



**Tower Engineering Solutions**

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## Structural Analysis Report

**Existing 185 ft. SUMMIT Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT04169-A-2**

**Customer Site Name: Higganum**

**Carrier Name:**

**Carrier Site ID / Name: CT33XC545 / Higganum**

**Site Location: 285 Chamberlain Hill Road**

**Higganum, Connecticut**

**Middlesex County**

**Latitude: 41.501764**

**Longitude: -72.618694**

### Analysis Result:

**Max Structural Usage: 57.1% [Pass]**

**Max Foundation Usage: 38.6% [Pass]**

**Additional Usage Caused by Mount Modification: +4.30%**

**Report Prepared By: Walter Velez**



## Introduction

The purpose of this report is to summarize the analysis results on the 185 ft. SUMMIT Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

<b>Tower Drawings</b>	Original structural design report prepared by Summit Manufacturing, LLC & Paul J. Ford and Company. Dated 11-29-1999. SUMMIT Job No 5350. Job No 29299-805. Previous structural report prepared by FDH Engineering, Inc. Dated 04-11-2014. Project No 1463AY1400.
<b>Foundation Drawing</b>	Original foundation design prepared by Summit Manufacturing, LLC & Paul J. Ford and Company. Dated 11-29-1999. SUMMIT Job No 5350. Job No 29299-805.
<b>Geotechnical Report</b>	Geotechnical report prepared by Criscuolo Shepard Associates, P.C. Dated 06-21-1999. File No 99137.
<b>Modification Drawings</b>	N/A

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G. In accordance with this standard, the structure was analyzed using **TESPoles**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

<b>Wind Speed Used in the Analysis:</b> <b>(Based on IBC 2012)</b>	Ultimate Design Wind Speed $V_{ult} = 127.0$ mph (3-Sec. Gust) Nominal Design Wind Speed $V_{asd} = 98.0$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA-222-G, 2012 IBC & 2016 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft.
<b>Seismic Parameters:</b>	$S_5 = 0.179$ , $S_1 = 0.062$

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

### Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	185.0	3	RFS APXVSP18-C-A20 - Panel	Low Profile Platform	(4) 1-1/4" Hybrid	Sprint Nextel
2		3	RFS APXV14-C-I20 - Panel			
3		4	RFS ACU-A20-N RET			
4		3	ALU TD-RRH8x20-25			
5		3	ALU 1900 MHz RRH			
6		3	ALU 800 MHz RRH			
7		3	ALU 800 MHz Filter			
8	177.5	6	Ericsson RRU11	Collar Mount (Andrew MTC 3335)	(12) 1 5/8"; [(2) 1/2" DC Power & (1) 3/8" Fiber; Inside (1) 3" Innerduct]	AT&T
9		1	Raycap DC6-48-60-18-8F			
10	175.0	6	Powerwave 7770 - Panel	Low Profile Platform		
11		3	KMW AM-X-CD-16-65-00T-RET - Panel			
12		6	Powerwave LGP13519			
13		12	Powerwave LGP21401			

### Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
14	185.0	3	RFS APXVSP18-C-A20 - Panel	Low Profile Platform w/ Handrail Kit (SitePro1 HRK14) & Reinforcement Kit (SitePro1 PRK 1245L)	(4) 1-1/4" Hybrid	Sprint Nextel
15		3	RFS APXV14-C-I20 - Panel			
16		4	RFS ACU-A20-N RET			
17		3	ALU TD-RRH8x20-25			
18		3	ALU 1900 MHz RRH			
19		3	ALU 800 MHz RRH			
20		3	ALU 800 MHz Filter			

All transmission lines are considered running inside of the pole shafts. Please see the attached coax layout for the line placement considered in the analysis.

## **Analysis Results**

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	<b>57.1%</b>	<b>32.5%</b>	<b>56.1%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Original Design Reactions	5025.0	39.0	41.0
Analysis Reactions	2953.5	23.2	49.7
Factored Reactions*	6783.8	52.7	55.4

\* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required. Some geotechnical soil parameters were obtained from the original foundation calculations included with the referenced tower and foundation design drawings.

## **Operational Condition (Rigidity):**

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.2508 degrees under the operational wind speed as specified in the Analysis Criteria.

## **Conclusions**

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA-222-G standards, the 2012 IBC and the 2016 Connecticut State Building Code under the design basic wind speed specified in the Analysis Criteria.

## Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

# Usage Diagram - Max Ratio 57.15% at 94.0ft

**Structure:** CT04169-A-2-SBA  
**Site Name:** Higganum  
**Height:** 185.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-G  
**Exposure:** B  
**Gh:** 1.1

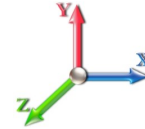
3/6/2018



Page: 1

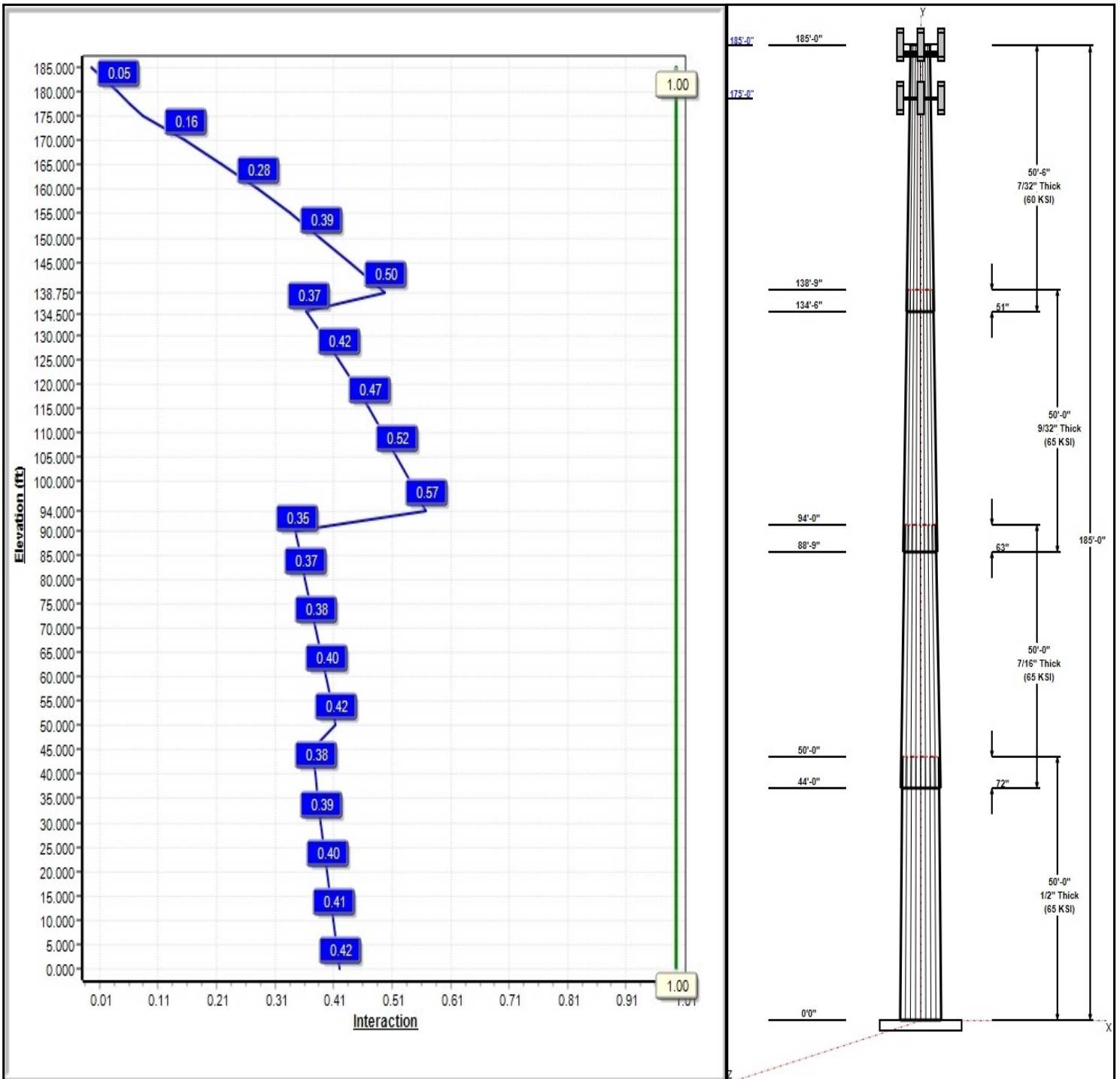
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

**Load Case : 1.2D + 1.6W 98 mph Wind**



**Iterations:** 26

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## Structure: CT04169-A-2-SBA

**Type:** Tapered  
**Site Name:** Higganum  
**Height:** 185.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.18003

3/6/2018

Page: 2



### Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	50.00	46.43	55.43	0.500		0.18003	65
2	50.00	39.38	48.38	0.438	Slip	0.18003	65
3	50.00	31.89	40.89	0.281	Slip	0.18003	65
4	50.50	24.00	33.09	0.219	Slip	0.18003	60

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
185.00	185.00	3	RFS APXVSP18-C-A20	Sprint Nextel
185.00	185.00	3	RFS APXVTM14-C-I20	Sprint Nextel
185.00	185.00	4	RFS ACU-A20-N RET	Sprint Nextel
185.00	185.00	3	ALU TD-RRH8x20-25	Sprint Nextel
185.00	185.00	3	ALU 1900 MHz RRH	Sprint Nextel
185.00	185.00	3	ALU 800 MHz RRH	Sprint Nextel
185.00	185.00	3	ALU 800 MHz Filter	Sprint Nextel
185.00	185.00	1	Low Profile Platform	Sprint Nextel
185.00	188.50	1	Lightning Rod	---
185.00	185.00	1	SitePro1 HRK14	Sprint Nextel
185.00	185.00	1	SitePro1 PRK 1245L	Sprint Nextel
177.50	177.50	1	Raycap DC6-48-60-18-8F	AT&T
177.50	177.50	1	Collar Mount (Andrew	AT&T
177.50	177.50	6	Ericsson RRU11	AT&T
175.00	175.00	6	Powerwave LGP13519	AT&T
175.00	175.00	12	Powerwave LGP21401	AT&T
175.00	175.00	1	Low Profile Platform	AT&T
175.00	175.00	6	Powerwave 7770	AT&T
175.00	175.00	3	KMW	AT&T

### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
3.00	185.00	Inside	1-1/4" Hybrid	Sprint Nextel
3.00	175.00	Inside	1 5/8" Coax	AT&T
3.00	175.00	Inside	1/2" DC Power	AT&T
3.00	175.00	Inside	3" Innerduct	AT&T
3.00	175.00	Inside	3/8" Fiber	AT&T

### Anchor Bolts

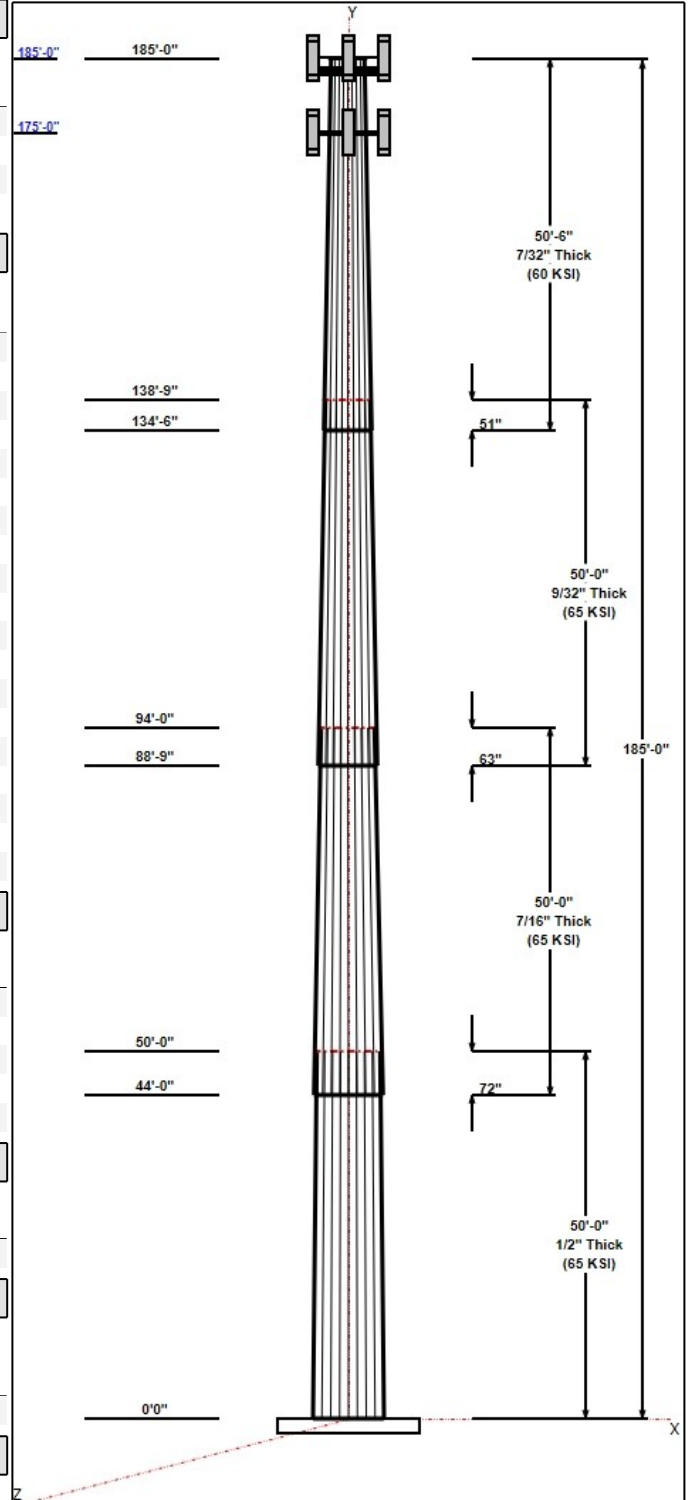
Qty	Specifications	Grade (ksi)	Arrangement
28	2.25" 18J	75.0	Cluster

### Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	67.0	50.0	Clipped

### Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 98 mph Wind	2953.5	23.2	49.7
0.9D + 1.6W 98 mph Wind	2918.9	23.2	37.3
1.2D + 1.0Di + 1.0Wi 50 mph Wind	887.8	7.0	71.5
1.2D + 1.0E	234.4	1.7	49.7



**Structure: CT04169-A-2-SBA**

**Type:** Tapered  
**Site Name:** Higganum  
**Height:** 185.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.18003

3/6/2018

Page: 3



0.9D + 1.0E	231.3	1.7	37.3
1.0D + 1.0W 60 mph Wind	687.1	5.4	41.5



Structure: CT04169-A-2-SBA - Coax Line Placement

Type: Monopole  
Site Name: Higganum  
Height: 185.00 (ft)

3/6/2018

Page: 4



## Shaft Properties

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 5

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	50.000	0.5000	65		0.00	13,616
2	18	50.000	0.4375	65	Slip	72.00	10,264
3	18	50.000	0.2813	65	Slip	63.00	5,484
4	18	50.500	0.2188	60	Slip	51.00	3,380
<b>Total Shaft Weight:</b>							<b>32,744</b>

Bottom

Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	55.43	0.00	87.17	33230.98	18.14	110.86	46.43	50.00	72.89	19425.1	14.96	92.86	0.180027
2	48.38	44.00	66.58	19336.95	18.09	110.59	39.38	94.00	54.08	10362.7	14.46	90.02	0.180027
3	40.89	88.75	36.25	7552.64	24.23	145.39	31.89	138.75	28.21	3561.29	18.58	113.3	0.180027
4	33.09	134.5	22.82	3115.98	25.26	151.27	24.00	185.00	16.51	1179.77	17.93	109.7	0.180027

