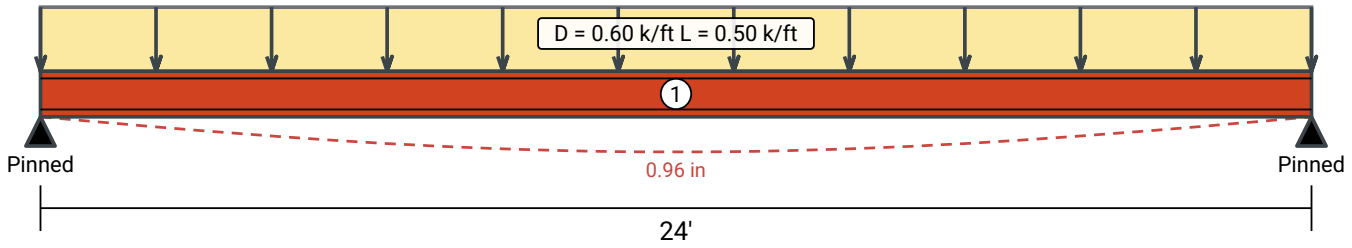
24 ft floor beam

AISC 360-22 LRFD Beam Design

November 23, 2026

Design OK (AISC 360-22 LRFD)



Design Summary

Check	Requirement	Value	Result
Bending	Unity < 1.0	0.67 F2.1: Yielding (1.2D + 1.6L + 0.5Lr)	OK
Shear	Unity < 1.0	0.18 G2.1: Nominal Shear Strength (1.2D + 1.6L + 0.5Lr)	OK
Deflection	Unity < 1.0	0.80 Service case (D + L)	OK

Design Inputs

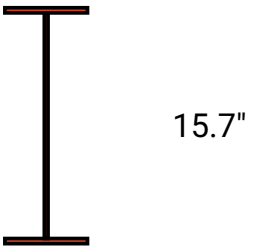
Member

Shape	W16X26
Material	Steel A992
Design specification	AISC 360-22 LRFD
Load combinations	ASCE 7-22
Weight	26 lb/ft
Self Weight	Included
Ix	301 in^4
Bracing	Continuous

Spans and Supports

Span 1	24' (Pinned to pinned)
Total length	24'

