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

April 10, 2017

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

Notice of Exempt Modification
93 Lake Street, Manchester, CT 06042
41 47 20.7 N
-72 28 55.5 W
T-Mobile #: CTHA075D_L700

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 105.5-foot level of the existing 109-foot Monopole Tower at 93 Lake Street. The tower is owned by SBA Infrastructure, LLC. The property is owned by Alan Rossetto. T-Mobile intends to add (3) new L700MHz antennas. These antennas would be installed at the 105.5-foot level of the tower. T-Mobile's full scope of proposed work is as follows:

Remove:
- (3) RFS-APXV206513E panel antennas (entitlements only – antennas not on tower)

Remove and Replace:
- None

Install:
- (3) Commscope-LNX-6515DS-A1M panel antennas
- (3) Ericsson S11B12 RRHs

Existing Equipment to Remain (including entitlements):
- (3) Ericsson-Air21 B2A/B4P panel antennas
- (3) Ericsson-Air21 B4A/B2P panel antennas
- (3) Ericsson KRY112 144 TMAs
- (3) Ericsson ETW200VA12UB TMAs
- (1) 1-5/8" fiber
- (12) 7/8" lines

This facility was approved on May 8, 2008 by the Council in Case/Docket # 351. This approval included the conditions that the monopole not exceed 110', be sufficient to accommodate the carrier and other entities, both public and private, provide reasonable space for any Town public safety services for no compensation, and that an RF report be produced as configurations were changed. 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 Scott Shaley, General Manager for the Town of Manchester, Gary Anderson, Director of Planning and Economic Development, as well as the property owner, Alan Rossetto. (Separate notice is not being sent to the 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 with certain modifications.

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: Scott Shaley, General Manager
Town of Manchester, 41 Center Street, Manchester, CT 06045
Gary Anderson, AICP, Director of Planning and Economic Development
Town of Manchester, Lincoln Center, 2nd Floor, 494 Main St., Manchester, CT 06045
Alan Rossetto, Property Owner
23 Longview Drive Lancaster NH 03584

POWER DENSITY

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	105.5	Height (AGL):	105.5	Height (AGL):	105.5
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.70	Antenna B1 MPE%	1.70	Antenna C1 MPE%	1.70
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):	105.5	Height (AGL):	105.5	Height (AGL):	105.5
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	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,410.96	ERP (W):	6,410.96	ERP (W):	6,410.96
Antenna A2 MPE%	2.33	Antenna B2 MPE%	2.33	Antenna C2 MPE%	2.33
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	105.5	Height (AGL):	105.5	Height (AGL):	105.5
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.67	Antenna B3 MPE%	0.67	Antenna C3 MPE%	0.67

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**4.70 %**
Clearwire	0.23 %
Site Total MPE %:	**4.93 %**

T-Mobile Sector A Total:	4.70 %
T-Mobile Sector B Total:	4.70 %
T-Mobile Sector C Total:	4.70 %
Site Total:	4.93 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	105.5	16.95	AWS - 2100 MHz	1000	1.70%
T-Mobile AWS - 2100 MHz UMTS	2	871.21	105.5	6.33	AWS - 2100 MHz	1000	0.63%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	105.5	8.48	PCS - 1950 MHz	1000	0.85%
T-Mobile PCS - 1950 MHz GSM	2	1,167.14	105.5	8.48	PCS - 1950 MHz	1000	0.85%
T-Mobile 700 MHz LTE	1	865.21	105.5	3.14	700 MHz	467	0.67%
						Total:	**4.70%**

93 LAKE STREET

Location	93 LAKE STREET	**Mblu**	135/ 3330/ 93/ /
Acct#	333000093R	**Owner**	ROSSETTO ALAN C
Assessment	$141,800	**Appraisal**	$202,600
PID	8968	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$133,300	$69,300	$202,600
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$93,300	$48,500	$141,800

Owner of Record

Owner ROSSETTO ALAN C
Address 23 LONGVIEW DRIVE
LANCASTER, NH 03584

Sale Price $0
Certificate
Book & Page 3432/ 212
Sale Date 04/12/2007
Instrument 36

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
ROSSETTO ALAN C	$0		3432/ 212	36	04/12/2007
ROSSETTO ALAN C TR	$0	C	739/ 164		05/21/1980

Building Information

Building 1 : Section 1

Year Built: 1913
Living Area: 1,985
Replacement Cost: $174,215
Replacement Cost Less Depreciation: $115,000

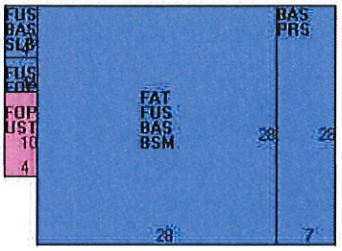
Building Attributes	
Field	**Description**
Style	Family Conver.
Model	Multi-Family

Building Photo

Grade:	Average
Stories:	2 Stories
Occupancy	2
Exterior Wall 1	Aluminum Sidin
Exterior Wall 2	
Roof Structure:	Hip/Truss
Roof Cover	Asphalt Shingl
Interior Wall 1	Plaster
Interior Wall 2	Plywood Panel
Interior Flr 1	Carpet
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	Partial
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	7
Bath Style:	Average
Kitchen Style:	Average
Extra Kitchens	
Whirlpool	
Fireplace	
Fin Basement	
Fin Bsmnt Qual	
Fin Bsmnt 2	
Fin Bsmnt2 Qual	
Bsmnt Garage	

(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\01\33/66.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,004	1,004
FUS	Upper Story, Finished	824	824
FAT	Attic, Finished	784	157
BSM	Basement	784	0
FOP	Porch, Open	56	0
PRS	Piers	196	0
SLB	Slab	24	0
UST	Utility, Storage, Unfinished	40	0
		3,712	1,985

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
A/C	Partial AC	1004 S.F.	$1,300	1

Land

Land Use **Land Line Valuation**

Use Code	102	**Size (Acres)**	1
Description	Two Family	**Frontage**	0
Zone	RR	**Depth**	0
Neighborhood	60	**Assessed Value**	$48,500
Alt Land Appr	No	**Appraised Value**	$69,300
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FGR4	Garage W Loft			528 S.F	$8,400	1
FGR1	Garage Average			512 S.F.	$7,700	1
BTH1	Cabana			60 S.F.	$900	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$111,700	$85,800	$197,500
2010	$159,600	$104,600	$264,200
2005	$85,700	$54,000	$139,700

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$78,200	$60,100	$138,300
2010	$111,800	$73,200	$185,000
2005	$60,100	$37,800	$97,900

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: CTHA075D

HA075 / Optasite
93 Lake Street
Manchester, CT 06042

March 24, 2017

EBI Project Number: 6217001146

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	4.93 %

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

EBI Consulting
environmental | engineering | due diligence

March 24, 2017

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

Emissions Analysis for Site: **CTHA075D – HA075 / Optasite**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **93 Lake Street, Manchester, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **93 Lake Street, Manchester, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

6) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF path tan additional 1.27 dB of cable loss was factored into the calculations used for this analysis. This is based on manufacturers Specifications for 100 feet of 1-5/8" coax cable on each path.

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 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 AIR21 B4A/B2P** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **105.5 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 public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	105.5	Height (AGL):	105.5	Height (AGL):	105.5
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.70	Antenna B1 MPE%	1.70	Antenna C1 MPE%	1.70
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):	105.5	Height (AGL):	105.5	Height (AGL):	105.5
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	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,410.96	ERP (W):	6,410.96	ERP (W):	6,410.96
Antenna A2 MPE%	2.33	Antenna B2 MPE%	2.33	Antenna C2 MPE%	2.33
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	105.5	Height (AGL):	105.5	Height (AGL):	105.5
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.67	Antenna B3 MPE%	0.67	Antenna C3 MPE%	0.67

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**4.70 %**
Clearwire	0.23 %
Site Total MPE %:	**4.93 %**

T-Mobile Sector A Total:	4.70 %
T-Mobile Sector B Total:	4.70 %
T-Mobile Sector C Total:	4.70 %
Site Total:	4.93 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	105.5	16.95	AWS - 2100 MHz	1000	1.70%
T-Mobile AWS - 2100 MHz UMTS	2	871.21	105.5	6.33	AWS - 2100 MHz	1000	0.63%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	105.5	8.48	PCS - 1950 MHz	1000	0.85%
T-Mobile PCS - 1950 MHz GSM	2	1,167.14	105.5	8.48	PCS - 1950 MHz	1000	0.85%
T-Mobile 700 MHz LTE	1	865.21	105.5	3.14	700 MHz	467	0.67%
						Total:	**4.70%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	4.70 %
Sector B:	4.70 %
Sector C:	4.70 %
T-Mobile Per Sector Maximum:	4.70 %
Site Total:	4.93 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.93%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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

Structural Analysis Report

Existing 109 ft SABRE Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13529-A

Customer Site Name: Manchester 1

Carrier Name: T-Mobile

Carrier Site ID / Name: CTHA075D / HA075/Optasite

Site Location: 93 Lake Street

Manchester, Connecticut

Hartford County

Latitude: 41.789083

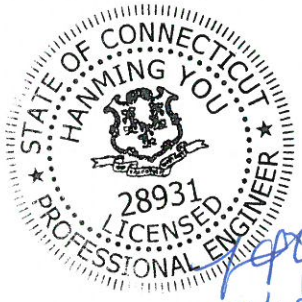
Longitude: -72.482083

Analysis Result:

Max Structural Usage: 36.4% [Pass]

Max Foundation Usage: 39.0% [Pass]

Report Prepared By: Tawfeeq Alajaj



3/15/17

Introduction

The purpose of this report is to summarize the analysis results on the 109 ft SABRE 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	Sabre Towers & Poles (Project No. 09-06160) Structural Design Report dated June 17, 2008.
Foundation Drawing	Sabre Towers & Poles (Project No. 09-06160) Structural Design Report dated June 17, 2008.
Geotechnical Report	Terracon Consulting Engineers & Scientists (Project No. J2085152) Geotechnical Engineering Report dated June 6, 2008.
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 125 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 97.0 mph (3-Sec. Gust)
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 / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.178, S_1 = 0.063

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
-	105.5	3	RFS - APXV206513E - Panel	Low Profile Platform	(1) 1 5/8" Fiber (12) 7/8"	T-Mobile
-		3	Ericsson - Air21 B2A/B4P - Panel			
-		3	Ericsson - AIR 21 B4A/B2P - Panel			
-		3	Ericsson KRY112 144 TMAs			
-		3	Ericsson ETW200VA12UB TMAs			
7	95.0	3	Argus - LLPX310R - Panel	(3) T-Arms	(2) 1/2" (3) 1/2" Fiber (3) 5/16" (3) 5/8" Power	Clearwire
8		2	Andrew - VHLP2.5-11 - Dish			
9		3	Samsung BTS			

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	105.5	3	Ericsson - Air21 B2A/B4P - Panel	Low Profile Platform	(1) 1 5/8" Fiber (12) 7/8"	T-Mobile
2		3	Ericsson - AIR 21 B4A/B2P - Panel			
3		3	Commscope - LNX-6515DS-A1M - Panel			
4		3	Ericsson KRY112 144 TMAs			
5		3	Ericsson ETW200VA12UB TMAs			
6		3	Ericsson S11B12 RRHs			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**34.7%**	**36.4%**	**30.3%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	2581.7	27.3
Analysis Reactions	1112.3	14.7
Factored Reactions*	3485.3	36.9
% of Design Reactions	31.9%	39.7%

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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 0.5129 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Antenna Mount Note:

The existing mount contributed no additional stress to the tower since it was already existing.

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 34.71% at 0.0ft

Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Gh:**	1.1		
Base Elev:	1.000 (ft)			Page: 1	

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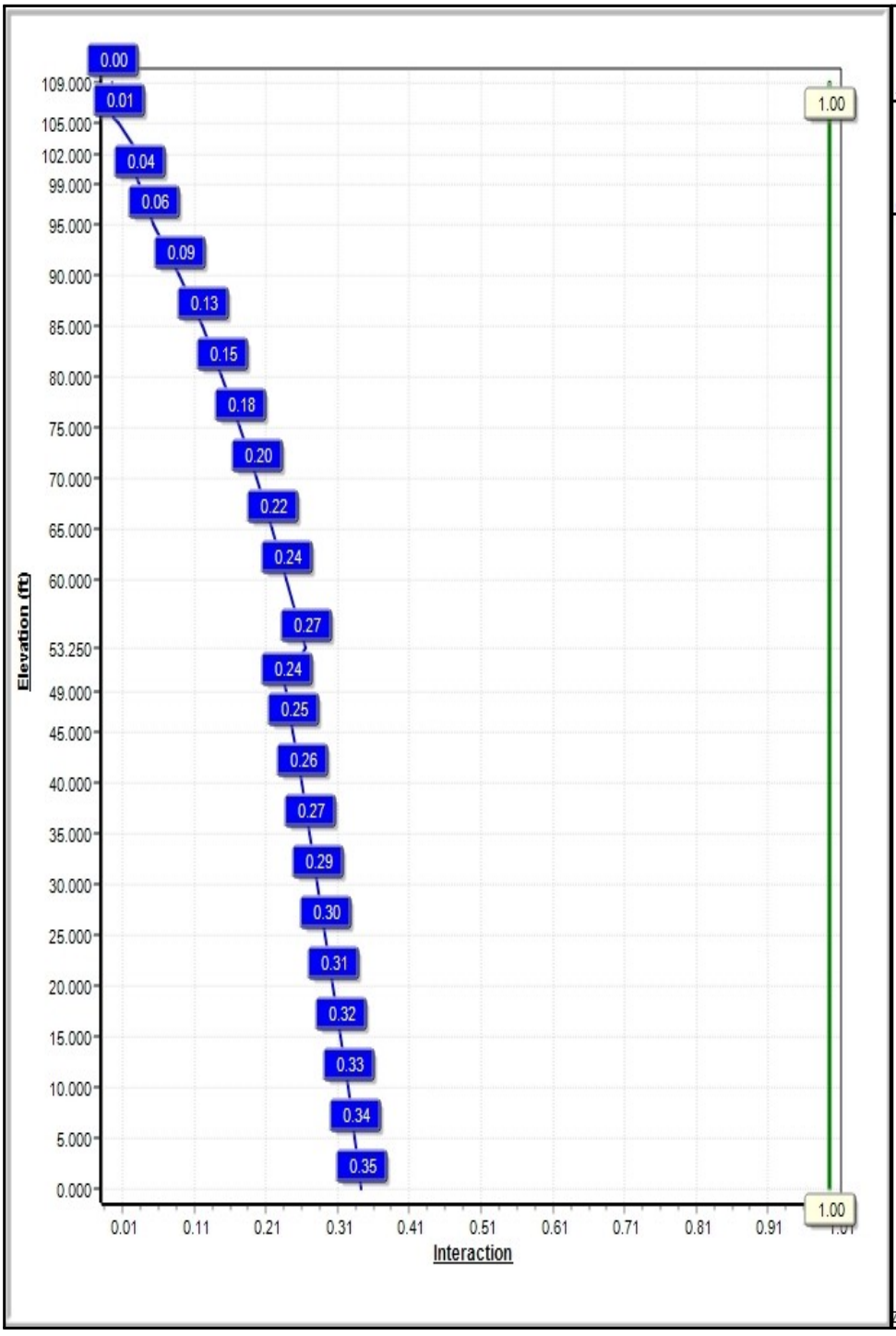
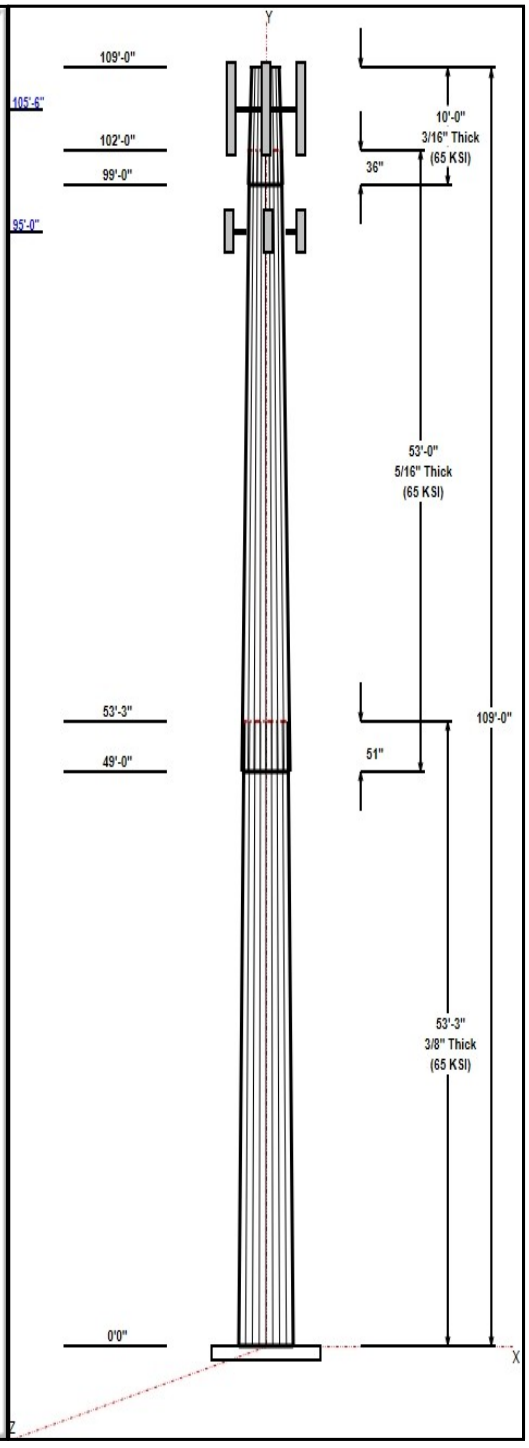
Dead Load Factor:	1.20	**Iterations:**	20
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 97 mph Wind





