

PLP  
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Computerized Composite FLAGPOLE Engineering and Design  
with Load Calculations Based on Standards Established by  
The National Association of Architectural Metal Manufacturers (NAAMM)  
and

The American Association of State Highway and Transportation Officials (AASHTO)  
6th Edition 2013, using Appendix C-Alternate Method for Wind Pressures.

TABLE 1

GIVEN INFORMATION

Flagpole name.....	100COM
Height of pole.....	100 feet
Depth of bury in ground.....	10 feet
Base diameter.....	17.647 inches
Tip diameter.....	6.862 inches
Flag size, hoist x fly.....	0 feet x 0 feet (polyester fabric)
wind speed.....	125 MPH, gust factor 1.3
Material.....	PLP16, 50 inches wide
Breaking Stress.....	24000 psi
Modulus of Elasticity.....	2000000 psi
wall Th./Inside Dia. ratio....	.018

TABLE 2

100COM  
FLAGPOLE

## BENDING MOMENT, STRESS, &amp; DEFLECTION

POLE HEIGHT feet	OUTSIDE DIAMETER inches	INERTIA MOMENT inch <sup>4</sup>	SECTION MODULUS inch <sup>3</sup>	BENDING MOMENT ft-lbs	STRESS psi	DEFLECTION feet
100.000	6.862	19.035	5.548	0.000	0.000	20.815
99.000	7.046	20.646	5.860	11.018	22.561	20.492
98.000	7.285	22.871	6.279	44.406	84.868	20.169
97.000	7.523	25.240	6.710	100.878	180.408	19.846
96.000	7.854	36.377	9.263	181.262	234.815	19.523
95.000	8.056	35.267	8.756	286.431	392.573	19.201
94.000	8.316	38.877	9.350	417.174	535.414	18.878
93.000	8.544	42.238	9.887	574.242	696.947	18.556
92.000	8.763	45.645	10.418	758.378	873.577	18.235
91.000	8.948	42.910	9.591	970.254	1213.972	17.914
90.000	9.266	60.464	13.051	1210.589	1113.120	17.594
89.000	9.517	65.629	13.792	1480.233	1287.914	17.275
88.000	9.744	70.546	14.480	1780.015	1475.168	16.956
87.000	9.897	66.236	13.385	2110.614	1892.208	16.639
86.000	10.089	70.241	13.924	2472.606	2130.896	16.323
85.000	10.284	74.471	14.483	2866.570	2375.138	16.007
84.000	10.534	89.563	17.005	3293.165	2323.969	15.694
83.000	10.699	93.924	17.557	3753.071	2565.114	15.381
82.000	10.878	98.812	18.167	4246.891	2805.188	15.070
81.000	11.077	104.442	18.858	4775.197	3038.700	14.761
80.000	11.276	110.283	19.561	5338.604	3275.112	14.453
79.000	11.521	130.067	22.579	5937.776	3155.725	14.147
78.000	11.700	136.350	23.308	6573.405	3384.340	13.842
77.000	11.899	143.568	24.131	7246.123	3603.371	13.540
76.000	12.124	166.280	27.430	7956.567	3480.830	13.239
75.000	12.292	173.438	28.220	8705.383	3701.840	12.940
74.000	12.432	179.557	28.886	9493.128	3943.649	12.642
73.000	12.541	184.420	29.411	10320.243	4210.800	12.347
72.000	12.707	208.306	32.786	11187.142	4094.597	12.053
71.000	12.833	214.703	33.461	12094.273	4337.323	11.762
70.000	12.966	221.595	34.181	13042.077	4578.717	11.472
69.000	13.048	208.196	31.912	14030.923	5276.061	11.185
68.000	13.270	256.379	38.640	15061.228	4677.348	10.900
67.000	13.343	241.931	36.263	16133.464	5338.767	10.617
66.000	13.463	248.656	36.939	17248.021	5603.174	10.337
65.000	13.596	256.253	37.695	18405.244	5859.153	10.059
64.000	13.769	287.110	41.704	19605.582	5641.375	9.784
63.000	13.857	292.772	42.256	20849.482	5920.875	9.511
62.000	13.907	296.022	42.572	22137.262	6239.997	9.241
61.000	13.960	299.493	42.907	23469.117	6563.661	8.973
60.000	14.020	303.456	43.289	24845.211	6887.264	8.708
59.000	14.028	303.987	43.340	26265.688	7272.460	8.446
58.000	14.028	303.987	43.340	27730.609	7678.068	8.188
57.000	14.191	337.510	47.567	29240.117	7376.615	7.932
56.000	14.232	340.511	47.851	30794.482	7722.523	7.680
55.000	14.271	343.382	48.123	32393.959	8077.786	7.431
54.000	14.302	345.676	48.339	34038.641	8449.900	7.185
53.000	14.351	349.322	48.683	35728.656	8806.928	6.943
52.000	14.443	379.850	52.600	37464.184	8546.980	6.705
51.000	14.506	384.963	53.076	39245.457	8872.972	6.470
50.000	14.538	387.578	53.319	41072.660	9243.786	6.239

