Filed by:
Kri Pelletier, Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3804 - kpelletier@sbasite.com

November 29, 2016

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Notice of Exempt Modification
11 Francis J. Clarke Circle, Bethel, CT 06801
N 41° 21' 36.27"
W -73° 25' 30.06"
AT&T #: 10070932_LTE - CT5513

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 127-foot level of the existing 155' Monopole Tower at 11 Francis J. Clarke Circle, Bethel, CT. The tower is owned by SBA Towers, LLC. The property is owned by Costa Stergue. AT&T does not intend any antenna re-configuration at this time. It does, however, propose to install (3) RRRUs at the 127-foot level. The full scope of proposed work is as follows:

Remove:

- None

Remove and Replace:

- Remove (3) Ericsson RRU 11 RRHs and replace with (3) Ericsson RRUS 12 RRHs

Install:

- (6) Kathrein 860 10025 RETs

Existing Equipment to Remain (Including Entitlements):

- (1) Raycap DC Surge Suppressor
- (3) Ericsson RRU 11 RRHs
- (6) Powerwave LGP21401 TMAs
- (3) Powerwave P65-16-XLH-RR Panel Antennas
- (3) Powerwave 7770 Panel Antennas

This facility was approved by the Town of Bethel's Inland Wetlands Commission on 10/28/98 and Planning and Zoning Commission on 11/14/00. The Tower was not constructed within a year of approval, as originally stipulated, so the Planning and Zoning Commission approved to reinstate the terms and conditions of the original approval on 4/9/02. All collocators were to have equipment placed within the leased area. No other tower conditions were set, therefore this modification is in full compliance.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to Matt Knickerbocker, First Selectman for the Town of Bethel, as well as the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-referenced telecommunication facility constitute an exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kri Pelletier
Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581

508.251.0720 x3804 + T
508.366.2610 + F
203.446.7700 + C
kpelletier@sbasite.com

Attachments
cc: Matt Knickerbocker, First Selectman -- as elected official
Town of Bethel, 1 School Street, Bethel, CT 06801
Costa Stergue – as property owner
562 Redding Road, Redding, CT 06896-1903

POWER DENSITY

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**127 feet**	Height (AGL):	**127 feet**	Height (AGL):	**127 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.68 %**	Antenna B1 MPE%	**0.68 %**	Antenna C1 MPE%	**0.68 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR
Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd
Height (AGL):	**127 feet**	Height (AGL):	**127 feet**	Height (AGL):	**127 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	6,117.63	ERP (W):	6,117.63	ERP (W):	6,117.63
Antenna A2 MPE%	**2.13 %**	Antenna B2 MPE%	**2.13 %**	Antenna C2 MPE%	**2.13 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.81 %**
T-Mobile	0.03 %
Verizon Wireless	2.37 %
Nextel	0.78 %
Clearwire	0.08 %
Sprint	0.28 %
Site Total MPE %:	**6.35 %**

AT&T Sector A Total:	2.81 %
AT&T Sector B Total:	2.81 %
AT&T Sector C Total:	2.81 %
Site Total:	6.35 %

AT&T _ Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	127	2.03	850 MHz	567	0.36%
AT&T 1900 MHz (PCS) UMTS	2	656.33	127	3.22	1900 MHz (PCS)	1000	0.32%
AT&T 700 MHz LTE	2	1,117.25	127	5.49	700 MHz	467	1.17%
AT&T 1900 MHz (PCS) LTE	2	1,941.56	127	9.53	1900 MHz (PCS)	1000	0.95%
						Total:	2.81%

Bethel, CT : Commercial Property Record Card

[Back to Search Results] [Start a New Search][Help with Printing]

Search For Properties

Account	Map Block Lot	Street #	Street Name
		11	FRANCIS J CLARKE CIRCLE

Search | Reset Search

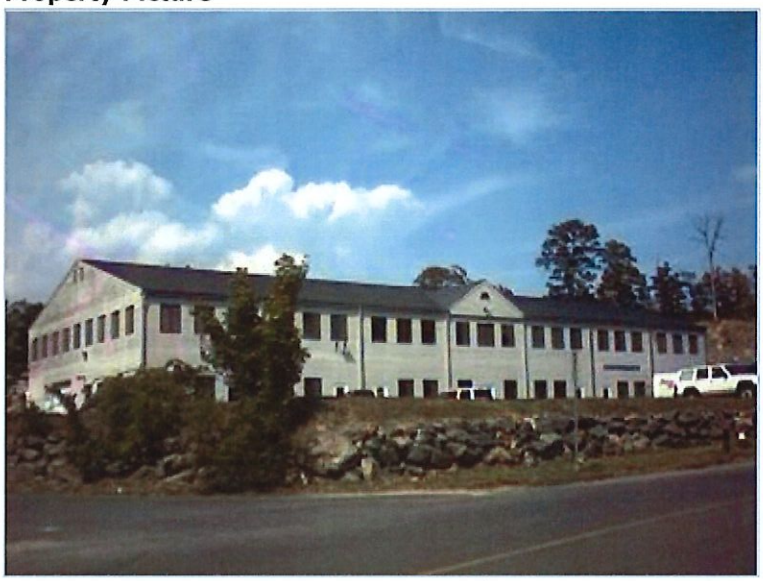
Account	Card	Map-Block-Lot	Location	Zoning	State Class	Acres
R05677	1	09 23 150-05	11 FRANCIS J CLARKE CIRCLE	IP	401 - Manufacturing	5.803

Living Units
0

Owner Information

Stergue Costa
562 Redding Road
West Redding CT 06896

Property Picture



Deed Information

Book/Page: 385/409
Deed Date: 1986/07/22

Building Information

Building No: 1
Year Built: 1992
No of Units: 7
Structure Type: Manufacturing
Grade: C
Identical Units: 1
Net Leasable Area: 19220

Valuation

Land:	$392,750
Building:	$716,750
Total:	$1,109,500
Net Assessment:	$776,650

Sales History

Book/Page	Date	Price	Type	Validity

Permit History

Date	Purpose	Price
2014/07/02	SBA 3ANTENNA	$0
2012/10/18	SPRINT6ANTENNA	$0

Out Building Information

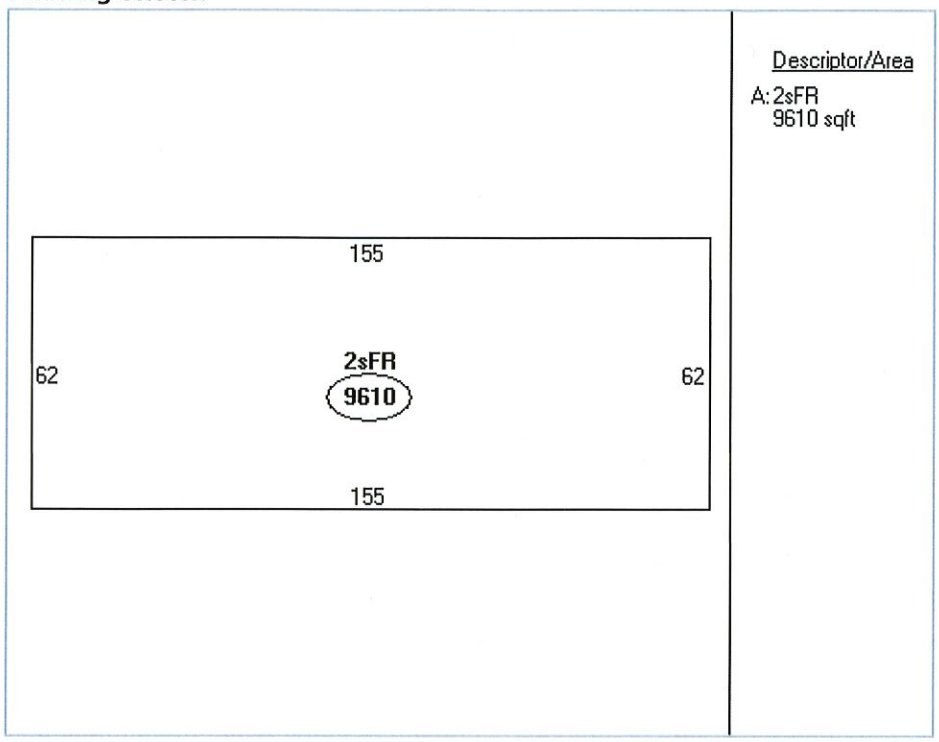
Structure Code	Width	Lgth/SqFt	Year	RCNLD
Asphalt Parking	1	20000	1992	$31,250
Shed Metal	1	360	2006	$9,450
Shed Metal	1	240	2006	$6,300

Exterior/Interior Information

Levels	Size	Use Type	Ext. Walls	Const. Type	Partitions	Heating	A/C	Plumbing	Condition	Func. Utility	Unadj. RCNLD
01-01	9610	Light Manufacturing	Frame	Wood Joist	None	Unit	None	Below Normal	Normal	Normal	$119,390
02-02	7378		Frame	Wood Joist	Normal	Unit	None		Normal	Normal	$76,920

		Light Manufacturing						Below Normal			
02-02	2232	Multi-Use Office	Frame	Wood Joist	Normal	Hot Air	Central	Normal	Normal	Normal	$58,120

Building Sketch



Notice

The information delivered through this on-line database is provided in the spirit of open access to government information and is intended as an enhanced service and convenience for citizens of Bethel, CT.

The providers of this database: CLT, Big Room Studios, and Bethel, CT assume no liability for any error or omission in the information provided here.

Currently All Values Have Not Been Finalized and Are Subject To Change.

Comments regarding this service should be directed to: Assessor@betheltownhall.org

EBI Consulting
environmental | engineering | due diligence

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

AT&T Existing Facility

Site ID: CT5513

Bethel
11 Francis J. Clark Circle
Bethel, CT 06801

November 11, 2016

EBI Project Number: 6216005157

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	6.35 %

November 11, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT5513 – Bethel**

EBI Consulting was directed to analyze the proposed AT&T facility located at **11 Francis J. Clark Circle, Bethel, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **11 Francis J. Clark Circle, Bethel, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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 UMTS channels (850 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 (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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 6-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 **Powerwave 7770 and the Powerwave P65-16-XLH-RR** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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 centerlines of the proposed antennas are **127 feet** above ground level (AGL) for **Sector A**, **127 feet** above ground level (AGL) for **Sector B** and **127 feet** above ground level (AGL) for Sector C.

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.

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**127 feet**	Height (AGL):	**127 feet**	Height (AGL):	**127 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.68 %**	Antenna B1 MPE%	**0.68 %**	Antenna C1 MPE%	**0.68 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR
Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd
Height (AGL):	**127 feet**	Height (AGL):	**127 feet**	Height (AGL):	**127 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	6,117.63	ERP (W):	6,117.63	ERP (W):	6,117.63
Antenna A2 MPE%	**2.13 %**	Antenna B2 MPE%	**2.13 %**	Antenna C2 MPE%	**2.13 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.81 %**
T-Mobile	0.03 %
Verizon Wireless	2.37 %
Nextel	0.78 %
Clearwire	0.08 %
Sprint	0.28 %
Site Total MPE %:	**6.35 %**

AT&T Sector A Total:	2.81 %
AT&T Sector B Total:	2.81 %
AT&T Sector C Total:	2.81 %
Site Total:	6.35 %

AT&T _ Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	127	2.03	850 MHz	567	0.36%
AT&T 1900 MHz (PCS) UMTS	2	656.33	127	3.22	1900 MHz (PCS)	1000	0.32%
AT&T 700 MHz LTE	2	1,117.25	127	5.49	700 MHz	467	1.17%
AT&T 1900 MHz (PCS) LTE	2	1,941.56	127	9.53	1900 MHz (PCS)	1000	0.95%
						Total:	2.81%

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 AT&T 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:

AT&T Sector	Power Density Value (%)
Sector A:	2.81 %
Sector B:	2.81 %
Sector C:	2.81 %
AT&T Maximum Total (per sector):	2.81 %
Site Total:	6.35 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.35 %** 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.

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

Structural Analysis Report

Existing 155 ft. SUMMIT Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT00248-S

Customer Site Name: North Bethel

Carrier Name: AT&T

Carrier Site ID / Name: 5513 FA# 10070932 / Bethel-Francis J Clarke Circle

Site Location: 11 Francis J. Clarke Circle

Bethel, Connecticut

Fairfield County

Latitude: 41.360522

Longitude: -73.424474

Analysis Result:

Max Structural Usage: 50.3% [Pass]

Max Foundation Usage: 61% [Pass]

Report Prepared By : Stacey Hesselbein

11/8/16

Introduction

The purpose of this report is to summarize the analysis results on the 155 ft. SUMMIT Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Tower Drawings by Summit Manufacturing LLC., Job # 4071 Dated 10/22/1998
Foundation Drawing	Foundation Design by Paul J. Ford and Company, Job # 29200-1210 Dated 08/17/2000
Geotechnical Report	Geotechnical Report by Jaworski Geotech Inc., Project # C98342G Dated 08/06/1998
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 120 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 93.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft.
Seismic Parameters:	S_S = 0.215, S_1 = 0.066

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	157.4	3	RFS - APXVSPP18-C-A20 - Panel	(1)Low Profile Platform (1)Collar Mount	(4) 1 1/4"	Sprint
2		3	RFS - APXVTM14-C-120 - Panel			
3		3	Alcatel - 1900MHz RRH - RRU			
4		3	Alcatel - 800 MHz RRH - RRU			
5		3	Alcatel - TD-RRH8x20-25 - RRH			
6		3	Alcatel - 800MHz External Notch Filter			
7		4	RFS - ACU-A20-N - RET			
8	137.0	6	Commscope - SBNHH-1D65B - Panel	(1)Low Profile Platform	(10) 1 5/8" (2) 1 5/8" Hybrid	Verizon
9		2	Antel - LPA-80080/4CF - Panel			
10		2	Antel - LPA-80080-6CF-EDIN - Panel			
11		2	Antel - LPA-80063/6CF - Panel			
12		3	Alcatel - 4X45 RRH AWS -RRU			
13		3	Alcatel - RRH2X60-PCS - RRU			
14		3	Alcatel - RRH2X60-700 - RRU			
15		6	RFS - FD9R6004/2C-3L - Diplexer			
16		2	RFS - DB-T1-6Z-8AB-0Z -Distribution Box			
-	127.0	3	Powerwave - 7770.00 - Panel	(1)Low Profile Platform	(9) 1 1/4" (1) Fiber (2) DC	AT&T
-		3	Powerwave - P65-16-XL-2 - Panel			
-		6	Powerwave - LGP21401 - TMA			
-		6	Ericsson - RRUS-11 - RRU			
-		1	Raycap - DC6-48-60-18-8F - SP			
24	117.0	3	Ericsson - AIR 21 B2A/B4P - Panel	(3) T-Arms (Valmont P/N RMV12-3xx)	[1](12) 1 5/8" [2](1) 1 5/8" Hybrid	T-Mobile
25		3	Ericsson - AIR 21 B4A/B2P - Panel			

1. The (12)1 5/8" Coax and are considered double stacked running outside of the pole shaft
2. The (1) 1 5/8" Hybrid is considered running outside of 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
17	127.0	3	Powerwave - 7770 - Panel	(1)Low Profile Platform	(9) 1 1/4" (2) 3/4" DC (1) 1/2" Fiber	AT&T
18		3	Powerwave - P65-16-XLH-RR - Panel			
19		6	Powerwave - LGP21401 - TMA			
20		3	Ericsson - RRU 11 - RRH			
21		3	Ericsson - RRUS 12 - RRH			
22		6	Kathrein - 860 10025 - RET			
23		1	Raycap - DC6-48-60-18-8F - SP			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**50.3%**	**38.0%**	**46.2%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	2485.2	22.1	70.3

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-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.1099 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 50.33% at 0.0ft

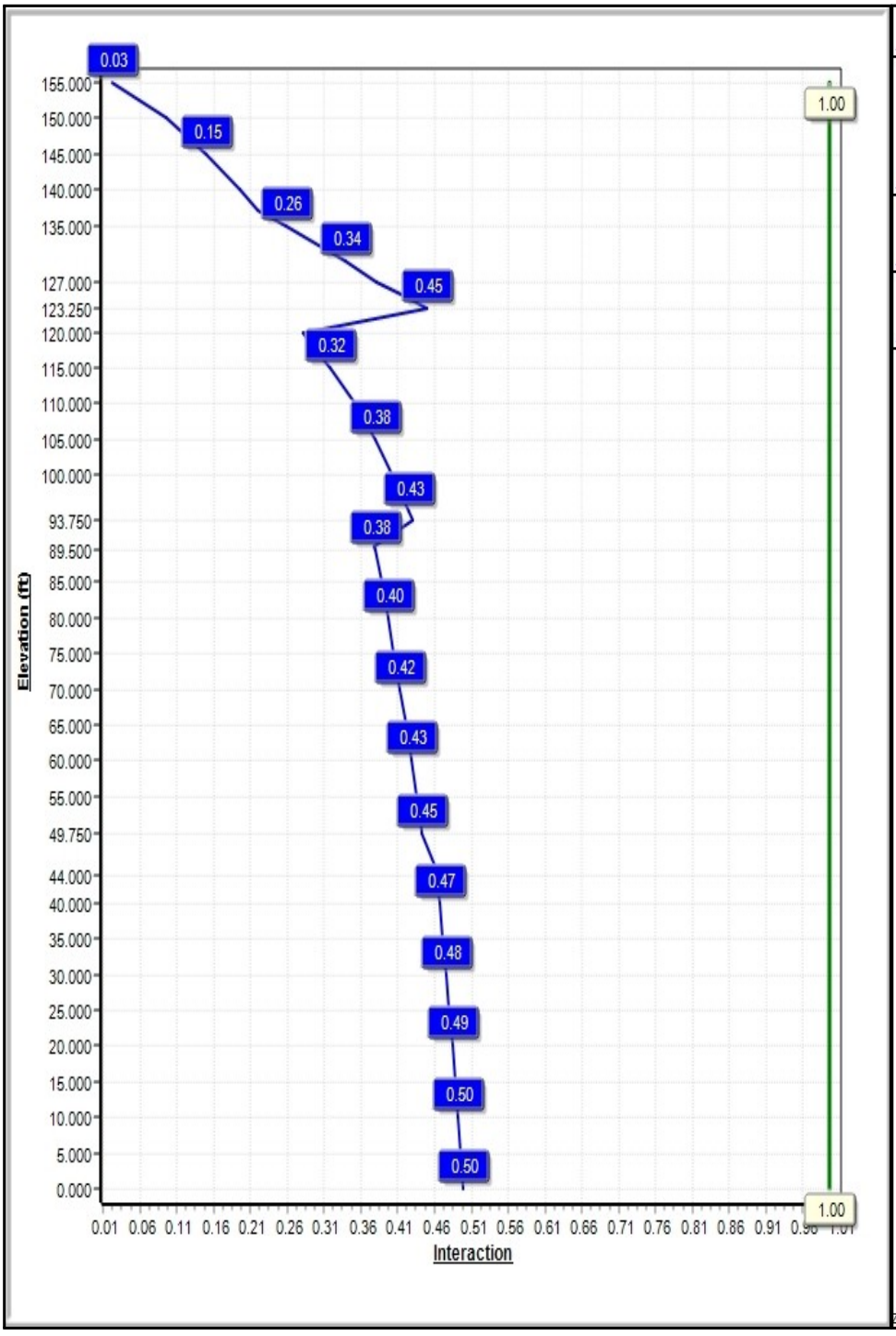
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel	**Exposure:**	B	
Height:	155.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

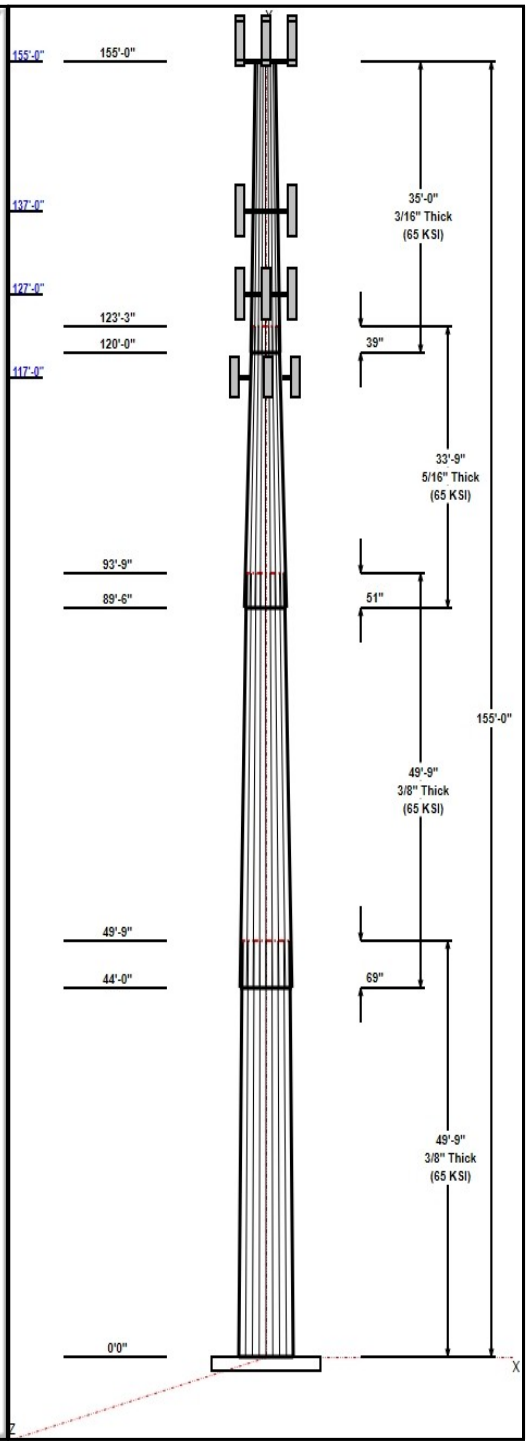
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 93 mph Wind

Iterations: 24





Structure: CT00248-S-SBA

Type: Tapered
Site Name: North Bethel
Height: 155.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.27148

11/8/2016

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	49.75	43.32	56.83	0.375		0.27148	65
2	49.75	32.13	45.63	0.375	Slip	0.27148	65
3	33.75	24.74	33.91	0.313	Slip	0.27148	65
4	35.00	16.50	26.00	0.188	Slip	0.27148	65