## Load Summary

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 6

### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	185.00	RFS APXVSP18-C-A20	3	57.00	8.02	0.83	233.51	10.873	0.83	0.00	0.00
2	185.00	RFS APXVTM14-C-I20	3	55.00	6.34	0.78	219.51	7.479	0.78	0.00	0.00
3	185.00	RFS ACU-A20-N RET	4	1.00	0.12	0.60	5.39	0.380	0.60	0.00	0.00
4	185.00	ALU TD-RRH8x20-25	3	70.00	4.05	0.67	183.30	4.882	0.67	0.00	0.00
5	185.00	ALU 1900 MHz RRH	3	60.00	2.38	0.67	212.01	3.269	0.67	0.00	0.00
6	185.00	ALU 800 MHz RRH	3	53.00	2.13	0.67	128.53	3.129	0.67	0.00	0.00
7	185.00	ALU 800 MHz Filter	3	8.80	0.67	0.60	21.34	0.984	0.60	0.00	0.00
8	185.00	Low Profile Platform	1	1500.00	22.00	1.00	2836.65	40.036	1.00	0.00	0.00
9	185.00	Lightning Rod	1	35.00	1.05	1.00	67.08	3.474	1.00	0.00	3.50
10	185.00	SitePro1 HRK14	1	302.36	8.13	1.00	668.79	16.244	1.00	0.00	0.00
11	185.00	SitePro1 PRK 1245L	1	464.91	9.50	1.00	796.34	19.659	1.00	0.00	0.00
12	177.50	Raycap DC6-48-60-18-8F	1	31.80	2.20	0.90	94.67	3.265	0.90	0.00	0.00
13	177.50	Collar Mount (Andrew MTC 3335)	1	150.00	5.00	0.75	277.79	8.550	0.75	0.00	0.00
14	177.50	Ericsson RRU11	6	50.70	2.57	0.71	133.92	3.233	0.71	0.00	0.00
15	175.00	Powerwave LGP13519	6	5.30	0.13	0.60	14.95	0.306	0.60	0.00	0.00
16	175.00	Powerwave LGP21401	12	14.10	1.10	0.60	39.49	1.824	0.60	0.00	0.00
17	175.00	Low Profile Platform	1	1500.00	22.00	0.00	2829.24	39.936	0.00	0.00	0.00
18	175.00	Powerwave 7770	6	35.00	5.51	0.77	172.76	6.583	0.77	0.00	0.00
19	175.00	KMW AM-X-CD-16-65-00T-RET	3	48.50	8.02	0.79	213.30	10.857	0.79	0.00	0.00
<b>Totals:</b>			<b>62</b>	<b>5,760.17</b>			<b>13,630.26</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
3.00	185.00	(4) 1-1/4" Hybrid	0.00	Inside
3.00	175.00	(12) 1 5/8" Coax	0.00	Inside
3.00	175.00	(2) 1/2" DC Power	0.00	Inside
3.00	175.00	(1) 3" Innerduct	0.00	Inside
3.00	175.00	(1) 3/8" Fiber	0.00	Inside

## Shaft Section Properties

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 7

**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.5000	55.430	87.171	33231.0	18.14	110.86	80.1	1180.	0.0
5.00		0.5000	54.530	85.742	31623.9	17.82	109.06	80.4	1142.	1471.0
10.00		0.5000	53.630	84.314	30069.6	17.50	107.26	80.8	1104.	1446.7
15.00		0.5000	52.730	82.885	28567.0	17.18	105.46	81.2	1067.	1422.4
20.00		0.5000	51.829	81.457	27115.3	16.87	103.66	81.6	1030.	1398.1
25.00		0.5000	50.929	80.028	25713.7	16.55	101.86	81.9	994.4	1373.7
30.00		0.5000	50.029	78.600	24361.2	16.23	100.06	82.3	959.1	1349.4
35.00		0.5000	49.129	77.172	23056.9	15.91	98.26	82.5	924.4	1325.1
40.00		0.5000	48.229	75.743	21800.1	15.60	96.46	82.5	890.3	1300.8
44.00	Bot - Section 2	0.5000	47.509	74.600	20828.2	15.34	95.02	82.5	863.5	1023.2
45.00		0.5000	47.329	74.315	20589.8	15.28	94.66	82.5	856.9	479.5
50.00	Top - Section 1	0.4375	47.304	65.077	18059.3	17.65	108.12	0.0	0.0	2370.1
55.00		0.4375	46.404	63.827	17038.6	17.29	106.07	81.1	723.2	1096.6
60.00		0.4375	45.503	62.577	16057.1	16.93	104.01	81.5	695.0	1075.3
65.00		0.4375	44.603	61.327	15114.0	16.57	101.95	81.9	667.4	1054.1
70.00		0.4375	43.703	60.078	14208.6	16.20	99.89	82.3	640.4	1032.8
75.00		0.4375	42.803	58.828	13340.1	15.84	97.84	82.5	613.9	1011.5
80.00		0.4375	41.903	57.578	12507.7	15.48	95.78	82.5	587.9	990.3
85.00		0.4375	41.003	56.328	11710.7	15.11	93.72	82.5	562.5	969.0
88.75	Bot - Section 3	0.4375	40.328	55.390	11135.7	14.84	92.18	82.5	543.9	712.8
90.00		0.4375	40.103	55.078	10948.3	14.75	91.66	82.5	537.7	388.7
94.00	Top - Section 2	0.2813	39.945	35.406	7037.5	23.63	142.03	0.0	0.0	1229.2
95.00		0.2813	39.765	35.245	6942.1	23.52	141.39	73.7	343.9	120.2
100.00		0.2813	38.865	34.442	6478.0	22.96	138.19	74.4	328.3	592.8
105.00		0.2813	37.965	33.638	6035.1	22.39	134.99	75.1	313.1	579.2
110.00		0.2813	37.065	32.835	5612.9	21.83	131.78	75.7	298.3	565.5
115.00		0.2813	36.164	32.031	5210.8	21.26	128.58	76.4	283.8	551.8
120.00		0.2813	35.264	31.228	4828.5	20.70	125.38	77.1	269.7	538.1
125.00		0.2813	34.364	30.424	4465.2	20.13	122.18	77.7	255.9	524.5
130.00		0.2813	33.464	29.621	4120.7	19.57	118.98	78.4	242.5	510.8
134.50	Bot - Section 4	0.2813	32.654	28.898	3826.2	19.06	116.10	79.0	230.8	448.0
135.00		0.2813	32.564	28.817	3794.4	19.00	115.78	79.0	229.5	87.9
138.75	Top - Section 3	0.2188	32.326	22.292	2903.4	24.65	147.78	0.0	0.0	651.3
140.00		0.2188	32.101	22.136	2842.8	24.47	146.75	68.1	174.4	94.5
145.00		0.2188	31.201	21.511	2608.8	23.74	142.63	68.8	164.7	371.3
150.00		0.2188	30.301	20.886	2387.9	23.01	138.52	69.6	155.2	360.7
155.00		0.2188	29.401	20.261	2179.9	22.29	134.40	70.4	146.0	350.0
160.00		0.2188	28.501	19.636	1984.4	21.56	130.29	71.1	137.1	339.4
165.00		0.2188	27.601	19.011	1800.9	20.84	126.17	71.9	128.5	328.8
170.00		0.2188	26.700	18.386	1629.0	20.11	122.06	72.6	120.2	318.1
175.00		0.2188	25.800	17.761	1468.5	19.39	117.94	73.4	112.1	307.5
177.50		0.2188	25.350	17.448	1392.3	19.02	115.89	73.8	108.2	149.8
180.00		0.2188	24.900	17.136	1318.9	18.66	113.83	74.1	104.3	147.1
185.00		0.2188	24.000	16.511	1179.8	17.93	109.71	74.9	96.8	286.2

**32743.5**

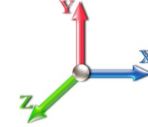
## Wind Loading - Shaft

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Page:</b> 8
	<b>Struct Class:</b> II	



**Load Case:** 1.2D + 1.6W 98 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	16.350	17.98	384.58	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	16.350	17.98	378.34	0.650	0.000	5.00	23.262	15.12	435.1	0.0	1765.2
10.00		1.00	0.70	16.350	17.98	372.09	0.650	0.000	5.00	22.881	14.87	428.0	0.0	1736.0
15.00		1.00	0.70	16.350	17.98	365.84	0.650	0.000	5.00	22.500	14.63	420.8	0.0	1706.8
20.00		1.00	0.70	16.350	17.98	359.60	0.650	0.000	5.00	22.119	14.38	413.7	0.0	1677.7
25.00		1.00	0.70	16.350	17.98	353.35	0.650	0.000	5.00	21.738	14.13	406.6	0.0	1648.5
30.00		1.00	0.70	16.364	18.00	347.26	0.650	0.000	5.00	21.357	13.88	399.8	0.0	1619.3
35.00		1.00	0.73	17.100	18.81	348.60	0.650	0.000	5.00	20.977	13.63	410.4	0.0	1590.2
40.00		1.00	0.76	17.765	19.54	348.80	0.650	0.000	5.00	20.596	13.39	418.6	0.0	1561.0
44.00	Bot - Section 2	1.00	0.78	18.256	20.08	348.31	0.650	0.000	4.00	16.202	10.53	338.4	0.0	1227.8
45.00		1.00	0.79	18.374	20.21	348.10	0.650	0.000	1.00	4.087	2.66	85.9	0.0	575.4
50.00	Top - Section 1	1.00	0.81	18.935	20.83	346.66	0.650	0.000	5.00	20.204	13.13	437.7	0.0	2844.1
55.00		1.00	0.83	19.458	21.40	351.22	0.650	0.000	5.00	19.823	12.89	441.3	0.0	1315.9
60.00		1.00	0.85	19.948	21.94	348.72	0.650	0.000	5.00	19.443	12.64	443.7	0.0	1290.4
65.00		1.00	0.87	20.409	22.45	345.75	0.650	0.000	5.00	19.062	12.39	445.1	0.0	1264.9
70.00		1.00	0.89	20.846	22.93	342.38	0.650	0.000	5.00	18.681	12.14	445.5	0.0	1239.3
75.00		1.00	0.91	21.261	23.39	338.65	0.650	0.000	5.00	18.300	11.90	445.1	0.0	1213.8
80.00		1.00	0.93	21.656	23.82	334.60	0.650	0.000	5.00	17.919	11.65	443.9	0.0	1188.3
85.00		1.00	0.94	22.035	24.24	330.26	0.650	0.000	5.00	17.538	11.40	442.1	0.0	1162.8
88.75	Bot - Section 3	1.00	0.96	22.308	24.54	326.83	0.650	0.000	3.75	12.904	8.39	329.3	0.0	855.3
90.00		1.00	0.96	22.398	24.64	325.66	0.650	0.000	1.25	4.313	2.80	110.5	0.0	466.4
94.00	Top - Section 2	1.00	0.97	22.678	24.95	321.80	0.650	0.000	4.00	13.642	8.87	353.9	0.0	1475.0
95.00		1.00	0.97	22.746	25.02	325.42	0.650	0.000	1.00	3.372	2.19	87.8	0.0	144.2
100.00		1.00	0.99	23.082	25.39	320.39	0.650	0.000	5.00	16.634	10.81	439.2	0.0	711.4
105.00		1.00	1.00	23.406	25.75	315.16	0.650	0.000	5.00	16.253	10.56	435.2	0.0	695.0
110.00		1.00	1.02	23.719	26.09	309.74	0.650	0.000	5.00	15.872	10.32	430.7	0.0	678.6
115.00		1.00	1.03	24.022	26.42	304.14	0.650	0.000	5.00	15.491	10.07	425.7	0.0	662.2
120.00		1.00	1.04	24.316	26.75	298.38	0.650	0.000	5.00	15.111	9.82	420.3	0.0	645.8
125.00		1.00	1.05	24.602	27.06	292.46	0.650	0.000	5.00	14.730	9.57	414.6	0.0	629.4
130.00		1.00	1.07	24.879	27.37	286.40	0.650	0.000	5.00	14.349	9.33	408.4	0.0	613.0
134.50	Bot - Section 4	1.00	1.08	25.122	27.63	280.83	0.650	0.000	4.50	12.588	8.18	361.8	0.0	537.6
135.00		1.00	1.08	25.149	27.66	280.21	0.650	0.000	0.50	1.398	0.91	40.2	0.0	105.5
138.75	Top - Section 3	1.00	1.09	25.346	27.88	275.47	0.650	0.000	3.75	10.365	6.74	300.5	0.0	781.6
140.00		1.00	1.09	25.411	27.95	277.66	0.650	0.000	1.25	3.407	2.21	99.1	0.0	113.4
145.00		1.00	1.10	25.667	28.23	271.23	0.650	0.000	5.00	13.391	8.70	393.2	0.0	445.6
150.00		1.00	1.11	25.917	28.51	264.69	0.650	0.000	5.00	13.011	8.46	385.8	0.0	432.8
155.00		1.00	1.12	26.161	28.78	258.03	0.650	0.000	5.00	12.630	8.21	378.0	0.0	420.0
160.00		1.00	1.13	26.399	29.04	251.27	0.650	0.000	5.00	12.249	7.96	369.9	0.0	407.3
165.00		1.00	1.14	26.633	29.30	244.40	0.650	0.000	5.00	11.868	7.71	361.6	0.0	394.5
170.00		1.00	1.15	26.861	29.55	237.44	0.650	0.000	5.00	11.487	7.47	353.0	0.0	381.8
175.00	Appurtenance(s)	1.00	1.16	27.084	29.79	230.39	0.650	0.000	5.00	11.106	7.22	344.1	0.0	369.0
177.50	Appurtenance(s)	1.00	1.16	27.194	29.91	226.83	0.650	0.000	2.50	5.410	3.52	168.3	0.0	179.7
180.00		1.00	1.17	27.303	30.03	223.25	0.650	0.000	2.50	5.315	3.45	166.0	0.0	176.5
185.00	Appurtenance(s)	1.00	1.18	27.518	30.27	216.02	0.650	0.000	5.00	10.345	6.72	325.7	0.0	343.5
<b>Totals:</b>								<b>185.00</b>				<b>15,204.4</b>		<b>39,292.2</b>

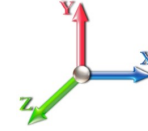
## Discrete Appurtenance Forces

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 1.2D + 1.6W 98 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	185.00	RFS APXVTM14-C-I20	3	27.518	30.269	0.70	0.90	13.35	198.00	0.000	0.000	646.65	0.00	0.00	
2	185.00	SitePro1 HRK14	1	27.518	30.269	1.00	1.00	8.13	362.83	0.000	0.000	393.74	0.00	0.00	
3	185.00	Lightning Rod	1	27.665	30.432	1.00	1.00	1.05	42.00	0.000	3.500	51.13	0.00	178.94	
4	185.00	Low Profile Platform	1	27.518	30.269	1.00	1.00	22.00	1800.00	0.000	0.000	1065.48	0.00	0.00	
5	185.00	ALU 800 MHz Filter	3	27.518	30.269	0.48	0.80	0.96	31.68	0.000	0.000	46.73	0.00	0.00	
6	185.00	ALU 800 MHz RRH	3	27.518	30.269	0.54	0.80	3.43	190.80	0.000	0.000	165.88	0.00	0.00	
7	185.00	ALU 1900 MHz RRH	3	27.518	30.269	0.54	0.80	3.83	216.00	0.000	0.000	185.35	0.00	0.00	
8	185.00	ALU TD-RRH8x20-25	3	27.518	30.269	0.54	0.80	6.51	252.00	0.000	0.000	315.40	0.00	0.00	
9	185.00	RFS ACU-A20-N RET	4	27.518	30.269	0.48	0.80	0.23	4.80	0.000	0.000	11.16	0.00	0.00	
10	185.00	SitePro1 PRK 1245L	1	27.518	30.269	1.00	1.00	9.50	557.89	0.000	0.000	460.09	0.00	0.00	
11	185.00	RFS APXVSP18-C-A20	3	27.518	30.269	0.75	0.90	17.97	205.20	0.000	0.000	870.44	0.00	0.00	
12	177.50	Ericsson RRU11	6	27.194	29.913	0.57	0.80	8.76	365.04	0.000	0.000	419.20	0.00	0.00	
13	177.50	Collar Mount (Andrew	1	27.194	29.913	0.56	0.75	2.81	180.00	0.000	0.000	134.61	0.00	0.00	
14	177.50	Raycap DC6-48-60-18-8F	1	27.194	29.913	0.72	0.80	1.58	38.16	0.000	0.000	75.81	0.00	0.00	
15	175.00	KMW	3	27.084	29.792	0.63	0.80	15.21	174.60	0.000	0.000	724.83	0.00	0.00	
16	175.00	Powerwave 7770	6	27.084	29.792	0.62	0.80	20.36	252.00	0.000	0.000	970.76	0.00	0.00	
17	175.00	Low Profile Platform	1	27.084	29.792	0.00	1.00	22.00	1800.00	0.000	0.000	1048.69	0.00	0.00	
18	175.00	Powerwave LGP21401	12	27.084	29.792	0.48	0.80	6.34	203.04	0.000	0.000	302.02	0.00	0.00	
19	175.00	Powerwave LGP13519	6	27.084	29.792	0.48	0.80	0.37	38.16	0.000	0.000	17.85	0.00	0.00	
<b>Totals:</b>									<b>6,912.20</b>						<b>7,905.81</b>

## Total Applied Force Summary

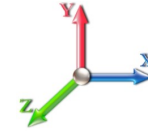
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 10

