Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

Structural Analysis Report

Existing 152 ft Rohn Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT13065-A

Customer Site Name: Guilford

Carrier Name: AT&T

Carrier Site ID / Name: CTL05641

Site Location: 331 Killingworth Road (Rt 80)

Guilford, Connecticut

New Haven County

Latitude: 41.353164

Longitude: -72.688252

Analysis Result:

Max Structural Usage: 94% [Pass]

Max Foundation Usage: 61% [Pass]

Report Prepared By : Ram Kodali

STATE OF CONNECTICUT
HAMMING YOU
28931
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PROFESSIONAL ENGINEER

10/28/16

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Introduction

The purpose of this report is to summarize the analysis results on the 152 ft Rohn Self Supporting Tower 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

Tower Drawings	Rohn, Dwg # C851129, dated 8/6/1985
Foundation Drawing	FDH, Project # 09-03151E N1,dated 6/10/2009
Geotechnical Report	FDH, Project # 09-03151EG1, dated 5/5/2009
Modification Drawings	All-Points Technology Corp., Job # CT2001D1, dated 4/28/05 FDH, Project # 09-03151E S2, dated 9/4/09 FDH, Project # 11-10199E S2, dated 4/19/12 FDH, Project # 12-04638E S3, dated 2/6/13 FDH, Project # 15BEQG1400, dated 2/27/15 FDH, Project # 14664X1400, dated 5/29/14

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 **TESTowers,** 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.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 130 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4” radial ice concurrent
Operational Wind Speed:	60 mph + 0” Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft

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	157.0	1	Phillips Dodge 201-7 Omni	Pipe/leg	(1) 7/8"	TCI Cablevision
2	154.3	1	Decibel DB589 Omni		(1) 7/8"	American Messaging
-	149.0	6	Powerwave 7770.00 - Panel	(3) Sector Frames	(12) 1 5/8" (1) 1/2"Fiber & (2) 3/4" DC (1) 3" Innerduct Conduit	AT&T
-		3	KMW AM-X-CD-16-65-00T			
-		6	Powerwave LGP21401			
-		6	Ericsson RRUS-11			
-		6	Powerwave LGP21901			
-		1	Raycap DC6-48-60-18-8F			
10	140.4	3	RFS APXVSPP18-C-A20 - Panel	(3) Sector Frames	(4) 1-1/4" Fiber	Sprint
11		3	RFS APXVTM14-C-I20 - Panel			
12		3	Alcatel Lucent 1900 MHz RRHs			
13		3	Alcatel Lucent 800 MHz RRHs			
14		3	Alcatel Lucent 800 MHz Filters			
15		3	Alcatel Lucent TD-RRH8x20-25 RRHs			
16		4	RFS ACU-A20-N RETs			
17	131.0	1	DB26 GPS	Pipe	(13) 1 5/8"	Verizon
18	128.0	4	Andrew HBXX-6516DS-A2M - Panel	(3) Sector Frames		
19		2	Andrew HBXX-6517DS-A2M - Panel			
20		4	Andrew LNX-6513DS-A1M - Panel			
21		3	Alcatel Lucent RRH2x60-AWS			
22		3	Alcatel Lucent RRH2X60-PCS			
23		6	RFS FD9R6004/2C-3L			
24		2	Andrew LNX-6514DS-A1M - Panel			
25		1	RFS DB-T1-6Z-8AB-0Z			
26	84.9	1	Decibel DB26 GPS	Pipe	(1) 1/2"	
27	10.0	1	Channel Master 6922 Dish	Pipe	(1) RG-6	American Messaging

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
3	149.0	6	Powerwave Allgon 7770.00 - Panel	(3) Sector Frames	(12) 1 5/8" (1) 1/2"Fiber & (2) 3/4" DC (1) 3" Innerduct Conduit	AT&T
4		3	KMW AM-X-CD-16-65-00T-RET - Panel			
5		6	Powerwave LGP21401 TMA			
6		6	Ericsson RRUS-11			
7		3	Ericsson RRUS-12			
8		6	Powerwave LGP21901 Diplexer			
9		1	Raycap DC6-48-60-18-8F			

There are no proposed coax lines.

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:

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	**94.0%**	**80.0%**	**17.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	188.7	159.7	20.9

The foundation has been investigated using the supplied documents and soils report and was found to be adequate. Therefore, no modification to the foundation will be required.

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 0.1738 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/EIA 222-G Standard under the design basic wind speed as 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.

Structure: CT13065-A-SBA

Site Name:	Guilford			**Code:**	EIA/TIA-222-G	10/28/2016
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	101.00	
Height:	152.00 (ft)	**Base Width:**	20.78	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	6.52	**Operational WS:**	60.00	Page: 1

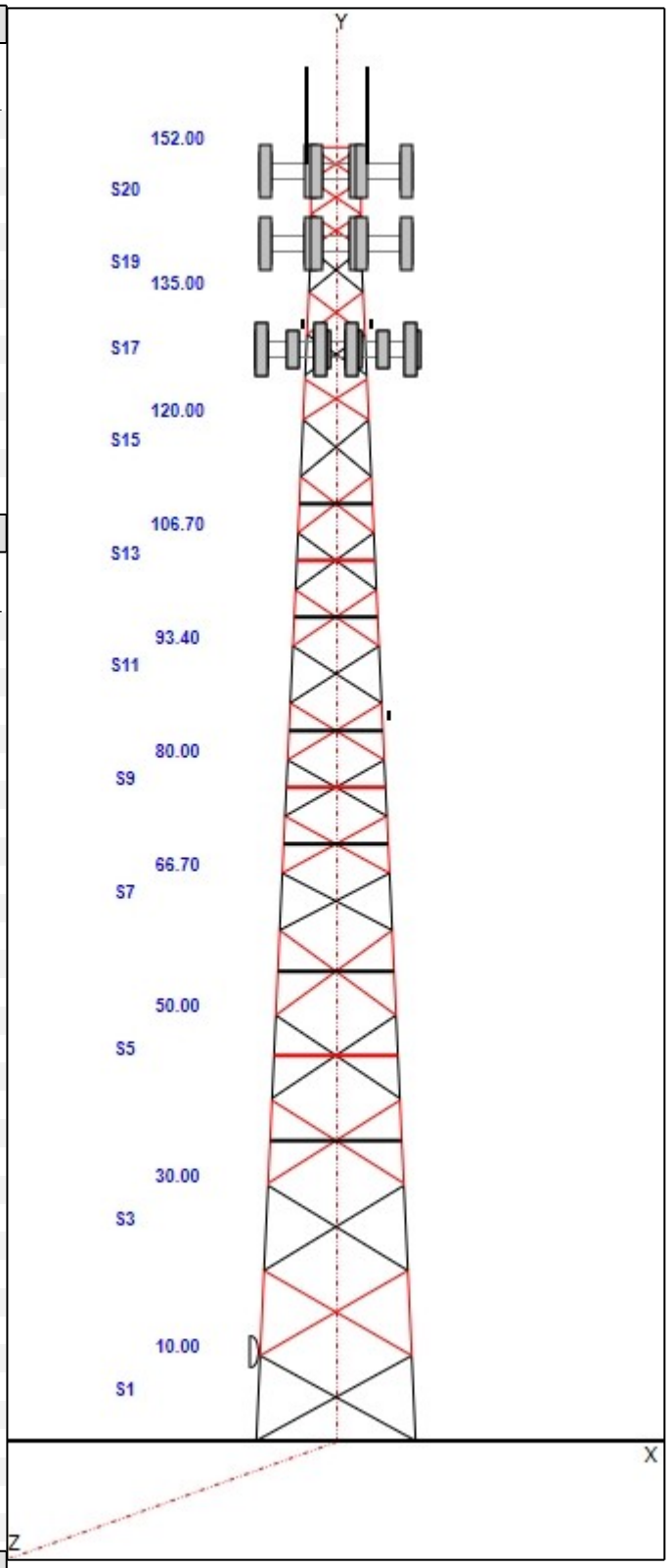
Section Properties

Sect	Leg Members	Diagonal Members	Horizontal Members
1-2	MOD 5"PST+6"PX1/2P	SAE 3.5X3.5X0.25	
3	MOD 4"PX+5"PX1/2P	SAE 3X3X0.375	
4	PX 4" DIA PIPE	SAE 3X3X0.375	
5-6	PX 4" DIA PIPE	SAE 3X3X0.25	
7	MOD 3"PX+4"PX1/2P	SAE 2.5X2.5X0.25	
8	PX 3" DIA PIPE	SAE 2.5X2.5X0.25	
9	PX 3" DIA PIPE	SAE 2.5X2.5X0.1875	
10	MOD 2.5"PX+3'PX1/2P	SAE 2X2X0.375	
11	MOD 2.5"PX+3.5"PX1/2	SAE 2X2X0.375	
12	PX 2-1/2" DIA PIPE	SAE 2X2X0.375	
13-15	PX 2-1/2" DIA PIPE	DAE 2X2X0.125	
16-17	PST 2-1/2" DIA PIPE	SAE 1.75X1.75X0.25	
18-19	PST 2-1/2" DIA PIPE	SAE 1.75X1.75X0.125	
20	PST 2" DIA PIPE	SAE 1.5X1.5X0.125	SAE 2X2X0.125

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
150.00	157.00	1	Phillips Dodge 201-7 Omni
150.00	154.30	1	Decibel DB589 Omni
150.00	150.00	1	Pipe Mount
149.00	149.00	3	Sector Frames
149.00	149.00	6	Powerwave Allgon 7770.00
149.00	149.00	3	KMW AM-X-CD-16-65-00T-RET
149.00	149.00	6	Powerwave LGP21401 TMA
149.00	149.00	6	Ericsson RRUS-11
149.00	149.00	3	Ericsson RRUS-12
149.00	149.00	6	Powerwave LGP21901 Diplexer
149.00	149.00	1	Raycap DC6-48-60-18-8F-Surge Suppressor/BOB
140.40	140.40	3	Sector Frames
140.40	140.40	3	RFS APXVSPP18-C-A20
140.40	140.40	3	RFS APXVTM14-C-I20
140.40	140.40	3	Alcatel Lucent 1900 MHz RRHs
140.40	140.40	3	Alcatel Lucent 800 MHz RRHs
140.40	140.40	3	Alcatel Lucent 800 MHz Filters
140.40	140.40	3	Alcatel Lucent TD-RRH8x20-25 RRHs
140.40	140.40	4	RFS ACU-A20-N RETs
131.00	131.00	1	DB26 GPS
131.00	131.00	1	Pipe Mount
128.00	128.00	3	Sector Frames
128.00	128.00	4	Andrew HBXX-6516DS-A2M
128.00	128.00	2	Andrew HBXX-6517DS-A2M
128.00	128.00	4	Andrew LNX-6513DS-A1M
128.00	128.00	3	Alcatel Lucent RRH2x60-AWS
128.00	128.00	3	Alcatel Lucent RRH2X60-PCS
128.00	128.00	6	RFS FD9R6004/2C-3L
128.00	128.00	2	Andrew LNX-6514DS-A1M
128.00	128.00	1	RFS DB-T1-6Z-8AB-0Z
84.90	84.90	1	DB26 GPS
84.90	84.90	1	Pipe Mount
10.00	10.00	1	Channel Master 6922 Dish

Linear Appurtenances



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Structure: CT13065-A-SBA

Site Name:	Guilford			**Code:**	EIA/TIA-222-G	10/28/2016
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	101.00	
Height:	152.00 (ft)	**Base Width:**	20.78	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	6.52	**Operational WS:**	60.00	Page: 2

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Elev From (ft)	Elev To (ft)	Qty	Description
0.00	152.00	1	Climbing Ladder
8.00	152.00	1	7/8" Coax
8.00	150.00	1	7/8" Coax
0.00	149.00	1	W/G Ladder
10.00	149.00	12	1 5/8" Coax
10.00	149.00	1	10 mm Fiber Trunk
10.00	149.00	1	3" Innerduct
10.00	149.00	2	3/4" DC
0.00	140.40	1	W/G Ladder
8.00	140.40	4	1-1/4" Fiber
0.00	128.00	1	W/G Ladder
8.00	128.00	12	1 5/8" Coax
8.00	128.00	1	1 5/8" Coax
0.00	120.00	1	W/G Ladder
8.00	83.90	1	1/2" Coax
0.00	10.00	1	RG6

Base Reactions

Leg			Overturning		
Max Uplift:	-159.75	(kips	Moment:	3190.19	(ft-kips)
Max Down:	188.73	(kips	Total Down:	34.40	(kips)
Max Shear:	20.87	(kips	Total Shear:	35.18	(kips)

