

PLP
COMPOSITE TECHNOLOGIES INC.
57 Creamery Road
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DATE: 09-16-2013

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)
Year 2001 and Interims, using Appendix C-Alternate Method for Wind Pressures.

TABLE 1

GIVEN INFORMATION

Flagpole name.....	70C
Height of pole.....	70 feet
Depth of bury in ground.....	7 feet
Base diameter.....	15.856 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

70C
FLAGPOLE

BENDING MOMENT, STRESS, & DEFLECTION

POLE HEIGHT feet	OUTSIDE DIAMETER inches	INERTIA MOMENT inch ⁴	SECTION MODULUS inch ³	BENDING MOMENT ft-lbs	STRESS psi	DEFLECTION feet
70.000	6.862	19.035	5.548	0.000	0.000	10.218
69.000	7.046	20.646	5.860	11.018	22.561	10.005
68.000	7.285	22.871	6.279	44.406	84.868	9.791
67.000	7.523	25.240	6.710	100.878	180.408	9.578
66.000	7.716	23.591	6.115	181.153	355.501	9.365
65.000	8.056	35.267	8.756	285.994	391.974	9.152
64.000	8.316	38.877	9.350	416.299	534.291	8.939
63.000	8.544	42.238	9.887	572.930	695.355	8.726
62.000	8.763	45.645	10.418	756.628	871.562	8.515
61.000	8.948	42.910	9.591	968.067	1211.236	8.303
60.000	9.174	46.306	10.095	1207.892	1435.838	8.093
59.000	9.517	65.629	13.792	1476.880	1284.997	7.883
58.000	9.744	70.546	14.480	1775.933	1471.786	7.675
57.000	9.897	66.236	13.385	2105.804	1887.896	7.467
56.000	10.089	70.241	13.924	2467.067	2126.123	7.260
55.000	10.284	74.471	14.483	2860.302	2369.945	7.055
54.000	10.488	79.074	15.079	3286.131	2615.135	6.851
53.000	10.699	93.924	17.557	3745.200	2559.734	6.648
52.000	10.878	98.812	18.167	4238.145	2799.411	6.447
51.000	11.077	104.442	18.858	4765.577	3032.578	6.248
50.000	11.276	110.283	19.561	5328.108	3268.674	6.050
49.000	11.475	116.337	20.277	5924.208	3506.036	5.854
48.000	11.700	136.350	23.308	6552.324	3373.486	5.659
47.000	11.899	143.568	24.131	7213.046	3586.923	5.467
46.000	12.078	150.275	24.884	7906.936	3813.002	5.276
45.000	12.292	173.438	28.220	8634.527	3671.710	5.087
44.000	12.432	179.557	28.886	9396.346	3903.444	4.900
43.000	12.541	184.420	29.411	10192.810	4158.806	4.715
42.000	12.615	171.643	27.213	11024.219	4861.382	4.531
41.000	12.741	176.934	27.774	11890.842	5137.546	4.350
40.000	12.874	182.636	28.373	12792.996	5410.671	4.172
39.000	13.002	188.238	28.955	13731.049	5690.610	3.996
38.000	13.132	194.043	29.553	14705.357	5971.176	3.823
37.000	13.297	220.585	33.178	15716.308	5684.322	3.652
36.000	13.417	226.728	33.797	16764.309	5952.333	3.484
35.000	13.550	233.668	34.490	17849.729	6210.448	3.319
34.000	13.677	240.426	35.158	18972.934	6475.831	3.156
33.000	13.765	245.184	35.624	20134.244	6782.201	2.996
32.000	13.815	247.915	35.891	21333.908	7132.951	2.839
31.000	13.868	250.833	36.174	22572.107	7487.783	2.686
30.000	13.928	254.163	36.497	23848.977	7841.481	2.535
29.000	13.936	254.609	36.540	25162.881	8263.733	2.388
28.000	13.936	254.609	36.540	26512.117	8706.835	2.244
27.000	14.053	261.195	37.173	27896.750	9005.539	2.105
26.000	14.094	263.529	37.396	29316.949	9407.533	1.969
25.000	14.133	265.762	37.609	30772.883	9818.838	1.837
24.000	14.210	293.338	41.286	32264.672	9377.882	1.709
23.000	14.259	296.442	41.580	33792.461	9752.589	1.585
22.000	14.305	299.377	41.856	35356.391	10136.519	1.465
21.000	14.368	303.427	42.237	36956.605	10499.900	1.350
20.000	14.354	278.657	38.826	38593.188	11927.909	1.239

19.000	14.407	281.811	39.121	40266.207	12351.173	1.133
18.000	14.563	340.915	46.819	41975.797	10758.568	1.031
17.000	14.583	317.525	43.547	43722.238	12048.228	0.935
16.000	14.729	378.316	51.370	45505.703	10630.066	0.843
15.000	14.756	380.446	51.565	47326.453	11013.639	0.756
14.000	14.789	383.061	51.803	49180.863	11392.494	0.673
13.000	14.880	416.264	55.950	51065.297	10952.435	0.595
12.000	14.940	421.439	56.418	52979.879	11268.813	0.521
11.000	15.034	456.160	60.684	54924.777	10861.179	0.452
10.000	15.095	461.873	61.196	56900.176	11157.716	0.387
9.000	15.098	435.269	57.659	58906.125	12259.506	0.327
8.000	15.234	502.463	65.966	60942.758	11086.223	0.271
7.000	15.245	476.124	62.463	63010.242	12105.127	0.220
6.000	15.344	513.711	66.959	65108.668	11668.348	0.173
5.000	15.418	521.373	67.632	67238.234	11930.191	0.132
4.000	15.464	526.173	68.051	69399.031	12237.645	0.094
3.000	15.559	565.189	72.651	71591.195	11824.943	0.062
2.000	15.599	569.677	73.040	73814.930	12127.293	0.034
1.000	15.695	610.086	77.743	76070.305	11741.854	0.011
0.000	15.755	617.308	78.363	78357.461	11999.093	0.000
-1.000	15.794	622.032	78.768	67163.539	10232.085	0.000
-2.000	15.834	626.903	79.184	55969.613	8481.917	0.000
-3.000	15.838	596.987	75.387	44775.691	7127.362	0.000
-4.000	15.850	567.622	71.624	33581.770	5626.324	0.000
-5.000	15.855	537.101	67.752	22387.846	3965.281	0.000
-6.000	15.869	507.113	63.912	11193.923	2101.736	0.000
-7.000	15.856	474.191	59.812	0.000	0.000	0.000

Maximum stress is 12351.17 PSI, located at 19 FT above ground.