

VMG LIGNUM LVL

GRADE 1.4E
ROOF LOAD TABLES



UNIFORM LOAD SPAN TABLES

MAXIMUM ALLOWABLE UNIFORM LOAD TABLE NOTES

1. Allowable load tables are for single or multiple span beams with uniformly distributed loads based on the reference design values listed in ESR-5621 Table 1 (below). Clear spans are tabulated. The design span assumed in the table calculations is the clear span plus half the required bearing length on each end.
2. For multiple span beams, use the largest clear span. Other spans along the multiple span beam must be at least half of the largest span.
3. Continuous lateral restraint must be provided at the top edge of the beam. For multiple span beams, the bottom of the beam is assumed to be sufficiently braced to assume no reduction in strength for lateral stability. Lateral restraint is required at the supports to prevent rotation of the beam.
4. The Floor $L/360$ values on the 100% load duration tables are maximum live loads to meet the span based live load deflection criteria. Snow or Roof $L/240$ values on the 115% or 125% load duration tables are similar. The Total Load values are the maximum total allowable stress design (ASD) load for bending, shear, and total load deflection. Total load values have been reduced to account for the self-weight of the beam. A total load deflection limit of $L/240$ has been assumed for floor loads and $L/180$ for roof/snow load. Creep has not been considered.
5. The Req Brg values are the minimum required end/interior bearing lengths. Interior bearing is only applicable at interior supports along continuous, multiple span beams. Required bearing is based on 425 psi compression perpendicular to grain strength of a Spruce-Pine-Fir (SPF) wood plate with a bearing area factor, C_b , assuming the plate end is more than 3" away from the beam. For LVL grade 2.0E bearing on steel or other substrates where required bearing length is controlled by the LVL compression perpendicular to grain strength, the bearing lengths are shown in addition to the SPF plate bearing requirements. For the LVL grade 1.4E, the required bearing length does not change for substrates other than a SPF wood plate.
6. Ten year load duration ($CD = 1.0$) is assumed for floors with occupancy live loads, two month duration ($CD = 1.15$) is assumed for roofs with snow load, and seven day duration ($CD = 1.25$) is assumed for roof live load.
7. Dry conditions and sustained temperatures below 100°F have been assumed.
8. Table uniform load cells with no value (--) are less than 10 plf.

HOW TO USE MAXIMUM ALLOWABLE UNIFORM LOAD TABLES

1. Determine bearing condition at the supports. The clear span is the distance between the interior edges of the supports.
2. Calculate the applied uniform live/roof/snow load and total load on the beam using the appropriate ASD load combination (e.g., 1.0D + 1.0L). Determine the applicable live/roof/snow deflection criteria.
3. Use the span table for the appropriate live load type (floor, roof, or snow) and select a beam with tabulated maximum allowable loads that exceed the applied live load and total load. Confirm the available bearing length meets the tabulated minimum required bearing. The beam must satisfy all maximum uniform load requirements and have the minimum required bearing length to be adequate.

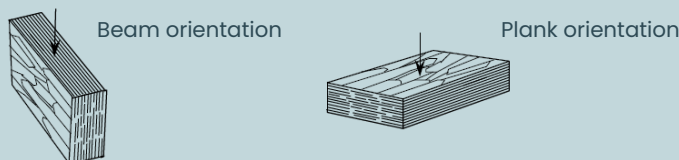


Figure 1 – an illustration of beam and plank orientation as noted in table 1

Table 1-reference design values for VMG LIGNUM LVL^{1,2}

BEAM ORIENTATION ³					PLANK ORIENTATION ³				AXIAL	
Modulus of elasticity		Bending ^{7,8}	Shear F _v	Compression	Modulus of elasticity		Bending	Shear F _v	Compression	Tension
E _{true} ⁴ (x10 ⁶ psi)	E _{apparent} ^{5,6} (x10 ⁶ psi)	F _b (psi)	(psi)	Perp-to-Grain F _{c1} ¹⁰ (psi)	E _{true} ⁴ (x10 ⁶ psi)	E _{apparent} ^{5,6} (x10 ⁶ psi)	F _b (psi)	(psi)	Perp-to-Grain F _{c1} ¹⁰ (psi)	F _t ⁹ (psi)
1.4	1.3	1,850	250	550	1.4	1.3	2,200	150	300	1,600
2.0	1.9	3,050	350	700	2.0	1.9	3,300	150	380	2,700

