TEMPORARY STREET LIGHT POLE

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ver 10-10-15

Project: EZ SLIP BARRIER CONNECTION BRACKET

General Data:

C.G of Fixture	**22**	ft
Base Height Above Ground	**3.5**	ft
C.G. of Fixture from Pole CL	**1.5**	ft
EPA of Fixture (total)	**2.3**	sf
Weight of Fixture (total)	**75**	lbs
Wind Speed (V)	**90**	mph
I r =	1	
Material for Pole & Arm	**A500**	

Pole Data:

Shape of Pole	**Rd**	
Length	**20**	ft
Base OD	**2.875**	in
Top OD	**2.875**	in
Wall Thickness	**0.276**	in
Aver. Unit Wt /LF	7.67	lbs/lf
Area Aver.	2.25	in^2
r =	1.30	in
Area @ Base	2.25	in
Section Modulus @ Base	1.34	in^3
Mom. of Inertia @ Base	1.92	in^4
Torsion Constant (J)	2.93	in^4
Projected Area of Pole	4.79	sf
Exposure category	**C**	
Kz for Pole:	0.95	
Vd =	21.5625	Vd<39 so
Cd for Pole (based on wind tunnel)	**1.00**	
Gust Factor G =	1.14	
Overload factor =	1.33	

Calculations: AASHTO Wind Calc

Wind Pressure = 0.00256*V^2*Kz*G*Ir

P = 22.44 *Cd, psf P fat = 1.6 psf (conservative)

Fixtures:	Design Wind		Fatigue Wind @ 25 mph
Dead Load	75	lbs	75
Wind Load	51.61	lbs	3.68
OT Moment	1316.02	ft-lbs	93.84
Pole:			
Dead Load:	153.31	lbs	153.31
EPA	4.77	sf	5.27
Wind Load:	107.09	lbs	8.43
C.G. of Pole	10.00	ft	10.00
OT Moment	1070.88	ft-lbs	84.33
Torsion M	77.41	ft-lbs	5.52
Sum of Loads @ Base:			
axial	228.31	lbs	228.31
shear	158.70	lbs	12.11
moment	2386.90	ft-lbs	178.17
torsion	77.41	ft-lbs	5.52

Material Yield = 42000 psi

Allowable Stresses: Welded - no heat treat

Fa = .6*Fy =	25,200	psi
Fb = .66*Fy =	27,720	psi
Fv = .33*Fy =	13,860	psi
F fatigue =	2600	psi

Stress Calculations:

		Design Wind		Fatigue Wind
Pole:	fa = axial / Area =	101.4	psi	101.4
	fb = OT Mom / Sect Mod. =	21375.2	psi	1595.6
	fv = (2*shear/a)+(torsion/j) =	458.3	psi	33.4

CSR's:

Post: Design Wind: CSR = fa/Fa + (fb/Fb)+(fv/Fv)^2 = 0.58 **csr < 1.0 so OK!**

Fatigue Wind: CSR = fa/Fa + (fb/Fb)+(fv/Fv)^2 = 0.67 **csr < 1.0 so OK!**

NOTE: By inspection, since pole diameter and wall thickness is less that base stub pole diameter and wall thickness, stub tube design is OK.

Maximum Bending in Base Plate:	A36 Plate		Maximum Bending in Slip Plates
Minimum Width	4.75	in	1 in
Thickness	0.5	in	2.5 in
Min dist betwn plates	6.125	in	2.375 in
initial Mom of Inertia =	0.049479	in^4	1.3020833 in^4
Area =	2.375	in^2	2.5 in^2
Transformed Moment =	44.5498	in^4	16.425781 in^4
Sect Modulus =	14.547	in^3	13.832 in^3
DesignMoment =	2386.90	ft-lbs	2386.90 ft-lbs
Design Stress =	1968.996	psi	2070.724 psi
Allowable Stress =	35910	psi so OK	35910 psi so OK
Fatigue Moment =	178.17	ft-lbs	178.17 ft-lbs
Fatigue Stress =	146.9786	psi	154.57225 psi
Allowable Stress =	2600	psi so OK	2600 psi so OK