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

September 12, 2018

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

Notice of Exempt Modification
12 Burr Road, Bloomfield, CT 06002
41 49 4.29 N
-72 45 52.24 W
T-Mobile #: CTHA145B_L700 4x2

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 130-foot level of the existing 140-foot Monopole Tower at 12 Burr Road in Bloomfield, CT. The tower is owned by SBA Towers II, LLC. The property is owned by Maple Hill Farms, Inc. T-Mobile plans to replace (9) existing antennas with (9) newer technology antennas at the 130-foot level of the tower. The full scope of proposed work is as follows:

Remove:
- (1) 1-5/8" lines
- (1) 1-5/8" fiber

Remove and Replace:
- Remove: (3) Ericsson AIR21 B4A/B2P Panel Antennas
  - Replace with: (3) RFS APXVAARR24_43-U-NA20 (Octa) Panel Antennas
- Remove: (3) Commscope LNX-6515DS-A1M Panel Antennas
  - Replace with: (3) Ericsson AIR32 KRD901146-1_B66A (Octa) Panel Antennas
- Remove: (6) Ericsson KRY 112 144/1
  - Replace with (3) Ericsson KRY 112 144/2 TMAs
- Remove: (3) Ericsson S11B12
  - Replace with (3) Ericsson Radio 4449 B71 + B12

Install:
- (2) 1-1/4" fiber

Existing Equipment to Remain (including entitlements):
- (3) Ericsson AIR21 B2A/B4P Panel Antennas
- (17) 1-5/8" line
- (3) T-Arms

This facility was approved by the Council on October 8, 2009, under Docket 379. Approval was given for a 130' monopole no taller than necessary to accommodate the carrier and other entities both public and private. (On January 19, 2012 under Petition No. 1020, MetroPCS received approval to add a 10-foot extension to the tower bringing it to 140-feet.) No platforms were to be permitted on the tower. Space was to be given to the Town of Bloomfield's Fire, Police, and Medical Departments without compensation. Antennas were to be flush or t-arm mounted. An RF report was to be provided when operations caused a change in power density. And upon the establishment of any new state or federal radio frequency standards applicable to the frequency of the facility, it was to be brought into compliance with such standards. This modification complies with the aforementioned conditions.

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 Bloomfield's Mayor, Suzette DeBeatham-Brown, and Zoning Enforcement Officer, Michael Kosilla, as well as to the property owner, Maple Hill Farms, Inc. (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, T-Mobile 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: The Honorable Suzette DeBeatham-Brown / with attachments
Bloomfield Town Hall, 800 Bloomfield Ave., Bloomfield, CT 06002
Michael Kosilla, Zoning Enforcement Officer / with attachments
Bloomfield Town Hall, 800 Bloomfield Ave., Bloomfield, CT 06002
Maple Hill Farms, Inc. / with attachments
12 Burr Rd., Bloomfield, CT 06002

POWER DENSITY

T-Mobile Site Inventory and Power Data

Sector	A	Sector	B	Sector	C
Antenna	1	Antenna	1	Antenna	1
Make / Model:	Ericsson AIR32	Make / Model:	Ericsson AIR32 KRD901146	Make / Model:	Ericsson AIR32 KRD901146
Gain:	15.9	Gain:	15.9 dBd	Gain:	15.9 dBd
Height	130	Height	130	Height	130
Frequency Band	1900 MHz (PCS) / 2100	Frequency Band	1900 MHz (PCS) / 2100	Frequency Band	1900 MHz (PCS) / 2100
Channel	4	Channel	4	Channel	4
Total TX Power (W)	2	Total TX Power (W)	2	Total TX Power (W)	20
ERP	7,780.	ERP	7,780.	ERP	7,780.
Antenna A1	1.	Antenna B1	1.	Antenna C1	1.
Antenna	2	Antenna	2	Antenna	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21	Make / Model:	Ericsson AIR21
Gain:	15.9	Gain:	15.9 dBd	Gain:	15.9 dBd
Height	130	Height	130	Height	130
Frequency Band	1900 MHz (PCS) / 2100	Frequency Band	1900 MHz (PCS) / 2100	Frequency Band	1900 MHz (PCS) / 2100
Channel	2	Channel	2	Channel	2
Total TX Power (W)	5	Total TX Power (W)	5	Total TX Power (W)	5
ERP	2,139.	ERP	2,139.	ERP	2,139.
Antenna A2	0.	Antenna B2	0.	Antenna C2	0.
Antenna	3	Antenna	3	Antenna	3
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height	130	Height	130	Height	130
Frequency Band	600 MHz / 700 MHz	Frequency Band	600 MHz / 700 MHz	Frequency Band	600 MHz / 700 MHz
Channel	4	Channel	4	Channel	4
Total TX Power (W)	1	Total TX Power (W)	1	Total TX Power (W)	12
ERP	2,443.	ERP	2,443.	ERP	2,443.
Antenna A3	1.	Antenna B3	1.	Antenna C3	1.

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	**3.68 %**
Clearwire	**0.22 %**
Verizon Wireless	**5.51 %**
AT&T	**3.37 %**
MetroPCS	**0.46 %**
Site Total MPE %:	**13.24 %**

T-Mobile Sector A Total:	3.68 %
T-Mobile Sector B Total:	3.68 %
T-Mobile Sector C Total:	3.68 %
Site Total:	13.24 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	130	7.28	PCS - 1900 MHz	1000.00	0.73%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	130	10.92	AWS - 2100 MHz	1000.00	1.09%
T-Mobile PCS - 1900 MHz GSM	1	583.57	130	1.36	PCS - 1900 MHz	1000.00	0.14%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	130	3.64	AWS - 2100 MHz	1000.00	0.36%
T-Mobile 600 MHz LTE	2	788.97	130	3.69	600 MHz	400.00	0.92%
T-Mobile 700 MHz LTE	2	432.54	130	2.02	700 MHz	467.00	0.44%
						Total:	**3.68%**

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
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3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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Town of Bloomfield, CT

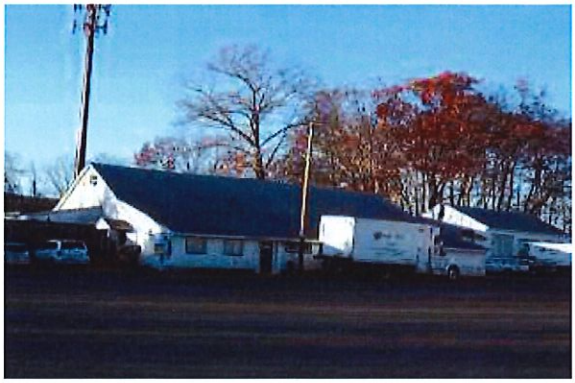
Property Listing Report | Map Block Lot 85-1-126-213 | Account R04478

Property Information

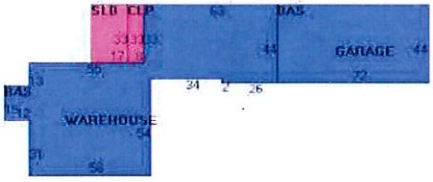
Property Location	12 BURR RD
Owner	MAPLE HILL FARMS INC
Co-Owner	
Mailing Address	12 BURR RD BLOOMFIELD CT 06002
Land Use	300 Industrial
Land Class	I
Zoning Code	R-40
Census Tract	
Sub Lot	

Neighborhood	
Acreage	29.54
Utilities	
Lot Setting/Desc	
Survey Map	
Foundation	POURED CONC.

Photo



Sketch



Primary Construction Details

Year Built	1961
Stories	1
Building Style	Warehouse - Storage
Building Use	Industrial
Building Condition	D
Floors	Concrete
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Gable
Roof Cover	Asphalt Shingl

Exterior Walls	T111
Interior Walls	Average
Heating Type	Forced Air
Heating Fuel	Gas
AC Type	
Gross Bldg Area	10546
Total Living Area	9721

Report Created On 9/5/2018

Town of Bloomfield, CT

Property Listing Report | Map Block Lot 85-1-126-213 | Account R04478

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	449200	314440
Extras	3200	2240
Outbuildings	29000	20300
Land	408900	286230
Total	890300	623210

Outbuilding and Extra Items

Type	Description
Ovhd 8'	8 UNITS
Shed	288 S.F.
Shed	288 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Covered Loading Platform	264	0
Slab	561	0
First Floor	9721	9721
Total Area	10546	9721

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
MAPLE HILL FARMS INC	79/ 335	5/9/1957	0

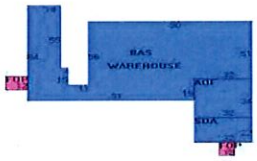
Report Created On 9/5/2018

Town of Bloomfield, CT

Property Listing Report | Map Block Lot 85-1-126-213 | Account R04478

Photo

Sketch



Primary Construction Details

Year Built	2005	Kitchen Style	
Stories	1	Roof Style	Gable
Building Style	Warehouse - Storage	Roof Cover	Metal/Tin
Building Use	Industrial	Exterior Walls	Pre-finsh Metl
Building Condition	C	Interior Walls	Average
Floors	Concrete	Heating Type	Hot Air-No Duc
Total Rooms		Heating Fuel	Gas
Bedrooms		AC Type	
Bathrooms		Gross Bldg Area	
Bath Style		Total Living Area	
Half Bath			

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Finished Open Po	240	0
Store Display	704	704
Office Area	1088	1088
First Floor	7474	7474
Total Area		

Report Created On 9/5/2018

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTHA145B

Maple Hill Farms
12 Burr Road
Bloomfield, CT 06002

August 9, 2018

EBI Project Number: 6218005452

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.24 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

August 9, 2018

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

Emissions Analysis for Site: **CTHA145B – Maple Hill Farms**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **12 Burr Road, Bloomfield, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general population 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 population 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 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **12 Burr Road, Bloomfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

7) 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.

8) 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 for directional panel antennas, 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.

9) The antennas used in this modeling are the **Ericsson AIR32 KRD901146-1 B66A/B2A** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

10) The antenna mounting height centerline of the proposed antennas is **130 feet** above ground level (AGL).

11) 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.

12) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 KRD901146-1 B66A/B2A	Make / Model:	Ericsson AIR32 KRD901146-1 B66A/B2A	Make / Model:	Ericsson AIR32 KRD901146-1 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**1.82**	Antenna B1 MPE%	**1.82**	Antenna C1 MPE%	**1.82**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	55	Total TX Power(W):	55	Total TX Power(W):	55
ERP (W):	2,139.75	ERP (W):	2,139.75	ERP (W):	2,139.75
Antenna A2 MPE%	**0.50**	Antenna B2 MPE%	**0.50**	Antenna C2 MPE%	**0.50**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**1.36**	Antenna B3 MPE%	**1.36**	Antenna C3 MPE%	**1.36**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.68 %**
Clearwire	**0.22 %**
Verizon Wireless	**5.51 %**
AT&T	**3.37 %**
MetroPCS	**0.46 %**
Site Total MPE %:	**13.24 %**

T-Mobile Sector A Total:	3.68 %
T-Mobile Sector B Total:	3.68 %
T-Mobile Sector C Total:	3.68 %
Site Total:	13.24 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _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
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	130	7.28	PCS - 1900 MHz	1000.00	0.73%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	130	10.92	AWS - 2100 MHz	1000.00	1.09%
T-Mobile PCS - 1900 MHz GSM	1	583.57	130	1.36	PCS - 1900 MHz	1000.00	0.14%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	130	3.64	AWS - 2100 MHz	1000.00	0.36%
T-Mobile 600 MHz LTE	2	788.97	130	3.69	600 MHz	400.00	0.92%
T-Mobile 700 MHz LTE	2	432.54	130	2.02	700 MHz	467.00	0.44%
						Total:	**3.68%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	3.68 %
Sector B:	3.68 %
Sector C:	3.68 %
T-Mobile Maximum MPE % (Per Sector):	3.68 %
Site Total:	13.24 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.24%** of the allowable FCC established general population 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
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 140 ft. ROHN Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13548-S

Customer Site Name: Bloomfield 4

Carrier Name: T-Mobile

Carrier Site ID / Name: CTHA145B / Maple Hill Farms

Site Location: 12 Burr Road

Bloomfield, Connecticut

Hartford County

Latitude: 41.817858

Longitude: -72.764511

Analysis Result:

Max Structural Usage: 74.7% [Pass]

Max Foundation Usage: 65.0% [Pass]

Additional Usage Caused by Mount Modification: N/A

Report Prepared By: Walter Velez

Introduction

The purpose of this report is to summarize the analysis results on the 140 ft. ROHN 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	Original structural design report & shaft section data prepared by ROHN. Dated 12-02-2009. Drawing No 606820-01-D1. File No 0606820. Previous structural report prepared by Tower Engineering Solutions. Dated 01-12-2016. TES Project No 17787 Rev1.
Foundation Drawing	Original foundation calculations & Drawings prepared by ROHN. Dated 12-02-2009. Drawing No 606820-01-F1 & 606820-01-F2. File No 0606820.
Geotechnical Report	Geotechnical report prepared by Tower Engineering Professionals, Inc. Dated 03-01-2010. Project No 093184.01 Rev 1.
Modification Drawings	Previous modifications by FDH Engineering, Inc. Dated 06-26-2012. Project No 12-02719E S1. / Modification inspection report prepared by FDH Engineering, Inc. Dated 08-30-2012. Project No 1206095TC1.

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} = 125.0 mph (3-Sec. Gust)
(Based on IBC 2012)	Nominal Design Wind Speed V_{asd} = 97.0 mph (3-Sec. Gust)
Wind Speed with Ice:	40 mph (3-Sec. Gust) with 1" 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:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft.
Seismic Parameters:	S_S = 0.181, S_1 = 0.055

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	130.0	3	Ericsson AIR21 B2A/B4P - Panel	(3) T-Arms	(18) 1 5/8"; (1) 1 5/8" Fiber	T-Mobile
2		3	Ericsson AIR21 B4A/B2P - Panel			
3		3	Commscope LNX-6515DS-A1M - Panel			
4		6	Ericsson KRY 112 144/1			
5		3	Ericsson S11B12			
6	117.0	6	Antel LPA-80063/6CFx5 - Panel	(3) T-Arms	(12) 1 5/8" (2) 1 5/8" Fiber	Verizon
7		9	Commscope SBNHH-1D65B - Panel			
8		3	ALU RRH2x60-700			
9		3	ALU RRH2x60-AWS			
10		3	ALU RRH2X60-PCS			
11		2	RFS DB-T1-6Z-8AB-0Z			
12	107.0	1	Andrew SBNH-1D6565C - Panel	Platform w/ Hand Rails	(12) 1 5/8"; (1) 1/2"; [(1) Fiber + (2) DC Cables inside (1) 3" Conduit]*	AT&T
13		1	KMW AM-X-CD-16-65-00T-RET - Panel			
14		12	Powerwave 7020.00			
15		9	Powerwave P65-16-XLH-RR - Panel			
16		1	Powerwave P65-17-XLH-RR - Panel			
17		12	Powerwave TT08-19DB111-001			
18	106.0	6	Andrew RRUS11 RRUs	(1) Valmont LWRM Ring Mount		
19		1	Raycap DC6-48-60-18-8F			

* Existing (1) Fiber + (2) DC Power lines installed inside (1) 3" Conduit running outside of the pole shaft and exposed to wind.

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
20	130.0	3	Ericsson AIR 21 B2A/B4P - Panel	(3) T-Arms	(17) 1 5/8"; (2) 1 1/4" Fiber	T-Mobile
21		3	RFS APXVAARR24_43-U-NA20 (Octa) - Panel			
22		3	Ericsson AIR32 KRD901146-1_B66A (Octa) - Panel			
23		3	Ericsson KRY 112 144/2 TMA's			
24		3	Ericsson Radio 4449 B71 + B12			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**68.3%**	**74.7%**	**58.8%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Original Design Reactions	4028.2	38.7	95.1
Analysis Reactions	2894.5	29.3	38.8

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 1.2116 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

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

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

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

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

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

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

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

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

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

Usage Diagram - Max Ratio 68.26% at 48.0ft

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4	**Exposure:**	C	
Height:	140.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

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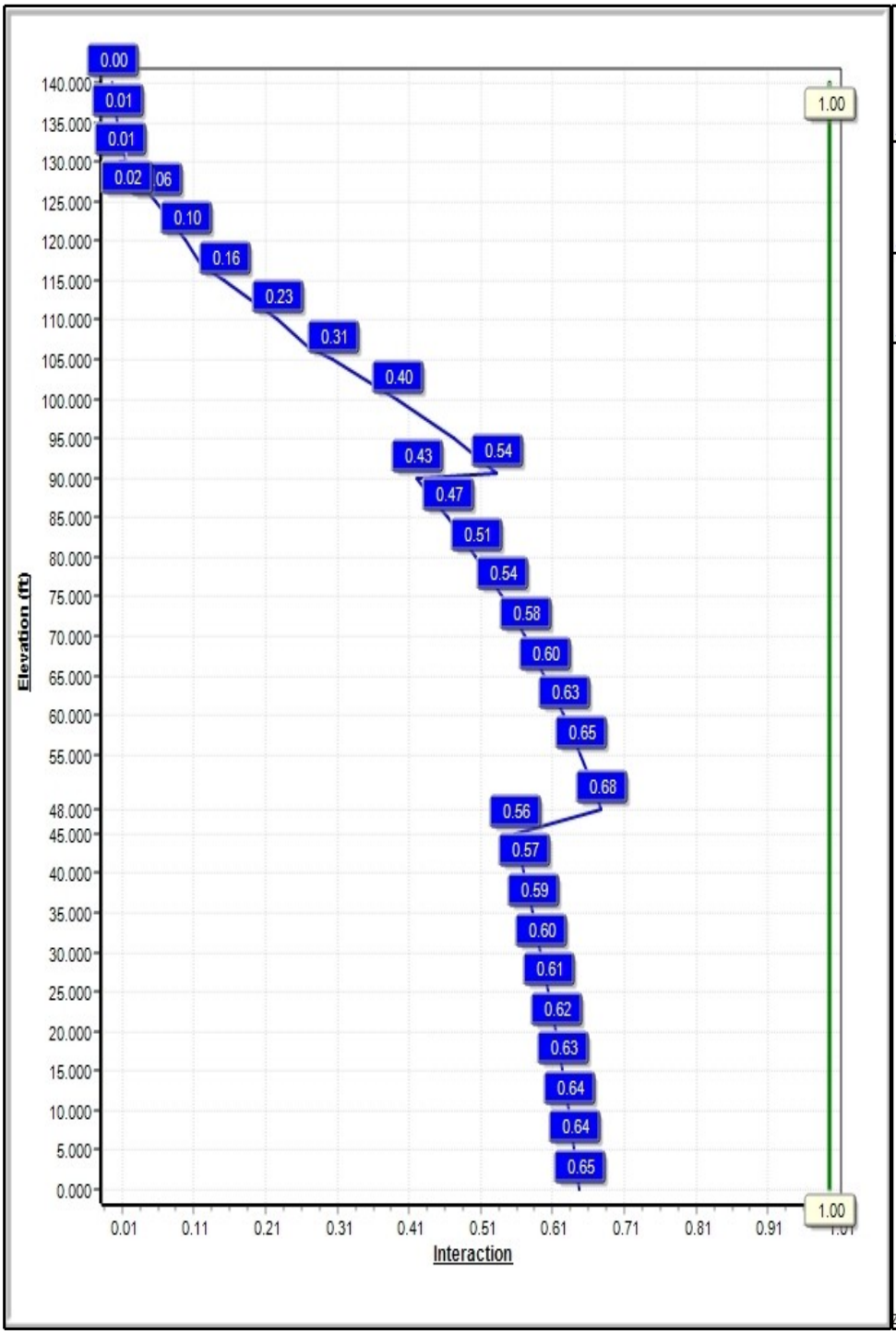
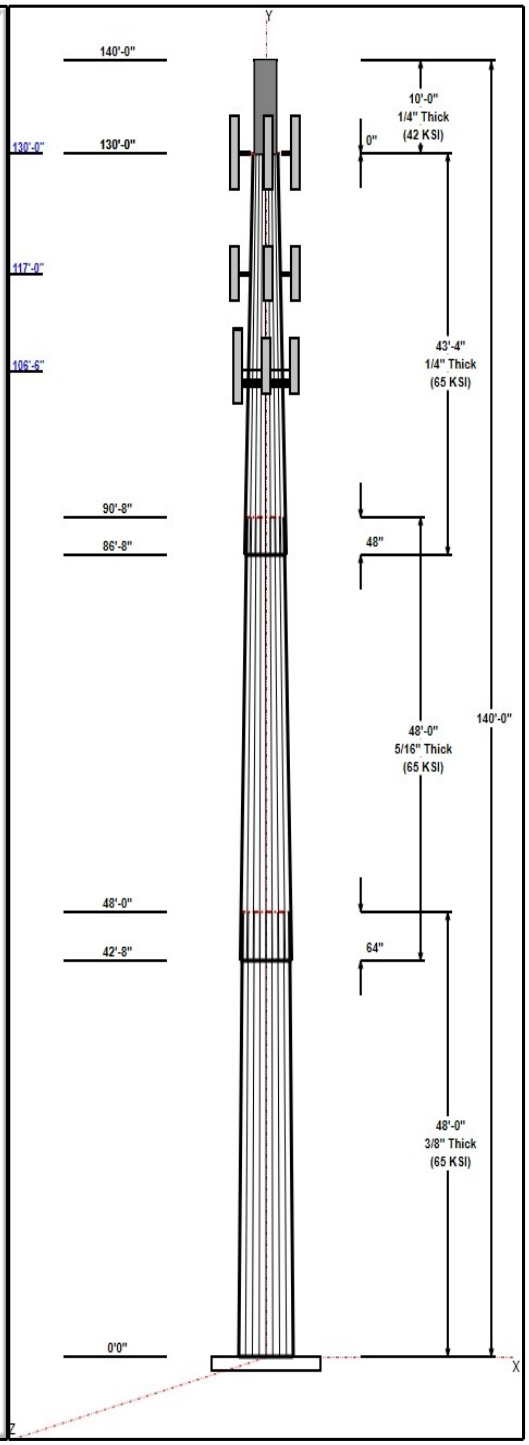
Dead Load Factor:	1.20	**Iterations:**	23
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 97 mph Wind





Structure: CT13548-S-SBA

Type: Custom
Site Name: Bloomfield 4
Height: 140.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.00000

7/30/2018

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	40.62	53.00	0.375		0.25788	65
2	48.00	30.24	42.62	0.313	Slip	0.25788	65
3	43.33	20.60	31.77	0.250	Slip	0.25788	65
4	10.00	20.00	20.00	0.250	Butt	0.00000	42

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
140.00	143.50	1	Lightning Rod	---
130.00	130.00	3	RFS	T-Mobile
130.00	130.00	3	Ericsson AIR32	T-Mobile
130.00	130.00	3	Ericsson Radio 4449 B71	T-Mobile
130.00	130.00	3	T-Arms	T-Mobile
130.00	130.00	3	Ericsson AIR 21 B2A/B4P	T-Mobile
130.00	130.00	3	Ericsson KRY 112 144/2	T-Mobile
117.00	117.00	6	Antel LPA-80063/6CFx5	Verizon
117.00	117.00	9	Commscope	Verizon
117.00	117.00	3	ALU RRH2x60-AWS	Verizon
117.00	117.00	3	ALU RRH2X60-PCS	Verizon
117.00	117.00	3	ALU RRH2x60-700	Verizon
117.00	117.00	2	RFS DB-T1-6Z-8AB-0Z	Verizon
117.00	117.00	3	T-Arms	Verizon
106.50	107.00	9	Powerwave	AT&T
106.50	107.00	1	Powerwave	AT&T
106.50	107.00	1	Andrew SBNH-1D6565C	AT&T
106.50	107.00	1	KMW	AT&T
106.50	107.00	12	Powerwave	AT&T
106.50	107.00	12	Powerwave 7020.00	AT&T
106.50	106.50	1	Platform w/ Hand Rails	AT&T
105.00	106.00	6	Andrew RRUS11 RRUs	AT&T
105.00	106.00	1	Raycap DC6-48-60-18-8F	AT&T
105.00	105.00	1	Valmont LWRM Ring	AT&T

Linear Appurtenances

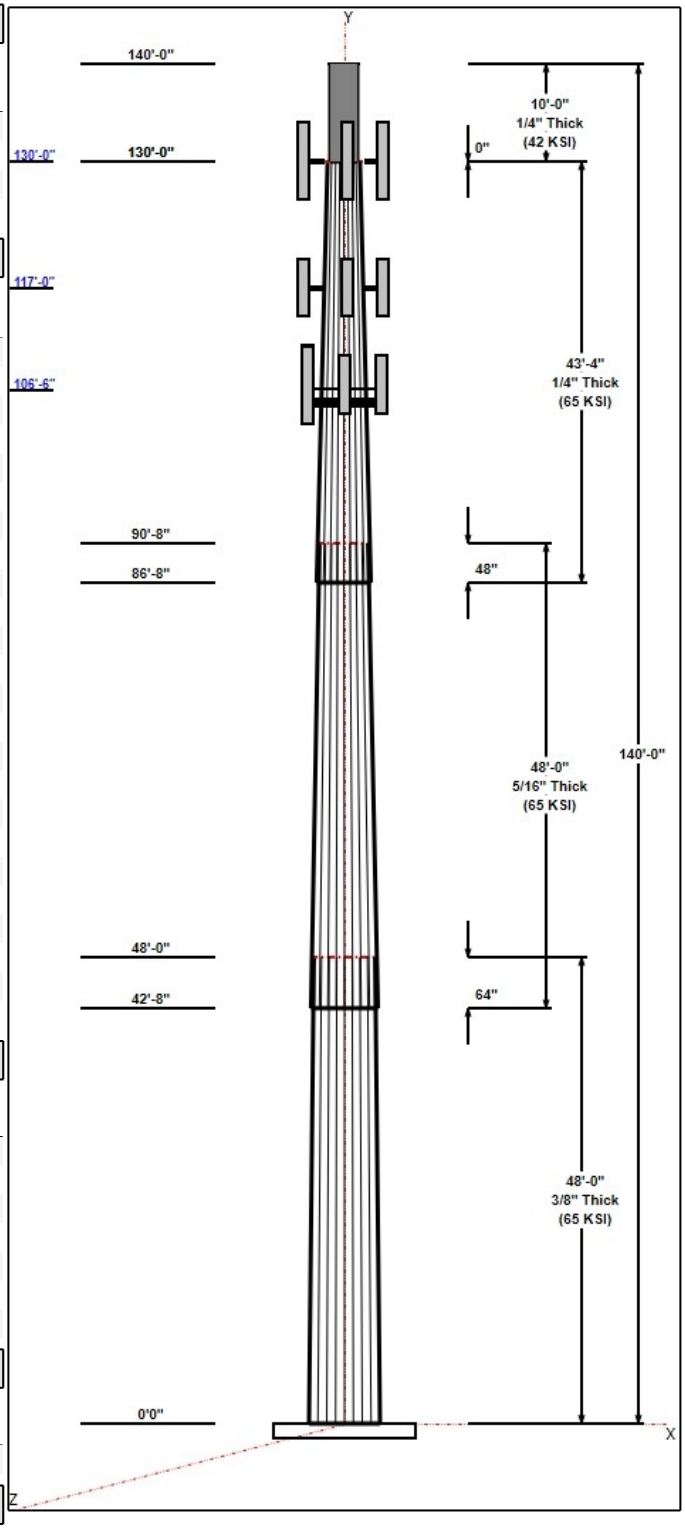
Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
3.00	130.00	Inside	1 1/4" Fiber	T-Mobile
3.00	130.00	Inside	1 5/8" Coax	T-Mobile
3.00	117.00	Inside	1 5/8" Coax	Verizon
3.00	117.00	Inside	1 5/8" Fiber	Verizon
3.00	106.50	Inside	1 5/8" Coax	AT&T
3.00	106.50	Inside	1/2" Coax	AT&T
3.00	106.50	Outside	3" Conduit	AT&T

