September 24, 2015

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
1 Deerfield Lane
Ansonia, CT 06401
N 41° 21' 3.06"
W 73° 02' 57.6954"
T-Mobile Site #: CTNH209A_L700

Members of the Siting Council:

On behalf of T-Mobile, SBA Communications is submitting an exempt modification application to the Connecticut Siting council for modification of existing equipment at a tower facility located at 1 Deerfield Lane, Ansonia, CT.

The 1 Deerfield Lane facility consists of a 169' Monopole Tower owned and operated by SBA Towers IV, LLC. In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located, Mayor David S. Cassetti, as well as the property owner, Macabee Properties, LLC.

As part of T-Mobile's L700 project, T-Mobile desires to upgrade their equipment to meet the new standards of 4G technology. The new equipment will allow customers to download files and browse the internet at a high rate of speed while also allowing their phones to be compatible with the latest 4G technology.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in T-Mobile's operations at the site along with the required fee of $625.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The overall height of the structure will be unaffected.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than the new equipment cabinets.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. The changes in radio frequency power density will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, SBA Communications on behalf of T-Mobile, respectfully submits that he proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at 508.251.0720 x 3804 with any questions you may have concerning this matter.

Thank you,

Kri Pelletier
SBA Communications Corporation
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
508-251-1755 + F
203-446-7700 + C
kpelletier@sbasite.com

T-Mobile

Equipment Modification

1 Deerfield Lane, Ansonia, CT
Site number CTNH209A_L700

Tower Owner: SBA Towers IV, LLC

Equipment Configuration: Monopole

Current and/or approved:

- (3) Ericsson - AIR 21 B2A B4P – Panel
- (3) Ericsson - AIR 21 B4A B2P – Panel
- (3) Ericsson KRY 112 144/1-TMA
- (12) 1-5/8" Lines
- (1) 1-5/8" Fiber

Final Configuration:

- (3) Ericsson - AIR B2A B4P – Panel
- (3) Ericsson - AIR B4A B2P – Panel
- (3) Commscope - LNX-6515DS – Panel
- (3) Ericsson S11B12-RRU
- (3) Ericsson KRY 112 144/1-TMA
- (12) 1-5/8" lines
- (1) 1-5/8" Fiber

Structural Information:

The attached structural analysis demonstrates that the tower and foundation will have adequate structural capacity to accommodate the proposed modifications.

Power Density:

The anticipated Maximum Composite contributions from the T-Mobile facility are 1.55% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 5.49% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.55 %**
Clearwire	0.12 %
Verizon Wireless	1.89 %
MetroPCS	0.36 %
AT&T	1.57 %
Site Total MPE %:	**5.49 %**

SBA Network Services, LLC

To: CONNECTICUT SITING COUNCIL 129986

Check Number: 2097394
Date: 07/07/2015

Invoice Number	Invoice Date	Description	Gross Amount	Taxes Withheld	Net Amount
PRSF07061507	07/08/2015	CSC Fee CTNH209A_L700	$625.00	$0.00	$625.00
			$625.00	$0.00	$625.00

SBA Network Services, LLC
8051 Congress Avenue
Boca Raton, FL 33487-1307
(561) 995-7670

Wells Fargo Bank

2097394

061209756 129986

DATE	AMOUNT
07/07/2015	$625.00

Void After 120 Days

Six Hundred Twenty Five Dollars And 00 Cents

Pay to the Order of:

CONNECTICUT SITING COUNCIL
ACCOUNTS RECEIVABLE
TEN FRANKLIN SQUARE

NEW BRITAIN, CT 06051

⑈2097394⑈ ⑆061209756⑆ 20799004 24566⑈

September 24, 2015

David S. Cassetti, Mayor
City of Ansonia
253 Main Street
Ansonia, CT 06401

RE: Telecommunications Facility @ 31 Deerfield Lane, Ansonia, CT 06401

Dear Mayor Cassetti,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes T-Mobile's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at 508.251.0720 x 3804.

Thank you,

Kri Pelletier
SBA Communications Company
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
508-251-1755 + F
203-446-7700 + C
kpelletier@sbasite.com

September 24, 2015

Macabee Properties, LLC
11 Hemlock Hollow Road
Woodbridge CT 06525
Attn: President or Manager

RE: Telecommunications Facility @ 31 Deerfield Lane, Ansonia, CT 06401

To Whom It May Concern:

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTNH209A

NH209/ OptaGelertnerFT
1 Deerfield Lane
Ansonia, CT 06401

September 24, 2015

EBI Project Number: 6215004877

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.49 %

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September 24, 2015

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CTNH209A – NH209/ OptaGelertnerFT**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1 Deerfield Lane, Ansonia, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **1 Deerfield Lane, Ansonia, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR21 (B4A/B2P** & **B2A/B4P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 (B4A/B2P** & **B2A/B4P)** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **167 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.65	Antenna B1 MPE%	0.65	Antenna C1 MPE%	0.65
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P□	Make / Model:	Ericsson AIR21 B2A/B4P□	Make / Model:	Ericsson AIR21 B2A/B4P□
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.65	Antenna B2 MPE%	0.65	Antenna C2 MPE%	0.65
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	167	Height (AGL):	167	Height (AGL):	167
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.26	Antenna B3 MPE%	0.26	Antenna C3 MPE%	0.26

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.55 %**
Clearwire	0.12 %
Verizon Wireless	1.89 %
MetroPCS	0.36 %
AT&T	1.57 %
Site Total MPE %:	**5.49 %**

T-Mobile Sector 1 Total:	1.55 %
T-Mobile Sector 2 Total:	1.55 %
T-Mobile Sector 3 Total:	1.55 %
Site Total:	5.49 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**167**	**6.47**	**2100**	**1000**	**0.65 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**167**	**1.20**	**700**	**467**	**0.26 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**167**	**3.24**	**1900**	**1000**	**0.32 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**167**	**3.24**	**2100**	**1000**	**0.32 %**
						Total:	**4.31%**

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Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	1.55 %
Sector 2:	1.55 %
Sector 3 :	1.55 %
T-Mobile Per Sector Maximum:	1.55 %
Site Total:	5.49 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.49%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

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

Post-Mod Structural Analysis Report

Existing 169 ft Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13071-A

Customer Site Name: Woodbridge

Carrier Name: T-Mobile

Carrier Site Number: CTNH209A

Carrier Site Name: N/A

Site Location: 1 Deerfield Lane

Ansonia, Connecticut

New Haven County

Latitude: 41.350750

Longitude: -73.049250

Analysis Result:

Max Structural Usage: 96.6% [Pass]

Max Foundation Usage: 97.0% [Pass]

Report Prepared By : Uma S Atluri

Introduction

The purpose of this report is to summarize the analysis results on the 169 ft Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any existing modification listed under Sources of Information was assumed completed and was included in this analysis.

The proposed modification by **TES** listed under Sources of Information was considered completed and was included in this analysis.

Sources of Information

Tower Drawings	Sabre, DWG # 08-01016-PE, dated 1/7/2008
Foundation Drawing	Sabre, DWG # 08-01016, dated 1/30/2008
Geotechnical Report	JGI Eastern, Inc., Project # J2085109, dated 1/29/2008
Existing Modification	N/A
Proposed Modification	**TES** Job # 17022

Analysis Criteria

The analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-F**.** 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.

Basic Wind Speed Used in the Analysis:	85.0 mph (fastest mile)(Equivalent to 105 mph 3-second Gust wind speed)
Basic Wind Speed with Ice:	74 mph (fastest mile) with 1/2” radial ice concurrent
Operational Wind Speed:	50 mph + 0” Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-F / 2005 Connecticut State Building Code/IBC 2003

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
-	167.5	3	Ericsson - AIR 21 B2A B4P - Panel	(3) T-Arms	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
		3	Ericsson - AIR 21 B4A B2P - Panel			
		3	Ericsson KRY 112 144/1-TMA			
6	157.0	3	ALU RRH2X60-AWS RRH	(3) T-Arms	(6) 1 5/8"* (12) 1 5/8" (1) 1 5/8" Fiber (1) 1/2"	Verizon
7		1	Antel BXA-70063/6CF - Panel			
8		4	Decibel - DB846F65ZAXY - Panel			
9		2	Decibel - DB846H80E-SX - Panel			
10		1	GPS			
11		6	Andrew - HBX-6517DS-VTM - Panel			
12		1	RFS DB T1-6Z-8AB-OZ Distribution Box			
13		2	Swedcom - SLCP 2x6014F - Panel			
14	150.0	1	Raycap DC6-48-60-18-8F-SA	Collar Mount	(12) 1 5/8" (1) 10 MM Fiber (2) DC Power	AT&T
15		6	Ericsson - RRUS 11-RRU			
16	148.0	6	Powerwave - 7770.00 - Panel	(3) T-Arms		
17		3	KMW - AM-X-CD-16-65-00T - Panel			
18		6	Powerwave - LGP13519 Diplexers			
19		6	Powerwave - LGP21401-TMA			
20	127.0	3	Samsung - 2.5GHz RRH BTS	(3) T-Arms	(4) 1/2" (3) 1/4" (3) 5/16" (3) 5/8"	Clearwire
21		3	Argus - LLPX310R - Panel			
22		3	Andrew - VHLP2-11 - Dish			
23		1	Andrew - VHLP800-11 - Dish			

*lines outside of the pole

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
1	167.0	3	Ericsson - AIR B2A B4P - Panel	(3) T-Arms w/Commscope VSR-MS-B stabilizer Pipe	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	Ericsson - AIR B4A B2P - Panel			
3		3	Commscope - LNX-6515DS - Panel			
4		3	Ericsson S11B12-RRU			
5		3	Ericsson KRY 112 144/1-TMA			

All the proposed transmission lines are considered running inside of the pole shafts.

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:	**96.6%**	**99.0%**	**85.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3966.9	32.3	51.2

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.

Operational Condition (Rigidity):

Maximum twist and sway of the microwave dishes under the operational wind speed as specified in the Analysis Criteria are listed in the table below:

Elevation (ft)	Antenna / Dish	Carrier	Twist (deg)	Sway (deg)
167.0	Various -Panels	T-Mobile	0.002	2.238
127.0	Andrew - VHLP2-11 - Dish	Clearwire	0.002	1.909

It is recommended that the carriers review the twist and sway values of the microwave dishes.

Conclusions

Based on the analysis results, the structure and its foundation will be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the design ANSI/TIA/EIA 222-F standards under a basic wind speed of 85 mph no ice and 74 mph with 1/2" radial ice after the following proposed modification is successfully completed.

- Proposed modification design drawing by **TES** Job # 17022

Pre-Mod Installation Determination

We have also checked this tower to determine if the proposed T-Mobile equipment loading can be installed prior to the completion of the required modifications. We ran a reduced wind loading case as required by TIA-1019 considering a construction period of no more than 6 months.

The tower and foundations passed, so the Carrier can proceed and install their proposed loading prior to the mods completion. Please be aware that this approval is being provided and is based on the method outlined in TIA-1019. This approval is not a blanket approval and there is still a risk that the tower will experience a wind event that cannot be predicted by TIA-1019 or our Engineers. In the event of an unforeseen wind event, Tower Engineering Solutions will not be liable nor responsible for damage to the tower or the Carriers equipment. Additionally, the tower cannot go beyond the 6 month construction period without the modifications being completed. If the modifications cannot be completed within 6 months from the completed installation of the Carrier's proposed equipment, TES must be notified immediately for further review.

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 or/and 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 Stress 96.6% at 100.0ft

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-F	8/31/2015
Site Name:	Woodbridge	**Exposure:**	C	
Height:	169.00 (ft)	**Gh:**	1.69	
Base Elev:	0.000 (ft)			Page: 1

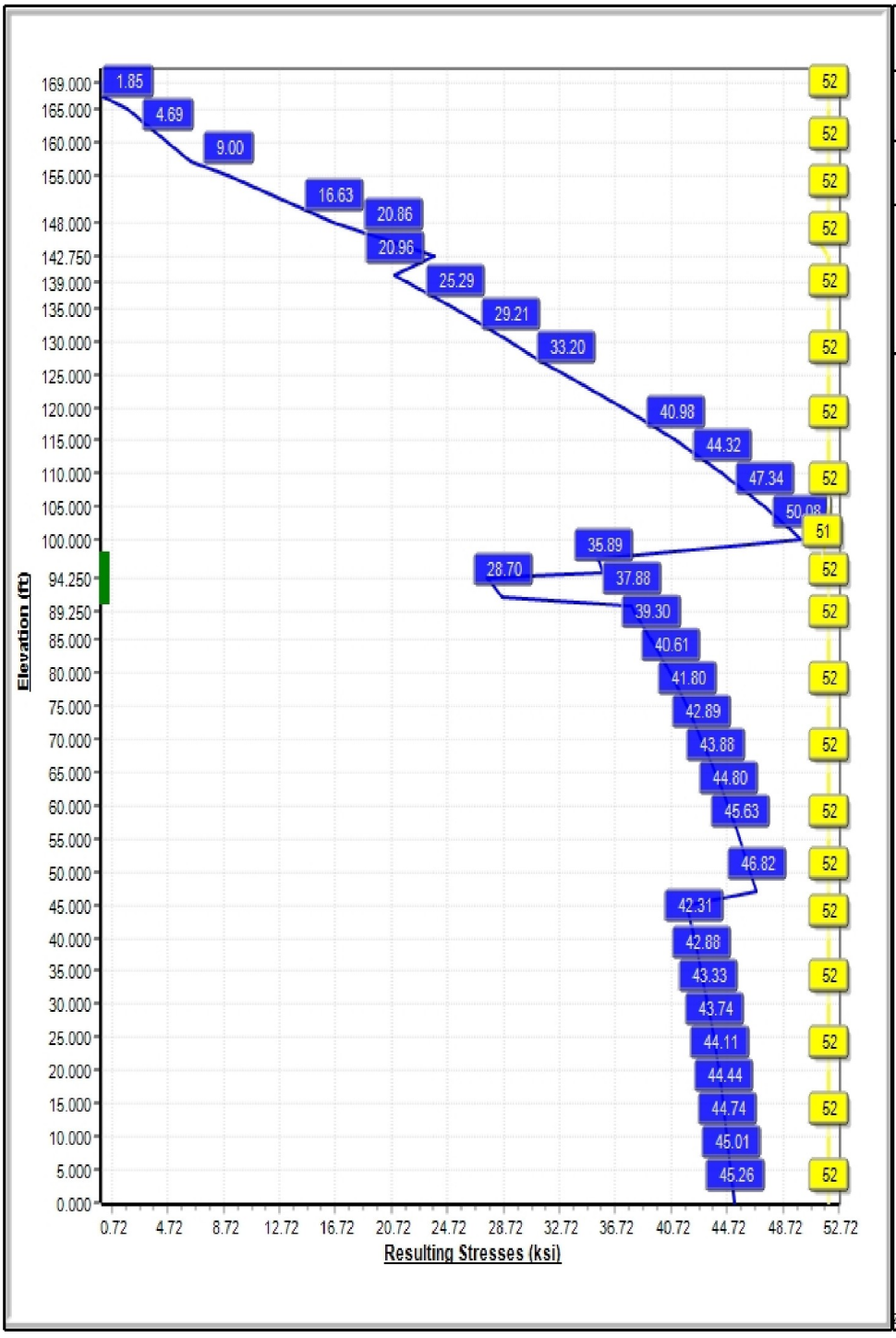
Tower Engineering Solutions

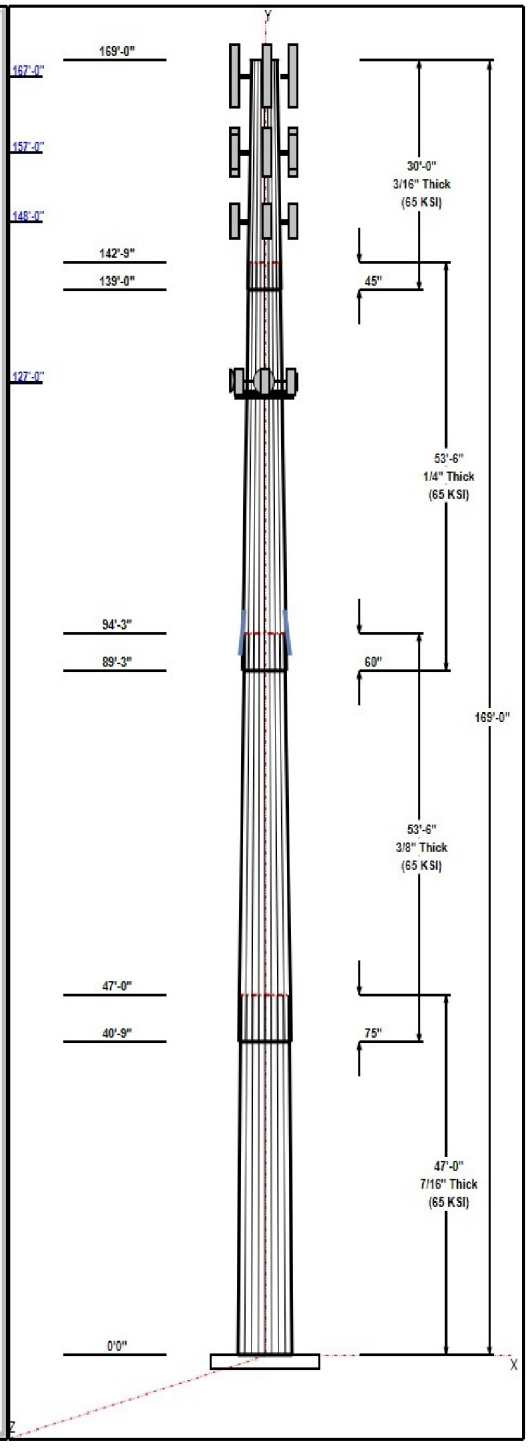
Dead Load Factor: 1.00
Wind Load Factor: 1.00

52 Alllowable Stress
50 Resulting Stress

Load Case : 85 mph Wind with 0 in Ice

Iterations: 27





Structure: CT13071-A-SBA

Type: Tapered
Site Name: Woodbridge
Height: 169.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.20003