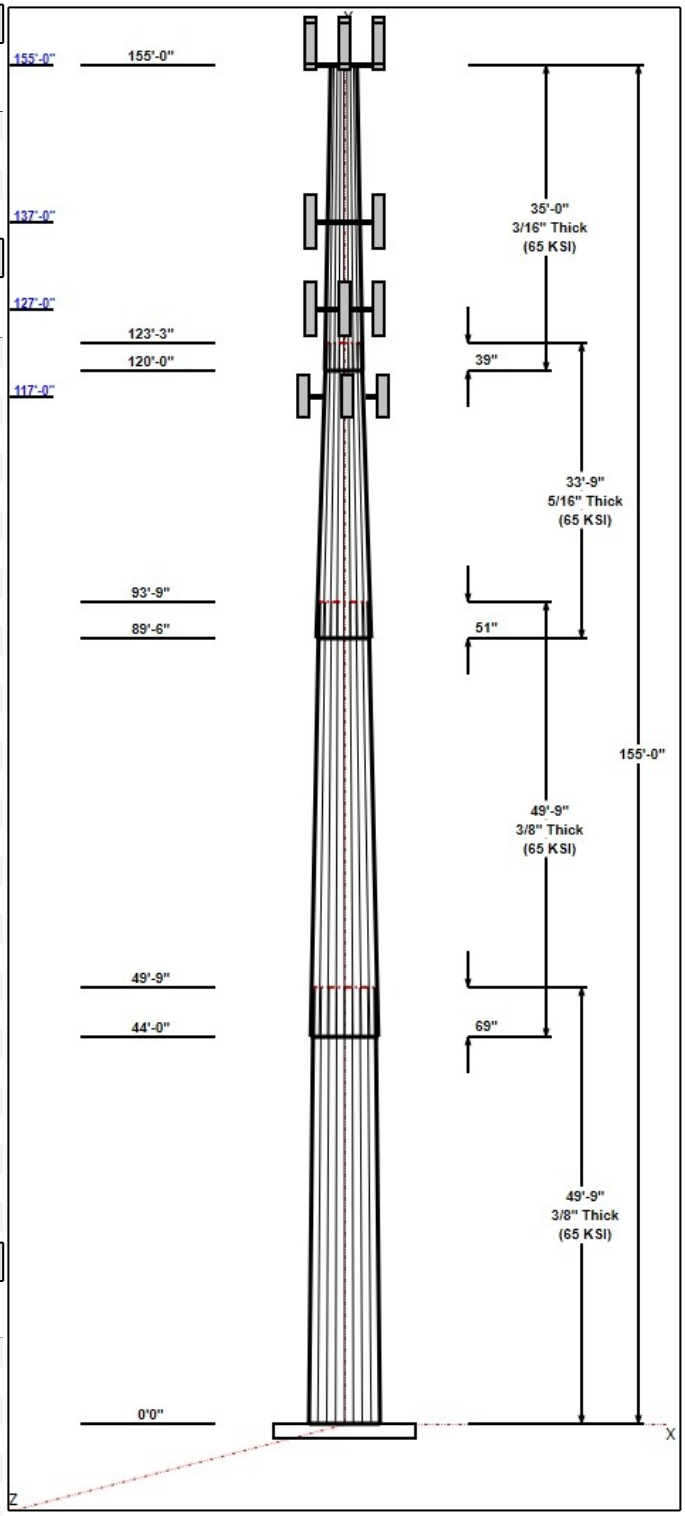
Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
155.00	157.40	3	APXVSPP18-C-A20	Sprint
155.00	157.40	4	ACU-A20-N	Sprint
155.00	157.40	3	APXVTM14-C-120	Sprint
155.00	157.40	3	TD-RRH8x20-25	Sprint
155.00	157.40	3	800 MHz RRH	Sprint
155.00	157.40	3	ALU 800MHz External	Sprint
155.00	157.40	3	1900MHz RRH	Sprint
155.00	155.00	1	Low Profile Platform	Sprint
155.00	155.00	1	Collar Mount	Sprint
155.00	155.00	1	6' Lightning rod	Verizon
137.00	137.00	6	SBNHH-1D65B	Verizon
137.00	137.00	2	LPA-80080/4CF ___	Verizon
137.00	137.00	2	LPA-80080-6CF-EDIN	Verizon
137.00	137.00	2	LPA-80063/6CF	Verizon
137.00	137.00	3	4X45 RRH AWS	Verizon
137.00	137.00	3	RRH2X60-PCS	Verizon
137.00	137.00	3	RRH2X60-700	Verizon
137.00	137.00	6	FD9R6004/2C-3L (3.1 lbs)	Verizon
137.00	137.00	2	DB-T1-6Z-8AB-0Z	Verizon
137.00	137.00	1	Low Profile Platform	Verizon
127.00	127.00	3	RRU 11	AT&T
127.00	127.00	3	P65-16-XLH-RR	AT&T
127.00	127.00	3	RRUS 12	AT&T
127.00	127.00	6	860 10025	AT&T
127.00	127.00	1	DC6-48-60-18-8F	AT&T
127.00	127.00	3	7770	AT&T
127.00	127.00	6	LGP21401	AT&T
127.00	127.00	1	Low Profile Platform	AT&T
117.00	117.00	3	AIR 21, 1.3M, B2A B4P	T-Mobile
117.00	117.00	3	AIR 21, 1.3M, B4A B2P	T-Mobile
117.00	117.00	3	T-Arms	T-Mobile

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	155.00	Inside	1 1/4" Coax	Sprint
0.00	137.00	Inside	1 5/8" Coax	Verizon
0.00	137.00	Inside	1 5/8" Hybrid	Verizon
0.00	127.00	Inside	1 1/4" Coax	AT&T
0.00	127.00	Inside	1/2" Fiber	AT&T
0.00	127.00	Inside	3/4" DC	AT&T
0.00	117.00	Outside	1 5/8" Coax	T-Mobile
0.00	117.00	Outside	1 5/8" Hybrid	T-Mobile

Anchor Bolts



Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	64.0	50.0	Clipped

Reactions

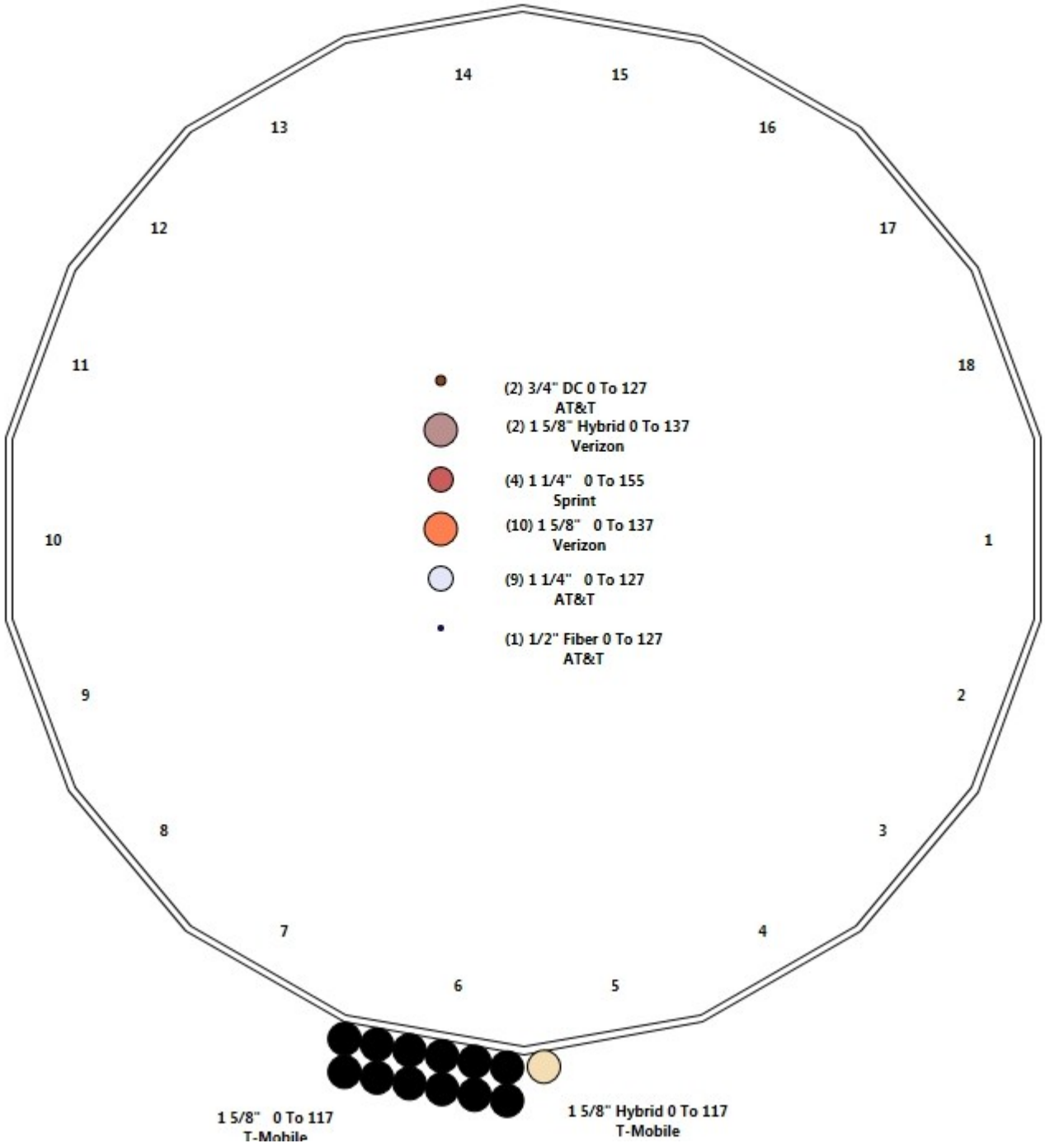
Load Case	Moment	Shear	Axial
1.2D + 1.6W 93 mph Wind	2485.2	22.1	43.0
0.9D + 1.6W 93 mph Wind	2459.6	22.1	32.3
1.2D + 1.0Di + 1.0Wi 50 mph Wind	769.1	6.9	70.3
1.2D + 1.0E	215.4	1.8	43.1
0.9D + 1.0E	213.0	1.8	32.3
1.0D + 1.0W 60 mph Wind	642.5	5.7	35.9

Structure: CT00248-S-SBA - Coax Line Placement

Type: Monopole
Site Name: North Bethel
Height: 155.00 (ft)

11/8/2016

Tower Engineering Solutions



Shaft Properties

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	49.750	0.3750	65		0.00	10,014
2	18	49.750	0.3750	65	Slip	69.00	7,759
3	18	33.750	0.3125	65	Slip	51.00	3,305
4	18	35.000	0.1875	65	Slip	39.00	1,493
					Total Shaft Weight:		**22,571**

	Bottom						Top						
Sec. No.	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Taper**
1	56.83	0.00	67.19	27057.20	25.31	151.55	43.32	49.75	51.12	11913.1	18.96	115.5	0.271484
2	45.63	44.00	53.87	13941.55	20.05	121.69	32.13	93.75	37.79	4814.44	13.70	85.68	0.271484
3	33.91	89.50	33.32	4751.23	17.72	108.50	24.74	123.25	24.23	1827.58	12.55	79.18	0.271484
4	26.00	120.0	15.36	1293.40	23.04	138.68	16.50	155.00	9.71	326.37	14.11	88.00	0.271484

Load Summary

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 6

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	**Elev (ft)**	**Description**	**Qty**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Hor. Ecc. (ft)**	**Vert Ecc (ft)**
1	155.00	APXVSPP18-C-A20	3	57.00	8.02	0.82	230.42	10.823	0.82	0.00	2.40
2	155.00	ACU-A20-N	4	1.00	0.14	1.00	5.31	0.438	1.00	0.00	2.40
3	155.00	APXVTM14-C-120	3	56.00	6.34	0.76	217.04	7.457	0.77	0.00	2.40
4	155.00	TD-RRH8x20-25	3	70.00	4.05	0.68	180.90	4.866	0.69	0.00	2.40
5	155.00	800 MHz RRH	3	53.00	2.49	0.92	127.20	3.638	0.92	0.00	2.40
6	155.00	ALU 800MHz External Notch Filt	3	8.80	0.78	0.69	26.50	1.429	0.72	0.00	2.40
7	155.00	1900MHz RRH	3	44.00	3.80	1.00	153.52	5.195	1.00	0.00	2.40
8	155.00	Low Profile Platform	1	1500.00	22.00	1.00	2813.21	39.720	1.00	0.00	0.00
9	155.00	Collar Mount	1	250.00	5.00	0.75	862.83	13.755	0.75	0.00	0.00
10	155.00	6' Lightning rod	1	6.50	0.38	1.00	42.92	1.471	1.00	0.00	0.00
11	137.00	SBNHH-1D65B	6	50.71	8.08	0.82	250.15	9.360	0.82	0.00	0.00
12	137.00	LPA-80080/4CF ___	2	12.00	2.61	0.93	217.55	7.254	0.93	0.00	0.00
13	137.00	LPA-80080-6CF-EDIN	2	21.00	4.33	0.93	187.91	5.693	0.93	0.00	0.00
14	137.00	LPA-80063/6CF	2	27.00	9.60	0.94	312.08	10.940	0.94	0.00	0.00
15	137.00	4X45 RRH AWS	3	62.00	2.71	0.82	144.69	3.962	0.83	0.00	0.00
16	137.00	RRH2X60-PCS	3	55.00	2.20	0.89	138.59	2.830	0.90	0.00	0.00
17	137.00	RRH2X60-700	3	60.00	3.50	0.73	146.50	4.282	0.74	0.00	0.00
18	137.00	FD9R6004/2C-3L (3.1 lbs)	6	3.10	0.36	0.62	11.05	0.799	0.65	0.00	0.00
19	137.00	DB-T1-6Z-8AB-0Z	2	44.00	4.80	1.00	186.20	5.665	1.00	0.00	0.00
20	137.00	Low Profile Platform	1	1200.00	25.00	1.00	2237.68	45.754	1.00	0.00	0.00
21	127.00	RRU 11	3	55.00	4.42	0.68	143.47	5.895	0.69	0.00	0.00
22	127.00	P65-16-XLH-RR	3	53.00	8.16	0.75	215.33	10.916	0.75	0.00	0.00
23	127.00	RRUS 12	3	60.00	2.70	0.67	125.91	3.349	0.69	0.00	0.00
24	127.00	860 10025	6	1.20	0.18	0.70	7.10	0.553	0.72	0.00	0.00
25	127.00	DC6-48-60-18-8F	1	31.80	1.47	1.00	92.60	2.158	1.00	0.00	0.00
26	127.00	7770	3	35.00	5.50	0.75	167.44	6.546	0.75	0.00	0.00
27	127.00	LGP21401	6	14.10	1.29	0.64	38.69	2.112	0.66	0.00	0.00
28	127.00	Low Profile Platform	1	1500.00	22.00	1.00	2787.31	39.370	1.00	0.00	0.00
29	117.00	AIR 21, 1.3M, B2A B4P	3	91.50	6.09	0.83	255.46	7.159	0.83	0.00	0.00
30	117.00	AIR 21, 1.3M, B4A B2P	3	90.40	6.09	0.83	254.36	7.159	0.83	0.00	0.00
31	117.00	T-Arms	3	350.00	8.00	0.75	588.33	14.810	0.75	0.00	0.00
		Totals:	**90**	**8,717.06**			**21,854.25**				

Linear Appurtenances

Bottom Elev. (ft)	**Top Elev. (ft)**	**Description**	**Exposed Width**	**Exposed**
0.00	155.00	(4) 1 1/4" Coax	0.00	Inside
0.00	137.00	(10) 1 5/8" Coax	0.00	Inside
0.00	137.00	(2) 1 5/8" Hybrid	0.00	Inside
0.00	127.00	(9) 1 1/4" Coax	0.00	Inside
0.00	127.00	(1) 1/2" Fiber	0.00	Inside
0.00	127.00	(2) 3/4" DC	0.00	Inside
0.00	117.00	(12) 1 5/8" Coax	4.00	Outside
0.00	117.00	(1) 1 5/8" Hybrid	0.00	Outside

Shaft Section Properties

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.3750	56.830	67.193	27057.2	25.31	151.55	71.6	937.7	0.0
5.00		0.3750	55.473	65.578	25152.0	24.67	147.93	72.4	893.1	1129.5
10.00		0.3750	54.115	63.962	23338.5	24.03	144.31	73.1	849.4	1102.0
15.00		0.3750	52.758	62.346	21614.3	23.40	140.69	73.9	806.9	1074.5
20.00		0.3750	51.400	60.731	19977.1	22.76	137.07	74.6	765.5	1047.0
25.00		0.3750	50.043	59.115	18424.8	22.12	133.45	75.4	725.2	1019.5
30.00		0.3750	48.685	57.499	16955.1	21.48	129.83	76.1	685.9	992.0
35.00		0.3750	47.328	55.884	15565.7	20.84	126.21	76.9	647.8	964.5
40.00		0.3750	45.971	54.268	14254.3	20.21	122.59	77.6	610.7	937.1
44.00	Bot - Section 2	0.3750	44.885	52.976	13259.9	19.69	119.69	78.2	581.9	729.9
45.00		0.3750	44.613	52.653	13018.7	19.57	118.97	78.4	574.8	362.5
49.75	Top - Section 1	0.3750	44.074	52.010	12548.2	19.31	117.53	0.0	0.0	1691.7
50.00		0.3750	44.006	51.930	12489.8	19.28	117.35	78.7	559.0	44.2
55.00		0.3750	42.648	50.314	11360.0	18.64	113.73	79.5	524.6	869.8
60.00		0.3750	41.291	48.698	10300.4	18.00	110.11	80.2	491.3	842.3
65.00		0.3750	39.934	47.083	9308.9	17.37	106.49	81.0	459.1	814.8
70.00		0.3750	38.576	45.467	8383.1	16.73	102.87	81.7	428.0	787.3
75.00		0.3750	37.219	43.852	7520.8	16.09	99.25	82.5	398.0	759.8
80.00		0.3750	35.861	42.236	6719.8	15.45	95.63	82.5	369.1	732.3
85.00		0.3750	34.504	40.620	5977.8	14.81	92.01	82.5	341.2	704.9
89.50	Bot - Section 3	0.3750	33.282	39.166	5358.6	14.24	88.75	82.5	317.1	610.9
90.00		0.3750	33.146	39.005	5292.5	14.18	88.39	82.5	314.5	123.1
93.75	Top - Section 2	0.3125	32.753	32.176	4278.3	17.07	104.81	0.0	0.0	907.0
95.00		0.3125	32.414	31.840	4145.5	16.88	103.72	81.5	251.9	136.1
100.00		0.3125	31.057	30.493	3641.5	16.11	99.38	82.4	230.9	530.3
105.00		0.3125	29.699	29.147	3180.1	15.35	95.04	82.5	210.9	507.4
110.00		0.3125	28.342	27.801	2759.5	14.58	90.69	82.5	191.8	484.4
115.00		0.3125	26.984	26.454	2377.7	13.82	86.35	82.5	173.5	461.5
117.00		0.3125	26.441	25.916	2235.4	13.51	84.61	82.5	166.5	178.2
120.00	Bot - Section 4	0.3125	25.627	25.108	2032.8	13.05	82.01	82.5	156.2	260.4
123.25	Top - Section 3	0.1875	25.120	14.837	1165.3	22.21	133.97	0.0	0.0	439.8
125.00		0.1875	24.645	14.554	1099.9	21.77	131.44	75.8	87.9	87.5
127.00		0.1875	24.102	14.231	1028.3	21.25	128.54	76.4	84.0	98.0
130.00		0.1875	23.287	13.747	926.7	20.49	124.20	77.3	78.4	142.8
135.00		0.1875	21.930	12.939	772.8	19.21	116.96	78.8	69.4	227.0
137.00		0.1875	21.387	12.616	716.3	18.70	114.06	79.4	66.0	87.0
140.00		0.1875	20.572	12.131	636.9	17.94	109.72	80.3	61.0	126.3
145.00		0.1875	19.215	11.323	517.9	16.66	102.48	81.8	53.1	199.5
150.00		0.1875	17.857	10.515	414.8	15.38	95.24	82.5	45.8	185.8
155.00		0.1875	16.500	9.708	326.4	14.11	88.00	82.5	39.0	172.0
										22570.6

Wind Loading - Shaft

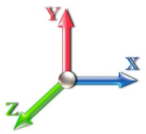
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	14.724	16.20	374.18	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	14.724	16.20	365.24	0.650	0.000	5.00	23.757	15.44	400.2	0.0	1355.4
10.00		1.00	0.70	14.724	16.20	356.30	0.650	0.000	5.00	23.183	15.07	390.5	0.0	1322.4
15.00		1.00	0.70	14.724	16.20	347.36	0.650	0.000	5.00	22.609	14.70	380.8	0.0	1289.4
20.00		1.00	0.70	14.724	16.20	338.43	0.650	0.000	5.00	22.034	14.32	371.2	0.0	1256.4
25.00		1.00	0.70	14.724	16.20	329.49	0.650	0.000	5.00	21.460	13.95	361.5	0.0	1223.4
30.00		1.00	0.70	14.736	16.21	320.69	0.650	0.000	5.00	20.886	13.58	352.1	0.0	1190.4
35.00		1.00	0.73	15.400	16.94	318.69	0.650	0.000	5.00	20.311	13.20	357.8	0.0	1157.5
40.00		1.00	0.76	15.999	17.60	315.51	0.650	0.000	5.00	19.737	12.83	361.2	0.0	1124.5
44.00	Bot - Section 2	1.00	0.78	16.441	18.08	312.28	0.650	0.000	4.00	15.376	9.99	289.2	0.0	875.8
45.00		1.00	0.79	16.546	18.20	311.39	0.650	0.000	1.00	3.850	2.50	72.9	0.0	435.0
49.75	Top - Section 1	1.00	0.81	17.028	18.73	306.75	0.650	0.000	4.75	17.974	11.68	350.1	0.0	2030.0
50.00		1.00	0.81	17.052	18.76	311.81	0.650	0.000	0.25	0.932	0.61	18.2	0.0	53.1
55.00		1.00	0.83	17.523	19.28	306.33	0.650	0.000	5.00	18.331	11.92	367.5	0.0	1043.7
60.00		1.00	0.85	17.964	19.76	300.29	0.650	0.000	5.00	17.757	11.54	364.9	0.0	1010.8
65.00		1.00	0.87	18.380	20.22	293.76	0.650	0.000	5.00	17.183	11.17	361.3	0.0	977.8
70.00		1.00	0.89	18.773	20.65	286.79	0.650	0.000	5.00	16.609	10.80	356.7	0.0	944.8
75.00		1.00	0.91	19.147	21.06	279.44	0.656 *	0.000	5.00	16.034	10.51	354.3	0.0	911.8
80.00		1.00	0.93	19.503	21.45	271.74	0.663 *	0.000	5.00	15.460	10.25	351.9	0.0	878.8
85.00		1.00	0.94	19.844	21.83	263.73	0.671 *	0.000	5.00	14.886	9.99	348.9	0.0	845.8
89.50	Bot - Section 3	1.00	0.96	20.138	22.15	256.28	0.679 *	0.000	4.50	12.906	8.77	310.8	0.0	733.0
90.00		1.00	0.96	20.170	22.19	255.43	0.684 *	0.000	0.50	1.432	0.98	34.8	0.0	147.7
93.75	Top - Section 2	1.00	0.97	20.407	22.45	249.04	0.688 *	0.000	3.75	10.555	7.26	260.8	0.0	1088.4
95.00		1.00	0.97	20.484	22.53	251.73	0.688 *	0.000	1.25	3.446	2.37	85.5	0.0	163.4
100.00		1.00	0.99	20.787	22.87	242.96	0.695 *	0.000	5.00	13.427	9.33	341.2	0.0	636.3
105.00		1.00	1.00	21.079	23.19	233.97	0.705 *	0.000	5.00	12.853	9.07	336.3	0.0	608.8
110.00		1.00	1.02	21.361	23.50	224.76	0.717 *	0.000	5.00	12.278	8.80	331.0	0.0	581.3
115.00		1.00	1.03	21.634	23.80	215.36	0.730 *	0.000	5.00	11.704	8.54	325.3	0.0	553.9
117.00	Appurtenance(s)	1.00	1.03	21.741	23.91	211.55	0.740 *	0.000	2.00	4.521	3.34	128.0	0.0	213.8
120.00	Bot - Section 4	1.00	1.04	21.898	24.09	205.77	0.650	0.000	3.00	6.609	4.30	165.6	0.0	312.5
123.25	Top - Section 3	1.00	1.05	22.066	24.27	199.45	0.650	0.000	3.25	7.030	4.57	177.5	0.0	527.8
125.00		1.00	1.05	22.155	24.37	199.04	0.650	0.000	1.75	3.685	2.39	93.4	0.0	105.0
127.00	Appurtenance(s)	1.00	1.06	22.256	24.48	195.10	0.650	0.000	2.00	4.125	2.68	105.0	0.0	117.5
130.00		1.00	1.07	22.405	24.65	189.14	0.650	0.000	3.00	6.015	3.91	154.2	0.0	171.4
135.00		1.00	1.08	22.648	24.91	179.07	0.650	0.000	5.00	9.565	6.22	247.8	0.0	272.4
137.00	Appurtenance(s)	1.00	1.08	22.743	25.02	175.01	0.650	0.000	2.00	3.665	2.38	95.4	0.0	104.3
140.00		1.00	1.09	22.884	25.17	168.86	0.650	0.000	3.00	5.326	3.46	139.4	0.0	151.6
145.00		1.00	1.10	23.115	25.43	158.51	0.650	0.000	5.00	8.417	5.47	222.6	0.0	239.4
150.00		1.00	1.11	23.340	25.67	148.03	0.650	0.000	5.00	7.843	5.10	209.4	0.0	222.9
155.00	Appurtenance(s)	1.00	1.12	23.560	25.92	137.42	0.650	0.000	5.00	7.268	4.72	195.9	0.0	206.4
								Totals:	**155.00**			**10,170.9**		**27,084.8**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

