Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

November 1, 2018

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

Notice of Exempt Modification
1590 Newfield Ave., Stamford, CT 06905
Latitude- 41.11275
Longitude- -73.538335278

Dear Ms. Bachman,

T-Mobile currently maintains (3) existing antennas at the 160' level of the existing 152' monopole at 1590 Newfield Ave. in Stamford, Connecticut. The tower is owned by American Tower Corporation. The property is owned by Cellco Partnership. 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 160' level of the tower. T-Mobile also intends to add (6) coax cables.

This facility was originally approved by the Connecticut Siting Council in Docket No. 45 on September 14, 1984. The modification complies with the original approval.

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 David Martin, Mayor of the City of Stamford, Ralph Blessing, Land Use Bureau Chief of the City of Stamford, 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: David Martin- as elected official
Ralph Blessing- as zoning official
American Tower- as tower owner
Cellco Partnership- as property owner

Google Maps

41°06'45.9"N 73°32'18.0"W

CT11373A Map

Map data ©2018 Google 100 ft

41°06'45.9"N 73°32'18.0"W

41.112750, -73.538335

133 Eastover Rd, Stamford, CT 06905

4F76+4M Stamford, Connecticut

EASTOVER ROAD

Location	EASTOVER ROAD	**Mblu**	004/ 2955/ / /
Acct#	004-2955	**Owner**	CELLCO PARTNERSHIP
Assessment	$703,460	**Appraisal**	$1,004,930
PID	183864	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$412,320	$592,610	$1,004,930

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$288,630	$414,830	$703,460

Owner of Record

Owner	CELLCO PARTNERSHIP	**Sale Price**	$594,710
Co-Owner	VERIZON WIRELESS	**Book & Page**	4954/ 250
Address	P.O. BOX 2549 ADDISON, TX 75001	**Sale Date**	03/30/1998
		Instrument	00

Ownership History

Ownership History				
Owner	**Sale Price**	**Book & Page**	**Instrument**	**Sale Date**
CELLCO PARTNERSHIP	$594,710	4954/ 250	00	03/30/1998
METRO MOBILE CTS OF FAIRFIELD	$0	3571/ 172	00	05/23/1990

Building Information

Building 1 : Section 1

Year Built: 1994
Living Area: 415

Building Attributes	
Field	**Description**
STYLE	Telephone Bldg
Stories:	1
Occupancy	1

Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	T&G/Rubber
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete Slab
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Radiant
AC Type	None
Bldg Use	Industrial MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300C
Heat/AC	None
Frame Type	Wood Frame
Baths/Plumbing	None
Ceiling/Wall	Ceil & Mn Wall
Rooms/Prtns	Light
Wall Height	9
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/StamfordCTPhotos//\00\12\83/3

Building Layout

BAS[415]

(http://images.vgsi.com/photos/StamfordCTPhotos//Sketches/18

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	415	415
		415	415

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	200
Description	Commercial MDL-94
Zone	RA1

Land Line Valuation

Size (Acres)	3.46
Depth	
Assessed Value	$414,830

Neighborhood 0100
Alt Land Appr No
Category

Appraised Value $592,610

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
AP1	Fence Chn Lk			1596 L.F.	$13,770	1
CEL1	Cell Tower			2 SITES	$370,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$412,320	$592,610	$1,004,930
2016	$394,720	$538,730	$933,450
2015	$394,720	$538,730	$933,450

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$288,630	$414,830	$703,460
2016	$276,310	$377,110	$653,420
2015	$276,310	$377,110	$653,420

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: CT11373A

Stamford/MP Exit 35-36
1590 Newfield Avenue
Stamford, CT 06905

October 25, 2018

EBI Project Number: 6218006830

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.48 %**

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

EBI Consulting
environmental | engineering | due diligence

October 25, 2018

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

Emissions Analysis for Site: **CT11373A – Stamford/MP Exit 35-36**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1590 Newfield Avenue, Stamford, 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), 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 **1590 Newfield Avenue, Stamford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

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

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

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

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

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

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

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

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

10) The antenna mounting height centerline of the proposed antennas is **160 feet** above ground level (AGL).

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12,95 / 13.35 / 15.65 / 16.35 dBd	Gain:	12,95 / 13.35 / 15.65 / 16.35 dBd	Gain:	12,95 / 13.35 / 15.65 / 16.35 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Frequency Bands	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	375	Total TX Power(W):	375	Total TX Power(W):	375
ERP (W):	12,836.51	ERP (W):	12,836.51	ERP (W):	12,836.51
Antenna A1 MPE%	**2.45**	Antenna B1 MPE%	**2.45**	Antenna C1 MPE%	**2.45**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.45 %**
Sensus (CL&P)	**0.12** %
AT&T	**5.53** %
Clearwire	**0.11** %
Nextel	**0.76** %
Sprint	**3.43** %
Verizon Wireless	**2.08** %
Site Total MPE %:	**14.48 %**

T-Mobile Sector A Total:	2.45 %
T-Mobile Sector B Total:	2.45 %
T-Mobile Sector C Total:	2.45 %
Site Total:	14.48 %

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	1,469.13	160	4.45	PCS - 1900 MHz	1000.00	0.45%
T-Mobile AWS - 2100 MHz LTE	2	2,589.11	160	7.85	AWS - 2100 MHz	1000.00	0.78%
T-Mobile PCS - 1900 MHz GSM	1	550.92	160	0.84	PCS - 1900 MHz	1000.00	0.08%
T-Mobile AWS - 2100 MHz UMTS	1	1,726.08	160	2.62	AWS - 2100 MHz	1000.00	0.26%
T-Mobile 600 MHz LTE	2	788.97	160	2.39	600 MHz	400.00	0.60%
T-Mobile 700 MHz LTE	2	432.54	160	1.31	700 MHz	467.00	0.28%
						Total:	**2.45%**

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:	2.45 %
Sector B:	2.45 %
Sector C:	2.45 %
T-Mobile Maximum MPE % (Per Sector):	2.45 %
Site Total:	14.48 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.48%** 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.

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Structural Analysis Report

Structure	:	**148 ft Monopole**
ATC Site Name	:	**SMFR - North, CT**
ATC Site Number	:	**302515**
Engineering Number	:	**12598483_C3_02**
Proposed Carrier	:	**T-Mobile**
Carrier Site Name	:	**CT11373A**
Carrier Site Number	:	**CT11373A**
Site Location	:	**0 Lot 4 Eastover Road** **Stamford, CT 06905-1403** **41.112800,-73.538400**
County	:	**Fairfield**
Date	:	**August 30, 2018**
Max Usage	:	**77%**
Result	:	**Pass**

Prepared By:
Trevor Ridilla, E.I.
Structural Engineer I

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32598
LICENSED
PROFESSIONAL ENGINEER

Authorized by "EOR"
Aug 30 2018 6:00 PM cosign

COA: PEC.0001553

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Calculations ..... Attached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 148 ft monopole to reflect the change in loading by T-Mobile.

Supporting Documents

Tower Drawings	Engineered Endeavors Job #5591, dated November 22, 1999
Foundation Drawing	Engineered Endeavors Job #5591, dated November 17, 1999
Geotechnical Report	Dr. Clarence Welti, dated October 25, 2000
Modifications	ATC Project #43868633, dated September 1, 2009 ATC Project #51772939, dated April 11, 2013

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, Vasd) / 120 mph (3-Second Gust, Vult)
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:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.25, 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					
160.0	160.0	3	Commscope ATSBT-TOP-MF-4G	Flush	(18) 1 5/8" Coax	T-Mobile
		3	Andrew E15S09P94			
		3	RFS ATMAP1412D-1A20			
148.0	152.0	6	Kaelus DBC0061F1V51-2	Platform w/ Handrails	(12) 1 1/4" Coax (6) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk (1) 3" Conduit	AT&T Mobility
		6	Powerwave LGP21401			
		1	Raycap DC6-48-60-18-8F			
		1	Raycap DC6-48-60-18-8F (23.5" Height)			
		1	Raycap DC6-48-60-0-8F (24" Height)			
		3	Ericsson RRUS 4478 B14			
		3	Ericsson RRUS 11 (Band 12) (55 lb)			
		3	Ericsson RRUS 32 (50.8 lbs)			
		3	Ericsson RRUS 32 B2			
		3	Ericsson RRUS 32 B66			
		3	Powerwave 7770.00			
		3	Quintel QS66512-2			
		3	CCI OPA-65R-LCUU-H6			
		3	Kathrein 80010965			
143.0	143.0	6	RFS FD9R6004	Low Profile Platform	(12) 1 5/8" Coax (2) 1 5/8" Hybriflex	Verizon
		4	Alcatel-Lucent RRH2X60-1900			
		4	Alcatel-Lucent RRH2x60 700			
		4	Alcatel-Lucent RRH4x45-B66 w/o Solar Shield			
		2	RFS DB-T1-6Z-8AB-0Z			
		1	Antel BXA-80063-6BF-EDIN-X			
		2	Antel BXA-70063/6CF __ 2°			
		1	Antel BXA-80080/6CF			
		4	Commscope SBNHH-1D65B			
		4	Commscope SBNHH-1D45B			
132.0	132.0	3	KMW KMDAPS2040000 (E-F Band)	Low Profile Platform	(9) 1 1/4" Coax (6) 1 5/8" Coax	Sprint Nextel
		3	KMW AM-X-WM-17-65-00T (48")			
		9	Decibel DB844H90E-XY			
120.0	120.0	3	Alcatel-Lucent RRH2x50-08	Low Profile Platform	(4) 1 1/4" Hybriflex	
		3	Alcatel-Lucent 800MHz 2X50W RRH w/ Filter			
		3	Alcatel-Lucent 4x40W RRH (91 lb)			
		3	TD-RRH8x20-25 w/ Solar Shield			
		3	RFS APXVSPP18-C-A20			
		3	Commscope DT465B-2XR			
100.0	105.0	1	Antel BCD-87010 ___ 4°	Side Arm	(1) 7/8" Coax	Sensus USA
75.0	75.0	1	PCTEL GPS-TMG-HR-26N	Side Arm	(1) 1/2" Coax	Sprint Nextel

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
159.0	159.0	3	Andrew SBNHH-1D65B	-	-	T-Mobile

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
160.0	160.0	3	RFS APXVAARR24_43-U-NA20	Flush	(6) 1 5/8" Coax	T-Mobile

[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	3%	Pass
Shaft	57%	Pass
Base Plate	53%	Pass
Reinforcement	61%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3,233.7	72%
Axial (Kips)	69.1	7%
Shear (Kips)	26.6	77%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
160.0	RFS APXVAARR24_43-U-NA20	T-Mobile	0.000	0.000

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

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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:

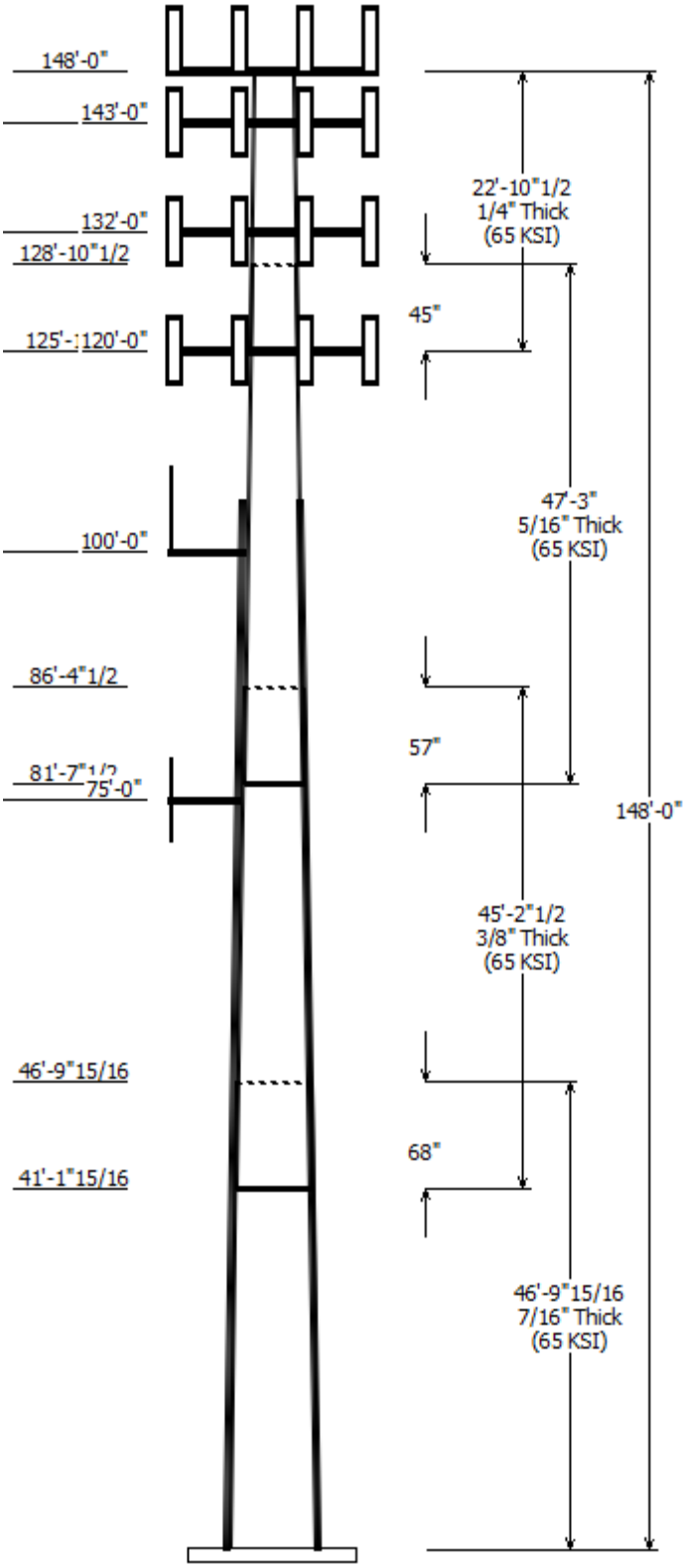
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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

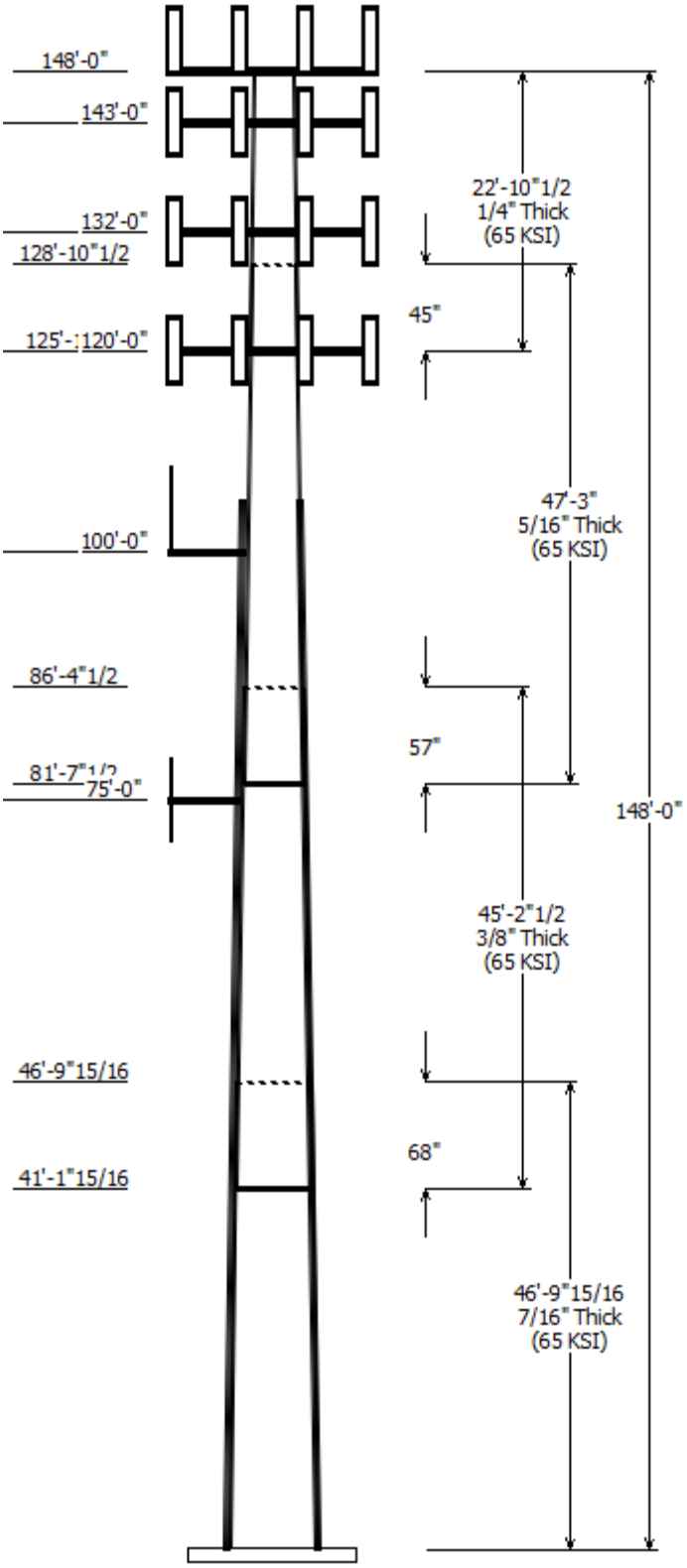
Pole :	302515	Code:	ANSI/TIA-222-G
Location :	SMFR - North, CT		
Description :	148 ft EEI Monopole		
Client :	T-MOBILE	Struct Class :	II
Shape :	18 Sides	Exposure :	B
Height :	148.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.195101 (in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	46.830	38.86	48.00	0.438		0.000	18 Sides	65
2	45.210	31.89	40.71	0.375	Slip Joint	68.000	18 Sides	65
3	47.250	24.23	33.45	0.313	Slip Joint	57.000	18 Sides	65
4	22.877	21.00	25.46	0.250	Slip Joint	45.000	18 Sides	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
160.000	160.000	3	RFS APXVAARR24_43-U-NA20
160.000	160.000	3	RFS ATMAP1412D-1A20
160.000	160.000	3	Andrew E15S09P94
160.000	160.000	3	Commscope ATSBT-TOP-MF-
148.000	152.000	1	Raycap DC6-48-60-0-8F (24" Hei
148.000	152.000	3	Ericsson RRUS 32 B66
148.000	152.000	3	Ericsson RRUS 4478 B14
148.000	152.000	3	Kathrein 80010965
148.000	152.000	6	Kaelus DBC0061F1V51-2
148.000	152.000	1	Raycap DC6-48-60-18-8F (23.5"
148.000	148.000	1	Flat Platform w/ Handrails
148.000	152.000	3	CCI OPA-65R-LCUU-H6
148.000	152.000	3	Quintel QS66512-2
148.000	152.000	3	Powerwave Allgon 7770.00
148.000	152.000	3	Ericsson RRUS 32 B2
148.000	152.000	3	Ericsson RRUS 32 (50.8 lbs)
148.000	152.000	3	Ericsson RRUS 11 (Band 12) (55
148.000	152.000	1	Raycap DC6-48-60-18-8F
148.000	152.000	6	Powerwave Allgon LGP21401
148.000	152.000	1	Pipe Mount
143.000	143.000	4	Commscope SBNHH-1D65B
143.000	143.000	6	RFS FD9R6004
143.000	143.000	1	Flat Low Profile Platform
143.000	143.000	1	Antel BXA-80080/6CF
143.000	143.000	4	Commscope SBNHH-1D45B
143.000	143.000	2	Antel BXA-70063/6CF __ 2°
143.000	143.000	1	Antel BXA-80063-6BF-EDIN-X
143.000	143.000	2	RFS DB-T1-6Z-8AB-0Z
143.000	143.000	4	Alcatel-Lucent RRH4x45-B66
143.000	143.000	4	Alcatel-Lucent RRH2x60 700
143.000	143.000	4	Alcatel-Lucent RRH2X60-1900
132.000	132.000	1	Flat Low Profile Platform
132.000	132.000	9	Decibel DB844H90E-XY
132.000	132.000	3	KMW AM-X-WM-17-65-00T (48")
132.000	132.000	3	KMW KMDAPS2040000 (E-F
120.000	120.000	3	Alcatel-Lucent RRH2x50-08
120.000	120.000	3	TD-RRH8x20-25 w/ Solar Shield
120.000	120.000	3	Commscope DT465B-2XR
120.000	120.000	1	Flat Low Profile Platform
120.000	120.000	3	RFS APXVSPP18-C-A20
120.000	120.000	3	Alcatel-Lucent 4x40W RRH (91 l
120.000	120.000	3	Alcatel-Lucent 800 MHz 2X50W
100.000	100.000	1	Flat Side Arm
100.000	105.000	1	Antel BCD-87010 ___ 4°