49.000	14.591	391.934	53.723	42943.195	9592.184	6.011
48.000	14.701	425.801	57.928	44854.449	9291.747	5.788
47.000	14.767	431.707	58.469	46806.660	9606.427	5.568
46.000	14.821	436.580	58.914	48800.043	9939.963	5.352
45.000	14.894	468.734	62.943	50834.770	9691.633	5.140
44.000	14.927	471.939	63.233	52911.008	10041.151	4.933
43.000	14.972	476.334	63.630	55028.879	10377.918	4.729
42.000	15.032	482.236	64.161	57188.508	10695.904	4.529
41.000	15.126	518.108	68.506	59390.062	10403.247	4.334
40.000	15.187	524.576	69.082	61633.777	10706.160	4.143
39.000	15.236	529.810	69.547	63919.832	11029.033	3.956
38.000	15.280	534.540	69.966	66248.375	11362.387	3.773
37.000	15.383	573.440	74.555	68619.562	11044.653	3.595
36.000	15.436	579.559	75.092	71033.617	11351.479	3.421
35.000	15.556	622.024	79.972	73490.781	11027.437	3.251
34.000	15.602	627.725	80.467	75991.234	11332.505	3.086
33.000	15.697	668.614	85.190	78535.234	11062.592	2.925
32.000	15.783	709.254	89.876	81123.031	10831.363	2.768
31.000	15.787	680.542	86.216	83754.750	11657.495	2.616
30.000	15.893	724.674	91.194	86430.555	11373.177	2.468
29.000	15.932	730.194	91.664	89148.641	11670.725	2.324
28.000	16.018	772.846	96.497	91907.125	11429.202	2.184
27.000	16.068	780.349	97.131	94706.219	11700.448	2.049
26.000	16.172	827.151	102.294	97546.086	11443.005	1.918
25.000	16.223	835.273	102.974	100426.875	11703.186	1.792
24.000	16.329	884.056	108.280	103348.844	11453.463	1.670
23.000	16.362	889.617	108.742	106312.094	11731.868	1.552
22.000	16.409	897.580	109.401	109316.945	11990.786	1.438
21.000	16.500	945.651	114.624	112363.375	11763.293	1.329
20.000	16.640	1003.947	120.667	115451.633	11481.375	1.224
19.000	16.699	1015.070	121.573	118582.055	11704.823	1.123
18.000	16.759	1060.060	126.506	121754.797	11549.283	1.026
17.000	16.818	1071.733	127.451	124970.047	11766.432	0.934
16.000	16.885	1119.213	132.569	128227.898	11607.057	0.845
15.000	16.934	1129.376	133.386	131528.562	11832.932	0.761
14.000	17.021	1182.287	138.921	134867.875	11649.893	0.681
13.000	17.074	1193.821	139.841	138241.672	11862.778	0.605
12.000	17.148	1245.307	145.242	141650.156	11703.222	0.533
11.000	17.201	1257.378	146.198	145093.297	11909.305	0.466
10.000	17.298	1315.630	152.114	148571.438	11720.565	0.402
9.000	17.347	1327.327	153.032	152084.625	11925.679	0.343
8.000	17.459	1391.067	159.352	155632.984	11719.905	0.287
7.000	17.525	1407.603	160.639	159216.812	11893.732	0.236
6.000	17.616	1468.133	166.682	162836.109	11723.134	0.189
5.000	17.651	1477.297	167.390	166491.156	11935.595	0.145
4.000	17.744	1539.927	173.572	170181.922	11765.656	0.106
3.000	17.804	1556.324	174.829	173908.750	11936.867	0.071
2.000	17.874	1614.293	180.630	177671.656	11803.448	0.040
1.000	17.981	1683.964	187.305	181470.859	11626.234	0.013
0.000	18.025	1696.953	188.289	185306.500	11809.933	0.000

-1.000	18.075	1711.793	189.410	166775.844	10566.021	0.000
-2.000	18.121	1725.523	190.445	148245.203	9341.001	0.000
-3.000	18.125	1686.544	186.101	129714.547	8364.121	0.000
-4.000	18.129	1647.169	181.716	111183.898	7342.245	0.000
-5.000	18.041	1500.508	166.344	92653.250	6683.964	0.000
-6.000	17.953	1354.928	150.942	74122.602	5892.814	0.000
-7.000	17.911	1262.111	140.931	55591.949	4733.533	0.000
-8.000	17.869	1169.216	130.865	37061.301	3398.422	0.000
-9.000	17.735	974.690	109.917	18530.650	2023.050	0.000
-10.000	17.647	832.519	94.352	0.000	0.000	0.000

Maximum stress is 11990.79 PSI, located at 22 FT above ground.