

August 12, 2015

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

RE: Notice of Exempt Modification  
723 Farmington Ave  
New Britain, CT 06053  
N 41° 41' 54.56"  
W 72° 47' 8.052"  
T-Mobile Site #: CTHA105A\_L700

Members of the Siting Council:

On behalf of T-Mobile Northeast LLC, SBA Communications is submitting an exempt modification application to the Connecticut Siting council for modification of existing equipment at a tower facility located at 723 Farmington Ave New Britain, CT.

The 723 Farmington Ave facility consists of a 119' Monopole Tower owned and operated by SBA Towers, 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.

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 antennas and associated 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. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna and equipment configuration 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

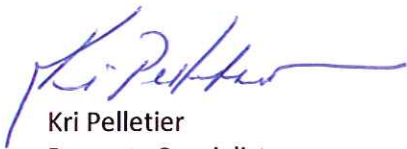
significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

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 Northeast LLC, respectfully submits that the 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  
Property Specialist  
SBA Communications Corporation  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
508-251-1755 + F  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)

**T-Mobile Northeast LLC  
Equipment Modification**

723 Farmington Ave New Britain, CT  
Site number CTHA105A\_L700

**Tower Owner:** SBA Towers LLC  
**Equipment Configuration:** MonopoleTower

**Current and/or approved:**

- (3) Ericsson AIR 21 B2A B4P Panels
- (3) Ericsson AIR 21 B4A B2P Panels
- (3) Ericsson KRY 112/144/1 TMAs
- (12) 1 5/8" lines
- (1) 1 5/8" Fiber

**Planned Modifications:**

- (3) Ericsson AIR B2A B4P - Panel
- (3) Ericsson AIR B4A B2P - Panel
- (3) Commscope LNX-6515DS-A1M Panels
- (3) Ericsson Double TMA 17/21
- (3) Ericsson S11B12 RRU
- (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 17.95% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 80.01% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE%	
Carrier	MPE%
T-Mobile	17.95
Sprint	0.31 %
Clearwire	1.55 %
MetroPCS	19.98 %
AT&T	33.48 %
Verizon Wireless	6.74 %
<b>Site Total MPE %:</b>	<b>80.01 %</b>





August 12, 2015

Mayor Erin Stewart  
City of New Britain  
27 West Main Street  
New Britain, CT 06051

RE: Telecommunications Facility- 723 Farmington Ave New Britain, CT

Dear Mayor Stewart,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile Northeast LLC 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,

A handwritten signature in blue ink, appearing to read "Kri Pelletier", is positioned above the typed name.

Kri Pelletier  
Property Specialist  
SBA Communications Corporation  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
508-251-1755 + F  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)

August 12, 2015

Mr. Andrew Mechlinski  
Nest 88 Polish Falcons Alliance of America, Inc.  
201 Washington Street  
New Britain, CT 06051-1827

RE: Telecommunications Facility- 723 Farmington Ave New Britain, CT

Dear Mr. Mechlinski,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile Northeast LLC 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  
Property Specialist  
SBA Communications Corporation  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
508-251-1755 + F  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)

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

T-Mobile Existing Facility

Site ID: CTHA105A

New Britain 3, CT  
723 Farmington Avenue  
New Britain, CT 06053

**August 10, 2015**

**EBI Project Number: 6215004250**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>80.01 %</b>

August 10, 2015

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

Emissions Analysis for Site: **CTHA105A – New Britain 3, CT**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **723 Farmington Avenue, New Britain, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the 700 MHz Band is approximately 467  $\mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the PCS and AWS bands is 1000  $\mu\text{W}/\text{cm}^2$ . 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 **723 Farmington Avenue, New Britain, 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 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 **88 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.

**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):	88	Height (AGL):	88	Height (AGL):	88
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	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%	2.50	Antenna B1 MPE%	2.50	Antenna C1 MPE%	2.50
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):	88	Height (AGL):	88	Height (AGL):	88
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%	2.50	Antenna B2 MPE%	2.50	Antenna C2 MPE%	2.50
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):	88	Height (AGL):	88	Height (AGL):	88
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%	0.99	Antenna B3 MPE%	0.99	Antenna C3 MPE%	0.99

Site Composite MPE%	
Carrier	MPE%
T-Mobile	17.95
Sprint	0.31 %
Clearwire	1.55 %
MetroPCS	19.98 %
AT&T	33.48 %
Verizon Wireless	6.74 %
<b>Site Total MPE %:</b>	<b>80.01 %</b>

T-Mobile Sector 1 Total:	5.98 %
T-Mobile Sector 2 Total:	5.98 %
T-Mobile Sector 3 Total:	5.98 %
<b>Site Total:</b>	<b>80.01 %</b>

## 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:	5.98 %
Sector 2:	5.98 %
Sector 3 :	5.98 %
T-Mobile Total:	17.95 %
Site Total:	80.01 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **80.01%** 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

---

## **Structural Analysis Report**

**Existing 119 ft. Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT08558-B**

**Customer Site Name: New Britain 3, CT**

**Carrier Name: T-Mobile**

**Carrier Site Number: CTHA105A**

**Site Location: 723 Farmington Ave**

**New Britain, Connecticut**

**Hartford County**

**Latitude: 41.698414**

**Longitude: -72.785944**

### **Analysis Result:**

**Max Structural Usage: 91.1% [Pass]**

**Max Foundation Usage: 90.0 % [Pass]**

**Report Prepared By : Esha Goyal**







**Tower Engineering Solutions**

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

---

## **Structural Analysis Report**

**Existing 119 ft. Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT08558-B**

**Customer Site Name: New Britain 3, CT**

**Carrier Name: T-Mobile**

**Carrier Site Number: CTHA105A**

**Site Location: 723 Farmington Ave**

**New Britain, Connecticut**

**Hartford County**

**Latitude: 41.698414**

**Longitude: -72.785944**

### **Analysis Result:**

**Max Structural Usage: 91.1% [Pass]**

**Max Foundation Usage: 90.0% [Pass]**

**Report Prepared By : Esha Goyal**

## **Introduction**

The purpose of this report is to summarize the analysis results on the 119 ft. Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## **Sources of Information**

<b>Tower Drawings</b>	Original Tower drawings by Sabre, Job# 06-08008, dated 08/1/2005
<b>Foundation Drawing</b>	Original Foundation drawings by Sabre, Job# 06-08008, dated 08/1/2005
<b>Geotechnical Report</b>	Geotechnical Report prepared by DR. Clarence Welti, dated 07/7/2005
<b>Previous SA</b>	Previous SA by FDH Engineering, project# 1462VZ1400 (R1), dated 12/3/2014
<b>Modification Drawings</b>	N/A

## **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.

<b>Basic Wind Speed Used in the Analysis:</b>	80.0 mph (fastest mile)/95.0 mph (3-sec gust wind speed)
<b>Basic Wind Speed with Ice:</b>	69 mph (fastest mile) with 1/2" radial ice concurrent
<b>Operational Wind Speed:</b>	50 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-F / 2005 Connecticut State Building Code

## Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	118.0	3	Kathrein 800 10735V01 Panels	(3) T-Arms	(12) 1 5/8" (1) 1 5/8" Hybrid*	Verizon
2		3	Antel BXA-171063-12BF Panels			
3		3	Antel BXA-171063-8BF Panels			
4		3	Antel BXA-70063-6BF Panels			
5		1	RFS DB-T1-6Z-8AB-OZ Dist. Box			
6		6	RFS FD9R6004/2C-3L Diplexers			
7		3	ALU RRH2x40-AWS RRU's			
8	108.0	3	ALU 1900MHz RRU's	(3) T-Arms	(4) 1-1/4" Hybrid (3) 1/2" (6) 5/16"	Clearwire/ Sprint
9		3	ALU 800 MHz Filters			
10		3	ALU 800 MHz RRU's			
11		3	Kathrein 840 10054 Panels			
12		4	RFS ACU-A20-N RET's			
13		2	RFS APXVSP18-C-A20 Panels			
14		3	RFS APXVTM14-C-120 Panels			
15		2	DragonwaveHorizon ODU Radios			
16		1	Powerwave P40-16-XLPP-RR-A Panels			
17		3	ALU TD-RRH8x20-25 RRU's			
18	2	Andrew VHLP2.5 Dishes	(3) T-Arms	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile	
-	88.0	3				Ericsson AIR 21 B2A B4P Panels
-		3				Ericsson AIR 21 B4A B2P Panels
-		3	Ericsson KRY 112/144/1 TMA's			
19	98.0	6	Powerwave 7770.00 Panels	(3) T-Arms	(12) 1 5/8" (1) 10 MM fiber (3) WR- VG122ST	Cingular
20		1	KWM AM-X-CD-16-65-00T Panels			
21		1	Raycap DC6-48-60-18-8F Surge Arrestor			
22		3	CCI DTMABP7819VG12A TMA's			
23		6	Powerwave LGP 21401 TMA's			
24		6	Powerwave LGP13519 Diplexers			
25		2	Powerwave P65-16-XLH-RR Panels			
26	6	Ericsson RRU-11 RRU's	(3) T-Arms	(6) 1-5/8"	Pocket	
32	78.0	3				RFS APXV18-206517S-C Panels

\*(1)1-5/8" Hybrid cable of Verizon is installed outside the pole shaft.

## 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
27	88.0	3	Ericsson AIR B2A B4P - Panel	(3) T-Arms	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
28		3	Ericsson AIR B4A B2P - Panel			
29		3	Commscope LNX-6515DS-A1M Panels			
30		3	Ericsson Double TMA 17/21			
31		3	Ericsson S11B12 RRU			

All 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:	<b>91.1%</b>	<b>81.0%</b>	<b>77.0%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## Foundations

	Moment (Kip-Ft)	Shear (Kips)
Analysis Reactions	2105.3	23.4

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):**

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-F for the installed antennas. Maximum twist/sway at the elevation of the proposed equipment is 1.5578 degrees under the operational wind speed as specified in the Analysis Criteria.

### **Conclusions**

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-F Standard under the design basic wind speed as specified in the Analysis Criteria.

## Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed 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 91.1% at 0.0ft

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69

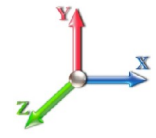
7/29/2015



Page: 1

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

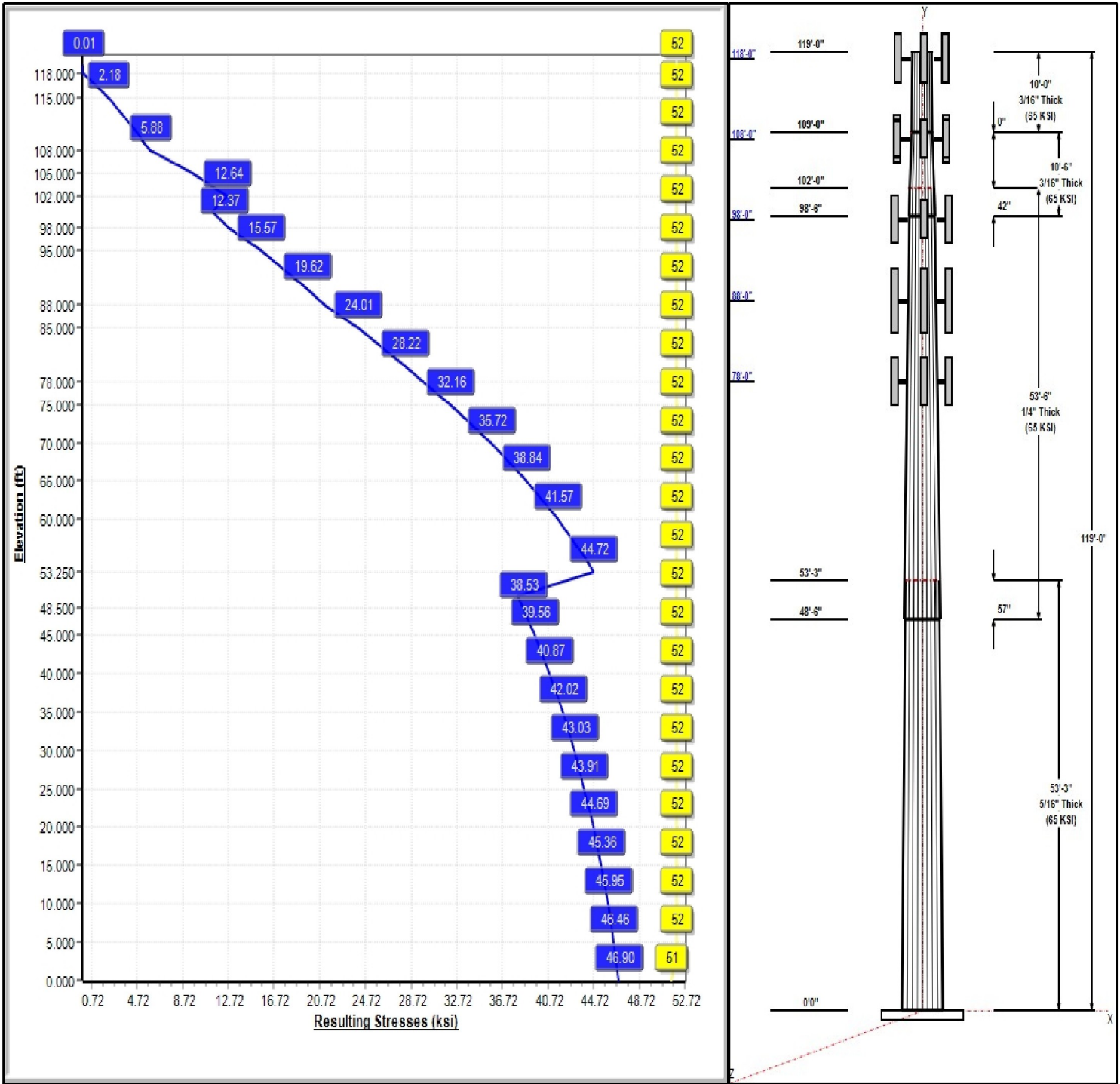
**Load Case : 80 mph Wind with 0 in Ice**



**Iterations:** 23

- 51 Allowable Stress
- 47 Resulting Stress

*Copyright © 2015 by Tower Engineering Solutions, LLC. All rights reserved.*



## Structure: CT08558-B-SBA

**Type:** Tapered  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.22164

7/29/2015

Page: 2



### Shaft Properties

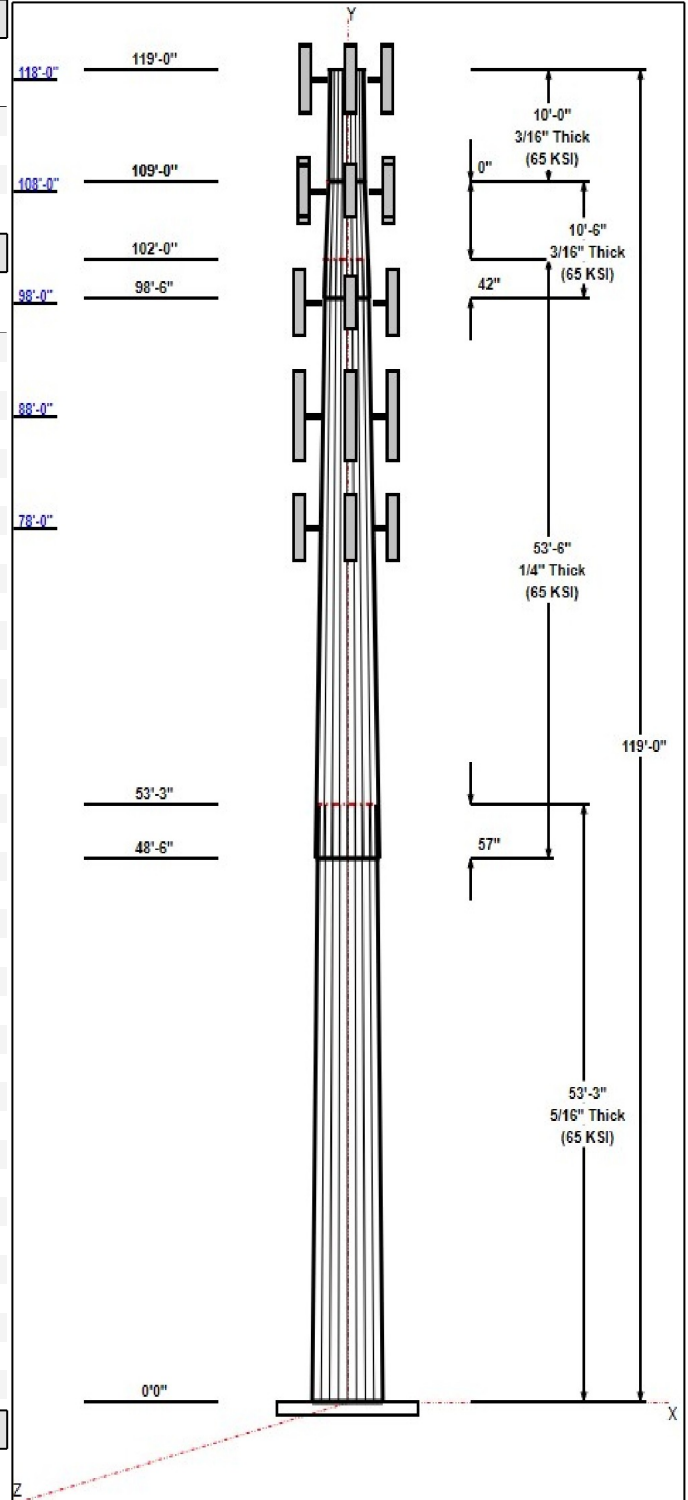
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	35.70	47.50	0.313		0.22164	65
2	53.50	25.39	37.25	0.250	Slip	0.22164	65
3	10.50	24.22	26.54	0.188	Slip	0.22164	65
4	10.00	22.00	24.22	0.188	Butt	0.22164	65

### Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
118.00	118.00	3	800 10735	Verizon
118.00	118.00	3	BXA-171063-12BF	Verizon
118.00	118.00	3	BXA-171063-8BF	Verizon
118.00	118.00	3	BXA-70063-6BF	Verizon
118.00	118.00	1	DB-B1-6Z-8AB-0Z Dist.	Verizon
118.00	118.00	6	FD9R6004/2C-3L (3.1 lbs)	Verizon
118.00	118.00	3	RRH2x40-AWS	Verizon
118.00	118.00	3	T-Arms	Verizon
108.00	108.00	3	1900MHz RRH	Clearwire/Sprint
108.00	108.00	3	800 MHz Filters	Clearwire/Sprint
108.00	108.00	3	800 MHz RRH	Clearwire/Sprint
108.00	108.00	3	840 10054	Clearwire/Sprint
108.00	108.00	4	ACU-A20-N	Clearwire/Sprint
108.00	108.00	2	APXVSP18-C	Clearwire/Sprint
108.00	108.00	3	APXVTM14-C-120	Clearwire/Sprint
108.00	108.00	2	Horizon	Clearwire/Sprint
108.00	108.00	1	P40-16-XLPP-RR-A	Clearwire/Sprint
108.00	108.00	3	T-Arms	Clearwire/Sprint
108.00	108.00	3	TD-RRH8x20-25	Clearwire/Sprint
108.00	108.00	2	VHLP2.5	Clearwire/Sprint
98.00	98.00	6	7770.00	Cingular
98.00	98.00	1	AM-X-CD-16-65-00T-RET	Cingular
98.00	98.00	1	DC6-48-60-18-8F	Cingular
98.00	98.00	3	DTMABP7819VG12A	Cingular
98.00	98.00	6	LGP 21401	Cingular
98.00	98.00	6	LGP13519	Cingular
98.00	98.00	2	P65-16-XLH-RR	Cingular
98.00	98.00	6	RRU-11	Cingular
98.00	98.00	3	T-Arms	Cingular
88.00	88.00	3	AIR B2A B4P	T-Mobile
88.00	88.00	3	AIR B4A B2P	T-Mobile
88.00	88.00	3	Double TMA 17/21	T-Mobile
88.00	88.00	3	LNx-6515DS-A1M	T-Mobile
88.00	88.00	3	S11B12	T-Mobile
88.00	88.00	3	T-Arms	T-Mobile
78.00	78.00	3	APXV18-206517S-C	Pocket
78.00	78.00	3	T-Arms	Pocket

### Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	118.00	Inside	1 5/8" Coax	Verizon
0.00	118.00	Outside	1 5/8" Hybrid	Verizon
0.00	108.00	Inside	1-1/4" Hybrid	Clearwire/Sprint
0.00	108.00	Inside	1/2" Coax	Clearwire/Sprint
0.00	108.00	Inside	5/16" Coax	Clearwire/Sprint





**Structure: CT08558-B-SBA**

**Type:** Tapered  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.22164

7/29/2015

Page: 3



0.00	98.00	Inside	1 5/8" Coax	Cingular
0.00	98.00	Inside	10 MM fiber	Cingular
0.00	98.00	Inside	WR-VG122ST	Cingular
0.00	88.00	Inside	1 5/8" Coax	T-Mobile
0.00	88.00	Inside	1 5/8" Fiber	T-Mobile
0.00	78.00	Inside	1 5/8" Coax	Pocket

**Anchor Bolts**

Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Cluster

**Base Plate**

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	52.0	60.0	Clipped

**Reactions**

Load Case	Moment	Shear	Axial
80 mph Wind with 0" Ice	2105.3	23.4	28.0
69.28 mph Wind with 0.5" Ice	1742.8	18.9	32.9
50 mph Wind with 0" Ice	823.0	9.1	28.0

## Shaft Properties

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 4



Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.3125	65		0.00	7,420
2	18	53.500	0.2500	65	Slip	57.00	4,488
3	18	10.500	0.1875	65	Slip	42.00	536
4	18	10.000	0.1875	65	Flange	0.00	464
<b>Total Shaft Weight:</b>							<b>12,908</b>

Bottom

Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper
1	47.50	0.00	46.80	13166.65	25.39	152	35.70	53.25	35.10	5552.15	18.73	114.2	0.221639
2	37.25	48.50	29.36	5078.18	24.86	149.0	25.39	102.0	19.95	1593.41	16.49	101.5	0.221639
3	26.54	98.50	15.68	1376.54	23.55	141.5	24.22	109.0	14.30	1043.15	21.36	129.1	0.221639
4	24.22	109.0	14.30	1043.15	21.36	129.1	22.00	119.0	12.98	780.30	19.27	117.3	0.221639

## Loading Summary

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 5



### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	118.0	800 10735	3	28.70	8.80	0.66	71.80	9.670	0.66	0.00	0.00
2	118.0	BXA-171063-12BF	3	15.00	4.73	0.84	42.20	5.400	0.84	0.00	0.00
3	118.0	BXA-171063-8BF	3	10.50	2.94	0.84	29.30	3.410	0.84	0.00	0.00
4	118.0	BXA-70063-6BF	3	17.00	7.73	0.70	57.60	8.540	0.70	0.00	0.00
5	118.0	DB-B1-6Z-8AB-0Z Dist. Box	1	21.40	4.78	0.91	51.10	5.040	0.91	0.00	0.00
6	118.0	FD9R6004/2C-3L (3.1 lbs)	6	3.10	0.36	0.75	5.40	0.500	0.75	0.00	0.00
7	118.0	RRH2x40-AWS	3	44.00	2.52	0.82	61.40	2.870	0.82	0.00	0.00
8	118.0	T-Arms	3	400.00	10.00	0.75	480.00	12.50	0.75	0.00	0.00
9	108.0	1900MHz RRH	3	44.00	3.80	0.88	75.20	4.200	0.88	0.00	0.00
10	108.0	800 MHz Filters	3	61.80	2.91	0.93	87.80	3.260	0.93	0.00	0.00
11	108.0	800 MHz RRH	3	53.00	2.49	0.92	74.10	2.820	0.92	0.00	0.00
12	108.0	840 10054	3	35.00	5.18	0.61	59.10	5.720	0.61	0.00	0.00
13	108.0	ACU-A20-N	4	1.00	0.14	0.79	2.30	0.220	0.79	0.00	0.00
14	108.0	APXVSP18-C	2	57.00	8.26	0.83	106.50	9.080	0.83	0.00	0.00
15	108.0	APXVTM14-C-120	3	56.00	6.90	0.79	91.90	7.290	0.79	0.00	0.00
16	108.0	Horizon	2	10.60	0.43	1.00	17.00	0.580	1.00	0.00	0.00
17	108.0	P40-16-XLPP-RR-A	1	53.00	10.50	0.66	0.00	11.23	0.66	0.00	0.00
18	108.0	T-Arms	3	400.00	10.00	0.75	480.00	12.50	0.75	0.00	0.00
19	108.0	TD-RRH8x20-25	3	70.00	4.72	0.69	92.00	4.970	0.69	0.00	0.00
20	108.0	VHLP2.5	2	47.60	8.43	1.00	97.00	8.920	1.00	0.00	0.00
21	98.00	7770.00	6	35.00	5.88	0.73	0.00	6.530	0.73	0.00	0.00
22	98.00	AM-X-CD-16-65-00T-RET	1	48.50	8.26	0.75	95.00	9.080	0.75	0.00	0.00
23	98.00	DC6-48-60-18-8F	1	31.80	1.47	1.00	49.50	1.670	1.00	0.00	0.00
24	98.00	DTMABP7819VG12A	3	19.20	1.14	0.67	26.50	1.360	0.67	0.00	0.00
25	98.00	LGP 21401	6	17.50	0.00	0.75	0.00	0.000	0.75	0.00	0.00
26	98.00	LGP13519	6	5.30	0.34	0.75	8.00	0.470	0.75	0.00	0.00
27	98.00	P65-16-XLH-RR	2	53.00	8.40	0.75	100.20	9.220	0.75	0.00	0.00
28	98.00	RRU-11	6	55.00	0.00	0.75	0.00	0.000	0.75	0.00	0.00
29	98.00	T-Arms	3	400.00	10.00	0.75	480.00	12.50	0.75	0.00	0.00
30	88.00	AIR B2A B4P	3	91.50	6.58	0.86	129.20	6.970	0.86	0.00	0.00
31	88.00	AIR B4A B2P	3	90.40	6.58	0.86	128.10	6.970	0.86	0.00	0.00
32	88.00	Double TMA 17/21	3	11.00	0.41	0.69	14.50	0.620	0.69	0.00	0.00
33	88.00	LNx-6515DS-A1M	3	49.80	11.41	0.80	115.60	12.34	0.80	0.00	0.00
34	88.00	S11B12	3	51.00	3.31	0.72	66.90	3.520	0.72	0.00	0.00
35	88.00	T-Arms	3	400.00	10.00	0.75	480.00	12.50	0.75	0.00	0.00
36	78.00	APXV18-206517S-C	3	26.40	5.16	0.74	53.00	5.840	0.74	0.00	0.00
37	78.00	T-Arms	3	400.00	10.00	0.75	480.00	12.50	0.75	0.00	0.00
<b>Totals:</b>			<b>115</b>	<b>9,513.40</b>			<b>11,955.20</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	No Ice		Ice		Exposed
			Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	
0.00	118.0	(12) 1 5/8" Coax	12.48	0.00	0.00	0.00	Inside
0.00	118.0	(1) 1 5/8" Hybrid	1.10	0.16	0.00	0.00	Outside

## Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
0.00	108.0	(4) 1-1/4" Hybrid		3.82	0.00		0.00	0.00		Inside	
0.00	108.0	(3) 1/2" Coax		0.96	0.00		0.00	0.00		Inside	
0.00	108.0	(6) 5/16" Coax		0.08	0.00		0.00	0.00		Inside	
0.00	98.00	(12) 1 5/8" Coax		12.48	0.00		0.00	0.00		Inside	
0.00	98.00	(1) 10 MM fiber		0.06	0.00		0.00	0.00		Inside	
0.00	98.00	(3) WR-VG122ST		0.82	0.00		0.00	0.00		Inside	
0.00	88.00	(12) 1 5/8" Coax		12.48	0.00		0.00	0.00		Inside	
0.00	88.00	(1) 1 5/8" Fiber		1.10	0.00		0.00	0.00		Inside	
0.00	78.00	(6) 1 5/8" Coax		12.48	0.00		0.00	0.00		Inside	
<b>Totals:</b>				<b>5,604.26</b>			<b>0.00</b>				



## Shaft Section Properties

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 7



**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.3125	47.500	46.802	13166.7	25.39	152.00	65	51	0.0
5.00		0.3125	46.392	45.703	12260.6	24.77	148.45	65	52	786.9
10.00		0.3125	45.284	44.604	11397.1	24.14	144.91	65	52	768.2
15.00		0.3125	44.175	43.505	10575.2	23.52	141.36	65	52	749.5
20.00		0.3125	43.067	42.406	9793.7	22.89	137.82	65	52	730.8
25.00		0.3125	41.959	41.307	9051.7	22.26	134.27	65	52	712.1
30.00		0.3125	40.851	40.208	8348.2	21.64	130.72	65	52	693.4
35.00		0.3125	39.743	39.108	7682.1	21.01	127.18	65	52	674.7
40.00		0.3125	38.634	38.009	7052.4	20.39	123.63	65	52	656.0
45.00		0.3125	37.526	36.910	6458.1	19.76	120.08	65	52	637.3
48.50	Bot - Section 2	0.3125	36.751	36.141	6062.6	19.33	117.60	65	52	435.0
50.00		0.3125	36.418	35.811	5898.2	19.14	116.54	65	52	332.8
53.25	Top - Section 1	0.2500	36.198	28.524	4656.9	24.12	144.79	65	52	710.7
55.00		0.2500	35.810	28.216	4507.8	23.85	143.24	65	52	168.9
60.00		0.2500	34.702	27.336	4099.4	23.06	138.81	65	52	472.6
65.00		0.2500	33.593	26.457	3716.4	22.28	134.37	65	52	457.6
70.00		0.2500	32.485	25.578	3358.0	21.50	129.94	65	52	442.7
75.00		0.2500	31.377	24.698	3023.4	20.72	125.51	65	52	427.7
78.00		0.2500	30.712	24.171	2833.8	20.25	122.85	65	52	249.4
80.00		0.2500	30.269	23.819	2711.9	19.94	121.08	65	52	163.3
85.00		0.2500	29.161	22.940	2422.5	19.16	116.64	65	52	397.8
88.00		0.2500	28.496	22.412	2259.2	18.69	113.98	65	52	231.5
90.00		0.2500	28.053	22.061	2154.5	18.38	112.21	65	52	151.3
95.00		0.2500	26.944	21.181	1907.0	17.59	107.78	65	52	367.9
98.00		0.2500	26.279	20.654	1768.0	17.12	105.12	65	52	213.5
98.50	Bot - Section 3	0.2500	26.169	20.566	1745.5	17.05	104.67	65	52	35.1
100.00		0.2500	25.836	20.302	1679.2	16.81	103.34	65	52	183.8
102.00	Top - Section 2	0.1875	25.768	15.223	1258.5	22.82	137.43	65	52	241.5
105.00		0.1875	25.103	14.827	1162.9	22.20	133.88	65	52	153.4
108.00		0.1875	24.438	14.432	1072.3	21.57	130.34	65	52	149.3
109.00	Top - Section 3	0.0000	0.000	0.000	0.0	NAN	NAN	0	0	48.9
109.00	Bot - Section 4	0.1875	24.216	14.300	1043.1	21.36	129.15	65	52	
110.00		0.1875	23.995	14.168	1014.5	21.15	127.97	65	52	48.4
115.00		0.1875	22.887	13.508	879.4	20.11	122.06	65	52	235.4
118.00		0.1875	22.222	13.113	804.3	19.49	118.52	65	52	135.9
119.00		0.1875	22.000	12.981	780.3	19.28	117.33	65	52	44.4