**Load Case:** 1.2D + 1.6W 98 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.60



**Iterations** 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		435.09	1805.78	0.00	0.00
10.00		427.97	1837.55	0.00	0.00
15.00		420.85	1808.38	0.00	0.00
20.00		413.72	1779.22	0.00	0.00
25.00		406.60	1750.05	0.00	0.00
30.00		399.81	1720.89	0.00	0.00
35.00		410.36	1691.72	0.00	0.00
40.00		418.58	1662.56	0.00	0.00
44.00		338.38	1309.05	0.00	0.00
45.00		85.90	595.69	0.00	0.00
50.00		437.66	2945.65	0.00	0.00
55.00		441.26	1417.46	0.00	0.00
60.00		443.68	1391.94	0.00	0.00
65.00		445.05	1366.42	0.00	0.00
70.00		445.49	1340.90	0.00	0.00
75.00		445.10	1315.38	0.00	0.00
80.00		443.95	1289.86	0.00	0.00
85.00		442.10	1264.34	0.00	0.00
88.75		329.32	931.51	0.00	0.00
90.00		110.52	491.83	0.00	0.00
94.00		353.92	1556.23	0.00	0.00
95.00		87.76	164.56	0.00	0.00
100.00		439.23	812.95	0.00	0.00
105.00		435.20	796.54	0.00	0.00
110.00		430.69	780.14	0.00	0.00
115.00		425.73	763.73	0.00	0.00
120.00		420.34	747.33	0.00	0.00
125.00		414.56	730.92	0.00	0.00
130.00		408.39	714.52	0.00	0.00
134.50		361.78	629.04	0.00	0.00
135.00		40.23	115.61	0.00	0.00
138.75		300.54	857.75	0.00	0.00
140.00		99.05	138.77	0.00	0.00
145.00		393.22	547.11	0.00	0.00
150.00		385.75	534.35	0.00	0.00
155.00		377.99	521.59	0.00	0.00
160.00		369.93	508.83	0.00	0.00
165.00		361.59	496.07	0.00	0.00
170.00		352.99	483.31	0.00	0.00
175.00	(28) attachments	3408.28	2938.35	0.00	0.00
177.50	(8) attachments	797.94	774.36	0.00	0.00
180.00		166.02	187.97	0.00	0.00
185.00	(26) attachments	4537.69	4227.58	0.00	178.94
	<b>Totals:</b>	<b>23,110.20</b>	<b>49,743.77</b>	<b>0.00</b>	<b>178.94</b>

# Calculated Forces

**Structure:** CT04169-A-2-SBA

**Code:** EIA/TIA-222-G

3/6/2018

**Site Name:** Higganum

**Exposure:** B



**Height:** 185.00 (ft)

**Crest Height:** 0.00

**Base Elev:** 0.000 (ft)

**Site Class:** C - Very Dense Soil

**Gh:** 1.1

**Topography:** 1

**Struct Class:** II

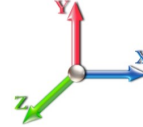
Page: 11

**Load Case:** 1.2D + 1.6W 98 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60

**Iterations** 26



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.72	-23.16	0.00	-2953.5	0.00	2953.54	6281.65	3140.82	14160.7	7090.90	0.00	0.000	0.000	0.424
5.00	-47.86	-22.83	0.00	-2837.7	0.00	2837.72	6207.52	3103.76	13762.2	6891.36	0.07	-0.124	0.000	0.420
10.00	-45.98	-22.50	0.00	-2723.5	0.00	2723.56	6132.44	3066.22	13367.2	6693.54	0.26	-0.249	0.000	0.414
15.00	-44.12	-22.17	0.00	-2611.0	0.00	2611.07	6056.39	3028.19	12975.7	6497.50	0.59	-0.375	0.000	0.409
20.00	-42.30	-21.83	0.00	-2500.2	0.00	2500.24	5979.38	2989.69	12587.8	6303.28	1.05	-0.502	0.000	0.404
25.00	-40.50	-21.50	0.00	-2391.0	0.00	2391.08	5901.42	2950.71	12203.7	6110.94	1.65	-0.631	0.000	0.398
30.00	-38.74	-21.17	0.00	-2283.5	0.00	2283.59	5822.49	2911.25	11823.5	5920.54	2.38	-0.760	0.000	0.392
35.00	-37.01	-20.82	0.00	-2177.7	0.00	2177.76	5733.46	2866.73	11429.0	5722.99	3.24	-0.890	0.000	0.387
40.00	-35.31	-20.44	0.00	-2073.6	0.00	2073.68	5627.33	2813.67	11007.6	5512.03	4.25	-1.021	0.000	0.383
44.00	-33.98	-20.12	0.00	-1991.9	0.00	1991.90	5542.43	2771.21	10676.3	5346.11	5.15	-1.128	0.000	0.379
45.00	-33.36	-20.07	0.00	-1971.7	0.00	1971.79	5521.20	2760.60	10594.3	5305.03	5.39	-1.155	0.000	0.378
50.00	-30.38	-19.64	0.00	-1871.4	0.00	1871.44	4722.80	2361.40	9081.59	4547.54	6.67	-1.287	0.000	0.418
55.00	-28.93	-19.23	0.00	-1773.2	0.00	1773.25	4656.60	2328.30	8780.72	4396.89	8.09	-1.421	0.000	0.410
60.00	-27.50	-18.82	0.00	-1677.0	0.00	1677.08	4589.45	2294.72	8483.02	4247.81	9.65	-1.565	0.000	0.401
65.00	-26.10	-18.41	0.00	-1582.9	0.00	1582.96	4521.33	2260.66	8188.59	4100.38	11.37	-1.709	0.000	0.392
70.00	-24.73	-17.98	0.00	-1490.9	0.00	1490.93	4452.25	2226.13	7897.53	3954.63	13.24	-1.854	0.000	0.383
75.00	-23.39	-17.55	0.00	-1401.0	0.00	1401.03	4370.60	2185.30	7589.78	3800.53	15.25	-1.999	0.000	0.374
80.00	-22.07	-17.12	0.00	-1313.2	0.00	1313.27	4277.74	2138.87	7269.08	3639.94	17.42	-2.143	0.000	0.366
85.00	-20.79	-16.67	0.00	-1227.6	0.00	1227.69	4184.88	2092.44	6955.30	3482.82	19.75	-2.288	0.000	0.358
88.75	-19.85	-16.33	0.00	-1165.1	0.00	1165.17	4115.23	2057.61	6724.50	3367.25	21.59	-2.397	0.000	0.351
90.00	-19.34	-16.22	0.00	-1144.7	0.00	1144.75	4092.01	2046.01	6648.44	3329.16	22.22	-2.434	0.000	0.349
94.00	-17.78	-15.83	0.00	-1079.8	0.00	1079.85	2345.44	1172.72	3825.50	1915.59	24.31	-2.549	0.000	0.571
95.00	-17.59	-15.77	0.00	-1064.0	0.00	1064.03	2339.01	1169.51	3797.57	1901.61	24.84	-2.579	0.000	0.567
100.00	-16.74	-15.35	0.00	-985.19	0.00	985.19	2306.26	1153.13	3658.43	1831.93	27.66	-2.789	0.000	0.545
105.00	-15.91	-14.94	0.00	-908.43	0.00	908.43	2272.55	1136.28	3520.24	1762.74	30.69	-2.997	0.000	0.523
110.00	-15.11	-14.52	0.00	-833.75	0.00	833.75	2237.88	1118.94	3383.12	1694.08	33.94	-3.202	0.000	0.499
115.00	-14.32	-14.10	0.00	-761.17	0.00	761.17	2202.25	1101.13	3247.17	1626.00	37.40	-3.404	0.000	0.475
120.00	-13.55	-13.68	0.00	-690.68	0.00	690.68	2165.66	1082.83	3112.49	1558.56	41.07	-3.602	0.000	0.450
125.00	-12.80	-13.26	0.00	-622.29	0.00	622.29	2128.11	1064.06	2979.20	1491.82	44.94	-3.796	0.000	0.423
130.00	-12.08	-12.84	0.00	-555.98	0.00	555.98	2089.60	1044.80	2847.40	1425.82	49.01	-3.983	0.000	0.396
134.50	-11.46	-12.45	0.00	-498.19	0.00	498.19	2054.12	1027.06	2730.15	1367.10	52.85	-4.147	0.000	0.370
135.00	-11.33	-12.42	0.00	-491.97	0.00	491.97	2050.13	1025.07	2717.20	1360.62	53.28	-4.166	0.000	0.367
138.75	-10.48	-12.07	0.00	-445.39	0.00	445.39	1362.09	681.04	1798.87	900.77	56.60	-4.297	0.000	0.502
140.00	-10.32	-11.99	0.00	-430.30	0.00	430.30	1356.31	678.16	1778.61	890.62	57.73	-4.341	0.000	0.491
145.00	-9.77	-11.59	0.00	-370.36	0.00	370.36	1332.67	666.33	1697.93	850.23	62.38	-4.541	0.000	0.443
150.00	-9.23	-11.19	0.00	-312.43	0.00	312.43	1308.18	654.09	1617.96	810.18	67.24	-4.728	0.000	0.393
155.00	-8.71	-10.79	0.00	-256.50	0.00	256.50	1282.83	641.42	1538.80	770.54	72.28	-4.897	0.000	0.340
160.00	-8.21	-10.40	0.00	-202.55	0.00	202.55	1256.64	628.32	1460.53	731.35	77.48	-5.047	0.000	0.284
165.00	-7.73	-10.01	0.00	-150.56	0.00	150.56	1229.59	614.80	1383.27	692.66	82.83	-5.173	0.000	0.224
170.00	-7.27	-9.62	0.00	-100.51	0.00	100.51	1201.70	600.85	1307.09	654.52	88.30	-5.273	0.000	0.160
175.00	-4.65	-5.96	0.00	-52.40	0.00	52.40	1172.95	586.47	1232.10	616.96	93.85	-5.339	0.000	0.089
177.50	-3.96	-5.10	0.00	-37.49	0.00	37.49	1158.25	579.13	1195.08	598.43	96.65	-5.361	0.000	0.066
180.00	-3.78	-4.91	0.00	-24.75	0.00	24.75	1143.35	571.67	1158.39	580.05	99.46	-5.377	0.000	0.046
185.00	0.00	-4.54	0.00	-0.18	0.00	0.18	1112.89	556.45	1086.05	543.83	105.09	-5.390	0.000	0.000



## Wind Loading - Shaft

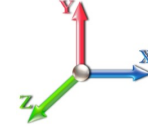
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 12

**Load Case:** 0.9D + 1.6W 98 mph Wind

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



**Iterations** 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	16.350	17.98	384.58	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	16.350	17.98	378.34	0.650	0.000	5.00	23.262	15.12	435.1	0.0	1323.9
10.00		1.00	0.70	16.350	17.98	372.09	0.650	0.000	5.00	22.881	14.87	428.0	0.0	1302.0
15.00		1.00	0.70	16.350	17.98	365.84	0.650	0.000	5.00	22.500	14.63	420.8	0.0	1280.1
20.00		1.00	0.70	16.350	17.98	359.60	0.650	0.000	5.00	22.119	14.38	413.7	0.0	1258.2
25.00		1.00	0.70	16.350	17.98	353.35	0.650	0.000	5.00	21.738	14.13	406.6	0.0	1236.4
30.00		1.00	0.70	16.364	18.00	347.26	0.650	0.000	5.00	21.357	13.88	399.8	0.0	1214.5
35.00		1.00	0.73	17.100	18.81	348.60	0.650	0.000	5.00	20.977	13.63	410.4	0.0	1192.6
40.00		1.00	0.76	17.765	19.54	348.80	0.650	0.000	5.00	20.596	13.39	418.6	0.0	1170.8
44.00	Bot - Section 2	1.00	0.78	18.256	20.08	348.31	0.650	0.000	4.00	16.202	10.53	338.4	0.0	920.9
45.00		1.00	0.79	18.374	20.21	348.10	0.650	0.000	1.00	4.087	2.66	85.9	0.0	431.5
50.00	Top - Section 1	1.00	0.81	18.935	20.83	346.66	0.650	0.000	5.00	20.204	13.13	437.7	0.0	2133.1
55.00		1.00	0.83	19.458	21.40	351.22	0.650	0.000	5.00	19.823	12.89	441.3	0.0	986.9
60.00		1.00	0.85	19.948	21.94	348.72	0.650	0.000	5.00	19.443	12.64	443.7	0.0	967.8
65.00		1.00	0.87	20.409	22.45	345.75	0.650	0.000	5.00	19.062	12.39	445.1	0.0	948.6
70.00		1.00	0.89	20.846	22.93	342.38	0.650	0.000	5.00	18.681	12.14	445.5	0.0	929.5
75.00		1.00	0.91	21.261	23.39	338.65	0.650	0.000	5.00	18.300	11.90	445.1	0.0	910.4
80.00		1.00	0.93	21.656	23.82	334.60	0.650	0.000	5.00	17.919	11.65	443.9	0.0	891.2
85.00		1.00	0.94	22.035	24.24	330.26	0.650	0.000	5.00	17.538	11.40	442.1	0.0	872.1
88.75	Bot - Section 3	1.00	0.96	22.308	24.54	326.83	0.650	0.000	3.75	12.904	8.39	329.3	0.0	641.5
90.00		1.00	0.96	22.398	24.64	325.66	0.650	0.000	1.25	4.313	2.80	110.5	0.0	349.8
94.00	Top - Section 2	1.00	0.97	22.678	24.95	321.80	0.650	0.000	4.00	13.642	8.87	353.9	0.0	1106.2
95.00		1.00	0.97	22.746	25.02	325.42	0.650	0.000	1.00	3.372	2.19	87.8	0.0	108.2
100.00		1.00	0.99	23.082	25.39	320.39	0.650	0.000	5.00	16.634	10.81	439.2	0.0	533.5
105.00		1.00	1.00	23.406	25.75	315.16	0.650	0.000	5.00	16.253	10.56	435.2	0.0	521.2
110.00		1.00	1.02	23.719	26.09	309.74	0.650	0.000	5.00	15.872	10.32	430.7	0.0	508.9
115.00		1.00	1.03	24.022	26.42	304.14	0.650	0.000	5.00	15.491	10.07	425.7	0.0	496.6
120.00		1.00	1.04	24.316	26.75	298.38	0.650	0.000	5.00	15.111	9.82	420.3	0.0	484.3
125.00		1.00	1.05	24.602	27.06	292.46	0.650	0.000	5.00	14.730	9.57	414.6	0.0	472.0
130.00		1.00	1.07	24.879	27.37	286.40	0.650	0.000	5.00	14.349	9.33	408.4	0.0	459.7
134.50	Bot - Section 4	1.00	1.08	25.122	27.63	280.83	0.650	0.000	4.50	12.588	8.18	361.8	0.0	403.2
135.00		1.00	1.08	25.149	27.66	280.21	0.650	0.000	0.50	1.398	0.91	40.2	0.0	79.1
138.75	Top - Section 3	1.00	1.09	25.346	27.88	275.47	0.650	0.000	3.75	10.365	6.74	300.5	0.0	586.2
140.00		1.00	1.09	25.411	27.95	277.66	0.650	0.000	1.25	3.407	2.21	99.1	0.0	85.0
145.00		1.00	1.10	25.667	28.23	271.23	0.650	0.000	5.00	13.391	8.70	393.2	0.0	334.2
150.00		1.00	1.11	25.917	28.51	264.69	0.650	0.000	5.00	13.011	8.46	385.8	0.0	324.6
155.00		1.00	1.12	26.161	28.78	258.03	0.650	0.000	5.00	12.630	8.21	378.0	0.0	315.0
160.00		1.00	1.13	26.399	29.04	251.27	0.650	0.000	5.00	12.249	7.96	369.9	0.0	305.5
165.00		1.00	1.14	26.633	29.30	244.40	0.650	0.000	5.00	11.868	7.71	361.6	0.0	295.9
170.00		1.00	1.15	26.861	29.55	237.44	0.650	0.000	5.00	11.487	7.47	353.0	0.0	286.3
175.00	Appurtenance(s)	1.00	1.16	27.084	29.79	230.39	0.650	0.000	5.00	11.106	7.22	344.1	0.0	276.7
177.50	Appurtenance(s)	1.00	1.16	27.194	29.91	226.83	0.650	0.000	2.50	5.410	3.52	168.3	0.0	134.8
180.00		1.00	1.17	27.303	30.03	223.25	0.650	0.000	2.50	5.315	3.45	166.0	0.0	132.4
185.00	Appurtenance(s)	1.00	1.18	27.518	30.27	216.02	0.650	0.000	5.00	10.345	6.72	325.7	0.0	257.6
<b>Totals:</b>								<b>185.00</b>			<b>15,204.4</b>	<b>29,469.2</b>		

## Discrete Appurtenance Forces

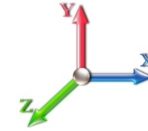
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 13