Cross Section



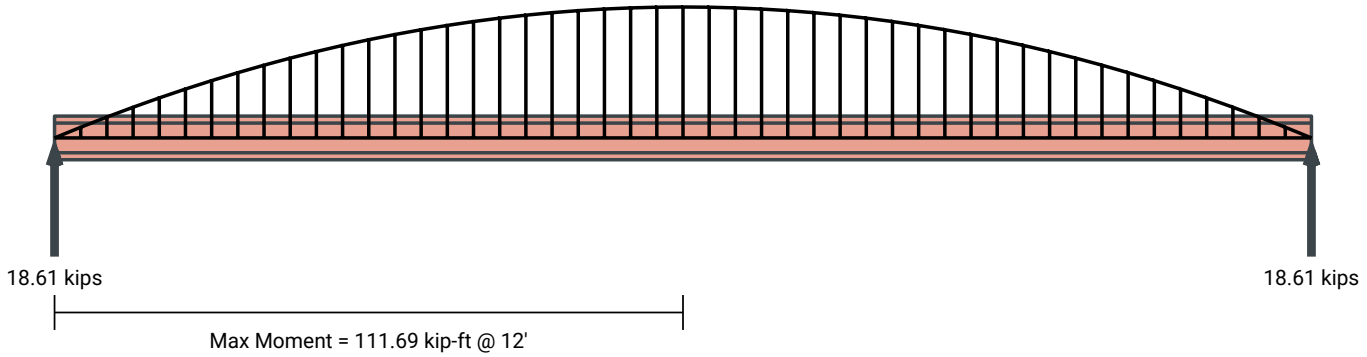
W16X26

Loads

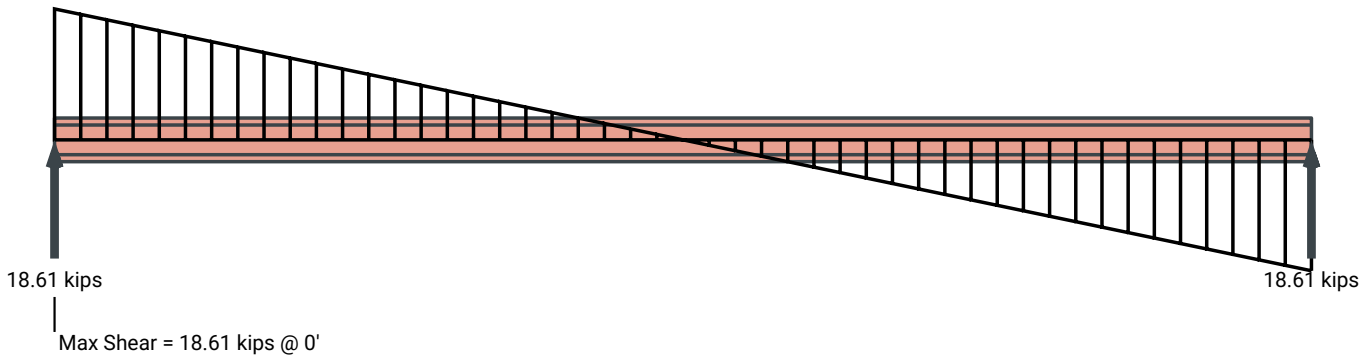
Uniform load, 0' to 24'	D = 0.60 k/ft L = 0.50 k/ft
Self weight	Included (26 lb/ft)

Design Checks

Bending Unity 0.67	OK
Mu (Demand)	111.69 kip-ft
Φ Mn (Capacity)	165.75 kip-ft
Controlling Equation	F2.1: Yielding
Location	12'
Load Combination	1.2D + 1.6L + 0.5Lr
Cb	1.00

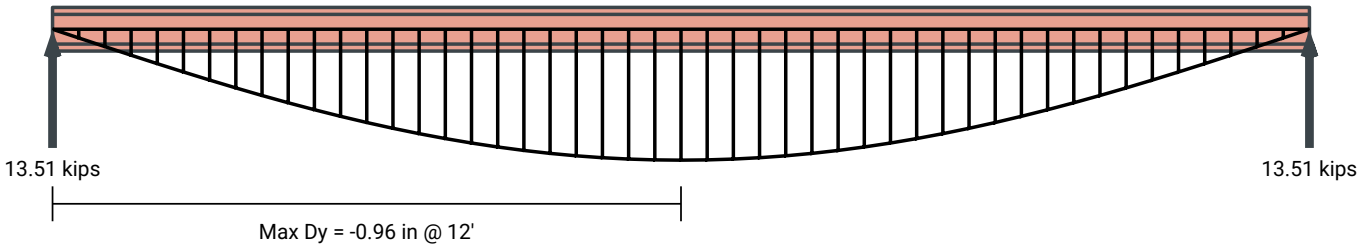


Shear Unity 0.18	OK
Vu (Demand)	18.61 kips
ΦVn (Capacity)	105.98 kips
Controlling Equation	G2.1: Nominal Shear Strength
Location	0'
Load Combination	1.2D + 1.6L + 0.5Lr



Deflection Unity 0.80 **OK**

Based On	Service Cases
Snow in Service Cases	0.7S (ASCE 7-22 snow; 2024 IBC Table 1604.3 note j)
Controlling Service Case	D + L
Max Dy	-0.96 in
Allowed Dy	1.20 in (L/240)
Live Load Limit	L/360
Dead + Live Limit	L/240
Snow or Wind Limit	L/360
Total Load Limit	L/240