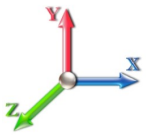
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	800 MHz RRH	3	23.663	26.030	0.92	1.00	6.87	190.80	0.000	2.400	286.22	0.00	686.92
2	155.00	APXVSPP18-C-A20	3	23.663	26.030	0.82	1.00	19.73	205.20	0.000	2.400	821.67	0.00	1972.01
3	155.00	ACU-A20-N	4	23.663	26.030	1.00	1.00	0.56	4.80	0.000	2.400	23.32	0.00	55.97
4	155.00	APXVTM14-C-120	3	23.663	26.030	0.76	1.00	14.46	201.60	0.000	2.400	602.02	0.00	1444.85
5	155.00	TD-RRH8x20-25	3	23.663	26.030	0.68	1.00	8.26	252.00	0.000	2.400	344.09	0.00	825.82
6	155.00	6' Lightning rod	1	23.560	25.916	1.00	1.00	0.38	7.80	0.000	0.000	15.76	0.00	0.00
7	155.00	ALU 800MHz External	3	23.663	26.030	0.69	1.00	1.61	31.68	0.000	2.400	67.24	0.00	161.39
8	155.00	1900MHz RRH	3	23.663	26.030	1.00	1.00	11.40	158.40	0.000	2.400	474.78	0.00	1139.47
9	155.00	Low Profile Platform	1	23.560	25.916	1.00	1.00	22.00	1800.00	0.000	0.000	912.23	0.00	0.00
10	155.00	Collar Mount	1	23.560	25.916	0.56	0.75	2.81	300.00	0.000	0.000	116.62	0.00	0.00
11	137.00	Low Profile Platform	1	22.743	25.017	1.00	1.00	25.00	1440.00	0.000	0.000	1000.70	0.00	0.00
12	137.00	DB-T1-6Z-8AB-0Z	2	22.743	25.017	0.80	0.80	7.68	105.60	0.000	0.000	307.41	0.00	0.00
13	137.00	FD9R6004/2C-3L (3.1 lbs)	6	22.743	25.017	0.50	0.80	1.07	22.32	0.000	0.000	42.88	0.00	0.00
14	137.00	RRH2X60-700	3	22.743	25.017	0.58	0.80	6.13	216.00	0.000	0.000	245.45	0.00	0.00
15	137.00	RRH2X60-PCS	3	22.743	25.017	0.71	0.80	4.70	198.00	0.000	0.000	188.10	0.00	0.00
16	137.00	4X45 RRH AWS	3	22.743	25.017	0.66	0.80	5.33	223.20	0.000	0.000	213.48	0.00	0.00
17	137.00	LPA-80080-6CF-EDIN	2	22.743	25.017	0.74	0.80	6.44	50.40	0.000	0.000	257.90	0.00	0.00
18	137.00	LPA-80080/4CF ___	2	22.743	25.017	0.74	0.80	3.88	28.80	0.000	0.000	155.46	0.00	0.00
19	137.00	SBNHH-1D65B	6	22.743	25.017	0.66	0.80	31.80	365.11	0.000	0.000	1273.01	0.00	0.00
20	137.00	LPA-80063/6CF	2	22.743	25.017	0.75	0.80	14.44	64.80	0.000	0.000	577.94	0.00	0.00
21	127.00	860 10025	6	22.256	24.482	0.56	0.80	0.60	8.64	0.000	0.000	23.69	0.00	0.00
22	127.00	RRU 11	3	22.256	24.482	0.54	0.80	7.21	198.00	0.000	0.000	282.55	0.00	0.00
23	127.00	P65-16-XLH-RR	3	22.256	24.482	0.60	0.80	14.69	190.80	0.000	0.000	575.34	0.00	0.00
24	127.00	RRUS 12	3	22.256	24.482	0.54	0.80	4.34	216.00	0.000	0.000	170.06	0.00	0.00
25	127.00	DC6-48-60-18-8F	1	22.256	24.482	0.80	0.80	1.18	38.16	0.000	0.000	46.06	0.00	0.00
26	127.00	7770	3	22.256	24.482	0.60	0.80	9.90	126.00	0.000	0.000	387.79	0.00	0.00
27	127.00	LGP21401	6	22.256	24.482	0.51	0.80	3.96	101.52	0.000	0.000	155.23	0.00	0.00
28	127.00	Low Profile Platform	1	22.256	24.482	1.00	1.00	22.00	1800.00	0.000	0.000	861.75	0.00	0.00
29	117.00	T-Arms	3	21.741	23.915	0.56	0.75	13.50	1260.00	0.000	0.000	516.55	0.00	0.00
30	117.00	AIR 21, 1.3M, B4A B2P	3	21.741	23.915	0.66	0.80	12.13	325.44	0.000	0.000	464.18	0.00	0.00
31	117.00	AIR 21, 1.3M, B2A B4P	3	21.741	23.915	0.66	0.80	12.13	329.40	0.000	0.000	464.18	0.00	0.00
							Totals:		**10,460.47**			**11,873.68**		

Total Applied Force Summary

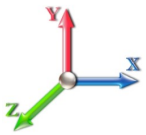
Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		400.18	1569.09	0.00	0.00
10.00		390.50	1536.10	0.00	0.00
15.00		380.83	1503.12	0.00	0.00
20.00		371.15	1470.13	0.00	0.00
25.00		361.48	1437.15	0.00	0.00
30.00		352.10	1404.16	0.00	0.00
35.00		357.84	1371.18	0.00	0.00
40.00		361.24	1338.19	0.00	0.00
44.00		289.20	1046.80	0.00	0.00
45.00		72.88	477.71	0.00	0.00
49.75		350.13	2233.06	0.00	0.00
50.00		18.17	63.74	0.00	0.00
55.00		367.48	1257.46	0.00	0.00
60.00		364.92	1224.47	0.00	0.00
65.00		361.29	1191.49	0.00	0.00
70.00		356.69	1158.50	0.00	0.00
75.00		354.27	1125.52	0.00	0.00
80.00		351.89	1092.53	0.00	0.00
85.00		348.91	1059.55	0.00	0.00
89.50		310.77	925.39	0.00	0.00
90.00		34.76	169.06	0.00	0.00
93.75		260.82	1248.70	0.00	0.00
95.00		85.54	216.80	0.00	0.00
100.00		341.22	850.03	0.00	0.00
105.00		336.31	822.55	0.00	0.00
110.00		330.99	795.06	0.00	0.00
115.00		325.27	767.57	0.00	0.00
117.00	(9) attachments	1572.87	2214.17	0.00	0.00
120.00		165.57	391.86	0.00	0.00
123.25		177.45	613.74	0.00	0.00
125.00		93.39	151.30	0.00	0.00
127.00	(26) attachments	2607.50	2849.56	0.00	0.00
130.00		154.17	226.23	0.00	0.00
135.00		247.83	363.85	0.00	0.00
137.00	(30) attachments	4357.70	2855.16	0.00	0.00
140.00		139.43	161.08	0.00	0.00
145.00		222.57	255.27	0.00	0.00
150.00		209.40	238.78	0.00	0.00
155.00	(25) attachments	3859.85	3374.56	0.00	6286.43
	Totals:	**22,044.56**	**43,050.66**	**0.00**	**6,286.43**

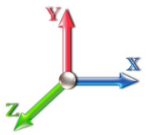
Linear Appurtenance Segment Forces (Factored)

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.069	0.000	14.724	0.00	74.88
5.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	14.724	0.00	6.60
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.071	0.000	14.724	0.00	74.88
10.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.071	0.000	14.724	0.00	6.60
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.073	0.000	14.724	0.00	74.88
15.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.073	0.000	14.724	0.00	6.60
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.075	0.000	14.724	0.00	74.88
20.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.075	0.000	14.724	0.00	6.60
25.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.077	0.000	14.724	0.00	74.88
25.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.077	0.000	14.724	0.00	6.60
30.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.079	0.000	14.736	0.00	74.88
30.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.079	0.000	14.736	0.00	6.60
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.081	0.000	15.400	0.00	74.88
35.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.081	0.000	15.400	0.00	6.60
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.084	0.000	15.999	0.00	74.88
40.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.084	0.000	15.999	0.00	6.60
44.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.086	0.000	16.441	0.00	59.90
44.00	1 5/8" Hybrid	Yes	4.00	0.000	0.00	0.00	0.00	0.086	0.000	16.441	0.00	5.28
45.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.087	0.000	16.546	0.00	14.98
45.00	1 5/8" Hybrid	Yes	1.00	0.000	0.00	0.00	0.00	0.087	0.000	16.546	0.00	1.32
49.75	1 5/8" Coax	Yes	4.75	0.000	3.96	1.57	0.00	0.089	0.000	17.028	0.00	71.14
49.75	1 5/8" Hybrid	Yes	4.75	0.000	0.00	0.00	0.00	0.089	0.000	17.028	0.00	6.27
50.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.089	0.000	17.052	0.00	3.74
50.00	1 5/8" Hybrid	Yes	0.25	0.000	0.00	0.00	0.00	0.089	0.000	17.052	0.00	0.33
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.090	0.000	17.523	0.00	74.88
55.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.090	0.000	17.523	0.00	6.60
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.093	0.000	17.964	0.00	74.88
60.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.093	0.000	17.964	0.00	6.60
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.096	0.000	18.380	0.00	74.88
65.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	18.380	0.00	6.60
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.099	0.000	18.773	0.00	74.88
70.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.099	0.000	18.773	0.00	6.60
75.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.103	1.009	19.147	0.00	74.88
75.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.103	1.009	19.147	0.00	6.60
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.107	1.020	19.503	0.00	74.88
80.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.020	19.503	0.00	6.60
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.111	1.033	19.844	0.00	74.88
85.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.111	1.033	19.844	0.00	6.60
89.50	1 5/8" Coax	Yes	4.50	0.000	3.96	1.48	0.00	0.115	1.045	20.138	0.00	67.39
89.50	1 5/8" Hybrid	Yes	4.50	0.000	0.00	0.00	0.00	0.115	1.045	20.138	0.00	5.94
90.00	1 5/8" Coax	Yes	0.50	0.000	3.96	0.17	0.00	0.117	1.052	20.170	0.00	7.49
90.00	1 5/8" Hybrid	Yes	0.50	0.000	0.00	0.00	0.00	0.117	1.052	20.170	0.00	0.66
93.75	1 5/8" Coax	Yes	3.75	0.000	3.96	1.24	0.00	0.119	1.058	20.407	0.00	56.16
93.75	1 5/8" Hybrid	Yes	3.75	0.000	0.00	0.00	0.00	0.119	1.058	20.407	0.00	4.95
95.00	1 5/8" Coax	Yes	1.25	0.000	3.96	0.41	0.00	0.120	1.059	20.484	0.00	18.72
95.00	1 5/8" Hybrid	Yes	1.25	0.000	0.00	0.00	0.00	0.120	1.059	20.484	0.00	1.65
100.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.123	1.069	20.787	0.00	74.88

Linear Appurtenance Segment Forces (Factored)

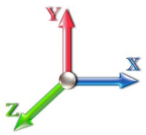
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
100.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.069	20.787	0.00	6.60
105.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.128	1.085	21.079	0.00	74.88
105.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.128	1.085	21.079	0.00	6.60
110.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.134	1.103	21.361	0.00	74.88
110.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.134	1.103	21.361	0.00	6.60
115.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.141	1.123	21.634	0.00	74.88
115.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.141	1.123	21.634	0.00	6.60
117.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.146	1.138	21.741	0.00	29.95
117.00	1 5/8" Hybrid	Yes	2.00	0.000	0.00	0.00	0.00	0.146	1.138	21.741	0.00	2.64
										Totals:	**0.0**	**1,906.6**

Calculated Forces

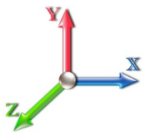
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-43.03	-22.09	0.00	-2485.2	0.00	2485.24	4331.76	2165.88	10060.7	5037.85	0.00	0.000	0.000	0.503
5.00	-41.41	-21.78	0.00	-2374.7	0.00	2374.77	4271.91	2135.96	9681.61	4848.00	0.07	-0.128	0.000	0.500
10.00	-39.82	-21.48	0.00	-2265.8	0.00	2265.85	4209.88	2104.94	9304.37	4659.10	0.27	-0.259	0.000	0.496
15.00	-38.27	-21.18	0.00	-2158.4	0.00	2158.45	4145.67	2072.83	8929.41	4471.34	0.62	-0.394	0.000	0.492
20.00	-36.75	-20.89	0.00	-2052.5	0.00	2052.53	4079.27	2039.64	8557.10	4284.91	1.10	-0.532	0.000	0.488
25.00	-35.27	-20.60	0.00	-1948.0	0.00	1948.08	4010.69	2005.34	8187.79	4099.98	1.74	-0.675	0.000	0.484
30.00	-33.82	-20.32	0.00	-1845.0	0.00	1845.06	3939.93	1969.96	7821.85	3916.74	2.52	-0.821	0.000	0.480
35.00	-32.40	-20.03	0.00	-1743.4	0.00	1743.46	3866.98	1933.49	7459.66	3735.38	3.46	-0.972	0.000	0.475
40.00	-31.02	-19.72	0.00	-1643.3	0.00	1643.33	3791.85	1895.92	7101.59	3556.07	4.57	-1.127	0.000	0.470
44.00	-29.95	-19.45	0.00	-1564.4	0.00	1564.46	3730.17	1865.09	6818.34	3414.24	5.56	-1.255	0.000	0.466
45.00	-29.44	-19.41	0.00	-1545.0	0.00	1545.01	3714.54	1857.27	6747.99	3379.01	5.83	-1.288	0.000	0.465
49.75	-27.19	-19.05	0.00	-1452.7	0.00	1452.79	3683.20	1841.60	6608.77	3309.30	7.19	-1.444	0.000	0.446
50.00	-27.10	-19.07	0.00	-1448.0	0.00	1448.03	3679.23	1839.62	6591.31	3300.56	7.27	-1.452	0.000	0.446
55.00	-25.80	-18.74	0.00	-1352.6	0.00	1352.67	3598.76	1799.38	6244.86	3127.07	8.87	-1.612	0.000	0.440
60.00	-24.53	-18.41	0.00	-1258.9	0.00	1258.96	3516.10	1758.05	5903.79	2956.28	10.65	-1.775	0.000	0.433
65.00	-23.30	-18.08	0.00	-1166.9	0.00	1166.90	3431.27	1715.63	5568.46	2788.37	12.60	-1.943	0.000	0.425
70.00	-22.10	-17.75	0.00	-1076.5	0.00	1076.50	3344.24	1672.12	5239.26	2623.52	14.73	-2.114	0.000	0.417
75.00	-20.94	-17.42	0.00	-987.74	0.00	987.74	3255.04	1627.52	4916.54	2461.92	17.03	-2.289	0.000	0.408
80.00	-19.81	-17.08	0.00	-900.65	0.00	900.65	3137.93	1568.96	4563.27	2285.03	19.53	-2.468	0.000	0.401
85.00	-18.71	-16.75	0.00	-815.23	0.00	815.23	3017.89	1508.95	4219.09	2112.68	22.21	-2.649	0.000	0.392
89.50	-17.78	-16.42	0.00	-739.88	0.00	739.88	2909.87	1454.93	3920.86	1963.34	24.79	-2.816	0.000	0.383
90.00	-17.59	-16.40	0.00	-731.67	0.00	731.67	2897.86	1448.93	3888.39	1947.09	25.08	-2.836	0.000	0.382
93.75	-16.33	-16.10	0.00	-670.17	0.00	670.17	2354.99	1177.49	3133.69	1569.17	27.36	-2.977	0.000	0.434
95.00	-16.08	-16.04	0.00	-650.04	0.00	650.04	2336.81	1168.40	3076.66	1540.62	28.15	-3.026	0.000	0.429
100.00	-15.19	-15.71	0.00	-569.82	0.00	569.82	2262.72	1131.36	2851.92	1428.08	31.43	-3.235	0.000	0.406
105.00	-14.33	-15.38	0.00	-491.26	0.00	491.26	2165.47	1082.73	2607.63	1305.76	34.93	-3.442	0.000	0.383
110.00	-13.51	-15.05	0.00	-414.36	0.00	414.36	2065.44	1032.72	2371.09	1187.31	38.64	-3.645	0.000	0.356
115.00	-12.73	-14.70	0.00	-339.13	0.00	339.13	1965.41	982.71	2145.79	1074.49	42.56	-3.839	0.000	0.322
117.00	-10.61	-13.00	0.00	-309.72	0.00	309.72	1925.40	962.70	2058.82	1030.94	44.19	-3.917	0.000	0.306
120.00	-10.20	-12.83	0.00	-270.72	0.00	270.72	1865.39	932.69	1931.73	967.30	46.68	-4.027	0.000	0.286
123.25	-9.58	-12.62	0.00	-229.03	0.00	229.03	1005.19	502.59	1030.12	515.83	49.46	-4.141	0.000	0.454
125.00	-9.42	-12.53	0.00	-206.94	0.00	206.94	992.91	496.46	998.01	499.75	50.99	-4.200	0.000	0.424
127.00	-6.75	-9.73	0.00	-181.87	0.00	181.87	978.56	489.28	961.59	481.51	52.77	-4.301	0.000	0.385
130.00	-6.51	-9.58	0.00	-152.67	0.00	152.67	956.38	478.19	907.53	454.44	55.52	-4.440	0.000	0.343
135.00	-6.15	-9.32	0.00	-104.76	0.00	104.76	917.66	458.83	819.21	410.21	60.28	-4.637	0.000	0.262
137.00	-3.65	-4.75	0.00	-86.12	0.00	86.12	901.57	450.78	784.57	392.87	62.23	-4.708	0.000	0.223
140.00	-3.49	-4.60	0.00	-71.87	0.00	71.87	876.76	438.38	733.42	367.25	65.22	-4.802	0.000	0.200
145.00	-3.25	-4.37	0.00	-48.84	0.00	48.84	833.68	416.84	650.52	325.74	70.32	-4.937	0.000	0.154
150.00	-3.02	-4.14	0.00	-27.00	0.00	27.00	781.24	390.62	565.69	283.26	75.54	-5.041	0.000	0.099
155.00	0.00	-3.86	0.00	-6.29	0.00	6.29	721.23	360.61	481.69	241.20	80.85	-5.098	0.000	0.026

Wind Loading - Shaft

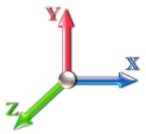
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	14.724	16.20	374.18	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	14.724	16.20	365.24	0.650	0.000	5.00	23.757	15.44	400.2	0.0	1016.5
10.00		1.00	0.70	14.724	16.20	356.30	0.650	0.000	5.00	23.183	15.07	390.5	0.0	991.8
15.00		1.00	0.70	14.724	16.20	347.36	0.650	0.000	5.00	22.609	14.70	380.8	0.0	967.0
20.00		1.00	0.70	14.724	16.20	338.43	0.650	0.000	5.00	22.034	14.32	371.2	0.0	942.3
25.00		1.00	0.70	14.724	16.20	329.49	0.650	0.000	5.00	21.460	13.95	361.5	0.0	917.6
30.00		1.00	0.70	14.736	16.21	320.69	0.650	0.000	5.00	20.886	13.58	352.1	0.0	892.8
35.00		1.00	0.73	15.400	16.94	318.69	0.650	0.000	5.00	20.311	13.20	357.8	0.0	868.1
40.00		1.00	0.76	15.999	17.60	315.51	0.650	0.000	5.00	19.737	12.83	361.2	0.0	843.4
44.00	Bot - Section 2	1.00	0.78	16.441	18.08	312.28	0.650	0.000	4.00	15.376	9.99	289.2	0.0	656.9
45.00		1.00	0.79	16.546	18.20	311.39	0.650	0.000	1.00	3.850	2.50	72.9	0.0	326.2
49.75	Top - Section 1	1.00	0.81	17.028	18.73	306.75	0.650	0.000	4.75	17.974	11.68	350.1	0.0	1522.5
50.00		1.00	0.81	17.052	18.76	311.81	0.650	0.000	0.25	0.932	0.61	18.2	0.0	39.8
55.00		1.00	0.83	17.523	19.28	306.33	0.650	0.000	5.00	18.331	11.92	367.5	0.0	782.8
60.00		1.00	0.85	17.964	19.76	300.29	0.650	0.000	5.00	17.757	11.54	364.9	0.0	758.1
65.00		1.00	0.87	18.380	20.22	293.76	0.650	0.000	5.00	17.183	11.17	361.3	0.0	733.3
70.00		1.00	0.89	18.773	20.65	286.79	0.650	0.000	5.00	16.609	10.80	356.7	0.0	708.6
75.00		1.00	0.91	19.147	21.06	279.44	0.656 *	0.000	5.00	16.034	10.51	354.3	0.0	683.8
80.00		1.00	0.93	19.503	21.45	271.74	0.663 *	0.000	5.00	15.460	10.25	351.9	0.0	659.1
85.00		1.00	0.94	19.844	21.83	263.73	0.671 *	0.000	5.00	14.886	9.99	348.9	0.0	634.4
89.50	Bot - Section 3	1.00	0.96	20.138	22.15	256.28	0.679 *	0.000	4.50	12.906	8.77	310.8	0.0	549.8
90.00		1.00	0.96	20.170	22.19	255.43	0.684 *	0.000	0.50	1.432	0.98	34.8	0.0	110.8
93.75	Top - Section 2	1.00	0.97	20.407	22.45	249.04	0.688 *	0.000	3.75	10.555	7.26	260.8	0.0	816.3
95.00		1.00	0.97	20.484	22.53	251.73	0.688 *	0.000	1.25	3.446	2.37	85.5	0.0	122.5
100.00		1.00	0.99	20.787	22.87	242.96	0.695 *	0.000	5.00	13.427	9.33	341.2	0.0	477.2
105.00		1.00	1.00	21.079	23.19	233.97	0.705 *	0.000	5.00	12.853	9.07	336.3	0.0	456.6
110.00		1.00	1.02	21.361	23.50	224.76	0.717 *	0.000	5.00	12.278	8.80	331.0	0.0	436.0
115.00		1.00	1.03	21.634	23.80	215.36	0.730 *	0.000	5.00	11.704	8.54	325.3	0.0	415.4
117.00	Appurtenance(s)	1.00	1.03	21.741	23.91	211.55	0.740 *	0.000	2.00	4.521	3.34	128.0	0.0	160.4
120.00	Bot - Section 4	1.00	1.04	21.898	24.09	205.77	0.650	0.000	3.00	6.609	4.30	165.6	0.0	234.4
123.25	Top - Section 3	1.00	1.05	22.066	24.27	199.45	0.650	0.000	3.25	7.030	4.57	177.5	0.0	395.8
125.00		1.00	1.05	22.155	24.37	199.04	0.650	0.000	1.75	3.685	2.39	93.4	0.0	78.8
127.00	Appurtenance(s)	1.00	1.06	22.256	24.48	195.10	0.650	0.000	2.00	4.125	2.68	105.0	0.0	88.2
130.00		1.00	1.07	22.405	24.65	189.14	0.650	0.000	3.00	6.015	3.91	154.2	0.0	128.5
135.00		1.00	1.08	22.648	24.91	179.07	0.650	0.000	5.00	9.565	6.22	247.8	0.0	204.3
137.00	Appurtenance(s)	1.00	1.08	22.743	25.02	175.01	0.650	0.000	2.00	3.665	2.38	95.4	0.0	78.3
140.00		1.00	1.09	22.884	25.17	168.86	0.650	0.000	3.00	5.326	3.46	139.4	0.0	113.7
145.00		1.00	1.10	23.115	25.43	158.51	0.650	0.000	5.00	8.417	5.47	222.6	0.0	179.6
150.00		1.00	1.11	23.340	25.67	148.03	0.650	0.000	5.00	7.843	5.10	209.4	0.0	167.2
155.00	Appurtenance(s)	1.00	1.12	23.560	25.92	137.42	0.650	0.000	5.00	7.268	4.72	195.9	0.0	154.8
								Totals:	**155.00**			**10,170.9**		**20,313.6**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

