Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

October 16, 2018

Melanie Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Notice of Exempt Modification
48 Ritch Avenue West, Greenwich, CT 06830
Latitude- 41.00506388
Longitude- -73.64831111

Dear Ms. Bachman,

T-Mobile currently maintains (9) existing antennas at the 77' level of the existing 87' monopine at 48 Ritch Avenue West, Greenwich, Connecticut (also known as 36 Ritch Avenue). The tower is owned by American Tower. The property is owned by 36 Ritch Avenue, LLC. T-Mobile now intends to remove (3) of the existing antennas and add (3) new 600/700/1900/2100 MHz antennas. These antennas would be installed at the same 77' level of the tower. T-Mobile also intends to swap (6) remote radio heads and add (1) hybrid cable.

This tower facility was originally approved by the Siting Council through Docket No. 414 dated July 14, 2011. T-Mobile was approved for tower-sharing on July 25, 2016. This approval did not come with conditions that would be violated by this proposed modification.

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 Peter J. Tesei, First Selectmen of the Town of Greenwich, Katie DeLuca, Planning and Zoning Director for the Town of Greenwich, as well as the tower owner and property owner.

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 modification will not result in an increase in the height of the existing structure

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

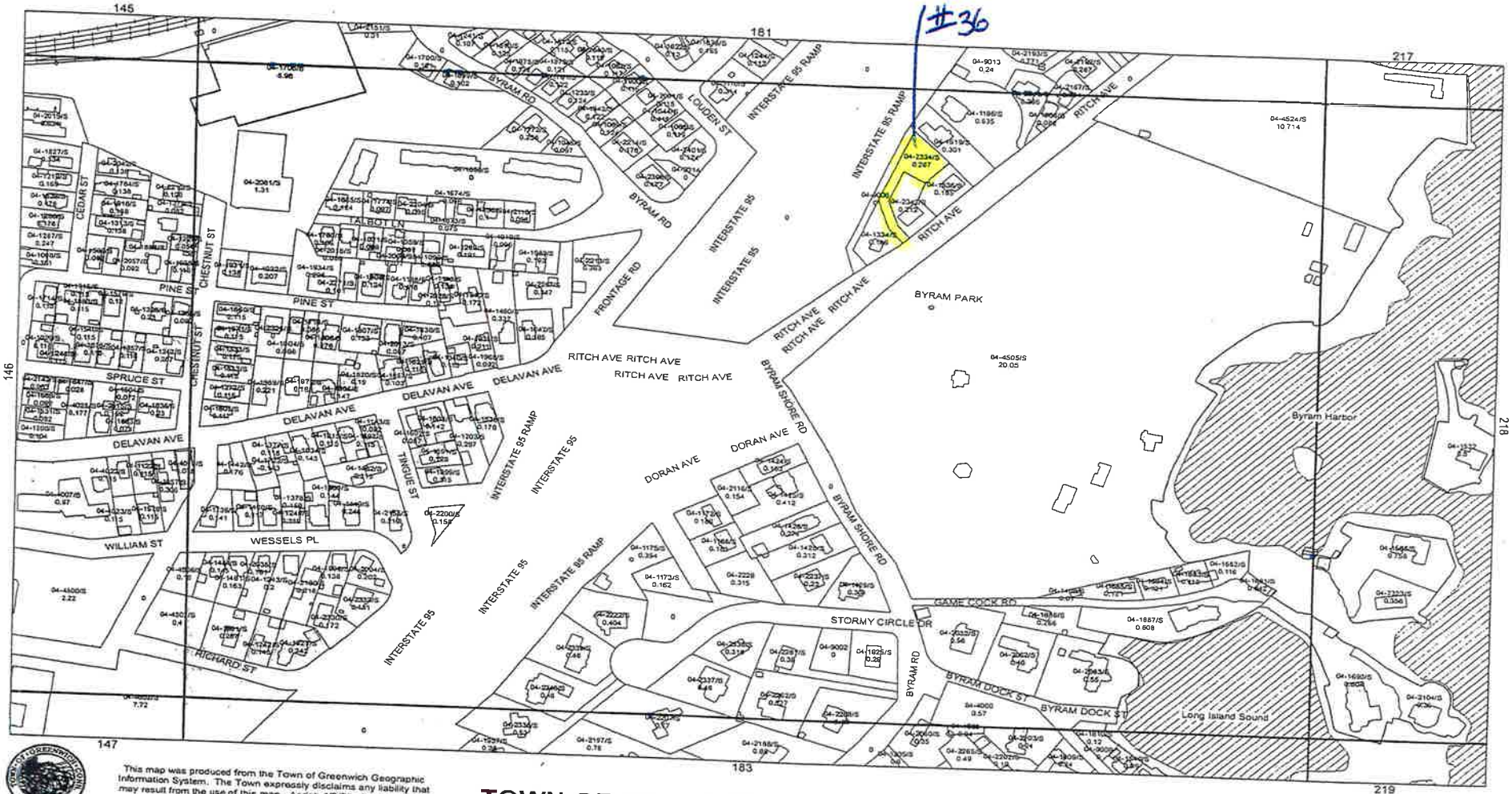
For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitute an exempt modification under R.C.S.A. 16-50j-72(b)(2).

Sincerely,

Kyle Richers

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
908-447-4716
krichers@transcendwireless.com

cc: Peter J Tesei- as elected official
Katie DeLuca- as zoning official
American Tower- as tower owner
36 Ritch Avenue, LLC- as property owner



This map was produced from the Town of Greenwich Geographic Information System. The Town expressly disclaims any liability that may result from the use of this map. Aerial: 4/2/08. Data: 10/1/08. Map: 7/20/09.

TOWN OF GREENWICH TAX MAP 182 VOL 3

Tax ID 182/005 Printed 07/21/2016 Card No. 1 of 1

ADMINISTRATIVE INFORMATION

PARCEL NUMBER
04-2334/S

Parent Parcel Number

Property Address
RITCH AVENUE 0036

Neighborhood
2700 BYRAM

Property Class
270 Telecommunications

TAXING DISTRICT INFORMATION

Jurisdiction	57	Greenwich, CT
Area	001	
Corporation	057	
District	04	
Section & Plat	040	
Routing Number	7117N0001	

Site Description

Topography:

Public Utilities:
Water, Sewer, Electric

Street or Road:

Neighborhood:

Zoning:
R-7 Single Family 7,500 SF

Legal Acres:
0.2670

OWNERSHIP

36 RITCH AVENUE LLC
16B ARTHER STREET
GREENWICH, CT 06831

LOT NO PT5 & PT7A-1-1-3 R ITCH AV N1B

TRANSFER OF OWNERSHIP

Date		
02/15/2002	KELLY BRIAN & LAURA W/S	Bk/Pg: 3786, 114 $0
11/16/2000	CATALANO ANTHONY ETAL DBA CATALANO B	Bk/Pg: 3492, 86 $125000
08/20/1986	NA	Bk/Pg: 1611, 290 $0

COMMERCIAL

VALUATION RECORD

Assessment Year		10/01/2005	11/30/2005	10/01/2010	10/01/2012	10/01/2015	10/01/2015	10/01/2015
Reason for Change		2005 Reval	2005 BAA	2010 Reval	2012 List	2015 Prelim	2015 Final	2015 BAA
VALUATION	L	622000	264400	605600	605600	664000	664000	664000
Market	B	0	0	101300	579000	2350700	2350700	2236000
	T	622000	264400	706900	1184600	3014700	3014700	2900000
VALUATION	I	435400	185080	423920	423920	464800	464800	464800
70% Assessed	B	0	0	70910	405300	1645490	1645490	1565200
	T	435400	185080	494830	829220	2110290	2110290	2030000

LAND DATA AND CALCULATIONS

Land Type	Rating Soil ID -or- Actual Frontage	Measured Acreage -or- Effective Frontage	Table Effective Depth	Prod. Factor -or- Depth Factor -or- Square Feet	Base Rate	Adjusted Rate	Extended Value	Influence Factor	Value
1 Primary Commercial				11630.52	57.09	57.09	664000		664000

BA10: Sustained
BA15: Decrease Total value by $114,700
BP12: 11-4098 Erection of 77' monopine to rplc orig flagpole type mono pole cmplt. Construction of equip storage bldg. cmplt. Both poles stndg and tied in as of 10/11/12 w/ orig. still operating. Add 2nd pole and misc site imprvmnts.
BP15: 15-0972, 9 Anteenna Panels, $15,000
CKMP: 8586
DBA: Telecommunications site w/ a 70' flagpole monopole owned by Cingular (and carrier), and a 77' monopine (pole) owned by Verizon (w/ Verizon, ATT & Mobile carriers) both serviced by a custom utility bldg.
LAND: See BP03 memo.

Permit Number / Type	FilingDate	Est. Cost / Est. SqFt	Field Visit

Supplemental Cards

TRUE TAX VALUE 664000

Supplemental Cards
TOTAL LAND VALUE 664000

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: CT11606H

CT606/VZ Byram Shore
48 Ritch Avenue W
Greenwich, CT 06830

August 20, 2018

EBI Project Number: 6218005663

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**55.08 %**

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

EBI Consulting
environmental | engineering | due diligence

August 20, 2018

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

Emissions Analysis for Site: **CT11606H – CT606/VZ Byram Shore**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **48 Ritch Avenue W, Greenwich, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **48 Ritch Avenue W, Greenwich, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

4) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) 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.

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

8) The antennas used in this modeling are the **Ericsson AIR32 B2A/B66Aa** & **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerline of the proposed antennas is **77 feet** above ground level (AGL).

10) 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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	77 feet	Height (AGL):	77 feet	Height (AGL):	77 feet
Frequency Bands	1900 MHz (PCS) / MHz (AWS)	Frequency Bands	1900 MHz (PCS) / MHz (AWS)	Frequency Bands	1900 MHz (PCS) / MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**5.55**	Antenna B1 MPE%	**5.55**	Antenna C1 MPE%	**5.55**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	77 feet	Height (AGL):	77 feet	Height (AGL):	77 feet
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	40	Total TX Power(W):	40	Total TX Power(W):	40
ERP (W):	1,706.32	ERP (W):	1,706.32	ERP (W):	1,706.32
Antenna A2 MPE%	**1.22**	Antenna B2 MPE%	**1.22**	Antenna C2 MPE%	**1.22**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	77 feet	Height (AGL):	77 feet	Height (AGL):	77 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**4.13**	Antenna B3 MPE%	**4.13**	Antenna C3 MPE%	**4.13**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**10.90 %**
AT&T	**28.94 %**
Verizon Wireless	**15.24 %**
Site Total MPE %:	**55.08 %**

T-Mobile Sector A Total:	10.90 %
T-Mobile Sector B Total:	10.90 %
T-Mobile Sector C Total:	10.90 %
Site Total:	55.08 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	77	22.20	PCS - 1900 MHz	1000.00	2.22%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	77	33.29	AWS - 2100 MHz	1000.00	3.33%
T-Mobile AWS - 2100 MHz UMTS	1	1,706.32	77	12.17	AWS - 2100 MHz	1000.00	1.22%
T-Mobile 600 MHz LTE	2	788.97	77	11.25	600 MHz	400.00	2.81%
T-Mobile 700 MHz LTE	2	432.54	77	6.17	700 MHz	467.00	1.32%
						Total:	**10.90%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	10.90 %
Sector B:	10.90 %
Sector C:	10.90 %
T-Mobile Maximum MPE % (Per Sector):	10.90 %
Site Total:	55.08 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **55.08%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**82.7 ft Monopine**
ATC Site Name	:	**Byram Park CT, CT**
ATC Site Number	:	**414240**
Engineering Number	:	**OAA737002_C3_02**
Proposed Carrier	:	**T-Mobile**
Carrier Site Name	:	**CT11606H**
Carrier Site Number	:	**CT11606H**
Site Location	:	**48 Ritch Avenue West** **Greenwich, CT 06830-9992** **41.005100,-73.648300**
County	:	**Fairfield**
Date	:	**October 1, 2018**
Max Usage	:	**60%**
Result	:	**Pass**

Prepared By:
Aaron Mccullough, E.I.
Structural Engineer I

Reviewed By:

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 82.7 ft monopine to reflect the change in loading by T-Mobile.

Supporting Documents

Tower Drawings	EEI Project #16733 Rev. 3, dated December 9, 2011
Foundation Drawing	Centek Engineering Job #09129 Rev. 0, dated February 14, 2012
Geotechnical Report	DET Job #2010.14, dated October 4, 2010

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	93 mph (3-Second Gust, V_{asd}) / 120 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.26, S_1 = 0.07
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
82.0	89.1	2	dbSpectra DS7C09P36U-D	Pole Mount	(2) 7/8" Coax (2) 1/2" Coax	Town Of Greenwich, CT
	82.0	1	Bird 428D-83I-01-T			
77.0	77.0	3	Ericsson AIR-32 B2A/B66Aa	T-Arms	(2) 1 5/8" Fiber	T-Mobile
		3	RFS APX16DWV-16DWVS-E-A20 (60" Height)			
68.0	68.0	6	CCI DTMABP7819VG12A	T-Arms	(12) 1 5/8" Coax (4) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk (1) 3" Conduit (1) 2" Conduit	AT&T Mobility
		2	Raycap DC6-48-60-18-8F(32.8 lbs)			
		3	Ericsson RRUS 4426 B66			
		3	Ericsson RRUS 32 B2			
		3	Ericsson RRUS-32 (77 lbs)			
		3	Ericsson RRUS-11			
		3	Powerwave P65-16-XLH-RR			
		3	Quintel QS66512-2			
		3	CCI OPA-65R-LCUU-H6			
57.0	57.0	3	Alcatel-Lucent RRH 2X60-1900	T-Arms	(18) 1 5/8" Coax (1) 1 5/8" Fiber (1) 1 5/8" Hybriflex	Verizon
		3	Alcatel-Lucent RRH2x60 700			
		3	Alcatel-Lucent B66 RRH4x45			
		2	Commscope RC2DC-4750-PF-48			
		3	Antel BXA-171063-12CF			
		2	Commscope SBNHH-1D65A			
		4	Commscope SBNHH-1D45A			
		6	Antel LPA-80063-6CF-EDIN-X			
	56.0	1	VZW Unused Reserve: 14,138 sq in			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
77.0	77.0	3	Ericsson RRUS 32 w/ Solar Shield (52.9 lbs)	-	-	T-Mobile
		3	Ericsson RRUS 11 B12			
		3	Commscope LNX-6512DS-A1M			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
77.0	77.0	3	Ericsson Radio 4449 B12,B71	T-Arms	(1) 1 5/8" Fiber	T-Mobile
		3	Ericsson RRUS 32 B66			
		3	RFS APXVAARR24_43-U-NA20			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	38%	Pass
Shaft	37%	Pass
Base Plate	31%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	4,555.2	4,555.2	2,338.0	51%
Shear (Kips)	74.4	74.4	44.6	60%

*** The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1**

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
77.0	Ericsson Radio 4449 B12,B71	T-Mobile	0.270	0.324
	Ericsson RRUS 32 B66			
	RFS APXVAARR24_43-U-NA20			

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

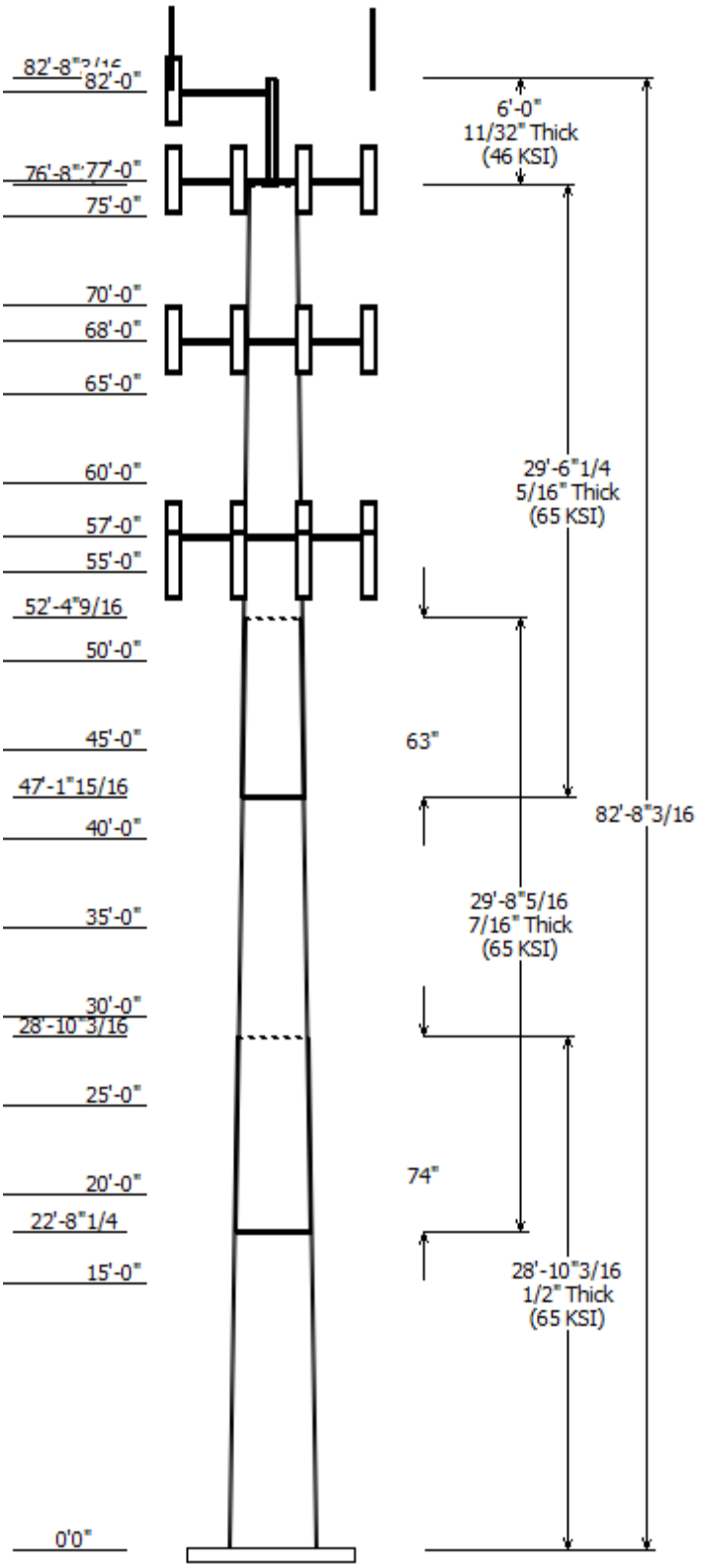
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Job Information

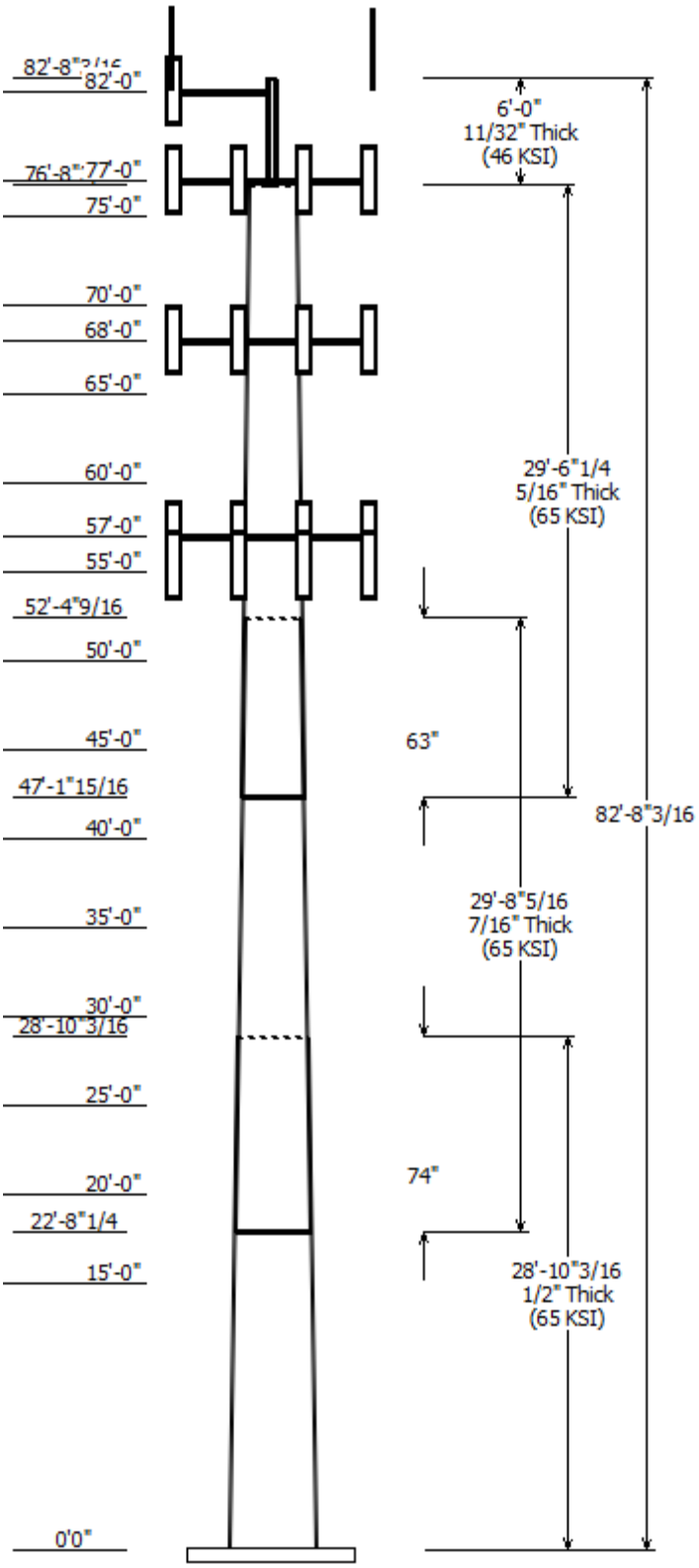
Pole :	414240	Code:	ANSI/TIA-222-G
Location :	Byram Park CT, CT		
Description :	77 ft monopine		
Client :	T-MOBILE	Struct Class :	II
Shape :	18 Sides	Exposure :	C
Height :	82.68 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.335790 (in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	28.852	42.31	52.00	0.500		0.000	18 Sides	65
2	29.693	35.28	45.25	0.438	Slip Joint	73.969	18 Sides	65
3	29.521	27.75	37.66	0.313	Slip Joint	62.656	18 Sides	65
4	6.000	4.500	4.500	0.337	Butt Joint	0.000	Round	46