8/31/2015

Tower Engineering Solutions

Shaft Properties

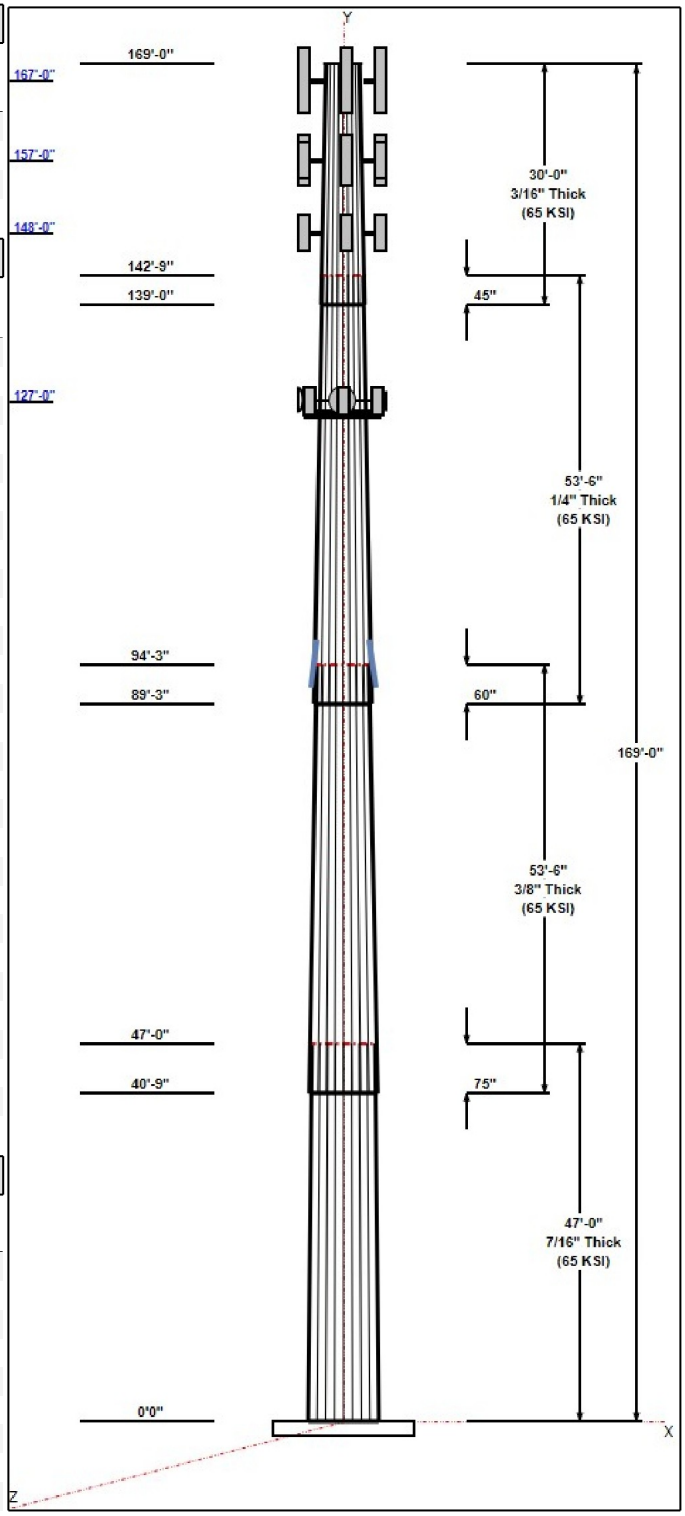
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	47.00	46.78	56.18	0.438		0.20003	65
2	53.50	38.08	48.78	0.375	Slip	0.20003	65
3	53.50	28.88	39.58	0.250	Slip	0.20003	65
4	30.00	24.00	30.00	0.188	Slip	0.20003	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
167.00	167.00	3	AIR B2A B4P	T-Mobile
167.00	167.00	3	AIR B4A B2P	T-Mobile
167.00	167.00	3	Ericsson KRY 112 144/1	T-Mobile
167.00	167.00	3	Ericsson S11B12	T-Mobile
167.00	167.00	3	LNX-6515DS	T-Mobile
167.00	167.50	3	T-Arms/Commscope	T-Mobile
157.00	157.00	3	ALU RRH2X60-AWS RRH	Verizon
157.00	157.00	1	BXA-70063/6CF	Verizon
157.00	157.00	4	DB846F65ZAXY	Verizon
157.00	157.00	2	DB846H80E-SX	Verizon
157.00	157.00	1	GPS	Verizon
157.00	157.00	6	HBX-6517DS-VTM	Verizon
157.00	157.00	1	RFS DB T1-6Z-8AB-OZ	Verizon
157.00	157.00	2	SLCP 2x6014F	Verizon
157.00	157.00	3	T-Arms	Verizon
150.00	150.00	1	Collar Mount	AT&T
150.00	150.00	1	DC6-48-60-18-8F-SA	AT&T
150.00	150.00	6	RRUS 11	AT&T
148.00	148.00	6	7770.00	AT&T
148.00	148.00	3	AM-X-CD-16-65-00T	AT&T
148.00	148.00	6	LGP13519 Diplexers	AT&T
148.00	148.00	6	LGP21401-TMA	AT&T
148.00	148.00	3	T-Arms	AT&T
127.00	127.00	3	2.5GHz RRH BTS	Clearwire
127.00	127.00	3	LLPX310R	Clearwire
127.00	127.00	3	Sector Frames	Clearwire
127.00	127.00	3	VHLP2-11	Clearwire
127.00	127.00	1	VHLP800-11	Clearwire

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	167.00	Inside	1 5/8" Coax	
0.00	167.00	Inside	1 5/8" Fiber	
0.00	157.00	Inside	1 5/8" Coax	
0.00	157.00	Outside	1 5/8" Coax	
0.00	157.00	Inside	1 5/8" Fiber	
0.00	157.00	Inside	1/2" Coax	
0.00	150.00	Inside	1 5/8" Coax	
0.00	150.00	Inside	10 MM Fiber	
0.00	150.00	Inside	DC Power	
0.00	127.00	Inside	1/2" Coax	
0.00	127.00	Inside	1/4" Coax	
0.00	127.00	Inside	5/16" Coax	
0.00	127.00	Inside	5/8"	
89.25	99.25	Outside	1" Reinforcing plate	



Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
16	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	61.3	60.0	Square

Reactions

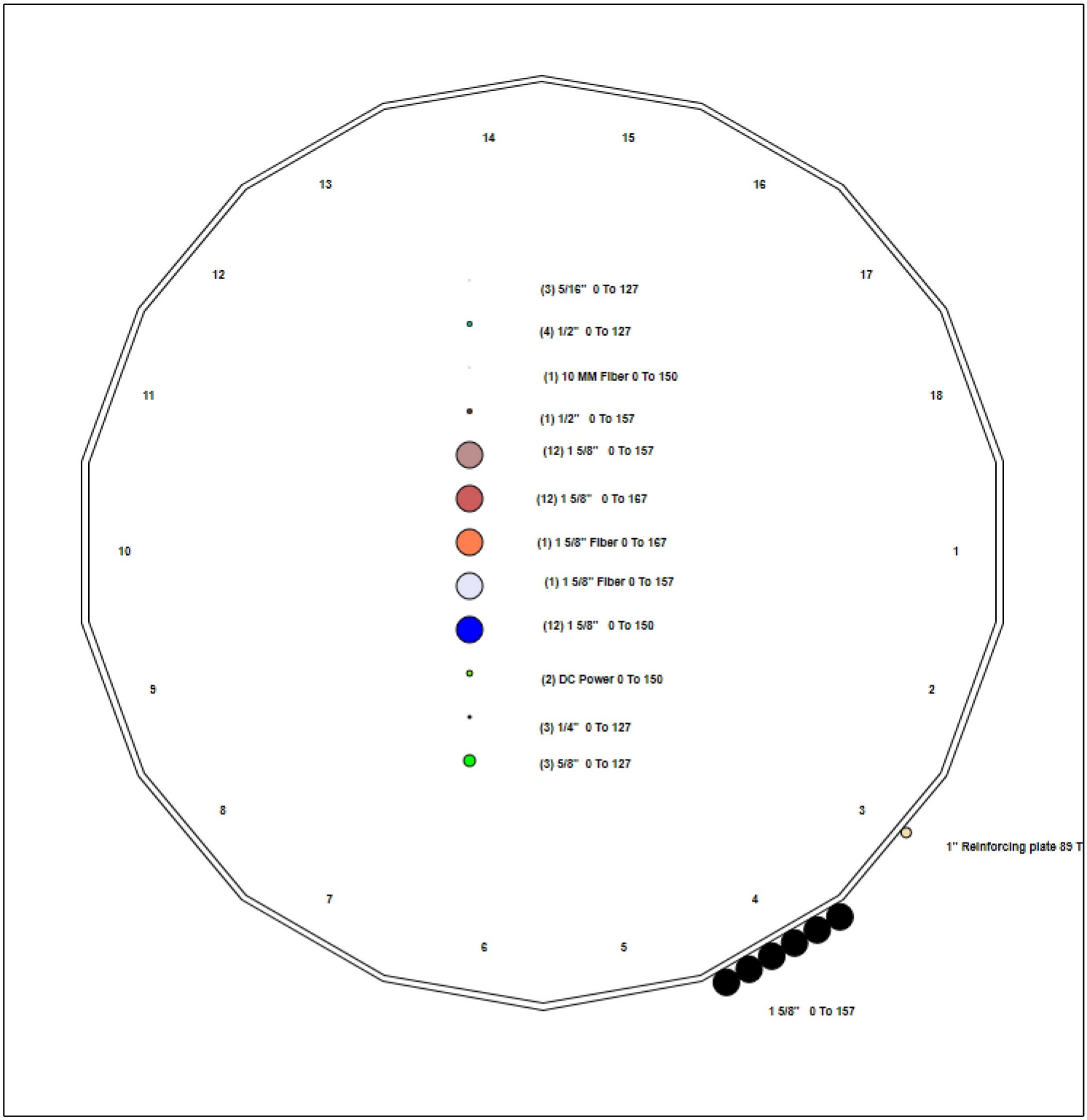
Load Case	Moment	Shear	Axial
85 mph Wind with 0" Ice	3966.9	32.3	42.8
73.61 mph Wind with 0.5" Ice	3179.0	25.8	51.2
50 mph Wind with 0" Ice	1374.7	11.2	42.9

Structure: CT13071-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Woodbridge
Height: 169.00 (ft)

8/31/2015

Tower Engineering Solutions



Shaft Properties

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 5	

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	47.000	0.4375	65		0.00	11,335
2	18	53.500	0.3750	65	Slip	75.00	9,329
3	18	53.500	0.2500	65	Slip	60.00	4,908
4	18	30.000	0.1875	65	Slip	45.00	1,629
					Total Shaft Weight:		**27,200**

	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	56.18	0.00	77.40	30386.58	21.23	128.4	46.78	47.00	64.35	17459.0	17.44	106.9	0.200030
2	48.78	40.75	57.61	17053.51	21.52	130.0	38.08	94.25	44.87	8058.91	16.49	101.5	0.200030
3	39.58	89.25	31.21	6097.74	26.50	158.3	28.88	142.7	22.71	2351.56	18.95	115.5	0.200030
4	30.00	139.0	17.74	1992.41	26.80	160.0	24.00	169.0	14.17	1015.22	21.15	128	0.200030

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	**Elev To (ft)**	**Qty**	**Description**	**Fy (ksi)**	**Fu (ksi)**	**Offset (in)**	**Description**	**Spacing (in)**	**Description**	**Spacing (in)**	**Lower Qty**	**Upper Qty**
91.25	97.25	3	LNP LP6X100-G-10TT	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt		9	9

Loading Summary

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	**Elev (ft)**	**Description**	**Qty**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Hor. Ecc. (ft)**	**Vert Ecc (ft)**
1	167.0	AIR B2A B4P	3	91.50	6.58	0.86	129.20	6.970	0.86	0.00	0.00
2	167.0	AIR B4A B2P	3	90.40	6.58	0.86	128.10	6.970	0.86	0.00	0.00
3	167.0	Ericsson KRY 112 144/1	3	11.00	0.41	0.67	14.10	0.550	0.67	0.00	0.00
4	167.0	Ericsson S11B12	3	51.00	3.31	0.67	75.70	3.890	0.67	0.00	0.00
5	167.0	LNX-6515DS	3	50.30	11.41	0.84	115.60	12.34	0.84	0.00	0.00
6	167.0	T-Arms/Commscope VSR-MS-B	3	340.00	6.75	0.75	420.00	10.50	0.75	0.00	0.50
7	157.0	ALU RRH2X60-AWS RRH	3	60.00	3.96	0.76	80.10	4.230	0.76	0.00	0.00
8	157.0	BXA-70063/6CF	1	17.00	7.73	0.70	57.60	8.540	0.70	0.00	0.00
9	157.0	DB846F65ZAXY	4	21.00	7.05	0.93	0.00	0.000	0.93	0.00	0.00
10	157.0	DB846H80E-SX	2	16.00	5.01	1.10	0.00	0.000	1.10	0.00	0.00
11	157.0	GPS	1	10.00	1.00	1.00	18.00	1.250	1.00	0.00	0.00
12	157.0	HBX-6517DS-VTM	6	18.70	5.30	0.75	46.20	6.010	0.75	0.00	0.00
13	157.0	RFS DB T1-6Z-8AB-OZ Distribution	1	19.00	3.74	0.68	35.80	3.960	0.68	0.00	0.00
14	157.0	SLCP 2x6014F	2	20.00	7.21	0.89	70.40	7.880	0.89	0.00	0.00
15	157.0	T-Arms	3	350.00	8.00	0.75	420.00	10.50	0.75	0.00	0.00
16	150.0	Collar Mount	1	100.00	3.00	1.00	450.00	5.000	1.00	0.00	0.00
17	150.0	DC6-48-60-18-8F-SA	1	31.80	1.47	1.00	49.50	1.670	1.00	0.00	0.00
18	150.0	RRUS 11	6	50.70	2.94	0.67	66.00	3.140	0.67	0.00	0.00
19	148.0	7770.00	6	35.00	5.88	0.73	0.00	6.530	0.73	0.00	0.00
20	148.0	AM-X-CD-16-65-00T	3	33.00	6.62	0.81	74.50	7.270	0.81	0.00	0.00
21	148.0	LGP13519 Diplexers	6	5.30	0.34	0.50	8.00	0.470	0.50	0.00	0.00
22	148.0	LGP21401-TMA	6	14.10	1.29	0.50	21.20	1.530	0.50	0.00	0.00
23	148.0	T-Arms	3	350.00	8.00	0.75	420.00	10.50	0.75	0.00	0.00
24	127.0	2.5GHz RRH BTS	3	33.00	1.82	0.73	44.90	2.090	0.73	0.00	0.00
25	127.0	LLPX310R	3	28.60	4.83	0.69	54.50	5.360	0.69	0.00	0.00
26	127.0	Sector Frames	3	500.00	15.00	0.75	700.00	21.50	0.75	0.00	0.00
27	127.0	VHLP2-11	3	27.00	4.68	0.90	55.00	5.050	0.90	0.10	0.00
28	127.0	VHLP800-11	1	48.00	8.43	1.00	97.00	8.920	1.00	0.10	0.00
		Totals:	**86**	**7,172.00**			**9,892.20**				

Linear Appurtenances

			No Ice		Ice		
Bottom Elev. (ft)	**Top Elev. (ft)**	**Description**	**Weight (lb/ft)**	**CaAa (sf/ft)**	**Weight (lb/ft)**	**CaAa (sf/ft)**	**Exposed**
0.00	167.0	(12) 1 5/8" Coax	12.00	0.00	12.00	0.00	Inside
0.00	167.0	(1) 1 5/8" Fiber	1.20	0.00	1.20	0.00	Inside
0.00	157.0	(12) 1 5/8" Coax	12.00	0.00	12.00	0.00	Inside
0.00	157.0	(6) 1 5/8" Coax	6.00	0.20	15.00	0.30	Outside
0.00	157.0	(1) 1 5/8" Fiber	1.20	0.00	1.20	0.00	Inside
0.00	157.0	(1) 1/2" Coax	0.75	0.00	0.75	0.00	Inside
0.00	150.0	(12) 1 5/8" Coax	12.00	0.00	12.00	0.00	Inside
0.00	150.0	(1) 10 MM Fiber	0.72	0.00	0.72	0.00	Inside
0.00	150.0	(2) DC Power	2.00	0.00	2.00	0.00	Inside
0.00	127.0	(4) 1/2" Coax	3.00	0.00	3.00	0.00	Inside
0.00	127.0	(3) 1/4" Coax	0.12	0.00	0.12	0.00	Inside
0.00	127.0	(3) 5/16" Coax	0.30	0.00	0.30	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)		Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	127.0		(3) 5/8"		0.52	0.00		0.52	0.00	Inside		
89.25	99.25		(1) 1" Reinforcing plate		0.00	0.17		0.00	0.27	Outside		
				Totals:	**8,044.93**			**9,457.93**				

Shaft Section Properties

Structure: CT13071-A-SBA
Site Name: Woodbridge
Height: 169.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/31/2015

Tower Engineering Solutions

Increment Length: 5 (ft)

											Additional Reinforcing			
Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Area (in^2)	Ixp (in^4)	Iyp (in^4)	Weight (lb)
0.00		0.4375	56.180	77.403	30386.6	21.23	128.41	65	52	0.0	0.00	0.0	0.0	0.0
5.00		0.4375	55.180	76.014	28780.1	20.83	126.13	65	52	1305.1				
10.00		0.4375	54.180	74.625	27231.3	20.43	123.84	65	52	1281.5				
15.00		0.4375	53.180	73.236	25739.1	20.02	121.55	65	52	1257.8				
20.00		0.4375	52.179	71.848	24302.4	19.62	119.27	65	52	1234.2				
25.00		0.4375	51.179	70.459	22920.2	19.22	116.98	65	52	1210.6				
30.00		0.4375	50.179	69.070	21591.5	18.81	114.70	65	52	1187.0				
35.00		0.4375	49.179	67.681	20315.1	18.41	112.41	65	52	1163.3				
40.00		0.4375	48.179	66.292	19090.0	18.01	110.12	65	52	1139.7				
40.75	Bot - Section 2	0.4375	48.029	66.084	18910.6	17.95	109.78	65	52	168.9				
45.00		0.4375	47.179	64.904	17915.2	17.60	107.84	65	52	1773.0				
47.00	Top - Section 1	0.3750	47.529	56.123	15766.0	20.94	126.74	65	52	823.4				
50.00		0.3750	46.929	55.408	15171.7	20.66	125.14	65	52	569.3				
55.00		0.3750	45.928	54.218	14214.7	20.19	122.48	65	52	932.6				
60.00		0.3750	44.928	53.028	13298.8	19.71	119.81	65	52	912.3				
65.00		0.3750	43.928	51.837	12423.2	19.24	117.14	65	52	892.1				
70.00		0.3750	42.928	50.647	11586.8	18.77	114.47	65	52	871.8				
75.00		0.3750	41.928	49.456	10788.9	18.30	111.81	65	52	851.6				
80.00		0.3750	40.928	48.266	10028.4	17.83	109.14	65	52	831.3				
85.00		0.3750	39.927	47.076	9304.6	17.36	106.47	65	52	811.1				
89.25	Bot - Section 3	0.3750	39.077	46.064	8717.4	16.96	104.21	65	52	673.5				
90.00		0.3750	38.927	45.885	8616.4	16.89	103.81	65	52	196.8				
91.25	RB1	0.3750	38.677	45.588	8449.9	16.78	103.14	65	52	326.3	18.00	4460.1	2812.1	76.6
94.25	Top - Section 2	0.2500	38.577	30.412	5644.2	25.80	154.31	65	52	774.6	18.00	4328.3	2729.4	183.7
95.00		0.2500	38.427	30.293	5578.2	25.69	153.71	65	51	77.5	18.00	4290.5	2703.4	45.9
97.25	RT1	0.2500	37.977	29.935	5383.3	25.37	151.91	65	51	230.6	18.00	4193.5	2642.6	137.8
100.00		0.2500	37.427	29.499	5151.2	24.99	149.71	65	52	278.1				
105.00		0.2500	36.427	28.705	4746.6	24.28	145.71	65	52	495.1				
110.00		0.2500	35.427	27.912	4363.7	23.58	141.71	65	52	481.6				
115.00		0.2500	34.427	27.118	4001.9	22.87	137.71	65	52	468.1				
120.00		0.2500	33.426	26.325	3660.8	22.17	133.71	65	52	454.6				
125.00		0.2500	32.426	25.531	3339.6	21.46	129.71	65	52	441.1				
127.00		0.2500	32.026	25.214	3216.6	21.18	128.10	65	52	172.7				
130.00		0.2500	31.426	24.737	3037.7	20.75	125.70	65	52	255.0				
135.00		0.2500	30.426	23.944	2754.7	20.05	121.70	65	52	414.1				
139.00	Bot - Section 4	0.2500	29.626	23.309	2541.3	19.48	118.50	65	52	321.6				
140.00		0.2500	29.426	23.150	2489.7	19.34	117.70	65	52	139.2				
142.75	Top - Section 3	0.1875	29.251	17.296	1845.8	26.10	156.00	65	52	378.0				
145.00		0.1875	28.801	17.028	1761.3	25.67	153.60	65	51	131.4				
148.00		0.1875	28.201	16.671	1652.8	25.11	150.40	65	52	172.0				
150.00		0.1875	27.801	16.433	1583.0	24.73	148.27	65	52	112.6				
155.00		0.1875	26.800	15.837	1417.2	23.79	142.94	65	52	274.5				
157.00		0.1875	26.400	15.599	1354.2	23.42	140.80	65	52	107.0				
160.00		0.1875	25.800	15.242	1263.3	22.85	137.60	65	52	157.4				
165.00		0.1875	24.800	14.647	1121.0	21.91	132.27	65	52	254.3				
167.00		0.1875	24.400	14.409	1067.3	21.54	130.13	65	52	98.9				
169.00		0.1875	24.000	14.171	1015.2	21.16	128.00	65	52	97.3				
									Total Weight	**27200.5**				**444.1**

Wind Loading - Shaft

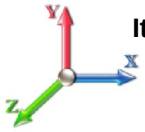
Structure: CT13071-A-SBA
Site Name: Woodbridge
Height: 169.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/31/2015