For SI: 1 inch = 25.4 mm, 1 psi = 6894.8 Pa

¹ The tabulated values are design values for normal duration of load and must be adjusted by the applicable adjustment factors in accordance with Section 8.3 of the 2024 and 2018 NDS. Modulus of elasticity and compression perpendicular-to-grain must not be adjusted for duration of load.

² The tabulated values are limited to dry interior conditions where the average moisture content in lumber is less than 16 percent.

³ Refer to Figure 1 for LVL orientations.

⁴ Reference E_{true} values are the shear-free modulus of elasticity, which do not include the effects of the shear deformation. When calculating the total deflection, both bending and shear deformations must be included. Equations for various span and load conditions are available in engineering references.

⁵ Reference E_{apparent} values are the apparent modulus of elasticity, which include the effects of shear deformation. When calculating the total deflection, standard engineering formulae for the pure bending deflection is sufficient.

⁶ Reference modulus of elasticity, E_{min}, used for beam stability calculations, must be calculated using the tabulated E_{apparent} in accordance with Appendix D of the 2024 and 2018 NDS. The COV_E may be taken as 0.10 when calculating E_{min}.

⁷ Reference bending design value in the beam orientation, F_b, may be increased by 4% when the member qualifies as a repetitive member, in accordance with Section 8.3.7 of the 2024 and 2018 NDS.

⁸ Reference bending design value in beam orientation is based on a reference depth of 12 inches. For other depths, the allowable bending stress, F_b, must be adjusted by multiplying F_b by (12/d)^{0.15}, where d is depth member in inches. For depths 3½ inches or less, multiply F_b by 1.203.

⁹ Reference tension design values, F_t, are assigned for a standard length of 36 inches. For lengths longer than 36 inches, multiply F_t by (36/L)^{0.09}, where L is the length in inches. For lengths less than 36 inches, use the reference tension design value given in the table above.

¹⁰ The bearing area factor, C_b, is permitted to be applied to the reference compression perpendicular-to-grain design values, F_{c1}, in accordance with the 2024 and 2018 NDS.

ROOF LOAD TABLE 125% LOAD DURATION (PLF)

