## SOUTHERN PINE LUMBER AND TIMBER
## BEAM CONVERSIONS TO SOUTHERN PINE GLULAM

# American Institute of Timber Construction

**Glued Laminated Timber Design Values**

$F_{bx}$ = **2400** psi

$F_{vx}$ = **300** psi

$E_x$ = **1,800,000** psi

**Simple Span Beam**

**Dry Service Conditions**

Lumber Design Values per **2001 NDS**

Beam Dimensions Are in Inches

| Lumber or Timber Nominal Size thickness x depth | Glulam Sizes to Substitute for Select Structural Grade Lumber or Timbers | | | Glulam Sizes to Substitute for No. 1 Grade Lumber or Timbers | | | Glulam Sizes to Substitute for No. 2 Grade Lumber or Timbers | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 x 8 | 3 x 6 7/8 | 5 x 6 7/8 | 6 3/4 x 5 1/2 | 3 x 6 7/8 | 5 x 6 7/8 | 6 3/4 x 5 1/2 | 3 x 6 7/8 | 5 x 6 7/8 | 6 3/4 x 5 1/2 |
| 3 x 10 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 |
| 3 x 12 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 |
| 3 x 14 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 11 | 6 3/4 x 9 5/8 |
| 4 x 6 | 3 x 6 7/8 | 5 x 5 1/2 | 6 3/4 x 5 1/2 | 3 x 6 7/8 | 5 x 5 1/2 | 6 3/4 x 5 1/2 | 3 x 6 7/8 | 5 x 5 1/2 | 6 3/4 x 5 1/2 |
| 4 x 8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 |
| 4 x 10 | 3 x 11 | 5 x 8 1/4 | 6 3/4 x 8 1/4 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 8 1/4 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 8 1/4 |
| 4 x 12 | 3 x 12 3/8 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 9 5/8 | 6 3/4 x 9 5/8 |
| 4 x 14 | 3 x 15 1/8 | 5 x 12 3/8 | 6 3/4 x 11 | 3 x 13 3/4 | 5 x 12 3/8 | 6 3/4 x 11 | 3 x 13 3/4 | 5 x 12 3/8 | 6 3/4 x 11 |
| 4 x 16 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 |
| 6 x 8 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 |
| 6 x 10 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 9 5/8 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 9 5/8 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 |
| 6 x 12 | 3 x 13 3/4 | 5 x 12 3/8 | 6 3/4 x 11 | 3 x 13 3/4 | 5 x 12 3/8 | 6 3/4 x 11 | 3 x 12 3/8 | 5 x 11 | 6 3/4 x 9 5/8 |
| 6 x 14 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 | 3 x 15 1/8 | 5 x 12 3/8 | 6 3/4 x 12 3/8 |
| 6 x 16 | 3 x 17 7/8 | 5 x 15 1/8 | 6 3/4 x 13 3/4 | 3 x 17 7/8 | 5 x 15 1/8 | 6 3/4 x 13 3/4 | 3 x 17 7/8 | 5 x 15 1/8 | 6 3/4 x 13 3/4 |
| 6 x 18 | 3 x 20 5/8 | 5 x 17 7/8 | 6 3/4 x 16 1/2 | 3 x 20 5/8 | 5 x 17 7/8 | 6 3/4 x 16 1/2 | 3 x 19 1/4 | 5 x 16 1/2 | 6 3/4 x 15 1/8 |
| 6 x 20 | 3 x 23 3/8 | 5 x 19 1/4 | 6 3/4 x 17 7/8 | 3 x 23 3/8 | 5 x 19 1/4 | 6 3/4 x 17 7/8 | 3 x 22 | 5 x 17 7/8 | 6 3/4 x 16 1/2 |
| 8 x 10 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 13 3/4 | 5 x 9 5/8 | 6 3/4 x 9 5/8 |
| 8 x 12 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 | 3 x 16 1/2 | 5 x 13 3/4 | 6 3/4 x 12 3/8 | 3 x 16 1/2 | 5 x 12 3/8 | 6 3/4 x 11 |
| 8 x 14 | 3 x 19 1/4 | 5 x 15 1/8 | 6 3/4 x 13 3/4 | 3 x 19 1/4 | 5 x 15 1/8 | 6 3/4 x 13 3/4 | 3 x 19 1/4 | 5 x 13 3/4 | 6 3/4 x 12 3/8 |
| 8 x 16 | 3 x 22 | 5 x 17 7/8 | 6 3/4 x 15 1/8 | 3 x 22 | 5 x 17 7/8 | 6 3/4 x 15 1/8 | 3 x 22 | 5 x 16 1/2 | 6 3/4 x 15 1/8 |
| 8 x 18 | 3 x 24 3/4 | 5 x 19 1/4 | 6 3/4 x 17 7/8 | 3 x 24 3/4 | 5 x 19 1/4 | 6 3/4 x 17 7/8 | 3 x 24 3/4 | 5 x 17 7/8 | 6 3/4 x 16 1/2 |
| 8 x 20 | 3 x 27 1/2 | 5 x 22 | 6 3/4 x 19 1/4 | 3 x 27 1/2 | 5 x 22 | 6 3/4 x 19 1/4 | 3 x 27 1/2 | 5 x 20 5/8 | 6 3/4 x 17 7/8 |
| [2] 2 x 8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 5 1/2 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 5 1/2 |
| [2] 2 x 10 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 8 1/4 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 8 1/4 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 |
| [2] 2 x 12 | 3 x 12 3/8 | 5 x 9 5/8 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 9 5/8 | 6 3/4 x 9 5/8 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 9 5/8 |
| [3] 2 x 8 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 | 3 x 8 1/4 | 5 x 6 7/8 | 6 3/4 x 6 7/8 |
| [3] 2 x 10 | 3 x 12 3/8 | 5 x 9 5/8 | 6 3/4 x 8 1/4 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 |
| [3] 2 x 12 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 11 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 11 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 9 5/8 |
| [4] 2 x 8 | 3 x 11 | 5 x 9 5/8 | 6 3/4 x 8 1/4 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 | 3 x 9 5/8 | 5 x 8 1/4 | 6 3/4 x 6 7/8 |
| [4] 2 x 10 | 3 x 13 3/4 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 11 | 6 3/4 x 9 5/8 | 3 x 12 3/8 | 5 x 9 5/8 | 6 3/4 x 9 5/8 |
| [4] 2 x 12 | 3 x 16 1/2 | 5 x 12 3/8 | 6 3/4 x 11 | 3 x 15 1/8 | 5 x 12 3/8 | 6 3/4 x 11 | 3 x 13 3/4 | 5 x 12 3/8 | 6 3/4 x 11 |

### Table Specifications:

These sizes are for dry service condition of use.

Reverse use of this table to convert from glued laminated timber sizes to sawn lumber or timber sizes 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, shear, and deflection.

A minimum glued laminated timber depth of 5.5 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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2/9/2004