Support Reactions

Load Cases

Equation	0'	24'
D	7.51 kips	7.51 kips
L	6.00 kips	6.00 kips

Load Combinations

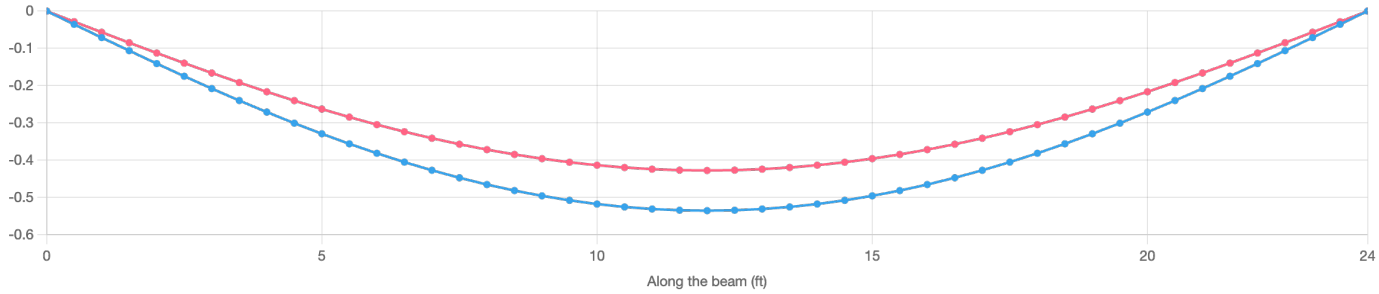
Equation	0'	24'
1.4D	10.52 kips	10.52 kips
1.2D + 1.6L + 0.5Lr *+ 2 more with the same reactions*	18.61 kips	18.61 kips
1.2D + 1.6Lr + 1.0L *+ 10 more with the same reactions*	15.01 kips	15.01 kips
1.2D + 1.6Lr + 0.5W *+ 2 more with the same reactions*	9.01 kips	9.01 kips
0.9D + 1.0W *+ 3 more with the same reactions*	6.76 kips	6.76 kips

Service Cases

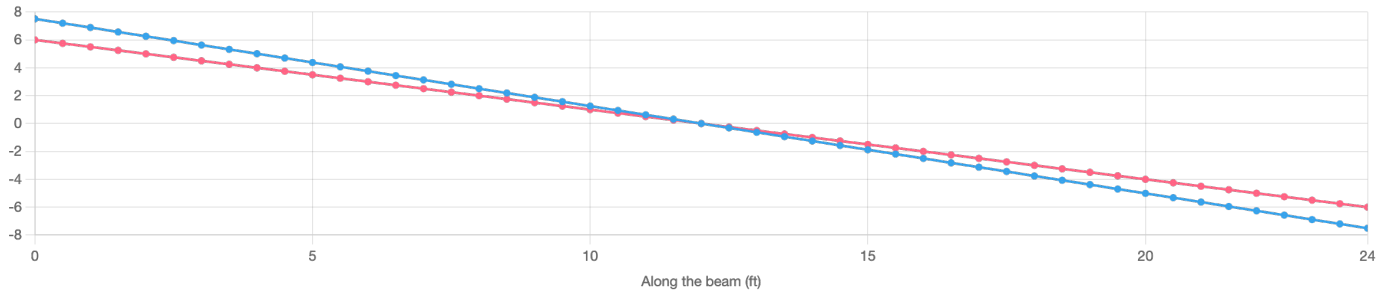
Equation	0'	24'
L (service) *+ 2 more with the same reactions*	6.00 kips	6.00 kips
D+L (service) *+ 1 more with the same reactions*	13.51 kips	13.51 kips

Load Case Plots

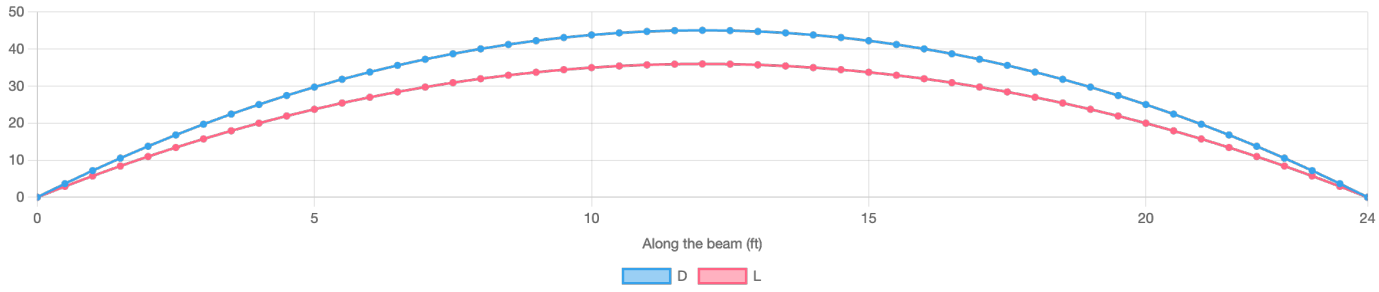
Dy (in)



Shear (kips)