75.000	75.000	1	Round Side Arm
75.000	75.000	1	PCTEL GPS-TMG-HR-26N

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
10.000	120.0	1 1/4" Hybriflex	Yes
10.000	120.0	1 1/4" Hybriflex	Yes
10.000	132.0	1 1/4" Coax	No
10.000	132.0	1 5/8" Coax	No
10.000	143.0	1 5/8" Coax	No
10.000	143.0	1 5/8" Hybriflex	Yes
10.000	148.0	0.39" Fiber Trunk	No
10.000	148.0	0.78" 8 AWG 6	No
10.000	148.0	1 1/4" Coax	No
10.000	148.0	3" Conduit	No
10.000	160.0	1 5/8" Coax	No
10.000	160.0	1 5/8" Coax	Yes
10.000	75.000	1/2" Coax	Yes
10.000	100.0	7/8" Coax	Yes
0.000	113.2	DYWIDAG	Yes

Load Cases

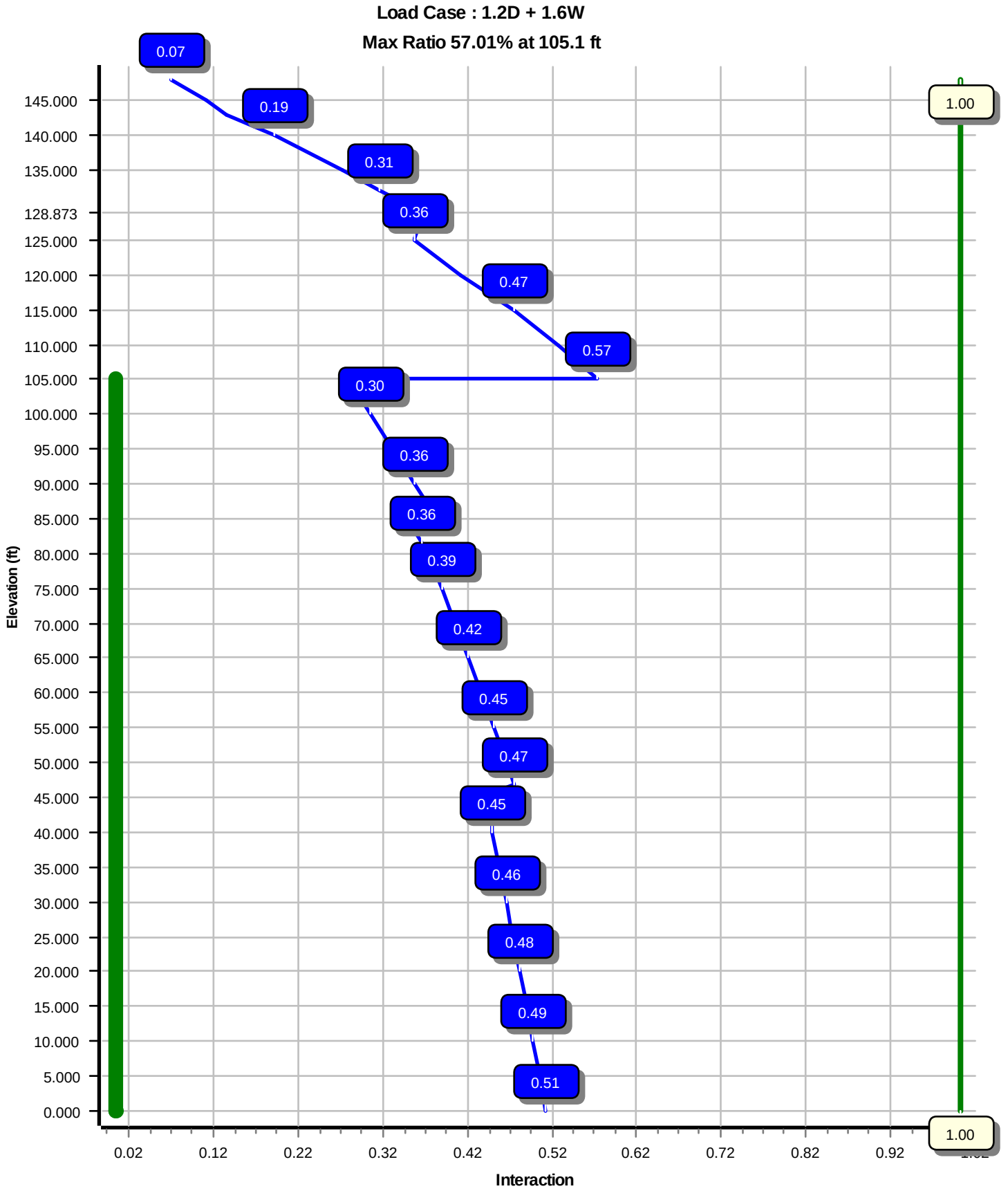
1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) 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	3233.69	26.63	69.12
0.9D + 1.6W	3060.76	25.22	51.84
1.2D + 1.0Di + 1.0Wi	915.01	7.44	106.84
(1.2 + 0.2Sds) * DL + E ELFM	270.16	2.20	69.40
(1.2 + 0.2Sds) * DL + E EMAM	583.10	4.86	69.40
(0.9 - 0.2Sds) * DL + E ELFM	265.33	2.19	46.90
(0.9 - 0.2Sds) * DL + E EMAM	571.87	4.85	46.90
1.0D + 1.0W	801.00	6.56	57.64

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 57.01% at 105.1 ft
0.07
0.19
0.31
0.36
0.47
0.57
0.30
0.36
0.36
0.39
0.42
0.45
0.47
0.45
0.46
0.48
0.49
0.51
1.00
1.00
145.000
140.000
135.000
128.873
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
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:	302515	Code: ANSI/TIA-222-G	
Site Name:	SMFR - North, CT	Engineering Number:12598483_C3_02	8/30/2018 9:40:26 AM
Customer:	T-MOBILE		

Analysis Parameters

Location :	FAIRFIELD County, CT	Height (ft) :	148
Code :	ANSI/TIA-222-G	Base Diameter (in) :	48.00
Shape :	18 Sides	Top Diameter (in) :	21.00
Pole Type :	Taper	Taper (in/ft) :	0.195
Pole Manfacturer :	EEI	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	93 mph
Exposure Category:	B	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):	2.54				
T_L (sec):	6	p:	1.3	C_s:	0.030
S_s:	0.249	S_1:	0.069	C_s Max:	0.030
F_a:	1.600	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.266	S_{d1}:	0.110		

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

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number:12598483_C3_02 8/30/2018 9:40:26 AM

Customer: T-MOBILE

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	46.830	0.4375	65		0.00	9,513	48.00	0.00	66.04	18876.3	17.93	109.71	38.86	46.83	53.36	9953.9	14.25	88.83	0.195101
2-18	45.210	0.3750	65	Slip	68.00	6,579	40.71	41.16	48.02	9874.4	17.74	108.58	31.89	86.37	37.52	4710.6	13.59	85.06	0.195101
3-18	47.250	0.3125	65	Slip	57.00	4,549	33.45	81.62	32.87	4560.0	17.46	107.04	24.23	128.87	23.72	1714.9	12.26	77.54	0.195101
4-18	22.877	0.2500	65	Slip	45.00	1,420	25.46	125.12	20.01	1606.8	16.55	101.85	21.00	148.00	16.46	895.7	13.40	84.00	0.195101
					Shaft Weight	22,062													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Distance From Face (ft)	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor
160.00	Andrew E15S09P94	3	0.000	0.000	14.60	0.660	0.50
160.00	Commscope ATSBT-TOP-MF-4G	3	0.000	0.000	1.80	0.200	0.50
160.00	RFS APXVAARR24_43-U-NA20	3	0.000	0.000	127.90	20.240	0.63
160.00	RFS ATMAP1412D-1A20	3	0.000	0.000	13.00	1.000	0.50
148.00	CCI OPA-65R-LCUU-H6	3	0.000	4.000	73.00	9.660	0.66
148.00	Ericsson RRUS 11 (Band 12) (55	3	0.000	4.000	55.00	2.520	0.67
148.00	Ericsson RRUS 32 (50.8 lbs)	3	0.000	4.000	50.80	2.690	0.67
148.00	Ericsson RRUS 32 B2	3	0.000	4.000	53.00	2.740	0.67
148.00	Ericsson RRUS 32 B66	3	0.000	4.000	53.00	2.740	0.67
148.00	Ericsson RRUS 4478 B14	3	0.000	4.000	59.90	1.840	0.50
148.00	Flat Platform w/ Handrails	1	0.000	0.000	2000.00	42.400	1.00
148.00	Kaelus DBC0061F1V51-2	6	0.000	4.000	25.50	0.510	0.50
148.00	Kathrein 80010965	3	0.000	4.000	97.60	13.810	0.62
148.00	Pipe Mount	1	0.000	4.000	200.00	6.400	1.00
148.00	Powerwave Allgon 7770.00	3	0.000	4.000	35.00	5.510	0.65
148.00	Powerwave Allgon LGP21401	6	0.000	4.000	14.10	1.100	0.50
148.00	Quintel QS66512-2	3	0.000	4.000	111.00	8.130	0.74
148.00	Raycap DC6-48-60-0-8F (24" Hei	1	0.000	4.000	32.80	1.280	1.00
148.00	Raycap DC6-48-60-18-8F	1	0.000	4.000	20.00	1.110	1.00
148.00	Raycap DC6-48-60-18-8F (23.5"	1	0.000	4.000	20.00	1.110	1.00
143.00	Alcatel-Lucent RRH2x60 700	4	0.000	0.000	56.70	2.150	0.67
143.00	Alcatel-Lucent RRH2X60-1900	4	0.000	0.000	43.00	1.880	0.50
143.00	Alcatel-Lucent RRH4x45-B66 w/o	4	0.000	0.000	63.30	2.470	0.67
143.00	Antel BXA-70063/6CF __ 2°	2	0.000	0.000	17.00	7.570	0.65
143.00	Antel BXA-80063-6BF-EDIN-X	1	0.000	0.000	19.20	7.260	0.66
143.00	Antel BXA-80080/6CF	1	0.000	0.000	22.00	7.780	0.65
143.00	Commscope SBNHH-1D45B	4	0.000	0.000	61.70	11.400	0.63
143.00	Commscope SBNHH-1D65B	4	0.000	0.000	50.70	8.170	0.69
143.00	Flat Low Profile Platform	1	0.000	0.000	1500.00	26.100	1.00
143.00	RFS DB-T1-6Z-8AB-0Z	2	0.000	0.000	44.00	4.800	0.67
143.00	RFS FD9R6004	6	0.000	0.000	3.10	0.370	0.50
132.00	Decibel DB844H90E-XY	9	0.000	0.000	14.00	3.610	0.74
132.00	Flat Low Profile Platform	1	0.000	0.000	1500.00	26.100	1.00
132.00	KMW AM-X-WM-17-65-00T (48")	3	0.000	0.000	14.20	3.360	0.64
132.00	KMW KMDAPS2040000 (E-F	3	0.000	0.000	15.90	0.970	0.50
120.00	Alcatel-Lucent 4x40W RRH (91 l	3	0.000	0.000	91.00	3.290	0.67
120.00	Alcatel-Lucent 800 MHz 2X50W R	3	0.000	0.000	64.00	2.060	0.67
120.00	Alcatel-Lucent RRH2x50-08	3	0.000	0.000	52.90	1.700	0.50
120.00	Commscope DT465B-2XR	3	0.000	0.000	58.00	9.100	0.69
120.00	Flat Low Profile Platform	1	0.000	0.000	1500.00	26.100	1.00
120.00	RFS APXVSPP18-C-A20	3	0.000	0.000	57.00	8.020	0.69
120.00	TD-RRH8x20-25 w/ Solar Shield	3	0.000	0.000	70.00	4.050	0.67
100.00	Antel BCD-87010 ___ 4°	1	0.000	5.000	26.50	2.900	1.00
100.00	Flat Side Arm	1	0.000	0.000	150.00	6.300	1.00
75.00	PCTEL GPS-TMG-HR-26N	1	0.000	0.000	0.60	0.090	1.00
75.00	Round Side Arm	1	0.000	0.000	150.00	5.200	1.00

Totals Num Loadings:46 128 12252.70

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
10.00	160.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	T-Mobile
10.00	160.00	12	1 5/8" Coax	1.98	0.82	N	3.96	Y	T-Mobile
10.00	148.00	2	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
10.00	148.00	6	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
10.00	148.00	12	1 1/4" Coax	1.55	0.63	N	0.00	N	AT&T Mobility
10.00	148.00	1	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
10.00	143.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
10.00	143.00	2	1 5/8" Hybriflex	1.98	1.30	N	0.00	Y	Verizon
10.00	132.00	9	1 1/4" Coax	1.55	0.63	N	0.00	N	Sprint Nextel
10.00	132.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	Sprint Nextel
10.00	120.00	3	1 1/4" Hybriflex Cable	1.54	1.00	N	0.00	Y	Sprint Nextel
10.00	120.00	1	1 1/4" Hybriflex Cable	1.54	1.00	N	0.00	Y	Sprint Nextel
0.00	113.25	4	DYWIDAG	2.50	16.70	N	1.66	Y	-
10.00	100.00	1	7/8" Coax	1.09	0.33	N	0.00	Y	Sensus USA
10.00	75.00	1	1/2" Coax	0.63	0.15	N	0.00	Y	Sprint Nextel

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Intermediate Connections			Connectors	Continuation?
						Description	Spacing (in)	Len (in)		
0.00	105.1	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	No

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)	Additional Reinforcing Area (in^2)	Additional Reinforcing Ix (in^4)	Additional Reinforcing Weight (lb)
0.00		0.4375	48.000	66.044	18,876.3	17.93	109.71	80.3	774.6	0.0	0.0	19.64	7,401	0.0
5.00		0.4375	47.024	64.690	17,738.5	17.54	107.48	80.8	743.0	0.0	1,112.1	19.64	7,141	334.0
10.00		0.4375	46.049	63.335	16,647.3	17.15	105.25	81.2	712.0	0.0	1,089.1	19.64	6,885	334.0
15.00		0.4375	45.073	61.980	15,601.9	16.76	103.03	81.7	681.8	0.0	1,066.1	19.64	6,634	334.0
20.00		0.4375	44.098	60.626	14,601.2	16.36	100.80	82.2	652.2	0.0	1,043.0	19.64	6,387	334.0
25.00		0.4375	43.122	59.271	13,644.2	15.97	98.57	82.6	623.2	0.0	1,020.0	19.64	6,145	334.0
30.00		0.4375	42.147	57.917	12,729.9	15.58	96.34	82.6	594.9	0.0	996.9	19.64	5,908	334.0
35.00		0.4375	41.171	56.562	11,857.5	15.18	94.11	82.6	567.3	0.0	973.9	19.64	5,676	334.0
40.00		0.4375	40.196	55.208	11,025.8	14.79	91.88	82.6	540.3	0.0	950.8	19.64	5,448	334.0
41.16	Bot - Section 2	0.4375	39.969	54.892	10,838.1	14.70	91.36	82.6	534.1	0.0	217.9	19.64	5,396	77.7
45.00		0.4375	39.220	53.853	10,234.0	14.40	89.65	82.6	513.9	0.0	1,330.9	19.64	5,396	256.3
46.83	Top - Section 1	0.3750	39.613	46.702	9,084.7	17.22	105.64	81.2	451.7	0.0	625.9	19.64	5,314	122.2
50.00		0.3750	38.995	45.966	8,661.8	16.93	103.99	81.5	437.5	0.0	499.8	19.64	5,174	211.8
55.00		0.3750	38.019	44.805	8,021.9	16.47	101.39	82.0	415.6	0.0	772.2	19.64	4,956	334.0
60.00		0.3750	37.044	43.644	7,414.3	16.01	98.78	82.6	394.2	0.0	752.4	19.64	4,744	334.0
65.00		0.3750	36.068	42.483	6,838.2	15.55	96.18	82.6	373.4	0.0	732.7	19.64	4,536	334.0
70.00		0.3750	35.093	41.321	6,292.7	15.09	93.58	82.6	353.2	0.0	712.9	19.64	4,332	334.0
75.00		0.3750	34.117	40.160	5,777.0	14.63	90.98	82.6	333.5	0.0	693.2	19.64	4,134	334.0
80.00		0.3750	33.142	38.999	5,290.3	14.17	88.38	82.6	314.4	0.0	673.4	19.64	3,940	334.0
81.62	Bot - Section 3	0.3750	32.825	38.622	5,138.4	14.02	87.53	82.6	308.3	0.0	214.4	19.64	3,878	108.4
85.00		0.3750	32.166	37.838	4,831.7	13.71	85.78	82.6	295.9	0.0	813.2	19.64	3,871	225.6
86.37	Top - Section 2	0.3125	32.523	31.948	4,188.0	16.94	104.08	81.5	253.6	0.0	326.0	19.64	3,819	91.7
90.00		0.3125	31.816	31.246	3,918.0	16.54	101.81	81.9	242.6	0.0	389.9	19.64	3,683	242.3
95.00		0.3125	30.840	30.279	3,565.2	15.99	98.69	82.6	227.7	0.0	523.4	19.64	3,500	334.0
100.0		0.3125	29.865	29.311	3,234.2	15.44	95.57	82.6	213.3	0.0	506.9	19.64	3,322	334.0
105.0		0.3125	28.889	28.344	2,924.4	14.89	92.45	82.6	199.4	0.0	490.5	19.64	3,148	334.0
105.1	Reinf. Top	0.3125	28.865	28.319	2,916.9	14.88	92.37	82.6	199.0	0.0	12.1	19.64	3,144	8.3
110.0		0.3125	27.914	27.376	2,635.0	14.34	89.32	82.6	185.9	0.0	462.0			
115.0		0.3125	26.938	26.409	2,365.4	13.79	86.20	82.6	172.9	0.0	457.5			
120.0		0.3125	25.963	25.441	2,114.8	13.24	83.08	82.6	160.4	0.0	441.1			
125.0		0.3125	24.987	24.473	1,882.6	12.69	79.96	82.6	148.4	0.0	424.6			
125.1	Bot - Section 4	0.3125	24.963	24.450	1,877.1	12.67	79.88	82.6	148.1	0.0	10.3			
128.8	Top - Section 3	0.2500	24.732	19.425	1,471.0	16.03	98.93	82.5	117.1	0.0	558.9			
130.0		0.2500	24.512	19.251	1,431.7	15.88	98.05	82.6	115.0	0.0	74.1			
132.0		0.2500	24.122	18.941	1,363.7	15.60	96.49	82.6	111.4	0.0	130.0			
135.0		0.2500	23.536	18.477	1,265.9	15.19	94.15	82.6	105.9	0.0	191.0			
140.0		0.2500	22.561	17.703	1,113.3	14.50	90.24	82.6	97.2	0.0	307.8			
143.0		0.2500	21.976	17.239	1,028.0	14.09	87.90	82.6	92.1	0.0	178.3			
145.0		0.2500	21.585	16.929	973.6	13.81	86.34	82.6	88.8	0.0	116.3			
148.0		0.2500	21.000	16.465	895.7	13.40	84.00	82.6	84.0	0.0	170.4			
											22,061.8			7,022.3

