SCOPE

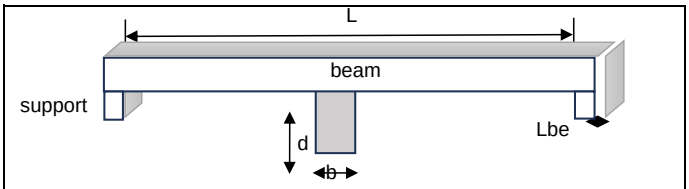
This Spreadsheet calculates the bending, shear, bearing, and deflection capacities of a simply supported beam with a distributed load along its length.

DESIGN CODE

[1]"2018 NDS," American Wood Council, 2018.
[2]"2018 NDS Supplement," American Wood Council, 2021.

DESIGN SUMMARY

Level	1
Label	FB1
Type	Beam



Description	Unit	Capacity	Demand	DCR	Result
Bending	kip-ft	1.09	1.0	0.95	PASS
Shear	kip	1.24	0.31	0.25	PASS
Deflection	in	0.69	1.150	1.67	FAIL
Bearing	kip	3.63	0.31	0.08	PASS

INPUT PARAMETERS

Design Loads

M	1.03	kip*ft	Maximum Moment	
V	0.31	kip	Maximum Shear	
R	0.31	kip	Maximum Reaction	

Design Geometry

L	13.5	ft	Clear Span length	
bn	2	in	Nominal width	
db	6	in	Nominal depth	
N	1	-	Number of Sections	
Lbe	3.5	in	Bearing Length at each end	

Material Properties

	D.F. Larch No.1		Wood Species and Grade	
Fb	1000	psi	Bending value	[2]- Tab. 4A
Emin	620000	psi	Min Modulus of elasticity	[2]- Tab. 4A
Fv	180	psi	Shear Parallel to grain	[2]- Tab. 4A
E	1700000	psi	Modulus of elasticity	[2]- Tab. 4A
fcp	625	psi	Compression perp. to grain	[2]- Tab. 4A

Adjustment Factors

Cd	1.25	Load duration Factor	[1]- Sec. 2.3.2
CM	1	Wet-service factor	[1]- Sec. 4.3.3
Ct	1	Temperature factor	[1]- Tab. 2.3.3.
CF	1	Size factor	[1]-Sec. 4.3.6
Cfu	1	Flat-use factor	[1]- Sec.4.3.7.
Ci	1	Incising factor	[1]- Sec. 4.3.8
Cr	1.15	Repetitive member factor	[1]-Sec. 4.3.9.
Cb	1.11	Bearing coefficient	[1]- Sec. 3.10.4.
CL	1.00	Beam stability factor	[1]- Sec. 3.3.3.8.

OUTPUT RESULTS

Geometric Parameters

b	1.5	in	Dressed beam breadth	
d	5.5	in	Dressed beam depth	
le	286.27	in	Effective length	
lu	165.5	in	Distance between lateral support points	[1]- Sec. 3.3.3.4.
S	7.56	in3	Section Modulus	

Adjusted Capacities

E'min	620000	psi	Adjusted Min Modulus of Elasticity	[1]- Tab. 4.3.1.
f'v	225	psi	Adjusted Shear stress	[1]- Tab. 4.3.1.
E'	1700000	psi	Adjusted Modulus of Elasticity	[1]- Tab. 4.3.1.
fcp'	691.96	psi	Adjusted perp. Compression Stress	[1]- Tab. 4.3.1.
F'bn	1725.00	psi	Adjusted Bending stress	[1]- Tab. 4.3.1.

Bending

Ma	1.0	kip*ft	Bending Demand	
Mn	1.09	kip*ft	Bending Strength	[1]- Sec 3.3.2.
DCR	0.95	PASS		

Shear

Va	0.31	kip	Shear Demand	
Vn	1.24	kip	Shear Strength	[1]- Sec 3.4.2.
DCR	0.25	PASS		

Deflection

Def_a	1.15	in	Deflection Demand	
Def_l	0.69	in	Deflection Limit	[1]- Sec 3.5.2.
DCR	1.67	FAIL		

Bearing

Ra	0.31	kip	Bearing Demand	

Bn	3.63	kip	Bearing Capacity	[1]- Sec 3.10.2.
DCR	0.08	PASS		