Project: federal street

Location: steel beam
Uniformly Loaded Floor Beam
[2012 International Building Code(AISC 13th Ed ASD)]
A992-50 W10x30 x 14.67 FT
Section Adequate By: 240.3%
Controlling Factor: Deflection

page / of

DEFLECTIONS	Center	
Live Load	0.14	IN L/1225
Dead Load	0.06	in
Total Load	0.20	IN L/863
Live Load Deflection Criteria: L/360	Total Load Deflection Criteria: L/240	

REACTIONS	A		B	
Live Load	4988	lb	4988	lb
Dead Load	2090	lb	2090	lb
Total Load	7078	lb	7078	lb
Bearing Length	0.81	in	0.81	in

BEAM DATA	Center	
Span Length	14.67	ft
Unbraced Length-Top	0	ft

STEEL PROPERTIES
W10x30 - A992-50

Properties:

Yield Stress:	F_y =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	10.5	in
Web Thickness:	t_w =	0.3	in
Flange Width:	b_f =	5.81	in
Flange Thickness:	t_f =	0.51	in
Distance to Web Toe of Fillet:	k =	0.81	in
Moment of Inertia About X-X Axis:	I_x =	170	in4
Section Modulus About X-X Axis:	S_x =	32.4	in3
Plastic Section Modulus About X-X Axis:	Z_x =	36.6	in3

Design Properties per AISC 13th Edition Steel Manual:

Flange Buckling Ratio:	FBR =	5.7	
Allowable Flange Buckling Ratio:	AFBR =	9.15	
Web Buckling Ratio:	WBR =	29.6	
Allowable Web Buckling Ratio:	AWBR =	90.55	
Controlling Unbraced Length:	L_b =	0	ft
Limiting Unbraced Length - for lateral-torsional buckling:	L_p =	4.84	ft
Nominal Flexural Strength w/ safety factor:	M_n =	91317	ft-lb
Controlling Equation:	F2-1		
Web height to thickness ratio:	h/t_w =	29.6	
Limiting height to thickness ratio for eqn. G2-2:	h/t_w-limit =	53.95	
Cv Factor:	C_v =	1	
Controlling Equation:	G2-2		
Nominal Shear Strength w/ safety factor:	V_n =	63000	lb

Controlling Moment: 25960 ft-lb
   7.335 ft from left support
   Created by combining all dead and live loads.
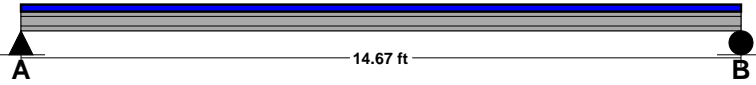
Controlling Shear: 7078 lb
   At support.
   Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	49.96 in4	170 in4
Moment:	25960 ft-lb	91317 ft-lb
Shear:	7078 lb	63000 lb

LOADING DIAGRAM

A ——————— 14.67 ft ——————— B

FLOOR LOADING		Side 1	Side 2
Floor Live Load	FLL =	40 psf	40 psf
Floor Dead Load	FDL =	15 psf	15 psf
Floor Tributary Width	FTW =	8 ft	9 ft
Wall Load	WALL =	0 plf	

BEAM LOADING			
Beam Total Live Load:	w_L =	680	plf
Beam Total Dead Load:	w_D =	255	plf
Beam Self Weight:	BSW =	30	plf
Total Maximum Load:	w_T =	965	plf

NOTES