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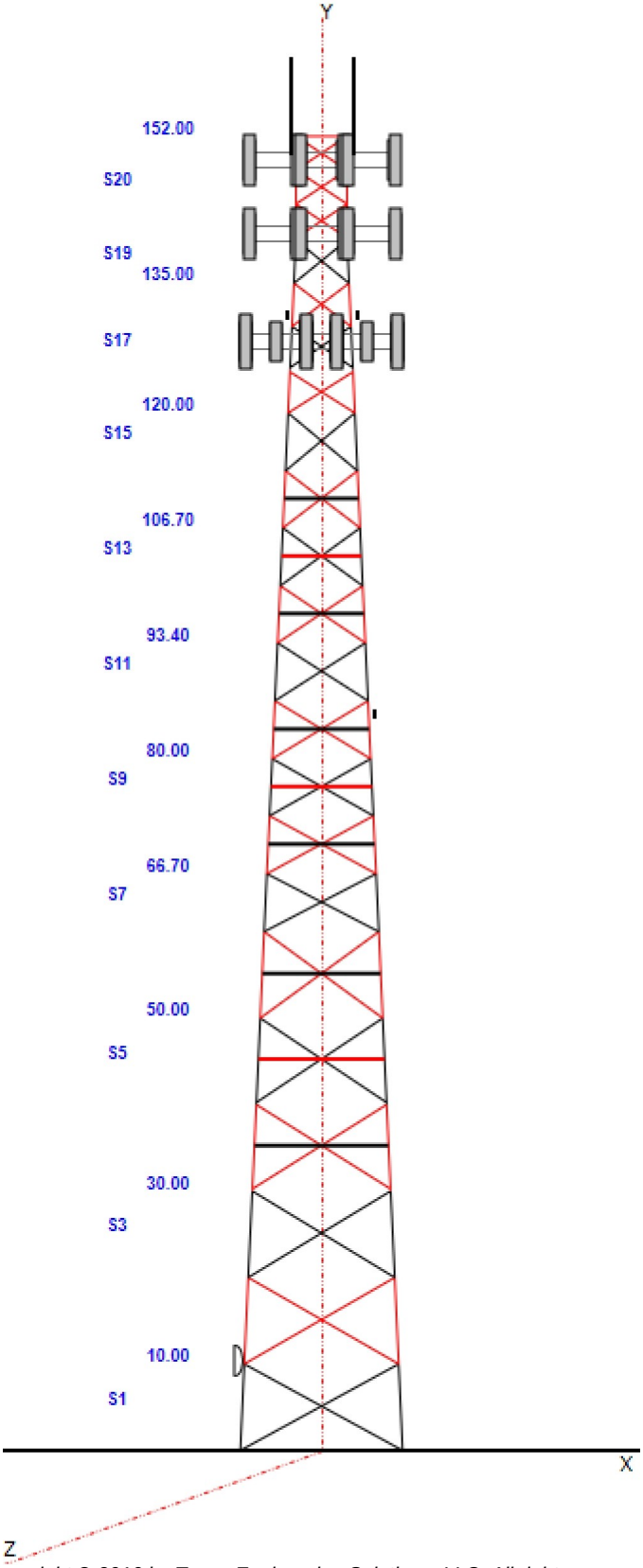
Structure: CT13065-A-SBA

Site Name:	Guilford			**Code:**	EIA/TIA-222-G		10/28/2016
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	101.00		
Height:	152.00 (ft)	**Base Width:**	20.78	**Basic Ice WS:**	50.00		
Base Elev:	0.00 (ft)	**Top Width:**	6.52	**Operational WS:**	60.00		Page: 3



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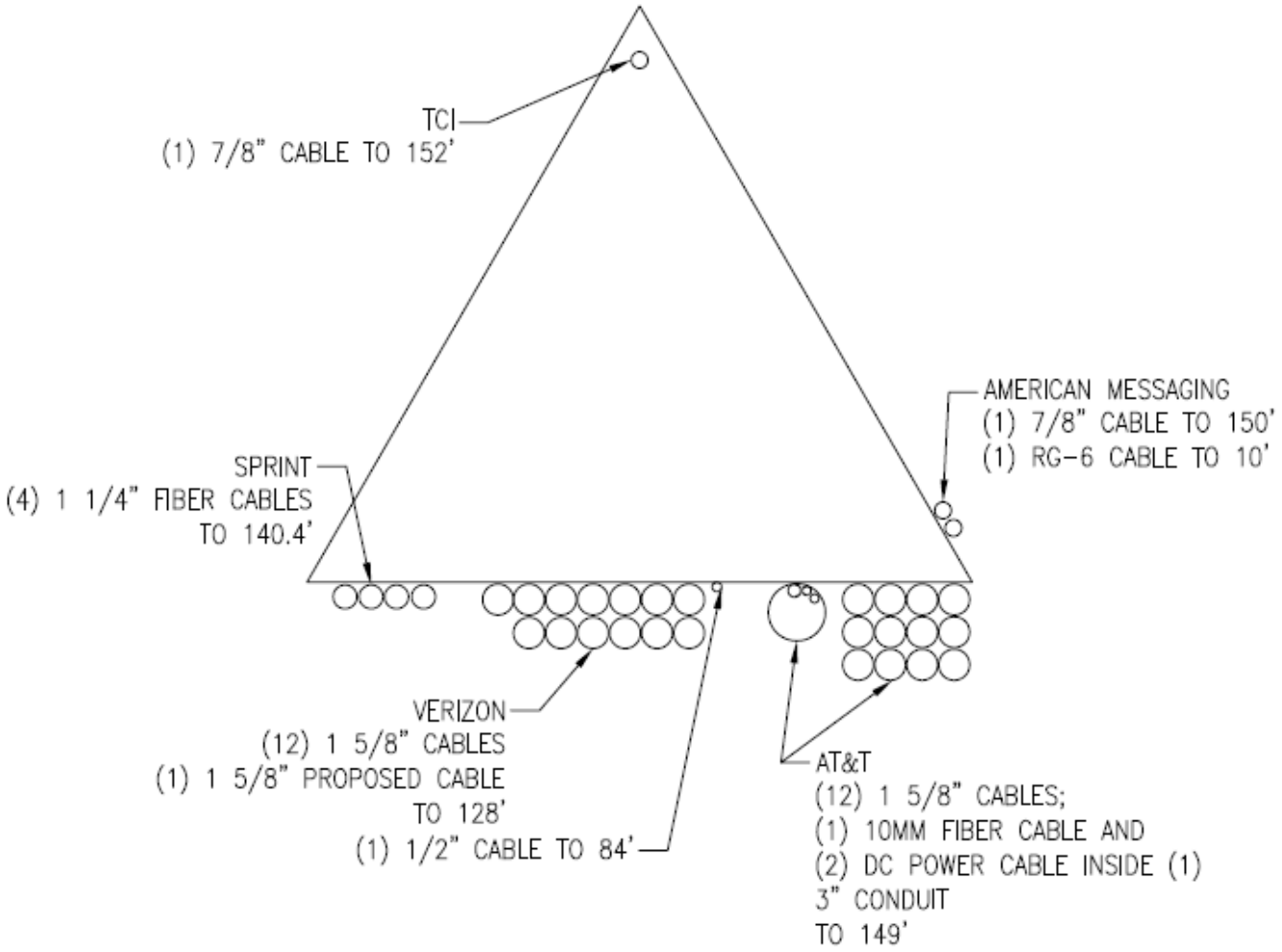
Structure: CT13065-A-SBA - Coax Line Placement

Type: Self Support
Site Name: Guilford
Height: 152.00 (ft)

10/28/2016



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Loading Summary

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 5

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Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	Ice Weight (lb)	Ice CaAa (sf)	Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
150.00	Phillips Dodge 201-7 Omni	1	4.00	1.070	36.24	4.001	99.600	1.300	1.300	1.00	1.00	7.000
150.00	Decibel DB589 Omni	1	11.50	1.380	48.91	3.698	110.400	0.000	1.500	1.00	1.00	4.300
150.00	Pipe Mount	1	45.00	5.000	82.59	8.481	0.000	0.000	0.000	0.80	0.75	0.000
149.00	Sector Frames	3	350.00	14.000	622.91	21.018	0.000	0.000	0.000	0.75	0.75	0.000
149.00	Powerwave Allgon 7770.00	6	35.00	5.500	169.73	6.562	55.000	11.000	5.000	0.80	0.75	0.000
149.00	KMW AM-X-CD-16-65-00T-RET	3	48.50	8.020	236.71	9.311	72.000	11.800	5.900	0.80	0.75	0.000
149.00	Powerwave LGP21401 TMA	6	17.50	0.000	45.63	1.231	14.000	7.000	2.700	0.80	0.67	0.000
149.00	Ericsson RRUS-11	6	51.00	2.520	123.08	3.152	17.000	17.800	7.200	0.80	0.67	0.000
149.00	Ericsson RRUS-12	3	60.00	2.700	134.10	3.773	18.200	17.800	6.000	0.80	0.67	0.000
149.00	Powerwave LGP21901 Diplexer	6	5.50	0.230	13.17	0.597	4.000	6.000	3.000	0.80	0.67	0.000
149.00	Raycap DC6-48-60-18-8F-Surge	1	20.00	1.260	72.62	1.918	23.500	9.700	9.700	1.00	1.00	0.000
140.40	Sector Frames	3	400.00	17.500	956.96	31.389	0.000	0.000	0.000	0.75	0.75	0.000
140.40	RFS APXVSPP18-C-A20	3	57.00	8.020	256.04	9.311	72.000	11.800	7.000	0.80	0.83	0.000
140.40	RFS APXVTM14-C-I20	3	56.00	6.340	215.89	7.450	56.300	12.600	6.300	0.80	0.79	0.000
140.40	Alcatel Lucent 1900 MHz RRHs	3	44.00	3.800	152.87	5.186	23.000	13.000	17.000	0.80	0.67	0.000
140.40	Alcatel Lucent 800 MHz RRHs	3	53.00	2.490	126.76	3.631	19.700	13.000	10.800	0.80	0.67	0.000
140.40	Alcatel Lucent 800 MHz Filters	3	61.80	2.910	152.28	4.123	19.700	13.000	15.200	0.80	0.67	0.000
140.40	Alcatel Lucent TD-RRH8x20-25	3	70.00	4.050	180.10	4.861	26.100	18.600	6.700	0.80	0.67	0.000
140.40	RFS ACU-A20-N RETs	4	1.00	0.140	5.28	0.436	4.000	2.000	3.500	0.80	0.67	0.000
131.00	DB26 GPS	1	10.00	1.000	38.85	1.701	12.000	9.000	6.000	1.00	1.00	0.000
131.00	Pipe Mount	1	45.00	2.000	82.09	3.374	0.000	0.000	0.000	1.00	1.00	0.000
128.00	Sector Frames	3	400.00	17.500	949.47	31.202	0.000	0.000	0.000	0.75	0.75	0.000
128.00	Andrew HBXX-6516DS-A2M	4	30.60	5.430	171.92	6.426	50.900	12.000	6.500	0.80	0.77	0.000
128.00	Andrew HBXX-6517DS-A2M	2	40.70	8.550	240.60	9.836	74.900	12.000	6.500	0.80	0.77	0.000
128.00	Andrew LNX-6513DS-A1M	4	30.40	5.830	184.95	6.901	54.700	11.900	7.100	0.80	0.83	0.000
128.00	Alcatel Lucent RRH2x60-AWS	3	55.00	3.500	133.72	4.277	37.000	11.000	6.000	0.80	0.67	0.000
128.00	Alcatel Lucent RRH2X60-PCS	3	55.00	2.200	137.85	2.825	22.000	12.000	9.400	0.80	0.67	0.000
128.00	RFS FD9R6004/2C-3L	6	3.10	0.360	11.00	0.796	5.800	6.500	1.500	0.80	0.67	0.000
128.00	Andrew LNX-6514DS-A1M	2	33.10	8.090	230.84	9.350	72.000	11.900	7.100	0.80	0.80	0.000
128.00	RFS DB-T1-6Z-8AB-0Z	1	18.90	4.800	159.90	5.659	24.000	24.000	10.000	1.00	1.00	0.000
84.90	DB26 GPS	1	10.00	1.000	37.65	1.671	12.000	9.000	6.000	1.00	1.00	0.000
84.90	Pipe Mount	1	45.00	2.000	80.55	3.317	0.000	0.000	0.000	1.00	1.00	0.000
10.00	Channel Master 6922 Dish	1	126.00	20.190	272.67	22.337	47.200	47.200	0.000	1.00	1.00	0.000
	Totals:	**95**	**6,534.50**		**18,246.16**						**Number of Appurtenances :**	**33**

