

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 = 699.81 in⁴
 Strong bolts = 74.70 in³

Base Plate Dia. = 22.00 inches
 Allow Tensile Stress = Ft = 27.50 ksi
 Allow Shear Stress = Fv = 16.50 ksi

Anchor Bolt Properties

Net Tensile Stress Area = At =	3.248	sq. inches
Gross Area = Ag =	3.978	sq. inches

Reactions

Reactions	Anchor kips	Mx kip-ft	Mz kip-ft	Shear kips	AB Tens. Stress ksi	AB Shear Stress ksi	CRF Eq. 4-24
61	3.81	0.00	0.00	0.00	4.29	0.00	0.50
61 c1	2.86	114.19	23.29	4.83	21.56	0.37	0.63
61 c2	2.86	68.51	34.89	3.19	16.39	0.25	0.36
61 c3	3.95	59.34	11.63	2.98	11.10	0.20	0.16
61 c4	3.95	35.60	17.44	1.60	8.22	0.12	0.09
					21.88	0.37	0.63

Baseplate Weld Design

S post = 69.01 in⁴
 A post = 21.21 in²
 Max. Weld Size = 0.4375 inches
 Min. Weld Size = 0.25 inches

Force per inch of post edge = 9.59 kips per inch
 Weld Stress based on Max. Weld Size = 16.16 ksi
 Weld Stress based on Min. Weld Size = 28.27 ksi

Weld Yield Strength = 70 ksi
 Allowable Weld Stress = 19.9 ksi
 Required weld size = 0.254 inches
 Design Weld Size = 0.3739813 inches
 Weld Length = 87.96 inches

Baseplate Weld Information

Post Bending Stress ksi	Post Axial Stress ksi	Max. Stress ksi
61	0.00	0.19
61 c1	19.85	0.13
61 c2	11.91	0.13
61 c3	10.32	0.16
61 c4	6.19	0.19

Baseplate Thickness

Width of baseplate section = 0.500 inches
 Thickness = 2.250 inches
 Sx = 7.59 in³
 Bolt spacing = 18.00 inches

Force per inch of post edge = 9.59 kips per inch
 Moment in Baseplate = 295.14 kip-inches
 Bending Stress = 42.85 ksi
 Allowable Bending Stress = 37.50 ksi

Capacity of 1/4" weld = 3.35 kips per inch
 Length of 1/4" weld required on each leg of each vertical stiffener = 10.57 inches

Truss Chord Splices

Bolt Stresses

Maximum Chord Force = 35.47 kips
 Max. Chord Diameter = 4.000 inches
 Bolt Circle Dia. = 7.000 inches
 Bolt Area = 0.334 in²
 A bolts = 2.007 sq. inches
 Allow Tensile Stress = Ft = 17.87 ksi
 Allow Tensile Stress = Ft = 38.00 ksi (A325 Bolts)
 Demand/Capacity Ratio = 0.47

Plate Stresses

Width of corr. plate section = 3.000 inches
 Thickness = 0.375 inches
 Sx = 0.281 in³
 Bolt Circle Circumference = 21.991 inches
 Bolt Spacing = 3.665 inches

Force per inch along circumference = 1.61 kips per inch
 Moment in Corr. plate = 2.17 kip-inches
 Bending Stress = 7.70 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 = 2.82 kips per inch
 Weld Stress based on Max. Weld Size = 8.83 ksi
 Weld Stress based on Min. Weld Size = 8.83 ksi

Weld Yield Strength = 70 ksi
 Allowable Weld Stress = 19.9 ksi
 Required weld size = 0.168 inches
 Design Weld Size = 0.226 inches
 Weld Length = 25.13 inches

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Moment kip-ft	Axial kips	SHEAR Horizontal kips	SHEAR Vertical kips	Bolt Tens. Stress ksi	Bolt Shear Stress ksi
35.07	73.23	0.10	0.00	27.08	0.10

Moment of inertia = 12.29 in⁴
 Area = 0.20 sq. in.
 S = 2.81 in³
 Allow Tensile Stress, Ft = 38.00 ksi
 Allow Shear Stress, Fv = 19.00 ksi

CRF = **0.10**

Bolt stresses based on A325 bolts (AASHTO Table 10.33.2B)
 Bolt stresses included in 2.0.1.7.5 for bolts per 1.0m diameter