Clear span (ft)		VMG LIGNUM 1.4E LVL, 1 Ply, 1.5" Thickness												
		Depth (in)												
		3.5	5.5	7.25	9.25	9.5	11.25	11.875	14	16	18	20	22	24
4	Roof L/240	230	750	1183	1728	1802	2272	2272	2271	2270	2270	2269	2268	2267
	Total Load	306	750	1183	1728	1802	2272	2272	2271	2270	2270	2269	2268	2267
	Req Brg (in)	1.5 / 2	2.1 / 5.3	3.5 / 8.8	5.4 / 13.5	5.6 / 14	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
5	Roof L/240	120	442	795	1191	1243	1614	1752	1907	1906	1905	1905	1904	1903
	Total Load	159	494	795	1191	1243	1614	1752	1907	1906	1905	1905	1904	1903
	Req Brg (in)	1.5 / 1.5	1.7 / 4.3	2.8 / 7	4.3 / 10.8	4.5 / 11.3	6.2 / 15.5	6.8 / 17	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
6	Roof L/240	70	263	567	860	899	1186	1294	1643	1642	1642	1641	1640	1639
	Total Load	93	348	567	860	899	1186	1294	1643	1642	1642	1641	1640	1639
	Req Brg (in)	1.5 / 1.5	1.5 / 3.5	2.3 / 5.8	3.6 / 9	3.8 / 9.5	5.2 / 13	5.7 / 14.3	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
7	Roof L/240	45	168	374	647	677	901	987	1289	1443	1442	1441	1440	1439
	Total Load	58	222	423	647	677	901	987	1289	1443	1442	1441	1440	1439
	Req Brg (in)	1.5 / 1.5	1.5 / 2.8	2 / 5	3.1 / 7.8	3.3 / 8.3	4.5 / 11.3	4.9 / 12.3	6.6 / 16.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
8	Roof L/240	30	114	254	503	527	706	774	1020	1266	1285	1284	1284	1283
	Total Load	39	150	326	503	527	706	774	1020	1266	1285	1284	1284	1283
	Req Brg (in)	1.5 / 1.5	1.5 / 2	1.8 / 4.5	2.7 / 6.8	2.9 / 7.3	3.9 / 9.8	4.3 / 10.8	5.8 / 14.5	7.4 / 18.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
9	Roof L/240	21	81	181	367	395	566	622	824	1030	1159	1158	1157	1157
	Total Load	27	106	239	401	420	566	622	824	1030	1159	1158	1157	1157
	Req Brg (in)	1.5 / 1.5	1.5 / 1.8	1.5 / 3.8	2.4 / 6	2.6 / 6.5	3.5 / 8.8	3.8 / 9.5	5.2 / 13	6.6 / 16.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
10	Roof L/240	15	59	134	271	292	464	509	678	851	1035	1055	1054	1053
	Total Load	19	77	175	327	343	464	509	678	851	1035	1055	1054	1053
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 3	2.2 / 5.5	2.3 / 5.8	3.1 / 7.8	3.5 / 8.8	4.7 / 11.8	6 / 15	7.4 / 18.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
11	Roof L/240	12	45	101	205	222	362	423	567	714	872	968	967	966
	Total Load	14	57	132	270	285	385	424	567	714	872	968	967	966
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	2 / 5	2.1 / 5.3	2.9 / 7.3	3.2 / 8	4.3 / 10.8	5.4 / 13.5	6.7 / 16.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
12	Roof L/240	--	34	78	160	173	282	330	480	607	743	888	893	893
	Total Load	--	44	102	209	226	326	359	480	607	743	888	893	893
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 2	1.7 / 4.3	1.8 / 4.5	2.6 / 6.5	2.9 / 7.3	3.9 / 9.8	5 / 12.5	6.2 / 15.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
13	Roof L/240	--	27	62	126	137	224	261	412	521	640	767	830	829
	Total Load	--	34	80	165	178	278	307	412	521	640	767	830	829
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 3.8	1.6 / 4	2.4 / 6	2.7 / 6.8	3.6 / 9	4.6 / 11.5	5.7 / 14.3	6.9 / 17.3	7.5 / 18.8	7.5 / 18.8
14	Roof L/240	--	22	50	102	110	180	211	340	452	556	668	775	774
	Total Load	--	27	63	132	143	236	265	356	452	556	668	775	774
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 3.3	1.5 / 3.5	2.2 / 5.5	2.5 / 6.3	3.4 / 8.5	4.3 / 10.8	5.3 / 13.3	6.4 / 16	7.5 / 18.8	7.5 / 18.8

ROOF LOAD TABLE 125% LOAD DURATION (PLF)