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Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	152.00	Climbing Ladder	1	1.00	6.90	100.00	1	Individual NR		N	1.00	1.00	
8.00	152.00	7/8" Coax	1	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	
8.00	150.00	7/8" Coax	1	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	
0.00	149.00	W/G Ladder	1	1.50	6.00	100.00	3	Individual NR		N	1.00	1.00	
10.00	149.00	1 5/8" Coax	12	1.98	1.04	33.30	3	Block		N	0.50	1.00	
10.00	149.00	10 mm Fiber Trunk	1	0.00	0.16	100.00	3	Individual NR		N	1.00	1.00	
10.00	149.00	3" Innerduct	1	3.00	0.25	100.00	3	Individual NR		N	1.00	1.00	
10.00	149.00	3/4" DC	2	0.00	0.40	100.00	3	Individual NR		N	1.00	1.00	
0.00	140.40	W/G Ladder	1	1.50	6.00	100.00	3	Individual NR		N	1.00	1.00	
8.00	140.40	1-1/4" Fiber	4	1.25	0.95	100.00	3	Individual IR		N	1.00	1.00	
0.00	128.00	W/G Ladder	1	1.50	6.00	100.00	3	Individual NR		N	1.00	1.00	
8.00	128.00	1 5/8" Coax	12	1.98	1.04	50.00	3	Block		N	0.50	1.00	
8.00	128.00	1 5/8" Coax	1	1.98	1.04	100.00	3	Individual NR		N	1.00	1.00	
0.00	120.00	W/G Ladder	1	1.50	6.00	100.00	1	Individual NR		N	1.00	1.00	
8.00	83.90	1/2" Coax	1	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	10.00	RG6	1	0.24	0.03	100.00	2	Individual NR		N	1.00	1.00	

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 7

Tower Engineering Solutions

Load Case: 1.2D + 1.6W Normal Wind — 1.2D + 1.6W 101 mph Wind at Normal To Face

Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	15.54	12.899	10.01	0.00	0.11	2.92	1.00	1.00	0.00	18.02	10.07	0.00	2,260.3	0.0	1113.32	221.53	1,334.84
2	15.0	15.54	12.376	10.01	0.00	0.11	2.91	1.00	1.00	0.00	17.51	36.38	0.00	2,564.8	0.0	1077.03	688.05	1,765.09
3	25.0	15.54	10.180	8.14	0.00	0.10	2.97	1.00	1.00	0.00	14.67	36.38	0.00	2,609.6	0.0	921.29	688.05	1,609.34
4	35.0	16.25	13.993	7.51	0.00	0.12	2.88	1.00	1.00	0.00	18.23	36.38	0.00	2,409.4	0.0	1158.53	719.64	1,878.17
5	45.0	17.46	12.625	7.51	0.00	0.12	2.88	1.00	1.00	0.00	16.81	36.38	0.00	2,000.0	0.0	1149.34	773.22	1,922.56
6	55.0	18.49	12.068	7.51	0.00	0.13	2.86	1.00	1.00	0.00	16.22	36.38	0.00	1,964.3	0.0	1167.72	818.84	1,986.56
7	63.4	19.25	6.441	5.03	0.00	0.12	2.90	1.00	1.00	0.00	9.20	24.37	0.00	1,308.4	0.0	698.53	571.23	1,269.76
8	70.0	19.81	9.039	3.92	0.00	0.14	2.81	1.00	1.00	0.00	11.26	24.37	0.00	1,259.2	0.0	853.53	587.88	1,441.41
9	76.7	20.34	8.631	3.86	0.00	0.14	2.80	1.00	1.00	0.00	10.82	24.01	0.00	1,114.0	0.0	837.02	594.31	1,431.33
10	83.3	20.82	6.607	3.55	0.00	0.12	2.88	1.00	1.00	0.00	8.61	24.22	0.00	1,334.1	0.0	702.80	614.72	1,317.52
11	90.0	21.29	4.360	4.47	0.00	0.11	2.92	1.00	1.00	0.00	6.86	24.01	0.00	1,199.7	0.0	580.65	624.05	1,204.70
12	96.7	21.73	6.421	3.17	0.00	0.13	2.84	1.00	1.00	0.00	8.21	23.65	0.00	1,214.0	0.0	690.45	627.38	1,317.83
13	103.3	22.14	5.911	3.22	0.00	0.13	2.85	1.00	1.00	0.00	7.73	24.01	0.00	987.3	0.0	662.50	649.10	1,311.60
14	110.0	22.54	5.382	3.17	0.00	0.13	2.84	1.00	1.00	0.00	7.18	23.65	0.00	972.3	0.0	624.23	650.91	1,275.14
15	116.6	22.92	3.631	3.22	0.00	0.11	2.92	1.00	1.00	0.00	5.45	24.01	0.00	860.2	0.0	495.29	671.95	1,167.24
16	122.5	23.25	2.725	2.40	0.00	0.12	2.89	1.00	1.00	0.00	4.08	17.29	0.00	577.9	0.0	372.32	484.80	857.12
17	127.5	23.51	2.593	2.40	0.00	0.12	2.87	1.00	1.00	0.00	3.95	14.32	0.00	526.9	0.0	362.45	404.21	766.66
18	132.5	23.77	2.514	2.40	0.00	0.13	2.85	1.00	1.00	0.00	3.87	9.85	0.00	373.5	0.0	356.21	278.00	634.20
19	137.5	24.03	2.395	2.40	0.00	0.14	2.82	1.00	1.00	0.00	3.75	9.85	0.00	369.3	0.0	346.31	280.96	627.26
20	146.0	24.44	6.622	4.75	0.00	0.14	2.81	1.00	1.00	0.00	9.31	13.69	0.00	650.7	0.0	868.78	404.65	1,273.43
														26,555.8	**0.0**			**26,391.78**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 8

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 60° Wind — 1.2D + 1.6W 101 mph Wind at 60° From Face

Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	15.54	12.899	10.01	0.00	0.11	2.92	0.80	1.00	0.00	15.44	10.07	0.00	2,260.3	0.0	953.96	221.53	1,175.48
2	15.0	15.54	12.376	10.01	0.00	0.11	2.91	0.80	1.00	0.00	15.03	36.38	0.00	2,564.8	0.0	924.74	688.05	1,612.79
3	25.0	15.54	10.180	8.14	0.00	0.10	2.97	0.80	1.00	0.00	12.64	36.38	0.00	2,609.6	0.0	793.45	688.05	1,481.50
4	35.0	16.25	13.993	7.51	0.00	0.12	2.88	0.80	1.00	0.00	15.43	36.38	0.00	2,409.4	0.0	980.62	719.64	1,700.27
5	45.0	17.46	12.625	7.51	0.00	0.12	2.88	0.80	1.00	0.00	14.29	36.38	0.00	2,000.0	0.0	976.72	773.22	1,749.93
6	55.0	18.49	12.068	7.51	0.00	0.13	2.86	0.80	1.00	0.00	13.81	36.38	0.00	1,964.3	0.0	993.97	818.84	1,812.81
7	63.4	19.25	6.441	5.03	0.00	0.12	2.90	0.80	1.00	0.00	7.91	24.37	0.00	1,308.4	0.0	600.73	571.23	1,171.97
8	70.0	19.81	9.039	3.92	0.00	0.14	2.81	0.80	1.00	0.00	9.45	24.37	0.00	1,259.2	0.0	716.46	587.88	1,304.34
9	76.7	20.34	8.631	3.86	0.00	0.14	2.80	0.80	1.00	0.00	9.09	24.01	0.00	1,114.0	0.0	703.45	594.31	1,297.76
10	83.3	20.82	6.607	3.55	0.00	0.12	2.88	0.80	1.00	0.00	7.29	24.22	0.00	1,334.1	0.0	595.00	614.72	1,209.72
11	90.0	21.29	4.360	4.47	0.00	0.11	2.92	0.80	1.00	0.00	5.99	24.01	0.00	1,199.7	0.0	506.88	624.05	1,130.94
12	96.7	21.73	6.421	3.17	0.00	0.13	2.84	0.80	1.00	0.00	6.93	23.65	0.00	1,214.0	0.0	582.50	627.38	1,209.88
13	103.3	22.14	5.911	3.22	0.00	0.13	2.85	0.80	1.00	0.00	6.55	24.01	0.00	987.3	0.0	561.19	649.10	1,210.29
14	110.0	22.54	5.382	3.17	0.00	0.13	2.84	0.80	1.00	0.00	6.10	23.65	0.00	972.3	0.0	530.58	650.91	1,181.49
15	116.6	22.92	3.631	3.22	0.00	0.11	2.92	0.80	1.00	0.00	4.72	24.01	0.00	860.2	0.0	429.26	671.95	1,101.21
16	122.5	23.25	2.725	2.40	0.00	0.12	2.89	0.80	1.00	0.00	3.54	17.29	0.00	577.9	0.0	322.60	484.80	807.40
17	127.5	23.51	2.593	2.40	0.00	0.12	2.87	0.80	1.00	0.00	3.43	14.32	0.00	526.9	0.0	314.86	404.21	719.07
18	132.5	23.77	2.514	2.40	0.00	0.13	2.85	0.80	1.00	0.00	3.37	9.85	0.00	373.5	0.0	309.95	278.00	587.95
19	137.5	24.03	2.395	2.40	0.00	0.14	2.82	0.80	1.00	0.00	3.27	9.85	0.00	369.3	0.0	302.12	280.96	583.08
20	146.0	24.44	6.622	4.75	0.00	0.14	2.81	0.80	1.00	0.00	7.99	13.69	0.00	650.7	0.0	745.24	404.65	1,149.89
														26,555.8	**0.0**			**24,197.75**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 9

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 90° Wind — 1.2D + 1.6W 101 mph Wind at 90° From Face

Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	15.54	12.899	10.01	0.00	0.11	2.92	0.85	1.00	0.00	16.09	10.07	0.00	2,260.3	0.0	993.80	221.53	1,215.32
2	15.0	15.54	12.376	10.01	0.00	0.11	2.91	0.85	1.00	0.00	15.65	36.38	0.00	2,564.8	0.0	962.81	688.05	1,650.87
3	25.0	15.54	10.180	8.14	0.00	0.10	2.97	0.85	1.00	0.00	13.15	36.38	0.00	2,609.6	0.0	825.41	688.05	1,513.46
4	35.0	16.25	13.993	7.51	0.00	0.12	2.88	0.85	1.00	0.00	16.13	36.38	0.00	2,409.4	0.0	1025.10	719.64	1,744.74
5	45.0	17.46	12.625	7.51	0.00	0.12	2.88	0.85	1.00	0.00	14.92	36.38	0.00	2,000.0	0.0	1019.87	773.22	1,793.09
6	55.0	18.49	12.068	7.51	0.00	0.13	2.86	0.85	1.00	0.00	14.41	36.38	0.00	1,964.3	0.0	1037.40	818.84	1,856.25
7	63.4	19.25	6.441	5.03	0.00	0.12	2.90	0.85	1.00	0.00	8.24	24.37	0.00	1,308.4	0.0	625.18	571.23	1,196.42
8	70.0	19.81	9.039	3.92	0.00	0.14	2.81	0.85	1.00	0.00	9.90	24.37	0.00	1,259.2	0.0	750.73	587.88	1,338.61
9	76.7	20.34	8.631	3.86	0.00	0.14	2.80	0.85	1.00	0.00	9.52	24.01	0.00	1,114.0	0.0	736.85	594.31	1,331.15
10	83.3	20.82	6.607	3.55	0.00	0.12	2.88	0.85	1.00	0.00	7.62	24.22	0.00	1,334.1	0.0	621.95	614.72	1,236.67
11	90.0	21.29	4.360	4.47	0.00	0.11	2.92	0.85	1.00	0.00	6.21	24.01	0.00	1,199.7	0.0	525.32	624.05	1,149.38
12	96.7	21.73	6.421	3.17	0.00	0.13	2.84	0.85	1.00	0.00	7.25	23.65	0.00	1,214.0	0.0	609.49	627.38	1,236.87
13	103.3	22.14	5.911	3.22	0.00	0.13	2.85	0.85	1.00	0.00	6.84	24.01	0.00	987.3	0.0	586.51	649.10	1,235.62
14	110.0	22.54	5.382	3.17	0.00	0.13	2.84	0.85	1.00	0.00	6.37	23.65	0.00	972.3	0.0	553.99	650.91	1,204.90
15	116.6	22.92	3.631	3.22	0.00	0.11	2.92	0.85	1.00	0.00	4.90	24.01	0.00	860.2	0.0	445.77	671.95	1,117.71
16	122.5	23.25	2.725	2.40	0.00	0.12	2.89	0.85	1.00	0.00	3.67	17.29	0.00	577.9	0.0	335.03	484.80	819.83
17	127.5	23.51	2.593	2.40	0.00	0.12	2.87	0.85	1.00	0.00	3.56	14.32	0.00	526.9	0.0	326.75	404.21	730.96
18	132.5	23.77	2.514	2.40	0.00	0.13	2.85	0.85	1.00	0.00	3.49	9.85	0.00	373.5	0.0	321.52	278.00	599.51
19	137.5	24.03	2.395	2.40	0.00	0.14	2.82	0.85	1.00	0.00	3.39	9.85	0.00	369.3	0.0	313.17	280.96	594.12
20	146.0	24.44	6.622	4.75	0.00	0.14	2.81	0.85	1.00	0.00	8.32	13.69	0.00	650.7	0.0	776.12	404.65	1,180.77
														26,555.8	**0.0**			**24,746.26**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 0.9D + 1.6W Normal Wind — 0.9D + 1.6W 101 mph Wind at Normal To Face