**Load Case:** 0.9D + 1.6W 98 mph Wind

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



**Iterations** 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	185.00	RFS APXVTM14-C-I20	3	27.518	30.269	0.70	0.90	13.35	148.50	0.000	0.000	646.65	0.00	0.00
2	185.00	SitePro1 HRK14	1	27.518	30.269	1.00	1.00	8.13	272.12	0.000	0.000	393.74	0.00	0.00
3	185.00	Lightning Rod	1	27.665	30.432	1.00	1.00	1.05	31.50	0.000	3.500	51.13	0.00	178.94
4	185.00	Low Profile Platform	1	27.518	30.269	1.00	1.00	22.00	1350.00	0.000	0.000	1065.48	0.00	0.00
5	185.00	ALU 800 MHz Filter	3	27.518	30.269	0.48	0.80	0.96	23.76	0.000	0.000	46.73	0.00	0.00
6	185.00	ALU 800 MHz RRH	3	27.518	30.269	0.54	0.80	3.43	143.10	0.000	0.000	165.88	0.00	0.00
7	185.00	ALU 1900 MHz RRH	3	27.518	30.269	0.54	0.80	3.83	162.00	0.000	0.000	185.35	0.00	0.00
8	185.00	ALU TD-RRH8x20-25	3	27.518	30.269	0.54	0.80	6.51	189.00	0.000	0.000	315.40	0.00	0.00
9	185.00	RFS ACU-A20-N RET	4	27.518	30.269	0.48	0.80	0.23	3.60	0.000	0.000	11.16	0.00	0.00
10	185.00	SitePro1 PRK 1245L	1	27.518	30.269	1.00	1.00	9.50	418.42	0.000	0.000	460.09	0.00	0.00
11	185.00	RFS APXVSP18-C-A20	3	27.518	30.269	0.75	0.90	17.97	153.90	0.000	0.000	870.44	0.00	0.00
12	177.50	Ericsson RRU11	6	27.194	29.913	0.57	0.80	8.76	273.78	0.000	0.000	419.20	0.00	0.00
13	177.50	Collar Mount (Andrew	1	27.194	29.913	0.56	0.75	2.81	135.00	0.000	0.000	134.61	0.00	0.00
14	177.50	Raycap DC6-48-60-18-8F	1	27.194	29.913	0.72	0.80	1.58	28.62	0.000	0.000	75.81	0.00	0.00
15	175.00	KMW	3	27.084	29.792	0.63	0.80	15.21	130.95	0.000	0.000	724.83	0.00	0.00
16	175.00	Powerwave 7770	6	27.084	29.792	0.62	0.80	20.36	189.00	0.000	0.000	970.76	0.00	0.00
17	175.00	Low Profile Platform	1	27.084	29.792	0.00	1.00	22.00	1350.00	0.000	0.000	1048.69	0.00	0.00
18	175.00	Powerwave LGP21401	12	27.084	29.792	0.48	0.80	6.34	152.28	0.000	0.000	302.02	0.00	0.00
19	175.00	Powerwave LGP13519	6	27.084	29.792	0.48	0.80	0.37	28.62	0.000	0.000	17.85	0.00	0.00
<b>Totals:</b>									<b>5,184.15</b>			<b>7,905.81</b>		

## Total Applied Force Summary

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

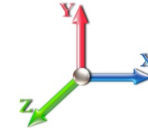


Page: 14

**Load Case:** 0.9D + 1.6W 98 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60



**Iterations** 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		435.09	1354.33	0.00	0.00
10.00		427.97	1378.16	0.00	0.00
15.00		420.85	1356.29	0.00	0.00
20.00		413.72	1334.41	0.00	0.00
25.00		406.60	1312.54	0.00	0.00
30.00		399.81	1290.67	0.00	0.00
35.00		410.36	1268.79	0.00	0.00
40.00		418.58	1246.92	0.00	0.00
44.00		338.38	981.79	0.00	0.00
45.00		85.90	446.77	0.00	0.00
50.00		437.66	2209.24	0.00	0.00
55.00		441.26	1063.09	0.00	0.00
60.00		443.68	1043.95	0.00	0.00
65.00		445.05	1024.81	0.00	0.00
70.00		445.49	1005.67	0.00	0.00
75.00		445.10	986.53	0.00	0.00
80.00		443.95	967.40	0.00	0.00
85.00		442.10	948.26	0.00	0.00
88.75		329.32	698.63	0.00	0.00
90.00		110.52	368.87	0.00	0.00
94.00		353.92	1167.17	0.00	0.00
95.00		87.76	123.42	0.00	0.00
100.00		439.23	609.71	0.00	0.00
105.00		435.20	597.41	0.00	0.00
110.00		430.69	585.10	0.00	0.00
115.00		425.73	572.80	0.00	0.00
120.00		420.34	560.49	0.00	0.00
125.00		414.56	548.19	0.00	0.00
130.00		408.39	535.89	0.00	0.00
134.50		361.78	471.78	0.00	0.00
135.00		40.23	86.70	0.00	0.00
138.75		300.54	643.31	0.00	0.00
140.00		99.05	104.08	0.00	0.00
145.00		393.22	410.33	0.00	0.00
150.00		385.75	400.76	0.00	0.00
155.00		377.99	391.19	0.00	0.00
160.00		369.93	381.62	0.00	0.00
165.00		361.59	372.06	0.00	0.00
170.00		352.99	362.49	0.00	0.00
175.00	(28) attachments	3408.28	2203.77	0.00	0.00
177.50	(8) attachments	797.94	580.77	0.00	0.00
180.00		166.02	140.98	0.00	0.00
185.00	(26) attachments	4537.69	3170.68	0.00	178.94
	<b>Totals:</b>	<b>23,110.20</b>	<b>37,307.83</b>	<b>0.00</b>	<b>178.94</b>

## Calculated Forces

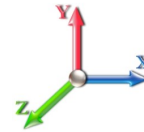
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 0.9D + 1.6W 98 mph Wind

**Iterations** 26

**Dead Load Factor** 0.90  
**Wind Load Factor** 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-37.28	-23.15	0.00	-2918.9	0.00	2918.95	6281.65	3140.82	14160.7	7090.90	0.00	0.000	0.000	0.418
5.00	-35.88	-22.79	0.00	-2803.2	0.00	2803.20	6207.52	3103.76	13762.2	6891.36	0.07	-0.122	0.000	0.413
10.00	-34.45	-22.43	0.00	-2689.2	0.00	2689.24	6132.44	3066.22	13367.2	6693.54	0.26	-0.246	0.000	0.407
15.00	-33.05	-22.08	0.00	-2577.0	0.00	2577.08	6056.39	3028.19	12975.7	6497.50	0.58	-0.371	0.000	0.402
20.00	-31.67	-21.72	0.00	-2466.6	0.00	2466.69	5979.38	2989.69	12587.8	6303.28	1.04	-0.496	0.000	0.397
25.00	-30.32	-21.37	0.00	-2358.0	0.00	2358.08	5901.42	2950.71	12203.7	6110.94	1.63	-0.623	0.000	0.391
30.00	-28.98	-21.02	0.00	-2251.2	0.00	2251.23	5822.49	2911.25	11823.5	5920.54	2.35	-0.750	0.000	0.385
35.00	-27.68	-20.65	0.00	-2146.1	0.00	2146.13	5733.46	2866.73	11429.0	5722.99	3.20	-0.879	0.000	0.380
40.00	-26.39	-20.27	0.00	-2042.8	0.00	2042.85	5627.33	2813.67	11007.6	5512.03	4.19	-1.008	0.000	0.375
44.00	-25.40	-19.94	0.00	-1961.7	0.00	1961.78	5542.43	2771.21	10676.3	5346.11	5.08	-1.112	0.000	0.372
45.00	-24.92	-19.88	0.00	-1941.8	0.00	1941.84	5521.20	2760.60	10594.3	5305.03	5.32	-1.139	0.000	0.371
50.00	-22.68	-19.45	0.00	-1842.4	0.00	1842.43	4722.80	2361.40	9081.59	4547.54	6.58	-1.270	0.000	0.410
55.00	-21.58	-19.03	0.00	-1745.1	0.00	1745.19	4656.60	2328.30	8780.72	4396.89	7.98	-1.401	0.000	0.402
60.00	-20.50	-18.62	0.00	-1650.0	0.00	1650.01	4589.45	2294.72	8483.02	4247.81	9.52	-1.543	0.000	0.393
65.00	-19.45	-18.19	0.00	-1556.9	0.00	1556.94	4521.33	2260.66	8188.59	4100.38	11.21	-1.685	0.000	0.384
70.00	-18.41	-17.76	0.00	-1465.9	0.00	1465.99	4452.25	2226.13	7897.53	3954.63	13.05	-1.827	0.000	0.375
75.00	-17.40	-17.33	0.00	-1377.1	0.00	1377.19	4370.60	2185.30	7589.78	3800.53	15.04	-1.969	0.000	0.366
80.00	-16.40	-16.89	0.00	-1290.5	0.00	1290.57	4277.74	2138.87	7269.08	3639.94	17.18	-2.112	0.000	0.358
85.00	-15.44	-16.44	0.00	-1206.1	0.00	1206.13	4184.88	2092.44	6955.30	3482.82	19.47	-2.254	0.000	0.350
88.75	-14.73	-16.10	0.00	-1144.4	0.00	1144.47	4115.23	2057.61	6724.50	3367.25	21.28	-2.361	0.000	0.344
90.00	-14.35	-16.00	0.00	-1124.3	0.00	1124.34	4092.01	2046.01	6648.44	3329.16	21.91	-2.397	0.000	0.341
94.00	-13.18	-15.61	0.00	-1060.3	0.00	1060.35	2345.44	1172.72	3825.50	1915.59	23.96	-2.511	0.000	0.559
95.00	-13.03	-15.54	0.00	-1044.7	0.00	1044.74	2339.01	1169.51	3797.57	1901.61	24.49	-2.539	0.000	0.555
100.00	-12.38	-15.12	0.00	-967.02	0.00	967.02	2306.26	1153.13	3658.43	1831.93	27.26	-2.746	0.000	0.533
105.00	-11.76	-14.70	0.00	-891.41	0.00	891.41	2272.55	1136.28	3520.24	1762.74	30.24	-2.950	0.000	0.511
110.00	-11.15	-14.28	0.00	-817.91	0.00	817.91	2237.88	1118.94	3383.12	1694.08	33.44	-3.151	0.000	0.488
115.00	-10.55	-13.86	0.00	-746.53	0.00	746.53	2202.25	1101.13	3247.17	1626.00	36.85	-3.349	0.000	0.464
120.00	-9.97	-13.44	0.00	-677.25	0.00	677.25	2165.66	1082.83	3112.49	1558.56	40.46	-3.544	0.000	0.439
125.00	-9.41	-13.02	0.00	-610.07	0.00	610.07	2128.11	1064.06	2979.20	1491.82	44.27	-3.733	0.000	0.414
130.00	-8.86	-12.60	0.00	-544.98	0.00	544.98	2089.60	1044.80	2847.40	1425.82	48.27	-3.917	0.000	0.387
134.50	-8.40	-12.22	0.00	-488.27	0.00	488.27	2054.12	1027.06	2730.15	1367.10	52.04	-4.078	0.000	0.361
135.00	-8.30	-12.19	0.00	-482.16	0.00	482.16	2050.13	1025.07	2717.20	1360.62	52.47	-4.096	0.000	0.359
138.75	-7.66	-11.85	0.00	-436.47	0.00	436.47	1362.09	681.04	1798.87	900.77	55.74	-4.225	0.000	0.490
140.00	-7.54	-11.76	0.00	-421.66	0.00	421.66	1356.31	678.16	1778.61	890.62	56.85	-4.268	0.000	0.479
145.00	-7.12	-11.36	0.00	-362.86	0.00	362.86	1332.67	666.33	1697.93	850.23	61.42	-4.464	0.000	0.432
150.00	-6.72	-10.96	0.00	-306.06	0.00	306.06	1308.18	654.09	1617.96	810.18	66.19	-4.646	0.000	0.383
155.00	-6.33	-10.57	0.00	-251.24	0.00	251.24	1282.83	641.42	1538.80	770.54	71.14	-4.812	0.000	0.331
160.00	-5.96	-10.19	0.00	-198.37	0.00	198.37	1256.64	628.32	1460.53	731.35	76.26	-4.959	0.000	0.276
165.00	-5.60	-9.80	0.00	-147.45	0.00	147.45	1229.59	614.80	1383.27	692.66	81.51	-5.083	0.000	0.218
170.00	-5.26	-9.43	0.00	-98.43	0.00	98.43	1201.70	600.85	1307.09	654.52	86.88	-5.180	0.000	0.155
175.00	-3.37	-5.84	0.00	-51.29	0.00	51.29	1172.95	586.47	1232.10	616.96	92.34	-5.246	0.000	0.086
177.50	-2.87	-4.99	0.00	-36.70	0.00	36.70	1158.25	579.13	1195.08	598.43	95.09	-5.267	0.000	0.064
180.00	-2.74	-4.81	0.00	-24.23	0.00	24.23	1143.35	571.67	1158.39	580.05	97.85	-5.282	0.000	0.044
185.00	0.00	-4.54	0.00	-0.18	0.00	0.18	1112.89	556.45	1086.05	543.83	103.38	-5.296	0.000	0.000

## Wind Loading - Shaft

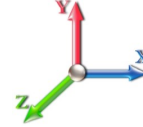
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 25

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	4.256	4.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	4.256	4.68	0.00	1.200	1.242	5.00	24.297	29.16	136.5	434.0	2199.1
10.00		1.00	0.70	4.256	4.68	0.00	1.200	1.331	5.00	23.990	28.79	134.8	458.3	2194.3
15.00		1.00	0.70	4.256	4.68	0.00	1.200	1.386	5.00	23.655	28.39	132.9	469.9	2176.8
20.00		1.00	0.70	4.256	4.68	0.00	1.200	1.427	5.00	23.308	27.97	130.9	476.0	2153.6
25.00		1.00	0.70	4.256	4.68	0.00	1.200	1.459	5.00	22.954	27.54	129.0	478.8	2127.3
30.00		1.00	0.70	4.260	4.69	0.00	1.200	1.486	5.00	22.596	27.11	127.0	479.4	2098.8
35.00		1.00	0.73	4.451	4.90	0.00	1.200	1.509	5.00	22.234	26.68	130.6	478.6	2068.8
40.00		1.00	0.76	4.625	5.09	0.00	1.200	1.529	5.00	21.870	26.24	133.5	476.6	2037.6
44.00	Bot - Section 2	1.00	0.78	4.752	5.23	0.00	1.200	1.544	4.00	17.232	20.68	108.1	379.5	1607.3
45.00		1.00	0.79	4.783	5.26	0.00	1.200	1.547	1.00	4.344	5.21	27.4	96.4	671.8
50.00	Top - Section 1	1.00	0.81	4.929	5.42	0.00	1.200	1.564	5.00	21.507	25.81	139.9	478.6	3322.7
55.00		1.00	0.83	5.065	5.57	0.00	1.200	1.579	5.00	21.139	25.37	141.3	474.4	1790.3
60.00		1.00	0.85	5.193	5.71	0.00	1.200	1.592	5.00	20.770	24.92	142.4	469.7	1760.1
65.00		1.00	0.87	5.313	5.84	0.00	1.200	1.605	5.00	20.399	24.48	143.1	464.6	1729.4
70.00		1.00	0.89	5.426	5.97	0.00	1.200	1.617	5.00	20.029	24.03	143.5	459.0	1698.4
75.00		1.00	0.91	5.534	6.09	0.00	1.200	1.628	5.00	19.657	23.59	143.6	453.1	1667.0
80.00		1.00	0.93	5.637	6.20	0.00	1.200	1.639	5.00	19.285	23.14	143.5	446.9	1635.2
85.00		1.00	0.94	5.736	6.31	0.00	1.200	1.649	5.00	18.912	22.69	143.2	440.5	1603.2
88.75	Bot - Section 3	1.00	0.96	5.807	6.39	0.00	1.200	1.656	3.75	13.939	16.73	106.8	326.6	1181.9
90.00		1.00	0.96	5.830	6.41	0.00	1.200	1.658	1.25	4.659	5.59	35.9	109.9	576.3
94.00	Top - Section 2	1.00	0.97	5.903	6.49	0.00	1.200	1.666	4.00	14.753	17.70	115.0	347.2	1822.2
95.00		1.00	0.97	5.921	6.51	0.00	1.200	1.667	1.00	3.650	4.38	28.5	86.5	230.8
100.00		1.00	0.99	6.008	6.61	0.00	1.200	1.676	5.00	18.030	21.64	143.0	425.5	1136.9
105.00		1.00	1.00	6.093	6.70	0.00	1.200	1.684	5.00	17.656	21.19	142.0	418.2	1113.1
110.00		1.00	1.02	6.174	6.79	0.00	1.200	1.692	5.00	17.282	20.74	140.9	410.6	1089.2
115.00		1.00	1.03	6.253	6.88	0.00	1.200	1.699	5.00	16.908	20.29	139.6	403.0	1065.1
120.00		1.00	1.04	6.330	6.96	0.00	1.200	1.707	5.00	16.533	19.84	138.1	395.1	1040.9
125.00		1.00	1.05	6.404	7.04	0.00	1.200	1.714	5.00	16.158	19.39	136.6	387.2	1016.5
130.00		1.00	1.07	6.476	7.12	0.00	1.200	1.720	5.00	15.783	18.94	134.9	379.1	992.0
134.50	Bot - Section 4	1.00	1.08	6.539	7.19	0.00	1.200	1.726	4.50	13.883	16.66	119.8	334.5	872.1
135.00		1.00	1.08	6.546	7.20	0.00	1.200	1.727	0.50	1.542	1.85	13.3	37.6	143.0
138.75	Top - Section 3	1.00	1.09	6.598	7.26	0.00	1.200	1.732	3.75	11.447	13.74	99.7	277.0	1058.6
140.00		1.00	1.09	6.615	7.28	0.00	1.200	1.733	1.25	3.768	4.52	32.9	91.8	205.2
145.00		1.00	1.10	6.681	7.35	0.00	1.200	1.739	5.00	14.841	17.81	130.9	358.8	804.3
150.00		1.00	1.11	6.746	7.42	0.00	1.200	1.745	5.00	14.465	17.36	128.8	350.2	783.0
155.00		1.00	1.12	6.810	7.49	0.00	1.200	1.751	5.00	14.089	16.91	126.6	341.5	761.6
160.00		1.00	1.13	6.872	7.56	0.00	1.200	1.757	5.00	13.713	16.46	124.4	332.8	740.0
165.00		1.00	1.14	6.933	7.63	0.00	1.200	1.762	5.00	13.336	16.00	122.0	323.9	718.4
170.00		1.00	1.15	6.992	7.69	0.00	1.200	1.767	5.00	12.960	15.55	119.6	315.0	696.7
175.00	Appurtenance(s)	1.00	1.16	7.050	7.76	0.00	1.200	1.772	5.00	12.583	15.10	117.1	305.9	674.9
177.50	Appurtenance(s)	1.00	1.16	7.079	7.79	0.00	1.200	1.775	2.50	6.150	7.38	57.5	150.7	330.4
180.00		1.00	1.17	7.107	7.82	0.00	1.200	1.777	2.50	6.056	7.27	56.8	148.4	324.9
185.00	Appurtenance(s)	1.00	1.18	7.163	7.88	0.00	1.200	1.782	5.00	11.830	14.20	111.9	287.6	631.1
<b>Totals:</b>								<b>185.00</b>				<b>4,953.8</b>		<b>54,551.0</b>