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
82.000	89.100	2	dbSpectra DS7C09P36U-D
82.000	82.000	1	Pole Mount
82.000	82.000	1	Bird 428D-83I-01-T
77.000	77.000	3	RFS APXVAARR24_43-U-NA20
77.000	77.000	3	Ericsson RRUS 32 B66
77.000	77.000	3	Ericsson Radio 4449 B12,B71
77.000	77.000	3	Flat T-Arms
77.000	77.000	3	RFS APX16DWV-16DWVS-E-A20
77.000	77.000	3	Ericsson AIR-32 B2A/B66Aa
75.000	75.400	1	Pine Branches
70.000	70.000	1	Pine Branches
68.000	68.000	3	Flat T-Arm
68.000	68.000	3	CCI OPA-65R-LCUU-H6
68.000	68.000	3	Quintel QS66512-2
68.000	68.000	3	Powerwave Allgon P65-16-
68.000	68.000	3	Ericsson RRUS-11
68.000	68.000	3	Ericsson RRUS-32 (77 lbs)
68.000	68.000	3	Ericsson RRUS 32 B2
68.000	68.000	3	Ericsson RRUS 4426 B66
68.000	68.000	2	Raycap DC6-48-60-18-8F(32.8 lb
68.000	68.000	6	CCI DTMABP7819VG12A
65.000	65.000	1	Pine Branches
60.000	60.000	1	Pine Branches
57.000	57.000	3	Alcatel-Lucent B66 RRH4x45
57.000	57.000	4	Commscope SBNHH-1D45A
57.000	57.000	2	Commscope SBNHH-1D65A
57.000	57.000	2	Commscope RC2DC-4750-PF-
57.000	57.000	3	Alcatel-Lucent RRH2x60 700
57.000	57.000	3	Alcatel-Lucent RRH 2X60-1900
57.000	57.000	6	Amphenol Antel LPA-80063-
57.000	57.000	3	Amphenol Antel BXA-171063-
57.000	56.000	1	VZW Unused Reserve: 14,138
57.000	57.000	3	Flat T-Arm
55.000	55.000	1	Pine Branches
50.000	50.000	1	Pine Branches
45.000	45.000	1	Pine Branches
40.000	40.000	1	Pine Branches
35.000	35.000	1	Pine Branches
30.000	30.000	1	Pine Branches
25.000	25.000	1	Pine Branches
20.000	20.000	1	Pine Branches
15.000	15.000	1	Pine Branches



Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	57.000	1 5/8" Coax	No
0.000	57.000	1 5/8" Fiber	No
0.000	57.000	1 5/8" Hybriflex	No
0.000	68.000	0.39" Fiber Trunk	No
0.000	68.000	0.78" 8 AWG 6	No
0.000	68.000	1 5/8" Coax	No
0.000	68.000	2" Conduit	No
0.000	68.000	3" Conduit	No
0.000	77.000	1 5/8" Fiber	No
0.000	77.000	1 5/8" Fiber	No
0.000	82.000	1/2" Coax	No
0.000	82.000	7/8" Coax	No

Load Cases

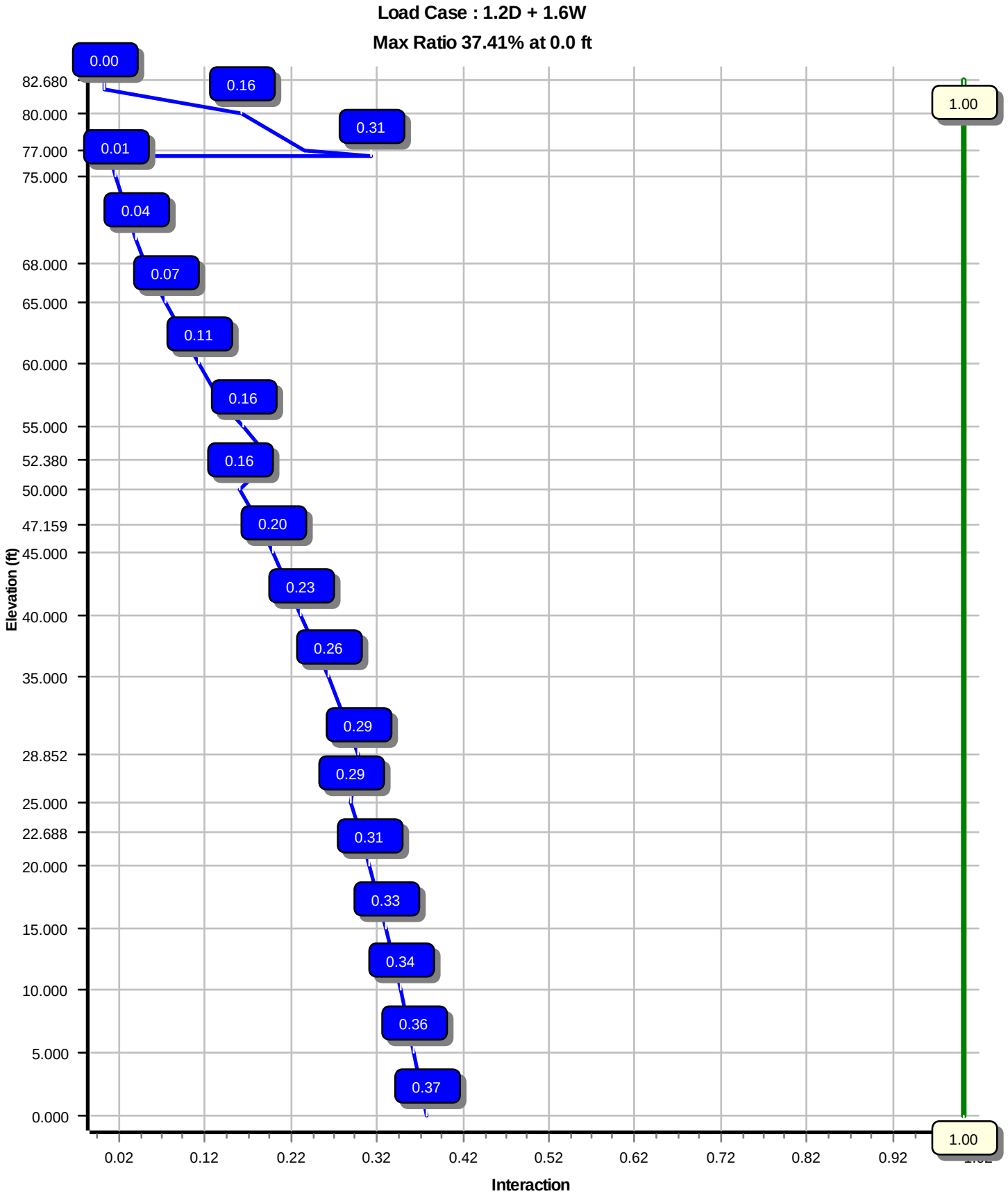
1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	2338.09	44.58	41.78
0.9D + 1.6W	2333.44	44.57	31.32
1.2D + 1.0Di + 1.0Wi	667.22	12.84	69.09
(1.2 + 0.2Sds) * DL + E ELFM	202.28	3.68	41.75
(1.2 + 0.2Sds) * DL + E EMAM	143.15	2.44	41.75
(0.9 - 0.2Sds) * DL + E ELFM	201.75	3.68	28.07
(0.9 - 0.2Sds) * DL + E EMAM	142.75	2.44	28.07
1.0D + 1.0W	607.90	11.60	34.85

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000


Load Case : 1.2D + 1.6W
Max Ratio 37.41% at 0.0 ft
0.00
0.16
0.31
0.01
0.04
0.07
0.11
0.16
0.16
0.20
0.23
0.26
0.29
0.29
0.31
0.33
0.34
0.36
0.37
1.00
1.00
82.680
80.000
77.000
75.000
68.000
65.000
60.000
55.000
52.380
50.000
47.159
45.000
40.000
35.000
28.852
25.000
22.688
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number:	414240	Code: ANSI/TIA-222-G	
Site Name:	Byram Park CT, CT	Engineering Number:OAA737002_C3_02	10/1/2018 1:30:41 PM
Customer:	T-MOBILE		

Analysis Parameters

Location :	FAIRFIELD County, CT	Height (ft) :	82.68
Code :	ANSI/TIA-222-G	Base Diameter (in) :	52.00
Shape :	18 Sides. Sect 4: Round	Top Diameter (in) :	4.50
Pole Type :	Custom	Taper (in/ft) :	0.336
Pole Manfacturer :	EEI	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	93 mph
Exposure Category:	C	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0 ft	Design Ice Thickness:	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	0.72				
T_L (sec):	6	p:	1	C_s:	0.106
S_s:	0.263	S_1:	0.071	C_s Max:	0.106
F_a:	1.590	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.279	S_{d1}:	0.114		

Load Cases

1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-18	28.852	0.5000	65		0.00	7,269	52.00	0.00	81.73	27386.5	16.57	104.00	42.31	28.85	66.35	14656.0	13.16	84.62	0.335790
2-18	29.693	0.4375	65	Slip	73.97	5,589	45.25	22.69	62.23	15794.9	16.48	103.44	35.28	52.38	48.39	7424.8	12.46	80.65	0.335790
3-18	29.521	0.3125	65	Slip	62.66	3,228	37.66	47.16	37.05	6530.4	19.49	120.53	27.75	76.68	27.22	2588.8	13.90	88.81	0.335790
4-R	6.000	0.3370	46	Butt	0.00	90	4.500	76.68	4.41	9.6	0.00	13.35	4.500	82.68	4.41	9.6	0.00	13.35	0.000000
				Shaft Weight		16,175													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Distance From Face (ft)	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor
82.00	Bird 428D-83I-01-T	1	0.000	0.000	8.90	0.540	0.50
82.00	dbSpectra DS7C09P36U-D	2	0.000	7.100	70.00	3.550	1.00
82.00	Pole Mount	1	0.000	0.000	40.00	1.630	1.00
77.00	Ericsson AIR-32 B2A/B66Aa	3	0.000	0.000	132.20	6.510	0.71
77.00	Ericsson Radio 4449 B12,B71	3	0.000	0.000	74.00	1.640	0.50
77.00	Ericsson RRUS 32 B66	3	0.000	0.000	53.00	2.740	0.67
77.00	Flat T-Arms	3	0.000	0.000	250.00	12.900	0.67
77.00	RFS APX16DWV-16DWVS-E-A20	3	0.000	0.000	41.90	7.010	0.60
77.00	RFS APXVAARR24_43-U-NA20	3	0.000	0.000	127.90	20.240	0.63
75.00	Pine Branches	1	0.000	0.400	600.00	45.000	1.00
70.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
68.00	CCI DTMABP7819VG12A	6	0.000	0.000	19.20	0.970	0.50
68.00	CCI OPA-65R-LCUU-H6	3	0.000	0.000	73.00	9.660	0.66
68.00	Ericsson RRUS 32 B2	3	0.000	0.000	53.00	2.740	0.67
68.00	Ericsson RRUS 4426 B66	3	0.000	0.000	48.40	1.650	0.50
68.00	Ericsson RRUS-11	3	0.000	0.000	55.00	3.790	0.67
68.00	Ericsson RRUS-32 (77 lbs)	3	0.000	0.000	77.00	3.310	0.67
68.00	Flat T-Arm	3	0.000	0.000	250.00	12.900	0.67
68.00	Powerwave Allgon P65-16-XLH-	3	0.000	0.000	53.00	8.130	0.67
68.00	Quintel QS66512-2	3	0.000	0.000	111.00	8.130	0.74
68.00	Raycap DC6-48-60-18-8F(32.8 lb	2	0.000	0.000	32.80	1.280	1.00
65.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
60.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
57.00	Alcatel-Lucent B66 RRH4x45	3	0.000	0.000	67.00	2.580	0.67
57.00	Alcatel-Lucent RRH 2X60-1900	3	0.000	0.000	39.60	1.880	0.50
57.00	Alcatel-Lucent RRH2x60 700	3	0.000	0.000	56.70	2.150	0.67
57.00	Amphenol Antel BXA-171063-	3	0.000	0.000	12.80	4.800	0.72
57.00	Amphenol Antel LPA-80063-6CF-	6	0.000	0.000	27.00	9.730	0.75
57.00	Commscope RC2DC-4750-PF-48	2	0.000	0.000	26.00	3.780	0.67
57.00	Commscope SBNHH-1D45A	4	0.000	0.000	50.50	7.240	0.63
57.00	Commscope SBNHH-1D65A	2	0.000	0.000	33.50	5.880	0.69
57.00	Flat T-Arm	3	0.000	0.000	250.00	12.900	0.67
57.00	VZW Unused Reserve: 14,138 sq	1	0.000	-1.000	1488.70	98.260	1.00
55.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
50.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
45.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
40.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
35.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
30.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
25.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
20.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
15.00	Pine Branches	1	0.000	0.000	600.00	45.000	1.00
Totals	Num Loadings:42	97			15617.90		

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	82.00	2	1/2" Coax	0.63	0.15	N	0.00	N	Town of Greenwich, CT
0.00	82.00	2	7/8" Coax	1.09	0.33	N	0.00	N	Town of Greenwich, CT
0.00	77.00	2	1 5/8" Fiber	1.63	1.61	N	0.00	N	T-Mobile
0.00	77.00	1	1 5/8" Fiber	1.63	1.61	N	0.00	N	T-Mobile
0.00	68.00	2	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
0.00	68.00	4	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	68.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
0.00	68.00	1	2" Conduit	2.38	3.65	N	0.00	N	AT&T Mobility
0.00	68.00	1	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
0.00	57.00	18	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
0.00	57.00	1	1 5/8" Fiber	1.63	1.61	N	0.00	N	Verizon
0.00	57.00	1	1 5/8" Hybriflex	1.98	1.30	N	0.00	N	Verizon

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.5000	52.000	81.728	27,386.5	16.57	104.00	81.9	1037.	0.0	0.0
5.00		0.5000	50.321	79.063	24,794.4	15.98	100.64	82.6	970.5	0.0	1,367.8
10.00		0.5000	48.642	76.399	22,371.2	15.39	97.28	82.6	905.9	0.0	1,322.5
15.00		0.5000	46.963	73.734	20,111.3	14.80	93.93	82.6	843.5	0.0	1,277.2
20.00		0.5000	45.284	71.070	18,009.0	14.21	90.57	82.6	783.3	0.0	1,231.8
22.69	Bot - Section 2	0.5000	44.382	69.638	16,942.1	13.89	88.76	82.6	751.9	0.0	643.4
25.00		0.5000	43.605	68.406	16,058.5	13.61	87.21	82.6	725.4	0.0	1,028.6
28.85	Top - Section 1	0.4375	43.187	59.361	13,706.1	15.64	98.71	82.6	625.1	0.0	1,672.8
30.00		0.4375	42.801	58.825	13,338.5	15.49	97.83	82.6	613.8	0.0	230.9
35.00		0.4375	41.122	56.494	11,814.7	14.81	93.99	82.6	565.9	0.0	981.0
40.00		0.4375	39.443	54.163	10,411.5	14.13	90.16	82.6	519.9	0.0	941.3
45.00		0.4375	37.764	51.831	9,124.1	13.46	86.32	82.6	475.9	0.0	901.7
47.16	Bot - Section 3	0.4375	37.040	50.825	8,602.8	13.16	84.66	82.6	457.5	0.0	377.1
50.00		0.4375	36.086	49.500	7,947.5	12.78	82.48	82.6	433.8	0.0	838.5
52.38	Top - Section 2	0.3125	35.911	35.308	5,653.3	18.50	114.92	79.6	310.1	0.0	685.6
55.00		0.3125	35.032	34.436	5,244.4	18.00	112.10	80.2	294.9	0.0	310.9
57.00		0.3125	34.360	33.770	4,945.9	17.62	109.95	80.7	283.5	0.0	232.1
60.00		0.3125	33.353	32.770	4,519.8	17.06	106.73	81.3	266.9	0.0	339.6
65.00		0.3125	31.674	31.105	3,865.2	16.11	101.36	82.5	240.4	0.0	543.4
68.00		0.3125	30.666	30.106	3,504.6	15.54	98.13	82.6	225.1	0.0	312.4
70.00		0.3125	29.995	29.440	3,277.1	15.16	95.98	82.6	215.2	0.0	202.6
75.00		0.3125	28.316	27.775	2,751.8	14.21	90.61	82.6	191.4	0.0	486.7
76.68	Top - Section 3	0.3125	27.752	27.215	2,588.8	13.90	88.81	82.6	183.7	0.0	157.2
76.68	Bot - Section 4	0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	
77.00		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	4.8
80.00		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	45.0
82.00		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	30.0
82.68		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	10.2
											16,175.3

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:41 PM

Customer: T-MOBILE

Load Case: 1.2D + 1.6W 93 mph with No Ice 15 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		221.4	0.0					0.0	0.0	221.4	0.0	0.0	0.0
5.00		435.5	1,641.4					0.0	282.1	435.5	1,923.5	0.0	0.0
10.00		420.9	1,587.0					0.0	282.1	420.9	1,869.1	0.0	0.0
15.00	Appurtenance(s)	412.7	1,532.6	1,416.0	0.0	0.0	720.0	0.0	282.1	1,828.8	2,534.7	0.0	0.0
20.00	Appurtenance(s)	318.0	1,478.2	1,502.5	0.0	0.0	720.0	0.0	282.1	1,820.5	2,480.3	0.0	0.0
22.69	Bot - Section 2	211.0	772.1					0.0	151.6	211.0	923.7	0.0	0.0
25.00	Appurtenance(s)	263.9	1,234.3	1,574.7	0.0	0.0	720.0	0.0	130.5	1,838.6	2,084.8	0.0	0.0
28.85	Top - Section 1	214.2	2,007.4					0.0	217.3	214.2	2,224.7	0.0	0.0
30.00	Appurtenance(s)	262.6	277.1	1,636.4	0.0	0.0	720.0	0.0	64.8	1,898.9	1,061.9	0.0	0.0
35.00	Appurtenance(s)	424.5	1,177.2	1,690.3	0.0	0.0	720.0	0.0	282.1	2,114.8	2,179.3	0.0	0.0
40.00	Appurtenance(s)	418.8	1,129.6	1,738.5	0.0	0.0	720.0	0.0	282.1	2,157.3	2,131.7	0.0	0.0
45.00	Appurtenance(s)	296.1	1,082.0	1,782.2	0.0	0.0	720.0	0.0	282.1	2,078.3	2,084.1	0.0	0.0
47.16	Bot - Section 3	205.3	452.5					0.0	121.8	205.3	574.3	0.0	0.0
50.00	Appurtenance(s)	213.7	1,006.3	1,822.1	0.0	0.0	720.0	0.0	160.3	2,035.8	1,886.5	0.0	0.0
52.38	Top - Section 2	201.8	822.7					0.0	134.3	201.8	957.0	0.0	0.0
55.00	Appurtenance(s)	184.2	373.0	1,859.1	0.0	0.0	720.0	0.0	147.8	2,043.3	1,240.8	0.0	0.0
57.00	Appurtenance(s)	196.0	278.5	8,144.5	0.0	-4,074.8	3,900.0	0.0	112.8	8,340.5	4,291.3	0.0	0.0
60.00	Appurtenance(s)	306.6	407.6	1,893.4	0.0	0.0	720.0	0.0	105.6	2,200.1	1,233.2	0.0	0.0
65.00	Appurtenance(s)	300.3	652.1	1,925.6	0.0	0.0	720.0	0.0	176.0	2,225.9	1,548.1	0.0	0.0
68.00	Appurtenance(s)	182.9	374.9	3,647.8	0.0	0.0	2,810.4	0.0	105.6	3,830.6	3,290.9	0.0	0.0
70.00	Appurtenance(s)	247.8	243.1	1,955.9	0.0	0.0	720.0	0.0	13.9	2,203.7	977.0	0.0	0.0
75.00	Appurtenance(s)	232.8	584.1	1,986.7	0.0	794.7	720.0	0.0	34.7	2,219.5	1,338.8	0.0	0.0
76.68	Top - Section 3	59.9	188.6					0.0	11.7	59.9	200.3	0.0	0.0
77.00	Appurtenance(s)	27.8	5.8	3,441.7	0.0	0.0	2,444.4	0.0	2.2	3,469.5	2,452.4	0.0	0.0
80.00		42.0	54.0					0.0	3.5	42.0	57.4	0.0	0.0
82.00	Appurtenance(s)	22.5	36.0	410.1	0.0	2,305.2	226.7	0.0	2.3	432.6	265.0	0.0	0.0
82.68		5.7	12.2					0.0	0.0	5.7	12.2	0.0	0.0
								Totals:		44,756.6	41,822.8	0.00	0.00