Load Case: 1.2D + 1.6W — 93 mph with No Ice — 23 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		169.3	0.0					0.0	0.0	169.3	0.0	0.0	0.0
5.00		335.1	1,334.6					0.0	801.6	335.1	2,136.2	0.0	0.0
10.00		338.6	1,306.9					0.0	801.6	338.6	2,108.5	0.0	0.0
15.00		343.2	1,279.3					0.0	1,197.5	343.2	2,476.8	0.0	0.0
20.00		338.3	1,251.6					0.0	1,197.5	338.3	2,449.1	0.0	0.0
25.00		333.5	1,223.9					0.0	1,197.5	333.5	2,421.5	0.0	0.0
30.00		332.5	1,196.3					0.0	1,197.5	332.5	2,393.8	0.0	0.0
35.00		338.4	1,168.6					0.0	1,197.5	338.4	2,366.2	0.0	0.0
40.00		211.8	1,141.0					0.0	1,197.5	211.8	2,338.5	0.0	0.0
41.16	Bot - Section 2	177.4	261.5					0.0	278.6	177.4	540.1	0.0	0.0
45.00		203.1	1,597.1					0.0	918.9	203.1	2,516.0	0.0	0.0
46.83	Top - Section 1	180.4	751.1					0.0	438.3	180.4	1,189.4	0.0	0.0
50.00		296.7	599.8					0.0	759.2	296.7	1,359.0	0.0	0.0
55.00		366.4	926.6					0.0	1,197.5	366.4	2,124.1	0.0	0.0
60.00		369.7	902.9					0.0	1,197.5	369.7	2,100.4	0.0	0.0
65.00		372.2	879.2					0.0	1,197.5	372.2	2,076.7	0.0	0.0
70.00		374.0	855.5					0.0	1,197.5	374.0	2,053.0	0.0	0.0
75.00	Appurtenance(s)	375.1	831.8	178.3	0.0	0.0	180.7	0.0	1,197.5	553.4	2,210.0	0.0	0.0
80.00		248.8	808.1					0.0	1,196.6	248.8	2,004.7	0.0	0.0
81.62	Bot - Section 3	190.3	257.3					0.0	388.5	190.3	645.8	0.0	0.0
85.00		181.9	975.8					0.0	808.1	181.9	1,783.9	0.0	0.0
86.37	Top - Section 2	190.3	391.2					0.0	328.7	190.3	719.9	0.0	0.0
90.00		327.3	467.9					0.0	867.9	327.3	1,335.9	0.0	0.0
95.00		378.6	628.1					0.0	1,196.6	378.6	1,824.7	0.0	0.0
100.00	Appurtenance(s)	377.3	608.3	338.1	0.0	537.9	211.8	0.0	1,196.6	715.4	2,016.7	0.0	0.0
105.00		193.0	588.6					0.0	1,194.6	193.0	1,783.2	0.0	0.0
105.13	Reinf. Top	187.4	14.5					0.0	29.9	187.4	44.3	0.0	0.0
110.00		360.0	554.3					0.0	774.0	360.0	1,328.3	0.0	0.0
115.00		336.5	549.1					0.0	653.6	336.5	1,202.6	0.0	0.0
120.00	Appurtenance(s)	316.6	529.3	2,759.8	0.0	0.0	3,214.4	0.0	393.0	3,076.4	4,136.8	0.0	0.0
125.00		161.3	509.5					0.0	369.0	161.3	878.6	0.0	0.0
125.12	Bot - Section 4	123.1	12.3					0.0	9.1	123.1	21.4	0.0	0.0
128.87	Top - Section 3	154.5	670.7					0.0	276.8	154.5	947.5	0.0	0.0
130.00		97.7	89.0					0.0	83.2	97.7	172.1	0.0	0.0
132.00	Appurtenance(s)	155.5	156.0	2,046.0	0.0	0.0	2,059.6	0.0	147.6	2,201.4	2,363.1	0.0	0.0
135.00		246.4	229.2					0.0	183.3	246.4	412.5	0.0	0.0
140.00		244.3	369.3					0.0	305.5	244.3	674.8	0.0	0.0
143.00	Appurtenance(s)	151.1	214.0	4,125.9	0.0	0.0	3,340.1	0.0	183.3	4,277.0	3,737.4	0.0	0.0
145.00		149.7	139.5					0.0	92.3	149.7	231.9	0.0	0.0
148.00	Appurtenance(s)	89.6	204.5	5,216.8	0.0	13,926.8	5,130.4	0.0	138.5	5,306.3	5,473.4	0.0	0.0
								Totals:		24,981.6	68,599.0	0.00	0.00

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:32 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.6W 93 mph with No Ice 23 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	-69.12	-26.63	0.00	-3,233.69	0.00	3,233.69	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.509
5.00	-66.91	-26.50	0.00	-3,100.52	0.00	3,100.52	4,702.37	2,351.19	8,987.95	4,500.65	0.09	-0.17	0.502
10.00	-64.72	-26.35	0.00	-2,968.03	0.00	2,968.03	4,630.27	2,315.13	8,663.09	4,337.98	0.36	-0.34	0.495
15.00	-62.17	-26.18	0.00	-2,836.30	0.00	2,836.30	4,557.03	2,278.52	8,341.98	4,177.19	0.82	-0.52	0.487
20.00	-59.64	-26.00	0.00	-2,705.42	0.00	2,705.42	4,482.67	2,241.34	8,024.78	4,018.36	1.46	-0.70	0.479
25.00	-57.14	-25.81	0.00	-2,575.44	0.00	2,575.44	4,403.56	2,201.78	7,705.28	3,858.37	2.29	-0.88	0.470
30.00	-54.68	-25.61	0.00	-2,446.39	0.00	2,446.39	4,302.92	2,151.46	7,355.37	3,683.15	3.30	-1.06	0.463
35.00	-52.24	-25.39	0.00	-2,318.34	0.00	2,318.34	4,202.28	2,101.14	7,013.59	3,512.01	4.51	-1.24	0.456
40.00	-49.85	-25.22	0.00	-2,191.39	0.00	2,191.39	4,101.65	2,050.82	6,679.95	3,344.94	5.90	-1.42	0.448
41.16	-49.28	-25.11	0.00	-2,162.05	0.00	2,162.05	4,078.23	2,039.12	6,603.48	3,306.65	6.25	-1.47	0.446
45.00	-46.72	-24.93	0.00	-2,065.70	0.00	2,065.70	4,001.01	2,000.51	6,354.43	3,181.94	7.49	-1.61	0.434
46.83	-45.50	-24.79	0.00	-2,020.09	0.00	2,020.09	3,410.94	1,705.47	5,490.25	2,749.21	8.12	-1.68	0.473
50.00	-44.08	-24.57	0.00	-1,941.52	0.00	1,941.52	3,371.32	1,685.66	5,340.15	2,674.05	9.27	-1.79	0.464
55.00	-41.89	-24.27	0.00	-1,818.67	0.00	1,818.67	3,307.92	1,653.96	5,106.10	2,556.85	11.26	-1.99	0.449
60.00	-39.72	-23.96	0.00	-1,697.31	0.00	1,697.31	3,242.50	1,621.25	4,874.14	2,440.69	13.44	-2.18	0.433
65.00	-37.59	-23.63	0.00	-1,577.50	0.00	1,577.50	3,156.24	1,578.12	4,616.98	2,311.92	15.82	-2.37	0.419
70.00	-35.47	-23.29	0.00	-1,459.34	0.00	1,459.34	3,069.98	1,534.99	4,366.78	2,186.64	18.41	-2.56	0.403
75.00	-33.22	-22.74	0.00	-1,342.91	0.00	1,342.91	2,983.72	1,491.86	4,123.56	2,064.84	21.19	-2.75	0.387
80.00	-31.18	-22.46	0.00	-1,229.21	0.00	1,229.21	2,897.46	1,448.73	3,887.31	1,946.54	24.17	-2.93	0.369
81.62	-30.51	-22.28	0.00	-1,192.76	0.00	1,192.76	2,869.45	1,434.73	3,812.10	1,908.88	25.17	-2.99	0.363
85.00	-28.71	-22.05	0.00	-1,117.51	0.00	1,117.51	2,811.20	1,405.60	3,658.02	1,831.73	27.34	-3.12	0.346
86.37	-27.96	-21.86	0.00	-1,087.23	0.00	1,087.23	2,342.68	1,171.34	3,095.01	1,549.81	28.24	-3.17	0.375
90.00	-26.59	-21.53	0.00	-1,007.94	0.00	1,007.94	2,304.43	1,152.21	2,976.95	1,490.69	30.69	-3.29	0.356
95.00	-24.73	-21.12	0.00	-900.27	0.00	900.27	2,249.56	1,124.78	2,815.20	1,409.69	34.24	-3.47	0.329
100.00	-22.70	-20.35	0.00	-794.12	0.00	794.12	2,177.68	1,088.84	2,637.27	1,320.60	37.96	-3.64	0.303
105.00	-20.90	-20.07	0.00	-692.37	0.00	692.37	2,105.79	1,052.90	2,465.16	1,234.41	41.86	-3.80	0.276
105.13	-20.85	-19.91	0.00	-689.86	0.00	689.86	2,103.99	1,052.00	2,460.93	1,232.29	41.96	-3.81	0.276
105.13	-20.85	-19.91	0.00	-689.86	0.00	689.86	2,103.99	1,052.00	2,460.93	1,232.29	41.96	-3.81	0.570
110.00	-19.47	-19.54	0.00	-592.80	0.00	592.80	2,033.91	1,016.95	2,298.85	1,151.13	45.92	-3.95	0.525
115.00	-18.20	-19.20	0.00	-495.13	0.00	495.13	1,962.02	981.01	2,138.35	1,070.76	50.22	-4.25	0.472
120.00	-14.24	-15.88	0.00	-399.11	0.00	399.11	1,890.14	945.07	1,983.66	993.30	54.81	-4.52	0.410
125.00	-13.34	-15.68	0.00	-319.69	0.00	319.69	1,818.26	909.13	1,834.77	918.75	59.67	-4.76	0.356
125.12	-13.31	-15.58	0.00	-317.76	0.00	317.76	1,816.48	908.24	1,831.17	916.95	59.79	-4.76	0.354
128.87	-12.35	-15.36	0.00	-259.35	0.00	259.35	1,443.09	721.55	1,448.31	725.23	63.60	-4.93	0.367
130.00	-12.17	-15.27	0.00	-242.04	0.00	242.04	1,430.26	715.13	1,422.41	712.26	64.77	-4.97	0.349
132.00	-9.98	-12.89	0.00	-211.51	0.00	211.51	1,407.26	703.63	1,376.79	689.42	66.87	-5.06	0.314
135.00	-9.56	-12.63	0.00	-172.86	0.00	172.86	1,372.75	686.38	1,309.76	655.86	70.09	-5.18	0.271
140.00	-8.89	-12.34	0.00	-109.72	0.00	109.72	1,315.24	657.62	1,201.77	601.78	75.60	-5.34	0.189
143.00	-5.56	-7.73	0.00	-72.71	0.00	72.71	1,280.74	640.37	1,139.20	570.45	78.98	-5.41	0.132
145.00	-5.34	-7.57	0.00	-57.24	0.00	57.24	1,257.74	628.87	1,098.42	550.03	81.25	-5.45	0.108
148.00	0.00	-7.02	0.00	-34.54	0.00	34.54	1,223.23	611.62	1,038.64	520.09	84.69	-5.49	0.067

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:32 AM

Customer: T-MOBILE

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 23 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.60

Wind Importance 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		169.3	0.0					0.0	0.0	169.3	0.0	0.0	0.0
5.00		335.1	1,000.9					0.0	601.2	335.1	1,602.1	0.0	0.0
10.00		328.2	980.2					0.0	601.2	328.2	1,581.4	0.0	0.0
15.00		321.2	959.4					0.0	898.1	321.2	1,857.6	0.0	0.0
20.00		314.3	938.7					0.0	898.1	314.3	1,836.8	0.0	0.0
25.00		307.3	918.0					0.0	898.1	307.3	1,816.1	0.0	0.0
30.00		303.9	897.2					0.0	898.1	303.9	1,795.4	0.0	0.0
35.00		306.7	876.5					0.0	898.1	306.7	1,774.6	0.0	0.0
40.00		190.9	855.7					0.0	898.1	190.9	1,753.9	0.0	0.0
41.16	Bot - Section 2	158.7	196.1					0.0	209.0	158.7	405.1	0.0	0.0
45.00		181.1	1,197.8					0.0	689.2	181.1	1,887.0	0.0	0.0
46.83	Top - Section 1	160.5	563.3					0.0	328.7	160.5	892.1	0.0	0.0
50.00		263.0	449.8					0.0	569.4	263.0	1,019.2	0.0	0.0
55.00		322.3	695.0					0.0	898.1	322.3	1,593.1	0.0	0.0
60.00		322.0	677.2					0.0	898.1	322.0	1,575.3	0.0	0.0
65.00		320.8	659.4					0.0	898.1	320.8	1,557.5	0.0	0.0
70.00		318.8	641.6					0.0	898.1	318.8	1,539.8	0.0	0.0
75.00	Appurtenance(s)	316.1	623.8	178.3	0.0	0.0	135.5	0.0	898.1	494.4	1,657.5	0.0	0.0
80.00		208.0	606.1					0.0	897.5	208.0	1,503.5	0.0	0.0
81.62	Bot - Section 3	157.5	192.9					0.0	291.4	157.5	484.3	0.0	0.0
85.00		150.0	731.8					0.0	606.1	150.0	1,337.9	0.0	0.0
86.37	Top - Section 2	156.4	293.4					0.0	246.5	156.4	539.9	0.0	0.0
90.00		267.4	350.9					0.0	651.0	267.4	1,001.9	0.0	0.0
95.00		305.7	471.1					0.0	897.5	305.7	1,368.5	0.0	0.0
100.00	Appurtenance(s)	300.4	456.2	338.1	0.0	537.9	158.8	0.0	897.5	638.5	1,512.6	0.0	0.0
105.00		152.5	441.4					0.0	896.0	152.5	1,337.4	0.0	0.0
105.13	Reinf. Top	145.9	10.8					0.0	22.4	145.9	33.2	0.0	0.0
110.00		284.9	415.8					0.0	580.5	284.9	996.3	0.0	0.0
115.00		282.0	411.8					0.0	490.2	282.0	902.0	0.0	0.0
120.00	Appurtenance(s)	275.1	397.0	2,759.8	0.0	0.0	2,410.8	0.0	294.8	3,034.9	3,102.6	0.0	0.0
125.00		139.1	382.2					0.0	276.8	139.1	658.9	0.0	0.0
125.12	Bot - Section 4	104.7	9.2					0.0	6.8	104.7	16.1	0.0	0.0
128.87	Top - Section 3	131.4	503.0					0.0	207.6	131.4	710.6	0.0	0.0
130.00		82.9	66.7					0.0	62.4	82.9	129.1	0.0	0.0
132.00	Appurtenance(s)	131.0	117.0	2,046.0	0.0	0.0	1,544.7	0.0	110.7	2,176.9	1,772.3	0.0	0.0
135.00		205.1	171.9					0.0	137.5	205.1	309.4	0.0	0.0
140.00		201.2	277.0					0.0	229.1	201.2	506.1	0.0	0.0
143.00	Appurtenance(s)	122.9	160.5	4,125.9	0.0	0.0	2,505.1	0.0	137.5	4,248.7	2,803.1	0.0	0.0
145.00		120.3	104.6					0.0	69.3	120.3	173.9	0.0	0.0
148.00	Appurtenance(s)	71.7	153.4	5,216.8	0.0	13,926.8	3,847.8	0.0	103.9	5,288.4	4,105.1	0.0	0.0
								Totals:		23,601.0	51,449.3	0.00	0.00

