

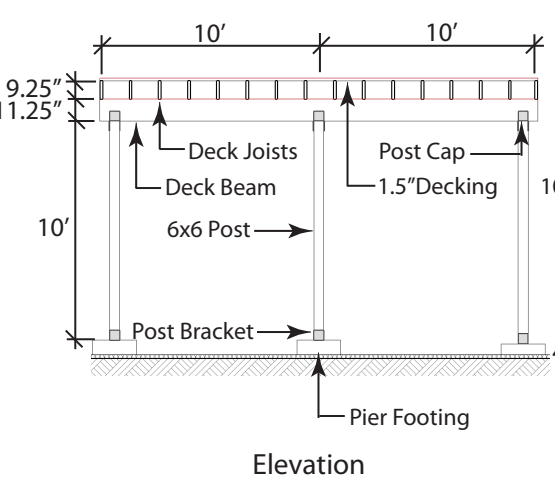


# Deck Beam [USA Wood Beam]

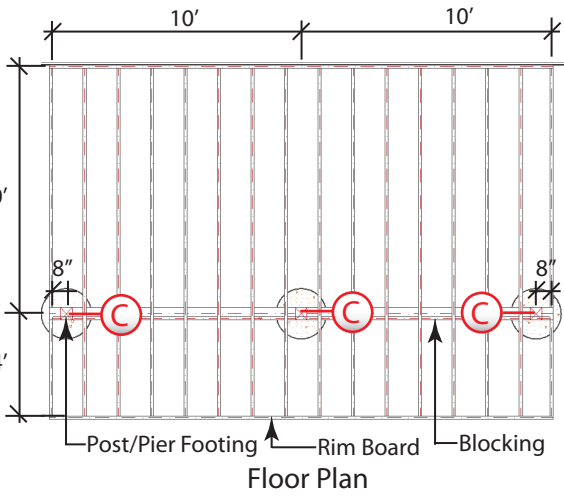
See how you can design a Deck Beam to ASD or LRFD requirements!

Learn how to translate your CAD Plan and Elevation directly to a ClearCalcs Calculation!

Please be aware that ClearCalcs does not offer engineering advice and cannot assist with individual projects. This example should not be used as advice, recommendations, or instructions for engineering design and should only be followed as a guide to using ClearCalcs' USA Wood Beam calculator.



Elevation



Floor Plan

## DESIGN CRITERIA

Size/Type: 4-2x12 D.Fir-L **A**

Length: 20' **B**

Support: 6x6 D.Fir-L Column **C**

\*A nominal 6x6 Wood Post section has a design dimension of 5.5"x5.5" which is used as the bearing area

Deck Loading (Load Linked) **E**

Dead: 10 psf    Snow: 40 psf

Live: 60 psf **D**

\*60 psf is typical for a deck except in the IRC where it is 40 psf. California Residential Code also amends the IRC to use 60 psf

Key Properties

Primary Loading

height=13.3 in  
width=6 in

Section Type: Standard Sections Database

Size and Grade: 2x12 D.Fir-L No. 1 **A**

Number of Plies: 4

Beam Plan Length:  $L_x = 20$  ft **B**

Total Material Length:  $L = 20$  ft, 0 in

Continuous Bracing for Lateral Torsional Buckling: Top Braced

Supports and Braces: Refer to plan for support locations

Support/Brace Type	Position From Left $x_i$ (in)	Bearing Length $\Delta_i$ (in)
Pinned	8 in	5.5
Pinned	L-8 in	5.5
Pinned	L/2	5.5
Pinned		

Support distance measured from the left side of beam

Must be set for bearing check

Design Code for Load Combinations: International Building Code (IBC) 2018

Beam Incline: Horizontal

Repeating Member?: Non-Repeating

Service Condition: Wet

Temperature Range:  $T \leq 100^\circ\text{F}$

Incised?: Yes **A**

Deflection Limit Absolute Limit:  $\Delta_{max} = 1$  in

Live / Short-term Deflection Limit:  $(L/)_ST = 360$

Long Term Deflection Limit:  $(L/)_LT = 240$

Simplified DL+LL Deflection Limit:  $(L/)_DL+LL = 180$

Double L/ Deflection Limits for Cantilevers?: No

Expected design conditions for outdoor wood deck provided by "Deck Beam" preset

Maximum allowable deflection specified by building code

Loads

Distance from Left of Beam (ft)

Minimum Balcony/Deck Live Load:  $LL_{min,deck} = 60$  psf **D**

Distributed Loads

Label	Start Location $x_{start}$ (ft)	End Location $x_{end}$ (ft)	Total Start Trib. Width $ZW_s$ (ft)	Total End Trib. Width $ZW_e$ (ft)	Load Magnitudes $w$
Deck Loads	0	20	9	9	D, L, S
					TW_s, D, L, Lr

Line Loads

Label	Start Location $x_{start}$ (ft)	End Location $x_{end}$ (ft)	Load Magnitudes $w_{line}$
Joist Self-Weight	0	20	D: 28.8 plf, 28.8 plf
			D, L, Lr

Deck Loads and Joist weight can be entered as psf/plf with their respective tributary widths/location per building code requirements

Alternatively, consider using ClearCalcs' Load Linking function to quickly and more accurately link loads from the deck joists to the deck beam!

Line Loads

Label	Start Location $x_{start}$ (ft)	End Location $x_{end}$ (ft)	Load Magnitudes $w_{line}$
DeckJoist-2	0	20	D, L, S
			D, L, Lr

Bending Axis: Strong (X-X)

Include Self-weight: Yes

Live Load Type: Occupancy

Brace at Point Loads?: No

IRC span tables typically includes self-weight as part of dead load

This design example is part 2 of 4 examples in our "Deck Design Series." For additional information regarding load linking and the other design examples available in this series, please visit the ClearCalcs Support Center.