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:43 PM

Customer: T-MOBILE

Load Case: 1.2D + 1.6W 93 mph with No Ice 15 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Calculated Forces

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 (deg)	Ratio
0.00	-41.78	-44.58	0.00	-2,338.09	0.00	2,338.09	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.374
5.00	-39.76	-44.22	0.00	-2,115.20	0.00	2,115.20	5,874.00	2,937.00	11,999.0	6,008.46	0.06	-0.12	0.359
10.00	-37.81	-43.87	0.00	-1,894.10	0.00	1,894.10	5,676.05	2,838.02	11,200.1	5,608.37	0.25	-0.23	0.345
15.00	-35.20	-42.10	0.00	-1,674.75	0.00	1,674.75	5,478.10	2,739.05	10,428.6	5,222.07	0.55	-0.34	0.327
20.00	-32.67	-40.31	0.00	-1,464.26	0.00	1,464.26	5,280.14	2,640.07	9,684.72	4,849.56	0.98	-0.46	0.308
22.69	-31.71	-40.12	0.00	-1,355.94	0.00	1,355.94	5,173.75	2,586.87	9,296.23	4,655.02	1.25	-0.52	0.298
25.00	-29.60	-38.30	0.00	-1,263.16	0.00	1,263.16	5,082.19	2,541.10	8,968.32	4,490.82	1.51	-0.57	0.287
28.85	-27.34	-38.08	0.00	-1,115.66	0.00	1,115.66	4,410.21	2,205.11	7,728.69	3,870.09	2.00	-0.65	0.295
30.00	-26.26	-36.20	0.00	-1,071.93	0.00	1,071.93	4,370.43	2,185.21	7,589.18	3,800.23	2.16	-0.67	0.288
35.00	-24.05	-34.10	0.00	-890.92	0.00	890.92	4,197.22	2,098.61	6,996.61	3,503.50	2.93	-0.78	0.260
40.00	-21.90	-31.95	0.00	-720.41	0.00	720.41	4,024.01	2,012.01	6,428.12	3,218.84	3.79	-0.87	0.230
45.00	-19.82	-29.86	0.00	-560.66	0.00	560.66	3,850.81	1,925.40	5,883.72	2,946.23	4.76	-0.96	0.196
47.16	-19.23	-29.66	0.00	-496.20	0.00	496.20	3,776.02	1,888.01	5,656.10	2,832.26	5.20	-1.00	0.181
50.00	-17.36	-27.60	0.00	-411.94	0.00	411.94	3,677.60	1,838.80	5,363.40	2,685.69	5.81	-1.04	0.158
52.38	-16.39	-27.39	0.00	-346.25	0.00	346.25	2,530.81	1,265.41	3,698.60	1,852.05	6.34	-1.07	0.194
55.00	-15.17	-25.33	0.00	-274.49	0.00	274.49	2,486.37	1,243.18	3,543.07	1,774.17	6.93	-1.10	0.161
57.00	-11.04	-16.91	0.00	-223.83	0.00	223.83	2,451.82	1,225.91	3,425.65	1,715.37	7.40	-1.13	0.135
60.00	-9.84	-14.70	0.00	-173.09	0.00	173.09	2,398.99	1,199.50	3,251.77	1,628.30	8.12	-1.16	0.111
65.00	-8.33	-12.44	0.00	-99.61	0.00	99.61	2,308.28	1,154.14	2,968.33	1,486.37	9.37	-1.21	0.071
68.00	-5.12	-8.54	0.00	-62.28	0.00	62.28	2,236.73	1,118.37	2,783.02	1,393.58	10.13	-1.22	0.047
70.00	-4.19	-6.32	0.00	-45.19	0.00	45.19	2,187.24	1,093.62	2,660.62	1,332.29	10.65	-1.23	0.036
75.00	-2.90	-4.07	0.00	-12.79	0.00	12.79	2,063.52	1,031.76	2,366.67	1,185.09	11.95	-1.25	0.012
76.68	-2.70	-4.01	0.00	-5.95	0.00	5.95	2,021.95	1,010.98	2,271.76	1,137.57	12.39	-1.25	0.007
76.68	-2.70	-4.01	0.00	-5.95	0.00	5.95	182.47	91.23	29.26	20.19	12.39	-1.25	0.311
77.00	-0.32	-0.49	0.00	-4.67	0.00	4.67	182.47	91.23	29.26	20.19	12.47	-1.25	0.233
80.00	-0.26	-0.45	0.00	-3.20	0.00	3.20	182.47	91.23	29.26	20.19	13.37	-1.60	0.160
82.00	-0.01	-0.01	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	14.08	-1.76	0.000
82.68	0.00	-0.01	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	14.33	-1.76	0.000

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:43 PM

Customer: T-MOBILE

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 15 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		221.4	0.0					0.0	0.0	221.4	0.0	0.0	0.0
5.00		435.5	1,231.1					0.0	211.5	435.5	1,442.6	0.0	0.0
10.00		420.9	1,190.3					0.0	211.5	420.9	1,401.8	0.0	0.0
15.00	Appurtenance(s)	412.7	1,149.5	1,416.0	0.0	0.0	540.0	0.0	211.5	1,828.8	1,901.0	0.0	0.0
20.00	Appurtenance(s)	318.0	1,108.7	1,502.5	0.0	0.0	540.0	0.0	211.5	1,820.5	1,860.2	0.0	0.0
22.69	Bot - Section 2	211.0	579.0					0.0	113.7	211.0	692.8	0.0	0.0
25.00	Appurtenance(s)	263.9	925.7	1,574.7	0.0	0.0	540.0	0.0	97.8	1,838.6	1,563.6	0.0	0.0
28.85	Top - Section 1	214.2	1,505.5					0.0	163.0	214.2	1,668.5	0.0	0.0
30.00	Appurtenance(s)	262.6	207.8	1,636.4	0.0	0.0	540.0	0.0	48.6	1,898.9	796.4	0.0	0.0
35.00	Appurtenance(s)	424.5	882.9	1,690.3	0.0	0.0	540.0	0.0	211.5	2,114.8	1,634.5	0.0	0.0
40.00	Appurtenance(s)	418.8	847.2	1,738.5	0.0	0.0	540.0	0.0	211.5	2,157.3	1,598.8	0.0	0.0
45.00	Appurtenance(s)	296.1	811.5	1,782.2	0.0	0.0	540.0	0.0	211.5	2,078.3	1,563.1	0.0	0.0
47.16	Bot - Section 3	205.3	339.4					0.0	91.3	205.3	430.7	0.0	0.0
50.00	Appurtenance(s)	213.7	754.7	1,822.1	0.0	0.0	540.0	0.0	120.2	2,035.8	1,414.9	0.0	0.0
52.38	Top - Section 2	201.8	617.0					0.0	100.7	201.8	717.7	0.0	0.0
55.00	Appurtenance(s)	184.2	279.8	1,859.1	0.0	0.0	540.0	0.0	110.8	2,043.3	930.6	0.0	0.0
57.00	Appurtenance(s)	196.0	208.9	8,144.5	0.0	-4,074.8	2,925.0	0.0	84.6	8,340.5	3,218.5	0.0	0.0
60.00	Appurtenance(s)	306.6	305.7	1,893.4	0.0	0.0	540.0	0.0	79.2	2,200.1	924.9	0.0	0.0
65.00	Appurtenance(s)	300.3	489.0	1,925.6	0.0	0.0	540.0	0.0	132.0	2,225.9	1,161.1	0.0	0.0
68.00	Appurtenance(s)	182.9	281.2	3,647.8	0.0	0.0	2,107.8	0.0	79.2	3,830.6	2,468.2	0.0	0.0
70.00	Appurtenance(s)	247.8	182.4	1,955.9	0.0	0.0	540.0	0.0	10.4	2,203.7	732.8	0.0	0.0
75.00	Appurtenance(s)	232.8	438.1	1,986.7	0.0	794.7	540.0	0.0	26.1	2,219.5	1,004.1	0.0	0.0
76.68	Top - Section 3	59.9	141.5					0.0	8.8	59.9	150.2	0.0	0.0
77.00	Appurtenance(s)	27.8	4.3	3,441.7	0.0	0.0	1,833.3	0.0	1.7	3,469.5	1,839.3	0.0	0.0
80.00		42.0	40.5					0.0	2.6	42.0	43.1	0.0	0.0
82.00	Appurtenance(s)	22.5	27.0	410.1	0.0	2,305.2	170.0	0.0	1.7	432.6	198.7	0.0	0.0
82.68		5.7	9.2					0.0	0.0	5.7	9.2	0.0	0.0
								Totals:		44,756.6	31,367.1	0.00	0.00

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:45 PM

Customer: T-MOBILE

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 15 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Calculated Forces

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 (deg)	Ratio
0.00	-31.32	-44.57	0.00	-2,333.44	0.00	2,333.44	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.372
5.00	-29.79	-44.19	0.00	-2,110.60	0.00	2,110.60	5,874.00	2,937.00	11,999.0	6,008.46	0.06	-0.12	0.357
10.00	-28.30	-43.82	0.00	-1,889.65	0.00	1,889.65	5,676.05	2,838.02	11,200.1	5,608.37	0.25	-0.23	0.342
15.00	-26.33	-42.04	0.00	-1,670.54	0.00	1,670.54	5,478.10	2,739.05	10,428.6	5,222.07	0.55	-0.34	0.325
20.00	-24.42	-40.24	0.00	-1,460.37	0.00	1,460.37	5,280.14	2,640.07	9,684.72	4,849.56	0.97	-0.45	0.306
22.69	-23.69	-40.04	0.00	-1,352.23	0.00	1,352.23	5,173.75	2,586.87	9,296.23	4,655.02	1.25	-0.51	0.295
25.00	-22.10	-38.22	0.00	-1,259.63	0.00	1,259.63	5,082.19	2,541.10	8,968.32	4,490.82	1.51	-0.56	0.285
28.85	-20.40	-38.00	0.00	-1,112.45	0.00	1,112.45	4,410.21	2,205.11	7,728.69	3,870.09	2.00	-0.65	0.292
30.00	-19.58	-36.12	0.00	-1,068.80	0.00	1,068.80	4,370.43	2,185.21	7,589.18	3,800.23	2.16	-0.67	0.286
35.00	-17.92	-34.01	0.00	-888.22	0.00	888.22	4,197.22	2,098.61	6,996.61	3,503.50	2.92	-0.77	0.258
40.00	-16.30	-31.86	0.00	-718.16	0.00	718.16	4,024.01	2,012.01	6,428.12	3,218.84	3.78	-0.87	0.227
45.00	-14.74	-29.77	0.00	-558.86	0.00	558.86	3,850.81	1,925.40	5,883.72	2,946.23	4.75	-0.96	0.194
47.16	-14.29	-29.57	0.00	-494.59	0.00	494.59	3,776.02	1,888.01	5,656.10	2,832.26	5.19	-0.99	0.179
50.00	-12.89	-27.52	0.00	-410.58	0.00	410.58	3,677.60	1,838.80	5,363.40	2,685.69	5.79	-1.04	0.157
52.38	-12.17	-27.31	0.00	-345.09	0.00	345.09	2,530.81	1,265.41	3,698.60	1,852.05	6.32	-1.07	0.192
55.00	-11.26	-25.25	0.00	-273.54	0.00	273.54	2,486.37	1,243.18	3,543.07	1,774.17	6.92	-1.10	0.159
57.00	-8.20	-16.86	0.00	-223.04	0.00	223.04	2,451.82	1,225.91	3,425.65	1,715.37	7.38	-1.13	0.134
60.00	-7.31	-14.64	0.00	-172.47	0.00	172.47	2,398.99	1,199.50	3,251.77	1,628.30	8.10	-1.16	0.109
65.00	-6.18	-12.40	0.00	-99.25	0.00	99.25	2,308.28	1,154.14	2,968.33	1,486.37	9.34	-1.20	0.070
68.00	-3.80	-8.52	0.00	-62.06	0.00	62.06	2,236.73	1,118.37	2,783.02	1,393.58	10.11	-1.22	0.046
70.00	-3.11	-6.30	0.00	-45.03	0.00	45.03	2,187.24	1,093.62	2,660.62	1,332.29	10.62	-1.23	0.035
75.00	-2.15	-4.06	0.00	-12.75	0.00	12.75	2,063.52	1,031.76	2,366.67	1,185.09	11.92	-1.24	0.012
76.68	-2.00	-3.99	0.00	-5.93	0.00	5.93	2,021.95	1,010.98	2,271.76	1,137.57	12.36	-1.24	0.006
76.68	-2.00	-3.99	0.00	-5.93	0.00	5.93	182.47	91.23	29.26	20.19	12.36	-1.24	0.307
77.00	-0.24	-0.49	0.00	-4.66	0.00	4.66	182.47	91.23	29.26	20.19	12.44	-1.24	0.232
80.00	-0.19	-0.44	0.00	-3.20	0.00	3.20	182.47	91.23	29.26	20.19	13.34	-1.59	0.159
82.00	-0.01	-0.01	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	14.04	-1.76	0.000
82.68	0.00	-0.01	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	14.29	-1.76	0.000

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:46 PM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 15 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		77.1	0.0					0.0	0.0	77.1	0.0	0.0	0.0
5.00		152.2	2,015.1					0.0	282.1	152.2	2,297.2	0.0	0.0
10.00		147.9	1,991.6					0.0	282.1	147.9	2,273.7	0.0	0.0
15.00	Appurtenance(s)	145.6	1,944.7	395.1	0.0	0.0	1,646.7	0.0	282.1	540.8	3,873.4	0.0	0.0
20.00	Appurtenance(s)	112.6	1,890.0	424.3	0.0	0.0	1,657.9	0.0	282.1	536.8	3,829.9	0.0	0.0
22.69	Bot - Section 2	74.8	993.6					0.0	151.6	74.8	1,145.2	0.0	0.0
25.00	Appurtenance(s)	93.8	1,427.5	449.7	0.0	0.0	1,668.5	0.0	130.5	543.5	3,226.5	0.0	0.0
28.85	Top - Section 1	76.2	2,324.1					0.0	217.3	76.2	2,541.4	0.0	0.0
30.00	Appurtenance(s)	93.7	371.6	471.0	0.0	0.0	1,675.9	0.0	64.8	564.7	2,112.3	0.0	0.0
35.00	Appurtenance(s)	151.8	1,577.0	488.3	0.0	0.0	1,679.5	0.0	282.1	640.1	3,538.5	0.0	0.0
40.00	Appurtenance(s)	150.4	1,519.4	504.9	0.0	0.0	1,684.6	0.0	282.1	655.3	3,486.1	0.0	0.0
45.00	Appurtenance(s)	106.6	1,460.7	520.1	0.0	0.0	1,689.2	0.0	282.1	626.7	3,432.0	0.0	0.0
47.16	Bot - Section 3	74.1	614.3					0.0	121.8	74.1	736.1	0.0	0.0
50.00	Appurtenance(s)	77.2	1,218.6	534.5	0.0	0.0	1,694.2	0.0	160.3	611.7	3,073.1	0.0	0.0
52.38	Top - Section 2	73.1	997.9					0.0	134.3	73.1	1,132.1	0.0	0.0
55.00	Appurtenance(s)	66.9	562.2	547.4	0.0	0.0	1,698.0	0.0	147.8	614.3	2,407.9	0.0	0.0
57.00	Appurtenance(s)	71.4	420.9	2,146.6	0.0	-1,201.8	6,965.7	0.0	112.8	2,217.9	7,499.4	0.0	0.0
60.00	Appurtenance(s)	112.0	616.1	559.4	0.0	0.0	1,701.2	0.0	105.6	671.4	2,422.9	0.0	0.0
65.00	Appurtenance(s)	110.0	985.2	570.4	0.0	0.0	1,703.7	0.0	176.0	680.4	2,865.0	0.0	0.0
68.00	Appurtenance(s)	67.3	570.0	885.4	0.0	0.0	5,528.6	0.0	105.6	952.6	6,204.2	0.0	0.0
70.00	Appurtenance(s)	91.6	371.0	581.6	0.0	0.0	1,707.6	0.0	13.9	673.2	2,092.4	0.0	0.0
75.00	Appurtenance(s)	86.2	888.3	591.9	0.0	236.8	1,709.5	0.0	34.7	678.2	2,632.5	0.0	0.0
76.68	Top - Section 3	22.3	289.4					0.0	11.7	22.3	301.1	0.0	0.0
77.00	Appurtenance(s)	10.4	9.7	788.9	0.0	0.0	5,209.3	0.0	2.2	799.3	5,221.2	0.0	0.0
80.00		15.7	90.8					0.0	3.5	15.7	94.2	0.0	0.0
82.00	Appurtenance(s)	8.5	60.6	162.5	0.0	981.7	574.4	0.0	2.3	171.0	637.3	0.0	0.0
82.68		2.2	20.6					0.0	0.0	2.2	20.6	0.0	0.0
								Totals:		12,893.4	69,096.2	0.00	0.00

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:48 PM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 15 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

Calculated Forces

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 (deg)	Ratio
0.00	-69.09	-12.84	0.00	-667.22	0.00	667.22	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.116
5.00	-66.79	-12.72	0.00	-603.03	0.00	603.03	5,874.00	2,937.00	11,999.0	6,008.46	0.02	-0.03	0.112
10.00	-64.51	-12.61	0.00	-539.42	0.00	539.42	5,676.05	2,838.02	11,200.1	5,608.37	0.07	-0.07	0.108
15.00	-60.63	-12.10	0.00	-476.38	0.00	476.38	5,478.10	2,739.05	10,428.6	5,222.07	0.16	-0.10	0.102
20.00	-56.79	-11.58	0.00	-415.90	0.00	415.90	5,280.14	2,640.07	9,684.72	4,849.56	0.28	-0.13	0.097
22.69	-55.65	-11.51	0.00	-384.79	0.00	384.79	5,173.75	2,586.87	9,296.23	4,655.02	0.36	-0.15	0.093
25.00	-52.42	-10.98	0.00	-358.16	0.00	358.16	5,082.19	2,541.10	8,968.32	4,490.82	0.43	-0.16	0.090
28.85	-49.87	-10.91	0.00	-315.88	0.00	315.88	4,410.21	2,205.11	7,728.69	3,870.09	0.57	-0.18	0.093
30.00	-47.76	-10.35	0.00	-303.35	0.00	303.35	4,370.43	2,185.21	7,589.18	3,800.23	0.62	-0.19	0.091
35.00	-44.22	-9.72	0.00	-251.59	0.00	251.59	4,197.22	2,098.61	6,996.61	3,503.50	0.83	-0.22	0.082
40.00	-40.73	-9.07	0.00	-202.99	0.00	202.99	4,024.01	2,012.01	6,428.12	3,218.84	1.08	-0.25	0.073
45.00	-37.30	-8.44	0.00	-157.65	0.00	157.65	3,850.81	1,925.40	5,883.72	2,946.23	1.35	-0.27	0.063
47.16	-36.56	-8.37	0.00	-139.43	0.00	139.43	3,776.02	1,888.01	5,656.10	2,832.26	1.48	-0.28	0.059
50.00	-33.49	-7.75	0.00	-115.66	0.00	115.66	3,677.60	1,838.80	5,363.40	2,685.69	1.65	-0.29	0.052
52.38	-32.36	-7.67	0.00	-97.22	0.00	97.22	2,530.81	1,265.41	3,698.60	1,852.05	1.80	-0.30	0.065
55.00	-29.95	-7.05	0.00	-77.12	0.00	77.12	2,486.37	1,243.18	3,543.07	1,774.17	1.97	-0.31	0.056
57.00	-22.46	-4.79	0.00	-63.02	0.00	63.02	2,451.82	1,225.91	3,425.65	1,715.37	2.10	-0.32	0.046
60.00	-20.04	-4.11	0.00	-48.64	0.00	48.64	2,398.99	1,199.50	3,251.77	1,628.30	2.31	-0.33	0.038
65.00	-17.18	-3.42	0.00	-28.08	0.00	28.08	2,308.28	1,154.14	2,968.33	1,486.37	2.66	-0.34	0.026
68.00	-10.98	-2.43	0.00	-17.82	0.00	17.82	2,236.73	1,118.37	2,783.02	1,393.58	2.88	-0.35	0.018
70.00	-8.90	-1.74	0.00	-12.97	0.00	12.97	2,187.24	1,093.62	2,660.62	1,332.29	3.02	-0.35	0.014
75.00	-6.27	-1.05	0.00	-4.01	0.00	4.01	2,063.52	1,031.76	2,366.67	1,185.09	3.39	-0.35	0.006
76.68	-5.97	-1.02	0.00	-2.25	0.00	2.25	2,021.95	1,010.98	2,271.76	1,137.57	3.51	-0.35	0.005
76.68	-5.97	-1.02	0.00	-2.25	0.00	2.25	182.47	91.23	29.26	20.19	3.51	-0.35	0.144
77.00	-0.75	-0.19	0.00	-1.92	0.00	1.92	182.47	91.23	29.26	20.19	3.54	-0.35	0.099
80.00	-0.66	-0.18	0.00	-1.34	0.00	1.34	182.47	91.23	29.26	20.19	3.81	-0.50	0.070
82.00	-0.02	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	4.03	-0.57	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	4.11	-0.57	0.000