Structure: CT13529-A-SBA

Type: Tapered
Site Name: Manchester 1
Height: 109.00 (ft)
Base Elev: 1.00 (ft)

Base Shape: 18 Sided
Taper: 0.20697

3/15/2017

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	32.68	43.70	0.375		0.20697	65
2	53.00	23.21	34.18	0.313	Slip	0.20697	65
3	10.00	22.14	24.21	0.188	Slip	0.20697	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
105.50	105.50	3	Air21 B2A/B4P	T-Mobile
105.50	105.50	3	AIR 21 B4A/B2P	T-Mobile
105.50	105.50	3	LNX-6515DS-A1M	T-Mobile
105.50	105.50	3	Ericsson KRY112 144	T-Mobile
105.50	105.50	3	Ericsson ETW200VA12UB	T-Mobile
105.50	105.50	3	Ericsson S11B12 RRHs	T-Mobile
105.50	105.50	1	Low Profile Platform	T-Mobile
95.00	95.00	3	LLPX310R	Clearwire
95.00	95.00	2	VHLP2.5-11	Clearwire
95.00	95.00	3	Samsung BTS	Clearwire
95.00	95.00	3	T-Arms	Clearwire

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	105.50	Inside	1 5/8" Fiber	T-Mobile
0.00	105.50	Inside	7/8" Coax	T-Mobile
0.00	95.00	Inside	1/2" Coax	Clearwire
0.00	95.00	Inside	1/2" Fiber	Clearwire
0.00	95.00	Inside	5/16" Coax	Clearwire
0.00	95.00	Inside	5/8" Power	Clearwire

Anchor Bolts

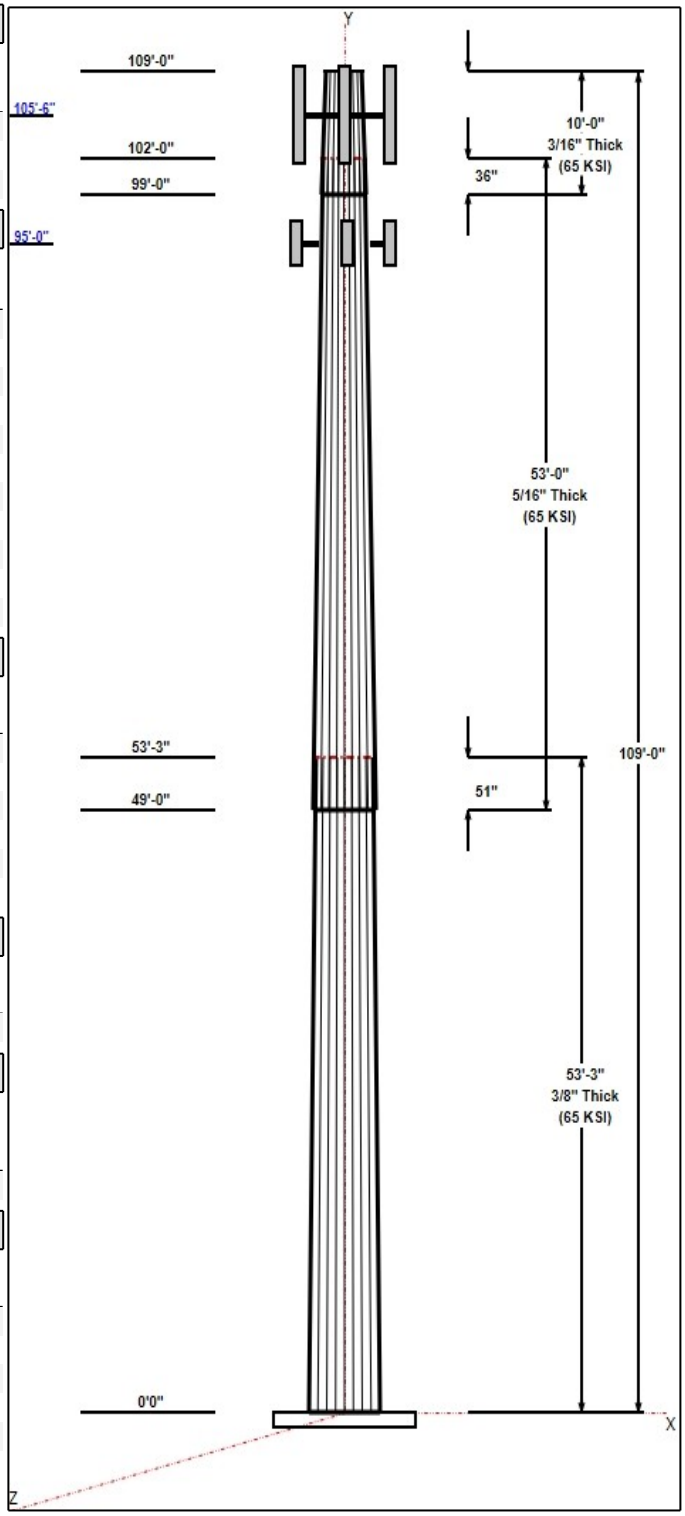
Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	49.0	60.0	Clipped

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	1112.3	14.7	22.0
0.9D + 1.6W 97 mph Wind	1106.7	14.6	16.5
1.2D + 1.0Di + 1.0Wi 50 mph Wind	337.6	4.5	37.0
1.2D + 1.0E	93.0	1.0	22.1
0.9D + 1.0E	92.5	1.0	16.5
1.0D + 1.0W 60 mph Wind	265.1	3.5	18.4



Structure: CT13529-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Manchester 1
Height: 109.00 (ft)

3/15/2017

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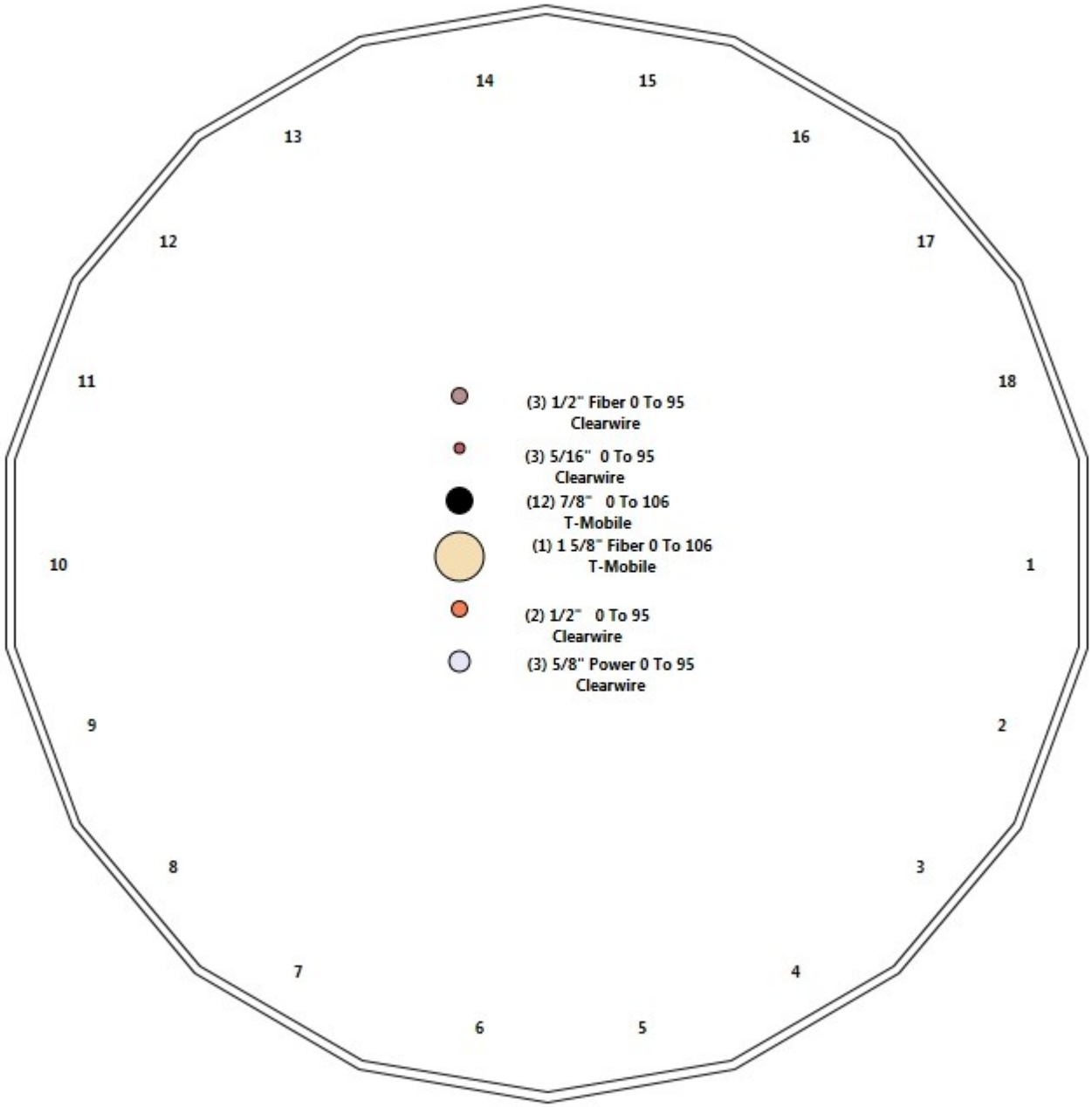

Shaft Properties

Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 4

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.3750	65		0.00	8,155
2	18	53.000	0.3125	65	Slip	51.00	5,078
3	18	10.000	0.1875	65	Slip	36.00	465
					Total Shaft Weight:		**13,698**

	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	43.70	0.00	51.57	12229.01	19.14	116.53	32.68	53.25	38.45	5069.13	13.96	87.14	0.206972
2	34.18	49.00	33.59	4869.37	17.88	109.39	23.21	102.00	22.71	1505.13	11.69	74.28	0.206972
3	24.21	99.00	14.30	1042.28	21.36	129.12	22.14	109.00	13.06	795.42	19.41	118.0	0.206972

Load Summary

Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	**Elev (ft)**	**Description**	**Qty**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Hor. Ecc. (ft)**	**Vert Ecc (ft)**
1	105.50	Air21 B2A/B4P	3	91.50	6.09	0.86	321.42	7.531	0.86	0.00	0.00
2	105.50	AIR 21 B4A/B2P	3	90.40	6.09	0.86	320.32	7.531	0.86	0.00	0.00
3	105.50	LNX-6515DS-A1M	3	49.80	11.47	0.80	345.56	15.679	0.80	0.00	0.00
4	105.50	Ericsson KRY112 144 TMAs	3	11.00	0.41	0.70	24.89	1.022	0.70	0.00	0.00
5	105.50	Ericsson ETW200VA12UB TMAs	3	11.00	0.47	0.67	26.81	1.124	0.67	0.00	0.00
6	105.50	Ericsson S11B12 RRHs	3	51.00	2.83	0.70	140.68	3.695	0.70	0.00	0.00
7	105.50	Low Profile Platform	1	1500.00	22.00	1.00	3186.46	44.756	1.00	0.00	0.00
8	95.00	LLPX310R	3	27.60	4.31	0.69	143.37	6.428	0.69	0.00	0.00
9	95.00	VHLP2.5-11	2	47.60	8.43	1.00	267.80	10.606	1.00	0.00	0.00
10	95.00	Samsung BTS	3	45.00	3.54	0.82	156.64	5.314	0.82	0.00	0.00
11	95.00	T-Arms	3	350.00	8.00	0.75	661.55	16.902	0.75	0.00	0.00
		Totals:	**30**	**3,777.10**			**10,145.82**				

Linear Appurtenances

Bottom Elev. (ft)	**Top Elev. (ft)**	**Description**	**Exposed Width**	**Exposed**
0.00	105.50	(1) 1 5/8" Fiber	0.00	Inside
0.00	105.50	(12) 7/8" Coax	0.00	Inside
0.00	95.00	(2) 1/2" Coax	0.00	Inside
0.00	95.00	(3) 1/2" Fiber	0.00	Inside
0.00	95.00	(3) 5/16" Coax	0.00	Inside
0.00	95.00	(3) 5/8" Power	0.00	Inside

Shaft Section Properties

Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

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	43.700	51.566	12229.0	19.14	116.53	78.9	551.2	0.0
5.00		0.3750	42.665	50.334	11373.5	18.65	113.77	79.5	525.1	866.9
10.00		0.3750	41.630	49.102	10558.8	18.16	111.01	80.0	499.6	845.9
15.00		0.3750	40.595	47.871	9784.0	17.68	108.25	80.6	474.7	824.9
20.00		0.3750	39.561	46.639	9048.0	17.19	105.49	81.2	450.5	804.0
25.00		0.3750	38.526	45.407	8349.9	16.70	102.74	81.8	426.9	783.0
30.00		0.3750	37.491	44.176	7688.7	16.22	99.98	82.3	403.9	762.1
35.00		0.3750	36.456	42.944	7063.3	15.73	97.22	82.5	381.6	741.1
40.00		0.3750	35.421	41.712	6472.8	15.24	94.46	82.5	359.9	720.2
45.00		0.3750	34.386	40.480	5916.2	14.76	91.70	82.5	338.9	699.2
49.00	Bot - Section 2	0.3750	33.558	39.495	5494.6	14.37	89.49	82.5	322.5	544.3
50.00		0.3750	33.351	39.249	5392.4	14.27	88.94	82.5	318.5	247.9
53.25	Top - Section 1	0.3125	33.304	32.722	4499.8	17.38	106.57	0.0	0.0	795.2
55.00		0.3125	32.942	32.363	4353.2	17.18	105.41	81.2	260.3	193.8
60.00		0.3125	31.907	31.336	3952.0	16.59	102.10	81.9	244.0	541.9
65.00		0.3125	30.872	30.310	3576.2	16.01	98.79	82.5	228.2	524.4
70.00		0.3125	29.837	29.283	3225.1	15.42	95.48	82.5	212.9	507.0
75.00		0.3125	28.802	28.257	2897.7	14.84	92.17	82.5	198.2	489.5
80.00		0.3125	27.767	27.231	2593.3	14.26	88.86	82.5	183.9	472.0
85.00		0.3125	26.732	26.204	2310.9	13.67	85.54	82.5	170.3	454.6
90.00		0.3125	25.697	25.178	2049.9	13.09	82.23	82.5	157.1	437.1
95.00		0.3125	24.663	24.151	1809.2	12.51	78.92	82.5	144.5	419.6
99.00	Bot - Section 3	0.3125	23.835	23.330	1630.9	12.04	76.27	82.5	134.8	323.1
100.00		0.3125	23.628	23.125	1588.2	11.92	75.61	82.5	132.4	127.5
102.00	Top - Section 2	0.1875	23.589	13.926	963.5	20.77	125.81	0.0	0.0	251.6
105.00		0.1875	22.968	13.557	888.9	20.19	122.50	77.7	76.2	140.3
105.50		0.1875	22.864	13.495	876.8	20.09	121.94	77.8	75.5	23.0
109.00		0.1875	22.140	13.064	795.4	19.41	118.08	78.6	70.8	158.2
										13698.2

Wind Loading - Shaft

Structure: CT13529-A-SBA
Site Name: Manchester 1
Height: 109.00 (ft)
Base Elev: 1.000 (ft)
Gh: 1.1 **Topography:** 1

Code: EIA/TIA-222-G 3/15/2017
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

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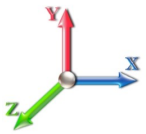
Load Case: 1.2D + 1.6W 97 mph Wind
Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 20

