

BEAM CONVERSIONS TO WESTERN SPECIES GLULAM

Glued Laminated Timber Design Values

Steel Design Values (AISC, 9th edition, ASD)

Simple Span Beam

Dry Service Conditions

$F_{bx} = 2400$  psi

$F_y = 36$  ksi

$E_x = 1,800,000$  psi

$F_b = 0.66 * F_y$

$E = 29,000$  ksi

Glulam Beam Dimensions Are in Inches

Steel Section	Glulam Sizes to Substitute for Use in Floor Systems $C_D = 1.0$				Glulam Sizes to Substitute for Use in Roof Systems with Snow Loads $C_D = 1.15$				Glulam Sizes to Substitute for Use in Roof Systems with Non-Snow Loads $C_D = 1.25$			
	W 6 x 9	3 1/8 x 10 1/2	5 1/8 x 9	6 3/4 x 9	3 1/8 x 10 1/2	5 1/8 x 9	6 3/4 x 9	3 1/8 x 10 1/2	5 1/8 x 9	6 3/4 x 9	3 1/8 x 10 1/2	5 1/8 x 9
W 8 x 10	3 1/8 x 13 1/2	5 1/8 x 12	6 3/4 x 10 1/2	3 1/8 x 13 1/2	5 1/8 x 12	6 3/4 x 10 1/2	3 1/8 x 13 1/2	5 1/8 x 12	6 3/4 x 10 1/2	3 1/8 x 13 1/2	5 1/8 x 12	6 3/4 x 10 1/2
W 8 x 15	3 1/8 x 15	5 1/8 x 13 1/2	6 3/4 x 12	3 1/8 x 15	5 1/8 x 13 1/2	6 3/4 x 12	3 1/8 x 15	5 1/8 x 13 1/2	6 3/4 x 12	3 1/8 x 15	5 1/8 x 13 1/2	6 3/4 x 12
W 12 x 14	3 1/8 x 18	5 1/8 x 15	6 3/4 x 15	3 1/8 x 18	5 1/8 x 15	6 3/4 x 15	3 1/8 x 18	5 1/8 x 15	6 3/4 x 15	3 1/8 x 18	5 1/8 x 15	6 3/4 x 15
W 12 x 16	3 1/8 x 19 1/2	5 1/8 x 16 1/2	6 3/4 x 15	3 1/8 x 19 1/2	5 1/8 x 16 1/2	6 3/4 x 15	3 1/8 x 19 1/2	5 1/8 x 16 1/2	6 3/4 x 15	3 1/8 x 19 1/2	5 1/8 x 16 1/2	6 3/4 x 15
W 12 x 19	3 1/8 x 21	5 1/8 x 18	6 3/4 x 16 1/2	3 1/8 x 21	5 1/8 x 18	6 3/4 x 16 1/2	3 1/8 x 21	5 1/8 x 18	6 3/4 x 16 1/2	3 1/8 x 21	5 1/8 x 18	6 3/4 x 16 1/2
W 10 x 22	3 1/8 x 22 1/2	5 1/8 x 18	6 3/4 x 16 1/2	3 1/8 x 21	5 1/8 x 16 1/2	6 3/4 x 16 1/2	3 1/8 x 19 1/2	5 1/8 x 16 1/2	6 3/4 x 16 1/2	3 1/8 x 19 1/2	5 1/8 x 16 1/2	6 3/4 x 16 1/2
W 12 x 22	3 1/8 x 24	5 1/8 x 19 1/2	6 3/4 x 16 1/2	3 1/8 x 22 1/2	5 1/8 x 19 1/2	6 3/4 x 16 1/2	3 1/8 x 22 1/2	5 1/8 x 19 1/2	6 3/4 x 16 1/2	3 1/8 x 22 1/2	5 1/8 x 19 1/2	6 3/4 x 16 1/2
W 14 x 22	-- x --	5 1/8 x 21	6 3/4 x 18	3 1/8 x 24	5 1/8 x 21	6 3/4 x 18	3 1/8 x 24	5 1/8 x 21	6 3/4 x 18	3 1/8 x 24	5 1/8 x 21	6 3/4 x 18
W 12 x 26	-- x --	5 1/8 x 21	6 3/4 x 19 1/2	-- x --	5 1/8 x 21	6 3/4 x 19 1/2	3 1/8 x 24	5 1/8 x 21	6 3/4 x 19 1/2	3 1/8 x 24	5 1/8 x 21	6 3/4 x 19 1/2
W 14 x 26	-- x --	5 1/8 x 22 1/2	6 3/4 x 19 1/2	-- x --	5 1/8 x 21	6 3/4 x 19 1/2	-- x --	5 1/8 x 21	6 3/4 x 19 1/2	-- x --	5 1/8 x 21	6 3/4 x 19 1/2
W 16 x 26	-- x --	5 1/8 x 22 1/2	6 3/4 x 21	-- x --	5 1/8 x 22 1/2	6 3/4 x 21	-- x --	5 1/8 x 22 1/2	6 3/4 x 21	-- x --	5 1/8 x 22 1/2	6 3/4 x 21
W 12 x 30	-- x --	5 1/8 x 24	6 3/4 x 21	-- x --	5 1/8 x 21	6 3/4 x 19 1/2	-- x --	5 1/8 x 21	6 3/4 x 19 1/2	-- x --	5 1/8 x 21	6 3/4 x 19 1/2
W 14 x 30	-- x --	5 1/8 x 24	6 3/4 x 21	-- x --	5 1/8 x 22 1/2	6 3/4 x 21	-- x --	5 1/8 x 22 1/2	6 3/4 x 21	-- x --	5 1/8 x 22 1/2	6 3/4 x 21
