Rosboro Treated X-Beam: Design Values[1]

Product	Layup Combination	Flexural Stress F_b (psi)[2]		Compression Perpendicular to Grain (psi) $F_{c\perp}$	Shear F_v (psi)[3]	MOE (10^6 psi)	
		Tension Zone	Compression Zone			Apparent	True
Treated X-Beam	24F-V4	2400	1850	650	265	1.8	1.9
Wet-Use factor		0.80	0.80	0.53	0.875	0.833	

(1) The tabulated values are for dry conditions of use (moisture content of less than 16%). For Wet-Use, the design values shall be multiplied by the Wet-Use factor given at the bottom of the table.

(2) F_b shall be adjusted by the volume effect factor using the following formula:

$C_v = (5.125/b)^{1/x} \times (12/d)^{1/x} \times (21/L)^{1/x} \leq 1.0$

where: b = beam width (in.),

d = beam depth (in.),

L = beam length (ft.), and

x = 10

(3) For non-prismatic members, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS-12, 3.4.3.3), the design shear (F_v) shall be multiplied by a factor of 0.72.

Minimum Bearing Length (in.)

Product	Width (in.)	Reaction (lbf)																	
		3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	12,000	14,000	16,000	18,000	20,000	22,000	24,000	26,000	28,000	30,000
Treated Glulam - Dry-Use ($F_{c\perp}$ = 650 psi)	3 1/2	1.50	1.76	2.20	2.64	3.08	3.52	3.96	4.40	5.27	6.15	7.03	7.91	8.79	9.67	10.55	11.43	12.31	13.19
	5 1/2	1.50	1.50	1.50	1.68	1.96	2.24	2.52	2.80	3.36	3.92	4.48	5.03	5.59	6.15	6.71	7.27	7.83	8.39
Treated Glulam - Wet-Use ($F_{c\perp}$ = 392 psi)	3 1/2	2.49	3.32	4.15	4.98	5.81	6.63	7.46	8.29	9.95	11.61	13.27	14.93	16.59	18.25	19.90	21.56	23.22	24.88
	5 1/2	1.58	2.11	2.64	3.17	3.69	4.22	4.75	5.28	6.33	7.39	8.44	9.50	10.56	11.61	12.67	13.72	14.78	15.83

(1) Minimum bearing length is 1 1/2".

(2) Bearing across full width of the beam is required.

(3) Bearing length shall be adjusted when the allowable bearing stress of the supporting member is less than the tabulated $F_{c\perp}$ values of the glulam beam.

Treated X-Beam Design Properties

EWS 24F-V4

Dry-Use

F_b = 2,400 psi

F_v = 265 psi

E = 1.8 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Weight (lbf/ft.)	Maximum Resistive Shear (lbf)			Maximum Resistive Moment (ft.-lbf)			EI (10^6 in.^{2}- lb)
			100%	115%	125%	100%	115%	125%	
3 1/2	9 1/2	8.4	5,874	6,755	7,343	10,529	12,109	13,161	450
	11 7/8	10.5	7,343	8,444	9,178	16,452	18,920	20,565	879
	14	12.4	8,657	9,955	10,821	22,867	26,297	28,583	1,441
	16	14.2	9,893	11,377	12,367	29,867	34,347	37,333	2,150
	18	16.0	11,130	12,800	13,913	37,800	43,470	47,250	3,062
5 1/2	9 1/2	13.2	9,231	10,615	11,539	16,546	19,028	20,682	707
	11 7/8	16.6	11,539	13,269	14,423	25,853	29,731	32,316	1,382
	14	19.5	13,603	15,644	17,004	35,933	41,323	44,917	2,264
	16	22.3	15,547	17,879	19,433	46,933	53,973	58,667	3,379
	18	25.0	17,490	20,114	21,863	59,400	68,310	74,250	4,811

(1) Beam weight is assumed to be 36.5 pcf.

(2) Maximum resistive moment shall be adjusted by the volume factor based on NDS-12.

Rosboro's Treated X-Beam is a 24F-V4 glulam that is manufactured with an unbalanced lay-up. In unbalanced beams, the strength of the lumber used on the beams tension side is greater than the lumber used on the corresponding compression side (top). As a result, unbalanced beams may not carry as much load in a multi-span or cantilever application. The load carrying capacity is reduced as the span length or cantilever length is increased. **It is a common misconception that unbalanced beams cannot be used in multi-span or cantilever applications.** The table to the right list the loads that can be carried by an unbalanced Treated X-beam in both simple-span and multi-span applications. The top or compression face is clearly marked with a "TOP" and treatment stamp.

Unbalanced Glulam Layup