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	330.70	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	322.87	0.650	0.000	5.00	18.270	11.88	406.5	0.0	1040.2
10.00		1.00	0.85	19.450	21.40	315.03	0.650	0.000	5.00	17.832	11.59	396.8	0.0	1015.1
15.00		1.00	0.86	19.690	21.66	309.09	0.650	0.000	5.00	17.395	11.31	391.8	0.0	989.9
20.00		1.00	0.91	20.851	22.94	309.96	0.650	0.000	5.00	16.957	11.02	404.5	0.0	964.8
25.00		1.00	0.95	21.810	23.99	308.72	0.650	0.000	5.00	16.519	10.74	412.1	0.0	939.6
30.00		1.00	0.99	22.632	24.90	306.04	0.650	0.000	5.00	16.081	10.45	416.4	0.0	914.5
35.00		1.00	1.02	23.356	25.69	302.31	0.650	0.000	5.00	15.643	10.17	418.0	0.0	889.3
40.00		1.00	1.05	24.004	26.40	297.78	0.650	0.000	5.00	15.205	9.88	417.6	0.0	864.2
45.00		1.00	1.07	24.593	27.05	292.60	0.650	0.000	5.00	14.768	9.60	415.5	0.0	839.0
49.00	Bot - Section 2	1.00	1.09	25.029	27.53	288.07	0.650	0.000	4.00	11.499	7.47	329.2	0.0	653.1
50.00		1.00	1.10	25.133	27.65	286.89	0.650	0.000	1.00	2.884	1.87	82.9	0.0	297.5
53.25	Top - Section 1	1.00	1.11	25.462	28.01	282.94	0.650	0.000	3.25	9.251	6.01	269.5	0.0	954.2
55.00		1.00	1.12	25.633	28.20	286.17	0.650	0.000	1.75	4.905	3.19	143.8	0.0	232.5
60.00		1.00	1.14	26.099	28.71	279.69	0.650	0.000	5.00	13.718	8.92	409.6	0.0	650.3
65.00		1.00	1.16	26.535	29.19	272.87	0.650	0.000	5.00	13.281	8.63	403.1	0.0	629.3
70.00		1.00	1.18	26.946	29.64	265.76	0.650	0.000	5.00	12.843	8.35	395.9	0.0	608.3
75.00		1.00	1.19	27.335	30.07	258.39	0.650	0.000	5.00	12.405	8.06	387.9	0.0	587.4
80.00		1.00	1.21	27.704	30.47	250.78	0.650	0.000	5.00	11.967	7.78	379.3	0.0	566.4
85.00		1.00	1.23	28.056	30.86	242.96	0.650	0.000	5.00	11.529	7.49	370.0	0.0	545.5
90.00		1.00	1.24	28.391	31.23	234.95	0.650	0.000	5.00	11.091	7.21	360.2	0.0	524.5
95.00	Appurtenance(s)	1.00	1.25	28.713	31.58	226.76	0.650	0.000	5.00	10.654	6.92	349.9	0.0	503.6
99.00	Bot - Section 3	1.00	1.27	28.961	31.86	220.09	0.650	0.000	4.00	8.208	5.33	271.9	0.0	387.8
100.00		1.00	1.27	29.021	31.92	218.41	0.650	0.000	1.00	2.040	1.33	67.7	0.0	153.0
102.00	Top - Section 2	1.00	1.27	29.142	32.06	215.02	0.650	0.000	2.00	4.027	2.62	134.3	0.0	301.9
105.00		1.00	1.28	29.318	32.25	213.39	0.650	0.000	3.00	5.909	3.84	198.2	0.0	168.3
105.50	Appurtenance(s)	1.00	1.28	29.347	32.28	212.53	0.650	0.000	0.50	0.970	0.63	32.6	0.0	27.6
109.00		1.00	1.29	29.548	32.50	206.50	0.650	0.000	3.50	6.664	4.33	225.3	0.0	189.8
								Totals:	**109.00**			**8,490.6**		**16,437.9**

Discrete Appurtenance Forces

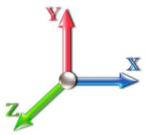
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 20

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	105.50	AIR 21 B4A/B2P	3	29.347	32.282	0.69	0.80	12.57	325.44	0.000	0.000	649.24	0.00	0.00
2	105.50	Ericsson S11B12 RRHs	3	29.347	32.282	0.56	0.80	4.75	183.60	0.000	0.000	245.57	0.00	0.00
3	105.50	Ericsson	3	29.347	32.282	0.54	0.80	0.76	39.60	0.000	0.000	39.04	0.00	0.00
4	105.50	Ericsson KRY112 144	3	29.347	32.282	0.56	0.80	0.69	39.60	0.000	0.000	35.58	0.00	0.00
5	105.50	LNX-6515DS-A1M	3	29.347	32.282	0.64	0.80	22.02	179.28	0.000	0.000	1137.48	0.00	0.00
6	105.50	Low Profile Platform	1	29.347	32.282	1.00	1.00	22.00	1800.00	0.000	0.000	1136.33	0.00	0.00
7	105.50	Air21 B2A/B4P	3	29.347	32.282	0.69	0.80	12.57	329.40	0.000	0.000	649.24	0.00	0.00
8	95.00	T-Arms	3	28.713	31.584	0.56	0.75	13.50	1260.00	0.000	0.000	682.22	0.00	0.00
9	95.00	Samsung BTS	3	28.713	31.584	0.66	0.80	6.97	162.00	0.000	0.000	352.06	0.00	0.00
10	95.00	VHLP2.5-11	2	28.713	31.584	1.00	1.00	16.86	114.24	0.000	0.000	852.02	0.00	0.00
11	95.00	LLPX310R	3	28.713	31.584	0.55	0.80	7.14	99.36	0.000	0.000	360.68	0.00	0.00
							Totals:		**4,532.52**			**6,139.46**		

Total Applied Force Summary

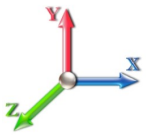
Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 9

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 20

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		406.53	1092.85	0.00	0.00
10.00		396.79	1067.70	0.00	0.00
15.00		391.83	1042.55	0.00	0.00
20.00		404.47	1017.40	0.00	0.00
25.00		412.15	992.26	0.00	0.00
30.00		416.36	967.11	0.00	0.00
35.00		417.98	941.96	0.00	0.00
40.00		417.56	916.82	0.00	0.00
45.00		415.48	891.67	0.00	0.00
49.00		329.24	695.23	0.00	0.00
50.00		82.92	308.05	0.00	0.00
53.25		269.48	988.43	0.00	0.00
55.00		143.83	250.96	0.00	0.00
60.00		409.59	702.88	0.00	0.00
65.00		403.15	681.93	0.00	0.00
70.00		395.90	660.97	0.00	0.00
75.00		387.92	640.01	0.00	0.00
80.00		379.28	619.06	0.00	0.00
85.00		370.04	598.10	0.00	0.00
90.00		360.25	577.15	0.00	0.00
95.00	(11) attachments	2596.92	2191.79	0.00	0.00
99.00		271.93	422.71	0.00	0.00
100.00		67.72	161.70	0.00	0.00
102.00		134.26	319.39	0.00	0.00
105.00		198.20	194.54	0.00	0.00
105.50	(19) attachments	3925.03	2928.90	0.00	0.00
109.00		225.27	189.79	0.00	0.00
	Totals:	**14,630.06**	**22,061.90**	**0.00**	**0.00**

Calculated Forces

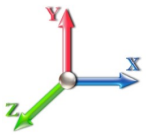
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 20

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	-22.05	-14.65	0.00	-1112.2	0.00	1112.29	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.347
5.00	-20.92	-14.29	0.00	-1039.0	0.00	1039.02	3599.77	1799.88	6249.10	3129.20	0.07	-0.125	0.000	0.338
10.00	-19.82	-13.93	0.00	-967.56	0.00	967.56	3536.97	1768.49	5988.52	2998.71	0.27	-0.251	0.000	0.328
15.00	-18.75	-13.58	0.00	-897.89	0.00	897.89	3472.90	1736.45	5731.22	2869.87	0.60	-0.376	0.000	0.318
20.00	-17.71	-13.21	0.00	-829.99	0.00	829.99	3407.57	1703.79	5477.38	2742.76	1.06	-0.502	0.000	0.308
25.00	-16.70	-12.82	0.00	-763.97	0.00	763.97	3340.97	1670.48	5227.15	2617.46	1.65	-0.627	0.000	0.297
30.00	-15.71	-12.43	0.00	-699.87	0.00	699.87	3273.10	1636.55	4980.70	2494.05	2.38	-0.752	0.000	0.285
35.00	-14.75	-12.03	0.00	-637.74	0.00	637.74	3190.51	1595.26	4718.31	2362.66	3.23	-0.876	0.000	0.275
40.00	-13.81	-11.62	0.00	-577.61	0.00	577.61	3099.00	1549.50	4450.18	2228.40	4.21	-0.998	0.000	0.264
45.00	-12.91	-11.22	0.00	-519.50	0.00	519.50	3007.49	1503.75	4189.89	2098.06	5.32	-1.119	0.000	0.252
49.00	-12.21	-10.88	0.00	-474.64	0.00	474.64	2934.29	1467.14	3987.31	1996.62	6.30	-1.214	0.000	0.242
50.00	-11.89	-10.81	0.00	-463.75	0.00	463.75	2915.98	1457.99	3937.45	1971.65	6.56	-1.238	0.000	0.239
53.25	-10.90	-10.53	0.00	-428.64	0.00	428.64	2384.18	1192.09	3226.87	1615.83	7.43	-1.315	0.000	0.270
55.00	-10.63	-10.39	0.00	-410.22	0.00	410.22	2365.01	1182.50	3165.45	1585.08	7.92	-1.356	0.000	0.263
60.00	-9.92	-9.99	0.00	-358.26	0.00	358.26	2309.37	1154.68	2992.01	1498.23	9.41	-1.482	0.000	0.243
65.00	-9.23	-9.58	0.00	-308.33	0.00	308.33	2251.87	1125.94	2821.03	1412.61	11.02	-1.602	0.000	0.222
70.00	-8.56	-9.18	0.00	-260.41	0.00	260.41	2175.62	1087.81	2632.26	1318.09	12.76	-1.715	0.000	0.202
75.00	-7.92	-8.79	0.00	-214.49	0.00	214.49	2099.36	1049.68	2450.04	1226.84	14.62	-1.820	0.000	0.179
80.00	-7.30	-8.40	0.00	-170.53	0.00	170.53	2023.10	1011.55	2274.35	1138.87	16.57	-1.914	0.000	0.153
85.00	-6.71	-8.02	0.00	-128.52	0.00	128.52	1946.84	973.42	2105.20	1054.16	18.63	-1.996	0.000	0.125
90.00	-6.13	-7.65	0.00	-88.41	0.00	88.41	1870.59	935.29	1942.58	972.73	20.75	-2.063	0.000	0.094
95.00	-4.04	-4.97	0.00	-50.17	0.00	50.17	1794.33	897.16	1786.50	894.58	22.94	-2.111	0.000	0.058
99.00	-3.62	-4.69	0.00	-30.27	0.00	30.27	1733.32	866.66	1666.34	834.41	24.72	-2.136	0.000	0.038
100.00	-3.46	-4.62	0.00	-25.58	0.00	25.58	1718.07	859.04	1636.96	819.69	25.17	-2.141	0.000	0.033
102.00	-3.15	-4.47	0.00	-16.35	0.00	16.35	964.69	482.34	927.47	464.42	26.07	-2.149	0.000	0.039
105.00	-2.96	-4.26	0.00	-2.94	0.00	2.94	947.47	473.74	886.56	443.94	27.42	-2.154	0.000	0.010
105.50	-0.18	-0.23	0.00	-0.81	0.00	0.81	944.56	472.28	879.78	440.54	27.65	-2.154	0.000	0.002
109.00	0.00	-0.23	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	29.23	-2.155	0.000	0.000

Wind Loading - Shaft

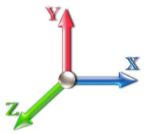
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 20

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	330.70	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	322.87	0.650	0.000	5.00	18.270	11.88	406.5	0.0	780.2
10.00		1.00	0.85	19.450	21.40	315.03	0.650	0.000	5.00	17.832	11.59	396.8	0.0	761.3
15.00		1.00	0.86	19.690	21.66	309.09	0.650	0.000	5.00	17.395	11.31	391.8	0.0	742.4
20.00		1.00	0.91	20.851	22.94	309.96	0.650	0.000	5.00	16.957	11.02	404.5	0.0	723.6
25.00		1.00	0.95	21.810	23.99	308.72	0.650	0.000	5.00	16.519	10.74	412.1	0.0	704.7
30.00		1.00	0.99	22.632	24.90	306.04	0.650	0.000	5.00	16.081	10.45	416.4	0.0	685.9
35.00		1.00	1.02	23.356	25.69	302.31	0.650	0.000	5.00	15.643	10.17	418.0	0.0	667.0
40.00		1.00	1.05	24.004	26.40	297.78	0.650	0.000	5.00	15.205	9.88	417.6	0.0	648.1
45.00		1.00	1.07	24.593	27.05	292.60	0.650	0.000	5.00	14.768	9.60	415.5	0.0	629.3
49.00	Bot - Section 2	1.00	1.09	25.029	27.53	288.07	0.650	0.000	4.00	11.499	7.47	329.2	0.0	489.8
50.00		1.00	1.10	25.133	27.65	286.89	0.650	0.000	1.00	2.884	1.87	82.9	0.0	223.1
53.25	Top - Section 1	1.00	1.11	25.462	28.01	282.94	0.650	0.000	3.25	9.251	6.01	269.5	0.0	715.7
55.00		1.00	1.12	25.633	28.20	286.17	0.650	0.000	1.75	4.905	3.19	143.8	0.0	174.4
60.00		1.00	1.14	26.099	28.71	279.69	0.650	0.000	5.00	13.718	8.92	409.6	0.0	487.7
65.00		1.00	1.16	26.535	29.19	272.87	0.650	0.000	5.00	13.281	8.63	403.1	0.0	472.0
70.00		1.00	1.18	26.946	29.64	265.76	0.650	0.000	5.00	12.843	8.35	395.9	0.0	456.3
75.00		1.00	1.19	27.335	30.07	258.39	0.650	0.000	5.00	12.405	8.06	387.9	0.0	440.5
80.00		1.00	1.21	27.704	30.47	250.78	0.650	0.000	5.00	11.967	7.78	379.3	0.0	424.8
85.00		1.00	1.23	28.056	30.86	242.96	0.650	0.000	5.00	11.529	7.49	370.0	0.0	409.1
90.00		1.00	1.24	28.391	31.23	234.95	0.650	0.000	5.00	11.091	7.21	360.2	0.0	393.4
95.00	Appurtenance(s)	1.00	1.25	28.713	31.58	226.76	0.650	0.000	5.00	10.654	6.92	349.9	0.0	377.7
99.00	Bot - Section 3	1.00	1.27	28.961	31.86	220.09	0.650	0.000	4.00	8.208	5.33	271.9	0.0	290.8
100.00		1.00	1.27	29.021	31.92	218.41	0.650	0.000	1.00	2.040	1.33	67.7	0.0	114.7
102.00	Top - Section 2	1.00	1.27	29.142	32.06	215.02	0.650	0.000	2.00	4.027	2.62	134.3	0.0	226.4
105.00		1.00	1.28	29.318	32.25	213.39	0.650	0.000	3.00	5.909	3.84	198.2	0.0	126.2
105.50	Appurtenance(s)	1.00	1.28	29.347	32.28	212.53	0.650	0.000	0.50	0.970	0.63	32.6	0.0	20.7
109.00		1.00	1.29	29.548	32.50	206.50	0.650	0.000	3.50	6.664	4.33	225.3	0.0	142.3
								Totals:	**109.00**			**8,490.6**		**12,328.4**

Discrete Appurtenance Forces

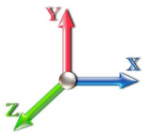
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 20

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	105.50	AIR 21 B4A/B2P	3	29.347	32.282	0.69	0.80	12.57	244.08	0.000	0.000	649.24	0.00	0.00
2	105.50	Ericsson S11B12 RRHs	3	29.347	32.282	0.56	0.80	4.75	137.70	0.000	0.000	245.57	0.00	0.00
3	105.50	Ericsson	3	29.347	32.282	0.54	0.80	0.76	29.70	0.000	0.000	39.04	0.00	0.00
4	105.50	Ericsson KRY112 144	3	29.347	32.282	0.56	0.80	0.69	29.70	0.000	0.000	35.58	0.00	0.00
5	105.50	LNX-6515DS-A1M	3	29.347	32.282	0.64	0.80	22.02	134.46	0.000	0.000	1137.48	0.00	0.00
6	105.50	Low Profile Platform	1	29.347	32.282	1.00	1.00	22.00	1350.00	0.000	0.000	1136.33	0.00	0.00
7	105.50	Air21 B2A/B4P	3	29.347	32.282	0.69	0.80	12.57	247.05	0.000	0.000	649.24	0.00	0.00
8	95.00	T-Arms	3	28.713	31.584	0.56	0.75	13.50	945.00	0.000	0.000	682.22	0.00	0.00
9	95.00	Samsung BTS	3	28.713	31.584	0.66	0.80	6.97	121.50	0.000	0.000	352.06	0.00	0.00
10	95.00	VHLP2.5-11	2	28.713	31.584	1.00	1.00	16.86	85.68	0.000	0.000	852.02	0.00	0.00
11	95.00	LLPX310R	3	28.713	31.584	0.55	0.80	7.14	74.52	0.000	0.000	360.68	0.00	0.00
							Totals:		**3,399.39**			**6,139.46**		

Total Applied Force Summary

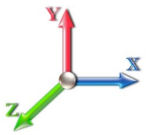
Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 20