## Discrete Appurtenance Forces

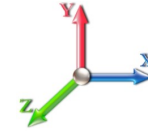
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 17

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	185.00	RFS APXVTM14-C-I20	3	7.163	7.879	0.70	0.90	15.75	691.54	0.000	0.000	124.10	0.00	0.00
2	185.00	SitePro1 HRK14	1	7.163	7.879	1.00	1.00	16.24	1031.62	0.000	0.000	127.99	0.00	0.00
3	185.00	Lightning Rod	1	7.201	7.922	1.00	1.00	3.47	65.08	0.000	3.500	27.52	0.00	96.31
4	185.00	Low Profile Platform	1	7.163	7.879	1.00	1.00	40.04	2836.65	0.000	0.000	315.46	0.00	0.00
5	185.00	ALU 800 MHz Filter	3	7.163	7.879	0.48	0.80	1.42	-126.60	0.000	0.000	11.17	0.00	0.00
6	185.00	ALU 800 MHz RRH	3	7.163	7.879	0.54	0.80	5.03	354.08	0.000	0.000	39.65	0.00	0.00
7	185.00	ALU 1900 MHz RRH	3	7.163	7.879	0.54	0.80	5.26	626.44	0.000	0.000	41.42	0.00	0.00
8	185.00	ALU TD-RRH8x20-25	3	7.163	7.879	0.54	0.80	7.85	591.91	0.000	0.000	61.85	0.00	0.00
9	185.00	RFS ACU-A20-N RET	4	7.163	7.879	0.48	0.80	0.73	17.15	0.000	0.000	5.74	0.00	0.00
10	185.00	SitePro1 PRK 1245L	1	7.163	7.879	1.00	1.00	19.66	794.23	0.000	0.000	154.90	0.00	0.00
11	185.00	RFS APXVSP18-C-A20	3	7.163	7.879	0.75	0.90	24.37	586.25	0.000	0.000	191.99	0.00	0.00
12	177.50	Ericsson RRU11	6	7.079	7.787	0.57	0.80	11.02	864.35	0.000	0.000	85.80	0.00	0.00
13	177.50	Collar Mount (Andrew	1	7.079	7.787	0.56	0.75	4.81	7.79	0.000	0.000	37.45	0.00	0.00
14	177.50	Raycap DC6-48-60-18-8F	1	7.079	7.787	0.72	0.80	2.35	83.33	0.000	0.000	18.31	0.00	0.00
15	175.00	KMW	3	7.050	7.755	0.63	0.80	20.59	529.50	0.000	0.000	159.64	0.00	0.00
16	175.00	Powerwave 7770	6	7.050	7.755	0.62	0.80	24.33	1078.56	0.000	0.000	188.68	0.00	0.00
17	175.00	Low Profile Platform	1	7.050	7.755	0.00	1.00	39.94	2829.24	0.000	0.000	309.71	0.00	0.00
18	175.00	Powerwave LGP21401	12	7.050	7.755	0.48	0.80	10.50	422.52	0.000	0.000	81.46	0.00	0.00
19	175.00	Powerwave LGP13519	6	7.050	7.755	0.48	0.80	0.88	79.83	0.000	0.000	6.84	0.00	0.00
<b>Totals:</b>								<b>13,363.47</b>				<b>1,989.67</b>		

## Total Applied Force Summary

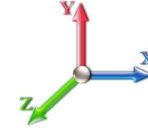
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 18

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



**Iterations** 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		136.50	2239.73	0.00	0.00
10.00		134.77	2295.87	0.00	0.00
15.00		132.89	2278.32	0.00	0.00
20.00		130.94	2255.18	0.00	0.00
25.00		128.95	2228.81	0.00	0.00
30.00		127.05	2200.32	0.00	0.00
35.00		130.64	2170.31	0.00	0.00
40.00		133.50	2139.15	0.00	0.00
44.00		108.09	1688.51	0.00	0.00
45.00		27.43	692.12	0.00	0.00
50.00		139.93	3424.26	0.00	0.00
55.00		141.33	1891.89	0.00	0.00
60.00		142.36	1861.67	0.00	0.00
65.00		143.05	1831.00	0.00	0.00
70.00		143.46	1799.93	0.00	0.00
75.00		143.60	1768.52	0.00	0.00
80.00		143.51	1736.79	0.00	0.00
85.00		143.19	1704.79	0.00	0.00
88.75		106.85	1258.08	0.00	0.00
90.00		35.85	601.72	0.00	0.00
94.00		114.95	1903.46	0.00	0.00
95.00		28.53	251.08	0.00	0.00
100.00		143.00	1238.44	0.00	0.00
105.00		142.00	1214.70	0.00	0.00
110.00		140.85	1190.78	0.00	0.00
115.00		139.56	1166.70	0.00	0.00
120.00		138.14	1142.46	0.00	0.00
125.00		136.59	1118.08	0.00	0.00
130.00		134.92	1093.57	0.00	0.00
134.50		119.84	963.51	0.00	0.00
135.00		13.33	153.16	0.00	0.00
138.75		99.69	1134.73	0.00	0.00
140.00		32.90	230.57	0.00	0.00
145.00		130.89	905.86	0.00	0.00
150.00		128.81	884.54	0.00	0.00
155.00		126.65	863.12	0.00	0.00
160.00		124.39	841.59	0.00	0.00
165.00		122.04	819.98	0.00	0.00
170.00		119.61	798.28	0.00	0.00
175.00	(28) attachments	863.45	5716.14	0.00	0.00
177.50	(8) attachments	199.02	1297.33	0.00	0.00
180.00		56.81	336.39	0.00	0.00
185.00	(26) attachments	1213.63	8122.37	0.00	96.31
	<b>Totals:</b>	<b>6,943.51</b>	<b>71,453.80</b>	<b>0.00</b>	<b>96.31</b>

## Calculated Forces

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	<b>3/6/2018</b>
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

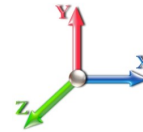


Page: 19

**Load Case:** 1.2D + 1.0Di + 1.0Wi 50 mph Wind

**Iterations** 25

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-71.45	-6.97	0.00	-887.82	0.00	887.82	6281.65	3140.82	14160.7	7090.90	0.00	0.000	0.000	0.137
5.00	-69.21	-6.87	0.00	-852.99	0.00	852.99	6207.52	3103.76	13762.2	6891.36	0.02	-0.037	0.000	0.135
10.00	-66.91	-6.78	0.00	-818.62	0.00	818.62	6132.44	3066.22	13367.2	6693.54	0.08	-0.075	0.000	0.133
15.00	-64.62	-6.69	0.00	-784.71	0.00	784.71	6056.39	3028.19	12975.7	6497.50	0.18	-0.113	0.000	0.131
20.00	-62.37	-6.59	0.00	-751.28	0.00	751.28	5979.38	2989.69	12587.8	6303.28	0.32	-0.151	0.000	0.130
25.00	-60.13	-6.50	0.00	-718.31	0.00	718.31	5901.42	2950.71	12203.7	6110.94	0.50	-0.190	0.000	0.128
30.00	-57.93	-6.40	0.00	-685.82	0.00	685.82	5822.49	2911.25	11823.5	5920.54	0.71	-0.228	0.000	0.126
35.00	-55.75	-6.30	0.00	-653.81	0.00	653.81	5733.46	2866.73	11429.0	5722.99	0.97	-0.268	0.000	0.124
40.00	-53.61	-6.19	0.00	-622.30	0.00	622.30	5627.33	2813.67	11007.6	5512.03	1.28	-0.307	0.000	0.122
44.00	-51.92	-6.09	0.00	-597.54	0.00	597.54	5542.43	2771.21	10676.3	5346.11	1.55	-0.339	0.000	0.121
45.00	-51.23	-6.08	0.00	-591.45	0.00	591.45	5521.20	2760.60	10594.3	5305.03	1.62	-0.347	0.000	0.121
50.00	-47.80	-5.95	0.00	-561.05	0.00	561.05	4722.80	2361.40	9081.59	4547.54	2.00	-0.387	0.000	0.134
55.00	-45.91	-5.83	0.00	-531.29	0.00	531.29	4656.60	2328.30	8780.72	4396.89	2.43	-0.427	0.000	0.131
60.00	-44.04	-5.71	0.00	-502.14	0.00	502.14	4589.45	2294.72	8483.02	4247.81	2.90	-0.470	0.000	0.128
65.00	-42.21	-5.58	0.00	-473.61	0.00	473.61	4521.33	2260.66	8188.59	4100.38	3.41	-0.513	0.000	0.125
70.00	-40.40	-5.45	0.00	-445.71	0.00	445.71	4452.25	2226.13	7897.53	3954.63	3.98	-0.556	0.000	0.122
75.00	-38.63	-5.32	0.00	-418.46	0.00	418.46	4370.60	2185.30	7589.78	3800.53	4.58	-0.600	0.000	0.119
80.00	-36.89	-5.18	0.00	-391.87	0.00	391.87	4277.74	2138.87	7269.08	3639.94	5.23	-0.643	0.000	0.116
85.00	-35.19	-5.04	0.00	-365.96	0.00	365.96	4184.88	2092.44	6955.30	3482.82	5.93	-0.686	0.000	0.113
88.75	-33.93	-4.93	0.00	-347.05	0.00	347.05	4115.23	2057.61	6724.50	3367.25	6.48	-0.718	0.000	0.111
90.00	-33.33	-4.90	0.00	-340.88	0.00	340.88	4092.01	2046.01	6648.44	3329.16	6.67	-0.729	0.000	0.111
94.00	-31.42	-4.78	0.00	-321.26	0.00	321.26	2345.44	1172.72	3825.50	1915.59	7.30	-0.764	0.000	0.181
95.00	-31.17	-4.76	0.00	-316.49	0.00	316.49	2339.01	1169.51	3797.57	1901.61	7.46	-0.772	0.000	0.180
100.00	-29.93	-4.64	0.00	-292.67	0.00	292.67	2306.26	1153.13	3658.43	1831.93	8.30	-0.835	0.000	0.173
105.00	-28.71	-4.51	0.00	-269.49	0.00	269.49	2272.55	1136.28	3520.24	1762.74	9.21	-0.897	0.000	0.166
110.00	-27.52	-4.37	0.00	-246.96	0.00	246.96	2237.88	1118.94	3383.12	1694.08	10.18	-0.957	0.000	0.158
115.00	-26.35	-4.24	0.00	-225.09	0.00	225.09	2202.25	1101.13	3247.17	1626.00	11.21	-1.017	0.000	0.150
120.00	-25.20	-4.11	0.00	-203.88	0.00	203.88	2165.66	1082.83	3112.49	1558.56	12.31	-1.076	0.000	0.142
125.00	-24.09	-3.97	0.00	-183.34	0.00	183.34	2128.11	1064.06	2979.20	1491.82	13.47	-1.133	0.000	0.134
130.00	-22.99	-3.84	0.00	-163.46	0.00	163.46	2089.60	1044.80	2847.40	1425.82	14.68	-1.188	0.000	0.126
134.50	-22.03	-3.71	0.00	-146.19	0.00	146.19	2054.12	1027.06	2730.15	1367.10	15.83	-1.236	0.000	0.118
135.00	-21.87	-3.70	0.00	-144.34	0.00	144.34	2050.13	1025.07	2717.20	1360.62	15.96	-1.242	0.000	0.117
138.75	-20.74	-3.58	0.00	-130.46	0.00	130.46	1362.09	681.04	1798.87	900.77	16.95	-1.280	0.000	0.160
140.00	-20.51	-3.56	0.00	-125.98	0.00	125.98	1356.31	678.16	1778.61	890.62	17.28	-1.293	0.000	0.157
145.00	-19.60	-3.43	0.00	-108.19	0.00	108.19	1332.67	666.33	1697.93	850.23	18.67	-1.352	0.000	0.142
150.00	-18.72	-3.29	0.00	-91.05	0.00	91.05	1308.18	654.09	1617.96	810.18	20.12	-1.406	0.000	0.127
155.00	-17.86	-3.16	0.00	-74.58	0.00	74.58	1282.83	641.42	1538.80	770.54	21.62	-1.455	0.000	0.111
160.00	-17.02	-3.03	0.00	-58.78	0.00	58.78	1256.64	628.32	1460.53	731.35	23.16	-1.499	0.000	0.094
165.00	-16.20	-2.89	0.00	-43.65	0.00	43.65	1229.59	614.80	1383.27	692.66	24.75	-1.536	0.000	0.076
170.00	-15.40	-2.76	0.00	-29.19	0.00	29.19	1201.70	600.85	1307.09	654.52	26.38	-1.564	0.000	0.057
175.00	-9.71	-1.74	0.00	-15.40	0.00	15.40	1172.95	586.47	1232.10	616.96	28.03	-1.584	0.000	0.033
177.50	-8.42	-1.51	0.00	-11.06	0.00	11.06	1158.25	579.13	1195.08	598.43	28.86	-1.590	0.000	0.026
180.00	-8.09	-1.44	0.00	-7.29	0.00	7.29	1143.35	571.67	1158.39	580.05	29.69	-1.595	0.000	0.020
185.00	0.00	-1.21	0.00	-0.10	0.00	0.10	1112.89	556.45	1086.05	543.83	31.37	-1.599	0.000	0.000



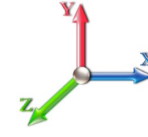
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 20

<b>Load Case: 1.2D + 1.0E</b>					<b>Iterations</b> 24
<b>Gust Response Factor</b>	1.10			<b>Sds</b> 0.14	<b>Ss</b> 0.18
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b> 0.07	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.31	<b>SA</b> 0.02	<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1470.9	0.00	0.03	0.02	19.65	
10.00		1446.6	0.01	0.05	0.03	28.57	
15.00		1422.3	0.01	0.06	0.03	32.98	
20.00		1398.0	0.02	0.07	0.04	35.11	
25.00		1373.7	0.03	0.07	0.04	36.05	
30.00		1349.4	0.05	0.07	0.04	36.39	
35.00		1325.1	0.07	0.07	0.04	36.49	
40.00		1300.8	0.09	0.07	0.04	36.53	
44.00	Bot - Section 2	1023.1	0.11	0.07	0.04	29.19	
45.00		479.48	0.11	0.07	0.04	13.73	
50.00	Top - Section 1	2370.0	0.14	0.07	0.03	69.17	
55.00		1096.5	0.17	0.07	0.03	32.48	
60.00		1075.3	0.20	0.06	0.02	32.00	
65.00		1054.0	0.23	0.06	0.02	30.95	
70.00		1032.7	0.27	0.05	0.01	29.02	
75.00		1011.5	0.31	0.04	0.01	25.88	
80.00		990.25	0.35	0.03	0.01	21.20	
85.00		968.99	0.40	0.02	0.01	14.82	
88.75	Bot - Section 3	712.79	0.43	0.01	0.01	6.73	
90.00		388.70	0.45	0.00	0.01	2.83	
94.00	Top - Section 2	1229.1	0.49	-0.01	0.01	-0.12	
95.00		120.21	0.50	-0.02	0.01	-0.24	
100.00		592.82	0.55	-0.04	0.01	-6.85	
105.00		579.15	0.61	-0.06	0.02	-11.62	
110.00		565.48	0.67	-0.08	0.02	-15.03	
115.00		551.81	0.73	-0.10	0.04	-16.86	
120.00		538.14	0.80	-0.11	0.05	-17.14	
125.00		524.47	0.86	-0.12	0.07	-16.00	
130.00		510.80	0.93	-0.12	0.10	-13.59	
134.50	Bot - Section 4	448.03	1.00	-0.11	0.13	-9.40	
135.00		87.88	1.01	-0.11	0.13	-1.78	
138.75	Top - Section 3	651.32	1.06	-0.09	0.17	-9.03	
140.00		94.49	1.08	-0.08	0.18	-1.08	
145.00		371.30	1.16	-0.03	0.23	-0.09	
150.00		360.66	1.24	0.05	0.29	4.82	
155.00		350.03	1.33	0.16	0.36	10.29	
160.00		339.40	1.41	0.31	0.45	16.26	
165.00		328.76	1.50	0.51	0.55	22.66	
170.00		318.13	1.60	0.77	0.66	29.43	
175.00	Appurtenance(s)	2364.0	1.69	1.09	0.80	280.63	
177.50	Appurtenance(s)	635.76	1.74	1.28	0.88	84.44	
180.00		147.10	1.79	1.49	0.96	21.71	
185.00	Appurtenance(s)	3503.9	1.89	1.98	1.14	627.88	
<b>Totals:</b>		<b>38,503.7</b>				<b>1,549.0</b>	<b>Total Wind: 23,110.2</b>