Wind Load Factor: 1.60
Dead Load Factor: 0.90
Ice Dead Load Factor: 0.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	15.54	12.899	10.01	0.00	0.11	2.92	1.00	1.00	0.00	18.02	10.07	0.00	1,695.2	0.0	1113.32	221.53	1,334.84
2	15.0	15.54	12.376	10.01	0.00	0.11	2.91	1.00	1.00	0.00	17.51	36.38	0.00	1,923.6	0.0	1077.03	688.05	1,765.09
3	25.0	15.54	10.180	8.14	0.00	0.10	2.97	1.00	1.00	0.00	14.67	36.38	0.00	1,957.2	0.0	921.29	688.05	1,609.34
4	35.0	16.25	13.993	7.51	0.00	0.12	2.88	1.00	1.00	0.00	18.23	36.38	0.00	1,807.0	0.0	1158.53	719.64	1,878.17
5	45.0	17.46	12.625	7.51	0.00	0.12	2.88	1.00	1.00	0.00	16.81	36.38	0.00	1,500.0	0.0	1149.34	773.22	1,922.56
6	55.0	18.49	12.068	7.51	0.00	0.13	2.86	1.00	1.00	0.00	16.22	36.38	0.00	1,473.2	0.0	1167.72	818.84	1,986.56
7	63.4	19.25	6.441	5.03	0.00	0.12	2.90	1.00	1.00	0.00	9.20	24.37	0.00	981.3	0.0	698.53	571.23	1,269.76
8	70.0	19.81	9.039	3.92	0.00	0.14	2.81	1.00	1.00	0.00	11.26	24.37	0.00	944.4	0.0	853.53	587.88	1,441.41
9	76.7	20.34	8.631	3.86	0.00	0.14	2.80	1.00	1.00	0.00	10.82	24.01	0.00	835.5	0.0	837.02	594.31	1,431.33
10	83.3	20.82	6.607	3.55	0.00	0.12	2.88	1.00	1.00	0.00	8.61	24.22	0.00	1,000.6	0.0	702.80	614.72	1,317.52
11	90.0	21.29	4.360	4.47	0.00	0.11	2.92	1.00	1.00	0.00	6.86	24.01	0.00	899.8	0.0	580.65	624.05	1,204.70
12	96.7	21.73	6.421	3.17	0.00	0.13	2.84	1.00	1.00	0.00	8.21	23.65	0.00	910.5	0.0	690.45	627.38	1,317.83
13	103.3	22.14	5.911	3.22	0.00	0.13	2.85	1.00	1.00	0.00	7.73	24.01	0.00	740.5	0.0	662.50	649.10	1,311.60
14	110.0	22.54	5.382	3.17	0.00	0.13	2.84	1.00	1.00	0.00	7.18	23.65	0.00	729.2	0.0	624.23	650.91	1,275.14
15	116.6	22.92	3.631	3.22	0.00	0.11	2.92	1.00	1.00	0.00	5.45	24.01	0.00	645.1	0.0	495.29	671.95	1,167.24
16	122.5	23.25	2.725	2.40	0.00	0.12	2.89	1.00	1.00	0.00	4.08	17.29	0.00	433.4	0.0	372.32	484.80	857.12
17	127.5	23.51	2.593	2.40	0.00	0.12	2.87	1.00	1.00	0.00	3.95	14.32	0.00	395.1	0.0	362.45	404.21	766.66
18	132.5	23.77	2.514	2.40	0.00	0.13	2.85	1.00	1.00	0.00	3.87	9.85	0.00	280.1	0.0	356.21	278.00	634.20
19	137.5	24.03	2.395	2.40	0.00	0.14	2.82	1.00	1.00	0.00	3.75	9.85	0.00	277.0	0.0	346.31	280.96	627.26
20	146.0	24.44	6.622	4.75	0.00	0.14	2.81	1.00	1.00	0.00	9.31	13.69	0.00	488.0	0.0	868.78	404.65	1,273.43
														19,916.9	**0.0**			**26,391.78**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 60° Wind — 0.9D + 1.6W 101 mph Wind at 60° From Face

Wind Load Factor: 1.60
Dead Load Factor: 0.90
Ice Dead Load Factor: 0.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	15.54	12.899	10.01	0.00	0.11	2.92	0.80	1.00	0.00	15.44	10.07	0.00	1,695.2	0.0	953.96	221.53	1,175.48
2	15.0	15.54	12.376	10.01	0.00	0.11	2.91	0.80	1.00	0.00	15.03	36.38	0.00	1,923.6	0.0	924.74	688.05	1,612.79
3	25.0	15.54	10.180	8.14	0.00	0.10	2.97	0.80	1.00	0.00	12.64	36.38	0.00	1,957.2	0.0	793.45	688.05	1,481.50
4	35.0	16.25	13.993	7.51	0.00	0.12	2.88	0.80	1.00	0.00	15.43	36.38	0.00	1,807.0	0.0	980.62	719.64	1,700.27
5	45.0	17.46	12.625	7.51	0.00	0.12	2.88	0.80	1.00	0.00	14.29	36.38	0.00	1,500.0	0.0	976.72	773.22	1,749.93
6	55.0	18.49	12.068	7.51	0.00	0.13	2.86	0.80	1.00	0.00	13.81	36.38	0.00	1,473.2	0.0	993.97	818.84	1,812.81
7	63.4	19.25	6.441	5.03	0.00	0.12	2.90	0.80	1.00	0.00	7.91	24.37	0.00	981.3	0.0	600.73	571.23	1,171.97
8	70.0	19.81	9.039	3.92	0.00	0.14	2.81	0.80	1.00	0.00	9.45	24.37	0.00	944.4	0.0	716.46	587.88	1,304.34
9	76.7	20.34	8.631	3.86	0.00	0.14	2.80	0.80	1.00	0.00	9.09	24.01	0.00	835.5	0.0	703.45	594.31	1,297.76
10	83.3	20.82	6.607	3.55	0.00	0.12	2.88	0.80	1.00	0.00	7.29	24.22	0.00	1,000.6	0.0	595.00	614.72	1,209.72
11	90.0	21.29	4.360	4.47	0.00	0.11	2.92	0.80	1.00	0.00	5.99	24.01	0.00	899.8	0.0	506.88	624.05	1,130.94
12	96.7	21.73	6.421	3.17	0.00	0.13	2.84	0.80	1.00	0.00	6.93	23.65	0.00	910.5	0.0	582.50	627.38	1,209.88
13	103.3	22.14	5.911	3.22	0.00	0.13	2.85	0.80	1.00	0.00	6.55	24.01	0.00	740.5	0.0	561.19	649.10	1,210.29
14	110.0	22.54	5.382	3.17	0.00	0.13	2.84	0.80	1.00	0.00	6.10	23.65	0.00	729.2	0.0	530.58	650.91	1,181.49
15	116.6	22.92	3.631	3.22	0.00	0.11	2.92	0.80	1.00	0.00	4.72	24.01	0.00	645.1	0.0	429.26	671.95	1,101.21
16	122.5	23.25	2.725	2.40	0.00	0.12	2.89	0.80	1.00	0.00	3.54	17.29	0.00	433.4	0.0	322.60	484.80	807.40
17	127.5	23.51	2.593	2.40	0.00	0.12	2.87	0.80	1.00	0.00	3.43	14.32	0.00	395.1	0.0	314.86	404.21	719.07
18	132.5	23.77	2.514	2.40	0.00	0.13	2.85	0.80	1.00	0.00	3.37	9.85	0.00	280.1	0.0	309.95	278.00	587.95
19	137.5	24.03	2.395	2.40	0.00	0.14	2.82	0.80	1.00	0.00	3.27	9.85	0.00	277.0	0.0	302.12	280.96	583.08
20	146.0	24.44	6.622	4.75	0.00	0.14	2.81	0.80	1.00	0.00	7.99	13.69	0.00	488.0	0.0	745.24	404.65	1,149.89
														19,916.9	**0.0**			**24,197.75**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 12

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 90° Wind — 0.9D + 1.6W 101 mph Wind at 90° From Face

Wind Load Factor: 1.60
Dead Load Factor: 0.90
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	15.54	12.899	10.01	0.00	0.11	2.92	0.85	1.00	0.00	16.09	10.07	0.00	1,695.2	0.0	993.80	221.53	1,215.32
2	15.0	15.54	12.376	10.01	0.00	0.11	2.91	0.85	1.00	0.00	15.65	36.38	0.00	1,923.6	0.0	962.81	688.05	1,650.87
3	25.0	15.54	10.180	8.14	0.00	0.10	2.97	0.85	1.00	0.00	13.15	36.38	0.00	1,957.2	0.0	825.41	688.05	1,513.46
4	35.0	16.25	13.993	7.51	0.00	0.12	2.88	0.85	1.00	0.00	16.13	36.38	0.00	1,807.0	0.0	1025.10	719.64	1,744.74
5	45.0	17.46	12.625	7.51	0.00	0.12	2.88	0.85	1.00	0.00	14.92	36.38	0.00	1,500.0	0.0	1019.87	773.22	1,793.09
6	55.0	18.49	12.068	7.51	0.00	0.13	2.86	0.85	1.00	0.00	14.41	36.38	0.00	1,473.2	0.0	1037.40	818.84	1,856.25
7	63.4	19.25	6.441	5.03	0.00	0.12	2.90	0.85	1.00	0.00	8.24	24.37	0.00	981.3	0.0	625.18	571.23	1,196.42
8	70.0	19.81	9.039	3.92	0.00	0.14	2.81	0.85	1.00	0.00	9.90	24.37	0.00	944.4	0.0	750.73	587.88	1,338.61
9	76.7	20.34	8.631	3.86	0.00	0.14	2.80	0.85	1.00	0.00	9.52	24.01	0.00	835.5	0.0	736.85	594.31	1,331.15
10	83.3	20.82	6.607	3.55	0.00	0.12	2.88	0.85	1.00	0.00	7.62	24.22	0.00	1,000.6	0.0	621.95	614.72	1,236.67
11	90.0	21.29	4.360	4.47	0.00	0.11	2.92	0.85	1.00	0.00	6.21	24.01	0.00	899.8	0.0	525.32	624.05	1,149.38
12	96.7	21.73	6.421	3.17	0.00	0.13	2.84	0.85	1.00	0.00	7.25	23.65	0.00	910.5	0.0	609.49	627.38	1,236.87
13	103.3	22.14	5.911	3.22	0.00	0.13	2.85	0.85	1.00	0.00	6.84	24.01	0.00	740.5	0.0	586.51	649.10	1,235.62
14	110.0	22.54	5.382	3.17	0.00	0.13	2.84	0.85	1.00	0.00	6.37	23.65	0.00	729.2	0.0	553.99	650.91	1,204.90
15	116.6	22.92	3.631	3.22	0.00	0.11	2.92	0.85	1.00	0.00	4.90	24.01	0.00	645.1	0.0	445.77	671.95	1,117.71
16	122.5	23.25	2.725	2.40	0.00	0.12	2.89	0.85	1.00	0.00	3.67	17.29	0.00	433.4	0.0	335.03	484.80	819.83
17	127.5	23.51	2.593	2.40	0.00	0.12	2.87	0.85	1.00	0.00	3.56	14.32	0.00	395.1	0.0	326.75	404.21	730.96
18	132.5	23.77	2.514	2.40	0.00	0.13	2.85	0.85	1.00	0.00	3.49	9.85	0.00	280.1	0.0	321.52	278.00	599.51
19	137.5	24.03	2.395	2.40	0.00	0.14	2.82	0.85	1.00	0.00	3.39	9.85	0.00	277.0	0.0	313.17	280.96	594.12
20	146.0	24.44	6.622	4.75	0.00	0.14	2.81	0.85	1.00	0.00	8.32	13.69	0.00	488.0	0.0	776.12	404.65	1,180.77
														19,916.9	**0.0**			**24,746.26**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	3.81	12.899	23.52	13.51	0.17	2.69	1.00	1.00	1.24	26.31	21.75	3.73	4,005.7	1745.4	228.82	91.34	320.16
2	15.0	3.81	12.376	24.67	14.66	0.19	2.65	1.00	1.00	1.39	26.49	57.36	18.48	5,399.6	2834.8	226.88	244.12	471.00
3	25.0	3.81	10.180	23.13	14.99	0.18	2.68	1.00	1.00	1.46	23.38	58.33	19.45	5,366.8	2757.2	202.63	251.50	454.12
4	35.0	3.98	13.993	22.50	14.98	0.20	2.58	1.00	1.00	1.51	26.94	58.99	20.12	5,658.9	3249.5	235.33	264.65	499.99
5	45.0	4.28	12.625	22.42	14.91	0.21	2.57	1.00	1.00	1.55	25.54	59.51	20.63	5,216.0	3216.0	238.60	287.72	526.32
6	55.0	4.53	12.068	22.35	14.84	0.22	2.54	1.00	1.00	1.58	24.98	59.92	21.05	5,197.0	3232.8	244.31	306.81	551.12
7	63.4	4.72	6.441	17.07	12.03	0.23	2.49	1.00	1.00	1.60	16.36	40.35	14.30	3,350.4	2042.0	163.14	214.17	377.31
8	70.0	4.86	9.039	15.73	11.82	0.26	2.41	1.00	1.00	1.62	18.28	40.49	14.45	3,596.5	2337.3	181.67	219.18	400.85
9	76.7	4.98	8.631	15.36	11.50	0.27	2.38	1.00	1.00	1.63	17.69	40.02	14.36	3,407.7	2293.6	178.51	221.82	400.32
10	83.3	5.10	6.607	14.90	11.35	0.25	2.44	1.00	1.00	1.65	15.32	40.60	13.93	3,443.8	2109.7	161.88	229.85	391.74
11	90.0	5.22	4.360	15.58	11.11	0.24	2.46	1.00	1.00	1.66	13.45	40.50	12.96	3,051.5	1851.7	146.48	231.43	377.90
12	96.7	5.32	6.421	13.94	10.78	0.27	2.38	1.00	1.00	1.67	14.65	40.00	12.86	3,272.9	2058.8	157.70	231.17	388.87
13	103.3	5.43	5.911	13.83	10.61	0.27	2.37	1.00	1.00	1.68	14.09	40.70	13.14	3,374.4	2387.1	153.82	239.65	393.46
14	110.0	5.52	5.382	13.45	10.28	0.28	2.34	1.00	1.00	1.69	13.37	40.19	13.03	3,279.6	2307.3	147.00	240.26	387.26
15	116.6	5.62	3.631	13.34	10.12	0.27	2.38	1.00	1.00	1.70	11.50	40.89	13.30	2,952.0	2091.8	130.78	250.21	380.99
16	122.5	5.70	2.725	10.72	8.32	0.30	2.28	1.00	1.00	1.71	9.16	28.52	9.98	1,889.2	1311.3	101.33	175.28	276.60
17	127.5	5.76	2.593	10.49	8.09	0.31	2.26	1.00	1.00	1.72	8.92	24.44	9.44	1,723.3	1196.4	98.77	155.37	254.14
18	132.5	5.83	2.514	10.37	7.97	0.33	2.22	1.00	1.00	1.72	8.82	18.28	8.62	1,409.7	1036.2	97.08	123.72	220.80
19	137.5	5.89	2.395	10.16	7.76	0.34	2.19	1.00	1.00	1.73	8.63	18.31	8.65	1,393.3	1024.1	94.53	124.44	218.96
20	146.0	5.99	6.622	26.87	22.12	0.40	2.07	1.00	1.00	1.74	23.69	22.73	16.82	2,760.7	2110.0	249.59	175.06	424.65
														69,748.8	**43193.0**			**7,716.56**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 14