**12908.1**

## Wind Loading - Shaft

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 8



**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

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	16.384	27.69	316.67	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	16.384	27.69	309.28	0.650	0.000	5.00	19.561	12.71	352.1	0.0	786.9
10.00		0.00	1.00	16.384	27.69	301.89	0.650	0.000	5.00	19.099	12.41	343.7	0.0	768.2
15.00		0.00	1.00	16.384	27.69	294.50	0.650	0.000	5.00	18.637	12.11	335.4	0.0	749.5
20.00		0.00	1.00	16.384	27.69	287.11	0.650	0.000	5.00	18.176	11.81	327.1	0.0	730.8
25.00		0.00	1.00	16.384	27.69	279.73	0.650	0.000	5.00	17.714	11.51	318.8	0.0	712.1
30.00		0.00	1.00	16.384	27.69	272.34	0.650	0.000	5.00	17.252	11.21	310.5	0.0	693.4
35.00		0.00	1.02	16.662	28.16	267.19	0.650	0.000	5.00	16.790	10.91	307.3	0.0	674.7
40.00		0.00	1.06	17.310	29.25	264.74	0.650	0.000	5.00	16.329	10.61	310.5	0.0	656.0
45.00		0.00	1.09	17.902	30.25	261.51	0.650	0.000	5.00	15.867	10.31	312.0	0.0	637.3
48.50	Bot - Section 2	0.00	1.12	18.289	30.91	258.86	0.650	0.000	3.50	10.832	7.04	217.6	0.0	435.0
50.00		0.00	1.13	18.449	31.18	257.64	0.650	0.000	1.50	4.636	3.01	93.9	0.0	332.8
53.25	Top - Section 1	0.00	1.15	18.784	31.75	254.82	0.650	0.000	3.25	9.901	6.44	204.3	0.0	710.7
55.00		0.00	1.16	18.959	32.04	256.81	0.650	0.000	1.75	5.251	3.41	109.3	0.0	168.9
60.00		0.00	1.19	19.436	32.85	251.97	0.650	0.000	5.00	14.690	9.55	313.6	0.0	472.6
65.00		0.00	1.21	19.885	33.61	246.73	0.650	0.000	5.00	14.228	9.25	310.8	0.0	457.6
70.00		0.00	1.24	20.311	34.33	241.13	0.650	0.000	5.00	13.766	8.95	307.2	0.0	442.7
75.00		0.00	1.26	20.715	35.01	235.21	0.650	0.000	5.00	13.305	8.65	302.8	0.0	427.7
78.00	Appurtenance(s)	0.00	1.28	20.949	35.40	231.52	0.650	0.000	3.00	7.761	5.04	178.6	0.0	249.4
80.00		0.00	1.29	21.101	35.66	229.00	0.650	0.000	2.00	5.082	3.30	117.8	0.0	163.3
85.00		0.00	1.31	21.469	36.28	222.54	0.650	0.000	5.00	12.381	8.05	292.0	0.0	397.8
88.00	Appurtenance(s)	0.00	1.32	21.683	36.64	218.55	0.650	0.000	3.00	7.207	4.68	171.7	0.0	231.5
90.00		0.00	1.33	21.823	36.88	215.84	0.650	0.000	2.00	4.712	3.06	113.0	0.0	151.3
95.00		0.00	1.35	22.163	37.45	208.92	0.650	0.000	5.00	11.458	7.45	278.9	0.0	367.9
98.00	Appurtenance(s)	0.00	1.36	22.360	37.79	204.67	0.650	0.000	3.00	6.653	4.32	163.4	0.0	213.5
98.50	Bot - Section 3	0.00	1.37	22.393	37.84	203.96	0.650	0.000	0.50	1.093	0.71	26.9	0.0	35.1
100.00		0.00	1.37	22.490	38.01	201.80	0.650	0.000	1.50	3.297	2.14	81.5	0.0	183.8
102.00	Top - Section 2	0.00	1.38	22.617	38.22	198.90	0.650	0.000	2.00	4.332	2.82	107.6	0.0	241.5
105.00		0.00	1.39	22.806	38.54	197.44	0.650	0.000	3.00	6.359	4.13	159.3	0.0	153.4
108.00	Appurtenance(s)	0.00	1.40	22.990	38.85	192.99	0.650	0.000	3.00	6.193	4.03	156.4	0.0	149.3
109.00	Top - Section 3	0.00	1.41	23.051	38.96	191.49	0.650	0.000	1.00	2.027	1.32	51.3	0.0	48.9
110.00		0.00	1.41	23.111	39.06	189.99	0.650	0.000	1.00	2.009	1.31	51.0	0.0	48.4
115.00		0.00	1.43	23.406	39.56	182.37	0.650	0.000	5.00	9.767	6.35	251.1	0.0	235.4
118.00	Appurtenance(s)	0.00	1.44	23.579	39.85	177.72	0.650	0.000	3.00	5.639	3.67	146.0	0.0	135.9
119.00		0.00	1.44	23.636	39.94	176.16	0.650	0.000	1.00	1.843	1.20	47.8	0.0	44.4
<b>Totals:</b>									<b>119.00</b>			<b>7,171.4</b>		<b>12,908.1</b>

## Discrete Appurtenance Forces

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

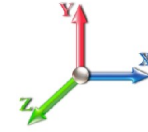
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 9



**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

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	118.00	RRH2x40-AWS	3	23.579	39.848	0.82	6.20	132.00	0.000	0.000	247.03	0.00	0.00
2	118.00	FD9R6004/2C-3L (3.1 lbs)	6	23.579	39.848	0.75	1.62	18.60	0.000	0.000	64.55	0.00	0.00
3	118.00	DB-B1-6Z-8AB-0Z Dist. Box	1	23.579	39.848	0.91	4.35	21.40	0.000	0.000	173.33	0.00	0.00
4	118.00	BXA-70063-6BF	3	23.579	39.848	0.70	16.23	51.00	0.000	0.000	646.86	0.00	0.00
5	118.00	BXA-171063-8BF	3	23.579	39.848	0.84	7.41	31.50	0.000	0.000	295.23	0.00	0.00
6	118.00	BXA-171063-12BF	3	23.579	39.848	0.84	11.92	45.00	0.000	0.000	474.98	0.00	0.00
7	118.00	800 10735	3	23.579	39.848	0.66	17.42	86.10	0.000	0.000	694.32	0.00	0.00
8	118.00	T-Arms	3	23.579	39.848	0.75	22.50	1200.00	0.000	0.000	896.59	0.00	0.00
9	108.00	ACU-A20-N	4	22.990	38.853	0.79	0.44	4.00	0.000	0.000	17.19	0.00	0.00
10	108.00	APXVSP18-C	2	22.990	38.853	0.83	13.71	114.00	0.000	0.000	532.74	0.00	0.00
11	108.00	APXVTM14-C-120	3	22.990	38.853	0.79	16.35	168.00	0.000	0.000	635.36	0.00	0.00
12	108.00	840 10054	3	22.990	38.853	0.61	9.48	105.00	0.000	0.000	368.30	0.00	0.00
13	108.00	800 MHz RRH	3	22.990	38.853	0.92	6.87	159.00	0.000	0.000	267.01	0.00	0.00
14	108.00	VHLP2.5	2	22.990	38.853	1.00	16.86	95.20	0.000	0.000	655.06	0.00	0.00
15	108.00	Horizon	2	22.990	38.853	1.00	0.86	21.20	0.000	0.000	33.41	0.00	0.00
16	108.00	P40-16-XLPP-RR-A	1	22.990	38.853	0.66	6.93	53.00	0.000	0.000	269.25	0.00	0.00
17	108.00	T-Arms	3	22.990	38.853	0.75	22.50	1200.00	0.000	0.000	874.19	0.00	0.00
18	108.00	TD-RRH8x20-25	3	22.990	38.853	0.69	9.77	210.00	0.000	0.000	379.61	0.00	0.00
19	108.00	800 MHz Filters	3	22.990	38.853	0.93	8.12	185.40	0.000	0.000	315.44	0.00	0.00
20	108.00	1900MHz RRH	3	22.990	38.853	0.88	10.03	132.00	0.000	0.000	389.77	0.00	0.00
21	98.00	LGP 21401	6	22.360	37.789	0.75	0.00	105.00	0.000	0.000	0.00	0.00	0.00
22	98.00	7770.00	6	22.360	37.789	0.73	25.75	210.00	0.000	0.000	973.24	0.00	0.00
23	98.00	DC6-48-60-18-8F	1	22.360	37.789	1.00	1.47	31.80	0.000	0.000	55.55	0.00	0.00
24	98.00	DTMABP7819VG12A	3	22.360	37.789	0.67	2.29	57.60	0.000	0.000	86.59	0.00	0.00
25	98.00	AM-X-CD-16-65-00T-RET	1	22.360	37.789	0.75	6.20	48.50	0.000	0.000	234.10	0.00	0.00
26	98.00	P65-16-XLH-RR	2	22.360	37.789	0.75	12.60	106.00	0.000	0.000	476.14	0.00	0.00
27	98.00	RRU-11	6	22.360	37.789	0.75	0.00	330.00	0.000	0.000	0.00	0.00	0.00
28	98.00	T-Arms	3	22.360	37.789	0.75	22.50	1200.00	0.000	0.000	850.26	0.00	0.00
29	98.00	LGP13519	6	22.360	37.789	0.75	1.53	31.80	0.000	0.000	57.82	0.00	0.00
30	88.00	Double TMA 17/21	3	21.683	36.645	0.69	0.85	33.00	0.000	0.000	31.10	0.00	0.00
31	88.00	AIR B2A B4P	3	21.683	36.645	0.86	16.98	274.50	0.000	0.000	622.10	0.00	0.00
32	88.00	AIR B4A B2P	3	21.683	36.645	0.86	16.98	271.20	0.000	0.000	622.10	0.00	0.00
33	88.00	S11B12	3	21.683	36.645	0.72	7.15	153.00	0.000	0.000	262.00	0.00	0.00
34	88.00	LNx-6515DS-A1M	3	21.683	36.645	0.80	27.38	149.40	0.000	0.000	1003.48	0.00	0.00
35	88.00	T-Arms	3	21.683	36.645	0.75	22.50	1200.00	0.000	0.000	824.51	0.00	0.00
36	78.00	T-Arms	3	20.949	35.403	0.75	22.50	1200.00	0.000	0.000	796.57	0.00	0.00
37	78.00	APXV18-206517S-C	3	20.949	35.403	0.74	11.46	79.20	0.000	0.000	405.55	0.00	0.00
<b>Totals:</b>								<b>9,513.40</b>			<b>15,531.34</b>		

## Total Applied Force Summary

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

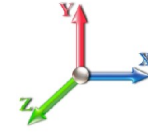
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 10



**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

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		374.20	1076.20	0.00	0.00
10.00		365.89	1057.50	0.00	0.00
15.00		357.58	1038.80	0.00	0.00
20.00		349.27	1020.10	0.00	0.00
25.00		340.96	1001.40	0.00	0.00
30.00		332.65	982.70	0.00	0.00
35.00		329.84	964.00	0.00	0.00
40.00		333.89	945.30	0.00	0.00
45.00		336.23	926.59	0.00	0.00
48.50		234.93	637.49	0.00	0.00
50.00		101.43	419.58	0.00	0.00
53.25		220.81	898.71	0.00	0.00
55.00		118.32	270.18	0.00	0.00
60.00		339.91	761.84	0.00	0.00
65.00		337.69	746.88	0.00	0.00
70.00		334.61	731.92	0.00	0.00
75.00		330.76	716.96	0.00	0.00
78.00	(6) appurtenances	1397.72	1702.19	0.00	0.00
80.00		129.20	254.04	0.00	0.00
85.00		321.03	624.64	0.00	0.00
88.00	(18) appurtenances	3554.53	2448.70	0.00	0.00
90.00		124.77	214.91	0.00	0.00
95.00		308.91	526.81	0.00	0.00
98.00	(34) appurtenances	2915.25	2429.61	0.00	0.00
98.50		29.91	44.28	0.00	0.00
100.00		90.58	211.50	0.00	0.00
102.00		119.85	278.34	0.00	0.00
105.00		177.80	208.69	0.00	0.00
108.00	(32) appurtenances	4912.38	2651.45	0.00	0.00
109.00		57.57	62.46	0.00	0.00
110.00		57.25	62.01	0.00	0.00
115.00		282.77	303.34	0.00	0.00
118.00	(25) appurtenances	3658.07	1762.22	0.00	0.00
119.00		47.84	44.39	0.00	0.00
<b>Totals:</b>		<b>23,324.41</b>	<b>28,025.73</b>	<b>0.00</b>	<b>0.00</b>

## Resulting Forces and Deflections

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

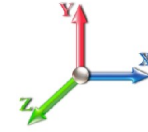
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 11



**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

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	-23.379	-27.979	0.000	0.000	0.000	-2105.2	0.000	0.000	0.000	0.000	0.000
5.00	-23.107	-26.814	0.000	0.000	0.000	-1988.4	-0.119	0.000	0.119	-0.221	0.000
10.00	-22.836	-25.669	0.000	0.000	0.000	-1872.8	-0.471	0.000	0.471	-0.445	0.000
15.00	-22.566	-24.545	0.000	0.000	0.000	-1758.6	-1.059	0.000	1.059	-0.672	0.000
20.00	-22.297	-23.440	0.000	0.000	0.000	-1645.8	-1.886	0.000	1.886	-0.901	0.000
25.00	-22.029	-22.356	0.000	0.000	0.000	-1534.3	-2.954	0.000	2.954	-1.132	0.000
30.00	-21.762	-21.292	0.000	0.000	0.000	-1424.2	-4.264	0.000	4.264	-1.364	0.000
35.00	-21.490	-20.250	0.000	0.000	0.000	-1315.4	-5.819	0.000	5.819	-1.598	0.000
40.00	-21.206	-19.229	0.000	0.000	0.000	-1207.9	-7.618	0.000	7.618	-1.831	0.000
45.00	-20.902	-18.242	0.000	0.000	0.000	-1101.9	-9.661	0.000	9.661	-2.064	0.000
48.50	-20.679	-17.572	0.000	0.000	0.000	-1028.8	-11.236	0.000	11.236	-2.228	0.000
50.00	-20.595	-17.116	0.000	0.000	0.000	-997.78	-11.948	0.000	11.948	-2.300	0.000
53.25	-20.370	-16.186	0.000	0.000	0.000	-930.85	-13.567	0.000	13.567	-2.451	0.000
55.00	-20.289	-15.859	0.000	0.000	0.000	-895.20	-14.481	0.000	14.481	-2.533	0.000
60.00	-19.983	-15.022	0.000	0.000	0.000	-793.76	-17.277	0.000	17.277	-2.799	0.000
65.00	-19.670	-14.207	0.000	0.000	0.000	-693.85	-20.349	0.000	20.349	-3.057	0.000
70.00	-19.352	-13.414	0.000	0.000	0.000	-595.50	-23.684	0.000	23.684	-3.304	0.000
75.00	-19.019	-12.658	0.000	0.000	0.000	-498.74	-27.270	0.000	27.270	-3.536	0.000
78.00	-17.537	-11.014	0.000	0.000	0.000	-441.69	-29.535	0.000	29.535	-3.669	0.000
80.00	-17.418	-10.726	0.000	0.000	0.000	-406.62	-31.090	0.000	31.090	-3.754	0.000
85.00	-17.082	-10.082	0.000	0.000	0.000	-319.53	-35.125	0.000	35.125	-3.944	0.000
88.00	-13.376	-7.868	0.000	0.000	0.000	-268.28	-37.636	0.000	37.636	-4.048	0.000
90.00	-13.251	-7.638	0.000	0.000	0.000	-241.53	-39.345	0.000	39.345	-4.112	0.000
95.00	-12.917	-7.112	0.000	0.000	0.000	-175.28	-43.726	0.000	43.726	-4.250	0.000
98.00	-9.831	-4.901	0.000	0.000	0.000	-136.53	-46.418	0.000	46.418	-4.320	0.000
98.50	-9.800	-4.855	0.000	0.000	0.000	-131.61	-46.870	0.000	46.870	-4.330	0.000
100.00	-9.696	-4.646	0.000	0.000	0.000	-116.91	-48.235	0.000	48.235	-4.361	0.000
102.00	-9.559	-4.371	0.000	0.000	0.000	-97.524	-50.068	0.000	50.068	-4.397	0.000
105.00	-9.369	-4.169	0.000	0.000	0.000	-68.848	-52.844	0.000	52.844	-4.442	0.000
108.00	-4.265	-1.906	0.000	0.000	0.000	-40.743	-55.647	0.000	55.647	-4.482	0.000
109.00	-4.204	-1.848	0.000	0.000	0.000	-36.477	-56.586	0.000	56.586	-4.492	0.000
110.00	-4.142	-1.789	0.000	0.000	0.000	-32.274	-57.527	0.000	57.527	-4.501	0.000
115.00	-3.837	-1.508	0.000	0.000	0.000	-11.562	-62.256	0.000	62.256	-4.532	0.000
118.00	-0.051	-0.040	0.000	0.000	0.000	-0.051	-65.104	0.000	65.104	-4.538	0.000
119.00	-0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.053	-4.538	0.000