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 27

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		0.00	1.00	18.496	31.26	397.94	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	18.496	31.26	390.86	0.650	0.000	5.00	23.200	15.08	471.4	0.0	1305.1
10.00		0.00	1.00	18.496	31.26	383.77	0.650	0.000	5.00	22.783	14.81	462.9	0.0	1281.5
15.00		0.00	1.00	18.496	31.26	376.69	0.650	0.000	5.00	22.367	14.54	454.4	0.0	1257.8
20.00		0.00	1.00	18.496	31.26	369.60	0.650	0.000	5.00	21.950	14.27	446.0	0.0	1234.2
25.00		0.00	1.00	18.496	31.26	362.52	0.650	0.000	5.00	21.533	14.00	437.5	0.0	1210.6
30.00		0.00	1.00	18.496	31.26	355.44	0.650	0.000	5.00	21.116	13.73	429.0	0.0	1187.0
35.00		0.00	1.02	18.810	31.79	351.29	0.650	0.000	5.00	20.700	13.45	427.7	0.0	1163.3
40.00		0.00	1.06	19.541	33.02	350.78	0.650	0.000	5.00	20.283	13.18	435.4	0.0	1139.7
40.75	Bot - Section 2	0.00	1.06	19.645	33.20	350.61	0.650	0.000	0.75	3.006	1.95	64.9	0.0	168.9
45.00		0.00	1.09	20.210	34.15	349.32	0.650	0.000	4.25	17.125	11.13	380.2	0.0	1773.0
47.00	Top - Section 1	0.00	1.11	20.463	34.58	348.52	0.650	0.000	2.00	7.955	5.17	178.8	0.0	823.4
50.00		0.00	1.13	20.827	35.20	352.74	0.650	0.000	3.00	11.807	7.67	270.1	0.0	569.3
55.00		0.00	1.16	21.402	36.17	349.95	0.650	0.000	5.00	19.345	12.57	454.8	0.0	932.6
60.00		0.00	1.19	21.941	37.08	346.62	0.650	0.000	5.00	18.928	12.30	456.2	0.0	912.3
65.00		0.00	1.21	22.449	37.94	342.80	0.650	0.000	5.00	18.512	12.03	456.5	0.0	892.1
70.00		0.00	1.24	22.929	38.75	338.56	0.650	0.000	5.00	18.095	11.76	455.8	0.0	871.8
75.00		0.00	1.26	23.386	39.52	333.94	0.650	0.000	5.00	17.678	11.49	454.1	0.0	851.6
80.00		0.00	1.29	23.821	40.26	329.00	0.650	0.000	5.00	17.262	11.22	451.7	0.0	831.3
85.00		0.00	1.31	24.237	40.96	323.75	0.650	0.000	5.00	16.845	10.95	448.5	0.0	811.1
89.25	Bot - Section 3	0.00	1.33	24.577	41.54	319.07	0.650	0.000	4.25	13.990	9.09	377.7	0.0	673.5
90.00		0.00	1.33	24.636	41.63	318.23	0.650	0.000	0.75	2.469	1.60	66.8	0.0	196.8
91.25	RB1	0.00	1.34	24.733	41.80	316.81	0.650	0.000	1.25	4.094	2.66	111.2	0.0	479.5
94.25	Top - Section 2	0.00	1.35	24.963	42.19	313.34	0.650	0.000	3.00	9.719	6.32	266.5	0.0	1142.1
95.00		0.00	1.35	25.020	42.28	316.58	0.650	0.000	0.75	2.406	1.56	66.1	0.0	169.3
97.25	RT1	0.00	1.36	25.188	42.57	313.92	0.650	0.000	2.25	7.163	4.66	198.2	0.0	506.2
100.00		0.00	1.37	25.389	42.91	310.60	0.650	0.000	2.75	8.640	5.62	241.0	0.0	278.1
105.00		0.00	1.39	25.745	43.51	304.42	0.650	0.000	5.00	15.386	10.00	435.1	0.0	495.1
110.00		0.00	1.41	26.090	44.09	298.03	0.650	0.000	5.00	14.970	9.73	429.0	0.0	481.6
115.00		0.00	1.43	26.423	44.66	291.47	0.650	0.000	5.00	14.553	9.46	422.4	0.0	468.1
120.00		0.00	1.45	26.747	45.20	284.72	0.650	0.000	5.00	14.136	9.19	415.3	0.0	454.6
125.00		0.00	1.46	27.060	45.73	277.82	0.650	0.000	5.00	13.719	8.92	407.8	0.0	441.1
127.00	Appurtenance(s)	0.00	1.47	27.183	45.94	275.02	0.650	0.000	2.00	5.371	3.49	160.4	0.0	172.7
130.00		0.00	1.48	27.365	46.25	270.76	0.650	0.000	3.00	7.932	5.16	238.4	0.0	255.0
135.00		0.00	1.50	27.662	46.75	263.56	0.650	0.000	5.00	12.886	8.38	391.6	0.0	414.1
139.00	Bot - Section 4	0.00	1.51	27.894	47.14	257.71	0.650	0.000	4.00	10.009	6.51	306.7	0.0	321.6
140.00		0.00	1.51	27.951	47.24	256.23	0.650	0.000	1.00	2.492	1.62	76.5	0.0	139.2
142.75	Top - Section 3	0.00	1.52	28.107	47.50	252.14	0.650	0.000	2.75	6.766	4.40	208.9	0.0	378.0
145.00		0.00	1.53	28.233	47.71	252.04	0.650	0.000	2.25	5.442	3.54	168.8	0.0	131.4
148.00	Appurtenance(s)	0.00	1.54	28.398	47.99	247.52	0.650	0.000	3.00	7.125	4.63	222.3	0.0	172.0
150.00	Appurtenance(s)	0.00	1.54	28.507	48.18	244.47	0.650	0.000	2.00	4.667	3.03	146.1	0.0	112.6
155.00		0.00	1.56	28.776	48.63	236.78	0.650	0.000	5.00	11.375	7.39	359.6	0.0	274.5
157.00	Appurtenance(s)	0.00	1.56	28.881	48.81	233.68	0.650	0.000	2.00	4.433	2.88	140.7	0.0	107.0
160.00		0.00	1.57	29.038	49.07	228.98	0.650	0.000	3.00	6.525	4.24	208.1	0.0	157.4
165.00		0.00	1.58	29.294	49.51	221.08	0.650	0.000	5.00	10.542	6.85	339.2	0.0	254.3
167.00	Appurtenance(s)	0.00	1.59	29.395	49.68	217.89	0.650	0.000	2.00	4.100	2.67	132.4	0.0	98.9
169.00		0.00	1.59	29.495	49.85	214.68	0.650	0.000	2.00	4.033	2.62	130.7	0.0	97.3
								Totals:	**169.00**			**14,303.6**		**28,088.6**

Discrete Appurtenance Forces

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 27

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LNX-6515DS	3	29.395	49.678	0.84	28.75	150.90	0.000	0.000	1428.41	0.00	0.00
2	167.00	Ericsson S11B12	3	29.395	49.678	0.67	6.65	153.00	0.000	0.000	330.51	0.00	0.00
3	167.00	Ericsson KRY 112 144/1	3	29.395	49.678	0.67	0.82	33.00	0.000	0.000	40.94	0.00	0.00
4	167.00	AIR B4A B2P	3	29.395	49.678	0.86	16.98	271.20	0.000	0.000	843.36	0.00	0.00
5	167.00	AIR B2A B4P	3	29.395	49.678	0.86	16.98	274.50	0.000	0.000	843.36	0.00	0.00
6	167.00	T-Arms/Commscope	3	29.420	49.721	0.75	15.19	1020.00	0.000	0.500	755.13	0.00	377.57
7	157.00	GPS	1	28.881	48.809	1.00	1.00	10.00	0.000	0.000	48.81	0.00	0.00
8	157.00	BXA-70063/6CF	1	28.881	48.809	0.70	5.41	17.00	0.000	0.000	264.11	0.00	0.00
9	157.00	DB846F65ZAXY	4	28.881	48.809	0.93	26.23	84.00	0.000	0.000	1280.07	0.00	0.00
10	157.00	DB846H80E-SX	2	28.881	48.809	1.10	11.02	32.00	0.000	0.000	537.98	0.00	0.00
11	157.00	T-Arms	3	28.881	48.809	0.75	18.00	1050.00	0.000	0.000	878.57	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	28.881	48.809	0.75	23.85	112.20	0.000	0.000	1164.10	0.00	0.00
13	157.00	RFS DB T1-6Z-8AB-OZ	1	28.881	48.809	0.68	2.54	19.00	0.000	0.000	124.13	0.00	0.00
14	157.00	SLCP 2x6014F	2	28.881	48.809	0.89	12.83	40.00	0.000	0.000	626.41	0.00	0.00
15	157.00	ALU RRH2X60-AWS RRH	3	28.881	48.809	0.76	9.03	180.00	0.000	0.000	440.69	0.00	0.00
16	150.00	DC6-48-60-18-8F-SA	1	28.507	48.177	1.00	1.47	31.80	0.000	0.000	70.82	0.00	0.00
17	150.00	Collar Mount	1	28.507	48.177	1.00	3.00	100.00	0.000	0.000	144.53	0.00	0.00
18	150.00	RRUS 11	6	28.507	48.177	0.67	11.82	304.20	0.000	0.000	569.40	0.00	0.00
19	148.00	LGP13519 Diplexers	6	28.398	47.993	0.50	1.02	31.80	0.000	0.000	48.95	0.00	0.00
20	148.00	7770.00	6	28.398	47.993	0.73	25.75	210.00	0.000	0.000	1236.03	0.00	0.00
21	148.00	AM-X-CD-16-65-00T	3	28.398	47.993	0.81	16.09	99.00	0.000	0.000	772.04	0.00	0.00
22	148.00	LGP21401-TMA	6	28.398	47.993	0.50	3.87	84.60	0.000	0.000	185.73	0.00	0.00
23	148.00	T-Arms	3	28.398	47.993	0.75	18.00	1050.00	0.000	0.000	863.87	0.00	0.00
24	127.00	VHLP800-11	1	27.183	45.940	1.00	8.43	48.00	1.455	0.000	387.27	563.49	0.00
25	127.00	VHLP2-11	3	27.183	45.940	0.90	12.64	81.00	1.455	0.000	580.50	844.63	0.00
26	127.00	Sector Frames	3	27.183	45.940	0.75	33.75	1500.00	0.000	0.000	1550.47	0.00	0.00
27	127.00	LLPX310R	3	27.183	45.940	0.69	10.00	85.80	0.000	0.000	459.31	0.00	0.00
28	127.00	2.5GHz RRH BTS	3	27.183	45.940	0.73	3.99	99.00	0.000	0.000	183.11	0.00	0.00
						Totals:		**7,172.00**			**16,658.63**		

Total Applied Force Summary

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 27

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		502.63	1564.16	0.00	0.00
10.00		494.16	1540.53	0.00	0.00
15.00		485.70	1516.90	0.00	0.00
20.00		477.23	1493.27	0.00	0.00
25.00		468.76	1469.64	0.00	0.00
30.00		460.30	1446.01	0.00	0.00
35.00		459.49	1422.38	0.00	0.00
40.00		468.41	1398.76	0.00	0.00
40.75		69.86	207.78	0.00	0.00
45.00		409.22	1993.19	0.00	0.00
47.00		192.64	927.00	0.00	0.00
50.00		291.25	724.70	0.00	0.00
55.00		490.99	1191.63	0.00	0.00
60.00		493.30	1171.38	0.00	0.00
65.00		494.44	1151.13	0.00	0.00
70.00		494.52	1130.88	0.00	0.00
75.00		493.66	1110.62	0.00	0.00
80.00		491.94	1090.37	0.00	0.00
85.00		489.44	1070.12	0.00	0.00
89.25		413.02	893.67	0.00	0.00
90.00		78.37	235.67	0.00	0.00
91.25		130.56	467.67	0.00	0.00
94.25		313.35	1113.79	0.00	0.00
95.00		77.87	162.26	0.00	0.00
97.25		233.62	484.94	0.00	0.00
100.00		279.16	420.56	0.00	0.00
105.00		478.65	754.19	0.00	0.00
110.00		473.11	740.69	0.00	0.00
115.00		467.06	727.19	0.00	0.00
120.00		460.53	713.68	0.00	0.00
125.00		453.55	700.18	0.00	0.00
127.00	(13) appurtenances	3339.42	2090.09	1408.12	0.00
130.00		266.18	398.57	0.00	0.00
135.00		438.31	653.48	0.00	0.00
139.00		344.39	513.06	0.00	0.00
140.00		85.95	187.08	0.00	0.00
142.75		235.04	509.61	0.00	0.00
145.00		190.26	239.10	0.00	0.00
148.00	(24) appurtenances	3357.71	1791.01	0.00	0.00
150.00	(8) appurtenances	950.17	644.38	0.00	0.00
155.00		408.20	440.27	0.00	0.00
157.00	(23) appurtenances	5525.05	1717.47	0.00	0.00
160.00		208.14	197.02	0.00	0.00
165.00		339.23	320.27	0.00	0.00
167.00	(18) appurtenances	4374.09	2027.87	0.00	377.57
169.00		130.68	97.25	0.00	0.00
	Totals:	**32,279.64**	**42,861.48**	**1,408.12**	**377.57**

Resulting Forces and Deflections

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 27

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-32.349	-42.809	0.000	-0.018	-1.384	-3966.8	0.000	0.000	0.000	0.000	0.000
5.00	-31.976	-41.144	0.000	-0.018	-1.384	-3805.1	-0.098	0.000	0.098	-0.182	0.000
10.00	-31.602	-39.503	0.000	-0.018	-1.384	-3645.2	-0.387	0.000	0.387	-0.366	0.000
15.00	-31.228	-37.889	0.000	-0.019	-1.384	-3487.2	-0.870	0.000	0.870	-0.552	0.000
20.00	-30.854	-36.299	0.000	-0.019	-1.384	-3331.1	-1.550	0.000	1.550	-0.741	0.000
25.00	-30.480	-34.735	0.000	-0.020	-1.385	-3176.8	-2.428	0.000	2.428	-0.931	0.000
30.00	-30.106	-33.196	0.000	-0.021	-1.385	-3024.4	-3.506	0.000	3.506	-1.124	0.000
35.00	-29.725	-31.682	0.000	-0.022	-1.385	-2873.9	-4.787	0.000	4.787	-1.318	-0.001
40.00	-29.281	-30.238	0.000	-0.022	-1.386	-2725.2	-6.273	0.000	6.273	-1.514	-0.001
40.75	-29.258	-29.981	0.000	-0.024	-1.386	-2703.3	-6.513	0.000	6.513	-1.544	-0.001
45.00	-28.853	-27.938	0.000	-0.024	-1.386	-2578.9	-7.965	0.000	7.965	-1.713	-0.001
47.00	-28.680	-26.967	0.000	-0.025	-1.386	-2521.2	-8.700	0.000	8.700	-1.794	-0.001
50.00	-28.444	-26.166	0.000	-0.027	-1.387	-2435.2	-9.867	0.000	9.867	-1.915	-0.001
55.00	-28.008	-24.884	0.000	-0.030	-1.387	-2293.0	-11.991	0.000	11.991	-2.137	-0.001
60.00	-27.561	-23.626	0.000	-0.032	-1.388	-2152.9	-14.348	0.000	14.348	-2.359	-0.001
65.00	-27.105	-22.392	0.001	-0.034	-1.389	-2015.1	-16.938	0.001	16.938	-2.582	-0.001
70.00	-26.640	-21.182	0.001	-0.037	-1.390	-1879.6	-19.762	0.001	19.762	-2.805	-0.001
75.00	-26.168	-19.997	0.001	-0.040	-1.391	-1746.4	-22.818	0.001	22.818	-3.028	-0.002
80.00	-25.690	-18.836	0.001	-0.044	-1.392	-1615.6	-26.107	0.001	26.107	-3.250	-0.002
85.00	-25.202	-17.708	0.001	-0.047	-1.393	-1487.1	-29.627	0.002	29.627	-3.470	-0.002
89.25	-24.766	-16.795	0.001	-0.048	-1.393	-1380.0	-32.800	0.002	32.800	-3.656	-0.002
90.00	-24.685	-16.545	0.001	-0.049	-1.393	-1361.4	-33.376	0.002	33.376	-3.690	-0.002
91.25	-24.546	-16.054	0.001	-0.051	-1.394	-1330.6	-34.349	0.002	34.349	-3.745	-0.002
94.25	-24.176	-14.938	0.001	-0.052	-1.394	-1256.9	-36.733	0.002	36.733	-3.843	-0.002
95.00	-24.103	-14.756	0.001	-0.053	-1.396	-1238.8	-37.338	0.002	37.338	-3.868	-0.002
97.25	-23.862	-14.245	0.001	-0.054	-1.397	-1184.6	-39.183	0.003	39.183	-3.961	-0.003
100.00	-23.604	-13.761	0.001	-0.058	-1.398	-1119.0	-41.496	0.003	41.496	-4.073	-0.003
105.00	-23.136	-12.928	0.001	-0.063	-1.400	-1000.9	-45.917	0.004	45.917	-4.366	-0.003
110.00	-22.665	-12.117	0.001	-0.068	-1.402	-885.31	-50.638	0.004	50.638	-4.649	-0.004
115.00	-22.191	-11.330	0.001	-0.075	-1.404	-771.99	-55.649	0.005	55.649	-4.919	-0.004
120.00	-21.715	-10.567	0.002	-0.081	-1.406	-661.04	-60.933	0.007	60.933	-5.174	-0.005
125.00	-21.226	-9.852	0.002	-0.088	-1.407	-552.46	-66.473	0.008	66.473	-5.409	-0.005
127.00	-17.718	-8.055	0.002	0.045	0.000	-510.01	-68.756	0.009	68.756	-5.500	-0.005
130.00	-17.437	-7.635	0.002	0.040	0.000	-456.86	-72.249	0.009	72.249	-5.628	-0.005
135.00	-16.955	-6.980	0.002	0.033	0.000	-369.68	-78.241	0.010	78.241	-5.822	-0.005
139.00	-16.570	-6.480	0.002	0.027	0.000	-301.86	-83.172	0.011	83.172	-5.960	-0.005
140.00	-16.471	-6.286	0.001	0.025	0.000	-285.29	-84.422	0.011	84.422	-5.993	-0.005
142.75	-16.191	-5.784	0.001	0.021	0.000	-239.99	-87.893	0.012	87.893	-6.076	-0.005
145.00	-15.984	-5.546	0.001	0.018	0.000	-203.56	-90.767	0.012	90.767	-6.136	-0.005
148.00	-12.457	-4.112	0.001	0.014	0.000	-155.61	-94.646	0.013	94.646	-6.223	-0.005
150.00	-11.447	-3.561	0.001	0.012	0.000	-130.70	-97.259	0.013	97.259	-6.272	-0.005
155.00	-10.996	-3.157	0.001	0.006	0.000	-73.464	-103.87	0.014	103.870	-6.364	-0.005
157.00	-5.315	-2.062	0.000	0.005	0.000	-51.472	-106.53	0.015	106.537	-6.389	-0.005
160.00	-5.087	-1.887	0.000	0.003	0.000	-35.526	-110.55	0.015	110.553	-6.417	-0.005
165.00	-4.715	-1.606	0.000	0.001	0.000	-10.089	-117.27	0.016	117.275	-6.442	-0.005
167.00	-0.141	-0.082	0.000	0.000	0.000	-0.282	-119.97	0.017	119.970	-6.445	-0.005
169.00	-0.131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	122.664	-6.445	-0.005