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	3.81	12.899	23.52	13.51	0.17	2.69	0.80	1.00	1.24	23.73	21.75	3.73	4,005.7	1745.4	206.38	91.34	297.72
2	15.0	3.81	12.376	24.67	14.66	0.19	2.65	0.80	1.00	1.39	24.01	57.36	18.48	5,399.6	2834.8	205.68	244.12	449.80
3	25.0	3.81	10.180	23.13	14.99	0.18	2.68	0.80	1.00	1.46	21.35	58.33	19.45	5,366.8	2757.2	184.98	251.50	436.48
4	35.0	3.98	13.993	22.50	14.98	0.20	2.58	0.80	1.00	1.51	24.14	58.99	20.12	5,658.9	3249.5	210.88	264.65	475.54
5	45.0	4.28	12.625	22.42	14.91	0.21	2.57	0.80	1.00	1.55	23.01	59.51	20.63	5,216.0	3216.0	215.01	287.72	502.73
6	55.0	4.53	12.068	22.35	14.84	0.22	2.54	0.80	1.00	1.58	22.57	59.92	21.05	5,197.0	3232.8	220.71	306.81	527.52
7	63.4	4.72	6.441	17.07	12.03	0.23	2.49	0.80	1.00	1.60	15.07	40.35	14.30	3,350.4	2042.0	150.30	214.17	364.46
8	70.0	4.86	9.039	15.73	11.82	0.26	2.41	0.80	1.00	1.62	16.47	40.49	14.45	3,596.5	2337.3	163.71	219.18	382.88
9	76.7	4.98	8.631	15.36	11.50	0.27	2.38	0.80	1.00	1.63	15.97	40.02	14.36	3,407.7	2293.6	161.09	221.82	382.91
10	83.3	5.10	6.607	14.90	11.35	0.25	2.44	0.80	1.00	1.65	14.00	40.60	13.93	3,443.8	2109.7	147.92	229.85	377.78
11	90.0	5.22	4.360	15.58	11.11	0.24	2.46	0.80	1.00	1.66	12.58	40.50	12.96	3,051.5	1851.7	136.98	231.43	368.41
12	96.7	5.32	6.421	13.94	10.78	0.27	2.38	0.80	1.00	1.67	13.37	40.00	12.86	3,272.9	2058.8	143.88	231.17	375.05
13	103.3	5.43	5.911	13.83	10.61	0.27	2.37	0.80	1.00	1.68	12.91	40.70	13.14	3,374.4	2387.1	140.91	239.65	380.56
14	110.0	5.52	5.382	13.45	10.28	0.28	2.34	0.80	1.00	1.69	12.29	40.19	13.03	3,279.6	2307.3	135.16	240.26	375.43
15	116.6	5.62	3.631	13.34	10.12	0.27	2.38	0.80	1.00	1.70	10.77	40.89	13.30	2,952.0	2091.8	122.52	250.21	372.73
16	122.5	5.70	2.725	10.72	8.32	0.30	2.28	0.80	1.00	1.71	8.61	28.52	9.98	1,889.2	1311.3	95.30	175.28	270.57
17	127.5	5.76	2.593	10.49	8.09	0.31	2.26	0.80	1.00	1.72	8.41	24.44	9.44	1,723.3	1196.4	93.03	155.37	248.40
18	132.5	5.83	2.514	10.37	7.97	0.33	2.22	0.80	1.00	1.72	8.32	18.28	8.62	1,409.7	1036.2	91.54	123.72	215.27
19	137.5	5.89	2.395	10.16	7.76	0.34	2.19	0.80	1.00	1.73	8.15	18.31	8.65	1,393.3	1024.1	89.28	124.44	213.71
20	146.0	5.99	6.622	26.87	22.12	0.40	2.07	0.80	1.00	1.74	22.36	22.73	16.82	2,760.7	2110.0	235.63	175.06	410.69
														69,748.8	**43193.0**			**7,428.63**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	3.81	12.899	23.52	13.51	0.17	2.69	0.85	1.00	1.24	24.38	21.75	3.73	4,005.7	1745.4	211.99	91.34	303.33
2	15.0	3.81	12.376	24.67	14.66	0.19	2.65	0.85	1.00	1.39	24.63	57.36	18.48	5,399.6	2834.8	210.98	244.12	455.10
3	25.0	3.81	10.180	23.13	14.99	0.18	2.68	0.85	1.00	1.46	21.86	58.33	19.45	5,366.8	2757.2	189.39	251.50	440.89
4	35.0	3.98	13.993	22.50	14.98	0.20	2.58	0.85	1.00	1.51	24.84	58.99	20.12	5,658.9	3249.5	216.99	264.65	481.65
5	45.0	4.28	12.625	22.42	14.91	0.21	2.57	0.85	1.00	1.55	23.65	59.51	20.63	5,216.0	3216.0	220.91	287.72	508.62
6	55.0	4.53	12.068	22.35	14.84	0.22	2.54	0.85	1.00	1.58	23.17	59.92	21.05	5,197.0	3232.8	226.61	306.81	533.42
7	63.4	4.72	6.441	17.07	12.03	0.23	2.49	0.85	1.00	1.60	15.40	40.35	14.30	3,350.4	2042.0	153.51	214.17	367.67
8	70.0	4.86	9.039	15.73	11.82	0.26	2.41	0.85	1.00	1.62	16.93	40.49	14.45	3,596.5	2337.3	168.20	219.18	387.38
9	76.7	4.98	8.631	15.36	11.50	0.27	2.38	0.85	1.00	1.63	16.40	40.02	14.36	3,407.7	2293.6	165.45	221.82	387.26
10	83.3	5.10	6.607	14.90	11.35	0.25	2.44	0.85	1.00	1.65	14.33	40.60	13.93	3,443.8	2109.7	151.41	229.85	381.27
11	90.0	5.22	4.360	15.58	11.11	0.24	2.46	0.85	1.00	1.66	12.80	40.50	12.96	3,051.5	1851.7	139.36	231.43	370.78
12	96.7	5.32	6.421	13.94	10.78	0.27	2.38	0.85	1.00	1.67	13.69	40.00	12.86	3,272.9	2058.8	147.33	231.17	378.50
13	103.3	5.43	5.911	13.83	10.61	0.27	2.37	0.85	1.00	1.68	13.20	40.70	13.14	3,374.4	2387.1	144.14	239.65	383.78
14	110.0	5.52	5.382	13.45	10.28	0.28	2.34	0.85	1.00	1.69	12.56	40.19	13.03	3,279.6	2307.3	138.12	240.26	378.39
15	116.6	5.62	3.631	13.34	10.12	0.27	2.38	0.85	1.00	1.70	10.96	40.89	13.30	2,952.0	2091.8	124.59	250.21	374.79
16	122.5	5.70	2.725	10.72	8.32	0.30	2.28	0.85	1.00	1.71	8.75	28.52	9.98	1,889.2	1311.3	96.80	175.28	272.08
17	127.5	5.76	2.593	10.49	8.09	0.31	2.26	0.85	1.00	1.72	8.54	24.44	9.44	1,723.3	1196.4	94.47	155.37	249.83
18	132.5	5.83	2.514	10.37	7.97	0.33	2.22	0.85	1.00	1.72	8.44	18.28	8.62	1,409.7	1036.2	92.93	123.72	216.65
19	137.5	5.89	2.395	10.16	7.76	0.34	2.19	0.85	1.00	1.73	8.27	18.31	8.65	1,393.3	1024.1	90.59	124.44	215.03
20	146.0	5.99	6.622	26.87	22.12	0.40	2.07	0.85	1.00	1.74	22.69	22.73	16.82	2,760.7	2110.0	239.12	175.06	414.18
														69,748.8	**43193.0**			**7,500.61**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 16

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Load Case: 1.0D + 1.0W Normal Wind — 1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	5.48	12.899	10.01	0.00	0.11	2.92	1.00	1.00	0.00	18.55	10.07	0.00	1,883.6	0.0	252.74	48.86	301.60
2	15.0	5.48	12.376	10.01	0.00	0.11	2.91	1.00	1.00	0.00	18.03	36.38	0.00	2,137.3	0.0	244.66	151.76	396.42
3	25.0	5.48	10.180	8.14	0.00	0.10	2.97	1.00	1.00	0.00	14.77	36.38	0.00	2,174.7	0.0	204.60	151.76	356.36
4	35.0	5.74	13.993	7.51	0.00	0.12	2.88	1.00	1.00	0.00	18.24	36.38	0.00	2,007.8	0.0	255.75	158.73	414.48
5	45.0	6.16	12.625	7.51	0.00	0.12	2.88	1.00	1.00	0.00	16.87	36.38	0.00	1,666.7	0.0	254.41	170.55	424.96
6	55.0	6.53	12.068	7.51	0.00	0.13	2.86	1.00	1.00	0.00	16.32	36.38	0.00	1,636.9	0.0	259.08	180.61	439.69
7	63.4	6.79	6.441	5.03	0.00	0.12	2.90	1.00	1.00	0.00	9.29	24.37	0.00	1,090.3	0.0	155.47	126.00	281.47
8	70.0	6.99	9.039	3.92	0.00	0.14	2.81	1.00	1.00	0.00	11.26	24.37	0.00	1,049.3	0.0	188.26	129.67	317.93
9	76.7	7.18	8.631	3.86	0.00	0.14	2.80	1.00	1.00	0.00	10.82	24.01	0.00	928.4	0.0	184.62	131.08	315.70
10	83.3	7.35	6.607	3.55	0.00	0.12	2.88	1.00	1.00	0.00	8.61	24.22	0.00	1,111.7	0.0	155.01	135.59	290.60
11	90.0	7.51	4.360	4.47	0.00	0.11	2.92	1.00	1.00	0.00	6.89	24.01	0.00	999.8	0.0	128.49	137.64	266.13
12	96.7	7.67	6.421	3.17	0.00	0.13	2.84	1.00	1.00	0.00	8.21	23.65	0.00	1,011.7	0.0	152.29	138.38	290.67
13	103.3	7.81	5.911	3.22	0.00	0.13	2.85	1.00	1.00	0.00	7.73	24.01	0.00	822.7	0.0	146.12	143.17	289.30
14	110.0	7.96	5.382	3.17	0.00	0.13	2.84	1.00	1.00	0.00	7.18	23.65	0.00	810.3	0.0	137.68	143.57	281.25
15	116.6	8.09	3.631	3.22	0.00	0.11	2.92	1.00	1.00	0.00	5.45	24.01	0.00	716.8	0.0	109.25	148.21	257.45
16	122.5	8.20	2.725	2.40	0.00	0.12	2.89	1.00	1.00	0.00	4.08	17.29	0.00	481.6	0.0	82.12	106.93	189.05
17	127.5	8.30	2.593	2.40	0.00	0.12	2.87	1.00	1.00	0.00	3.95	14.32	0.00	439.0	0.0	79.94	89.15	169.10
18	132.5	8.39	2.514	2.40	0.00	0.13	2.85	1.00	1.00	0.00	3.87	9.85	0.00	311.3	0.0	78.57	61.32	139.88
19	137.5	8.48	2.395	2.40	0.00	0.14	2.82	1.00	1.00	0.00	3.75	9.85	0.00	307.7	0.0	76.38	61.97	138.35
20	146.0	8.63	6.622	4.75	0.00	0.14	2.81	1.00	1.00	0.00	9.31	13.69	0.00	542.2	0.0	191.62	89.25	280.88
														22,129.9	**0.0**			**5,841.28**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 17