## Resulting Stresses

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 12



**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

### 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.60	1.01	0.00	0.00	0.00	46.27	46.90	51.5	0.911
5.00	0.59	1.02	0.00	0.00	0.00	45.84	46.46	52.0	0.894
10.00	0.58	1.03	0.00	0.00	0.00	45.34	45.95	52.0	0.884
15.00	0.56	1.05	0.00	0.00	0.00	44.76	45.36	52.0	0.873
20.00	0.55	1.06	0.00	0.00	0.00	44.10	44.69	52.0	0.860
25.00	0.54	1.07	0.00	0.00	0.00	43.33	43.91	52.0	0.845
30.00	0.53	1.09	0.00	0.00	0.00	42.46	43.03	52.0	0.828
35.00	0.52	1.11	0.00	0.00	0.00	41.46	42.02	52.0	0.808
40.00	0.51	1.12	0.00	0.00	0.00	40.32	40.87	52.0	0.786
45.00	0.49	1.14	0.00	0.00	0.00	39.01	39.56	52.0	0.761
48.50	0.49	1.15	0.00	0.00	0.00	38.00	38.53	52.0	0.741
50.00	0.48	1.16	0.00	0.00	0.00	37.54	38.07	52.0	0.732
53.25	0.57	1.44	0.00	0.00	0.00	44.08	44.72	52.0	0.860
55.00	0.56	1.45	0.00	0.00	0.00	43.33	43.96	52.0	0.846
60.00	0.55	1.47	0.00	0.00	0.00	40.94	41.57	52.0	0.800
65.00	0.54	1.50	0.00	0.00	0.00	38.21	38.84	52.0	0.747
70.00	0.52	1.52	0.00	0.00	0.00	35.10	35.72	52.0	0.687
75.00	0.51	1.55	0.00	0.00	0.00	31.54	32.16	52.0	0.619
78.00	0.46	1.46	0.00	0.00	0.00	29.17	29.73	52.0	0.572
80.00	0.45	1.47	0.00	0.00	0.00	27.65	28.22	52.0	0.543
85.00	0.44	1.50	0.00	0.00	0.00	23.43	24.01	52.0	0.462
88.00	0.35	1.20	0.00	0.00	0.00	20.62	21.07	52.0	0.405
90.00	0.35	1.21	0.00	0.00	0.00	19.16	19.62	52.0	0.377
95.00	0.34	1.23	0.00	0.00	0.00	15.09	15.57	52.0	0.300
98.00	0.24	0.96	0.00	0.00	0.00	12.36	12.71	52.0	0.245
98.50	0.24	0.96	0.00	0.00	0.00	12.02	12.37	52.0	0.238
100.00	0.23	0.96	0.00	0.00	0.00	10.96	11.31	52.0	0.218
102.00	0.29	1.27	0.00	0.00	0.00	12.17	12.64	52.0	0.243
105.00	0.28	1.27	0.00	0.00	0.00	9.05	9.59	52.0	0.185
108.00	0.13	0.60	0.00	0.00	0.00	5.66	5.88	52.0	0.113
109.00	0.13	0.59	0.00	0.00	0.00	5.16	5.39	52.0	0.104
109.00	0.13	0.59	0.00	0.00	0.00	5.16	5.39	52.0	0.104
110.00	0.13	0.59	0.00	0.00	0.00	4.65	4.88	52.0	0.094
115.00	0.11	0.57	0.00	0.00	0.00	1.83	2.18	52.0	0.042
118.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02	52.0	0.000
119.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	52.0	0.000



## Wind Loading - Shaft

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 13



**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

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	12.287	20.77	274.23	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	12.287	20.77	267.84	0.650	0.500	5.00	19.977	12.99	269.6	144.7	931.6
10.00		0.00	1.00	12.287	20.77	261.44	0.650	0.500	5.00	19.516	12.69	263.4	141.3	909.5
15.00		0.00	1.00	12.287	20.77	255.04	0.650	0.500	5.00	19.054	12.39	257.2	137.9	887.4
20.00		0.00	1.00	12.287	20.77	248.64	0.650	0.500	5.00	18.592	12.08	250.9	134.4	865.3
25.00		0.00	1.00	12.287	20.77	242.24	0.650	0.500	5.00	18.130	11.78	244.7	131.0	843.2
30.00		0.00	1.00	12.287	20.77	235.85	0.650	0.500	5.00	17.669	11.48	238.5	127.6	821.0
35.00		0.00	1.02	12.496	21.12	231.38	0.650	0.500	5.00	17.207	11.18	236.2	124.2	798.9
40.00		0.00	1.06	12.982	21.94	229.26	0.650	0.500	5.00	16.745	10.88	238.8	120.8	776.8
45.00		0.00	1.09	13.426	22.69	226.47	0.650	0.500	5.00	16.283	10.58	240.2	117.3	754.7
48.50	Bot - Section 2	0.00	1.12	13.716	23.18	224.17	0.650	0.500	3.50	11.124	7.23	167.6	80.5	515.5
50.00		0.00	1.13	13.836	23.38	223.11	0.650	0.500	1.50	4.761	3.09	72.4	34.6	367.4
53.25	Top - Section 1	0.00	1.15	14.087	23.81	220.68	0.650	0.500	3.25	10.172	6.61	157.4	73.6	784.3
55.00		0.00	1.16	14.218	24.03	222.39	0.650	0.500	1.75	5.396	3.51	84.3	39.2	208.2
60.00		0.00	1.19	14.576	24.63	218.21	0.650	0.500	5.00	15.107	9.82	241.9	108.6	581.2
65.00		0.00	1.21	14.913	25.20	213.67	0.650	0.500	5.00	14.645	9.52	239.9	105.2	562.8
70.00		0.00	1.24	15.232	25.74	208.82	0.650	0.500	5.00	14.183	9.22	237.3	101.8	544.4
75.00		0.00	1.26	15.536	26.26	203.69	0.650	0.500	5.00	13.721	8.92	234.2	98.4	526.1
78.00	Appurtenance(s)	0.00	1.28	15.711	26.55	200.50	0.650	0.500	3.00	8.011	5.21	138.3	57.8	307.2
80.00		0.00	1.29	15.825	26.74	198.32	0.650	0.500	2.00	5.248	3.41	91.2	38.0	201.3
85.00		0.00	1.31	16.101	27.21	192.72	0.650	0.500	5.00	12.798	8.32	226.4	91.5	489.3
88.00	Appurtenance(s)	0.00	1.32	16.262	27.48	189.26	0.650	0.500	3.00	7.457	4.85	133.2	53.7	285.2
90.00		0.00	1.33	16.366	27.66	186.92	0.650	0.500	2.00	4.879	3.17	87.7	35.2	186.6
95.00		0.00	1.35	16.621	28.09	180.92	0.650	0.500	5.00	11.874	7.72	216.8	84.7	452.5
98.00	Appurtenance(s)	0.00	1.36	16.769	28.34	177.24	0.650	0.500	3.00	6.903	4.49	127.2	49.6	263.1
98.50	Bot - Section 3	0.00	1.37	16.794	28.38	176.63	0.650	0.500	0.50	1.134	0.74	20.9	8.2	43.3
100.00		0.00	1.37	16.866	28.50	174.76	0.650	0.500	1.50	3.422	2.22	63.4	24.7	208.6
102.00	Top - Section 2	0.00	1.38	16.962	28.67	172.25	0.650	0.500	2.00	4.498	2.92	83.8	32.4	273.9
105.00		0.00	1.39	17.103	28.90	170.99	0.650	0.500	3.00	6.609	4.30	124.2	47.4	200.8
108.00	Appurtenance(s)	0.00	1.40	17.241	29.14	167.13	0.650	0.500	3.00	6.443	4.19	122.0	46.2	195.5
109.00	Top - Section 3	0.00	1.41	17.287	29.21	165.83	0.650	0.500	1.00	2.111	1.37	40.1	15.3	64.1
110.00		0.00	1.41	17.332	29.29	164.53	0.650	0.500	1.00	2.092	1.36	39.8	15.1	63.6
115.00		0.00	1.43	17.554	29.67	157.93	0.650	0.500	5.00	10.184	6.62	196.4	72.2	307.6
118.00	Appurtenance(s)	0.00	1.44	17.683	29.88	153.91	0.650	0.500	3.00	5.889	3.83	114.4	42.1	177.9
119.00		0.00	1.44	17.726	29.96	152.55	0.650	0.500	1.00	1.926	1.25	37.5	13.9	58.3
<b>Totals:</b>									<b>119.00</b>			<b>5,537.7</b>		<b>15,457.0</b>

## Discrete Appurtenance Forces

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

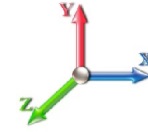
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 14



**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

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	118.00	RRH2x40-AWS	3	17.683	29.885	0.82	7.06	184.20	0.000	0.000	210.99	0.00	0.00
2	118.00	FD9R6004/2C-3L (3.1 lbs)	6	17.683	29.885	0.75	2.25	32.40	0.000	0.000	67.24	0.00	0.00
3	118.00	DB-B1-6Z-8AB-0Z Dist. Box	1	17.683	29.885	0.91	4.59	51.10	0.000	0.000	137.06	0.00	0.00
4	118.00	BXA-70063-6BF	3	17.683	29.885	0.70	17.93	172.80	0.000	0.000	535.95	0.00	0.00
5	118.00	BXA-171063-8BF	3	17.683	29.885	0.84	8.59	87.90	0.000	0.000	256.80	0.00	0.00
6	118.00	BXA-171063-12BF	3	17.683	29.885	0.84	13.61	126.60	0.000	0.000	406.67	0.00	0.00
7	118.00	800 10735	3	17.683	29.885	0.66	19.15	215.40	0.000	0.000	572.19	0.00	0.00
8	118.00	T-Arms	3	17.683	29.885	0.75	28.13	1440.00	0.000	0.000	840.50	0.00	0.00
9	108.00	ACU-A20-N	4	17.241	29.138	0.79	0.70	9.20	0.000	0.000	20.26	0.00	0.00
10	108.00	APXVSPP18-C	2	17.241	29.138	0.83	15.07	213.00	0.000	0.000	439.19	0.00	0.00
11	108.00	APXVTM14-C-120	3	17.241	29.138	0.79	17.28	275.70	0.000	0.000	503.43	0.00	0.00
12	108.00	840 10054	3	17.241	29.138	0.61	10.47	177.30	0.000	0.000	305.00	0.00	0.00
13	108.00	800 MHz RRH	3	17.241	29.138	0.92	7.78	222.30	0.000	0.000	226.79	0.00	0.00
14	108.00	VHLP2.5	2	17.241	29.138	1.00	17.84	194.00	0.000	0.000	519.82	0.00	0.00
15	108.00	Horizon	2	17.241	29.138	1.00	1.16	34.00	0.000	0.000	33.80	0.00	0.00
16	108.00	P40-16-XLPP-RR-A	1	17.241	29.138	0.66	7.41	0.00	0.000	0.000	215.96	0.00	0.00
17	108.00	T-Arms	3	17.241	29.138	0.75	28.13	1440.00	0.000	0.000	819.51	0.00	0.00
18	108.00	TD-RRH8x20-25	3	17.241	29.138	0.69	10.29	276.00	0.000	0.000	299.77	0.00	0.00
19	108.00	800 MHz Filters	3	17.241	29.138	0.93	9.10	263.40	0.000	0.000	265.02	0.00	0.00
20	108.00	1900MHz RRH	3	17.241	29.138	0.88	11.09	225.60	0.000	0.000	323.08	0.00	0.00
21	98.00	LGP 21401	6	16.769	28.340	0.75	0.00	0.00	0.000	0.000	0.00	0.00	0.00
22	98.00	7770.00	6	16.769	28.340	0.73	28.60	0.00	0.000	0.000	810.57	0.00	0.00
23	98.00	DC6-48-60-18-8F	1	16.769	28.340	1.00	1.67	49.50	0.000	0.000	47.33	0.00	0.00
24	98.00	DTMABP7819VG12A	3	16.769	28.340	0.67	2.73	79.50	0.000	0.000	77.47	0.00	0.00
25	98.00	AM-X-CD-16-65-00T-RET	1	16.769	28.340	0.75	6.81	95.00	0.000	0.000	193.00	0.00	0.00
26	98.00	P65-16-XLH-RR	2	16.769	28.340	0.75	13.83	200.40	0.000	0.000	391.95	0.00	0.00
27	98.00	RRU-11	6	16.769	28.340	0.75	0.00	0.00	0.000	0.000	0.00	0.00	0.00
28	98.00	T-Arms	3	16.769	28.340	0.75	28.13	1440.00	0.000	0.000	797.07	0.00	0.00
29	98.00	LGP13519	6	16.769	28.340	0.75	2.11	48.00	0.000	0.000	59.94	0.00	0.00
30	88.00	Double TMA 17/21	3	16.262	27.482	0.69	1.28	43.50	0.000	0.000	35.27	0.00	0.00
31	88.00	AIR B2A B4P	3	16.262	27.482	0.86	17.98	387.60	0.000	0.000	494.20	0.00	0.00
32	88.00	AIR B4A B2P	3	16.262	27.482	0.86	17.98	384.30	0.000	0.000	494.20	0.00	0.00
33	88.00	S11B12	3	16.262	27.482	0.72	7.60	200.70	0.000	0.000	208.95	0.00	0.00
34	88.00	LNx-6515DS-A1M	3	16.262	27.482	0.80	29.62	346.80	0.000	0.000	813.91	0.00	0.00
35	88.00	T-Arms	3	16.262	27.482	0.75	28.13	1440.00	0.000	0.000	772.93	0.00	0.00
36	78.00	T-Arms	3	15.711	26.551	0.75	28.13	1440.00	0.000	0.000	746.74	0.00	0.00
37	78.00	APXV18-206517S-C	3	15.711	26.551	0.74	12.96	159.00	0.000	0.000	344.23	0.00	0.00
<b>Totals:</b>								<b>11,955.20</b>			<b>13,286.78</b>		

## Total Applied Force Summary

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

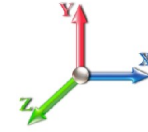
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 15



**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

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		269.65	1215.40	0.00	0.00
10.00		263.41	1193.28	0.00	0.00
15.00		257.18	1171.16	0.00	0.00
20.00		250.95	1149.03	0.00	0.00
25.00		244.72	1126.91	0.00	0.00
30.00		238.48	1104.79	0.00	0.00
35.00		236.19	1082.67	0.00	0.00
40.00		238.79	1060.55	0.00	0.00
45.00		240.15	1038.43	0.00	0.00
48.50		167.60	714.10	0.00	0.00
50.00		72.36	452.57	0.00	0.00
53.25		157.41	968.74	0.00	0.00
55.00		84.28	307.47	0.00	0.00
60.00		241.88	864.96	0.00	0.00
65.00		239.91	846.58	0.00	0.00
70.00		237.32	828.20	0.00	0.00
75.00		234.17	809.82	0.00	0.00
78.00	(6) appurtenances	1229.23	2076.48	0.00	0.00
80.00		91.24	289.82	0.00	0.00
85.00		226.36	710.66	0.00	0.00
88.00	(18) appurtenances	2952.66	3220.88	0.00	0.00
90.00		87.72	247.96	0.00	0.00
95.00		216.80	606.00	0.00	0.00
98.00	(34) appurtenances	2504.48	2267.59	0.00	0.00
98.50		20.93	51.96	0.00	0.00
100.00		63.41	234.58	0.00	0.00
102.00		83.82	308.56	0.00	0.00
105.00		124.17	252.79	0.00	0.00
108.00	(32) appurtenances	4093.65	3578.02	0.00	0.00
109.00		40.08	76.62	0.00	0.00
110.00		39.83	76.03	0.00	0.00
115.00		196.37	370.00	0.00	0.00
118.00	(25) appurtenances	3141.80	2525.79	0.00	0.00
119.00		37.50	58.28	0.00	0.00
<b>Totals:</b>		<b>18,824.49</b>	<b>32,886.69</b>	<b>0.00</b>	<b>0.00</b>

## Resulting Forces and Deflections

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

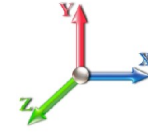
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 16



**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

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	-18.878	-32.856	0.000	0.000	0.000	-1742.7	0.000	0.000	0.000	0.000	0.000
5.00	-18.708	-31.581	0.000	0.000	0.000	-1648.3	-0.098	0.000	0.098	-0.183	0.000
10.00	-18.538	-30.328	0.000	0.000	0.000	-1554.8	-0.390	0.000	0.390	-0.369	0.000
15.00	-18.367	-29.099	0.000	0.000	0.000	-1462.1	-0.878	0.000	0.878	-0.557	0.000
20.00	-18.197	-27.892	0.000	0.000	0.000	-1370.3	-1.564	0.000	1.564	-0.748	0.000
25.00	-18.026	-26.708	0.000	0.000	0.000	-1279.3	-2.451	0.000	2.451	-0.940	0.000
30.00	-17.854	-25.547	0.000	0.000	0.000	-1189.2	-3.540	0.000	3.540	-1.134	0.000
35.00	-17.678	-24.410	0.000	0.000	0.000	-1099.9	-4.833	0.000	4.833	-1.329	0.000
40.00	-17.492	-23.296	0.000	0.000	0.000	-1011.5	-6.330	0.000	6.330	-1.525	0.000
45.00	-17.287	-22.215	0.000	0.000	0.000	-924.11	-8.032	0.000	8.032	-1.720	0.000
48.50	-17.134	-21.477	0.000	0.000	0.000	-863.61	-9.345	0.000	9.345	-1.858	0.000
50.00	-17.081	-20.999	0.000	0.000	0.000	-837.90	-9.939	0.000	9.939	-1.918	0.000
53.25	-16.925	-20.008	0.000	0.000	0.000	-782.39	-11.289	0.000	11.289	-2.045	0.000
55.00	-16.880	-19.660	0.000	0.000	0.000	-752.77	-12.052	0.000	12.052	-2.114	0.000
60.00	-16.677	-18.741	0.000	0.000	0.000	-668.37	-14.386	0.000	14.386	-2.338	0.000
65.00	-16.468	-17.844	0.000	0.000	0.000	-584.99	-16.953	0.000	16.953	-2.555	0.000
70.00	-16.253	-16.970	0.000	0.000	0.000	-502.65	-19.742	0.000	19.742	-2.763	0.000
75.00	-16.021	-16.131	0.000	0.000	0.000	-421.39	-22.742	0.000	22.742	-2.959	0.000
78.00	-14.707	-14.098	0.000	0.000	0.000	-373.33	-24.638	0.000	24.638	-3.071	0.000
80.00	-14.629	-13.784	0.000	0.000	0.000	-343.92	-25.940	0.000	25.940	-3.143	0.000
85.00	-14.391	-13.056	0.000	0.000	0.000	-270.77	-29.320	0.000	29.320	-3.305	0.000
88.00	-11.267	-10.000	0.000	0.000	0.000	-227.60	-31.425	0.000	31.425	-3.392	0.000
90.00	-11.180	-9.740	0.000	0.000	0.000	-205.07	-32.858	0.000	32.858	-3.447	0.000
95.00	-10.940	-9.132	0.000	0.000	0.000	-149.17	-36.532	0.000	36.532	-3.564	0.000
98.00	-8.302	-7.021	0.000	0.000	0.000	-116.35	-38.790	0.000	38.790	-3.623	0.000
98.50	-8.280	-6.968	0.000	0.000	0.000	-112.20	-39.170	0.000	39.170	-3.632	0.000
100.00	-8.205	-6.734	0.000	0.000	0.000	-99.787	-40.315	0.000	40.315	-3.658	0.000
102.00	-8.106	-6.426	0.000	0.000	0.000	-83.377	-41.853	0.000	41.853	-3.689	0.000
105.00	-7.970	-6.177	0.000	0.000	0.000	-59.059	-44.183	0.000	44.183	-3.727	0.000
108.00	-3.652	-2.873	0.000	0.000	0.000	-35.150	-46.537	0.000	46.537	-3.762	0.000
109.00	-3.607	-2.799	0.000	0.000	0.000	-31.498	-47.325	0.000	47.325	-3.771	0.000
110.00	-3.564	-2.724	0.000	0.000	0.000	-27.891	-48.116	0.000	48.116	-3.779	0.000
115.00	-3.344	-2.367	0.000	0.000	0.000	-10.073	-52.087	0.000	52.087	-3.806	0.000
118.00	-0.041	-0.056	0.000	0.000	0.000	-0.041	-54.479	0.000	54.479	-3.810	0.000
119.00	-0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	55.277	-3.810	0.000