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:39 AM

Customer: T-MOBILE

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 23 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	-51.84	-25.22	0.00	-3,060.76	0.00	3,060.76	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.480
5.00	-50.16	-25.03	0.00	-2,934.64	0.00	2,934.64	4,702.37	2,351.19	8,987.95	4,500.65	0.09	-0.16	0.473
10.00	-48.51	-24.83	0.00	-2,809.50	0.00	2,809.50	4,630.27	2,315.13	8,663.09	4,337.98	0.35	-0.33	0.466
15.00	-46.59	-24.64	0.00	-2,685.33	0.00	2,685.33	4,557.03	2,278.52	8,341.98	4,177.19	0.78	-0.49	0.459
20.00	-44.68	-24.43	0.00	-2,562.16	0.00	2,562.16	4,482.67	2,241.34	8,024.78	4,018.36	1.38	-0.66	0.451
25.00	-42.80	-24.23	0.00	-2,439.99	0.00	2,439.99	4,403.56	2,201.78	7,705.28	3,858.37	2.17	-0.83	0.443
30.00	-40.94	-24.02	0.00	-2,318.84	0.00	2,318.84	4,302.92	2,151.46	7,355.37	3,683.15	3.13	-1.00	0.437
35.00	-39.10	-23.80	0.00	-2,198.74	0.00	2,198.74	4,202.28	2,101.14	7,013.59	3,512.01	4.27	-1.17	0.430
40.00	-37.30	-23.64	0.00	-2,079.75	0.00	2,079.75	4,101.65	2,050.82	6,679.95	3,344.94	5.59	-1.35	0.423
41.16	-36.86	-23.53	0.00	-2,052.25	0.00	2,052.25	4,078.23	2,039.12	6,603.48	3,306.65	5.92	-1.39	0.421
45.00	-34.94	-23.36	0.00	-1,961.98	0.00	1,961.98	4,001.01	2,000.51	6,354.43	3,181.94	7.09	-1.52	0.410
46.83	-34.02	-23.23	0.00	-1,919.24	0.00	1,919.24	3,410.94	1,705.47	5,490.25	2,749.21	7.69	-1.59	0.448
50.00	-32.95	-23.02	0.00	-1,845.61	0.00	1,845.61	3,371.32	1,685.66	5,340.15	2,674.05	8.78	-1.70	0.439
55.00	-31.29	-22.75	0.00	-1,730.51	0.00	1,730.51	3,307.92	1,653.96	5,106.10	2,556.85	10.66	-1.88	0.425
60.00	-29.66	-22.47	0.00	-1,616.77	0.00	1,616.77	3,242.50	1,621.25	4,874.14	2,440.69	12.73	-2.07	0.410
65.00	-28.04	-22.18	0.00	-1,504.44	0.00	1,504.44	3,156.24	1,578.12	4,616.98	2,311.92	15.00	-2.25	0.397
70.00	-26.45	-21.88	0.00	-1,393.55	0.00	1,393.55	3,069.98	1,534.99	4,366.78	2,186.64	17.45	-2.43	0.383
75.00	-24.75	-21.39	0.00	-1,284.16	0.00	1,284.16	2,983.72	1,491.86	4,123.56	2,064.84	20.09	-2.61	0.368
80.00	-23.21	-21.16	0.00	-1,177.22	0.00	1,177.22	2,897.46	1,448.73	3,887.31	1,946.54	22.92	-2.79	0.352
81.62	-22.71	-21.01	0.00	-1,142.87	0.00	1,142.87	2,869.45	1,434.73	3,812.10	1,908.88	23.87	-2.84	0.347
85.00	-21.35	-20.82	0.00	-1,071.92	0.00	1,071.92	2,811.20	1,405.60	3,658.02	1,831.73	25.93	-2.96	0.330
86.37	-20.79	-20.67	0.00	-1,043.32	0.00	1,043.32	2,342.68	1,171.34	3,095.01	1,549.81	26.79	-3.01	0.358
90.00	-19.75	-20.40	0.00	-968.36	0.00	968.36	2,304.43	1,152.21	2,976.95	1,490.69	29.12	-3.13	0.340
95.00	-18.34	-20.07	0.00	-866.35	0.00	866.35	2,249.56	1,124.78	2,815.20	1,409.69	32.49	-3.30	0.315
100.00	-16.81	-19.39	0.00	-765.44	0.00	765.44	2,177.68	1,088.84	2,637.27	1,320.60	36.04	-3.47	0.291
105.00	-15.46	-19.18	0.00	-668.48	0.00	668.48	2,105.79	1,052.90	2,465.16	1,234.41	39.75	-3.62	0.265
105.13	-15.41	-19.05	0.00	-666.08	0.00	666.08	2,103.99	1,052.00	2,460.93	1,232.29	39.85	-3.63	0.265
105.13	-15.41	-19.05	0.00	-666.08	0.00	666.08	2,103.99	1,052.00	2,460.93	1,232.29	39.85	-3.63	0.548
110.00	-14.37	-18.76	0.00	-573.20	0.00	573.20	2,033.91	1,016.95	2,298.85	1,151.13	43.63	-3.77	0.505
115.00	-13.40	-18.48	0.00	-479.41	0.00	479.41	1,962.02	981.01	2,138.35	1,070.76	47.73	-4.05	0.455
120.00	-10.46	-15.27	0.00	-387.02	0.00	387.02	1,890.14	945.07	1,983.66	993.30	52.11	-4.31	0.395
125.00	-9.78	-15.10	0.00	-310.67	0.00	310.67	1,818.26	909.13	1,834.77	918.75	56.75	-4.55	0.344
125.12	-9.75	-15.01	0.00	-308.81	0.00	308.81	1,816.48	908.24	1,831.17	916.95	56.87	-4.55	0.342
128.87	-9.03	-14.84	0.00	-252.52	0.00	252.52	1,443.09	721.55	1,448.31	725.23	60.51	-4.71	0.355
130.00	-8.89	-14.75	0.00	-235.80	0.00	235.80	1,430.26	715.13	1,422.41	712.26	61.63	-4.76	0.338
132.00	-7.28	-12.45	0.00	-206.29	0.00	206.29	1,407.26	703.63	1,376.79	689.42	63.64	-4.85	0.305
135.00	-6.96	-12.24	0.00	-168.94	0.00	168.94	1,372.75	686.38	1,309.76	655.86	66.72	-4.96	0.263
140.00	-6.45	-12.00	0.00	-107.76	0.00	107.76	1,315.24	657.62	1,201.77	601.78	72.00	-5.12	0.184
143.00	-4.04	-7.52	0.00	-71.75	0.00	71.75	1,280.74	640.37	1,139.20	570.45	75.24	-5.19	0.129
145.00	-3.87	-7.39	0.00	-56.71	0.00	56.71	1,257.74	628.87	1,098.42	550.03	77.41	-5.22	0.106
148.00	0.00	-7.01	0.00	-34.54	0.00	34.54	1,223.23	611.62	1,038.64	520.09	80.71	-5.26	0.067

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:39 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 23 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

		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		59.2	0.0					0.0	0.0	59.2	0.0	0.0	0.0
5.00		117.5	1,684.4					0.0	865.3	117.5	2,549.7	0.0	0.0
10.00		115.7	1,690.5					0.0	872.5	115.7	2,563.0	0.0	0.0
15.00		113.6	1,675.2					0.0	1,556.1	113.6	3,231.3	0.0	0.0
20.00		111.5	1,652.9					0.0	1,569.9	111.5	3,222.8	0.0	0.0
25.00		109.3	1,626.9					0.0	1,580.6	109.3	3,207.5	0.0	0.0
30.00		108.4	1,598.7					0.0	1,589.4	108.4	3,188.1	0.0	0.0
35.00		109.7	1,568.9					0.0	1,597.0	109.7	3,165.9	0.0	0.0
40.00		68.4	1,537.9					0.0	1,603.6	68.4	3,141.5	0.0	0.0
41.16	Bot - Section 2	56.9	354.1					0.0	374.0	56.9	728.1	0.0	0.0
45.00		65.0	1,904.4					0.0	1,235.5	65.0	3,140.0	0.0	0.0
46.83	Top - Section 1	57.7	897.4					0.0	590.4	57.7	1,487.9	0.0	0.0
50.00		94.7	850.7					0.0	1,024.4	94.7	1,875.1	0.0	0.0
55.00		116.3	1,316.2					0.0	1,619.7	116.3	2,935.9	0.0	0.0
60.00		116.5	1,286.5					0.0	1,624.2	116.5	2,910.7	0.0	0.0
65.00		116.4	1,256.4					0.0	1,628.3	116.4	2,884.7	0.0	0.0
70.00		116.0	1,225.9					0.0	1,632.2	116.0	2,858.1	0.0	0.0
75.00	Appurtenance(s)	115.3	1,195.0	48.6	0.0	0.0	225.5	0.0	1,635.9	164.0	3,056.4	0.0	0.0
80.00		76.0	1,163.9					0.0	1,617.9	76.0	2,781.8	0.0	0.0
81.62	Bot - Section 3	57.7	372.2					0.0	525.9	57.7	898.2	0.0	0.0
85.00		54.9	1,215.4					0.0	1,095.0	54.9	2,310.5	0.0	0.0
86.37	Top - Section 2	57.4	488.2					0.0	445.7	57.4	933.9	0.0	0.0
90.00		98.4	719.5					0.0	1,178.1	98.4	1,897.6	0.0	0.0
95.00		112.8	966.5					0.0	1,626.6	112.8	2,593.1	0.0	0.0
100.00	Appurtenance(s)	111.3	938.4	101.2	0.0	220.0	329.9	0.0	1,629.2	212.5	2,897.4	0.0	0.0
105.00		56.6	910.1					0.0	1,604.8	56.6	2,515.0	0.0	0.0
105.13	Reinf. Top	54.3	22.5					0.0	40.1	54.3	62.7	0.0	0.0
110.00		106.4	859.4					0.0	1,176.1	106.4	2,035.5	0.0	0.0
115.00		105.8	853.1					0.0	1,035.2	105.8	1,888.2	0.0	0.0
120.00	Appurtenance(s)	103.6	824.3	736.4	0.0	0.0	5,789.4	0.0	715.2	840.0	7,328.9	0.0	0.0
125.00		52.5	795.4					0.0	612.0	52.5	1,407.4	0.0	0.0
125.12	Bot - Section 4	39.6	19.4					0.0	15.1	39.6	34.5	0.0	0.0
128.87	Top - Section 3	49.8	883.9					0.0	459.7	49.8	1,343.6	0.0	0.0
130.00		31.5	152.6					0.0	138.2	31.5	290.8	0.0	0.0
132.00	Appurtenance(s)	49.9	267.4	542.5	0.0	0.0	3,660.5	0.0	245.5	592.3	4,173.4	0.0	0.0
135.00		78.4	392.9					0.0	330.4	78.4	723.3	0.0	0.0
140.00		77.2	632.4					0.0	551.5	77.2	1,183.9	0.0	0.0
143.00	Appurtenance(s)	47.3	368.5	1,076.1	0.0	0.0	7,488.0	0.0	331.3	1,123.4	8,187.9	0.0	0.0
145.00		46.5	241.0					0.0	171.8	46.5	412.8	0.0	0.0
148.00	Appurtenance(s)	27.8	353.2	1,299.7	0.0	3,325.2	11,950.9	0.0	257.9	1,327.5	12,562.1	0.0	0.0
								Totals:		7,068.21	104,609.	0.00	0.00

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:45 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 23 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	-106.84	-7.44	0.00	-915.01	0.00	915.01	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.158
5.00	-104.28	-7.41	0.00	-877.82	0.00	877.82	4,702.37	2,351.19	8,987.95	4,500.65	0.03	-0.05	0.156
10.00	-101.72	-7.38	0.00	-840.79	0.00	840.79	4,630.27	2,315.13	8,663.09	4,337.98	0.10	-0.10	0.154
15.00	-98.48	-7.34	0.00	-803.92	0.00	803.92	4,557.03	2,278.52	8,341.98	4,177.19	0.23	-0.15	0.151
20.00	-95.25	-7.30	0.00	-767.21	0.00	767.21	4,482.67	2,241.34	8,024.78	4,018.36	0.41	-0.20	0.149
25.00	-92.04	-7.26	0.00	-730.70	0.00	730.70	4,403.56	2,201.78	7,705.28	3,858.37	0.65	-0.25	0.146
30.00	-88.84	-7.22	0.00	-694.38	0.00	694.38	4,302.92	2,151.46	7,355.37	3,683.15	0.94	-0.30	0.144
35.00	-85.67	-7.17	0.00	-658.28	0.00	658.28	4,202.28	2,101.14	7,013.59	3,512.01	1.28	-0.35	0.142
40.00	-82.52	-7.13	0.00	-622.43	0.00	622.43	4,101.65	2,050.82	6,679.95	3,344.94	1.67	-0.40	0.139
41.16	-81.79	-7.10	0.00	-614.14	0.00	614.14	4,078.23	2,039.12	6,603.48	3,306.65	1.77	-0.42	0.139
45.00	-78.65	-7.05	0.00	-586.89	0.00	586.89	4,001.01	2,000.51	6,354.43	3,181.94	2.12	-0.46	0.135
46.83	-77.16	-7.02	0.00	-573.98	0.00	573.98	3,410.94	1,705.47	5,490.25	2,749.21	2.30	-0.48	0.148
50.00	-75.28	-6.97	0.00	-551.73	0.00	551.73	3,371.32	1,685.66	5,340.15	2,674.05	2.63	-0.51	0.145
55.00	-72.34	-6.89	0.00	-516.90	0.00	516.90	3,307.92	1,653.96	5,106.10	2,556.85	3.19	-0.56	0.140
60.00	-69.42	-6.81	0.00	-482.43	0.00	482.43	3,242.50	1,621.25	4,874.14	2,440.69	3.81	-0.62	0.135
65.00	-66.53	-6.73	0.00	-448.37	0.00	448.37	3,156.24	1,578.12	4,616.98	2,311.92	4.49	-0.67	0.131
70.00	-63.67	-6.64	0.00	-414.74	0.00	414.74	3,069.98	1,534.99	4,366.78	2,186.64	5.22	-0.73	0.126
75.00	-60.61	-6.49	0.00	-381.56	0.00	381.56	2,983.72	1,491.86	4,123.56	2,064.84	6.01	-0.78	0.121
80.00	-57.83	-6.41	0.00	-349.13	0.00	349.13	2,897.46	1,448.73	3,887.31	1,946.54	6.86	-0.83	0.116
81.62	-56.93	-6.36	0.00	-338.73	0.00	338.73	2,869.45	1,434.73	3,812.10	1,908.88	7.14	-0.85	0.114
85.00	-54.62	-6.30	0.00	-317.24	0.00	317.24	2,811.20	1,405.60	3,658.02	1,831.73	7.76	-0.88	0.109
86.37	-53.68	-6.25	0.00	-308.60	0.00	308.60	2,342.68	1,171.34	3,095.01	1,549.81	8.01	-0.90	0.118
90.00	-51.78	-6.16	0.00	-285.94	0.00	285.94	2,304.43	1,152.21	2,976.95	1,490.69	8.71	-0.93	0.113
95.00	-49.18	-6.04	0.00	-255.16	0.00	255.16	2,249.56	1,124.78	2,815.20	1,409.69	9.72	-0.99	0.105
100.00	-46.28	-5.82	0.00	-224.72	0.00	224.72	2,177.68	1,088.84	2,637.27	1,320.60	10.77	-1.03	0.097
105.00	-43.77	-5.73	0.00	-195.63	0.00	195.63	2,105.79	1,052.90	2,465.16	1,234.41	11.88	-1.08	0.089
105.13	-43.71	-5.69	0.00	-194.91	0.00	194.91	2,103.99	1,052.00	2,460.93	1,232.29	11.91	-1.08	0.088
105.13	-43.71	-5.69	0.00	-194.91	0.00	194.91	2,103.99	1,052.00	2,460.93	1,232.29	11.91	-1.08	0.179
110.00	-41.67	-5.59	0.00	-167.15	0.00	167.15	2,033.91	1,016.95	2,298.85	1,151.13	13.04	-1.12	0.166
115.00	-39.77	-5.51	0.00	-139.18	0.00	139.18	1,962.02	981.01	2,138.35	1,070.76	14.26	-1.20	0.150
120.00	-32.46	-4.55	0.00	-111.66	0.00	111.66	1,890.14	945.07	1,983.66	993.30	15.56	-1.28	0.130
125.00	-31.05	-4.48	0.00	-88.93	0.00	88.93	1,818.26	909.13	1,834.77	918.75	16.94	-1.35	0.114
125.12	-31.01	-4.45	0.00	-88.38	0.00	88.38	1,816.48	908.24	1,831.17	916.95	16.97	-1.35	0.113
128.87	-29.67	-4.39	0.00	-71.68	0.00	71.68	1,443.09	721.55	1,448.31	725.23	18.05	-1.39	0.119
130.00	-29.38	-4.36	0.00	-66.74	0.00	66.74	1,430.26	715.13	1,422.41	712.26	18.38	-1.41	0.114
132.00	-25.22	-3.67	0.00	-58.03	0.00	58.03	1,407.26	703.63	1,376.79	689.42	18.97	-1.43	0.102
135.00	-24.50	-3.59	0.00	-47.01	0.00	47.01	1,372.75	686.38	1,309.76	655.86	19.89	-1.47	0.090
140.00	-23.31	-3.50	0.00	-29.04	0.00	29.04	1,315.24	657.62	1,201.77	601.78	21.44	-1.51	0.066
143.00	-15.16	-2.16	0.00	-18.54	0.00	18.54	1,280.74	640.37	1,139.20	570.45	22.40	-1.53	0.044
145.00	-14.75	-2.11	0.00	-14.22	0.00	14.22	1,257.74	628.87	1,098.42	550.03	23.04	-1.54	0.038
148.00	0.00	-1.71	0.00	-7.90	0.00	7.90	1,223.23	611.62	1,038.64	520.09	24.01	-1.54	0.015

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:46 AM

Customer: T-MOBILE

Load Case: 1.0D + 1.0W Serviceability 60 mph 22 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		44.0	0.0					0.0	0.0	44.0	0.0	0.0	0.0
5.00		87.2	1,112.1					0.0	668.0	87.2	1,780.1	0.0	0.0
10.00		85.4	1,089.1					0.0	668.0	85.4	1,757.1	0.0	0.0
15.00		83.6	1,066.1					0.0	997.9	83.6	2,064.0	0.0	0.0
20.00		81.8	1,043.0					0.0	997.9	81.8	2,040.9	0.0	0.0
25.00		79.9	1,020.0					0.0	997.9	79.9	2,017.9	0.0	0.0
30.00		79.1	996.9					0.0	997.9	79.1	1,994.8	0.0	0.0
35.00		79.8	973.9					0.0	997.9	79.8	1,971.8	0.0	0.0
40.00		49.7	950.8					0.0	997.9	49.7	1,948.8	0.0	0.0
41.16	Bot - Section 2	41.3	217.9					0.0	232.2	41.3	450.1	0.0	0.0
45.00		47.1	1,330.9					0.0	765.7	47.1	2,096.7	0.0	0.0
46.83	Top - Section 1	41.8	625.9					0.0	365.2	41.8	991.2	0.0	0.0
50.00		68.4	499.8					0.0	632.7	68.4	1,132.5	0.0	0.0
55.00		83.9	772.2					0.0	997.9	83.9	1,770.1	0.0	0.0
60.00		83.8	752.4					0.0	997.9	83.8	1,750.4	0.0	0.0
65.00		83.4	732.7					0.0	997.9	83.4	1,730.6	0.0	0.0
70.00		82.9	712.9					0.0	997.9	82.9	1,710.9	0.0	0.0
75.00	Appurtenance(s)	82.2	693.2	46.4	0.0	0.0	150.6	0.0	997.9	128.6	1,841.7	0.0	0.0
80.00		54.1	673.4					0.0	997.2	54.1	1,670.6	0.0	0.0
81.62	Bot - Section 3	41.0	214.4					0.0	323.8	41.0	538.1	0.0	0.0
85.00		39.0	813.2					0.0	673.4	39.0	1,486.6	0.0	0.0
86.37	Top - Section 2	40.7	326.0					0.0	273.9	40.7	599.9	0.0	0.0
90.00		69.6	389.9					0.0	723.3	69.6	1,113.2	0.0	0.0
95.00		79.5	523.4					0.0	997.2	79.5	1,520.6	0.0	0.0
100.00	Appurtenance(s)	78.2	506.9	87.9	0.0	139.9	176.5	0.0	997.2	166.1	1,680.6	0.0	0.0
105.00		39.7	490.5					0.0	995.5	39.7	1,486.0	0.0	0.0
105.13	Reinf. Top	37.9	12.1					0.0	24.9	37.9	36.9	0.0	0.0
110.00		74.1	462.0					0.0	645.0	74.1	1,107.0	0.0	0.0
115.00		73.4	457.5					0.0	544.6	73.4	1,002.2	0.0	0.0
120.00	Appurtenance(s)	71.6	441.1	717.9	0.0	0.0	2,678.7	0.0	327.5	789.5	3,447.3	0.0	0.0
125.00		36.2	424.6					0.0	307.5	36.2	732.2	0.0	0.0
125.12	Bot - Section 4	27.2	10.3					0.0	7.6	27.2	17.9	0.0	0.0
128.87	Top - Section 3	34.2	558.9					0.0	230.7	34.2	789.6	0.0	0.0
130.00		21.6	74.1					0.0	69.3	21.6	143.4	0.0	0.0
132.00	Appurtenance(s)	34.1	130.0	532.2	0.0	0.0	1,716.3	0.0	123.0	566.3	1,969.3	0.0	0.0
135.00		53.4	191.0					0.0	152.8	53.4	343.7	0.0	0.0
140.00		52.3	307.8					0.0	254.6	52.3	562.4	0.0	0.0
143.00	Appurtenance(s)	32.0	178.3	1,073.3	0.0	0.0	2,783.4	0.0	152.8	1,105.3	3,114.5	0.0	0.0
145.00		31.3	116.3					0.0	77.0	31.3	193.2	0.0	0.0
148.00	Appurtenance(s)	18.6	170.4	1,357.1	0.0	3,623.0	4,275.3	0.0	115.4	1,375.8	4,561.2	0.0	0.0
								Totals:		6,139.71	57,165.9	0.00	0.00

