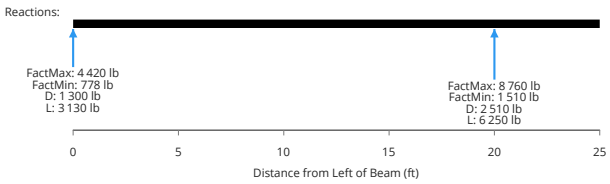
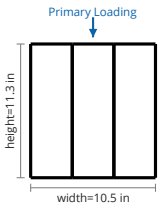
Client:	Happy Client	**Date:**	Sep 10, 2020
Author:	Efficient Engineer	**Job #:**	12345
Project:	Example Steel Beam	**Subject:**	B1
References:	NDS 2018 (ASD) and IBC 2018		

Summary

37%	Allowable Bending Moment	$M' = 57\,600$ lb · ft
25%	Allowable Shear	$V' = 22\,400$ lb
29%	Allowable Bearing Load	$R' = 30\,100$ lb
81%	Governing Live / Short-Term Deflection	$\delta_{ST} = 0.27$ in
	Critical Live / Short-Term Deflection Ratio	$(L/)_{ST} = 222$
65%	Governing Long-Term Deflection	$\delta_{LT} = 0.326$ in
	Critical Long-Term Deflection Ratio	$(L/)_{LT} = 184$
	Critical Simplified DL+LL Deflection Ratio	$(L/)_{DL+LL} = 400$



Key Properties

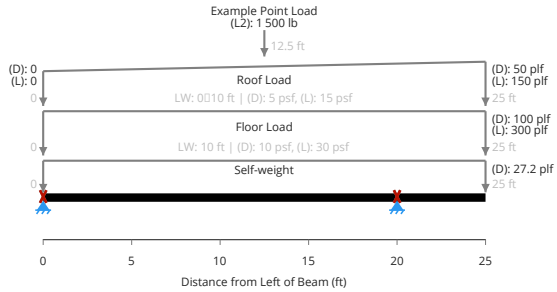


Member		3 plies - 3-1/2x11-1/4 PW LVL 2.0E-3100Fb
Total Length	$L =$	25 ft
Continuous Bracing for Lateral Torsional Buckling		No continuous bracing

Design Conditions

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

Loads



Member Properties

Cross-Sectional Area	$A = 118$ in^2
Strong Axis Moment of Inertia	$I_{xx} = 1\,250$ in^4
Section Modulus	$S = 221$ in^3
Base Allowable Bending Stress	$F_b = 3\,100$ psi
Base Allowable Shear Stress	$F_v = 285$ psi
Base Perpendicular Compression Allowable Stress	$F_{c\perp} = 850$ psi
Base Modulus of Elasticity	$E = 2\,000\,000$ psi

Elastic Modulus (NDS 2018 2.3)

Adjusted Modulus of Elasticity	$E' = 2\,000\,000$ psi

Section Bending (NDS 2018 2.3)

Volume Factor	$C_V = 1.01$

Positive Bending (NDS 2018 2.3)

Governing Duration Factor - Positive Bending	$C^+_{D,b} = 1$
Governing Beam Stability Factor - Positive Bending	$C^+_L = 0.994$
Adjusted Bending Strength - Positive Bending	$F'^+_b = 3\,120$ psi

Negative Bending (NDS 2018 2.3)

Governing Duration Factor - Negative Bending	$C^-_{D,b} = 1$
Governing Beam Stability Factor - Negative Bending	$C^-_L = 0.994$
Adjusted Bending Strength - Negative Bending	$F'^-_b = 3\,120$ psi

Shear Design (NDS 2018 3.4)

Governing Duration Factor	$C_D = 1$
Adjusted Shear Strength	$F'_v = 285$ psi

Bearing (NDS 2018 3.10)

Base Bearing Strength	$F'_{c\perp}/C_b = 850$ psi

Comments