Clear span (ft)		VMG LIGNUM 1.4E LVL, 1 Ply, 1.5" Thickness												
		Depth (in)												
		3.5	5.5	7.25	9.25	9.5	11.25	11.875	14	16	18	20	22	24
15	Roof L/240	--	18	40	83	90	148	172	279	396	487	586	691	726
	Total Load	--	21	51	107	116	192	225	312	396	487	586	691	726
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.8	1.5 / 3	1.9 / 4.8	2.3 / 5.8	3.1 / 7.8	4 / 10	5 / 12.5	6 / 15	7.2 / 18	7.5 / 18.8
16	Roof L/240	--	15	33	69	74	122	143	231	340	430	519	613	683
	Total Load	--	17	42	88	95	159	186	274	349	430	519	613	683
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	1.5 / 2.8	1.7 / 4.3	2 / 5	2.9 / 7.3	3.8 / 9.5	4.7 / 11.8	5.6 / 14	6.7 / 16.8	7.5 / 18.8
17	Roof L/240	--	12	28	57	62	102	120	194	286	382	461	546	635
	Total Load	--	14	34	73	79	132	155	243	310	382	461	546	635
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.3	1.5 / 2.3	1.5 / 3.8	1.8 / 4.5	2.8 / 7	3.5 / 8.8	4.4 / 11	5.3 / 13.3	6.3 / 15.8	7.4 / 18.5
18	Roof L/240	--	10	23	48	53	86	101	164	242	341	413	489	570
	Total Load	--	12	28	61	66	111	131	213	277	342	413	489	570
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2	1.5 / 2	1.5 / 3.5	1.6 / 4	2.6 / 6.5	3.3 / 8.3	4.1 / 10.3	5 / 12.5	6 / 15	7 / 17.5
19	Roof L/240	--	--	20	41	45	74	87	140	207	292	371	440	514
	Total Load	--	--	24	51	56	94	111	181	248	308	371	440	514
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2	1.5 / 3	1.5 / 3.5	2.3 / 5.8	3.2 / 8	3.9 / 9.8	4.8 / 12	5.7 / 14.3	6.7 / 16.8
20	Roof L/240	--	--	17	35	38	63	74	121	178	251	336	399	465
	Total Load	--	--	20	44	47	80	94	155	224	278	336	399	465
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2.8	1.5 / 3.3	2.1 / 5.3	3 / 7.5	3.7 / 9.3	4.5 / 11.3	5.4 / 13.5	6.3 / 15.8
22	Roof L/240	--	--	13	27	29	48	56	91	135	190	259	331	386
	Total Load	--	--	14	32	35	59	70	116	174	230	278	331	386
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.3	1.5 / 2.8	1.8 / 4.5	2.6 / 6.5	3.4 / 8.5	4.1 / 10.3	4.9 / 12.3	5.8 / 14.5
24	Roof L/240	--	--	--	21	22	37	43	71	105	148	201	266	325
	Total Load	--	--	--	24	26	45	53	89	133	190	234	278	325
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2	1.5 / 2.3	1.5 / 3.8	2.2 / 5.5	3.1 / 7.8	3.8 / 9.5	4.5 / 11.3	5.3 / 13.3
26	Roof L/240	--	--	--	16	18	29	34	56	83	117	159	210	271
	Total Load	--	--	--	18	20	34	41	69	104	149	199	237	277
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2	1.5 / 3.3	1.9 / 4.8	2.6 / 6.5	3.5 / 8.8	4.2 / 10.5	4.9 / 12.3
28	Roof L/240	--	--	--	13	14	23	27	45	66	94	128	169	219
	Total Load	--	--	--	14	15	27	32	54	82	118	163	204	239
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2.8	1.6 / 4	2.3 / 5.8	3.1 / 7.8	3.9 / 9.8	4.5 / 11.3
30	Roof L/240	--	--	--	10	11	19	22	36	54	77	105	138	179
	Total Load	--	--	--	10	11	21	25	43	66	95	132	176	208
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	1.5 / 3.5	2 / 5	2.7 / 6.8	3.6 / 9	4.2 / 10.5

ROOF LOAD TABLE 125% LOAD DURATION (PLF)