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:48 PM

Customer: T-MOBILE

Load Case: 1.0D + 1.0W Serviceability 60 mph 15 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		57.6	0.0					0.0	0.0	57.6	0.0	0.0	0.0
5.00		113.3	1,367.8					0.0	235.1	113.3	1,602.9	0.0	0.0
10.00		109.5	1,322.5					0.0	235.1	109.5	1,557.6	0.0	0.0
15.00	Appurtenance(s)	107.4	1,277.2	368.4	0.0	0.0	600.0	0.0	235.1	475.7	2,112.2	0.0	0.0
20.00	Appurtenance(s)	82.7	1,231.8	390.9	0.0	0.0	600.0	0.0	235.1	473.6	2,066.9	0.0	0.0
22.69	Bot - Section 2	54.9	643.4					0.0	126.3	54.9	769.7	0.0	0.0
25.00	Appurtenance(s)	68.7	1,028.6	409.7	0.0	0.0	600.0	0.0	108.7	478.3	1,737.3	0.0	0.0
28.85	Top - Section 1	55.7	1,672.8					0.0	181.1	55.7	1,853.9	0.0	0.0
30.00	Appurtenance(s)	68.3	230.9	425.7	0.0	0.0	600.0	0.0	54.0	494.0	884.9	0.0	0.0
35.00	Appurtenance(s)	110.4	981.0	439.7	0.0	0.0	600.0	0.0	235.1	550.2	1,816.1	0.0	0.0
40.00	Appurtenance(s)	109.0	941.3	452.3	0.0	0.0	600.0	0.0	235.1	561.2	1,776.4	0.0	0.0
45.00	Appurtenance(s)	77.0	901.7	463.6	0.0	0.0	600.0	0.0	235.1	540.7	1,736.7	0.0	0.0
47.16	Bot - Section 3	53.4	377.1					0.0	101.5	53.4	478.5	0.0	0.0
50.00	Appurtenance(s)	55.6	838.5	474.0	0.0	0.0	600.0	0.0	133.6	529.6	1,572.1	0.0	0.0
52.38	Top - Section 2	52.5	685.6					0.0	111.9	52.5	797.5	0.0	0.0
55.00	Appurtenance(s)	47.9	310.9	483.6	0.0	0.0	600.0	0.0	123.2	531.5	1,034.0	0.0	0.0
57.00	Appurtenance(s)	51.0	232.1	2,118.8	0.0	-1,060.0	3,250.0	0.0	94.0	2,169.8	3,576.1	0.0	0.0
60.00	Appurtenance(s)	79.8	339.6	492.6	0.0	0.0	600.0	0.0	88.0	572.3	1,027.7	0.0	0.0
65.00	Appurtenance(s)	78.1	543.4	500.9	0.0	0.0	600.0	0.0	146.7	579.1	1,290.1	0.0	0.0
68.00	Appurtenance(s)	47.6	312.4	948.9	0.0	0.0	2,342.0	0.0	88.0	996.5	2,742.5	0.0	0.0
70.00	Appurtenance(s)	64.5	202.6	508.8	0.0	0.0	600.0	0.0	11.6	573.3	814.2	0.0	0.0
75.00	Appurtenance(s)	60.6	486.7	516.8	0.0	206.7	600.0	0.0	29.0	577.4	1,115.7	0.0	0.0
76.68	Top - Section 3	15.7	157.2					0.0	9.7	15.7	166.9	0.0	0.0
77.00	Appurtenance(s)	8.6	4.8	895.3	0.0	0.0	2,037.0	0.0	1.9	904.0	2,043.7	0.0	0.0
80.00		13.1	45.0					0.0	2.9	13.1	47.9	0.0	0.0
82.00	Appurtenance(s)	7.0	30.0	106.7	0.0	599.7	188.9	0.0	1.9	113.7	220.8	0.0	0.0
82.68		1.8	10.2					0.0	0.0	1.8	10.2	0.0	0.0
								Totals:		11,648.4	34,852.4	0.00	0.00

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA737002_C3_02 10/1/2018 1:30:51 PM

Customer: T-MOBILE

Load Case: 1.0D + 1.0W Serviceability 60 mph 15 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Calculated Forces

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 (deg)	Ratio
0.00	-34.85	-11.60	0.00	-607.90	0.00	607.90	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.101
5.00	-33.24	-11.50	0.00	-549.90	0.00	549.90	5,874.00	2,937.00	11,999.0	6,008.46	0.02	-0.03	0.097
10.00	-31.68	-11.41	0.00	-492.38	0.00	492.38	5,676.05	2,838.02	11,200.1	5,608.37	0.06	-0.06	0.093
15.00	-29.56	-10.95	0.00	-435.33	0.00	435.33	5,478.10	2,739.05	10,428.6	5,222.07	0.14	-0.09	0.089
20.00	-27.49	-10.48	0.00	-380.60	0.00	380.60	5,280.14	2,640.07	9,684.72	4,849.56	0.25	-0.12	0.084
22.69	-26.72	-10.43	0.00	-352.44	0.00	352.44	5,173.75	2,586.87	9,296.23	4,655.02	0.32	-0.13	0.081
25.00	-24.98	-9.95	0.00	-328.32	0.00	328.32	5,082.19	2,541.10	8,968.32	4,490.82	0.39	-0.15	0.078
28.85	-23.12	-9.90	0.00	-289.98	0.00	289.98	4,410.21	2,205.11	7,728.69	3,870.09	0.52	-0.17	0.080
30.00	-22.24	-9.41	0.00	-278.61	0.00	278.61	4,370.43	2,185.21	7,589.18	3,800.23	0.56	-0.17	0.078
35.00	-20.42	-8.86	0.00	-231.57	0.00	231.57	4,197.22	2,098.61	6,996.61	3,503.50	0.76	-0.20	0.071
40.00	-18.64	-8.30	0.00	-187.26	0.00	187.26	4,024.01	2,012.01	6,428.12	3,218.84	0.99	-0.23	0.063
45.00	-16.90	-7.76	0.00	-145.75	0.00	145.75	3,850.81	1,925.40	5,883.72	2,946.23	1.24	-0.25	0.054
47.16	-16.42	-7.71	0.00	-129.00	0.00	129.00	3,776.02	1,888.01	5,656.10	2,832.26	1.35	-0.26	0.050
50.00	-14.85	-7.17	0.00	-107.10	0.00	107.10	3,677.60	1,838.80	5,363.40	2,685.69	1.51	-0.27	0.044
52.38	-14.05	-7.12	0.00	-90.03	0.00	90.03	2,530.81	1,265.41	3,698.60	1,852.05	1.65	-0.28	0.054
55.00	-13.02	-6.58	0.00	-71.39	0.00	71.39	2,486.37	1,243.18	3,543.07	1,774.17	1.80	-0.29	0.046
57.00	-9.46	-4.40	0.00	-58.22	0.00	58.22	2,451.82	1,225.91	3,425.65	1,715.37	1.92	-0.29	0.038
60.00	-8.43	-3.82	0.00	-45.03	0.00	45.03	2,398.99	1,199.50	3,251.77	1,628.30	2.11	-0.30	0.031
65.00	-7.14	-3.23	0.00	-25.93	0.00	25.93	2,308.28	1,154.14	2,968.33	1,486.37	2.44	-0.31	0.021
68.00	-4.41	-2.22	0.00	-16.23	0.00	16.23	2,236.73	1,118.37	2,783.02	1,393.58	2.63	-0.32	0.014
70.00	-3.60	-1.65	0.00	-11.78	0.00	11.78	2,187.24	1,093.62	2,660.62	1,332.29	2.77	-0.32	0.010
75.00	-2.48	-1.06	0.00	-3.35	0.00	3.35	2,063.52	1,031.76	2,366.67	1,185.09	3.11	-0.32	0.004
76.68	-2.32	-1.05	0.00	-1.56	0.00	1.56	2,021.95	1,010.98	2,271.76	1,137.57	3.22	-0.32	0.003
76.68	-2.32	-1.05	0.00	-1.56	0.00	1.56	182.47	91.23	29.26	20.19	3.22	-0.32	0.090
77.00	-0.28	-0.13	0.00	-1.23	0.00	1.23	182.47	91.23	29.26	20.19	3.24	-0.32	0.062
80.00	-0.23	-0.12	0.00	-0.84	0.00	0.84	182.47	91.23	29.26	20.19	3.48	-0.42	0.043
82.00	-0.01	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	3.66	-0.46	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	3.73	-0.46	0.000

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.26	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07	
Long-Period Transition Period (T_L):	6	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.59	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.28	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11	
Seismic Response Coefficient (C_s):	0.11	
Upper Limit C_s	0.11	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	0.72	
Redundancy Factor (p):	1.00	
Seismic Force Distribution Exponent (k):	1.11	
Total Unfactored Dead Load:	34.85	k
Seismic Base Shear (E):	3.68	k

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
26	82.34	10	1	0.001	2	13
25	81.00	32	4	0.002	7	40
24	78.50	48	6	0.003	10	60
23	76.84	7	1	0.000	1	8
22	75.84	167	20	0.009	33	210
21	72.50	516	59	0.026	97	648
20	69.00	214	23	0.010	38	269
19	66.50	400	42	0.019	68	503
18	62.50	690	67	0.030	110	867
17	58.50	428	39	0.017	63	537
16	56.00	326	28	0.012	46	410
15	53.69	434	36	0.016	58	545
14	51.19	797	63	0.028	102	1,001
13	48.58	972	72	0.032	117	1,221
12	46.08	479	33	0.015	54	601
11	42.50	1,137	73	0.032	118	1,427
10	37.50	1,176	65	0.029	106	1,477
9	32.50	1,216	58	0.025	94	1,527
8	29.43	285	12	0.005	20	358
7	26.93	1,854	71	0.031	116	2,328
6	23.84	1,137	38	0.017	62	1,428
5	21.34	770	23	0.010	37	967
4	17.50	1,467	35	0.015	57	1,842

3	12.50	1,512	25	0.011	40	1,899
2	7.50	1,558	15	0.006	24	1,956
1	2.50	1,603	4	0.002	7	2,013
Bird 428D-83I-01-T	82.00	9	1	0.001	2	11
Pole Mount	82.00	40	5	0.002	9	50
dbSpectra DS7C09P36U	82.00	140	18	0.008	30	176
Ericsson Radio 4449	77.00	222	27	0.012	45	279
Ericsson RRUS 32 B66	77.00	159	20	0.009	32	200
Ericsson AIR-32 B2A/	77.00	397	49	0.022	79	498
RFS APX16DWV-16DWVS-	77.00	126	15	0.007	25	158
Flat T-Arms	77.00	750	92	0.041	150	942
RFS APXVAARR24_43-U-	77.00	384	47	0.021	77	482
Pine Branches	75.00	600	72	0.032	117	753
Pine Branches	70.00	600	67	0.029	108	753
CCI DTMABP7819VG12A	68.00	115	12	0.005	20	145
Raycap DC6-48-60-18-	68.00	66	7	0.003	11	82
Ericsson RRUS 4426 B	68.00	145	16	0.007	25	182
Ericsson RRUS 32 B2	68.00	159	17	0.008	28	200
Ericsson RRUS-32 (77	68.00	231	25	0.011	40	290
Ericsson RRUS-11	68.00	165	18	0.008	29	207
Powerwave Allgon P65	68.00	159	17	0.008	28	200
Quintel QS66512-2	68.00	333	36	0.016	58	418
CCI OPA-65R-LCUU-H6	68.00	219	24	0.010	38	275
Flat T-Arm	68.00	750	81	0.036	131	942
Pine Branches	65.00	600	61	0.027	100	753
Pine Branches	60.00	600	56	0.025	91	753
Alcatel-Lucent RRH 2	57.00	119	10	0.005	17	149
Alcatel-Lucent RRH2x	57.00	170	15	0.007	24	214
Alcatel-Lucent B66 R	57.00	201	18	0.008	29	252
Commscope RC2DC-4750	57.00	52	5	0.002	7	65
Amphenol Antel BXA-1	57.00	38	3	0.001	6	48
Commscope SBNHH-1D65	57.00	67	6	0.003	10	84
Commscope SBNHH-1D45	57.00	202	18	0.008	29	254
Amphenol Antel LPA-8	57.00	162	14	0.006	23	203
Flat T-Arm	57.00	750	66	0.029	108	942
VZW Unused Reserve:	57.00	1,489	131	0.058	214	1,869
Pine Branches	55.00	600	51	0.022	83	753
Pine Branches	50.00	600	46	0.020	75	753
Pine Branches	45.00	600	41	0.018	66	753
Pine Branches	40.00	600	36	0.016	58	753
Pine Branches	35.00	600	31	0.014	50	753
Pine Branches	30.00	600	26	0.011	42	753
Pine Branches	25.00	600	21	0.009	35	753
Pine Branches	20.00	600	17	0.007	27	753
Pine Branches	15.00	600	12	0.005	20	753
		34,852	2,265	1.000	3,684	43,766

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
26	82.34	10	1	0.001	2	9
25	81.00	32	4	0.002	7	27
24	78.50	48	6	0.003	10	40
23	76.84	7	1	0.000	1	6
22	75.84	167	20	0.009	33	141
21	72.50	516	59	0.026	97	435
20	69.00	214	23	0.010	38	181
19	66.50	400	42	0.019	68	338
18	62.50	690	67	0.030	110	583

17	58.50	428	39	0.017	63	361
16	56.00	326	28	0.012	46	275
15	53.69	434	36	0.016	58	366
14	51.19	797	63	0.028	102	673
13	48.58	972	72	0.032	117	821
12	46.08	479	33	0.015	54	404
11	42.50	1,137	73	0.032	118	960
10	37.50	1,176	65	0.029	106	993
9	32.50	1,216	58	0.025	94	1,027
8	29.43	285	12	0.005	20	241
7	26.93	1,854	71	0.031	116	1,565
6	23.84	1,137	38	0.017	62	960
5	21.34	770	23	0.010	37	650
4	17.50	1,467	35	0.015	57	1,238
3	12.50	1,512	25	0.011	40	1,277
2	7.50	1,558	15	0.006	24	1,315
1	2.50	1,603	4	0.002	7	1,353
Bird 428D-83I-01-T	82.00	9	1	0.001	2	8
Pole Mount	82.00	40	5	0.002	9	34
dbSpectra DS7C09P36U	82.00	140	18	0.008	30	118
Ericsson Radio 4449	77.00	222	27	0.012	45	187
Ericsson RRUS 32 B66	77.00	159	20	0.009	32	134
Ericsson AIR-32 B2A/	77.00	397	49	0.022	79	335
RFS APX16DWV-16DWVS-	77.00	126	15	0.007	25	106
Flat T-Arms	77.00	750	92	0.041	150	633
RFS APXVAARR24_43-U-	77.00	384	47	0.021	77	324
Pine Branches	75.00	600	72	0.032	117	507
Pine Branches	70.00	600	67	0.029	108	507
CCI DTMABP7819VG12A	68.00	115	12	0.005	20	97
Raycap DC6-48-60-18-	68.00	66	7	0.003	11	55
Ericsson RRUS 4426 B	68.00	145	16	0.007	25	123
Ericsson RRUS 32 B2	68.00	159	17	0.008	28	134
Ericsson RRUS-32 (77	68.00	231	25	0.011	40	195
Ericsson RRUS-11	68.00	165	18	0.008	29	139
Powerwave Allgon P65	68.00	159	17	0.008	28	134
Quintel QS66512-2	68.00	333	36	0.016	58	281
CCI OPA-65R-LCUU-H6	68.00	219	24	0.010	38	185
Flat T-Arm	68.00	750	81	0.036	131	633
Pine Branches	65.00	600	61	0.027	100	507
Pine Branches	60.00	600	56	0.025	91	507
Alcatel-Lucent RRH 2	57.00	119	10	0.005	17	100
Alcatel-Lucent RRH2x	57.00	170	15	0.007	24	144
Alcatel-Lucent B66 R	57.00	201	18	0.008	29	170
Commscope RC2DC-4750	57.00	52	5	0.002	7	44
Amphenol Antel BXA-1	57.00	38	3	0.001	6	32
Commscope SBNHH-1D65	57.00	67	6	0.003	10	57
Commscope SBNHH-1D45	57.00	202	18	0.008	29	171
Amphenol Antel LPA-8	57.00	162	14	0.006	23	137
Flat T-Arm	57.00	750	66	0.029	108	633
VZW Unused Reserve:	57.00	1,489	131	0.058	214	1,257
Pine Branches	55.00	600	51	0.022	83	507
Pine Branches	50.00	600	46	0.020	75	507
Pine Branches	45.00	600	41	0.018	66	507
Pine Branches	40.00	600	36	0.016	58	507
Pine Branches	35.00	600	31	0.014	50	507
Pine Branches	30.00	600	26	0.011	42	507
Pine Branches	25.00	600	21	0.009	35	507
Pine Branches	20.00	600	17	0.007	27	507
Pine Branches	15.00	600	12	0.005	20	507
		34,852	2,265	1.000	3,684	29,424

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Calculated Forces

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 (deg)	Ratio
0.00	-41.75	-3.68	0.00	-202.28	0.00	202.28	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.039
5.00	-39.80	-3.66	0.00	-183.89	0.00	183.89	5,874.00	2,937.00	11,999.0	6,008.46	0.01	-0.01	0.037
10.00	-37.90	-3.63	0.00	-165.57	0.00	165.57	5,676.05	2,838.02	11,200.1	5,608.37	0.02	-0.02	0.036
15.00	-35.30	-3.56	0.00	-147.43	0.00	147.43	5,478.10	2,739.05	10,428.6	5,222.07	0.05	-0.03	0.035
20.00	-33.58	-3.50	0.00	-129.64	0.00	129.64	5,280.14	2,640.07	9,684.72	4,849.56	0.08	-0.04	0.033
22.69	-32.15	-3.44	0.00	-120.25	0.00	120.25	5,173.75	2,586.87	9,296.23	4,655.02	0.11	-0.05	0.032
25.00	-29.07	-3.29	0.00	-112.30	0.00	112.30	5,082.19	2,541.10	8,968.32	4,490.82	0.13	-0.05	0.031
28.85	-28.71	-3.27	0.00	-99.65	0.00	99.65	4,410.21	2,205.11	7,728.69	3,870.09	0.18	-0.06	0.032
30.00	-26.43	-3.13	0.00	-95.90	0.00	95.90	4,370.43	2,185.21	7,589.18	3,800.23	0.19	-0.06	0.031
35.00	-24.20	-2.98	0.00	-80.24	0.00	80.24	4,197.22	2,098.61	6,996.61	3,503.50	0.26	-0.07	0.029
40.00	-22.02	-2.80	0.00	-65.35	0.00	65.35	4,024.01	2,012.01	6,428.12	3,218.84	0.33	-0.08	0.026
45.00	-20.66	-2.68	0.00	-51.34	0.00	51.34	3,850.81	1,925.40	5,883.72	2,946.23	0.42	-0.09	0.023
47.16	-19.44	-2.56	0.00	-45.56	0.00	45.56	3,776.02	1,888.01	5,656.10	2,832.26	0.46	-0.09	0.021
50.00	-17.69	-2.39	0.00	-38.27	0.00	38.27	3,677.60	1,838.80	5,363.40	2,685.69	0.51	-0.09	0.019
52.38	-17.14	-2.33	0.00	-32.60	0.00	32.60	2,530.81	1,265.41	3,698.60	1,852.05	0.56	-0.10	0.024
55.00	-15.98	-2.20	0.00	-26.50	0.00	26.50	2,486.37	1,243.18	3,543.07	1,774.17	0.61	-0.10	0.021
57.00	-11.36	-1.66	0.00	-22.10	0.00	22.10	2,451.82	1,225.91	3,425.65	1,715.37	0.65	-0.10	0.018
60.00	-9.74	-1.46	0.00	-17.13	0.00	17.13	2,398.99	1,199.50	3,251.77	1,628.30	0.72	-0.10	0.015
65.00	-8.49	-1.29	0.00	-9.84	0.00	9.84	2,308.28	1,154.14	2,968.33	1,486.37	0.83	-0.11	0.010
68.00	-5.28	-0.83	0.00	-5.98	0.00	5.98	2,236.73	1,118.37	2,783.02	1,393.58	0.90	-0.11	0.007
70.00	-3.88	-0.63	0.00	-4.32	0.00	4.32	2,187.24	1,093.62	2,660.62	1,332.29	0.95	-0.11	0.005
75.00	-2.92	-0.47	0.00	-1.19	0.00	1.19	2,063.52	1,031.76	2,366.67	1,185.09	1.06	-0.11	0.002
76.68	-2.91	-0.47	0.00	-0.39	0.00	0.39	2,021.95	1,010.98	2,271.76	1,137.57	1.10	-0.11	0.002
76.68	-2.91	-0.47	0.00	-0.39	0.00	0.39	182.47	91.23	29.26	20.19	1.10	-0.11	0.035
77.00	-0.29	-0.05	0.00	-0.24	0.00	0.24	182.47	91.23	29.26	20.19	1.11	-0.11	0.013
80.00	-0.25	-0.04	0.00	-0.09	0.00	0.09	182.47	91.23	29.26	20.19	1.19	-0.13	0.006
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.24	-0.13	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.26	-0.13	0.000