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

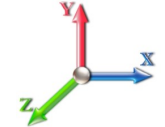
## Calculated Forces

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	<b>3/6/2018</b>
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 21

<b>Load Case: 1.2D + 1.0E</b>										<b>Iterations</b> 24
<b>Gust Response Factor</b>	1.10						<b>Sds</b>	0.14		<b>Ss</b> 0.18
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.07					<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.31	<b>SA</b>	0.02	<b>Seismic Importance Factor</b>	1.00			



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.74	-1.67	0.00	-234.45	0.00	234.45	6281.65	3140.82	14160.7	7090.90	0.00	0.00	0.00	0.041
5.00	-47.94	-1.66	0.00	-226.09	0.00	226.09	6207.52	3103.76	13762.2	6891.36	0.01	-0.01	0.041	
10.00	-46.10	-1.64	0.00	-217.79	0.00	217.79	6132.44	3066.22	13367.2	6693.54	0.02	-0.02	0.040	
15.00	-44.29	-1.61	0.00	-209.59	0.00	209.59	6056.39	3028.19	12975.7	6497.50	0.05	-0.03	0.040	
20.00	-42.51	-1.58	0.00	-201.53	0.00	201.53	5979.38	2989.69	12587.8	6303.28	0.08	-0.04	0.039	
25.00	-40.76	-1.55	0.00	-193.60	0.00	193.60	5901.42	2950.71	12203.7	6110.94	0.13	-0.05	0.039	
30.00	-39.04	-1.52	0.00	-185.83	0.00	185.83	5822.49	2911.25	11823.5	5920.54	0.19	-0.06	0.038	
35.00	-37.35	-1.49	0.00	-178.21	0.00	178.21	5733.46	2866.73	11429.0	5722.99	0.26	-0.07	0.038	
40.00	-35.69	-1.46	0.00	-170.75	0.00	170.75	5627.33	2813.67	11007.6	5512.03	0.34	-0.08	0.037	
44.00	-34.38	-1.43	0.00	-164.91	0.00	164.91	5542.43	2771.21	10676.3	5346.11	0.41	-0.09	0.037	
45.00	-33.78	-1.42	0.00	-163.48	0.00	163.48	5521.20	2760.60	10594.3	5305.03	0.43	-0.09	0.037	
50.00	-30.83	-1.35	0.00	-156.37	0.00	156.37	4722.80	2361.40	9081.59	4547.54	0.54	-0.10	0.041	
55.00	-29.42	-1.32	0.00	-149.61	0.00	149.61	4656.60	2328.30	8780.72	4396.89	0.65	-0.12	0.040	
60.00	-28.02	-1.29	0.00	-142.99	0.00	142.99	4589.45	2294.72	8483.02	4247.81	0.78	-0.13	0.040	
65.00	-26.66	-1.27	0.00	-136.52	0.00	136.52	4521.33	2260.66	8188.59	4100.38	0.92	-0.14	0.039	
70.00	-25.32	-1.24	0.00	-130.19	0.00	130.19	4452.25	2226.13	7897.53	3954.63	1.07	-0.15	0.039	
75.00	-24.00	-1.22	0.00	-123.99	0.00	123.99	4370.60	2185.30	7589.78	3800.53	1.24	-0.17	0.038	
80.00	-22.71	-1.20	0.00	-117.92	0.00	117.92	4277.74	2138.87	7269.08	3639.94	1.42	-0.18	0.038	
85.00	-21.45	-1.18	0.00	-111.94	0.00	111.94	4184.88	2092.44	6955.30	3482.82	1.61	-0.19	0.037	
88.75	-20.52	-1.17	0.00	-107.51	0.00	107.51	4115.23	2057.61	6724.50	3367.25	1.77	-0.20	0.037	
90.00	-20.02	-1.17	0.00	-106.04	0.00	106.04	4092.01	2046.01	6648.44	3329.16	1.82	-0.20	0.037	
94.00	-18.47	-1.17	0.00	-101.36	0.00	101.36	2345.44	1172.72	3825.50	1915.59	2.00	-0.22	0.061	
95.00	-18.30	-1.17	0.00	-100.19	0.00	100.19	2339.01	1169.51	3797.57	1901.61	2.04	-0.22	0.061	
100.00	-17.49	-1.17	0.00	-94.34	0.00	94.34	2306.26	1153.13	3658.43	1831.93	2.28	-0.24	0.059	
105.00	-16.69	-1.18	0.00	-88.47	0.00	88.47	2272.55	1136.28	3520.24	1762.74	2.54	-0.26	0.058	
110.00	-15.91	-1.18	0.00	-82.59	0.00	82.59	2237.88	1118.94	3383.12	1694.08	2.83	-0.28	0.056	
115.00	-15.15	-1.18	0.00	-76.70	0.00	76.70	2202.25	1101.13	3247.17	1626.00	3.13	-0.30	0.054	
120.00	-14.40	-1.18	0.00	-70.80	0.00	70.80	2165.66	1082.83	3112.49	1558.56	3.45	-0.32	0.052	
125.00	-13.67	-1.18	0.00	-64.90	0.00	64.90	2128.11	1064.06	2979.20	1491.82	3.80	-0.34	0.050	
130.00	-12.95	-1.18	0.00	-59.00	0.00	59.00	2089.60	1044.80	2847.40	1425.82	4.16	-0.36	0.048	
134.50	-12.32	-1.18	0.00	-53.68	0.00	53.68	2054.12	1027.06	2730.15	1367.10	4.51	-0.38	0.045	
135.00	-12.21	-1.18	0.00	-53.09	0.00	53.09	2050.13	1025.07	2717.20	1360.62	4.55	-0.38	0.045	
138.75	-11.35	-1.18	0.00	-48.67	0.00	48.67	1362.09	681.04	1798.87	900.77	4.85	-0.39	0.062	
140.00	-11.21	-1.18	0.00	-47.20	0.00	47.20	1356.31	678.16	1778.61	890.62	4.95	-0.40	0.061	
145.00	-10.66	-1.18	0.00	-41.31	0.00	41.31	1332.67	666.33	1697.93	850.23	5.38	-0.42	0.057	
150.00	-10.13	-1.17	0.00	-35.42	0.00	35.42	1308.18	654.09	1617.96	810.18	5.83	-0.44	0.051	
155.00	-9.61	-1.16	0.00	-29.56	0.00	29.56	1282.83	641.42	1538.80	770.54	6.31	-0.46	0.046	
160.00	-9.10	-1.14	0.00	-23.75	0.00	23.75	1256.64	628.32	1460.53	731.35	6.80	-0.48	0.040	
165.00	-8.60	-1.12	0.00	-18.03	0.00	18.03	1229.59	614.80	1383.27	692.66	7.30	-0.49	0.033	
170.00	-8.12	-1.09	0.00	-12.44	0.00	12.44	1201.70	600.85	1307.09	654.52	7.83	-0.50	0.026	
175.00	-5.18	-0.78	0.00	-7.00	0.00	7.00	1172.95	586.47	1232.10	616.96	8.36	-0.51	0.016	
177.50	-4.41	-0.69	0.00	-5.05	0.00	5.05	1158.25	579.13	1195.08	598.43	8.63	-0.52	0.012	
180.00	-4.22	-0.67	0.00	-3.33	0.00	3.33	1143.35	571.67	1158.39	580.05	8.90	-0.52	0.009	
185.00	0.00	-0.63	0.00	0.00	0.00	0.00	1112.89	556.45	1086.05	543.83	9.44	-0.52	0.000	

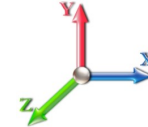
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 22

<b>Load Case:</b> 0.9D + 1.0E					<b>Iterations</b> 23
<b>Gust Response Factor</b>	1.10			<b>Sds</b> 0.14	<b>Ss</b> 0.18
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b> 0.07	<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.31	<b>SA</b> 0.02	<b>Seismic Importance Factor</b> 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1470.9	0.00	0.03	0.02	19.65	
10.00		1446.6	0.01	0.05	0.03	28.57	
15.00		1422.3	0.01	0.06	0.03	32.98	
20.00		1398.0	0.02	0.07	0.04	35.11	
25.00		1373.7	0.03	0.07	0.04	36.05	
30.00		1349.4	0.05	0.07	0.04	36.39	
35.00		1325.1	0.07	0.07	0.04	36.49	
40.00		1300.8	0.09	0.07	0.04	36.53	
44.00	Bot - Section 2	1023.1	0.11	0.07	0.04	29.19	
45.00		479.48	0.11	0.07	0.04	13.73	
50.00	Top - Section 1	2370.0	0.14	0.07	0.03	69.17	
55.00		1096.5	0.17	0.07	0.03	32.48	
60.00		1075.3	0.20	0.06	0.02	32.00	
65.00		1054.0	0.23	0.06	0.02	30.95	
70.00		1032.7	0.27	0.05	0.01	29.02	
75.00		1011.5	0.31	0.04	0.01	25.88	
80.00		990.25	0.35	0.03	0.01	21.20	
85.00		968.99	0.40	0.02	0.01	14.82	
88.75	Bot - Section 3	712.79	0.43	0.01	0.01	6.73	
90.00		388.70	0.45	0.00	0.01	2.83	
94.00	Top - Section 2	1229.1	0.49	-0.01	0.01	-0.12	
95.00		120.21	0.50	-0.02	0.01	-0.24	
100.00		592.82	0.55	-0.04	0.01	-6.85	
105.00		579.15	0.61	-0.06	0.02	-11.62	
110.00		565.48	0.67	-0.08	0.02	-15.03	
115.00		551.81	0.73	-0.10	0.04	-16.86	
120.00		538.14	0.80	-0.11	0.05	-17.14	
125.00		524.47	0.86	-0.12	0.07	-16.00	
130.00		510.80	0.93	-0.12	0.10	-13.59	
134.50	Bot - Section 4	448.03	1.00	-0.11	0.13	-9.40	
135.00		87.88	1.01	-0.11	0.13	-1.78	
138.75	Top - Section 3	651.32	1.06	-0.09	0.17	-9.03	
140.00		94.49	1.08	-0.08	0.18	-1.08	
145.00		371.30	1.16	-0.03	0.23	-0.09	
150.00		360.66	1.24	0.05	0.29	4.82	
155.00		350.03	1.33	0.16	0.36	10.29	
160.00		339.40	1.41	0.31	0.45	16.26	
165.00		328.76	1.50	0.51	0.55	22.66	
170.00		318.13	1.60	0.77	0.66	29.43	
175.00	Appurtenance(s)	2364.0	1.69	1.09	0.80	280.63	
177.50	Appurtenance(s)	635.76	1.74	1.28	0.88	84.44	
180.00		147.10	1.79	1.49	0.96	21.71	
185.00	Appurtenance(s)	3503.9	1.89	1.98	1.14	627.88	
<b>Totals:</b>		<b>38,503.7</b>				<b>1,549.0</b>	<b>Total Wind: 23,110.2</b>

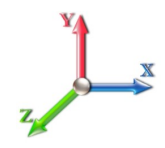
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

## Calculated Forces

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	<b>3/6/2018</b>
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



<b>Load Case: 0.9D + 1.0E</b>										<b>Iterations</b> 23
<b>Gust Response Factor</b>	1.10						<b>Sds</b>	0.14		<b>Ss</b> 0.18
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.07					<b>S1</b> 0.06
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.31	<b>SA</b>	0.02	<b>Seismic Importance Factor</b>	1.00			



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-37.31	-1.67	0.00	-231.29	0.00	231.29	6281.65	3140.82	14160.7	7090.90	0.00	0.00	0.00	0.039
5.00	-35.95	-1.66	0.00	-222.94	0.00	222.94	6207.52	3103.76	13762.2	6891.36	0.01	-0.01	0.038	
10.00	-34.57	-1.63	0.00	-214.66	0.00	214.66	6132.44	3066.22	13367.2	6693.54	0.02	-0.02	0.038	
15.00	-33.22	-1.61	0.00	-206.49	0.00	206.49	6056.39	3028.19	12975.7	6497.50	0.05	-0.03	0.037	
20.00	-31.88	-1.58	0.00	-198.47	0.00	198.47	5979.38	2989.69	12587.8	6303.28	0.08	-0.04	0.037	
25.00	-30.57	-1.54	0.00	-190.59	0.00	190.59	5901.42	2950.71	12203.7	6110.94	0.13	-0.05	0.036	
30.00	-29.28	-1.51	0.00	-182.88	0.00	182.88	5822.49	2911.25	11823.5	5920.54	0.19	-0.06	0.036	
35.00	-28.01	-1.48	0.00	-175.32	0.00	175.32	5733.46	2866.73	11429.0	5722.99	0.26	-0.07	0.036	
40.00	-26.76	-1.44	0.00	-167.93	0.00	167.93	5627.33	2813.67	11007.6	5512.03	0.34	-0.08	0.035	
44.00	-25.78	-1.42	0.00	-162.15	0.00	162.15	5542.43	2771.21	10676.3	5346.11	0.41	-0.09	0.035	
45.00	-25.33	-1.40	0.00	-160.74	0.00	160.74	5521.20	2760.60	10594.3	5305.03	0.43	-0.09	0.035	
50.00	-23.13	-1.34	0.00	-153.71	0.00	153.71	4722.80	2361.40	9081.59	4547.54	0.53	-0.10	0.039	
55.00	-22.06	-1.31	0.00	-147.03	0.00	147.03	4656.60	2328.30	8780.72	4396.89	0.64	-0.11	0.038	
60.00	-21.02	-1.28	0.00	-140.50	0.00	140.50	4589.45	2294.72	8483.02	4247.81	0.77	-0.13	0.038	
65.00	-19.99	-1.25	0.00	-134.12	0.00	134.12	4521.33	2260.66	8188.59	4100.38	0.91	-0.14	0.037	
70.00	-18.99	-1.22	0.00	-127.88	0.00	127.88	4452.25	2226.13	7897.53	3954.63	1.06	-0.15	0.037	
75.00	-18.00	-1.20	0.00	-121.78	0.00	121.78	4370.60	2185.30	7589.78	3800.53	1.22	-0.16	0.036	
80.00	-17.03	-1.18	0.00	-115.80	0.00	115.80	4277.74	2138.87	7269.08	3639.94	1.40	-0.18	0.036	
85.00	-16.08	-1.16	0.00	-109.92	0.00	109.92	4184.88	2092.44	6955.30	3482.82	1.59	-0.19	0.035	
88.75	-15.39	-1.15	0.00	-105.57	0.00	105.57	4115.23	2057.61	6724.50	3367.25	1.74	-0.20	0.035	
90.00	-15.02	-1.15	0.00	-104.13	0.00	104.13	4092.01	2046.01	6648.44	3329.16	1.79	-0.20	0.035	
94.00	-13.85	-1.15	0.00	-99.53	0.00	99.53	2345.44	1172.72	3825.50	1915.59	1.97	-0.21	0.058	
95.00	-13.73	-1.15	0.00	-98.38	0.00	98.38	2339.01	1169.51	3797.57	1901.61	2.01	-0.21	0.058	
100.00	-13.12	-1.15	0.00	-92.63	0.00	92.63	2306.26	1153.13	3658.43	1831.93	2.25	-0.23	0.056	
105.00	-12.52	-1.15	0.00	-86.86	0.00	86.86	2272.55	1136.28	3520.24	1762.74	2.50	-0.25	0.055	
110.00	-11.93	-1.16	0.00	-81.09	0.00	81.09	2237.88	1118.94	3383.12	1694.08	2.78	-0.27	0.053	
115.00	-11.36	-1.16	0.00	-75.31	0.00	75.31	2202.25	1101.13	3247.17	1626.00	3.08	-0.29	0.051	
120.00	-10.80	-1.16	0.00	-69.52	0.00	69.52	2165.66	1082.83	3112.49	1558.56	3.40	-0.31	0.050	
125.00	-10.25	-1.16	0.00	-63.73	0.00	63.73	2128.11	1064.06	2979.20	1491.82	3.73	-0.33	0.048	
130.00	-9.71	-1.16	0.00	-57.94	0.00	57.94	2089.60	1044.80	2847.40	1425.82	4.09	-0.35	0.045	
134.50	-9.24	-1.16	0.00	-52.73	0.00	52.73	2054.12	1027.06	2730.15	1367.10	4.43	-0.37	0.043	
135.00	-9.15	-1.16	0.00	-52.15	0.00	52.15	2050.13	1025.07	2717.20	1360.62	4.47	-0.37	0.043	
138.75	-8.51	-1.15	0.00	-47.81	0.00	47.81	1362.09	681.04	1798.87	900.77	4.77	-0.39	0.059	
140.00	-8.41	-1.16	0.00	-46.36	0.00	46.36	1356.31	678.16	1778.61	890.62	4.87	-0.39	0.058	
145.00	-8.00	-1.16	0.00	-40.58	0.00	40.58	1332.67	666.33	1697.93	850.23	5.29	-0.41	0.054	
150.00	-7.59	-1.15	0.00	-34.80	0.00	34.80	1308.18	654.09	1617.96	810.18	5.74	-0.43	0.049	
155.00	-7.20	-1.14	0.00	-29.04	0.00	29.04	1282.83	641.42	1538.80	770.54	6.20	-0.45	0.043	
160.00	-6.82	-1.12	0.00	-23.34	0.00	23.34	1256.64	628.32	1460.53	731.35	6.68	-0.47	0.037	
165.00	-6.45	-1.10	0.00	-17.73	0.00	17.73	1229.59	614.80	1383.27	692.66	7.18	-0.48	0.031	
170.00	-6.09	-1.07	0.00	-12.23	0.00	12.23	1201.70	600.85	1307.09	654.52	7.69	-0.50	0.024	
175.00	-3.89	-0.77	0.00	-6.90	0.00	6.90	1172.95	586.47	1232.10	616.96	8.22	-0.50	0.014	
177.50	-3.31	-0.68	0.00	-4.98	0.00	4.98	1158.25	579.13	1195.08	598.43	8.48	-0.51	0.011	
180.00	-3.16	-0.66	0.00	-3.28	0.00	3.28	1143.35	571.67	1158.39	580.05	8.75	-0.51	0.008	
185.00	0.00	-0.63	0.00	0.00	0.00	0.00	1112.89	556.45	1086.05	543.83	9.28	-0.51	0.000	

