-LAM® LVL** sizes are available in structural cross sections from thicknesses of 1 inch to 7 inches, depths up to 48 inches, and lengths up to 66 feet.

VERSA-LAM® LVL is also sold under the proprietary name of **VERSA-STUD®** with dimensions matching common lumber sizes

REQUIREMENTS:

General:

VERSA-LAM® LVL shall be manufactured to meet the requirements of the Manufacturing Standards/Quality Control Manual for Laminated Veneer Lumber on file with HUD. The quality control test records shall be made available to HUD upon request.

Veneer:

Veneer shall be of an approved species and thickness meeting grading requirements described in the facility quality manual.

Adhesive:

The adhesive shall meet the requirements of ASTM D2559 Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions, and ASTM D7247 Standard Test Method for Evaluating the Shear Strength of Adhesive Bonds in Laminated Wood Products at Elevated Temperatures. The adhesive bond shall meet the requirements of PS 1-09 for Exposure 1.

Design:

The customary design practices for structural composite lumber are applicable to VERSA-LAM® LVL. Design shall be in accordance with the National Design Specification for Wood Construction {ANSI/AWC NDS} unless modified by this Materials Release (MR). The allowable design properties shall be in accordance with:

- TABLE 1 – DESIGN VALUES
- TABLE 2 – VERSA-LAM® LVL RIM BOARD DESIGN CAPACITIES
- TABLE 3 – ALLOWABLE NAIL SPACING FOR VERSA-LAM® LVL
- TABLE 4 – EQUIVALENT SPECIFIC GRAVITIES FOR CONNECTOR DESIGN

TABLE 1 – DESIGN VALUES (psi)^{1,2}

PRODUCT GRADE	MODULUS OF ELASTICITY ⁵ E (×10 ⁶ psi)	FLEXURAL STRESS, F _b		TENSION PARALLEL TO GRAIN ⁴ , F _t	COMP. PARALLEL TO GRAIN, F _c	COMPRESSION PERPENDICULAR TO GRAIN, F _{c⊥}		HORIZONTAL SHEAR, F _v	
		Joist ³	Plank			Perp. to Narrow Face (Plank)	Parallel to Narrow Face (Joist)	Parallel to Narrow Face (Plank)	Perp. to Narrow Face (Joist)
1.3 1600 ⁶	1.3	1600	1600	1100	2500	450	525	150	225
1.3 1750 ⁶	1.3	1750	1600	1100	2500	450	525	150	225
1.4 1800/1100	1.4	1800	1800	1100	2500	450	525	150	225
1.4 1950/1100	1.4	1950	1800	1100	2500	450	525	150	225
1.4 1800 ⁶	1.4	1800	1800	1250	2500	450	525	150	225
1.4 1950 ⁶	1.4	1950	1800	1250	2500	450	525	150	225
1.5 2050/1250	1.5	2050	2050	1250	2500	450	525	150	225
1.5 2250/1250	1.5	2250	2050	1250	2500	450	525	150	225
1.5 2050 ⁶	1.5	2050	2050	1400	2500	450	525	150	225
1.5 2250 ⁶	1.5	2250	2050	1400	2500	450	525	150	225
1.6 2250/1400	1.6	2250	2250	1400	2500	450	525	150	225
1.6 2450/1400	1.6	2450	2250	1400	2500	450	525	150	225
1.6 2250 ⁶	1.6	2250	2250	1500	2500	450	525	150	225
1.6 2450 ⁶	1.6	2450	2250	1500	2500	450	525	150	225
1.7 2400/1500	1.7	2400	2400	1500	3000	450	750	190	285
1.7 2650/1500	1.7	2650	2400	1500	3000	450	750	190	285
1.7 2400 ⁶	1.7	2400	2400	1650	3000	450	750	190	285
1.7 2650 ⁶	1.7	2650	2400	1650	3000	450	750	190	285
1.8 2500/1650	1.8	2500	2500	1650	3000	450	750	190	285
1.8 2750/1650	1.8	2750	2500	1650	3000	450	750	190	285
1.8 2500 ⁶	1.8	2500	2500	1825	3000	450	750	190	285
1.8 2750 ⁶	1.8	2750	2500	1825	3000	450	750	190	285
1.9 2600/1825	1.9	2600	2600	1825	3000	450	750	190	285
1.9 2850/1825	1.9	2850	2600	1825	3000	450	750	190	285
1.9 2600 ⁶	1.9	2600	2600	1950	3000	450	750	190	285
1.9 2850 ⁶	1.9	2850	2600	1950	3000	450	750	190	285
2.0 2800/1950	2.0	2800	2800	1950	3000	450	750	190	285
2.0 3100/1950	2.0	3100	2800	1950	3000	450	750	190	285
2.0 2800 ⁶	2.0	2800	2800	2150	3000	450	750	190	285
2.0 3100 ⁶	2.0	3100	2800	2150	3000	450	750	190	285
2.1 2900/2150	2.1	2900	2900	2150	3000	450	750	190	285
2.1 3200/2150	2.1	3200	2900	2150	3000	450	750	190	285
2.1 2900 ⁶	2.1	2900	2900	2250	3000	450	750	190	285
2.1 3200 ⁶	2.1	3200	2900	2250	3000	450	750	190	285
2.2 3100/2250	2.2	3100	3100	2250	3000	450	750	190	285
2.2 3400/2250	2.2	3400	3100	2250	3000	450	750	190	285
2.2 3100 ⁶	2.2	3100	3100	2425	3000	450	750	190	285
2.2 3400 ⁶	2.2	3400	3100	2425	3000	450	750	190	285