Site Number: 302515 Code: ANSI/TIA-222-G

Site Name: SMFR - North, CT Engineering Number: 12598483_C3_02 8/30/2018 9:40:53 AM

Customer: T-MOBILE

Load Case: 1.0D + 1.0W Serviceability 60 mph 22 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	-57.64	-6.56	0.00	-801.00	0.00	801.00	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.133
5.00	-55.85	-6.52	0.00	-768.18	0.00	768.18	4,702.37	2,351.19	8,987.95	4,500.65	0.02	-0.04	0.131
10.00	-54.09	-6.47	0.00	-735.60	0.00	735.60	4,630.27	2,315.13	8,663.09	4,337.98	0.09	-0.09	0.129
15.00	-52.02	-6.42	0.00	-703.24	0.00	703.24	4,557.03	2,278.52	8,341.98	4,177.19	0.20	-0.13	0.127
20.00	-49.97	-6.37	0.00	-671.13	0.00	671.13	4,482.67	2,241.34	8,024.78	4,018.36	0.36	-0.17	0.125
25.00	-47.95	-6.32	0.00	-639.26	0.00	639.26	4,403.56	2,201.78	7,705.28	3,858.37	0.57	-0.22	0.122
30.00	-45.95	-6.27	0.00	-607.64	0.00	607.64	4,302.92	2,151.46	7,355.37	3,683.15	0.82	-0.26	0.121
35.00	-43.98	-6.22	0.00	-576.27	0.00	576.27	4,202.28	2,101.14	7,013.59	3,512.01	1.12	-0.31	0.119
40.00	-42.02	-6.18	0.00	-545.17	0.00	545.17	4,101.65	2,050.82	6,679.95	3,344.94	1.46	-0.35	0.117
41.16	-41.57	-6.15	0.00	-537.99	0.00	537.99	4,078.23	2,039.12	6,603.48	3,306.65	1.55	-0.36	0.116
45.00	-39.47	-6.11	0.00	-514.39	0.00	514.39	4,001.01	2,000.51	6,354.43	3,181.94	1.86	-0.40	0.113
46.83	-38.48	-6.07	0.00	-503.21	0.00	503.21	3,410.94	1,705.47	5,490.25	2,749.21	2.01	-0.42	0.123
50.00	-37.34	-6.02	0.00	-483.95	0.00	483.95	3,371.32	1,685.66	5,340.15	2,674.05	2.30	-0.45	0.121
55.00	-35.57	-5.95	0.00	-453.84	0.00	453.84	3,307.92	1,653.96	5,106.10	2,556.85	2.79	-0.49	0.117
60.00	-33.81	-5.88	0.00	-424.07	0.00	424.07	3,242.50	1,621.25	4,874.14	2,440.69	3.34	-0.54	0.113
65.00	-32.08	-5.81	0.00	-394.65	0.00	394.65	3,156.24	1,578.12	4,616.98	2,311.92	3.93	-0.59	0.110
70.00	-30.37	-5.73	0.00	-365.60	0.00	365.60	3,069.98	1,534.99	4,366.78	2,186.64	4.57	-0.64	0.106
75.00	-28.52	-5.61	0.00	-336.93	0.00	336.93	2,983.72	1,491.86	4,123.56	2,064.84	5.26	-0.68	0.102
80.00	-26.85	-5.55	0.00	-308.90	0.00	308.90	2,897.46	1,448.73	3,887.31	1,946.54	6.01	-0.73	0.097
81.62	-26.31	-5.51	0.00	-299.90	0.00	299.90	2,869.45	1,434.73	3,812.10	1,908.88	6.26	-0.75	0.096
85.00	-24.82	-5.46	0.00	-281.29	0.00	281.29	2,811.20	1,405.60	3,658.02	1,831.73	6.79	-0.78	0.091
86.37	-24.22	-5.42	0.00	-273.80	0.00	273.80	2,342.68	1,171.34	3,095.01	1,549.81	7.02	-0.79	0.099
90.00	-23.10	-5.35	0.00	-254.14	0.00	254.14	2,304.43	1,152.21	2,976.95	1,490.69	7.63	-0.82	0.094
95.00	-21.58	-5.27	0.00	-227.38	0.00	227.38	2,249.56	1,124.78	2,815.20	1,409.69	8.52	-0.87	0.087
100.00	-19.90	-5.09	0.00	-200.92	0.00	200.92	2,177.68	1,088.84	2,637.27	1,320.60	9.45	-0.91	0.081
105.00	-18.41	-5.03	0.00	-175.48	0.00	175.48	2,105.79	1,052.90	2,465.16	1,234.41	10.42	-0.95	0.074
105.13	-18.37	-5.00	0.00	-174.85	0.00	174.85	2,103.99	1,052.00	2,460.93	1,232.29	10.45	-0.95	0.073
105.13	-18.37	-5.00	0.00	-174.85	0.00	174.85	2,103.99	1,052.00	2,460.93	1,232.29	10.45	-0.95	0.151
110.00	-17.26	-4.92	0.00	-150.48	0.00	150.48	2,033.91	1,016.95	2,298.85	1,151.13	11.44	-0.99	0.139
115.00	-16.26	-4.85	0.00	-125.86	0.00	125.86	1,962.02	981.01	2,138.35	1,070.76	12.51	-1.06	0.126
120.00	-12.82	-4.01	0.00	-101.61	0.00	101.61	1,890.14	945.07	1,983.66	993.30	13.66	-1.13	0.109
125.00	-12.09	-3.97	0.00	-81.55	0.00	81.55	1,818.26	909.13	1,834.77	918.75	14.88	-1.19	0.095
125.12	-12.07	-3.94	0.00	-81.06	0.00	81.06	1,816.48	908.24	1,831.17	916.95	14.91	-1.19	0.095
128.87	-11.28	-3.90	0.00	-66.27	0.00	66.27	1,443.09	721.55	1,448.31	725.23	15.87	-1.24	0.099
130.00	-11.13	-3.88	0.00	-61.88	0.00	61.88	1,430.26	715.13	1,422.41	712.26	16.16	-1.25	0.095
132.00	-9.18	-3.27	0.00	-54.13	0.00	54.13	1,407.26	703.63	1,376.79	689.42	16.69	-1.27	0.085
135.00	-8.83	-3.22	0.00	-44.31	0.00	44.31	1,372.75	686.38	1,309.76	655.86	17.50	-1.30	0.074
140.00	-8.27	-3.16	0.00	-28.23	0.00	28.23	1,315.24	657.62	1,201.77	601.78	18.89	-1.34	0.053
143.00	-5.18	-1.98	0.00	-18.77	0.00	18.77	1,280.74	640.37	1,139.20	570.45	19.74	-1.36	0.037
145.00	-4.99	-1.94	0.00	-14.81	0.00	14.81	1,257.74	628.87	1,098.42	550.03	20.31	-1.37	0.031
148.00	0.00	-1.82	0.00	-8.98	0.00	8.98	1,223.23	611.62	1,038.64	520.09	21.17	-1.38	0.017

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.25	
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:	1.60	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.27	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11	
Seismic Response Coefficient (C_s):	0.03	
Upper Limit C_s	0.03	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	2.54	
Redundancy Factor (p):	1.30	
Seismic Force Distribution Exponent (k):	2.00	
Total Unfactored Dead Load:	57.64	k
Seismic Base Shear (E):	2.25	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)
39	146.50	286	6,136	0.013	30	358
38	144.00	193	4,007	0.009	19	242
37	141.50	331	6,629	0.014	32	415
36	137.50	562	10,632	0.023	51	705
35	133.50	344	6,126	0.013	30	431
34	131.00	253	4,341	0.009	21	317
33	129.44	143	2,403	0.005	12	180
32	127.00	790	12,735	0.027	61	989
31	125.06	18	279	0.001	1	22
30	122.50	732	10,987	0.024	53	917
29	117.50	769	10,612	0.023	51	963
28	112.50	1,002	12,684	0.027	61	1,256
27	107.56	1,107	12,807	0.027	62	1,387
26	105.06	37	408	0.001	2	46
25	102.50	1,486	15,612	0.033	75	1,862
24	97.50	1,504	14,298	0.031	69	1,885
23	92.50	1,521	13,010	0.028	63	1,905
22	88.19	1,113	8,657	0.019	42	1,395
21	85.69	600	4,405	0.009	21	752
20	83.31	1,487	10,318	0.022	50	1,863
19	80.81	538	3,514	0.008	17	674
18	77.50	1,671	10,034	0.022	48	2,093
17	72.50	1,691	8,889	0.019	43	2,119

16	67.50	1,711	7,795	0.017	38	2,144
15	62.50	1,731	6,760	0.014	33	2,169
14	57.50	1,750	5,787	0.012	28	2,193
13	52.50	1,770	4,879	0.010	24	2,218
12	48.42	1,132	2,655	0.006	13	1,419
11	45.92	991	2,090	0.004	10	1,242
10	43.08	2,097	3,891	0.008	19	2,627
9	40.58	450	741	0.002	4	564
8	37.50	1,949	2,740	0.006	13	2,442
7	32.50	1,972	2,083	0.004	10	2,471
6	27.50	1,995	1,509	0.003	7	2,500
5	22.50	2,018	1,022	0.002	5	2,529
4	17.50	2,041	625	0.001	3	2,558
3	12.50	2,064	322	0.001	2	2,586
2	7.50	1,757	99	0.000	0	2,202
1	2.50	1,780	11	0.000	0	2,231
Commscope ATSBT-TOP-	160.00	5	138	0.000	1	7
Andrew E15S09P94	160.00	44	1,121	0.002	5	55
RFS ATMAP1412D-1A20	160.00	39	998	0.002	5	49
RFS APXVAARR24_43-U-	160.00	384	9,823	0.021	47	481
Kaelus DBC0061F1V51-	148.00	153	3,351	0.007	16	192
Powerwave Allgon LGP	148.00	85	1,853	0.004	9	106
Raycap DC6-48-60-18-	148.00	20	438	0.001	2	25
Raycap DC6-48-60-18-	148.00	20	438	0.001	2	25
Raycap DC6-48-60-0-8	148.00	33	718	0.002	3	41
Ericsson RRUS 4478 B	148.00	180	3,936	0.008	19	225
Ericsson RRUS 11 (Ba	148.00	165	3,614	0.008	17	207
Ericsson RRUS 32 (50	148.00	152	3,338	0.007	16	191
Ericsson RRUS 32 B2	148.00	159	3,483	0.007	17	199
Ericsson RRUS 32 B66	148.00	159	3,483	0.007	17	199
Powerwave Allgon 777	148.00	105	2,300	0.005	11	132
Pipe Mount	148.00	200	4,381	0.009	21	251
Quintel QS66512-2	148.00	333	7,294	0.016	35	417
CCI OPA-65R-LCUU-H6	148.00	219	4,797	0.010	23	274
Kathrein 80010965	148.00	293	6,413	0.014	31	367
Flat Platform w/ Han	148.00	2,000	43,808	0.094	211	2,506
RFS FD9R6004	143.00	19	380	0.001	2	23
Alcatel-Lucent RRH2X	143.00	172	3,517	0.008	17	216
Alcatel-Lucent RRH2x	143.00	227	4,638	0.010	22	284
Alcatel-Lucent RRH4x	143.00	253	5,178	0.011	25	317
RFS DB-T1-6Z-8AB-0Z	143.00	88	1,800	0.004	9	110
Antel BXA-80063-6BF-	143.00	19	393	0.001	2	24
Antel BXA-70063/6CF	143.00	34	695	0.001	3	43
Antel BXA-80080/6CF	143.00	22	450	0.001	2	28
Commscope SBNHH-1D65	143.00	203	4,147	0.009	20	254
Commscope SBNHH-1D45	143.00	247	5,047	0.011	24	309
Flat Low Profile Pla	143.00	1,500	30,674	0.066	148	1,880
KMW KMDAPS2040000 (E	132.00	48	831	0.002	4	60
KMW AM-X-WM-17-65-00	132.00	43	742	0.002	4	53
Decibel DB844H90E-XY	132.00	126	2,195	0.005	11	158
Flat Low Profile Pla	132.00	1,500	26,136	0.056	126	1,880
Alcatel-Lucent RRH2x	120.00	159	2,285	0.005	11	199
Alcatel-Lucent 800 M	120.00	192	2,765	0.006	13	241
Alcatel-Lucent 4x40W	120.00	273	3,931	0.008	19	342
TD-RRH8x20-25 w/ Sol	120.00	210	3,024	0.006	15	263
RFS APXVSPP18-C-A20	120.00	171	2,462	0.005	12	214
Commscope DT465B-2XR	120.00	174	2,506	0.005	12	218
Flat Low Profile Pla	120.00	1,500	21,600	0.046	104	1,880
Antel BCD-87010 ___	100.00	26	265	0.001	1	33
Flat Side Arm	100.00	150	1,500	0.003	7	188
PCTEL GPS-TMG-HR-26N	75.00	1	3	0.000	0	1
Round Side Arm	75.00	150	844	0.002	4	188
		57,638	466,269	1.000	2,248	72,227

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)
39	146.50	286	6,136	0.013	30	242
38	144.00	193	4,007	0.009	19	164
37	141.50	331	6,629	0.014	32	280
36	137.50	562	10,632	0.023	51	476
35	133.50	344	6,126	0.013	30	291
34	131.00	253	4,341	0.009	21	214
33	129.44	143	2,403	0.005	12	121
32	127.00	790	12,735	0.027	61	669
31	125.06	18	279	0.001	1	15
30	122.50	732	10,987	0.024	53	620
29	117.50	769	10,612	0.023	51	651
28	112.50	1,002	12,684	0.027	61	849
27	107.56	1,107	12,807	0.027	62	937
26	105.06	37	408	0.001	2	31
25	102.50	1,486	15,612	0.033	75	1,258
24	97.50	1,504	14,298	0.031	69	1,274
23	92.50	1,521	13,010	0.028	63	1,288
22	88.19	1,113	8,657	0.019	42	943
21	85.69	600	4,405	0.009	21	508
20	83.31	1,487	10,318	0.022	50	1,259
19	80.81	538	3,514	0.008	17	456
18	77.50	1,671	10,034	0.022	48	1,415
17	72.50	1,691	8,889	0.019	43	1,432
16	67.50	1,711	7,795	0.017	38	1,449
15	62.50	1,731	6,760	0.014	33	1,466
14	57.50	1,750	5,787	0.012	28	1,482
13	52.50	1,770	4,879	0.010	24	1,499
12	48.42	1,132	2,655	0.006	13	959
11	45.92	991	2,090	0.004	10	839
10	43.08	2,097	3,891	0.008	19	1,776
9	40.58	450	741	0.002	4	381
8	37.50	1,949	2,740	0.006	13	1,650
7	32.50	1,972	2,083	0.004	10	1,670
6	27.50	1,995	1,509	0.003	7	1,689
5	22.50	2,018	1,022	0.002	5	1,709
4	17.50	2,041	625	0.001	3	1,728
3	12.50	2,064	322	0.001	2	1,748
2	7.50	1,757	99	0.000	0	1,488
1	2.50	1,780	11	0.000	0	1,508
Commscope ATSBT-TOP-	160.00	5	138	0.000	1	5
Andrew E15S09P94	160.00	44	1,121	0.002	5	37
RFS ATMAP1412D-1A20	160.00	39	998	0.002	5	33
RFS APXVAARR24_43-U-	160.00	384	9,823	0.021	47	325
Kaelus DBC0061F1V51-	148.00	153	3,351	0.007	16	130
Powerwave Allgon LGP	148.00	85	1,853	0.004	9	72
Raycap DC6-48-60-18-	148.00	20	438	0.001	2	17
Raycap DC6-48-60-18-	148.00	20	438	0.001	2	17
Raycap DC6-48-60-0-8	148.00	33	718	0.002	3	28
Ericsson RRUS 4478 B	148.00	180	3,936	0.008	19	152
Ericsson RRUS 11 (Ba	148.00	165	3,614	0.008	17	140
Ericsson RRUS 32 (50	148.00	152	3,338	0.007	16	129
Ericsson RRUS 32 B2	148.00	159	3,483	0.007	17	135
Ericsson RRUS 32 B66	148.00	159	3,483	0.007	17	135
Powerwave Allgon 777	148.00	105	2,300	0.005	11	89
Pipe Mount	148.00	200	4,381	0.009	21	169
Quintel QS66512-2	148.00	333	7,294	0.016	35	282
CCI OPA-65R-LCUU-H6	148.00	219	4,797	0.010	23	185

Kathrein 80010965	148.00	293	6,413	0.014	31	248
Flat Platform w/ Han	148.00	2,000	43,808	0.094	211	1,694
RFS FD9R6004	143.00	19	380	0.001	2	16
Alcatel-Lucent RRH2X	143.00	172	3,517	0.008	17	146
Alcatel-Lucent RRH2x	143.00	227	4,638	0.010	22	192
Alcatel-Lucent RRH4x	143.00	253	5,178	0.011	25	214
RFS DB-T1-6Z-8AB-0Z	143.00	88	1,800	0.004	9	75
Antel BXA-80063-6BF-	143.00	19	393	0.001	2	16
Antel BXA-70063/6CF	143.00	34	695	0.001	3	29
Antel BXA-80080/6CF	143.00	22	450	0.001	2	19
Commscope SBNHH-1D65	143.00	203	4,147	0.009	20	172
Commscope SBNHH-1D45	143.00	247	5,047	0.011	24	209
Flat Low Profile Pla	143.00	1,500	30,674	0.066	148	1,270
KMW KMDAPS2040000 (E	132.00	48	831	0.002	4	40
KMW AM-X-WM-17-65-00	132.00	43	742	0.002	4	36
Decibel DB844H90E-XY	132.00	126	2,195	0.005	11	107
Flat Low Profile Pla	132.00	1,500	26,136	0.056	126	1,270
Alcatel-Lucent RRH2x	120.00	159	2,285	0.005	11	134
Alcatel-Lucent 800 M	120.00	192	2,765	0.006	13	163
Alcatel-Lucent 4x40W	120.00	273	3,931	0.008	19	231
TD-RRH8x20-25 w/ Sol	120.00	210	3,024	0.006	15	178
RFS APXVSPP18-C-A20	120.00	171	2,462	0.005	12	145
Commscope DT465B-2XR	120.00	174	2,506	0.005	12	147
Flat Low Profile Pla	120.00	1,500	21,600	0.046	104	1,270
Antel BCD-87010 ___	100.00	26	265	0.001	1	22
Flat Side Arm	100.00	150	1,500	0.003	7	127
PCTEL GPS-TMG-HR-26N	75.00	1	3	0.000	0	1
Round Side Arm	75.00	150	844	0.002	4	127
		57,638	466,269	1.000	2,248	48,812