## Resulting Stresses

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

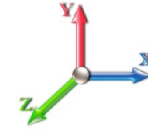
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 17



**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

### 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.70	0.81	0.00	0.00	0.00	38.31	39.03	51.5	0.758
5.00	0.69	0.82	0.00	0.00	0.00	38.00	38.72	52.0	0.745
10.00	0.68	0.84	0.00	0.00	0.00	37.64	38.35	52.0	0.738
15.00	0.67	0.85	0.00	0.00	0.00	37.21	37.91	52.0	0.729
20.00	0.66	0.86	0.00	0.00	0.00	36.71	37.40	52.0	0.720
25.00	0.65	0.88	0.00	0.00	0.00	36.13	36.81	52.0	0.708
30.00	0.64	0.89	0.00	0.00	0.00	35.45	36.12	52.0	0.695
35.00	0.62	0.91	0.00	0.00	0.00	34.67	35.33	52.0	0.680
40.00	0.61	0.93	0.00	0.00	0.00	33.76	34.41	52.0	0.662
45.00	0.60	0.94	0.00	0.00	0.00	32.72	33.36	52.0	0.642
48.50	0.59	0.96	0.00	0.00	0.00	31.89	32.53	52.0	0.626
50.00	0.59	0.96	0.00	0.00	0.00	31.52	32.15	52.0	0.619
53.25	0.70	1.20	0.00	0.00	0.00	37.05	37.81	52.0	0.727
55.00	0.70	1.21	0.00	0.00	0.00	36.43	37.19	52.0	0.715
60.00	0.69	1.23	0.00	0.00	0.00	34.47	35.22	52.0	0.678
65.00	0.67	1.25	0.00	0.00	0.00	32.22	32.96	52.0	0.634
70.00	0.66	1.28	0.00	0.00	0.00	29.63	30.37	52.0	0.584
75.00	0.65	1.31	0.00	0.00	0.00	26.64	27.39	52.0	0.527
78.00	0.58	1.23	0.00	0.00	0.00	24.65	25.32	52.0	0.487
80.00	0.58	1.24	0.00	0.00	0.00	23.39	24.06	52.0	0.463
85.00	0.57	1.26	0.00	0.00	0.00	19.86	20.54	52.0	0.395
88.00	0.45	1.01	0.00	0.00	0.00	17.49	18.02	52.0	0.347
90.00	0.44	1.02	0.00	0.00	0.00	16.27	16.80	52.0	0.323
95.00	0.43	1.04	0.00	0.00	0.00	12.84	13.39	52.0	0.258
98.00	0.34	0.81	0.00	0.00	0.00	10.54	10.97	52.0	0.211
98.50	0.34	0.81	0.00	0.00	0.00	10.25	10.68	52.0	0.205
100.00	0.33	0.81	0.00	0.00	0.00	9.35	9.79	52.0	0.188
102.00	0.42	1.07	0.00	0.00	0.00	10.40	10.98	52.0	0.211
105.00	0.42	1.08	0.00	0.00	0.00	7.77	8.40	52.0	0.162
108.00	0.20	0.51	0.00	0.00	0.00	4.88	5.16	52.0	0.099
109.00	0.20	0.51	0.00	0.00	0.00	4.45	4.73	52.0	0.091
109.00	0.20	0.51	0.00	0.00	0.00	4.45	4.73	52.0	0.091
110.00	0.19	0.51	0.00	0.00	0.00	4.02	4.30	52.0	0.083
115.00	0.18	0.50	0.00	0.00	0.00	1.60	1.97	52.0	0.038
118.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02	52.0	0.000
119.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	52.0	0.000

## Wind Loading - Shaft

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 18



**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

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	197.92	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	193.30	0.650	0.000	5.00	19.561	12.71	137.5	0.0	786.9
10.00		0.00	1.00	6.400	10.82	188.68	0.650	0.000	5.00	19.099	12.41	134.3	0.0	768.2
15.00		0.00	1.00	6.400	10.82	184.06	0.650	0.000	5.00	18.637	12.11	131.0	0.0	749.5
20.00		0.00	1.00	6.400	10.82	179.45	0.650	0.000	5.00	18.176	11.81	127.8	0.0	730.8
25.00		0.00	1.00	6.400	10.82	174.83	0.650	0.000	5.00	17.714	11.51	124.5	0.0	712.1
30.00		0.00	1.00	6.400	10.82	170.21	0.650	0.000	5.00	17.252	11.21	121.3	0.0	693.4
35.00		0.00	1.02	6.509	11.00	166.99	0.650	0.000	5.00	16.790	10.91	120.0	0.0	674.7
40.00		0.00	1.06	6.762	11.43	165.46	0.650	0.000	5.00	16.329	10.61	121.3	0.0	656.0
45.00		0.00	1.09	6.993	11.82	163.44	0.650	0.000	5.00	15.867	10.31	121.9	0.0	637.3
48.50	Bot - Section 2	0.00	1.12	7.144	12.07	161.79	0.650	0.000	3.50	10.832	7.04	85.0	0.0	435.0
50.00		0.00	1.13	7.207	12.18	161.02	0.650	0.000	1.50	4.636	3.01	36.7	0.0	332.8
53.25	Top - Section 1	0.00	1.15	7.338	12.40	159.26	0.650	0.000	3.25	9.901	6.44	79.8	0.0	710.7
55.00		0.00	1.16	7.406	12.52	160.50	0.650	0.000	1.75	5.251	3.41	42.7	0.0	168.9
60.00		0.00	1.19	7.592	12.83	157.48	0.650	0.000	5.00	14.690	9.55	122.5	0.0	472.6
65.00		0.00	1.21	7.768	13.13	154.21	0.650	0.000	5.00	14.228	9.25	121.4	0.0	457.6
70.00		0.00	1.24	7.934	13.41	150.71	0.650	0.000	5.00	13.766	8.95	120.0	0.0	442.7
75.00		0.00	1.26	8.092	13.68	147.01	0.650	0.000	5.00	13.305	8.65	118.3	0.0	427.7
78.00	Appurtenance(s)	0.00	1.28	8.183	13.83	144.70	0.650	0.000	3.00	7.761	5.04	69.8	0.0	249.4
80.00		0.00	1.29	8.242	13.93	143.13	0.650	0.000	2.00	5.082	3.30	46.0	0.0	163.3
85.00		0.00	1.31	8.387	14.17	139.09	0.650	0.000	5.00	12.381	8.05	114.1	0.0	397.8
88.00	Appurtenance(s)	0.00	1.32	8.470	14.31	136.59	0.650	0.000	3.00	7.207	4.68	67.1	0.0	231.5
90.00		0.00	1.33	8.525	14.41	134.90	0.650	0.000	2.00	4.712	3.06	44.1	0.0	151.3
95.00		0.00	1.35	8.657	14.63	130.57	0.650	0.000	5.00	11.458	7.45	109.0	0.0	367.9
98.00	Appurtenance(s)	0.00	1.36	8.735	14.76	127.92	0.650	0.000	3.00	6.653	4.32	63.8	0.0	213.5
98.50	Bot - Section 3	0.00	1.37	8.747	14.78	127.47	0.650	0.000	0.50	1.093	0.71	10.5	0.0	35.1
100.00		0.00	1.37	8.785	14.85	126.12	0.650	0.000	1.50	3.297	2.14	31.8	0.0	183.8
102.00	Top - Section 2	0.00	1.38	8.835	14.93	124.31	0.650	0.000	2.00	4.332	2.82	42.0	0.0	241.5
105.00		0.00	1.39	8.908	15.06	123.40	0.650	0.000	3.00	6.359	4.13	62.2	0.0	153.4
108.00	Appurtenance(s)	0.00	1.40	8.980	15.18	120.62	0.650	0.000	3.00	6.193	4.03	61.1	0.0	149.3
109.00	Top - Section 3	0.00	1.41	9.004	15.22	119.68	0.650	0.000	1.00	2.027	1.32	20.1	0.0	48.9
110.00		0.00	1.41	9.028	15.26	118.74	0.650	0.000	1.00	2.009	1.31	19.9	0.0	48.4
115.00		0.00	1.43	9.143	15.45	113.98	0.650	0.000	5.00	9.767	6.35	98.1	0.0	235.4
118.00	Appurtenance(s)	0.00	1.44	9.211	15.57	111.08	0.650	0.000	3.00	5.639	3.67	57.0	0.0	135.9
119.00		0.00	1.44	9.233	15.60	110.10	0.650	0.000	1.00	1.843	1.20	18.7	0.0	44.4
<b>Totals:</b>									<b>119.00</b>			<b>2,801.3</b>		<b>12,908.1</b>



## Discrete Appurtenance Forces

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

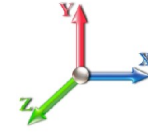
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 19



**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

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	118.00	RRH2x40-AWS	3	9.211	15.566	0.82	6.20	132.00	0.000	0.000	96.50	0.00	0.00
2	118.00	FD9R6004/2C-3L (3.1 lbs)	6	9.211	15.566	0.75	1.62	18.60	0.000	0.000	25.22	0.00	0.00
3	118.00	DB-B1-6Z-8AB-0Z Dist. Box	1	9.211	15.566	0.91	4.35	21.40	0.000	0.000	67.71	0.00	0.00
4	118.00	BXA-70063-6BF	3	9.211	15.566	0.70	16.23	51.00	0.000	0.000	252.68	0.00	0.00
5	118.00	BXA-171063-8BF	3	9.211	15.566	0.84	7.41	31.50	0.000	0.000	115.32	0.00	0.00
6	118.00	BXA-171063-12BF	3	9.211	15.566	0.84	11.92	45.00	0.000	0.000	185.54	0.00	0.00
7	118.00	800 10735	3	9.211	15.566	0.66	17.42	86.10	0.000	0.000	271.22	0.00	0.00
8	118.00	T-Arms	3	9.211	15.566	0.75	22.50	1200.00	0.000	0.000	350.23	0.00	0.00
9	108.00	ACU-A20-N	4	8.980	15.177	0.79	0.44	4.00	0.000	0.000	6.71	0.00	0.00
10	108.00	APXVSP18-C	2	8.980	15.177	0.83	13.71	114.00	0.000	0.000	208.10	0.00	0.00
11	108.00	APXVTM14-C-120	3	8.980	15.177	0.79	16.35	168.00	0.000	0.000	248.19	0.00	0.00
12	108.00	840 10054	3	8.980	15.177	0.61	9.48	105.00	0.000	0.000	143.87	0.00	0.00
13	108.00	800 MHz RRH	3	8.980	15.177	0.92	6.87	159.00	0.000	0.000	104.30	0.00	0.00
14	108.00	VHLP2.5	2	8.980	15.177	1.00	16.86	95.20	0.000	0.000	255.88	0.00	0.00
15	108.00	Horizon	2	8.980	15.177	1.00	0.86	21.20	0.000	0.000	13.05	0.00	0.00
16	108.00	P40-16-XLPP-RR-A	1	8.980	15.177	0.66	6.93	53.00	0.000	0.000	105.18	0.00	0.00
17	108.00	T-Arms	3	8.980	15.177	0.75	22.50	1200.00	0.000	0.000	341.48	0.00	0.00
18	108.00	TD-RRH8x20-25	3	8.980	15.177	0.69	9.77	210.00	0.000	0.000	148.28	0.00	0.00
19	108.00	800 MHz Filters	3	8.980	15.177	0.93	8.12	185.40	0.000	0.000	123.22	0.00	0.00
20	108.00	1900MHz RRH	3	8.980	15.177	0.88	10.03	132.00	0.000	0.000	152.25	0.00	0.00
21	98.00	LGP 21401	6	8.735	14.761	0.75	0.00	105.00	0.000	0.000	0.00	0.00	0.00
22	98.00	7770.00	6	8.735	14.761	0.73	25.75	210.00	0.000	0.000	380.17	0.00	0.00
23	98.00	DC6-48-60-18-8F	1	8.735	14.761	1.00	1.47	31.80	0.000	0.000	21.70	0.00	0.00
24	98.00	DTMABP7819VG12A	3	8.735	14.761	0.67	2.29	57.60	0.000	0.000	33.82	0.00	0.00
25	98.00	AM-X-CD-16-65-00T-RET	1	8.735	14.761	0.75	6.20	48.50	0.000	0.000	91.45	0.00	0.00
26	98.00	P65-16-XLH-RR	2	8.735	14.761	0.75	12.60	106.00	0.000	0.000	185.99	0.00	0.00
27	98.00	RRU-11	6	8.735	14.761	0.75	0.00	330.00	0.000	0.000	0.00	0.00	0.00
28	98.00	T-Arms	3	8.735	14.761	0.75	22.50	1200.00	0.000	0.000	332.13	0.00	0.00
29	98.00	LGP13519	6	8.735	14.761	0.75	1.53	31.80	0.000	0.000	22.58	0.00	0.00
30	88.00	Double TMA 17/21	3	8.470	14.314	0.69	0.85	33.00	0.000	0.000	12.15	0.00	0.00
31	88.00	AIR B2A B4P	3	8.470	14.314	0.86	16.98	274.50	0.000	0.000	243.01	0.00	0.00
32	88.00	AIR B4A B2P	3	8.470	14.314	0.86	16.98	271.20	0.000	0.000	243.01	0.00	0.00
33	88.00	S11B12	3	8.470	14.314	0.72	7.15	153.00	0.000	0.000	102.34	0.00	0.00
34	88.00	LNx-6515DS-A1M	3	8.470	14.314	0.80	27.38	149.40	0.000	0.000	391.98	0.00	0.00
35	88.00	T-Arms	3	8.470	14.314	0.75	22.50	1200.00	0.000	0.000	322.07	0.00	0.00
36	78.00	T-Arms	3	8.183	13.829	0.75	22.50	1200.00	0.000	0.000	311.16	0.00	0.00
37	78.00	APXV18-206517S-C	3	8.183	13.829	0.74	11.46	79.20	0.000	0.000	158.42	0.00	0.00
<b>Totals:</b>								<b>9,513.40</b>			<b>6,066.93</b>		

## Total Applied Force Summary

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

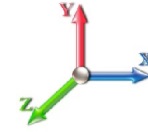
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 20



