

# Wood Beam Calculator

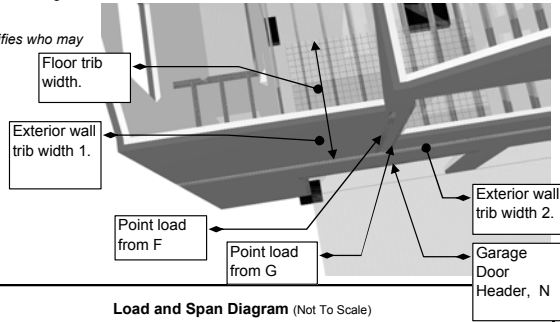
**Assumptions:** Beams are simple span (no overhangs, etc.). Full length of top of beam is laterally supported. No shear stress modifications. Bending in strong axis only. No wet use or high moisture content. No high temperature use. Dynamic loading not considered. Design values from 1997 National Design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



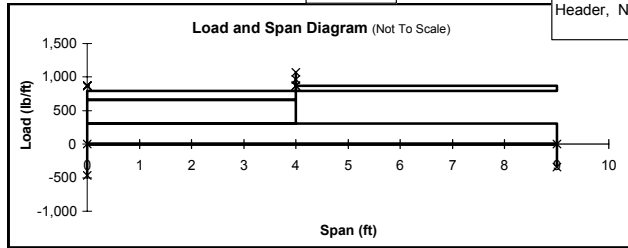
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**Job Name:** Two story wood framed example  
**Beam I.D.:** Garage Door Header N  
**Other Info.:**



## General Information

Span, L = 9.00 ft  
 Max. Allowed Live Deflection, L / 360 = 0.30 in  
 Max. Allowed Total Deflection, L / 240 = 0.45 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
Floor Loads	40 psf	12 psf	6.00 ft	240.0 lb/ft	240.0 lb/ft	72.0 lb/ft
Load Subtotals				240.0 lb/ft	240.0 lb/ft	72.0 lb/ft
Total Uniform Loads				$W_L = 240.0$ lb/ft		$W_D = 72.0$ lb/ft
Combined Total Uniform Load				$W_U = 312.0$ 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				From F	1,350 lb	670 lb	$x_C = 4.00$ ft
Point Load D				From G	407 lb	520 lb	$x_D = 4.00$ 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	6.50 ft	247.0 lb/ft	104.0 lb/ft	351.0 lb/ft	0.00 ft	4.00 ft
Partial Load B		10 psf	13.00 ft	-	130.0 lb/ft	130.0 lb/ft	0.00 ft	4.00 ft
Partial Load C		10 psf	7.70 ft	-	77.0 lb/ft	77.0 lb/ft	4.00 ft	9.00 ft

Note: Start and End Points Measured From Left Support

## 4x And Smaller (Lumber)

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

## 5x And Larger (Timbers)

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

-	12 x 12	-
6 x 14	14 x 14	-
8 x 12	16 x 16	-
10 x 12	-	-

## Glued Laminated Members

Glulam Grade: 24F-V4

2.5 x 12	5.125 x 9
3 x 10.5	6.75 x 7.5
3.125 x 10.5	8.75 x 9
5 x 9	

(Applies Only To Western Species Glued-Laminated Beams)

## 2.0E Parallam PSL

1-3/4" x 14"	5-1/4" x 9-1/4"
2-11/16" x 11-1/4"	7" x 9-1/4"
3-1/2" x 9-1/4"	

## Truss-Joist MacMillan I-Joists

-	-
-	-

**Final Member:** Glued Laminated  
**Final Size:** 5 x 9  
**Minimum Bearing Length = 1.50 in**  
 (Assuming Full-Width Bearing)

## Reactions Including Self-Weight

	$R_1$	$R_2$
Live Load:	2,825 lb	2,080 lb
Dead Load:	1,871 lb	1,389 lb
Total Load:	4,695 lb	3,470 lb

## Add'l Detail - Incl. Self Wt.

Max Moment: 12,348 ft-lb  
 Member Design Shear: 4,092 lb  
 Total Deflection: 0.292 in  
 Live Deflection: 0.177 in  
 Req'd EI, no self-weight added 3,514E+08 (in<sup>4</sup>-lb)  
 Approx. Self Weight 11.21 plf  
 Min. Calc'd Bearing Length 1.44 in

**Efficiency of Member:**  
 Bending Overdesign: 25.7%  
 Shear Overdesign: 60.2%  
 Deflection Overdesign: 54.0%

**Final Member Selected: 5 x 9, Glued Laminated, 24F-V4**

This member makes it by: **25.7%**  
 Controlling criteria is: **Bending**