Clear span (ft)		VMG LIGNUM 1.4E LVL, 1 Ply, 1.5" Thickness												
		Depth (in)												
		3.5	5.5	7.25	9.25	9.5	11.25	11.875	14	16	18	20	22	24
4	Roof L/240	267	871	1375	2008	2087	2575	2575	2574	2573	2572	2571	2570	2569
	Total Load	354	871	1375	2008	2087	2575	2575	2574	2573	2572	2571	2570	2569
	Req Brg (in)	1.5 / 2.3	2.2 / 5.5	3.6 / 9	5.5 / 13.8	5.8 / 14.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
5	Roof L/240	140	516	924	1380	1441	1872	2032	2161	2160	2159	2158	2157	2156
	Total Load	185	576	924	1380	1441	1872	2032	2161	2160	2159	2158	2157	2156
	Req Brg (in)	1.5 / 1.5	1.7 / 4.3	2.9 / 7.3	4.5 / 11.3	4.7 / 11.8	6.4 / 16	7 / 17.5	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
6	Roof L/240	82	305	660	1001	1046	1380	1502	1862	1861	1860	1859	1858	1857
	Total Load	108	404	660	1001	1046	1380	1502	1862	1861	1860	1859	1858	1857
	Req Brg (in)	1.5 / 1.5	1.5 / 3.8	2.4 / 6	3.7 / 9.3	3.9 / 9.8	5.3 / 13.3	5.9 / 14.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
7	Roof L/240	52	197	435	753	788	1049	1146	1498	1635	1634	1633	1632	1631
	Total Load	68	260	492	753	788	1049	1146	1498	1635	1634	1633	1632	1631
	Req Brg (in)	1.5 / 1.5	1.5 / 2.8	2.1 / 5.3	3.2 / 8	3.4 / 8.5	4.6 / 11.5	5.1 / 12.8	6.8 / 17	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
8	Roof L/240	35	133	297	586	613	822	902	1185	1457	1456	1455	1454	1453
	Total Load	45	175	380	586	613	822	902	1185	1457	1456	1455	1454	1453
	Req Brg (in)	1.5 / 1.5	1.5 / 2.3	1.8 / 4.5	2.8 / 7	3 / 7.5	4 / 10	4.4 / 11	6 / 15	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
9	Roof L/240	25	94	211	427	461	659	724	960	1197	1313	1312	1311	1311
	Total Load	31	123	278	468	490	659	724	960	1197	1313	1312	1311	1311
	Req Brg (in)	1.5 / 1.5	1.5 / 1.8	1.5 / 3.8	2.5 / 6.3	2.6 / 6.5	3.6 / 9	4 / 10	5.3 / 13.3	6.8 / 17	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
10	Roof L/240	18	69	156	315	340	540	593	790	991	1196	1195	1194	1193
	Total Load	22	90	204	381	400	540	593	790	991	1196	1195	1194	1193
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 3	2.3 / 5.8	2.4 / 6	3.2 / 8	3.6 / 9	4.8 / 12	6.1 / 15.3	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
11	Roof L/240	14	52	118	239	258	422	493	660	831	1015	1097	1096	1095
	Total Load	16	67	154	314	332	450	495	660	831	1015	1097	1096	1095
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	2.1 / 5.3	2.2 / 5.5	2.9 / 7.3	3.2 / 8	4.4 / 11	5.6 / 14	6.9 / 17.3	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
12	Roof L/240	10	40	91	186	201	328	384	560	707	864	1013	1012	1011
	Total Load	12	51	118	244	264	379	418	560	707	864	1013	1012	1011
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 2.3	1.7 / 4.3	1.9 / 4.8	2.7 / 6.8	3 / 7.5	4 / 10	5.1 / 12.8	6.4 / 16	7.5 / 18.8	7.5 / 18.8	7.5 / 18.8
13	Roof L/240	--	32	72	147	159	260	304	480	607	745	893	940	940
	Total Load	--	40	93	192	208	324	357	480	607	745	893	940	940
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 3.8	1.6 / 4	2.5 / 6.3	2.8 / 7	3.7 / 9.3	4.7 / 11.8	5.9 / 14.8	7.1 / 17.8	7.5 / 18.8	7.5 / 18.8
14	Roof L/240	--	25	58	119	128	210	246	396	527	647	778	878	877
	Total Load	--	31	74	154	167	275	309	415	527	647	778	878	877
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 3.3	1.5 / 3.5	2.3 / 5.8	2.6 / 6.5	3.5 / 8.8	4.4 / 11	5.5 / 13.8	6.6 / 16.5	7.5 / 18.8	7.5 / 18.8

ROOF LOAD TABLE 125% LOAD DURATION (PLF)