**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

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		146.17	1076.20	0.00	0.00
10.00		142.93	1057.50	0.00	0.00
15.00		139.68	1038.80	0.00	0.00
20.00		136.43	1020.10	0.00	0.00
25.00		133.19	1001.40	0.00	0.00
30.00		129.94	982.70	0.00	0.00
35.00		128.84	964.00	0.00	0.00
40.00		130.42	945.30	0.00	0.00
45.00		131.34	926.59	0.00	0.00
48.50		91.77	637.49	0.00	0.00
50.00		39.62	419.58	0.00	0.00
53.25		86.25	898.71	0.00	0.00
55.00		46.22	270.18	0.00	0.00
60.00		132.78	761.84	0.00	0.00
65.00		131.91	746.88	0.00	0.00
70.00		130.71	731.92	0.00	0.00
75.00		129.20	716.96	0.00	0.00
78.00	(6) appurtenances	545.98	1702.19	0.00	0.00
80.00		50.47	254.04	0.00	0.00
85.00		125.40	624.64	0.00	0.00
88.00	(18) appurtenances	1388.49	2448.70	0.00	0.00
90.00		48.74	214.91	0.00	0.00
95.00		120.67	526.81	0.00	0.00
98.00	(34) appurtenances	1138.77	2429.61	0.00	0.00
98.50		11.68	44.28	0.00	0.00
100.00		35.38	211.50	0.00	0.00
102.00		46.82	278.34	0.00	0.00
105.00		69.45	208.69	0.00	0.00
108.00	(32) appurtenances	1918.90	2651.45	0.00	0.00
109.00		22.49	62.46	0.00	0.00
110.00		22.36	62.01	0.00	0.00
115.00		110.46	303.34	0.00	0.00
118.00	(25) appurtenances	1428.93	1762.22	0.00	0.00
119.00		18.69	44.39	0.00	0.00
<b>Totals:</b>		<b>9,111.10</b>	<b>28,025.73</b>	<b>0.00</b>	<b>0.00</b>

## Resulting Forces and Deflections

**Structure:** CT08558-B-SB  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

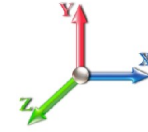
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 21



**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

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	-9.131	-28.019	0.000	0.000	0.000	-823.02	0.000	0.000	0.000	0.000	0.000
5.00	-9.025	-26.929	0.000	0.000	0.000	-777.37	-0.047	0.000	0.047	-0.086	0.000
10.00	-8.920	-25.858	0.000	0.000	0.000	-732.24	-0.184	0.000	0.184	-0.174	0.000
15.00	-8.815	-24.806	0.000	0.000	0.000	-687.64	-0.414	0.000	0.414	-0.263	0.000
20.00	-8.710	-23.773	0.000	0.000	0.000	-643.57	-0.737	0.000	0.737	-0.352	0.000
25.00	-8.606	-22.759	0.000	0.000	0.000	-600.02	-1.155	0.000	1.155	-0.442	0.000
30.00	-8.502	-21.764	0.000	0.000	0.000	-556.99	-1.667	0.000	1.667	-0.533	0.000
35.00	-8.397	-20.788	0.000	0.000	0.000	-514.48	-2.275	0.000	2.275	-0.625	0.000
40.00	-8.287	-19.831	0.000	0.000	0.000	-472.50	-2.979	0.000	2.979	-0.716	0.000
45.00	-8.169	-18.895	0.000	0.000	0.000	-431.07	-3.778	0.000	3.778	-0.807	0.000
48.50	-8.082	-18.253	0.000	0.000	0.000	-402.48	-4.394	0.000	4.394	-0.871	0.000
50.00	-8.050	-17.828	0.000	0.000	0.000	-390.35	-4.672	0.000	4.672	-0.899	0.000
53.25	-7.963	-16.924	0.000	0.000	0.000	-364.19	-5.306	0.000	5.306	-0.959	0.000
55.00	-7.932	-16.645	0.000	0.000	0.000	-350.26	-5.663	0.000	5.663	-0.991	0.000
60.00	-7.814	-15.872	0.000	0.000	0.000	-310.60	-6.757	0.000	6.757	-1.095	0.000
65.00	-7.693	-15.115	0.000	0.000	0.000	-271.53	-7.959	0.000	7.959	-1.196	0.000
70.00	-7.570	-14.373	0.000	0.000	0.000	-233.07	-9.264	0.000	9.264	-1.292	0.000
75.00	-7.441	-13.651	0.000	0.000	0.000	-195.22	-10.667	0.000	10.667	-1.383	0.000
78.00	-6.862	-11.957	0.000	0.000	0.000	-172.90	-11.554	0.000	11.554	-1.435	0.000
80.00	-6.816	-11.698	0.000	0.000	0.000	-159.17	-12.162	0.000	12.162	-1.468	0.000
85.00	-6.686	-11.070	0.000	0.000	0.000	-125.09	-13.742	0.000	13.742	-1.543	0.000
88.00	-5.236	-8.657	0.000	0.000	0.000	-105.03	-14.725	0.000	14.725	-1.584	0.000
90.00	-5.187	-8.440	0.000	0.000	0.000	-94.567	-15.394	0.000	15.394	-1.609	0.000
95.00	-5.057	-7.914	0.000	0.000	0.000	-68.633	-17.109	0.000	17.109	-1.663	0.000
98.00	-3.849	-5.517	0.000	0.000	0.000	-53.462	-18.163	0.000	18.163	-1.690	0.000
98.50	-3.837	-5.473	0.000	0.000	0.000	-51.537	-18.340	0.000	18.340	-1.694	0.000
100.00	-3.797	-5.262	0.000	0.000	0.000	-45.782	-18.874	0.000	18.874	-1.706	0.000
102.00	-3.743	-4.984	0.000	0.000	0.000	-38.189	-19.592	0.000	19.592	-1.720	0.000
105.00	-3.669	-4.776	0.000	0.000	0.000	-26.961	-20.679	0.000	20.679	-1.738	0.000
108.00	-1.670	-2.184	0.000	0.000	0.000	-15.955	-21.777	0.000	21.777	-1.753	0.000
109.00	-1.646	-2.122	0.000	0.000	0.000	-14.285	-22.144	0.000	22.144	-1.757	0.000
110.00	-1.622	-2.061	0.000	0.000	0.000	-12.639	-22.513	0.000	22.513	-1.761	0.000
115.00	-1.503	-1.761	0.000	0.000	0.000	-4.528	-24.364	0.000	24.364	-1.773	0.000
118.00	-0.020	-0.044	0.000	0.000	0.000	-0.020	-25.480	0.000	25.480	-1.775	0.000
119.00	-0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	25.851	-1.775	0.000

## Resulting Stresses

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

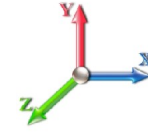
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

7/29/2015  
 Page: 22



**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

### 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)	f Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.60	0.39	0.00	0.00	0.00	18.09	18.70	51.5	0.363
5.00	0.59	0.40	0.00	0.00	0.00	17.92	18.52	52.0	0.356
10.00	0.58	0.40	0.00	0.00	0.00	17.73	18.32	52.0	0.352
15.00	0.57	0.41	0.00	0.00	0.00	17.50	18.08	52.0	0.348
20.00	0.56	0.41	0.00	0.00	0.00	17.24	17.82	52.0	0.343
25.00	0.55	0.42	0.00	0.00	0.00	16.95	17.51	52.0	0.337
30.00	0.54	0.43	0.00	0.00	0.00	16.61	17.16	52.0	0.330
35.00	0.53	0.43	0.00	0.00	0.00	16.22	16.76	52.0	0.323
40.00	0.52	0.44	0.00	0.00	0.00	15.77	16.31	52.0	0.314
45.00	0.51	0.45	0.00	0.00	0.00	15.26	15.79	52.0	0.304
48.50	0.51	0.45	0.00	0.00	0.00	14.86	15.39	52.0	0.296
50.00	0.50	0.45	0.00	0.00	0.00	14.68	15.20	52.0	0.292
53.25	0.59	0.56	0.00	0.00	0.00	17.25	17.87	52.0	0.344
55.00	0.59	0.57	0.00	0.00	0.00	16.95	17.57	52.0	0.338
60.00	0.58	0.58	0.00	0.00	0.00	16.02	16.63	52.0	0.320
65.00	0.57	0.59	0.00	0.00	0.00	14.95	15.56	52.0	0.299
70.00	0.56	0.60	0.00	0.00	0.00	13.74	14.34	52.0	0.276
75.00	0.55	0.61	0.00	0.00	0.00	12.34	12.94	52.0	0.249
78.00	0.49	0.57	0.00	0.00	0.00	11.42	11.95	52.0	0.230
80.00	0.49	0.58	0.00	0.00	0.00	10.82	11.36	52.0	0.219
85.00	0.48	0.59	0.00	0.00	0.00	9.17	9.71	52.0	0.187
88.00	0.39	0.47	0.00	0.00	0.00	8.07	8.50	52.0	0.163
90.00	0.38	0.47	0.00	0.00	0.00	7.50	7.93	52.0	0.153
95.00	0.37	0.48	0.00	0.00	0.00	5.91	6.34	52.0	0.122
98.00	0.27	0.38	0.00	0.00	0.00	4.84	5.15	52.0	0.099
98.50	0.27	0.38	0.00	0.00	0.00	4.71	5.02	52.0	0.096
100.00	0.26	0.38	0.00	0.00	0.00	4.29	4.60	52.0	0.088
102.00	0.33	0.50	0.00	0.00	0.00	4.76	5.16	52.0	0.099
105.00	0.32	0.50	0.00	0.00	0.00	3.55	3.96	52.0	0.076
108.00	0.15	0.23	0.00	0.00	0.00	2.22	2.40	52.0	0.046
109.00	0.15	0.23	0.00	0.00	0.00	2.02	2.21	52.0	0.042
109.00	0.15	0.23	0.00	0.00	0.00	2.02	2.21	52.0	0.042
110.00	0.15	0.23	0.00	0.00	0.00	1.82	2.01	52.0	0.039
115.00	0.13	0.22	0.00	0.00	0.00	0.72	0.93	52.0	0.018
118.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	52.0	0.000
119.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	52.0	0.000

## Final Analysis Summary

**Structure:** CT08558-B-SBA  
**Site Name:** New Britain 3, CT  
**Height:** 119.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/29/2015  
 Page: 23



### Reactions

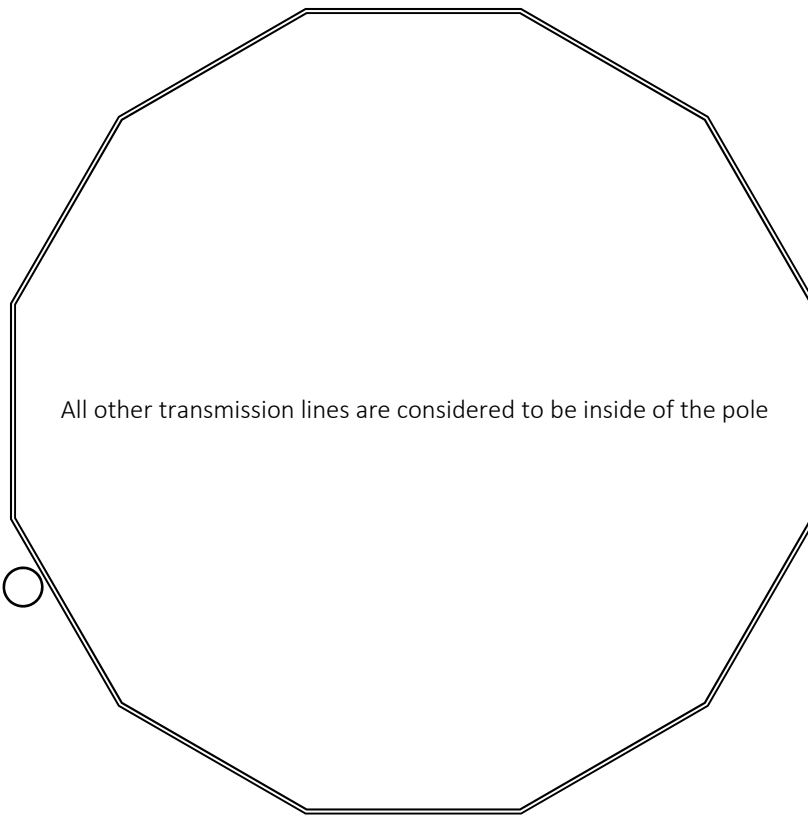
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	t MZ (ft-kips)
80 mph Wind with 0" Ice	23.4	0.00	27.98	0.00	0.00	2105.30
69.28 mph Wind with 0.5" Ice	18.9	0.00	32.86	0.00	0.00	1742.78
50 mph Wind with 0" Ice	9.1	0.00	28.02	0.00	0.00	823.03

### 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
80 mph Wind with 0" Ice	0.60	1.01	0.00	0.00	0.00	46.27	46.90	51.5	0.00	0.911
69.28 mph Wind with 0.5" Ice	0.70	0.81	0.00	0.00	0.00	38.31	39.03	51.5	0.00	0.758
50 mph Wind with 0" Ice	0.60	0.39	0.00	0.00	0.00	18.09	18.70	51.5	0.00	0.363

# Coax Layout

CT08558-B-SBA



Verizon's (1) 1-5/8" hybriflex cable is installed outside the monopole shaft.





# Monopole Mat Foundation Design

Date  
7/29/2015

Customer Name:	T-Mobile	EIA/TIA Standard:	EIA-222-F
Site Name:		Structure Height (Ft.):	119
Site Number:	CT08558-B-SBA	Engineer Name:	E. Goyal
Engr. Number:	16675	Engineer Login ID:	

**Foundation Info Obtained from:**

Drawings/Calculations
Monopole
Analysis

**Structure Type:**

**Analysis or Design?**

**Base Reactions (Unfactored)**

Axial Load (Kips):	32.9	Shear Force (Kips):	23.4
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2105.3

Allowable overstress %: 5.0%

**Foundation Geometries:**

Diameter of Pier (ft.):	6.0	Depth of Base BG (ft.):	5.5
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft.):	1.50
Length of Pad (ft.):	21.5	Width of Pad (ft.):	21.5

Final Length of pad (ft)	21.5	Final width of pad (ft):	21.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0

**Material Properties and Rebar Info:**

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	30	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
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):	38	Qty. of Rebar in Pad (W):	38	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	38	Qty. of Rebar in Pad (W):	38	

Apply 1.35 factor for e/w Per G: 1.35

**Soil Design Parameters:**

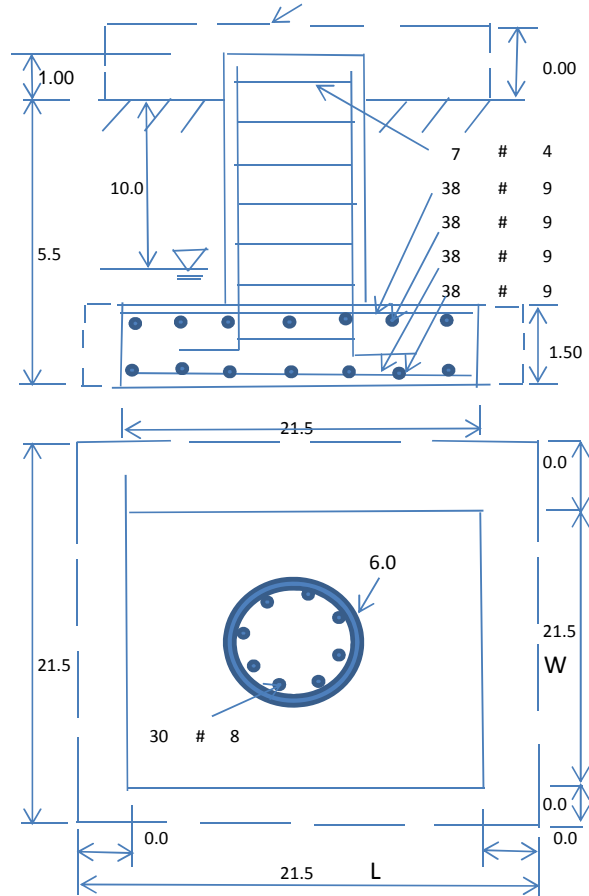
Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	50.0	Pcf	
Water Table B.G.S. (ft):	10.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:
Allowable Net Soil Bearing (psf):	12000	Allowable Skin Friction:	0	Psf	Angle from Bottm of Pad:
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:
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.):	1735.90	Total Dry Soil Weight (Kips):	216.99
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	216.99	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	834.75	Total Dry Concrete Weight (Kips):	125.21
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	125.21	Total Vertical Load on Base (Kips):	375.10

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	2554	<	Allowable Soil Bearing (psf):	12000	0.21	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	2688.2	>	Applied Momont (kips-ft):	2257	0.84	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.79					OK!



**Check the capacities of Reinforcing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.30		

Load/  
Capacity  
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	3392.5	> Design Factored Moment (Mu, Kips-Ft):	2889.0	0.85	OK!
Calculated Shear Capacity (Kips):	501.5	> Design Factored Shear (Kips):	30.4	0.06	OK!
Calculated Tension Capacity (Tn, Kips):	1279.8	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7156.5	> Design Factored Axial Load (Pu Kips):	42.8	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.86	OK! Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	353.4	> One-Way Factored Shear (L-D. Kips):	214.8	0.61	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	353.4	> One-Way Factored Shear (W-D., Kips)	214.8	0.61	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	401.1	> One-Way Factored Shear (C-C, Kips):	287.7	0.72	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0102	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0102		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	2246.6	> Moment at Bottom ( L-Direct. K-Ft):	541.0	0.24	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	2246.6	> Moment at Bottom ( W-Direct. K-Ft):	541.0	0.24	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	3099.9	> Moment at Bottom ( C-C Dir. K-Ft):	765.1	0.25	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0102	OK! Upper Steel Reinf. Ratio (W-Direct. ):	0.0102		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	2246.6	> Moment at the top (L-Dir Kips-Ft):	129.5	0.06	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	2246.6	> Moment at the top (W-Dir Kips-Ft):	129.5	0.06	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	3099.9	> Moment at the top (C-C Direc. K-Ft):	479.4	0.15	OK!