For SI: 1 psi=0.00689 MPa.

¹Reference design values are based on dry conditions of use where the in-service moisture content of the LVL is less than 16 percent.

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

³The tabulated reference flexural stress, F_b, is for LVL with a 12-inch depth. For other depths, multiply by the size factor C_t=(12/d)^{1/9}, where d is the member depth in inches.

⁴The tabulated reference tension stress, F_t, is for LVL with a 4-foot length. For longer lengths, multiply by the length factor C_L=(4/L)^{1/8}, where L is the member length in feet.

⁵The reference modulus of elasticity for beam stability and column stability calculations, E_{min}, must be calculated in accordance with Appendix D of the NDS. When calculating E_{min}, the coefficient of variation of modulus of elasticity, COV_E, may be taken as 0.10.

⁶Product may also be labeled according to both F_b and F_t. Example: 2.0 2800 is equivalent to 2.0 2800/2150.

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

$$D = \frac{270WL^4}{Ebd^3}$$

where:

D	=	Deflection (inches)
W	=	Uniform load (plf)
L	=	Span (feet)
E	=	Modulus of elasticity (psi)
b	=	Beam width (inches)
d	=	Beam depth (inches)

TABLE 2—VERSA-LAM® LVL RIM BOARD DESIGN CAPACITIES

MODULUS OF ELASTICITY, E (x10 ⁶ psi)	MINIMUM THICKNESS (inches)	ALLOWABLE VERTICAL LOAD ¹				LATERAL CAPACITY ^{5,6,7} (lb/ft)	CONTAINS CROSS-PLY VENEER
		Distributed Load (lb/ft)		Concentrated Load (3½ in. Min. Width) (lb)			
		d ² ≤ 16	16 < d ² ≤ 20	d ² ≤ 16	16 < d ² ≤ 20		
1.3 - 1.6	1	2000	N/A	N/A	N/A	190	No
	1 ¹ / ₁₆	2000	N/A	N/A	N/A	205	No
	1 ¹ / ₈	2000	N/A	N/A	N/A	220	No
	1 ³ / ₁₆	2000	N/A	N/A	N/A	230	No
	1 ¹ / ₄	3250	3250	2250	2250	See Note 3	No
	1 ⁵ / ₁₆	6000	5450	4450	4450	See Note 3	Yes
	1 ¹ / ₂	6480	5600 ⁸	4600	4450 ⁸	See Note 3	Yes
1.7 - 2.2	2 ¹ / ₄	3250	3250	2250	2250	See Note 4	No
	1	4250	3700	3700	3500	190	No
	1 ¹ / ₁₆	4250	3700	3700	3500	205	No
	1 ¹ / ₈	4250	3700	3700	3500	220	No
	1 ³ / ₁₆	4250	3700	3700	3500	230	No
2.0 - 2.2	1 ¹ / ₄	4250	3700	3700	3500	See Note 3	No
	1 ¹ / ₂	5450	4300	4300	3900	See Note 3	No
	1 ³ / ₄	5700	4300	4300	3900	See Note 3	No
	2 ¹ / ₄	5700	4300	4300	3900	See Note 4	No

For SI: 1 inch = 25.4 mm, 1 lb = 4.4 N, 1 lb/ft = 47.8 Pa.