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	-69.40	-2.20	0.00	-270.16	0.00	270.16	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.053
5.00	-67.20	-2.21	0.00	-259.17	0.00	259.17	4,702.37	2,351.19	8,987.95	4,500.65	0.01	-0.01	0.052
10.00	-64.62	-2.23	0.00	-248.11	0.00	248.11	4,630.27	2,315.13	8,663.09	4,337.98	0.03	-0.03	0.051
15.00	-62.06	-2.24	0.00	-236.97	0.00	236.97	4,557.03	2,278.52	8,341.98	4,177.19	0.07	-0.04	0.050
20.00	-59.53	-2.25	0.00	-225.78	0.00	225.78	4,482.67	2,241.34	8,024.78	4,018.36	0.12	-0.06	0.049
25.00	-57.03	-2.25	0.00	-214.54	0.00	214.54	4,403.56	2,201.78	7,705.28	3,858.37	0.19	-0.07	0.048
30.00	-54.56	-2.25	0.00	-203.28	0.00	203.28	4,302.92	2,151.46	7,355.37	3,683.15	0.28	-0.09	0.047
35.00	-52.11	-2.25	0.00	-192.02	0.00	192.02	4,202.28	2,101.14	7,013.59	3,512.01	0.38	-0.10	0.046
40.00	-51.55	-2.25	0.00	-180.77	0.00	180.77	4,101.65	2,050.82	6,679.95	3,344.94	0.49	-0.12	0.045
41.16	-48.92	-2.24	0.00	-178.15	0.00	178.15	4,078.23	2,039.12	6,603.48	3,306.65	0.52	-0.12	0.045
45.00	-47.68	-2.23	0.00	-169.58	0.00	169.58	4,001.01	2,000.51	6,354.43	3,181.94	0.63	-0.13	0.044
46.83	-46.26	-2.22	0.00	-165.50	0.00	165.50	3,410.94	1,705.47	5,490.25	2,749.21	0.68	-0.14	0.048
50.00	-44.04	-2.20	0.00	-158.46	0.00	158.46	3,371.32	1,685.66	5,340.15	2,674.05	0.77	-0.15	0.046
55.00	-41.85	-2.18	0.00	-147.46	0.00	147.46	3,307.92	1,653.96	5,106.10	2,556.85	0.94	-0.16	0.044
60.00	-39.68	-2.15	0.00	-136.58	0.00	136.58	3,242.50	1,621.25	4,874.14	2,440.69	1.12	-0.18	0.043
65.00	-37.53	-2.11	0.00	-125.83	0.00	125.83	3,156.24	1,578.12	4,616.98	2,311.92	1.32	-0.20	0.041
70.00	-35.41	-2.07	0.00	-115.26	0.00	115.26	3,069.98	1,534.99	4,366.78	2,186.64	1.53	-0.21	0.039
75.00	-33.13	-2.02	0.00	-104.89	0.00	104.89	2,983.72	1,491.86	4,123.56	2,064.84	1.76	-0.23	0.037
80.00	-32.46	-2.01	0.00	-94.79	0.00	94.79	2,897.46	1,448.73	3,887.31	1,946.54	2.00	-0.24	0.035
81.62	-30.59	-1.95	0.00	-91.53	0.00	91.53	2,869.45	1,434.73	3,812.10	1,908.88	2.08	-0.24	0.034
85.00	-29.84	-1.93	0.00	-84.94	0.00	84.94	2,811.20	1,405.60	3,658.02	1,831.73	2.26	-0.25	0.033
86.37	-28.45	-1.89	0.00	-82.29	0.00	82.29	2,342.68	1,171.34	3,095.01	1,549.81	2.33	-0.26	0.035
90.00	-26.54	-1.82	0.00	-75.44	0.00	75.44	2,304.43	1,152.21	2,976.95	1,490.69	2.53	-0.27	0.033
95.00	-24.66	-1.75	0.00	-66.34	0.00	66.34	2,249.56	1,124.78	2,815.20	1,409.69	2.82	-0.28	0.030
100.00	-22.57	-1.66	0.00	-57.60	0.00	57.60	2,177.68	1,088.84	2,637.27	1,320.60	3.12	-0.29	0.028
105.00	-22.53	-1.66	0.00	-49.30	0.00	49.30	2,105.79	1,052.90	2,465.16	1,234.41	3.43	-0.30	0.026
105.13	-21.14	-1.59	0.00	-49.10	0.00	49.10	2,103.99	1,052.00	2,460.93	1,232.29	3.44	-0.30	0.025
105.13	-21.14	-1.59	0.00	-49.10	0.00	49.10	2,103.99	1,052.00	2,460.93	1,232.29	3.44	-0.30	0.050
110.00	-19.88	-1.53	0.00	-41.34	0.00	41.34	2,033.91	1,016.95	2,298.85	1,151.13	3.76	-0.31	0.046
115.00	-18.92	-1.48	0.00	-33.69	0.00	33.69	1,962.02	981.01	2,138.35	1,070.76	4.10	-0.34	0.041
120.00	-14.65	-1.22	0.00	-26.29	0.00	26.29	1,890.14	945.07	1,983.66	993.30	4.46	-0.35	0.034
125.00	-14.63	-1.22	0.00	-20.20	0.00	20.20	1,818.26	909.13	1,834.77	918.75	4.84	-0.37	0.030
125.12	-13.64	-1.15	0.00	-20.05	0.00	20.05	1,816.48	908.24	1,831.17	916.95	4.85	-0.37	0.029
128.87	-13.46	-1.14	0.00	-15.72	0.00	15.72	1,443.09	721.55	1,448.31	725.23	5.14	-0.38	0.031
130.00	-13.14	-1.12	0.00	-14.44	0.00	14.44	1,430.26	715.13	1,422.41	712.26	5.23	-0.38	0.029
132.00	-10.56	-0.93	0.00	-12.20	0.00	12.20	1,407.26	703.63	1,376.79	689.42	5.39	-0.39	0.025
135.00	-9.85	-0.88	0.00	-9.41	0.00	9.41	1,372.75	686.38	1,309.76	655.86	5.64	-0.39	0.022
140.00	-9.44	-0.84	0.00	-5.03	0.00	5.03	1,315.24	657.62	1,201.77	601.78	6.06	-0.40	0.016
143.00	-5.71	-0.52	0.00	-2.51	0.00	2.51	1,280.74	640.37	1,139.20	570.45	6.31	-0.41	0.009
145.00	-5.35	-0.49	0.00	-1.47	0.00	1.47	1,257.74	628.87	1,098.42	550.03	6.48	-0.41	0.007
148.00	0.00	-0.45	0.00	0.00	0.00	0.00	1,223.23	611.62	1,038.64	520.09	6.74	-0.41	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	-46.90	-2.19	0.00	-265.33	0.00	265.33	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.048
5.00	-45.42	-2.21	0.00	-254.36	0.00	254.36	4,702.37	2,351.19	8,987.95	4,500.65	0.01	-0.01	0.048
10.00	-43.67	-2.21	0.00	-243.33	0.00	243.33	4,630.27	2,315.13	8,663.09	4,337.98	0.03	-0.03	0.047
15.00	-41.94	-2.22	0.00	-232.26	0.00	232.26	4,557.03	2,278.52	8,341.98	4,177.19	0.07	-0.04	0.046
20.00	-40.23	-2.22	0.00	-221.16	0.00	221.16	4,482.67	2,241.34	8,024.78	4,018.36	0.12	-0.06	0.045
25.00	-38.54	-2.22	0.00	-210.04	0.00	210.04	4,403.56	2,201.78	7,705.28	3,858.37	0.19	-0.07	0.044
30.00	-36.87	-2.22	0.00	-198.92	0.00	198.92	4,302.92	2,151.46	7,355.37	3,683.15	0.27	-0.09	0.043
35.00	-35.22	-2.22	0.00	-187.81	0.00	187.81	4,202.28	2,101.14	7,013.59	3,512.01	0.37	-0.10	0.042
40.00	-34.84	-2.22	0.00	-176.73	0.00	176.73	4,101.65	2,050.82	6,679.95	3,344.94	0.48	-0.12	0.042
41.16	-33.06	-2.20	0.00	-174.16	0.00	174.16	4,078.23	2,039.12	6,603.48	3,306.65	0.51	-0.12	0.041
45.00	-32.22	-2.19	0.00	-165.72	0.00	165.72	4,001.01	2,000.51	6,354.43	3,181.94	0.61	-0.13	0.040
46.83	-31.26	-2.18	0.00	-161.71	0.00	161.71	3,410.94	1,705.47	5,490.25	2,749.21	0.66	-0.14	0.044
50.00	-29.76	-2.16	0.00	-154.80	0.00	154.80	3,371.32	1,685.66	5,340.15	2,674.05	0.76	-0.15	0.042
55.00	-28.28	-2.14	0.00	-144.01	0.00	144.01	3,307.92	1,653.96	5,106.10	2,556.85	0.92	-0.16	0.041
60.00	-26.81	-2.11	0.00	-133.33	0.00	133.33	3,242.50	1,621.25	4,874.14	2,440.69	1.10	-0.18	0.039
65.00	-25.36	-2.07	0.00	-122.80	0.00	122.80	3,156.24	1,578.12	4,616.98	2,311.92	1.29	-0.19	0.037
70.00	-23.93	-2.03	0.00	-112.46	0.00	112.46	3,069.98	1,534.99	4,366.78	2,186.64	1.50	-0.21	0.036
75.00	-22.39	-1.98	0.00	-102.32	0.00	102.32	2,983.72	1,491.86	4,123.56	2,064.84	1.72	-0.22	0.034
80.00	-21.93	-1.96	0.00	-92.44	0.00	92.44	2,897.46	1,448.73	3,887.31	1,946.54	1.96	-0.23	0.032
81.62	-20.67	-1.91	0.00	-89.26	0.00	89.26	2,869.45	1,434.73	3,812.10	1,908.88	2.04	-0.24	0.031
85.00	-20.17	-1.89	0.00	-82.82	0.00	82.82	2,811.20	1,405.60	3,658.02	1,831.73	2.21	-0.25	0.030
86.37	-19.22	-1.84	0.00	-80.23	0.00	80.23	2,342.68	1,171.34	3,095.01	1,549.81	2.28	-0.25	0.032
90.00	-17.93	-1.78	0.00	-73.55	0.00	73.55	2,304.43	1,152.21	2,976.95	1,490.69	2.48	-0.26	0.030
95.00	-16.66	-1.71	0.00	-64.66	0.00	64.66	2,249.56	1,124.78	2,815.20	1,409.69	2.76	-0.27	0.028
100.00	-15.25	-1.62	0.00	-56.13	0.00	56.13	2,177.68	1,088.84	2,637.27	1,320.60	3.05	-0.29	0.025
105.00	-15.22	-1.62	0.00	-48.03	0.00	48.03	2,105.79	1,052.90	2,465.16	1,234.41	3.36	-0.30	0.023
105.13	-14.28	-1.55	0.00	-47.83	0.00	47.83	2,103.99	1,052.00	2,460.93	1,232.29	3.37	-0.30	0.023
105.13	-14.28	-1.55	0.00	-47.83	0.00	47.83	2,103.99	1,052.00	2,460.93	1,232.29	3.37	-0.30	0.046
110.00	-13.44	-1.49	0.00	-40.26	0.00	40.26	2,033.91	1,016.95	2,298.85	1,151.13	3.68	-0.31	0.042
115.00	-12.78	-1.44	0.00	-32.80	0.00	32.80	1,962.02	981.01	2,138.35	1,070.76	4.01	-0.33	0.037
120.00	-9.90	-1.19	0.00	-25.60	0.00	25.60	1,890.14	945.07	1,983.66	993.30	4.36	-0.35	0.031
125.00	-9.88	-1.19	0.00	-19.66	0.00	19.66	1,818.26	909.13	1,834.77	918.75	4.73	-0.36	0.027
125.12	-9.21	-1.12	0.00	-19.52	0.00	19.52	1,816.48	908.24	1,831.17	916.95	4.74	-0.36	0.026
128.87	-9.09	-1.11	0.00	-15.31	0.00	15.31	1,443.09	721.55	1,448.31	725.23	5.03	-0.37	0.027
130.00	-8.88	-1.09	0.00	-14.05	0.00	14.05	1,430.26	715.13	1,422.41	712.26	5.12	-0.37	0.026
132.00	-7.13	-0.91	0.00	-11.88	0.00	11.88	1,407.26	703.63	1,376.79	689.42	5.27	-0.38	0.022
135.00	-6.66	-0.85	0.00	-9.16	0.00	9.16	1,372.75	686.38	1,309.76	655.86	5.51	-0.39	0.019
140.00	-6.38	-0.82	0.00	-4.90	0.00	4.90	1,315.24	657.62	1,201.77	601.78	5.92	-0.39	0.013
143.00	-3.86	-0.51	0.00	-2.44	0.00	2.44	1,280.74	640.37	1,139.20	570.45	6.17	-0.40	0.007
145.00	-3.62	-0.48	0.00	-1.43	0.00	1.43	1,257.74	628.87	1,098.42	550.03	6.34	-0.40	0.005
148.00	0.00	-0.45	0.00	0.00	0.00	0.00	1,223.23	611.62	1,038.64	520.09	6.59	-0.40	0.000

Site Number:	302515	Code: ANSI/TIA-222-G	
Site Name:	SMFR - North, CT	Engineering Number: 12598483_C3_02	8/30/2018 9:40:53 AM
Customer:	T-MOBILE		

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):	0.25
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.27
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11
Period Based on Rayleigh Method (sec):	2.54
Redundancy Factor (p):	1.30

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)
39	146.50	286	1.852	1.785	1.069	0.465	115	358
38	144.00	193	1.789	1.490	0.959	0.411	69	242
37	141.50	331	1.728	1.230	0.858	0.360	103	415
36	137.50	562	1.631	0.879	0.713	0.285	139	705
35	133.50	344	1.538	0.599	0.589	0.217	65	431
34	131.00	253	1.481	0.455	0.520	0.178	39	317
33	129.44	143	1.446	0.376	0.480	0.155	19	180
32	127.00	790	1.392	0.268	0.423	0.121	83	989
31	125.06	18	1.350	0.195	0.382	0.096	1	22
30	122.50	732	1.295	0.113	0.332	0.066	42	917
29	117.50	769	1.191	-0.003	0.248	0.014	10	963
28	112.50	1,002	1.092	-0.074	0.182	-0.026	-23	1,256
27	107.56	1,107	0.998	-0.110	0.131	-0.056	-54	1,387
26	105.06	37	0.952	-0.119	0.109	-0.067	-2	46
25	102.50	1,486	0.907	-0.122	0.090	-0.076	-98	1,862
24	97.50	1,504	0.820	-0.115	0.060	-0.084	-110	1,885
23	92.50	1,521	0.738	-0.098	0.038	-0.082	-108	1,905
22	88.19	1,113	0.671	-0.078	0.025	-0.070	-68	1,395
21	85.69	600	0.634	-0.065	0.019	-0.060	-31	752
20	83.31	1,487	0.599	-0.053	0.014	-0.048	-62	1,863
19	80.81	538	0.563	-0.040	0.011	-0.034	-16	674
18	77.50	1,671	0.518	-0.023	0.008	-0.013	-19	2,093
17	72.50	1,691	0.454	0.000	0.006	0.018	27	2,119
16	67.50	1,711	0.393	0.020	0.007	0.045	66	2,144
15	62.50	1,731	0.337	0.036	0.009	0.063	95	2,169
14	57.50	1,750	0.285	0.048	0.014	0.074	113	2,193
13	52.50	1,770	0.238	0.057	0.018	0.080	122	2,218
12	48.42	1,132	0.202	0.062	0.023	0.081	79	1,419
11	45.92	991	0.182	0.065	0.026	0.081	70	1,242
10	43.08	2,097	0.160	0.067	0.029	0.080	146	2,627
9	40.58	450	0.142	0.069	0.031	0.080	31	564
8	37.50	1,949	0.121	0.070	0.034	0.079	133	2,442
7	32.50	1,972	0.091	0.071	0.038	0.077	131	2,471
6	27.50	1,995	0.065	0.072	0.041	0.075	130	2,500

5	22.50	2,018	0.044	0.071	0.042	0.073	127	2,529
4	17.50	2,041	0.026	0.067	0.040	0.070	123	2,558
3	12.50	2,064	0.013	0.059	0.035	0.064	114	2,586
2	7.50	1,757	0.005	0.044	0.025	0.052	79	2,202
1	2.50	1,780	0.001	0.018	0.010	0.026	39	2,231
Commscope ATSBT-	160.00	5	2.209	4.120	1.851	0.810	4	7
Andrew E15S09P94	160.00	44	2.209	4.120	1.851	0.810	31	55
RFS ATMAP1412D-1A20	160.00	39	2.209	4.120	1.851	0.810	27	49
RFS APXVAARR24_43-U-	160.00	384	2.209	4.120	1.851	0.810	269	481
Kaelus DBC0061F1V51-	148.00	153	1.890	1.980	1.140	0.499	66	192
Powerwave Allgon LGP	148.00	85	1.890	1.980	1.140	0.499	37	106
Raycap DC6-48-60-18-	148.00	20	1.890	1.980	1.140	0.499	9	25
Raycap DC6-48-60-18-	148.00	20	1.890	1.980	1.140	0.499	9	25
Raycap DC6-48-60-0-8	148.00	33	1.890	1.980	1.140	0.499	14	41
Ericsson RRUS 4478 B	148.00	180	1.890	1.980	1.140	0.499	78	225
Ericsson RRUS 11 (Ba	148.00	165	1.890	1.980	1.140	0.499	71	207
Ericsson RRUS 32 (50	148.00	152	1.890	1.980	1.140	0.499	66	191
Ericsson RRUS 32 B2	148.00	159	1.890	1.980	1.140	0.499	69	199
Ericsson RRUS 32 B66	148.00	159	1.890	1.980	1.140	0.499	69	199
Powerwave Allgon 777	148.00	105	1.890	1.980	1.140	0.499	45	132
Pipe Mount	148.00	200	1.890	1.980	1.140	0.499	87	251
Quintel QS66512-2	148.00	333	1.890	1.980	1.140	0.499	144	417
CCI OPA-65R-LCUU-H6	148.00	219	1.890	1.980	1.140	0.499	95	274
Kathrein 80010965	148.00	293	1.890	1.980	1.140	0.499	127	367
Flat Platform w/ Han	148.00	2,000	1.890	1.980	1.140	0.499	865	2,506
RFS FD9R6004	143.00	19	1.764	1.382	0.917	0.391	6	23
Alcatel-Lucent RRH2X	143.00	172	1.764	1.382	0.917	0.391	58	216
Alcatel-Lucent RRH2x	143.00	227	1.764	1.382	0.917	0.391	77	284
Alcatel-Lucent RRH4x	143.00	253	1.764	1.382	0.917	0.391	86	317
RFS DB-T1-6Z-8AB-0Z	143.00	88	1.764	1.382	0.917	0.391	30	110
Antel BXA-80063-6BF-	143.00	19	1.764	1.382	0.917	0.391	7	24
Antel BXA-70063/6CF	143.00	34	1.764	1.382	0.917	0.391	12	43
Antel BXA-80080/6CF	143.00	22	1.764	1.382	0.917	0.391	7	28
Commscope SBNHH-	143.00	203	1.764	1.382	0.917	0.391	69	254
Commscope SBNHH-	143.00	247	1.764	1.382	0.917	0.391	84	309
Flat Low Profile Pla	143.00	1,500	1.764	1.382	0.917	0.391	508	1,880
KMW KMDAPS2040000	132.00	48	1.503	0.510	0.547	0.193	8	60
KMW AM-X-WM-17-65-	132.00	43	1.503	0.510	0.547	0.193	7	53
Decibel DB844H90E-XY	132.00	126	1.503	0.510	0.547	0.193	21	158
Flat Low Profile Pla	132.00	1,500	1.503	0.510	0.547	0.193	251	1,880
Alcatel-Lucent RRH2x	120.00	159	1.243	0.049	0.288	0.039	5	199
Alcatel-Lucent 800 M	120.00	192	1.243	0.049	0.288	0.039	6	241
Alcatel-Lucent 4x40W	120.00	273	1.243	0.049	0.288	0.039	9	342
TD-RRH8x20-25 w/ Sol	120.00	210	1.243	0.049	0.288	0.039	7	263
RFS APXVSPP18-C-A20	120.00	171	1.243	0.049	0.288	0.039	6	214
Commscope DT465B-	120.00	174	1.243	0.049	0.288	0.039	6	218
Flat Low Profile Pla	120.00	1,500	1.243	0.049	0.288	0.039	50	1,880
Antel BCD-87010 ___	100.00	26	0.863	-0.120	0.074	-0.081	-2	33
Flat Side Arm	100.00	150	0.863	-0.120	0.074	-0.081	-11	188
PCTEL GPS-TMG-HR-	75.00	1	0.485	-0.011	0.007	0.003	0	1
Round Side Arm	75.00	150	0.485	-0.011	0.007	0.003	0	188
		57,638	103.837	72.865	47.783	19.279	5,210	72,227