Pier Foundation Design For Monopole			Date
			Customer Name:
Site Name:		Structure Height (Ft.):	119
Site Number:	CT08558-B-SBA	Engineer Name:	E. Goyal
Engr. Number:	16675	Engineer Login ID:	

**Foundation Info Obtained from:**

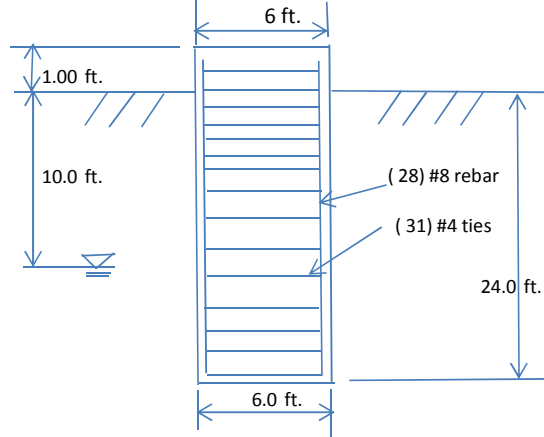
Drawings/Calculations	Acceptable overstress ( $\leq 5.0\%$ )
Structure Type:	Monopole
Analysis or Design?	Analysis

**Base Reactions (Unfactored)**

Axial Load (Kips):	32.9	Shear Force (Kips):	23.4
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2105.3

**Foundation Geometries:**

Mods required -Yes/No ?:	No		ft.
Diameter of Pier (ft.):	6.0	Depth of Base B. G. S. :	24.0 ft.
Pier Height A. G. (ft.):	1.00		



**Monopole Pier Foundation**

**Material Properties and Reabr Info:**

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000 ksi
Vertical bar yield (ksi):	60	Tie steel yield strength:	60 ksi
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4
Qty. of Vertical Rebars:	28	Tie Spacing:	12.0 in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0 pcf

**Soil Design Parameters:**

Water Table B.G.S. (ft):	10.0	Unit weight of water:	62.4 psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	30 (°)
Skin Frictions are to be obtained from:	Soil Report		

Depth of Layers (ft)		$\gamma_{soil}$ (pcf)	$\phi$ (°)	Cohesion (psf)	Allowable Skin Friction (psf)	Allowable Bearing (psf)	Soil Types				
Top	Bottom										
0.0	2.0	135	0	0	0	0	Sand				
2.0	10.0	135	34	0	0	0	Sand				
10.0	25.0	137	34	0	0	0	Sand				
25.0	30.0	137	34	0	0	0	Sand				

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

**Foundation Analysis and Design:**

Total Dry Soil Volume from Conical Failure (cu. Ft.):	5907	Dry Soil Weight from Conical Failure:	797	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	2024	Buoyant Soil Weight from Conical Failure (K	194	Kips
Total Dry Concrete Volume (cu. Ft.):	311	Total Dry Concrete Weight:	46.7	Kips
Total Buoyant Concrete Volume (cu. Ft.):	395.8	Total Buoyant Concrete Weight:	34.68	Kips
Total Effective Concrete Weight (Kips):	81.3	Total Effective Soil Weight:	991.0	Kips
Total Effective Vertical Load on Base (Kips):	38.2			

**Check Soil Capacities:**

Allowable Foundation Overturning Resistance (kips-ft.):	4209.0	>	Applied Moment (kips-ft):	2495	Usage	0.59	OK!
Factor of Safety of Passive Soil Resistance against Moment:	3.37	OK!					

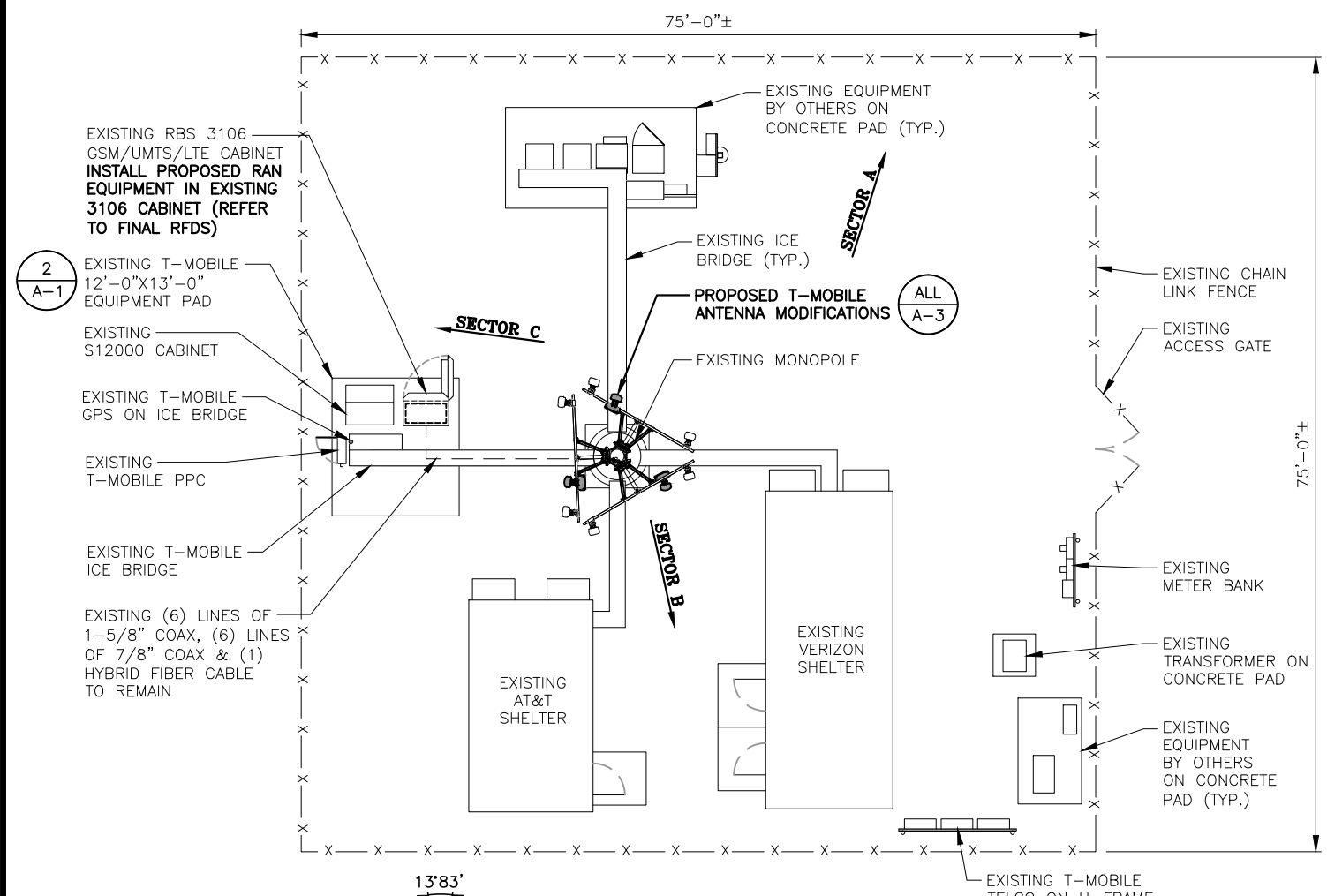
**Check the capacities of Reinforceing Concrete:**

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.30

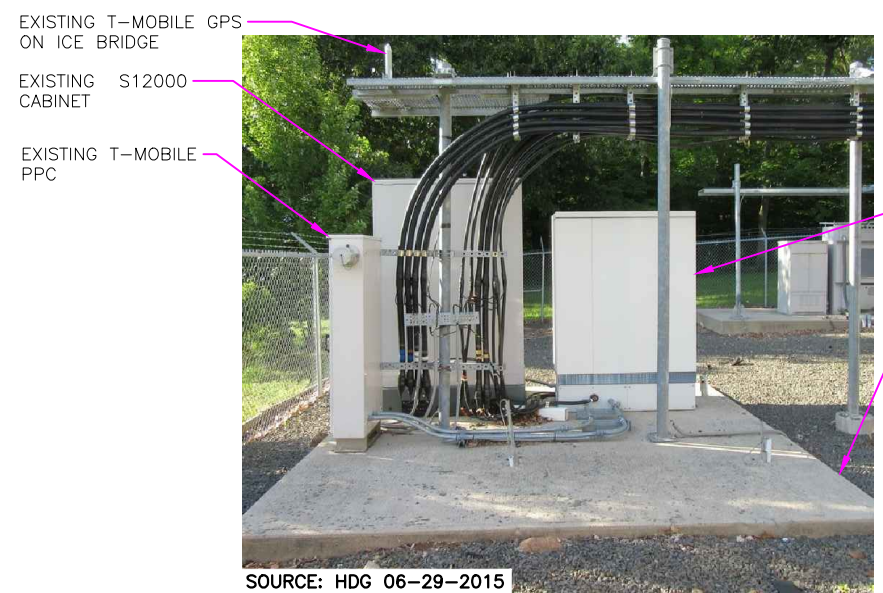
Reinforcing Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.20	Usage	
Calculated Moment Capacity (Mn,Kips-Ft):	3165	>	Design Factored Moment (Mu, K-Ft):	2855.4	0.90 OK!
Calculated Shear Capacity (Kips):	785.8	>	Design Factored Shear (Kips):	305.6	0.39 OK!
Calculated Tension Capacity (Tn, Kips):	1194.5	>	Design Factored Tension (Tu Kips):	0.0	0.00 OK!
Calculated Compression Capacity (Pn, Kips):	7159	>	Design Factored Axial Load (Pu Kips):	42.8	0.01 OK!
Moment & Axial Strength Combination(Tu/Tn+Mu/Mn):	0.91	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI			





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



**EQUIPMENT PHOTO DETAIL**  
 SCALE: N.T.S.

**T-MOBILE T-ARMS**  
 ELEV. = 88.0'± A.G.L (SBA\*)

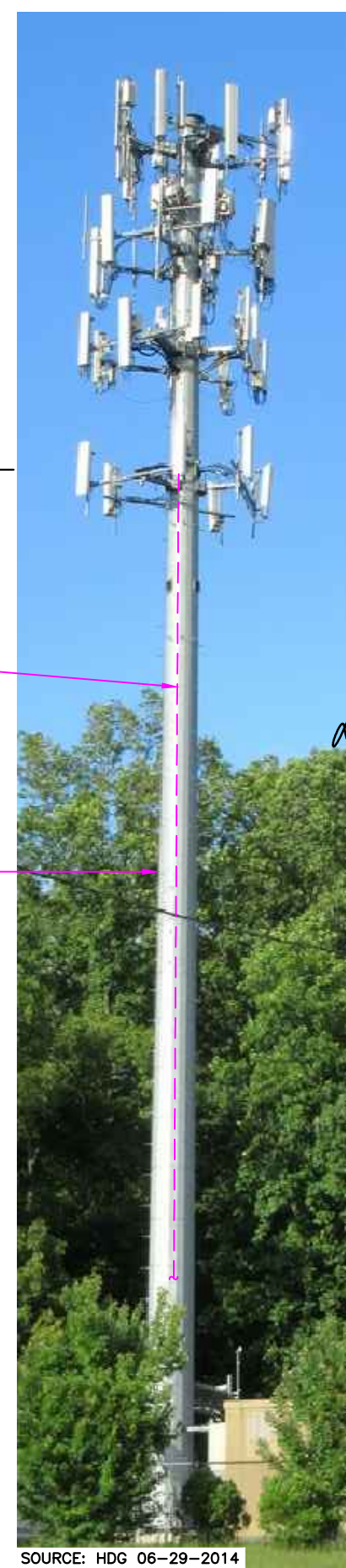
EXISTING (6) LINES OF 1-5/8" COAX, (6) LINES OF 7/8" COAX AND (1) HYBRID FIBER CABLE TO REMAIN (REFER TO SBA PROVIDED STRUCTURAL ANALYSIS FOR SPECIAL CABLE INSTALLATION REQUIREMENTS, BUNDLING, SHIELDING, MOUNTING AND RELOCATION OF EXISTING CABLES)

EXISTING MONOPOLE

**STRUCTURAL NOTES:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS.

**SPECIAL WORK NOTE:**  
 CONTRACTOR TO VERIFY EXISTING ANTENNA PIPE MAST TO HAVE (2) POINTS OF CONNECTION. IF THERE IS ONLY (1) POINT OF CONNECTION THE CONTRACTOR WILL ADD A SECOND TO EACH EXISTING ANTENNAS OR CENTER ANTENNAS VERTICALLY ON THE ANTENNA MAST SUPPORT ASSEMBLY.

**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.



**ELEVATION PHOTO DETAIL**  
 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**  
 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

CHECKED BY: BB

APPROVED BY: DPH

**SUBMITTALS**

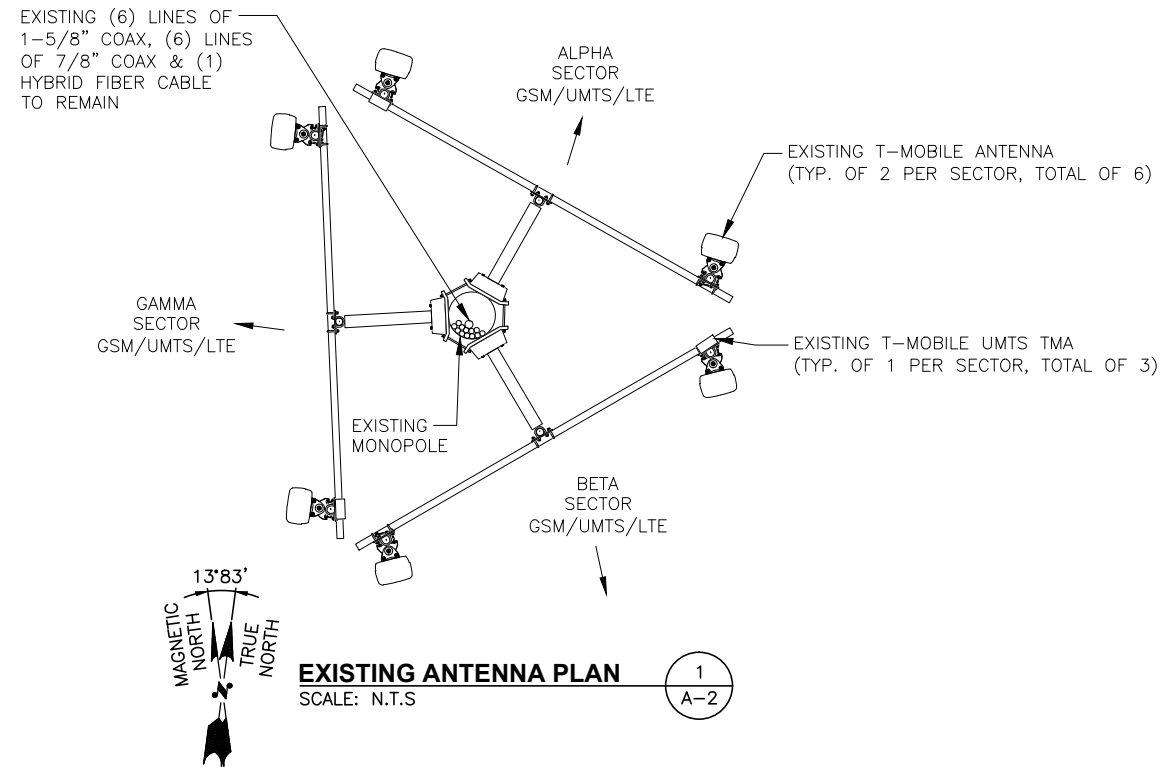
REV.	DATE	DESCRIPTION	BY
0	07/20/15	ISSUED FOR CONSTRUCTION	VP

SITE NUMBER:  
 CTHA105A  
 SITE NAME:  
 HA105/SBA STANLEY\_FT  
 SITE ADDRESS:  
 723 FARMINGTON AVENUE  
 NEW BRITAIN, CT 06053  
 HARTFORD COUNTY