Clear span (ft)		VMG LIGNUM 1.4E LVL, 1 Ply, 1.5" Thickness												
		Depth (in)												
		3.5	5.5	7.25	9.25	9.5	11.25	11.875	14	16	18	20	22	24
15	Roof L/240	--	21	47	97	105	172	201	325	461	568	683	805	823
	Total Load	--	25	59	125	135	224	263	363	461	568	683	805	823
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.8	1.5 / 3	2 / 5	2.3 / 5.8	3.2 / 8	4.1 / 10.3	5.1 / 12.8	6.2 / 15.5	7.4 / 18.5	7.5 / 18.8
16	Roof L/240	--	17	39	80	87	142	167	269	397	501	604	713	774
	Total Load	--	20	49	103	111	185	217	320	406	501	604	713	774
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	1.5 / 2.8	1.8 / 4.5	2.1 / 5.3	3 / 7.5	3.9 / 9.8	4.8 / 12	5.8 / 14.5	6.9 / 17.3	7.5 / 18.8
17	Roof L/240	--	14	32	67	72	119	140	226	333	446	537	636	731
	Total Load	--	16	40	85	92	154	181	283	361	446	537	636	731
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.3	1.5 / 2.5	1.6 / 4	1.8 / 4.5	2.9 / 7.3	3.6 / 9	4.5 / 11.3	5.5 / 13.8	6.5 / 16.3	7.5 / 18.8
18	Roof L/240	--	12	27	57	61	101	118	191	282	397	481	569	664
	Total Load	--	13	33	71	77	129	152	248	322	398	481	569	664
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2	1.5 / 2.3	1.5 / 3.5	1.6 / 4	2.7 / 6.8	3.4 / 8.5	4.3 / 10.8	5.2 / 13	6.2 / 15.5	7.2 / 18
19	Roof L/240	--	10	23	48	52	86	101	163	241	340	433	513	599
	Total Load	--	11	28	60	65	109	129	211	289	358	433	513	599
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2	1.5 / 3.3	1.5 / 3.8	2.4 / 6	3.3 / 8.3	4 / 10	4.9 / 12.3	5.8 / 14.5	6.8 / 17
20	Roof L/240	--	--	20	41	45	74	87	141	208	293	391	465	542
	Total Load	--	--	23	51	55	93	110	181	261	324	391	465	542
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 1.8	1.5 / 3	1.5 / 3.3	2.2 / 5.5	3.1 / 7.8	3.8 / 9.5	4.7 / 11.8	5.5 / 13.8	6.5 / 16.3
22	Roof L/240	--	--	15	31	34	56	65	106	157	222	302	385	450
	Total Load	--	--	17	37	41	69	82	135	202	268	324	385	450
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	1.5 / 2.8	1.8 / 4.5	2.7 / 6.8	3.5 / 8.8	4.2 / 10.5	5 / 12.5	5.9 / 14.8
24	Roof L/240	--	--	12	24	26	43	51	82	122	172	234	309	379
	Total Load	--	--	12	28	30	52	62	103	155	221	272	324	379
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2	1.5 / 2.5	1.5 / 3.8	2.2 / 5.5	3.2 / 8	3.9 / 9.8	4.6 / 11.5	5.4 / 13.5
26	Roof L/240	--	--	--	19	20	34	40	65	96	136	185	245	316
	Total Load	--	--	--	21	23	40	48	80	121	173	232	276	323
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2	1.5 / 3.3	1.9 / 4.8	2.7 / 6.8	3.6 / 9	4.3 / 10.8	5 / 12.5
28	Roof L/240	--	--	--	15	16	27	32	52	77	110	149	197	254
	Total Load	--	--	--	16	17	31	37	63	96	138	190	237	278
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.8	1.5 / 2.8	1.7 / 4.3	2.3 / 5.8	3.2 / 8	4 / 10	4.7 / 11.8
30	Roof L/240	--	--	--	12	13	22	26	42	63	89	122	161	208
	Total Load	--	--	--	12	13	24	29	50	77	111	153	205	242
	Req Brg (in)	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 1.5	1.5 / 2.5	1.5 / 3.8	2.1 / 5.3	2.8 / 7	3.7 / 9.3	4.4 / 11

ALLOWABLE UNIFORM LOADS APPLIED TO EITHER FACE OF BEAM

ALLOWABLE UNIFORM LOADS APPLIED TO EITHER FACE OF BEAM NOTES

1. Allowable uniform loads in pounds per linear foot (plf) applied to either face of multi-ply beams with various ply-to-ply fastening. Tabulated allowable loads assume normal load duration.
2. Refer to screw manufacturer's various evaluation reports for spacing requirements.
3. When fastening from both sides, stagger fastener rows by half the row spacing.
4. Concentrated face loads require additional analysis when the concentrated load divided by the tabulated fastener spacing exceeds the tabulated allowable uniform load.