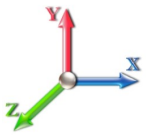
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	800 MHz RRH	3	23.663	26.030	0.92	1.00	6.87	143.10	0.000	2.400	286.22	0.00	686.92
2	155.00	APXVSPP18-C-A20	3	23.663	26.030	0.82	1.00	19.73	153.90	0.000	2.400	821.67	0.00	1972.01
3	155.00	ACU-A20-N	4	23.663	26.030	1.00	1.00	0.56	3.60	0.000	2.400	23.32	0.00	55.97
4	155.00	APXVTM14-C-120	3	23.663	26.030	0.76	1.00	14.46	151.20	0.000	2.400	602.02	0.00	1444.85
5	155.00	TD-RRH8x20-25	3	23.663	26.030	0.68	1.00	8.26	189.00	0.000	2.400	344.09	0.00	825.82
6	155.00	6' Lightning rod	1	23.560	25.916	1.00	1.00	0.38	5.85	0.000	0.000	15.76	0.00	0.00
7	155.00	ALU 800MHz External	3	23.663	26.030	0.69	1.00	1.61	23.76	0.000	2.400	67.24	0.00	161.39
8	155.00	1900MHz RRH	3	23.663	26.030	1.00	1.00	11.40	118.80	0.000	2.400	474.78	0.00	1139.47
9	155.00	Low Profile Platform	1	23.560	25.916	1.00	1.00	22.00	1350.00	0.000	0.000	912.23	0.00	0.00
10	155.00	Collar Mount	1	23.560	25.916	0.56	0.75	2.81	225.00	0.000	0.000	116.62	0.00	0.00
11	137.00	Low Profile Platform	1	22.743	25.017	1.00	1.00	25.00	1080.00	0.000	0.000	1000.70	0.00	0.00
12	137.00	DB-T1-6Z-8AB-0Z	2	22.743	25.017	0.80	0.80	7.68	79.20	0.000	0.000	307.41	0.00	0.00
13	137.00	FD9R6004/2C-3L (3.1 lbs)	6	22.743	25.017	0.50	0.80	1.07	16.74	0.000	0.000	42.88	0.00	0.00
14	137.00	RRH2X60-700	3	22.743	25.017	0.58	0.80	6.13	162.00	0.000	0.000	245.45	0.00	0.00
15	137.00	RRH2X60-PCS	3	22.743	25.017	0.71	0.80	4.70	148.50	0.000	0.000	188.10	0.00	0.00
16	137.00	4X45 RRH AWS	3	22.743	25.017	0.66	0.80	5.33	167.40	0.000	0.000	213.48	0.00	0.00
17	137.00	LPA-80080-6CF-EDIN	2	22.743	25.017	0.74	0.80	6.44	37.80	0.000	0.000	257.90	0.00	0.00
18	137.00	LPA-80080/4CF ___	2	22.743	25.017	0.74	0.80	3.88	21.60	0.000	0.000	155.46	0.00	0.00
19	137.00	SBNHH-1D65B	6	22.743	25.017	0.66	0.80	31.80	273.83	0.000	0.000	1273.01	0.00	0.00
20	137.00	LPA-80063/6CF	2	22.743	25.017	0.75	0.80	14.44	48.60	0.000	0.000	577.94	0.00	0.00
21	127.00	860 10025	6	22.256	24.482	0.56	0.80	0.60	6.48	0.000	0.000	23.69	0.00	0.00
22	127.00	RRU 11	3	22.256	24.482	0.54	0.80	7.21	148.50	0.000	0.000	282.55	0.00	0.00
23	127.00	P65-16-XLH-RR	3	22.256	24.482	0.60	0.80	14.69	143.10	0.000	0.000	575.34	0.00	0.00
24	127.00	RRUS 12	3	22.256	24.482	0.54	0.80	4.34	162.00	0.000	0.000	170.06	0.00	0.00
25	127.00	DC6-48-60-18-8F	1	22.256	24.482	0.80	0.80	1.18	28.62	0.000	0.000	46.06	0.00	0.00
26	127.00	7770	3	22.256	24.482	0.60	0.80	9.90	94.50	0.000	0.000	387.79	0.00	0.00
27	127.00	LGP21401	6	22.256	24.482	0.51	0.80	3.96	76.14	0.000	0.000	155.23	0.00	0.00
28	127.00	Low Profile Platform	1	22.256	24.482	1.00	1.00	22.00	1350.00	0.000	0.000	861.75	0.00	0.00
29	117.00	T-Arms	3	21.741	23.915	0.56	0.75	13.50	945.00	0.000	0.000	516.55	0.00	0.00
30	117.00	AIR 21, 1.3M, B4A B2P	3	21.741	23.915	0.66	0.80	12.13	244.08	0.000	0.000	464.18	0.00	0.00
31	117.00	AIR 21, 1.3M, B2A B4P	3	21.741	23.915	0.66	0.80	12.13	247.05	0.000	0.000	464.18	0.00	0.00
							Totals:		**7,845.35**			**11,873.68**		

Total Applied Force Summary

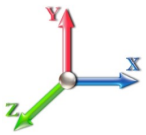
Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 16

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		400.18	1176.82	0.00	0.00
10.00		390.50	1152.08	0.00	0.00
15.00		380.83	1127.34	0.00	0.00
20.00		371.15	1102.60	0.00	0.00
25.00		361.48	1077.86	0.00	0.00
30.00		352.10	1053.12	0.00	0.00
35.00		357.84	1028.38	0.00	0.00
40.00		361.24	1003.64	0.00	0.00
44.00		289.20	785.10	0.00	0.00
45.00		72.88	358.28	0.00	0.00
49.75		350.13	1674.80	0.00	0.00
50.00		18.17	47.80	0.00	0.00
55.00		367.48	943.09	0.00	0.00
60.00		364.92	918.35	0.00	0.00
65.00		361.29	893.62	0.00	0.00
70.00		356.69	868.88	0.00	0.00
75.00		354.27	844.14	0.00	0.00
80.00		351.89	819.40	0.00	0.00
85.00		348.91	794.66	0.00	0.00
89.50		310.77	694.04	0.00	0.00
90.00		34.76	126.80	0.00	0.00
93.75		260.82	936.53	0.00	0.00
95.00		85.54	162.60	0.00	0.00
100.00		341.22	637.53	0.00	0.00
105.00		336.31	616.91	0.00	0.00
110.00		330.99	596.29	0.00	0.00
115.00		325.27	575.68	0.00	0.00
117.00	(9) attachments	1572.87	1660.63	0.00	0.00
120.00		165.57	293.90	0.00	0.00
123.25		177.45	460.30	0.00	0.00
125.00		93.39	113.47	0.00	0.00
127.00	(26) attachments	2607.50	2137.17	0.00	0.00
130.00		154.17	169.67	0.00	0.00
135.00		247.83	272.89	0.00	0.00
137.00	(30) attachments	4357.70	2141.37	0.00	0.00
140.00		139.43	120.81	0.00	0.00
145.00		222.57	191.45	0.00	0.00
150.00		209.40	179.08	0.00	0.00
155.00	(25) attachments	3859.85	2530.92	0.00	6286.43
	Totals:	**22,044.56**	**32,287.99**	**0.00**	**6,286.43**

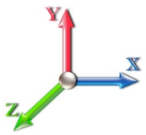
Linear Appurtenance Segment Forces (Factored)

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.069	0.000	14.724	0.00	56.16
5.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	14.724	0.00	4.95
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.071	0.000	14.724	0.00	56.16
10.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.071	0.000	14.724	0.00	4.95
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.073	0.000	14.724	0.00	56.16
15.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.073	0.000	14.724	0.00	4.95
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.075	0.000	14.724	0.00	56.16
20.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.075	0.000	14.724	0.00	4.95
25.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.077	0.000	14.724	0.00	56.16
25.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.077	0.000	14.724	0.00	4.95
30.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.079	0.000	14.736	0.00	56.16
30.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.079	0.000	14.736	0.00	4.95
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.081	0.000	15.400	0.00	56.16
35.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.081	0.000	15.400	0.00	4.95
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.084	0.000	15.999	0.00	56.16
40.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.084	0.000	15.999	0.00	4.95
44.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.086	0.000	16.441	0.00	44.93
44.00	1 5/8" Hybrid	Yes	4.00	0.000	0.00	0.00	0.00	0.086	0.000	16.441	0.00	3.96
45.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.087	0.000	16.546	0.00	11.23
45.00	1 5/8" Hybrid	Yes	1.00	0.000	0.00	0.00	0.00	0.087	0.000	16.546	0.00	0.99
49.75	1 5/8" Coax	Yes	4.75	0.000	3.96	1.57	0.00	0.089	0.000	17.028	0.00	53.35
49.75	1 5/8" Hybrid	Yes	4.75	0.000	0.00	0.00	0.00	0.089	0.000	17.028	0.00	4.70
50.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.089	0.000	17.052	0.00	2.81
50.00	1 5/8" Hybrid	Yes	0.25	0.000	0.00	0.00	0.00	0.089	0.000	17.052	0.00	0.25
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.090	0.000	17.523	0.00	56.16
55.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.090	0.000	17.523	0.00	4.95
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.093	0.000	17.964	0.00	56.16
60.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.093	0.000	17.964	0.00	4.95
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.096	0.000	18.380	0.00	56.16
65.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	18.380	0.00	4.95
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.099	0.000	18.773	0.00	56.16
70.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.099	0.000	18.773	0.00	4.95
75.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.103	1.009	19.147	0.00	56.16
75.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.103	1.009	19.147	0.00	4.95
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.107	1.020	19.503	0.00	56.16
80.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.020	19.503	0.00	4.95
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.111	1.033	19.844	0.00	56.16
85.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.111	1.033	19.844	0.00	4.95
89.50	1 5/8" Coax	Yes	4.50	0.000	3.96	1.48	0.00	0.115	1.045	20.138	0.00	50.54
89.50	1 5/8" Hybrid	Yes	4.50	0.000	0.00	0.00	0.00	0.115	1.045	20.138	0.00	4.46
90.00	1 5/8" Coax	Yes	0.50	0.000	3.96	0.17	0.00	0.117	1.052	20.170	0.00	5.62
90.00	1 5/8" Hybrid	Yes	0.50	0.000	0.00	0.00	0.00	0.117	1.052	20.170	0.00	0.50
93.75	1 5/8" Coax	Yes	3.75	0.000	3.96	1.24	0.00	0.119	1.058	20.407	0.00	42.12
93.75	1 5/8" Hybrid	Yes	3.75	0.000	0.00	0.00	0.00	0.119	1.058	20.407	0.00	3.71
95.00	1 5/8" Coax	Yes	1.25	0.000	3.96	0.41	0.00	0.120	1.059	20.484	0.00	14.04
95.00	1 5/8" Hybrid	Yes	1.25	0.000	0.00	0.00	0.00	0.120	1.059	20.484	0.00	1.24
100.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.123	1.069	20.787	0.00	56.16

Linear Appurtenance Segment Forces (Factored)

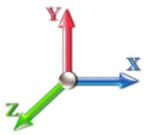
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
100.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.069	20.787	0.00	4.95
105.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.128	1.085	21.079	0.00	56.16
105.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.128	1.085	21.079	0.00	4.95
110.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.134	1.103	21.361	0.00	56.16
110.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.134	1.103	21.361	0.00	4.95
115.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.141	1.123	21.634	0.00	56.16
115.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.141	1.123	21.634	0.00	4.95
117.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.146	1.138	21.741	0.00	22.46
117.00	1 5/8" Hybrid	Yes	2.00	0.000	0.00	0.00	0.00	0.146	1.138	21.741	0.00	1.98
										Totals:	**0.0**	**1,430.0**

Calculated Forces

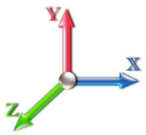
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-32.26	-22.08	0.00	-2459.5	0.00	2459.58	4331.76	2165.88	10060.7	5037.85	0.00	0.000	0.000	0.496
5.00	-31.04	-21.75	0.00	-2349.1	0.00	2349.18	4271.91	2135.96	9681.61	4848.00	0.07	-0.126	0.000	0.492
10.00	-29.84	-21.42	0.00	-2240.4	0.00	2240.44	4209.88	2104.94	9304.37	4659.10	0.27	-0.256	0.000	0.488
15.00	-28.66	-21.10	0.00	-2133.3	0.00	2133.33	4145.67	2072.83	8929.41	4471.34	0.61	-0.389	0.000	0.484
20.00	-27.51	-20.79	0.00	-2027.8	0.00	2027.81	4079.27	2039.64	8557.10	4284.91	1.09	-0.526	0.000	0.480
25.00	-26.39	-20.48	0.00	-1923.8	0.00	1923.86	4010.69	2005.34	8187.79	4099.98	1.72	-0.667	0.000	0.476
30.00	-25.29	-20.18	0.00	-1821.4	0.00	1821.45	3939.93	1969.96	7821.85	3916.74	2.50	-0.812	0.000	0.472
35.00	-24.21	-19.87	0.00	-1720.5	0.00	1720.54	3866.98	1933.49	7459.66	3735.38	3.43	-0.960	0.000	0.467
40.00	-23.17	-19.55	0.00	-1621.1	0.00	1621.18	3791.85	1895.92	7101.59	3556.07	4.51	-1.113	0.000	0.462
44.00	-22.36	-19.27	0.00	-1542.9	0.00	1542.99	3730.17	1865.09	6818.34	3414.24	5.50	-1.239	0.000	0.458
45.00	-21.98	-19.23	0.00	-1523.7	0.00	1523.71	3714.54	1857.27	6747.99	3379.01	5.76	-1.272	0.000	0.457
49.75	-20.28	-18.87	0.00	-1432.3	0.00	1432.37	3683.20	1841.60	6608.77	3309.30	7.11	-1.426	0.000	0.438
50.00	-20.21	-18.88	0.00	-1427.6	0.00	1427.66	3679.23	1839.62	6591.31	3300.56	7.18	-1.434	0.000	0.438
55.00	-19.22	-18.54	0.00	-1333.2	0.00	1333.26	3598.76	1799.38	6244.86	3127.07	8.77	-1.591	0.000	0.432
60.00	-18.26	-18.20	0.00	-1240.5	0.00	1240.56	3516.10	1758.05	5903.79	2956.28	10.52	-1.753	0.000	0.425
65.00	-17.33	-17.86	0.00	-1149.5	0.00	1149.56	3431.27	1715.63	5568.46	2788.37	12.45	-1.918	0.000	0.417
70.00	-16.42	-17.52	0.00	-1060.2	0.00	1060.25	3344.24	1672.12	5239.26	2623.52	14.54	-2.086	0.000	0.409
75.00	-15.54	-17.19	0.00	-972.63	0.00	972.63	3255.04	1627.52	4916.54	2461.92	16.82	-2.259	0.000	0.400
80.00	-14.68	-16.85	0.00	-886.71	0.00	886.71	3137.93	1568.96	4563.27	2285.03	19.28	-2.435	0.000	0.393
85.00	-13.86	-16.50	0.00	-802.48	0.00	802.48	3017.89	1508.95	4219.09	2112.68	21.93	-2.614	0.000	0.385
89.50	-13.15	-16.18	0.00	-728.21	0.00	728.21	2909.87	1454.93	3920.86	1963.34	24.47	-2.777	0.000	0.376
90.00	-13.00	-16.16	0.00	-720.12	0.00	720.12	2897.86	1448.93	3888.39	1947.09	24.76	-2.797	0.000	0.374
93.75	-12.06	-15.87	0.00	-659.53	0.00	659.53	2354.99	1177.49	3133.69	1569.17	27.01	-2.936	0.000	0.426
95.00	-11.86	-15.80	0.00	-639.69	0.00	639.69	2336.81	1168.40	3076.66	1540.62	27.79	-2.984	0.000	0.420
100.00	-11.19	-15.47	0.00	-560.67	0.00	560.67	2262.72	1131.36	2851.92	1428.08	31.02	-3.190	0.000	0.398
105.00	-10.54	-15.13	0.00	-483.33	0.00	483.33	2165.47	1082.73	2607.63	1305.76	34.47	-3.394	0.000	0.375
110.00	-9.91	-14.80	0.00	-407.66	0.00	407.66	2065.44	1032.72	2371.09	1187.31	38.13	-3.593	0.000	0.348
115.00	-9.33	-14.46	0.00	-333.65	0.00	333.65	1965.41	982.71	2145.79	1074.49	42.00	-3.784	0.000	0.315
117.00	-7.75	-12.79	0.00	-304.73	0.00	304.73	1925.40	962.70	2058.82	1030.94	43.60	-3.860	0.000	0.300
120.00	-7.45	-12.62	0.00	-266.34	0.00	266.34	1865.39	932.69	1931.73	967.30	46.06	-3.969	0.000	0.280
123.25	-6.98	-12.42	0.00	-225.32	0.00	225.32	1005.19	502.59	1030.12	515.83	48.80	-4.081	0.000	0.444
125.00	-6.86	-12.33	0.00	-203.58	0.00	203.58	992.91	496.46	998.01	499.75	50.31	-4.140	0.000	0.415
127.00	-4.90	-9.59	0.00	-178.91	0.00	178.91	978.56	489.28	961.59	481.51	52.06	-4.238	0.000	0.377
130.00	-4.71	-9.43	0.00	-150.15	0.00	150.15	956.38	478.19	907.53	454.44	54.77	-4.375	0.000	0.336
135.00	-4.44	-9.18	0.00	-102.99	0.00	102.99	917.66	458.83	819.21	410.21	59.46	-4.569	0.000	0.256
137.00	-2.65	-4.66	0.00	-84.64	0.00	84.64	901.57	450.78	784.57	392.87	61.38	-4.638	0.000	0.218
140.00	-2.53	-4.52	0.00	-70.65	0.00	70.65	876.76	438.38	733.42	367.25	64.33	-4.731	0.000	0.195
145.00	-2.35	-4.29	0.00	-48.05	0.00	48.05	833.68	416.84	650.52	325.74	69.35	-4.863	0.000	0.150
150.00	-2.18	-4.07	0.00	-26.62	0.00	26.62	781.24	390.62	565.69	283.26	74.50	-4.966	0.000	0.097
155.00	0.00	-3.86	0.00	-6.29	0.00	6.29	721.23	360.61	481.69	241.20	79.73	-5.022	0.000	0.026

Wind Loading - Shaft

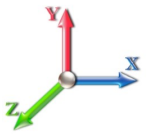
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

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

Dead Load Factor 1.20

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		1.00	0.70	4.256	4.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	4.256	4.68	0.00	1.200	1.242	5.00	24.792	29.75	139.3	441.3	1796.7
10.00		1.00	0.70	4.256	4.68	0.00	1.200	1.331	5.00	24.292	29.15	136.5	462.4	1784.8
15.00		1.00	0.70	4.256	4.68	0.00	1.200	1.386	5.00	23.764	28.52	133.5	470.2	1759.6
20.00		1.00	0.70	4.256	4.68	0.00	1.200	1.427	5.00	23.223	27.87	130.5	472.1	1728.5
25.00		1.00	0.70	4.256	4.68	0.00	1.200	1.459	5.00	22.676	27.21	127.4	470.7	1694.1
30.00		1.00	0.70	4.260	4.69	0.00	1.200	1.486	5.00	22.124	26.55	124.4	466.9	1657.4
35.00		1.00	0.73	4.451	4.90	0.00	1.200	1.509	5.00	21.569	25.88	126.7	461.6	1619.0
40.00		1.00	0.76	4.625	5.09	0.00	1.200	1.529	5.00	21.011	25.21	128.3	454.9	1579.4
44.00	Bot - Section 2	1.00	0.78	4.752	5.23	0.00	1.200	1.544	4.00	16.405	19.69	102.9	359.1	1235.0
45.00		1.00	0.79	4.783	5.26	0.00	1.200	1.547	1.00	4.108	4.93	25.9	90.9	525.9
49.75	Top - Section 1	1.00	0.81	4.922	5.41	0.00	1.200	1.563	4.75	19.211	23.05	124.8	424.4	2454.4
50.00		1.00	0.81	4.929	5.42	0.00	1.200	1.564	0.25	0.997	1.20	6.5	22.3	75.4
55.00		1.00	0.83	5.065	5.57	0.00	1.200	1.579	5.00	19.647	23.58	131.4	437.3	1481.0
60.00		1.00	0.85	5.193	5.71	0.00	1.200	1.592	5.00	19.084	22.90	130.8	427.7	1438.4
65.00		1.00	0.87	5.313	5.84	0.00	1.200	1.605	5.00	18.520	22.22	129.9	417.6	1395.4
70.00		1.00	0.89	5.426	5.97	0.00	1.200	1.617	5.00	17.956	21.55	128.6	407.1	1351.9
75.00		1.00	0.91	5.534	6.09	0.00	1.210 *	1.628	5.00	17.391	21.05	128.2	396.2	1307.9
80.00		1.00	0.93	5.637	6.20	0.00	1.224 *	1.639	5.00	16.826	20.60	127.7	384.9	1263.7
85.00		1.00	0.94	5.736	6.31	0.00	1.239 *	1.649	5.00	16.260	20.15	127.1	373.3	1219.1
89.50	Bot - Section 3	1.00	0.96	5.821	6.40	0.00	1.254 *	1.657	4.50	14.149	17.75	113.6	326.4	1059.4
90.00		1.00	0.96	5.830	6.41	0.00	1.263 *	1.658	0.50	1.570	1.98	12.7	36.8	184.5
93.75	Top - Section 2	1.00	0.97	5.899	6.49	0.00	1.270 *	1.665	3.75	11.596	14.73	95.6	269.2	1357.6
95.00		1.00	0.97	5.921	6.51	0.00	1.271 *	1.667	1.25	3.794	4.82	31.4	89.0	252.3
100.00		1.00	0.99	6.008	6.61	0.00	1.282 *	1.676	5.00	14.824	19.01	125.6	343.5	979.8
105.00		1.00	1.00	6.093	6.70	0.00	1.302 *	1.684	5.00	14.256	18.56	124.4	330.9	939.8
110.00		1.00	1.02	6.174	6.79	0.00	1.324 *	1.692	5.00	13.688	18.12	123.1	318.2	899.5
115.00		1.00	1.03	6.253	6.88	0.00	1.348 *	1.699	5.00	13.120	17.68	121.6	305.2	859.1
117.00	Appurtenance(s)	1.00	1.03	6.284	6.91	0.00	1.366 *	1.702	2.00	5.088	6.95	48.0	120.0	333.8
120.00	Bot - Section 4	1.00	1.04	6.330	6.96	0.00	1.200	1.707	3.00	7.462	8.95	62.3	175.2	487.8
123.25	Top - Section 3	1.00	1.05	6.378	7.02	0.00	1.200	1.711	3.25	7.956	9.55	67.0	186.8	714.6
125.00		1.00	1.05	6.404	7.04	0.00	1.200	1.714	1.75	4.184	5.02	35.4	99.0	204.0
127.00	Appurtenance(s)	1.00	1.06	6.433	7.08	0.00	1.200	1.716	2.00	4.697	5.64	39.9	111.0	228.5
130.00		1.00	1.07	6.476	7.12	0.00	1.200	1.720	3.00	6.875	8.25	58.8	161.6	333.0
135.00		1.00	1.08	6.546	7.20	0.00	1.200	1.727	5.00	11.005	13.21	95.1	255.7	528.1
137.00	Appurtenance(s)	1.00	1.08	6.574	7.23	0.00	1.200	1.729	2.00	4.242	5.09	36.8	100.1	204.4
140.00		1.00	1.09	6.615	7.28	0.00	1.200	1.733	3.00	6.192	7.43	54.1	145.2	296.8
145.00		1.00	1.10	6.681	7.35	0.00	1.200	1.739	5.00	9.866	11.84	87.0	228.1	467.5
150.00		1.00	1.11	6.746	7.42	0.00	1.200	1.745	5.00	9.297	11.16	82.8	214.1	437.0
155.00	Appurtenance(s)	1.00	1.12	6.810	7.49	0.00	1.200	1.751	5.00	8.727	10.47	78.5	200.0	406.4
								Totals:	**155.00**			**3,704.0**		**38,541.4**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