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

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 (deg)	Ratio
0.00	-28.07	-3.68	0.00	-201.75	0.00	201.75	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.036
5.00	-26.76	-3.66	0.00	-183.36	0.00	183.36	5,874.00	2,937.00	11,999.0	6,008.46	0.01	-0.01	0.035
10.00	-25.48	-3.62	0.00	-165.06	0.00	165.06	5,676.05	2,838.02	11,200.1	5,608.37	0.02	-0.02	0.034
15.00	-23.73	-3.55	0.00	-146.95	0.00	146.95	5,478.10	2,739.05	10,428.6	5,222.07	0.05	-0.03	0.032
20.00	-22.58	-3.49	0.00	-129.20	0.00	129.20	5,280.14	2,640.07	9,684.72	4,849.56	0.08	-0.04	0.031
22.69	-21.62	-3.43	0.00	-119.82	0.00	119.82	5,173.75	2,586.87	9,296.23	4,655.02	0.11	-0.04	0.030
25.00	-19.54	-3.28	0.00	-111.90	0.00	111.90	5,082.19	2,541.10	8,968.32	4,490.82	0.13	-0.05	0.029
28.85	-19.30	-3.26	0.00	-99.28	0.00	99.28	4,410.21	2,205.11	7,728.69	3,870.09	0.17	-0.06	0.030
30.00	-17.77	-3.12	0.00	-95.54	0.00	95.54	4,370.43	2,185.21	7,589.18	3,800.23	0.19	-0.06	0.029
35.00	-16.27	-2.97	0.00	-79.93	0.00	79.93	4,197.22	2,098.61	6,996.61	3,503.50	0.26	-0.07	0.027
40.00	-14.80	-2.79	0.00	-65.09	0.00	65.09	4,024.01	2,012.01	6,428.12	3,218.84	0.33	-0.08	0.024
45.00	-13.89	-2.67	0.00	-51.14	0.00	51.14	3,850.81	1,925.40	5,883.72	2,946.23	0.42	-0.08	0.021
47.16	-13.07	-2.55	0.00	-45.37	0.00	45.37	3,776.02	1,888.01	5,656.10	2,832.26	0.46	-0.09	0.019
50.00	-11.89	-2.38	0.00	-38.12	0.00	38.12	3,677.60	1,838.80	5,363.40	2,685.69	0.51	-0.09	0.017
52.38	-11.52	-2.32	0.00	-32.46	0.00	32.46	2,530.81	1,265.41	3,698.60	1,852.05	0.56	-0.10	0.022
55.00	-10.74	-2.19	0.00	-26.39	0.00	26.39	2,486.37	1,243.18	3,543.07	1,774.17	0.61	-0.10	0.019
57.00	-7.64	-1.65	0.00	-22.01	0.00	22.01	2,451.82	1,225.91	3,425.65	1,715.37	0.65	-0.10	0.016
60.00	-6.55	-1.45	0.00	-17.06	0.00	17.06	2,398.99	1,199.50	3,251.77	1,628.30	0.72	-0.10	0.013
65.00	-5.71	-1.28	0.00	-9.80	0.00	9.80	2,308.28	1,154.14	2,968.33	1,486.37	0.83	-0.11	0.009
68.00	-3.55	-0.83	0.00	-5.96	0.00	5.96	2,236.73	1,118.37	2,783.02	1,393.58	0.90	-0.11	0.006
70.00	-2.61	-0.62	0.00	-4.30	0.00	4.30	2,187.24	1,093.62	2,660.62	1,332.29	0.94	-0.11	0.004
75.00	-1.96	-0.47	0.00	-1.18	0.00	1.18	2,063.52	1,031.76	2,366.67	1,185.09	1.06	-0.11	0.002
76.68	-1.95	-0.47	0.00	-0.39	0.00	0.39	2,021.95	1,010.98	2,271.76	1,137.57	1.10	-0.11	0.001
76.68	-1.95	-0.47	0.00	-0.39	0.00	0.39	182.47	91.23	29.26	20.19	1.10	-0.11	0.030
77.00	-0.19	-0.05	0.00	-0.24	0.00	0.24	182.47	91.23	29.26	20.19	1.11	-0.11	0.013
80.00	-0.17	-0.04	0.00	-0.09	0.00	0.09	182.47	91.23	29.26	20.19	1.18	-0.13	0.005
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.24	-0.13	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.25	-0.13	0.000

Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.26
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.59
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.28
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11
Period Based on Rayleigh Method (sec):	0.72
Redundancy Factor (p):	1.00

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
26	82.34	10	1.874	1.899	1.111	0.583	4	13
25	81.00	32	1.814	1.603	1.001	0.530	11	40
24	78.50	48	1.704	1.136	0.820	0.440	14	60
23	76.84	7	1.632	0.882	0.715	0.386	2	8
22	75.84	167	1.590	0.749	0.657	0.356	40	210
21	72.50	516	1.453	0.392	0.489	0.267	92	648
20	69.00	214	1.316	0.144	0.351	0.193	28	269
19	66.50	400	1.223	0.027	0.272	0.153	41	503
18	62.50	690	1.080	-0.080	0.175	0.106	49	867
17	58.50	428	0.946	-0.119	0.106	0.079	23	537
16	56.00	326	0.867	-0.121	0.075	0.071	15	410
15	53.69	434	0.797	-0.111	0.053	0.067	19	545
14	51.19	797	0.724	-0.094	0.035	0.065	35	1,001
13	48.58	972	0.652	-0.071	0.022	0.066	43	1,221
12	46.08	479	0.587	-0.048	0.013	0.068	22	601
11	42.50	1,137	0.499	-0.016	0.007	0.071	54	1,427
10	37.50	1,176	0.389	0.022	0.007	0.071	56	1,477
9	32.50	1,216	0.292	0.047	0.013	0.068	55	1,527
8	29.43	285	0.239	0.057	0.018	0.064	12	358
7	26.93	1,854	0.200	0.063	0.023	0.060	75	2,328
6	23.84	1,137	0.157	0.067	0.029	0.055	42	1,428
5	21.34	770	0.126	0.070	0.034	0.051	26	967
4	17.50	1,467	0.085	0.071	0.039	0.046	45	1,842
3	12.50	1,512	0.043	0.071	0.042	0.039	39	1,899
2	7.50	1,558	0.016	0.061	0.036	0.031	32	1,956
1	2.50	1,603	0.002	0.030	0.017	0.015	16	2,013
Bird 428D-83I-01-T	82.00	9	1.859	1.821	1.082	0.569	3	11
Pole Mount	82.00	40	1.859	1.821	1.082	0.569	15	50
dbSpectra DS7C09P36U	82.00	140	1.859	1.821	1.082	0.569	53	176
Ericsson Radio 4449	77.00	222	1.639	0.905	0.725	0.391	58	279
Ericsson RRUS 32 B66	77.00	159	1.639	0.905	0.725	0.391	41	200
Ericsson AIR-32 B2A/	77.00	397	1.639	0.905	0.725	0.391	103	498
RFS APX16DWV-	77.00	126	1.639	0.905	0.725	0.391	33	158
Flat T-Arms	77.00	750	1.639	0.905	0.725	0.391	195	942

RFS APXVAARR24_43-U-	77.00	384	1.639	0.905	0.725	0.391	100	482
Pine Branches	75.00	600	1.555	0.646	0.611	0.331	133	753
Pine Branches	70.00	600	1.355	0.204	0.387	0.212	85	753
CCI DTMABP7819VG12A	68.00	115	1.278	0.092	0.317	0.176	14	145
Raycap DC6-48-60-18-	68.00	66	1.278	0.092	0.317	0.176	8	82
Ericsson RRUS 4426 B	68.00	145	1.278	0.092	0.317	0.176	17	182
Ericsson RRUS 32 B2	68.00	159	1.278	0.092	0.317	0.176	19	200
Ericsson RRUS-32 (77	68.00	231	1.278	0.092	0.317	0.176	27	290
Ericsson RRUS-11	68.00	165	1.278	0.092	0.317	0.176	19	207
Powerwave Allgon P65	68.00	159	1.278	0.092	0.317	0.176	19	200
Quintel QS66512-2	68.00	333	1.278	0.092	0.317	0.176	39	418
CCI OPA-65R-LCUU-H6	68.00	219	1.278	0.092	0.317	0.176	26	275
Flat T-Arm	68.00	750	1.278	0.092	0.317	0.176	88	942
Pine Branches	65.00	600	1.168	-0.023	0.232	0.133	53	753
Pine Branches	60.00	600	0.995	-0.111	0.129	0.087	35	753
Alcatel-Lucent RRH 2	57.00	119	0.898	-0.122	0.087	0.074	6	149
Alcatel-Lucent RRH2x	57.00	170	0.898	-0.122	0.087	0.074	8	214
Alcatel-Lucent B66 R	57.00	201	0.898	-0.122	0.087	0.074	10	252
Commscope RC2DC-	57.00	52	0.898	-0.122	0.087	0.074	3	65
Amphenol Antel BXA-1	57.00	38	0.898	-0.122	0.087	0.074	2	48
Commscope SBNHH-	57.00	67	0.898	-0.122	0.087	0.074	3	84
Commscope SBNHH-	57.00	202	0.898	-0.122	0.087	0.074	10	254
Amphenol Antel LPA-8	57.00	162	0.898	-0.122	0.087	0.074	8	203
Flat T-Arm	57.00	750	0.898	-0.122	0.087	0.074	37	942
VZW Unused Reserve:	57.00	1,489	0.898	-0.122	0.087	0.074	73	1,869
Pine Branches	55.00	600	0.836	-0.118	0.065	0.068	27	753
Pine Branches	50.00	600	0.691	-0.084	0.028	0.066	26	753
Pine Branches	45.00	600	0.560	-0.038	0.011	0.069	28	753
Pine Branches	40.00	600	0.442	0.004	0.006	0.072	29	753
Pine Branches	35.00	600	0.339	0.036	0.009	0.070	28	753
Pine Branches	30.00	600	0.249	0.056	0.017	0.065	26	753
Pine Branches	25.00	600	0.173	0.066	0.027	0.057	23	753
Pine Branches	20.00	600	0.111	0.070	0.036	0.049	20	753
Pine Branches	15.00	600	0.062	0.072	0.041	0.042	17	753
		34,852	66.026	18.102	19.392	11.871	2,453	43,766

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
26	82.34	10	1.874	1.899	1.111	0.583	4	9
25	81.00	32	1.814	1.603	1.001	0.530	11	27
24	78.50	48	1.704	1.136	0.820	0.440	14	40
23	76.84	7	1.632	0.882	0.715	0.386	2	6
22	75.84	167	1.590	0.749	0.657	0.356	40	141
21	72.50	516	1.453	0.392	0.489	0.267	92	435
20	69.00	214	1.316	0.144	0.351	0.193	28	181
19	66.50	400	1.223	0.027	0.272	0.153	41	338
18	62.50	690	1.080	-0.080	0.175	0.106	49	583
17	58.50	428	0.946	-0.119	0.106	0.079	23	361
16	56.00	326	0.867	-0.121	0.075	0.071	15	275
15	53.69	434	0.797	-0.111	0.053	0.067	19	366
14	51.19	797	0.724	-0.094	0.035	0.065	35	673
13	48.58	972	0.652	-0.071	0.022	0.066	43	821
12	46.08	479	0.587	-0.048	0.013	0.068	22	404
11	42.50	1,137	0.499	-0.016	0.007	0.071	54	960
10	37.50	1,176	0.389	0.022	0.007	0.071	56	993
9	32.50	1,216	0.292	0.047	0.013	0.068	55	1,027
8	29.43	285	0.239	0.057	0.018	0.064	12	241

7	26.93	1,854	0.200	0.063	0.023	0.060	75	1,565
6	23.84	1,137	0.157	0.067	0.029	0.055	42	960
5	21.34	770	0.126	0.070	0.034	0.051	26	650
4	17.50	1,467	0.085	0.071	0.039	0.046	45	1,238
3	12.50	1,512	0.043	0.071	0.042	0.039	39	1,277
2	7.50	1,558	0.016	0.061	0.036	0.031	32	1,315
1	2.50	1,603	0.002	0.030	0.017	0.015	16	1,353
Bird 428D-83I-01-T	82.00	9	1.859	1.821	1.082	0.569	3	8
Pole Mount	82.00	40	1.859	1.821	1.082	0.569	15	34
dbSpectra DS7C09P36U	82.00	140	1.859	1.821	1.082	0.569	53	118
Ericsson Radio 4449	77.00	222	1.639	0.905	0.725	0.391	58	187
Ericsson RRUS 32 B66	77.00	159	1.639	0.905	0.725	0.391	41	134
Ericsson AIR-32 B2A/	77.00	397	1.639	0.905	0.725	0.391	103	335
RFS APX16DWV-	77.00	126	1.639	0.905	0.725	0.391	33	106
Flat T-Arms	77.00	750	1.639	0.905	0.725	0.391	195	633
RFS APXVAARR24_43-U-	77.00	384	1.639	0.905	0.725	0.391	100	324
Pine Branches	75.00	600	1.555	0.646	0.611	0.331	133	507
Pine Branches	70.00	600	1.355	0.204	0.387	0.212	85	507
CCI DTMABP7819VG12A	68.00	115	1.278	0.092	0.317	0.176	14	97
Raycap DC6-48-60-18-	68.00	66	1.278	0.092	0.317	0.176	8	55
Ericsson RRUS 4426 B	68.00	145	1.278	0.092	0.317	0.176	17	123
Ericsson RRUS 32 B2	68.00	159	1.278	0.092	0.317	0.176	19	134
Ericsson RRUS-32 (77	68.00	231	1.278	0.092	0.317	0.176	27	195
Ericsson RRUS-11	68.00	165	1.278	0.092	0.317	0.176	19	139
Powerwave Allgon P65	68.00	159	1.278	0.092	0.317	0.176	19	134
Quintel QS66512-2	68.00	333	1.278	0.092	0.317	0.176	39	281
CCI OPA-65R-LCUU-H6	68.00	219	1.278	0.092	0.317	0.176	26	185
Flat T-Arm	68.00	750	1.278	0.092	0.317	0.176	88	633
Pine Branches	65.00	600	1.168	-0.023	0.232	0.133	53	507
Pine Branches	60.00	600	0.995	-0.111	0.129	0.087	35	507
Alcatel-Lucent RRH 2	57.00	119	0.898	-0.122	0.087	0.074	6	100
Alcatel-Lucent RRH2x	57.00	170	0.898	-0.122	0.087	0.074	8	144
Alcatel-Lucent B66 R	57.00	201	0.898	-0.122	0.087	0.074	10	170
Commscope RC2DC-	57.00	52	0.898	-0.122	0.087	0.074	3	44
Amphenol Antel BXA-1	57.00	38	0.898	-0.122	0.087	0.074	2	32
Commscope SBNHH-	57.00	67	0.898	-0.122	0.087	0.074	3	57
Commscope SBNHH-	57.00	202	0.898	-0.122	0.087	0.074	10	171
Amphenol Antel LPA-8	57.00	162	0.898	-0.122	0.087	0.074	8	137
Flat T-Arm	57.00	750	0.898	-0.122	0.087	0.074	37	633
VZW Unused Reserve:	57.00	1,489	0.898	-0.122	0.087	0.074	73	1,257
Pine Branches	55.00	600	0.836	-0.118	0.065	0.068	27	507
Pine Branches	50.00	600	0.691	-0.084	0.028	0.066	26	507
Pine Branches	45.00	600	0.560	-0.038	0.011	0.069	28	507
Pine Branches	40.00	600	0.442	0.004	0.006	0.072	29	507
Pine Branches	35.00	600	0.339	0.036	0.009	0.070	28	507
Pine Branches	30.00	600	0.249	0.056	0.017	0.065	26	507
Pine Branches	25.00	600	0.173	0.066	0.027	0.057	23	507
Pine Branches	20.00	600	0.111	0.070	0.036	0.049	20	507
Pine Branches	15.00	600	0.062	0.072	0.041	0.042	17	507
		34,852	66.026	18.102	19.392	11.871	2,453	29,424

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

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 (deg)	Ratio
0.00	-41.75	-2.44	0.00	-143.15	0.00	143.15	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.029
5.00	-39.80	-2.41	0.00	-130.95	0.00	130.95	5,874.00	2,937.00	11,999.0	6,008.46	0.00	-0.01	0.029
10.00	-37.90	-2.38	0.00	-118.89	0.00	118.89	5,676.05	2,838.02	11,200.1	5,608.37	0.02	-0.01	0.028
15.00	-35.30	-2.32	0.00	-107.00	0.00	107.00	5,478.10	2,739.05	10,428.6	5,222.07	0.03	-0.02	0.027
20.00	-33.58	-2.28	0.00	-95.40	0.00	95.40	5,280.14	2,640.07	9,684.72	4,849.56	0.06	-0.03	0.026
22.69	-32.15	-2.24	0.00	-89.29	0.00	89.29	5,173.75	2,586.87	9,296.23	4,655.02	0.08	-0.03	0.025
25.00	-29.07	-2.14	0.00	-84.12	0.00	84.12	5,082.19	2,541.10	8,968.32	4,490.82	0.09	-0.04	0.024
28.85	-28.71	-2.13	0.00	-75.88	0.00	75.88	4,410.21	2,205.11	7,728.69	3,870.09	0.13	-0.04	0.026
30.00	-26.43	-2.05	0.00	-73.44	0.00	73.44	4,370.43	2,185.21	7,589.18	3,800.23	0.14	-0.04	0.025
35.00	-24.20	-1.96	0.00	-63.21	0.00	63.21	4,197.22	2,098.61	6,996.61	3,503.50	0.19	-0.05	0.024
40.00	-22.02	-1.88	0.00	-53.39	0.00	53.39	4,024.01	2,012.01	6,428.12	3,218.84	0.24	-0.06	0.022
45.00	-20.67	-1.83	0.00	-43.98	0.00	43.98	3,850.81	1,925.40	5,883.72	2,946.23	0.31	-0.06	0.020
47.16	-19.45	-1.79	0.00	-40.02	0.00	40.02	3,776.02	1,888.01	5,656.10	2,832.26	0.34	-0.07	0.019
50.00	-17.69	-1.73	0.00	-34.93	0.00	34.93	3,677.60	1,838.80	5,363.40	2,685.69	0.38	-0.07	0.018
52.38	-17.15	-1.71	0.00	-30.82	0.00	30.82	2,530.81	1,265.41	3,698.60	1,852.05	0.41	-0.07	0.023
55.00	-15.98	-1.67	0.00	-26.35	0.00	26.35	2,486.37	1,243.18	3,543.07	1,774.17	0.45	-0.08	0.021
57.00	-11.36	-1.48	0.00	-23.02	0.00	23.02	2,451.82	1,225.91	3,425.65	1,715.37	0.49	-0.08	0.018
60.00	-9.74	-1.39	0.00	-18.58	0.00	18.58	2,398.99	1,199.50	3,251.77	1,628.30	0.54	-0.08	0.015
65.00	-8.49	-1.30	0.00	-11.62	0.00	11.62	2,308.28	1,154.14	2,968.33	1,486.37	0.63	-0.09	0.011
68.00	-5.28	-0.99	0.00	-7.73	0.00	7.73	2,236.73	1,118.37	2,783.02	1,393.58	0.68	-0.09	0.008
70.00	-3.88	-0.81	0.00	-5.75	0.00	5.75	2,187.24	1,093.62	2,660.62	1,332.29	0.72	-0.09	0.006
75.00	-2.92	-0.64	0.00	-1.69	0.00	1.69	2,063.52	1,031.76	2,366.67	1,185.09	0.81	-0.09	0.003
76.68	-2.91	-0.64	0.00	-0.62	0.00	0.62	2,021.95	1,010.98	2,271.76	1,137.57	0.85	-0.09	0.002
76.68	-2.91	-0.64	0.00	-0.62	0.00	0.62	182.47	91.23	29.26	20.19	0.85	-0.09	0.047
77.00	-0.29	-0.09	0.00	-0.41	0.00	0.41	182.47	91.23	29.26	20.19	0.85	-0.09	0.022
80.00	-0.25	-0.08	0.00	-0.15	0.00	0.15	182.47	91.23	29.26	20.19	0.92	-0.12	0.009
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	0.97	-0.12	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	0.99	-0.12	0.000