HOW TO USE THE ALLOWABLE UNIFORM LOADS APPLIED TO EITHER FACE OF BEAM TABLES

1. Compute the allowable stress design uniform load on the beam.
2. Ensure the calculated uniform load is less than the allowable uniform load for the desired fastening.

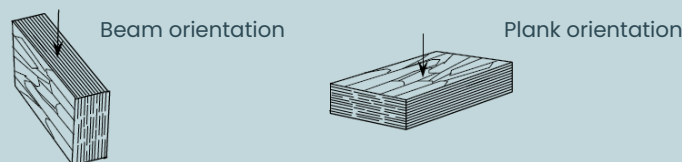


Figure 1 – an illustration of beam and plank orientation as noted in table1

Table 1-reference design values for VMG LIGNUM LVL^{1,2}

BEAM ORIENTATION ³					PLANK ORIENTATION ³					AXIAL	
Modulus of elasticity		Bending ^{7,8} F _b (psi)	Shear F _v (psi)	Compression Perp-to-Grain F _{c1} ¹⁰ (psi)	Modulus of elasticity		Bending F _b (psi)	Shear F _v (psi)	Compression Perp-to-Grain F _{c1} ¹⁰ (psi)	Compression F _c (psi)	Tension F _t ⁹ (psi)
E _{true} ⁴ (x10 ⁶ psi)	E _{apparent} ^{5,6} (x10 ⁶ psi)				E _{true} ⁴ (x10 ⁶ psi)	E _{apparent} ^{5,6} (x10 ⁶ psi)					
1.4	1.3	1.850	250	550	1.4	1.3	2.200	150	300	2.300	1.600
2.0	1.9	3.050	350	700	2.0	1.9	3.300	150	380	3.000	2.700

For SI: 1 inch = 25.4 mm, 1 psi = 6894.8 Pa

¹ The tabulated values are design values for normal duration of load and must be adjusted by the applicable adjustment factors in accordance with Section 8.3 of the 2024 and 2018 NDS. Modulus of elasticity and compression perpendicular-to-grain must not be adjusted for duration of load.

² The tabulated values are limited to dry interior conditions where the average moisture content in lumber is less than 16 percent.

³ Refer to Figure 1 for LVL orientations.

⁴ Reference E_{true} values are the shear-free modulus of elasticity, which do not include the effects of the shear deformation. When calculating the total deflection, both bending and shear deformations must be included. Equations for various span and load conditions are available in engineering references.

⁵ Reference E_{apparent} values are the apparent modulus of elasticity, which include the effects of shear deformation. When calculating the total deflection, standard engineering formulae for the pure bending deflection is sufficient.

⁶ Reference modulus of elasticity, E_{min} , used for beam stability calculations, must be calculated using the tabulated E_{apparent} in accordance with Appendix D of the 2024 and 2018 NDS. The COV_E may be taken as 0.10 when calculating E_{min} .

⁷ Reference bending design value in the beam orientation, $F_{b'}$, may be increased by 4% when the member qualifies as a repetitive member, in accordance with Section 8.3.7 of the 2024 and 2018 NDS.

⁸ Reference bending design value in beam orientation is based on a reference depth of 12 inches. For other depths, the allowable bending stress, $F_{b'}$, must be adjusted by multiplying F_b by $(12/d)^{0.15}$, where d is depth member in inches. For depths $3\frac{1}{2}$ inches or less, multiply F_b by 1.203.

⁹ Reference tension design values, F_t , are assigned for a standard length of 36 inches. For lengths longer than 36 inches, multiply F_t by $(36/L)^{0.09}$, where L is the length in inches. For lengths less than 36 inches, use the reference tension design value given in the table above.

¹⁰ The bearing area factor, $C_{b'}$, is permitted to be applied to the reference compression perpendicular-to-grain design values, $F_{c1'}$ in accordance with the 2024 and 2018 NDS.