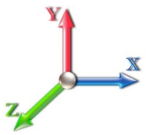
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	800 MHz RRH	3	6.840	7.524	0.92	1.00	10.04	350.11	0.000	2.400	75.54	0.00	181.29
2	155.00	APXVSPP18-C-A20	3	6.840	7.524	0.82	1.00	26.62	576.96	0.000	2.400	200.32	0.00	480.76
3	155.00	ACU-A20-N	4	6.840	7.524	1.00	1.00	1.75	16.84	0.000	2.400	13.17	0.00	31.61
4	155.00	APXVTM14-C-120	3	6.840	7.524	0.77	1.00	17.23	684.73	0.000	2.400	129.61	0.00	311.06
5	155.00	TD-RRH8x20-25	3	6.840	7.524	0.69	1.00	10.07	584.70	0.000	2.400	75.79	0.00	181.89
6	155.00	6' Lightning rod	1	6.810	7.491	1.00	1.00	1.47	38.92	0.000	0.000	11.02	0.00	0.00
7	155.00	ALU 800MHz External	3	6.840	7.524	0.72	1.00	3.09	69.78	0.000	2.400	23.22	0.00	55.74
8	155.00	1900MHz RRH	3	6.840	7.524	1.00	1.00	15.58	393.37	0.000	2.400	117.25	0.00	281.40
9	155.00	Low Profile Platform	1	6.810	7.491	1.00	1.00	39.72	2813.21	0.000	0.000	297.54	0.00	0.00
10	155.00	Collar Mount	1	6.810	7.491	0.56	0.75	7.74	737.83	0.000	0.000	57.96	0.00	0.00
11	137.00	Low Profile Platform	1	6.574	7.231	1.00	1.00	45.75	2177.68	0.000	0.000	330.86	0.00	0.00
12	137.00	DB-T1-6Z-8AB-0Z	2	6.574	7.231	0.80	0.80	9.06	390.00	0.000	0.000	65.55	0.00	0.00
13	137.00	FD9R6004/2C-3L (3.1 lbs)	6	6.574	7.231	0.52	0.80	2.49	56.24	0.000	0.000	18.03	0.00	0.00
14	137.00	RRH2X60-700	3	6.574	7.231	0.59	0.80	7.60	415.20	0.000	0.000	54.99	0.00	0.00
15	137.00	RRH2X60-PCS	3	6.574	7.231	0.72	0.80	6.11	448.76	0.000	0.000	44.20	0.00	0.00
16	137.00	4X45 RRH AWS	3	6.574	7.231	0.66	0.80	7.89	407.98	0.000	0.000	57.08	0.00	0.00
17	137.00	LPA-80080-6CF-EDIN	2	6.574	7.231	0.74	0.80	8.47	287.61	0.000	0.000	61.26	0.00	0.00
18	137.00	LPA-80080/4CF ___	2	6.574	7.231	0.74	0.80	10.79	439.91	0.000	0.000	78.05	0.00	0.00
19	137.00	SBNHH-1D65B	6	6.574	7.231	0.66	0.80	36.84	1561.76	0.000	0.000	266.39	0.00	0.00
20	137.00	LPA-80063/6CF	2	6.574	7.231	0.75	0.80	16.45	634.96	0.000	0.000	118.98	0.00	0.00
21	127.00	860 10025	6	6.433	7.076	0.58	0.80	1.91	34.42	0.000	0.000	13.51	0.00	0.00
22	127.00	RRU 11	3	6.433	7.076	0.55	0.80	9.76	386.32	0.000	0.000	69.08	0.00	0.00
23	127.00	P65-16-XLH-RR	3	6.433	7.076	0.60	0.80	19.65	536.18	0.000	0.000	139.05	0.00	0.00
24	127.00	RRUS 12	3	6.433	7.076	0.55	0.80	5.55	366.63	0.000	0.000	39.24	0.00	0.00
25	127.00	DC6-48-60-18-8F	1	6.433	7.076	0.80	0.80	1.73	81.26	0.000	0.000	12.22	0.00	0.00
26	127.00	7770	3	6.433	7.076	0.60	0.80	11.78	523.33	0.000	0.000	83.39	0.00	0.00
27	127.00	LGP21401	6	6.433	7.076	0.53	0.80	6.69	206.45	0.000	0.000	47.34	0.00	0.00
28	127.00	Low Profile Platform	1	6.433	7.076	1.00	1.00	39.37	2787.31	0.000	0.000	278.60	0.00	0.00
29	117.00	T-Arms	3	6.284	6.913	0.56	0.75	24.99	1765.00	0.000	0.000	172.75	0.00	0.00
30	117.00	AIR 21, 1.3M, B4A B2P	3	6.284	6.913	0.66	0.80	14.26	817.32	0.000	0.000	98.57	0.00	0.00
31	117.00	AIR 21, 1.3M, B2A B4P	3	6.284	6.913	0.66	0.80	14.26	821.28	0.000	0.000	98.57	0.00	0.00
							Totals:		**21,412.07**			**3,149.13**		

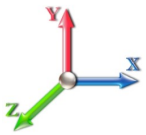
Total Applied Force Summary

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 22

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

Dead Load Factor 1.20

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		139.28	2174.95	0.00	0.00
10.00		136.47	2174.78	0.00	0.00
15.00		133.50	2156.95	0.00	0.00
20.00		130.47	2131.35	0.00	0.00
25.00		127.39	2101.26	0.00	0.00
30.00		124.40	2068.20	0.00	0.00
35.00		126.73	2033.00	0.00	0.00
40.00		128.26	1996.19	0.00	0.00
44.00		102.91	1570.01	0.00	0.00
45.00		25.93	609.74	0.00	0.00
49.75		124.81	2854.77	0.00	0.00
50.00		6.49	96.44	0.00	0.00
55.00		131.36	1904.63	0.00	0.00
60.00		130.80	1863.97	0.00	0.00
65.00		129.88	1822.68	0.00	0.00
70.00		128.61	1780.83	0.00	0.00
75.00		128.16	1738.49	0.00	0.00
80.00		127.73	1695.71	0.00	0.00
85.00		127.11	1652.54	0.00	0.00
89.50		113.63	1450.56	0.00	0.00
90.00		12.71	227.96	0.00	0.00
93.75		95.56	1684.34	0.00	0.00
95.00		31.40	361.33	0.00	0.00
100.00		125.64	1417.02	0.00	0.00
105.00		124.42	1378.13	0.00	0.00
110.00		123.07	1338.99	0.00	0.00
115.00		121.61	1299.61	0.00	0.00
117.00	(9) attachments	417.93	3913.82	0.00	0.00
120.00		62.35	567.10	0.00	0.00
123.25		66.99	800.58	0.00	0.00
125.00		35.37	250.27	0.00	0.00
127.00	(26) attachments	722.32	5203.31	0.00	0.00
130.00		58.77	387.83	0.00	0.00
135.00		95.09	619.58	0.00	0.00
137.00	(30) attachments	1132.21	7061.13	0.00	0.00
140.00		54.07	306.27	0.00	0.00
145.00		87.02	483.37	0.00	0.00
150.00		82.79	452.87	0.00	0.00
155.00	(25) attachments	1079.86	6688.71	0.00	1523.75
	Totals:	**6,853.10**	**70,319.27**	**0.00**	**1,523.75**

Linear Appurtenance Segment Forces (Factored)

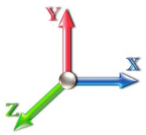
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.69	0.00	0.069	0.000	4.256	0.00	218.70
5.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	4.256	0.00	27.35
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.76	0.00	0.071	0.000	4.256	0.00	228.34
10.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.071	0.000	4.256	0.00	29.45
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.81	0.00	0.073	0.000	4.256	0.00	234.34
15.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.073	0.000	4.256	0.00	30.79
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.84	0.00	0.075	0.000	4.256	0.00	238.78
20.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.075	0.000	4.256	0.00	31.80
25.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.87	0.00	0.077	0.000	4.256	0.00	242.32
25.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.077	0.000	4.256	0.00	32.62
30.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.89	0.00	0.079	0.000	4.260	0.00	245.28
30.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.079	0.000	4.260	0.00	33.31
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.91	0.00	0.081	0.000	4.451	0.00	247.84
35.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.081	0.000	4.451	0.00	33.91
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.92	0.00	0.084	0.000	4.625	0.00	250.09
40.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.084	0.000	4.625	0.00	34.45
44.00	1 5/8" Coax	Yes	4.00	0.000	3.96	2.35	0.00	0.086	0.000	4.752	0.00	201.37
44.00	1 5/8" Hybrid	Yes	4.00	0.000	0.00	0.00	0.00	0.086	0.000	4.752	0.00	27.87
45.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.59	0.00	0.087	0.000	4.783	0.00	50.42
45.00	1 5/8" Hybrid	Yes	1.00	0.000	0.00	0.00	0.00	0.087	0.000	4.783	0.00	6.99
49.75	1 5/8" Coax	Yes	4.75	0.000	3.96	2.80	0.00	0.089	0.000	4.922	0.00	241.15
49.75	1 5/8" Hybrid	Yes	4.75	0.000	0.00	0.00	0.00	0.089	0.000	4.922	0.00	33.58
50.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.15	0.00	0.089	0.000	4.929	0.00	12.70
50.00	1 5/8" Hybrid	Yes	0.25	0.000	0.00	0.00	0.00	0.089	0.000	4.929	0.00	1.77
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.97	0.00	0.090	0.000	5.065	0.00	255.60
55.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.090	0.000	5.065	0.00	35.77
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.98	0.00	0.093	0.000	5.193	0.00	257.14
60.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.093	0.000	5.193	0.00	36.14
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.99	0.00	0.096	0.000	5.313	0.00	258.57
65.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	5.313	0.00	36.49
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.00	0.00	0.099	0.000	5.426	0.00	259.91
70.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.099	0.000	5.426	0.00	36.82
75.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.01	0.00	0.103	1.009	5.534	0.00	261.17
75.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.103	1.009	5.534	0.00	37.13
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.02	0.00	0.107	1.020	5.637	0.00	262.35
80.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.020	5.637	0.00	37.42
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.02	0.00	0.111	1.033	5.736	0.00	263.47
85.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.111	1.033	5.736	0.00	37.70
89.50	1 5/8" Coax	Yes	4.50	0.000	3.96	2.73	0.00	0.115	1.045	5.821	0.00	237.99
89.50	1 5/8" Hybrid	Yes	4.50	0.000	0.00	0.00	0.00	0.115	1.045	5.821	0.00	34.15
90.00	1 5/8" Coax	Yes	0.50	0.000	3.96	0.30	0.00	0.117	1.052	5.830	0.00	26.45
90.00	1 5/8" Hybrid	Yes	0.50	0.000	0.00	0.00	0.00	0.117	1.052	5.830	0.00	3.80
93.75	1 5/8" Coax	Yes	3.75	0.000	3.96	2.28	0.00	0.119	1.058	5.899	0.00	198.98
93.75	1 5/8" Hybrid	Yes	3.75	0.000	0.00	0.00	0.00	0.119	1.058	5.899	0.00	28.62
95.00	1 5/8" Coax	Yes	1.25	0.000	3.96	0.76	0.00	0.120	1.059	5.921	0.00	66.39
95.00	1 5/8" Hybrid	Yes	1.25	0.000	0.00	0.00	0.00	0.120	1.059	5.921	0.00	9.55
100.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.05	0.00	0.123	1.069	6.008	0.00	266.52

Linear Appurtenance Segment Forces (Factored)

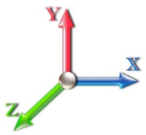
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
100.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.069	6.008	0.00	38.46
105.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.05	0.00	0.128	1.085	6.093	0.00	267.44
105.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.128	1.085	6.093	0.00	38.69
110.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.06	0.00	0.134	1.103	6.174	0.00	268.33
110.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.134	1.103	6.174	0.00	38.92
115.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.07	0.00	0.141	1.123	6.253	0.00	269.18
115.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.141	1.123	6.253	0.00	39.13
117.00	1 5/8" Coax	Yes	2.00	0.000	3.96	1.23	0.00	0.146	1.138	6.284	0.00	107.81
117.00	1 5/8" Hybrid	Yes	2.00	0.000	0.00	0.00	0.00	0.146	1.138	6.284	0.00	15.69
										Totals:	**0.0**	**6,767.0**

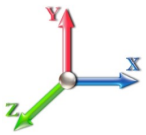
Calculated Forces

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-70.32	-6.88	0.00	-769.07	0.00	769.07	4331.76	2165.88	10060.7	5037.85	0.00	0.000	0.000	0.169
5.00	-68.14	-6.78	0.00	-734.68	0.00	734.68	4271.91	2135.96	9681.61	4848.00	0.02	-0.040	0.000	0.168
10.00	-65.96	-6.69	0.00	-700.76	0.00	700.76	4209.88	2104.94	9304.37	4659.10	0.08	-0.080	0.000	0.166
15.00	-63.80	-6.60	0.00	-667.30	0.00	667.30	4145.67	2072.83	8929.41	4471.34	0.19	-0.122	0.000	0.165
20.00	-61.66	-6.51	0.00	-634.28	0.00	634.28	4079.27	2039.64	8557.10	4284.91	0.34	-0.165	0.000	0.163
25.00	-59.55	-6.43	0.00	-601.71	0.00	601.71	4010.69	2005.34	8187.79	4099.98	0.54	-0.209	0.000	0.162
30.00	-57.48	-6.34	0.00	-569.59	0.00	569.59	3939.93	1969.96	7821.85	3916.74	0.78	-0.254	0.000	0.160
35.00	-55.44	-6.25	0.00	-537.89	0.00	537.89	3866.98	1933.49	7459.66	3735.38	1.07	-0.300	0.000	0.158
40.00	-53.44	-6.15	0.00	-506.65	0.00	506.65	3791.85	1895.92	7101.59	3556.07	1.41	-0.348	0.000	0.157
44.00	-51.87	-6.06	0.00	-482.05	0.00	482.05	3730.17	1865.09	6818.34	3414.24	1.72	-0.388	0.000	0.155
45.00	-51.26	-6.05	0.00	-475.99	0.00	475.99	3714.54	1857.27	6747.99	3379.01	1.80	-0.398	0.000	0.155
49.75	-48.40	-5.93	0.00	-447.23	0.00	447.23	3683.20	1841.60	6608.77	3309.30	2.22	-0.446	0.000	0.148
50.00	-48.30	-5.95	0.00	-445.75	0.00	445.75	3679.23	1839.62	6591.31	3300.56	2.25	-0.448	0.000	0.148
55.00	-46.40	-5.84	0.00	-416.03	0.00	416.03	3598.76	1799.38	6244.86	3127.07	2.74	-0.497	0.000	0.146
60.00	-44.53	-5.73	0.00	-386.84	0.00	386.84	3516.10	1758.05	5903.79	2956.28	3.29	-0.548	0.000	0.144
65.00	-42.70	-5.62	0.00	-358.19	0.00	358.19	3431.27	1715.63	5568.46	2788.37	3.89	-0.599	0.000	0.141
70.00	-40.92	-5.51	0.00	-330.09	0.00	330.09	3344.24	1672.12	5239.26	2623.52	4.55	-0.652	0.000	0.138
75.00	-39.18	-5.40	0.00	-302.54	0.00	302.54	3255.04	1627.52	4916.54	2461.92	5.26	-0.705	0.000	0.135
80.00	-37.48	-5.29	0.00	-275.54	0.00	275.54	3137.93	1568.96	4563.27	2285.03	6.03	-0.760	0.000	0.133
85.00	-35.82	-5.17	0.00	-249.12	0.00	249.12	3017.89	1508.95	4219.09	2112.68	6.85	-0.816	0.000	0.130
89.50	-34.37	-5.05	0.00	-225.86	0.00	225.86	2909.87	1454.93	3920.86	1963.34	7.65	-0.866	0.000	0.127
90.00	-34.14	-5.05	0.00	-223.33	0.00	223.33	2897.86	1448.93	3888.39	1947.09	7.74	-0.872	0.000	0.126
93.75	-32.45	-4.94	0.00	-204.40	0.00	204.40	2354.99	1177.49	3133.69	1569.17	8.44	-0.916	0.000	0.144
95.00	-32.09	-4.93	0.00	-198.22	0.00	198.22	2336.81	1168.40	3076.66	1540.62	8.68	-0.930	0.000	0.142
100.00	-30.67	-4.81	0.00	-173.57	0.00	173.57	2262.72	1131.36	2851.92	1428.08	9.69	-0.994	0.000	0.135
105.00	-29.29	-4.70	0.00	-149.50	0.00	149.50	2165.47	1082.73	2607.63	1305.76	10.77	-1.057	0.000	0.128
110.00	-27.95	-4.58	0.00	-126.02	0.00	126.02	2065.44	1032.72	2371.09	1187.31	11.91	-1.119	0.000	0.120
115.00	-26.65	-4.45	0.00	-103.14	0.00	103.14	1965.41	982.71	2145.79	1074.49	13.11	-1.178	0.000	0.110
117.00	-22.74	-3.96	0.00	-94.24	0.00	94.24	1925.40	962.70	2058.82	1030.94	13.61	-1.202	0.000	0.103
120.00	-22.17	-3.90	0.00	-82.36	0.00	82.36	1865.39	932.69	1931.73	967.30	14.38	-1.235	0.000	0.097
123.25	-21.37	-3.83	0.00	-69.68	0.00	69.68	1005.19	502.59	1030.12	515.83	15.23	-1.270	0.000	0.156
125.00	-21.12	-3.79	0.00	-62.99	0.00	62.99	992.91	496.46	998.01	499.75	15.70	-1.288	0.000	0.147
127.00	-15.93	-2.96	0.00	-55.40	0.00	55.40	978.56	489.28	961.59	481.51	16.25	-1.319	0.000	0.131
130.00	-15.55	-2.91	0.00	-46.51	0.00	46.51	956.38	478.19	907.53	454.44	17.09	-1.361	0.000	0.119
135.00	-14.93	-2.81	0.00	-31.96	0.00	31.96	917.66	458.83	819.21	410.21	18.55	-1.421	0.000	0.094
137.00	-7.90	-1.50	0.00	-26.34	0.00	26.34	901.57	450.78	784.57	392.87	19.15	-1.443	0.000	0.076
140.00	-7.59	-1.45	0.00	-21.83	0.00	21.83	876.76	438.38	733.42	367.25	20.06	-1.471	0.000	0.068
145.00	-7.11	-1.35	0.00	-14.59	0.00	14.59	833.68	416.84	650.52	325.74	21.63	-1.512	0.000	0.053
150.00	-6.66	-1.26	0.00	-7.83	0.00	7.83	781.24	390.62	565.69	283.26	23.23	-1.543	0.000	0.036
155.00	0.00	-1.08	0.00	-1.52	0.00	1.52	721.23	360.61	481.69	241.20	24.85	-1.559	0.000	0.006

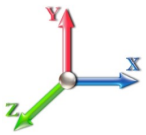
Seismic Segment Forces (Factored)

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 26

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.23	**Iterations**	22
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.11	**Ss**	0.21
Wind Load Factor	0.00	**Structure Frequency**	0.36	**SA**	0.04	**S1**	0.07
						Seismic Importance Factor	1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1129.4	0.00	0.03	0.02	25.98	
10.00		1101.9	0.01	0.05	0.03	36.50	
15.00		1074.5	0.02	0.06	0.04	40.95	
20.00		1047.0	0.03	0.07	0.04	42.60	
25.00		1019.5	0.05	0.07	0.04	42.99	
30.00		992.03	0.07	0.07	0.04	42.91	
35.00		964.55	0.10	0.07	0.04	42.70	
40.00		937.06	0.13	0.07	0.03	42.45	
44.00	Bot - Section 2	729.86	0.15	0.07	0.03	33.59	
45.00		362.47	0.16	0.07	0.03	16.73	
49.75	Top - Section 1	1691.6	0.19	0.06	0.02	78.65	
50.00		44.21	0.20	0.06	0.02	2.06	
55.00		869.78	0.24	0.06	0.02	39.70	
60.00		842.29	0.28	0.05	0.01	36.05	
65.00		814.81	0.33	0.04	0.01	30.14	
70.00		787.32	0.39	0.02	0.01	21.52	
75.00		759.83	0.44	0.00	0.01	10.34	
80.00		732.34	0.50	-0.02	0.01	-2.24	
85.00		704.86	0.57	-0.04	0.01	-14.21	
89.50	Bot - Section 3	610.87	0.63	-0.06	0.02	-20.42	
90.00		123.08	0.64	-0.07	0.02	-4.27	
93.75	Top - Section 2	907.01	0.69	-0.08	0.03	-38.56	
95.00		136.14	0.71	-0.09	0.03	-6.05	
100.00		530.26	0.79	-0.11	0.05	-25.65	
105.00		507.35	0.87	-0.12	0.08	-23.51	
110.00		484.45	0.95	-0.12	0.11	-18.65	
115.00		461.54	1.04	-0.10	0.15	-11.53	
117.00	Appurtenance(s)	1773.9	1.08	-0.08	0.17	-31.97	
120.00	Bot - Section 4	260.43	1.13	-0.05	0.21	-1.54	
123.25	Top - Section 3	439.82	1.20	0.00	0.25	4.15	
125.00		87.51	1.23	0.03	0.28	1.63	
127.00	Appurtenance(s)	2330.5	1.27	0.08	0.31	70.10	
130.00		142.80	1.33	0.16	0.36	6.98	
135.00		227.01	1.43	0.35	0.47	19.23	
137.00	Appurtenance(s)	2348.8	1.48	0.44	0.52	236.49	
140.00		126.31	1.54	0.61	0.59	15.96	
145.00		199.52	1.65	0.96	0.75	34.71	
150.00		185.78	1.77	1.41	0.93	42.29	
155.00	Appurtenance(s)	2798.9	1.89	1.98	1.14	804.62	
	Totals:	**31,287.7**				**1,623.4**	**Total Wind:** **22,044.6**

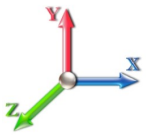
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E



Gust Response Factor	1.10			**Sds**	0.23			**Iterations**	22
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.11			**Ss**	0.21
Wind Load Factor	0.00	**Structure Frequency**	0.36	**SA**	0.04			**S1**	0.07
								Seismic Importance Factor	1.00

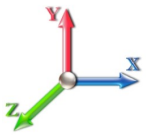
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-43.05	-1.83	0.00	-215.39	0.00	215.39	4331.76	2165.88	10060.7	5037.85		0.00	0.00	0.053
5.00	-41.48	-1.81	0.00	-206.26	0.00	206.26	4271.91	2135.96	9681.61	4848.00		0.01	-0.01	0.052
10.00	-39.94	-1.78	0.00	-197.23	0.00	197.23	4209.88	2104.94	9304.37	4659.10		0.02	-0.02	0.052
15.00	-38.44	-1.74	0.00	-188.33	0.00	188.33	4145.67	2072.83	8929.41	4471.34		0.05	-0.03	0.051
20.00	-36.97	-1.71	0.00	-179.61	0.00	179.61	4079.27	2039.64	8557.10	4284.91		0.10	-0.05	0.051
25.00	-35.53	-1.67	0.00	-171.06	0.00	171.06	4010.69	2005.34	8187.79	4099.98		0.15	-0.06	0.051
30.00	-34.13	-1.64	0.00	-162.70	0.00	162.70	3939.93	1969.96	7821.85	3916.74		0.22	-0.07	0.050
35.00	-32.76	-1.60	0.00	-154.52	0.00	154.52	3866.98	1933.49	7459.66	3735.38		0.30	-0.09	0.050
40.00	-31.42	-1.56	0.00	-146.52	0.00	146.52	3791.85	1895.92	7101.59	3556.07		0.40	-0.10	0.049
44.00	-30.37	-1.53	0.00	-140.28	0.00	140.28	3730.17	1865.09	6818.34	3414.24		0.49	-0.11	0.049
45.00	-29.89	-1.52	0.00	-138.75	0.00	138.75	3714.54	1857.27	6747.99	3379.01		0.51	-0.11	0.049
49.75	-27.66	-1.44	0.00	-131.54	0.00	131.54	3683.20	1841.60	6608.77	3309.30		0.63	-0.13	0.047
50.00	-27.60	-1.44	0.00	-131.18	0.00	131.18	3679.23	1839.62	6591.31	3300.56		0.64	-0.13	0.047
55.00	-26.34	-1.40	0.00	-123.99	0.00	123.99	3598.76	1799.38	6244.86	3127.07		0.78	-0.14	0.047
60.00	-25.11	-1.37	0.00	-116.98	0.00	116.98	3516.10	1758.05	5903.79	2956.28		0.94	-0.16	0.047
65.00	-23.92	-1.34	0.00	-110.13	0.00	110.13	3431.27	1715.63	5568.46	2788.37		1.11	-0.17	0.046
70.00	-22.76	-1.32	0.00	-103.41	0.00	103.41	3344.24	1672.12	5239.26	2623.52		1.30	-0.19	0.046
75.00	-21.64	-1.32	0.00	-96.79	0.00	96.79	3255.04	1627.52	4916.54	2461.92		1.51	-0.21	0.046
80.00	-20.55	-1.32	0.00	-90.21	0.00	90.21	3137.93	1568.96	4563.27	2285.03		1.73	-0.22	0.046
85.00	-19.49	-1.32	0.00	-83.61	0.00	83.61	3017.89	1508.95	4219.09	2112.68		1.98	-0.24	0.046
89.50	-18.56	-1.32	0.00	-77.66	0.00	77.66	2909.87	1454.93	3920.86	1963.34		2.21	-0.26	0.046
90.00	-18.39	-1.32	0.00	-77.00	0.00	77.00	2897.86	1448.93	3888.39	1947.09		2.24	-0.26	0.046
93.75	-17.14	-1.32	0.00	-72.05	0.00	72.05	2354.99	1177.49	3133.69	1569.17		2.45	-0.28	0.053
95.00	-16.92	-1.32	0.00	-70.40	0.00	70.40	2336.81	1168.40	3076.66	1540.62		2.53	-0.28	0.053
100.00	-16.07	-1.32	0.00	-63.78	0.00	63.78	2262.72	1131.36	2851.92	1428.08		2.84	-0.31	0.052
105.00	-15.25	-1.33	0.00	-57.16	0.00	57.16	2165.47	1082.73	2607.63	1305.76		3.17	-0.33	0.051
110.00	-14.45	-1.33	0.00	-50.53	0.00	50.53	2065.44	1032.72	2371.09	1187.31		3.53	-0.35	0.050
115.00	-13.69	-1.33	0.00	-43.89	0.00	43.89	1965.41	982.71	2145.79	1074.49		3.91	-0.38	0.048
117.00	-11.47	-1.31	0.00	-41.24	0.00	41.24	1925.40	962.70	2058.82	1030.94		4.07	-0.39	0.046
120.00	-11.08	-1.32	0.00	-37.29	0.00	37.29	1865.39	932.69	1931.73	967.30		4.32	-0.40	0.044
123.25	-10.47	-1.31	0.00	-33.02	0.00	33.02	1005.19	502.59	1030.12	515.83		4.60	-0.42	0.074
125.00	-10.31	-1.31	0.00	-30.73	0.00	30.73	992.91	496.46	998.01	499.75		4.75	-0.43	0.072
127.00	-7.47	-1.22	0.00	-28.11	0.00	28.11	978.56	489.28	961.59	481.51		4.93	-0.44	0.066
130.00	-7.24	-1.21	0.00	-24.45	0.00	24.45	956.38	478.19	907.53	454.44		5.22	-0.46	0.061
135.00	-6.87	-1.19	0.00	-18.38	0.00	18.38	917.66	458.83	819.21	410.21		5.72	-0.50	0.052
137.00	-4.02	-0.93	0.00	-15.99	0.00	15.99	901.57	450.78	784.57	392.87		5.93	-0.51	0.045
140.00	-3.86	-0.92	0.00	-13.19	0.00	13.19	876.76	438.38	733.42	367.25		6.26	-0.53	0.040
145.00	-3.60	-0.88	0.00	-8.60	0.00	8.60	833.68	416.84	650.52	325.74		6.83	-0.55	0.031
150.00	-3.37	-0.84	0.00	-4.19	0.00	4.19	781.24	390.62	565.69	283.26		7.42	-0.57	0.019
155.00	0.00	-0.80	0.00	0.00	0.00	0.00	721.23	360.61	481.69	241.20		8.02	-0.58	0.000