## Wind Loading - Shaft

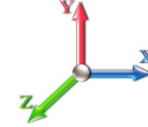
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 24

Load Case: 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	6.129	6.74	235.46	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	231.63	0.650	0.000	5.00	23.262	15.12	101.9	0.0	1471.0
10.00		1.00	0.70	6.129	6.74	227.81	0.650	0.000	5.00	22.881	14.87	100.3	0.0	1446.7
15.00		1.00	0.70	6.129	6.74	223.99	0.650	0.000	5.00	22.500	14.63	98.6	0.0	1422.4
20.00		1.00	0.70	6.129	6.74	220.16	0.650	0.000	5.00	22.119	14.38	96.9	0.0	1398.1
25.00		1.00	0.70	6.129	6.74	216.34	0.650	0.000	5.00	21.738	14.13	95.3	0.0	1373.7
30.00		1.00	0.70	6.134	6.75	212.61	0.650	0.000	5.00	21.357	13.88	93.7	0.0	1349.4
35.00		1.00	0.73	6.410	7.05	213.43	0.650	0.000	5.00	20.977	13.63	96.1	0.0	1325.1
40.00		1.00	0.76	6.659	7.33	213.55	0.650	0.000	5.00	20.596	13.39	98.1	0.0	1300.8
44.00	Bot - Section 2	1.00	0.78	6.843	7.53	213.25	0.650	0.000	4.00	16.202	10.53	79.3	0.0	1023.2
45.00		1.00	0.79	6.887	7.58	213.12	0.650	0.000	1.00	4.087	2.66	20.1	0.0	479.5
50.00	Top - Section 1	1.00	0.81	7.098	7.81	212.24	0.650	0.000	5.00	20.204	13.13	102.5	0.0	2370.1
55.00		1.00	0.83	7.294	8.02	215.03	0.650	0.000	5.00	19.823	12.89	103.4	0.0	1096.6
60.00		1.00	0.85	7.477	8.22	213.50	0.650	0.000	5.00	19.443	12.64	103.9	0.0	1075.3
65.00		1.00	0.87	7.650	8.42	211.68	0.650	0.000	5.00	19.062	12.39	104.3	0.0	1054.1
70.00		1.00	0.89	7.814	8.60	209.62	0.650	0.000	5.00	18.681	12.14	104.4	0.0	1032.8
75.00		1.00	0.91	7.969	8.77	207.34	0.650	0.000	5.00	18.300	11.90	104.3	0.0	1011.5
80.00		1.00	0.93	8.118	8.93	204.86	0.650	0.000	5.00	17.919	11.65	104.0	0.0	990.3
85.00		1.00	0.94	8.260	9.09	202.20	0.650	0.000	5.00	17.538	11.40	103.6	0.0	969.0
88.75	Bot - Section 3	1.00	0.96	8.362	9.20	200.10	0.650	0.000	3.75	12.904	8.39	77.2	0.0	712.8
90.00		1.00	0.96	8.396	9.24	199.38	0.650	0.000	1.25	4.313	2.80	25.9	0.0	388.7
94.00	Top - Section 2	1.00	0.97	8.501	9.35	197.02	0.650	0.000	4.00	13.642	8.87	82.9	0.0	1229.2
95.00		1.00	0.97	8.526	9.38	199.24	0.650	0.000	1.00	3.372	2.19	20.6	0.0	120.2
100.00		1.00	0.99	8.652	9.52	196.16	0.650	0.000	5.00	16.634	10.81	102.9	0.0	592.8
105.00		1.00	1.00	8.774	9.65	192.95	0.650	0.000	5.00	16.253	10.56	102.0	0.0	579.2
110.00		1.00	1.02	8.891	9.78	189.64	0.650	0.000	5.00	15.872	10.32	100.9	0.0	565.5
115.00		1.00	1.03	9.005	9.91	186.21	0.650	0.000	5.00	15.491	10.07	99.7	0.0	551.8
120.00		1.00	1.04	9.115	10.03	182.68	0.650	0.000	5.00	15.111	9.82	98.5	0.0	538.1
125.00		1.00	1.05	9.222	10.14	179.06	0.650	0.000	5.00	14.730	9.57	97.1	0.0	524.5
130.00		1.00	1.07	9.326	10.26	175.35	0.650	0.000	5.00	14.349	9.33	95.7	0.0	510.8
134.50	Bot - Section 4	1.00	1.08	9.417	10.36	171.94	0.650	0.000	4.50	12.588	8.18	84.8	0.0	448.0
135.00		1.00	1.08	9.427	10.37	171.55	0.650	0.000	0.50	1.398	0.91	9.4	0.0	87.9
138.75	Top - Section 3	1.00	1.09	9.501	10.45	168.66	0.650	0.000	3.75	10.365	6.74	70.4	0.0	651.3
140.00		1.00	1.09	9.525	10.48	170.00	0.650	0.000	1.25	3.407	2.21	23.2	0.0	94.5
145.00		1.00	1.10	9.621	10.58	166.06	0.650	0.000	5.00	13.391	8.70	92.1	0.0	371.3
150.00		1.00	1.11	9.715	10.69	162.05	0.650	0.000	5.00	13.011	8.46	90.4	0.0	360.7
155.00		1.00	1.12	9.806	10.79	157.98	0.650	0.000	5.00	12.630	8.21	88.6	0.0	350.0
160.00		1.00	1.13	9.896	10.89	153.84	0.650	0.000	5.00	12.249	7.96	86.7	0.0	339.4
165.00		1.00	1.14	9.983	10.98	149.64	0.650	0.000	5.00	11.868	7.71	84.7	0.0	328.8
170.00		1.00	1.15	10.069	11.08	145.37	0.650	0.000	5.00	11.487	7.47	82.7	0.0	318.1
175.00	Appurtenance(s)	1.00	1.16	10.152	11.17	141.06	0.650	0.000	5.00	11.106	7.22	80.6	0.0	307.5
177.50	Appurtenance(s)	1.00	1.16	10.194	11.21	138.88	0.650	0.000	2.50	5.410	3.52	39.4	0.0	149.8
180.00		1.00	1.17	10.234	11.26	136.68	0.650	0.000	2.50	5.315	3.45	38.9	0.0	147.1
185.00	Appurtenance(s)	1.00	1.18	10.315	11.35	132.26	0.650	0.000	5.00	10.345	6.72	76.3	0.0	286.2
<b>Totals:</b>									<b>185.00</b>			<b>3,562.0</b>		<b>32,743.5</b>

## Discrete Appurtenance Forces

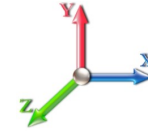
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 25

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations** 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	185.00	RFS APXVTM14-C-I20	3	10.315	11.346	0.70	0.90	13.35	165.00	0.000	0.000	151.50	0.00	0.00	
2	185.00	SitePro1 HRK14	1	10.315	11.346	1.00	1.00	8.13	302.36	0.000	0.000	92.24	0.00	0.00	
3	185.00	Lightning Rod	1	10.370	11.407	1.00	1.00	1.05	35.00	0.000	3.500	11.98	0.00	41.92	
4	185.00	Low Profile Platform	1	10.315	11.346	1.00	1.00	22.00	1500.00	0.000	0.000	249.62	0.00	0.00	
5	185.00	ALU 800 MHz Filter	3	10.315	11.346	0.48	0.80	0.96	26.40	0.000	0.000	10.95	0.00	0.00	
6	185.00	ALU 800 MHz RRH	3	10.315	11.346	0.54	0.80	3.43	159.00	0.000	0.000	38.86	0.00	0.00	
7	185.00	ALU 1900 MHz RRH	3	10.315	11.346	0.54	0.80	3.83	180.00	0.000	0.000	43.42	0.00	0.00	
8	185.00	ALU TD-RRH8x20-25	3	10.315	11.346	0.54	0.80	6.51	210.00	0.000	0.000	73.89	0.00	0.00	
9	185.00	RFS ACU-A20-N RET	4	10.315	11.346	0.48	0.80	0.23	4.00	0.000	0.000	2.61	0.00	0.00	
10	185.00	SitePro1 PRK 1245L	1	10.315	11.346	1.00	1.00	9.50	464.91	0.000	0.000	107.79	0.00	0.00	
11	185.00	RFS APXVSP18-C-A20	3	10.315	11.346	0.75	0.90	17.97	171.00	0.000	0.000	203.92	0.00	0.00	
12	177.50	Ericsson RRU11	6	10.194	11.213	0.57	0.80	8.76	304.20	0.000	0.000	98.21	0.00	0.00	
13	177.50	Collar Mount (Andrew	1	10.194	11.213	0.56	0.75	2.81	150.00	0.000	0.000	31.54	0.00	0.00	
14	177.50	Raycap DC6-48-60-18-8F	1	10.194	11.213	0.72	0.80	1.58	31.80	0.000	0.000	17.76	0.00	0.00	
15	175.00	KMW	3	10.152	11.168	0.63	0.80	15.21	145.50	0.000	0.000	169.81	0.00	0.00	
16	175.00	Powerwave 7770	6	10.152	11.168	0.62	0.80	20.36	210.00	0.000	0.000	227.43	0.00	0.00	
17	175.00	Low Profile Platform	1	10.152	11.168	0.00	1.00	22.00	1500.00	0.000	0.000	245.69	0.00	0.00	
18	175.00	Powerwave LGP21401	12	10.152	11.168	0.48	0.80	6.34	169.20	0.000	0.000	70.76	0.00	0.00	
19	175.00	Powerwave LGP13519	6	10.152	11.168	0.48	0.80	0.37	31.80	0.000	0.000	4.18	0.00	0.00	
<b>Totals:</b>									<b>5,760.17</b>						<b>1,852.15</b>

## Total Applied Force Summary

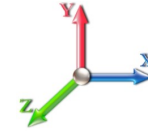
<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 26

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



**Iterations** 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		101.93	1504.81	0.00	0.00
10.00		100.26	1531.29	0.00	0.00
15.00		98.59	1506.98	0.00	0.00
20.00		96.93	1482.68	0.00	0.00
25.00		95.26	1458.38	0.00	0.00
30.00		93.67	1434.07	0.00	0.00
35.00		96.14	1409.77	0.00	0.00
40.00		98.06	1385.47	0.00	0.00
44.00		79.28	1090.87	0.00	0.00
45.00		20.12	496.41	0.00	0.00
50.00		102.53	2454.71	0.00	0.00
55.00		103.38	1181.21	0.00	0.00
60.00		103.94	1159.95	0.00	0.00
65.00		104.27	1138.68	0.00	0.00
70.00		104.37	1117.42	0.00	0.00
75.00		104.28	1096.15	0.00	0.00
80.00		104.01	1074.88	0.00	0.00
85.00		103.58	1053.62	0.00	0.00
88.75		77.15	776.26	0.00	0.00
90.00		25.89	409.85	0.00	0.00
94.00		82.92	1296.86	0.00	0.00
95.00		20.56	137.13	0.00	0.00
100.00		102.90	677.45	0.00	0.00
105.00		101.96	663.78	0.00	0.00
110.00		100.90	650.11	0.00	0.00
115.00		99.74	636.44	0.00	0.00
120.00		98.48	622.77	0.00	0.00
125.00		97.12	609.10	0.00	0.00
130.00		95.68	595.43	0.00	0.00
134.50		84.76	524.20	0.00	0.00
135.00		9.42	96.34	0.00	0.00
138.75		70.41	714.79	0.00	0.00
140.00		23.21	115.64	0.00	0.00
145.00		92.12	455.93	0.00	0.00
150.00		90.37	445.29	0.00	0.00
155.00		88.55	434.66	0.00	0.00
160.00		86.67	424.03	0.00	0.00
165.00		84.71	413.39	0.00	0.00
170.00		82.70	402.76	0.00	0.00
175.00	(28) attachments	798.48	2448.63	0.00	0.00
177.50	(8) attachments	186.94	645.30	0.00	0.00
180.00		38.89	156.64	0.00	0.00
185.00	(26) attachments	1063.08	3522.98	0.00	41.92
	<b>Totals:</b>	<b>5,414.20</b>	<b>41,453.14</b>	<b>0.00</b>	<b>41.92</b>