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		406.53	819.63	0.00	0.00
10.00		396.79	800.77	0.00	0.00
15.00		391.83	781.91	0.00	0.00
20.00		404.47	763.05	0.00	0.00
25.00		412.15	744.19	0.00	0.00
30.00		416.36	725.33	0.00	0.00
35.00		417.98	706.47	0.00	0.00
40.00		417.56	687.61	0.00	0.00
45.00		415.48	668.75	0.00	0.00
49.00		329.24	521.42	0.00	0.00
50.00		82.92	231.04	0.00	0.00
53.25		269.48	741.32	0.00	0.00
55.00		143.83	188.22	0.00	0.00
60.00		409.59	527.16	0.00	0.00
65.00		403.15	511.44	0.00	0.00
70.00		395.90	495.73	0.00	0.00
75.00		387.92	480.01	0.00	0.00
80.00		379.28	464.29	0.00	0.00
85.00		370.04	448.58	0.00	0.00
90.00		360.25	432.86	0.00	0.00
95.00	(11) attachments	2596.92	1643.84	0.00	0.00
99.00		271.93	317.03	0.00	0.00
100.00		67.72	121.28	0.00	0.00
102.00		134.26	239.54	0.00	0.00
105.00		198.20	145.91	0.00	0.00
105.50	(19) attachments	3925.03	2196.68	0.00	0.00
109.00		225.27	142.34	0.00	0.00
	Totals:	**14,630.06**	**16,546.43**	**0.00**	**0.00**

Calculated Forces

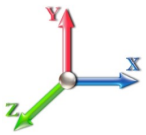
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 20

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	-16.53	-14.65	0.00	-1106.7	0.00	1106.70	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.344
5.00	-15.68	-14.27	0.00	-1033.4	0.00	1033.46	3599.77	1799.88	6249.10	3129.20	0.07	-0.124	0.000	0.335
10.00	-14.85	-13.91	0.00	-962.09	0.00	962.09	3536.97	1768.49	5988.52	2998.71	0.26	-0.249	0.000	0.325
15.00	-14.04	-13.54	0.00	-892.56	0.00	892.56	3472.90	1736.45	5731.22	2869.87	0.59	-0.374	0.000	0.315
20.00	-13.25	-13.16	0.00	-824.85	0.00	824.85	3407.57	1703.79	5477.38	2742.76	1.05	-0.499	0.000	0.305
25.00	-12.48	-12.77	0.00	-759.05	0.00	759.05	3340.97	1670.48	5227.15	2617.46	1.64	-0.624	0.000	0.294
30.00	-11.74	-12.37	0.00	-695.21	0.00	695.21	3273.10	1636.55	4980.70	2494.05	2.36	-0.747	0.000	0.282
35.00	-11.01	-11.96	0.00	-633.37	0.00	633.37	3190.51	1595.26	4718.31	2362.66	3.21	-0.870	0.000	0.272
40.00	-10.31	-11.56	0.00	-573.55	0.00	573.55	3099.00	1549.50	4450.18	2228.40	4.19	-0.992	0.000	0.261
45.00	-9.62	-11.15	0.00	-515.76	0.00	515.76	3007.49	1503.75	4189.89	2098.06	5.29	-1.112	0.000	0.249
49.00	-9.10	-10.82	0.00	-471.18	0.00	471.18	2934.29	1467.14	3987.31	1996.62	6.26	-1.206	0.000	0.239
50.00	-8.86	-10.74	0.00	-460.36	0.00	460.36	2915.98	1457.99	3937.45	1971.65	6.52	-1.231	0.000	0.237
53.25	-8.11	-10.46	0.00	-425.46	0.00	425.46	2384.18	1192.09	3226.87	1615.83	7.38	-1.307	0.000	0.267
55.00	-7.91	-10.32	0.00	-407.16	0.00	407.16	2365.01	1182.50	3165.45	1585.08	7.87	-1.347	0.000	0.260
60.00	-7.38	-9.92	0.00	-355.55	0.00	355.55	2309.37	1154.68	2992.01	1498.23	9.35	-1.472	0.000	0.241
65.00	-6.86	-9.51	0.00	-305.97	0.00	305.97	2251.87	1125.94	2821.03	1412.61	10.96	-1.591	0.000	0.220
70.00	-6.36	-9.12	0.00	-258.40	0.00	258.40	2175.62	1087.81	2632.26	1318.09	12.68	-1.703	0.000	0.199
75.00	-5.87	-8.72	0.00	-212.82	0.00	212.82	2099.36	1049.68	2450.04	1226.84	14.53	-1.807	0.000	0.176
80.00	-5.41	-8.34	0.00	-169.21	0.00	169.21	2023.10	1011.55	2274.35	1138.87	16.47	-1.901	0.000	0.151
85.00	-4.96	-7.96	0.00	-127.52	0.00	127.52	1946.84	973.42	2105.20	1054.16	18.51	-1.982	0.000	0.124
90.00	-4.53	-7.59	0.00	-87.73	0.00	87.73	1870.59	935.29	1942.58	972.73	20.62	-2.049	0.000	0.093
95.00	-2.98	-4.94	0.00	-49.79	0.00	49.79	1794.33	897.16	1786.50	894.58	22.79	-2.096	0.000	0.057
99.00	-2.68	-4.65	0.00	-30.05	0.00	30.05	1733.32	866.66	1666.34	834.41	24.56	-2.122	0.000	0.038
100.00	-2.56	-4.58	0.00	-25.40	0.00	25.40	1718.07	859.04	1636.96	819.69	25.01	-2.126	0.000	0.033
102.00	-2.32	-4.44	0.00	-16.24	0.00	16.24	964.69	482.34	927.47	464.42	25.90	-2.134	0.000	0.037
105.00	-2.18	-4.23	0.00	-2.92	0.00	2.92	947.47	473.74	886.56	443.94	27.24	-2.139	0.000	0.009
105.50	-0.13	-0.23	0.00	-0.81	0.00	0.81	944.56	472.28	879.78	440.54	27.47	-2.140	0.000	0.002
109.00	0.00	-0.23	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	29.03	-2.140	0.000	0.000

Wind Loading - Shaft

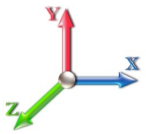
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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	5.168	5.68	0.00	1.200	1.410	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.687	5.00	19.676	23.61	134.2	468.5	1508.7
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.792	5.00	19.326	23.19	131.8	487.3	1502.4
15.00		1.00	0.86	5.232	5.76	0.00	1.200	1.860	5.00	18.945	22.73	130.8	494.6	1484.6
20.00		1.00	0.91	5.540	6.09	0.00	1.200	1.912	5.00	18.550	22.26	135.7	496.5	1461.2
25.00		1.00	0.95	5.795	6.37	0.00	1.200	1.953	5.00	18.146	21.78	138.8	495.0	1434.7
30.00		1.00	0.99	6.013	6.61	0.00	1.200	1.988	5.00	17.737	21.28	140.8	491.3	1405.8
35.00		1.00	1.02	6.206	6.83	0.00	1.200	2.017	5.00	17.324	20.79	141.9	486.0	1375.4
40.00		1.00	1.05	6.378	7.02	0.00	1.200	2.044	5.00	16.909	20.29	142.4	479.5	1343.7
45.00		1.00	1.07	6.534	7.19	0.00	1.200	2.068	5.00	16.490	19.79	142.2	471.9	1311.0
49.00	Bot - Section 2	1.00	1.09	6.650	7.32	0.00	1.200	2.085	4.00	12.889	15.47	113.1	372.2	1025.3
50.00		1.00	1.10	6.678	7.35	0.00	1.200	2.089	1.00	3.232	3.88	28.5	94.3	391.9
53.25	Top - Section 1	1.00	1.11	6.765	7.44	0.00	1.200	2.102	3.25	10.390	12.47	92.8	302.9	1257.1
55.00		1.00	1.12	6.811	7.49	0.00	1.200	2.109	1.75	5.520	6.62	49.6	162.0	394.5
60.00		1.00	1.14	6.934	7.63	0.00	1.200	2.127	5.00	15.491	18.59	141.8	453.1	1103.4
65.00		1.00	1.16	7.050	7.76	0.00	1.200	2.144	5.00	15.067	18.08	140.2	443.1	1072.4
70.00		1.00	1.18	7.160	7.88	0.00	1.200	2.159	5.00	14.642	17.57	138.4	432.5	1040.9
75.00		1.00	1.19	7.263	7.99	0.00	1.200	2.174	5.00	14.217	17.06	136.3	421.6	1009.0
80.00		1.00	1.21	7.361	8.10	0.00	1.200	2.188	5.00	13.790	16.55	134.0	410.3	976.7
85.00		1.00	1.23	7.454	8.20	0.00	1.200	2.201	5.00	13.363	16.04	131.5	398.6	944.1
90.00		1.00	1.24	7.544	8.30	0.00	1.200	2.214	5.00	12.936	15.52	128.8	386.7	911.2
95.00	Appurtenance(s)	1.00	1.25	7.629	8.39	0.00	1.200	2.225	5.00	12.508	15.01	126.0	374.5	878.1
99.00	Bot - Section 3	1.00	1.27	7.695	8.46	0.00	1.200	2.234	4.00	9.697	11.64	98.5	291.7	679.4
100.00		1.00	1.27	7.711	8.48	0.00	1.200	2.237	1.00	2.413	2.90	24.6	73.5	226.4
102.00	Top - Section 2	1.00	1.27	7.743	8.52	0.00	1.200	2.241	2.00	4.774	5.73	48.8	144.9	446.8
105.00		1.00	1.28	7.790	8.57	0.00	1.200	2.248	3.00	7.033	8.44	72.3	212.8	381.1
105.50	Appurtenance(s)	1.00	1.28	7.798	8.58	0.00	1.200	2.249	0.50	1.157	1.39	11.9	35.3	63.0
109.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	3.50	7.980	9.58	82.7	241.1	430.9
								Totals:	**109.00**			**2,938.4**		**26,059.4**

Discrete Appurtenance Forces

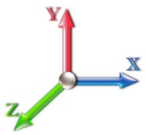
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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	105.50	AIR 21 B4A/B2P	3	7.798	8.577	0.69	0.80	15.54	1015.21	0.000	0.000	133.33	0.00	0.00
2	105.50	Ericsson S11B12 RRHs	3	7.798	8.577	0.56	0.80	6.21	404.34	0.000	0.000	53.25	0.00	0.00
3	105.50	Ericsson	3	7.798	8.577	0.54	0.80	1.81	76.53	0.000	0.000	15.50	0.00	0.00
4	105.50	Ericsson KRY112 144	3	7.798	8.577	0.56	0.80	1.72	71.97	0.000	0.000	14.73	0.00	0.00
5	105.50	LNX-6515DS-A1M	3	7.798	8.577	0.64	0.80	30.10	869.17	0.000	0.000	258.21	0.00	0.00
6	105.50	Low Profile Platform	1	7.798	8.577	1.00	1.00	44.76	3186.46	0.000	0.000	383.89	0.00	0.00
7	105.50	Air21 B2A/B4P	3	7.798	8.577	0.69	0.80	15.54	1019.17	0.000	0.000	133.33	0.00	0.00
8	95.00	T-Arms	3	7.629	8.392	0.56	0.75	28.52	1984.66	0.000	0.000	239.35	0.00	0.00
9	95.00	Samsung BTS	3	7.629	8.392	0.66	0.80	10.46	421.92	0.000	0.000	87.77	0.00	0.00
10	95.00	VHLP2.5-11	2	7.629	8.392	1.00	1.00	21.21	455.85	0.000	0.000	178.01	0.00	0.00
11	95.00	LLPX310R	3	7.629	8.392	0.55	0.80	10.64	368.96	0.000	0.000	89.33	0.00	0.00
							Totals:		**9,874.24**			**1,586.69**		

Total Applied Force Summary

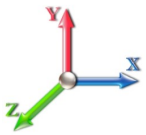
Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 17

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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		134.22	1561.32	0.00	0.00
10.00		131.84	1555.00	0.00	0.00
15.00		130.83	1537.17	0.00	0.00
20.00		135.65	1513.87	0.00	0.00
25.00		138.81	1487.27	0.00	0.00
30.00		140.80	1458.44	0.00	0.00
35.00		141.92	1427.99	0.00	0.00
40.00		142.35	1396.28	0.00	0.00
45.00		142.24	1363.58	0.00	0.00
49.00		113.14	1067.44	0.00	0.00
50.00		28.49	402.39	0.00	0.00
53.25		92.78	1291.29	0.00	0.00
55.00		49.62	412.91	0.00	0.00
60.00		141.79	1156.03	0.00	0.00
65.00		140.22	1124.98	0.00	0.00
70.00		138.38	1093.48	0.00	0.00
75.00		136.30	1061.57	0.00	0.00
80.00		133.99	1029.31	0.00	0.00
85.00		131.49	996.72	0.00	0.00
90.00		128.81	963.84	0.00	0.00
95.00	(11) attachments	720.42	4162.08	0.00	0.00
99.00		98.50	714.36	0.00	0.00
100.00		24.56	235.17	0.00	0.00
102.00		48.80	464.30	0.00	0.00
105.00		72.32	407.34	0.00	0.00
105.50	(19) attachments	1004.14	6710.18	0.00	0.00
109.00		82.70	430.86	0.00	0.00
	Totals:	**4,525.12**	**37,025.19**	**0.00**	**0.00**

Calculated Forces

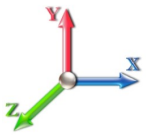
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

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	-37.02	-4.54	0.00	-337.63	0.00	337.63	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.114
5.00	-35.46	-4.43	0.00	-314.95	0.00	314.95	3599.77	1799.88	6249.10	3129.20	0.02	-0.038	0.000	0.111
10.00	-33.90	-4.32	0.00	-292.82	0.00	292.82	3536.97	1768.49	5988.52	2998.71	0.08	-0.076	0.000	0.107
15.00	-32.36	-4.20	0.00	-271.24	0.00	271.24	3472.90	1736.45	5731.22	2869.87	0.18	-0.114	0.000	0.104
20.00	-30.85	-4.08	0.00	-250.22	0.00	250.22	3407.57	1703.79	5477.38	2742.76	0.32	-0.152	0.000	0.100
25.00	-29.36	-3.96	0.00	-229.80	0.00	229.80	3340.97	1670.48	5227.15	2617.46	0.50	-0.190	0.000	0.097
30.00	-27.90	-3.83	0.00	-210.00	0.00	210.00	3273.10	1636.55	4980.70	2494.05	0.72	-0.227	0.000	0.093
35.00	-26.47	-3.70	0.00	-190.84	0.00	190.84	3190.51	1595.26	4718.31	2362.66	0.98	-0.264	0.000	0.089
40.00	-25.07	-3.57	0.00	-172.33	0.00	172.33	3099.00	1549.50	4450.18	2228.40	1.27	-0.301	0.000	0.085
45.00	-23.70	-3.43	0.00	-154.49	0.00	154.49	3007.49	1503.75	4189.89	2098.06	1.61	-0.337	0.000	0.082
49.00	-22.64	-3.32	0.00	-140.77	0.00	140.77	2934.29	1467.14	3987.31	1996.62	1.90	-0.365	0.000	0.078
50.00	-22.23	-3.29	0.00	-137.45	0.00	137.45	2915.98	1457.99	3937.45	1971.65	1.98	-0.372	0.000	0.077
53.25	-20.94	-3.20	0.00	-126.74	0.00	126.74	2384.18	1192.09	3226.87	1615.83	2.24	-0.395	0.000	0.087
55.00	-20.53	-3.15	0.00	-121.15	0.00	121.15	2365.01	1182.50	3165.45	1585.08	2.39	-0.407	0.000	0.085
60.00	-19.37	-3.02	0.00	-105.37	0.00	105.37	2309.37	1154.68	2992.01	1498.23	2.83	-0.444	0.000	0.079
65.00	-18.24	-2.88	0.00	-90.29	0.00	90.29	2251.87	1125.94	2821.03	1412.61	3.32	-0.479	0.000	0.072
70.00	-17.15	-2.74	0.00	-75.90	0.00	75.90	2175.62	1087.81	2632.26	1318.09	3.84	-0.512	0.000	0.065
75.00	-16.09	-2.60	0.00	-62.20	0.00	62.20	2099.36	1049.68	2450.04	1226.84	4.39	-0.543	0.000	0.058
80.00	-15.06	-2.46	0.00	-49.19	0.00	49.19	2023.10	1011.55	2274.35	1138.87	4.98	-0.570	0.000	0.051
85.00	-14.06	-2.33	0.00	-36.86	0.00	36.86	1946.84	973.42	2105.20	1054.16	5.59	-0.594	0.000	0.042
90.00	-13.10	-2.19	0.00	-25.22	0.00	25.22	1870.59	935.29	1942.58	972.73	6.22	-0.613	0.000	0.033
95.00	-8.95	-1.43	0.00	-14.25	0.00	14.25	1794.33	897.16	1786.50	894.58	6.87	-0.627	0.000	0.021
99.00	-8.23	-1.32	0.00	-8.54	0.00	8.54	1733.32	866.66	1666.34	834.41	7.40	-0.634	0.000	0.015
100.00	-8.00	-1.30	0.00	-7.21	0.00	7.21	1718.07	859.04	1636.96	819.69	7.53	-0.635	0.000	0.013
102.00	-7.53	-1.24	0.00	-4.62	0.00	4.62	964.69	482.34	927.47	464.42	7.80	-0.637	0.000	0.018
105.00	-7.13	-1.17	0.00	-0.89	0.00	0.89	947.47	473.74	886.56	443.94	8.20	-0.639	0.000	0.010
105.50	-0.43	-0.09	0.00	-0.31	0.00	0.31	944.56	472.28	879.78	440.54	8.26	-0.639	0.000	0.001
109.00	0.00	-0.08	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	8.73	-0.639	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 19