Seismic Segment Forces (Factored)

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 28

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.23	**Iterations**	22
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.11	**Ss**	0.21
Wind Load Factor	0.00	**Structure Frequency**	0.36	**SA**	0.04	**S1**	0.07
						Seismic Importance Factor	1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1129.4	0.00	0.03	0.02	25.98	
10.00		1101.9	0.01	0.05	0.03	36.50	
15.00		1074.5	0.02	0.06	0.04	40.95	
20.00		1047.0	0.03	0.07	0.04	42.60	
25.00		1019.5	0.05	0.07	0.04	42.99	
30.00		992.03	0.07	0.07	0.04	42.91	
35.00		964.55	0.10	0.07	0.04	42.70	
40.00		937.06	0.13	0.07	0.03	42.45	
44.00	Bot - Section 2	729.86	0.15	0.07	0.03	33.59	
45.00		362.47	0.16	0.07	0.03	16.73	
49.75	Top - Section 1	1691.6	0.19	0.06	0.02	78.65	
50.00		44.21	0.20	0.06	0.02	2.06	
55.00		869.78	0.24	0.06	0.02	39.70	
60.00		842.29	0.28	0.05	0.01	36.05	
65.00		814.81	0.33	0.04	0.01	30.14	
70.00		787.32	0.39	0.02	0.01	21.52	
75.00		759.83	0.44	0.00	0.01	10.34	
80.00		732.34	0.50	-0.02	0.01	-2.24	
85.00		704.86	0.57	-0.04	0.01	-14.21	
89.50	Bot - Section 3	610.87	0.63	-0.06	0.02	-20.42	
90.00		123.08	0.64	-0.07	0.02	-4.27	
93.75	Top - Section 2	907.01	0.69	-0.08	0.03	-38.56	
95.00		136.14	0.71	-0.09	0.03	-6.05	
100.00		530.26	0.79	-0.11	0.05	-25.65	
105.00		507.35	0.87	-0.12	0.08	-23.51	
110.00		484.45	0.95	-0.12	0.11	-18.65	
115.00		461.54	1.04	-0.10	0.15	-11.53	
117.00	Appurtenance(s)	1773.9	1.08	-0.08	0.17	-31.97	
120.00	Bot - Section 4	260.43	1.13	-0.05	0.21	-1.54	
123.25	Top - Section 3	439.82	1.20	0.00	0.25	4.15	
125.00		87.51	1.23	0.03	0.28	1.63	
127.00	Appurtenance(s)	2330.5	1.27	0.08	0.31	70.10	
130.00		142.80	1.33	0.16	0.36	6.98	
135.00		227.01	1.43	0.35	0.47	19.23	
137.00	Appurtenance(s)	2348.8	1.48	0.44	0.52	236.49	
140.00		126.31	1.54	0.61	0.59	15.96	
145.00		199.52	1.65	0.96	0.75	34.71	
150.00		185.78	1.77	1.41	0.93	42.29	
155.00	Appurtenance(s)	2798.9	1.89	1.98	1.14	804.62	
	Totals:	**31,287.7**				**1,623.4**	**Total Wind:** **22,044.6**

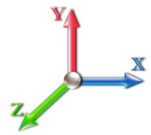
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.23	**Iterations**	22		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.11	**Ss**	0.21		
Wind Load Factor	0.00	**Structure Frequency**	0.36	**SA**	0.04	**S1**	0.07	**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-32.29	-1.82	0.00	-212.98	0.00	212.98	4331.76	2165.88	10060.7	5037.85		0.00	0.00	0.050
5.00	-31.11	-1.80	0.00	-203.86	0.00	203.86	4271.91	2135.96	9681.61	4848.00		0.01	-0.01	0.049
10.00	-29.96	-1.77	0.00	-194.84	0.00	194.84	4209.88	2104.94	9304.37	4659.10		0.02	-0.02	0.049
15.00	-28.83	-1.74	0.00	-185.97	0.00	185.97	4145.67	2072.83	8929.41	4471.34		0.05	-0.03	0.049
20.00	-27.73	-1.70	0.00	-177.28	0.00	177.28	4079.27	2039.64	8557.10	4284.91		0.09	-0.05	0.048
25.00	-26.65	-1.66	0.00	-168.78	0.00	168.78	4010.69	2005.34	8187.79	4099.98		0.15	-0.06	0.048
30.00	-25.60	-1.62	0.00	-160.46	0.00	160.46	3939.93	1969.96	7821.85	3916.74		0.22	-0.07	0.047
35.00	-24.57	-1.59	0.00	-152.34	0.00	152.34	3866.98	1933.49	7459.66	3735.38		0.30	-0.08	0.047
40.00	-23.56	-1.55	0.00	-144.42	0.00	144.42	3791.85	1895.92	7101.59	3556.07		0.39	-0.10	0.047
44.00	-22.78	-1.51	0.00	-138.23	0.00	138.23	3730.17	1865.09	6818.34	3414.24		0.48	-0.11	0.047
45.00	-22.42	-1.50	0.00	-136.72	0.00	136.72	3714.54	1857.27	6747.99	3379.01		0.50	-0.11	0.046
49.75	-20.74	-1.42	0.00	-129.59	0.00	129.59	3683.20	1841.60	6608.77	3309.30		0.62	-0.13	0.045
50.00	-20.70	-1.42	0.00	-129.23	0.00	129.23	3679.23	1839.62	6591.31	3300.56		0.63	-0.13	0.045
55.00	-19.75	-1.38	0.00	-122.13	0.00	122.13	3598.76	1799.38	6244.86	3127.07		0.77	-0.14	0.045
60.00	-18.83	-1.35	0.00	-115.20	0.00	115.20	3516.10	1758.05	5903.79	2956.28		0.92	-0.16	0.044
65.00	-17.94	-1.32	0.00	-108.45	0.00	108.45	3431.27	1715.63	5568.46	2788.37		1.09	-0.17	0.044
70.00	-17.07	-1.30	0.00	-101.83	0.00	101.83	3344.24	1672.12	5239.26	2623.52		1.28	-0.19	0.044
75.00	-16.23	-1.30	0.00	-95.31	0.00	95.31	3255.04	1627.52	4916.54	2461.92		1.49	-0.20	0.044
80.00	-15.41	-1.30	0.00	-88.83	0.00	88.83	3137.93	1568.96	4563.27	2285.03		1.71	-0.22	0.044
85.00	-14.61	-1.30	0.00	-82.34	0.00	82.34	3017.89	1508.95	4219.09	2112.68		1.95	-0.24	0.044
89.50	-13.92	-1.30	0.00	-76.50	0.00	76.50	2909.87	1454.93	3920.86	1963.34		2.18	-0.26	0.044
90.00	-13.79	-1.30	0.00	-75.85	0.00	75.85	2897.86	1448.93	3888.39	1947.09		2.21	-0.26	0.044
93.75	-12.85	-1.30	0.00	-70.98	0.00	70.98	2354.99	1177.49	3133.69	1569.17		2.42	-0.27	0.051
95.00	-12.69	-1.30	0.00	-69.35	0.00	69.35	2336.81	1168.40	3076.66	1540.62		2.49	-0.28	0.050
100.00	-12.05	-1.30	0.00	-62.86	0.00	62.86	2262.72	1131.36	2851.92	1428.08		2.80	-0.30	0.049
105.00	-11.44	-1.30	0.00	-56.35	0.00	56.35	2165.47	1082.73	2607.63	1305.76		3.12	-0.32	0.048
110.00	-10.84	-1.30	0.00	-49.83	0.00	49.83	2065.44	1032.72	2371.09	1187.31		3.48	-0.35	0.047
115.00	-10.26	-1.30	0.00	-43.31	0.00	43.31	1965.41	982.71	2145.79	1074.49		3.85	-0.37	0.046
117.00	-8.60	-1.29	0.00	-40.71	0.00	40.71	1925.40	962.70	2058.82	1030.94		4.01	-0.38	0.044
120.00	-8.31	-1.29	0.00	-36.83	0.00	36.83	1865.39	932.69	1931.73	967.30		4.26	-0.40	0.043
123.25	-7.85	-1.29	0.00	-32.62	0.00	32.62	1005.19	502.59	1030.12	515.83		4.53	-0.41	0.071
125.00	-7.73	-1.29	0.00	-30.36	0.00	30.36	992.91	496.46	998.01	499.75		4.69	-0.42	0.069
127.00	-5.60	-1.20	0.00	-27.79	0.00	27.79	978.56	489.28	961.59	481.51		4.87	-0.44	0.063
130.00	-5.43	-1.20	0.00	-24.18	0.00	24.18	956.38	478.19	907.53	454.44		5.15	-0.46	0.059
135.00	-5.15	-1.18	0.00	-18.19	0.00	18.19	917.66	458.83	819.21	410.21		5.64	-0.49	0.050
137.00	-3.01	-0.92	0.00	-15.83	0.00	15.83	901.57	450.78	784.57	392.87		5.85	-0.50	0.044
140.00	-2.89	-0.91	0.00	-13.05	0.00	13.05	876.76	438.38	733.42	367.25		6.17	-0.52	0.039
145.00	-2.70	-0.87	0.00	-8.51	0.00	8.51	833.68	416.84	650.52	325.74		6.73	-0.54	0.029
150.00	-2.52	-0.83	0.00	-4.15	0.00	4.15	781.24	390.62	565.69	283.26		7.31	-0.56	0.018
155.00	0.00	-0.80	0.00	0.00	0.00	0.00	721.23	360.61	481.69	241.20		7.91	-0.57	0.000

Wind Loading - Shaft

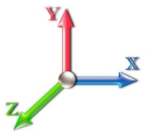
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

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		1.00	0.70	6.129	6.74	241.40	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	235.64	0.650	0.000	5.00	23.757	15.44	104.1	0.0	1129.5
10.00		1.00	0.70	6.129	6.74	229.87	0.650	0.000	5.00	23.183	15.07	101.6	0.0	1102.0
15.00		1.00	0.70	6.129	6.74	224.11	0.650	0.000	5.00	22.609	14.70	99.1	0.0	1074.5
20.00		1.00	0.70	6.129	6.74	218.34	0.650	0.000	5.00	22.034	14.32	96.6	0.0	1047.0
25.00		1.00	0.70	6.129	6.74	212.57	0.650	0.000	5.00	21.460	13.95	94.0	0.0	1019.5
30.00		1.00	0.70	6.134	6.75	206.90	0.650	0.000	5.00	20.886	13.58	91.6	0.0	992.0
35.00		1.00	0.73	6.410	7.05	205.60	0.650	0.000	5.00	20.311	13.20	93.1	0.0	964.5
40.00		1.00	0.76	6.659	7.33	203.55	0.650	0.000	5.00	19.737	12.83	94.0	0.0	937.1
44.00	Bot - Section 2	1.00	0.78	6.843	7.53	201.47	0.650	0.000	4.00	15.376	9.99	75.2	0.0	729.9
45.00		1.00	0.79	6.887	7.58	200.90	0.650	0.000	1.00	3.850	2.50	19.0	0.0	362.5
49.75	Top - Section 1	1.00	0.81	7.088	7.80	197.91	0.650	0.000	4.75	17.974	11.68	91.1	0.0	1691.7
50.00		1.00	0.81	7.098	7.81	201.17	0.650	0.000	0.25	0.932	0.61	4.7	0.0	44.2
55.00		1.00	0.83	7.294	8.02	197.63	0.650	0.000	5.00	18.331	11.92	95.6	0.0	869.8
60.00		1.00	0.85	7.477	8.22	193.74	0.650	0.000	5.00	17.757	11.54	94.9	0.0	842.3
65.00		1.00	0.87	7.650	8.42	189.52	0.650	0.000	5.00	17.183	11.17	94.0	0.0	814.8
70.00		1.00	0.89	7.814	8.60	185.03	0.650	0.000	5.00	16.609	10.80	92.8	0.0	787.3
75.00		1.00	0.91	7.969	8.77	180.29	0.656 *	0.000	5.00	16.034	10.51	92.2	0.0	759.8
80.00		1.00	0.93	8.118	8.93	175.32	0.663 *	0.000	5.00	15.460	10.25	91.5	0.0	732.3
85.00		1.00	0.94	8.260	9.09	170.15	0.671 *	0.000	5.00	14.886	9.99	90.8	0.0	704.9
89.50	Bot - Section 3	1.00	0.96	8.382	9.22	165.34	0.679 *	0.000	4.50	12.906	8.77	80.8	0.0	610.9
90.00		1.00	0.96	8.396	9.24	164.80	0.684 *	0.000	0.50	1.432	0.98	9.0	0.0	123.1
93.75	Top - Section 2	1.00	0.97	8.494	9.34	160.67	0.688 *	0.000	3.75	10.555	7.26	67.9	0.0	907.0
95.00		1.00	0.97	8.526	9.38	162.40	0.688 *	0.000	1.25	3.446	2.37	22.3	0.0	136.1
100.00		1.00	0.99	8.652	9.52	156.75	0.695 *	0.000	5.00	13.427	9.33	88.8	0.0	530.3
105.00		1.00	1.00	8.774	9.65	150.95	0.705 *	0.000	5.00	12.853	9.07	87.5	0.0	507.4
110.00		1.00	1.02	8.891	9.78	145.01	0.717 *	0.000	5.00	12.278	8.80	86.1	0.0	484.4
115.00		1.00	1.03	9.005	9.91	138.94	0.730 *	0.000	5.00	11.704	8.54	84.6	0.0	461.5
117.00	Appurtenance(s)	1.00	1.03	9.049	9.95	136.48	0.740 *	0.000	2.00	4.521	3.34	33.3	0.0	178.2
120.00	Bot - Section 4	1.00	1.04	9.115	10.03	132.76	0.650	0.000	3.00	6.609	4.30	43.1	0.0	260.4
123.25	Top - Section 3	1.00	1.05	9.185	10.10	128.68	0.650	0.000	3.25	7.030	4.57	46.2	0.0	439.8
125.00		1.00	1.05	9.222	10.14	128.41	0.650	0.000	1.75	3.685	2.39	24.3	0.0	87.5
127.00	Appurtenance(s)	1.00	1.06	9.264	10.19	125.87	0.650	0.000	2.00	4.125	2.68	27.3	0.0	98.0
130.00		1.00	1.07	9.326	10.26	122.02	0.650	0.000	3.00	6.015	3.91	40.1	0.0	142.8
135.00		1.00	1.08	9.427	10.37	115.53	0.650	0.000	5.00	9.565	6.22	64.5	0.0	227.0
137.00	Appurtenance(s)	1.00	1.08	9.466	10.41	112.91	0.650	0.000	2.00	3.665	2.38	24.8	0.0	87.0
140.00		1.00	1.09	9.525	10.48	108.94	0.650	0.000	3.00	5.326	3.46	36.3	0.0	126.3
145.00		1.00	1.10	9.621	10.58	102.27	0.650	0.000	5.00	8.417	5.47	57.9	0.0	199.5
150.00		1.00	1.11	9.715	10.69	95.50	0.650	0.000	5.00	7.843	5.10	54.5	0.0	185.8
155.00	Appurtenance(s)	1.00	1.12	9.806	10.79	88.66	0.650	0.000	5.00	7.268	4.72	51.0	0.0	172.0
								Totals:	**155.00**			**2,645.9**		**22,570.6**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

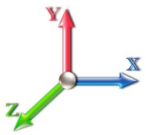
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	155.00	800 MHz RRH	3	9.849	10.834	0.92	1.00	6.87	159.00	0.000	2.400	74.46	0.00	178.70
2	155.00	APXVSPP18-C-A20	3	9.849	10.834	0.82	1.00	19.73	171.00	0.000	2.400	213.75	0.00	513.01
3	155.00	ACU-A20-N	4	9.849	10.834	1.00	1.00	0.56	4.00	0.000	2.400	6.07	0.00	14.56
4	155.00	APXVTM14-C-120	3	9.849	10.834	0.76	1.00	14.46	168.00	0.000	2.400	156.61	0.00	375.87
5	155.00	TD-RRH8x20-25	3	9.849	10.834	0.68	1.00	8.26	210.00	0.000	2.400	89.51	0.00	214.83
6	155.00	6' Lightning rod	1	9.806	10.787	1.00	1.00	0.38	6.50	0.000	0.000	4.10	0.00	0.00
7	155.00	ALU 800MHz External	3	9.849	10.834	0.69	1.00	1.61	26.40	0.000	2.400	17.49	0.00	41.98
8	155.00	1900MHz RRH	3	9.849	10.834	1.00	1.00	11.40	132.00	0.000	2.400	123.51	0.00	296.43
9	155.00	Low Profile Platform	1	9.806	10.787	1.00	1.00	22.00	1500.00	0.000	0.000	237.31	0.00	0.00
10	155.00	Collar Mount	1	9.806	10.787	0.56	0.75	2.81	250.00	0.000	0.000	30.34	0.00	0.00
11	137.00	Low Profile Platform	1	9.466	10.413	1.00	1.00	25.00	1200.00	0.000	0.000	260.33	0.00	0.00
12	137.00	DB-T1-6Z-8AB-0Z	2	9.466	10.413	0.80	0.80	7.68	88.00	0.000	0.000	79.97	0.00	0.00
13	137.00	FD9R6004/2C-3L (3.1 lbs)	6	9.466	10.413	0.50	0.80	1.07	18.60	0.000	0.000	11.16	0.00	0.00
14	137.00	RRH2X60-700	3	9.466	10.413	0.58	0.80	6.13	180.00	0.000	0.000	63.85	0.00	0.00
15	137.00	RRH2X60-PCS	3	9.466	10.413	0.71	0.80	4.70	165.00	0.000	0.000	48.93	0.00	0.00
16	137.00	4X45 RRH AWS	3	9.466	10.413	0.66	0.80	5.33	186.00	0.000	0.000	55.54	0.00	0.00
17	137.00	LPA-80080-6CF-EDIN	2	9.466	10.413	0.74	0.80	6.44	42.00	0.000	0.000	67.09	0.00	0.00
18	137.00	LPA-80080/4CF ___	2	9.466	10.413	0.74	0.80	3.88	24.00	0.000	0.000	40.44	0.00	0.00
19	137.00	SBNHH-1D65B	6	9.466	10.413	0.66	0.80	31.80	304.26	0.000	0.000	331.17	0.00	0.00
20	137.00	LPA-80063/6CF	2	9.466	10.413	0.75	0.80	14.44	54.00	0.000	0.000	150.35	0.00	0.00
21	127.00	860 10025	6	9.264	10.190	0.56	0.80	0.60	7.20	0.000	0.000	6.16	0.00	0.00
22	127.00	RRU 11	3	9.264	10.190	0.54	0.80	7.21	165.00	0.000	0.000	73.51	0.00	0.00
23	127.00	P65-16-XLH-RR	3	9.264	10.190	0.60	0.80	14.69	159.00	0.000	0.000	149.67	0.00	0.00
24	127.00	RRUS 12	3	9.264	10.190	0.54	0.80	4.34	180.00	0.000	0.000	44.24	0.00	0.00
25	127.00	DC6-48-60-18-8F	1	9.264	10.190	0.80	0.80	1.18	31.80	0.000	0.000	11.98	0.00	0.00
26	127.00	7770	3	9.264	10.190	0.60	0.80	9.90	105.00	0.000	0.000	100.88	0.00	0.00
27	127.00	LGP21401	6	9.264	10.190	0.51	0.80	3.96	84.60	0.000	0.000	40.38	0.00	0.00
28	127.00	Low Profile Platform	1	9.264	10.190	1.00	1.00	22.00	1500.00	0.000	0.000	224.18	0.00	0.00
29	117.00	T-Arms	3	9.049	9.954	0.56	0.75	13.50	1050.00	0.000	0.000	134.38	0.00	0.00
30	117.00	AIR 21, 1.3M, B4A B2P	3	9.049	9.954	0.66	0.80	12.13	271.20	0.000	0.000	120.76	0.00	0.00
31	117.00	AIR 21, 1.3M, B2A B4P	3	9.049	9.954	0.66	0.80	12.13	274.50	0.000	0.000	120.76	0.00	0.00
							Totals:		**8,717.06**			**3,088.89**		

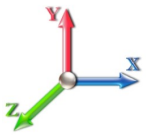
Total Applied Force Summary

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 32

Load Case: 1.0D + 1.0W 60 mph Wind

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		104.10	1307.57	0.00	0.00
10.00		101.59	1280.08	0.00	0.00
15.00		99.07	1252.60	0.00	0.00
20.00		96.55	1225.11	0.00	0.00
25.00		94.04	1197.62	0.00	0.00
30.00		91.60	1170.13	0.00	0.00
35.00		93.09	1142.65	0.00	0.00
40.00		93.98	1115.16	0.00	0.00
44.00		75.23	872.34	0.00	0.00
45.00		18.96	398.09	0.00	0.00
49.75		91.09	1860.89	0.00	0.00
50.00		4.73	53.12	0.00	0.00
55.00		95.60	1047.88	0.00	0.00
60.00		94.93	1020.39	0.00	0.00
65.00		93.99	992.91	0.00	0.00
70.00		92.79	965.42	0.00	0.00
75.00		92.16	937.93	0.00	0.00
80.00		91.54	910.44	0.00	0.00
85.00		90.77	882.96	0.00	0.00
89.50		80.84	771.16	0.00	0.00
90.00		9.04	140.89	0.00	0.00
93.75		67.85	1040.59	0.00	0.00
95.00		22.25	180.67	0.00	0.00
100.00		88.77	708.36	0.00	0.00
105.00		87.49	685.45	0.00	0.00
110.00		86.11	662.55	0.00	0.00
115.00		84.62	639.64	0.00	0.00
117.00	(9) attachments	409.18	1845.14	0.00	0.00
120.00		43.07	326.55	0.00	0.00
123.25		46.16	511.45	0.00	0.00
125.00		24.29	126.08	0.00	0.00
127.00	(26) attachments	678.33	2374.63	0.00	0.00
130.00		40.11	188.52	0.00	0.00
135.00		64.47	303.21	0.00	0.00
137.00	(30) attachments	1133.64	2379.30	0.00	0.00
140.00		36.27	134.23	0.00	0.00
145.00		57.90	212.72	0.00	0.00
150.00		54.48	198.98	0.00	0.00
155.00	(25) attachments	1004.12	2812.14	0.00	1635.39
	Totals:	**5,734.80**	**35,875.55**	**0.00**	**1,635.39**