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
24	1.5" F1554 105	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.0000	61.5	50.0	Round



Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	2894.5	29.3	38.8
0.9D + 1.6W 97 mph Wind	2869.2	29.3	29.1
1.2D + 1.0Di + 1.0Wi 40 mph Wind	526.3	5.3	70.1
1.2D + 1.0E	98.0	1.0	38.8
0.9D + 1.0E	97.1	1.0	29.1
1.0D + 1.0W 60 mph Wind	688.8	7.0	32.4

Structure: CT13548-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Bloomfield 4
Height: 140.00 (ft)

7/30/2018

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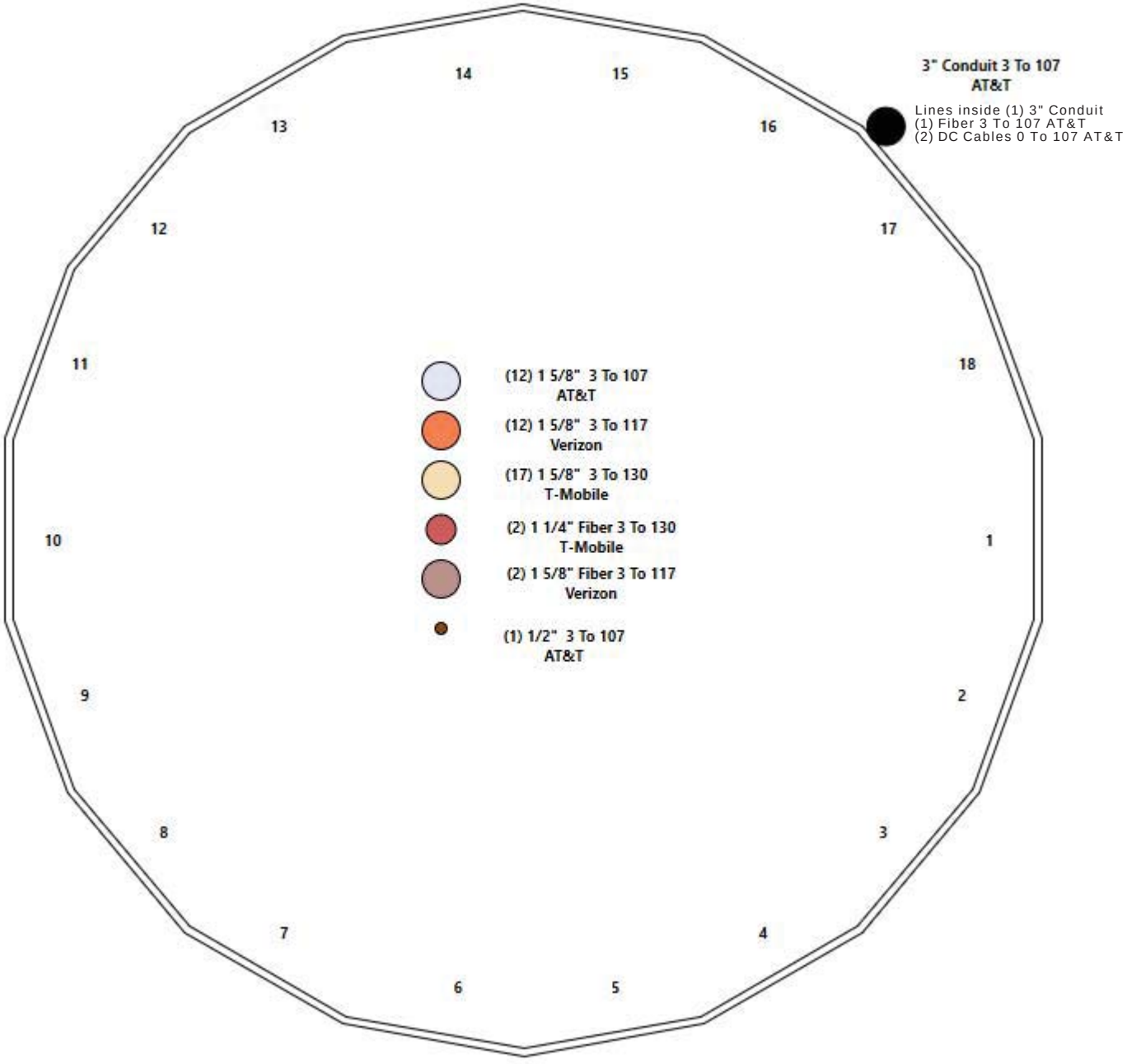

Shaft Properties

Structure:	CT13548-S-SBA		**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4		**Exposure:**	C	
Height:	140.00 (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

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.3750	65		0.00	9,027
2	18	48.000	0.3125	65	Slip	64.00	5,851
3	18	43.333	0.2500	65	Slip	48.00	3,035
4	R	10.000	0.2500	42	Flange	0.00	528
					Total Shaft Weight:		**18,441**

	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	53.00	0.00	62.63	21915.53	23.51	141.33	40.62	48.00	47.90	9803.05	17.69	108.3	0.257885
2	42.62	42.67	41.96	9490.86	22.64	136.39	30.24	90.67	29.69	3360.13	15.65	96.78	0.257885
3	31.77	86.67	25.01	3140.87	21.00	127.10	20.60	130.00	16.15	844.85	13.12	82.40	0.257885
4	20.00	130.0	15.51	756.89	0.00	80.00	20.00	140.00	15.51	756.89	0.00	80.00	0.000000

Load Summary

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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	

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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	140.00	Lightning Rod	1	35.00	1.05	1.00	76.60	4.193	1.00	0.00	3.50
2	130.00	RFS APXVAARR24 43-U-NA20	3	128.00	20.24	0.72	716.14	22.767	0.72	0.00	0.00
3	130.00	Ericsson AIR32 KRD901146-1 B66A	3	132.20	6.51	0.86	388.68	8.075	0.86	0.00	0.00
4	130.00	Ericsson Radio 4449 B71 + B12	3	74.00	1.63	0.67	141.90	2.303	0.67	0.00	0.00
5	130.00	T-Arms	3	350.00	8.00	0.75	671.14	17.176	0.75	0.00	0.00
6	130.00	Ericsson AIR 21 B2A/B4P	3	83.00	6.05	0.86	318.76	7.517	0.86	0.00	0.00
7	130.00	Ericsson KRY 112 144/2 TMA's	3	11.02	0.35	0.60	25.22	0.883	0.60	0.00	0.00
8	117.00	Antel LPA-80063/6CFx5	6	27.00	9.60	0.85	418.17	11.391	0.85	0.00	0.00
9	117.00	Commscope SBNHH-1D65B	9	50.71	8.16	0.83	327.59	9.766	0.83	0.00	0.00
10	117.00	ALU RRH2x60-AWS	3	60.00	3.50	0.67	173.53	4.526	0.67	0.00	0.00
11	117.00	ALU RRH2X60-PCS	3	55.00	1.99	0.67	137.80	3.352	0.67	0.00	0.00
12	117.00	ALU RRH2x60-700	3	60.00	3.50	0.67	173.53	4.526	0.67	0.00	0.00
13	117.00	RFS DB-T1-6Z-8AB-0Z	2	44.00	4.10	0.67	361.20	5.142	0.67	0.00	0.00
14	117.00	T-Arms	3	350.00	8.00	0.75	667.78	17.079	0.75	0.00	0.00
15	106.50	Powerwave P65-16-XLH-RR	9	53.00	8.16	0.80	265.66	11.771	0.80	0.00	0.50
16	106.50	Powerwave P65-17-XLH-RR	1	59.00	11.44	0.80	338.08	15.607	0.80	0.00	0.50
17	106.50	Andrew SBNH-1D6565C	1	66.10	11.47	0.80	362.30	15.659	0.80	0.00	0.50
18	106.50	KMW AM-X-CD-16-65-00T-RET	1	48.50	8.02	0.78	257.58	11.620	0.78	0.00	0.50
19	106.50	Powerwave TT08-19DB111-001	12	22.00	0.92	0.60	56.29	1.872	0.60	0.00	0.50
20	106.50	Powerwave 7020.00	12	2.20	0.40	0.60	15.38	1.024	0.60	0.00	0.50
21	106.50	Platform w/ Hand Rails	1	2000.00	40.00	1.00	4698.33	66.983	1.00	0.00	0.00
22	105.00	Andrew RRUS11 RRUs	6	50.70	2.52	0.67	173.03	3.379	0.67	0.00	1.00
23	105.00	Raycap DC6-48-60-18-8F	1	32.80	1.47	0.67	112.34	2.370	0.67	0.00	1.00
24	105.00	Valmont LWRM Ring Mount	1	350.00	5.00	0.80	727.23	9.491	0.80	0.00	0.00
		Totals:	**93**	**8,279.05**			**27,284.75**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
3.00	130.00	(2) 1 1/4" Fiber	0.00	Inside
3.00	130.00	(17) 1 5/8" Coax	0.00	Inside
3.00	117.00	(12) 1 5/8" Coax	0.00	Inside
3.00	117.00	(2) 1 5/8" Fiber	0.00	Inside
3.00	106.50	(12) 1 5/8" Coax	0.00	Inside
3.00	106.50	(1) 1/2" Coax	0.00	Inside
3.00	106.50	(1) 3" Conduit	0.00	Outside

Shaft Section Properties

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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	53.000	62.635	21915.5	23.51	141.33	73.7	814.4	0.0
5.00		0.3750	51.711	61.100	20343.7	22.90	137.89	74.5	774.9	1052.6
10.00		0.3750	50.421	59.565	18849.0	22.30	134.46	75.2	736.3	1026.5
15.00		0.3750	49.132	58.031	17429.3	21.69	131.02	75.9	698.7	1000.4
20.00		0.3750	47.842	56.496	16082.7	21.09	127.58	76.6	662.1	974.3
25.00		0.3750	46.553	54.961	14807.4	20.48	124.14	77.3	626.5	948.2
30.00		0.3750	45.263	53.427	13601.3	19.87	120.70	78.0	591.9	922.0
35.00		0.3750	43.974	51.892	12462.5	19.27	117.26	78.7	558.2	895.9
40.00		0.3750	42.685	50.357	11389.2	18.66	113.83	79.5	525.5	869.8
42.67	Bot - Section 2	0.3750	41.997	49.539	10842.8	18.34	111.99	79.8	508.5	453.2
45.00		0.3750	41.395	48.823	10379.3	18.05	110.39	80.2	493.9	721.3
48.00	Top - Section 1	0.3125	41.247	40.600	8595.0	21.86	131.99	0.0	0.0	912.1
50.00		0.3125	40.731	40.088	8274.2	21.57	130.34	76.0	400.1	274.6
55.00		0.3125	39.441	38.810	7507.3	20.84	126.21	76.9	374.9	671.2
60.00		0.3125	38.152	37.531	6789.3	20.12	122.09	77.7	350.5	649.4
65.00		0.3125	36.862	36.252	6118.7	19.39	117.96	78.6	326.9	627.7
70.00		0.3125	35.573	34.973	5493.7	18.66	113.83	79.5	304.2	605.9
75.00		0.3125	34.284	33.694	4912.8	17.93	109.71	80.3	282.2	584.1
80.00		0.3125	32.994	32.415	4374.3	17.21	105.58	81.2	261.1	562.4
85.00		0.3125	31.705	31.136	3876.7	16.48	101.46	82.0	240.8	540.6
86.67	Bot - Section 3	0.3125	31.275	30.710	3719.7	16.24	100.08	82.3	234.3	175.4
90.00		0.3125	30.415	29.857	3418.4	15.75	97.33	82.5	221.4	623.4
90.67	Top - Section 2	0.2500	30.743	24.196	2842.5	20.27	122.97	0.0	0.0	122.6
95.00		0.2500	29.626	23.309	2541.3	19.48	118.50	78.5	169.0	350.2
100.00		0.2500	28.337	22.286	2221.2	18.58	113.35	79.6	154.4	387.9
105.00		0.2500	27.047	21.263	1929.1	17.67	108.19	80.6	140.5	370.5
106.50		0.2500	26.660	20.956	1846.7	17.39	106.64	80.9	136.4	107.7
110.00		0.2500	25.758	20.240	1663.8	16.76	103.03	81.7	127.2	245.3
115.00		0.2500	24.468	19.217	1424.0	15.85	97.87	82.5	114.6	335.7
117.00		0.2500	23.952	18.807	1335.0	15.48	95.81	82.5	109.8	129.4
120.00		0.2500	23.179	18.193	1208.5	14.94	92.72	82.5	102.7	188.9
125.00		0.2500	21.889	17.170	1015.8	14.03	87.56	82.5	91.4	300.8
130.00	Top - Section 3	0.2500	20.600	16.147	844.8	13.12	82.40	82.5	80.8	283.4
130.00	Bot - Section 4	0.2500	20.000	15.512	756.9	13.12	82.40	41.7	75.7	
135.00		0.2500	20.000	15.512	756.9	0.00	80.00	41.7	75.7	263.9
140.00		0.2500	20.000	15.512	756.9	0.00	80.00	41.7	75.7	263.9
										18441.1

Wind Loading - Shaft

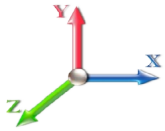
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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	0.85	19.450	21.40	401.07	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	391.32	0.650	0.000	5.00	22.151	14.40	492.9	0.0	1263.1
10.00		1.00	0.85	19.450	21.40	381.56	0.650	0.000	5.00	21.606	14.04	480.8	0.0	1231.8
15.00		1.00	0.85	19.450	21.40	371.80	0.650	0.000	5.00	21.060	13.69	468.6	0.0	1200.5
20.00		1.00	0.90	20.638	22.70	372.93	0.650	0.000	5.00	20.515	13.33	484.3	0.0	1169.1
25.00		1.00	0.95	21.630	23.79	371.50	0.650	0.000	5.00	19.969	12.98	494.1	0.0	1137.8
30.00		1.00	0.98	22.477	24.72	368.21	0.650	0.000	5.00	19.423	12.63	499.4	0.0	1106.5
35.00		1.00	1.01	23.218	25.54	363.57	0.650	0.000	5.00	18.878	12.27	501.4	0.0	1075.1
40.00		1.00	1.04	23.880	26.27	357.91	0.650	0.000	5.00	18.332	11.92	500.8	0.0	1043.8
42.67	Bot - Section 2	1.00	1.06	24.207	26.63	354.54	0.650	0.000	2.67	9.554	6.21	264.6	0.0	543.9
45.00		1.00	1.07	24.479	26.93	351.43	0.650	0.000	2.33	8.356	5.43	234.0	0.0	865.6
48.00	Top - Section 1	1.00	1.08	24.814	27.30	347.21	0.650	0.000	3.00	10.569	6.87	300.0	0.0	1094.5
50.00		1.00	1.09	25.029	27.53	349.64	0.650	0.000	2.00	6.937	4.51	198.6	0.0	329.5
55.00		1.00	1.12	25.536	28.09	341.99	0.650	0.000	5.00	16.960	11.02	495.5	0.0	805.4
60.00		1.00	1.14	26.008	28.61	333.85	0.650	0.000	5.00	16.415	10.67	488.4	0.0	779.3
65.00		1.00	1.16	26.450	29.09	325.30	0.650	0.000	5.00	15.869	10.31	480.2	0.0	753.2
70.00		1.00	1.17	26.866	29.55	316.38	0.650	0.000	5.00	15.324	9.96	471.0	0.0	727.1
75.00		1.00	1.19	27.259	29.98	307.13	0.650	0.000	5.00	14.778	9.61	460.8	0.0	701.0
80.00		1.00	1.21	27.632	30.39	297.60	0.650	0.000	5.00	14.232	9.25	449.9	0.0	674.9
85.00		1.00	1.22	27.987	30.79	287.80	0.650	0.000	5.00	13.687	8.90	438.2	0.0	648.8
86.67	Bot - Section 3	1.00	1.23	28.101	30.91	284.48	0.650	0.000	1.67	4.441	2.89	142.8	0.0	210.4
90.00		1.00	1.24	28.325	31.16	277.76	0.650	0.000	3.33	8.841	5.75	286.5	0.0	748.0
90.67	Top - Section 2	1.00	1.24	28.369	31.21	276.40	0.650	0.000	0.67	1.739	1.13	56.4	0.0	147.1
95.00		1.00	1.25	28.650	31.51	272.09	0.650	0.000	4.33	11.068	7.19	362.8	0.0	420.3
100.00		1.00	1.27	28.961	31.86	261.66	0.650	0.000	5.00	12.262	7.97	406.2	0.0	465.4
105.00	Appurtenance(s)	1.00	1.28	29.260	32.19	251.04	0.650	0.000	5.00	11.716	7.62	392.2	0.0	444.6
106.50	Appurtenance(s)	1.00	1.28	29.347	32.28	247.82	0.650	0.000	1.50	3.408	2.22	114.4	0.0	129.3
110.00		1.00	1.29	29.548	32.50	240.25	0.650	0.000	3.50	7.762	5.05	262.4	0.0	294.4
115.00		1.00	1.30	29.826	32.81	229.29	0.650	0.000	5.00	10.625	6.91	362.5	0.0	402.8
117.00	Appurtenance(s)	1.00	1.31	29.934	32.93	224.86	0.650	0.000	2.00	4.097	2.66	140.3	0.0	155.3
120.00		1.00	1.32	30.094	33.10	218.18	0.650	0.000	3.00	5.982	3.89	206.0	0.0	226.6
125.00		1.00	1.33	30.354	33.39	206.93	0.650	0.000	5.00	9.534	6.20	331.1	0.0	361.0
130.00	Top - Section 3	1.00	1.34	30.605	33.67	195.55	0.650	0.000	5.00	8.989	5.84	314.7	0.0	340.1
135.00		1.00	1.35	30.850	33.93	187.71	0.600	0.000	5.00	8.333	5.00	271.5	0.0	316.7
140.00	Appurtenance(s)	1.00	1.36	31.087	34.20	188.43	0.600	0.000	5.00	8.333	5.00	273.6	0.0	316.7
								Totals:	**140.00**			**12,126.9**		**22,129.4**

Discrete Appurtenance Forces

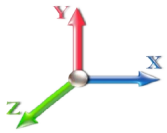
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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	140.00	Lightning Rod	1	31.249	34.374	1.00	1.00	1.05	42.00	0.000	3.500	57.75	0.00	202.12
2	130.00	Ericsson Radio 4449 B71	3	30.605	33.666	0.54	0.80	2.62	266.40	0.000	0.000	141.18	0.00	0.00
3	130.00	RFS	3	30.605	33.666	0.58	0.80	34.97	460.80	0.000	0.000	1883.93	0.00	0.00
4	130.00	Ericsson AIR32	3	30.605	33.666	0.69	0.80	13.44	475.92	0.000	0.000	723.77	0.00	0.00
5	130.00	T-Arms	3	30.605	33.666	0.75	1.00	18.00	1260.00	0.000	0.000	969.58	0.00	0.00
6	130.00	Ericsson AIR 21 B2A/B4P	3	30.605	33.666	0.69	0.80	12.49	298.80	0.000	0.000	672.63	0.00	0.00
7	130.00	Ericsson KRY 112 144/2	3	30.605	33.666	0.48	0.80	0.50	39.67	0.000	0.000	27.15	0.00	0.00
8	117.00	T-Arms	3	29.934	32.927	0.56	0.75	13.50	1260.00	0.000	0.000	711.23	0.00	0.00
9	117.00	RFS DB-T1-6Z-8AB-0Z	2	29.934	32.927	0.54	0.80	4.40	105.60	0.000	0.000	231.56	0.00	0.00
10	117.00	ALU RRH2x60-700	3	29.934	32.927	0.54	0.80	5.63	216.00	0.000	0.000	296.50	0.00	0.00
11	117.00	ALU RRH2X60-PCS	3	29.934	32.927	0.54	0.80	3.20	198.00	0.000	0.000	168.58	0.00	0.00
12	117.00	ALU RRH2x60-AWS	3	29.934	32.927	0.54	0.80	5.63	216.00	0.000	0.000	296.50	0.00	0.00
13	117.00	Commscope	9	29.934	32.927	0.66	0.80	48.76	547.67	0.000	0.000	2569.08	0.00	0.00
14	117.00	Antel LPA-80063/6CFx5	6	29.934	32.927	0.68	0.80	39.17	194.40	0.000	0.000	2063.52	0.00	0.00
15	106.50	KMW	1	29.376	32.314	0.58	0.75	4.69	58.20	0.000	0.500	242.57	0.00	121.29
16	106.50	Powerwave	9	29.376	32.314	0.60	0.75	44.06	572.40	0.000	0.500	2278.20	0.00	1139.10
17	106.50	Powerwave	1	29.376	32.314	0.60	0.75	6.86	70.80	0.000	0.500	354.88	0.00	177.44
18	106.50	Andrew SBNH-1D6565C	1	29.376	32.314	0.60	0.75	6.88	79.32	0.000	0.500	355.81	0.00	177.91
19	106.50	Powerwave	12	29.376	32.314	0.45	0.75	4.97	316.80	0.000	0.500	256.86	0.00	128.43
20	106.50	Powerwave 7020.00	12	29.376	32.314	0.45	0.75	2.16	31.68	0.000	0.500	111.68	0.00	55.84
21	106.50	Platform w/ Hand Rails	1	29.347	32.282	1.00	1.00	40.00	2400.00	0.000	0.000	2066.05	0.00	0.00
22	105.00	Valmont LWRM Ring	1	29.260	32.186	0.64	0.80	3.20	420.00	0.000	0.000	164.79	0.00	0.00
23	105.00	Raycap DC6-48-60-18-8F	1	29.318	32.250	0.54	0.80	0.79	39.36	0.000	1.000	40.66	0.00	40.66
24	105.00	Andrew RRUS11 RRUs	6	29.318	32.250	0.54	0.80	8.10	365.04	0.000	1.000	418.18	0.00	418.18
							Totals:		**9,934.86**			**17,102.66**		

Total Applied Force Summary

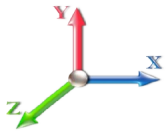
Structure:	CT13548-S-SBA		**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4		**Exposure:**	C	
Height:	140.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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		492.89	1379.69	0.00	0.00
10.00		480.75	1523.21	0.00	0.00
15.00		468.61	1491.88	0.00	0.00
20.00		484.34	1460.55	0.00	0.00
25.00		494.13	1429.21	0.00	0.00
30.00		499.44	1397.88	0.00	0.00
35.00		501.42	1366.55	0.00	0.00
40.00		500.82	1335.21	0.00	0.00
42.67		264.58	699.30	0.00	0.00
45.00		234.01	1001.56	0.00	0.00
48.00		300.03	1269.34	0.00	0.00
50.00		198.62	446.05	0.00	0.00
55.00		495.46	1096.84	0.00	0.00
60.00		488.38	1070.73	0.00	0.00
65.00		480.18	1044.61	0.00	0.00
70.00		470.96	1018.50	0.00	0.00
75.00		460.84	992.39	0.00	0.00
80.00		449.90	966.28	0.00	0.00
85.00		438.21	940.17	0.00	0.00
86.67		142.77	307.59	0.00	0.00
90.00		286.50	942.30	0.00	0.00
90.67		56.44	185.95	0.00	0.00
95.00		362.76	672.85	0.00	0.00
100.00		406.25	756.87	0.00	0.00
105.00	(8) attachments	1015.81	1560.38	0.00	458.84
106.50	(37) attachments	5780.49	3745.92	0.00	1800.00
110.00		262.38	438.52	0.00	0.00
115.00		362.54	608.70	0.00	0.00
117.00	(29) attachments	6477.30	2975.30	0.00	0.00
120.00		205.96	297.76	0.00	0.00
125.00		331.07	479.56	0.00	0.00
130.00	(18) attachments	4732.95	3260.27	0.00	0.00
135.00		271.48	316.70	0.00	0.00
140.00	(1) attachments	331.31	358.70	0.00	202.12
	Totals:	**29,229.56**	**38,837.31**	**0.00**	**2,460.96**

Linear Appurtenance Segment Forces (Factored)

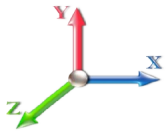
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	19.450	0.00	3.86
10.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	19.450	0.00	9.66
15.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	19.450	0.00	9.66
20.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	20.638	0.00	9.66
25.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	21.630	0.00	9.66
30.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.477	0.00	9.66
35.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.218	0.00	9.66
40.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.880	0.00	9.66
42.67	3" Conduit	Yes	2.67	0.000	0.00	0.00	0.00	0.000	0.000	24.207	0.00	5.15
45.00	3" Conduit	Yes	2.33	0.000	0.00	0.00	0.00	0.000	0.000	24.479	0.00	4.51
48.00	3" Conduit	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	24.814	0.00	5.80
50.00	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	25.029	0.00	3.86
55.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	25.536	0.00	9.66
60.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.008	0.00	9.66
65.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.450	0.00	9.66
70.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.866	0.00	9.66
75.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.259	0.00	9.66
80.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.632	0.00	9.66
85.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.987	0.00	9.66
86.67	3" Conduit	Yes	1.67	0.000	0.00	0.00	0.00	0.000	0.000	28.101	0.00	3.22
90.00	3" Conduit	Yes	3.33	0.000	0.00	0.00	0.00	0.000	0.000	28.325	0.00	6.44
90.67	3" Conduit	Yes	0.67	0.000	0.00	0.00	0.00	0.000	0.000	28.369	0.00	1.29
95.00	3" Conduit	Yes	4.33	0.000	0.00	0.00	0.00	0.000	0.000	28.650	0.00	8.37
100.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.961	0.00	9.66
105.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.260	0.00	9.66
106.50	3" Conduit	Yes	1.50	0.000	0.00	0.00	0.00	0.000	0.000	29.347	0.00	2.90
										Totals:	**0.0**	**200.0**