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.59		**SA**	0.06	**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	0.01	0.01	0.00	
5.00		866.86	0.01	0.05	0.03	14.53	
10.00		845.90	0.02	0.06	0.04	18.92	
15.00		824.94	0.04	0.07	0.04	20.63	
20.00		803.99	0.07	0.07	0.04	21.37	
25.00		783.03	0.11	0.07	0.04	21.86	
30.00		762.08	0.15	0.07	0.03	22.21	
35.00		741.12	0.20	0.06	0.02	22.17	
40.00		720.16	0.26	0.05	0.02	21.26	
45.00		699.21	0.33	0.04	0.01	18.95	
49.00	Bot - Section 2	544.28	0.39	0.02	0.01	12.64	
50.00		247.94	0.41	0.02	0.01	5.45	
53.25	Top - Section 1	795.19	0.46	0.00	0.01	13.59	
55.00		193.79	0.49	-0.01	0.01	2.72	
60.00		541.88	0.58	-0.05	0.01	2.36	
65.00		524.42	0.68	-0.08	0.03	-2.51	
70.00		506.96	0.79	-0.11	0.05	-5.23	
75.00		489.49	0.90	-0.12	0.09	-4.64	
80.00		472.03	1.02	-0.10	0.14	-0.17	
85.00		454.57	1.16	-0.03	0.22	8.22	
90.00		437.10	1.29	0.11	0.33	20.24	
95.00	Appurtenance(s)	1782.6	1.44	0.36	0.47	150.70	
99.00	Bot - Section 3	323.14	1.56	0.67	0.62	39.57	
100.00		127.47	1.59	0.76	0.66	16.95	
102.00	Top - Section 2	251.60	1.66	0.97	0.75	39.06	
105.00		140.28	1.76	1.34	0.90	26.90	
105.50	Appurtenance(s)	2437.1	1.77	1.41	0.93	483.14	
109.00		158.16	1.89	1.98	1.14	38.98	
	Totals:	**17,475.3**				**1,029.9**	**Total Wind:** **14,630.1**

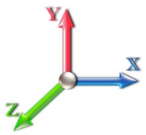
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	19
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.59	**SA**	0.06			**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	-22.06	-1.04	0.00	-93.03	0.00	93.03	3661.29	1830.65	6512.81	3261.25		0.00	0.00	0.035
5.00	-20.97	-1.03	0.00	-87.81	0.00	87.81	3599.77	1799.88	6249.10	3129.20		0.01	-0.01	0.034
10.00	-19.90	-1.02	0.00	-82.64	0.00	82.64	3536.97	1768.49	5988.52	2998.71		0.02	-0.02	0.033
15.00	-18.86	-1.00	0.00	-77.55	0.00	77.55	3472.90	1736.45	5731.22	2869.87		0.05	-0.03	0.032
20.00	-17.84	-0.98	0.00	-72.55	0.00	72.55	3407.57	1703.79	5477.38	2742.76		0.09	-0.04	0.032
25.00	-16.85	-0.96	0.00	-67.64	0.00	67.64	3340.97	1670.48	5227.15	2617.46		0.14	-0.05	0.031
30.00	-15.88	-0.94	0.00	-62.83	0.00	62.83	3273.10	1636.55	4980.70	2494.05		0.20	-0.07	0.030
35.00	-14.94	-0.92	0.00	-58.12	0.00	58.12	3190.51	1595.26	4718.31	2362.66		0.28	-0.08	0.029
40.00	-14.02	-0.90	0.00	-53.51	0.00	53.51	3099.00	1549.50	4450.18	2228.40		0.36	-0.09	0.029
45.00	-13.13	-0.88	0.00	-49.00	0.00	49.00	3007.49	1503.75	4189.89	2098.06		0.46	-0.10	0.028
49.00	-12.43	-0.87	0.00	-45.47	0.00	45.47	2934.29	1467.14	3987.31	1996.62		0.55	-0.11	0.027
50.00	-12.13	-0.87	0.00	-44.60	0.00	44.60	2915.98	1457.99	3937.45	1971.65		0.57	-0.11	0.027
53.25	-11.14	-0.85	0.00	-41.78	0.00	41.78	2384.18	1192.09	3226.87	1615.83		0.65	-0.12	0.031
55.00	-10.89	-0.85	0.00	-40.29	0.00	40.29	2365.01	1182.50	3165.45	1585.08		0.69	-0.12	0.030
60.00	-10.18	-0.85	0.00	-36.04	0.00	36.04	2309.37	1154.68	2992.01	1498.23		0.83	-0.13	0.028
65.00	-9.50	-0.85	0.00	-31.80	0.00	31.80	2251.87	1125.94	2821.03	1412.61		0.97	-0.15	0.027
70.00	-8.84	-0.85	0.00	-27.55	0.00	27.55	2175.62	1087.81	2632.26	1318.09		1.13	-0.16	0.025
75.00	-8.20	-0.85	0.00	-23.31	0.00	23.31	2099.36	1049.68	2450.04	1226.84		1.30	-0.17	0.023
80.00	-7.58	-0.85	0.00	-19.07	0.00	19.07	2023.10	1011.55	2274.35	1138.87		1.49	-0.18	0.020
85.00	-6.98	-0.84	0.00	-14.83	0.00	14.83	1946.84	973.42	2105.20	1054.16		1.68	-0.19	0.018
90.00	-6.41	-0.82	0.00	-10.63	0.00	10.63	1870.59	935.29	1942.58	972.73		1.88	-0.20	0.014
95.00	-4.21	-0.66	0.00	-6.55	0.00	6.55	1794.33	897.16	1786.50	894.58		2.09	-0.20	0.010
99.00	-3.79	-0.62	0.00	-3.91	0.00	3.91	1733.32	866.66	1666.34	834.41		2.26	-0.21	0.007
100.00	-3.63	-0.60	0.00	-3.29	0.00	3.29	1718.07	859.04	1636.96	819.69		2.31	-0.21	0.006
102.00	-3.31	-0.56	0.00	-2.09	0.00	2.09	964.69	482.34	927.47	464.42		2.39	-0.21	0.008
105.00	-3.12	-0.53	0.00	-0.41	0.00	0.41	947.47	473.74	886.56	443.94		2.52	-0.21	0.004
105.50	-0.19	-0.04	0.00	-0.14	0.00	0.14	944.56	472.28	879.78	440.54		2.55	-0.21	0.001
109.00	0.00	-0.04	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99		2.70	-0.21	0.000

Seismic Segment Forces (Factored)

Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.59		**SA**	0.06	**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	0.01	0.01	0.00	
5.00		866.86	0.01	0.05	0.03	14.53	
10.00		845.90	0.02	0.06	0.04	18.92	
15.00		824.94	0.04	0.07	0.04	20.63	
20.00		803.99	0.07	0.07	0.04	21.37	
25.00		783.03	0.11	0.07	0.04	21.86	
30.00		762.08	0.15	0.07	0.03	22.21	
35.00		741.12	0.20	0.06	0.02	22.17	
40.00		720.16	0.26	0.05	0.02	21.26	
45.00		699.21	0.33	0.04	0.01	18.95	
49.00	Bot - Section 2	544.28	0.39	0.02	0.01	12.64	
50.00		247.94	0.41	0.02	0.01	5.45	
53.25	Top - Section 1	795.19	0.46	0.00	0.01	13.59	
55.00		193.79	0.49	-0.01	0.01	2.72	
60.00		541.88	0.58	-0.05	0.01	2.36	
65.00		524.42	0.68	-0.08	0.03	-2.51	
70.00		506.96	0.79	-0.11	0.05	-5.23	
75.00		489.49	0.90	-0.12	0.09	-4.64	
80.00		472.03	1.02	-0.10	0.14	-0.17	
85.00		454.57	1.16	-0.03	0.22	8.22	
90.00		437.10	1.29	0.11	0.33	20.24	
95.00	Appurtenance(s)	1782.6	1.44	0.36	0.47	150.70	
99.00	Bot - Section 3	323.14	1.56	0.67	0.62	39.57	
100.00		127.47	1.59	0.76	0.66	16.95	
102.00	Top - Section 2	251.60	1.66	0.97	0.75	39.06	
105.00		140.28	1.76	1.34	0.90	26.90	
105.50	Appurtenance(s)	2437.1	1.77	1.41	0.93	483.14	
109.00		158.16	1.89	1.98	1.14	38.98	
	Totals:	**17,475.3**				**1,029.9**	**Total Wind:** **14,630.1**

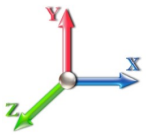
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	19		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18		
Wind Load Factor	0.00	**Structure Frequency**	0.59	**SA**	0.06	**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	-16.55	-1.04	0.00	-92.52	0.00	92.52	3661.29	1830.65	6512.81	3261.25		0.00	0.00	0.033
5.00	-15.73	-1.03	0.00	-87.31	0.00	87.31	3599.77	1799.88	6249.10	3129.20		0.01	-0.01	0.032
10.00	-14.93	-1.02	0.00	-82.15	0.00	82.15	3536.97	1768.49	5988.52	2998.71		0.02	-0.02	0.032
15.00	-14.14	-1.00	0.00	-77.07	0.00	77.07	3472.90	1736.45	5731.22	2869.87		0.05	-0.03	0.031
20.00	-13.38	-0.98	0.00	-72.08	0.00	72.08	3407.57	1703.79	5477.38	2742.76		0.09	-0.04	0.030
25.00	-12.64	-0.96	0.00	-67.19	0.00	67.19	3340.97	1670.48	5227.15	2617.46		0.14	-0.05	0.029
30.00	-11.91	-0.94	0.00	-62.40	0.00	62.40	3273.10	1636.55	4980.70	2494.05		0.20	-0.06	0.029
35.00	-11.20	-0.92	0.00	-57.72	0.00	57.72	3190.51	1595.26	4718.31	2362.66		0.28	-0.08	0.028
40.00	-10.52	-0.90	0.00	-53.14	0.00	53.14	3099.00	1549.50	4450.18	2228.40		0.36	-0.09	0.027
45.00	-9.85	-0.88	0.00	-48.66	0.00	48.66	3007.49	1503.75	4189.89	2098.06		0.46	-0.10	0.026
49.00	-9.33	-0.87	0.00	-45.15	0.00	45.15	2934.29	1467.14	3987.31	1996.62		0.54	-0.11	0.026
50.00	-9.09	-0.86	0.00	-44.28	0.00	44.28	2915.98	1457.99	3937.45	1971.65		0.57	-0.11	0.026
53.25	-8.35	-0.85	0.00	-41.49	0.00	41.49	2384.18	1192.09	3226.87	1615.83		0.64	-0.12	0.029
55.00	-8.16	-0.84	0.00	-40.01	0.00	40.01	2365.01	1182.50	3165.45	1585.08		0.69	-0.12	0.029
60.00	-7.64	-0.84	0.00	-35.79	0.00	35.79	2309.37	1154.68	2992.01	1498.23		0.82	-0.13	0.027
65.00	-7.13	-0.84	0.00	-31.58	0.00	31.58	2251.87	1125.94	2821.03	1412.61		0.97	-0.15	0.026
70.00	-6.63	-0.84	0.00	-27.36	0.00	27.36	2175.62	1087.81	2632.26	1318.09		1.12	-0.16	0.024
75.00	-6.15	-0.84	0.00	-23.15	0.00	23.15	2099.36	1049.68	2450.04	1226.84		1.30	-0.17	0.022
80.00	-5.69	-0.84	0.00	-18.94	0.00	18.94	2023.10	1011.55	2274.35	1138.87		1.48	-0.18	0.019
85.00	-5.24	-0.83	0.00	-14.73	0.00	14.73	1946.84	973.42	2105.20	1054.16		1.67	-0.19	0.017
90.00	-4.80	-0.81	0.00	-10.57	0.00	10.57	1870.59	935.29	1942.58	972.73		1.87	-0.20	0.013
95.00	-3.16	-0.66	0.00	-6.51	0.00	6.51	1794.33	897.16	1786.50	894.58		2.08	-0.20	0.009
99.00	-2.84	-0.62	0.00	-3.89	0.00	3.89	1733.32	866.66	1666.34	834.41		2.25	-0.20	0.006
100.00	-2.72	-0.60	0.00	-3.27	0.00	3.27	1718.07	859.04	1636.96	819.69		2.29	-0.21	0.006
102.00	-2.48	-0.56	0.00	-2.08	0.00	2.08	964.69	482.34	927.47	464.42		2.38	-0.21	0.007
105.00	-2.34	-0.53	0.00	-0.40	0.00	0.40	947.47	473.74	886.56	443.94		2.51	-0.21	0.003
105.50	-0.14	-0.04	0.00	-0.14	0.00	0.14	944.56	472.28	879.78	440.54		2.53	-0.21	0.000
109.00	0.00	-0.04	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99		2.68	-0.21	0.000

Wind Loading - Shaft

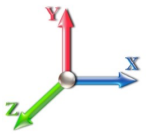
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 19

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	204.55	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	199.71	0.650	0.000	5.00	18.270	11.88	97.2	0.0	866.9
10.00		1.00	0.85	7.442	8.19	194.87	0.650	0.000	5.00	17.832	11.59	94.9	0.0	845.9
15.00		1.00	0.86	7.534	8.29	191.19	0.650	0.000	5.00	17.395	11.31	93.7	0.0	824.9
20.00		1.00	0.91	7.978	8.78	191.73	0.650	0.000	5.00	16.957	11.02	96.7	0.0	804.0
25.00		1.00	0.95	8.345	9.18	190.96	0.650	0.000	5.00	16.519	10.74	98.6	0.0	783.0
30.00		1.00	0.99	8.659	9.53	189.30	0.650	0.000	5.00	16.081	10.45	99.6	0.0	762.1
35.00		1.00	1.02	8.936	9.83	187.00	0.650	0.000	5.00	15.643	10.17	100.0	0.0	741.1
40.00		1.00	1.05	9.184	10.10	184.19	0.650	0.000	5.00	15.205	9.88	99.9	0.0	720.2
45.00		1.00	1.07	9.410	10.35	180.99	0.650	0.000	5.00	14.768	9.60	99.4	0.0	699.2
49.00	Bot - Section 2	1.00	1.09	9.576	10.53	178.19	0.650	0.000	4.00	11.499	7.47	78.7	0.0	544.3
50.00		1.00	1.10	9.616	10.58	177.46	0.650	0.000	1.00	2.884	1.87	19.8	0.0	247.9
53.25	Top - Section 1	1.00	1.11	9.742	10.72	175.02	0.650	0.000	3.25	9.251	6.01	64.4	0.0	795.2
55.00		1.00	1.12	9.807	10.79	177.01	0.650	0.000	1.75	4.905	3.19	34.4	0.0	193.8
60.00		1.00	1.14	9.986	10.98	173.00	0.650	0.000	5.00	13.718	8.92	97.9	0.0	541.9
65.00		1.00	1.16	10.153	11.17	168.79	0.650	0.000	5.00	13.281	8.63	96.4	0.0	524.4
70.00		1.00	1.18	10.310	11.34	164.39	0.650	0.000	5.00	12.843	8.35	94.7	0.0	507.0
75.00		1.00	1.19	10.459	11.50	159.83	0.650	0.000	5.00	12.405	8.06	92.8	0.0	489.5
80.00		1.00	1.21	10.600	11.66	155.12	0.650	0.000	5.00	11.967	7.78	90.7	0.0	472.0
85.00		1.00	1.23	10.734	11.81	150.28	0.650	0.000	5.00	11.529	7.49	88.5	0.0	454.6
90.00		1.00	1.24	10.863	11.95	145.33	0.650	0.000	5.00	11.091	7.21	86.1	0.0	437.1
95.00	Appurtenance(s)	1.00	1.25	10.986	12.08	140.26	0.650	0.000	5.00	10.654	6.92	83.7	0.0	419.6
99.00	Bot - Section 3	1.00	1.27	11.081	12.19	136.14	0.650	0.000	4.00	8.208	5.33	65.0	0.0	323.1
100.00		1.00	1.27	11.104	12.21	135.10	0.650	0.000	1.00	2.040	1.33	16.2	0.0	127.5
102.00	Top - Section 2	1.00	1.27	11.150	12.26	133.00	0.650	0.000	2.00	4.027	2.62	32.1	0.0	251.6
105.00		1.00	1.28	11.218	12.34	131.99	0.650	0.000	3.00	5.909	3.84	47.4	0.0	140.3
105.50	Appurtenance(s)	1.00	1.28	11.229	12.35	131.46	0.650	0.000	0.50	0.970	0.63	7.8	0.0	23.0
109.00		1.00	1.29	11.305	12.44	127.73	0.650	0.000	3.50	6.664	4.33	53.9	0.0	158.2
								Totals:	**109.00**			**2,030.4**		**13,698.2**

