

Shelton Structural Glued Laminated Timber **PR-L321**
Shelton Structures Inc. dba Revised March 9, 2024
Shelton Lam and Deck

Products: Shelton Glulam Columns
Shelton Structures Inc. dba Shelton Lam and Deck, 192 Downie Road, Chehalis, WA 98532
(360) 740-1008

1. Basis of the product report:
 - 2021, 2018, 2015, and 2012 International Building Code (IBC): Sections 104.11 Alternative materials and 2303.1.3 Structural glued laminated timber
 - 2021, 2018, and 2015 International Residential Code (IRC): Sections R104.11 Alternative materials, and R502.1.3, R602.1.3, and R802.1.2 Structural glued laminated timber
 - 2012 IRC: Sections R104.11 Alternative materials, and R502.1.5, R602.1.2, and R802.1.4 Structural glued laminated timber
 - ANSI 117-2020 and ANSI 117-2015 recognized in the 2021 IBC and IRC, and 2018 IBC and IRC, respectively
 - ANSI A190.1-2017, ANSI A190.1-2012, and ANSI/AITC A190.1-2007 recognized in the 2021 and 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
 - ASTM D3737-18e1, D3737-12 and D3737-08 recognized in the 2021 IBC and IRC, 2018 and 2015 IBC and IRC, and 2012 IBC and IRC, respectively
 - ANSI A190.1-2017, ANSI A190.1-2012, and ANSI/AITC A190.1-2007 recognized in the 2021 and 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
2. Product description:

Shelton glulam columns are manufactured in accordance with ANSI A190.1 using Combination 22 layup recognized in the ANSI 117 *Standard Specification for Structural Glued Laminated Timber of Softwood Species* and *National Design Specification (NDS) Supplement*. It is manufactured in nominal widths of 3-5/16 to 7-1/16 inches, depths ranging from 3-5/16 to 7-1/16 inches, and lengths up to 16 feet.
3. Design properties:

Table 1 lists the allowable design properties for Shelton glulam columns of a solid, rectangular or square cross section.
4. Product installation:

Shelton glulam columns shall be installed in accordance with the recommendations provided by the manufacturer and APA Construction Guide: *Glulam Connection Details*, Form T300 (www.apawood.org/resource-library).
5. Fire-rated assemblies:

Design of fire-resistant exposed wood members in accordance with Chapter 16 of the *National Design Specification for Wood Construction (NDS)*, Section 722.1 of the 2021, 2018, and 2015 IBC, or Section 722.6.3 of the 2012 IBC shall be applicable to Shelton glulam columns. Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer and APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (see link above).
6. Limitations:
 - a) Shelton glulam columns shall be designed in accordance with the code using the design properties specified in this report.

- b) Shelton glulam columns shall have a minimum depth of 3-5/16 inches and a maximum depth of 7-1/16 inches.
- c) Shelton glulam columns are produced at Shelton Structures Inc. dba Shelton Lam and Deck, Chehalis, WA facilities under a quality assurance program audited by APA.
- d) This report is subject to re-examination in one year.

7. Identification:

Shelton glulam columns described in this report are identified by a label bearing the manufacturer's name (Shelton Lam & Deck) and/or trademark, the APA assigned plant number (1049), the product standard (ANSI A190.1), the APA logo, the combination symbol, the report number PR-L321, and a means of identifying the date of manufacture.

Table 1. Allowable Design Values for Shelton Glulam Columns for Normal Duration of Load^(1,2)