Calculated Forces

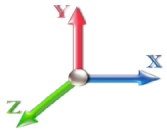
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



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	-38.79	-29.29	0.00	-2894.4	0.00	2894.48	4157.29	2078.64	8996.15	4504.76	0.00	0.000	0.000	0.652
5.00	-37.32	-28.92	0.00	-2748.0	0.00	2748.02	4094.64	2047.32	8641.94	4327.39	0.10	-0.183	0.000	0.644
10.00	-35.70	-28.55	0.00	-2603.4	0.00	2603.43	4030.02	2015.01	8290.37	4151.35	0.39	-0.370	0.000	0.636
15.00	-34.12	-28.18	0.00	-2460.6	0.00	2460.69	3963.43	1981.72	7941.76	3976.78	0.88	-0.561	0.000	0.628
20.00	-32.57	-27.79	0.00	-2319.7	0.00	2319.78	3894.87	1947.44	7596.41	3803.85	1.57	-0.756	0.000	0.618
25.00	-31.05	-27.39	0.00	-2180.8	0.00	2180.81	3824.34	1912.17	7254.65	3632.72	2.47	-0.955	0.000	0.609
30.00	-29.57	-26.97	0.00	-2043.8	0.00	2043.88	3751.84	1875.92	6916.79	3463.54	3.58	-1.158	0.000	0.598
35.00	-28.12	-26.54	0.00	-1909.0	0.00	1909.04	3677.38	1838.69	6583.15	3296.47	4.91	-1.365	0.000	0.587
40.00	-26.72	-26.08	0.00	-1776.3	0.00	1776.34	3600.94	1800.47	6254.04	3131.67	6.45	-1.575	0.000	0.575
42.67	-25.98	-25.85	0.00	-1706.8	0.00	1706.80	3559.36	1779.68	6080.47	3044.76	7.36	-1.691	0.000	0.568
45.00	-24.93	-25.63	0.00	-1646.4	0.00	1646.49	3522.53	1761.26	5929.77	2969.29	8.22	-1.794	0.000	0.562
48.00	-23.62	-25.34	0.00	-1569.6	0.00	1569.60	2765.58	1382.79	4652.71	2329.81	9.39	-1.926	0.000	0.683
50.00	-23.11	-25.19	0.00	-1518.9	0.00	1518.92	2743.08	1371.54	4556.27	2281.52	10.21	-2.016	0.000	0.675
55.00	-21.92	-24.75	0.00	-1392.9	0.00	1392.97	2685.46	1342.73	4317.17	2161.80	12.46	-2.266	0.000	0.653
60.00	-20.77	-24.31	0.00	-1269.2	0.00	1269.21	2625.87	1312.94	4081.16	2043.62	14.97	-2.518	0.000	0.629
65.00	-19.64	-23.87	0.00	-1147.6	0.00	1147.65	2564.31	1282.15	3848.56	1927.14	17.74	-2.772	0.000	0.604
70.00	-18.54	-23.43	0.00	-1028.3	0.00	1028.30	2500.78	1250.39	3619.69	1812.53	20.78	-3.025	0.000	0.575
75.00	-17.48	-22.99	0.00	-911.14	0.00	911.14	2435.28	1217.64	3394.85	1699.95	24.08	-3.276	0.000	0.544
80.00	-16.45	-22.56	0.00	-796.18	0.00	796.18	2367.81	1183.90	3174.36	1589.54	27.65	-3.523	0.000	0.508
85.00	-15.47	-22.10	0.00	-683.41	0.00	683.41	2298.37	1149.18	2958.55	1481.47	31.47	-3.763	0.000	0.468
86.67	-15.13	-21.97	0.00	-646.57	0.00	646.57	2274.78	1137.39	2887.71	1446.00	32.79	-3.845	0.000	0.454
90.00	-14.18	-21.64	0.00	-573.34	0.00	573.34	2218.24	1109.12	2736.97	1370.52	35.53	-4.000	0.000	0.425
90.67	-13.95	-21.60	0.00	-558.91	0.00	558.91	1688.87	844.43	2115.41	1059.28	36.09	-4.032	0.000	0.537
95.00	-13.23	-21.24	0.00	-465.30	0.00	465.30	1646.42	823.21	1986.06	994.50	39.84	-4.220	0.000	0.477
100.00	-12.43	-20.82	0.00	-359.10	0.00	359.10	1595.61	797.80	1839.56	921.15	44.38	-4.450	0.000	0.398
105.00	-10.91	-19.71	0.00	-254.53	0.00	254.53	1542.83	771.41	1696.33	849.43	49.15	-4.647	0.000	0.307
106.50	-7.63	-13.65	0.00	-223.16	0.00	223.16	1526.61	763.30	1654.04	828.25	50.62	-4.700	0.000	0.275
110.00	-7.19	-13.37	0.00	-175.37	0.00	175.37	1488.07	744.04	1556.67	779.49	54.10	-4.807	0.000	0.230
115.00	-6.59	-12.97	0.00	-108.51	0.00	108.51	1427.69	713.85	1417.28	709.69	59.20	-4.929	0.000	0.158
117.00	-4.18	-6.26	0.00	-82.58	0.00	82.58	1397.29	698.64	1357.25	679.64	61.28	-4.967	0.000	0.125
120.00	-3.90	-6.03	0.00	-63.80	0.00	63.80	1351.68	675.84	1269.65	635.77	64.41	-5.014	0.000	0.103
125.00	-3.45	-5.66	0.00	-33.63	0.00	33.63	1275.66	637.83	1130.14	565.91	69.69	-5.071	0.000	0.062
130.00	-0.62	-0.66	0.00	-5.31	0.00	5.31	1199.65	599.83	998.75	500.12	75.01	-5.098	0.000	0.011
130.00	-0.62	-0.66	0.00	-5.31	0.00	5.31	582.69	291.35	473.23	281.02	75.01	-5.098	0.000	0.020
135.00	-0.33	-0.36	0.00	-2.01	0.00	2.01	582.69	291.35	473.23	281.02	80.34	-5.105	0.000	0.008
140.00	0.00	-0.33	0.00	-0.20	0.00	0.20	582.69	291.35	473.23	281.02	85.68	-5.107	0.000	0.001

Wind Loading - Shaft

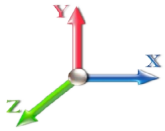
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	0.85	19.450	21.40	401.07	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	391.32	0.650	0.000	5.00	22.151	14.40	492.9	0.0	947.3
10.00		1.00	0.85	19.450	21.40	381.56	0.650	0.000	5.00	21.606	14.04	480.8	0.0	923.8
15.00		1.00	0.85	19.450	21.40	371.80	0.650	0.000	5.00	21.060	13.69	468.6	0.0	900.3
20.00		1.00	0.90	20.638	22.70	372.93	0.650	0.000	5.00	20.515	13.33	484.3	0.0	876.8
25.00		1.00	0.95	21.630	23.79	371.50	0.650	0.000	5.00	19.969	12.98	494.1	0.0	853.3
30.00		1.00	0.98	22.477	24.72	368.21	0.650	0.000	5.00	19.423	12.63	499.4	0.0	829.8
35.00		1.00	1.01	23.218	25.54	363.57	0.650	0.000	5.00	18.878	12.27	501.4	0.0	806.3
40.00		1.00	1.04	23.880	26.27	357.91	0.650	0.000	5.00	18.332	11.92	500.8	0.0	782.8
42.67	Bot - Section 2	1.00	1.06	24.207	26.63	354.54	0.650	0.000	2.67	9.554	6.21	264.6	0.0	407.9
45.00		1.00	1.07	24.479	26.93	351.43	0.650	0.000	2.33	8.356	5.43	234.0	0.0	649.2
48.00	Top - Section 1	1.00	1.08	24.814	27.30	347.21	0.650	0.000	3.00	10.569	6.87	300.0	0.0	820.9
50.00		1.00	1.09	25.029	27.53	349.64	0.650	0.000	2.00	6.937	4.51	198.6	0.0	247.1
55.00		1.00	1.12	25.536	28.09	341.99	0.650	0.000	5.00	16.960	11.02	495.5	0.0	604.1
60.00		1.00	1.14	26.008	28.61	333.85	0.650	0.000	5.00	16.415	10.67	488.4	0.0	584.5
65.00		1.00	1.16	26.450	29.09	325.30	0.650	0.000	5.00	15.869	10.31	480.2	0.0	564.9
70.00		1.00	1.17	26.866	29.55	316.38	0.650	0.000	5.00	15.324	9.96	471.0	0.0	545.3
75.00		1.00	1.19	27.259	29.98	307.13	0.650	0.000	5.00	14.778	9.61	460.8	0.0	525.7
80.00		1.00	1.21	27.632	30.39	297.60	0.650	0.000	5.00	14.232	9.25	449.9	0.0	506.1
85.00		1.00	1.22	27.987	30.79	287.80	0.650	0.000	5.00	13.687	8.90	438.2	0.0	486.6
86.67	Bot - Section 3	1.00	1.23	28.101	30.91	284.48	0.650	0.000	1.67	4.441	2.89	142.8	0.0	157.8
90.00		1.00	1.24	28.325	31.16	277.76	0.650	0.000	3.33	8.841	5.75	286.5	0.0	561.0
90.67	Top - Section 2	1.00	1.24	28.369	31.21	276.40	0.650	0.000	0.67	1.739	1.13	56.4	0.0	110.3
95.00		1.00	1.25	28.650	31.51	272.09	0.650	0.000	4.33	11.068	7.19	362.8	0.0	315.2
100.00		1.00	1.27	28.961	31.86	261.66	0.650	0.000	5.00	12.262	7.97	406.2	0.0	349.1
105.00	Appurtenance(s)	1.00	1.28	29.260	32.19	251.04	0.650	0.000	5.00	11.716	7.62	392.2	0.0	333.4
106.50	Appurtenance(s)	1.00	1.28	29.347	32.28	247.82	0.650	0.000	1.50	3.408	2.22	114.4	0.0	97.0
110.00		1.00	1.29	29.548	32.50	240.25	0.650	0.000	3.50	7.762	5.05	262.4	0.0	220.8
115.00		1.00	1.30	29.826	32.81	229.29	0.650	0.000	5.00	10.625	6.91	362.5	0.0	302.1
117.00	Appurtenance(s)	1.00	1.31	29.934	32.93	224.86	0.650	0.000	2.00	4.097	2.66	140.3	0.0	116.4
120.00		1.00	1.32	30.094	33.10	218.18	0.650	0.000	3.00	5.982	3.89	206.0	0.0	170.0
125.00		1.00	1.33	30.354	33.39	206.93	0.650	0.000	5.00	9.534	6.20	331.1	0.0	270.8
130.00	Top - Section 3	1.00	1.34	30.605	33.67	195.55	0.650	0.000	5.00	8.989	5.84	314.7	0.0	255.1
135.00		1.00	1.35	30.850	33.93	187.71	0.600	0.000	5.00	8.333	5.00	271.5	0.0	237.5
140.00	Appurtenance(s)	1.00	1.36	31.087	34.20	188.43	0.600	0.000	5.00	8.333	5.00	273.6	0.0	237.5
								Totals:	**140.00**			**12,126.9**		**16,597.0**

Discrete Appurtenance Forces

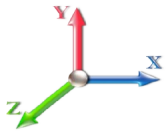
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	140.00	Lightning Rod	1	31.249	34.374	1.00	1.00	1.05	31.50	0.000	3.500	57.75	0.00	202.12
2	130.00	Ericsson Radio 4449 B71	3	30.605	33.666	0.54	0.80	2.62	199.80	0.000	0.000	141.18	0.00	0.00
3	130.00	RFS	3	30.605	33.666	0.58	0.80	34.97	345.60	0.000	0.000	1883.93	0.00	0.00
4	130.00	Ericsson AIR32	3	30.605	33.666	0.69	0.80	13.44	356.94	0.000	0.000	723.77	0.00	0.00
5	130.00	T-Arms	3	30.605	33.666	0.75	1.00	18.00	945.00	0.000	0.000	969.58	0.00	0.00
6	130.00	Ericsson AIR 21 B2A/B4P	3	30.605	33.666	0.69	0.80	12.49	224.10	0.000	0.000	672.63	0.00	0.00
7	130.00	Ericsson KRY 112 144/2	3	30.605	33.666	0.48	0.80	0.50	29.75	0.000	0.000	27.15	0.00	0.00
8	117.00	T-Arms	3	29.934	32.927	0.56	0.75	13.50	945.00	0.000	0.000	711.23	0.00	0.00
9	117.00	RFS DB-T1-6Z-8AB-0Z	2	29.934	32.927	0.54	0.80	4.40	79.20	0.000	0.000	231.56	0.00	0.00
10	117.00	ALU RRH2x60-700	3	29.934	32.927	0.54	0.80	5.63	162.00	0.000	0.000	296.50	0.00	0.00
11	117.00	ALU RRH2X60-PCS	3	29.934	32.927	0.54	0.80	3.20	148.50	0.000	0.000	168.58	0.00	0.00
12	117.00	ALU RRH2x60-AWS	3	29.934	32.927	0.54	0.80	5.63	162.00	0.000	0.000	296.50	0.00	0.00
13	117.00	Commscope	9	29.934	32.927	0.66	0.80	48.76	410.75	0.000	0.000	2569.08	0.00	0.00
14	117.00	Antel LPA-80063/6CFx5	6	29.934	32.927	0.68	0.80	39.17	145.80	0.000	0.000	2063.52	0.00	0.00
15	106.50	KMW	1	29.376	32.314	0.58	0.75	4.69	43.65	0.000	0.500	242.57	0.00	121.29
16	106.50	Powerwave	9	29.376	32.314	0.60	0.75	44.06	429.30	0.000	0.500	2278.20	0.00	1139.10
17	106.50	Powerwave	1	29.376	32.314	0.60	0.75	6.86	53.10	0.000	0.500	354.88	0.00	177.44
18	106.50	Andrew SBNH-1D6565C	1	29.376	32.314	0.60	0.75	6.88	59.49	0.000	0.500	355.81	0.00	177.91
19	106.50	Powerwave	12	29.376	32.314	0.45	0.75	4.97	237.60	0.000	0.500	256.86	0.00	128.43
20	106.50	Powerwave 7020.00	12	29.376	32.314	0.45	0.75	2.16	23.76	0.000	0.500	111.68	0.00	55.84
21	106.50	Platform w/ Hand Rails	1	29.347	32.282	1.00	1.00	40.00	1800.00	0.000	0.000	2066.05	0.00	0.00
22	105.00	Valmont LWRM Ring	1	29.260	32.186	0.64	0.80	3.20	315.00	0.000	0.000	164.79	0.00	0.00
23	105.00	Raycap DC6-48-60-18-8F	1	29.318	32.250	0.54	0.80	0.79	29.52	0.000	1.000	40.66	0.00	40.66
24	105.00	Andrew RRUS11 RRUs	6	29.318	32.250	0.54	0.80	8.10	273.78	0.000	1.000	418.18	0.00	418.18
							Totals:		**7,451.15**			**17,102.66**		

Total Applied Force Summary

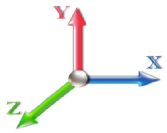
Structure:	CT13548-S-SBA		**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4		**Exposure:**	C	
Height:	140.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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		492.89	1034.77	0.00	0.00
10.00		480.75	1142.41	0.00	0.00
15.00		468.61	1118.91	0.00	0.00
20.00		484.34	1095.41	0.00	0.00
25.00		494.13	1071.91	0.00	0.00
30.00		499.44	1048.41	0.00	0.00
35.00		501.42	1024.91	0.00	0.00
40.00		500.82	1001.41	0.00	0.00
42.67		264.58	524.48	0.00	0.00
45.00		234.01	751.17	0.00	0.00
48.00		300.03	952.00	0.00	0.00
50.00		198.62	334.53	0.00	0.00
55.00		495.46	822.63	0.00	0.00
60.00		488.38	803.04	0.00	0.00
65.00		480.18	783.46	0.00	0.00
70.00		470.96	763.88	0.00	0.00
75.00		460.84	744.29	0.00	0.00
80.00		449.90	724.71	0.00	0.00
85.00		438.21	705.13	0.00	0.00
86.67		142.77	230.69	0.00	0.00
90.00		286.50	706.73	0.00	0.00
90.67		56.44	139.47	0.00	0.00
95.00		362.76	504.64	0.00	0.00
100.00		406.25	567.65	0.00	0.00
105.00	(8) attachments	1015.81	1170.28	0.00	458.84
106.50	(37) attachments	5780.49	2809.44	0.00	1800.00
110.00		262.38	328.89	0.00	0.00
115.00		362.54	456.53	0.00	0.00
117.00	(29) attachments	6477.30	2231.47	0.00	0.00
120.00		205.96	223.32	0.00	0.00
125.00		331.07	359.67	0.00	0.00
130.00	(18) attachments	4732.95	2445.20	0.00	0.00
135.00		271.48	237.52	0.00	0.00
140.00	(1) attachments	331.31	269.02	0.00	202.12
	Totals:	**29,229.56**	**29,127.99**	**0.00**	**2,460.96**

Linear Appurtenance Segment Forces (Factored)

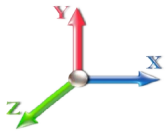
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	19.450	0.00	2.90
10.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	19.450	0.00	7.25
15.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	19.450	0.00	7.25
20.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	20.638	0.00	7.25
25.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	21.630	0.00	7.25
30.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.477	0.00	7.25
35.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.218	0.00	7.25
40.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.880	0.00	7.25
42.67	3" Conduit	Yes	2.67	0.000	0.00	0.00	0.00	0.000	0.000	24.207	0.00	3.86
45.00	3" Conduit	Yes	2.33	0.000	0.00	0.00	0.00	0.000	0.000	24.479	0.00	3.38
48.00	3" Conduit	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	24.814	0.00	4.35
50.00	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	25.029	0.00	2.90
55.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	25.536	0.00	7.25
60.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.008	0.00	7.25
65.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.450	0.00	7.25
70.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.866	0.00	7.25
75.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.259	0.00	7.25
80.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.632	0.00	7.25
85.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.987	0.00	7.25
86.67	3" Conduit	Yes	1.67	0.000	0.00	0.00	0.00	0.000	0.000	28.101	0.00	2.42
90.00	3" Conduit	Yes	3.33	0.000	0.00	0.00	0.00	0.000	0.000	28.325	0.00	4.83
90.67	3" Conduit	Yes	0.67	0.000	0.00	0.00	0.00	0.000	0.000	28.369	0.00	0.97
95.00	3" Conduit	Yes	4.33	0.000	0.00	0.00	0.00	0.000	0.000	28.650	0.00	6.28
100.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.961	0.00	7.25
105.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.260	0.00	7.25
106.50	3" Conduit	Yes	1.50	0.000	0.00	0.00	0.00	0.000	0.000	29.347	0.00	2.17
										Totals:	**0.0**	**150.0**

Calculated Forces

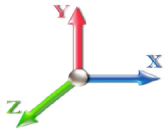
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



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	-29.08	-29.28	0.00	-2869.1	0.00	2869.15	4157.29	2078.64	8996.15	4504.76	0.00	0.000	0.000	0.644
5.00	-27.95	-28.87	0.00	-2722.7	0.00	2722.77	4094.64	2047.32	8641.94	4327.39	0.10	-0.181	0.000	0.636
10.00	-26.72	-28.47	0.00	-2578.4	0.00	2578.41	4030.02	2015.01	8290.37	4151.35	0.39	-0.367	0.000	0.628
15.00	-25.51	-28.08	0.00	-2436.0	0.00	2436.05	3963.43	1981.72	7941.76	3976.78	0.87	-0.556	0.000	0.619
20.00	-24.33	-27.67	0.00	-2295.6	0.00	2295.65	3894.87	1947.44	7596.41	3803.85	1.56	-0.749	0.000	0.610
25.00	-23.17	-27.24	0.00	-2157.3	0.00	2157.32	3824.34	1912.17	7254.65	3632.72	2.45	-0.946	0.000	0.600
30.00	-22.04	-26.80	0.00	-2021.1	0.00	2021.13	3751.84	1875.92	6916.79	3463.54	3.55	-1.147	0.000	0.590
35.00	-20.93	-26.35	0.00	-1887.1	0.00	1887.15	3677.38	1838.69	6583.15	3296.47	4.86	-1.351	0.000	0.578
40.00	-19.87	-25.88	0.00	-1755.4	0.00	1755.41	3600.94	1800.47	6254.04	3131.67	6.39	-1.559	0.000	0.566
42.67	-19.30	-25.64	0.00	-1686.4	0.00	1686.40	3559.36	1779.68	6080.47	3044.76	7.29	-1.674	0.000	0.560
45.00	-18.51	-25.42	0.00	-1626.5	0.00	1626.59	3522.53	1761.26	5929.77	2969.29	8.14	-1.775	0.000	0.553
48.00	-17.52	-25.12	0.00	-1550.3	0.00	1550.34	2765.58	1382.79	4652.71	2329.81	9.29	-1.906	0.000	0.672
50.00	-17.12	-24.96	0.00	-1500.1	0.00	1500.10	2743.08	1371.54	4556.27	2281.52	10.11	-1.994	0.000	0.664
55.00	-16.21	-24.51	0.00	-1375.3	0.00	1375.30	2685.46	1342.73	4317.17	2161.80	12.33	-2.241	0.000	0.643
60.00	-15.32	-24.05	0.00	-1252.7	0.00	1252.77	2625.87	1312.94	4081.16	2043.62	14.81	-2.490	0.000	0.619
65.00	-14.46	-23.60	0.00	-1132.5	0.00	1132.52	2564.31	1282.15	3848.56	1927.14	17.56	-2.740	0.000	0.594
70.00	-13.62	-23.15	0.00	-1014.5	0.00	1014.53	2500.78	1250.39	3619.69	1812.53	20.56	-2.990	0.000	0.566
75.00	-12.80	-22.70	0.00	-898.78	0.00	898.78	2435.28	1217.64	3394.85	1699.95	23.83	-3.238	0.000	0.534
80.00	-12.01	-22.26	0.00	-785.26	0.00	785.26	2367.81	1183.90	3174.36	1589.54	27.35	-3.481	0.000	0.499
85.00	-11.27	-21.81	0.00	-673.95	0.00	673.95	2298.37	1149.18	2958.55	1481.47	31.12	-3.719	0.000	0.460
86.67	-11.01	-21.68	0.00	-637.59	0.00	637.59	2274.78	1137.39	2887.71	1446.00	32.43	-3.799	0.000	0.446
90.00	-10.29	-21.36	0.00	-565.34	0.00	565.34	2218.24	1109.12	2736.97	1370.52	35.14	-3.952	0.000	0.418
90.67	-10.11	-21.31	0.00	-551.10	0.00	551.10	1688.87	844.43	2115.41	1059.28	35.69	-3.983	0.000	0.527
95.00	-9.56	-20.95	0.00	-458.74	0.00	458.74	1646.42	823.21	1986.06	994.50	39.39	-4.168	0.000	0.468
100.00	-8.95	-20.54	0.00	-353.98	0.00	353.98	1595.61	797.80	1839.56	921.15	43.88	-4.396	0.000	0.391
105.00	-7.82	-19.45	0.00	-250.84	0.00	250.84	1542.83	771.41	1696.33	849.43	48.59	-4.590	0.000	0.301
106.50	-5.47	-13.47	0.00	-219.87	0.00	219.87	1526.61	763.30	1654.04	828.25	50.04	-4.642	0.000	0.269
110.00	-5.13	-13.19	0.00	-172.73	0.00	172.73	1488.07	744.04	1556.67	779.49	53.48	-4.748	0.000	0.225
115.00	-4.69	-12.80	0.00	-106.78	0.00	106.78	1427.69	713.85	1417.28	709.69	58.52	-4.867	0.000	0.154
117.00	-3.02	-6.15	0.00	-81.19	0.00	81.19	1397.29	698.64	1357.25	679.64	60.57	-4.905	0.000	0.122
120.00	-2.81	-5.93	0.00	-62.73	0.00	62.73	1351.68	675.84	1269.65	635.77	63.66	-4.951	0.000	0.101
125.00	-2.47	-5.57	0.00	-33.06	0.00	33.06	1275.66	637.83	1130.14	565.91	68.87	-5.007	0.000	0.060
130.00	-0.45	-0.64	0.00	-5.19	0.00	5.19	1199.65	599.83	998.75	500.12	74.13	-5.034	0.000	0.011
130.00	-0.45	-0.64	0.00	-5.19	0.00	5.19	582.69	291.35	473.23	281.02	74.13	-5.034	0.000	0.019
135.00	-0.24	-0.35	0.00	-1.97	0.00	1.97	582.69	291.35	473.23	281.02	79.40	-5.040	0.000	0.007
140.00	0.00	-0.33	0.00	-0.20	0.00	0.20	582.69	291.35	473.23	281.02	84.67	-5.042	0.000	0.001

