Baseplate Design - Single End Post Design

Anchor Bolt Analysis

Number of Bolts =	4	
Bolt Circle Dia. =	23.00	inches
A bolts =	12.961	sq. inches
I bolts =	859.01	in^4
Sstrong bolts =	74.70	in^3

Anchor Bolt Properties		
Net Tensile Stress Area = At =	3.248	sq. inches
Gross Area = Ag =	3.976	sq. inches

Base Plate Dia. =	**32.00**	**inches**
Allow.Tensile Stress = Ft =	27.50	ksi
Allow.Shear Stress = Fv =	16.50	ksi

Reactions	Axial kips	Mx kip-ft	Mz kip-ft	Shear kips	AB Tens. Stress ksi	AB Shear Stress ksi	CSR Eq. 9-34
G1	2.89	0.00	0.00	0.00	-0.30	0.00	0.00
GII C1	2.90	122.93	23.66	5.31	23.31	0.41	0.72
GII C2	2.90	73.70	35.49	3.47	17.32	0.27	0.40
GIII C1	4.03	83.56	11.83	2.82	11.80	0.22	0.19
GIII C2	4.03	38.14	17.74	1.74	8.67	0.13	0.10
					23.31	0.41	0.72

Baseplate weld design

S post =	89.01	in^4	
A post =	21.21	in^2	
Max. Weld Size =	0.4375	inches	
Min. Weld Size =	0.25	inches	
Force per inch of post edge =	10.75	kips per inch	
Weld Stress based on Max. Weld Size =	17.37	ksi	Based on double weld (socket connection)
Weld Stress based on Min. Weld Size =	30.40	ksi	Based on double weld (socket connection)
Weld Yield Strength =!	70	ksi	
Allowable Weld stress =	18.9	ksi	
Required weld size =	0.402	inches	
Design Weld Size =	**0.40214135**	**inches**	Based on double weld (socket connection)
Weld Length =	**87.96**	**inches**	Based on double weld (socket connection)

Baseplate Weld Information	Post Bending Str. (ksi)	Post. Axial Str. (ksi)	Max. Stress ksi
G1	0.00	0.18	0.18
GII C1	21.36	0.14	21.49
GII C2	12.81	0.14	12.95
GIII C1	11.05	0.19	11.24
GIII C2	6.63	0.19	6.82
			21.49

Baseplate Thickness

Width of Baseplate section =	9.000	inches	
Thickness =	2.250	inches	
Sx =	7.59	in^3	
Bolt spacing = X =	18.06	inches	Measured along circumference of bolt circle
Force per inch of post edge =	10.75	kips per inch	
Moment in Baseplate =	350.69	kip inches	
Bending Stress =	46.18	ksi	
Allowable Bending Stress =	37.50	ksi	
Baseplate stress exceeded, add vertical stiffeners			
Capacity of 1/4" weld =	3.36	kips per inch	
Length of 1/4" weld required on each leg of each vertical stiffener =	11.27	inches	

Truss Chord Splices

Bolt Stresses

Maximum Chord Force =	52.70	kips	
Max. Chord Diameter =	4.000	inches	
Bolt Circle Dia. =	7.000	inches	
Bolt Anet =	0.334	in^2	
A bolts =	2.007	sq. inches	6 bolts
Bolt Tensile Stress =	26.26	ksi	
Allow.Tensile Stress = Ft =	38.00	ksi (A325 Bolts)	
Demand/Capacity Ratio =	**0.69**		

For Monotube Only Loads:					
Mvert	Mhoriz.	SHEAR Horizontal	SHEAR Vertical	Bolt Tens. Stress	Bolt Shear Stress
kip-ft	kip-ft	kips	kips	ksi	ksi
44.28	101.87	2.66	0.00	379.56	1.54

Mtotal =	111.08 ft-kip
Vtotal =	3.08 kip
Moment of Inertia =	12.29 in^4
S =	3.51 in^3
Allow.Tensile Stress, Ft =	38.00 ksi
Allow.Shear Stress, Fv =	19.00 ksi
CSR =	0.02 OK

Bolt stresses based on A325 Bolts (AASHTO Table 10.32.3B)
Bolt stresses reduced by 0.875 for bolts over 1 inch diameter

Plate Stresses

Width of conn. plate section =	3.000	inches
Thickness =	0.750	inches
Sx =	0.281	in^3
Bolt Circle Circumference =	21.991	inches
Bolt Spacing =	3.665	inches
Force per inch along circumference =	2.40	kips per inch
Moment in Conn. plate =	3.22	kip inches
Bending Stress =	11.45	ksi
Allowable Bending Stress =	37.50	ksi

Weld Stresses

Max. Weld Size =	0.226	inches	
Min. Weld Size =	0.226	inches	
Force per inch of pipe edge =	4.19	kips per inch	
Weld Stress based on Max. Weld Size =	13.12	ksi	Based on double weld (socket connection)
Weld Stress based on Min. Weld Size =	13.12	ksi	Based on double weld (socket connection)
Weld Yield Strength =	70	ksi	
Allowable Weld stress =	18.9	ksi	
Required weld size =	0.157	inches	
Design Weld Size =	**0.226**	**inches**	Based on double weld (socket connection)
Weld Length =	**25.13**	**inches**	Based on double weld (socket connection)

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