

# Beam-No Name

Digital Canal  
 Project: unnamed  
 Job: q  
 Client: q

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 Designed by: auderer  
 Checked by: \_\_\_\_\_

## Input Data

<i>Span</i>	<i>Horizontal Span Length ft</i>	<i>Actual Length ft</i>	<i>Left Support Width in</i>	<i>Right Support Width in</i>
Member 1				
Span 1	12	12	3.5	3.5
Overall Length	12	12		

### Notes:

- Lengths are to center line of bearing.
- Spacing or tributary width is 1.3333 ft.

Area Loads					
<i>Dead psf</i>	<i>Construction psf</i>	<i>Floor Live psf</i>	<i>Roof Live psf</i>	<i>Wind psf</i>	<i>Snow psf</i>
10	0	40	0	0	0

## User Defined Loads

<i>Load Case</i>	<i>Load Type</i>	<i>Distance(s) to Start ft</i>	<i>Load Length ft</i>	<i>Load at Start lb</i>	<i>Load at End lb</i>	<i>Offset ft</i>
Description: Floor Live	Concentrated	7		450		0

### Notes:

- Positive loads act down.
- Distances are measured along horizontal axis.
- Live loads are patterned to 100%.
- Weight of members is not included in the calculations.

## Details of Member Forces - Load Combinations

<i>Member</i>	<i>Span</i>	<i>Load Comb.</i>	<i>Shear Left lb</i>	<i>Shear Right lb</i>	<i>Bending Left End ft-lb</i>	<i>Bending Right End ft-lb</i>	<i>Bending Max. ft-lb</i>	<i>Dist. to Max. ft</i>	<i>Torsion ft-lb</i>	<i>Defl. in</i>
1	1	Dead	80.00	-80.00			239.99	6.00		-0.033
		Dead+Floor Live w/Pattern Loads	587.49	-662.49			2467.56	7.03		-0.309

## Reactions

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<i>Support</i>	<i>Load Comb.</i>	<i>Horizontal lb</i>	<i>Vertical lb</i>	<i>Moment ft-lb</i>
1	Dead	0.00	80.00	0.00
	Dead+Floor Live w/Pattern Loads	0.00	587.49	0.00
2	Dead	0.00	80.00	0.00
	Dead+Floor Live w/Pattern Loads	0.00	662.49	0.00

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






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## Timber Design 1 - Option 1 - Design of Member 1 - 2x10

### Design Data

Design of Member 1 - 2x10 		
Material type is Select Structural -Douglas Fir-Larch -Dimensional		
Check for repetitive use? Yes	Top flange bracing is Fully Braced	$E_{bx}$ : 1.9e+06 psi
Moist use? No	Bottom flange bracing is Braced At Supports	$E_{by}$ : 1.9e+06 psi
$I_x = 98.9 \text{ in}^4$ $S_x = 21.4 \text{ in}^3$	$I_y = 2.6 \text{ in}^4$ $S_y = 3.5 \text{ in}^3$	G assumed as .06E
Shear $C_H = 1$ Snow $C_d = 1.15$	This is not a spaced column	$F_b$ : 1500 psi
Side loaded? No	$K_X = 1$	$F_t$ : 1000 psi
Overstress factor = 1	$L_X =$	$F_c$ : 1700 psi
Allowable Floor live load deflection = L/360	$K_Y = 1$	$F_{cL}$ : 625 psi
Allowable Floor total load deflection = L/240 (3 in Maximum)	$L_Y =$	$F_v$ : 95 psi
Member weight used in analysis = 0 plf	Area = 13.88 in <sup>2</sup>	Actual density: 35 pcf

### Critical Design Checks


	Critical Reaction lb	Axial psi	Bending - X psi	Bending - Y psi	Shear psi	LL Defl. in	TL Defl. in
Span 1 Value	662.49	0	1391.11	0	65.014	-0.276	-0.309
Allowable	3281.25	N.A.	1897.5	1897.5	95	0.4	0.6
% of Allow.	20 	0 	73 	0 	68 	68 	51 
Location	12	6.9829	6.9829	6.9829	11.0833	6.147	6.147

	$C_D$	$C_t$	$C_L$	$C_V$	$C_{Fb}$	$C_T$	$C_F$	$C_{Px}$	$C_{Py}$	$C_H$	$C_T$
Span 1	1.000	1.000	1.000	1.000	1.000	1.150	1.000	1.000	1.000	1.000	1.000

	$C_b$	$C_{Fb}$	$C_{Ft}$	$C_{Fc}$	$C_{Mb}$	$C_{Mt}$	$C_{Mv}$	$C_{McL}$	$C_{Mc}$	$C_{ME}$	$R_b$
Span 1	1.000	1.100	1.100	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0

	L/d Limit	$L_x/d$	$L_y/d$	$F_{CEx}$ psi	$F_{CEy}$ psi	$F_{bE}$ psi	$K_{CE}$	c	$F_c^*$ psi
Span 1	50	0	0	N.A.	N.A.	765.735	0.3	0.8	1700

#### Notes:

- Member has an actual/allowable ratio in span 1 of 73  %.
- Design is governed by bending fb/Fb.
- Governing load combination is Dead+Floor Live w/Pattern Loads.
- Maximum hanger forces: 587.49 lb (Left) and 662.49 lb (Right).

### Minimum Bearing

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<i>Span</i>	<i>Actual Length ft</i>	<i>Left Support Min. Bearing in</i>	<i>Right Support Min. Bearing in</i>
Span 1	12	1.5	1.5

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Notes:

- Locations of maximum stress, moment, etc. are measured from the left end of the member.
- Bearing across full width of beam is required.
- Structural adequacy of supporting members must be confirmed.
- Bearing lengths required may be limited by bearing stress on supporting members.
- A negative reaction indicates that the beam must be fastened to the support to resist uplift.
- See manufacturer's literature for side loaded connection requirements.
- Cantilever deflection allowables are based on twice the span length.
- Timber design if governed by NDS 1997.