Wind Loading - Shaft

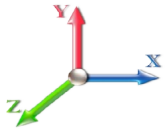
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	3.308	3.64	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	3.308	3.64	0.00	1.200	1.656	5.00	23.531	28.24	102.7	547.9	1811.1
10.00		1.00	0.85	3.308	3.64	0.00	1.200	1.775	5.00	23.085	27.70	100.8	574.4	1806.2
15.00		1.00	0.85	3.308	3.64	0.00	1.200	1.848	5.00	22.600	27.12	98.7	584.2	1784.6
20.00		1.00	0.90	3.509	3.86	0.00	1.200	1.902	5.00	22.100	26.52	102.4	586.6	1755.8
25.00		1.00	0.95	3.678	4.05	0.00	1.200	1.945	5.00	21.590	25.91	104.8	584.8	1722.6
30.00		1.00	0.98	3.822	4.20	0.00	1.200	1.981	5.00	21.074	25.29	106.3	580.2	1686.6
35.00		1.00	1.01	3.948	4.34	0.00	1.200	2.012	5.00	20.554	24.67	107.1	573.5	1648.6
40.00		1.00	1.04	4.061	4.47	0.00	1.200	2.039	5.00	20.031	24.04	107.4	565.2	1609.0
42.67	Bot - Section 2	1.00	1.06	4.116	4.53	0.00	1.200	2.052	2.67	10.466	12.56	56.9	298.8	842.7
45.00		1.00	1.07	4.163	4.58	0.00	1.200	2.063	2.33	9.158	10.99	50.3	263.1	1128.6
48.00	Top - Section 1	1.00	1.08	4.220	4.64	0.00	1.200	2.076	3.00	11.607	13.93	64.7	334.5	1429.0
50.00		1.00	1.09	4.256	4.68	0.00	1.200	2.085	2.00	7.632	9.16	42.9	221.3	550.8
55.00		1.00	1.12	4.342	4.78	0.00	1.200	2.105	5.00	18.714	22.46	107.3	542.0	1347.4
60.00		1.00	1.14	4.423	4.86	0.00	1.200	2.123	5.00	18.184	21.82	106.2	530.0	1309.3
65.00		1.00	1.16	4.498	4.95	0.00	1.200	2.140	5.00	17.653	21.18	104.8	517.4	1270.6
70.00		1.00	1.17	4.569	5.03	0.00	1.200	2.156	5.00	17.120	20.54	103.2	504.2	1231.3
75.00		1.00	1.19	4.635	5.10	0.00	1.200	2.171	5.00	16.587	19.90	101.5	490.5	1191.5
80.00		1.00	1.21	4.699	5.17	0.00	1.200	2.185	5.00	16.053	19.26	99.6	476.4	1151.2
85.00		1.00	1.22	4.759	5.24	0.00	1.200	2.198	5.00	15.519	18.62	97.5	461.9	1110.6
86.67	Bot - Section 3	1.00	1.23	4.779	5.26	0.00	1.200	2.203	1.67	5.053	6.06	31.9	152.3	362.8
90.00		1.00	1.24	4.817	5.30	0.00	1.200	2.211	3.33	10.070	12.08	64.0	302.6	1050.6
90.67	Top - Section 2	1.00	1.24	4.824	5.31	0.00	1.200	2.213	0.67	1.985	2.38	12.6	60.2	207.3
95.00		1.00	1.25	4.872	5.36	0.00	1.200	2.223	4.33	12.674	15.21	81.5	380.2	800.5
100.00		1.00	1.27	4.925	5.42	0.00	1.200	2.234	5.00	14.124	16.95	91.8	423.3	888.7
105.00	Appurtenance(s)	1.00	1.28	4.976	5.47	0.00	1.200	2.245	5.00	13.587	16.30	89.2	407.5	852.1
106.50	Appurtenance(s)	1.00	1.28	4.991	5.49	0.00	1.200	2.249	1.50	3.971	4.76	26.2	120.8	250.1
110.00		1.00	1.29	5.025	5.53	0.00	1.200	2.256	3.50	9.078	10.89	60.2	274.1	568.4
115.00		1.00	1.30	5.072	5.58	0.00	1.200	2.266	5.00	12.513	15.02	83.8	375.3	778.1
117.00	Appurtenance(s)	1.00	1.31	5.090	5.60	0.00	1.200	2.270	2.00	4.854	5.82	32.6	147.5	302.7
120.00		1.00	1.32	5.117	5.63	0.00	1.200	2.276	3.00	7.120	8.54	48.1	215.3	441.9
125.00		1.00	1.33	5.162	5.68	0.00	1.200	2.285	5.00	11.438	13.73	77.9	342.1	703.1
130.00	Top - Section 3	1.00	1.34	5.204	5.72	0.00	1.200	2.294	5.00	10.900	13.08	74.9	325.3	665.4
135.00		1.00	1.35	5.246	5.77	0.00	1.200	2.303	5.00	10.252	12.30	71.0	313.7	630.4
140.00	Appurtenance(s)	1.00	1.36	5.286	5.81	0.00	1.200	2.311	5.00	10.259	12.31	71.6	315.0	631.7
								Totals:	**140.00**			**2,682.3**		**35,521.3**

Discrete Appurtenance Forces

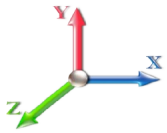
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

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	140.00	Lightning Rod	1	5.314	5.845	1.00	1.00	4.19	74.60	0.000	3.500	24.51	0.00	85.78
2	130.00	Ericsson Radio 4449 B71	3	5.204	5.725	0.54	0.80	3.70	485.70	0.000	0.000	21.20	0.00	0.00
3	130.00	RFS	3	5.204	5.725	0.58	0.80	39.34	2225.21	0.000	0.000	225.22	0.00	0.00
4	130.00	Ericsson AIR32	3	5.204	5.725	0.69	0.80	16.67	1245.36	0.000	0.000	95.41	0.00	0.00
5	130.00	T-Arms	3	5.204	5.725	0.75	1.00	38.65	2013.43	0.000	0.000	221.24	0.00	0.00
6	130.00	Ericsson AIR 21 B2A/B4P	3	5.204	5.725	0.69	0.80	15.52	1006.09	0.000	0.000	88.82	0.00	0.00
7	130.00	Ericsson KRY 112 144/2	3	5.204	5.725	0.48	0.80	1.27	73.02	0.000	0.000	7.28	0.00	0.00
8	117.00	T-Arms	3	5.090	5.599	0.56	0.75	28.82	2003.34	0.000	0.000	161.38	0.00	0.00
9	117.00	RFS DB-T1-6Z-8AB-0Z	2	5.090	5.599	0.54	0.80	5.51	725.80	0.000	0.000	30.87	0.00	0.00
10	117.00	ALU RRH2x60-700	3	5.090	5.599	0.54	0.80	7.28	496.29	0.000	0.000	40.75	0.00	0.00
11	117.00	ALU RRH2X60-PCS	3	5.090	5.599	0.54	0.80	5.39	402.29	0.000	0.000	30.18	0.00	0.00
12	117.00	ALU RRH2x60-AWS	3	5.090	5.599	0.54	0.80	7.28	496.29	0.000	0.000	40.75	0.00	0.00
13	117.00	Commscope	9	5.090	5.599	0.66	0.80	58.36	3039.62	0.000	0.000	326.80	0.00	0.00
14	117.00	Antel LPA-80063/6CFx5	6	5.090	5.599	0.68	0.80	46.48	2541.40	0.000	0.000	260.23	0.00	0.00
15	106.50	KMW	1	4.995	5.495	0.58	0.75	6.80	220.78	0.000	0.500	37.35	0.00	18.68
16	106.50	Powerwave	9	4.995	5.495	0.60	0.75	63.56	2061.52	0.000	0.500	349.28	0.00	174.64
17	106.50	Powerwave	1	4.995	5.495	0.60	0.75	9.36	287.88	0.000	0.500	51.46	0.00	25.73
18	106.50	Andrew SBNH-1D6565C	1	4.995	5.495	0.60	0.75	9.40	309.62	0.000	0.500	51.63	0.00	25.81
19	106.50	Powerwave	12	4.995	5.495	0.45	0.75	10.11	637.11	0.000	0.500	55.56	0.00	27.78
20	106.50	Powerwave 7020.00	12	4.995	5.495	0.45	0.75	5.53	155.02	0.000	0.500	30.38	0.00	15.19
21	106.50	Platform w/ Hand Rails	1	4.991	5.490	1.00	1.00	66.98	4498.33	0.000	0.000	367.71	0.00	0.00
22	105.00	Valmont LWRM Ring	1	4.976	5.473	0.64	0.80	6.07	697.23	0.000	0.000	33.24	0.00	0.00
23	105.00	Raycap DC6-48-60-18-8F	1	4.986	5.484	0.54	0.80	1.27	101.20	0.000	1.000	6.97	0.00	6.97
24	105.00	Andrew RRUS11 RRUs	6	4.986	5.484	0.54	0.80	10.87	1099.00	0.000	1.000	59.60	0.00	59.60
							Totals:		**26,896.12**			**2,617.83**		

Total Applied Force Summary

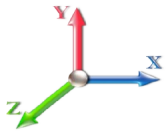
Structure:	CT13548-S-SBA		**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4		**Exposure:**	C	
Height:	140.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 20

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		102.74	1940.16	0.00	0.00
10.00		100.79	2132.29	0.00	0.00
15.00		98.67	2112.97	0.00	0.00
20.00		102.38	2085.75	0.00	0.00
25.00		104.83	2053.95	0.00	0.00
30.00		106.32	2019.10	0.00	0.00
35.00		107.12	1982.06	0.00	0.00
40.00		107.37	1943.35	0.00	0.00
42.67		56.87	1021.24	0.00	0.00
45.00		50.32	1285.03	0.00	0.00
48.00		64.65	1630.37	0.00	0.00
50.00		42.88	685.14	0.00	0.00
55.00		107.27	1683.95	0.00	0.00
60.00		106.16	1646.45	0.00	0.00
65.00		104.81	1608.28	0.00	0.00
70.00		103.24	1569.52	0.00	0.00
75.00		101.49	1530.24	0.00	0.00
80.00		99.57	1490.50	0.00	0.00
85.00		97.49	1450.34	0.00	0.00
86.67		31.87	476.06	0.00	0.00
90.00		64.02	1277.37	0.00	0.00
90.67		12.64	252.71	0.00	0.00
95.00		81.50	1095.66	0.00	0.00
100.00		91.82	1229.67	0.00	0.00
105.00	(8) attachments	189.05	3090.86	0.00	66.57
106.50	(37) attachments	969.52	8522.82	0.00	287.83
110.00		60.21	712.58	0.00	0.00
115.00		83.78	983.98	0.00	0.00
117.00	(29) attachments	923.59	10090.13	0.00	0.00
120.00		48.10	513.05	0.00	0.00
125.00		77.93	821.70	0.00	0.00
130.00	(18) attachments	734.06	7832.74	0.00	0.00
135.00		70.99	630.39	0.00	0.00
140.00	(1) attachments	96.10	706.25	0.00	85.78
	Totals:	**5,300.14**	**70,106.66**	**0.00**	**440.18**

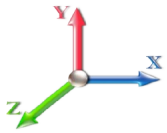
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

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	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	3.308	0.00	16.39
10.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	3.308	0.00	44.38
15.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	3.308	0.00	46.58
20.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	3.509	0.00	48.23
25.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	3.678	0.00	49.57
30.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	3.822	0.00	50.71
35.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	3.948	0.00	51.70
40.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.061	0.00	52.58
42.67	3" Conduit	Yes	2.67	0.000	0.00	0.00	0.00	0.000	0.000	4.116	0.00	28.27
45.00	3" Conduit	Yes	2.33	0.000	0.00	0.00	0.00	0.000	0.000	4.163	0.00	24.91
48.00	3" Conduit	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	4.220	0.00	32.29
50.00	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	4.256	0.00	21.64
55.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.342	0.00	54.76
60.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.423	0.00	55.38
65.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.498	0.00	55.96
70.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.569	0.00	56.50
75.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.635	0.00	57.01
80.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.699	0.00	57.49
85.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.759	0.00	57.95
86.67	3" Conduit	Yes	1.67	0.000	0.00	0.00	0.00	0.000	0.000	4.779	0.00	19.37
90.00	3" Conduit	Yes	3.33	0.000	0.00	0.00	0.00	0.000	0.000	4.817	0.00	38.93
90.67	3" Conduit	Yes	0.67	0.000	0.00	0.00	0.00	0.000	0.000	4.824	0.00	7.79
95.00	3" Conduit	Yes	4.33	0.000	0.00	0.00	0.00	0.000	0.000	4.872	0.00	50.97
100.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.925	0.00	59.21
105.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	4.976	0.00	59.59
106.50	3" Conduit	Yes	1.50	0.000	0.00	0.00	0.00	0.000	0.000	4.991	0.00	17.91
										Totals:	**0.0**	**1,116.1**

Calculated Forces

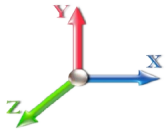
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

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	-70.11	-5.32	0.00	-526.27	0.00	526.27	4157.29	2078.64	8996.15	4504.76	0.00	0.000	0.000	0.134
5.00	-68.16	-5.26	0.00	-499.66	0.00	499.66	4094.64	2047.32	8641.94	4327.39	0.02	-0.033	0.000	0.132
10.00	-66.03	-5.19	0.00	-473.38	0.00	473.38	4030.02	2015.01	8290.37	4151.35	0.07	-0.067	0.000	0.130
15.00	-63.91	-5.13	0.00	-447.41	0.00	447.41	3963.43	1981.72	7941.76	3976.78	0.16	-0.102	0.000	0.129
20.00	-61.82	-5.06	0.00	-421.75	0.00	421.75	3894.87	1947.44	7596.41	3803.85	0.29	-0.138	0.000	0.127
25.00	-59.77	-4.99	0.00	-396.43	0.00	396.43	3824.34	1912.17	7254.65	3632.72	0.45	-0.174	0.000	0.125
30.00	-57.74	-4.92	0.00	-371.48	0.00	371.48	3751.84	1875.92	6916.79	3463.54	0.65	-0.211	0.000	0.123
35.00	-55.76	-4.84	0.00	-346.90	0.00	346.90	3677.38	1838.69	6583.15	3296.47	0.89	-0.248	0.000	0.120
40.00	-53.81	-4.75	0.00	-322.71	0.00	322.71	3600.94	1800.47	6254.04	3131.67	1.17	-0.286	0.000	0.118
42.67	-52.79	-4.71	0.00	-310.05	0.00	310.05	3559.36	1779.68	6080.47	3044.76	1.34	-0.307	0.000	0.117
45.00	-51.50	-4.67	0.00	-299.07	0.00	299.07	3522.53	1761.26	5929.77	2969.29	1.49	-0.326	0.000	0.115
48.00	-49.87	-4.61	0.00	-285.07	0.00	285.07	2765.58	1382.79	4652.71	2329.81	1.71	-0.350	0.000	0.140
50.00	-49.19	-4.59	0.00	-275.85	0.00	275.85	2743.08	1371.54	4556.27	2281.52	1.86	-0.366	0.000	0.139
55.00	-47.50	-4.51	0.00	-252.90	0.00	252.90	2685.46	1342.73	4317.17	2161.80	2.27	-0.412	0.000	0.135
60.00	-45.85	-4.43	0.00	-230.36	0.00	230.36	2625.87	1312.94	4081.16	2043.62	2.72	-0.458	0.000	0.130
65.00	-44.24	-4.34	0.00	-208.23	0.00	208.23	2564.31	1282.15	3848.56	1927.14	3.23	-0.504	0.000	0.125
70.00	-42.67	-4.26	0.00	-186.51	0.00	186.51	2500.78	1250.39	3619.69	1812.53	3.78	-0.549	0.000	0.120
75.00	-41.13	-4.18	0.00	-165.21	0.00	165.21	2435.28	1217.64	3394.85	1699.95	4.38	-0.595	0.000	0.114
80.00	-39.64	-4.09	0.00	-144.33	0.00	144.33	2367.81	1183.90	3174.36	1589.54	5.03	-0.640	0.000	0.108
85.00	-38.19	-4.00	0.00	-123.87	0.00	123.87	2298.37	1149.18	2958.55	1481.47	5.72	-0.683	0.000	0.100
86.67	-37.71	-3.97	0.00	-117.21	0.00	117.21	2274.78	1137.39	2887.71	1446.00	5.96	-0.698	0.000	0.098
90.00	-36.44	-3.90	0.00	-103.97	0.00	103.97	2218.24	1109.12	2736.97	1370.52	6.46	-0.726	0.000	0.092
90.67	-36.18	-3.90	0.00	-101.37	0.00	101.37	1688.87	844.43	2115.41	1059.28	6.56	-0.732	0.000	0.117
95.00	-35.08	-3.83	0.00	-84.47	0.00	84.47	1646.42	823.21	1986.06	994.50	7.24	-0.766	0.000	0.106
100.00	-33.85	-3.74	0.00	-65.33	0.00	65.33	1595.61	797.80	1839.56	921.15	8.07	-0.808	0.000	0.092
105.00	-30.76	-3.52	0.00	-46.55	0.00	46.55	1542.83	771.41	1696.33	849.43	8.93	-0.844	0.000	0.075
106.50	-22.26	-2.43	0.00	-40.98	0.00	40.98	1526.61	763.30	1654.04	828.25	9.20	-0.854	0.000	0.064
110.00	-21.54	-2.37	0.00	-32.48	0.00	32.48	1488.07	744.04	1556.67	779.49	9.83	-0.873	0.000	0.056
115.00	-20.56	-2.27	0.00	-20.64	0.00	20.64	1427.69	713.85	1417.28	709.69	10.76	-0.896	0.000	0.043
117.00	-10.49	-1.19	0.00	-16.09	0.00	16.09	1397.29	698.64	1357.25	679.64	11.14	-0.903	0.000	0.031
120.00	-9.97	-1.14	0.00	-12.51	0.00	12.51	1351.68	675.84	1269.65	635.77	11.71	-0.913	0.000	0.027
125.00	-9.15	-1.05	0.00	-6.81	0.00	6.81	1275.66	637.83	1130.14	565.91	12.67	-0.924	0.000	0.019
130.00	-1.33	-0.19	0.00	-1.57	0.00	1.57	1199.65	599.83	998.75	500.12	13.64	-0.930	0.000	0.004
130.00	-1.33	-0.19	0.00	-1.57	0.00	1.57	582.69	291.35	473.23	281.02	13.64	-0.930	0.000	0.008
135.00	-0.70	-0.11	0.00	-0.62	0.00	0.62	582.69	291.35	473.23	281.02	14.62	-0.932	0.000	0.003
140.00	0.00	-0.10	0.00	-0.09	0.00	0.09	582.69	291.35	473.23	281.02	15.59	-0.932	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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 + 1.0E							**Iterations**	20
Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.40	**SA**	0.04			**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		1052.6	0.00	0.03	0.02	20.40	
10.00		1026.4	0.01	0.05	0.03	28.40	
15.00		1000.3	0.02	0.06	0.04	31.58	
20.00		974.27	0.04	0.07	0.04	32.65	
25.00		948.16	0.06	0.07	0.04	32.88	
30.00		922.05	0.09	0.07	0.04	32.84	
35.00		895.94	0.12	0.07	0.03	32.74	
40.00		869.83	0.15	0.07	0.03	32.47	
42.67	Bot - Section 2	453.23	0.18	0.07	0.03	17.04	
45.00		721.30	0.20	0.06	0.02	27.14	
48.00	Top - Section 1	912.07	0.22	0.06	0.02	34.04	
50.00		274.56	0.24	0.06	0.02	10.11	
55.00		671.18	0.29	0.05	0.01	22.83	
60.00		649.42	0.35	0.03	0.01	18.38	
65.00		627.66	0.41	0.02	0.01	11.90	
70.00		605.90	0.47	-0.01	0.01	3.72	
75.00		584.14	0.54	-0.03	0.01	-4.98	
80.00		562.39	0.62	-0.06	0.02	-12.51	
85.00		540.63	0.70	-0.09	0.03	-17.45	
86.67	Bot - Section 3	175.37	0.72	-0.09	0.03	-6.05	
90.00		623.35	0.78	-0.11	0.05	-23.04	
90.67	Top - Section 2	122.58	0.79	-0.11	0.05	-4.55	
95.00		350.24	0.87	-0.12	0.08	-12.50	
100.00		387.87	0.96	-0.12	0.11	-11.04	
105.00	Appurtenance(s)	1057.4	1.06	-0.09	0.17	-16.19	
106.50	Appurtenance(s)	3048.7	1.09	-0.07	0.18	-31.21	
110.00		245.31	1.17	-0.02	0.23	0.89	
115.00		335.65	1.28	0.09	0.31	9.53	
117.00	Appurtenance(s)	2410.7	1.32	0.15	0.35	96.28	
120.00		188.86	1.39	0.26	0.42	11.15	
125.00		300.84	1.51	0.52	0.55	28.77	
130.00	Top - Section 3	2618.0	1.63	0.87	0.71	362.24	
135.00		263.91	1.76	1.35	0.91	49.44	
140.00	Appurtenance(s)	298.91	1.89	1.98	1.14	72.56	
	Totals:	**26,720.2**				**880.5**	**Total Wind:** **29,229.6**

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

Calculated Forces

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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 + 1.0E							**Iterations**	20
Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.40	**SA**	0.04	**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	-38.84	-1.02	0.00	-98.00	0.00	98.00	4157.29	2078.64	8996.15	4504.76		0.00	0.00	0.031
5.00	-37.46	-1.01	0.00	-92.89	0.00	92.89	4094.64	2047.32	8641.94	4327.39		0.00	-0.01	0.031
10.00	-35.93	-0.98	0.00	-87.87	0.00	87.87	4030.02	2015.01	8290.37	4151.35		0.01	-0.01	0.030
15.00	-34.44	-0.95	0.00	-82.96	0.00	82.96	3963.43	1981.72	7941.76	3976.78		0.03	-0.02	0.030
20.00	-32.98	-0.92	0.00	-78.20	0.00	78.20	3894.87	1947.44	7596.41	3803.85		0.05	-0.03	0.029
25.00	-31.55	-0.89	0.00	-73.59	0.00	73.59	3824.34	1912.17	7254.65	3632.72		0.08	-0.03	0.029
30.00	-30.15	-0.86	0.00	-69.12	0.00	69.12	3751.84	1875.92	6916.79	3463.54		0.12	-0.04	0.028
35.00	-28.79	-0.83	0.00	-64.81	0.00	64.81	3677.38	1838.69	6583.15	3296.47		0.17	-0.05	0.027
40.00	-27.45	-0.80	0.00	-60.65	0.00	60.65	3600.94	1800.47	6254.04	3131.67		0.22	-0.05	0.027
42.67	-26.75	-0.79	0.00	-58.51	0.00	58.51	3559.36	1779.68	6080.47	3044.76		0.25	-0.06	0.027
45.00	-25.75	-0.76	0.00	-56.67	0.00	56.67	3522.53	1761.26	5929.77	2969.29		0.28	-0.06	0.026
48.00	-24.48	-0.73	0.00	-54.40	0.00	54.40	2765.58	1382.79	4652.71	2329.81		0.32	-0.07	0.032
50.00	-24.04	-0.72	0.00	-52.94	0.00	52.94	2743.08	1371.54	4556.27	2281.52		0.35	-0.07	0.032
55.00	-22.94	-0.70	0.00	-49.36	0.00	49.36	2685.46	1342.73	4317.17	2161.80		0.42	-0.08	0.031
60.00	-21.87	-0.68	0.00	-45.87	0.00	45.87	2625.87	1312.94	4081.16	2043.62		0.51	-0.09	0.031
65.00	-20.82	-0.67	0.00	-42.47	0.00	42.47	2564.31	1282.15	3848.56	1927.14		0.60	-0.10	0.030
70.00	-19.80	-0.67	0.00	-39.12	0.00	39.12	2500.78	1250.39	3619.69	1812.53		0.71	-0.11	0.030
75.00	-18.81	-0.67	0.00	-35.78	0.00	35.78	2435.28	1217.64	3394.85	1699.95		0.82	-0.11	0.029
80.00	-17.85	-0.67	0.00	-32.43	0.00	32.43	2367.81	1183.90	3174.36	1589.54		0.95	-0.12	0.028
85.00	-16.91	-0.67	0.00	-29.07	0.00	29.07	2298.37	1149.18	2958.55	1481.47		1.08	-0.13	0.027
86.67	-16.60	-0.67	0.00	-27.96	0.00	27.96	2274.78	1137.39	2887.71	1446.00		1.13	-0.14	0.027
90.00	-15.66	-0.67	0.00	-25.72	0.00	25.72	2218.24	1109.12	2736.97	1370.52		1.23	-0.14	0.026
90.67	-15.47	-0.67	0.00	-25.27	0.00	25.27	1688.87	844.43	2115.41	1059.28		1.25	-0.15	0.033
95.00	-14.80	-0.67	0.00	-22.36	0.00	22.36	1646.42	823.21	1986.06	994.50		1.39	-0.16	0.031
100.00	-14.04	-0.67	0.00	-19.01	0.00	19.01	1595.61	797.80	1839.56	921.15		1.56	-0.17	0.029
105.00	-12.48	-0.67	0.00	-15.64	0.00	15.64	1542.83	771.41	1696.33	849.43		1.74	-0.18	0.027
106.50	-8.73	-0.66	0.00	-14.64	0.00	14.64	1526.61	763.30	1654.04	828.25		1.79	-0.18	0.023
110.00	-8.29	-0.66	0.00	-12.33	0.00	12.33	1488.07	744.04	1556.67	779.49		1.93	-0.19	0.021
115.00	-7.69	-0.65	0.00	-9.04	0.00	9.04	1427.69	713.85	1417.28	709.69		2.13	-0.20	0.018
117.00	-4.71	-0.54	0.00	-7.75	0.00	7.75	1397.29	698.64	1357.25	679.64		2.22	-0.20	0.015
120.00	-4.41	-0.53	0.00	-6.13	0.00	6.13	1351.68	675.84	1269.65	635.77		2.34	-0.21	0.013
125.00	-3.93	-0.50	0.00	-3.48	0.00	3.48	1275.66	637.83	1130.14	565.91		2.56	-0.21	0.009
130.00	-0.67	-0.12	0.00	-0.99	0.00	0.99	1199.65	599.83	998.75	500.12		2.78	-0.21	0.003
130.00	-0.67	-0.12	0.00	-0.99	0.00	0.99	582.69	291.35	473.23	281.02		2.78	-0.21	0.005
135.00	-0.36	-0.07	0.00	-0.37	0.00	0.37	582.69	291.35	473.23	281.02		3.01	-0.22	0.002
140.00	0.00	-0.07	0.00	0.00	0.00	0.00	582.69	291.35	473.23	281.02		3.23	-0.22	0.000

Seismic Segment Forces (Factored)

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E					**Iterations**	20
Gust Response Factor	1.10			**Sds**	0.19	**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.40	**SA**	0.04	**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		1052.6	0.00	0.03	0.02	20.40	
10.00		1026.4	0.01	0.05	0.03	28.40	
15.00		1000.3	0.02	0.06	0.04	31.58	
20.00		974.27	0.04	0.07	0.04	32.65	
25.00		948.16	0.06	0.07	0.04	32.88	
30.00		922.05	0.09	0.07	0.04	32.84	
35.00		895.94	0.12	0.07	0.03	32.74	
40.00		869.83	0.15	0.07	0.03	32.47	
42.67	Bot - Section 2	453.23	0.18	0.07	0.03	17.04	
45.00		721.30	0.20	0.06	0.02	27.14	
48.00	Top - Section 1	912.07	0.22	0.06	0.02	34.04	
50.00		274.56	0.24	0.06	0.02	10.11	
55.00		671.18	0.29	0.05	0.01	22.83	
60.00		649.42	0.35	0.03	0.01	18.38	
65.00		627.66	0.41	0.02	0.01	11.90	
70.00		605.90	0.47	-0.01	0.01	3.72	
75.00		584.14	0.54	-0.03	0.01	-4.98	
80.00		562.39	0.62	-0.06	0.02	-12.51	
85.00		540.63	0.70	-0.09	0.03	-17.45	
86.67	Bot - Section 3	175.37	0.72	-0.09	0.03	-6.05	
90.00		623.35	0.78	-0.11	0.05	-23.04	
90.67	Top - Section 2	122.58	0.79	-0.11	0.05	-4.55	
95.00		350.24	0.87	-0.12	0.08	-12.50	
100.00		387.87	0.96	-0.12	0.11	-11.04	
105.00	Appurtenance(s)	1057.4	1.06	-0.09	0.17	-16.19	
106.50	Appurtenance(s)	3048.7	1.09	-0.07	0.18	-31.21	
110.00		245.31	1.17	-0.02	0.23	0.89	
115.00		335.65	1.28	0.09	0.31	9.53	
117.00	Appurtenance(s)	2410.7	1.32	0.15	0.35	96.28	
120.00		188.86	1.39	0.26	0.42	11.15	
125.00		300.84	1.51	0.52	0.55	28.77	
130.00	Top - Section 3	2618.0	1.63	0.87	0.71	362.24	
135.00		263.91	1.76	1.35	0.91	49.44	
140.00	Appurtenance(s)	298.91	1.89	1.98	1.14	72.56	
	Totals:	**26,720.2**				**880.5**	**Total Wind:** **29,229.6**