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)
39	146.50	286	1.852	1.785	1.069	0.465	115	242
38	144.00	193	1.789	1.490	0.959	0.411	69	164

37	141.50	331	1.728	1.230	0.858	0.360	103	280
36	137.50	562	1.631	0.879	0.713	0.285	139	476
35	133.50	344	1.538	0.599	0.589	0.217	65	291
34	131.00	253	1.481	0.455	0.520	0.178	39	214
33	129.44	143	1.446	0.376	0.480	0.155	19	121
32	127.00	790	1.392	0.268	0.423	0.121	83	669
31	125.06	18	1.350	0.195	0.382	0.096	1	15
30	122.50	732	1.295	0.113	0.332	0.066	42	620
29	117.50	769	1.191	-0.003	0.248	0.014	10	651
28	112.50	1,002	1.092	-0.074	0.182	-0.026	-23	849
27	107.56	1,107	0.998	-0.110	0.131	-0.056	-54	937
26	105.06	37	0.952	-0.119	0.109	-0.067	-2	31
25	102.50	1,486	0.907	-0.122	0.090	-0.076	-98	1,258
24	97.50	1,504	0.820	-0.115	0.060	-0.084	-110	1,274
23	92.50	1,521	0.738	-0.098	0.038	-0.082	-108	1,288
22	88.19	1,113	0.671	-0.078	0.025	-0.070	-68	943
21	85.69	600	0.634	-0.065	0.019	-0.060	-31	508
20	83.31	1,487	0.599	-0.053	0.014	-0.048	-62	1,259
19	80.81	538	0.563	-0.040	0.011	-0.034	-16	456
18	77.50	1,671	0.518	-0.023	0.008	-0.013	-19	1,415
17	72.50	1,691	0.454	0.000	0.006	0.018	27	1,432
16	67.50	1,711	0.393	0.020	0.007	0.045	66	1,449
15	62.50	1,731	0.337	0.036	0.009	0.063	95	1,466
14	57.50	1,750	0.285	0.048	0.014	0.074	113	1,482
13	52.50	1,770	0.238	0.057	0.018	0.080	122	1,499
12	48.42	1,132	0.202	0.062	0.023	0.081	79	959
11	45.92	991	0.182	0.065	0.026	0.081	70	839
10	43.08	2,097	0.160	0.067	0.029	0.080	146	1,776
9	40.58	450	0.142	0.069	0.031	0.080	31	381
8	37.50	1,949	0.121	0.070	0.034	0.079	133	1,650
7	32.50	1,972	0.091	0.071	0.038	0.077	131	1,670
6	27.50	1,995	0.065	0.072	0.041	0.075	130	1,689
5	22.50	2,018	0.044	0.071	0.042	0.073	127	1,709
4	17.50	2,041	0.026	0.067	0.040	0.070	123	1,728
3	12.50	2,064	0.013	0.059	0.035	0.064	114	1,748
2	7.50	1,757	0.005	0.044	0.025	0.052	79	1,488
1	2.50	1,780	0.001	0.018	0.010	0.026	39	1,508
Commscope ATSBT-	160.00	5	2.209	4.120	1.851	0.810	4	5
Andrew E15S09P94	160.00	44	2.209	4.120	1.851	0.810	31	37
RFS ATMAP1412D-1A20	160.00	39	2.209	4.120	1.851	0.810	27	33
RFS APXVAARR24_43-U-	160.00	384	2.209	4.120	1.851	0.810	269	325
Kaelus DBC0061F1V51-	148.00	153	1.890	1.980	1.140	0.499	66	130
Powerwave Allgon LGP	148.00	85	1.890	1.980	1.140	0.499	37	72
Raycap DC6-48-60-18-	148.00	20	1.890	1.980	1.140	0.499	9	17
Raycap DC6-48-60-18-	148.00	20	1.890	1.980	1.140	0.499	9	17
Raycap DC6-48-60-0-8	148.00	33	1.890	1.980	1.140	0.499	14	28
Ericsson RRUS 4478 B	148.00	180	1.890	1.980	1.140	0.499	78	152
Ericsson RRUS 11 (Ba	148.00	165	1.890	1.980	1.140	0.499	71	140
Ericsson RRUS 32 (50	148.00	152	1.890	1.980	1.140	0.499	66	129
Ericsson RRUS 32 B2	148.00	159	1.890	1.980	1.140	0.499	69	135
Ericsson RRUS 32 B66	148.00	159	1.890	1.980	1.140	0.499	69	135
Powerwave Allgon 777	148.00	105	1.890	1.980	1.140	0.499	45	89
Pipe Mount	148.00	200	1.890	1.980	1.140	0.499	87	169
Quintel QS66512-2	148.00	333	1.890	1.980	1.140	0.499	144	282
CCI OPA-65R-LCUU-H6	148.00	219	1.890	1.980	1.140	0.499	95	185
Kathrein 80010965	148.00	293	1.890	1.980	1.140	0.499	127	248
Flat Platform w/ Han	148.00	2,000	1.890	1.980	1.140	0.499	865	1,694
RFS FD9R6004	143.00	19	1.764	1.382	0.917	0.391	6	16
Alcatel-Lucent RRH2X	143.00	172	1.764	1.382	0.917	0.391	58	146
Alcatel-Lucent RRH2x	143.00	227	1.764	1.382	0.917	0.391	77	192
Alcatel-Lucent RRH4x	143.00	253	1.764	1.382	0.917	0.391	86	214
RFS DB-T1-6Z-8AB-0Z	143.00	88	1.764	1.382	0.917	0.391	30	75
Antel BXA-80063-6BF-	143.00	19	1.764	1.382	0.917	0.391	7	16
Antel BXA-70063/6CF	143.00	34	1.764	1.382	0.917	0.391	12	29

Antel BXA-80080/6CF	143.00	22	1.764	1.382	0.917	0.391	7	19
Commscope SBNHH-	143.00	203	1.764	1.382	0.917	0.391	69	172
Commscope SBNHH-	143.00	247	1.764	1.382	0.917	0.391	84	209
Flat Low Profile Pla	143.00	1,500	1.764	1.382	0.917	0.391	508	1,270
KMW KMDAPS2040000	132.00	48	1.503	0.510	0.547	0.193	8	40
KMW AM-X-WM-17-65-	132.00	43	1.503	0.510	0.547	0.193	7	36
Decibel DB844H90E-XY	132.00	126	1.503	0.510	0.547	0.193	21	107
Flat Low Profile Pla	132.00	1,500	1.503	0.510	0.547	0.193	251	1,270
Alcatel-Lucent RRH2x	120.00	159	1.243	0.049	0.288	0.039	5	134
Alcatel-Lucent 800 M	120.00	192	1.243	0.049	0.288	0.039	6	163
Alcatel-Lucent 4x40W	120.00	273	1.243	0.049	0.288	0.039	9	231
TD-RRH8x20-25 w/ Sol	120.00	210	1.243	0.049	0.288	0.039	7	178
RFS APXVSPP18-C-A20	120.00	171	1.243	0.049	0.288	0.039	6	145
Commscope DT465B-	120.00	174	1.243	0.049	0.288	0.039	6	147
Flat Low Profile Pla	120.00	1,500	1.243	0.049	0.288	0.039	50	1,270
Antel BCD-87010 ___	100.00	26	0.863	-0.120	0.074	-0.081	-2	22
Flat Side Arm	100.00	150	0.863	-0.120	0.074	-0.081	-11	127
PCTEL GPS-TMG-HR-	75.00	1	0.485	-0.011	0.007	0.003	0	1
Round Side Arm	75.00	150	0.485	-0.011	0.007	0.003	0	127
		57,638	103.837	72.865	47.783	19.279	5,210	48,812

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	-69.40	-4.86	0.00	-583.10	0.00	583.10	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.101
5.00	-67.20	-4.81	0.00	-558.82	0.00	558.82	4,702.37	2,351.19	8,987.95	4,500.65	0.02	-0.03	0.099
10.00	-64.61	-4.73	0.00	-534.74	0.00	534.74	4,630.27	2,315.13	8,663.09	4,337.98	0.07	-0.06	0.098
15.00	-62.05	-4.64	0.00	-511.07	0.00	511.07	4,557.03	2,278.52	8,341.98	4,177.19	0.15	-0.09	0.096
20.00	-59.52	-4.54	0.00	-487.86	0.00	487.86	4,482.67	2,241.34	8,024.78	4,018.36	0.26	-0.13	0.094
25.00	-57.02	-4.44	0.00	-465.15	0.00	465.15	4,403.56	2,201.78	7,705.28	3,858.37	0.41	-0.16	0.093
30.00	-54.54	-4.33	0.00	-442.96	0.00	442.96	4,302.92	2,151.46	7,355.37	3,683.15	0.60	-0.19	0.092
35.00	-52.10	-4.22	0.00	-421.30	0.00	421.30	4,202.28	2,101.14	7,013.59	3,512.01	0.81	-0.22	0.090
40.00	-51.54	-4.21	0.00	-400.20	0.00	400.20	4,101.65	2,050.82	6,679.95	3,344.94	1.06	-0.26	0.089
41.16	-48.91	-4.06	0.00	-395.31	0.00	395.31	4,078.23	2,039.12	6,603.48	3,306.65	1.13	-0.26	0.089
45.00	-47.66	-4.00	0.00	-379.72	0.00	379.72	4,001.01	2,000.51	6,354.43	3,181.94	1.35	-0.29	0.087
46.83	-46.24	-3.93	0.00	-372.40	0.00	372.40	3,410.94	1,705.47	5,490.25	2,749.21	1.47	-0.30	0.095
50.00	-44.02	-3.82	0.00	-359.95	0.00	359.95	3,371.32	1,685.66	5,340.15	2,674.05	1.68	-0.33	0.093
55.00	-41.83	-3.72	0.00	-340.86	0.00	340.86	3,307.92	1,653.96	5,106.10	2,556.85	2.03	-0.36	0.091
60.00	-39.66	-3.63	0.00	-322.27	0.00	322.27	3,242.50	1,621.25	4,874.14	2,440.69	2.43	-0.40	0.089
65.00	-37.51	-3.58	0.00	-304.11	0.00	304.11	3,156.24	1,578.12	4,616.98	2,311.92	2.87	-0.43	0.087
70.00	-35.39	-3.56	0.00	-286.23	0.00	286.23	3,069.98	1,534.99	4,366.78	2,186.64	3.34	-0.47	0.085
75.00	-33.11	-3.58	0.00	-268.45	0.00	268.45	2,983.72	1,491.86	4,123.56	2,064.84	3.86	-0.51	0.083
80.00	-32.43	-3.60	0.00	-250.58	0.00	250.58	2,897.46	1,448.73	3,887.31	1,946.54	4.41	-0.55	0.081
81.62	-30.57	-3.65	0.00	-244.74	0.00	244.74	2,869.45	1,434.73	3,812.10	1,908.88	4.60	-0.56	0.080
85.00	-29.81	-3.69	0.00	-232.40	0.00	232.40	2,811.20	1,405.60	3,658.02	1,831.73	5.00	-0.58	0.077
86.37	-28.42	-3.75	0.00	-227.34	0.00	227.34	2,342.68	1,171.34	3,095.01	1,549.81	5.17	-0.59	0.084
90.00	-26.51	-3.85	0.00	-213.75	0.00	213.75	2,304.43	1,152.21	2,976.95	1,490.69	5.63	-0.62	0.081
95.00	-24.62	-3.96	0.00	-194.50	0.00	194.50	2,249.56	1,124.78	2,815.20	1,409.69	6.30	-0.66	0.076
100.00	-22.53	-4.06	0.00	-174.72	0.00	174.72	2,177.68	1,088.84	2,637.27	1,320.60	7.01	-0.70	0.071
105.00	-22.49	-4.06	0.00	-154.44	0.00	154.44	2,105.79	1,052.90	2,465.16	1,234.41	7.76	-0.73	0.067
105.13	-21.10	-4.11	0.00	-153.93	0.00	153.93	2,103.99	1,052.00	2,460.93	1,232.29	7.78	-0.73	0.066
105.13	-21.10	-4.11	0.00	-153.93	0.00	153.93	2,103.99	1,052.00	2,460.93	1,232.29	7.78	-0.73	0.135
110.00	-19.84	-4.13	0.00	-133.91	0.00	133.91	2,033.91	1,016.95	2,298.85	1,151.13	8.54	-0.77	0.126
115.00	-18.87	-4.13	0.00	-113.26	0.00	113.26	1,962.02	981.01	2,138.35	1,070.76	9.38	-0.83	0.115
120.00	-14.59	-3.95	0.00	-92.62	0.00	92.62	1,890.14	945.07	1,983.66	993.30	10.29	-0.89	0.101
125.00	-14.57	-3.95	0.00	-72.88	0.00	72.88	1,818.26	909.13	1,834.77	918.75	11.25	-0.95	0.087
125.12	-13.58	-3.86	0.00	-72.40	0.00	72.40	1,816.48	908.24	1,831.17	916.95	11.28	-0.95	0.086
128.87	-13.40	-3.84	0.00	-57.93	0.00	57.93	1,443.09	721.55	1,448.31	725.23	12.04	-0.99	0.089
130.00	-13.08	-3.80	0.00	-53.60	0.00	53.60	1,430.26	715.13	1,422.41	712.26	12.28	-1.00	0.084
132.00	-10.51	-3.41	0.00	-46.00	0.00	46.00	1,407.26	703.63	1,376.79	689.42	12.70	-1.02	0.074
135.00	-9.80	-3.26	0.00	-35.77	0.00	35.77	1,372.75	686.38	1,309.76	655.86	13.35	-1.04	0.062
140.00	-9.39	-3.15	0.00	-19.46	0.00	19.46	1,315.24	657.62	1,201.77	601.78	14.46	-1.07	0.040
143.00	-5.68	-2.07	0.00	-10.00	0.00	10.00	1,280.74	640.37	1,139.20	570.45	15.14	-1.09	0.022
145.00	-5.32	-1.95	0.00	-5.86	0.00	5.86	1,257.74	628.87	1,098.42	550.03	15.59	-1.09	0.015
148.00	0.00	-1.85	0.00	0.00	0.00	0.00	1,223.23	611.62	1,038.64	520.09	16.28	-1.09	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	-46.90	-4.85	0.00	-571.87	0.00	571.87	4,773.35	2,386.68	9,316.44	4,665.14	0.00	0.00	0.096
5.00	-45.41	-4.80	0.00	-547.61	0.00	547.61	4,702.37	2,351.19	8,987.95	4,500.65	0.02	-0.03	0.094
10.00	-43.66	-4.70	0.00	-523.63	0.00	523.63	4,630.27	2,315.13	8,663.09	4,337.98	0.06	-0.06	0.093
15.00	-41.93	-4.60	0.00	-500.11	0.00	500.11	4,557.03	2,278.52	8,341.98	4,177.19	0.14	-0.09	0.091
20.00	-40.22	-4.49	0.00	-477.10	0.00	477.10	4,482.67	2,241.34	8,024.78	4,018.36	0.26	-0.12	0.089
25.00	-38.53	-4.38	0.00	-454.64	0.00	454.64	4,403.56	2,201.78	7,705.28	3,858.37	0.40	-0.15	0.088
30.00	-36.86	-4.26	0.00	-432.74	0.00	432.74	4,302.92	2,151.46	7,355.37	3,683.15	0.58	-0.19	0.087
35.00	-35.21	-4.15	0.00	-411.41	0.00	411.41	4,202.28	2,101.14	7,013.59	3,512.01	0.80	-0.22	0.085
40.00	-34.82	-4.13	0.00	-390.68	0.00	390.68	4,101.65	2,050.82	6,679.95	3,344.94	1.04	-0.25	0.084
41.16	-33.05	-3.98	0.00	-385.88	0.00	385.88	4,078.23	2,039.12	6,603.48	3,306.65	1.10	-0.26	0.084
45.00	-32.21	-3.92	0.00	-370.61	0.00	370.61	4,001.01	2,000.51	6,354.43	3,181.94	1.32	-0.28	0.082
46.83	-31.25	-3.84	0.00	-363.44	0.00	363.44	3,410.94	1,705.47	5,490.25	2,749.21	1.43	-0.30	0.090
50.00	-29.75	-3.73	0.00	-351.26	0.00	351.26	3,371.32	1,685.66	5,340.15	2,674.05	1.64	-0.32	0.088
55.00	-28.26	-3.62	0.00	-332.62	0.00	332.62	3,307.92	1,653.96	5,106.10	2,556.85	1.99	-0.35	0.086
60.00	-26.80	-3.54	0.00	-314.50	0.00	314.50	3,242.50	1,621.25	4,874.14	2,440.69	2.38	-0.39	0.084
65.00	-25.34	-3.48	0.00	-296.83	0.00	296.83	3,156.24	1,578.12	4,616.98	2,311.92	2.81	-0.42	0.083
70.00	-23.91	-3.45	0.00	-279.45	0.00	279.45	3,069.98	1,534.99	4,366.78	2,186.64	3.27	-0.46	0.081
75.00	-22.37	-3.47	0.00	-262.19	0.00	262.19	2,983.72	1,491.86	4,123.56	2,064.84	3.77	-0.50	0.079
80.00	-21.91	-3.49	0.00	-244.83	0.00	244.83	2,897.46	1,448.73	3,887.31	1,946.54	4.31	-0.53	0.077
81.62	-20.65	-3.55	0.00	-239.16	0.00	239.16	2,869.45	1,434.73	3,812.10	1,908.88	4.49	-0.55	0.076
85.00	-20.14	-3.58	0.00	-227.18	0.00	227.18	2,811.20	1,405.60	3,658.02	1,831.73	4.89	-0.57	0.074
86.37	-19.19	-3.65	0.00	-222.26	0.00	222.26	2,342.68	1,171.34	3,095.01	1,549.81	5.05	-0.58	0.080
90.00	-17.90	-3.75	0.00	-209.04	0.00	209.04	2,304.43	1,152.21	2,976.95	1,490.69	5.51	-0.61	0.077
95.00	-16.63	-3.86	0.00	-190.29	0.00	190.29	2,249.56	1,124.78	2,815.20	1,409.69	6.16	-0.64	0.073
100.00	-15.21	-3.96	0.00	-171.01	0.00	171.01	2,177.68	1,088.84	2,637.27	1,320.60	6.85	-0.68	0.068
105.00	-15.18	-3.97	0.00	-151.21	0.00	151.21	2,105.79	1,052.90	2,465.16	1,234.41	7.58	-0.71	0.063
105.13	-14.24	-4.01	0.00	-150.71	0.00	150.71	2,103.99	1,052.00	2,460.93	1,232.29	7.60	-0.72	0.063
105.13	-14.24	-4.01	0.00	-150.71	0.00	150.71	2,103.99	1,052.00	2,460.93	1,232.29	7.60	-0.72	0.129
110.00	-13.39	-4.04	0.00	-131.15	0.00	131.15	2,033.91	1,016.95	2,298.85	1,151.13	8.35	-0.75	0.121
115.00	-12.73	-4.03	0.00	-110.97	0.00	110.97	1,962.02	981.01	2,138.35	1,070.76	9.17	-0.81	0.110
120.00	-9.84	-3.87	0.00	-90.81	0.00	90.81	1,890.14	945.07	1,983.66	993.30	10.06	-0.87	0.097
125.00	-9.83	-3.87	0.00	-71.47	0.00	71.47	1,818.26	909.13	1,834.77	918.75	11.00	-0.93	0.083
125.12	-9.16	-3.78	0.00	-70.99	0.00	70.99	1,816.48	908.24	1,831.17	916.95	11.03	-0.93	0.082
128.87	-9.04	-3.76	0.00	-56.82	0.00	56.82	1,443.09	721.55	1,448.31	725.23	11.77	-0.97	0.085
130.00	-8.82	-3.72	0.00	-52.58	0.00	52.58	1,430.26	715.13	1,422.41	712.26	12.00	-0.98	0.080
132.00	-7.08	-3.34	0.00	-45.14	0.00	45.14	1,407.26	703.63	1,376.79	689.42	12.41	-1.00	0.071
135.00	-6.61	-3.20	0.00	-35.11	0.00	35.11	1,372.75	686.38	1,309.76	655.86	13.05	-1.02	0.058
140.00	-6.33	-3.09	0.00	-19.11	0.00	19.11	1,315.24	657.62	1,201.77	601.78	14.14	-1.05	0.037
143.00	-3.83	-2.04	0.00	-9.82	0.00	9.82	1,280.74	640.37	1,139.20	570.45	14.80	-1.06	0.020
145.00	-3.59	-1.92	0.00	-5.75	0.00	5.75	1,257.74	628.87	1,098.42	550.03	15.25	-1.07	0.013
148.00	0.00	-1.85	0.00	0.00	0.00	0.00	1,223.23	611.62	1,038.64	520.09	15.92	-1.07	0.000