Resulting Stresses

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 27

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.55	0.84	0.00	0.01	0.00	44.68	45.26	52.0	0.871
5.00	0.54	0.85	0.00	0.01	0.00	44.45	45.01	52.0	0.866
10.00	0.53	0.85	0.00	0.01	0.00	44.19	44.74	52.0	0.861
15.00	0.52	0.86	0.00	0.01	0.00	43.90	44.44	52.0	0.855
20.00	0.51	0.87	0.00	0.01	0.00	43.57	44.11	52.0	0.849
25.00	0.49	0.87	0.00	0.01	0.00	43.22	43.74	52.0	0.841
30.00	0.48	0.88	0.00	0.01	0.00	42.82	43.33	52.0	0.834
35.00	0.47	0.89	0.00	0.01	0.00	42.39	42.88	52.0	0.825
40.00	0.46	0.89	0.00	0.01	0.00	41.90	42.39	52.0	0.815
40.75	0.45	0.89	0.00	0.01	0.00	41.83	42.31	52.0	0.814
45.00	0.43	0.90	0.00	0.01	0.00	41.38	41.84	52.0	0.805
47.00	0.48	1.03	0.00	0.01	0.00	46.31	46.82	52.0	0.901
50.00	0.47	1.03	0.00	0.01	0.00	45.89	46.40	52.0	0.893
55.00	0.46	1.04	0.00	0.01	0.00	45.14	45.63	52.0	0.878
60.00	0.45	1.05	0.00	0.01	0.00	44.31	44.80	52.0	0.862
65.00	0.43	1.05	0.00	0.01	0.00	43.41	43.88	52.0	0.844
70.00	0.42	1.06	0.00	0.02	0.00	42.43	42.89	52.0	0.825
75.00	0.40	1.07	0.00	0.02	0.00	41.35	41.80	52.0	0.804
80.00	0.39	1.07	0.00	0.02	0.00	40.17	40.61	52.0	0.781
85.00	0.38	1.08	0.00	0.02	0.00	38.88	39.30	52.0	0.756
89.25	0.36	1.08	0.00	0.02	0.00	37.69	38.10	52.0	0.733
90.00	0.36	1.08	0.00	0.02	0.00	37.47	37.88	52.0	0.729
91.25	0.35	1.09	0.00	0.02	0.00	28.35	28.70	52.0	0.552
94.25	0.49	1.60	0.00	0.03	0.00	27.53	27.53	52.0	0.530
95.00	0.49	1.60	0.00	0.03	0.00	35.89	35.89	51.2	0.701
97.25	0.48	1.61	0.00	0.03	0.00	35.01	35.48	51.5	0.689
100.00	0.47	1.61	0.00	0.03	0.00	49.53	50.08	51.8	0.966
105.00	0.45	1.62	0.00	0.03	0.00	46.80	47.34	52.0	0.911
110.00	0.43	1.64	0.00	0.03	0.00	43.79	44.32	52.0	0.853
115.00	0.42	1.65	0.00	0.04	0.00	40.46	40.98	52.0	0.788
120.00	0.40	1.66	0.00	0.04	0.00	36.77	37.29	52.0	0.717
125.00	0.39	1.68	0.00	0.04	0.01	32.68	33.20	52.0	0.639
127.00	0.32	1.42	0.00	0.00	0.00	30.94	31.35	52.0	0.603
130.00	0.31	1.42	0.00	0.00	0.00	28.80	29.21	52.0	0.562
135.00	0.29	1.43	0.00	0.00	0.00	24.88	25.29	52.0	0.487
139.00	0.28	1.43	0.00	0.00	0.00	21.44	21.86	52.0	0.421
140.00	0.27	1.43	0.00	0.00	0.00	20.54	20.96	52.0	0.403
142.75	0.33	1.89	0.00	0.00	0.00	23.17	23.73	52.0	0.457
145.00	0.33	1.89	0.00	0.00	0.00	20.28	20.86	51.2	0.407
148.00	0.25	1.51	0.00	0.00	0.00	16.18	16.63	51.7	0.321
150.00	0.22	1.40	0.00	0.00	0.00	13.98	14.41	52.0	0.277
155.00	0.20	1.40	0.00	0.00	0.00	8.46	9.00	52.0	0.173
157.00	0.13	0.69	0.00	0.00	0.00	6.11	6.36	52.0	0.122
160.00	0.12	0.67	0.00	0.00	0.00	4.42	4.69	52.0	0.090
165.00	0.11	0.65	0.00	0.00	0.00	1.36	1.85	52.0	0.036
167.00	0.01	0.02	0.00	0.00	0.00	0.04	0.06	52.0	0.001
169.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	52.0	0.001

Wind Loading - Shaft

Structure: CT13071-A-SBA
Site Name: Woodbridge
Height: 169.00 (ft)
Base Elev: 0.000 (ft)

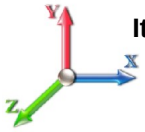
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/31/2015

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



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		0.00	1.00	13.871	23.44	344.62	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	13.871	23.44	338.48	0.650	0.500	5.00	23.617	15.35	359.9	171.8	1476.9
10.00		0.00	1.00	13.871	23.44	332.35	0.650	0.500	5.00	23.200	15.08	353.5	168.7	1450.2
15.00		0.00	1.00	13.871	23.44	326.21	0.650	0.500	5.00	22.783	14.81	347.2	165.6	1423.5
20.00		0.00	1.00	13.871	23.44	320.08	0.650	0.500	5.00	22.366	14.54	340.8	162.6	1396.8
25.00		0.00	1.00	13.871	23.44	313.94	0.650	0.500	5.00	21.950	14.27	334.5	159.5	1370.1
30.00		0.00	1.00	13.871	23.44	307.81	0.650	0.500	5.00	21.533	14.00	328.1	156.4	1343.3
35.00		0.00	1.02	14.106	23.84	304.22	0.650	0.500	5.00	21.116	13.73	327.2	153.3	1316.6
40.00		0.00	1.06	14.655	24.77	303.77	0.650	0.500	5.00	20.700	13.45	333.2	150.2	1289.9
40.75	Bot - Section 2	0.00	1.06	14.733	24.90	303.63	0.650	0.500	0.75	3.069	1.99	49.7	22.5	191.4
45.00		0.00	1.09	15.156	25.61	302.51	0.650	0.500	4.25	17.479	11.36	291.0	127.0	1900.0
47.00	Top - Section 1	0.00	1.11	15.346	25.93	301.82	0.650	0.500	2.00	8.121	5.28	136.9	59.3	882.7
50.00		0.00	1.13	15.620	26.40	305.47	0.650	0.500	3.00	12.057	7.84	206.9	87.8	657.1
55.00		0.00	1.16	16.051	27.13	303.06	0.650	0.500	5.00	19.762	12.85	348.4	143.3	1075.8
60.00		0.00	1.19	16.455	27.81	300.17	0.650	0.500	5.00	19.345	12.57	349.7	140.2	1052.5
65.00		0.00	1.21	16.836	28.45	296.86	0.650	0.500	5.00	18.928	12.30	350.1	137.1	1029.2
70.00		0.00	1.24	17.196	29.06	293.19	0.650	0.500	5.00	18.512	12.03	349.7	134.0	1005.8
75.00		0.00	1.26	17.538	29.64	289.20	0.650	0.500	5.00	18.095	11.76	348.6	130.9	982.5
80.00		0.00	1.29	17.865	30.19	284.91	0.650	0.500	5.00	17.678	11.49	346.9	127.8	959.2
85.00		0.00	1.31	18.177	30.72	280.37	0.650	0.500	5.00	17.261	11.22	344.7	124.7	935.8
89.25	Bot - Section 3	0.00	1.33	18.432	31.15	276.32	0.650	0.500	4.25	14.345	9.32	290.4	103.8	777.3
90.00		0.00	1.33	18.476	31.22	275.59	0.650	0.500	0.75	2.531	1.65	51.4	18.5	215.3
91.25	RB1	0.00	1.34	18.549	31.35	274.36	0.650	0.500	1.25	4.198	2.73	85.5	30.6	510.1
94.25	Top - Section 2	0.00	1.35	18.721	31.64	271.35	0.650	0.500	3.00	9.969	6.48	205.0	72.3	1214.5
95.00		0.00	1.35	18.764	31.71	274.15	0.650	0.500	0.75	2.469	1.60	50.9	18.0	187.4
97.25	RT1	0.00	1.36	18.890	31.92	271.85	0.650	0.500	2.25	7.350	4.78	152.5	53.4	559.6
100.00		0.00	1.37	19.041	32.18	268.98	0.650	0.500	2.75	8.869	5.76	185.5	64.4	342.5
105.00		0.00	1.39	19.308	32.63	263.63	0.650	0.500	5.00	15.803	10.27	335.2	113.9	609.1
110.00		0.00	1.41	19.566	33.07	258.10	0.650	0.500	5.00	15.386	10.00	330.7	110.9	592.5
115.00		0.00	1.43	19.816	33.49	252.41	0.650	0.500	5.00	14.969	9.73	325.9	107.8	575.9
120.00		0.00	1.45	20.059	33.90	246.57	0.650	0.500	5.00	14.553	9.46	320.7	104.7	559.3
125.00		0.00	1.46	20.294	34.30	240.59	0.650	0.500	5.00	14.136	9.19	315.1	101.6	542.7
127.00	Appurtenance(s)	0.00	1.47	20.386	34.45	238.16	0.650	0.500	2.00	5.538	3.60	124.0	40.1	212.8
130.00		0.00	1.48	20.523	34.68	234.48	0.650	0.500	3.00	8.182	5.32	184.4	59.1	314.1
135.00		0.00	1.50	20.745	35.06	228.25	0.650	0.500	5.00	13.303	8.65	303.1	95.4	509.6
139.00	Bot - Section 4	0.00	1.51	20.919	35.35	223.17	0.650	0.500	4.00	10.342	6.72	237.7	74.4	395.9
140.00		0.00	1.51	20.962	35.43	221.89	0.650	0.500	1.00	2.575	1.67	59.3	18.7	157.9
142.75	Top - Section 3	0.00	1.52	21.079	35.62	218.35	0.650	0.500	2.75	6.995	4.55	162.0	50.5	428.5
145.00		0.00	1.53	21.173	35.78	218.27	0.650	0.500	2.25	5.630	3.66	130.9	40.7	172.1
148.00	Appurtenance(s)	0.00	1.54	21.297	35.99	214.35	0.650	0.500	3.00	7.375	4.79	172.5	53.1	225.1
150.00	Appurtenance(s)	0.00	1.54	21.379	36.13	211.71	0.650	0.500	2.00	4.833	3.14	113.5	34.9	147.6
155.00		0.00	1.56	21.581	36.47	205.06	0.650	0.500	5.00	11.792	7.66	279.5	84.2	358.8
157.00	Appurtenance(s)	0.00	1.56	21.660	36.60	202.36	0.650	0.500	2.00	4.600	2.99	109.5	33.2	140.2
160.00		0.00	1.57	21.777	36.80	198.30	0.650	0.500	3.00	6.775	4.40	162.1	48.7	206.1
165.00		0.00	1.58	21.969	37.13	191.45	0.650	0.500	5.00	10.958	7.12	264.5	78.1	332.3
167.00	Appurtenance(s)	0.00	1.59	22.045	37.26	188.69	0.650	0.500	2.00	4.267	2.77	103.3	30.7	129.6
169.00		0.00	1.59	22.120	37.38	185.91	0.650	0.500	2.00	4.200	2.73	102.1	30.2	127.5
								Totals:	**169.00**			**11,004.2**		**32,283.4**

Discrete Appurtenance Forces

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LNX-6515DS	3	22.045	37.256	0.84	31.10	346.80	0.000	0.000	1158.56	0.00	0.00
2	167.00	Ericsson S11B12	3	22.045	37.256	0.67	7.82	227.10	0.000	0.000	291.30	0.00	0.00
3	167.00	Ericsson KRY 112 144/1	3	22.045	37.256	0.67	1.11	42.30	0.000	0.000	41.19	0.00	0.00
4	167.00	AIR B4A B2P	3	22.045	37.256	0.86	17.98	384.30	0.000	0.000	669.97	0.00	0.00
5	167.00	AIR B2A B4P	3	22.045	37.256	0.86	17.98	387.60	0.000	0.000	669.97	0.00	0.00
6	167.00	T-Arms/Commscope	3	22.064	37.288	0.75	23.63	1260.00	0.000	0.500	880.93	0.00	440.47
7	157.00	GPS	1	21.660	36.605	1.00	1.25	18.00	0.000	0.000	45.76	0.00	0.00
8	157.00	BXA-70063/6CF	1	21.660	36.605	0.70	5.98	57.60	0.000	0.000	218.82	0.00	0.00
9	157.00	DB846F65ZAXY	4	21.660	36.605	0.93	0.00	0.00	0.000	0.000	0.00	0.00	0.00
10	157.00	DB846H80E-SX	2	21.660	36.605	1.10	0.00	0.00	0.000	0.000	0.00	0.00	0.00
11	157.00	T-Arms	3	21.660	36.605	0.75	23.63	1260.00	0.000	0.000	864.79	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	21.660	36.605	0.75	27.05	277.20	0.000	0.000	989.98	0.00	0.00
13	157.00	RFS DB T1-6Z-8AB-OZ	1	21.660	36.605	0.68	2.69	35.80	0.000	0.000	98.57	0.00	0.00
14	157.00	SLCP 2x6014F	2	21.660	36.605	0.89	14.03	140.80	0.000	0.000	513.43	0.00	0.00
15	157.00	ALU RRH2X60-AWS RRH	3	21.660	36.605	0.76	9.64	240.30	0.000	0.000	353.03	0.00	0.00
16	150.00	DC6-48-60-18-8F-SA	1	21.379	36.131	1.00	1.67	49.50	0.000	0.000	60.34	0.00	0.00
17	150.00	Collar Mount	1	21.379	36.131	1.00	5.00	450.00	0.000	0.000	180.65	0.00	0.00
18	150.00	RRUS 11	6	21.379	36.131	0.67	12.62	396.00	0.000	0.000	456.07	0.00	0.00
19	148.00	LGP13519 Diplexers	6	21.297	35.993	0.50	1.41	48.00	0.000	0.000	50.75	0.00	0.00
20	148.00	7770.00	6	21.297	35.993	0.73	28.60	0.00	0.000	0.000	1029.44	0.00	0.00
21	148.00	AM-X-CD-16-65-00T	3	21.297	35.993	0.81	17.67	223.50	0.000	0.000	635.85	0.00	0.00
22	148.00	LGP21401-TMA	6	21.297	35.993	0.50	4.59	127.20	0.000	0.000	165.21	0.00	0.00
23	148.00	T-Arms	3	21.297	35.993	0.75	23.63	1260.00	0.000	0.000	850.33	0.00	0.00
24	127.00	VHLP800-11	1	20.386	34.453	1.00	8.92	97.00	1.455	0.000	307.32	447.15	0.00
25	127.00	VHLP2-11	3	20.386	34.453	0.90	13.63	165.00	1.455	0.000	469.77	683.51	0.00
26	127.00	Sector Frames	3	20.386	34.453	0.75	48.38	2100.00	0.000	0.000	1666.66	0.00	0.00
27	127.00	LLPX310R	3	20.386	34.453	0.69	11.10	163.50	0.000	0.000	382.26	0.00	0.00
28	127.00	2.5GHz RRH BTS	3	20.386	34.453	0.73	4.58	134.70	0.000	0.000	157.69	0.00	0.00
						Totals:		**9,892.20**			**13,208.64**		

Total Applied Force Summary

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

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		395.02	1780.97	0.00	0.00
10.00		388.67	1754.25	0.00	0.00
15.00		382.32	1727.54	0.00	0.00
20.00		375.97	1700.82	0.00	0.00
25.00		369.62	1674.11	0.00	0.00
30.00		363.27	1647.39	0.00	0.00
35.00		362.97	1620.68	0.00	0.00
40.00		370.38	1593.97	0.00	0.00
40.75		55.27	236.99	0.00	0.00
45.00		323.68	2158.46	0.00	0.00
47.00		152.47	1004.28	0.00	0.00
50.00		230.64	839.51	0.00	0.00
55.00		389.13	1379.90	0.00	0.00
60.00		391.39	1356.56	0.00	0.00
65.00		392.74	1333.22	0.00	0.00
70.00		393.27	1309.88	0.00	0.00
75.00		393.07	1286.54	0.00	0.00
80.00		392.21	1263.20	0.00	0.00
85.00		390.74	1239.86	0.00	0.00
89.25		330.16	1035.73	0.00	0.00
90.00		64.73	260.91	0.00	0.00
91.25		107.88	509.52	0.00	0.00
94.25		259.12	1213.14	0.00	0.00
95.00		64.44	187.02	0.00	0.00
97.25		193.46	558.62	0.00	0.00
100.00		229.43	509.68	0.00	0.00
105.00		384.12	913.14	0.00	0.00
110.00		380.30	896.55	0.00	0.00
115.00		376.09	879.96	0.00	0.00
120.00		371.51	863.37	0.00	0.00
125.00		366.58	846.78	0.00	0.00
127.00	(13) appurtenances	3128.39	2994.64	1130.67	0.00
130.00		215.66	484.68	0.00	0.00
135.00		355.74	793.91	0.00	0.00
139.00		280.08	623.43	0.00	0.00
140.00		69.92	214.78	0.00	0.00
142.75		191.37	584.85	0.00	0.00
145.00		155.10	300.04	0.00	0.00
148.00	(24) appurtenances	2936.51	2054.45	0.00	0.00
150.00	(8) appurtenances	832.26	1156.81	0.00	0.00
155.00		334.25	569.51	0.00	0.00
157.00	(23) appurtenances	3215.80	2254.18	0.00	0.00
160.00		162.07	245.71	0.00	0.00
165.00		264.46	398.34	0.00	0.00
167.00	(18) appurtenances	3815.24	2804.11	0.00	440.47
169.00		102.06	127.49	0.00	0.00
	Totals:	**25,699.58**	**51,189.50**	**1,130.67**	**440.47**

Resulting Forces and Deflections

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 26

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-25.766	-51.156	0.000	-0.014	-1.118	-3178.9	0.000	0.000	0.000	0.000	0.000
5.00	-25.495	-49.310	0.000	-0.015	-1.118	-3050.1	-0.078	0.000	0.078	-0.146	0.000
10.00	-25.222	-47.492	0.000	-0.015	-1.118	-2922.6	-0.310	0.000	0.310	-0.293	0.000
15.00	-24.949	-45.702	0.000	-0.015	-1.118	-2796.5	-0.698	0.000	0.698	-0.443	0.000
20.00	-24.674	-43.939	0.000	-0.015	-1.119	-2671.8	-1.242	0.000	1.242	-0.594	0.000
25.00	-24.398	-42.204	0.000	-0.016	-1.119	-2548.4	-1.946	0.000	1.946	-0.747	0.000
30.00	-24.121	-40.497	0.000	-0.017	-1.119	-2426.4	-2.811	0.000	2.811	-0.901	0.000
35.00	-23.837	-38.818	0.000	-0.017	-1.119	-2305.8	-3.838	0.000	3.838	-1.057	0.000
40.00	-23.493	-37.195	0.000	-0.017	-1.119	-2186.6	-5.030	0.000	5.030	-1.214	-0.001
40.75	-23.485	-36.926	0.000	-0.018	-1.119	-2169.0	-5.223	0.000	5.223	-1.239	-0.001
45.00	-23.172	-34.735	0.000	-0.018	-1.119	-2069.2	-6.387	0.000	6.387	-1.374	-0.001
47.00	-23.043	-33.702	0.000	-0.019	-1.119	-2022.9	-6.977	0.000	6.977	-1.439	-0.001
50.00	-22.870	-32.814	0.000	-0.021	-1.120	-1953.7	-7.912	0.000	7.912	-1.536	-0.001
55.00	-22.539	-31.376	0.000	-0.022	-1.120	-1839.4	-9.617	0.000	9.617	-1.714	-0.001
60.00	-22.199	-29.963	0.000	-0.024	-1.120	-1726.7	-11.508	0.000	11.508	-1.893	-0.001
65.00	-21.850	-28.576	0.000	-0.025	-1.121	-1615.7	-13.585	0.000	13.585	-2.071	-0.001
70.00	-21.492	-27.215	0.000	-0.027	-1.121	-1506.5	-15.850	0.001	15.850	-2.250	-0.001
75.00	-21.127	-25.881	0.000	-0.029	-1.122	-1399.0	-18.302	0.001	18.302	-2.428	-0.001
80.00	-20.756	-24.572	0.000	-0.031	-1.122	-1293.4	-20.940	0.001	20.940	-2.606	-0.001
85.00	-20.373	-23.294	0.001	-0.033	-1.123	-1189.6	-23.763	0.001	23.763	-2.782	-0.002
89.25	-20.026	-22.246	0.001	-0.034	-1.123	-1103.0	-26.307	0.001	26.307	-2.931	-0.002
90.00	-19.961	-21.976	0.001	-0.035	-1.123	-1088.0	-26.770	0.001	26.770	-2.958	-0.002
91.25	-19.850	-21.452	0.001	-0.035	-1.123	-1063.0	-27.550	0.001	27.550	-3.002	-0.002
94.25	-19.544	-20.237	0.001	-0.036	-1.124	-1003.5	-29.461	0.001	29.461	-3.080	-0.002
95.00	-19.486	-20.038	0.001	-0.037	-1.125	-988.87	-29.946	0.002	29.946	-3.100	-0.002
97.25	-19.291	-19.463	0.001	-0.037	-1.125	-945.02	-31.425	0.002	31.425	-3.175	-0.002
100.00	-19.087	-18.913	0.001	-0.040	-1.126	-891.97	-33.279	0.002	33.279	-3.264	-0.002
105.00	-18.722	-17.949	0.001	-0.043	-1.127	-796.54	-36.823	0.002	36.823	-3.497	-0.003
110.00	-18.351	-17.008	0.001	-0.046	-1.127	-702.93	-40.605	0.003	40.605	-3.722	-0.003
115.00	-17.975	-16.090	0.001	-0.050	-1.128	-611.18	-44.617	0.004	44.617	-3.936	-0.003
120.00	-17.595	-15.196	0.001	-0.054	-1.129	-521.30	-48.847	0.004	48.847	-4.138	-0.004
125.00	-17.199	-14.341	0.001	-0.058	-1.130	-433.33	-53.278	0.005	53.278	-4.323	-0.004
127.00	-13.869	-11.572	0.001	0.027	0.000	-398.93	-55.103	0.006	55.103	-4.394	-0.004
130.00	-13.641	-11.075	0.001	0.024	0.000	-357.33	-57.895	0.006	57.895	-4.494	-0.004
135.00	-13.247	-10.282	0.001	0.020	0.000	-289.12	-62.680	0.007	62.680	-4.646	-0.004
139.00	-12.927	-9.669	0.001	0.016	0.000	-236.13	-66.616	0.007	66.616	-4.754	-0.004
140.00	-12.847	-9.450	0.001	0.015	0.000	-223.21	-67.614	0.007	67.614	-4.780	-0.004
142.75	-12.616	-8.871	0.001	0.013	0.000	-187.88	-70.384	0.008	70.384	-4.844	-0.004
145.00	-12.445	-8.573	0.001	0.011	0.000	-159.49	-72.677	0.008	72.677	-4.892	-0.004
148.00	-9.349	-6.770	0.001	0.008	0.000	-122.16	-75.771	0.008	75.771	-4.960	-0.004
150.00	-8.425	-5.681	0.001	0.007	0.000	-103.46	-77.855	0.009	77.855	-4.999	-0.004
155.00	-8.047	-5.137	0.001	0.004	0.000	-61.336	-83.127	0.009	83.127	-5.073	-0.004
157.00	-4.645	-3.175	0.000	0.003	0.000	-45.243	-85.254	0.009	85.254	-5.094	-0.004
160.00	-4.463	-2.942	0.000	0.002	0.000	-31.309	-88.460	0.010	88.460	-5.118	-0.004
165.00	-4.164	-2.569	0.000	0.001	0.000	-8.995	-93.828	0.011	93.828	-5.141	-0.004
167.00	-0.113	-0.118	0.000	0.000	0.000	-0.226	-95.979	0.011	95.979	-5.143	-0.004
169.00	-0.102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.131	-5.144	-0.004