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

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 (deg)	Ratio
0.00	-28.07	-2.44	0.00	-142.75	0.00	142.75	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.027
5.00	-26.76	-2.41	0.00	-130.56	0.00	130.56	5,874.00	2,937.00	11,999.0	6,008.46	0.00	-0.01	0.026
10.00	-25.48	-2.37	0.00	-118.51	0.00	118.51	5,676.05	2,838.02	11,200.1	5,608.37	0.02	-0.01	0.026
15.00	-23.73	-2.31	0.00	-106.64	0.00	106.64	5,478.10	2,739.05	10,428.6	5,222.07	0.03	-0.02	0.025
20.00	-22.58	-2.27	0.00	-95.07	0.00	95.07	5,280.14	2,640.07	9,684.72	4,849.56	0.06	-0.03	0.024
22.69	-21.62	-2.23	0.00	-88.97	0.00	88.97	5,173.75	2,586.87	9,296.23	4,655.02	0.08	-0.03	0.023
25.00	-19.54	-2.13	0.00	-83.81	0.00	83.81	5,082.19	2,541.10	8,968.32	4,490.82	0.09	-0.04	0.023
28.85	-19.30	-2.12	0.00	-75.60	0.00	75.60	4,410.21	2,205.11	7,728.69	3,870.09	0.13	-0.04	0.024
30.00	-17.77	-2.04	0.00	-73.17	0.00	73.17	4,370.43	2,185.21	7,589.18	3,800.23	0.14	-0.04	0.023
35.00	-16.27	-1.96	0.00	-62.97	0.00	62.97	4,197.22	2,098.61	6,996.61	3,503.50	0.18	-0.05	0.022
40.00	-14.80	-1.87	0.00	-53.19	0.00	53.19	4,024.01	2,012.01	6,428.12	3,218.84	0.24	-0.06	0.020
45.00	-13.89	-1.83	0.00	-43.82	0.00	43.82	3,850.81	1,925.40	5,883.72	2,946.23	0.30	-0.06	0.018
47.16	-13.07	-1.78	0.00	-39.88	0.00	39.88	3,776.02	1,888.01	5,656.10	2,832.26	0.33	-0.07	0.018
50.00	-11.89	-1.72	0.00	-34.81	0.00	34.81	3,677.60	1,838.80	5,363.40	2,685.69	0.37	-0.07	0.016
52.38	-11.53	-1.70	0.00	-30.72	0.00	30.72	2,530.81	1,265.41	3,698.60	1,852.05	0.41	-0.07	0.021
55.00	-10.74	-1.66	0.00	-26.26	0.00	26.26	2,486.37	1,243.18	3,543.07	1,774.17	0.45	-0.08	0.019
57.00	-7.64	-1.47	0.00	-22.94	0.00	22.94	2,451.82	1,225.91	3,425.65	1,715.37	0.48	-0.08	0.016
60.00	-6.55	-1.39	0.00	-18.53	0.00	18.53	2,398.99	1,199.50	3,251.77	1,628.30	0.53	-0.08	0.014
65.00	-5.71	-1.29	0.00	-11.59	0.00	11.59	2,308.28	1,154.14	2,968.33	1,486.37	0.62	-0.09	0.010
68.00	-3.55	-0.99	0.00	-7.71	0.00	7.71	2,236.73	1,118.37	2,783.02	1,393.58	0.68	-0.09	0.007
70.00	-2.61	-0.81	0.00	-5.73	0.00	5.73	2,187.24	1,093.62	2,660.62	1,332.29	0.72	-0.09	0.005
75.00	-1.96	-0.64	0.00	-1.69	0.00	1.69	2,063.52	1,031.76	2,366.67	1,185.09	0.81	-0.09	0.002
76.68	-1.95	-0.63	0.00	-0.62	0.00	0.62	2,021.95	1,010.98	2,271.76	1,137.57	0.84	-0.09	0.002
76.68	-1.95	-0.63	0.00	-0.62	0.00	0.62	182.47	91.23	29.26	20.19	0.84	-0.09	0.041
77.00	-0.19	-0.09	0.00	-0.41	0.00	0.41	182.47	91.23	29.26	20.19	0.85	-0.09	0.022
80.00	-0.17	-0.08	0.00	-0.15	0.00	0.15	182.47	91.23	29.26	20.19	0.92	-0.12	0.008
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	0.97	-0.12	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	0.98	-0.12	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	44.58	0.00	41.78	0.00	0.00	2338.09	0.00	0.37
0.9D + 1.6W	44.57	0.00	31.32	0.00	0.00	2333.44	0.00	0.37
1.2D + 1.0Di + 1.0Wi	12.84	0.00	69.09	0.00	0.00	667.22	76.68	0.14
(1.2 + 0.2Sds) * DL + E ELFM	3.68	0.00	41.75	0.00	0.00	202.28	0.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	2.44	0.00	41.75	0.00	0.00	143.15	76.68	0.05
(0.9 - 0.2Sds) * DL + E ELFM	3.68	0.00	28.07	0.00	0.00	201.75	0.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	2.44	0.00	28.07	0.00	0.00	142.75	76.68	0.04
1.0D + 1.0W	11.60	0.00	34.85	0.00	0.00	607.90	0.00	0.10

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
4,555.20	38.30	74.40	2,338.09	69.09	44.58	51.33

Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
50.0	2.750	66.000	Round	0	0.00	8.252	279.30	702.07	0.40

Anchor Bolts

Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Start Angle (deg)	Compression Force (kip)	Compression Allow (kip)	Compression Ratio	Tension Force (kip)	Tension Allow (kip)	Tension Ratio
60.00	20	2.25" A615-	2.25	75.00	100.00	Radial	0.00	0.0	96.98	260.00	0.39	90.07	260.00	0.36

Base Plate & Anchor Rod Analysis

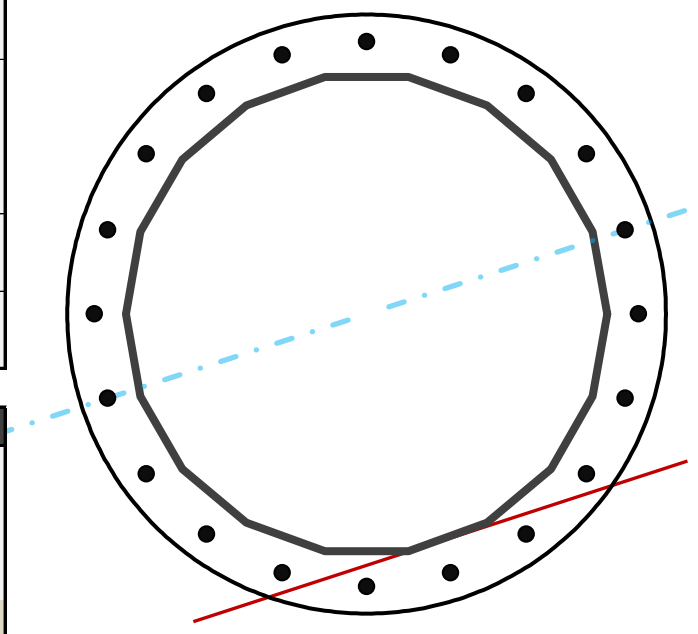
Pole Dimensions		
Number of Sides	18	-
Diameter	52	in
Thickness	0.5	in
Orientation Offset		°

Base Reactions		
Moment, Mu	2338.1	k-ft
Axial, Pu	41.8	k
Shear, Vu	44.6	k
Neutral Axis	198	°

Report Capacities		
Component	Capacity	Result
Base Plate	31%	Pass
Anchor Rods	38%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, ø	66	in
Thickness	2 3/4	in
Grade	A572-50	-
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	d	η=0.5
Clear Distance	3	in
Applied Moment, Mu	808.2	k
Bending Stress, ϕMn	2606.7	k

Original Anchor Rods		
Arrangement	Radial	-
Quantity	20	-
Diameter, ø	2 1/4	in
Bolt Circle	60	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	9.4	in
Orientation Offset	0	°
Applied Force, Pu	95.6	k
Anchor Rods, ϕPn	259.8	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	44.6	2338.1	1.00
Anchor Rod Forces	44.6	2338.1	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	80.4859	4.4714	0.3744		26690.34
Bolt	3.9761	3.2477	0.8393	4.5	29245.99
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate		
Shape	Round	-
Diameter, D	66	in
Thickness, t	2.75	in
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Base Plate Chord	40.645	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	3	-

Anchor Rods		
Anchor Rod Quantity, N	20	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	60	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	95.6	k
Applied Shear, Vu	1.1	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.368	OK
Interaction Capacity	0.376	OK

External Base Plate

Chord Length AA	34.296	in
Additional AA	5.500	in
Section Modulus, Z	75.239	in^3
Applied Moment, Mu	808.2	k-ft
Bending Capacity, ϕMn	3385.7	k-ft
Capacity, Mu/ϕMn	0.239	OK
Chord Length AB	33.035	in
Additional AB	5.500	in
Section Modulus, Z	72.855	in^3
Applied Moment, Mu	696.4	k-ft
Bending Capacity, ϕMn	3278.5	k-ft
Capacity, Mu/ϕMn	0.212	OK
Bend Line Length	30.639	in
Additional Bend Line	0.000	in
Section Modulus, Z	57.927	in^3
Applied Moment, Mu	808.2	k-ft
Bending Capacity, ϕMn	2606.7	k-ft
Capacity, Mu/ϕMn	0.310	OK

Internal Base Plate

Arc Length	0.000	in
Section Modulus, Z	0.000	in^3
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

CENTEK engineering

Centered on Solutions℠

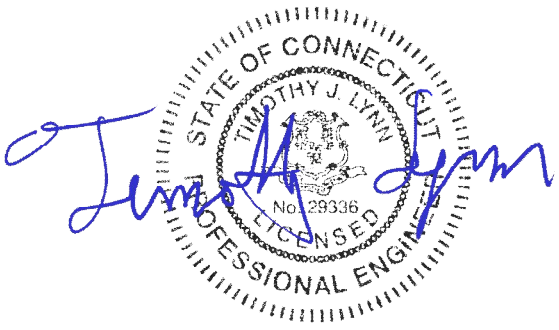
Structural Analysis Report

Antenna Mount Analysis

T-Mobile Site #: CT11606H

48 Ritch Ave West
Greenwich, CT 06830

Centek Project No. 18058.61



Date: June 11, 2018

Max Stress Ratio = 73.1%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

June 11, 2018

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11606H
48 Ritch Ave West
Greenwich, CT 06830

Centek Project No. 18058.61

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) 12-ft T-Arms to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2012 International Building Code as modified by the 2016 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  T-Arms: Three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas, three (3) Ericsson RRUS-11 remote radio units and three (3) Ericsson 4449 B71_B12 remote radio units mounted on three (3) T-Arms with a RAD center elevation of 77-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2012 International Building Code as modified by the 2016 Connecticut State Building Code considering a nominal design wind speed of 93 mph for Greenwich as required in Appendix N of the 2016 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	TIA-222-G Loads
Location:	Greenwich, CT
Rev. 0: 6/11/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18058.61

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed: $V := 93$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = Structure_Type := Pole (User Input)

Structure Category = SC := II (User Input)

Exposure Category = Exp := C (User Input)

Structure Height = $h := 77$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 77$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.85 & \text{if Structure\_Type = Lattice} \end{cases} = 0.95$$

(Per Table 2-2 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.15 & \text{if SC = 3} \end{cases} = 1$$

(Per Table 2-3 of TIA-222-G)

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.00 & \text{if SC = 3} \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.25 & \text{if SC = 3} \end{cases} = 1$$

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.088$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.633$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.198$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 25.196$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.283$$

CENTEK engineering
Centered on Solutions™ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	TIA-222-G Loads
Location:	Greenwich, CT
Rev. 0: 6/11/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18058.61

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 180$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 122$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.7$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 69$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 51$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6352$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5227$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 169$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 169$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 561$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 203$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18.8$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 191$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.2$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 84$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 399$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 399$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPX16DWV-16DWVS-E-A20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 179$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 43$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.7$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 69$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.6$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 27$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 41$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 3885$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 126$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 126$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4449 B71B12

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 10.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 74$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 45$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 36$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.7$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 17$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 74$ lbs

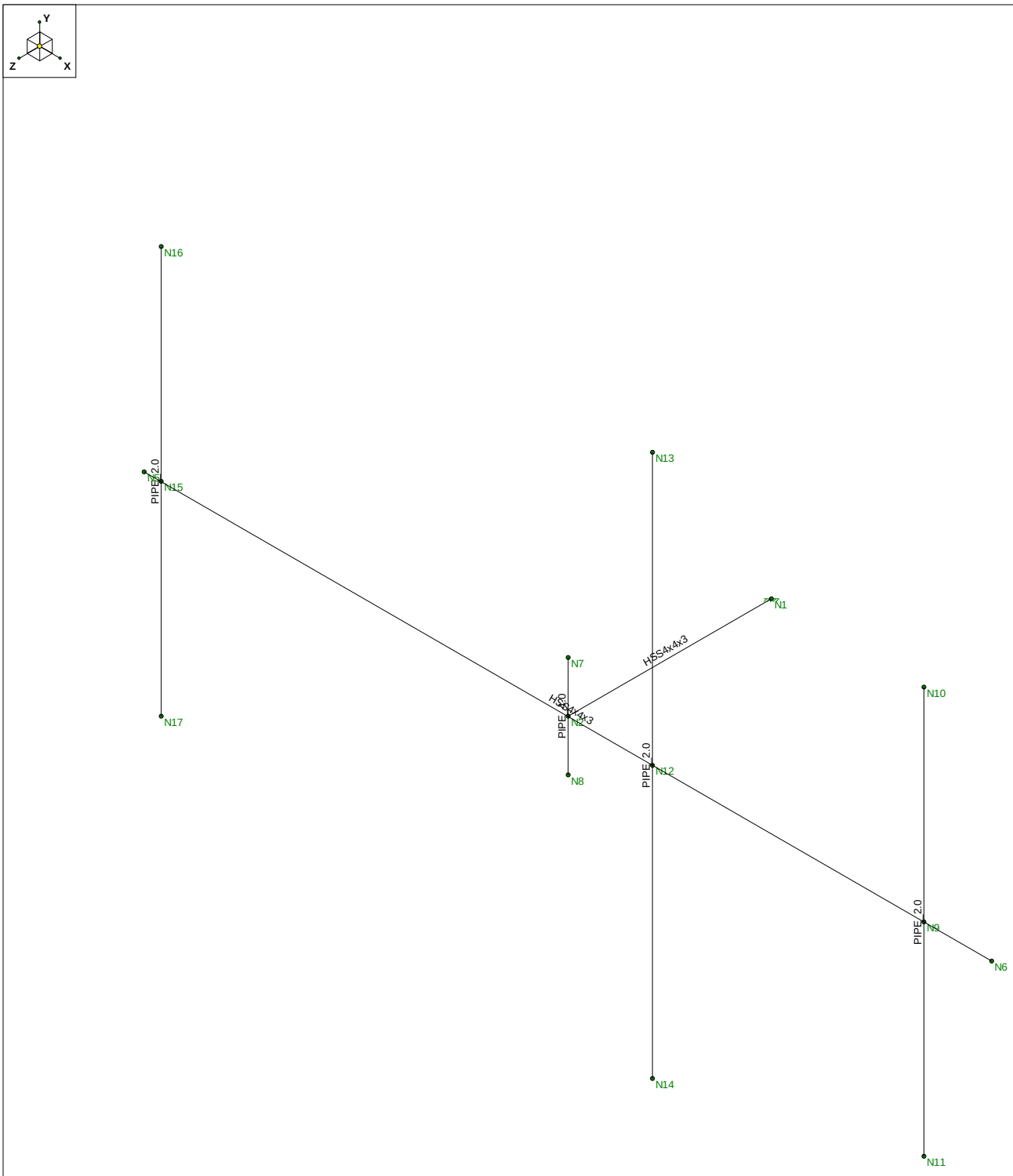
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2042$

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 66$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 66$ lbs



Envelope Only Solution

Centek		
TJL	CT11606H - Mount	June 11, 2018 at 5:13 PM
18058.61	Member Framing	Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
	AISC 14th(360-10): ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4x4x3	Beam	Tube	A500 Gr.46	Typical	2.58	6.21	6.21	10
2	Horz	HSS4x4x3	Beam	Pipe	A500 Gr.46	Typical	2.58	6.21	6.21	10
3	Antenna Mast	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Vert	PIPE_4.0	Beam	Pipe	A53 Grade B	Typical	2.96	6.82	6.82	13.6

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Outrigger	3			Lbyy						Lateral
2	M2	Horz	12.5			Lbyy						Lateral
3	M3	Vert	1.5			Lbyy						Lateral
4	M5	Antenna Mast	6			Lbyy						Lateral
5	M6	Antenna Mast	8			Lbyy						Lateral
6	M7	Antenna Mast	6			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N2			Outrigger	Beam	Tube	A500 Gr...	Typical
2	M2	N5	N6			Horz	Beam	Pipe	A500 Gr...	Typical
3	M3	N7	N8			Vert	Beam	Pipe	A53 Gra...	Typical
4	M5	N11	N10			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
5	M6	N14	N13			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
6	M7	N17	N16			Antenna Mast	Beam	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	0	0	3	0	
3	N5	-6.25	0	3	0	
4	N6	6.25	0	3	0	
5	N7	0	.75	3	0	
6	N8	0	-.75	3	0	
7	N9	5.25	0	3	0	
8	N10	5.25	3	3	0	
9	N11	5.25	-3	3	0	
10	N12	1.25	0	3	0	
11	N13	1.25	4	3	0	
12	N14	1.25	-4	3	0	
13	N15	-6	0	3	0	
14	N16	-6	3	3	0	
15	N17	-6	-3	3	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Y	-.067	1
2	M5	Y	-.067	5
3	M7	Y	-.021	1
4	M7	Y	-.021	5
5	M6	Y	-.077	1
6	M6	Y	-.077	7
7	M6	Y	-.074	2
8	M6	Y	-.074	6

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Y	-.085	1
2	M5	Y	-.085	5
3	M7	Y	-.063	1
4	M7	Y	-.063	5
5	M6	Y	-.2	1
6	M6	Y	-.2	7
7	M6	Y	-.066	2
8	M6	Y	-.066	6

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	X	.026	1
2	M5	X	.026	5
3	M7	X	.014	1
4	M7	X	.014	5
5	M6	X	.042	1
6	M6	X	.042	7
7	M6	X	.017	2
8	M6	X	.017	6

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	X	.061	1
2	M5	X	.061	5
3	M7	X	.022	1
4	M7	X	.022	5
5	M6	X	.102	1
6	M6	X	.102	7
7	M6	X	.036	2
8	M6	X	.036	6

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]

Member Point Loads (BLC 6 : Wind w/ Ice Z) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Z	.035	1
2	M5	Z	.035	5
3	M7	Z	.035	1
4	M7	Z	.035	5
5	M6	Z	.096	1
6	M6	Z	.096	7

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Z	.09	1
2	M5	Z	.09	5
3	M7	Z	.09	1
4	M7	Z	.09	5
5	M6	Z	.281	1
6	M6	Z	.281	7

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.002	.002	0	0
2	M3	X	.002	.002	0	0
3	M7	X	.002	.002	0	0
4	M6	X	.002	.002	0	0
5	M5	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	0	0
2	M3	X	.008	.008	0	0
3	M7	X	.008	.008	0	0
4	M6	X	.008	.008	0	0
5	M5	X	.008	.008	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.002	.002	0	0
2	M3	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.008	.008	0	0
2	M3	Z	.008	.008	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1						
2	Equipment Weight	None					8			
3	Ice Weight	None					8			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
4	Wind w/ Ice X	None					8	5		
5	Wind X	None					8	5		
6	Wind w/ Ice Z	None					6	2		
7	Wind Z	None					6	2		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.2D + 1.6..	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6..	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0..	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6..	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6..	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0..	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	5	1.666	3	0	3	-1.851	2	.901	5	1.819	6
2		min	-1.021	2	.629	2	-1.654	4	-4.953	6	-2.999	2	.761	2
3	Totals:	max	0	5	1.666	3	0	3						
4		min	-1.021	2	.629	2	-1.654	4						