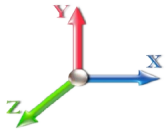
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	20
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.40	**SA**	0.04	**S1**	0.06
						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	-29.13	-1.02	0.00	-97.09	0.00	97.09	4157.29	2078.64	8996.15	4504.76		0.00	0.00	0.029
5.00	-28.09	-1.00	0.00	-91.99	0.00	91.99	4094.64	2047.32	8641.94	4327.39		0.00	-0.01	0.028
10.00	-26.95	-0.98	0.00	-86.97	0.00	86.97	4030.02	2015.01	8290.37	4151.35		0.01	-0.01	0.028
15.00	-25.83	-0.95	0.00	-82.08	0.00	82.08	3963.43	1981.72	7941.76	3976.78		0.03	-0.02	0.027
20.00	-24.74	-0.92	0.00	-77.34	0.00	77.34	3894.87	1947.44	7596.41	3803.85		0.05	-0.03	0.027
25.00	-23.66	-0.89	0.00	-72.74	0.00	72.74	3824.34	1912.17	7254.65	3632.72		0.08	-0.03	0.026
30.00	-22.62	-0.86	0.00	-68.30	0.00	68.30	3751.84	1875.92	6916.79	3463.54		0.12	-0.04	0.026
35.00	-21.59	-0.83	0.00	-64.02	0.00	64.02	3677.38	1838.69	6583.15	3296.47		0.16	-0.05	0.025
40.00	-20.59	-0.80	0.00	-59.89	0.00	59.89	3600.94	1800.47	6254.04	3131.67		0.22	-0.05	0.025
42.67	-20.06	-0.78	0.00	-57.77	0.00	57.77	3559.36	1779.68	6080.47	3044.76		0.25	-0.06	0.025
45.00	-19.31	-0.75	0.00	-55.95	0.00	55.95	3522.53	1761.26	5929.77	2969.29		0.27	-0.06	0.024
48.00	-18.36	-0.72	0.00	-53.69	0.00	53.69	2765.58	1382.79	4652.71	2329.81		0.31	-0.06	0.030
50.00	-18.03	-0.71	0.00	-52.26	0.00	52.26	2743.08	1371.54	4556.27	2281.52		0.34	-0.07	0.029
55.00	-17.20	-0.69	0.00	-48.71	0.00	48.71	2685.46	1342.73	4317.17	2161.80		0.42	-0.08	0.029
60.00	-16.40	-0.67	0.00	-45.27	0.00	45.27	2625.87	1312.94	4081.16	2043.62		0.50	-0.09	0.028
65.00	-15.62	-0.66	0.00	-41.91	0.00	41.91	2564.31	1282.15	3848.56	1927.14		0.60	-0.09	0.028
70.00	-14.85	-0.66	0.00	-38.60	0.00	38.60	2500.78	1250.39	3619.69	1812.53		0.70	-0.10	0.027
75.00	-14.11	-0.66	0.00	-35.31	0.00	35.31	2435.28	1217.64	3394.85	1699.95		0.81	-0.11	0.027
80.00	-13.38	-0.66	0.00	-32.01	0.00	32.01	2367.81	1183.90	3174.36	1589.54		0.94	-0.12	0.026
85.00	-12.68	-0.66	0.00	-28.71	0.00	28.71	2298.37	1149.18	2958.55	1481.47		1.07	-0.13	0.025
86.67	-12.45	-0.66	0.00	-27.61	0.00	27.61	2274.78	1137.39	2887.71	1446.00		1.12	-0.14	0.025
90.00	-11.74	-0.66	0.00	-25.41	0.00	25.41	2218.24	1109.12	2736.97	1370.52		1.22	-0.14	0.024
90.67	-11.60	-0.66	0.00	-24.97	0.00	24.97	1688.87	844.43	2115.41	1059.28		1.24	-0.14	0.030
95.00	-11.10	-0.66	0.00	-22.11	0.00	22.11	1646.42	823.21	1986.06	994.50		1.37	-0.15	0.029
100.00	-10.53	-0.66	0.00	-18.80	0.00	18.80	1595.61	797.80	1839.56	921.15		1.54	-0.16	0.027
105.00	-9.36	-0.66	0.00	-15.49	0.00	15.49	1542.83	771.41	1696.33	849.43		1.72	-0.18	0.024
106.50	-6.55	-0.65	0.00	-14.50	0.00	14.50	1526.61	763.30	1654.04	828.25		1.77	-0.18	0.022
110.00	-6.22	-0.65	0.00	-12.23	0.00	12.23	1488.07	744.04	1556.67	779.49		1.91	-0.19	0.020
115.00	-5.76	-0.64	0.00	-8.97	0.00	8.97	1427.69	713.85	1417.28	709.69		2.11	-0.20	0.017
117.00	-3.53	-0.54	0.00	-7.69	0.00	7.69	1397.29	698.64	1357.25	679.64		2.19	-0.20	0.014
120.00	-3.31	-0.52	0.00	-6.08	0.00	6.08	1351.68	675.84	1269.65	635.77		2.32	-0.20	0.012
125.00	-2.95	-0.49	0.00	-3.46	0.00	3.46	1275.66	637.83	1130.14	565.91		2.53	-0.21	0.008
130.00	-0.51	-0.12	0.00	-0.99	0.00	0.99	1199.65	599.83	998.75	500.12		2.75	-0.21	0.002
130.00	-0.51	-0.12	0.00	-0.99	0.00	0.99	582.69	291.35	473.23	281.02		2.75	-0.21	0.004
135.00	-0.27	-0.07	0.00	-0.37	0.00	0.37	582.69	291.35	473.23	281.02		2.97	-0.21	0.002
140.00	0.00	-0.07	0.00	0.00	0.00	0.00	582.69	291.35	473.23	281.02		3.20	-0.21	0.000

Wind Loading - Shaft

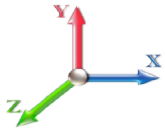
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	248.09	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	242.05	0.650	0.000	5.00	22.151	14.40	117.9	0.0	1052.6
10.00		1.00	0.85	7.442	8.19	236.02	0.650	0.000	5.00	21.606	14.04	115.0	0.0	1026.5
15.00		1.00	0.85	7.442	8.19	229.98	0.650	0.000	5.00	21.060	13.69	112.1	0.0	1000.4
20.00		1.00	0.90	7.896	8.69	230.68	0.650	0.000	5.00	20.515	13.33	115.8	0.0	974.3
25.00		1.00	0.95	8.276	9.10	229.80	0.650	0.000	5.00	19.969	12.98	118.2	0.0	948.2
30.00		1.00	0.98	8.600	9.46	227.76	0.650	0.000	5.00	19.423	12.63	119.4	0.0	922.0
35.00		1.00	1.01	8.883	9.77	224.89	0.650	0.000	5.00	18.878	12.27	119.9	0.0	895.9
40.00		1.00	1.04	9.137	10.05	221.39	0.650	0.000	5.00	18.332	11.92	119.8	0.0	869.8
42.67	Bot - Section 2	1.00	1.06	9.262	10.19	219.31	0.650	0.000	2.67	9.554	6.21	63.3	0.0	453.2
45.00		1.00	1.07	9.366	10.30	217.38	0.650	0.000	2.33	8.356	5.43	56.0	0.0	721.3
48.00	Top - Section 1	1.00	1.08	9.494	10.44	214.77	0.650	0.000	3.00	10.569	6.87	71.7	0.0	912.1
50.00		1.00	1.09	9.576	10.53	216.27	0.650	0.000	2.00	6.937	4.51	47.5	0.0	274.6
55.00		1.00	1.12	9.770	10.75	211.54	0.650	0.000	5.00	16.960	11.02	118.5	0.0	671.2
60.00		1.00	1.14	9.951	10.95	206.51	0.650	0.000	5.00	16.415	10.67	116.8	0.0	649.4
65.00		1.00	1.16	10.120	11.13	201.22	0.650	0.000	5.00	15.869	10.31	114.8	0.0	627.7
70.00		1.00	1.17	10.279	11.31	195.70	0.650	0.000	5.00	15.324	9.96	112.6	0.0	605.9
75.00		1.00	1.19	10.430	11.47	189.98	0.650	0.000	5.00	14.778	9.61	110.2	0.0	584.1
80.00		1.00	1.21	10.572	11.63	184.08	0.650	0.000	5.00	14.232	9.25	107.6	0.0	562.4
85.00		1.00	1.22	10.708	11.78	178.02	0.650	0.000	5.00	13.687	8.90	104.8	0.0	540.6
86.67	Bot - Section 3	1.00	1.23	10.752	11.83	175.96	0.650	0.000	1.67	4.441	2.89	34.1	0.0	175.4
90.00		1.00	1.24	10.838	11.92	171.81	0.650	0.000	3.33	8.841	5.75	68.5	0.0	623.4
90.67	Top - Section 2	1.00	1.24	10.855	11.94	170.97	0.650	0.000	0.67	1.739	1.13	13.5	0.0	122.6
95.00		1.00	1.25	10.962	12.06	168.31	0.650	0.000	4.33	11.068	7.19	86.7	0.0	350.2
100.00		1.00	1.27	11.081	12.19	161.85	0.650	0.000	5.00	12.262	7.97	97.1	0.0	387.9
105.00	Appurtenance(s)	1.00	1.28	11.195	12.31	155.28	0.650	0.000	5.00	11.716	7.62	93.8	0.0	370.5
106.50	Appurtenance(s)	1.00	1.28	11.229	12.35	153.29	0.650	0.000	1.50	3.408	2.22	27.4	0.0	107.7
110.00		1.00	1.29	11.305	12.44	148.61	0.650	0.000	3.50	7.762	5.05	62.7	0.0	245.3
115.00		1.00	1.30	11.412	12.55	141.83	0.650	0.000	5.00	10.625	6.91	86.7	0.0	335.7
117.00	Appurtenance(s)	1.00	1.31	11.453	12.60	139.09	0.650	0.000	2.00	4.097	2.66	33.6	0.0	129.4
120.00		1.00	1.32	11.514	12.67	134.96	0.650	0.000	3.00	5.982	3.89	49.3	0.0	188.9
125.00		1.00	1.33	11.614	12.78	128.00	0.650	0.000	5.00	9.534	6.20	79.2	0.0	300.8
130.00	Top - Section 3	1.00	1.34	11.710	12.88	120.96	0.650	0.000	5.00	8.989	5.84	75.3	0.0	283.4
135.00		1.00	1.35	11.803	12.98	116.11	0.600	0.000	5.00	8.333	5.00	64.9	0.0	263.9
140.00	Appurtenance(s)	1.00	1.36	11.894	13.08	116.56	0.600	0.000	5.00	8.333	5.00	65.4	0.0	263.9
								Totals:	**140.00**			**2,899.9**		**18,441.1**

Discrete Appurtenance Forces

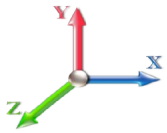
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

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	140.00	Lightning Rod	1	11.956	13.152	1.00	1.00	1.05	35.00	0.000	3.500	13.81	0.00	48.33
2	130.00	Ericsson Radio 4449 B71	3	11.710	12.881	0.54	0.80	2.62	222.00	0.000	0.000	33.76	0.00	0.00
3	130.00	RFS	3	11.710	12.881	0.58	0.80	34.97	384.00	0.000	0.000	450.51	0.00	0.00
4	130.00	Ericsson AIR32	3	11.710	12.881	0.69	0.80	13.44	396.60	0.000	0.000	173.08	0.00	0.00
5	130.00	T-Arms	3	11.710	12.881	0.75	1.00	18.00	1050.00	0.000	0.000	231.86	0.00	0.00
6	130.00	Ericsson AIR 21 B2A/B4P	3	11.710	12.881	0.69	0.80	12.49	249.00	0.000	0.000	160.85	0.00	0.00
7	130.00	Ericsson KRY 112 144/2	3	11.710	12.881	0.48	0.80	0.50	33.06	0.000	0.000	6.49	0.00	0.00
8	117.00	T-Arms	3	11.453	12.598	0.56	0.75	13.50	1050.00	0.000	0.000	170.08	0.00	0.00
9	117.00	RFS DB-T1-6Z-8AB-0Z	2	11.453	12.598	0.54	0.80	4.40	88.00	0.000	0.000	55.37	0.00	0.00
10	117.00	ALU RRH2x60-700	3	11.453	12.598	0.54	0.80	5.63	180.00	0.000	0.000	70.90	0.00	0.00
11	117.00	ALU RRH2X60-PCS	3	11.453	12.598	0.54	0.80	3.20	165.00	0.000	0.000	40.31	0.00	0.00
12	117.00	ALU RRH2x60-AWS	3	11.453	12.598	0.54	0.80	5.63	180.00	0.000	0.000	70.90	0.00	0.00
13	117.00	Commscope	9	11.453	12.598	0.66	0.80	48.76	456.39	0.000	0.000	614.35	0.00	0.00
14	117.00	Antel LPA-80063/6CFx5	6	11.453	12.598	0.68	0.80	39.17	162.00	0.000	0.000	493.46	0.00	0.00
15	106.50	KMW	1	11.240	12.364	0.58	0.75	4.69	48.50	0.000	0.500	58.01	0.00	29.00
16	106.50	Powerwave	9	11.240	12.364	0.60	0.75	44.06	477.00	0.000	0.500	544.79	0.00	272.40
17	106.50	Powerwave	1	11.240	12.364	0.60	0.75	6.86	59.00	0.000	0.500	84.86	0.00	42.43
18	106.50	Andrew SBNH-1D6565C	1	11.240	12.364	0.60	0.75	6.88	66.10	0.000	0.500	85.09	0.00	42.54
19	106.50	Powerwave	12	11.240	12.364	0.45	0.75	4.97	264.00	0.000	0.500	61.42	0.00	30.71
20	106.50	Powerwave 7020.00	12	11.240	12.364	0.45	0.75	2.16	26.40	0.000	0.500	26.71	0.00	13.35
21	106.50	Platform w/ Hand Rails	1	11.229	12.351	1.00	1.00	40.00	2000.00	0.000	0.000	494.06	0.00	0.00
22	105.00	Valmont LWRM Ring	1	11.195	12.315	0.64	0.80	3.20	350.00	0.000	0.000	39.41	0.00	0.00
23	105.00	Raycap DC6-48-60-18-8F	1	11.218	12.339	0.54	0.80	0.79	32.80	0.000	1.000	9.72	0.00	9.72
24	105.00	Andrew RRUS11 RRUs	6	11.218	12.339	0.54	0.80	8.10	304.20	0.000	1.000	100.00	0.00	100.00
							Totals:		**8,279.05**			**4,089.81**		

Total Applied Force Summary

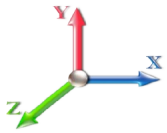
Structure:	CT13548-S-SBA		**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4		**Exposure:**	C	
Height:	140.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		117.87	1149.74	0.00	0.00
10.00		114.96	1269.34	0.00	0.00
15.00		112.06	1243.23	0.00	0.00
20.00		115.82	1217.12	0.00	0.00
25.00		118.16	1191.01	0.00	0.00
30.00		119.43	1164.90	0.00	0.00
35.00		119.91	1138.79	0.00	0.00
40.00		119.76	1112.68	0.00	0.00
42.67		63.27	582.75	0.00	0.00
45.00		55.96	834.63	0.00	0.00
48.00		71.75	1057.78	0.00	0.00
50.00		47.50	371.70	0.00	0.00
55.00		118.48	914.03	0.00	0.00
60.00		116.79	892.27	0.00	0.00
65.00		114.83	870.51	0.00	0.00
70.00		112.62	848.75	0.00	0.00
75.00		110.20	826.99	0.00	0.00
80.00		107.59	805.24	0.00	0.00
85.00		104.79	783.48	0.00	0.00
86.67		34.14	256.32	0.00	0.00
90.00		68.51	785.25	0.00	0.00
90.67		13.50	154.96	0.00	0.00
95.00		86.75	560.71	0.00	0.00
100.00		97.15	630.72	0.00	0.00
105.00	(8) attachments	242.91	1300.32	0.00	109.72
106.50	(37) attachments	1382.30	3121.60	0.00	430.44
110.00		62.74	365.43	0.00	0.00
115.00		86.69	507.25	0.00	0.00
117.00	(29) attachments	1548.93	2479.42	0.00	0.00
120.00		49.25	248.14	0.00	0.00
125.00		79.17	399.64	0.00	0.00
130.00	(18) attachments	1131.80	2716.89	0.00	0.00
135.00		64.92	263.91	0.00	0.00
140.00	(1) attachments	79.23	298.91	0.00	48.33
	Totals:	**6,989.74**	**32,364.43**	**0.00**	**588.50**

Linear Appurtenance Segment Forces (Factored)

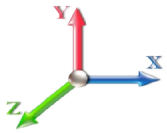
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

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	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	3.22
10.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	8.05
15.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	8.05
20.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.896	0.00	8.05
25.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.276	0.00	8.05
30.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.600	0.00	8.05
35.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.883	0.00	8.05
40.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.137	0.00	8.05
42.67	3" Conduit	Yes	2.67	0.000	0.00	0.00	0.00	0.000	0.000	9.262	0.00	4.29
45.00	3" Conduit	Yes	2.33	0.000	0.00	0.00	0.00	0.000	0.000	9.366	0.00	3.76
48.00	3" Conduit	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	9.494	0.00	4.83
50.00	3" Conduit	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	9.576	0.00	3.22
55.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.770	0.00	8.05
60.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.951	0.00	8.05
65.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.120	0.00	8.05
70.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.279	0.00	8.05
75.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.430	0.00	8.05
80.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.572	0.00	8.05
85.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.708	0.00	8.05
86.67	3" Conduit	Yes	1.67	0.000	0.00	0.00	0.00	0.000	0.000	10.752	0.00	2.68
90.00	3" Conduit	Yes	3.33	0.000	0.00	0.00	0.00	0.000	0.000	10.838	0.00	5.37
90.67	3" Conduit	Yes	0.67	0.000	0.00	0.00	0.00	0.000	0.000	10.855	0.00	1.07
95.00	3" Conduit	Yes	4.33	0.000	0.00	0.00	0.00	0.000	0.000	10.962	0.00	6.98
100.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.081	0.00	8.05
105.00	3" Conduit	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.195	0.00	8.05
106.50	3" Conduit	Yes	1.50	0.000	0.00	0.00	0.00	0.000	0.000	11.229	0.00	2.42
										Totals:	**0.0**	**166.6**

Calculated Forces

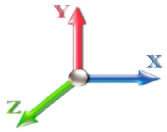
Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

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	-32.36	-7.00	0.00	-688.85	0.00	688.85	4157.29	2078.64	8996.15	4504.76	0.00	0.000	0.000	0.161
5.00	-31.21	-6.91	0.00	-653.84	0.00	653.84	4094.64	2047.32	8641.94	4327.39	0.02	-0.044	0.000	0.159
10.00	-29.93	-6.81	0.00	-619.30	0.00	619.30	4030.02	2015.01	8290.37	4151.35	0.09	-0.088	0.000	0.157
15.00	-28.68	-6.72	0.00	-585.23	0.00	585.23	3963.43	1981.72	7941.76	3976.78	0.21	-0.134	0.000	0.154
20.00	-27.46	-6.63	0.00	-551.61	0.00	551.61	3894.87	1947.44	7596.41	3803.85	0.37	-0.180	0.000	0.152
25.00	-26.27	-6.53	0.00	-518.48	0.00	518.48	3824.34	1912.17	7254.65	3632.72	0.59	-0.227	0.000	0.150
30.00	-25.10	-6.42	0.00	-485.85	0.00	485.85	3751.84	1875.92	6916.79	3463.54	0.85	-0.276	0.000	0.147
35.00	-23.95	-6.32	0.00	-453.74	0.00	453.74	3677.38	1838.69	6583.15	3296.47	1.17	-0.325	0.000	0.144
40.00	-22.84	-6.21	0.00	-422.15	0.00	422.15	3600.94	1800.47	6254.04	3131.67	1.53	-0.375	0.000	0.141
42.67	-22.25	-6.15	0.00	-405.60	0.00	405.60	3559.36	1779.68	6080.47	3044.76	1.75	-0.402	0.000	0.139
45.00	-21.41	-6.10	0.00	-391.25	0.00	391.25	3522.53	1761.26	5929.77	2969.29	1.95	-0.427	0.000	0.138
48.00	-20.35	-6.03	0.00	-372.96	0.00	372.96	2765.58	1382.79	4652.71	2329.81	2.23	-0.458	0.000	0.167
50.00	-19.98	-5.99	0.00	-360.90	0.00	360.90	2743.08	1371.54	4556.27	2281.52	2.43	-0.479	0.000	0.165
55.00	-19.06	-5.88	0.00	-330.95	0.00	330.95	2685.46	1342.73	4317.17	2161.80	2.96	-0.539	0.000	0.160
60.00	-18.16	-5.78	0.00	-301.53	0.00	301.53	2625.87	1312.94	4081.16	2043.62	3.56	-0.599	0.000	0.154
65.00	-17.29	-5.67	0.00	-272.64	0.00	272.64	2564.31	1282.15	3848.56	1927.14	4.22	-0.659	0.000	0.148
70.00	-16.43	-5.57	0.00	-244.28	0.00	244.28	2500.78	1250.39	3619.69	1812.53	4.94	-0.719	0.000	0.141
75.00	-15.60	-5.46	0.00	-216.45	0.00	216.45	2435.28	1217.64	3394.85	1699.95	5.73	-0.779	0.000	0.134
80.00	-14.79	-5.36	0.00	-189.15	0.00	189.15	2367.81	1183.90	3174.36	1589.54	6.58	-0.837	0.000	0.125
85.00	-14.01	-5.25	0.00	-162.36	0.00	162.36	2298.37	1149.18	2958.55	1481.47	7.48	-0.894	0.000	0.116
86.67	-13.75	-5.22	0.00	-153.61	0.00	153.61	2274.78	1137.39	2887.71	1446.00	7.80	-0.914	0.000	0.112
90.00	-12.96	-5.14	0.00	-136.22	0.00	136.22	2218.24	1109.12	2736.97	1370.52	8.45	-0.951	0.000	0.105
90.67	-12.81	-5.13	0.00	-132.79	0.00	132.79	1688.87	844.43	2115.41	1059.28	8.58	-0.958	0.000	0.133
95.00	-12.24	-5.05	0.00	-110.56	0.00	110.56	1646.42	823.21	1986.06	994.50	9.48	-1.003	0.000	0.119
100.00	-11.61	-4.95	0.00	-85.32	0.00	85.32	1595.61	797.80	1839.56	921.15	10.56	-1.058	0.000	0.100
105.00	-10.31	-4.69	0.00	-60.48	0.00	60.48	1542.83	771.41	1696.33	849.43	11.69	-1.104	0.000	0.078
106.50	-7.22	-3.25	0.00	-53.02	0.00	53.02	1526.61	763.30	1654.04	828.25	12.04	-1.117	0.000	0.069
110.00	-6.85	-3.18	0.00	-41.66	0.00	41.66	1488.07	744.04	1556.67	779.49	12.87	-1.143	0.000	0.058
115.00	-6.34	-3.08	0.00	-25.76	0.00	25.76	1427.69	713.85	1417.28	709.69	14.08	-1.171	0.000	0.041
117.00	-3.90	-1.49	0.00	-19.59	0.00	19.59	1397.29	698.64	1357.25	679.64	14.57	-1.180	0.000	0.032
120.00	-3.65	-1.43	0.00	-15.14	0.00	15.14	1351.68	675.84	1269.65	635.77	15.32	-1.191	0.000	0.027
125.00	-3.25	-1.34	0.00	-7.98	0.00	7.98	1275.66	637.83	1130.14	565.91	16.58	-1.205	0.000	0.017
130.00	-0.56	-0.16	0.00	-1.26	0.00	1.26	1199.65	599.83	998.75	500.12	17.84	-1.212	0.000	0.003
130.00	-0.56	-0.16	0.00	-1.26	0.00	1.26	582.69	291.35	473.23	281.02	17.84	-1.212	0.000	0.005
135.00	-0.30	-0.09	0.00	-0.48	0.00	0.48	582.69	291.35	473.23	281.02	19.11	-1.213	0.000	0.002
140.00	0.00	-0.08	0.00	-0.05	0.00	0.05	582.69	291.35	473.23	281.02	20.38	-1.214	0.000	0.000

Final Analysis Summary

Structure:	CT13548-S-SBA	**Code:**	EIA/TIA-222-G	7/30/2018	
Site Name:	Bloomfield 4	**Exposure:**	C		
Height:	140.00 (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	

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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 97 mph Wind	29.3	0.00	38.79	0.00	0.00	2894.48
0.9D + 1.6W 97 mph Wind	29.3	0.00	29.08	0.00	0.00	2869.15
1.2D + 1.0Di + 1.0Wi 40 mph Wind	5.3	0.00	70.11	0.00	0.00	526.27
1.2D + 1.0E	1.0	0.00	38.84	0.00	0.00	98.00
0.9D + 1.0E	1.0	0.00	29.13	0.00	0.00	97.09
1.0D + 1.0W 60 mph Wind	7.0	0.00	32.36	0.00	0.00	688.85

