

Wood Beam Calculator

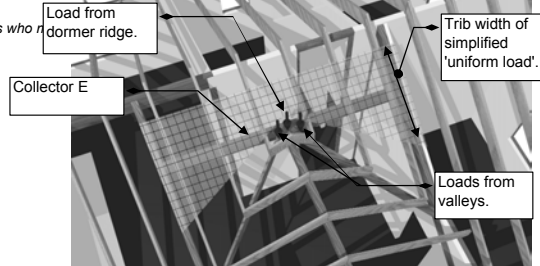


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Assumptions: Beams are simple span (no overhangs, etc.). Full length of top of beam is laterally supported. No shear stress modifications. Bending in strong axis only. No wet use or high moisture content. No high temperature use. Dynamic loading not considered. Design values from 1997 National Design Specification for Wood Construction.

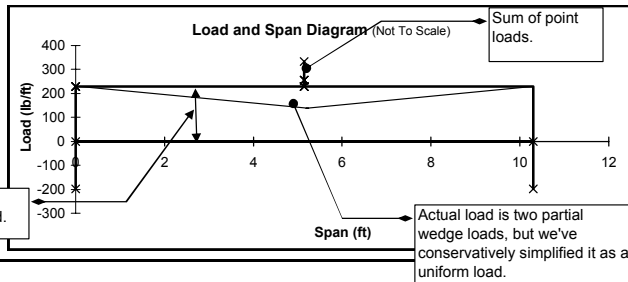
Disclaimer: All users of this software shall comply with State Engineering Law, which specifies who perform engineering, and defines the practice of engineering.

Job Name: Two story wood framed example
Beam I.D.: Collector E
Other Info.:



General Information

Span, L = 10.30 ft
 Max. Allowed Live Deflection, L / 360 = 0.34 in
 Max. Allowed Total Deflection, L / 240 = 0.52 in
 Load Duration: Two Months (Snow)
 Add Self Wt.? Yes No
 Loads Other Than Uniform Loads? Yes



Uniform Loads Over Full Length of Member

	Live, psf	Dead, psf	Tributary width, ft	Uniform Live Load, plf	Reduced Live Load, plf	Unif. Dead Load, plf
Roof Loads (not including snow)	16 psf	16 psf	4.25 ft	-	-	68.0 lb/ft
Roof Snow (only)	38 psf		4.25 ft	161.5 lb/ft	161.5 lb/ft	
Load Subtotals				161.5 lb/ft	161.5 lb/ft	68.0 lb/ft
Total Uniform Loads				W _L = 161.5 lb/ft		W _D = 68.0 lb/ft
Combined Total Uniform Load				W _U = 229.5 lb/ft		

Concentrated (Point) Loads

	Live Load, psf	Dead Load, psf	Trib. Width, ft.	Trib. Length, ft.	Live, lbs	Dead, lbs	Location, ft.
Point Load C			Ridge C		663 lb	377 lb	x _C = 5.15 ft
Point Load D			Valley D		185 lb	86 lb	x _D = 5.15 ft
Point Load E			Valley D		185 lb	86 lb	x _E = 5.15 ft

Note: Location Measured From Left Support

4x And Smaller (Lumber)

Lumber Material: Douglas Fir-Larch
 Lumber Grade: No. 2
 Repetitive Member Use? No

-	3 x 16
-	4 x 14
(3) 2 x 12	

5x And Larger (Timbers)

Timber Material: Douglas Fir - Larch
 Timber Grade: WCLIB - No. 2

-	-	-
6 x 12	-	-
8 x 10	-	-
10 x 10	-	-

Glued Laminated Members

Glulam Grade: 24F-V4

2.5 x 9	5.125 x 7.5
3 x 9	6.75 x 7.5
3.125 x 9	8.75 x 9
5 x 7.5	

(Applies Only To Western Species Glued-Laminated Beams)

2.0E Parallam PSL

1-3/4" x 9-1/2"	5-1/4" x 9-1/4"
2-11/16" x 9-1/4"	7" x 9-1/4"
3-1/2" x 9-1/4"	

Truss-Joist MacMillan I-Joists

-	-
-	-

Final Member: Sawn Wood
Final Size: (3) 2 x 12
Minimum Bearing Length = 1.50 in
 (Assuming Full-Width Bearing)

Reactions Including Self-Weight

	R ₁	R ₂
Live Load:	1,348 lb	1,348 lb
Dead Load:	691 lb	691 lb
Total Load:	2,040 lb	2,040 lb

Efficiency of Member:

Bending Overdesign:	29.2%
Shear Overdesign:	103.5%
Deflection Overdesign:	255.9%

Add'l Detail - Incl. Self Wt.

Max Moment: 7,289 ft-lb
 Member Design Shear: 1,812 lb
 Total Deflection: 0.145 in
 Live Deflection: 0.096 in
 Req'd EI, no self-weight added: 2.375E+08 (in⁴-lb)
 Approx. Self Weight: 12.94 plf
 Min. Calc'd Bearing Length: 0.73 in

Final Member Selected: (3) 2 x 12, Douglas Fir-Larch, No. 2

This member makes it by: **29.2%**
 Controlling criteria is: **Bending**