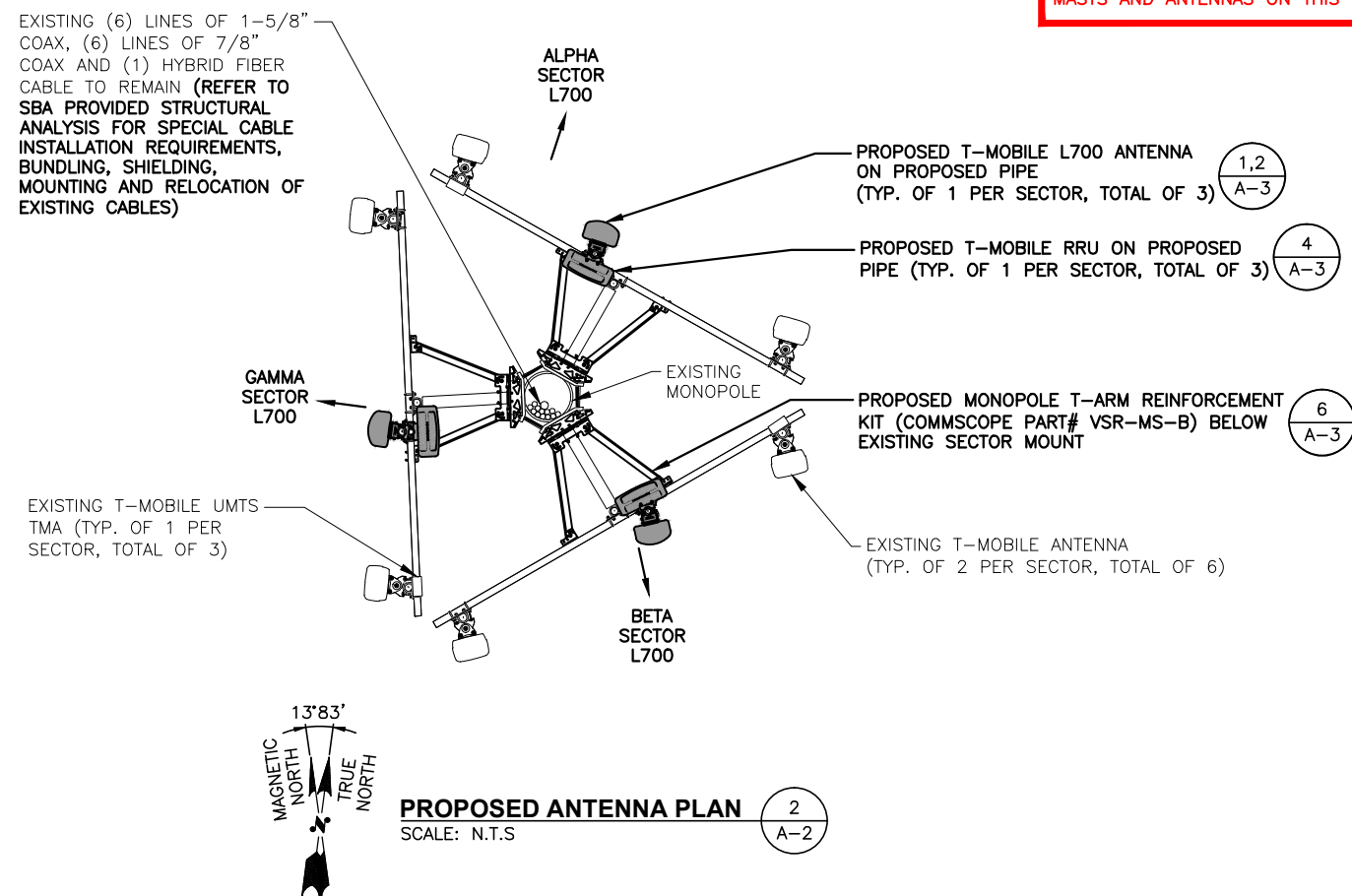
SHEET TITLE  
 COMPOUND & ELEVATION PLAN

SHEET NUMBER  
**A-1**





**EXISTING ANTENNA PLAN**  
SCALE: N.T.S. 1  
A-2



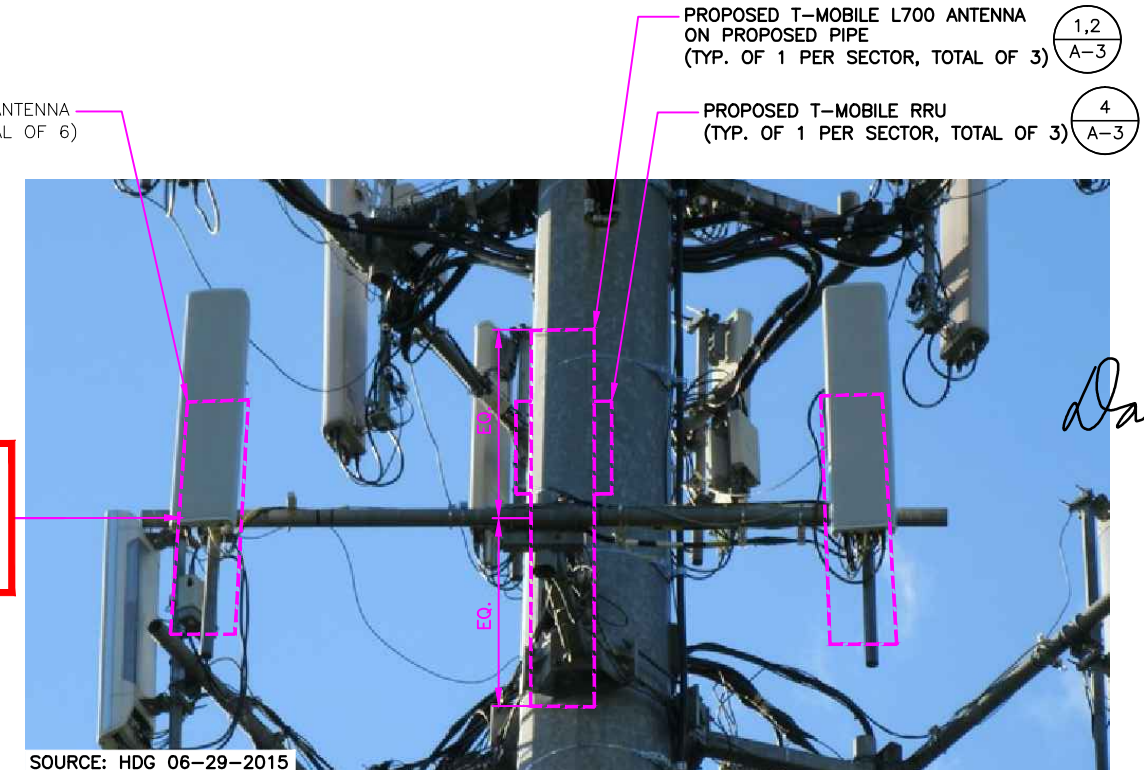
**PROPOSED ANTENNA PLAN**  
SCALE: N.T.S. 2  
A-2

**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.

**STRUCTURAL NOTES:**  
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS.

**SPECIAL WORK NOTE:**  
CONTRACTOR TO VERIFY EXISTING ANTENNA PIPE MAST TO HAVE (2) POINTS OF CONNECTION. IF THERE IS ONLY (1) POINT OF CONNECTION THE CONTRACTOR WILL ADD A SECOND TO EACH EXISTING ANTENNAS OR CENTER ANTENNAS VERTICALLY ON THE ANTENNA MAST SUPPORT ASSEMBLY.

**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 ALL PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.



**PROPOSED ANTENNA PHOTO DETAIL**  
SCALE: N.T.S. 3  
A-2

**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**   
  
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

CHECKED BY: BB

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
0	07/20/15	ISSUED FOR CONSTRUCTION	VP

SITE NUMBER:  
CTHA105A  
  
SITE NAME:  
HA105/SBA  
STANLEY\_FT  
  
SITE ADDRESS:  
723 FARMINGTON AVENUE  
NEW BRITAIN, CT 06053  
HARTFORD COUNTY

SHEET TITLE  
EXISTING &  
PROPOSED ANTENNA  
PLANS

SHEET NUMBER  
**A-2**

**T-MOBILE  
NORTHEAST LLC**

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



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



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



*Daniel P. Hamm*

CHECKED BY: BB

APPROVED BY: DPH

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
0	07/20/15	ISSUED FOR CONSTRUCTION	VP

SITE NUMBER:

CTHA105A

SITE NAME:

HA105/SBA  
STANLEY\_FT

SITE ADDRESS:

723 FARMINGTON AVENUE  
NEW BRITAIN, CT 06053  
HARTFORD COUNTY

SHEET TITLE

EQUIPMENT DETAILS

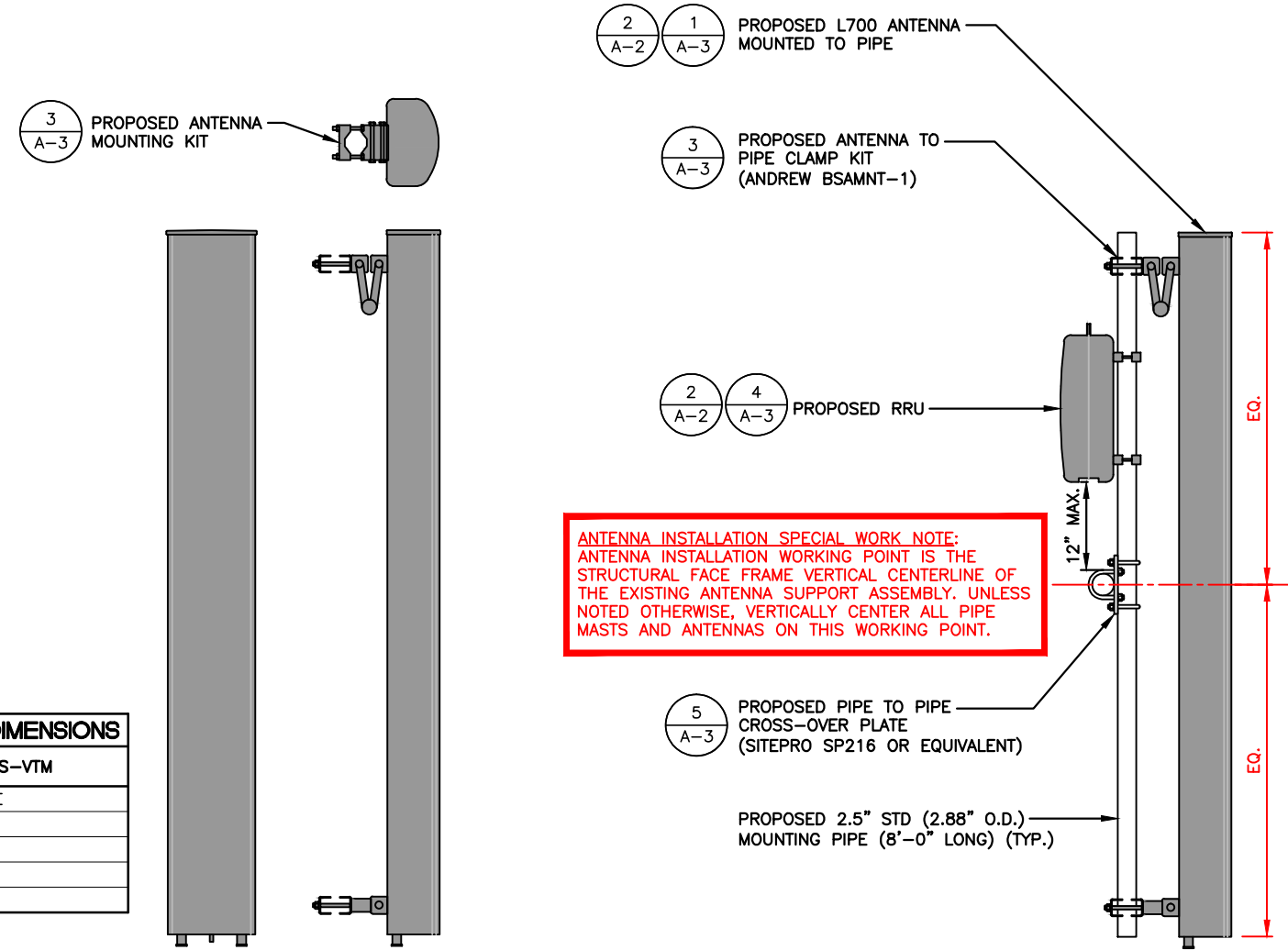
SHEET NUMBER

**A-3**

**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.

**STRUCTURAL NOTES:**  
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS.

**SPECIAL WORK NOTE:**  
CONTRACTOR TO VERIFY EXISTING ANTENNA PIPE MUST TO HAVE (2) POINTS OF CONNECTION. IF THERE IS ONLY (1) POINT OF CONNECTION THE CONTRACTOR WILL ADD A SECOND TO EACH EXISTING ANTENNAS OR CENTER ANTENNAS VERTICALLY ON THE ANTENNA MAST SUPPORT ASSEMBLY.



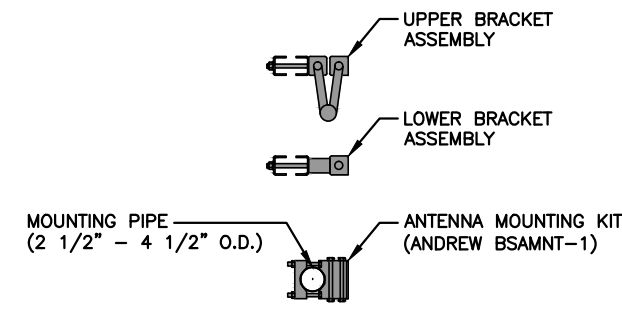
**ANTENNA INSTALLATION SPECIAL WORK NOTE:**  
ANTENNA INSTALLATION WORKING POINT IS THE STRUCTURAL FACE FRAME VERTICAL CENTERLINE OF THE EXISTING ANTENNA SUPPORT ASSEMBLY. UNLESS NOTED OTHERWISE, VERTICALLY CENTER ALL PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.

**L700 ANTENNA DIMENSIONS**

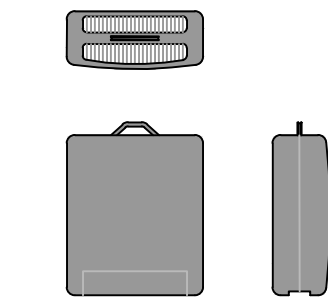
MODEL #	LNX-6515DS-VTM
MANUF.	COMMSCOPE
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	96.4"
WEIGHT	50.3 LBS

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

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



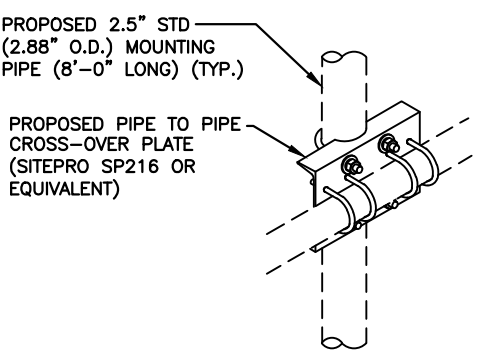
**ANTENNA MOUNTING BRACKET** 3  
SCALE: N.T.S. A-3



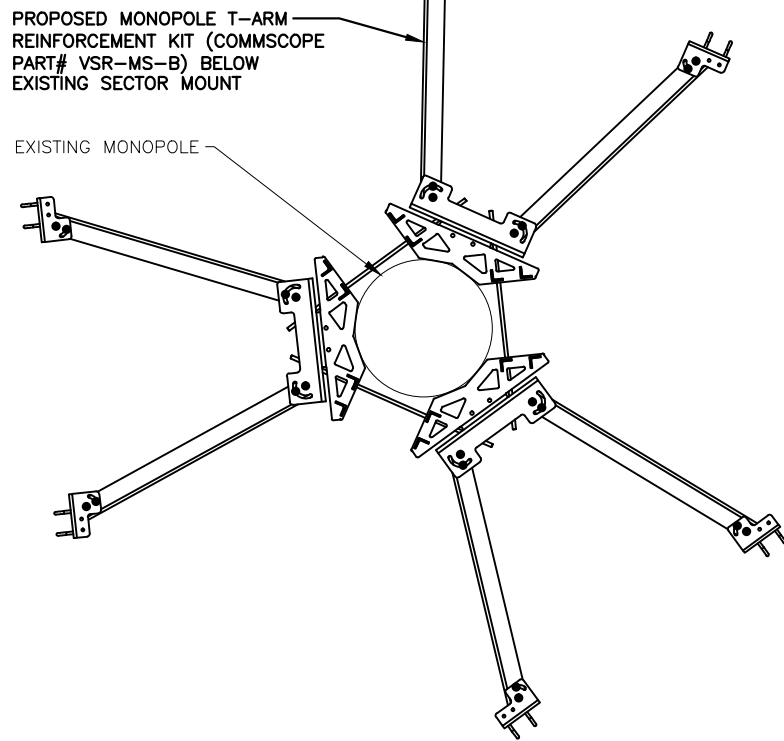
**PROPOSED RRU DETAIL** 4  
SCALE: N.T.S. A-3

**RRU DIMENSIONS**

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



**PIPE TO PIPE CROSS-OVER PLATE** 5  
SCALE: N.T.S. A-3



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