Discrete Appurtenance Forces

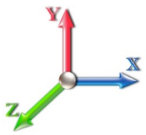
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 19

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	105.50	AIR 21 B4A/B2P	3	11.229	12.351	0.69	0.80	12.57	271.20	0.000	0.000	155.26	0.00	0.00
2	105.50	Ericsson S11B12 RRHs	3	11.229	12.351	0.56	0.80	4.75	153.00	0.000	0.000	58.72	0.00	0.00
3	105.50	Ericsson	3	11.229	12.351	0.54	0.80	0.76	33.00	0.000	0.000	9.33	0.00	0.00
4	105.50	Ericsson KRY112 144	3	11.229	12.351	0.56	0.80	0.69	33.00	0.000	0.000	8.51	0.00	0.00
5	105.50	LNX-6515DS-A1M	3	11.229	12.351	0.64	0.80	22.02	149.40	0.000	0.000	272.01	0.00	0.00
6	105.50	Low Profile Platform	1	11.229	12.351	1.00	1.00	22.00	1500.00	0.000	0.000	271.73	0.00	0.00
7	105.50	Air21 B2A/B4P	3	11.229	12.351	0.69	0.80	12.57	274.50	0.000	0.000	155.26	0.00	0.00
8	95.00	T-Arms	3	10.986	12.085	0.56	0.75	13.50	1050.00	0.000	0.000	163.14	0.00	0.00
9	95.00	Samsung BTS	3	10.986	12.085	0.66	0.80	6.97	135.00	0.000	0.000	84.19	0.00	0.00
10	95.00	VHLP2.5-11	2	10.986	12.085	1.00	1.00	16.86	95.20	0.000	0.000	203.74	0.00	0.00
11	95.00	LLPX310R	3	10.986	12.085	0.55	0.80	7.14	82.80	0.000	0.000	86.25	0.00	0.00
							Totals:		**3,777.10**			**1,468.15**		

Total Applied Force Summary

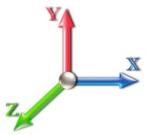
Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 25

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 19

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		97.22	910.71	0.00	0.00
10.00		94.89	889.75	0.00	0.00
15.00		93.70	868.79	0.00	0.00
20.00		96.72	847.84	0.00	0.00
25.00		98.56	826.88	0.00	0.00
30.00		99.57	805.93	0.00	0.00
35.00		99.95	784.97	0.00	0.00
40.00		99.85	764.01	0.00	0.00
45.00		99.35	743.06	0.00	0.00
49.00		78.73	579.36	0.00	0.00
50.00		19.83	256.71	0.00	0.00
53.25		64.44	823.69	0.00	0.00
55.00		34.39	209.13	0.00	0.00
60.00		97.95	585.73	0.00	0.00
65.00		96.41	568.27	0.00	0.00
70.00		94.67	550.81	0.00	0.00
75.00		92.76	533.34	0.00	0.00
80.00		90.70	515.88	0.00	0.00
85.00		88.49	498.42	0.00	0.00
90.00		86.15	480.95	0.00	0.00
95.00	(11) attachments	621.01	1826.49	0.00	0.00
99.00		65.03	352.26	0.00	0.00
100.00		16.20	134.75	0.00	0.00
102.00		32.11	266.16	0.00	0.00
105.00		47.40	162.12	0.00	0.00
105.50	(19) attachments	938.60	2440.75	0.00	0.00
109.00		53.87	158.16	0.00	0.00
	Totals:	**3,498.53**	**18,384.92**	**0.00**	**0.00**

Calculated Forces

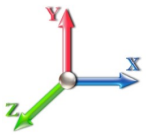
Structure:	CT13529-A-SBA	**Code:**	EIA/TIA-222-G	3/15/2017	
Site Name:	Manchester 1	**Exposure:**	C		
Height:	109.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 19

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	-18.38	-3.50	0.00	-265.09	0.00	265.09	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.086
5.00	-17.47	-3.41	0.00	-247.58	0.00	247.58	3599.77	1799.88	6249.10	3129.20	0.02	-0.030	0.000	0.084
10.00	-16.58	-3.33	0.00	-230.51	0.00	230.51	3536.97	1768.49	5988.52	2998.71	0.06	-0.060	0.000	0.082
15.00	-15.71	-3.24	0.00	-213.87	0.00	213.87	3472.90	1736.45	5731.22	2869.87	0.14	-0.090	0.000	0.079
20.00	-14.86	-3.15	0.00	-197.67	0.00	197.67	3407.57	1703.79	5477.38	2742.76	0.25	-0.120	0.000	0.076
25.00	-14.03	-3.06	0.00	-181.92	0.00	181.92	3340.97	1670.48	5227.15	2617.46	0.39	-0.149	0.000	0.074
30.00	-13.23	-2.96	0.00	-166.63	0.00	166.63	3273.10	1636.55	4980.70	2494.05	0.57	-0.179	0.000	0.071
35.00	-12.44	-2.87	0.00	-151.82	0.00	151.82	3190.51	1595.26	4718.31	2362.66	0.77	-0.209	0.000	0.068
40.00	-11.67	-2.77	0.00	-137.50	0.00	137.50	3099.00	1549.50	4450.18	2228.40	1.00	-0.238	0.000	0.065
45.00	-10.93	-2.67	0.00	-123.65	0.00	123.65	3007.49	1503.75	4189.89	2098.06	1.27	-0.266	0.000	0.063
49.00	-10.35	-2.59	0.00	-112.97	0.00	112.97	2934.29	1467.14	3987.31	1996.62	1.50	-0.289	0.000	0.060
50.00	-10.09	-2.57	0.00	-110.38	0.00	110.38	2915.98	1457.99	3937.45	1971.65	1.56	-0.295	0.000	0.059
53.25	-9.27	-2.51	0.00	-102.02	0.00	102.02	2384.18	1192.09	3226.87	1615.83	1.77	-0.313	0.000	0.067
55.00	-9.06	-2.47	0.00	-97.63	0.00	97.63	2365.01	1182.50	3165.45	1585.08	1.89	-0.323	0.000	0.065
60.00	-8.47	-2.38	0.00	-85.26	0.00	85.26	2309.37	1154.68	2992.01	1498.23	2.24	-0.353	0.000	0.061
65.00	-7.90	-2.28	0.00	-73.38	0.00	73.38	2251.87	1125.94	2821.03	1412.61	2.63	-0.381	0.000	0.055
70.00	-7.35	-2.19	0.00	-61.97	0.00	61.97	2175.62	1087.81	2632.26	1318.09	3.04	-0.408	0.000	0.050
75.00	-6.82	-2.09	0.00	-51.04	0.00	51.04	2099.36	1049.68	2450.04	1226.84	3.48	-0.433	0.000	0.045
80.00	-6.30	-2.00	0.00	-40.58	0.00	40.58	2023.10	1011.55	2274.35	1138.87	3.95	-0.456	0.000	0.039
85.00	-5.81	-1.91	0.00	-30.59	0.00	30.59	1946.84	973.42	2105.20	1054.16	4.44	-0.475	0.000	0.032
90.00	-5.33	-1.82	0.00	-21.04	0.00	21.04	1870.59	935.29	1942.58	972.73	4.94	-0.491	0.000	0.024
95.00	-3.50	-1.18	0.00	-11.94	0.00	11.94	1794.33	897.16	1786.50	894.58	5.46	-0.503	0.000	0.015
99.00	-3.15	-1.12	0.00	-7.21	0.00	7.21	1733.32	866.66	1666.34	834.41	5.89	-0.509	0.000	0.010
100.00	-3.02	-1.10	0.00	-6.09	0.00	6.09	1718.07	859.04	1636.96	819.69	5.99	-0.510	0.000	0.009
102.00	-2.75	-1.06	0.00	-3.89	0.00	3.89	964.69	482.34	927.47	464.42	6.21	-0.512	0.000	0.011
105.00	-2.59	-1.02	0.00	-0.70	0.00	0.70	947.47	473.74	886.56	443.94	6.53	-0.513	0.000	0.004
105.50	-0.16	-0.06	0.00	-0.19	0.00	0.19	944.56	472.28	879.78	440.54	6.58	-0.513	0.000	0.001
109.00	0.00	-0.05	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	6.96	-0.513	0.000	0.000

Final Analysis Summary

Structure:	CT13529-A-SBA		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 27

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 97 mph Wind	14.7	0.00	22.05	0.00	0.00	1112.29
0.9D + 1.6W 97 mph Wind	14.6	0.00	16.53	0.00	0.00	1106.70
1.2D + 1.0Di + 1.0Wi 50 mph Wind	4.5	0.00	37.02	0.00	0.00	337.63
1.2D + 1.0E	1.0	0.00	22.06	0.00	0.00	93.03
0.9D + 1.0E	1.0	0.00	16.55	0.00	0.00	92.52
1.0D + 1.0W 60 mph Wind	3.5	0.00	18.38	0.00	0.00	265.09

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	-22.05	-14.65	0.00	-1112.2	0.00	-1112.2	3661.29	1830.6	6512.81	3261.25	0.00	0.347
0.9D + 1.6W 97 mph Wind	-16.53	-14.65	0.00	-1106.7	0.00	-1106.7	3661.29	1830.6	6512.81	3261.25	0.00	0.344
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-37.02	-4.54	0.00	-337.63	0.00	-337.63	3661.29	1830.6	6512.81	3261.25	0.00	0.114
1.2D + 1.0E	-22.06	-1.04	0.00	-93.03	0.00	-93.03	3661.29	1830.6	6512.81	3261.25	0.00	0.035
0.9D + 1.0E	-16.55	-1.04	0.00	-92.52	0.00	-92.52	3661.29	1830.6	6512.81	3261.25	0.00	0.033
1.0D + 1.0W 60 mph Wind	-18.38	-3.50	0.00	-265.09	0.00	-265.09	3661.29	1830.6	6512.81	3261.25	0.00	0.086

Base Plate Summary

Structure:	CT13529-A-SB		**Code:**	EIA/TIA-222-G	3/15/2017
Site Name:	Manchester 1		**Exposure:**	C	
Height:	109.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 28

Tower Engineering Solutions

Reactions	
Original Design	
Moment (kip-ft):	2581.67
Axial (kip):	41.24
Shear (kip):	27.34
Analysis	
Moment (kip-ft):	1112.29
Axial (kip):	37.02
Shear (kip):	14.65
Moment Design %:	43.08

Base Plate	
Yield (ksi):	60.00
Width (in):	49.00
Style:	Clipped
Polygon Sides:	4.00
Clip Length (in):	6.00
Effective Len (in):	9.37
Moment (kip-in):	290.01
Allow Stress (ksi):	81.00
Applied Stress (ksi):	0.00
Stress Ratio:	0.30

Anchor Bolts	
Bolt Circle:	50.00
Number Bolts:	12.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Clustered
Cluster Dist (in):	6.00
Start Angle (deg):	45.00
Compression	
Force (kip):	92.07
Allowable (kip):	260.00
Ratio:	0.36
Tension	
Force (kip):	85.90
Allowable (kip):	260.00
Ratio:	0.34

Monopole Mat Foundation Design

			Date: 3/15/2017
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	109
Site Number:	CT13529-A-SBA	**Engineer Name:**	T. Alajaj
Engr. Number:	31778	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

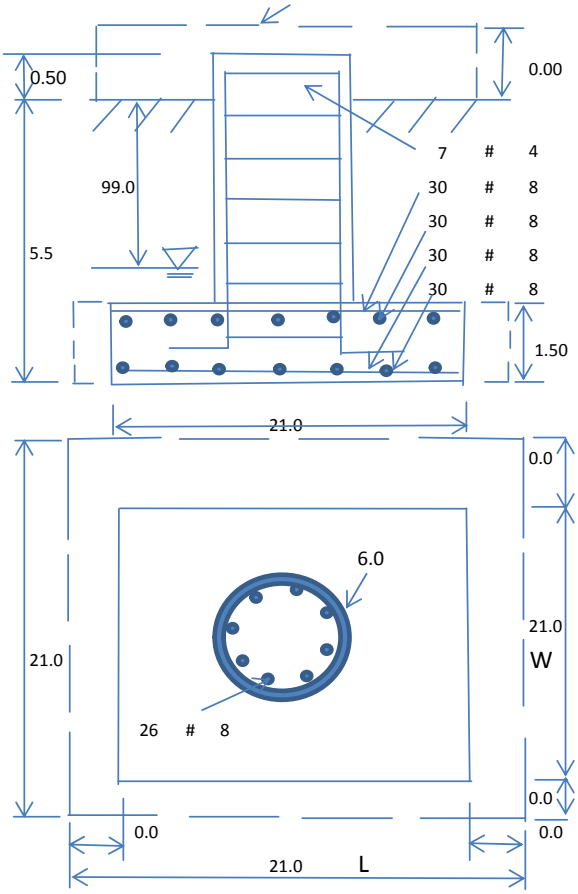
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	22.1	Shear Force (Kips):	14.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	1112.3
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	6.0	Depth of Base BG (ft.):	5.5
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	1.50
Length of Pad (ft.):	21	Width of Pad (ft.):	21
Final Length of pad (ft)	21.0	Final width of pad (ft):	21.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4500	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	26	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30
Apply 1.35 factor for e/w Per G:	1.35		

Soil Design Parameters:

Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	12000	Ultimate Skin Friction:	175	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.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

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

Total Dry Soil Volume (cu. Ft.):	1650.90	Total Dry Soil Weight (Kips):	198.11
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	198.11	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	788.73	Total Dry Concrete Weight (Kips):	118.31
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	118.31	Total Vertical Load on Base (Kips):	338.47

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1438	<	Allowable Factored Soil Bearing (psf):	9000	0.16	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	3221.7	>	Design Factored Momont (kips-ft):	1201	0.37	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.68	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		

(1) Concrete Pier:

					Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	3009.3	>	Design Factored Moment (Mu, Kips-F	1178.5	0.39	OK!
Calculated Shear Capacity (Kips):	524.9	>	Design Factored Shear (Kips):	14.7	0.03	OK!
Calculated Tension Capacity (Tn, Kips):	1109.2	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	8057.4	>	Design Factored Axial Load (Pu Kips):	22.1	0.00	OK!
Moment & Axial Strength Combination:	0.39	OK!	Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI				

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	367.7	>	One-Way Factored Shear (L-D. Kips):	110.0	0.30	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	367.7	>	One-Way Factored Shear (W-D., Kips)	110.0	0.30	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	414.9	>	One-Way Factored Shear (C-C, Kips):	103.5	0.25	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0065	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0065		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	1465.4	>	Moment at Bottom (L-Direct. K-Ft):	346.0	0.24	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	1465.4	>	Moment at Bottom (W-Direct. K-Ft):	346.0	0.24	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	2043.3	>	Moment at Bottom (C-C Dir. K-Ft):	489.3	0.24	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0065	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0065		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	1465.4	>	Moment at the top (L-Dir Kips-Ft):	66.5	0.05	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	1465.4	>	Moment at the top (W-Dir Kips-Ft):	66.5	0.05	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	2043.3	>	Moment at the top (C-C Direc. K-Ft):	145.7	0.07	OK!

SITE NAME: HA075/OPTASITE

93 LAKE STREET
MANCHESTER, CT 06042

SITE NUMBER: CTHA075D

SITE CONFIG: 702Cu

PROJECT NOTES

GENERAL NOTES:

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T–MOBILE. 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.

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.

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 STRUCTURAL NOTES:

TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE–BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.

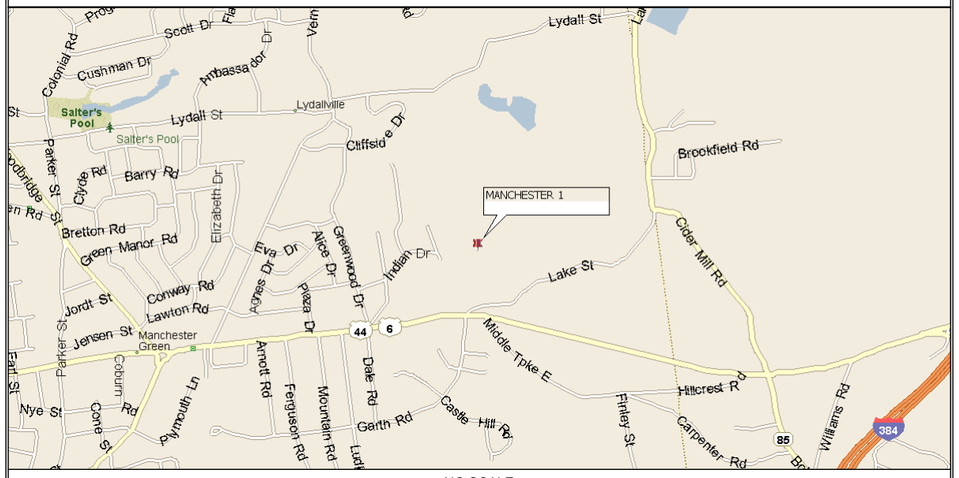
ENGINEER OF RECORD HAS MADE A VISUAL ASSESSMENT ONLY AND HAS DETERMINED THAT THE EXISTING ANTENNA MOUNT SHALL BE REPLACED OR MODIFIED TO ACCOMMODATE ANY ADDITIONAL EQUIPMENT LOAD. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.