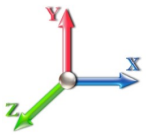
Linear Appurtenance Segment Forces (Factored)

Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.069	0.000	6.129	0.00	62.40
5.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	6.129	0.00	5.50
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.071	0.000	6.129	0.00	62.40
10.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.071	0.000	6.129	0.00	5.50
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.073	0.000	6.129	0.00	62.40
15.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.073	0.000	6.129	0.00	5.50
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.075	0.000	6.129	0.00	62.40
20.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.075	0.000	6.129	0.00	5.50
25.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.077	0.000	6.129	0.00	62.40
25.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.077	0.000	6.129	0.00	5.50
30.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.079	0.000	6.134	0.00	62.40
30.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.079	0.000	6.134	0.00	5.50
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.081	0.000	6.410	0.00	62.40
35.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.081	0.000	6.410	0.00	5.50
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.084	0.000	6.659	0.00	62.40
40.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.084	0.000	6.659	0.00	5.50
44.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.086	0.000	6.843	0.00	49.92
44.00	1 5/8" Hybrid	Yes	4.00	0.000	0.00	0.00	0.00	0.086	0.000	6.843	0.00	4.40
45.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.087	0.000	6.887	0.00	12.48
45.00	1 5/8" Hybrid	Yes	1.00	0.000	0.00	0.00	0.00	0.087	0.000	6.887	0.00	1.10
49.75	1 5/8" Coax	Yes	4.75	0.000	3.96	1.57	0.00	0.089	0.000	7.088	0.00	59.28
49.75	1 5/8" Hybrid	Yes	4.75	0.000	0.00	0.00	0.00	0.089	0.000	7.088	0.00	5.23
50.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.089	0.000	7.098	0.00	3.12
50.00	1 5/8" Hybrid	Yes	0.25	0.000	0.00	0.00	0.00	0.089	0.000	7.098	0.00	0.28
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.090	0.000	7.294	0.00	62.40
55.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.090	0.000	7.294	0.00	5.50
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.093	0.000	7.477	0.00	62.40
60.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.093	0.000	7.477	0.00	5.50
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.096	0.000	7.650	0.00	62.40
65.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	7.650	0.00	5.50
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.099	0.000	7.814	0.00	62.40
70.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.099	0.000	7.814	0.00	5.50
75.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.103	1.009	7.969	0.00	62.40
75.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.103	1.009	7.969	0.00	5.50
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.107	1.020	8.118	0.00	62.40
80.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.020	8.118	0.00	5.50
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.111	1.033	8.260	0.00	62.40
85.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.111	1.033	8.260	0.00	5.50
89.50	1 5/8" Coax	Yes	4.50	0.000	3.96	1.48	0.00	0.115	1.045	8.382	0.00	56.16
89.50	1 5/8" Hybrid	Yes	4.50	0.000	0.00	0.00	0.00	0.115	1.045	8.382	0.00	4.95
90.00	1 5/8" Coax	Yes	0.50	0.000	3.96	0.17	0.00	0.117	1.052	8.396	0.00	6.24
90.00	1 5/8" Hybrid	Yes	0.50	0.000	0.00	0.00	0.00	0.117	1.052	8.396	0.00	0.55
93.75	1 5/8" Coax	Yes	3.75	0.000	3.96	1.24	0.00	0.119	1.058	8.494	0.00	46.80
93.75	1 5/8" Hybrid	Yes	3.75	0.000	0.00	0.00	0.00	0.119	1.058	8.494	0.00	4.13
95.00	1 5/8" Coax	Yes	1.25	0.000	3.96	0.41	0.00	0.120	1.059	8.526	0.00	15.60
95.00	1 5/8" Hybrid	Yes	1.25	0.000	0.00	0.00	0.00	0.120	1.059	8.526	0.00	1.38
100.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.123	1.069	8.652	0.00	62.40

Linear Appurtenance Segment Forces (Factored)

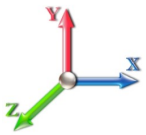
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
100.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.069	8.652	0.00	5.50
105.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.128	1.085	8.774	0.00	62.40
105.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.128	1.085	8.774	0.00	5.50
110.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.134	1.103	8.891	0.00	62.40
110.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.134	1.103	8.891	0.00	5.50
115.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.141	1.123	9.005	0.00	62.40
115.00	1 5/8" Hybrid	Yes	5.00	0.000	0.00	0.00	0.00	0.141	1.123	9.005	0.00	5.50
117.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.146	1.138	9.049	0.00	24.96
117.00	1 5/8" Hybrid	Yes	2.00	0.000	0.00	0.00	0.00	0.146	1.138	9.049	0.00	2.20
										Totals:	**0.0**	**1,588.9**

Calculated Forces

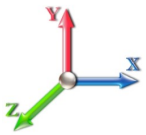
Structure:	CT00248-S-SBA	**Code:**	EIA/TIA-222-G	11/8/2016	
Site Name:	North Bethel	**Exposure:**	B		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-35.87	-5.74	0.00	-642.55	0.00	642.55	4331.76	2165.88	10060.7	5037.85	0.00	0.000	0.000	0.136
5.00	-34.56	-5.66	0.00	-613.82	0.00	613.82	4271.91	2135.96	9681.61	4848.00	0.02	-0.033	0.000	0.135
10.00	-33.28	-5.58	0.00	-585.52	0.00	585.52	4209.88	2104.94	9304.37	4659.10	0.07	-0.067	0.000	0.134
15.00	-32.02	-5.50	0.00	-557.63	0.00	557.63	4145.67	2072.83	8929.41	4471.34	0.16	-0.102	0.000	0.132
20.00	-30.80	-5.42	0.00	-530.15	0.00	530.15	4079.27	2039.64	8557.10	4284.91	0.29	-0.138	0.000	0.131
25.00	-29.59	-5.34	0.00	-503.06	0.00	503.06	4010.69	2005.34	8187.79	4099.98	0.45	-0.174	0.000	0.130
30.00	-28.42	-5.26	0.00	-476.37	0.00	476.37	3939.93	1969.96	7821.85	3916.74	0.65	-0.212	0.000	0.129
35.00	-27.28	-5.18	0.00	-450.06	0.00	450.06	3866.98	1933.49	7459.66	3735.38	0.90	-0.251	0.000	0.128
40.00	-26.16	-5.10	0.00	-424.14	0.00	424.14	3791.85	1895.92	7101.59	3556.07	1.18	-0.291	0.000	0.126
44.00	-25.28	-5.03	0.00	-403.74	0.00	403.74	3730.17	1865.09	6818.34	3414.24	1.44	-0.324	0.000	0.125
45.00	-24.88	-5.02	0.00	-398.71	0.00	398.71	3714.54	1857.27	6747.99	3379.01	1.51	-0.333	0.000	0.125
49.75	-23.02	-4.93	0.00	-374.87	0.00	374.87	3683.20	1841.60	6608.77	3309.30	1.86	-0.373	0.000	0.120
50.00	-22.97	-4.93	0.00	-373.63	0.00	373.63	3679.23	1839.62	6591.31	3300.56	1.88	-0.375	0.000	0.119
55.00	-21.92	-4.84	0.00	-348.99	0.00	348.99	3598.76	1799.38	6244.86	3127.07	2.29	-0.416	0.000	0.118
60.00	-20.89	-4.76	0.00	-324.78	0.00	324.78	3516.10	1758.05	5903.79	2956.28	2.75	-0.458	0.000	0.116
65.00	-19.90	-4.67	0.00	-301.00	0.00	301.00	3431.27	1715.63	5568.46	2788.37	3.25	-0.502	0.000	0.114
70.00	-18.93	-4.58	0.00	-277.66	0.00	277.66	3344.24	1672.12	5239.26	2623.52	3.80	-0.546	0.000	0.112
75.00	-17.99	-4.49	0.00	-254.76	0.00	254.76	3255.04	1627.52	4916.54	2461.92	4.40	-0.591	0.000	0.109
80.00	-17.08	-4.41	0.00	-232.29	0.00	232.29	3137.93	1568.96	4563.27	2285.03	5.04	-0.637	0.000	0.107
85.00	-16.19	-4.32	0.00	-210.26	0.00	210.26	3017.89	1508.95	4219.09	2112.68	5.74	-0.684	0.000	0.105
89.50	-15.42	-4.23	0.00	-190.82	0.00	190.82	2909.87	1454.93	3920.86	1963.34	6.40	-0.727	0.000	0.103
90.00	-15.28	-4.23	0.00	-188.71	0.00	188.71	2897.86	1448.93	3888.39	1947.09	6.48	-0.732	0.000	0.102
93.75	-14.23	-4.15	0.00	-172.85	0.00	172.85	2354.99	1177.49	3133.69	1569.17	7.07	-0.768	0.000	0.116
95.00	-14.05	-4.14	0.00	-167.66	0.00	167.66	2336.81	1168.40	3076.66	1540.62	7.27	-0.781	0.000	0.115
100.00	-13.34	-4.05	0.00	-146.97	0.00	146.97	2262.72	1131.36	2851.92	1428.08	8.12	-0.835	0.000	0.109
105.00	-12.65	-3.97	0.00	-126.71	0.00	126.71	2165.47	1082.73	2607.63	1305.76	9.02	-0.888	0.000	0.103
110.00	-11.99	-3.88	0.00	-106.89	0.00	106.89	2065.44	1032.72	2371.09	1187.31	9.98	-0.941	0.000	0.096
115.00	-11.35	-3.79	0.00	-87.49	0.00	87.49	1965.41	982.71	2145.79	1074.49	10.99	-0.991	0.000	0.087
117.00	-9.51	-3.35	0.00	-79.91	0.00	79.91	1925.40	962.70	2058.82	1030.94	11.41	-1.011	0.000	0.082
120.00	-9.18	-3.31	0.00	-69.85	0.00	69.85	1865.39	932.69	1931.73	967.30	12.06	-1.039	0.000	0.077
123.25	-8.67	-3.26	0.00	-59.10	0.00	59.10	1005.19	502.59	1030.12	515.83	12.77	-1.069	0.000	0.123
125.00	-8.54	-3.23	0.00	-53.40	0.00	53.40	992.91	496.46	998.01	499.75	13.17	-1.084	0.000	0.116
127.00	-6.18	-2.51	0.00	-46.93	0.00	46.93	978.56	489.28	961.59	481.51	13.63	-1.110	0.000	0.104
130.00	-5.99	-2.47	0.00	-39.40	0.00	39.40	956.38	478.19	907.53	454.44	14.34	-1.146	0.000	0.093
135.00	-5.69	-2.41	0.00	-27.03	0.00	27.03	917.66	458.83	819.21	410.21	15.57	-1.197	0.000	0.072
137.00	-3.33	-1.22	0.00	-22.21	0.00	22.21	901.57	450.78	784.57	392.87	16.07	-1.215	0.000	0.060
140.00	-3.20	-1.19	0.00	-18.54	0.00	18.54	876.76	438.38	733.42	367.25	16.84	-1.239	0.000	0.054
145.00	-2.99	-1.13	0.00	-12.61	0.00	12.61	833.68	416.84	650.52	325.74	18.16	-1.274	0.000	0.042
150.00	-2.79	-1.07	0.00	-6.98	0.00	6.98	781.24	390.62	565.69	283.26	19.51	-1.301	0.000	0.028
155.00	0.00	-1.00	0.00	-1.64	0.00	1.64	721.23	360.61	481.69	241.20	20.88	-1.316	0.000	0.007

Final Analysis Summary

Structure:	CT00248-S-SBA		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 36

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 93 mph Wind	22.1	0.00	43.03	0.00	0.00	2485.24
0.9D + 1.6W 93 mph Wind	22.1	0.00	32.26	0.00	0.00	2459.58
1.2D + 1.0Di + 1.0Wi 50 mph Wind	6.9	0.00	70.32	0.00	0.00	769.07
1.2D + 1.0E	1.8	0.00	43.05	0.00	0.00	215.39
0.9D + 1.0E	1.8	0.00	32.29	0.00	0.00	212.98
1.0D + 1.0W 60 mph Wind	5.7	0.00	35.87	0.00	0.00	642.55

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 93 mph Wind	-43.03	-22.09	0.00	-2485.2	0.00	-2485.2	4331.76	2165.8	10060.7	5037.85	0.00	0.503
0.9D + 1.6W 93 mph Wind	-32.26	-22.08	0.00	-2459.5	0.00	-2459.5	4331.76	2165.8	10060.7	5037.85	0.00	0.496
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-70.32	-6.88	0.00	-769.07	0.00	-769.07	4331.76	2165.8	10060.7	5037.85	0.00	0.169
1.2D + 1.0E	-10.47	-1.31	0.00	-33.02	0.00	-33.02	1005.19	502.59	1030.12	515.83	123.25	0.074
0.9D + 1.0E	-7.85	-1.29	0.00	-32.62	0.00	-32.62	1005.19	502.59	1030.12	515.83	123.25	0.071
1.0D + 1.0W 60 mph Wind	-35.87	-5.74	0.00	-642.55	0.00	-642.55	4331.76	2165.8	10060.7	5037.85	0.00	0.136

Base Plate Summary

Structure:	CT00248-S-SB		**Code:**	EIA/TIA-222-G	11/8/2016
Site Name:	North Bethel		**Exposure:**	B	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 37

Tower Engineering Solutions

Reactions

Original Design

Moment (kip-ft):	3850.00
Axial (kip):	38.70
Shear (kip):	32.40

Analysis

Moment (kip-ft):	2485.24
Axial (kip):	70.32
Shear (kip):	22.09
Moment Design %:	64.55

Base Plate

Yield (ksi):	50.00
Width (in):	64.00
Style:	Clipped
Polygon Sides:	0.00
Clip Length (in):	15.00
Effective Len (in):	8.82
Moment (kip-in):	346.71
Allow Stress (ksi):	67.50
Applied Stress (ksi):	0.00
Stress Ratio:	0.46

Anchor Bolts

Bolt Circle:	64.00
Number Bolts:	20.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Clustered
Cluster Dist (in):	6.00
Start Angle (deg):	45.00

Compression

Force (kip):	96.71
Allowable (kip):	260.00
Ratio:	0.38

Tension

Force (kip):	89.68
Allowable (kip):	260.00
Ratio:	0.35

Monopole Mat Foundation Design

			Date: 11/8/2016
Customer Name:	AT&T	**EIA/TIA Standard:**	EIA-222-G
Site Name:	North Bethal	**Structure Height (Ft.):**	155
Site Number:	CT00248-S-SBA	**Engineer Name:**	S. Hesselbein
Engr. Number:	27571	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

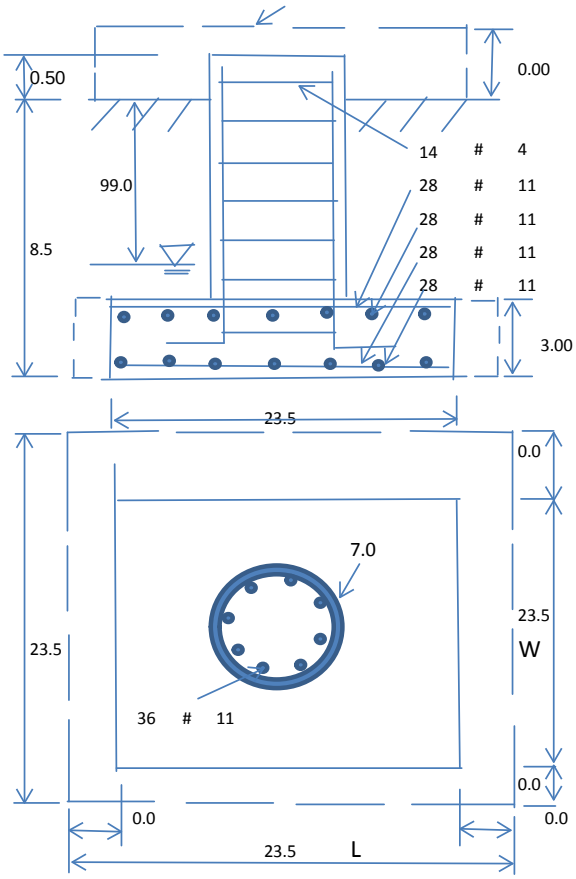
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	43.0	Shear Force (Kips):	22.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2485.2
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	8.5
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	3.00
Length of Pad (ft.):	23.5	Width of Pad (ft.):	23.5
Final Length of pad (ft)	23.5	Final width of pad (ft):	23.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	40	
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	36	Tie Spacing (in):	8.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	11	
Concrete Cover (in.):	4	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	28	Qty. of Rebar in Pad (W):	28	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	28	Qty. of Rebar in Pad (W):	28	
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):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	5000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	2825.71	Total Dry Soil Weight (Kips):	353.21
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	353.21	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1887.66	Total Dry Concrete Weight (Kips):	283.15
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	283.15	Total Vertical Load on Base (Kips):	679.39

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	2300	<	Allowable Factored Soil Bearing (psf):	3750	0.61	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	7235.1	>	Design Factored Momont (kips-ft):	2684	0.37	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.70	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75			
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00			
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	1.56		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	8832.5	>	Design Factored Moment (Mu, Kips-F	2617.8	0.30	OK!
Calculated Shear Capacity (Kips):	589.7	>	Design Factored Shear (Kips):	22.1	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	3032.6	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7273.9	>	Design Factored Axial Load (Pu Kips):	43.0	0.01	OK!
Moment & Axial Strength Combination:	0.30	OK!	Check Tie Spacing (Design/Required):		0.6667	OK!
Pier Reinforcement Ratio:	0.010	Reinforcement Ratio is satisfied per ACI				
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	725.5	>	One-Way Factored Shear (L-D. Kips):	185.1	0.26	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	725.5	>	One-Way Factored Shear (W-D., Kips)	185.1	0.26	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	809.9	>	One-Way Factored Shear (C-C, Kips):	302.2	0.37	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0049	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0049		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5796.6	>	Moment at Bottom (L-Direct. K-Ft):	521.9	0.09	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5796.6	>	Moment at Bottom (W-Direct. K-Ft):	521.9	0.09	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8062.5	>	Moment at Bottom (C-C Dir. K-Ft):	738.1	0.09	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0049	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0049		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	5796.6	>	Moment at the top (L-Dir Kips-Ft):	558.0	0.10	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	5796.6	>	Moment at the top (W-Dir Kips-Ft):	558.0	0.10	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	8062.5	>	Moment at the top (C-C Direc. K-Ft):	317.5	0.04	OK!

PROJECT TEAM

SITE ACQUISITION & ZONING:

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581

ENGINEERING:

TRYLON TSF
1825 W. WALNUT HILL LANE SUITE 302
IRVING, TX 75038
KATYA SERAVALLE
PHONE: 519-465-4125

RF ENGINEER:

AT&T MOBILITY – NEW ENGLAND
550 COCHITUATE ROAD
SUITE 550 13 & 14
FRAMINGHAM, MA 01701
CAMERON SYME
508-596-7146
cs6970@att.com

CONSTRUCTION MANAGEMENT:

EMPIRE TELECOM
16 ESQUIRE ROAD
BILLERICA, MA 01821
GRZEGORZ "GREG" DORMAN
484-683-1750
gdorman@empiretelecomm.com

TOWER OWNER:

SBA TOWERS LLC
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581

SBA SITE ID: CT00248-S
SBA SITE NAME: NORTH BETHEL, CT

SBA REGIONAL SITE MANAGER: STEPHEN ROTH
(860)539-4920
sroth@sbasite.com

GENERAL NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

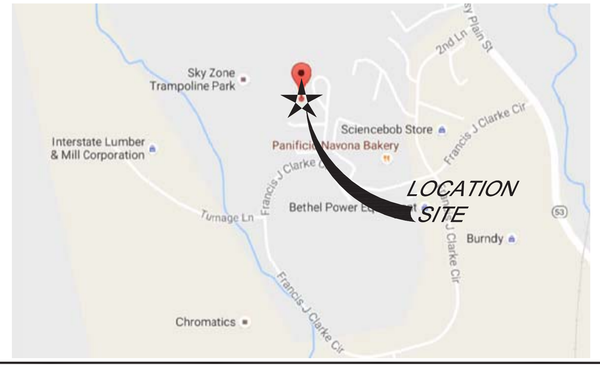
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SITE INFORMATION

LATITUDE:	41° 21' 36.33084" N
LONGITUDE:	-73° 25' 29.99604" W
LAT./LONG. TYPE:	NAD 83
GROUND ELEVATION:	N/A
APN/UPC:	N/A
AREA OF CONSTRUCTION:	EXISTING
ZONING/JURISDICTION:	UNKNOWN
CURRENT ZONING:	UNKNOWN
EXISTING USE:	UNMANNED TELECOMMUNICATIOINS FACILITY
COUNTY:	FAIRFIELD
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.

LTE MULTI CARRIER RRU ADD
CT5513
BETHEL
11 FRANCIS J. CLARKE CIRCLE
BETHEL, CT 06801
FA CODE: 10070932

VICINITY MAP



NOT TO SCALE

NORTH

DRIVING DIRECTIONS

UPDATED 4/04BETHEL WEST CT-513TAKE RT. 287 EAST TO 684 NORTH. GET OFF EXIT FOR 84-EAST DANBURY FOLLOW TO EXIT 5.GO THROUGH STOP SIGN. AT THE LIGHT MAKE A RIGHT AND FOLLOW RT 53 TO SITE..SITE LOCATED UNDER MONOPOLE.DEMARC LOCATED IN COMPOUND. ADDRESS: 11 FRANCIS J CLARK CIR.BETHEL,CONNECTICUT 06801

CODE COMPLIANCE

BUILDING CODE:	2012 INTERNATIONAL BUILDING CODE WITH CONNECTICUT STATE AMENDMENTS
ELECTRICAL CODE:	2014 NATIONAL ELECTRICAL CODE WITH CONNECTICUT STATE AMENDMENTS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

CONNECTICUT ONE CALL SYSTEM, INC. 1-900-922-4455 STOP CALL BEFORE YOU DIG!

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

APPROVALS

AT&T (RF): _____ DATE: _____

AT&T (CONST.): _____ DATE: _____

AT&T (OPS): _____ DATE: _____

TOWER OWNER: _____ DATE: _____

JURISDICTIONAL APPROVAL

BASED ON INFORMATION PROVIDED BY AT&T REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW OR ADMINISTRATIVE REVIEW).

PROJECT DESCRIPTION

THIS PROJECT WILL BE COMPRISED OF:
CHANGES ON THE EXISTING MONOPINE TOWER:

- INSTALL (3) NEW RRUS-12, (1) PER SECTOR FOR (3) SECTORS.
- REUSE (3) EXISTING RRUS11.
- REUSE (1) EXISTING FIBER TRUNK.
- REUSE (2) EXISTING DC TRUNK.
- REUSE (1) EXISTING DC/FIBER SQUID.
- REUSE (6) EXISTING RF CABLES.

Michael Plahovinsak
Digitally signed by Michael Plahovinsak
Date: 2016.11.07 17:45:59 -05'00'

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GROUNDING & GENERAL NOTES
A-1	SITE PLAN
A-2	EQUIPMENT LAYOUT
A-3	ANTENNA LAYOUTS & TOWER ELEVATION
A-4	DETAILS
G-1	GROUNDING, ONE-LINE DIAGRAM & DETAILS

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE
125 WESTBOROUGH, MA 01581

PLANS PREPARED BY:
Trylon
1825 W. WALNUT HILL LANE SUITE 302
IRVING, TX 5038
519-465-4125

NO.	DATE	DESCRIPTION	BY
A	11/02/16	FOR REVIEW	GM
B	11/07/16	UPDATED AS PER REDLINES	GM

SITE INFORMATION:
CT5513
BETHEL
FA CODE: 10070932
11 FRANCIS J. CLARKE CIRCLE
BETHEL, CT 06801

SEAL:
STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
REGISTERED PROFESSIONAL ENGINEER
11-7-2016
MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18391 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – EMPIRE TELECOM
   SUBCONTRACTOR – TBD (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR

9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCR1 'AP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
    - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
    - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS

20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
    - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
    - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
    - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
    - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
    - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
    - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
    - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').

