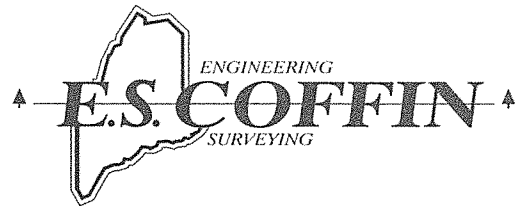


Client GET AIR

Location _____

Date _____

Subject FRAMMS



Sheet 1 of _____

By _____

Job # 14-112

TYPICAL PLATFORM FRAMMS

$$L_{MAX} = 10'0''$$

$$TRIB = 1.33'$$

$$W_D = 15(1.33) = 20$$

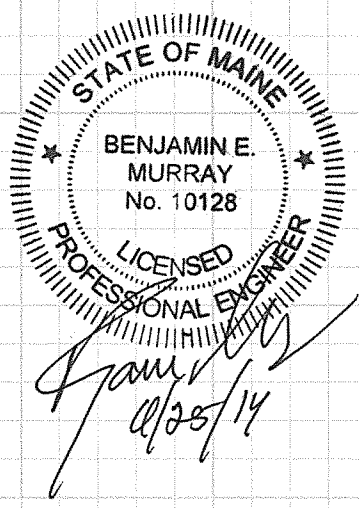
$$W_L = 125(1.33) = \underline{167}$$

187 #/A

$$M_{MAX} = \frac{167(10)^2}{8} = 2337.5 \text{ lb. ft}$$

= 29,050 lb-in

800S16Z-54 8x15/8 16 GA.



TYPICAL WALL SUPPORT

$$H_{MAX} = 4'0'' \text{ UP TO } 9'0''$$

$$TRIB_{MAX} = \frac{10}{2}(1.33) = 6.7 \text{ FT}^2$$

$$P_D = 15(6.7) = 100$$

$$P_L = 125(6.7) = \underline{837.5}$$

937.5 #

350S16Z-33 C 14" O.C.



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Title : GET AIR PORTLAND
Job # 14-112
Dsgnr: E.S. COFFIN ENGINEER **Date:** 4:25PM, 25 JUN 14
Description : CHANGE OF USE
Scope : STRUCTURAL DESIGN

Rev: 560100
 User: KW-0604103, Ver 5.6.1, 25-Oct-2002
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Steel Beam Design

Page 1
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Description GUARD RAIL

General Information

Calculations are designed to AISC 9th Edition ASD and 1997 UBC Requirements

Steel Section : HSS2X2X1/8

Center Span	4.25 ft	Fixed-Fixed	Fy	46.00 ksi
Left Cant.	0.00 ft	Bm Wt. Added to Loads	Load Duration Factor	1.00
Right Cant	0.00 ft	LL & ST Act Together	Elastic Modulus	29,000.0 ksi
Lu : Unbraced Length	4.25 ft			

Point Loads

	# 1	# 2	# 3	# 4	# 5	# 6	# 7	
Dead Load								k
Live Load	0.200							k
Short Term								k
Location	2.125							ft

Summary

Beam OK
 Static Load Case Governs Stress

Using: HSS2X2X1/8 section, Span = 4.25ft, Fy = 46.0ksi
 End Fixity = Fixed-Fixed, Lu = 4.25ft, LDF = 1.000

	<u>Actual</u>	<u>Allowable</u>		
Moment	0.111 k-ft	1.118 k-ft	Max. Deflection	-0.010 in
fb : Bending Stress	2.729 ksi	27.600 ksi	Length/DL Defl	171593.2 : 1
fb / Fb	0.099 : 1		Length/(DL+LL Defl)	5,049.2 : 1
Shear	0.106 k	4.269 k		
fv : Shear Stress	0.229 ksi	18.400 ksi		
fv / Fv	0.012 : 1			

Force & Stress Summary

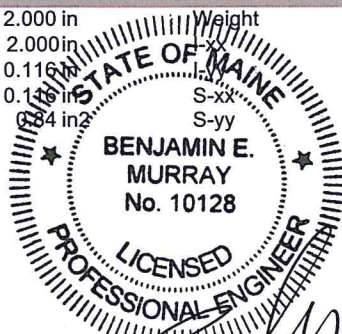
<<-- These columns are Dead + Live Load placed as noted -->>