¹Allowable loads given in this table are not permitted to be increased by the load duration factor, C_D.

²d = member depth (inches).

³The lateral capacity (in-plane shear) is as permitted in the applicable code for solid-sawn lumber framing in horizontal wood diaphragms with nominally 2-inch-thick framing.

⁴The lateral capacity (in-plane shear) is as permitted in the applicable code for solid-sawn lumber framing in horizontal wood diaphragms with nominally 3-inch-thick framing.

⁵VERSA-LAM® used as rim joist may be substituted for solid-sawn framing in horizontal wood diaphragms as shown in Tables 4.2A, 4.2B and 4.2C of the 2015 ANSI/AWC SDPWS, Table 2306.2.1(1) of the 2009 IBC and Table 2306.3.1 of the 2006 IBC (maximum horizontal shear values must be limited as noted).

⁶Toe-nailed connections are not limited by the 150 plf lateral load capacity noted for Seismic Design Categories D, E, and F in Section 4.1.7 of the 2015 ANSI/AWC SDPWS and Section 2305.1.4 of the 2006 IBC.

⁷See Table 3 for minimum nail spacing requirements.

⁸The applicable depth range is between 16 inches and 24 inches for the indicated values corresponding to 1½ inch-thick product with cross-ply veneers.

TABLE 3—ALLOWABLE NAIL SPACING FOR VERSA-LAM® LVL (inches)¹

CONNECTOR SIZE	NAILS PARALLEL TO THE GLUE LINE										NAILS PERP. TO THE GLUE LINE	
	Minimum Thickness 1 inch		Minimum Thickness 1¼ inches		Minimum Thickness 1½ inches		Minimum Thickness 1¾ inches		Minimum Thickness 3½ inches		All Thicknesses ²	
	o.c.	End ³	o.c.	End ³	o.c.	End ³	o.c.	End ³	o.c.	End ³	o.c.	End ³
8d box	3	1½	3	1½	3	1½	2	1	2	½	2	½
8d common	4	3	3	2	3	2	3	2	2	1	2	1
10d & 12d box	4	3	3	2	3	2	3	2	2	1	2	1
16d box	4	3	3	2	3	2	3	2	2	1	2	1
10d & 12d common	6	4	4	3	4	3	4	3	2	2	2	2
16d sinker	6	4	4	3	4	3	4	3	2	2	2	2
16d common	6	4	6	4	6	4	6	3	2	2	2	2

For SI: 1 inch = 25.4 mm.

¹ Edge distances must be sufficient to prevent splitting.

²For multiple rows of fasteners, the rows must be offset ½ inch or more from each other, equally spaced from the centerline of the VERSA-LAM® LVL member and staggered.

³“End” refers to the minimum distance between the nail and the end(s) of the piece(s) being connected.

TABLE 4—EQUIVALENT SPECIFIC GRAVITIES FOR CONNECTOR DESIGN

PRODUCT	MODULUS OF ELASTICITY, E (x10 ⁶ psi) ¹	NAILS					
		Lateral Installed into Wide Face		Lateral Installed into Narrow Face		Withdrawal	
		Loaded Parallel to Length	Loaded Perpendicular to Length	Loaded Parallel to Length	Loaded Perpendicular to Length	Installed into Wide Face	Installed into Narrow Face
VERSA-LAM [®]	1.3 – 2.2	0.50	0.50	0.50	0.50	0.50	0.50

PRODUCT	MODULUS OF ELASTICITY, E (x10 ⁶ psi) ¹	BOLTS			
		Lateral Installed into Wide face		Lateral Installed into Narrow Face	
		Loaded Parallel to Length	Loaded Perpendicular to Length	Loaded Parallel to Length	Loaded Perpendicular to Length
VERSA-LAM [®]	1.3 – 2.2	0.50	0.50	0.50	0.50

INSTALLATION:

Installation shall be in accordance with the HUD Minimum Property Standards (MPS) and the requirements of the applicable local code for wood construction with the following modifications:

QUALITY ASSURANCE AND CERTIFICATION:

Boise Cascade Wood Products, LLC shall certify that VERSA-LAM[®] conforms to the requirements of this MR. APA – The Engineered Wood Association (IAS Accreditation Number AA-649) shall validate the manufacturer's certification that VERSA-LAM[®] meets the requirements of this MR.