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60° Wind — 1.0D + 1.0W 60 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.00
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	5.48	12.899	10.01	0.00	0.11	2.92	0.80	1.00	0.00	15.97	10.07	0.00	1,883.6	0.0	217.59	48.86	266.45
2	15.0	5.48	12.376	10.01	0.00	0.11	2.91	0.80	1.00	0.00	15.55	36.38	0.00	2,137.3	0.0	211.07	151.76	362.83
3	25.0	5.48	10.180	8.14	0.00	0.10	2.97	0.80	1.00	0.00	12.74	36.38	0.00	2,174.7	0.0	176.40	151.76	328.16
4	35.0	5.74	13.993	7.51	0.00	0.12	2.88	0.80	1.00	0.00	15.44	36.38	0.00	2,007.8	0.0	216.51	158.73	375.24
5	45.0	6.16	12.625	7.51	0.00	0.12	2.88	0.80	1.00	0.00	14.35	36.38	0.00	1,666.7	0.0	216.34	170.55	386.88
6	55.0	6.53	12.068	7.51	0.00	0.13	2.86	0.80	1.00	0.00	13.90	36.38	0.00	1,636.9	0.0	220.76	180.61	401.37
7	63.4	6.79	6.441	5.03	0.00	0.12	2.90	0.80	1.00	0.00	8.00	24.37	0.00	1,090.3	0.0	133.90	126.00	259.90
8	70.0	6.99	9.039	3.92	0.00	0.14	2.81	0.80	1.00	0.00	9.45	24.37	0.00	1,049.3	0.0	158.03	129.67	287.69
9	76.7	7.18	8.631	3.86	0.00	0.14	2.80	0.80	1.00	0.00	9.09	24.01	0.00	928.4	0.0	155.16	131.08	286.24
10	83.3	7.35	6.607	3.55	0.00	0.12	2.88	0.80	1.00	0.00	7.29	24.22	0.00	1,111.7	0.0	131.24	135.59	266.82
11	90.0	7.51	4.360	4.47	0.00	0.11	2.92	0.80	1.00	0.00	6.02	24.01	0.00	999.8	0.0	112.22	137.64	249.86
12	96.7	7.67	6.421	3.17	0.00	0.13	2.84	0.80	1.00	0.00	6.93	23.65	0.00	1,011.7	0.0	128.48	138.38	266.86
13	103.3	7.81	5.911	3.22	0.00	0.13	2.85	0.80	1.00	0.00	6.55	24.01	0.00	822.7	0.0	123.78	143.17	266.95
14	110.0	7.96	5.382	3.17	0.00	0.13	2.84	0.80	1.00	0.00	6.10	23.65	0.00	810.3	0.0	117.03	143.57	260.60
15	116.6	8.09	3.631	3.22	0.00	0.11	2.92	0.80	1.00	0.00	4.72	24.01	0.00	716.8	0.0	94.68	148.21	242.89
16	122.5	8.20	2.725	2.40	0.00	0.12	2.89	0.80	1.00	0.00	3.54	17.29	0.00	481.6	0.0	71.15	106.93	178.09
17	127.5	8.30	2.593	2.40	0.00	0.12	2.87	0.80	1.00	0.00	3.43	14.32	0.00	439.0	0.0	69.45	89.15	158.60
18	132.5	8.39	2.514	2.40	0.00	0.13	2.85	0.80	1.00	0.00	3.37	9.85	0.00	311.3	0.0	68.37	61.32	129.68
19	137.5	8.48	2.395	2.40	0.00	0.14	2.82	0.80	1.00	0.00	3.27	9.85	0.00	307.7	0.0	66.64	61.97	128.61
20	146.0	8.63	6.622	4.75	0.00	0.14	2.81	0.80	1.00	0.00	7.99	13.69	0.00	542.2	0.0	164.37	89.25	253.63
														22,129.9	**0.0**			**5,357.35**

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Section Forces

Structure:	CT13065-A-SBA		**Code:**	EIA/TIA-222-G	10/28/2016
Site Name:	Guilford		**Exposure:**	B	
Height:	152.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 18

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 90° Wind — 1.0D + 1.0W 60 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.00
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	5.48	12.899	10.01	0.00	0.11	2.92	0.85	1.00	0.00	16.62	10.07	0.00	1,883.6	0.0	226.38	48.86	275.24
2	15.0	5.48	12.376	10.01	0.00	0.11	2.91	0.85	1.00	0.00	16.17	36.38	0.00	2,137.3	0.0	219.46	151.76	371.23
3	25.0	5.48	10.180	8.14	0.00	0.10	2.97	0.85	1.00	0.00	13.25	36.38	0.00	2,174.7	0.0	183.45	151.76	335.21
4	35.0	5.74	13.993	7.51	0.00	0.12	2.88	0.85	1.00	0.00	16.14	36.38	0.00	2,007.8	0.0	226.32	158.73	385.05
5	45.0	6.16	12.625	7.51	0.00	0.12	2.88	0.85	1.00	0.00	14.98	36.38	0.00	1,666.7	0.0	225.85	170.55	396.40
6	55.0	6.53	12.068	7.51	0.00	0.13	2.86	0.85	1.00	0.00	14.51	36.38	0.00	1,636.9	0.0	230.34	180.61	410.95
7	63.4	6.79	6.441	5.03	0.00	0.12	2.90	0.85	1.00	0.00	8.32	24.37	0.00	1,090.3	0.0	139.30	126.00	265.29
8	70.0	6.99	9.039	3.92	0.00	0.14	2.81	0.85	1.00	0.00	9.90	24.37	0.00	1,049.3	0.0	165.59	129.67	295.25
9	76.7	7.18	8.631	3.86	0.00	0.14	2.80	0.85	1.00	0.00	9.52	24.01	0.00	928.4	0.0	162.52	131.08	293.61
10	83.3	7.35	6.607	3.55	0.00	0.12	2.88	0.85	1.00	0.00	7.62	24.22	0.00	1,111.7	0.0	137.18	135.59	272.77
11	90.0	7.51	4.360	4.47	0.00	0.11	2.92	0.85	1.00	0.00	6.23	24.01	0.00	999.8	0.0	116.29	137.64	253.93
12	96.7	7.67	6.421	3.17	0.00	0.13	2.84	0.85	1.00	0.00	7.25	23.65	0.00	1,011.7	0.0	134.43	138.38	272.81
13	103.3	7.81	5.911	3.22	0.00	0.13	2.85	0.85	1.00	0.00	6.84	24.01	0.00	822.7	0.0	129.37	143.17	272.54
14	110.0	7.96	5.382	3.17	0.00	0.13	2.84	0.85	1.00	0.00	6.37	23.65	0.00	810.3	0.0	122.19	143.57	265.76
15	116.6	8.09	3.631	3.22	0.00	0.11	2.92	0.85	1.00	0.00	4.90	24.01	0.00	716.8	0.0	98.32	148.21	246.53
16	122.5	8.20	2.725	2.40	0.00	0.12	2.89	0.85	1.00	0.00	3.67	17.29	0.00	481.6	0.0	73.90	106.93	180.83
17	127.5	8.30	2.593	2.40	0.00	0.12	2.87	0.85	1.00	0.00	3.56	14.32	0.00	439.0	0.0	72.07	89.15	161.23
18	132.5	8.39	2.514	2.40	0.00	0.13	2.85	0.85	1.00	0.00	3.49	9.85	0.00	311.3	0.0	70.92	61.32	132.23
19	137.5	8.48	2.395	2.40	0.00	0.14	2.82	0.85	1.00	0.00	3.39	9.85	0.00	307.7	0.0	69.07	61.97	131.04
20	146.0	8.63	6.622	4.75	0.00	0.14	2.81	0.85	1.00	0.00	8.32	13.69	0.00	542.2	0.0	171.19	89.25	260.44
														22,129.9	**0.0**			**5,478.33**

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Force/Stress Compression Summary

Structure:	CT13065-A-SBA	**Code:**	EIA/TIA-222-G	10/28/2016	
Site Name:	Guilford	**Exposure:**	B		
Height:	152.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 19	

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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	10	MOD - 5"PST+6"PX1/2P	-182.97	1.2D + 1.6W Normal Wind	10.02	100	100	100	68.10	50.00	272.55	67.0	Member X
2	20	MOD - 5"PST+6"PX1/2P	-171.15	1.2D + 1.6W Normal Wind	10.02	100	100	100	68.10	50.00	272.55	62.0	Member X
3	30	MOD - 4"PX+5"PX1/2P	-158.53	1.2D + 1.6W Normal Wind	10.02	100	100	100	76.37	50.00	219.25	72.0	Member X
4	40	PX - 4" DIA PIPE	-145.31	1.2D + 1.6W Normal Wind	9.77	50	50	50	39.60	50.00	176.95	82.0	Member X
5	50	PX - 4" DIA PIPE	-133.59	1.2D + 1.6W Normal Wind	9.77	50	50	50	39.59	50.00	176.96	75.0	Member X
6	60	PX - 4" DIA PIPE	-120.71	1.2D + 1.6W Normal Wind	10.02	50	50	50	40.61	50.00	175.91	68.0	Member X
7	66.7	MOD - 3"PX+4"PX1/2P	-110.18	1.2D + 1.6W Normal Wind	6.71	100	100	100	71.98	50.00	160.76	68.0	Member X
8	73.4	PX - 3" DIA PIPE	-101.23	1.2D + 1.6W Normal Wind	6.71	50	50	50	35.33	50.00	124.05	81.0	Member X
9	80	PX - 3" DIA PIPE	-92.87	1.2D + 1.6W Normal Wind	6.61	50	50	50	34.80	50.00	124.38	74.0	Member X
10	86.7	MOD - 2.5"PX+3'PX1/2P	-84.02	1.2D + 1.6W Normal Wind	6.71	50	50	50	0.00	50.00	88.48	94.0	User Input
11	93.4	MOD - 2.5"PX+3.5"PX1/2P	-75.32	1.2D + 1.6W Normal Wind	6.71	100	100	100	88.36	50.00	104.04	72.0	Member X
12	100	PX - 2-1/2" DIA PIPE	-66.28	1.2D + 1.6W Normal Wind	6.61	50	50	50	42.93	50.00	88.48	74.0	Member X
13	106.7	PX - 2-1/2" DIA PIPE	-57.20	1.2D + 1.6W Normal Wind	6.71	50	50	50	43.58	50.00	88.12	64.0	Member X
14	113.3	PX - 2-1/2" DIA PIPE	-48.03	1.2D + 1.6W Normal Wind	6.61	50	50	50	42.93	50.00	88.49	54.0	Member X
15	120	PX - 2-1/2" DIA PIPE	-38.45	1.2D + 1.6W Normal Wind	6.71	100	100	100	87.15	50.00	58.10	66.0	Member X
16	125	PST - 2-1/2" DIA PIPE	-30.17	1.2D + 1.6W Normal Wind	4.76	100	100	100	60.29	50.00	58.78	51.0	Member X
17	130	PST - 2-1/2" DIA PIPE	-22.31	1.2D + 1.6W Normal Wind	4.76	100	100	100	60.29	50.00	58.78	37.0	Member X
18	135	PST - 2-1/2" DIA PIPE	-15.59	1.2D + 1.6W Normal Wind	5.01	100	100	100	63.46	50.00	57.12	27.0	Member X
19	140	PST - 2-1/2" DIA PIPE	-9.79	1.2D + 1.6W Normal Wind	5.01	100	100	100	63.46	50.00	57.12	17.0	Member X
20	152	PST - 2" DIA PIPE	-7.08	1.2D + 1.6W Normal Wind	0.25	100	100	100	3.81	50.00	48.10	14.0	Member X