	<u>Maximum</u>	<u>DL Only</u>	<u>LL @ Center</u>	<u>LL+ST @ Center</u>	<u>LL @ Cants</u>	<u>LL+ST @ Cants</u>	
Max. M +	0.11 k-ft	0.00	0.11				k-ft
Max. M -		-0.00	-0.11				k-ft
Max. M @ Left		-0.00	-0.11				k-ft
Max. M @ Right		-0.00	-0.11				k-ft
Shear @ Left	0.11 k	0.01	0.11				k
Shear @ Right	0.11 k	0.01	0.11				k
Center Defl.	-0.010 in	-0.000	-0.010	-0.010	0.000	0.000 in	
Left Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000 in	
Right Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000 in	
...Query Defl @	0.000 ft	0.000	0.000	0.000	0.000	0.000 in	
Reaction @ Left	0.11	0.01	0.11	0.11			k
Reaction @ Rt	0.11	0.01	0.11	0.11			k

Fa calc'd per Eq. E2-2, K*L/r > Cc

Section Properties HSS2X2X1/8

Depth	2.000 in	Weight	2.85 #/ft	r-xx	0.761 in
Width	2.000 in	S-x	0.49 in4	r-yy	0.761 in
Web Thick	0.116 in	S-y	0.49 in4	Rt	0.000 in
Flange Thickness	0.146 in		0.486 in3		
Area	0.84 in2		0.486 in3		



Handwritten signature and date: 6/25/14



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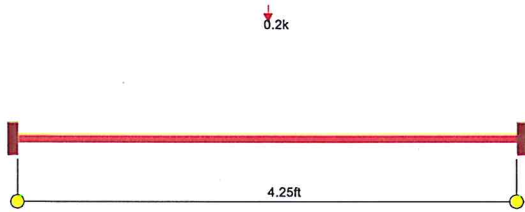
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Steel Beam Design

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Description GUARD RAIL

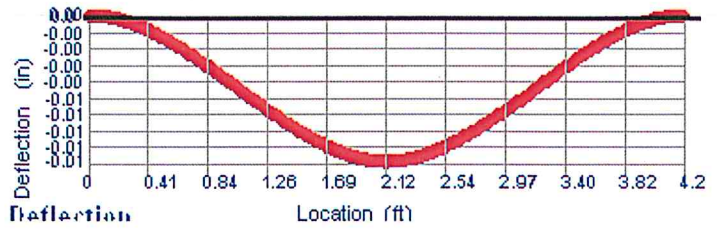
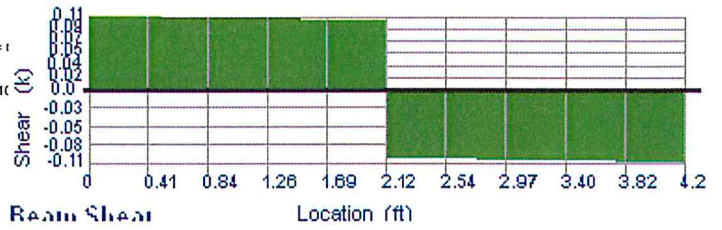
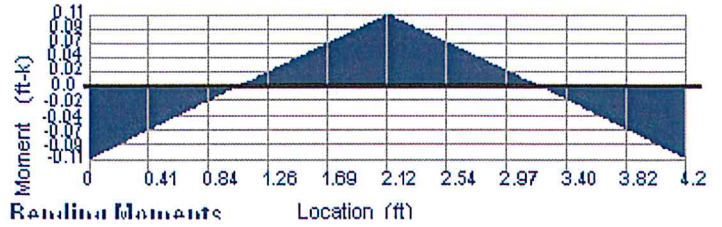
Sketch & Diagram



Mmax @ left = 0.11k-ft
 Rmax = 0.106k
 Vmax @ left = 0.106k

Mmax = 0.1k-ft
 Dmax = -0.010in

Mmax @ right = 0
 Rmax = 0.106k
 Vmax @ right = 0.106k





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Steel Column

Page 1

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Description TYPICAL GUARD POST

General Information

Calculations are designed to AISC 9th Edition ASD and 1997 UBC Requirements

Steel Section	HSS3X3X3/16	Fy	46.00 ksi	X-X Sidesway :	Restrained
		Duration Factor	1.330	Y-Y Sidesway :	Restrained
Column Height	6.500 ft	Elastic Modulus	29,000.00 ksi		
End Fixity	Fix-Free	X-X Unbraced	3.500 ft	Kxx	2.000
Live & Short Term Loads Combined		Y-Y Unbraced	3.500 ft	Kyy	2.000

Loads

Axial Load...