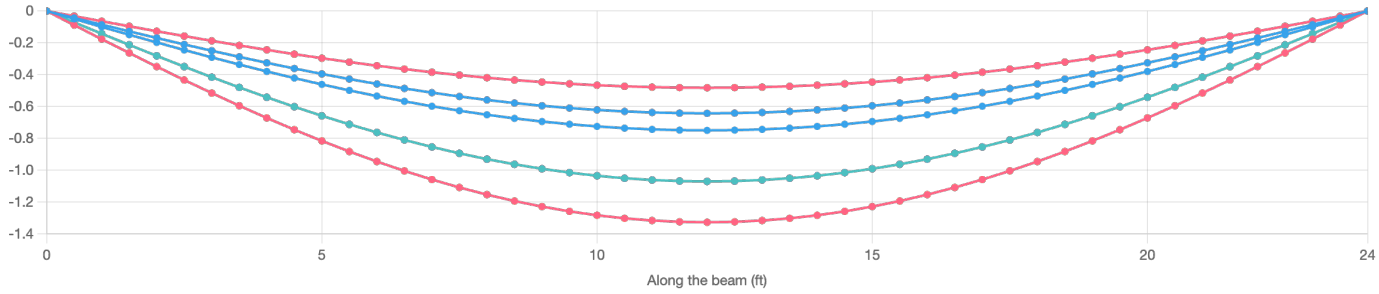


Moment (kip-ft)

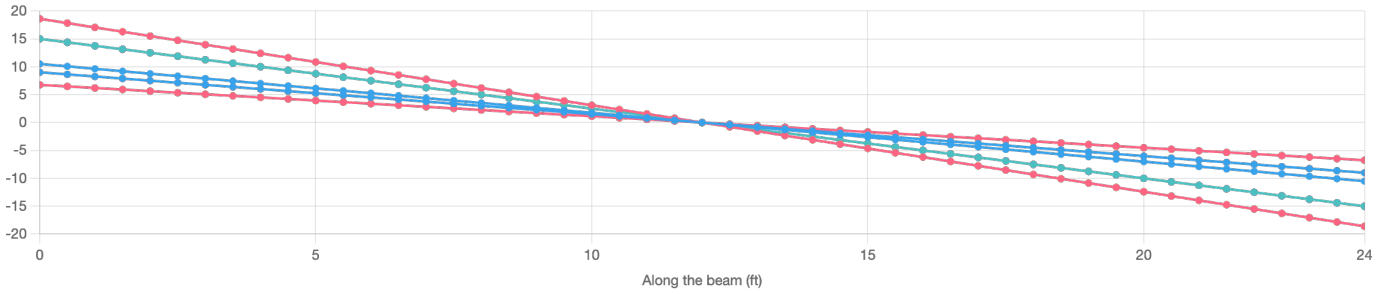


Load Combination Plots

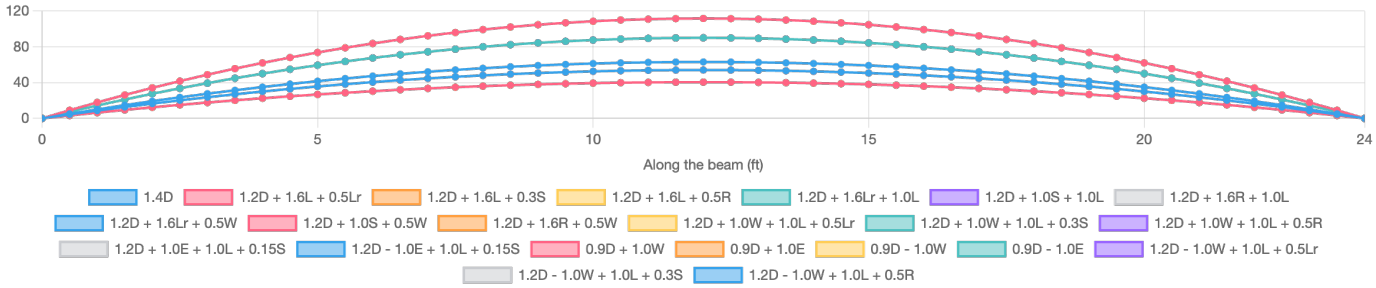
Dy (in)



Shear (kips)