Splices

		Top Splice						Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	10	1.2D + 1.6W Normal Wind	176.96	0.00	0.00			1.2D + 1.6W Normal Wind	189.23	0.00			
2	20	1.2D + 1.6W Normal Wind	164.84	0.00	0.00	1	4	1.2D + 1.6W Normal Wind	176.96	0.00		. A354-BC	4
3	30	1.2D + 1.6W Normal Wind	152.16	0.00	0.00			1.2D + 1.6W Normal Wind	164.84	0.00		1 A325-X	4
4	40	1.2D + 1.6W Normal Wind	139.61	0.00	0.00	1	4	1.2D + 1.6W Normal Wind	152.16	0.00		1 A325-X	4
5	50	1.2D + 1.6W Normal Wind	127.22	0.00	0.00			1.2D + 1.6W Normal Wind	139.61	0.00		/8 A325-X	4
6	60	1.2D + 1.6W Normal Wind	114.43	0.00	0.00	1	4	1.2D + 1.6W Normal Wind	127.22	0.00		1 A325-X	4
7	66.7	1.2D + 1.6W Normal Wind	105.59	0.00	0.00			1.2D + 1.6W Normal Wind	114.43	0.00		/8 A325-X	4
8	73.4	1.2D + 1.6W Normal Wind	96.90	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	105.59	0.00		1 A325-X	4
9	80	1.2D + 1.6W Normal Wind	88.45	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	96.90	0.00		1 A325-X	4
10	86.7	1.2D + 1.6W Normal Wind	79.66	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	88.45	0.00		/4 A325-X	4
11	93.4	1.2D + 1.6W Normal Wind	70.74	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	79.66	0.00		/8 A325-X	4
12	100	1.2D + 1.6W Normal Wind	61.83	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	70.74	0.00		/8 A325-X	4
13	106.7	1.2D + 1.6W Normal Wind	52.58	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	61.83	0.00		/8 A325-X	4
14	113.3	1.2D + 1.6W Normal Wind	43.31	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	52.58	0.00		/8 A325-X	4
15	120	1.2D + 1.6W Normal Wind	33.77	0.00	0.00	7/8	4	1.2D + 1.6W Normal Wind	43.31	0.00		/8 A325-X	4
16	125	1.2D + 1.6W Normal Wind	26.70	0.00	0.00			1.2D + 1.6W Normal Wind	33.77	0.00		/8 A325-X	4
17	130	1.2D + 1.6W Normal Wind	18.76	0.00	0.00	3/4	4	1.2D + 1.6W Normal Wind	26.70	0.00		/8 A325-X	4
18	135	1.2D + 1.6W Normal Wind	12.84	0.00	0.00	3/4	4	1.2D + 1.6W Normal Wind	18.76	0.00		/8 A325-X	4
19	140	1.2D + 1.6W Normal Wind	7.04	0.00	0.00			1.2D + 1.6W Normal Wind	12.84	0.00			
20	152	1.2D + 1.0Di + 1.0Wi 90° Wind	0.23	0.00	0.00			1.2D + 1.6W Normal Wind	7.04	0.00		/8 A325-X	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10										0.00	0	0				

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Force/Stress Compression Summary

Structure:	CT13065-A-SBA	**Code:**	EIA/TIA-222-G	10/28/2016	
Site Name:	Guilford	**Exposure:**	B		
Height:	152.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 20	

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HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
2	20										0.00	0	0				
3	30										0.00	0	0				
4	40										0.00	0	0				
5	50										0.00	0	0				
6	60										0.00	0	0				
7	66.7										0.00	0	0				
8	73.4										0.00	0	0				
9	80										0.00	0	0				
10	86.7										0.00	0	0				
11	93.4										0.00	0	0				
12	100										0.00	0	0				
13	106.										0.00	0	0				
14	113.										0.00	0	0				
15	120										0.00	0	0				
16	125										0.00	0	0				
17	130										0.00	0	0				
18	135										0.00	0	0				
19	140										0.00	0	0				
20	152	SAE - 2X2X0.125	-0.49	1.2D + 1.6W Normal Wind	6.52	100	100	100	196.58	36.00	2.81	10	10	972.00	696.0	17	Member Z

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	SAE - 3.5X3.5X0.25	-6.84	1.2D + 1.6W 90° Wind	22.61	49	49	49	191.59	50.00	10.40	1	1	15.19	11.6	65	Member Z
2	20	SAE - 3.5X3.5X0.25	-6.92	1.2D + 1.6W 90° Wind	21.72	49	49	49	183.99	50.00	11.28	1	1	15.19	11.6	61	Member Z
3	30	SAE - 3X3X0.375	-6.77	1.2D + 1.6W 90° Wind	20.81	49	49	49	208.49	36.00	10.97	1	1	15.19	15.6	61	Member Z
4	40	SAE - 3X3X0.375	-6.45	1.2D + 1.6W 90° Wind	19.77	49	49	49	198.04	36.00	12.15	1	1	15.19	15.6	53	Member Z
5	50	SAE - 3X3X0.25	-6.23	1.2D + 1.6W 90° Wind	18.89	49	49	49	187.63	36.00	9.24	1	1	15.19	10.4	67	Member Z
6	60	SAE - 3X3X0.25	-6.39	1.2D + 1.6W 90° Wind	18.19	49	49	49	180.66	36.00	9.97	1	1	15.19	10.4	64	Member Z
7	66.7	SAE - 2.5X2.5X0.25	-5.33	1.2D + 1.6W 90° Wind	15.83	49	49	49	189.62	36.00	7.48	1	1	9.72	8.26	71	Member Z
8	73.4	SAE - 2.5X2.5X0.25	-5.27	1.2D + 1.6W 90° Wind	15.21	49	49	49	182.11	36.00	8.11	1	1	9.72	8.26	65	Member Z
9	80	SAE - 2.5X2.5X0.1875	-4.96	1.2D + 1.6W 90° Wind	14.54	49	49	49	172.67	36.00	6.83	1	1	9.72	6.20	79	Bolt Bear
10	86.7	SAE - 2X2X0.375	-4.94	1.2D + 1.6W 90° Wind	13.97	49	49	49	211.21	36.00	6.89	1	1	9.72	12.4	71	Member Z
11	93.4	SAE - 2X2X0.375	-4.71	1.2D + 1.6W 90° Wind	13.38	49	49	49	202.25	36.00	7.51	1	1	9.72	12.4	62	Member Z
12	100	SAE - 2X2X0.375	-4.66	1.2D + 1.6W 90° Wind	12.74	49	49	49	192.63	36.00	8.28	1	1	9.72	12.4	56	Member Z
13	106.	DAE - 2X2X0.125	-4.57	1.2D + 1.6W 90° Wind	12.23	49	49	49	195.39	36.00	5.68	1	1	9.72	8.26	80	Member Y
14	113.	DAE - 2X2X0.125	-4.45	1.2D + 1.6W 90° Wind	11.61	49	49	49	185.61	36.00	6.30	1	1	9.72	8.26	70	Member Y
15	120	DAE - 2X2X0.125	-4.38	1.2D + 1.6W 90° Wind	11.13	49	49	49	177.93	36.00	6.85	1	1	9.72	8.26	63	Member Y
16	125	SAE - 1.75X1.75X0.25	-4.13	1.2D + 1.6W 90° Wind	9.58	50	50	50	168.63	36.00	6.44	1	1	9.72	8.26	64	Member Z
17	130	SAE - 1.75X1.75X0.25	-3.98	1.2D + 1.6W 90° Wind	9.13	50	50	50	160.67	36.00	7.09	1	1	9.72	8.26	56	Member Z
18	135	SAE - 1.75X1.75X0.125	-2.56	1.2D + 1.6W 90° Wind	8.86	50	50	50	153.16	36.00	4.04	1	1	9.72	4.13	63	Member Z
19	140	SAE - 1.75X1.75X0.125	-2.76	1.2D + 1.6W 90° Wind	8.45	50	50	50	146.10	36.00	4.44	1	1	9.72	4.13	66	Bolt Bear
20	152	SAE - 1.5X1.5X0.125	-1.50	1.2D + 1.6W Normal Wind	7.63	50	50	50	154.74	36.00	3.40	1	1	9.72	4.13	44	Member Z

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Force/Stress Tension Summary

Structure:	CT13065-A-SBA	**Code:**	EIA/TIA-222-G	10/28/2016	
Site Name:	Guilford	**Exposure:**	B		
Height:	152.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 21	

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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	10	MOD - 5"PST+6"PX1/2P	154.95	0.9D + 1.6W 60° Wind	50	382.59	40.00	Member
2	20	MOD - 5"PST+6"PX1/2P	142.34	1.2D + 1.6W 60° Wind	50	382.59	37.00	Member
3	30	MOD - 4"PX+5"PX1/2P	134.60	0.9D + 1.6W 60° Wind	50	335.85	40.00	Member
4	40	PX - 4" DIA PIPE	130.25	0.9D + 1.6W 60° Wind	50	198.45	65.00	Member
5	50	PX - 4" DIA PIPE	120.19	0.9D + 1.6W 60° Wind	50	198.45	60.00	Member
6	60	PX - 4" DIA PIPE	103.27	0.9D + 1.6W 60° Wind	50	198.45	52.00	Member
7	66.7	MOD - 3"PX+4"PX1/2P	94.33	0.9D + 1.6W 60° Wind	50	234.80	40.00	Member
8	73.4	PX - 3" DIA PIPE	86.72	0.9D + 1.6W 60° Wind	50	135.90	63.00	Member
9	80	PX - 3" DIA PIPE	79.48	0.9D + 1.6W 60° Wind	50	135.90	58.00	Member
10	86.7	MOD - 2.5"PX+3'PX1/2P	71.74	0.9D + 1.6W 60° Wind	50	169.27	42.00	Member
11	93.4	MOD - 2.5"PX+3.5"PX1/2P	63.02	1.2D + 1.6W 60° Wind	50	184.12	34.00	Member
12	100	PX - 2-1/2" DIA PIPE	56.24	0.9D + 1.6W 60° Wind	50	101.25	55.00	Member
13	106.7	PX - 2-1/2" DIA PIPE	48.23	0.9D + 1.6W 60° Wind	50	101.25	47.00	Member
14	113.3	PX - 2-1/2" DIA PIPE	39.89	0.9D + 1.6W 60° Wind	50	101.25	39.00	Member
15	120	PX - 2-1/2" DIA PIPE	30.41	1.2D + 1.6W 60° Wind	50	101.25	30.00	Member
16	125	PST - 2-1/2" DIA PIPE	23.57	0.9D + 1.6W 60° Wind	50	76.68	30.00	Member
17	130	PST - 2-1/2" DIA PIPE	20.49	0.9D + 1.6W 60° Wind	50	76.68	26.00	Member
18	135	PST - 2-1/2" DIA PIPE	10.77	1.2D + 1.6W 60° Wind	50	76.68	14.00	Member
19	140	PST - 2-1/2" DIA PIPE	5.51	1.2D + 1.6W 60° Wind	50	76.68	7.00	Member
20	152	PST - 2" DIA PIPE	3.48	0.9D + 1.6W 60° Wind	50	48.15	7.00	Member

Splices

		Top Splice						Bottom Splice						
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	10	0.9D + 1.6W 60° Wind	149.46	0.00	0.00			0.9D + 1.6W 60° Wind	160.8	0.00			
2	20	0.9D + 1.6W 60° Wind	138.91	212.04	65.51	1	4	0.9D + 1.6W 60° Wind	149.4	242.28	61.69	1 A354-BC	4
3	30	0.9D + 1.6W 60° Wind	128.58	0.00	0.00			0.9D + 1.6W 60° Wind	138.9	212.04	65.51	1 A325-X	4
4	40	0.9D + 1.6W 60° Wind	118.99	212.04	56.12	1	4	0.9D + 1.6W 60° Wind	128.5	212.04	60.64	1 A325-X	4
5	50	0.9D + 1.6W 60° Wind	108.67	0.00	0.00			0.9D + 1.6W 60° Wind	118.9	166.24	71.58	7/8 A325-X	4
6	60	0.9D + 1.6W 60° Wind	97.19	212.04	45.83	1	4	0.9D + 1.6W 60° Wind	108.6	212.04	51.25	1 A325-X	4
7	66.7	0.9D + 1.6W 60° Wind	89.98	0.00	0.00			0.9D + 1.6W 60° Wind	97.19	166.24	58.46	7/8 A325-X	4
8	73.4	0.9D + 1.6W 60° Wind	82.54	166.24	49.65	7/8	4	0.9D + 1.6W 60° Wind	89.98	212.04	42.44	1 A325-X	4
9	80	0.9D + 1.6W 60° Wind	75.25	166.24	45.26	7/8	4	0.9D + 1.6W 60° Wind	82.54	212.04	38.93	1 A325-X	4
10	86.7	0.9D + 1.6W 60° Wind	67.50	166.24	40.61	7/8	4	0.9D + 1.6W 60° Wind	75.25	120.40	62.50	3/4 A325-X	4
11	93.4	0.9D + 1.6W 60° Wind	59.75	166.24	35.94	7/8	4	0.9D + 1.6W 60° Wind	67.50	166.24	40.61	7/8 A325-X	4
12	100	0.9D + 1.6W 60° Wind	51.92	166.24	31.23	7/8	4	0.9D + 1.6W 60° Wind	59.75	166.24	35.94	7/8 A325-X	4
13	106.7	0.9D + 1.6W 60° Wind	43.70	166.24	26.29	7/8	4	0.9D + 1.6W 60° Wind	51.92	82.84	62.67	5/8 A325-X	4
14	113.3	0.9D + 1.6W 60° Wind	35.31	166.24	21.24	7/8	4	0.9D + 1.6W 60° Wind	43.70	166.24	26.29	7/8 A325-X	4
15	120	0.9D + 1.6W 60° Wind	26.59	166.24	15.99	7/8	4	0.9D + 1.6W 60° Wind	35.31	166.24	21.24	7/8 A325-X	4
16	125	0.9D + 1.6W 60° Wind	20.43	0.00	0.00			0.9D + 1.6W 60° Wind	26.59	82.84	32.09	5/8 A325-X	4
17	130	0.9D + 1.6W 60° Wind	12.89	120.40	10.71	3/4	4	0.9D + 1.6W 60° Wind	20.43	166.24	12.29	7/8 A325-X	4
18	135	0.9D + 1.6W 60° Wind	8.67	120.40	7.20	3/4	4	0.9D + 1.6W 60° Wind	12.89	166.24	7.75	7/8 A325-X	4
19	140	0.9D + 1.6W 60° Wind	3.20	0.00	0.00			0.9D + 1.6W 60° Wind	8.67	0.00			
20	152		0.00	0.00	0.00			0.9D + 1.6W 60° Wind	3.20	82.84	3.87	5/8 A325-X	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	10	-			50	0.00	0	0					
2	20	-			50	0.00	0	0					