Envelope Joint Displacements

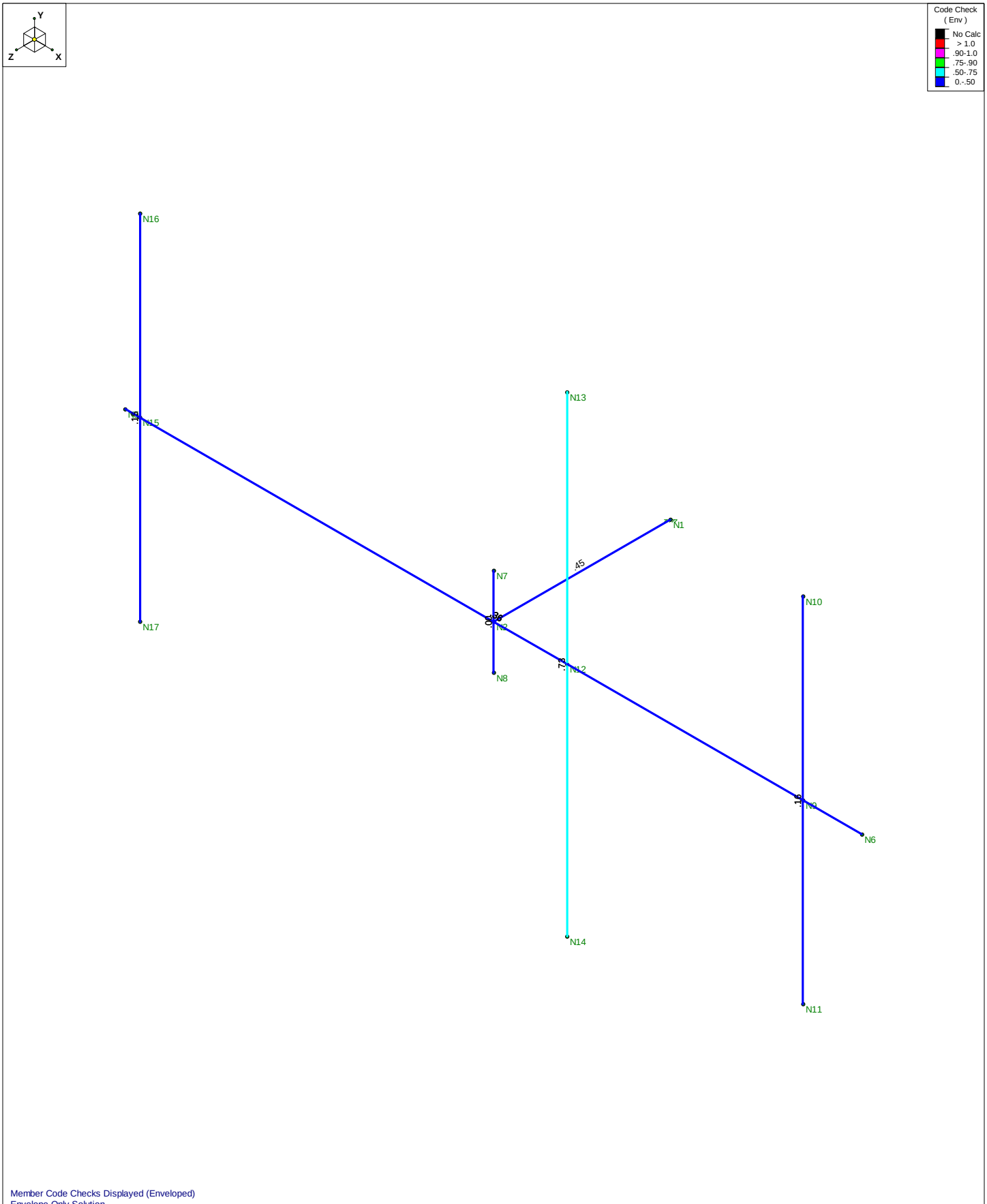
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	2	0	2	0	4	0	6	0	2	0	2
2		min	0	5	0	3	0	3	0	2	0	5	0	6
3	N2	max	.11	2	-.068	2	0	4	7.412e-03	6	4.46e-03	2	-2.947e-03	2
4		min	-.049	5	-.182	6	0	3	2.757e-03	2	-2.713e-03	5	-7.047e-03	6
5	N5	max	.11	2	.136	3	.335	2	7.413e-03	6	4.472e-03	1	-1.614e-03	2
6		min	-.049	5	.083	2	.027	6	2.757e-03	2	7.789e-04	6	-2.997e-03	3
7	N6	max	.11	2	-.427	2	.5	5	7.424e-03	6	4.441e-03	1	-5.407e-03	2
8		min	-.049	5	-1.053	6	-.333	2	2.757e-03	2	-7.902e-03	4	-1.31e-02	6
9	N7	max	.145	1	-.068	2	.067	6	7.412e-03	6	4.46e-03	2	-2.948e-03	2
10		min	-.022	5	-.182	6	.025	2	2.757e-03	2	-2.713e-03	5	-7.047e-03	6
11	N8	max	.084	2	-.068	2	-.024	5	7.411e-03	6	4.46e-03	2	-2.946e-03	2
12		min	-.084	4	-.182	6	-.067	3	2.757e-03	2	-2.713e-03	5	-7.047e-03	6
13	N9	max	.11	2	-.363	2	.405	5	7.424e-03	6	4.441e-03	2	-5.406e-03	2
14		min	-.049	5	-.896	6	-.28	2	2.757e-03	2	-7.9e-03	5	-1.31e-02	6
15	N10	max	.517	3	-.363	2	.62	4	8.148e-03	6	4.441e-03	2	-5.436e-03	5
16		min	.147	5	-.896	6	-.181	2	2.761e-03	2	-7.9e-03	5	-1.375e-02	3
17	N11	max	-.014	2	-.363	2	.385	5	7.372e-03	3	4.441e-03	2	-2.898e-03	2
18		min	-.48	6	-.896	6	-.412	1	-6.264e-05	5	-7.9e-03	5	-1.305e-02	6
19	N12	max	.11	2	-.123	2	.065	5	7.422e-03	6	4.451e-03	2	-4.137e-03	2
20		min	-.049	5	-.315	6	-.067	2	2.757e-03	2	-5.333e-03	4	-1.004e-02	6
21	N13	max	.736	1	-.123	2	.972	4	2.389e-02	4	4.451e-03	2	-4.174e-03	5
22		min	.151	5	-.315	6	.066	2	2.773e-03	2	-5.333e-03	4	-1.538e-02	1
23	N14	max	.269	2	-.123	2	.653	5	7.267e-03	3	4.451e-03	2	5.605e-03	2
24		min	-.486	6	-.315	6	-.367	3	-1.717e-02	5	-5.333e-03	4	-9.854e-03	6

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
25	N15	max	.11	2	.127	3	.322	2	7.413e-03	6	4.472e-03	2	-1.614e-03	2
26		min	-.049	5	.078	2	.025	6	2.757e-03	2	7.789e-04	6	-2.997e-03	3
27	N16	max	.223	1	.127	3	.454	1	8.124e-03	6	4.472e-03	2	-1.619e-03	5
28		min	.01	5	.078	2	.264	5	2.759e-03	2	7.789e-04	6	-3.422e-03	1
29	N17	max	.087	2	.127	3	.222	2	7.384e-03	3	4.472e-03	2	-3.466e-04	2
30		min	-.126	4	.078	2	-.222	6	-7.828e-05	5	7.789e-04	6	-2.989e-03	6

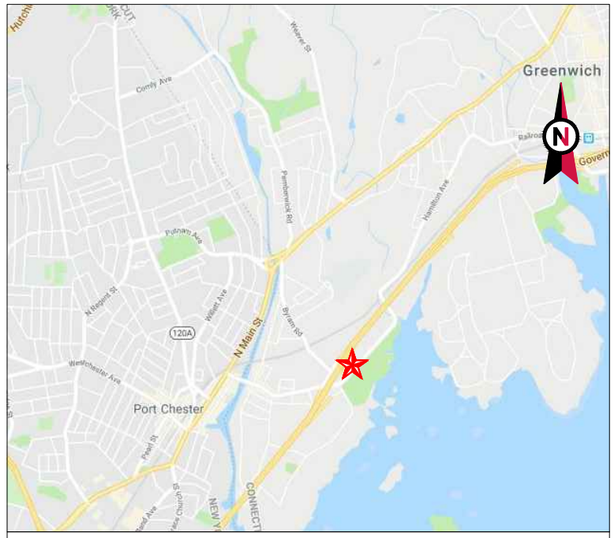
Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	HSS4x4x3	.449	0	3	.228	0	y 3	103.013	106.812	12.662	12.662	1...	H1-1b
2	M2	HSS4x4x3	.360	6.25	4	.045	6.25	y 6	56.955	106.812	12.662	12.662	1...	H1-1b
3	M3	PIPE_4.0	.000	.75	1	.000	.75	1	92.571	93.24	10.631	10.631	1...	H1-1b
4	M5	PIPE_2.0	.156	3	4	.015	3	4	20.867	32.13	1.872	1.872	1...	H1-1b
5	M6	PIPE_2.0	.731	4	4	.047	4	4	14.916	32.13	1.872	1.872	1...	H1-1b
6	M7	PIPE_2.0	.155	3	4	.015	3	4	20.867	32.13	1.872	1.872	1...	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11606H - Mount	June 11, 2018 at 5:12 PM
18058.61	Unity Check	Mount.r3d



VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: BYRAM PARK CT
ATC SITE NUMBER: 414240
T-MOBILE SITE ID: CT11606H
SITE ADDRESS: 48 RITCH AVENUE WEST GREENWICH, CT 06830

LOCATION MAP

T-MOBILE ANTENNA AMENDMENT
67D97DB2 CONFIGURATION

COMPLIANCE CODE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE (IBC)
2. NATIONAL ELECTRIC CODE (NEC)
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

UTILITY COMPANIES

POWER COMPANY: EVERSOURCE
PHONE: (866) 554-6025

TELEPHONE COMPANY: UNKNOWN
PHONE: N/A

811 Know what's below. Call before you dig.

PROJECT SUMMARY

SITE ADDRESS:

48 RITCH AVENUE WEST
GREENWICH, CT 06830
COUNTY: FAIRFIELD

GEOGRAPHIC COORDINATES:

LATITUDE: 41.00506388

LONGITUDE: -73.64831111

GROUND ELEVATION: 53' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

ENGINEER:

ATC TOWER SERVICES, LLC
3500 REGENCY PKWY STE 100
CARY, NC 27518

PROPERTY OWNER:

36 RITCH AVENUE LLC
16B ARTHER ST
GREENWICH, CT, 06831

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

REMOVE (3) PANELS AND (3) RRUs

INSTALL (3) NEW PANELS, (1) 1-1/4" HYBRID CABLES, AND (6) RRUs

EXISTING (6) PANELS, (3) RRUs, AND (2) 1-1/4" HYBRID CABLES TO REMAIN

PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.

PROJECT LOCATION DIRECTIONS

FROM GREENWITCH, CT:

TAKE RITCH AVE W AND HAMILTON AVE TO GLEN ST IN GREENWICH, 4 MIN (1.6 MI), HEAD NORTHEAST ON I-95 N, 0.2 MI, TAKE EXIT 2 FOR BYRAM TOWARD DELAVAN AVE, 0.2 MI, CONTINUE ONTO DORAN AVE, 361 FT, TURN LEFT ONTO BYRAM SHORE RD, 167 FT, TURN RIGHT ONTO RITCH AVE W, 0.6 MI, CONTINUE ONTO HAMILTON AVE, 0.5 MI, TAKE RODWELL AVE TO HAMILTON AVE, 43 S (0.2 MI), TURN RIGHT ONTO GLEN ST, 351 FT, GLEN ST TURNS LEFT AND BECOMES RODWELL AVE, 476 FT, RODWELL AVE TURNS LEFT AND BECOMES STONE AVE, 358 FT, CONTINUE ON HAMILTON AVE. DRIVE TO RITCH AVE W, 3 MIN (1.1 MI), TURN LEFT ONTO HAMILTON AVE, 0.6 MI, CONTINUE ONTO RITCH AVE W, DESTINATION WILL BE ON THE RIGHT

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	1	09/13/18	TC
G-002	GENERAL NOTES	0	08/29/18	NS
C-101	DETAILED SITE PLAN & TOWER ELEVATION	0	08/29/18	NS
C-501	ANTENNA INFORMATION & SCHEDULE	1	09/13/18	TC
C-502	CONSTRUCTION DETAILS	0	08/29/18	NS
E-501	GROUNDING DETAILS	0	08/29/18	NS
R-601	SUPPLEMENTAL	0	08/29/18	SIA

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18
1	RRU PLACEMENT	TC	09/13/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	1

GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC MASTER SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE WIRELESS REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE WIRELESS REP IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
17. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
18. CONTRACTOR SHALL FURNISH T-MOBILE WIRELESS WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
19. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE WIRELESS REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
20. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
24. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
25. CONTRACTOR SHALL NOTIFY T-MOBILE WIRELESS REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
27. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
28. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE T-MOBILE WIRELESS REP. ANY WORK FOUND BY THE T-MOBILE WIRELESS REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
29. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   - A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
   - B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
   - C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
   - D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
   - E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
   - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
   - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
   - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
   - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
   - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
   - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
   - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

GENERAL NOTES

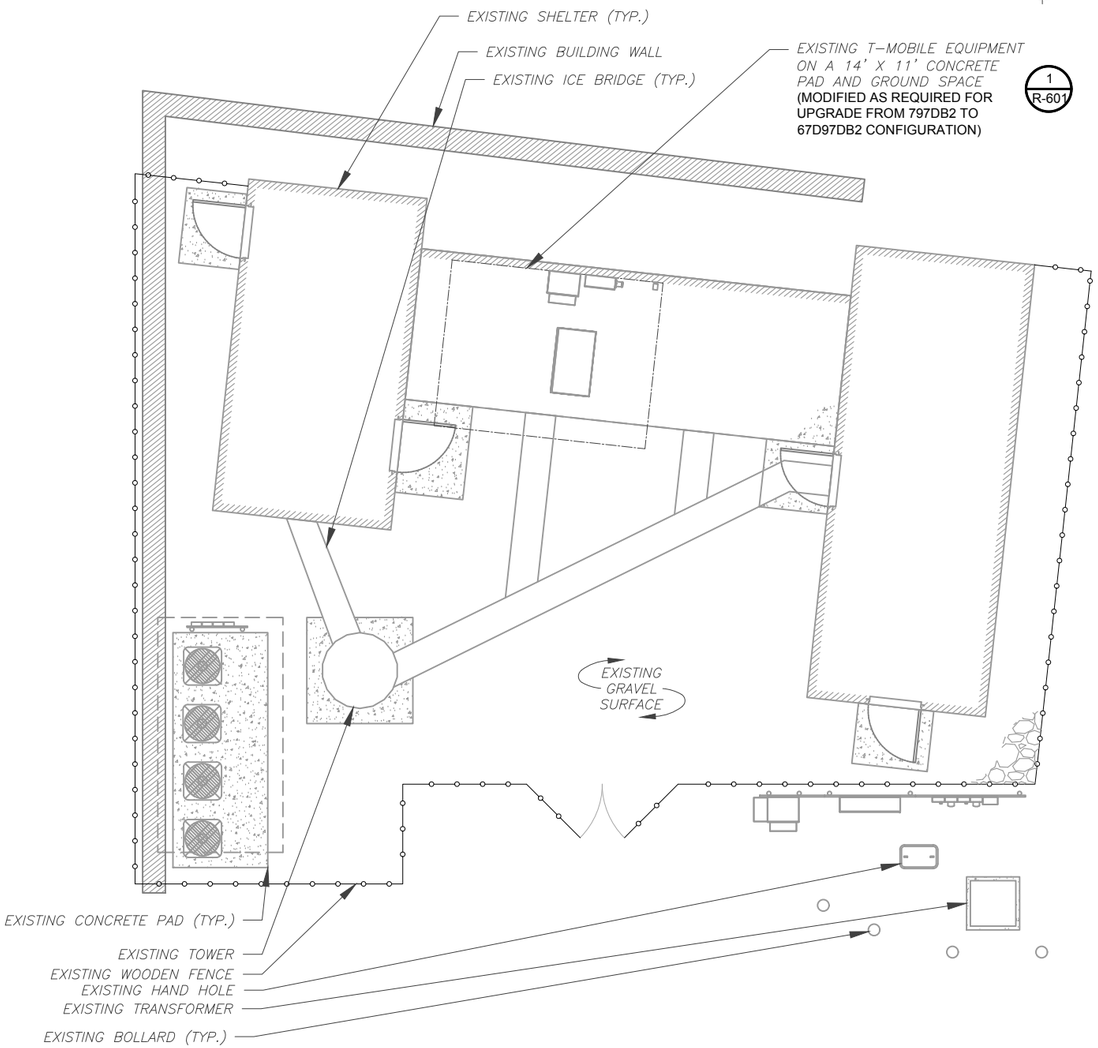
SHEET NUMBER:	REVISION:
G-002	0

SITE PLAN NOTES:

1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.

2. ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.

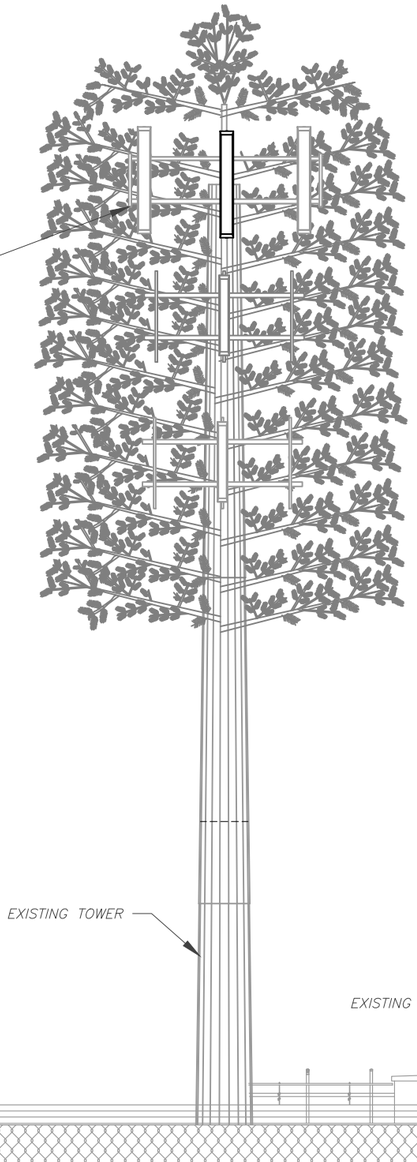
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.



1 DETAILED SITE PLAN

0 10' 20'

SCALE: 1"=10' (11X17)
1"=5' (22X34)



2 TOWER ELEVATION

SCALE: NOT TO SCALE

TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA HEIGHTS, ANTENNA AZIMUTHS AND MOUNT CONFIGURATIONS.
3. THE PROPOSED PROJECT INCLUDES MODIFYING TOWER MOUNTED EQUIPMENT AS INDICATED ON SHEET C-501.
4. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL ()

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

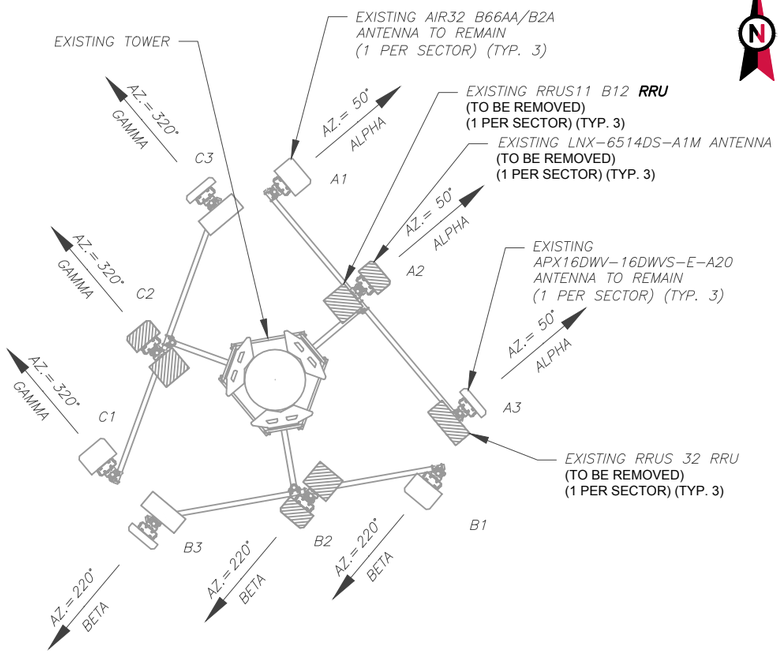
SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

DETAILED SITE PLAN & TOWER ELEVATION

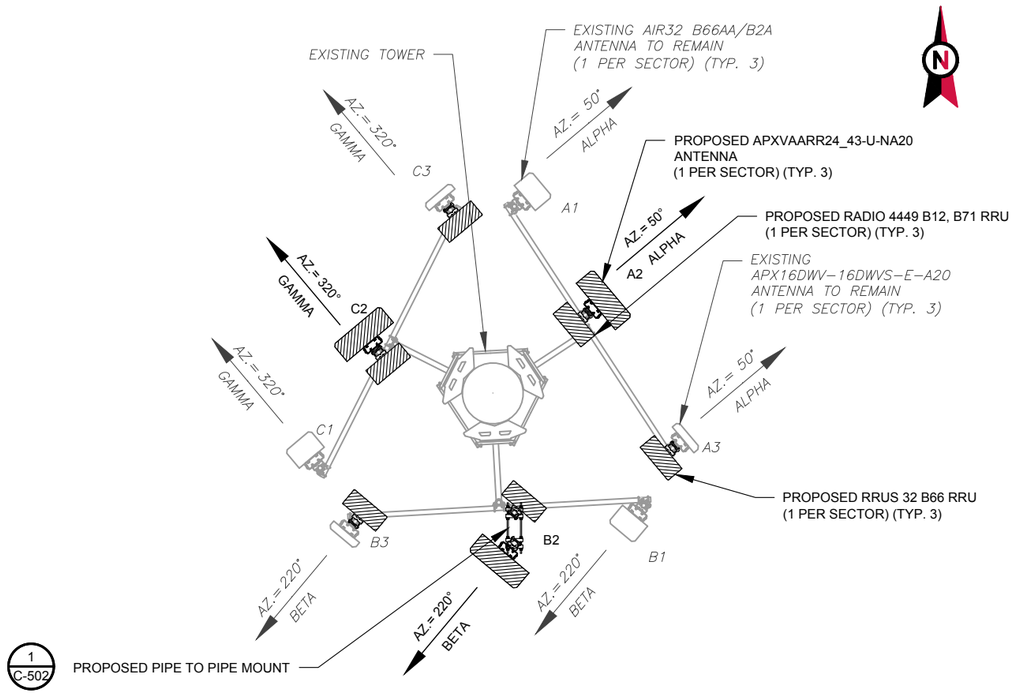
SHEET NUMBER:	REVISION:
C-101	0



1 EXISTING ANTENNA PLAN

NOTES:

1. ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIGURATION OR MOUNT CONFIGURATION. CONTRACTOR TO VERIFY MOUNT CONFIGURATION HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (I.E. CLEARANCES, MOUNT PIPE OR SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.