B+T GROUP ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTIONS ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES.

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS	LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS NOT PERMITTED	DIPLEXERS:	UNRESTRICTED
SECTOR B:	ACCESS NOT PERMITTED	RADIO CABINETS:	UNRESTRICTED
SECTOR C:	ACCESS NOT PERMITTED	PPC DISCONNECT:	UNRESTRICTED
RRH:	ACCESS NOT PERMITTED	MAIN CIRCUIT D/C:	UNRESTRICTED
TMA:	ACCESS NOT PERMITTED	NIU/T DEMARC:	UNRESTRICTED
GPS/LMU:	CAUTION: OSHA APPROVED PORTABLE 6' STEP–LADDER REQUIRED	OTHER/SPECIAL:	NONE

LOCATION MAP



NO SCALE

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T–MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION: (TOWN OF MANCHESTER)	BASED ON INFORMATION PROVIDED BY T–MOBILE, REGULATORY COMPLIANCE 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 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:	93 LAKE STREET MANCHESTER, CT 06042
LATITUDE: LONGITUDE:	41.78916000° N 72.48222000° W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES & ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
TOWER OWNER:	SBA INFRASTRUCTURE, LLC
SBA SITE ID:	CT13529–A
SBA SITE NAME:	MANCHESTER 1
SBA REGIONAL SITE MANAGER:	STEPHEN ROTH (860) 539–4920 sroth@sbasite.com

APPROVALS

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

ACCEPTANCE DOES NOT CONSTITUTE APPROVAL OF DESIGN, CALCULATIONS, ANALYSIS, TEST METHODS OF MATERIALS DEVELOPED OR SELECTED BY THE SUBCONTRACTOR AND DOES NOT RELIEVE SUBCONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T–1	TITLE SHEET	0
GN–1	GENERAL NOTES	0
C–1	COMPOUND AND ELEVATION PLAN	0
C–2	EXISTING AND PROPOSED ANTENNA PLANS	0
C–3	DETAILS	0
RF–1	RFDS DIAGRAMS	0
E–1	GROUNDING DETAILS AND NOTES	0

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www.btgrp.com

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BLOOMFIELD, CT 06002

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

CTHA075D

HA075/OPTASITE

93 LAKE STREET
MANCHESTER, CT 06042

PROJECT NO:	112431.001
CHECKED BY:	SLM

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	3/20/17	CCC	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/18

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
3/20/17

SHEET NUMBER:	REVISION:
T-1	0

GROUNDING NOTES:

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

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GE'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 & 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 CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BUS 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 ELECTRICAL 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 BONDED FITTINGS OR BY BINDING 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' OR MORE OF 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BAR TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, 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 MATERIAL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALL 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 AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS. 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, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF 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 THE 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 NOTED OTHERWISE, PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WETHER SHALL BE HOT DIPPED GALVANIZED. TOUCH-UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

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, AL 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 IF 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.
    - BUILDING CODE: IBC 2012
    - ELECTRICAL CODE: NEC 2012

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

    AMERICAN CONCRETE INSTITUTE (ACI) 318;
    BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

    MANUAL OF STEEL CONSTRUCTION; ASD, FOURTEENTH 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, METHOD 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	GC	GENERAL CONTRACTOR	REF.	REFERENCE
AWG	AMERICAN WIRE GAUGE	MAX.	MAXIMUM	REQ.	REQUIRED
BCW	BARE COPPER WIRE	MGB	MASTER GROUND BAR	RF	RADIO FREQUENCY
BTS	BASE TRANSCEIVER STATION	MIN.	MINIMUM	T.B.D.	TO BE DETERMINED
(E)	EXISTING	(N)	PROPOSED	T.B.R.	TO BE REMOVED
EG	EQUIPMENT GROUND	N.T.S.	NOT TO SCALE	T.B.R.R.	TO BE REMOVED AND REPLACED
EGR	EQUIPMENT GROUND RING	RE:	REFERENCE	(TYP)	TYPICAL

B+T GRP
1717 S. BOULDER
SUITE 300
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T-MOBILE NORTHEAST, LLC
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SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581

CTHA075D

HA075/OPTASITE

93 LAKE STREET
MANCHESTER, CT 06042

PROJECT NO:	**112431.001**
CHECKED BY:	**SLM**

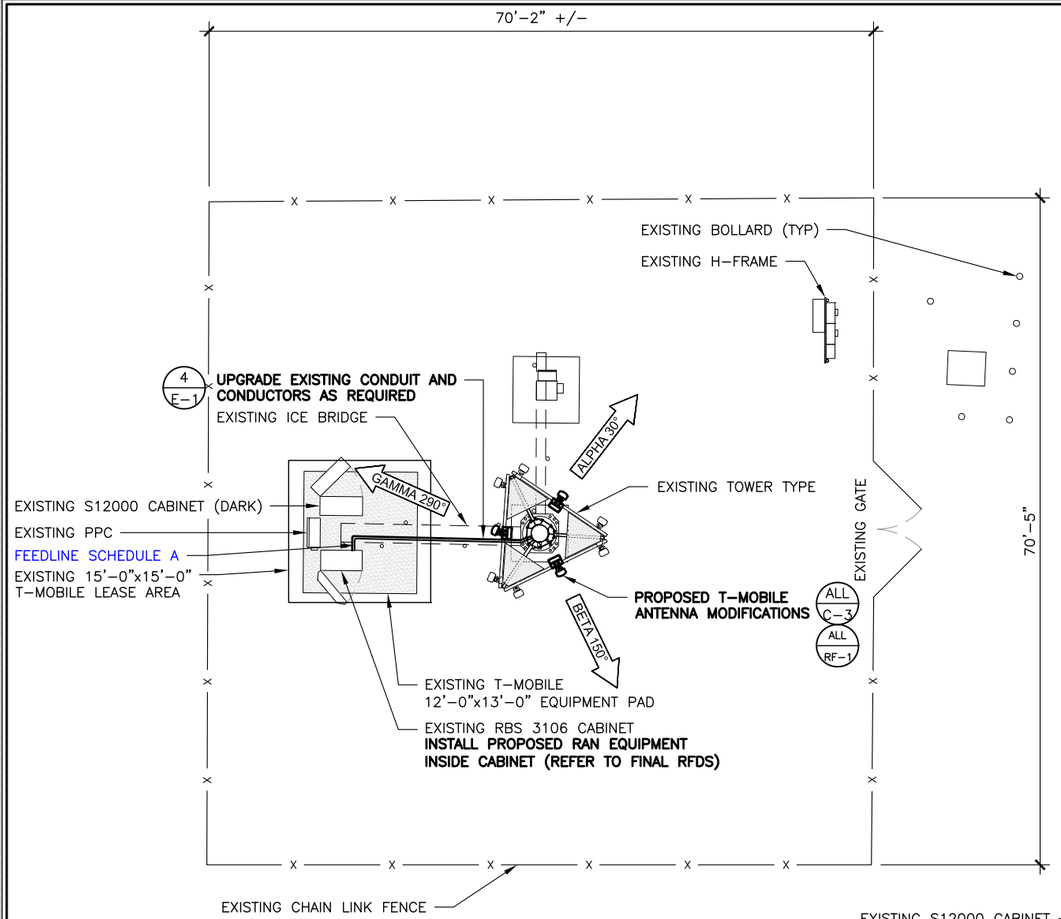
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	3/20/17	CCC	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/18

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
3/20/17

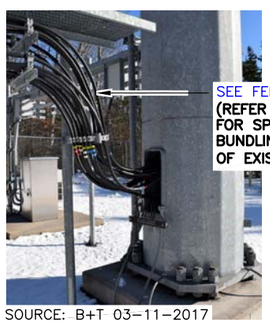
SHEET NUMBER:	REVISION:
GN-1	0



1 OVERALL SITE PLAN

SCALE: 0' 8' 16' 32' 64' 11x17 SCALE: 1/16"=1'-0" 22x34 SCALE: 1/8"=1'-0"

N



SEE FEEDLINE SCHEDULE.
(REFER TO SBA PROVIDED STRUCTURAL ANALYSIS FOR SPECIAL CABLE INSTALLATION REQUIREMENTS, BUNDLING, SHIELDING, MOUNTING AND RELOCATION OF EXISTING CABLES)

SOURCE: B+T 03-11-2017

2A FEEDLINE PHOTO DETAIL

SCALE: N.T.S.

EXISTING T-MOBILE PANEL ANTENNA (TYP)

2 / C-2 ALL / C-3 T-MOBILE MOUNT
ELEV. = 105.5'± A.G.L. (SBA*)

SPECIAL PRE-CONSTRUCTION WORK NOTE:

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.

ANTENNA MOUNT STRUCTURAL DESIGN NOTE:

ENGINEER-OF-RECORD HAS MADE A VISUAL ASSESSMENT ONLY OF EXISTING ANTENNA MOUNT ASSEMBLIES, WITHOUT THE BENEFIT OF A RIGOROUS ANTENNA MOUNT STRUCTURAL ANALYSIS, AND RECOMMENDS THAT EXISTING AND PROPOSED TOWER TOP EQUIPMENT BE INSTALLED AS DEPICTED HEREIN. STRUCTURAL DETAILS AS DEPICTED HEREIN FOR MODIFICATION OF EXISTING ANTENNA MOUNT ASSEMBLIES ARE PRELIMINARY ONLY AND THAT FINAL CONSTRUCTION DETAILS MAY BE SUBJECT TO CHANGE PENDING THE COMPLETION OF A SEPARATE SUPPLEMENTAL ANTENNA MOUNT STRUCTURAL ASSESSMENT, SUPPLEMENTAL STRUCTURAL MAPPING/CONDITIONS ASSESSMENT REPORT AND/OR SUPPLEMENTAL RIGOROUS ANTENNA MOUNT STRUCTURAL ANALYSIS.

2A / C-1 T-MOBILE FEEDLINES ROUTED INSIDE TOWER

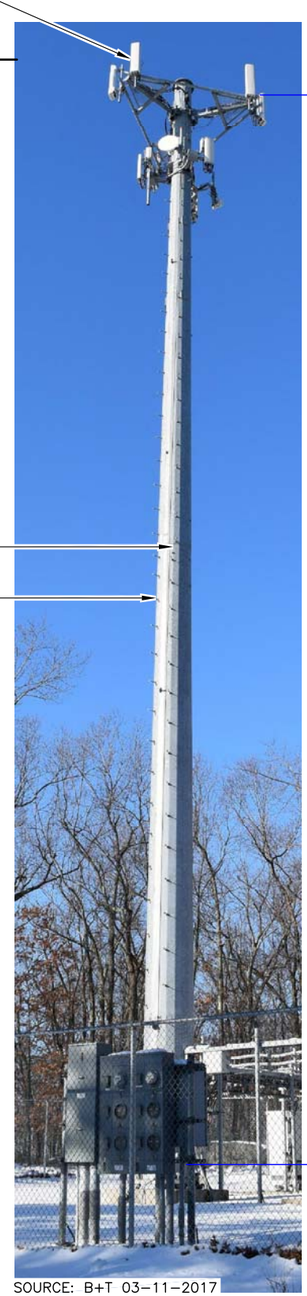
EXISTING TOWER TYPE

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO REMAIN: (6) 1 5/8" COAX & (1) 1 1/4" HYBRID FIBER PROPOSED 9x18" HCS HYBRID FIBER	INSIDE POLE
EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER		

SOURCE: B+T 03-11-2017

2B EQUIPMENT PHOTO DETAIL

SCALE: N.T.S.



SOURCE: B+T 03-11-2017

3 ELEVATION PHOTO DETAIL

SCALE: N.T.S.

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BLOOMFIELD, CT 06002

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

CTHA075D

HA075/OPTASITE

93 LAKE STREET
MANCHESTER, CT 06042

PROJECT NO:	112431.001
CHECKED BY:	SLM

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	3/20/17	CCC	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/18

STATE OF CONNECTICUT 31627 LICENSED PROFESSIONAL ENGINEER
3/20/17

SHEET NUMBER: C-1 REVISION: 0

NOTE:
AT TIME OF CONSTRUCTION, CONTRACTOR TO VERIFY AZIMUTHS OF EXISTING ANTENNAS. IF DIFFERENT FROM RFDS, PLEASE NOTIFY THE RF ENGINEER AND CONSTRUCTION MANAGER WITH ACTUAL AZIMUTH TO ENSURE T-MOBILE'S DATABASE IS ACCURATE AND UP-TO-DATE.

SPECIAL PRE-CONSTRUCTION WORK NOTE:

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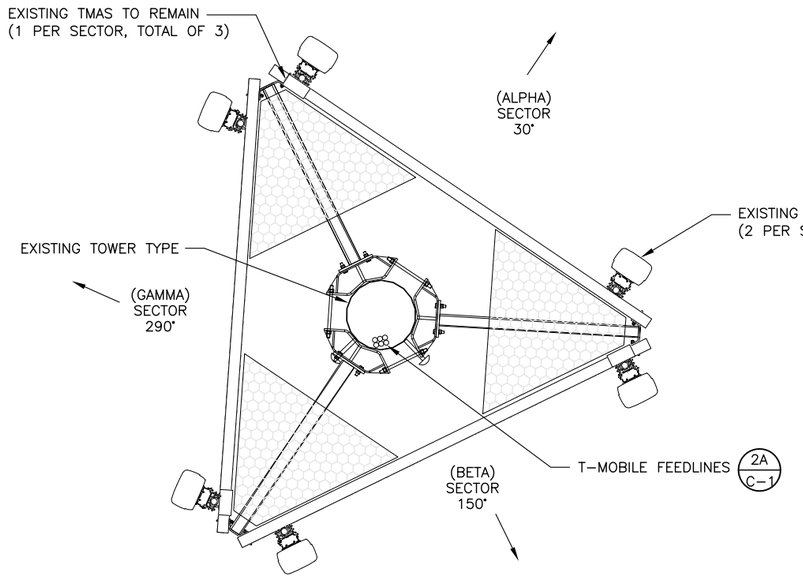


1A EXISTING ANTENNA PLAN

SCALE: 0' 1' 4' 10'

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

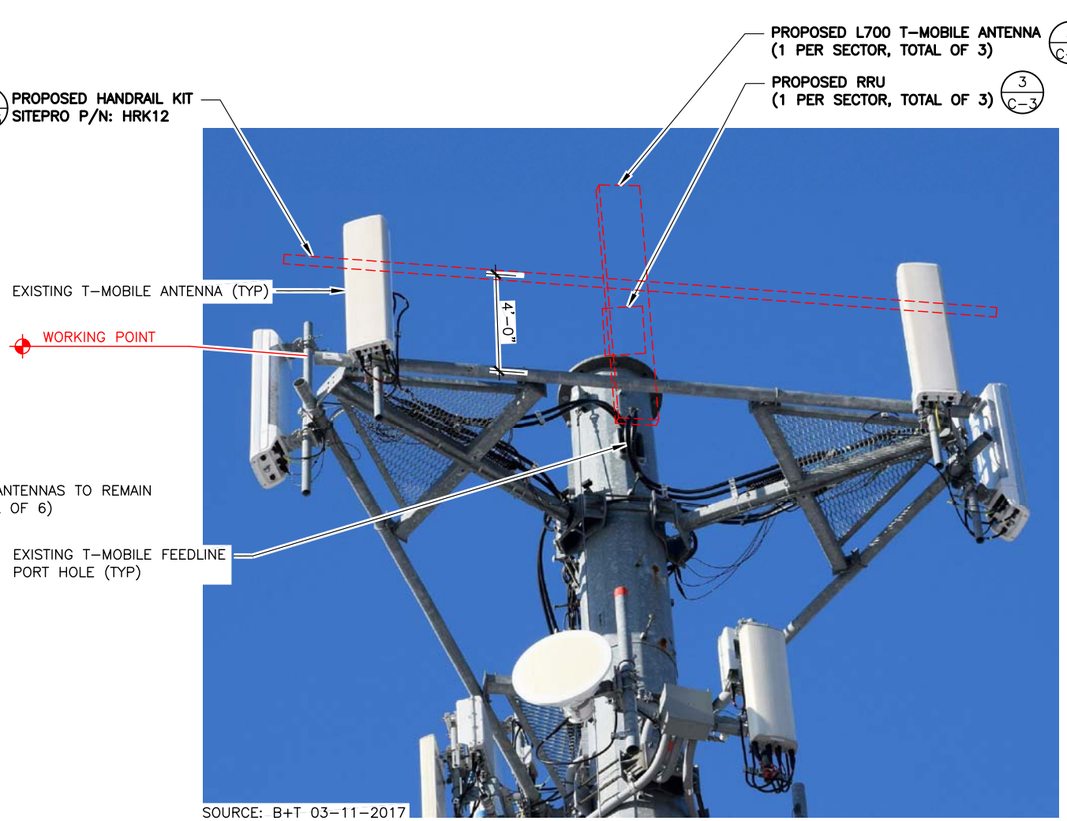
N

1B PROPOSED ANTENNA PLAN

SCALE: 0' 1' 4' 10'

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

N



SOURCE: B+T 03-11-2017

2 ANTENNA MOUNT PHOTO DETAIL

SCALE: N.T.S.