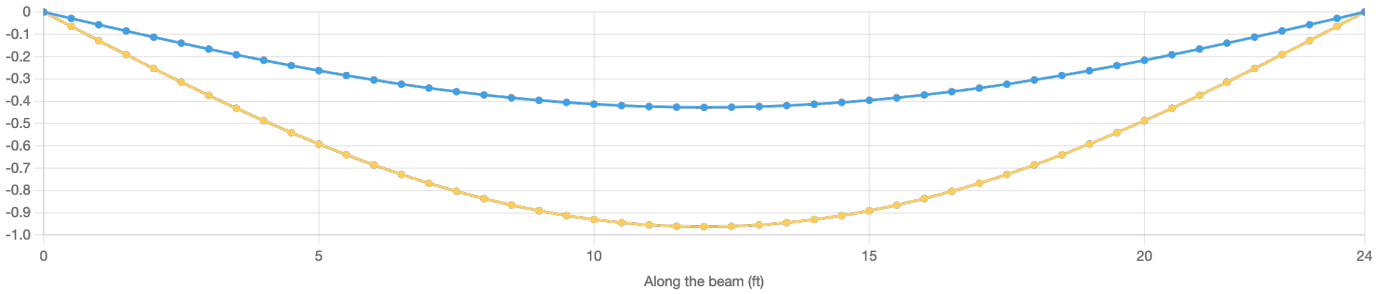


Moment (kip-ft)

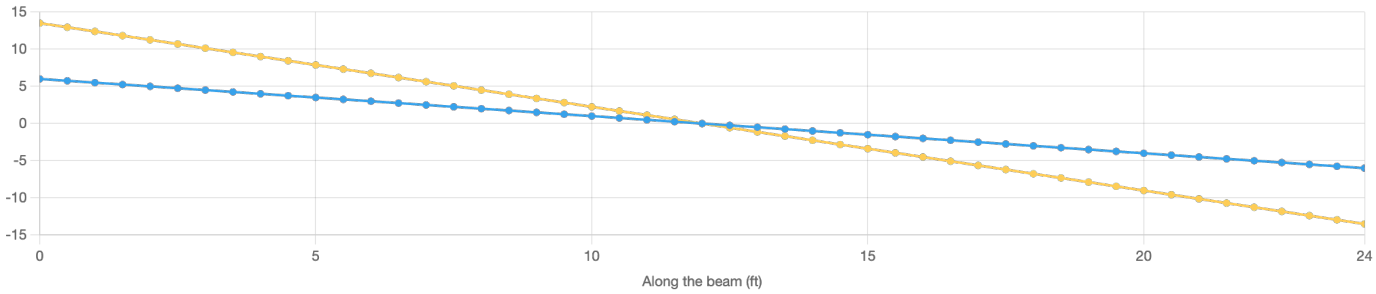


Service Case Plots

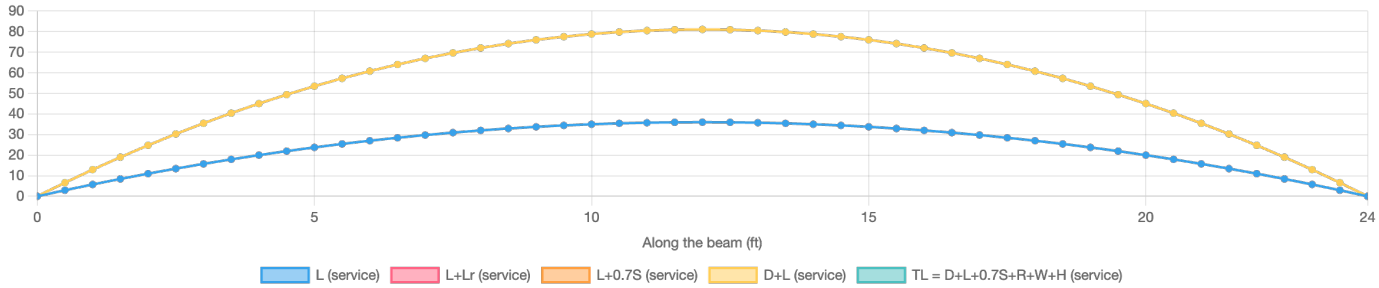
Dy (in)



Shear (kips)



Moment (kip-ft)



These calculations were produced with WebStructural software. They should be reviewed by a licensed design professional, who is responsible for verifying the inputs, assumptions and results before use.