2 FINAL ANTENNA PLAN

NOTES:

1. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH THE ATC CM.
2. SPACING OF PROPOSED EQUIPMENT SHALL BE CONFIRMED FOR TOWER CONFLICTS AND PROPOSED MOUNTS SHALL NOT IMPEDE TOWER CLIMBING PEGS.

EXISTING ANTENNA/ COAX SCHEDULE

SECTOR	ANT.	MANUFACTURER (MODEL #)	RAD CENTER	AZIMUTH (TN)	MECH. D-TILT	ELEC. D-TILT	ADDITIONAL TOWER MOUNTED EQUIPMENT	ANTENNA COAX DESCRIPTION
ALPHA	A1	AIR32 B66AA/B2A	77'-0"	50°	–	–	RRUS 32	–
ALPHA	A2	LNX-6514DS-A1M	77'-0"	50°	–	–	RRUS11 B12	–
ALPHA	A3	APX16DWV-16DWVS-E-A20	77'-0"	50°	–	–	–	–
BETA	B1	AIR32 B66AA/B2A	77'-0"	220°	–	–	RRUS 32	–
BETA	B2	LNX-6514DS-A1M	77'-0"	220°	–	–	RRUS11 B12	–
BETA	B3	APX16DWV-16DWVS-E-A20	77'-0"	220°	–	–	–	–
GAMMA	C1	AIR32 B66AA/B2A	77'-0"	320°	–	–	RRUS 32	–
GAMMA	C2	LNX-6514DS-A1M	77'-0"	320°	–	–	RRUS11 B12	–
GAMMA	C3	APX16DWV-16DWVS-E-A20	77'-0"	320°	–	–	–	–

1. (2) EXISTING 1-1/4" HYBRID CABLES (TO REMAIN)

3 ANTENNA SCHEDULE

FINAL ANTENNA/ COAX SCHEDULE

SECTOR	ANT.	MANUFACTURER (MODEL #)	RAD CENTER	AZIMUTH (TN)	MECH. D-TILT	ELEC. D-TILT	ADDITIONAL TOWER MOUNTED EQUIPMENT	ANTENNA COAX DESCRIPTION
ALPHA	A1	AIR32 B66AA/B2A	77'-0"	50°	–	–	-	–
ALPHA	A2	APXVAARR24_43-U-NA20	77'-0"	50°	-	-	RADIO 4449 B12, B71	–
ALPHA	A3	APX16DWV-16DWVS-E-A20	77'-0"	50°	–	–	RRUS 32 B66	–
BETA	B1	AIR32 B66AA/B2A	77'-0"	220°	–	–	-	–
BETA	B2	APXVAARR24_43-U-NA20	77'-0"	220°	-	-	RADIO 4449 B12, B71	–
BETA	B3	APX16DWV-16DWVS-E-A20	77'-0"	220°	–	–	RRUS 32 B66	–
GAMMA	C1	AIR32 B66AA/B2A	77'-0"	320°	–	–	-	–
GAMMA	C2	APXVAARR24_43-U-NA20	77'-0"	320°	-	-	RADIO 4449 B12, B71	–
GAMMA	C3	APX16DWV-16DWVS-E-A20	77'-0"	320°	–	–	RRUS 32 B66	–

1. BASED ON APPROVED ATC APPLICATION OAA737002, DATED 07/11/2018. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS.
2. (2) EXISTING 1-1/4" HYBRID CABLES (TO REMAIN)
3. (1) PROPOSED 1-1/4" HYBRID CABLE (110'±)

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18
1	RRU PLACEMENT	TC	09/13/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

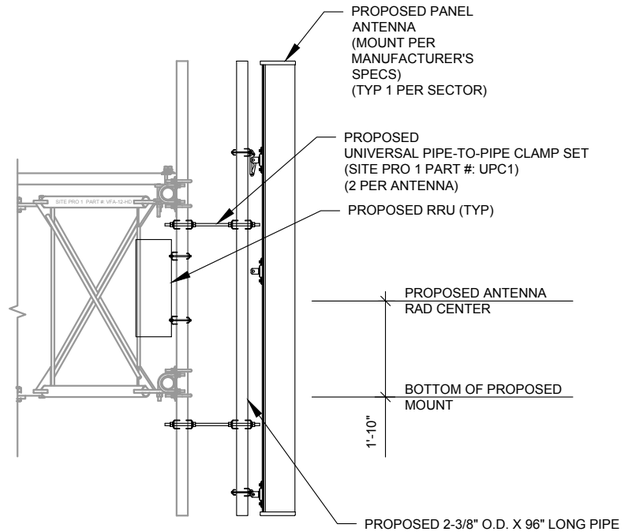
SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-501	1



1 PROPOSED PIPE-TO-PIPE MOUNT DETAIL (ELEVATION)

SCALE: NOT TO SCALE

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

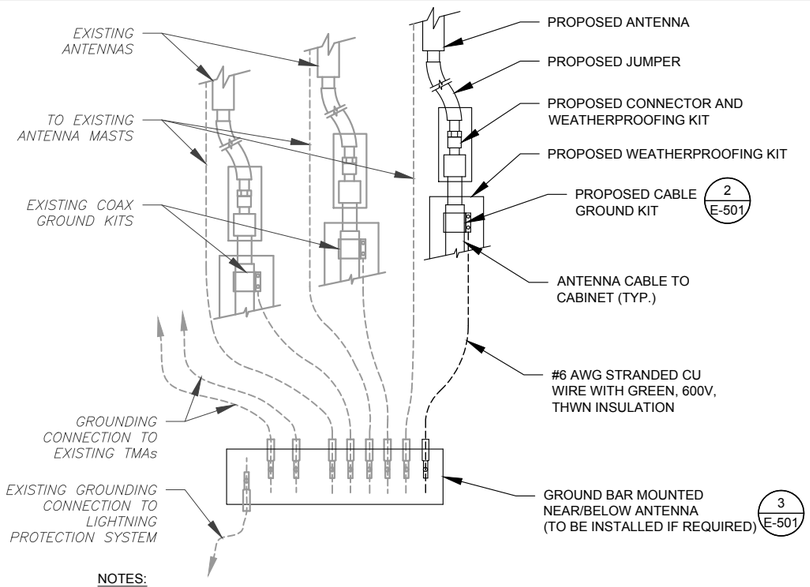
SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-502	0

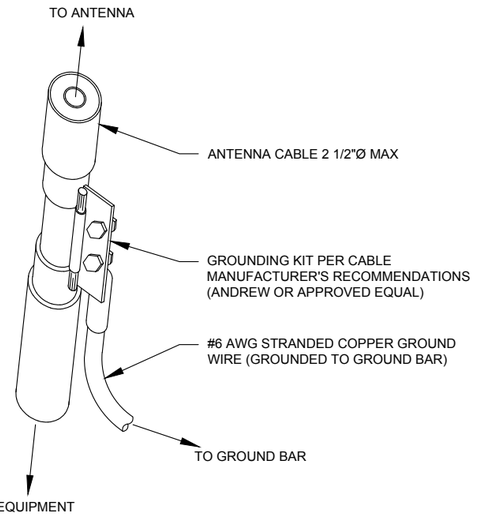


NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH T-MOBILE GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH T-MOBILE GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: NOT TO SCALE

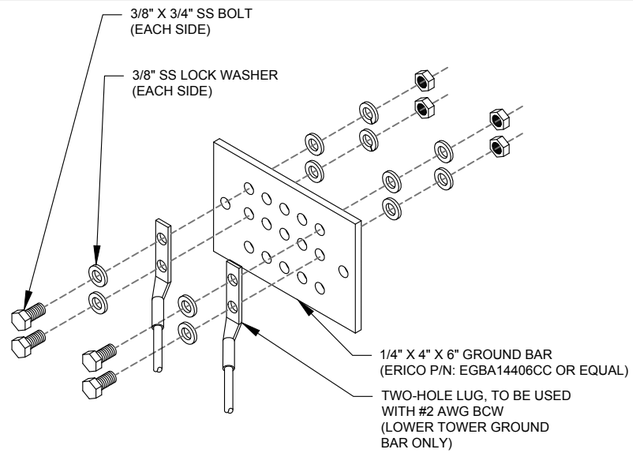


GROUND KIT NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: NOT TO SCALE



GROUND BAR NOTES:

1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

3 TOWER GROUND BAR DETAIL

SCALE: NOT TO SCALE

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

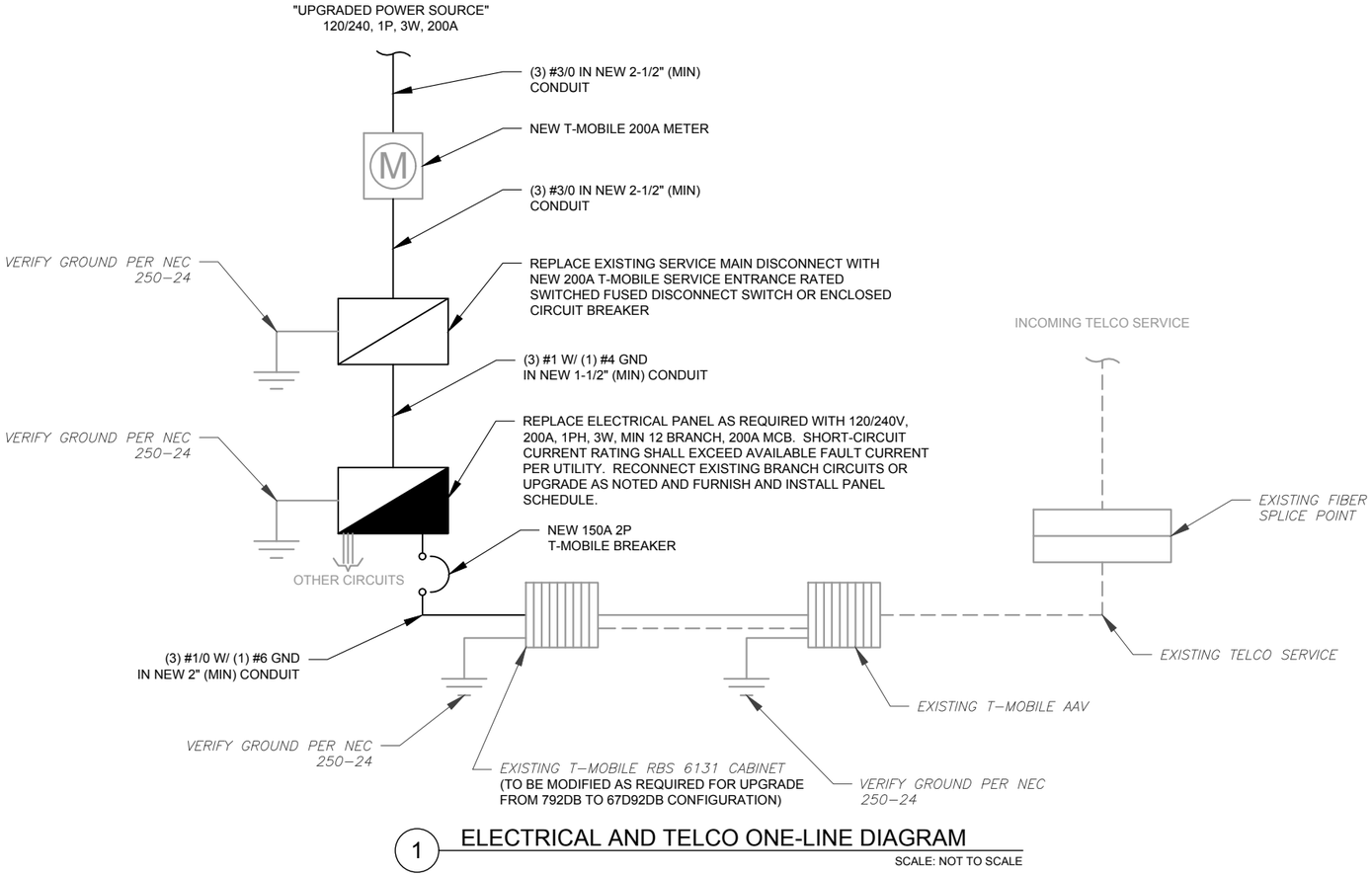
SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-501	0



1 ELECTRICAL AND TELCO ONE-LINE DIAGRAM

SCALE: NOT TO SCALE

LEGEND

- EXISTING POWER CONDUIT
- NEW POWER CONDUIT
- EXISTING TELCO CONDUIT
- NEW TELCO CONDUIT
- ELECTRICAL BREAKER
- ELECTRICAL METER
- ELECTRICAL GROUNDING
- ELECTRICAL SINK
- INCOMING TELCO SERVICE
- DISCONNECT

NOTES:

1. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRIC CODES AND ALL LOCAL AND STATE CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC.
2. EXTERIOR CONDUIT: UNDERGROUND POWER AND BACKHAUL SERVICE LINES SHALL BE ROUTED IN A COMMON TRENCH. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 AND CONDUIT EXPOSED ABOVE GROUND SHALL BE RIGID GALVANIZED STEEL UNLESS OTHERWISE INDICATED. POWER CONDUIT LINES SHALL BE SIZED AS REQUIRED PER CABLE SIZING AND NEC.
3. INTERIOR CONDUIT: ALL CIRCUITS SHALL CONSIST OF PULLED CONDUCTORS IN EMT. WHEN REQUIRED TO CONNECT INTO EQUIPMENT. FLEXIBLE METALLIC CONDUIT SHALL BE ALLOWED PROVIDED THAT IT DOES NOT EXCEED 3' IN LENGTH. FLEXIBLE METAL CONDUIT SHALL BE GROUNDED IN ACCORDANCE WITH THE APLICABLE CODE.
4. CLASSIFIED "DAMP" OR "WET" LOCATION: ALL CIRCUITS SHALL CONSIST OF PULLED CONDUCTORS IN RMC CONDUIT. CONNECTIONS TO COMMUNICATION CABINET AND VIVRATING EQUIPMENT SHALL CONSIST OF PULLED CONDUCTORS IN LIQUID TIGHT FLEXIBLE STEEL CONDUIT, MAXIMUM 6' IN LENGTH. LIQUID TIGHT FLEXIBLE STEEL CONDUIT SHALL BE GROUNDED IN ACCORDANCE WITH THE APPLICABLE CODE.
5. CONTRACTOR SHALL PROVIDE A TEMPORARY SHUNT WHEN REQUIRED. SHUNT SHALL BE THROUGH METERING DEVICE WHEN APPLICABLE IF ALLOWED BY UTILITY SERVICE CO.
6. COORDINATE ALL DISCONNECTS AND INTERRUPTIONS OF ELECTRICAL SERVICE WITH OWNER. A TIMETABLE OF INTERRUPTIONS AND SHUTDOWNS SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL NO LATER THAN ONE WEEK BEFORE INTERRUPTIONS ARE SCHEDULED. FORTY EIGHT HOURS PRIOR CONTRACTOR SHALL NOTIFY ALL INVOLVED PARTIES.

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NS	08/29/18

ATC SITE NUMBER:
414240

ATC SITE NAME:
BYRAM PARK CT

SITE ADDRESS:
48 RITCH AVENUE WEST
GREENWICH, CT 06830

SEAL:

T-Mobile

DRAWN BY:	NS
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607178

GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-502	0

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 702Cu Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment
Baseband	DUS41 (L2100) · DUW30 (U1900 (DECOMMISSIONED)) · DUG20 (G1900)	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length*
Multiplexer	XMU (L700)	

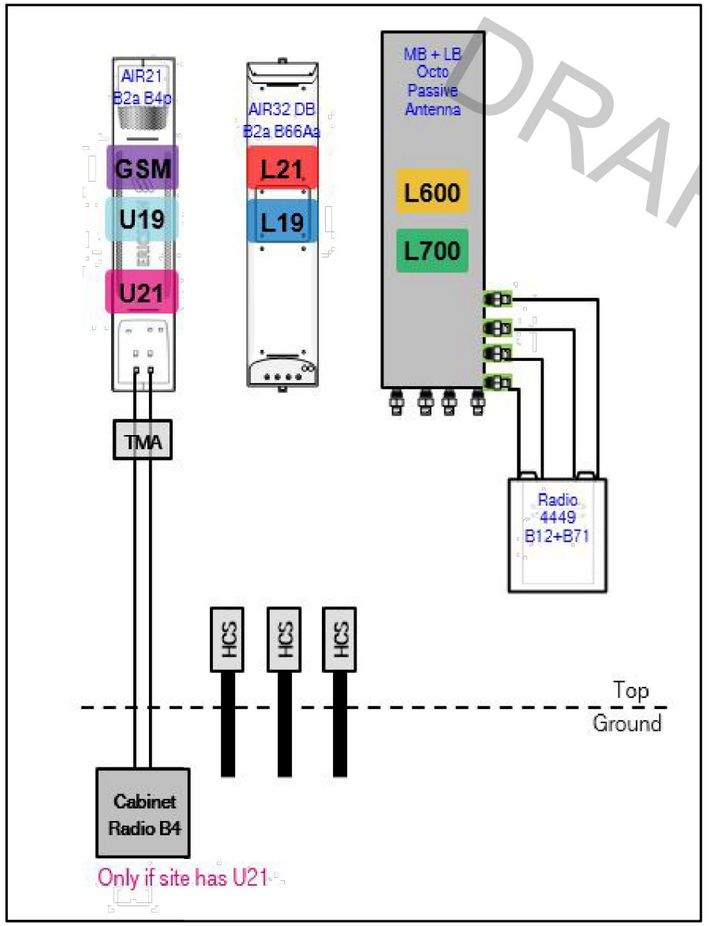
Proposed RAN Equipment

Template: 67D92DB Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment
Baseband	DUW30 (U2100) · DUG20 (G1900) · BB 5216 (L2100, L1900, L700, L600)	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length* · Ericsson 6x12 HCS 6AWG 50m
Multiplexer	XMU	
Radio	RU22 (x3) (U2100)	

RAN Scope of Work:

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE



2 ANTENNA CONFIGURATION
SCALE: NOT TO SCALE

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-601	0

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, October 17, 2018 9:58 AM
To: krichers@transcendwireless.com
Subject: UPS Delivery Notification, Reference Number 1: CT11606H CSC Zoning

Your package has been delivered.

Delivery Date: Wednesday, 10/17/2018
Delivery Time: 09:53 AM

At the request of TRANSCEND WIRELESS this notice alerts you that the status of the shipment listed below has changed.

Shipment Detail

Tracking Number:	1ZV257424297533065
Ship To:	Katie DeLuca Town of Greenwich 101 FIELD POINT RD GREENWICH, CT 06830 US
UPS Service:	UPS GROUND
Number of Packages:	1
Weight:	1.0 LBS
Delivery Location:	MAIL ROOM CALABRECE
Signature Required:	A signature is required for package delivery
Reference Number 1:	CT11606H CSC Zoning

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, October 17, 2018 9:58 AM
To: krichers@transcendwireless.com
Subject: UPS Delivery Notification, Reference Number 1: CT11606H CSC FS

Your package has been delivered.

Delivery Date: Wednesday, 10/17/2018
Delivery Time: 09:53 AM

At the request of TRANSCEND WIRELESS this notice alerts you that the status of the shipment listed below has changed.

Shipment Detail

Tracking Number:	1ZV257424296403055
Ship To:	Peter J. Tesei Town of Greenwich 101 FIELD POINT RD GREENWICH, CT 06830 US
UPS Service:	UPS GROUND
Number of Packages:	1
Weight:	1.0 LBS
Delivery Location:	MAIL ROOM CALABRECE
Signature Required:	A signature is required for package delivery
Reference Number 1:	CT11606H CSC FS

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Friday, October 19, 2018 11:04 AM
To: krichers@transcendwireless.com
Subject: UPS Delivery Notification, Reference Number 1: CT11606H CSC TO

Flag Status: Flagged

Your package has been delivered.

Delivery Date: Friday, 10/19/2018
Delivery Time: 10:56 AM

At the request of TRANSCEND WIRELESS this notice alerts you that the status of the shipment listed below has changed.

Shipment Detail

Tracking Number:	1ZV257424298683071
Ship To:	Contacts Management American Tower Corporation 10 PRESIDENTIAL WAY WOBURN, MA 01801 US
UPS Service:	UPS GROUND
Number of Packages:	1
Weight:	1.0 LBS
Delivery Location:	RECEIVER LONG
Signature Required:	A signature is required for package delivery
Reference Number 1:	CT11606H CSC TO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, October 17, 2018 2:37 PM
To: krichers@transcendwireless.com
Subject: UPS Delivery Notification, Reference Number 1: CT11606H CSC PO

Your package has been delivered.

Delivery Date: Wednesday, 10/17/2018
Delivery Time: 02:33 PM

Set Delivery Instructions | Get Free Alerts | View Delivery Planner

At the request of TRANSCEND WIRELESS this notice alerts you that the status of the shipment listed below has changed.

Shipment Detail

Tracking Number:	1ZV257424299853082
Ship To:	36 Ritch Avenue LLC 16 ARTHER ST GREENWICH, CT 06831 US
UPS Service:	UPS GROUND
Number of Packages:	1
Package Weight:	1.0 LBS
Delivery Location:	RESIDENTIAL
Signed by:	KELLY