

VMG LIGNUM LVL

GRADE 1.4E

ALLOWABLE HOLES FOR BEAMS



ALLOWABLE HOLES FOR BEAMS

ALLOWABLE HOLE FOR BEAM NOTES

1. Allowable hole tables for flexural members based on APA V900D (Feb 2021) and the reference design values listed in ESR-5621 Table 1. Allowable shear and moment demands at the hole location are tabulated for various beam depths and hole diameters. Allowable demands assume capacities with all applicable adjustment factors equal to 1.0. Apply the appropriate adjustment factors for load duration, wet service, temperature, and beam stability to the tabulated values.
2. Interpolation of table values is permitted if the interpolated shear or moment allowable is multiplied by 0.95 in addition to applicable adjustment factors. Shaded table values exceed the maximum hole diameter and are provided for interpolation only.
3. Refer to APA V900D for hole effects on bending stiffness and hole placement requirements. Shear values have been reduced when necessary to permit consideration of a maximum hole diameter of $2d/3$ within 0.15d or 1.75" of an edge, where d is the beam depth, as discussed in V900D section 6(i).
4. Maximum hole diameter has been limited to 7 inches. Holes up to $2d/3$ are permitted if shear and moment capacities are determined per APA V900D meeting placement requirements.

HOW TO USE THE ALLOWABLE HOLE FOR BEAM TABLES

1. Ensure hole(s) meet APA V900D placement requirements.
2. Determine the ASD shear and moment forces in the beam at the hole location along the span.
3. Determine any additional adjustment factors for the condition (load duration, wet service, etc.)
4. Determine allowable shear and moment forces for the beam depth and hole diameter.
5. Ensure the calculated shear and moment forces are less than the table allowable values multiplied by applicable adjustment factors.
6. Refer to APA V900D for effective stiffness of the beam with hole(s) when checking deflection

Allowable Shear and Moment Capacity for VMG LIGNUM 1.4E LVL, 1.50" Thickness

Depth (in)	Max Hole Dia. (in)	Capacity	No Hole	Hole Diameter (in)					
				2	3	4	5	6	7
9.25	5.7	Shear (lb)	2310	770	770	740	485	285	0
		Moment (lb-ft)	3425	2500	2375	2375	2375	2240	0
9.5	6.0	Shear (lb)	2375	790	790	790	530	320	0
		Moment (lb-ft)	3600	2610	2455	2455	2455	2455	0
11.25	7.0	Shear (lb)	2810	935	935	935	865	610	400
		Moment (lb-ft)	4925	3475	3190	3005	3005	3005	3005
11.875	7.0	Shear (lb)	2965	985	985	985	985	725	500
		Moment (lb-ft)	5440	3840	3505	3320	3240	3240	3240
14	7.0	Shear (lb)	3500	1165	1165	1165	1165	1140	875
		Moment (lb-ft)	7380	5400	4935	4635	4465	4395	4395
16	7.0	Shear (lb)	4000	1330	1330	1330	1330	1330	1265
		Moment (lb-ft)	9445	7100	6515	6100	5835	5685	5630
18	7.0	Shear (lb)	4500	1500	1500	1500	1500	1500	1500
		Moment (lb-ft)	11750	9030	8315	7790	7420	7180	7045

Allowable Shear and Moment Capacity for VMG LIGNUM 1.4E LVL, 1.75" Thickness

Depth (in)	Max Hole Dia. (in)	Capacity	No Hole	Hole Diameter (in)					
				2	3	4	5	6	7
9.25	5.7	Shear (lb)	2695	895	895	865	565	330	0
		Moment (lb-ft)	4000	2915	2770	2770	2770	2615	0
9.5	6.0	Shear (lb)	2770	920	920	920	620	375	0
		Moment (lb-ft)	4200	3045	2865	2865	2865	2865	0
11.25	7.0	Shear (lb)	3280	1090	1090	1090	1010	710	465
		Moment (lb-ft)	5745	4055	3720	3510	3510	3510	3510
11.875	7.0	Shear (lb)	3460	1150	1150	1150	1150	845	580
		Moment (lb-ft)	6350	4485	4090	3875	3780	3780	3780
14	7.0	Shear (lb)	4080	1360	1360	1360	1360	1330	1020
		Moment (lb-ft)	8610	6300	5755	5405	5210	5130	5130
16	7.0	Shear (lb)	4665	1555	1555	1555	1555	1555	1475
		Moment (lb-ft)	11020	8285	7600	7120	6805	6635	6565
18	7.0	Shear (lb)	5250	1750	1750	1750	1750	1750	1750
		Moment (lb-ft)	13705	10535	9705	9090	8655	8375	8220