Combination Symbol	Species ⁽²⁾	Grade	All Loading				Axially Loaded			Bending about Y-Y Axis				Bending about X-X Axis		Fasteners Specific Gravity for Dowel-Type Fastener Design
			Modulus of Elasticity ⁽³⁾			Compression Perpendicular to Grain	Tension Parallel to Grain	Compression Parallel to Grain		Loaded Parallel to Wide Faces of Laminations			Loaded Perpendicular to Wide Faces of Laminations			
			$E_{x \text{ true}}, E_{y \text{ true}}$ or E_{axial} (10 ⁶ psi)	$E_{x \text{ app}}$ or $E_{y \text{ app}}$ (10 ⁶ psi)	$E_{x \text{ min}}, E_{y \text{ min}}$ or $E_{\text{axial min}}$ (10 ⁶ psi)		2 or More Lams	4 or More Lams	2 or 3 Lams	Bending			Shear Parallel to Grain ^(4,5)	Bending ^(6,7)	Shear Parallel to Grain ⁽⁴⁾	
						$F_{c\perp}$ (psi)	F_t (psi)	F_c (psi)	F_c (psi)	4 or More Lams	3 Lams	2 Lams		F_{vy} (psi)		
			$F_{c\perp}$ (psi)	F_t (psi)	F_c (psi)	F_c (psi)	F_{by} (psi)	F_{by} (psi)	F_{by} (psi)	F_{vy} (psi)	F_{bx} (psi)	F_{vx} (psi)	SG			
22	SW ⁽⁶⁾	L3	1.1	1.0	0.53	315	525	850	725	800	700	575	170	725	195	0.35
Wet-use factors			0.833			0.53	0.8	0.73		0.8			0.875	0.8	0.875	see NDS

- ⁽¹⁾ The tabulated allowable design values are applicable only to columns made with a solid, rectangular or square cross section and are for normal duration of loading. For other durations of loading, see applicable building code. The tabulated design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the factors shown at the bottom of the table.
- ⁽²⁾ SW = Softwood species.
- ⁽³⁾ The tabulated E values include shear-free (true) modulus of elasticity ($E_{x \text{ true}}, E_{y \text{ true}},$ and E_{axial}), apparent modulus of elasticity ($E_{x \text{ app}}$ and $E_{y \text{ app}}$), and 5th percentile modulus of elasticity ($E_{x \text{ min}}, E_{y \text{ min}},$ and $E_{\text{axial min}}$). For column stability calculation (NDS 3.7.1), $E_{\text{axial min}}$ shall be used. For calculating column deflections due to lateral loads (used as a beam), the tabulated $E_{x \text{ app}}$ or $E_{y \text{ app}}$ values shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated $E_{x \text{ true}}$ or $E_{y \text{ true}}$.
- ⁽⁴⁾ For non-prismatic members, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3), the tabulated F_{vx} and F_{vy} values shall be multiplied by 0.72.
- ⁽⁵⁾ The tabulated F_{vy} values are for members of 4 or more lams. The tabulated F_{vy} values shall be multiplied by a factor of 0.95 for 3 lams and 0.84 for 2 lams.
- ⁽⁶⁾ The values of F_{bx} are based on members 5-1/8 inches in width by 12 inches in depth by 21 feet in length. For members with a larger volume, F_{bx} shall be multiplied by a volume factor, $C_v = (5.125/b)^{1/10} (12/d)^{1/10} (21/L)^{1/10}$, where b is the beam width (in.), d is the beam depth (in.), and L is the beam length between the points of zero moment (ft).
- ⁽⁷⁾ When the member depth is greater than 15 inches, the tabulated F_{vx} values shall be multiplied by a factor of 0.88.
- ⁽⁸⁾ When Western Cedars, Western Cedars (North), Western Woods, and Redwood (open grain) are used in combinations for Softwood Species (SW), the design value for modulus of elasticity shall be reduced by 100,000 psi. When Coast Sitka Spruce, Coast Species, Western White Pine, and Eastern White Pine are used in combinations for Softwood Species (SW), tabulated design values for shear parallel to grain, F_{vx} and F_{vy} , shall be reduced by 10 psi, before applying any other adjustments.

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HEADQUARTERS**

7011 So. 19th St. ▪ Tacoma, Washington 98466
Phone: (253) 565-6600 ▪ Fax: (253) 565-7265 ▪ Internet Address: www.apawood.org

PRODUCT SUPPORT HELP DESK
(253) 620-7400 ▪ *E-mail Address:* help@apawood.org

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