W 16 x 31	-- x --	5 1/8 x 25 1/2	6 3/4 x 22 1/2	-- x --	5 1/8 x 25 1/2	6 3/4 x 22 1/2	-- x --	5 1/8 x 25 1/2	6 3/4 x 22 1/2	-- x --	5 1/8 x 25 1/2	6 3/4 x 22 1/2
W 14 x 34	-- x --	5 1/8 x 27	6 3/4 x 22 1/2	-- x --	5 1/8 x 24	6 3/4 x 22 1/2	-- x --	5 1/8 x 24	6 3/4 x 22 1/2	-- x --	5 1/8 x 24	6 3/4 x 22 1/2
W 18 x 35	-- x --	5 1/8 x 28 1/2	6 3/4 x 25 1/2	-- x --	5 1/8 x 27	6 3/4 x 25 1/2	-- x --	5 1/8 x 27	6 3/4 x 25 1/2	-- x --	5 1/8 x 27	6 3/4 x 25 1/2
W 16 x 40	-- x --	5 1/8 x 31 1/2	6 3/4 x 27	-- x --	5 1/8 x 28 1/2	6 3/4 x 25 1/2	-- x --	5 1/8 x 27	6 3/4 x 25 1/2	-- x --	5 1/8 x 27	6 3/4 x 25 1/2
W 21 x 44	-- x --	5 1/8 x 34 1/2	6 3/4 x 30	-- x --	5 1/8 x 33	6 3/4 x 30	-- x --	5 1/8 x 33	6 3/4 x 30	-- x --	5 1/8 x 33	6 3/4 x 30
W 18 x 50	-- x --	5 1/8 x 36	6 3/4 x 31 1/2	-- x --	5 1/8 x 34 1/2	6 3/4 x 30	-- x --	5 1/8 x 33	6 3/4 x 28 1/2	-- x --	5 1/8 x 33	6 3/4 x 28 1/2
W 21 x 50	-- x --	5 1/8 x 37 1/2	6 3/4 x 33	-- x --	5 1/8 x 34 1/2	6 3/4 x 31 1/2	-- x --	5 1/8 x 34 1/2	6 3/4 x 31 1/2	-- x --	5 1/8 x 34 1/2	6 3/4 x 31 1/2
W 18 x 55	-- x --	5 1/8 x 39	6 3/4 x 33	-- x --	5 1/8 x 36	6 3/4 x 31 1/2	-- x --	5 1/8 x 34 1/2	6 3/4 x 30	-- x --	5 1/8 x 34 1/2	6 3/4 x 30
W 21 x 62	-- x --	-- x --	6 3/4 x 39	-- x --	5 1/8 x 40 1/2	6 3/4 x 36	-- x --	5 1/8 x 39	6 3/4 x 34 1/2	-- x --	5 1/8 x 39	6 3/4 x 34 1/2

Table Specifications:

These sizes are for dry service condition of use.

Reverse use of this table to convert from glued laminated timber sizes to steel sections is non-conservative in all cases and is **NOT PERMITTED**.

Smaller glued laminated timber sizes may be possible with engineering calculations based on actual span and loading conditions.

Glued laminated timber beam sizes are based on a span to depth (L/d) ratio of 21. When the span to depth ratio is larger, sizes should be determined by engineering calculations.

To determine glued laminated timber beam sizes,  $F_{bx}$  was adjusted by the volume factor. It is assumed that all beams are adequately braced for lateral stability.

Tabulated beam sizes have been checked for adequacy in flexure and deflection. **It is the responsibility of the designer to check for adequacy in shear.**

A minimum glued laminated timber depth of 6 inches is used in this table. Standard glued laminated timber sizes are used in this table.

While these design conversions have been prepared in accordance with recognized engineering principles and are based on accurate technical data,

conversions should not be used without competent examination and verification of the accuracy, suitability, and applicability by a qualified design professional.

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