Resulting Stresses

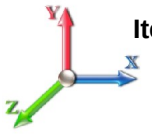
Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 26

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.66	0.67	0.00	0.01	0.00	35.81	36.49	52.0	0.702
5.00	0.65	0.68	0.00	0.01	0.00	35.63	36.30	52.0	0.698
10.00	0.64	0.68	0.00	0.01	0.00	35.43	36.08	52.0	0.694
15.00	0.62	0.69	0.00	0.01	0.00	35.20	35.85	52.0	0.690
20.00	0.61	0.69	0.00	0.01	0.00	34.95	35.58	52.0	0.685
25.00	0.60	0.70	0.00	0.01	0.00	34.67	35.29	52.0	0.679
30.00	0.59	0.70	0.00	0.01	0.00	34.36	34.97	52.0	0.673
35.00	0.57	0.71	0.00	0.01	0.00	34.01	34.61	52.0	0.666
40.00	0.56	0.71	0.00	0.01	0.00	33.62	34.21	52.0	0.658
40.75	0.56	0.72	0.00	0.01	0.00	33.56	34.15	52.0	0.657
45.00	0.54	0.72	0.00	0.01	0.00	33.20	33.76	52.0	0.649
47.00	0.60	0.83	0.00	0.01	0.00	37.15	37.78	52.0	0.727
50.00	0.59	0.83	0.00	0.01	0.00	36.82	37.44	52.0	0.720
55.00	0.58	0.84	0.00	0.01	0.00	36.21	36.82	52.0	0.708
60.00	0.57	0.84	0.00	0.01	0.00	35.54	36.14	52.0	0.695
65.00	0.55	0.85	0.00	0.01	0.00	34.81	35.39	52.0	0.681
70.00	0.54	0.86	0.00	0.01	0.00	34.01	34.58	52.0	0.665
75.00	0.52	0.86	0.00	0.01	0.00	33.13	33.68	52.0	0.648
80.00	0.51	0.87	0.00	0.01	0.00	32.16	32.71	52.0	0.629
85.00	0.49	0.87	0.00	0.01	0.00	31.10	31.63	52.0	0.609
89.25	0.48	0.88	0.00	0.02	0.00	30.13	30.65	52.0	0.590
90.00	0.48	0.88	0.00	0.02	0.00	29.95	30.47	52.0	0.586
91.25	0.47	0.88	0.00	0.02	0.00	22.65	23.12	52.0	0.445
94.25	0.67	1.30	0.00	0.02	0.00	21.98	21.98	52.0	0.423
95.00	0.66	1.30	0.00	0.02	0.00	28.65	28.65	51.2	0.559
97.25	0.65	1.30	0.00	0.02	0.00	27.93	28.58	51.5	0.555
100.00	0.64	1.30	0.00	0.02	0.00	39.48	40.19	51.8	0.775
105.00	0.63	1.31	0.00	0.03	0.00	37.24	37.94	52.0	0.730
110.00	0.61	1.33	0.00	0.03	0.00	34.77	35.46	52.0	0.682
115.00	0.59	1.34	0.00	0.03	0.00	32.03	32.71	52.0	0.629
120.00	0.58	1.35	0.00	0.03	0.00	29.00	29.67	52.0	0.571
125.00	0.56	1.36	0.00	0.03	0.00	25.63	26.31	52.0	0.506
127.00	0.46	1.11	0.00	0.00	0.00	24.20	24.73	52.0	0.476
130.00	0.45	1.11	0.00	0.00	0.00	22.52	23.05	52.0	0.443
135.00	0.43	1.12	0.00	0.00	0.00	19.46	19.98	52.0	0.384
139.00	0.41	1.12	0.00	0.00	0.00	16.77	17.30	52.0	0.333
140.00	0.41	1.12	0.00	0.00	0.00	16.07	16.59	52.0	0.319
142.75	0.51	1.47	0.00	0.00	0.00	18.14	18.83	52.0	0.362
145.00	0.50	1.47	0.00	0.00	0.00	15.89	16.59	51.2	0.324
148.00	0.41	1.13	0.00	0.00	0.00	12.70	13.25	51.7	0.256
150.00	0.35	1.03	0.00	0.00	0.00	11.07	11.56	52.0	0.222
155.00	0.32	1.02	0.00	0.00	0.00	7.07	7.60	52.0	0.146
157.00	0.20	0.60	0.00	0.00	0.00	5.37	5.67	52.0	0.109
160.00	0.19	0.59	0.00	0.00	0.00	3.90	4.21	52.0	0.081
165.00	0.18	0.57	0.00	0.00	0.00	1.21	1.71	52.0	0.033
167.00	0.01	0.02	0.00	0.00	0.00	0.03	0.05	52.0	0.001
169.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	52.0	0.000

Wind Loading - Shaft

Structure: CT13071-A-SBA
Site Name: Woodbridge
Height: 169.00 (ft)
Base Elev: 0.000 (ft)

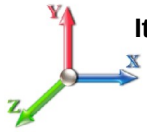
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/31/2015

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

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		0.00	1.00	6.400	10.82	234.08	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	229.92	0.650	0.000	5.00	23.200	15.08	163.1	0.0	1305.1
10.00		0.00	1.00	6.400	10.82	225.75	0.650	0.000	5.00	22.783	14.81	160.2	0.0	1281.5
15.00		0.00	1.00	6.400	10.82	221.58	0.650	0.000	5.00	22.367	14.54	157.2	0.0	1257.8
20.00		0.00	1.00	6.400	10.82	217.41	0.650	0.000	5.00	21.950	14.27	154.3	0.0	1234.2
25.00		0.00	1.00	6.400	10.82	213.25	0.650	0.000	5.00	21.533	14.00	151.4	0.0	1210.6
30.00		0.00	1.00	6.400	10.82	209.08	0.650	0.000	5.00	21.116	13.73	148.5	0.0	1187.0
35.00		0.00	1.02	6.509	11.00	206.64	0.650	0.000	5.00	20.700	13.45	148.0	0.0	1163.3
40.00		0.00	1.06	6.762	11.43	206.34	0.650	0.000	5.00	20.283	13.18	150.7	0.0	1139.7
40.75	Bot - Section 2	0.00	1.06	6.798	11.49	206.24	0.650	0.000	0.75	3.006	1.95	22.4	0.0	168.9
45.00		0.00	1.09	6.993	11.82	205.48	0.650	0.000	4.25	17.125	11.13	131.6	0.0	1773.0
47.00	Top - Section 1	0.00	1.11	7.080	11.97	205.01	0.650	0.000	2.00	7.955	5.17	61.9	0.0	823.4
50.00		0.00	1.13	7.207	12.18	207.49	0.650	0.000	3.00	11.807	7.67	93.5	0.0	569.3
55.00		0.00	1.16	7.406	12.52	205.86	0.650	0.000	5.00	19.345	12.57	157.4	0.0	932.6
60.00		0.00	1.19	7.592	12.83	203.89	0.650	0.000	5.00	18.928	12.30	157.9	0.0	912.3
65.00		0.00	1.21	7.768	13.13	201.65	0.650	0.000	5.00	18.512	12.03	158.0	0.0	892.1
70.00		0.00	1.24	7.934	13.41	199.15	0.650	0.000	5.00	18.095	11.76	157.7	0.0	871.8
75.00		0.00	1.26	8.092	13.68	196.44	0.650	0.000	5.00	17.678	11.49	157.1	0.0	851.6
80.00		0.00	1.29	8.242	13.93	193.53	0.650	0.000	5.00	17.262	11.22	156.3	0.0	831.3
85.00		0.00	1.31	8.387	14.17	190.44	0.650	0.000	5.00	16.845	10.95	155.2	0.0	811.1
89.25	Bot - Section 3	0.00	1.33	8.504	14.37	187.69	0.650	0.000	4.25	13.990	9.09	130.7	0.0	673.5
90.00		0.00	1.33	8.525	14.41	187.19	0.650	0.000	0.75	2.469	1.60	23.1	0.0	196.8
91.25	RB1	0.00	1.34	8.558	14.46	186.36	0.650	0.000	1.25	4.094	2.66	38.5	0.0	479.5
94.25	Top - Section 2	0.00	1.35	8.638	14.60	184.32	0.650	0.000	3.00	9.719	6.32	92.2	0.0	1142.1
95.00		0.00	1.35	8.657	14.63	186.22	0.650	0.000	0.75	2.406	1.56	22.9	0.0	169.3
97.25	RT1	0.00	1.36	8.715	14.73	184.66	0.650	0.000	2.25	7.163	4.66	68.6	0.0	506.2
100.00		0.00	1.37	8.785	14.85	182.71	0.650	0.000	2.75	8.640	5.62	83.4	0.0	278.1
105.00		0.00	1.39	8.908	15.06	179.07	0.650	0.000	5.00	15.386	10.00	150.6	0.0	495.1
110.00		0.00	1.41	9.028	15.26	175.31	0.650	0.000	5.00	14.970	9.73	148.5	0.0	481.6
115.00		0.00	1.43	9.143	15.45	171.45	0.650	0.000	5.00	14.553	9.46	146.2	0.0	468.1
120.00		0.00	1.45	9.255	15.64	167.48	0.650	0.000	5.00	14.136	9.19	143.7	0.0	454.6
125.00		0.00	1.46	9.363	15.82	163.42	0.650	0.000	5.00	13.719	8.92	141.1	0.0	441.1
127.00	Appurtenance(s)	0.00	1.47	9.406	15.90	161.77	0.650	0.000	2.00	5.371	3.49	55.5	0.0	172.7
130.00		0.00	1.48	9.469	16.00	159.27	0.650	0.000	3.00	7.932	5.16	82.5	0.0	255.0
135.00		0.00	1.50	9.572	16.18	155.04	0.650	0.000	5.00	12.886	8.38	135.5	0.0	414.1
139.00	Bot - Section 4	0.00	1.51	9.652	16.31	151.59	0.650	0.000	4.00	10.009	6.51	106.1	0.0	321.6
140.00		0.00	1.51	9.672	16.35	150.72	0.650	0.000	1.00	2.492	1.62	26.5	0.0	139.2
142.75	Top - Section 3	0.00	1.52	9.726	16.44	148.32	0.650	0.000	2.75	6.766	4.40	72.3	0.0	378.0
145.00		0.00	1.53	9.769	16.51	148.26	0.650	0.000	2.25	5.442	3.54	58.4	0.0	131.4
148.00	Appurtenance(s)	0.00	1.54	9.826	16.61	145.60	0.650	0.000	3.00	7.125	4.63	76.9	0.0	172.0
150.00	Appurtenance(s)	0.00	1.54	9.864	16.67	143.81	0.650	0.000	2.00	4.667	3.03	50.6	0.0	112.6
155.00		0.00	1.56	9.957	16.83	139.28	0.650	0.000	5.00	11.375	7.39	124.4	0.0	274.5
157.00	Appurtenance(s)	0.00	1.56	9.994	16.89	137.46	0.650	0.000	2.00	4.433	2.88	48.7	0.0	107.0
160.00		0.00	1.57	10.048	16.98	134.70	0.650	0.000	3.00	6.525	4.24	72.0	0.0	157.4
165.00		0.00	1.58	10.136	17.13	130.05	0.650	0.000	5.00	10.542	6.85	117.4	0.0	254.3
167.00	Appurtenance(s)	0.00	1.59	10.171	17.19	128.17	0.650	0.000	2.00	4.100	2.67	45.8	0.0	98.9
169.00		0.00	1.59	10.206	17.25	126.28	0.650	0.000	2.00	4.033	2.62	45.2	0.0	97.3
								Totals:	**169.00**			**4,949.3**		**28,088.6**

Discrete Appurtenance Forces

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	167.00	LNX-6515DS	3	10.171	17.190	0.84	28.75	150.90	0.000	0.000	494.26	0.00	0.00
2	167.00	Ericsson S11B12	3	10.171	17.190	0.67	6.65	153.00	0.000	0.000	114.36	0.00	0.00
3	167.00	Ericsson KRY 112 144/1	3	10.171	17.190	0.67	0.82	33.00	0.000	0.000	14.17	0.00	0.00
4	167.00	AIR B4A B2P	3	10.171	17.190	0.86	16.98	271.20	0.000	0.000	291.82	0.00	0.00
5	167.00	AIR B2A B4P	3	10.171	17.190	0.86	16.98	274.50	0.000	0.000	291.82	0.00	0.00
6	167.00	T-Arms/Commscope	3	10.180	17.204	0.75	15.19	1020.00	0.000	0.500	261.29	0.00	130.65
7	157.00	GPS	1	9.994	16.889	1.00	1.00	10.00	0.000	0.000	16.89	0.00	0.00
8	157.00	BXA-70063/6CF	1	9.994	16.889	0.70	5.41	17.00	0.000	0.000	91.39	0.00	0.00
9	157.00	DB846F65ZAXY	4	9.994	16.889	0.93	26.23	84.00	0.000	0.000	442.93	0.00	0.00
10	157.00	DB846H80E-SX	2	9.994	16.889	1.10	11.02	32.00	0.000	0.000	186.15	0.00	0.00
11	157.00	T-Arms	3	9.994	16.889	0.75	18.00	1050.00	0.000	0.000	304.00	0.00	0.00
12	157.00	HBX-6517DS-VTM	6	9.994	16.889	0.75	23.85	112.20	0.000	0.000	402.80	0.00	0.00
13	157.00	RFS DB T1-6Z-8AB-OZ	1	9.994	16.889	0.68	2.54	19.00	0.000	0.000	42.95	0.00	0.00
14	157.00	SLCP 2x6014F	2	9.994	16.889	0.89	12.83	40.00	0.000	0.000	216.75	0.00	0.00
15	157.00	ALU RRH2X60-AWS RRH	3	9.994	16.889	0.76	9.03	180.00	0.000	0.000	152.49	0.00	0.00
16	150.00	DC6-48-60-18-8F-SA	1	9.864	16.670	1.00	1.47	31.80	0.000	0.000	24.51	0.00	0.00
17	150.00	Collar Mount	1	9.864	16.670	1.00	3.00	100.00	0.000	0.000	50.01	0.00	0.00
18	150.00	RRUS 11	6	9.864	16.670	0.67	11.82	304.20	0.000	0.000	197.02	0.00	0.00
19	148.00	LGP13519 Diplexers	6	9.826	16.607	0.50	1.02	31.80	0.000	0.000	16.94	0.00	0.00
20	148.00	7770.00	6	9.826	16.607	0.73	25.75	210.00	0.000	0.000	427.69	0.00	0.00
21	148.00	AM-X-CD-16-65-00T	3	9.826	16.607	0.81	16.09	99.00	0.000	0.000	267.14	0.00	0.00
22	148.00	LGP21401-TMA	6	9.826	16.607	0.50	3.87	84.60	0.000	0.000	64.27	0.00	0.00
23	148.00	T-Arms	3	9.826	16.607	0.75	18.00	1050.00	0.000	0.000	298.92	0.00	0.00
24	127.00	VHLP800-11	1	9.406	15.896	1.00	8.43	48.00	1.455	0.000	134.00	194.98	0.00
25	127.00	VHLP2-11	3	9.406	15.896	0.90	12.64	81.00	1.455	0.000	200.86	292.26	0.00
26	127.00	Sector Frames	3	9.406	15.896	0.75	33.75	1500.00	0.000	0.000	536.50	0.00	0.00
27	127.00	LLPX310R	3	9.406	15.896	0.69	10.00	85.80	0.000	0.000	158.93	0.00	0.00
28	127.00	2.5GHz RRH BTS	3	9.406	15.896	0.73	3.99	99.00	0.000	0.000	63.36	0.00	0.00
						Totals:		**7,172.00**			**5,764.23**		

Total Applied Force Summary

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

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		173.92	1564.16	0.00	0.00
10.00		170.99	1540.53	0.00	0.00
15.00		168.06	1516.90	0.00	0.00
20.00		165.13	1493.27	0.00	0.00
25.00		162.20	1469.64	0.00	0.00
30.00		159.27	1446.01	0.00	0.00
35.00		158.99	1422.38	0.00	0.00
40.00		162.08	1398.76	0.00	0.00
40.75		24.17	207.78	0.00	0.00
45.00		141.60	1993.19	0.00	0.00
47.00		66.66	927.00	0.00	0.00
50.00		100.78	724.70	0.00	0.00
55.00		169.89	1191.63	0.00	0.00
60.00		170.69	1171.38	0.00	0.00
65.00		171.09	1151.13	0.00	0.00
70.00		171.11	1130.88	0.00	0.00
75.00		170.82	1110.62	0.00	0.00
80.00		170.22	1090.37	0.00	0.00
85.00		169.36	1070.12	0.00	0.00
89.25		142.91	893.67	0.00	0.00
90.00		27.12	235.67	0.00	0.00
91.25		45.18	467.67	0.00	0.00
94.25		108.43	1113.79	0.00	0.00
95.00		26.94	162.26	0.00	0.00
97.25		80.84	484.94	0.00	0.00
100.00		96.59	420.56	0.00	0.00
105.00		165.62	754.19	0.00	0.00
110.00		163.71	740.69	0.00	0.00
115.00		161.61	727.19	0.00	0.00
120.00		159.35	713.68	0.00	0.00
125.00		156.94	700.18	0.00	0.00
127.00	(13) appurtenances	1155.51	2090.09	487.24	0.00
130.00		92.10	398.57	0.00	0.00
135.00		151.66	653.48	0.00	0.00
139.00		119.17	513.06	0.00	0.00
140.00		29.74	187.08	0.00	0.00
142.75		81.33	509.61	0.00	0.00
145.00		65.83	239.10	0.00	0.00
148.00	(24) appurtenances	1161.84	1791.01	0.00	0.00
150.00	(8) appurtenances	328.78	644.38	0.00	0.00
155.00		141.25	440.27	0.00	0.00
157.00	(23) appurtenances	1911.78	1717.47	0.00	0.00
160.00		72.02	197.02	0.00	0.00
165.00		117.38	320.27	0.00	0.00
167.00	(18) appurtenances	1513.53	2027.87	0.00	130.65
169.00		45.22	97.25	0.00	0.00
	Totals:	**11,169.43**	**42,861.48**	**487.24**	**130.65**

