Tall Wall Column Table

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Glulam Columns – Maximum Allowable Wind Loads (plf) / Vertical Loads or Total Axial Loads (lbf). DF Comb. #3

Deflection Ratio	Wall Height (ft.)	Max. Defl. (in.)	3 1/2" Wall Thickness						5 1/2" Wall Thickness					7 1/8" Wall Thickness		
			3 1/2"	4 1/2"	5 1/4"	5 1/2 "	6"	7"	4 1/2"	5 1/2"	6"	7"	7 1/2"	4 1/2"	6"	7 1/2"
L/360	30	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28	0.93	-	-	-	-	-	-	-	-	-	-	-	25 / 6,436	34 / 8,994	43 / 11,202
	26	0.87	-	-	-	-	-	-	-	-	-	-	-	32 / 7,093	43 / 10,002	54 / 12,484
	24	0.80	-	-	-	-	-	-	-	-	-	-	-	41 / 7,888	54 / 11,275	68 / 14,049
	22	0.73	-	-	-	-	-	-	24 / 4,881	30 / 6,236	32 / 6,847	38 / 7,948	41 / 8,500	53 / 8,841	71 / 12,637	88 / 15,856
	20	0.67	-	-	-	-	-	-	32 / 5,603	40 / 7,190	43 / 7,882	50 / 9,205	54 / 9,837	70 / 9,949	94 / 14,336	118 / 17,890
	18	0.60	-	-	-	-	-	-	44 / 6,465	54 / 8,415	59 / 9,178	69 / 10,694	74 / 11,459	96 / 11,146	129 / 16,247	161 / 20,345
	16	0.53	-	-	-	-	-	-	63 / 7,491	77 / 9,875	84 / 10,775	99 / 12,511	106 / 13,406	137 / 12,378	183 / 18,003	228 / 22,503
	14	0.47	-	24 / 3,169	28 / 3,882	30 / 4,043	32 / 4,437	38 / 5,151	94 / 8,718	115 / 11,653	126 / 12,681	147 / 14,796	157 / 15,870	203 / 13,517	271 / 18,023	322 / 22,529
	12	0.40	30 / 3,071	39 / 3,933	45 / 4,882	47 / 5,120	52 / 5,560	60 / 6,510	149 / 10,068	182 / 12,768	199 / 13,929	232 / 16,250	249 / 17,411	320 / 13,349	376 / 18,044	376 / 22,555
L/240	30	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28	1.40	-	-	-	-	-	-	-	-	-	-	-	38 / 5,358	51 / 7,697	64 / 9,611
	26	1.30	-	-	-	-	-	-	-	-	-	-	-	48 / 5,808	64 / 8,460	81 / 10,510
	24	1.20	-	-	-	-	-	-	-	-	-	-	-	61 / 6,332	82 / 9,284	102 / 11,640
	22	1.10	-	-	-	-	-	-	36 / 4,121	45 / 5,368	49 / 5,862	57 / 6,843	61 / 7,339	79 / 6,887	106 / 10,256	133 / 12,783
	20	1.00	-	-	-	-	-	-	49 / 4,569	60 / 6,084	65 / 6,660	76 / 7,758	81 / 8,340	106 / 7,348	141 / 11,259	177 / 14,013
	18	0.90	-	-	-	-	-	-	67 / 5,132	82 / 6,927	89 / 7,585	104 / 8,843	112 / 9,445	145 / 7,752	193 / 12,243	242 / 15,265
	16	0.80	-	-	-	-	-	-	95 / 5,725	116 / 7,908	127 / 8,598	148 / 10,050	159 / 10,748	205 / 7,886	274 / 13,016	282 / 19,909
	14	0.70	28 / 2,103	36 / 2,705	43 / 3,347	45 / 3,508	49 / 3,828	57 / 4,476	142 / 6,204	173 / 8,894	189 / 9,697	220 / 11,338	236 / 12,123	305 / 7,203	322 / 17,993	322 / 22,529
	12	0.60	45 / 2,527	58 / 3,244	68 / 4,120	71 / 4,324	78 / 4,700	91 / 5,484	224 / 6,376	274 / 9,691	298 / 10,607	348 / 12,371	373 / 13,252	376 / 10,389	376 / 18,044	376 / 22,555
L/180	30	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	28	1.87	-	-	-	-	-	-	-	-	-	-	-	51 / 4,316	69 / 6,402	86 / 8,017
	26	1.73	-	-	-	-	-	-	-	-	-	-	-	64 / 4,556	86 / 6,909	108 / 8,598
	24	1.60	-	-	-	-	-	-	-	-	-	-	-	82 / 4,727	109 / 7,432	137 / 9,228
	22	1.47	-	-	-	-	-	-	49 / 3,335	60 / 4,547	65 / 4,986	76 / 5,807	82 / 6,186	106 / 4,870	142 / 7,848	177 / 9,832
	20	1.33	-	-	-	-	-	-	65 / 3,630	80 / 5,024	87 / 5,496	101 / 6,437	109 / 6,853	141 / 4,783	188 / 8,197	226 / 10,839
	18	1.20	-	-	-	-	-	-	89 / 3,877	109 / 5,550	119 / 6,044	139 / 7,043	149 / 7,549	193 / 4,284	251 / 8,576	251 / 14,702
	16	1.07	-	-	-	-	-	-	127 / 3,952	155 / 5,976	169 / 6,523	198 / 7,576	212 / 8,123	274 / 2,965	282 / 12,548	282 / 19,909
	14	0.93	38 / 1,732	49 / 2,223	57 / 2,878	60 / 3,006	65 / 3,294	76 / 3,836	189 / 3,665	231 / 6,129	252 / 6,688	294 / 7,803	315 / 8,360	322 / 6,078	322 / 17,993	322 / 22,529
	12	0.80	60 / 1,999	78 / 2,540	91 / 3,388	95 / 3,561	104 / 3,872	121 / 4,529	298 / 2,451	365 / 5,494	376 / 7,046	376 / 11,101	376 / 13,107	376 / 10,389	376 / 18,044	376 / 22,555