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 97 mph Wind	-23.62	-25.34	0.00	-1569.6	0.00	-1569.6	2765.58	1382.7	4652.71	2329.81	48.00	0.683
0.9D + 1.6W 97 mph Wind	-17.52	-25.12	0.00	-1550.3	0.00	-1550.3	2765.58	1382.7	4652.71	2329.81	48.00	0.672
1.2D + 1.0Di + 1.0Wi 40 mph Wind	-49.87	-4.61	0.00	-285.07	0.00	-285.07	2765.58	1382.7	4652.71	2329.81	48.00	0.140
1.2D + 1.0E	-15.47	-0.67	0.00	-25.27	0.00	-25.27	1688.87	844.43	2115.41	1059.28	90.67	0.033
0.9D + 1.0E	-11.60	-0.66	0.00	-24.97	0.00	-24.97	1688.87	844.43	2115.41	1059.28	90.67	0.030
1.0D + 1.0W 60 mph Wind	-20.35	-6.03	0.00	-372.96	0.00	-372.96	2765.58	1382.7	4652.71	2329.81	48.00	0.167

Base Plate Summary

Structure:	CT13548-S-SB		**Code:**	EIA/TIA-222-G	7/30/2018
Site Name:	Bloomfield 4		**Exposure:**	C	
Height:	140.00 (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

Tower Engineering Solutions

Reactions

Original Design

Moment (kip-ft):	4028.20
Axial (kip):	95.10
Shear (kip):	38.70

Analysis

Moment (kip-ft):	2894.48
Axial (kip):	70.11
Shear (kip):	29.29
Moment Design %:	71.86

Base Plate

Yield (ksi):	50.00
Width (in):	61.50
Style:	Round
Polygon Sides:	0.00
Clip Length (in):	0.00
Effective Len (in):	9.48
Moment (kip-in):	251.17
Allow Stress (ksi):	67.50
Applied Stress (ksi):	0.00
Stress Ratio:	0.59

Anchor Bolts

Bolt Circle:	57.88
Number Bolts:	24.00
Bolt Type:	1.5" F1554 105
Bolt Diameter (in):	1.50
Yield (ksi):	105.00
Ultimate (ksi):	125.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00

Compression

Force (kip):	102.94
Allowable (kip):	141.00
Ratio:	0.75

Tension

Force (kip):	97.10
Allowable (kip):	141.00
Ratio:	0.71

Monopole Mat Foundation Design

			Date: 7/30/2018
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
Site Name:	Bloomfield 4	**Structure Height (Ft.):**	140
Site Number:	CT13548-S-SBA	**Engineer Name:**	W. Velez
Engr. Number:	57632	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

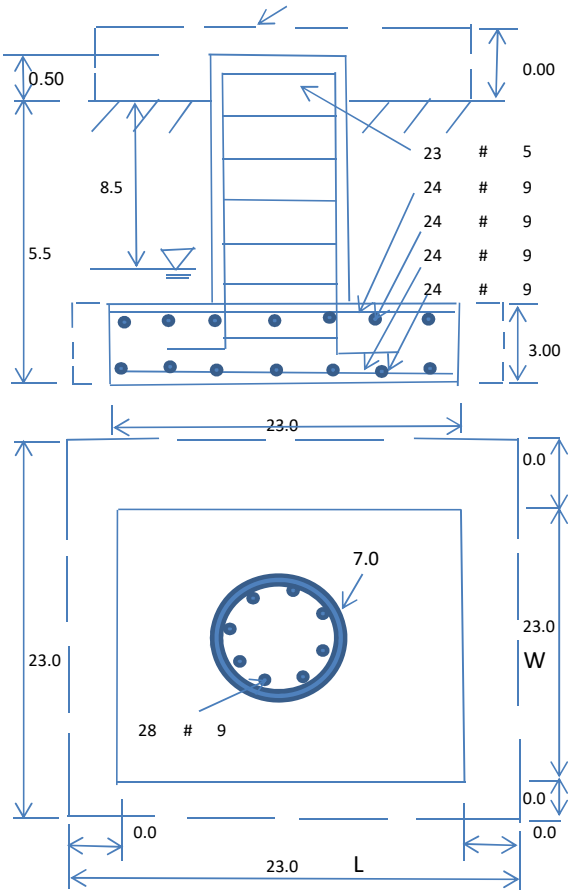
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	38.8	Shear Force (Kips):	29.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2894.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	5.5
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	3.00
Length of Pad (ft.):	23	Width of Pad (ft.):	23
Final Length of pad (ft)	23.0	Final width of pad (ft):	23.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	28	Tie Spacing (in):	3.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	115.0	Soil Buoyant Weight:	64.1	Pcf		
Water Table B.G.S. (ft):	8.5	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	6000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:	1.00			

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

Total Dry Soil Volume (cu. Ft.):	1226.29	Total Dry Soil Weight (Kips):	141.02
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	141.02	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1702.45	Total Dry Concrete Weight (Kips):	255.37
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	255.37	Total Vertical Load on Base (Kips):	435.18

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	2666	<	Allowable Factored Soil Bearing (psf):	4500	0.59	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	4548.7	>	Design Factored Momont (kips-ft):	2960	0.65	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.54	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):	1.00		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	4809.3	>	Design Factored Moment (Mu, Kips-Ft	2982.4	0.62	OK!
Calculated Shear Capacity (Kips):	1359.0	>	Design Factored Shear (Kips):	29.3	0.02	OK!
Calculated Tension Capacity (Tn, Kips):	1512.0	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9748.3	>	Design Factored Axial Load (Pu Kips):	38.8	0.00	OK!
Moment & Axial Strength Combination:	0.62	OK!	Check Tie Spacing (Design/Required):		0.25	OK!
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI				
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	849.3	>	One-Way Factored Shear (L-D. Kips):	182.2	0.21	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	849.3	>	One-Way Factored Shear (W-D., Kips):	182.2	0.21	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	743.0	>	One-Way Factored Shear (C-C, Kips):	176.3	0.24	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0027	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0027		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	3420.4	>	Moment at Bottom (L-Dir. K-Ft):	922.9	0.27	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	3420.4	>	Moment at Bottom (W-Dir. K-Ft):	922.9	0.27	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4805.0	>	Moment at Bottom (C-C Dir. K-Ft):	1305.2	0.27	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0027	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0027		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	3420.4	>	Moment at the top (L-Dir K-Ft):	423.8	0.12	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	3420.4	>	Moment at the top (W-Dir K-Ft):	423.8	0.12	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	4805.0	>	Moment at the top (C-C Dir. K-Ft):	399.1	0.08	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	1157.8	k-ft.	Max. factored shear stress v_{u_CD}:		3.0	Psi
Max. factored shear stress v_{u_AB}:	8.1	Psi	Factored shear Strength ϕv_n:		189.7	Psi
Max. factored shear stress v_u:	8.1	Psi	Check Usage of Punching Shear Capacity:		0.04	OK!

Pier Foundation Design For Monopole

			Date: 7/30/2018
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
Site Name:	Bloomfield 4	**Structure Height (Ft.):**	140
Site Number:	CT13548-S-SBA	**Engineer Name:**	W. Velez
Engr. Number:	57632	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Acceptable overstress (5.0%

Structure Type: Monopole

Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	38.8	Shear Force (Kips):	29.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2894.5

Foundation Geometries:

Mods required -Yes/No ?:	No			ft.
Diameter of Pier (ft.):	7.0	Depth of Base B. G. S. :	30.0	ft.
Pier Height A. G. (ft.):	0.50			

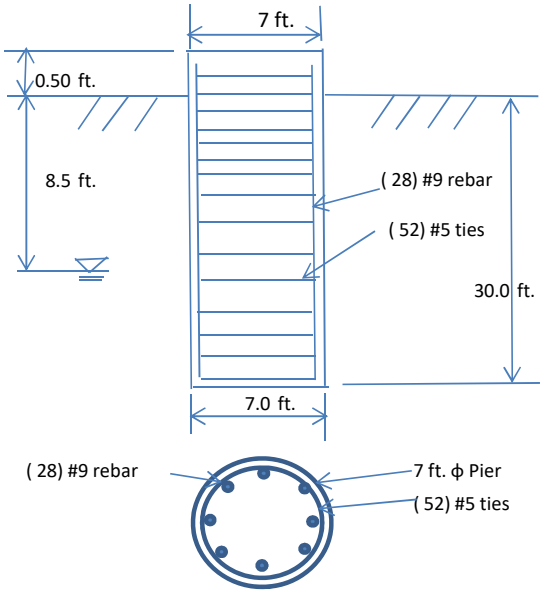
Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	60	ksi
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	28	Tie Spacing:	8.0	in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0	pcf

Soil Design Parameters:

Water Table B.G.S. (ft):	8.5	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	30	(°)

Skin Frictions are to be obtained from: Soil Report



Monopole Pier Foundation

Depth of Layers (ft) Top	Depth of Layers (ft) Bottom	γ_{soil} (pcf)	ϕ (°)	Cohesion (psf)	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types
0.0	4.0	110	10	0	0	0	Silt
4.0	8.0	115	33	0	400	0	Sand
8.0	15.0	115	33	0	550	0	Sand
15.0	26.0	115	33	0	800	0	Sand
26.0	31.0	115	33	0	1100	6000	Sand

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

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75	
Total Dry Soil Volume from Conical Failure (cu. Ft.):	8715	Dry Soil Weight from Conical Failure:	982	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	6404	Buoyant Soil Weight from Conical Failure (K	447	Kips
Total Dry Concrete Volume (cu. Ft.):	346	Total Dry Concrete Weight:	52.0	Kips
Total Buoyant Concrete Volume (cu. Ft.):	827.4	Total Buoyant Concrete Weight:	72.48	Kips
Total Effective Concrete Weight (Kips):	124.4	Total Effective Soil Weight:	1429.1	Kips
Total Effective Vertical Load on Base (Kips):	68.6			

Check Soil Capacities:

					Usage	
Allowable Foundation Overturning Resistance (kips-ft.):	10167.4	>	Design Factored Momont (kips-ft):	3480	0.34	OK!
Factor of Safety of Passive Soil Resistance against Moment:	2.92	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	

Reinforcing Concrete Pier:

					Usage	
Vertical Steel Rebar Area (sq. in./each):	1.00		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	4778.1	>	Design Factored Moment (Mu, K-Ft):	3033.3	0.63	OK!
Calculated Shear Capacity (Kips):	968.2	>	Design Factored Shear (Kips):	227.4	0.23	OK!
Calculated Tension Capacity (Tn, Kips):	1512.0	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9748	>	Design Factored Axial Load (Pu Kips):	38.8	0.00	OK!
Moment & Axial Strength Combination:	0.63	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.005		Reinforcement Ratio is too small			

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

Antenna Mount Analysis Report

Existing 140-Ft Rohn Monopole Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT13548-S-SBA

Customer Site Name: Bloomfield 4

Carrier Name: T-Mobile

Carrier Site ID / Name: CTHA145B

Site Location:

Bloomfield, Connecticut

Hartford County

Latitude: 41.817858

Longitude: -72.764511

7/10/18

Analysis Result:

Max Structural Usage: 96.6% [Pass]

Report Prepared By: Saroj Dangol

Introduction

The purpose of this report is to summarize the analysis results on the (3) T-Arms at 130.0' elevation to support the proposed antenna configuration. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Mount Drawings	Mount mapping by SGS Towers dated 06/26/2018
Antenna Loading	SBA Application #: 88706, v1 dated 05/21/2018
Modification Drawings	N/A

Analysis Criteria

Basic Wind Speed Used in the Analysis: V_{ULT} = 125 mph (3-Sec. Gust) / Equivalent to
V_{ASD} = 97 mph (3-Sec. Gust)
Basic Wind Speed with Ice: 50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed: 60 mph +0" Radial ice
Standard/Codes: ANSI/TIA/EIA 222-G
Exposure Category: C
Structure Class: II
Topographic Category: 1
Crest Height (Ft): 0

The site is a Risk Category II structure per table 1604.5 of the 2012 IBC. This site does not support emergency communication equipment for first responders such as fire departments, police, hospitals, ambulance services or any of the facilities listed for Risk Categories III and IV. The scope of work detailed in this structural analysis does not include items that are a part of emergency service as the 911 or essential facility service of an emergency response system.

Mount Information

(3) T-Arms at 130.0' elevation at azimuths 30/150/270

Final Antenna Configuration

3 Ericsson AIR 21 B2A/B4P
3 Ericsson AIR32 KRD901146-1_B66A (Octa)
3 RFS APXVAARR24_43-U-NA20 (Octa)
3 Ericsson KRY 112 144/2
3 Ericsson Radio 4449 B71 + B12

Any proposed antennas not currently installed should be mounted such that the centers of the antennas do not exceed 0.5 ft vertically from the center of the T-Arms.

In addition to the proposed equipment loading, a 500 lb serviceability load was also considered in this analysis in accordance with TIA requirements.

Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 96.6%, which occurs in the front face horizontal member. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

Attachments

1. Mount Photos
2. Analysis Calculations

Standard Conditions

1. The loading configuration as analyzed in this report is as provided from the customer. Any deviation from this design shall be communicated to TES to verify deviation will not adversely impact the analysis.

2. The analysis is based on the presumption that the antenna mount 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. The mount analysis is not a condition assessment of the mount.

4. The mount analysis was performed in accordance with the loading provided, and if applicable the modification required to support the additional loading.

5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.

6. The modification drawings are not intended to convey means or methods. These are the responsibility of the installing contractor.

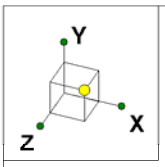
7. Rigging plan review is available if the contractor requires for a construction class IV or other if required. Review fee would apply.

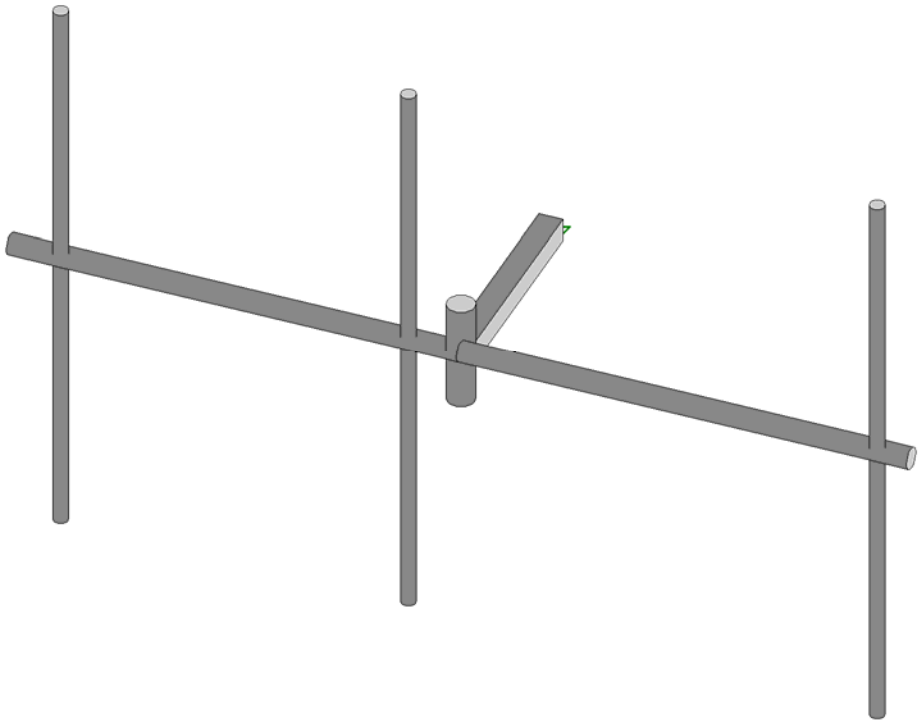
8. The mount modification package was created based upon information provided for the mount loading. The underlying tower is assumed to provide support and sufficient rigidity to support the mount loads as a tower analysis was not part of the mount analysis.

9. TES is not responsible for modifications to climbing facilities unless communicated to TES in writing.

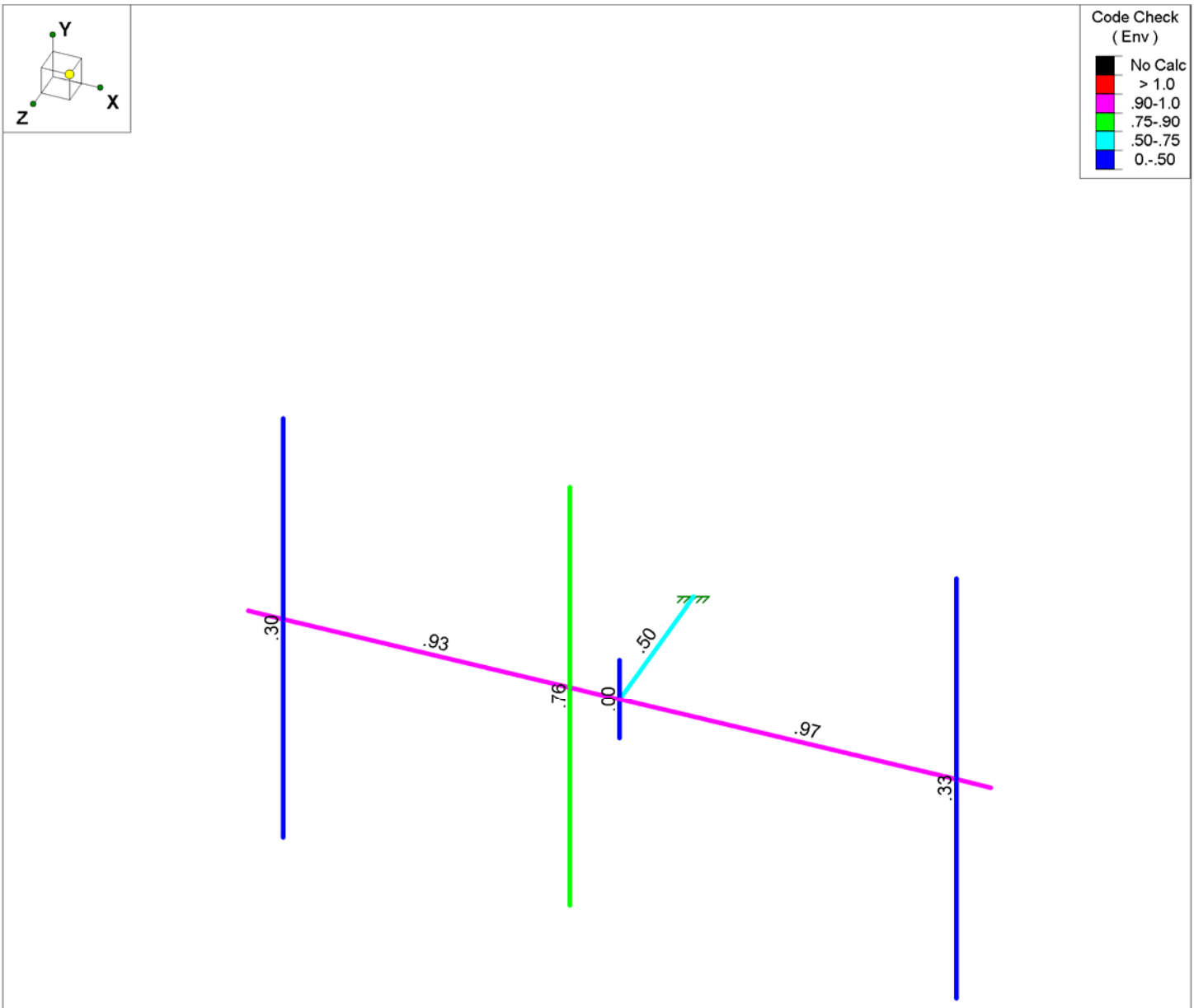

06/26/2018 12:53


06/26/2018 13:03





Tower Engineering Solutio...	CT13548-S-SBA_MT-Z_Sector A	SK - 1
		July 10, 2018 at 3:10 PM
TES Project No. 55115		CT13548-S-SBA_55115_RISA.r3d



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13548-S-SBA_MT-Z_Sector A	SK - 2
		July 10, 2018 at 3:10 PM
TES Project No. 55115		CT13548-S-SBA_55115_RISA.r3d

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Antenna D	None					8			
2	Antenna Di	None					8			
3	Antenna W Front	None					8			
4	Antenna Wi Front	None					8			
5	Antenna W Side	None					8			
6	Antenna Wi Side	None					8			
7	Service L1	None					1			
8	Service L2	None					1			
9	Structure D	None		-1						
10	Structure Di	None						7		
11	Structure W Front	None						7		
12	Structure Wi Front	None						7		
13	Structure W Side	None						7		
14	Structure Wi Side	None						7		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
1	1.2D+1.6W (Front)	Yes	Y		1	1.2	9	1.2	3	1.6	11	1.6												
2	1.2D+1.6W (Back)	Yes	Y		1	1.2	9	1.2	3	-1.6	11	-1.6												
3	1.2D+1.6W (Left)	Yes	Y		1	1.2	9	1.2	5	1.6	13	1.6												
4	1.2D+1.6W (Right)	Yes	Y		1	1.2	9	1.2	5	-1.6	13	-1.6												
5	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	1	12	1								
6	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	-1	12	-1								
7	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	1	14	1								
8	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	-1	14	-1								
9	1.2D+1.5L1+.16W (...	Yes	Y		1	1.2	9	1.2	7	1.5	3	.16	11	.16										
10	1.2D+1.5L2+.16W (...	Yes	Y		1	1.2	9	1.2	8	1.5	3	.16	11	.16										
11	1.4D		Y		1	1.4	9	1.4																

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	0	3	0	
3	N3	-6.25	0	3	0	
4	N4	6.25	0	3	0	
5	NP1	-5.666667	3.833333	3	0	
6	NP2	-5.666667	-4.166667	3	0	
7	NP3	-0.833333	3.833333	3	0	
8	NP4	-0.833333	-4.166667	3	0	
9	NP5	5.666667	3.833333	3	0	
10	NP6	5.666667	-4.166667	3	0	
11	AN1	0	.75	3	0	
12	AN2	0	-.75	3	0	
13	N13	-5.666667	0	3	0	
14	N14	-0.833333	0	3	0	
15	N15	5.666667	0	3	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	xxxxx	HSS16x0.438	Beam	None	A572 Gr.50	Typical	19.9	606	606	1210

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[ft]	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	PIPE_3.0	6.25			Lbyy						Gravity
2	M2	HSS4x4x4	3			Lbyy						Gravity
3	MP1A	PIPE_2.0	8			Lbyy						Gravity
4	MP2A	PIPE_2.0	8			Lbyy						Gravity
5	MP3A	PIPE_2.0	8			Lbyy						Gravity
6	AM1	PIPE_4.0	1.5			Lbyy						Gravity
7	AM2	PIPE_3.0	6.25			Lbyy						Gravity

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	1393.425	4	2310.175	6	2003.172	1	-1.044	1	4.142	4	4.424	10
2		min	-1393.425	3	694.626	1	-2003.172	2	-7.142	6	-4.145	3	-4.018	9
3	Totals:	max	1393.425	4	2310.175	6	2003.172	1						
4		min	-1393.425	3	694.626	1	-2003.172	2						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation ...	LC	Y Rotation ...	LC	Z Rotation [...	LC
1	N1	max	0	3	0	1	0	2	0	6	0	3	0	9
2		min	0	4	0	6	0	1	0	1	0	4	0	10
3	N2	max	.098	3	-.014	1	0	2	7.135e-03	6	4.027e-03	3	1.216e-02	9
4		min	-.098	4	-.172	6	0	1	4.49e-05	1	-4.022e-03	4	-1.339e-02	10
5	N3	max	.099	3	.653	10	.817	2	8.701e-03	6	1.483e-02	2	3.754e-02	9
6		min	-.099	4	-2.352	9	-.818	1	-3.941e-03	1	-1.483e-02	1	-8.676e-03	10
7	N4	max	.099	3	.478	9	.684	2	8.644e-03	6	1.332e-02	1	5.82e-03	9
8		min	-.099	4	-2.527	10	-.684	1	-3.511e-03	1	-1.332e-02	2	-4.04e-02	10
9	NP1	max	.398	10	.592	10	1.314	2	1.456e-02	2	1.483e-02	2	3.762e-02	9
10		min	-1.731	9	-2.09	9	-1.11	1	-1.012e-02	1	-1.483e-02	1	-8.695e-03	10
11	NP2	max	1.872	9	.593	10	.381	2	7.861e-03	6	1.483e-02	2	3.745e-02	9
12		min	-.435	10	-2.089	9	-.603	1	-1.837e-03	1	-1.483e-02	1	-8.655e-03	10
13	NP3	max	.573	3	.025	10	.901	2	2.463e-02	2	5.217e-03	2	1.931e-02	9
14		min	-.889	9	-.26	9	-.711	1	-2.049e-02	1	-5.222e-03	1	-1.374e-02	3
15	NP4	max	.959	9	.029	10	.135	2	8.413e-03	5	5.217e-03	2	1.921e-02	9
16		min	-.6	10	-.257	9	-.409	5	-3.83e-03	2	-5.222e-03	1	-1.196e-02	10
17	NP5	max	1.861	10	.436	9	1.195	2	1.474e-02	2	1.332e-02	1	5.839e-03	9
18		min	-.27	9	-2.246	10	-.986	1	-1.02e-02	1	-1.333e-02	2	-4.053e-02	10
19	NP6	max	.289	9	.437	9	.279	2	7.784e-03	6	1.332e-02	1	5.801e-03	9
20		min	-2.017	10	-2.244	10	-.516	5	-1.346e-03	1	-1.333e-02	2	-4.026e-02	10
21	AN1	max	.123	3	-.014	1	.064	6	7.135e-03	6	4.027e-03	3	1.216e-02	9
22		min	-.112	4	-.172	6	0	1	4.366e-05	1	-4.022e-03	4	-1.339e-02	10
23	AN2	max	.108	9	-.014	1	-.001	1	7.134e-03	6	4.027e-03	3	1.216e-02	9
24		min	-.122	10	-.172	6	-.064	6	4.613e-05	1	-4.022e-03	4	-1.339e-02	10
25	N13	max	.099	3	.593	10	.713	2	8.701e-03	6	1.483e-02	2	3.754e-02	9
26		min	-.099	4	-2.089	9	-.714	1	-3.941e-03	1	-1.483e-02	1	-8.677e-03	10
27	N14	max	.098	3	.028	10	.041	3	7.643e-03	6	5.217e-03	2	1.924e-02	9
28		min	-.098	4	-.258	9	-.041	4	-1.276e-03	1	-5.222e-03	1	-1.198e-02	10
29	N15	max	.099	3	.437	9	.591	2	8.644e-03	6	1.332e-02	1	5.82e-03	9
30		min	-.099	4	-2.245	10	-.591	1	-3.511e-03	1	-1.332e-02	2	-4.04e-02	10