Resulting Forces and Deflections

Structure:	CT13071-A-SB	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-11.193	-42.855	0.000	-0.002	-0.486	-1374.7	0.000	0.000	0.000	0.000	0.000
5.00	-11.064	-41.279	0.000	-0.002	-0.486	-1318.7	-0.034	0.000	0.034	-0.063	0.000
10.00	-10.935	-39.726	0.000	-0.002	-0.486	-1263.4	-0.134	0.000	0.134	-0.127	0.000
15.00	-10.806	-38.198	0.000	-0.002	-0.486	-1208.7	-0.302	0.000	0.302	-0.191	0.000
20.00	-10.677	-36.693	0.000	-0.002	-0.486	-1154.7	-0.537	0.000	0.537	-0.257	0.000
25.00	-10.548	-35.212	0.000	-0.002	-0.486	-1101.3	-0.841	0.000	0.841	-0.323	0.000
30.00	-10.419	-33.755	0.000	-0.003	-0.486	-1048.6	-1.215	0.000	1.215	-0.389	0.000
35.00	-10.288	-32.321	0.000	-0.003	-0.486	-996.54	-1.659	0.000	1.659	-0.457	0.000
40.00	-10.135	-30.917	0.000	-0.003	-0.486	-945.10	-2.174	0.000	2.174	-0.525	0.000
40.75	-10.127	-30.704	0.000	-0.003	-0.486	-937.50	-2.258	0.000	2.258	-0.535	0.000
45.00	-9.988	-28.704	0.000	-0.003	-0.486	-894.46	-2.761	0.000	2.761	-0.594	0.000
47.00	-9.928	-27.772	0.000	-0.003	-0.486	-874.49	-3.016	0.000	3.016	-0.622	0.000
50.00	-9.847	-27.038	0.000	-0.003	-0.486	-844.70	-3.420	0.000	3.420	-0.664	0.000
55.00	-9.698	-25.836	0.000	-0.004	-0.486	-795.46	-4.157	0.000	4.157	-0.741	0.000
60.00	-9.544	-24.654	0.000	-0.004	-0.486	-746.98	-4.975	0.000	4.975	-0.818	0.000
65.00	-9.388	-23.493	0.000	-0.004	-0.486	-699.26	-5.873	0.000	5.873	-0.895	0.000
70.00	-9.228	-22.353	0.000	-0.004	-0.486	-652.32	-6.852	0.000	6.852	-0.973	-0.001
75.00	-9.067	-21.233	0.000	-0.005	-0.487	-606.18	-7.913	0.000	7.913	-1.050	-0.001
80.00	-8.903	-20.134	0.000	-0.005	-0.487	-560.84	-9.054	0.000	9.054	-1.127	-0.001
85.00	-8.735	-19.057	0.000	-0.006	-0.487	-516.33	-10.275	0.000	10.275	-1.203	-0.001
89.25	-8.585	-18.161	0.000	-0.006	-0.487	-479.21	-11.376	0.000	11.376	-1.268	-0.001
90.00	-8.557	-17.924	0.000	-0.006	-0.487	-472.77	-11.577	0.000	11.577	-1.280	-0.001
91.25	-8.510	-17.453	0.000	-0.006	-0.487	-462.07	-11.914	0.000	11.914	-1.299	-0.001
94.25	-8.382	-16.339	0.000	-0.006	-0.487	-436.54	-12.742	0.000	12.742	-1.333	-0.001
95.00	-8.357	-16.174	0.000	-0.006	-0.487	-430.26	-12.952	0.000	12.952	-1.342	-0.001
97.25	-8.274	-15.686	0.000	-0.007	-0.487	-411.45	-13.592	0.000	13.592	-1.374	-0.001
100.00	-8.187	-15.258	0.000	-0.007	-0.487	-388.70	-14.395	0.000	14.395	-1.413	-0.001
105.00	-8.027	-14.494	0.000	-0.008	-0.487	-347.77	-15.930	0.000	15.930	-1.515	-0.001
110.00	-7.866	-13.745	0.000	-0.008	-0.487	-307.63	-17.570	0.001	17.570	-1.613	-0.001
115.00	-7.705	-13.011	0.000	-0.009	-0.487	-268.30	-19.310	0.001	19.310	-1.707	-0.001
120.00	-7.542	-12.291	0.000	-0.010	-0.487	-229.78	-21.146	0.001	21.146	-1.795	-0.002
125.00	-7.374	-11.589	0.000	-0.011	-0.487	-192.07	-23.071	0.001	23.071	-1.877	-0.002
127.00	-6.156	-9.534	0.000	0.005	0.000	-177.32	-23.864	0.001	23.864	-1.909	-0.002
130.00	-6.060	-9.133	0.000	0.005	0.000	-158.86	-25.078	0.001	25.078	-1.953	-0.002
135.00	-5.894	-8.479	0.000	0.004	0.000	-128.56	-27.161	0.001	27.161	-2.021	-0.002
139.00	-5.761	-7.968	0.000	0.003	0.000	-104.98	-28.875	0.001	28.875	-2.069	-0.002
140.00	-5.727	-7.780	0.000	0.003	0.000	-99.226	-29.310	0.001	29.310	-2.080	-0.002
142.75	-5.630	-7.271	0.000	0.003	0.000	-83.477	-30.517	0.001	30.517	-2.109	-0.002
145.00	-5.559	-7.032	0.000	0.002	0.000	-70.810	-31.516	0.001	31.516	-2.130	-0.002
148.00	-4.333	-5.284	0.000	0.002	0.000	-54.133	-32.865	0.002	32.865	-2.160	-0.002
150.00	-3.982	-4.651	0.000	0.001	0.000	-45.468	-33.774	0.002	33.774	-2.178	-0.002
155.00	-3.825	-4.215	0.000	0.001	0.000	-25.558	-36.073	0.002	36.073	-2.209	-0.002
157.00	-1.849	-2.573	0.000	0.001	0.000	-17.907	-37.000	0.002	37.000	-2.218	-0.002
160.00	-1.770	-2.378	0.000	0.000	0.000	-12.359	-38.397	0.002	38.397	-2.228	-0.002
165.00	-1.640	-2.063	0.000	0.000	0.000	-3.509	-40.735	0.002	40.735	-2.237	-0.002
167.00	-0.049	-0.095	0.000	0.000	0.000	-0.098	-41.672	0.002	41.672	-2.238	-0.002
169.00	-0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	42.609	-2.238	-0.002

Resulting Stresses

Structure:	CT13071-A-SBA	**Code:**	EIA/TIA-222-F	8/31/2015	
Site Name:	Woodbridge	**Exposure:**	C		
Height:	169.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 25

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.55	0.29	0.00	0.00	0.00	15.49	16.05	52.0	0.309
5.00	0.54	0.29	0.00	0.00	0.00	15.40	15.96	52.0	0.307
10.00	0.53	0.30	0.00	0.00	0.00	15.32	15.86	52.0	0.305
15.00	0.52	0.30	0.00	0.00	0.00	15.22	15.75	52.0	0.303
20.00	0.51	0.30	0.00	0.00	0.00	15.11	15.63	52.0	0.301
25.00	0.50	0.30	0.00	0.00	0.00	14.98	15.49	52.0	0.298
30.00	0.49	0.30	0.00	0.00	0.00	14.85	15.35	52.0	0.295
35.00	0.48	0.31	0.00	0.00	0.00	14.70	15.19	52.0	0.292
40.00	0.47	0.31	0.00	0.00	0.00	14.53	15.01	52.0	0.289
40.75	0.46	0.31	0.00	0.00	0.00	14.51	14.98	52.0	0.288
45.00	0.44	0.31	0.00	0.00	0.00	14.35	14.80	52.0	0.285
47.00	0.49	0.36	0.00	0.00	0.00	16.06	16.57	52.0	0.319
50.00	0.49	0.36	0.00	0.00	0.00	15.92	16.42	52.0	0.316
55.00	0.48	0.36	0.00	0.00	0.00	15.66	16.15	52.0	0.311
60.00	0.46	0.36	0.00	0.01	0.00	15.38	15.85	52.0	0.305
65.00	0.45	0.36	0.00	0.01	0.00	15.06	15.53	52.0	0.299
70.00	0.44	0.37	0.00	0.01	0.00	14.72	15.18	52.0	0.292
75.00	0.43	0.37	0.00	0.01	0.00	14.35	14.80	52.0	0.285
80.00	0.42	0.37	0.00	0.01	0.00	13.95	14.38	52.0	0.277
85.00	0.40	0.37	0.00	0.01	0.00	13.50	13.92	52.0	0.268
89.25	0.39	0.38	0.00	0.01	0.00	13.09	13.50	52.0	0.260
90.00	0.39	0.38	0.00	0.01	0.00	13.01	13.42	52.0	0.258
91.25	0.38	0.38	0.00	0.01	0.00	9.85	10.23	52.0	0.197
94.25	0.54	0.56	0.00	0.01	0.00	9.56	9.56	52.0	0.184
95.00	0.53	0.56	0.00	0.01	0.00	12.47	12.47	51.2	0.243
97.25	0.52	0.56	0.00	0.01	0.00	12.16	12.68	51.5	0.246
100.00	0.52	0.56	0.00	0.01	0.00	17.21	17.75	51.8	0.343
105.00	0.50	0.56	0.00	0.01	0.00	16.26	16.80	52.0	0.323
110.00	0.49	0.57	0.00	0.01	0.00	15.22	15.74	52.0	0.303
115.00	0.48	0.57	0.00	0.01	0.00	14.06	14.58	52.0	0.280
120.00	0.47	0.58	0.00	0.01	0.00	12.78	13.29	52.0	0.256
125.00	0.45	0.58	0.00	0.01	0.00	11.36	11.86	52.0	0.228
127.00	0.38	0.49	0.00	0.00	0.00	10.76	11.17	52.0	0.215
130.00	0.37	0.49	0.00	0.00	0.00	10.01	10.42	52.0	0.200
135.00	0.35	0.50	0.00	0.00	0.00	8.65	9.05	52.0	0.174
139.00	0.34	0.50	0.00	0.00	0.00	7.46	7.85	52.0	0.151
140.00	0.34	0.50	0.00	0.00	0.00	7.14	7.53	52.0	0.145
142.75	0.42	0.66	0.00	0.00	0.00	8.06	8.56	52.0	0.165
145.00	0.41	0.66	0.00	0.00	0.00	7.05	7.55	51.2	0.147
148.00	0.32	0.52	0.00	0.00	0.00	5.63	6.01	51.7	0.116
150.00	0.28	0.49	0.00	0.00	0.00	4.86	5.22	52.0	0.100
155.00	0.27	0.49	0.00	0.00	0.00	2.94	3.32	52.0	0.064
157.00	0.16	0.24	0.00	0.00	0.00	2.13	2.33	52.0	0.045
160.00	0.16	0.23	0.00	0.00	0.00	1.54	1.74	52.0	0.034
165.00	0.14	0.23	0.00	0.00	0.00	0.47	0.73	52.0	0.014
167.00	0.01	0.01	0.00	0.00	0.00	0.01	0.02	52.0	0.000
169.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	52.0	0.000

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	t MZ (ft-kips)
85 mph Wind with 0" Ice	32.3	0.00	42.81	0.02	1.38	3966.86
73.61 mph Wind with 0.5" Ice	25.8	0.00	51.16	0.01	1.12	3178.97
50 mph Wind with 0" Ice	11.2	0.00	42.86	0.00	0.49	1374.74

Max Stresses

Load Case	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
85 mph Wind with 0" Ice	0.47	1.61	0.00	0.03	0.00	49.53	50.08	51.8	100.00	0.966
73.61 mph Wind with 0.5" Ice	0.64	1.30	0.00	0.02	0.00	39.48	40.19	51.8	100.00	0.775
50 mph Wind with 0" Ice	0.52	0.56	0.00	0.01	0.00	17.21	17.75	51.8	100.00	0.343

Additional Steel Summary

			Intermediate Connectors				Upper Termination			Lower Termination			Max Member			
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	V (kips)	Shear Allow (kips)	MQ/I (kips)	Num Reqd	Num Actual	MQ/I (kips)	Num Reqd	Num Actual	MQ/I (kips)	Ta (kips)	Pa (kips)	Ratio
91.3	97.3	(3) LNP-LP6X100-G-10TT	-325.1	-7.80	22.5	193.7	9	9	162.2	2	9	198.7	260.0	257.3	0.772

Monopole Mat Foundation Design

			Date: 8/31/2015
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-F
Site Name:		**Structure Height (Ft.):**	169
Site Number:	CT13071-A-SBA	**Engineer Name:**	U. Atluri
Engr. Number:	17022	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

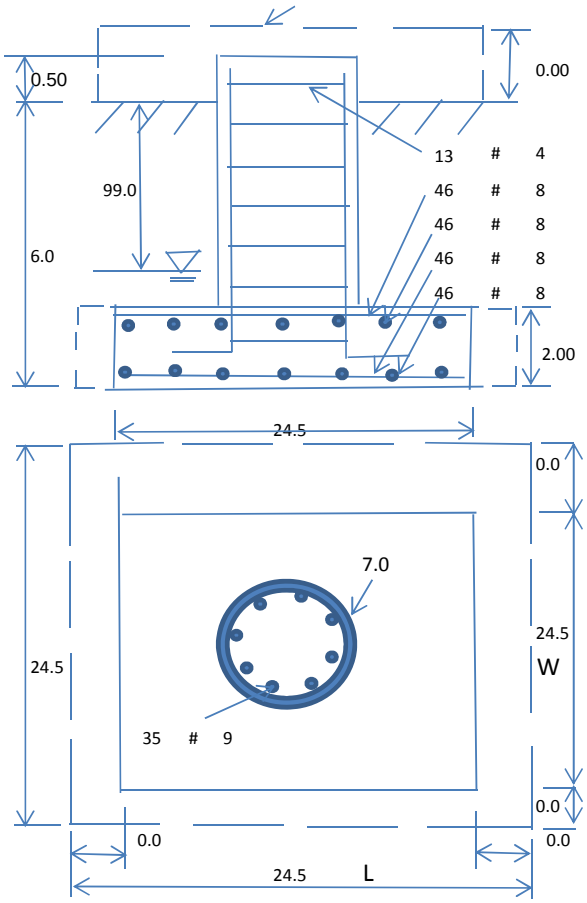
Analysis or Design? Analysis

Base Reactions (Unfactored)

Axial Load (Kips):	51.2	Shear Force (Kips):	32.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3966.9
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	2.00
Length of Pad (ft.):	24.5	Width of Pad (ft.):	24.5
Final Length of pad (ft)	24.5	Final width of pad (ft):	24.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	35	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	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):	46	Qty. of Rebar in Pad (W):	46	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	46	Qty. of Rebar in Pad (W):	46	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Allowable Net Soil Bearing (psf):	6666	Allowable Skin Friction:	200	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 hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design:

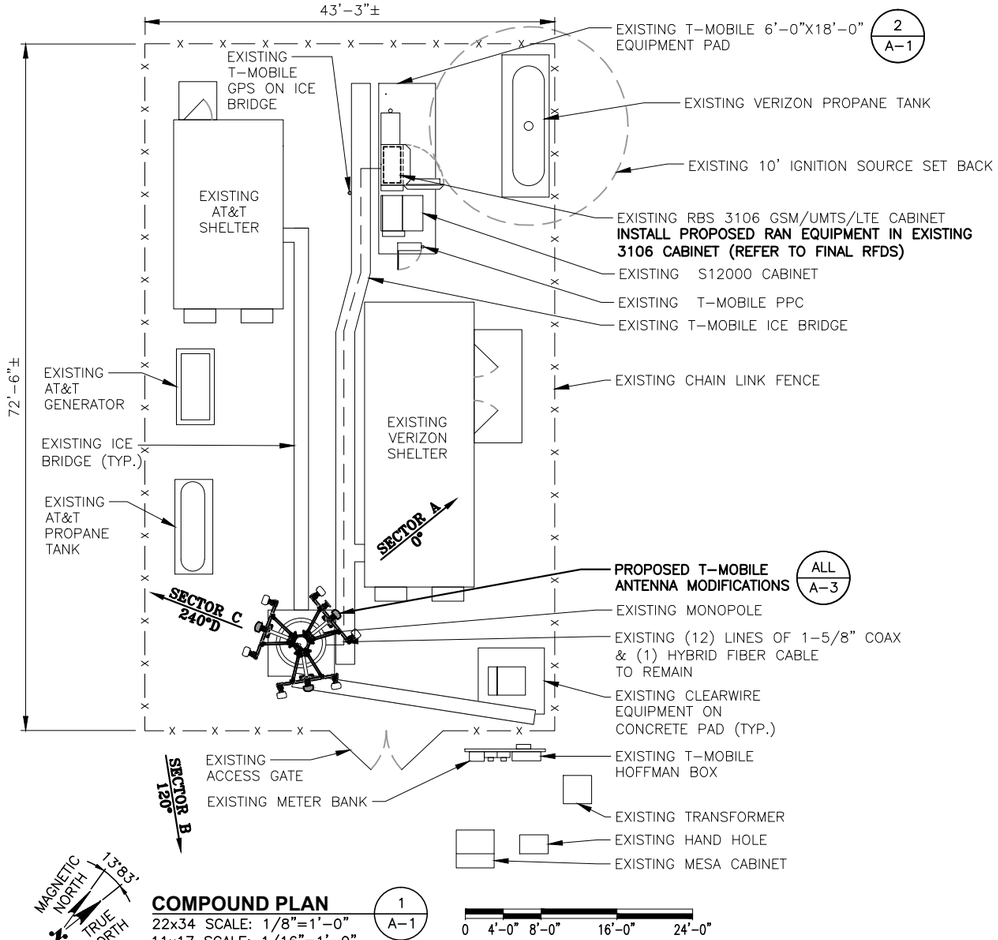
Total Dry Soil Volume (cu. Ft.):	2247.06	Total Dry Soil Weight (Kips):	269.65
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	269.65	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1373.68	Total Dry Concrete Weight (Kips):	206.05
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	206.05	Total Vertical Load on Base (Kips):	526.90

Check Soil Capacities:

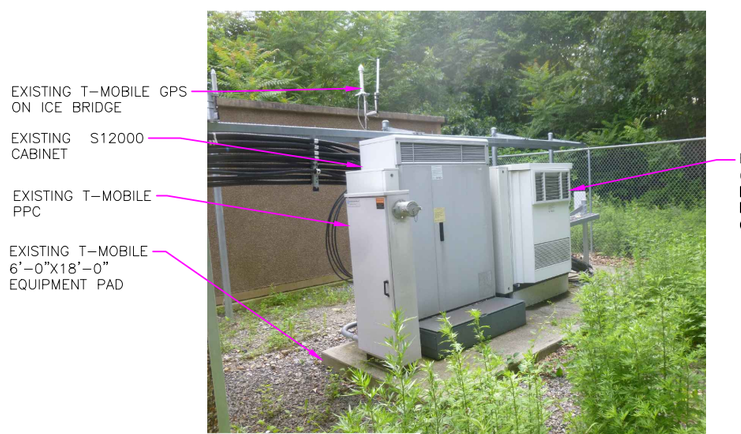
				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	3629	<	Allowable Soil Bearing (psf): 6666	0.54	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	4303.0	>	Applied Momont (kips-ft): 4177	0.97	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.55	OK!			

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.30		
				Load/ Capacity Ratio	
(1) Concrete Pier:					
Vertical Steel Rebar Area (sq. in./each):	1.00	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	5579.6 >	Design Factored Moment (Mu, Kips-F	5345.9	0.96	OK!
Calculated Shear Capacity (Kips):	794.5 >	Design Factored Shear (Kips):	42.0	0.05	OK!
Calculated Tension Capacity (Tn, Kips):	1890.0 >	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9736.0 >	Design Factored Axial Load (Pu Kips):	66.6	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.96 OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:					
One-Way Design Shear Capacity (L-Direction, Kips):	571.8 >	One-Way Factored Shear (L-D. Kips):	374.6	0.66	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	571.8 >	One-Way Factored Shear (W-D., Kips)	374.6	0.66	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	645.2 >	One-Way Factored Shear (C-C, Kips):	525.6	0.81	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0060 OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0060		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	3174.0 >	Moment at Bottom (L-Direct. K-Ft):	1014.4	0.32	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	3174.0 >	Moment at Bottom (W-Direct. K-Ft):	1014.4	0.32	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4424.9 >	Moment at Bottom (C-C Dir. K-Ft):	1434.6	0.32	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0060 OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0060		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	3174.0 >	Moment at the top (L-Dir Kips-Ft):	517.8	0.16	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	3174.0 >	Moment at the top (W-Dir Kips-Ft):	517.8	0.16	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	4424.9 >	Moment at the top (C-C Direc. K-Ft):	866.8	0.20	OK!