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Force/Stress Tension Summary

Structure:	CT13065-A-SBA	**Code:**	EIA/TIA-222-G	10/28/2016	
Site Name:	Guilford	**Exposure:**	B		
Height:	152.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 22	

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HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
3	30	-			36	0.00	0	0					
4	40	-			36	0.00	0	0					
5	50	-			36	0.00	0	0					
6	60	-			36	0.00	0	0					
7	66.7	-			36	0.00	0	0					
8	73.4	-			36	0.00	0	0					
9	80	-			36	0.00	0	0					
10	86.7	-			36	0.00	0	0					
11	93.4	-			36	0.00	0	0					
12	100	-			36	0.00	0	0					
13	106.7	-			36	0.00	0	0					
14	113.3	-			36	0.00	0	0					
15	120	-			36	0.00	0	0					
16	125	-			36	0.00	0	0					
17	130	-			36	0.00	0	0					
18	135	-			36	0.00	0	0					
19	140	-			36	0.00	0	0					
20	152	SAE - 2X2X0.125	0.28	1.2D + 1.6W Normal Wi	36	-318.96	100	100	972.00	696.00	288.19		Member

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	10	SAE - 3.5X3.5X0.25	6.65	1.2D + 1.6W 90° Wind	50	54.94	1	1	15.19	11.69	23.91	56	Bolt Bear
2	20	SAE - 3.5X3.5X0.25	6.87	1.2D + 1.6W 90° Wind	50	54.94	1	1	15.19	11.69	23.91	58	Bolt Bear
3	30	SAE - 3X3X0.375	6.69	1.2D + 1.6W 90° Wind	36	59.66	1	1	15.19	15.65	19.77	44	Bolt Shear
4	40	SAE - 3X3X0.375	6.18	1.2D + 1.6W 90° Wind	36	59.66	1	1	15.19	15.65	19.77	40	Bolt Shear
5	50	SAE - 3X3X0.25	6.16	1.2D + 1.6W 90° Wind	36	40.86	1	1	15.19	10.43	13.18	59	Bolt Bear
6	60	SAE - 3X3X0.25	6.17	1.2D + 1.6W 90° Wind	36	40.86	1	1	15.19	10.43	13.18	59	Bolt Bear
7	66.7	SAE - 2.5X2.5X0.25	5.35	1.2D + 1.6W 90° Wind	36	33.73	1	1	9.72	8.26	11.69	64	Bolt Bear
8	73.4	SAE - 2.5X2.5X0.25	5.14	1.2D + 1.6W 90° Wind	36	33.73	1	1	9.72	8.26	11.69	62	Bolt Bear
9	80	SAE - 2.5X2.5X0.1875	4.88	1.2D + 1.6W 90° Wind	36	25.60	1	1	9.72	6.20	9.79	78	Bolt Bear
10	86.7	SAE - 2X2X0.375	4.90	1.2D + 1.6W 90° Wind	36	36.72	1	1	9.72	12.40	13.46	50	Bolt Shear
11	93.4	SAE - 2X2X0.375	4.73	1.2D + 1.6W 90° Wind	36	36.72	1	1	9.72	12.40	13.46	48	Bolt Shear
12	100	SAE - 2X2X0.375	4.54	1.2D + 1.6W 90° Wind	36	36.72	1	1	9.72	12.40	13.46	46	Bolt Shear
13	106.7	DAE - 2X2X0.125	4.51	1.2D + 1.6W 90° Wind	36	28.77	1	1	9.72	8.26	8.97	54	Bolt Bear
14	113.3	DAE - 2X2X0.125	4.42	1.2D + 1.6W 90° Wind	36	28.77	1	1	9.72	8.26	8.97	53	Bolt Bear
15	120	DAE - 2X2X0.125	4.31	1.2D + 1.6W 90° Wind	36	28.77	1	1	9.72	8.26	8.97	52	Bolt Bear
16	125	SAE - 1.75X1.75X0.25	4.13	1.2D + 1.6W 90° Wind	36	21.33	1	1	9.72	8.26	7.61	54	Blck Shear
17	130	SAE - 1.75X1.75X0.25	3.91	1.2D + 1.6W 90° Wind	36	21.33	1	1	9.72	8.26	7.61	51	Blck Shear
18	135	SAE - 1.75X1.75X0.125	2.60	1.2D + 1.6W 90° Wind	36	11.15	1	1	9.72	4.13	3.81	68	Blck Shear
19	140	SAE - 1.75X1.75X0.125	2.68	1.2D + 1.6W 90° Wind	36	11.15	1	1	9.72	4.13	3.81	70	Blck Shear
20	152	SAE - 1.5X1.5X0.125	1.45	1.2D + 1.6W 90° Wind	36	9.20	1	1	9.72	4.13	3.81	38	Blck Shear

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Support Forces Summary

Structure:	CT13065-A-SBA	**Code:**	EIA/TIA-222-G	10/28/2016	
Site Name:	Guilford	**Exposure:**	B		
Height:	152.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 23

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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind	1	0.01	188.73	-20.87	
	1a	7.01	-77.15	-7.17	
	1b	-7.02	-77.18	-7.15	
1.2D + 1.6W 60° Wind	1	-2.46	95.81	-10.14	
	1a	-10.06	95.66	3.12	
	1b	-16.07	-157.08	-9.49	
1.2D + 1.6W 90° Wind	1	-2.90	11.55	-0.63	
	1a	-15.90	159.25	7.72	
	1b	-14.77	-136.40	-7.08	
0.9D + 1.6W Normal Wind	1	0.01	185.65	-20.69	
	1a	7.16	-79.91	-7.26	
	1b	-7.17	-79.94	-7.23	
0.9D + 1.6W 60° Wind	1	-2.46	92.83	-9.97	
	1a	-9.91	92.71	3.03	
	1b	-16.22	-159.75	-9.57	
0.9D + 1.6W 90° Wind	1	-2.90	8.66	-0.46	
	1a	-15.75	156.23	7.63	
	1b	-14.92	-139.10	-7.17	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	76.27	-5.95	
	1a	1.59	5.02	-1.73	
	1b	-1.59	4.96	-1.73	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.66	51.47	-3.11	
	1a	-3.03	51.28	1.01	
	1b	-4.08	-16.50	-2.39	
1.2D + 1.0Di + 1.0Wi 90° Wind	1	-0.78	28.88	-0.51	
	1a	-4.65	69.02	2.27	
	1b	-3.77	-11.64	-1.76	
1.0D + 1.0W Normal Wind	1	0.00	46.68	-4.87	
	1a	1.10	-8.99	-1.31	
	1b	-1.10	-9.02	-1.31	
1.0D + 1.0W 60° Wind	1	-0.53	27.22	-2.60	
	1a	-2.52	27.12	0.88	
	1b	-3.03	-25.68	-1.79	
1.0D + 1.0W 90° Wind	1	-0.63	9.62	-0.58	
	1a	-3.76	40.41	1.86	
	1b	-2.75	-21.37	-1.28	

Max Reactions

Leg			Overturning		
Max Uplift:	-159.75	(kips)	Moment:	3190.19	(ft-kips)
Max Down:	188.73	(kips)	Total Down:	34.40	(kips)
Max Shear:	20.87	(kips)	Total Shear:	35.18	(kips)

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Max Reactions

Leg			Overturning		
Max Uplift:	-159.75	(kips)	Moment:	3190.19	(ft-kips)
Max Down:	188.73	(kips)	Total Down:	34.40	(kips)
Max Shear:	20.87	(kips)	Total Shear:	35.18	(kips)

Anchor Bolts

Bolt Size (in.):	1.00	Number Bolts:	4
Yield Strength (Ksi):	92.00	Tensile Strength (Ksi):	120.00
Detail Type:	C		

Interaction Ratio: 0.85

Max Usages

Max Leg: 94.0% (1.2D + 1.6W Normal Wind - Sect 10)
Max Diag: 80.0% (1.2D + 1.6W 90° Wind - Sect 13)
Max Horiz: 17.0% (1.2D + 1.6W Normal Wind - Sect 20)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.6W 101 mph Wind at 60° From Face	10.00	0.0050	0.0035	0.0556
	86.70	0.3100	0.0208	0.4431
	130.00	0.7599	0.0325	0.6817
	140.25	0.8931	0.0420	0.8752
	148.08	0.9951	0.0472	0.7512
0.9D + 1.6W 101 mph Wind at 90° From Face	10.00	0.0040	0.0030	0.0556
	86.70	0.3142	0.0113	0.4479
	130.00	0.7681	-0.0314	0.6999
	140.25	0.9025	-0.0389	0.8666
	148.08	1.0050	-0.0395	0.7436
0.9D + 1.6W 101 mph Wind at Normal To Face	10.00	0.0077	0.0059	0.0610
	86.70	0.3244	0.0196	0.4613
	130.00	0.7911	-0.0258	0.7069
	140.25	0.9290	-0.0294	0.9088
	148.08	1.0346	-0.0285	0.8377
1.0D + 1.0W 60 mph Wind at 60° From Face	10.00	0.0012	0.0007	0.0118
	86.70	0.0645	0.0044	0.0917
	130.00	0.1573	-0.0057	0.1401
	140.25	0.1847	-0.0065	0.1790
	148.08	0.2056	0.0055	0.1537
1.0D + 1.0W 60 mph Wind at 90° From Face	10.00	0.0009	0.0006	0.0118
	86.70	0.0655	0.0025	0.0927
	130.00	0.1591	-0.0068	0.1442
	140.25	0.1867	-0.0077	0.1782
	148.08	0.2078	-0.0065	0.1525

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1.0D + 1.0W 60 mph Wind at Normal To Face	10.00	0.0018	0.0013	0.0130
	86.70	0.0675	0.0045	0.0955
	130.00	0.1639	-0.0058	0.1459
	140.25	0.1923	-0.0062	0.1871
	148.08	0.2140	-0.0049	0.1738
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	10.00	0.0024	0.0003	0.0129
	86.70	0.0822	0.0056	0.1174
	130.00	0.1993	-0.0072	0.1740
	140.25	0.2333	0.0079	0.2177
	148.08	0.2593	0.0070	0.1851
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	10.00	0.0033	0.0002	0.0163
	86.70	0.0848	0.0033	0.1224
	130.00	0.2062	-0.0087	0.1842
	140.25	0.2414	-0.0099	0.2256
	148.08	0.2683	-0.0091	0.1843
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	10.00	0.0011	0.0010	0.0103
	86.70	0.0868	0.0057	0.1209
	130.00	0.2090	-0.0068	0.1846
	140.25	0.2448	-0.0072	0.2350
	148.08	0.2721	-0.0059	0.2284
1.2D + 1.6W 101 mph Wind at 60° From Face	10.00	0.0051	0.0035	0.0556
	86.70	0.3104	0.0208	0.4439
	130.00	0.7612	0.0327	0.6829
	140.25	0.8947	0.0422	0.8770
	148.08	0.9969	0.0475	0.7527
1.2D + 1.6W 101 mph Wind at 90° From Face	10.00	0.0040	0.0030	0.0557
	86.70	0.3146	0.0113	0.4487
	130.00	0.7695	-0.0316	0.7014
	140.25	0.9041	-0.0391	0.8688
	148.08	1.0069	-0.0398	0.7454
1.2D + 1.6W 101 mph Wind at Normal To Face	10.00	0.0077	0.0059	0.0610
	86.70	0.3248	0.0197	0.4621
	130.00	0.7924	-0.0260	0.7084
	140.25	0.9306	-0.0296	0.9111
	148.08	1.0364	-0.0287	0.8397

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