Each piece of VERSA-LAM[®] certified as conforming to this MR shall be marked with the following information:

1. Boise Cascade
2. Product designation
3. The registered APA Validation Mark
4. MR 1241*
5. Date of manufacture
6. Identification of the manufacturing plant

*HUD MR 1241 may be used instead of HUD MR 1241c if the products are date stamped.

SAMPLE STAMP

BOISE CASCADE®	VERSA-LAM®	2.0 3100/1950	ICC ES ESR 1040	Prod. Date
			CCMC 12472-R	00/00/00 00:00
			HUD MR-1241	White City, OR
				APA

WARRANTY:

Boise Cascade warrants its VERSA-LAM® products to comply with our specifications, to be free from defects in material and workmanship, and to meet or exceed our performance specifications for the normal and expected life of the structure when correctly stored, installed and used according to our Installation Guide.

The manufacturer's warranty does not relieve the builder, in any way, of responsibility under the terms of the Builder's Warranty required by the National Housing Act, or under any provisions applicable to any other housing program. A copy of the manufacturer's warranty shall be furnished by the builder to the owner.

MANUFACTURER'S RESPONSIBILITIES:

Issuance of this Materials Release (MR) commits the manufacturer to fulfill, as a minimum, the following:

1. Produce, label and certify the material, product or system in strict accordance with the terms of this MR.
2. Provide necessary corrective action in a timely manner for all cases of justified complaint, poor performance or failure reported by HUD.
3. When requested, provide the Office of Manufactured Housing Programs, HUD Headquarters, with a representative list of properties in which the material, product or system has been used, including complete addresses or descriptions of locations, and dates of installation.
4. Inform HUD in advance of changes in production facilities, methods, design of the product, company name, ownership or mailing address.
5. If between the annual reviews of the QCM, significant changes are made to the product which would by definition revise the previously recognized facts, HUD will be informed within 30 days of formal implantations of these significant changes.

EVALUATION:

This Materials Release shall be valid for a period of three years from the date of initial issuance or most recent renewal or revision, whichever is later. The holder of this Materials Release shall apply for renewal or revision 90 days prior to the Review Date printed on this Materials Release. Submittals for renewal or revision shall be sent to:

U.S. Department of Housing and Urban Development
Office of Manufactured Housing Programs
451 Seventh Street, SW, Room 9170
Washington, DC 20410-8000

Appropriate user fee(s) for the TSP program can be submitted through the Pay.gov website at <https://pay.gov/public/form/start/73881741>.

The holder of this Materials Release may apply for revision at any time prior to the Review Date. Minor revisions may be in the form of a supplement to the Materials Release.

If the Department determines that a proposed renewal or supplement constitutes a revision, the appropriate user fee for a revision will need to be submitted in accordance with 24 CFR § 200.934 User fee system for the technical suitability of products program, and the current user fee schedule.

CANCELLATION:

Failure to apply for a renewal or revision shall constitute a basis for cancellation of the Materials Release. HUD will notify the manufacturer that the Materials Release may be canceled when:

1. Conditions under which the document was issued have changed so as to affect production of, or to compromise the integrity of the accepted material, product, or system;
2. The manufacturer has changed its organizational form without notifying HUD; or,
3. The manufacturer has not complied with responsibilities it assumed as a condition of HUD' s acceptance.

However, before cancellation, HUD will give the manufacturer a written notice, of the specific reasons for cancellation, and the opportunity to present views on why the Materials Release should not be canceled. No refund of fees will be made on a canceled document.

This Materials Release is issued solely for the captioned firm and is not transferable to any person or successor entity.