COMPOUND PLAN 1 A-1
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"



SOURCE: HDG 07-01-2015

EQUIPMENT PHOTO DETAIL 2 A-1
SCALE: N.T.S

STRUCTURAL NOTES:
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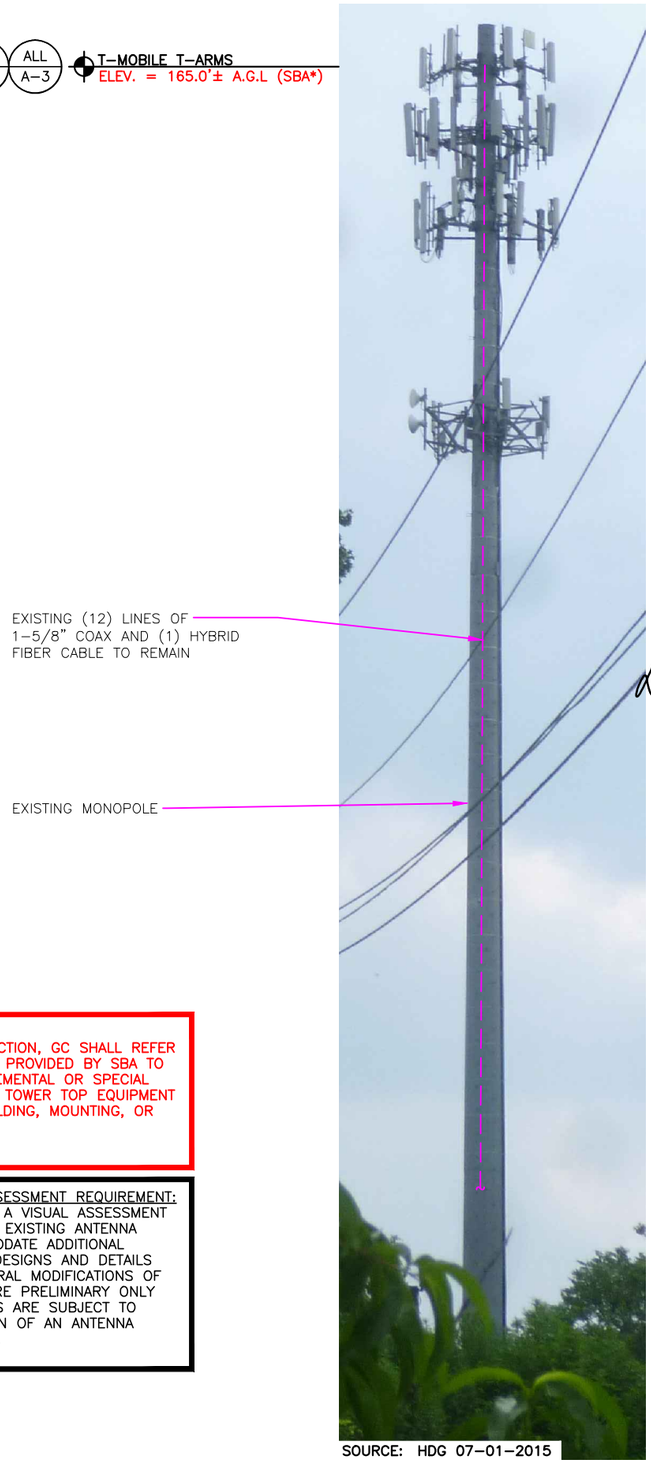
ANTENNA MOUNT STRUCTURAL ASSESSMENT REQUIREMENT:
ENGINEER OF RECORD HAS MADE A VISUAL ASSESSMENT ONLY AND DETERMINED THAT THE EXISTING ANTENNA MOUNT IS ADEQUATE TO ACCOMMODATE ADDITIONAL EQUIPMENT LOADS. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.

2 A-2 ALL A-3 **T-MOBILE T-ARMS**
ELEV. = 165.0'± A.G.L (SBA*)



SOURCE: HDG 07-01-2015

ELEVATION PHOTO DETAIL 3 A-1
SCALE: N.T.S

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

SBA
SBA COMMUNICATIONS CORP.
33 BOSTON POST ROAD WEST, SUITE 320 TEL: (508) 251-0720
MARLBOROUGH, MA 01752 FAX: (508) 251-1755

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090 TEL: (978) 557-5553
N. ANDOVER, MA 01845 FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER
Daniel P. Hamm

CHECKED BY: BB

APPROVED BY: DPH

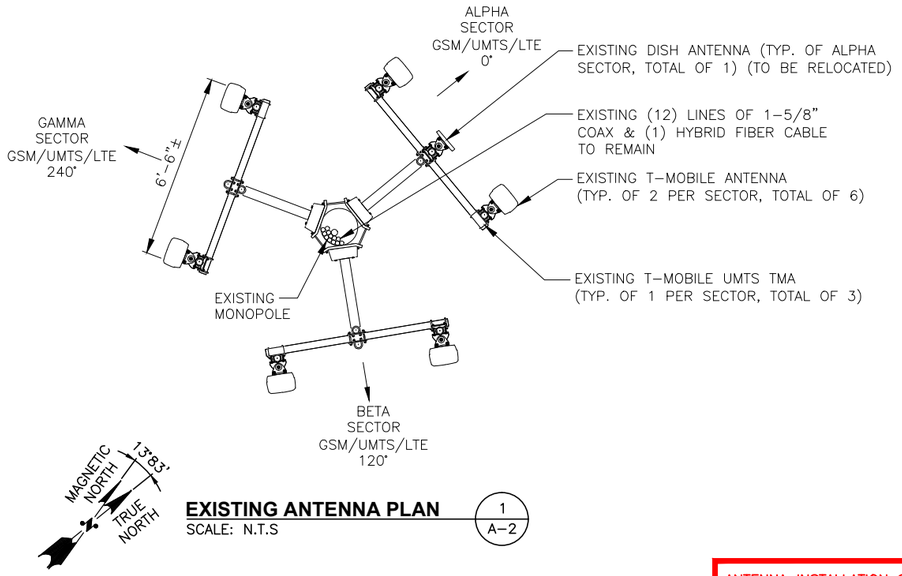
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	09/04/15	CONSTRUCTION REVISED	KMS
0	07/22/15	ISSUED FOR CONSTRUCTION	VP

SITE NUMBER:
CTNH209A
SITE NAME:
NH209/OPTA GELERTNER FT
SITE ADDRESS:
1 DEERFIELD LANE
ANSONIA, CT 06401
NEW HAVEN COUNTY

SHEET TITLE
COMPOUND & ELEVATION PLAN

SHEET NUMBER
A-1



EXISTING ANTENNA PLAN (1 / A-2)
SCALE: N.T.S

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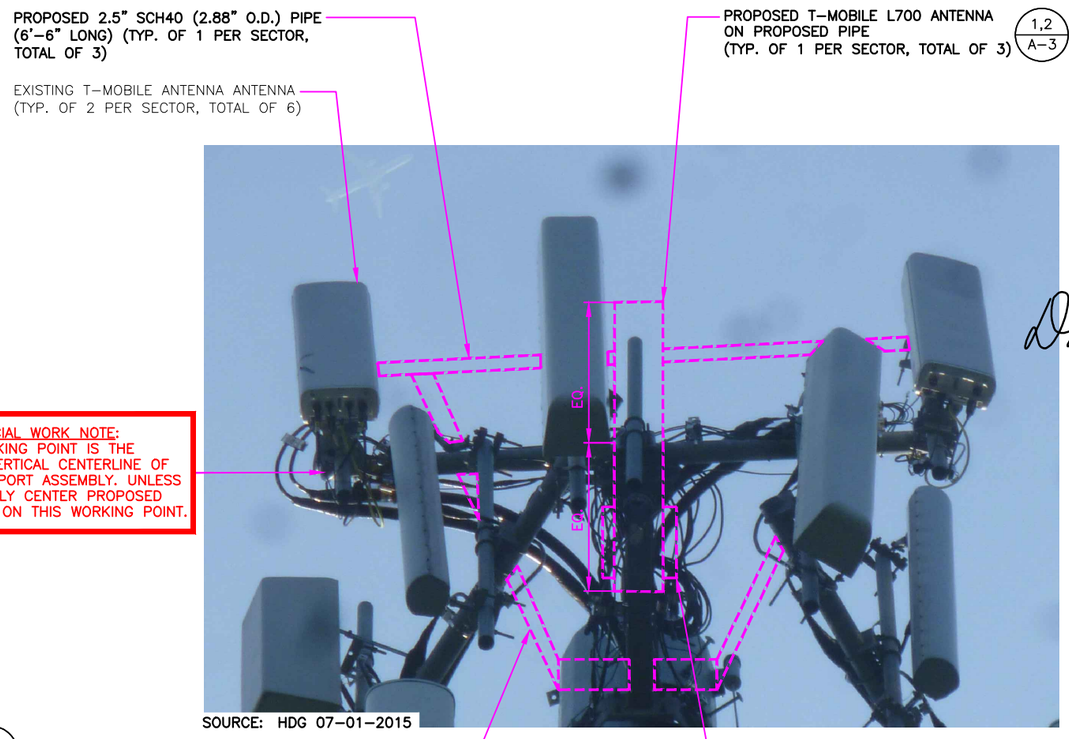
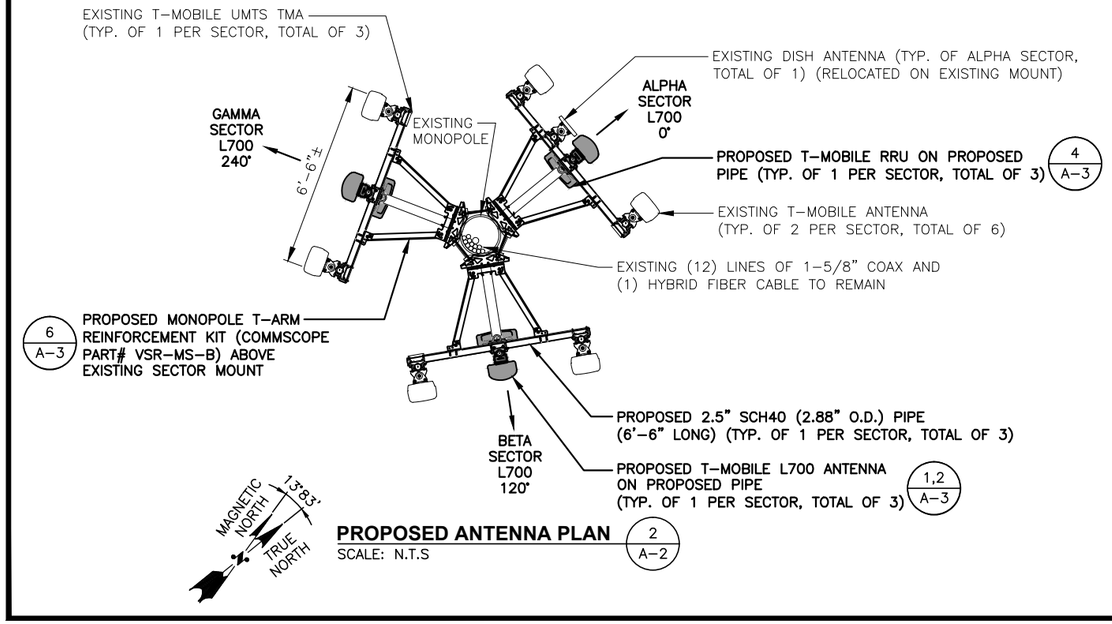


SOURCE: HDG 07-01-2015

PROPOSED ANTENNA PHOTO DETAIL (3 / A-2)
SCALE: N.T.S

ANTENNA INSTALLATION SPECIAL WORK NOTE:
ANTENNA INSTALLATION WORKING POINT IS THE STRUCTURAL FACE FRAME VERTICAL CENTERLINE OF THE EXISTING ANTENNA SUPPORT ASSEMBLY. UNLESS NOTED OTHERWISE, VERTICALLY CENTER PROPOSED PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.



PROPOSED ANTENNA PLAN (2 / A-2)
SCALE: N.T.S

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35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
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DANIEL P. HAMM
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LICENSED PROFESSIONAL ENGINEER

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APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	09/04/15	CONSTRUCTION REVISED	KMS
0	07/22/15	ISSUED FOR CONSTRUCTION	VP

SITE NUMBER:
CTNH209A

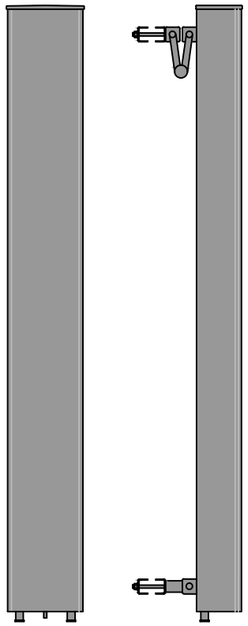
SITE NAME:
NH209/OPTA
GELERTNER FT

SITE ADDRESS:
1 DEERFIELD LANE
ANSONIA, CT 06401
NEW HAVEN COUNTY

SHEET TITLE
EXISTING & PROPOSED ANTENNA PLANS

SHEET NUMBER
A-2

3 / A-3 PROPOSED ANTENNA MOUNTING KIT



L700 ANTENNA DIMENSIONS	
MODEL #	LNX-6515DS-VTM
MANUF.	COMMSCOPE
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	96.4"
WEIGHT	50.3 LBS

L700 ANTENNA DETAIL 1 / A-3
SCALE: N.T.S

PROPOSED PIPE TO PIPE CROSS-OVER KIT (SITEPRO SCX23-K OR EQUIVALENT) (TYP. OF 3 PER BETA & GAMMA SECTORS, TYP. IF 4 PER ALPHA SECTOR, TOTAL OF 10)

PROPOSED 2.5" SCH40 (2.88" O.D.) PIPE (12'-6" LONG) (TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED MONOPOLE T-ARM REINFORCEMENT KIT (COMMSCOPE PART# VSR-MS-B) ABOVE EXISTING SECTOR MOUNT

SET UPPER RAIL AT HIGHEST AVAILABLE SETTING BELOW EXISTING ANTENNA'S MOUNTING BRACKET

EXISTING SECTOR MOUNT

ANTENNA INSTALLATION SPECIAL WORK NOTE:
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5 / A-3 PROPOSED PIPE TO PIPE CROSS-OVER KIT (SITEPRO SP219-H OR EQUIVALENT)

2 / A-2 4,4A / A-3 PROPOSED RRU

PROPOSED 2.5" STD (2.88" O.D.) MOUNTING PIPE (8'-0" LONG) (TYP.)

3 / A-3 PROPOSED ANTENNA TO PIPE CLAMP KIT (ANDREW BSAMNT-1)

PROPOSED L700 ANTENNA MOUNTED TO PIPE 2 / A-2 1 / A-3

EQ.

12" MAX.

EQ.

PROPOSED L700 ANTENNA & RRU MOUNTING DETAIL 2 / A-3
SCALE: N.T.S

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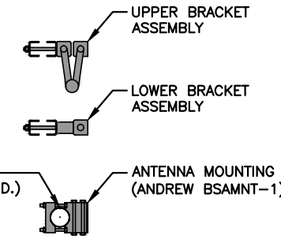
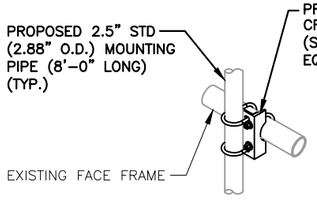


ANTENNA MOUNTING BRACKET 3 / A-3
SCALE: N.T.S

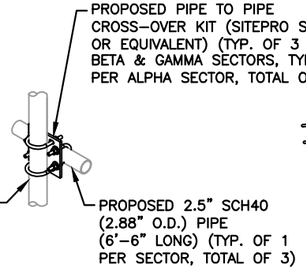
RRU DIMENSIONS	
MODEL #	RRU11 B12
MANUF.	ERICSSON
WIDTH	17"
DEPTH	7"
HEIGHT	20"
WEIGHT	50.6 LBS

PROPOSED RRU DETAIL 4 / A-3
SCALE: N.T.S

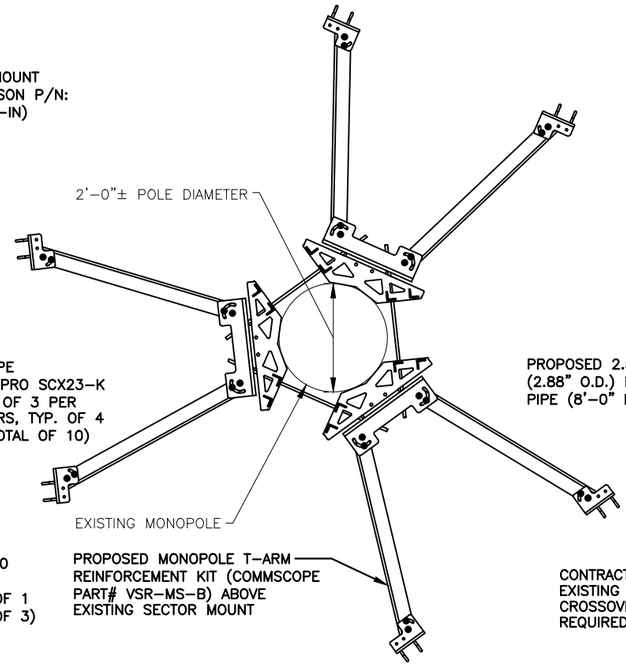
RRU MOUNT ASSEMBLY 4A / A-3
SCALE: N.T.S

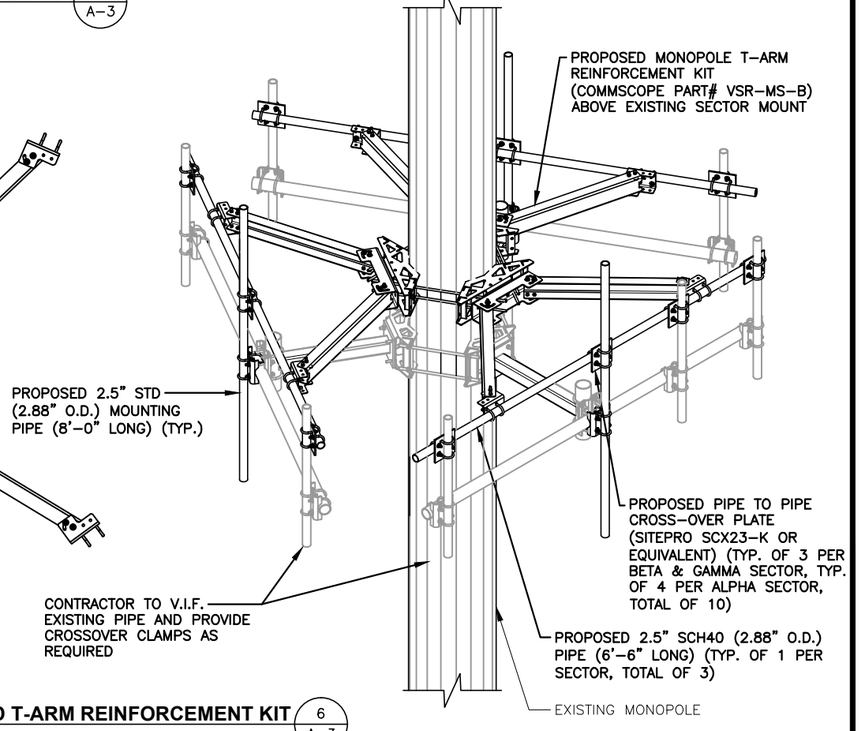


LOWER PIPE TO PIPE CROSS-OVER KIT 5 / A-3
SCALE: N.T.S



UPPER PIPE TO PIPE CROSS-OVER KIT 5A / A-3
SCALE: N.T.S





PROPOSED T-ARM REINFORCEMENT KIT 6 / A-3
SCALE: N.T.S

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

SBA
SBA COMMUNICATIONS CORP.
33 BOSTON POST ROAD WEST, SUITE 320 TEL: (508) 251-0720
MARLBOROUGH, MA 01752 FAX: (508) 251-1755

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090 TEL: (978) 557-5553
N. ANDOVER, MA 01845 FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CHECKED BY: BB

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	09/04/15	CONSTRUCTION REVISED	KMS
0	07/22/15	ISSUED FOR CONSTRUCTION	VP

SITE NUMBER:
CTNH209A
SITE NAME:
NH209/OPTA GELERTNER FT
SITE ADDRESS:
1 DEERFIELD LANE
ANSONIA, CT 06401
NEW HAVEN COUNTY

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-3

MODIFICATION AND DESIGN DRAWINGS FOR AN EXISTING 169' SABRE MONOPOLE

PROPOSED CARRIER: T-MOBILE

SBA SITE: CT13071-A / WOODBRIDGE

COORDINATES (LATITUDE: 41.350750°, LONGITUDE: -73.049250°)

COMPLETE FABRICATION DRAWINGS FOR ALL MATERIALS REQUIRED FOR THIS PROJECT ARE AVAILABLE FROM TOWER ENGINEERING SOLUTIONS (TES). PLEASE CONTACT TES FOR MORE INFORMATION.

