Baseplate Design - Single End Post Design

Anchor Bolt Analysis

Number of Bolts =	4		
Bolt Circle Dia. =	22.00	inches	
A bolts =	9.993	sq. inches	
I bolts =	654.57	in^4	
Sstrong bolts =	54.96	in^3	

Anchor Bolt Properties		
Net Tensile Stress Area = At =	2.496	sq. inches
Gross Area = Ag =	3.142	sq. inches

Base Plate Dia. = 30.00 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. 5-24
G1	3.76	0.00	0.00		-0.38	0.00	0.00
G5 C1	2.83	94.89	24.83	3.92	25.86	0.39	0.68
G5 C2	2.83	56.93	37.24	2.72	20.28	0.27	0.54
G6 C1	3.81	49.87	12.41	2.13	13.22	0.21	0.23
G6 C2	3.81	29.92	18.62	1.34	10.22	0.13	0.14
					25.86	0.39	0.68

Baseplate weld design

S post =	69.01	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 =	12.30	kips per inch	
Weld Stress based on Max. Weld Size =	19.88	ksi	Based on double weld (socket connection)
Weld Stress based on Min. Weld Size =	34.79	ksi	Based on double weld (socket connection)
Weld Yield Strength =	70	ksi	
Allowable Weld stress =	18.9	ksi	
Required weld size =	0.460	inches	
Design Weld Size =	**0.4602018**	**inches**	Based on double weld (socket connection)
Weld Length =	**87.56**	**inches**	Based on double weld (socket connection)

Baseplate Weld Information	Post Bending Str. (typ)	Post Axial Str. (typ)	Max. Stress ksi
G1	0.00	0.18	0.18
G5 C1	24.46	0.13	24.60
G5 C2	14.68	0.13	14.81
G6 C1	12.71	0.18	12.89
G6 C2	7.63	0.18	7.81
			24.60

Baseplate Thickness

Width of Baseplate section =	9.000	inches	
Thickness =	2.000	inches	
Sx =	5.33	in^3	
Bolt spacing = X =	17.28	inches	Measured along circumference of bolt circle
Force per inch of post edge =	12.30	kips per inch	
Moment in Baseplate =	367.18	kip inches	
Bending Stress =	68.85	ksi	
Allowable Bending Stress =	37.50	ksi	
Baseplate stress exceeded, add vertical stiffeners			
Capacity of 1/4" weld =	5.36	kips per inch	
Length of 1/4" weld required on each leg of each vertical stiffener =	9.62	inches	

Truss Chord Splices

Bolt Stresses

Maximum Chord Force =	43.69	kips		
Max. Chord Diameter =	4.000	inches		
Bolt Circle Dia. =	7.000	inches		
Bolt Area =	0.334	in^2		
A bolts =	1.338	sq. inches	4	bolts
Bolt Tensile Stress =	32.66	ksi		
Allow.Tensile Stress = Ft =	38.00	ksi (A325 Bolts)		
Demand/Capacity Ratio =	**0.86**			

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Loads:

Mvert. kip-ft	Mhoriz. kip-ft	SHEAR Horizontal kips	SHEAR Vertical kips	Bolt Tens. Stress ksi	Bolt Shear Stress ksi
43.97	69.90	0.00	0.16	512.92	0.47

Mtotal =	100.07 ft-kip
Vtotal =	0.63 kip
Moment of Inertia =	8.19 in^4
S =	2.34 in^3
Allow.Tensile Stress, Ft =	38.00 ksi
Allow.Shear Stress, Fv =	19.00 ksi
CSR =	0.47 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 =	5.498	inches	
Force per inch along circumference =	1.99	kips per inch	
Moment in Conn. plate =	6.01	kip inches	
Bending Stress =	21.35	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 =	3.48	kips per inch	
Weld Stress based on Max. Weld Size =	10.69	ksi	Based on double weld (socket connection)
Weld Stress based on Min. Weld Size =	10.69	ksi	Based on double weld (socket connection)
Weld Yield Strength =	70	ksi	
Allowable Weld stress =	18.9	ksi	
Required weld size =	0.130	inches	
Design Weld Size =	**0.226**	**inches**	Based on double weld (socket connection)
Weld Length =	**25.13**	**inches**	Based on double weld (socket connection)

Conn.

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