

Wood Beam Calculator

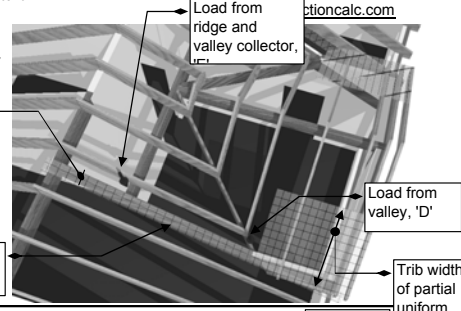
Assumptions: Beams are simple span (no overhangs, etc.). Full length of top of beam is laterally supported. No shear stress modifications. Bending in strong axis only. No wet use or high moisture content. No high temperature use. Dynamic loading not considered. Design values from 1997 National Design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

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



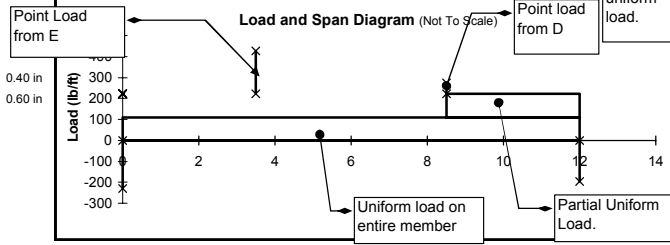
Job Name: Two story wood framed example
Beam I.D.: Corner Collector F
Other Info.:

Trib width of full length uniform load.



General Information

Span, L = 12.00 ft
 Max. Allowed Live Deflection, L / 360 = 0.40 in
 Max. Allowed Total Deflection, L / 240 = 0.60 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	2.00 ft	-	-	32.0 lb/ft
Roof Snow (only)	38 psf		2.00 ft	76.0 lb/ft	76.0 lb/ft	
Load Subtotals				76.0 lb/ft	76.0 lb/ft	32.0 lb/ft
Total Uniform Loads				$W_L = 76.0$ lb/ft		$W_D = 32.0$ lb/ft
Combined Total Uniform Load				$W_U = 108.0$ 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				Collector E	1,348 lb	691 lb	$x_C = 3.50$ ft
Point Load D				Valley D	370 lb	163 lb	$x_D = 8.50$ ft

Note: Location Measured From Left Support

Partial Uniform Loads

	Live Load, psf	Dead Load, psf	Tributary width, ft	Live Load, plf	Dead Load, plf	Comb'd Load, plf	Start Point, ft.	End Point, ft.
Partial Load A	38 psf	16 psf	2.10 ft	79.8 lb/ft	33.6 lb/ft	113.4 lb/ft	8.50 ft	12.00 ft

Note: Start and End Points Measured From Left Support

4x And Smaller (Lumber)

Lumber Material: Douglas Fir-Larch
 Lumber Grade: No. 1 & Btr.
 Repetitive Member Use? No Yes
 Selections: 3 x 14, (2) 2 x 14, (3) 2 x 10, 4 x 12

5x And Larger (Timbers)

Timber Material: Douglas Fir - Larch
 Timber Grade: WCLIB - No. 2
 Selections: 6 x 12, 8 x 12

Glued Laminated Members

Glulam Grade: 24F-V4
 Selections: 2.5 x 10.5, 3 x 9, 3.125 x 9, 5 x 7.5, 5.125 x 7.5, 6.75 x 7.5, 8.75 x 9

(Applies Only To Western Species Glued-Laminated Beams)

2.0E Parallam PSL

1-3/4" x 11-1/4"	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: 4 x 12
Minimum Bearing Length = 1.50 in
 (Assuming Full-Width Bearing)

Reactions Including Self-Weight

	R ₁	R ₂
Live Load:	1,559 lb	1,350 lb
Dead Load:	807 lb	670 lb
Total Load:	2,366 lb	2,020 lb

Efficiency of Member:

Bending Overdesign:	23.1%
Shear Overdesign:	27.2%
Deflection Overdesign:	136.5%

Add'l Detail - Incl. Self Wt.

Max Moment:	7,589 ft-lb
Member Design Shear:	2,255 lb
Total Deflection:	0.254 in
Live Deflection:	0.169 in
Req'd EI, no self-weight added (in ² -lb):	3,142E+08
Approx. Self Weight:	10.07 plf
Min. Calc'd Bearing Length:	1.08 in

Final Member Selected: 4 x 12, Douglas Fir-Larch, No. 1 & Btr.

This member makes it by: **23.1%**
 Controlling criteria is: **Bending**