

## Rosboro X-Beam Columns: Design Values

Layup Combination	Bending about Y-Y Axis $F_{by}$ (psi)	Bending about X-X Axis $F_{bx}$ (psi)	Compression Parallel $F_c$ (psi) <sup>3</sup>	$E_{axial}$ ( $10^6$ psi)
EWS 3 DF	2100 <sup>(1)</sup>	2000 <sup>(2)</sup>	2300 <sup>(3)</sup>	1.9

Notes:

1. Applicable to 4 or more lams. This value shall be reduced to 1,850 psi for 3 lams and 1,550 psi for 2 lams.
2. Applicable to column depths up to 15". For column depths exceeding 15",  $F_{bx} = 1,760$  psi.
3. Applicable to 4 or more lams. This value shall be reduced to 1,900 psi for 2 or 3 lams.

## Allowable Axial Loads (Pounds) for Combination No. 3 Glulam Columns

Side loads are not permitted. End loads are limited to a maximum eccentricity of either  $1/6$  column width or depth, whichever is worse.

Effective Column Length (ft.)	Lamination Net Width = 3 1/2 in.						Lamination Net Width = 5 1/2 in.								
	Net Depth = 4 1/2 in. (3 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 7 1/2 in. (5 lams)		
	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
8	8,570	8,970	9,190	11,940	12,440	12,720	26,850	29,050	30,350	30,600	33,220	34,770	38,900	41,980	43,780
9	7,290	7,570	7,740	10,090	10,450	10,660	24,130	25,810	26,790	27,660	29,670	30,770	34,800	37,120	38,460
10	6,250	6,470	6,590	8,610	8,880	9,040	21,580	22,890	23,640	24,790	26,210	27,030	30,990	32,760	33,790
11	5,410	5,570	5,670	7,420	7,630	7,750	19,300	20,330	20,930	22,080	23,190	23,830	27,600	28,980	29,780
12	4,720	4,850	4,920	6,460	6,620	6,720	17,290	18,120	18,600	19,700	20,590	21,100	24,630	25,740	26,380
13	4,150	4,250	4,310	5,660	5,800	5,870	15,540	16,220	16,610	17,650	18,370	18,790	22,070	22,970	23,480
14	3,670	3,760	3,810	5,010	5,110	5,180	14,020	14,580	14,900	15,880	16,470	16,810	19,850	20,590	21,020
15	-	-	-	-	-	-	12,690	13,160	13,430	14,340	14,840	15,120	17,930	18,550	18,900
16	-	-	-	-	-	-	11,540	11,930	12,160	13,010	13,420	13,660	16,260	16,780	17,080
17	-	-	-	-	-	-	10,530	10,860	11,060	11,840	12,200	12,400	14,800	15,250	15,500
18	-	-	-	-	-	-	9,640	9,930	10,090	10,820	11,130	11,300	13,530	13,910	14,120
19	-	-	-	-	-	-	8,850	9,100	9,250	9,920	10,190	10,340	12,410	12,730	12,920
20	-	-	-	-	-	-	8,160	8,370	8,500	9,130	9,360	9,490	11,410	11,700	11,860
21	-	-	-	-	-	-	7,540	7,730	7,840	8,430	8,630	8,740	10,530	10,780	10,920
22	-	-	-	-	-	-	6,980	7,150	7,250	7,800	7,980	8,070	9,750	9,970	10,090

Notes:

- (1) The tabulated allowable loads apply only to one-piece glulam members made with all L2D laminations (Combination 3) without special tension laminations.
- (2) Applicable service conditions = dry.
- (3) The tabulated allowable loads are based on simply axially loaded columns subjected to a maximum eccentricity of either  $1/6$  column width or  $1/6$  column depth, whichever is worse. For side loads, other eccentric end loads, or other combined axial and flexural loads, see 2005 NDS.
- (4) The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
- (5) Design properties for normal load duration and dry-use service conditions:  
 Compression parallel to grain ( $F_c$ ) = 2,300 psi for 4 or more lams, or 1,900 psi for 2 or 3 lams.  
 Modulus of elasticity ( $E$ ) =  $1.9 \times 10^6$  psi  
 Flexural stress when loaded parallel to wide faces of lamination ( $F_{by}$ ) = 2,100 psi for 4 or more lams, or 1,850 psi for 3 lams. Flexural stress when loaded perpendicular to wide faces of lamination ( $F_{bx}$ ) = 2,000 psi for 2 lams to 15 in. deep without special tension laminations. Volume factor for  $F_{bx}$  is in accordance with 2005 NDS. Size factor for  $F_{by}$  is  $(12/d)^{1/9}$ , where  $d$  is equal to the lamination width in inches.

## Axial Loads

Allowable Axial Load Tables:

Side loads and bracket loads are not permitted. End loads are limited to a maximum eccentricity of either  $1/6$  column width or  $1/6$  column depth.

