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

DATE: 02-02-2018

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.....	SW50
Height of pole.....	50 feet
Depth of bury in ground.....	5 feet
Base diameter.....	9.818 inches
Tip diameter.....	4.044 inches
Flag size, hoist x fly.....	0 feet x 0 feet (polyester fabric)
Wind speed.....	180 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

SW50
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
50.000	4.044	2.231	1.103	0.000	0.000	10.173
49.000	4.322	2.736	1.266	12.373	117.287	9.841
48.000	4.677	3.484	1.490	50.129	403.797	9.511
47.000	5.136	7.793	3.035	115.078	455.038	9.180
46.000	5.359	7.718	2.880	209.383	872.314	8.850
45.000	5.598	8.827	3.153	334.699	1273.630	8.521
44.000	5.807	9.879	3.402	492.340	1736.408	8.194
43.000	6.006	10.956	3.648	683.545	2248.293	7.868
42.000	6.119	9.778	3.196	909.353	3414.475	7.545
41.000	6.258	10.473	3.347	1170.580	4196.965	7.225
40.000	6.377	11.093	3.479	1467.963	5063.355	6.909
39.000	6.483	11.666	3.599	1802.201	6009.260	6.598
38.000	6.717	17.826	5.308	2174.110	4915.216	6.291
37.000	6.822	18.696	5.481	2584.672	5658.609	5.990
36.000	6.936	19.673	5.673	3034.693	6419.708	5.694
35.000	7.026	20.467	5.826	3524.785	7260.138	5.403
34.000	7.146	21.558	6.034	4055.547	8065.792	5.118
33.000	7.245	22.488	6.208	4627.599	8945.376	4.841
32.000	7.367	23.669	6.426	5241.575	9788.527	4.570
31.000	7.464	24.638	6.602	5898.113	10720.974	4.308
30.000	7.576	25.788	6.808	6597.831	11629.671	4.054
29.000	7.767	35.150	9.051	7339.453	9730.745	3.809
28.000	7.878	36.720	9.322	8121.799	10454.810	3.572
27.000	8.026	46.710	11.640	8945.604	9222.588	3.342
26.000	8.089	43.880	10.849	9811.488	10852.229	3.120
25.000	8.172	45.284	11.083	10719.916	11607.229	2.906
24.000	8.370	57.539	13.749	11671.452	10186.789	2.700
23.000	8.430	58.827	13.957	12666.805	10890.978	2.501
22.000	8.522	60.840	14.278	13706.513	11519.507	2.310
21.000	8.666	73.568	16.978	14791.088	10454.037	2.128
20.000	8.738	75.486	17.278	15921.120	11057.773	1.952
19.000	8.789	76.866	17.491	17097.059	11729.484	1.785
18.000	8.906	85.145	19.121	18319.283	11497.000	1.625
17.000	9.018	98.789	21.909	19588.311	10728.782	1.472
16.000	9.099	101.594	22.331	20904.705	11233.667	1.328
15.000	9.145	103.210	22.572	22268.885	11838.887	1.190
14.000	9.315	120.376	25.846	23676.449	10992.897	1.060
13.000	9.379	122.993	26.227	25123.068	11494.719	0.938
12.000	9.500	139.456	29.359	26609.184	10875.971	0.822
11.000	9.514	134.419	28.257	28135.148	11948.236	0.714
10.000	9.646	152.188	31.555	29701.240	11295.204	0.613
9.000	9.713	155.552	32.030	31307.828	11729.565	0.519
8.000	9.857	175.257	35.560	32955.348	11121.082	0.432
7.000	9.900	177.692	35.897	34644.199	11581.084	0.352
6.000	10.030	191.565	38.198	36374.793	11427.106	0.279
5.000	10.078	194.490	38.597	38147.469	11860.238	0.214
4.000	10.207	209.158	40.983	39962.602	11701.128	0.155
3.000	10.328	230.689	44.673	41820.668	11233.909	0.102
2.000	10.399	235.786	45.348	43722.109	11569.820	0.057
1.000	10.515	258.252	49.121	45667.312	11156.336	0.018
0.000	10.541	253.305	48.061	47656.648	11899.079	0.000

-1.000	10.328	203.173	39.344	38125.320	11628.266	0.000
-2.000	10.175	158.791	31.212	28593.988	10993.482	0.000
-3.000	9.888	96.332	19.485	19062.660	11740.159	0.000
-4.000	9.774	63.752	13.045	9531.330	8767.640	0.000
-5.000	9.818	64.633	13.166	0.000	0.000	0.000

Maximum stress is 11948.24 PSI, located at 11 FT above ground.