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k...	LC	y-y Mom...	LC	z-z Mom...	LC
1	M1	1	max	0	1	0	1	0	1	0	1	0	1	0	1
2			min	0	1	0	1	0	1	0	1	0	1	0	1
3		2	max	333.928	3	-154.131	4	459.088	2	.271	2	.444	2	.853	9
4			min	-333.928	4	-906.328	9	-459.088	1	-.243	1	-.444	1	-.027	3
5		3	max	333.928	3	-167.339	4	488.377	2	.271	2	1.184	2	2.279	9
6			min	-333.928	4	-919.535	9	-488.377	1	-.243	1	-1.184	1	.227	3
7		4	max	333.928	3	-180.546	4	517.666	2	.271	2	1.97	2	3.727	9
8			min	-333.928	4	-932.742	9	-517.666	1	-.243	1	-1.97	1	.502	3
9		5	max	886.193	3	-371.778	4	1386.401	2	.763	2	3.501	2	5.346	9
10			min	-886.192	4	-1409.048	7	-1386.401	1	-.699	1	-3.501	1	.618	3
11	M2	1	max	2003.172	1	2312.54	5	1393.425	3	4.424	10	4.142	4	7.142	6
12			min	-2003.172	2	689.951	2	-1393.425	4	-4.018	9	-4.145	3	1.044	1
13		2	max	2003.172	1	2284.659	5	1366.647	3	4.424	10	3.107	4	5.421	6
14			min	-2003.172	2	678.851	2	-1366.647	4	-4.018	9	-3.11	3	.527	1
15		3	max	2003.172	1	2256.778	5	1339.868	3	4.424	10	2.092	4	3.722	6
16			min	-2003.172	2	667.751	2	-1339.868	4	-4.018	9	-2.095	3	.018	1
17		4	max	2003.172	1	2228.897	5	1313.09	3	4.424	10	1.098	4	2.044	6
18			min	-2003.172	2	656.652	2	-1313.09	4	-4.018	9	-1.1	3	-.483	1
19		5	max	2003.172	1	2201.015	5	1286.311	3	4.424	10	.509	1	1.08	2
20			min	-2003.172	2	645.552	2	-1286.312	4	-4.018	9	-.509	2	-.975	1
21	MP1A	1	max	0	1	2.113	8	.305	1	0	10	0	1	0	1
22			min	0	1	-.307	10	-1.182	6	0	8	0	1	0	1
23		2	max	207.143	6	141.946	4	189.765	1	0	10	.19	1	.142	3
24			min	63.23	9	-141.658	3	-189.923	2	0	8	-.19	2	-.142	4
25		3	max	-71.559	10	166.92	3	215.139	2	0	8	.266	1	.218	3
26			min	-241.538	8	-167.212	4	-214.98	1	0	10	-.267	2	-.219	4
27		4	max	-8.329	10	25.395	3	25.679	2	0	8	.026	1	.025	3
28			min	-34.394	8	-25.688	4	-25.52	1	0	10	-.026	2	-.026	4
29		5	max	0	10	.313	10	.983	6	0	8	0	10	0	4
30			min	-.003	9	-1.956	8	-.08	1	0	10	0	9	0	3
31	MP2A	1	max	0	1	1.774	8	.959	1	0	10	0	1	0	1
32			min	0	1	-.78	10	-2.502	6	0	8	0	1	0	1
33		2	max	276.532	5	225.604	4	376.888	1	0	10	.634	1	.366	3
34			min	46.054	9	-225.502	3	-377.157	2	0	8	-.635	2	-.367	4
35		3	max	-47.08	10	244.764	3	397.455	2	0	7	.881	1	.538	3
36			min	-295.175	6	-244.801	4	-397.357	1	0	10	-.881	2	-.538	4
37		4	max	-38.75	10	219.324	3	372.016	2	0	7	.112	1	.074	3
38			min	-260.782	6	-219.361	4	-371.917	1	0	10	-.112	2	-.074	4
39		5	max	0	10	.286	10	1.192	5	0	7	0	10	0	4
40			min	0	9	-.818	7	-.048	2	0	10	0	9	0	3
41	MP3A	1	max	0	1	.315	9	.466	1	0	7	0	1	0	1
42			min	0	1	-3.132	7	-1.548	6	0	9	0	1	0	1
43		2	max	244.524	8	153.143	4	202.198	1	0	7	.202	1	.154	3
44			min	88.798	10	-153.896	3	-202.444	2	0	9	-.202	2	-.153	4
45		3	max	-95.979	9	178.254	3	226.513	2	0	9	.277	1	.231	3
46			min	-275.57	7	-177.587	4	-226.295	1	0	7	-.278	2	-.228	4
47		4	max	-8.329	9	25.899	3	25.741	2	0	9	.026	1	.026	3
48			min	-34.395	7	-25.232	4	-25.523	1	0	7	-.026	2	-.025	4
49		5	max	0	9	2.542	7	1.11	6	0	9	0	9	0	4
50			min	-.003	10	-.281	9	-.084	1	0	7	0	10	0	3
51	AM1	1	max	0	1	.055	9	0	1	0	1	0	1	0	1
52			min	0	1	-.061	10	-.083	6	0	1	0	1	0	1
53		2	max	11.646	7	9.045	4	9.038	1	0	1	.002	1	.002	3
54			min	4.532	1	-9.05	3	-9.056	2	0	1	-.002	2	-.002	4
55		3	max	23.293	7	18.082	4	18.075	1	0	1	.007	1	.007	3
56			min	9.065	1	-18.088	3	-18.093	2	0	1	-.007	2	-.007	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k...	LC	y-y Mom...	LC	z-z Mom...	LC
57		4	max	-4.532	1	9.05	3	9.056	2	0	1	.002	1	.002	3
58			min	-11.646	7	-9.045	4	-9.038	1	0	1	-.002	2	-.002	4
59		5	max	0	1	.061	10	.083	6	0	1	0	1	0	1
60			min	0	1	-.055	9	0	1	0	1	0	1	0	1
61	AM2	1	max	363.968	4	1007.989	10	580.621	1	.277	1	2.992	2	5.547	10
62			min	-363.968	3	255.076	3	-580.621	2	-.317	2	-2.992	1	1.12	4
63		2	max	363.968	4	994.782	10	551.332	1	.277	1	2.108	2	3.982	10
64			min	-363.968	3	241.869	3	-551.332	2	-.317	2	-2.108	1	.726	4
65		3	max	363.968	4	981.575	10	522.043	1	.277	1	1.27	2	2.438	10
66			min	-363.968	3	228.662	3	-522.043	2	-.317	2	-1.27	1	.353	4
67		4	max	363.968	4	968.368	10	492.754	1	.277	1	.477	2	.915	10
68			min	-363.968	3	215.454	3	-492.754	2	-.317	2	-.477	1	0	4
69		5	max	0	1	0	1	0	1	0	1	0	1	0	1
70			min	0	1	0	1	0	1	0	1	0	1	0	1

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shea...	Loc...	Dir	LC	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn...	Cb	Eqn
1	AM2	PIPE_3.0	.966	0	10	.094	0		2	52901....	65205	5.749	5.749	1.81	H1-1b
2	M1	PIPE_3.0	.932	6.25	9	.222	6.25		2	52901....	65205	5.749	5.749	1.845	H1-1b
3	MP2A	PIPE_2.0	.764	3.833	2	.046	3.833		2	14916....	32130	1.872	1.872	2.03	H1-1b
4	M2	HSS4x4x4	.503	0	7	.361	0	y	10	13436...	139518	16.181	16.181	1.649	H1-1b
5	MP3A	PIPE_2.0	.331	3.833	2	.024	3.833		2	14916....	32130	1.872	1.872	1.366	H1-1b
6	MP1A	PIPE_2.0	.300	3.833	2	.023	3.833		2	14916....	32130	1.872	1.872	1.359	H1-1b
7	AM1	PIPE_4.0	.001	.75	2	.001	.75		2	92571....	93240	10.631	10.631	1	H1-1b

SITE NAME: MAPLE HILL FARMS

12 BURR ROAD
BLOOMFIELD, CT 06002

SITE NUMBER: CTHA145B

PROJECT: T-MOBILE L600

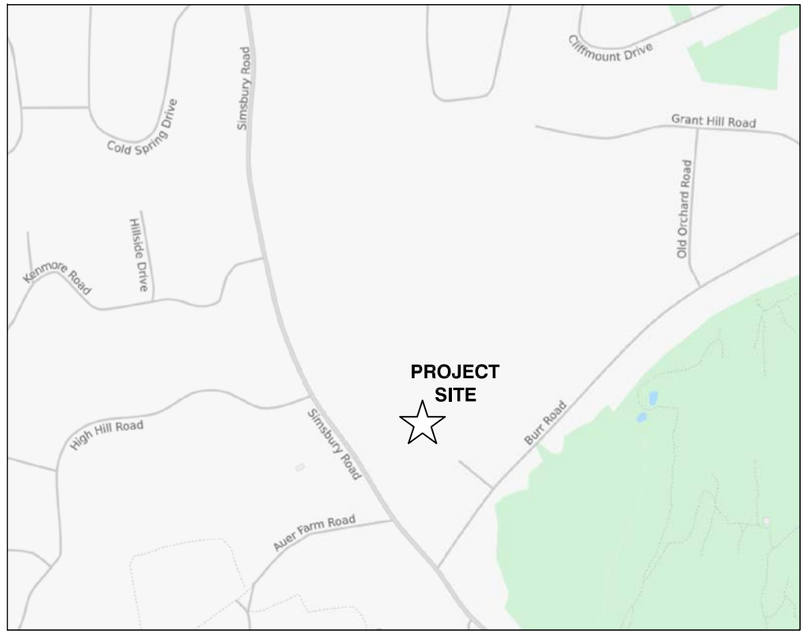
CONFIGURATION: 67D92DB

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE NORTHEAST, LLC. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST. LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL CONSTRUCTION NOTES

1. TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE TO FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.
2. 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.
3. PROTERRA DESIGN GROUP ASSUMES THAT THE MONOPOLE IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES.
4. ANY REQUIRED ANTENNA MOUNT WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE ANTENNA MOUNT STRUCTURAL ANALYSIS, (MSA) PREPARED BY OTHERS.



T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
ANTENNA/TMA/RRU	
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED*
(*CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED)	
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	SPECIAL ZONING NOTE (ELIGIBLE FACILITY REQUEST): BASED ON INFORMATION PROVIDED BY T-MOBILE 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).
SITE ADDRESS:	12 BURR ROAD BLOOMFIELD, CT 06002
LATITUDE:	41° 49' 04.29" N (41.8179°) (FROM SBA RECORD)
LONGITUDE:	72° 45' 52.24" W (-72.7645°) (FROM SBA RECORD)
JURISDICTION:	TOWN OF BLOOMFIELD/ CT SITING COUNCIL
BUILDING CODE:	2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS (IBC 2012 BASED)
ELECTRICAL CODE:	2014 NATIONAL ELECTRICAL CODE AND AMENDMENTS
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
TOWER OWNER:	SBA TOWERS II, LLC
SBA SITE ID:	CT13548-S
SBA SITE NAME:	BLOOMFIELD 4
SBA REGIONAL SITE MANAGER:	STEPHEN ROTH (860) 539-4920

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

DIG SAFE SYSTEM
(MA, ME, NH, RI, VT):
1-888-344-7233

CALL BEFORE YOU DIG
(CT): 1-800-922-4455

UNDERGROUND SERVICE ALERT

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
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A-1	COMPOUND PLAN	0
A-2	ELEVATIONS	0
A-3	EXISTING & PROPOSED ANTENNA PLAN	0
A-4	DETAILS	0
A-5	DETAILS	0
E-1	ONE-LINE DIAGRAM & GROUNDING DETAILS	0

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 8/22/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	08/22/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CTHA145B
SITE NAME:
MAPLE HILL FARMS
SITE ADDRESS:
12 BURR ROAD
BLOOMFIELD, CT 06002

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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) LIGHTNING 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.
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 SURCUITS 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 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 ELECTRICL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SBA COMMUNICATIONS CORP.
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE

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. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. 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.
9. 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.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CUR\BS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. 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) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (FY = 35 KSI). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. 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.
18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS 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 ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
    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.

    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), STEEL CONSTRUCTION MANUAL, 14TH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL

    ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	RAN	RADIO ACCESS NETWORK
AWG	AMERICAN WIRE GAUGE	G.C.	GENERAL CONTRACTOR	REF	REFERENCE
BTCW	BARE TINNED SOLID COPPER WIRE	GRC	GALVANIZED RIGID CONDUIT	REQ	REQUIRED
		MSA	MOUNT STRUCTURAL ANALYSIS	RF	RADIO FREQUENCY
BGR	BURIED GROUND RING	MGB	MASTER GROUND BAR	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	MIN	MINIMUM	TBR	TO BE REMOVED
EXISTING	EXISTING OR (E)	PROPOSED	NEW OR (P)	TBRR	TO BE REMOVED AND REPLACED
EGB	EQUIPMENT GROUND BAR	N.T.S.	NOT TO SCALE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	RAD	RADIATION CENTERLINE (ANTENNA)	VIF	VERIFY IN FIELD

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER
8/22/18

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

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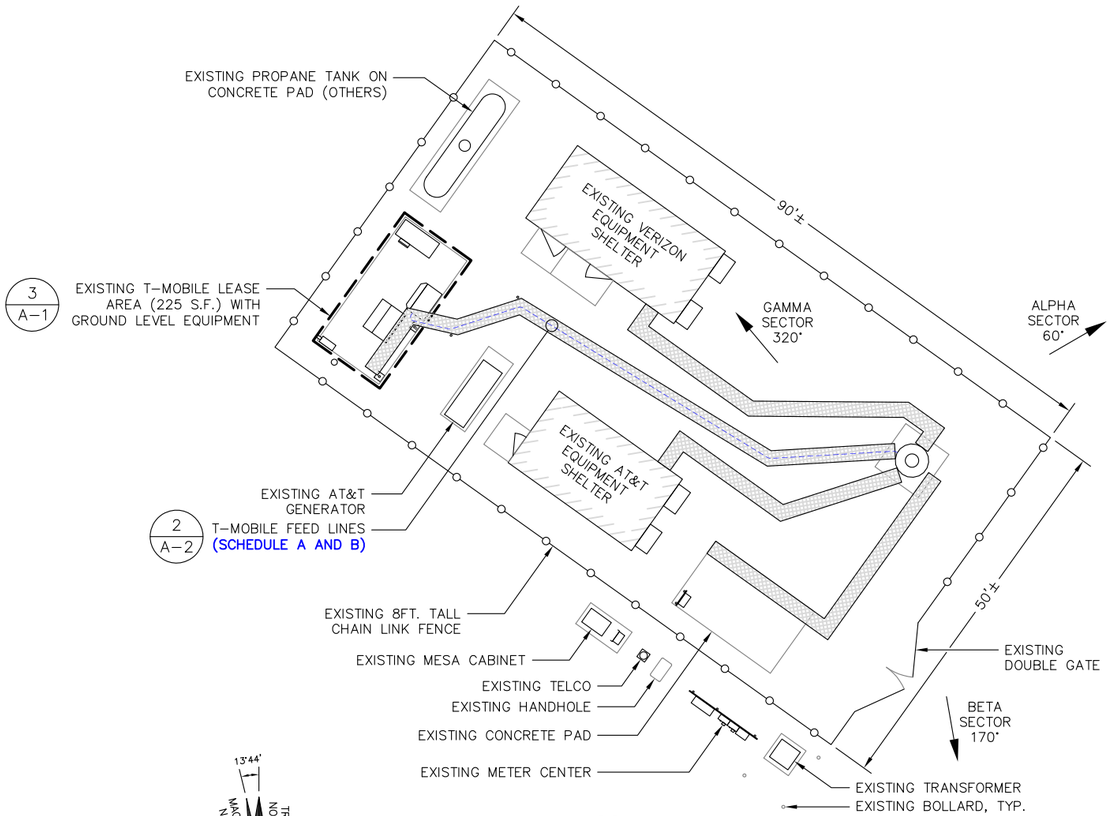
SITE NUMBER:
CTHA145B
SITE NAME:
MAPLE HILL FARMS
SITE ADDRESS:
12 BURR ROAD
BLOOMFIELD, CT 06002

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1



COMPOUND PLAN

SCALE: 1"=20' (11"x17")
1"=10' (22"x34")

1 / A-1

20 10 0 20

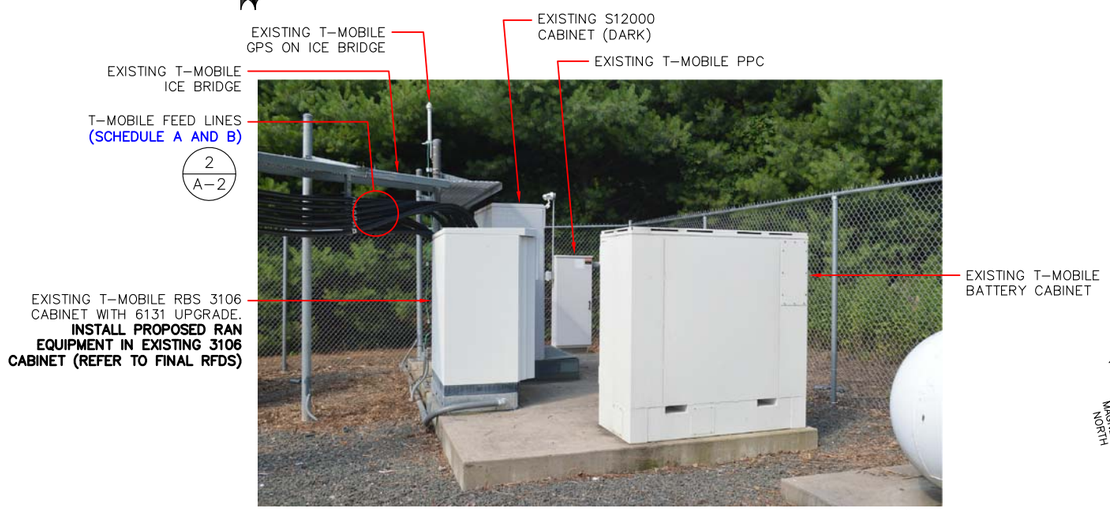
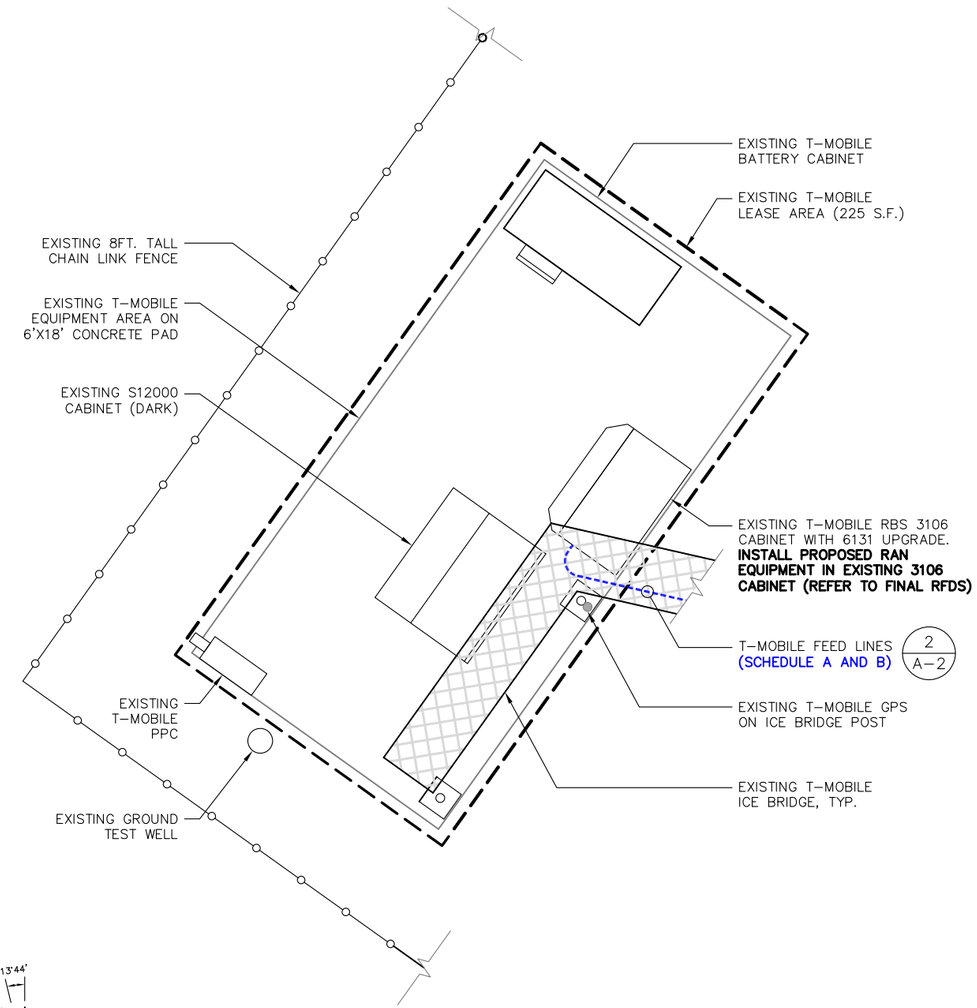


IMAGE SOURCE: PROTERRA 07/13/2018

EQUIPMENT PHOTO DETAIL

SCALE: N.T.S.

2 / A-1



GROUND EQUIPMENT PLAN

SCALE: 1"=5' (11"x17")
1"=2.5' (22"x34")

3 / A-1

5 2.5 0 5

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COMPOUND PLAN

SHEET NUMBER
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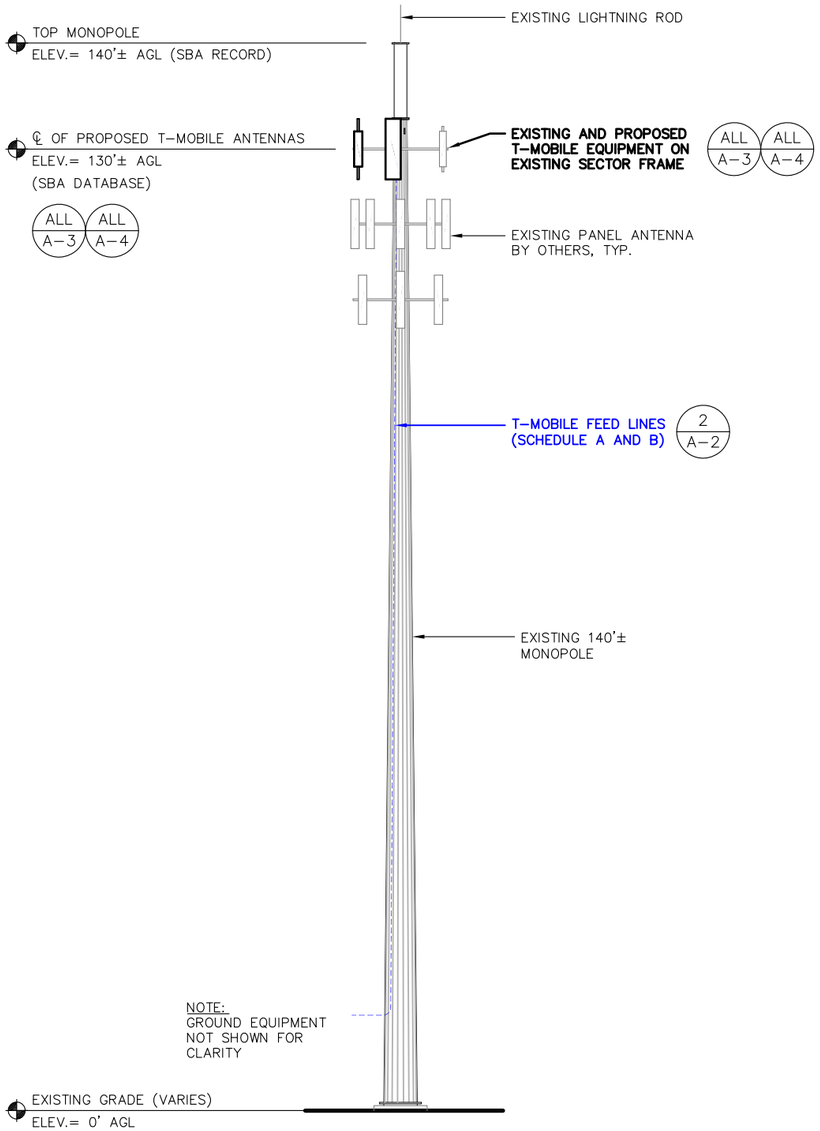

ELEVATION DETAIL

1 / A-2

SCALE: 1"=25' (11"x17")
1"=12.5' (22"x34")

25 12.5 0 25

SPECIAL CONSTRUCTION WORK NOTE (PAINT-TO-MATCH REQUIRED):
PAINT-TO-MATCH BROWN ALL PROPOSED AND EXPOSED EQUIPMENT, INCLUDING EXISTING UN-PAINTED LEGACY EQUIPMENT CONSISTING OF ANTENNA RADOMES, ANTENNA BACKPLANES, RRU SOLAR SHIELD, TMA, AND ASSOCIATED MOUNTING HARDWARE (PIPES, BRACKETS, HANGERS), AND EXPOSED HYBDRID CABLES, COAX JUMPERS, FIBER JUMPERS AND DC CABLES. ANTENNA RADOME PAINT SHALL CONTAIN <5% METALLIC PIGMENTS/EMULSIONS AND EQUIVALENT TO SHERMAN-WILLIAMS COROTHANE II (AND/OR OTHERWISE APPROVED BY ANTENNA MANUFACTURER/RF ENGINEER).

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO REMAIN: (17) 1⅝" COAX (1) HYBRID TO 130' RAD	UP MONOPOLE TO RAD
B	PROPOSED: (1) 6 X 12 HYBRID TO 130' RAD	UP MONOPOLE TO RAD

NOTE: EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER

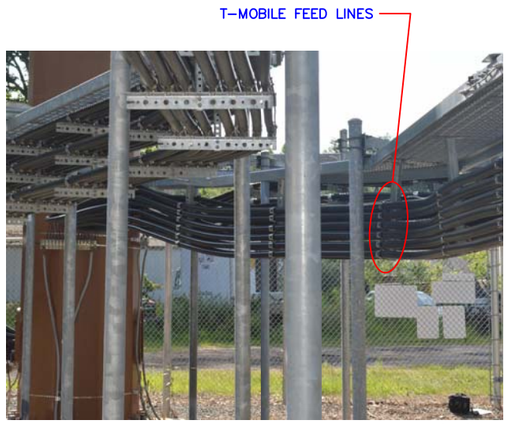

IMAGE SOURCE: PROTERRA 07/13/2018

FEEDLINE PHOTO DETAIL AT TOWER BASE

2 / A-2

SCALE: N.T.S.