## Calculated Forces

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

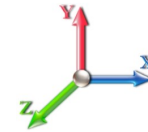


Page: 27

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Iterations** 24

**Dead Load Factor** 1.00  
**Wind Load Factor** 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.45	-5.42	0.00	-687.06	0.00	687.06	6281.65	3140.82	14160.7	7090.90	0.00	0.000	0.000	0.103
5.00	-39.94	-5.34	0.00	-659.94	0.00	659.94	6207.52	3103.76	13762.2	6891.36	0.02	-0.029	0.000	0.102
10.00	-38.41	-5.26	0.00	-633.23	0.00	633.23	6132.44	3066.22	13367.2	6693.54	0.06	-0.058	0.000	0.101
15.00	-36.90	-5.18	0.00	-606.94	0.00	606.94	6056.39	3028.19	12975.7	6497.50	0.14	-0.087	0.000	0.100
20.00	-35.42	-5.10	0.00	-581.05	0.00	581.05	5979.38	2989.69	12587.8	6303.28	0.24	-0.117	0.000	0.098
25.00	-33.95	-5.02	0.00	-555.57	0.00	555.57	5901.42	2950.71	12203.7	6110.94	0.38	-0.147	0.000	0.097
30.00	-32.52	-4.94	0.00	-530.49	0.00	530.49	5822.49	2911.25	11823.5	5920.54	0.55	-0.177	0.000	0.095
35.00	-31.11	-4.85	0.00	-505.81	0.00	505.81	5733.46	2866.73	11429.0	5722.99	0.75	-0.207	0.000	0.094
40.00	-29.72	-4.76	0.00	-481.56	0.00	481.56	5627.33	2813.67	11007.6	5512.03	0.99	-0.237	0.000	0.093
44.00	-28.63	-4.69	0.00	-462.51	0.00	462.51	5542.43	2771.21	10676.3	5346.11	1.20	-0.262	0.000	0.092
45.00	-28.13	-4.67	0.00	-457.83	0.00	457.83	5521.20	2760.60	10594.3	5305.03	1.25	-0.268	0.000	0.091
50.00	-25.67	-4.57	0.00	-434.47	0.00	434.47	4722.80	2361.40	9081.59	4547.54	1.55	-0.299	0.000	0.101
55.00	-24.49	-4.48	0.00	-411.61	0.00	411.61	4656.60	2328.30	8780.72	4396.89	1.88	-0.330	0.000	0.099
60.00	-23.33	-4.38	0.00	-389.23	0.00	389.23	4589.45	2294.72	8483.02	4247.81	2.24	-0.364	0.000	0.097
65.00	-22.19	-4.28	0.00	-367.35	0.00	367.35	4521.33	2260.66	8188.59	4100.38	2.64	-0.397	0.000	0.094
70.00	-21.07	-4.18	0.00	-345.95	0.00	345.95	4452.25	2226.13	7897.53	3954.63	3.08	-0.431	0.000	0.092
75.00	-19.97	-4.08	0.00	-325.06	0.00	325.06	4370.60	2185.30	7589.78	3800.53	3.54	-0.464	0.000	0.090
80.00	-18.89	-3.98	0.00	-304.67	0.00	304.67	4277.74	2138.87	7269.08	3639.94	4.05	-0.498	0.000	0.088
85.00	-17.84	-3.87	0.00	-284.79	0.00	284.79	4184.88	2092.44	6955.30	3482.82	4.59	-0.531	0.000	0.086
88.75	-17.06	-3.79	0.00	-270.27	0.00	270.27	4115.23	2057.61	6724.50	3367.25	5.02	-0.557	0.000	0.084
90.00	-16.65	-3.77	0.00	-265.53	0.00	265.53	4092.01	2046.01	6648.44	3329.16	5.16	-0.565	0.000	0.084
94.00	-15.36	-3.68	0.00	-250.46	0.00	250.46	2345.44	1172.72	3825.50	1915.59	5.65	-0.592	0.000	0.137
95.00	-15.22	-3.66	0.00	-246.78	0.00	246.78	2339.01	1169.51	3797.57	1901.61	5.77	-0.599	0.000	0.136
100.00	-14.54	-3.56	0.00	-228.48	0.00	228.48	2306.26	1153.13	3658.43	1831.93	6.43	-0.647	0.000	0.131
105.00	-13.87	-3.47	0.00	-210.66	0.00	210.66	2272.55	1136.28	3520.24	1762.74	7.13	-0.696	0.000	0.126
110.00	-13.22	-3.37	0.00	-193.33	0.00	193.33	2237.88	1118.94	3383.12	1694.08	7.88	-0.743	0.000	0.120
115.00	-12.58	-3.27	0.00	-176.49	0.00	176.49	2202.25	1101.13	3247.17	1626.00	8.69	-0.790	0.000	0.114
120.00	-11.96	-3.17	0.00	-160.14	0.00	160.14	2165.66	1082.83	3112.49	1558.56	9.54	-0.836	0.000	0.108
125.00	-11.35	-3.07	0.00	-144.29	0.00	144.29	2128.11	1064.06	2979.20	1491.82	10.44	-0.881	0.000	0.102
130.00	-10.75	-2.98	0.00	-128.91	0.00	128.91	2089.60	1044.80	2847.40	1425.82	11.39	-0.924	0.000	0.096
134.50	-10.23	-2.89	0.00	-115.52	0.00	115.52	2054.12	1027.06	2730.15	1367.10	12.28	-0.962	0.000	0.089
135.00	-10.13	-2.88	0.00	-114.07	0.00	114.07	2050.13	1025.07	2717.20	1360.62	12.38	-0.967	0.000	0.089
138.75	-9.42	-2.80	0.00	-103.28	0.00	103.28	1362.09	681.04	1798.87	900.77	13.15	-0.997	0.000	0.122
140.00	-9.30	-2.78	0.00	-99.78	0.00	99.78	1356.31	678.16	1778.61	890.62	13.41	-1.007	0.000	0.119
145.00	-8.84	-2.69	0.00	-85.88	0.00	85.88	1332.67	666.33	1697.93	850.23	14.49	-1.054	0.000	0.108
150.00	-8.40	-2.59	0.00	-72.45	0.00	72.45	1308.18	654.09	1617.96	810.18	15.62	-1.097	0.000	0.096
155.00	-7.96	-2.50	0.00	-59.48	0.00	59.48	1282.83	641.42	1538.80	770.54	16.79	-1.136	0.000	0.083
160.00	-7.54	-2.41	0.00	-46.97	0.00	46.97	1256.64	628.32	1460.53	731.35	18.00	-1.171	0.000	0.070
165.00	-7.13	-2.32	0.00	-34.91	0.00	34.91	1229.59	614.80	1383.27	692.66	19.24	-1.200	0.000	0.056
170.00	-6.73	-2.23	0.00	-23.31	0.00	23.31	1201.70	600.85	1307.09	654.52	20.51	-1.223	0.000	0.041
175.00	-4.30	-1.38	0.00	-12.15	0.00	12.15	1172.95	586.47	1232.10	616.96	21.80	-1.239	0.000	0.023
177.50	-3.65	-1.18	0.00	-8.69	0.00	8.69	1158.25	579.13	1195.08	598.43	22.45	-1.244	0.000	0.018
180.00	-3.50	-1.14	0.00	-5.74	0.00	5.74	1143.35	571.67	1158.39	580.05	23.11	-1.248	0.000	0.013
185.00	0.00	-1.06	0.00	-0.04	0.00	0.04	1112.89	556.45	1086.05	543.83	24.41	-1.251	0.000	0.000



## Final Analysis Summary

<b>Structure:</b> CT04169-A-2-SBA	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 28

### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 98 mph Wind	23.2	0.00	49.72	0.00	0.00	2953.54
0.9D + 1.6W 98 mph Wind	23.2	0.00	37.28	0.00	0.00	2918.95
1.2D + 1.0Di + 1.0Wi 50 mph Wind	7.0	0.00	71.45	0.00	0.00	887.82
1.2D + 1.0E	1.7	0.00	49.74	0.00	0.00	234.45
0.9D + 1.0E	1.7	0.00	37.31	0.00	0.00	231.29
1.0D + 1.0W 60 mph Wind	5.4	0.00	41.45	0.00	0.00	687.06

### Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 98 mph Wind	-17.78	-15.83	0.00	-1079.8	0.00	-1079.8	2345.44	1172.7	3825.50	1915.59	94.00	0.571
0.9D + 1.6W 98 mph Wind	-13.18	-15.61	0.00	-1060.3	0.00	-1060.3	2345.44	1172.7	3825.50	1915.59	94.00	0.559
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-31.42	-4.78	0.00	-321.26	0.00	-321.26	2345.44	1172.7	3825.50	1915.59	94.00	0.181
1.2D + 1.0E	-11.35	-1.18	0.00	-48.67	0.00	-48.67	1362.09	681.04	1798.87	900.77	138.75	0.062
0.9D + 1.0E	-8.51	-1.15	0.00	-47.81	0.00	-47.81	1362.09	681.04	1798.87	900.77	138.75	0.059
1.0D + 1.0W 60 mph Wind	-15.36	-3.68	0.00	-250.46	0.00	-250.46	2345.44	1172.7	3825.50	1915.59	94.00	0.137

## Base Plate Summary

<b>Structure:</b> CT04169-A-2-	<b>Code:</b> EIA/TIA-222-G	3/6/2018
<b>Site Name:</b> Higganum	<b>Exposure:</b> B	
<b>Height:</b> 185.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> C - Very Dense Soil	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



Page: 29

Reactions	Base Plate	Anchor Bolts
Original Design	<b>Yield (ksi):</b> 50.00	<b>Bolt Circle:</b> 63.00
<b>Moment (kip-ft):</b> 5025.00	<b>Width (in):</b> 67.00	<b>Number Bolts:</b> 28.00
<b>Axial (kip):</b> 41.00	<b>Style:</b> Clipped	<b>Bolt Type:</b> 2.25" 18J
<b>Shear (kip):</b> 39.00	<b>Polygon Sides:</b> 0.00	<b>Bolt Diameter (in):</b> 2.25
Analysis	<b>Clip Length (in):</b> 15.00	<b>Yield (ksi):</b> 75.00
<b>Moment (kip-ft):</b> 2953.54	<b>Effective Len (in):</b> 6.58	<b>Ultimate (ksi):</b> 100.00
<b>Axial (kip):</b> 71.45	<b>Moment (kip-in):</b> 313.85	<b>Arrangement:</b> Clustered
<b>Shear (kip):</b> 23.16	<b>Allow Stress (ksi):</b> 67.50	<b>Cluster Dist (in):</b> 6.00
	<b>Applied Stress (ksi):</b> 0.00	<b>Start Angle (deg):</b> 45.00
<b>Moment Design %:</b> 58.78	<b>Stress Ratio:</b> 0.56	<b>Compression</b>
		<b>Force (kip):</b> 82.92
		<b>Allowable (kip):</b> 260.00
		<b>Ratio:</b> 0.33
		<b>Tension</b>
		<b>Force (kip):</b> 77.82
		<b>Allowable (kip):</b> 260.00
		<b>Ratio:</b> 0.31



# Monopole Mat Foundation Design

Date  
3/6/2018

<b>Customer Name:</b>	SBA Communcations Corp	<b>EIA/TIA Standard:</b>	EIA-222-G
<b>Site Name:</b>	Higganum	<b>Structure Height (Ft.):</b>	53
<b>Site Number:</b>	CT04169-A-2-SBA	<b>Engineer Name:</b>	W. Velez
<b>Engr. Number:</b>	48831	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations
Monopole
Analysis

**Structure Type:**

**Analysis or Design?**

**Base Reactions (Factored):**

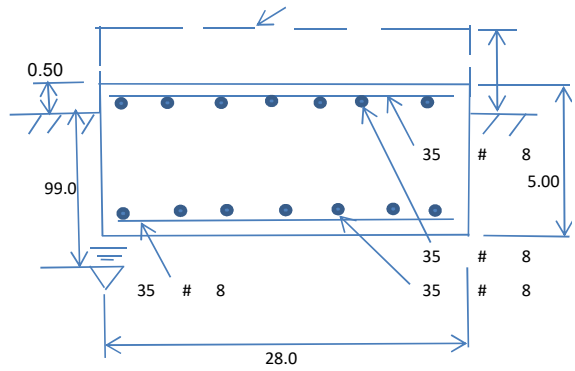
Axial Load (Kips):	49.7	Shear Force (Kips):	23.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2953.5

Allowable overstress %: 5.0%

**Foundation Geometries:**

Anchor Bolt Circle (ft.):	5.25	Depth of Base BG (ft.):	4.50
Thickness of Pad (ft.):	5.00	Width of Pad (ft.):	28
Length of Pad (ft.):	28		

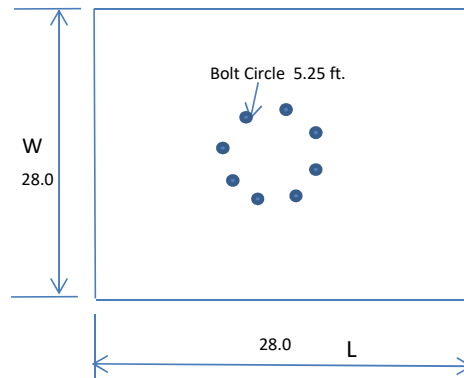
Final Length of pad (ft) 28.0 Final width of pad (ft): 28.0



**Material Properties and Reabr Info:**

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Pad Rebar Yield (Ksi):	60	Tie Spacing (in):	12.0	
Pad Steel Rebar Size (#):	8			
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	35	Qty. of Rebar in Pad (W):	35	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	35	Qty. of Rebar in Pad (W):	35	

Apply 1.35 factor for e/w Per G: 1.00



**Soil Design Parameters:**

Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	40000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:	1.00			

**Foundation Analysis and Design:**

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	0.00	Total Dry Soil Weight (Kips):	0.00
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.00	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3920.00	Total Dry Concrete Weight (Kips):	588.00
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	588.00	Total Vertical Load on Base (Kips):	637.72

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	1710	<	Allowable Factored Soil Bearing (psf):	30000	0.06	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	8104.9	>	Design Factored Momont (kips-ft):	2963	0.37	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.74					OK!

Load/  
Capacity  
Ratio

**Check the capacities of Reinforcing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

**Concrete Pad:**

One-Way Design Shear Capacity (L-Direction, Kips):	1559.7	>	One-Way Factored Shear (L-D. Kips):	212.6	0.14	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1559.7	>	One-Way Factored Shear (W-D., Kips):	212.6	0.14	OK!
One-Way Design Shear Capacity (Corner-Corner, Kips):	1885.4	>	One-Way Factored Shear (C-C, Kips):	389.0	0.21	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0015	OK!	Lower Steel Pad Reinf. Ratio (W-Direct	0.0015		
Lower Steel Pad Moment Capacity (L-Direction, Kips-ft):	6909.6	>	Moment at Bottom ( L-Direct, K-Ft):	682.0	0.10	OK!
Lower Steel Pad Moment Capacity (W-Direction, Kips-ft):	6909.6	>	Moment at Bottom ( W-Direct, K-Ft):	682.0	0.10	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	9742.6	>	Moment at Bottom ( C-C Dir, K-Ft):	964.5	0.10	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0015	OK!	Upper Steel Reinf. Ratio (W-Direct. ):	0.0015		
Upper Steel Pad Moment Capacity (L-Direction, Kips-ft):	6909.6	>	Moment at the top (L-Dir Kips-Ft):	74.1	0.01	OK!
Upper Steel Pad Moment Capacity (W-Direction, Kips-ft):	6909.6	>	Moment at the top (W-Dir Kips-Ft):	74.1	0.01	OK!
Upper Steel Pad Moment Capacity (Corner-Corner, K-ft):	9742.6	>	Moment at the top (C-C Direc, K-Ft):	443.1	0.05	OK!



Pier Foundation Design For Monopole			Date
			3/6/2018
Customer Name:	Sprint Nextel	EIA/TIA Standard:	EIA-222-G
Site Name:	Higganum	Structure Height (Ft.):	185
Site Number:	CT04169-A-2-SBA	Engineer Name:	W. Velez
Engr. Number:	48831	Engineer Login ID:	

**Foundation Info Obtained from:**

Drawings/Calculations Acceptable overstress ( < 5.0%

**Structure Type:**

Monopole

**Analysis or Design?**

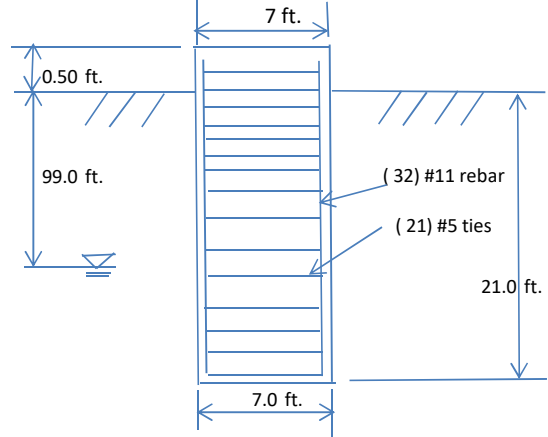
Analysis

**Base Reactions (Factored):**

Axial Load (Kips):	49.7	Shear Force (Kips):	23.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2953.5

**Foundation Geometries:**

Mods required -Yes/No ?:	No		ft.
Diameter of Pier (ft.):	7.0	Depth of Base B. G. S. :	21.0 ft.
Pier Height A. G. (ft.):	0.50		



**Monopole Pier Foundation**

**Material Properties and Reabr Info:**

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	40	ksi
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	32	Tie Spacing:	18.0	in.
Concrete Cover (in.):	4	Concrete unit weight:	150.0	pcf

**Soil Design Parameters:**

Water Table B.G.S. (ft):	99.0	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	30	(°)
Skin Frictions are to be obtained from:		Soil Report		

Depth of Layers (ft)		$\gamma_{soil}$ (pcf)	$\phi$ (°)	Cohesion (psf)	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types						
Top	Bottom												
0.0	3.0	100	0	0		0							
3.0	14.5	100	0	11850		0							
14.5	18.5	100	0	4850		0							
18.5	23.5	100	0	4850		40000							

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

**Foundation Analysis and Design:**

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75
Total Dry Soil Volume from Conical Failure (cu. Ft.):	6013	Dry Soil Weight from Conical Failure:	601 Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	0	Buoyant Soil Weight from Conical Failure (K	0 Kips
Total Dry Concrete Volume (cu. Ft.):	827	Total Dry Concrete Weight:	124.1 Kips
Total Buoyant Concrete Volume (cu. Ft.):	0.0	Total Buoyant Concrete Weight:	0.00 Kips
Total Effective Concrete Weight (Kips):	124.1	Total Effective Soil Weight:	601.3 Kips
Total Effective Vertical Load on Base (Kips):	93.0		

**Check Soil Capacities:**

Allowable Foundation Overturning Resistance (kips-ft.):	27086.7	>	Design Factored Moment (kips-ft):	3195	Usage	0.12	OK!
Factor of Safety of Passive Soil Resistance against Moment:	8.48						OK!

**Check the capacities of Reinforcing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90		Strength reduction factor (Shear):	0.75			
Strength reduction factor (Axial compression):	0.65		Wind Load Factor on Concrete Design:	1.00			
Reinforcing Concrete Pier:							
Vertical Steel Rebar Area (sq. in./each):	1.56		Tie / Stirrup Area (sq. in./each):	0.31			
Calculated Moment Capacity (Mn,Kips-Ft):	7850.8	>	Design Factored Moment (Mu, K-Ft):	3031.0	Usage	0.39	OK!
Calculated Shear Capacity (Kips):	970.0	>	Design Factored Shear (Kips):	353.6		0.36	OK!
Calculated Tension Capacity (Tn, Kips):	2695.7	>	Design Factored Tension (Tu Kips):	0.0		0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7282	>	Design Factored Axial Load (Pu Kips):	49.7		0.01	OK!
Moment & Axial Strength Combination:	0.39	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00		in.	
Pier Reinforcement Ratio:	0.009		Reinforcement Ratio is satisfied per ACI				