Dead Load	0.10 k	Ecc. for X-X Axis Moments	0.000 in
Live Load	k	Ecc. for Y-Y Axis Moments	0.000 in
Short Term Load	k		

Point lateral Loads...

	<u>DL</u>	<u>LL</u>	<u>ST</u>	<u>Height</u>
Along Y-Y (strong axis moments)		0.200	k	6.500 ft
Along X-X (y moments)			k	ft

Summary

Column Design OK

Section : HSS3X3X3/16, Height = 6.50ft, Axial Loads: DL = 0.10, LL = 0.00, ST = 0.00k, Ecc. = 0.000in

Unbraced Lengths: X-X = 3.50ft, Y-Y = 3.50ft

Combined Stress Ratios	<u>Dead</u>	<u>Live</u>	<u>DL + LL</u>	<u>DL + ST + (LL if Chosen)</u>
AISC Formula H1 - 1				
AISC Formula H1 - 2				
AISC Formula H1 - 3	0.0028	0.3446	0.3474	0.2612

XX Axis : Fa calc'd per Eq. E2-1, K*L/r < Cc

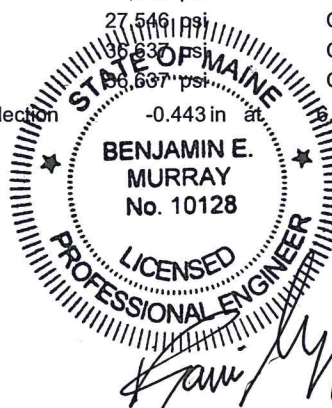
YY Axis : Fa calc'd per Eq. E2-1, K*

Stresses

Allowable & Actual Stresses	<u>Dead</u>	<u>Live</u>	<u>DL + LL</u>	<u>DL + Short</u>
Fa : Allowable	19.16 ksi	19.16 ksi	19.16 ksi	25.48 ksi
fa : Actual	0.05 ksi	0.00 ksi	0.05 ksi	0.05 ksi
Fb:xx : Allow [F1-6]	27.60 ksi	27.60 ksi	27.60 ksi	36.71 ksi
Fb:xx : Allow [F1-7] & [F1-8]	27.60 ksi	27.60 ksi	27.60 ksi	36.71 ksi
fb : xx Actual	0.00 ksi	9.51 ksi	9.51 ksi	9.51 ksi
Fb:yy : Allow [F1-6]	27.60 ksi	27.60 ksi	27.60 ksi	36.71 ksi
Fb:yy : Allow [F1-7] & [F1-8]	27.60 ksi	27.60 ksi	27.60 ksi	36.71 ksi
fb : yy Actual	0.00 ksi	0.00 ksi	0.00 ksi	0.00 ksi

Analysis Values

F'ex : DL+LL	27,546 psi	Cm:x DL+LL	1.00	Cb:x DL+LL	1.00
F'ey : DL+LL	27,546 psi	Cm:y DL+LL	0.60	Cb:y DL+LL	1.00
F'ex : DL+LL+ST	36,637 psi	Cm:x DL+LL+ST	1.00	Cb:x DL+LL+ST	1.00
F'ey : DL+LL+ST	36,637 psi	Cm:y DL+LL+ST	0.60	Cb:y DL+LL+ST	1.00
Max X-X Axis Deflection	-0.443 in at 6.500 ft	Max Y-Y Axis Deflection	0.000 in at		0.000 ft





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Steel Column

Description TYPICAL GUARD POST

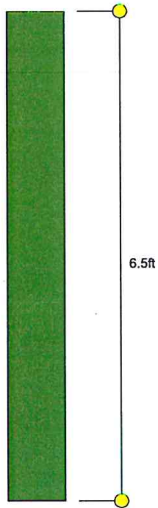
Section Properties HSS3X3X3/16

Depth	3.00 in	Weight	6.42 #/ft	I-xx	2.46 in4
Width	3.000 in	Area	1.89 in2	I-yy	2.46 in4
Web Thick	0.174 in	Rt	0.000 in	S-xx	1.640 in3
Flange Thickness	0.174 in			S-yy	1.640 in3
				r-xx	1.141 in
				r-yy	1.141 in

Sketch & Diagram

Axial DL = 0.1k
 Axial LL = 0k
 Axial ST = 0k

(3) →



(3): X-X Axis Point Load: DL=0, LL=0.2s, ST=0k @ 6.5ft