SHEET	SHEET TITLE	REV
T-1	TITLE SHEET	0
BOM	BILL OF MATERIALS	0
GN-1	GENERAL NOTES	0
A-1	TOWER PROFILE	0
A-2	REINFORCEMENT ASSEMBLY P6X100-G-10TT (18 SIDE 3 PIECES ON FLAT# 1, 7 AND 13)	0

NOTE:

1. THE MODIFICATION DRAWINGS ARE BASED ON THE **TES** PROJECT NO. 16846-R1, DATED 08/18/15.

TES
Tower Engineering Solutions
8445 FREEPORT PARKWAY, SUITE 375
IRVING, TX 75063
PH: (972) 483-0607

SBA
5900 BROKEN SOUND PARKWAY, NW
BOCA RATON, FL 33487
(800)-487-SITE

TES JOB NO: 17022

CUSTOMER SITE NO: CT13071-A

CUSTOMER SITE NAME: WOODBRIDGE

1 DEERFIELD LANE
ANSONIA, CT 06401

STATE OF CONNECTICUT
HANMING YOU
28931
LICENSED
PROFESSIONAL ENGINEER
9/1/15

DRAWN BY:	AD
CHECKED BY:	USA/KMM
DATE:	09/01/15

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	AD	09/01/15

SHEET TITLE: TITLE SHEET

SHEET NUMBER: T-1

REV #: 0

BILL OF MATERIALS

QUANTITY COUNTED	QUANTITY PROVIDED	PART NUMBER	DESCRIPTIONS	LENGTH	SHEET LIST (INSTALLATION)	SHEET LIST (FABRICATE)	PIECE WEIGHT (LBS)	WEIGHT (LB)	NOTES
			MATERIAL & HARDWARE						
3	3	P6X100-G-10TT	6" x 1.00" Flat Bar, 10 ft. Long, Standard, Termination at both ends	10'-0"	A-2	P6X100-G-10TT	211.2	633.7	Galvanized
60	65	HB16-2	Lindapter 5/8" Type HB Hollo-Bolt (HCF)	---		---	---	---	Galvanized
			Following Items are Non-standard Parts						
			ALL LPXXXX and RLPXXXX PARTS ARE PATENT PENDING AND ARE ALL AVAILABLE FROM METROSITE, LLC. **180 IND PARK BLVD COMMERCE, GA 30529** **OFFICE: (706) 335-7045** **FAX: (706) 335-7056**						
			NOTE: ALL MATERIALS, WHICH WEREN'T LISTED IN THIS SHEET, ARE ASSUMED TO BE PROVIDED BY THE CONTRACTOR.						
						TOTAL WEIGHT (LBS) =		**633.7**	

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(800)-487-SITE

TES JOB NO:
17022

CUSTOMER SITE NO:
CT13071-A

CUSTOMER SITE NAME:
WOODBRIDGE

1 DEERFIELD LANE
ANSONIA, CT 06401

DRAWN BY:	AD
CHECKED BY:	USA/KMM
DATE:	09/01/15

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	AD	09/01/15

SHEET TITLE:

BILL OF MATERIAL

SHEET NUMBER: BOM

REV #: 0

GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE ANSI/TIA-222-G, TIA-1019-A 2012 AND ANY OTHER GOVERNING BUILDING CODES AND OSHA SAFETY REGULATIONS.
2. ALL WORK INDICATED ON THE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TELECOMMUNICATIONS TOWER, POLE AND FOUNDATION CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND FABRICATION OF ALL MISCELLANEOUS PARTS (SUCH AS SHIMS), TEMPORARY SUPPORTS, AND GUYINGS, ETC., PER TIA-1019-A 2001, TO COMPLETE THE ASSEMBLY AS SHOWN IN THE DRAWINGS.
4. CONTRACTOR SHALL PROCEED WITH THE INSTALLATION WORK CAREFULLY SO THE WORK WILL NOT DAMAGE ANY EXISTING CABLE, EQUIPMENT OR THE STRUCTURE.
5. THE USE OF GAS TORCH OR WELDER, ARE NOT ALLOWED ON ANY TOWER STRUCTURE WITHOUT THE CONSENT OF THE TOWER OWNER.

FABRICATION

1. ALL STEEL SHALL MEET OR EXCEED THE MINIMUM STRENGTH AS SPECIFIED IN THE DRAWINGS. IF YIELD STRENGTH WAS NOT NOTED IN THE DRAWINGS, CONTRACTORS SHALL CONTACT TES FOR DIRECTION.
2. ALL FIELD CUT EDGES SHALL BE GROUND SMOOTH. ALL FIELD CUT AND DRILLED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATES OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

WELDING

1. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
2. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING APPROX. 0.5" BEYOND THE PROPOSED FIELD WELD SURFACES.
3. AFTER INSPECTION, ALL FIELD WELDED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

BOLTED ASSEMBLIES AND TIGHTENING OF CONNECTIONS

1. ALL HIGH STRENGTH BOLTS SHALL CONFORM TO THE PROVISIONS OF THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS AS APPROVED BY THE RCSC.
2. FLANGE BOLTS SHALL BE TIGHTENED BY THE AISC "TURN-OF-THE-NUT" METHOD. THE FOLLOWING CHART SHOULD BE USED FOR THE "TURN-OF-THE-NUT" TIGHTENING.
3. SPLICE BOLTS AND ALL OTHER BOLTS IN BEARING TYPE CONNECTIONS SHALL BE TIGHTENED TO A SNUG-TIGHT CONDITION.
4. THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS ATTAINED BY EITHER A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER WITH AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.

WELDING

1. ALL WELDS SHALL BE INSPECTED VISUALLY. A MINIMUM OF 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. 100% OF WELDS SHALL BE INSPECTED IF DEFECTS ARE FOUND.
2. WELD INSPECTIONS SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.

VERIFICATION AND INSPECTION

1. IF APPLICABLE, VERIFICATION INSPECTION TO BE PERFORMED SHALL BE IN ACCORDANCE TO IBC-2012 SECTION 1705 - TABLE 1705.2.2 FOR STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL AND TABLE 1705.3 FOR CONCRETE CONSTRUCTION.

TABLE 8.2 NUT ROTATION FROM SNUG-TIGHT CONDITION FOR TURN-OF-NUT PRETENSIONING [a,b]

BOLT LENGTH[c]	DISPOSITION OF OUTER FACE OF BOLTED PARTS		
	BOTH FACES NORMAL TO BOLT AXIS	ONE FACE NORMAL TO BOLT AXIS, OTHER SLOPED NOT MORE THAN 1:20 [d]	BOTH FACES SLOPED NOT MORE THAN 1:20 FROM NORMAL TO BOLT AXIS [d]
NOT MORE THAN $4d_b$	1/3 TURN	1/2 TURN	2/3 TURN
MORE THAN $4d_b$ BUT NOT MORE THAN $8d_b$	1/2 TURN	2/3 TURN	5/6 TURN
MORE THAN $8d_b$ BUT NOT MORE THAN $12d_b$	2/3 TURN	5/6 TURN	1 TURN

[a] NUT ROTATION IS RELATIVE TO BOLT REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED. FOR REQUIRED NUT ROTATIONS OF 1/2 TURN AND LESS, THE TOLERANCE IS PLUS OR MINUS 30 DEGREES; FOR REQUIRED NUT ROTATIONS OF 2/3 TURN AND MORE, THE TOLERANCE IS PLUS OR MINUS 45 DEGREES.

[b] APPLICATION ONLY TO JOINTS IN WHICH ALL MATERIAL WITHIN THE GRIP IS STEEL.

[c] WHEN THE BOLT LENGTH EXCEEDS 12d , THE REQUIRED NUT ROTATION SHALL BE DETERMINED BY ACTUAL TESTING IN A SUITABLE TENSION CALIBRATOR THAT SIMULATES THE CONDITIONS OF SOLIDLY FITTING STEEL.

[d] BEVELED WASHER NOT USED.

SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, JUNE 30, 2004
RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS

INSTALLATION TORQUE REQUIRED FOR HOLLO BOLTS AND AJAX BOLTS:

1. M16 HOLLO BOLT: 140 FT-LBS
2. M20 AJAX BOLT: 390 FT-LBS

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(800)-487-SITE

TES JOB NO: 17022

CUSTOMER SITE NO: CT13071-A

CUSTOMER SITE NAME: WOODBRIDGE

1 DEERFIELD LANE
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DRAWN BY:	AD
CHECKED BY:	USA/KMM
DATE:	09/01/15

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	AD	09/01/15

SHEET TITLE: GENERAL NOTES

SHEET NUMBER: GN-1

REV #: 0

NOTE:

TEMPORARILY RELOCATE ANY EXISTING COAX ATTACHED TO THE MONOPOLE AND ANY OTHER MEMBERS WHERE OBSTRUCTION WITH THE PROPOSED MODIFICATION MAY OCCUR.

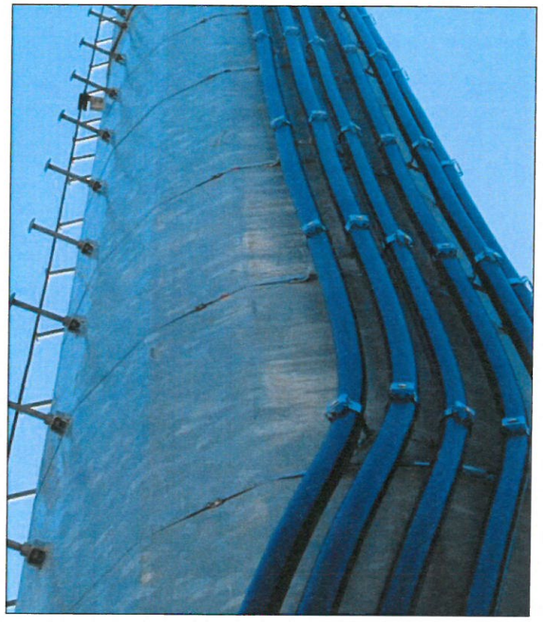
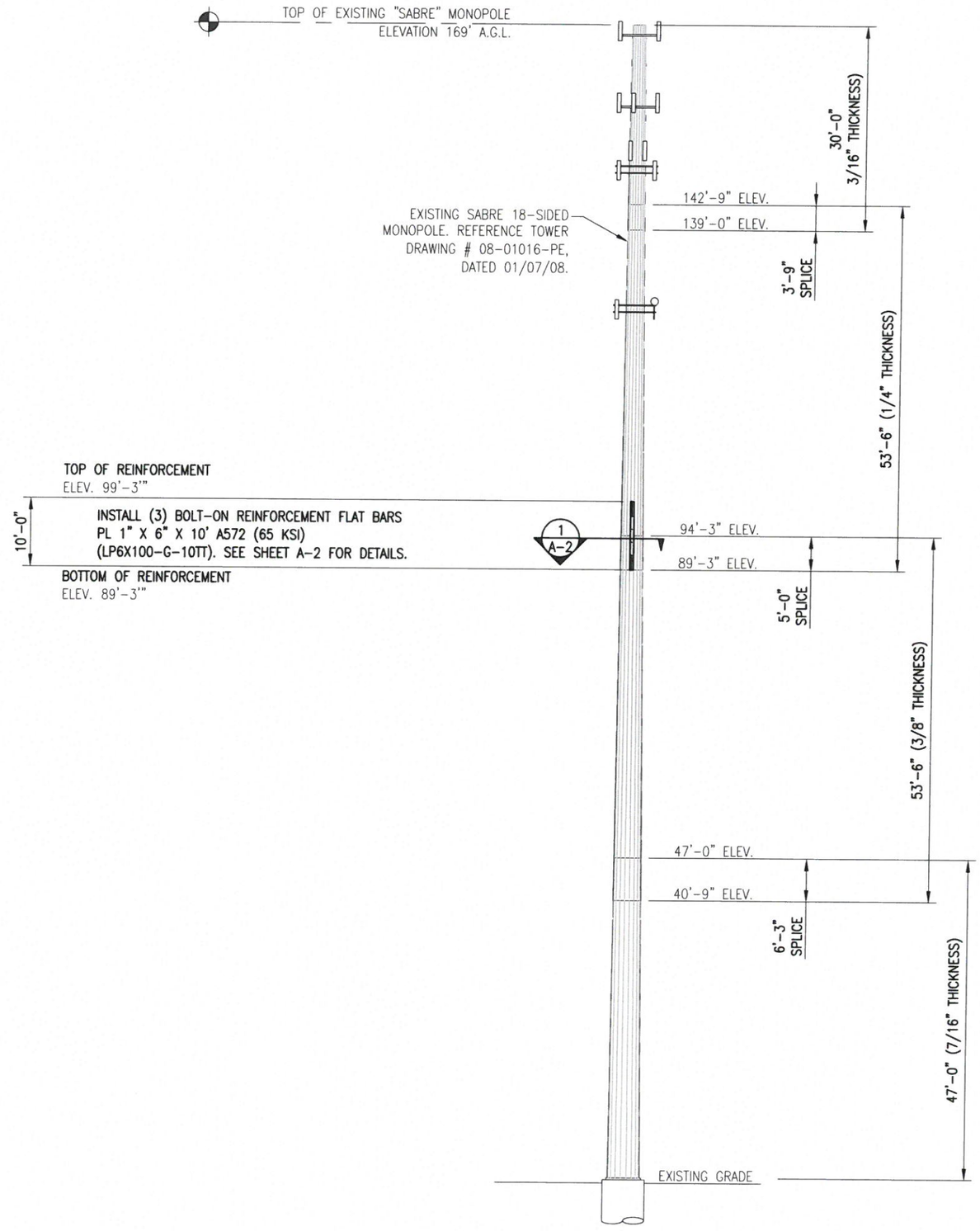


PHOTO 1



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DATE:	09/01/15

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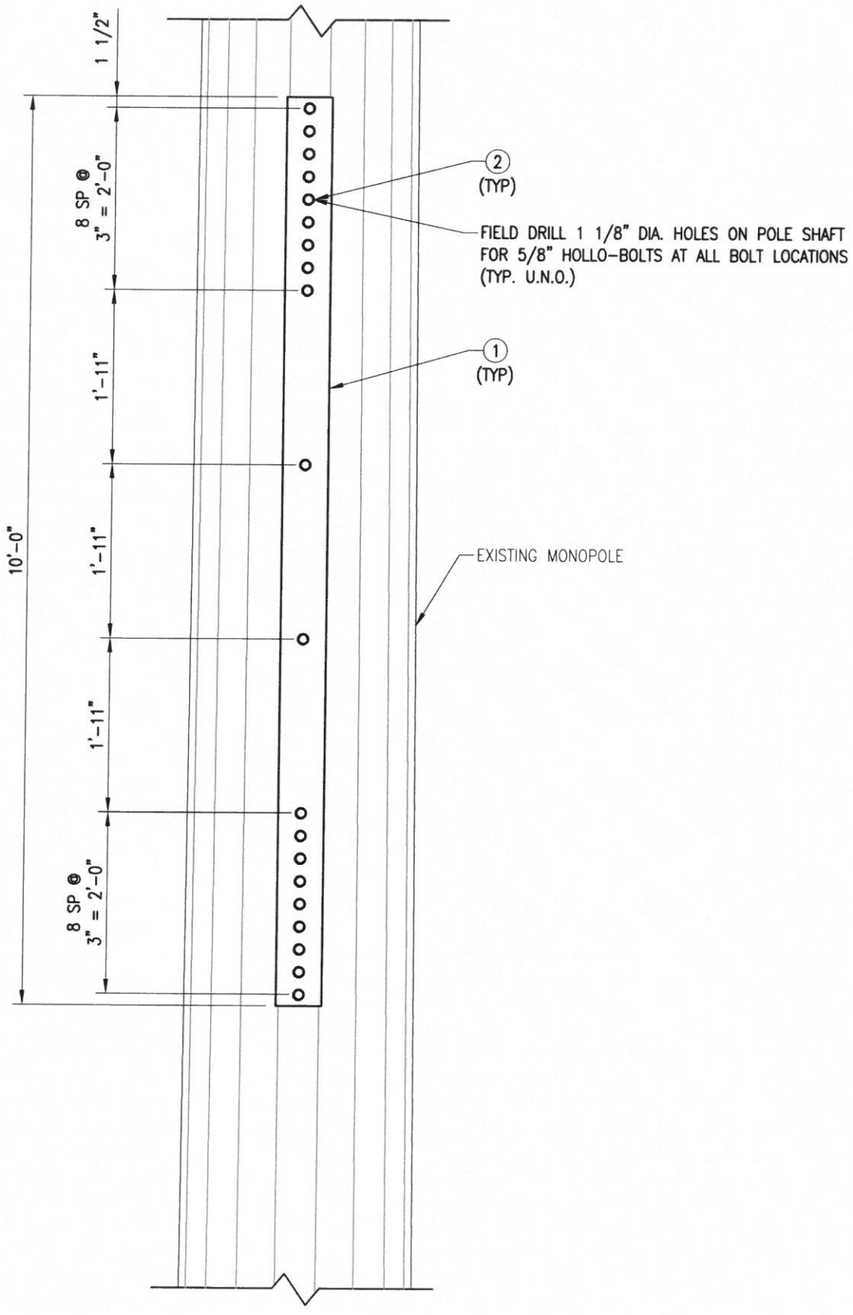
0	FIRST ISSUE	AD	09/01/15

SHEET TITLE:

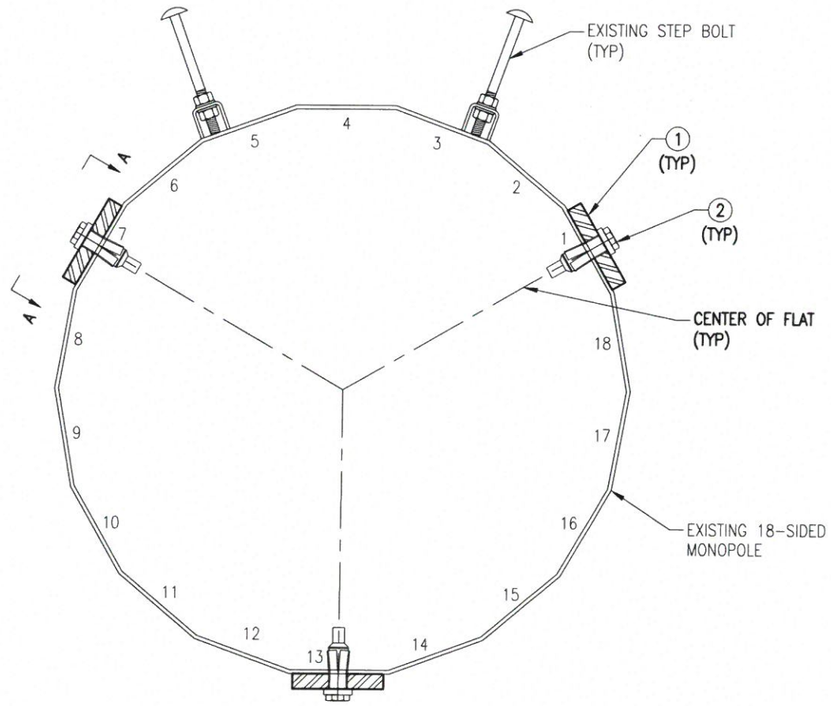
TOWER PROFILE

SHEET NUMBER:	REV #:
A-1	0



SECTION "A-A"

ELEVATION VIEW



1 A-2 PLAN VIEW

NOTE:
1. INSTALLATION TORQUE FOR HOLLO-BOLTS:
M16 HOLLO-BOLTS: 140 FT-LBS

ITEM NO.	MATERIAL PART NO.	DESCRIPTION	QTY. REQ'D
1	P6X100-G-10TT	PL 1" X 6" X 10'-0" A572, (65 KSI)	3
2	HB16-2	LINDAPTER TYPE HB HOLLO-BOLT (HDG)	60

TES
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SHEET TITLE:
REINFORCEMENT ASSEMBLY
P6X100-G-10TT
(18 SIDE 3 PIECES ON FLAT# 1, 7 AND 13)

SHEET NUMBER: A-2

REV #: 0