14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE
125 WESTBOROUGH, MA 01581

PLANS PREPARED BY:
Trylon
1825 W. WALNUT HILL LANE SUITE 302
IRVING, TX 5038
519-465-4125

NO.	DATE	DESCRIPTION	BY
A	11/02/16	FOR REVIEW	GM
B	11/07/16	UPDATED AS PER REDLINES	GM

SITE INFORMATION:

CT5513
BETHEL
FA CODE: 10070932

11 FRANCIS J. CLARKE CIRCLE
BETHEL, CT 06801

SEAL:

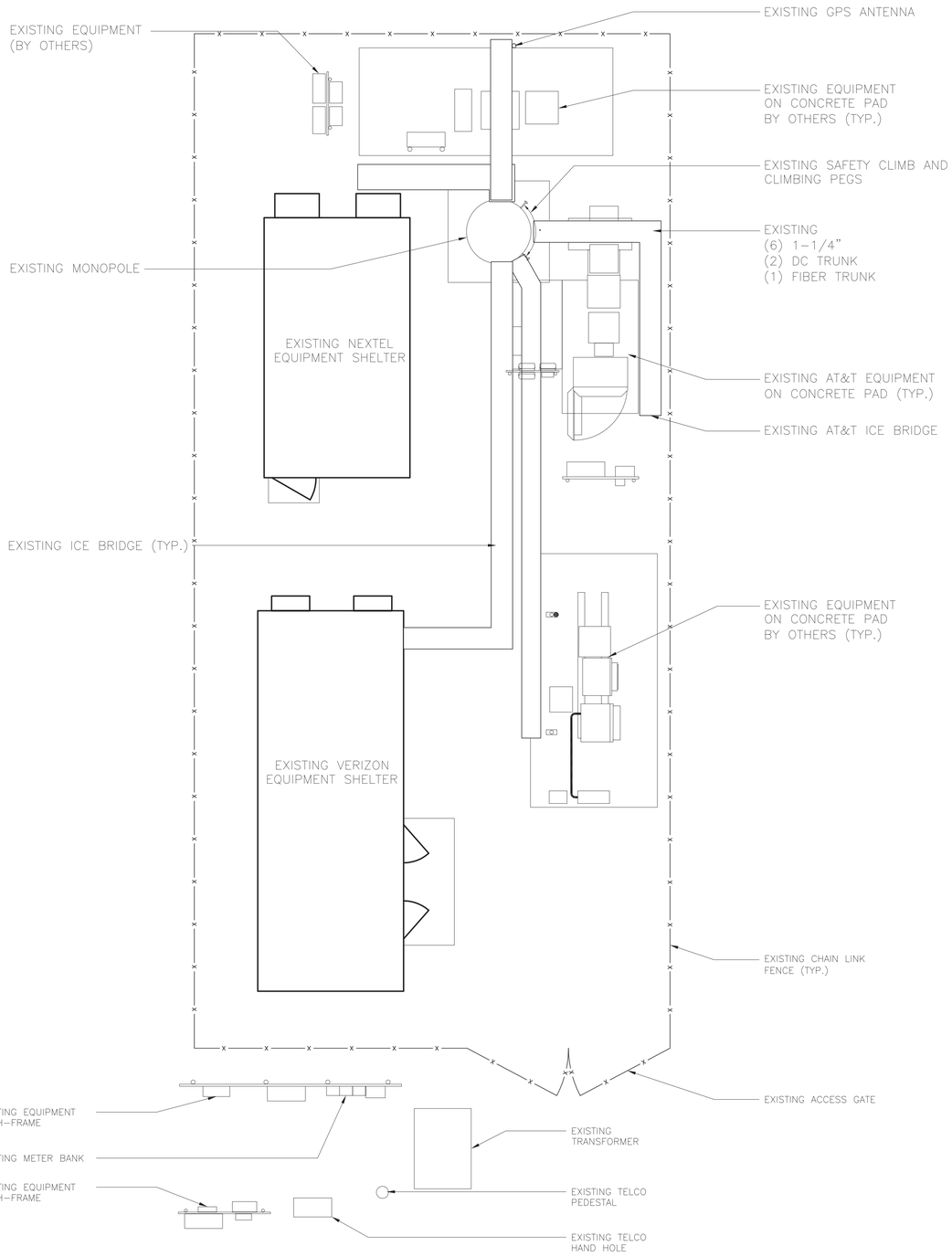
MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

SHEET TITLE:

GENERAL NOTES &
GROUNDING NOTES

SHEET NUMBER:

GN-1



SITE PLAN

22"x34" SCALE: 3/16" = 1'-0"
11"x17" SCALE: 3/32" = 1'-0"

4' 2' 0" 4'

1

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE
125 WESTBOROUGH, MA 01581

PLANS PREPARED BY:
Trylon
1825 W. WALNUT HILL LANE SUITE 302
IRVING, TX 5038
519-465-4125

NO.	DATE	DESCRIPTION	BY
A	11/02/16	FOR REVIEW	GM
B	11/07/16	UPDATED AS PER REDLINES	GM

SITE INFORMATION:

CT5513
BETHEL
FA CODE: 10070932

11 FRANCIS J. CLARKE CIRCLE
BETHEL, CT 06801

SEAL:

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
PROFESSIONAL ENGINEER
11-7-2016

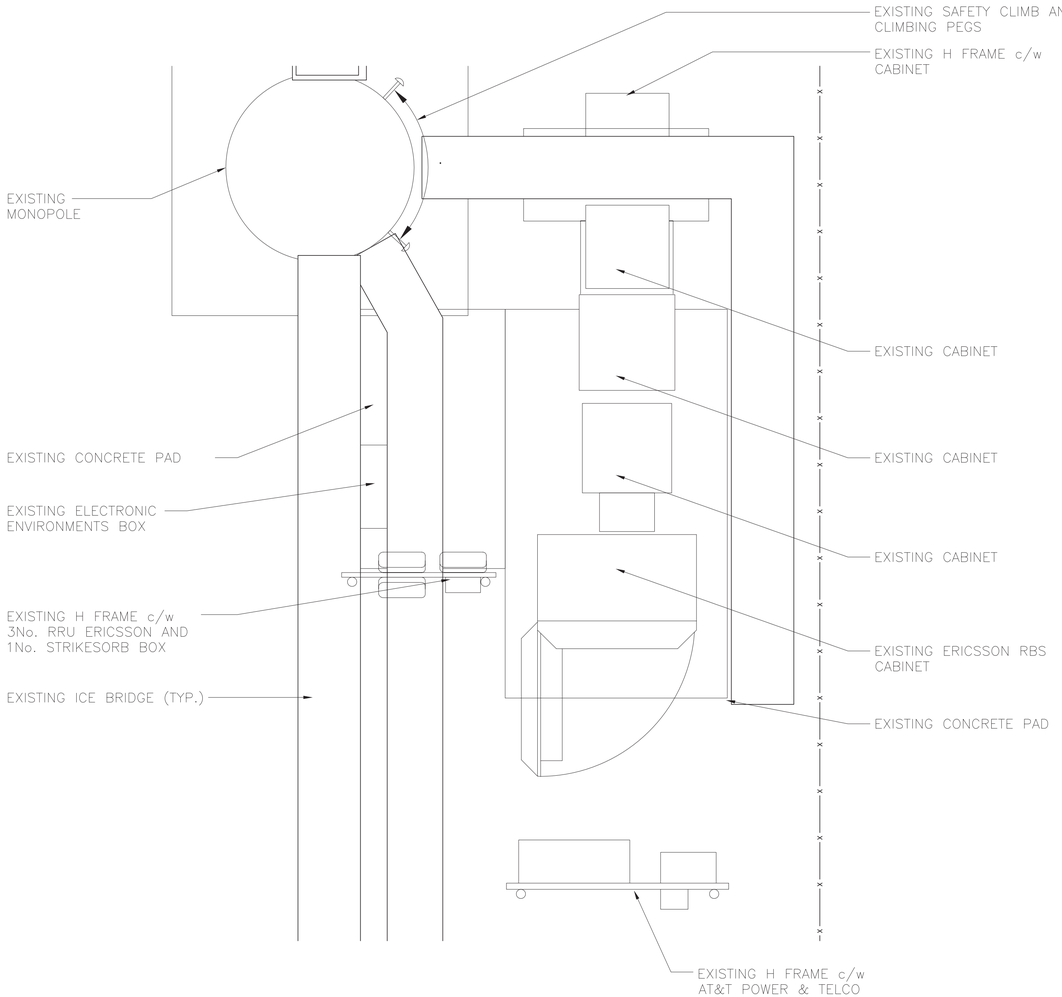
MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

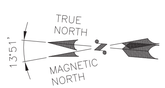
SHEET TITLE:

SITE PLAN

SHEET NUMBER:

A-1





ENLARGED PARTIAL SITE PLAN

22"x34" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

1

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SBA
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11-7-2016

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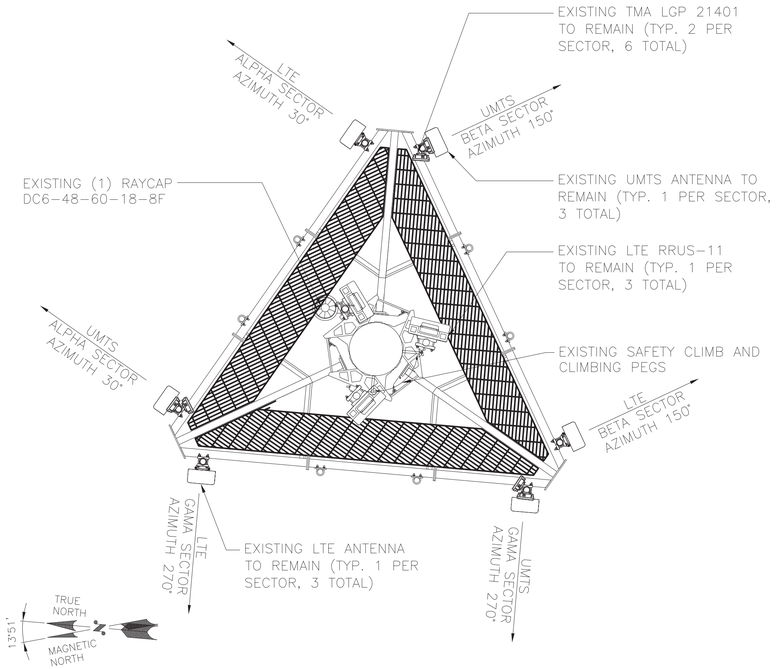
Sole Proprietor - Independent Engineer
18381 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

SHEET TITLE:

EQUIPMENT LAYOUTS

SHEET NUMBER:

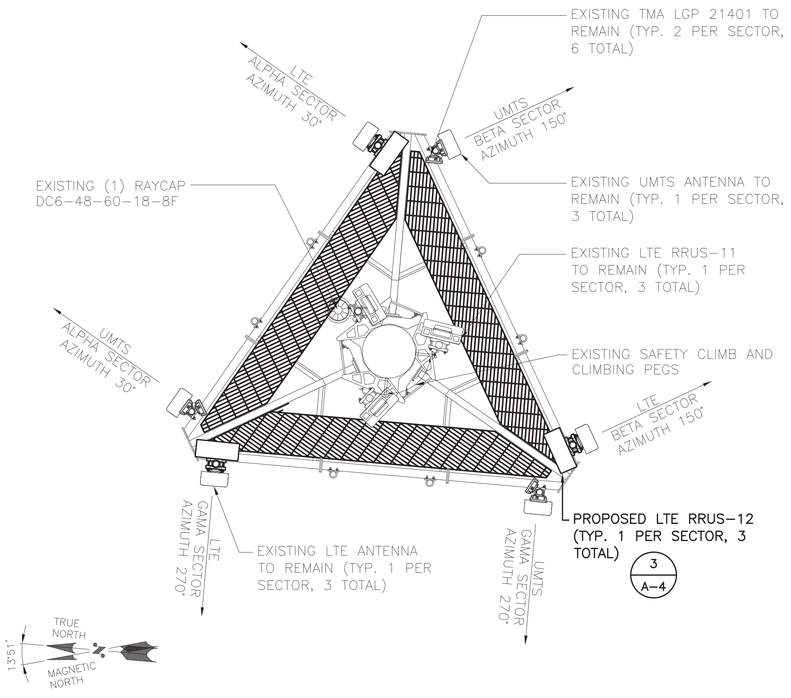
A-2



EXISTING ANTENNA LAYOUT

22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"
2' 1' 0" 2'

1



PROPOSED ANTENNA LAYOUT

22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"
2' 1' 0" 2'

2

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

SOURCE: TRYLON 10/28/16

NOTE:
CARRIER POSITIONS AND RAD ELEVATIONS PROVIDED BY SBA, TRYLON HAS NOT INDEPENDENTLY FIELD VERIFIED.

PROPOSED ELEVATION

22"x34" SCALE: 1" = 10'-0"
11"x17" SCALE: 1" = 20'-0"
10' 5' 0" 10'

3

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

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11 FRANCIS J. CLARKE CIRCLE
BETHEL, CT 06801

SEAL:

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
REGISTERED PROFESSIONAL ENGINEER
11-7-2016

MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
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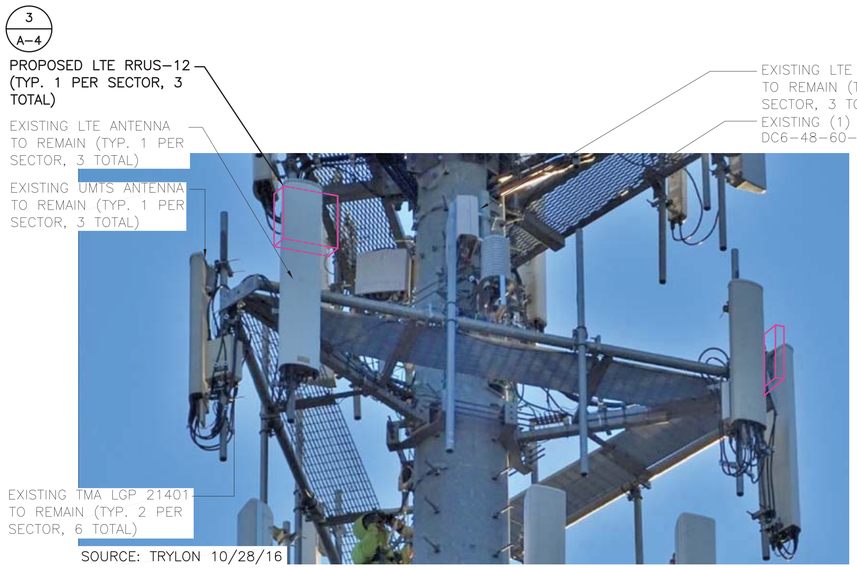
SHEET TITLE:

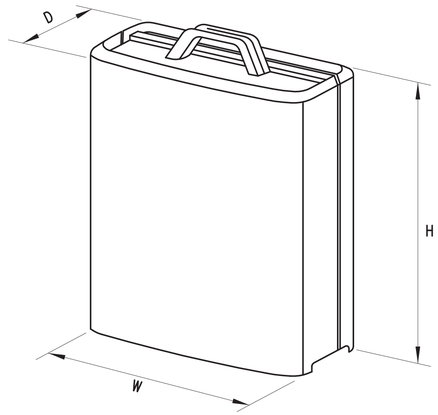
ANTENNA LAYOUTS, TOWER ELEVATION & MOUNTING DETAILS

SHEET NUMBER:

A-3

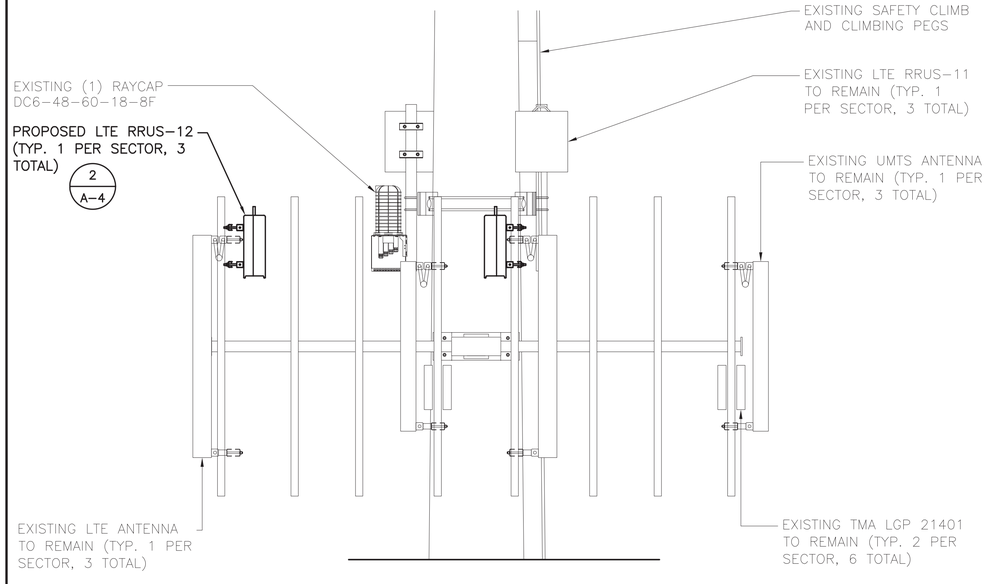


RRUS MOUNT DETAILS | N.T.S | 1



MODEL	H x W x D	WEIGHT
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS

RRUS DETAILS | N.T.S | 2



MOUNTING DETAIL | 22"x34" SCALE: 1/2" = 1'-0" | 11"x17" SCALE: 1/4" = 1'-0" | 2' 1' 0" 2' | 3

NOT USED

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SBA
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PLANS PREPARED BY:
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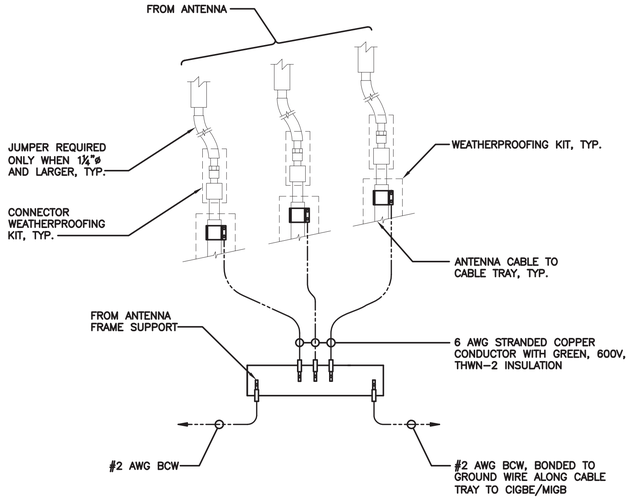
SHEET TITLE:

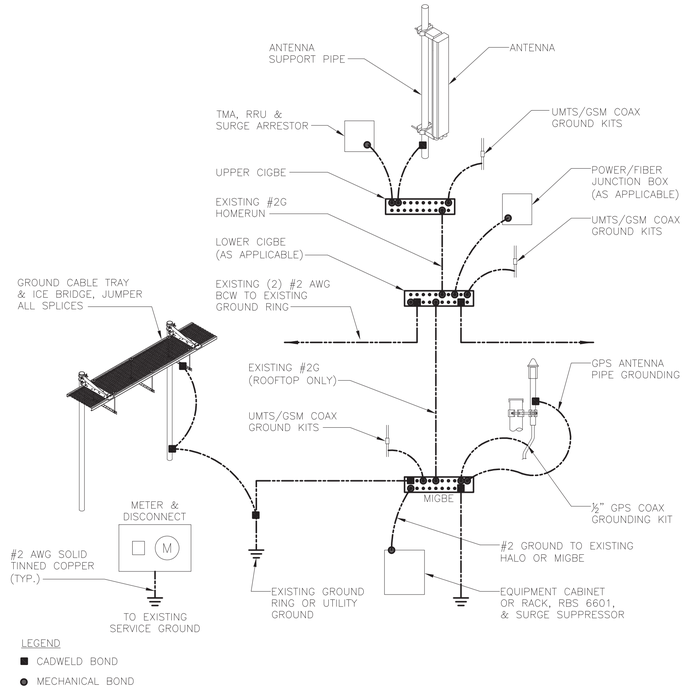
DETAILS

SHEET NUMBER:

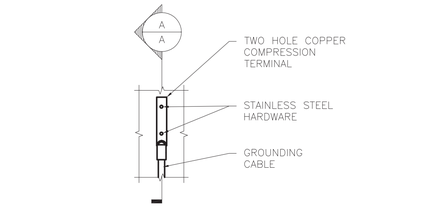
A-4



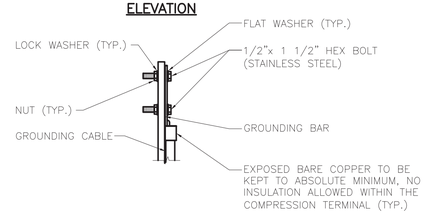
GROUND WIRE TO GROUND BAR CONNECTION DETAILS | N.T.S | 1



GROUND RISER DIAGRAM | N.T.S | 2



ELEVATION

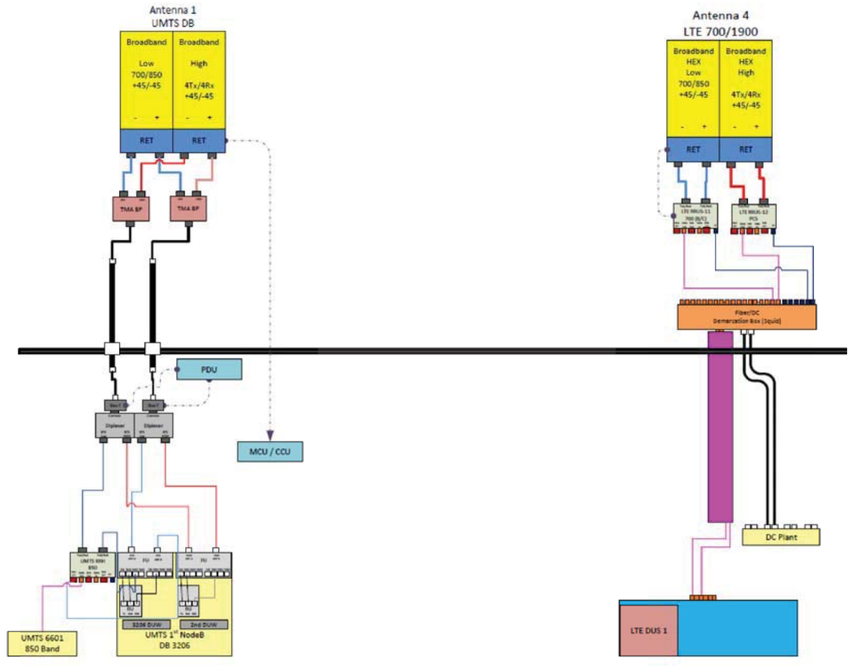


SECTION "A-A"

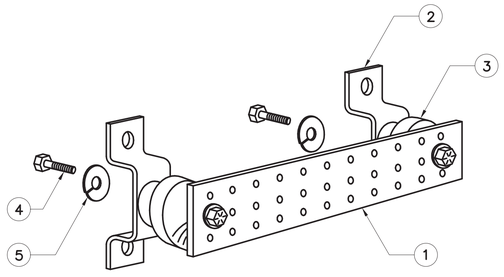
NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAILS | N.T.S | 3



RUN WIRING DIAGRAM | N.T.S | 4



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅜"-11x1" H.H.C.S.
5	4	⅜" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAILS | N.T.S | 5

at&t Mobility
550 COCHITUATE ROAD
FRAMINGHAM,MA 01701

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

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BETHEL, CT 06801

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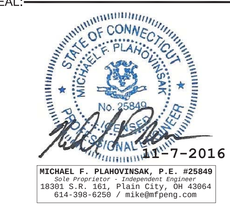

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614-398-6250 / mike@mfpeng.com

SHEET TITLE:

GROUNDING, ONE-LINE DIAGRAM & DETAILS

SHEET NUMBER:

G-1