Notes:

1. Design per the 2015 NDS. Load duration factor = 1.6. Buckling length coefficient, K_e = 1.0. Dry conditions of use.
2. Table assumes wood structural panel sheathing on exterior of wall, gypsum on interior.
3. Full width blocking at 8' on-center maximum.
4. Deflection limits are based on the Main Wind Force Resisting System pressures, which were estimated by multiplying the Components and Cladding (C&C) pressure by 0.7 (2015 IRC, Table R301.7; 2015 IBC, Table 1604.3).
5. Deflection is calculated using $$\Delta = \frac{240wL^4}{Ebd^3} + \frac{28.8wL^2}{Ebd}$$

Δ = deflection (in.)
w = uniform load (plf), L = span (ft), b = member width = glulam depth measured parallel to the wall length (in.)
d = member depth = glulam width measured in the wide faces of laminations = wall thickness (in.), E = modulus of elasticity (psi)

6. Design properties: E_{true} is 2.0 x 10^6 psi; E_{axial} min is 1.00 x 10^6 psi ; compression strength parallel to grain F_c is 2,300 psi for members with 4 or more laminations and 1,900 psi for members with 2 or 3 laminations; bending strength about Y-Y axis (loaded parallel to wide face of laminations) Fby is 2,100 psi for members with 4 or more laminations and 1,850 psi for members with 3 laminations; shear strength parallel to grain Fvy is 230 psi.
7. Axial loads are applied eccentrically, at a maximum distance 1/6 the wall thickness dimension of the column, measured from the column centerline.
8. Compression perpendicular to grain stress of 425 psi is assumed for the bearing plate (SPF).
9. The maximum lateral connection capacity at the column ends is limited to four Simpson A23 clips (2,260 lbf per clip).
10. The maximum lateral load is limited to the lesser of the deflection limit, allowable bending stress, allowable shear stress, or the connection limit.
11. One round hole with a maximum diameter of 25% of the depth of column shall be permitted to be placed anywhere along the column at the centerline of the depth, except holes shall be at least 6'' away from the end of the column.
12. Table is based on dry service conditions.
13. These values are for preliminary design use only. Final design shall include a complete analysis, including the bearing capacity of the foundation supporting the column.
14. Please visit Rosboro website www.rosboro.com for additional tables and comments.