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SHEET NUMBER:	REVISION:
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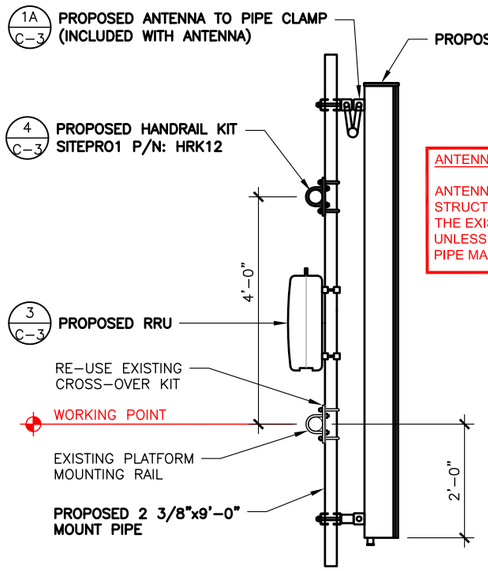
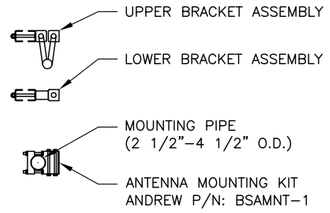


1 PROPOSED L700 ANTENNA & RRU MOUNTING DETAIL

SCALE: N.T.S.

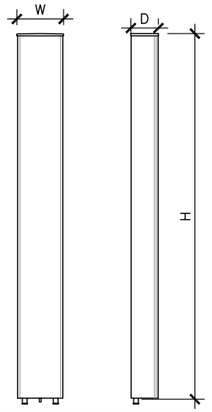
ANTENNA INSTALLATION SPECIAL WORK NOTE:

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



1A L700 ANTENNA MOUNTING BRACKET

SCALE: N.T.S.



L700 ANTENNA SPECS	
MANUFACTURER	ANDREW
MODEL #	LNX-6515DS
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	96.4"
WEIGHT	50.3 LBS

2 L700 ANTENNA DETAIL

SCALE: N.T.S.

SPECIAL PRE-CONSTRUCTION WORK NOTE:

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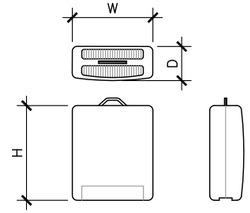

RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RRUS11 B12
WIDTH	17"
DEPTH	7"
HEIGHT	20"
WEIGHT	50.6 LBS

3 REMOTE RADIO UNIT (RRU)

SCALE: N.T.S.

ANTENNA MOUNT STRUCTURAL DESIGN NOTE:

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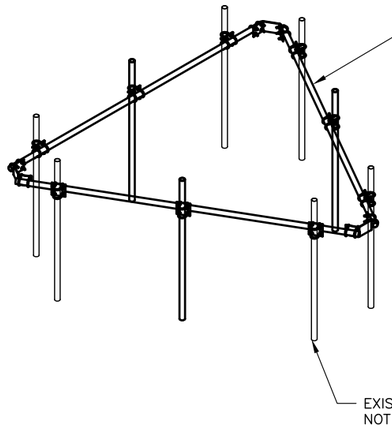

4 PROPOSED HANDRAIL KIT

SCALE: N.T.S.

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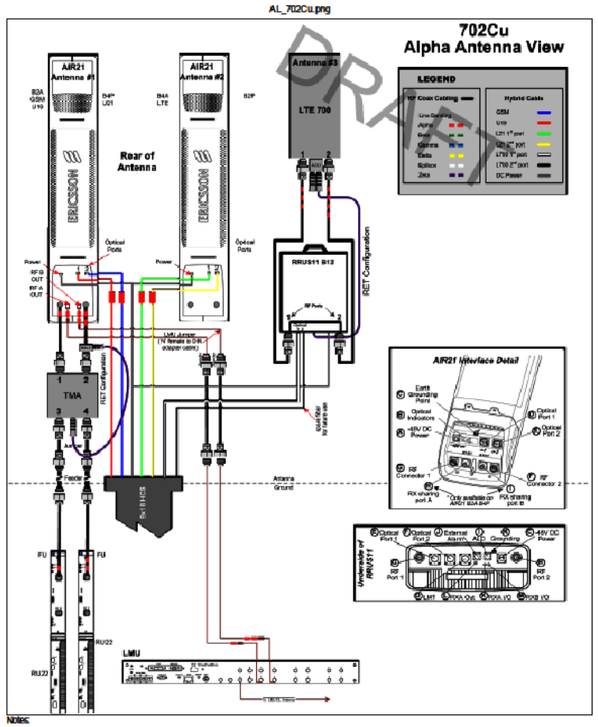

RF DESIGN GENERAL NOTE:

1. RF DESIGN BASED ON RFDS DATED 02/15/17 , GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT THE LATEST RFDS AND RAN WIRING DIAGRAM IS USED FOR EQUIPMENT INSTALLATION.
2. PRIOR TO INSTALLATION OF TOWER TOP EQUIPMENT, GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY AZIMUTHS OF EXISTING ANTENNAS. DISCREPANCIES AND ACTUAL AZIMUTHS SHALL BE REPORTED IMMEDIATELY TO RF ENGINEER AND T-MOBILE CONSTRUCTION MANAGER.

RFDS FOOTNOTES:

1. INFORMATION IN BOLD RED TEXT IS PROVIDED BY A&E AND HIGHLIGHTS IMPORTANT DISCREPANCIES BETWEEN RFDS AND ACTUAL FIELD MEASUREMENTS OR SBA-PROVIDED RECORD INFORMATION.

* SBA-PROVIDED ANTENNA RAD AGL BASED ON COLOCATION APPLICATION AND STRUCTURAL ANALYSIS AND SHALL SUPERCEDE ANY CONFLICTING RFDS ANTENNA RAD AGL.

** HYBRID TRUNK FEEDLINE LENGTHS AS PROVIDED BY A&E BASED ON SCALED DIMENSIONS FROM RBS TO ANTENNA/RRU CONNECTIONS PLUS 20' FOR (2) 10' COILS EACH AT TOP AND BOTTOM TERMINATIONS. T-MOBILE CONSTRUCTION MANAGER SHALL CONFIRM ALL EQUIPMENT SCHEDULES, PART NUMBERS AND FEEDLINE/JUMPER LENGTHS BEFORE PREPARING A BILL OF MATERIALS.

Existing RAN Equipment

Template: 2C

Enclosure	1	2
Enclosure Type	RBS 3106	S12000 Outdoor
Baseband	DUW30 (x2) DUL20 DUG20	
Radio	RUS2 (x6)	

Proposed RAN Equipment

Template: 702Cu Outdoor

Enclosure	1	2	3
Enclosure Type	RBS 3106	Ancillary Equipment	S12000 Outdoor
Baseband	DUW30 (x2) DUL20 DUG20		
Hybrid Cable System		Ericsson 9x18 HCS "Select Length"	
Radio	RUS2 (x6)		

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1		2	3	
Antenna Model	KRC118023-1_B2A_B4P (Quad)		LNX-6515DS-A1M (Dual)	KRC118046-1 B2P_B4A (Quad)	
Azimuth	30		30	30	
M. Tilt	0		0	0	
Height	105		105	105	
Ports	P1	P2	P3	P4	P5
Active Tech.	U1900 G1900	U2100	L700	L2100	
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2	2	
Cables	Fiber Jumper - 15 ft Fiber Jumper - 15 ft	1-5/8" Coax - 120 ft 1-5/8" Coax - 120 ft	Coax Jumper - 6 ft Coax Jumper - 6 ft	Fiber Jumper - 15 ft Fiber Jumper - 15 ft	
TMAs		Generic Style 1B - Twin AWS			
Diplexers / Combiners					
Radio			RRUS11 B12		
Sector Equipment					

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1		2	3	
Antenna Model	KRC118023-1_B2A_B4P (Quad)		LNX-6515DS-A1M (Dual)	KRC118046-1 B2P_B4A (Quad)	
Azimuth	150		150	150	
M. Tilt	0		0	0	
Height	105		105	105	
Ports	P1	P2	P3	P4	P5
Active Tech.	U1900 G1900	U2100	L700	L2100	
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2	2	
Cables	Fiber Jumper - 15 ft Fiber Jumper - 15 ft	1-5/8" Coax - 120 ft 1-5/8" Coax - 120 ft	Coax Jumper - 6 ft Coax Jumper - 6 ft	Fiber Jumper - 15 ft Fiber Jumper - 15 ft	
TMAs		Generic Style 1B - Twin AWS			
Diplexers / Combiners					
Radio			RRUS11 B12		
Sector Equipment					

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1		2	3	
Antenna Model	KRC118023-1_B2A_B4P (Quad)		LNX-6515DS-A1M (Dual)	KRC118046-1 B2P_B4A (Quad)	
Azimuth	290		290	290	
M. Tilt	2		0	2	
Height	105		105	105	
Ports	P1	P2	P3	P4	P5
Active Tech.	U1900 G1900	U2100	L700	L2100	
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	3	2		6	
Cables	Fiber Jumper - 15 ft Fiber Jumper - 15 ft	1-5/8" Coax - 125 ft 1-5/8" Coax - 125 ft	Coax Jumper - 6 ft Coax Jumper - 6 ft	Fiber Jumper - 15 ft Fiber Jumper - 15 ft	
TMAs		Generic Style 1B - Twin AWS			
Diplexers / Combiners					
Radio			RRUS11 B12		
Sector Equipment					

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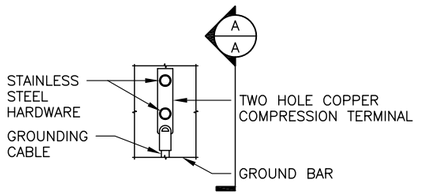
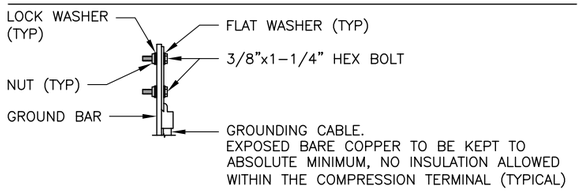
3/20/17

SHEET NUMBER: RF-1
REVISION: 0



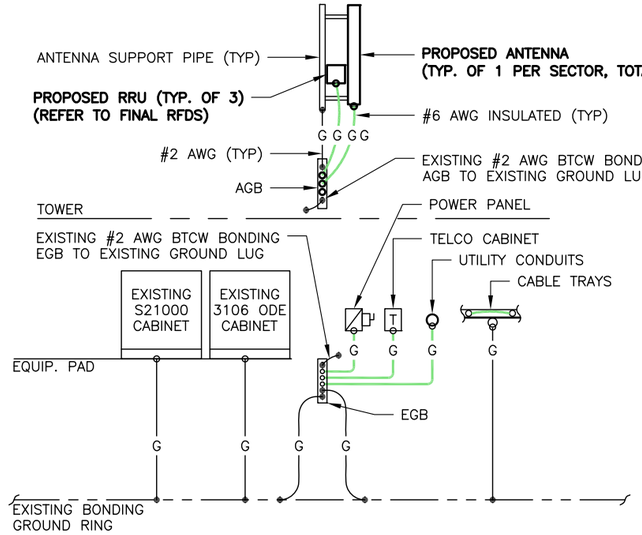
ELEVATION



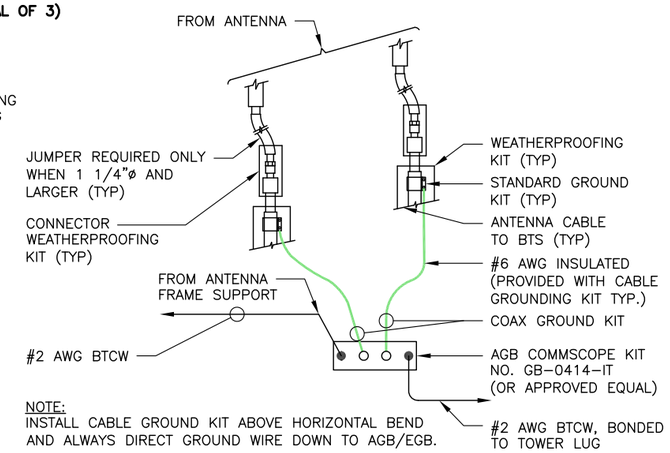
SECTION "A-A"

NOTE:
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.

1 TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.

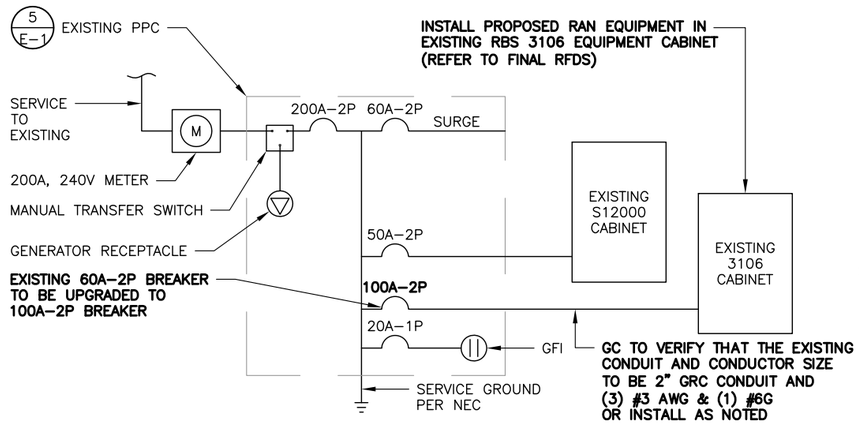


2 TYPICAL GROUNDING RISER DIAGRAM
SCALE: N.T.S.



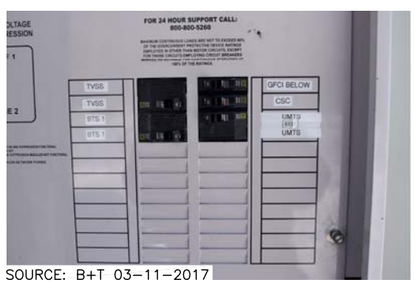
NOTE:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

3 TOWER TOP CABLE GROUNDING DETAIL
SCALE: N.T.S.



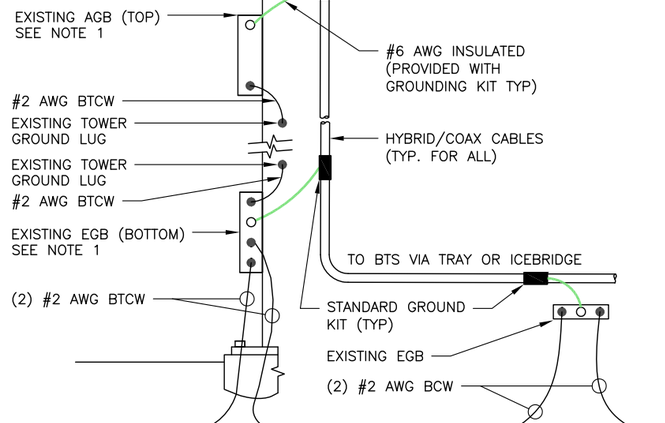
4 ONE-LINE POWER DIAGRAM
SCALE: N.T.S.

SOURCE: B+T 03-11-2017



SOURCE: B+T 03-11-2017

5 PHOTO DETAIL: PPC PANEL
SCALE: N.T.S.



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

6 TOWER BOTTOM CABLE GROUNDING DETAIL
SCALE: N.T.S.

ELECTRICAL LEGEND

A	AMPERE
BTCW	BARE TINNED (SOLID) COPPER WIRE
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
KWH	KILOWATT – HOUR
PPC	POWER PROTECTION CABINET
V	VOLT
	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
	GROUND
	EXOTHERMIC CONNECTION (CAD WELD) MECHANICAL CONNECTION
AGB/EGB	ANTENNA GROUND BAR/EQUIPMENT GROUND BAR
MGB	MASTER GROUND BAR
G	GROUND COPPER WIRE, SIZED AS NOTED
	EXPOSED WIRING, SIZE AS NOTED
	INSULATED WIRING, SIZE AS NOTED
	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 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 THIN INSULATION.
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 LUGS. 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.
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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CTHA075D

HA075/OPTASITE

93 LAKE STREET
MANCHESTER, CT 06042

PROJECT NO:	112431.001
CHECKED BY:	SLM

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	3/20/17	CCC	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/18

SHEET NUMBER:	REVISION:
E-1	0