

Project: Woodstock Railing
 Location: MLB1, Woodstock Bridge Railing,
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(AISC 14th Ed ASD)]
 HSS 2.375 x 0.218 x 21.3 FT (7 + 7.3 + 7) / ASTM A501-36
 Section Adequate By: 109.0%
 Controlling Factor: Deflection

StruCalc
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DEFLECTIONS	Left	Center	Right
Live Load	0.17 IN L/502	0.13 IN L/669	0.17 IN L/502
Dead Load	0.01 in	0.00 in	0.01 in
Total Load	0.17 IN L/485	0.13 IN L/663	0.17 IN L/485
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180			

REACTIONS	A	B	C	D
Live Load	243 lb	674 lb	698 lb	243 lb
Dead Load	14 lb	40 lb	40 lb	14 lb
Total Load	257 lb	714 lb	738 lb	257 lb
Uplift (1.5 F.S)	-25 lb	-35 lb	-35 lb	-27 lb
Bearing Length	0.41 in	0.41 in	0.41 in	0.41 in

BEAM DATA	Left	Center	Right
Span Length	7 ft	7.3 ft	7 ft
Unbraced Length-Top	0 ft	0 ft	0 ft
Unbraced Length-Bottom	7 ft	7.3 ft	7 ft

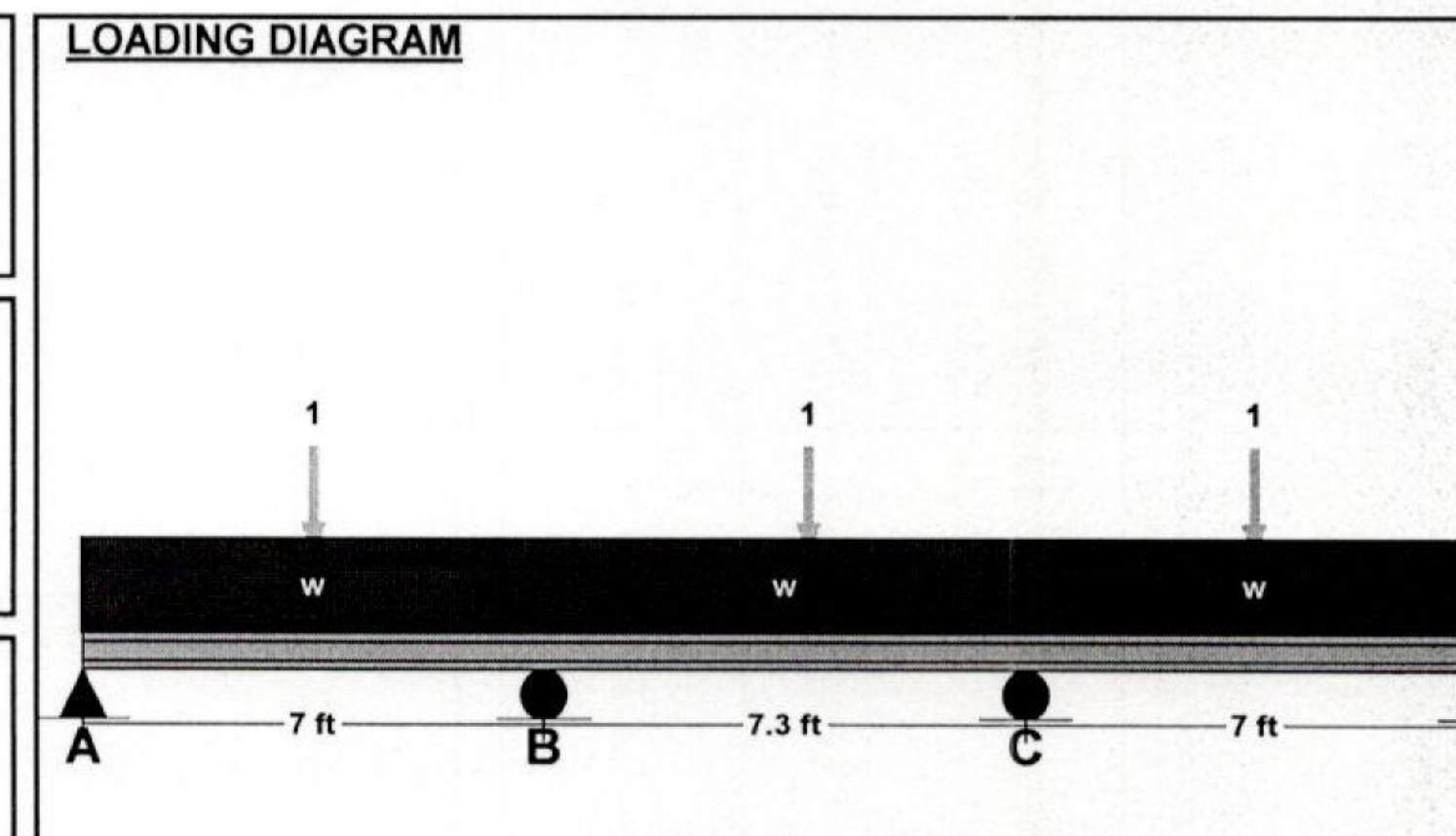
STEEL PROPERTIES
 HSS 2.375 x 0.218 - A501-36

Properties:
 Steel Yield Strength: $F_y = 42$ ksi
 Modulus of Elasticity: $E = 29000$ ksi
 Tube Steel Section (X Axis): $dx = 2.38$ in
 Tube Steel Section (Y Axis): $dy = 2.38$ in
 Tube Steel Wall Thickness: $t = 0.203$ in
 Area: $A = 1.39$ in²
 Moment of Inertia (X Axis): $I_x = 0.82$ in⁴
 Section Modulus (X Axis): $S_x = 0.69$ in³
 Plastic Section Modulus: $Z = 0.96$ in³
Design Properties per AISC 14th Edition Steel Manual:
 Flange Buckling Ratio: $FBR = 11.7$
 Allowable Flange Buckling Ratio: $AFBR = 48.33$
 Allowable Flange Buckling Ratio non-compact: $AFBR_{NC} = 214.05$
 Nominal Flexural Strength w/ Safety Factor: $M_n = 2012$ ft-lb
 Controlling Equation: F8-1
 Shear Buckling Stress Coefficient Eqn. G6-2b: $F_{cr} = 25$ ksi
 Nominal Shear Strength w/ Safety Factor: $V_n = 10487$ lb

Controlling Moment: -575 ft-lb
 7.3 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2, 3
Controlling Shear: 375 lb
 At left support of span 3 (Right Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	0.39 in ⁴	0.82 in ⁴
Moment:	-575 ft-lb	2012 ft-lb
Shear:	375 lb	10487 lb

NOTES
 2 inch shc 80 pipe, max span of 7.3 feet
 P=20#, w=50#/ft



UNIFORM LOADS	Left	Center	Right
Uniform Live Load	50 plf	50 plf	50 plf
Uniform Dead Load	0 plf	0 plf	0 plf
Beam Self Weight	5 plf	5 plf	5 plf
Total Uniform Load	55 plf	55 plf	55 plf

POINT LOADS - LEFT SPAN
 Load Number One
 Live Load 200 lb
 Dead Load 0 lb
 Location 3.5 ft

CENTER SPAN
 Load Number One
 Live Load 200 lb
 Dead Load 0 lb
 Location 4 ft

RIGHT SPAN
 Load Number One
 Live Load 200 lb
 Dead Load 0 lb
 Location 3.5 ft

