

PLP
COMPOSITE TECHNOLOGIES INC.
57 Creamery Road
P.O. Box 429
Fitzwilliam, New Hampshire 03447

DATE: 08-28-2013

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.....	60C
Height of pole.....	60 feet
Depth of bury in ground.....	6 feet
Base diameter.....	10.699 inches
Tip diameter.....	4.228 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

60C
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
60.000	4.228	4.789	2.265	0.000	0.000	13.471
59.000	4.506	5.844	2.594	10.753	49.747	13.108
58.000	4.815	6.381	2.650	42.806	193.804	12.744
57.000	5.136	7.793	3.035	95.744	378.588	12.381
56.000	5.359	7.718	2.880	169.200	704.904	12.019
55.000	5.598	8.827	3.153	262.878	1000.331	11.657
54.000	5.807	9.879	3.402	376.530	1327.961	11.296
53.000	6.006	10.956	3.648	509.929	1677.241	10.937
52.000	6.119	9.778	3.196	662.895	2489.066	10.579
51.000	6.258	10.473	3.347	835.412	2995.264	10.224
50.000	6.377	11.093	3.479	1027.743	3544.933	9.872
49.000	6.483	11.666	3.599	1239.049	4131.484	9.523
48.000	6.717	17.826	5.308	1468.521	3320.025	9.177
47.000	6.822	18.696	5.481	1716.634	3758.218	8.835
46.000	6.936	19.673	5.673	1983.776	4196.558	8.496
45.000	7.026	20.467	5.826	2270.243	4676.107	8.161
44.000	7.146	21.558	6.034	2576.323	5123.867	7.829
43.000	7.245	22.488	6.208	2902.314	5610.316	7.502
42.000	7.367	23.669	6.426	3248.524	6066.549	7.180
41.000	7.464	24.638	6.602	3615.260	6571.443	6.862
40.000	7.576	25.788	6.808	4002.820	7055.574	6.550
39.000	7.629	22.788	5.974	4411.464	8861.246	6.244
38.000	7.740	23.816	6.154	4841.422	9440.575	5.944
37.000	7.796	24.346	6.246	5292.926	10169.317	5.652
36.000	7.905	25.400	6.426	5766.204	10767.281	5.368
35.000	8.080	35.591	8.810	6261.572	8529.234	5.091
34.000	8.186	37.043	9.050	6779.422	8989.006	4.821
33.000	8.246	37.882	9.188	7320.067	9560.420	4.558
32.000	8.338	39.193	9.401	7883.729	10063.139	4.301
31.000	8.390	39.948	9.523	8470.612	10674.227	4.052
30.000	8.462	41.008	9.692	9080.907	11243.046	3.810
29.000	8.513	41.770	9.813	9713.708	11878.173	3.577
28.000	8.676	54.458	12.554	10368.159	9910.797	3.351
27.000	8.696	54.846	12.614	11044.513	10506.870	3.133
26.000	8.777	56.434	12.860	11742.949	10957.973	2.922
25.000	8.823	57.350	13.000	12463.615	11504.754	2.718
24.000	8.947	65.344	14.607	13206.694	10849.638	2.522
23.000	9.011	66.797	14.826	13972.418	11309.351	2.334
22.000	9.040	67.463	14.925	14760.957	11867.831	2.153
21.000	9.192	82.674	17.988	15572.499	10388.486	1.979
20.000	9.232	83.793	18.153	16407.270	10846.094	1.813
19.000	9.299	85.692	18.430	17265.459	11241.577	1.654
18.000	9.351	87.184	18.647	18147.207	11678.313	1.502
17.000	9.394	88.432	18.827	19052.660	12143.629	1.357
16.000	9.524	98.650	20.716	19981.979	11574.818	1.220
15.000	9.572	100.200	20.936	20935.391	11999.607	1.091
14.000	9.747	119.412	24.502	21910.697	10730.798	0.969
13.000	9.776	120.522	24.657	22905.701	11147.857	0.853
12.000	9.847	123.268	25.037	23920.555	11465.053	0.745
11.000	9.871	124.206	25.166	24955.336	11899.647	0.643
10.000	9.943	127.047	25.555	26010.182	12213.663	0.549

9.000	10.006	136.711	27.326	27085.176	11894.346	0.462
8.000	10.083	140.018	27.773	28180.475	12176.023	0.382
7.000	10.210	160.507	31.441	29296.242	11181.385	0.309
6.000	10.280	163.976	31.902	30432.691	11447.350	0.243
5.000	10.324	166.182	32.193	31589.971	11775.115	0.184
4.000	10.400	177.790	34.190	32768.199	11500.857	0.131
3.000	10.431	179.456	34.408	33967.504	11846.298	0.086
2.000	10.509	183.695	34.959	35187.996	12078.439	0.047
1.000	10.591	196.333	37.076	36429.789	11791.007	0.014
0.000	10.674	201.202	37.699	37693.066	11997.955	0.000
-1.000	10.716	203.696	38.017	31410.889	9914.731	0.000
-2.000	10.681	184.816	34.607	25128.711	8713.506	0.000
-3.000	10.705	177.475	33.157	18846.533	6820.766	0.000
-4.000	10.702	159.685	29.842	12564.355	5052.333	0.000
-5.000	10.630	138.632	26.083	6282.178	2890.222	0.000
-6.000	10.699	141.433	26.439	0.000	0.000	0.000

Maximum stress is 12213.66 PSI, located at 10 FT above ground.