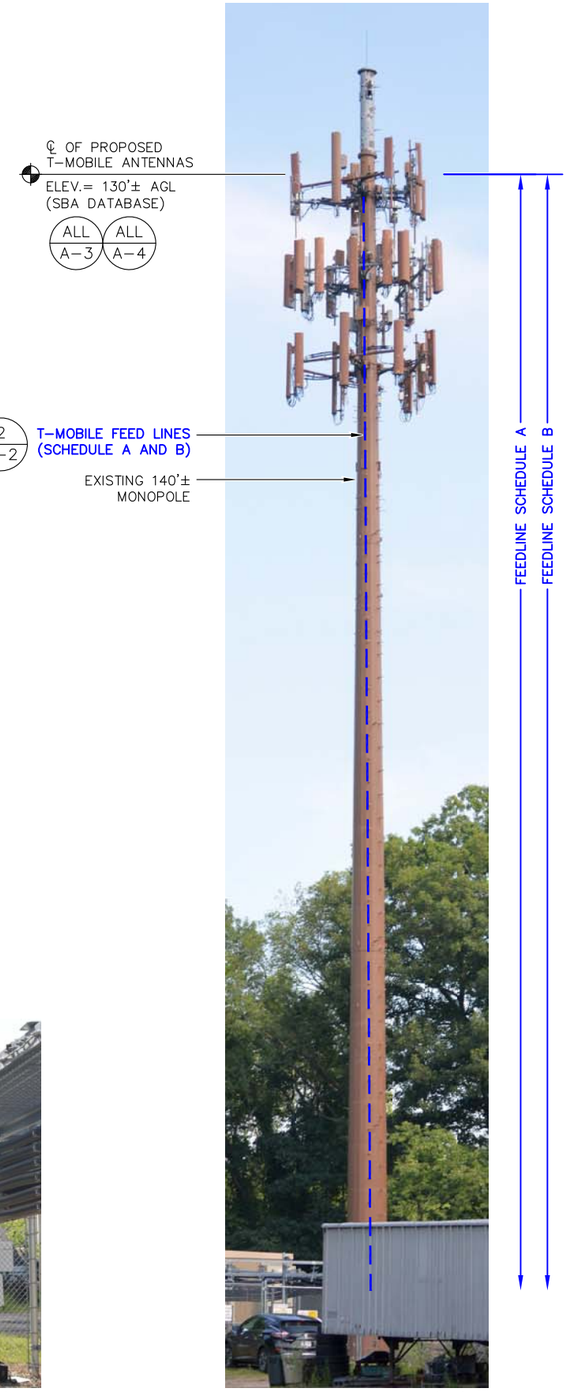

IMAGE SOURCE: PROTERRA 07/13/2018

PARTIAL ELEVATION PHOTO DETAIL

3 / A-2

SCALE: N.T.S.

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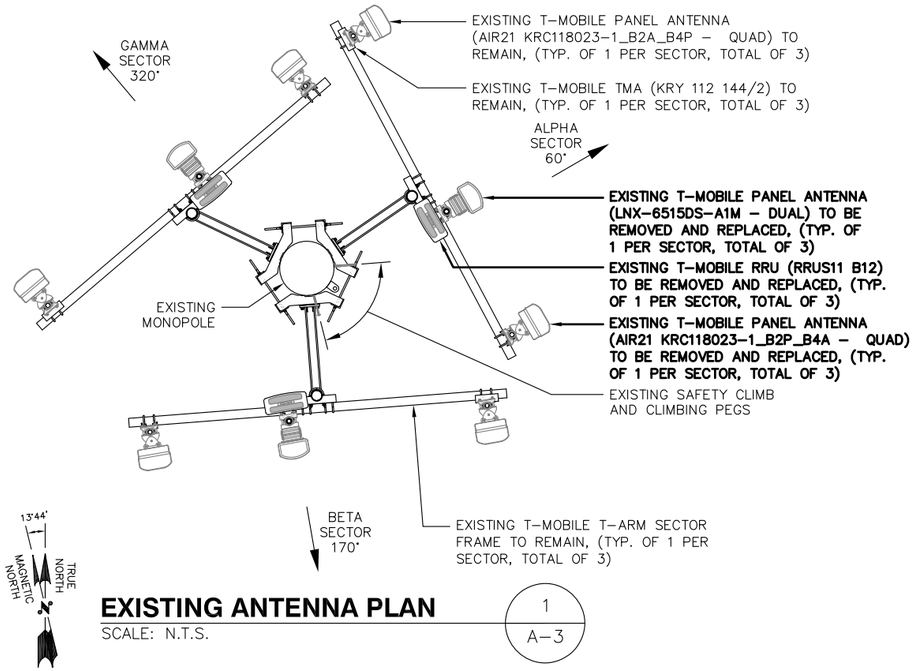
ELEVATIONS

SHEET NUMBER
A-2



EXISTING T-MOBILE PANEL ANTENNA (AIR21 KRC118023-1_B2A_B4P - QUAD) TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING T-MOBILE TMA (KRY 112 144/2) TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING T-MOBILE PANEL ANTENNA (LNX-6515DS-A1M - DUAL) TO BE REMOVED AND REPLACED, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING T-MOBILE RRU (RRUS11 B12) TO BE REMOVED AND REPLACED, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING T-MOBILE PANEL ANTENNA (AIR21 KRC118023-1_B2P_B4A - QUAD) TO BE REMOVED AND REPLACED, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

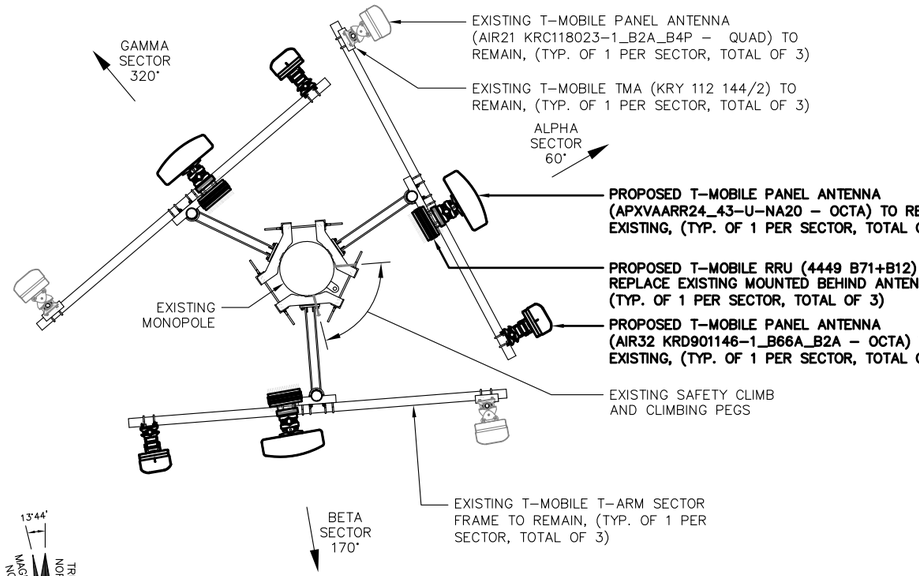
EXISTING SAFETY CLIMB AND CLIMBING PEGS

EXISTING T-MOBILE T-ARM SECTOR FRAME TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING ANTENNA PLAN

SCALE: N.T.S.

1 / A-3



EXISTING T-MOBILE PANEL ANTENNA (AIR21 KRC118023-1_B2A_B4P - QUAD) TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING T-MOBILE TMA (KRY 112 144/2) TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED T-MOBILE PANEL ANTENNA (APXVAARR24_43-U-NA20 - OCTA) TO REPLACE EXISTING, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (1/A-4, 1/A-5)

PROPOSED T-MOBILE RRU (4449 B71+B12) TO REPLACE EXISTING MOUNTED BEHIND ANTENNA, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (1/A-4, 3/A-5)

PROPOSED T-MOBILE PANEL ANTENNA (AIR32 KRD901146-1_B66A_B2A - OCTA) TO REPLACE EXISTING, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (2/A-4, 2/A-5)

EXISTING SAFETY CLIMB AND CLIMBING PEGS

EXISTING T-MOBILE T-ARM SECTOR FRAME TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED ANTENNA PLAN

SCALE: N.T.S.

2 / A-3

EXISTING T-MOBILE PANEL ANTENNA (AIR21 KRC118023-1_B2A_B4P - QUAD) TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING T-MOBILE TMA (KRY 112 144/2) TO REMAIN, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (BEHIND ANTENNA IN PHOTO)

EXISTING T-MOBILE PANEL ANTENNA (LNX-6515DS-A1M - DUAL) TO BE REMOVED, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED T-MOBILE PANEL ANTENNA (APXVAARR24_43-U-NA20 - OCTA) TO REPLACE EXISTING, (TYP. OF 1 PER SECTOR, TOTAL OF 3). (1/A-4, 1/A-5)
(SEE ANTENNA INSTALLATION NOTE)

EXISTING T-MOBILE PANEL ANTENNA (AIR21 KRC118023-1_B2P_B4A - QUAD) TO BE REMOVED, (TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED T-MOBILE PANEL ANTENNA (AIR32 KRD901146-1_B66A_B2A - OCTA) TO REPLACE EXISTING, (TYP. OF 1 PER SECTOR, TOTAL OF 3). (2/A-4, 2/A-5)
(SEE ANTENNA INSTALLATION NOTE)

PROPOSED T-MOBILE RRU (4449 B71+B12) TO REPLACE EXISTING MOUNTED BEHIND ANTENNA, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (1/A-4, 3/A-5)

IMAGE SOURCE: PROTERRA 07/13/2018
NOTE: ONLY SECTOR SHOWN FOR CLARITY

ANTENNA PHOTO DETAIL

SCALE: N.T.S.

3 / A-3

T-MOBILE NORTHEAST LLC
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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 8/22/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

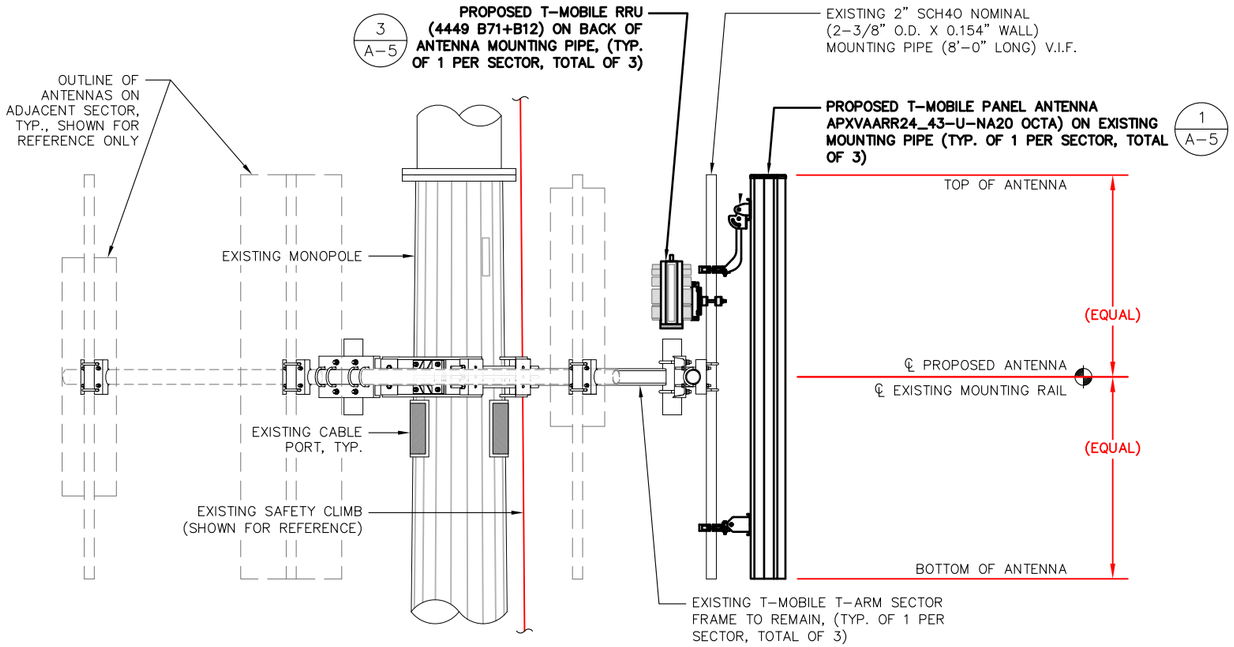
REV.	DATE	DESCRIPTION	BY
0	08/22/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CTHA145B
SITE NAME:
MAPLE HILL FARMS

SITE ADDRESS:
12 BURR ROAD
BLOOMFIELD, CT 06002

SHEET TITLE
EXISTING & PROPOSED ANTENNA PLAN

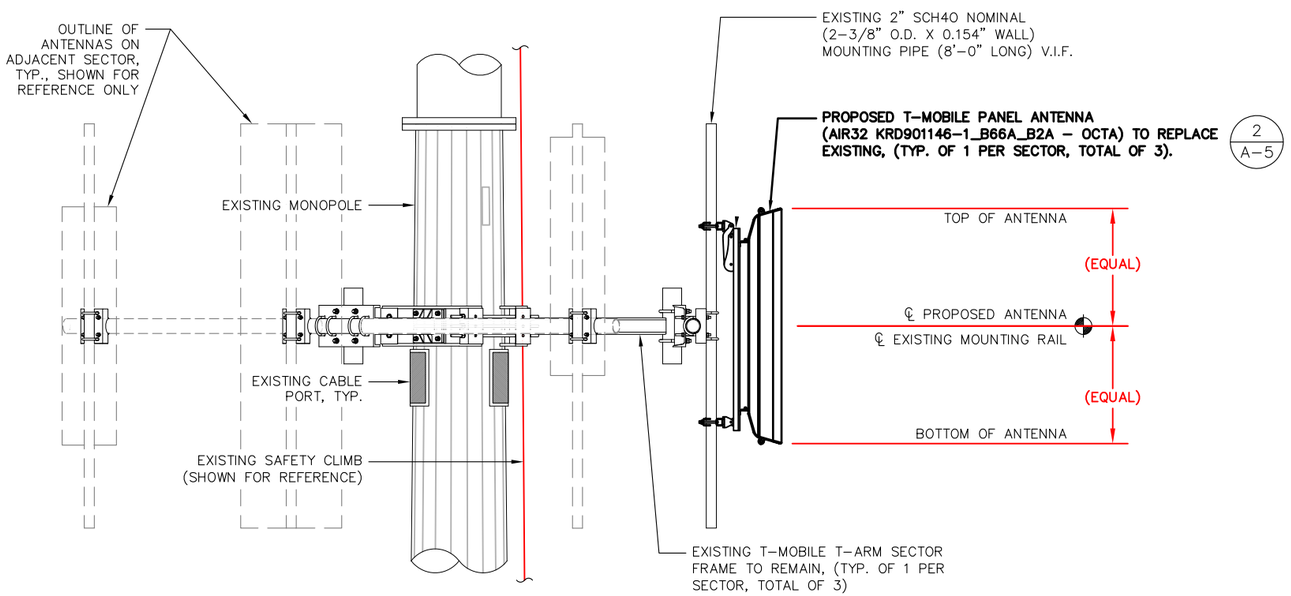
SHEET NUMBER
A-3



PROPOSED ANTENNA MOUNTING DETAIL (APXVAARR24_43-U-NA20 OCTA)

1
A-4

SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (AIR32 KRD901146-1_B66A_B2A - OCTA)

2
A-4

SCALE: N.T.S.

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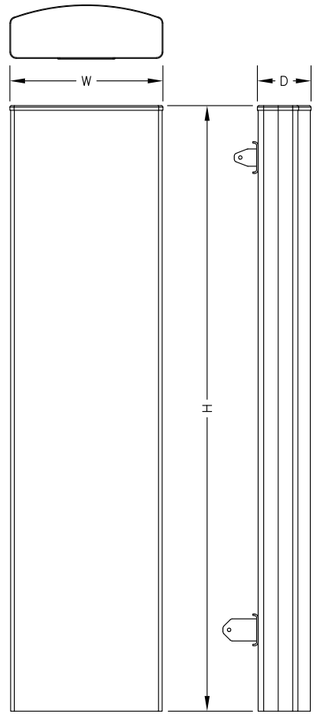
SHEET TITLE
DETAILS

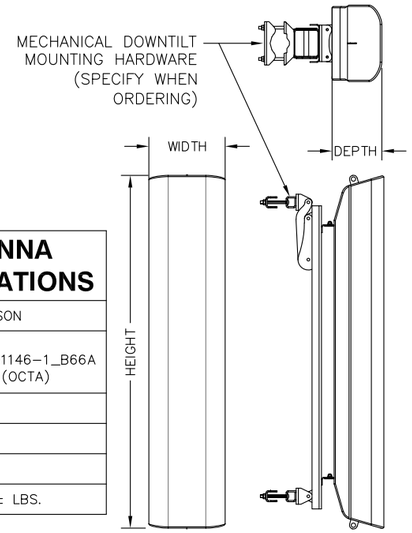
SHEET NUMBER
A-4



APXVAARR24_43-U-NA20 (OCTA) ANTENNA SPECIFICATIONS	
MANUF.	RFS
MODEL #	APXVAARR24_43-U-NA20 (OCTA)
HEIGHT	95.9"
WIDTH	24"
DEPTH	8.7"
WEIGHT	128± LBS.

ANTENNA DETAIL (APXVAARR24_43-U-NA20 OCTA) 1 / A-5

SCALE: N.T.S.

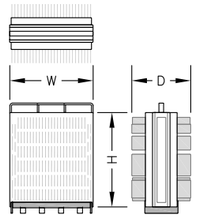


AIR ANTENNA SPECIFICATIONS	
MANUF.	ERICSSON
MODEL #	AIR32 KRD901146-1_B66A _B2A (OCTA)
HEIGHT	56.6"
WIDTH	12.9"
DEPTH	8.7"
WEIGHT	132.2± LBS.

ANTENNA DETAIL (AIR32 KRD901146-1_B66A_B2A OCTA) 2 / A-5

SCALE: N.T.S.

RRU SPECIFICATIONS	
MANUF.	ERICSSON
MODEL #	4449 B71+B12
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	9.2"
WEIGHT	74± LBS.



REMOTE RADIO UNIT (RRU) DETAIL (4449 B71+B12) 3 / A-5

SCALE: N.T.S.

ANTENNA CONFIGURATION

SECTOR	BAND	ANTENNA MODEL	ANTENNA RAD (SBA DATABASE)	AZIMUTH	RADIOS	CABLE FEED LINES
ALPHA	G1900 U2100	ERICSSON – AIR21 KRC118023-1_B2A_B4P (QUAD)	130'±	60°	EXISTING (1) KRY 112 144/2	EXISTING (2) 1-5/8" COAX
	L600 L700	RFS – APXVAARR24_43-U-NA20 (OCTA)	130'±	60°	PROPOSED (1) 4449 B71+B12 RRU,	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
	L1900 L2100	ERICSSON – AIR32 KRD901146-1_B66A_B2A (OCTA)	130'±	60°	–	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
BETA	G1900 U2100	ERICSSON – AIR21 KRC118023-1_B2A_B4P (QUAD)	130'±	170°	EXISTING (1) KRY 112 144/2	EXISTING (2) 1-5/8" COAX
	L600 L700	RFS – APXVAARR24_43-U-NA20 (OCTA)	130'±	170°	PROPOSED (1) 4449 B71+B12 RRU,	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
	L1900 L2100	ERICSSON – AIR32 KRD901146-1_B66A_B2A (OCTA)	130'±	170°	–	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
GAMMA	G1900 U2100	ERICSSON – AIR21 KRC118023-1_B2A_B4P (QUAD)	130'±	320°	EXISTING (1) KRY 112 144/2	EXISTING (2) 1-5/8" COAX
	L600 L700	RFS – APXVAARR24_43-U-NA20 (OCTA)	130'±	320°	PROPOSED (1) 4449 B71+B12 RRU,	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
	L1900 L2100	ERICSSON – AIR32 KRD901146-1_B66A_B2A (OCTA)	130'±	320°	–	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK

REFER TO FINAL RFDS FOR FINAL ANTENNA SETTINGS, CONFIGURATION, QUANTITIES AND RAN WIRING.

T-Mobile

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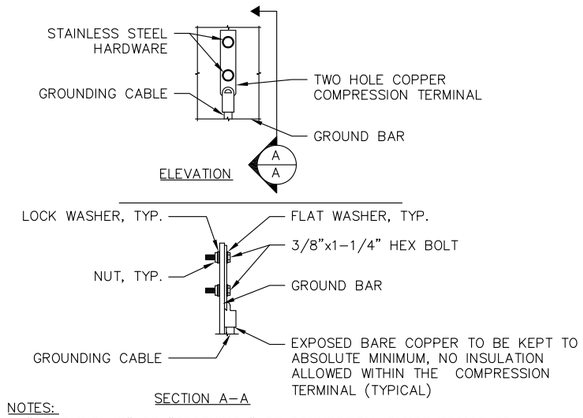
SHEET TITLE
DETAILS

SHEET NUMBER
A-5

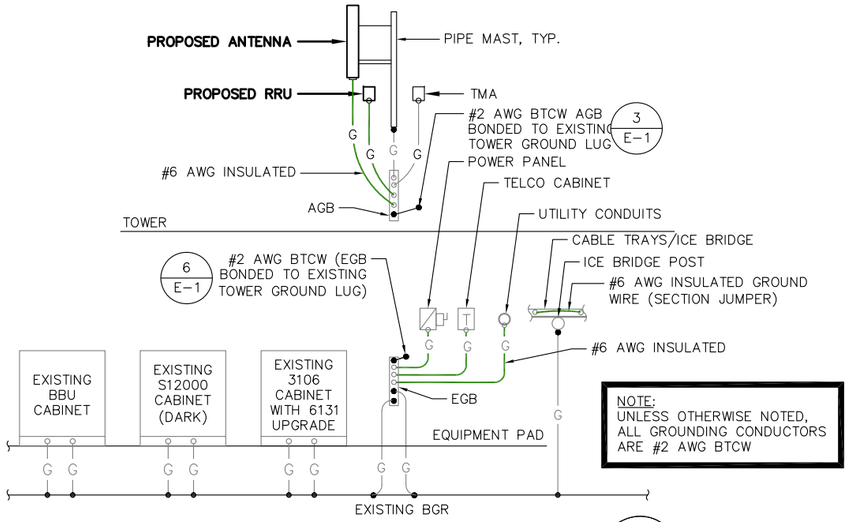


NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

1 / E-1

SCALE: N.T.S.

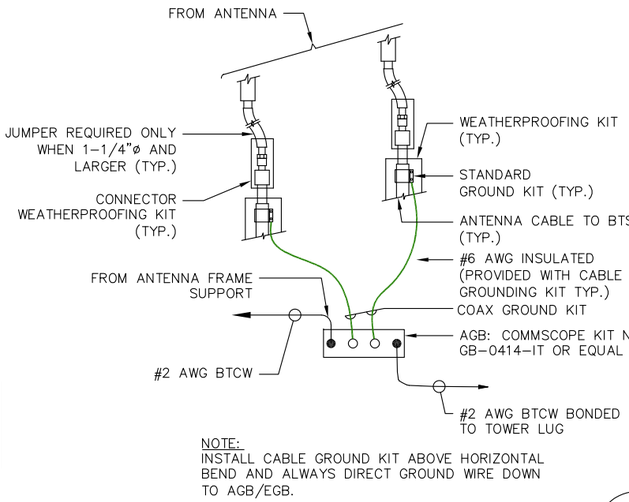


NOTE:
UNLESS OTHERWISE NOTED, ALL GROUNDING CONDUCTORS ARE #2 AWG BTCW

TYPICAL GROUNDING RISER DIAGRAM

2 / E-1

SCALE: N.T.S.

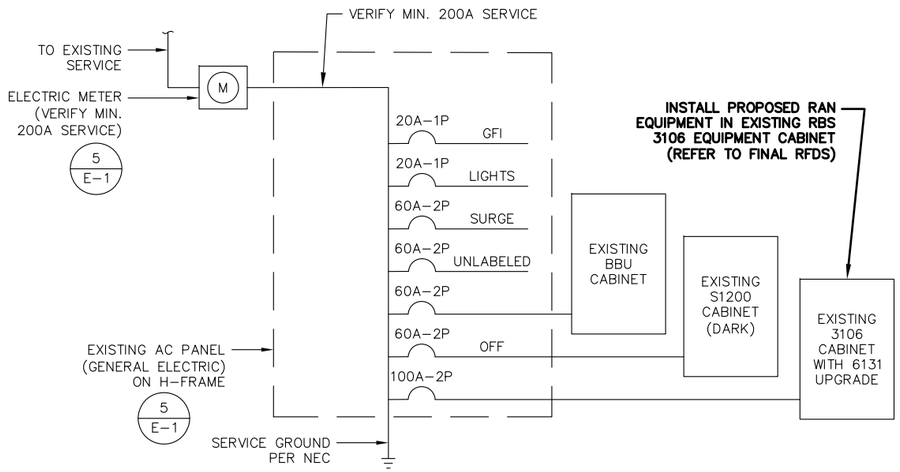


NOTE:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL

3 / E-1

SCALE: N.T.S.



ONE LINE POWER SCHEMATIC

4 / E-1

SCALE: N.T.S.

INSTALL PROPOSED RAN EQUIPMENT IN EXISTING RBS 3106 EQUIPMENT CABINET (REFER TO FINAL RFDS)

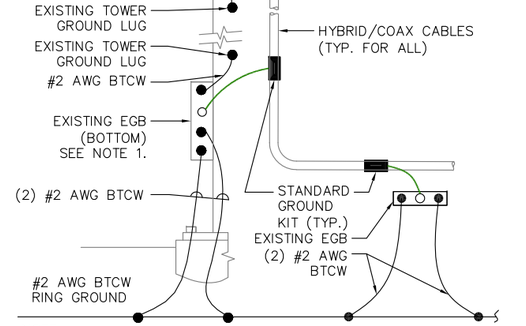
IMAGE SOURCE: PROTERRA 07/13/2018

IMAGE SOURCE: PROTERRA 07/13/2018

PHOTO DETAIL: PPC PANEL

5 / E-1

SCALE: N.T.S.



NOTE:
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED

TOWER BOTTOM CABLE GROUNDING DETAIL

6 / E-1

SCALE: N.T.S.

ELECTRICAL LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
G	GROUND
⏚	GROUND
MGB	MASTER GROUND BAR — ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
—G—	GROUND COPPER WIRE, SIZE AS NOTED
	EXPOSED WIRING
	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
⊙	5/8"x10' COPPER CLAD STAINLESS STEEL GROUND ROD
	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

CONTRACTOR NOTE:
G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

ELECTRICAL & GROUNDING NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2014 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
14. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LYGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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SHEET TITLE
ONE-LINE DIAGRAM & GROUNDING DETAILS

SHEET NUMBER
E-1