Analysis Summary

Load Case	Reactions Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Max Usage Elev (ft)	Interaction Ratio
1.2D + 1.6W	26.63	0.00	69.12	0.00	0.00	3233.69	105.13	0.57
0.9D + 1.6W	25.22	0.00	51.84	0.00	0.00	3060.76	105.13	0.55
1.2D + 1.0Di + 1.0Wi	7.44	0.00	106.84	0.00	0.00	915.01	105.13	0.18
(1.2 + 0.2Sds) * DL + E ELFM	2.20	0.00	69.40	0.00	0.00	270.16	0.00	0.05
(1.2 + 0.2Sds) * DL + E EMAM	4.86	0.00	69.40	0.00	0.00	583.10	105.13	0.13
(0.9 - 0.2Sds) * DL + E ELFM	2.19	0.00	46.90	0.00	0.00	265.33	0.00	0.05
(0.9 - 0.2Sds) * DL + E EMAM	4.85	0.00	46.90	0.00	0.00	571.87	105.13	0.13
1.0D + 1.0W	6.56	0.00	57.64	0.00	0.00	801.00	105.13	0.15

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	Upper Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Lower Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Max Member Pu (kip)	phiPn (kip)	Ratio
0.00	105.	(4) SOL-#20 All Thre	290.2	8.7	16.8	119.9	12.0	10	24	0.0	12.0	0	0	202.9	330.5	0.614

Base Plate & Anchor Rod Analysis

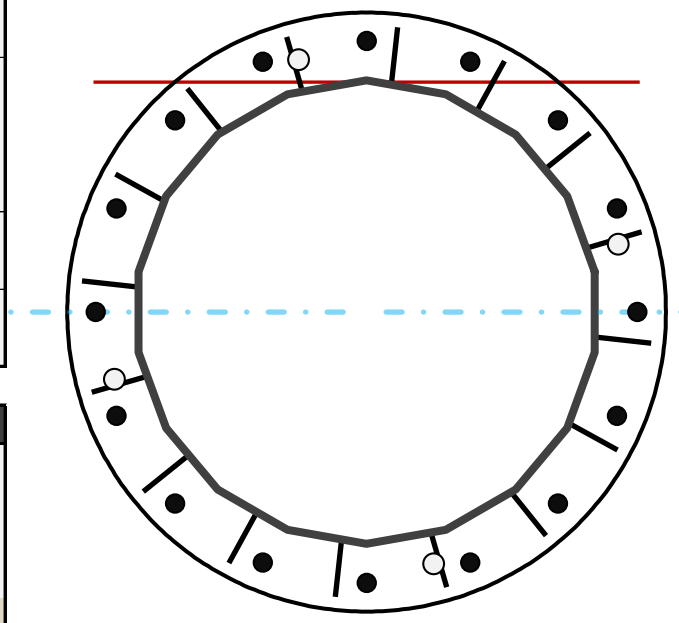
Pole Dimensions		
Number of Sides	18	-
Diameter	48.00	in
Thickness	0.438	in
Orientation Offset	10	°

Base Reactions		
Moment, Mu	3233.7	k-ft
Axial, Pu	69.1	k
Shear, Vu	26.6	k
Neutral Axis	0	°

Report Capacities		
Component	Capacity	Result
Base Plate	44%	Pass
Anchor Rods	53%	Pass
Dwyidag	51%	Pass

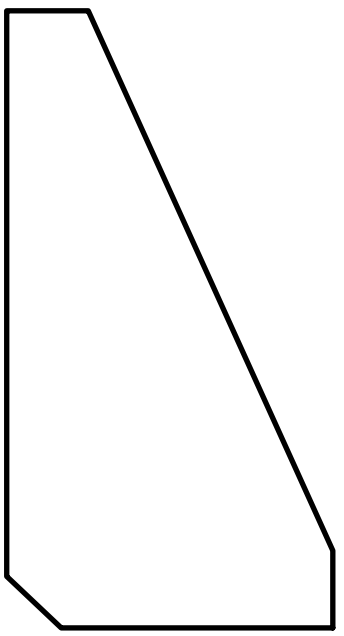
Base Plate		
Shape	Round	-
Diameter, ø	63	in
Thickness	2	in
Grade	A572-60	-
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	N/A	in
Orientation Offset	0	°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	1096.4	k
Bending Stress, ϕMn	2502.9	k

Dywidag Reinforcement		
Quantity	4	-
Bar Size	#20	in
Diameter, ø	2.5	in
Bracket Type	Angle	-
Circle	54.88	in
Orientation Offset	15	°
Applied Force, Pu	200.7	k
Dywidag Bar, ϕPn	392.7	k



Original Anchor Rods		
Arrangement	Radial	-
Quantity	16	-
Diameter, ø	2 1/4	in
Bolt Circle	57	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	11.2	in
Orientation Offset	0	°
Applied Force, Pu	124.4	k
Anchor Rods, ϕPn	259.8	k

Stiffeners		
Arrangement	Radial	-
Quantity	16	-
Height	12	in
Width	6	in
Effective Width	6.000	in
Thickness	3/4	in
Effective Thickness	0.750	in
Notch	1	in
Flat Edge	1.5	in
Grade	A36	-
Yield Strength, Fy	36	ksi
Tensile Strength, Fu	58	ksi
Horizontal Weld	Fillet	
Horizontal Fillet Size	3/8	in
Bevel Depth		in
Vertical Weld	Fillet	
Vertical Fillet Size	3/8	in
Weld Strength	70	ksi
Electrode Coefficient	1	-
Orientation Offset	5	°
Vertical Weld, ϕRn	198.2	k
Horz. Weld, ϕRn	106.4	k
Ten. Capacity, ϕTn	121.5	k
Comp. Capacity, ϕPn	766.0	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	26.6	2306.1	0.71
Anchor Rod Forces	26.6	2306.1	0.71
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	927.6	0.29
Stiffener Forces	13.8	1195.2	0.37

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	65.0407	3.6134	0.2316		18395.99
Bolt	3.9761	3.2477	0.8393	4.5	21116.92
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	4.9087	4.9087	1.9175		7399.77
Stiffener	3.7500	3.3750	54.0000		19792.69

Base Plate		
Shape	Round	-
Diameter, D	63	in
Thickness, t	2	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	40.804	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

External Base Plate		
Chord Length AA	35.160	in
Additional AA	11.190	in
Section Modulus, Z	46.351	in^3
Applied Moment, Mu	1096.4	k-ft
Bending Capacity, ϕMn	2502.9	k-ft
Capacity, Mu/ϕMn	0.438	OK
Chord Length AB	34.126	in
Additional AB	10.305	in
Section Modulus, Z	44.432	in^3
Applied Moment, Mu	965.1	k-ft
Bending Capacity, ϕMn	2399.3	k-ft
Capacity, Mu/ϕMn	0.402	OK
Bend Line Length	35.251	in
Additional Bend Line	23.764	in
Section Modulus, Z	59.015	in^3
Applied Moment, Mu	1096.4	k-ft
Bending Capacity, ϕMn	3186.8	k-ft
Capacity, Mu/ϕMn	0.344	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		

Anchor Rods		
Anchor Rod Quantity, N	16	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	57	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	124.4	k
Applied Shear, Vu	3.0	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.479	OK
Interaction Capacity	0.533	OK

Additional Bolt Group 1		
Bolt Quantity, N	0	-
Bolt Diameter, d	0	in
Bolt Circle, BC	0	in
Yield Strength, Fy	0	ksi
Tensile Strength, Fu	0	ksi
Applied Axial, Pu	0.0	k
Applied Shear, Vu	0.0	k
Compressive Capacity, ϕPn	0.0	k
Compressive Capacity, ϕPn		
Interaction Capacity		

Additional Bolt Group 2		
Bolt Quantity, N	0	-
Bolt Diameter, d	0	in
Bolt Circle, BC	0	in
Yield Strength, Fy	0	ksi
Tensile Strength, Fu	0	ksi
Applied Axial, Pu	0.0	k
Applied Shear, Vu	0.0	k
Compressive Capacity, ϕPn	0.0	k
Compressive Capacity, ϕPn		
Interaction Capacity		

Dywidag Reinforcement		
Dywidag Quantity, N	4	-
Dywidag Diameter, d	2.5	in
Bolt Circle, BC	54.88	in
Yield Strength, Fy	80	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	200.7	k
Compressive Capacity, ϕPn	392.7	k
Capacity, Pu/ϕPn	0.511	OK

Base Plate Stiffeners		
Applied Axial Force, Pu	67.2	k
Applied Horizontal Force, Vu	0.43	k

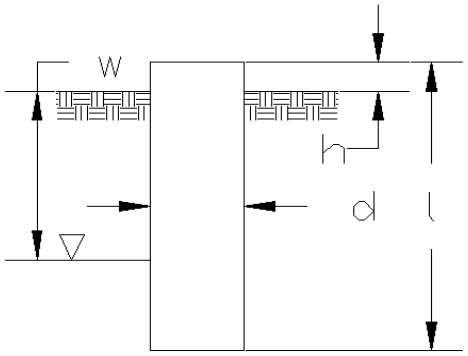
Vertical Weld		
Vert.-to-Stiffener a=e_x/l	0.167	-
Spacing Ratio, k	0.063	-
Weld Coefficient, C	3.670	-
Compressive Capacity, ϕPn	198.2	k
Vert.-to-Plate a=e_x/l	0.333	-
Spacing Ratio, k	0.063	-
Weld Coefficient, C	2.940	-
Shear Capacity, ϕVn	158.8	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$	0.342	OK

Horizontal Weld		
Horz.-to-Stiffener a=e_x/l	0.167	-
Spacing Ratio, k	0.125	-
Weld Coefficient, C	3.940	-
Effective Fillet	0.375	in
Compressive Capacity, ϕPn	106.4	k
Horz.-to-Pole a=e_x/l	0.333	-
Spacing Ratio, k	0.125	-
Weld Coefficient, C	3.090	-
Shear Capacity, ϕVn	83.4	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$	0.637	OK

Plate Tension		
Gross Cross Section	3.750	in^2
Net Cross Section	3.375	in^2
Tensile Capacity, ϕTn	121.5	k
Capacity, Tu/ϕTn	0.277	OK

Plate Compression		
Radius of Gyration	0.217	in^3
kl/r	33.26	-
4.71 √(E/Fy)	133.68	-
Buckling Stress(Fe)	258.8	-
Crit. Buckling Stress(Fcr)	227.0	ksi
Compressive Capacity, ϕPn	766.0	k
Capacity, Pu/ϕPn	0.044	OK

Site Name:	SMFR - North, CT	*Program Last Updated:*	*5/13/2014*
Site Number:	302515	*American Tower Corporation*	
Engineer:	Trevor.Ridilla		
Engineering Number:	12598483		
Date:	08/30/18		



Design Base Loads (Factored) - Analysis per TIA-222-G Standards

Analyze or Design a Foundation?	Analyze	
Foundation Mapped:	N	
Moment (M):	3233.7	k-ft
Shear/Leg (V):	26.6	k
Axial Load (P):	69.1	k
Uplift/Leg (U):	0.0	k
Tower Type (GT / SST / MP):	MP	
Diameter of Caisson (d):	6.5	ft
Caisson Embedment (L-h):	24.0	ft
Caisson Height Above Ground (h):	1.0	ft
Depth Below Ground Surface to Water Table (w):	22.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Water:	62.4	pcf
Tension Skin Friction/Compression Skin Friction:	1.00	
Pullout Angle:	30.0	degrees

Engineer Notes

Soil Mechanical Properties

Depth (ft) Top	Depth (ft) Bottom	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)	Ultimate Skin Friction (psf)	Ultimate Bearing Pressure (psf)
0.0	2.0	100	0	0	0	0
2.0	10.0	120	0	30	400	0
10.0	25.0	125	0	36	1400	40000

Required Embedment:	20.4	ft - OK, Caisson Embedment Satisfactory
Volume of Concrete:	829.6	ft^3 = 30.7 yd^3
Weight of Concrete (Buoyancy Effect Considered):	120.3	k
Average Soil Unit Weight:	114.0	pcf
Skin Friction Resistance:	465.6	k
Compressive Bearing Resistance:	1327.3	k
Pullout Weight (Minus Concrete Weight):	936.9	k
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	439.4	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	1344.7	k
P_u:	98.6	k
$T_u/\phi_s T_n$:	0.00	Result: OK
$P_u/\phi_s P_n$:	0.07	Result: OK
Total Lateral Resistance:	2023.1	k
Inflection Point (Below Ground Surface):	17.6	ft
Design Overturning Moment At Inflection Point (M_D):	3729.3	k-ft
Nominal Moment Capacity ($\phi_s M_n$):	6494.1	k-ft
$M_D/\phi_s M_n$:	0.57	Result: OK
ϕ_s:	0.75	

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	4000	psi
Vertical Steel Rebar Size #:	11	
Vertical Steel Rebar Area:	1.56	in^2
# of Vertical Steel Rebars:	21	
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	5	
Horizontal Tie / Stirrup Area:	0.31	in^2
Design Horizontal Tie / Stirrup Spacing:	12.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	60	ksi
Rebar Cage Diameter:	70.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression Reduction Factor (ϕ_V):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	3270.3	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	4571.5	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.72	Result: OK
Design Shear (V_u):	351.0	k
Nominal Shear Capacity ($\phi_V V_n$):	456.6	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.77	Result: OK
Design Tension (T_u):	0.0	k
Nominal Tension Capacity ($\phi_T T_n$):	1769.0	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	98.6	k
Nominal Compression Capacity ($\phi_P P_n$):	8390.2	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.01	Result: OK
Bending Reinforcement Ratio:	0.007	ACI318-05 - 10.8.4 & 10.9.1
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.72	Result: OK

CENTEK engineering

Centered on Solutions℠

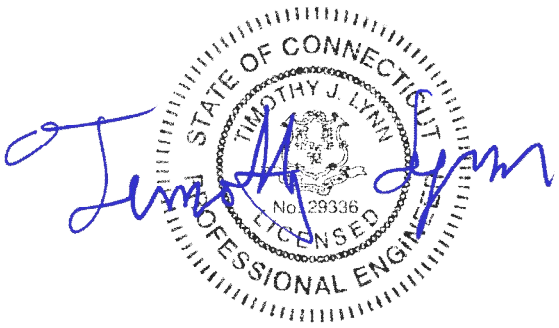
Structural Analysis Report

Antenna Mount Analysis

T-Mobile Site #: CT11373A

1590 Newfield Avenue
Stamford, CT

Centek Project No. 18058.60



Date: July 6, 2018

Max Stress Ratio = 56.0%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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- RF DATA SHEET, DATED 5/11/2018

CENTEK engineering

Centered on Solutions℠

July 6, 2018

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11373A
1590 Newfield Avenue
Stamford, CT 06905

Centek Project No. 18058.60

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 one (1) 2.5 Std. pipe mast 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:
  Pipe Mast: Three (3) RFS APXVAARR24-43-NA20 panel antennas and three (3) Ericsson 4449 B71_B12 remote radio units mounted on triple sector chain mounts (SitePro P/N CHM3) with a RAD center elevation of 159-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 Stamford 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 does not have sufficient capacity to support the aforementioned antenna configuration. Replacement of the existing pipe mast per the details provided within this report is required. 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: Stamford, CT

Rev. 0: 7/5/18

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 18058.60

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 = $h := 163$ ft (User Input)

Height to Center of Antennas = $z_{ant} := 159$ 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)

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

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

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.17$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.755$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.395$$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_d \cdot Kz_{ant} \cdot V^2 \cdot I_{Wind} = 29.352$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_d \cdot Kz_{ant} \cdot V_i^2 \cdot I_{Wind} = 8.484$

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 =	$N_{ant} := 3$		(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 =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} \cdot N_{ant} = 1961$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} \cdot N_{ant} = 711$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} \cdot N_{ant} = 673$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} \cdot N_{ant} = 299$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 459$	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 =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 433$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 1300$	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 =	$N_{RRUS} := 3$		(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 =	$F_{RRUS} := qz_{ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} \cdot N_{ant} = 159$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} \cdot N_{ant} = 125$	lbs

Wind Load (with ice)

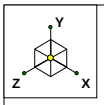
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} \cdot N_{ant} = 72$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.8$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} \cdot N_{ant} = 60$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 222$	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 =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2234$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 72$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 217$	lbs



Envelope Only Solution

Centek		
TJL	CT11373A - Mount	July 5, 2018 at 10:34 AM
18058.60	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	Pipe Mast	PIPE_8.0	Beam	Pipe	A53 Grade B	Typical	7.85	68.1	68.1	136

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	Pipe Mast	8			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			Pipe 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	8	0	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 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.125	1
2	M1	Y	-.125	7
3	M1	Y	-.23	1
4	M1	Y	-.23	7

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.65	1
2	M1	Y	-.65	7

Member Point Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.337	1
2	M1	X	.337	7

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.981	1
2	M1	X	.981	7

Member Point Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.337	1
2	M1	Z	.337	7

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.981	1
2	M1	Z	.981	7

Member Distributed Loads

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
No Data to Print ...					

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1						
2	Dead Load	None					4			
3	Ice Load	None					2			
4	Wind with Ice X	None					2			
5	Wind X	None					2			
6	Wind with Ice Z	None					2			
7	Wind Z	None					2			

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-d..	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-d..	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-d..	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-d..	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

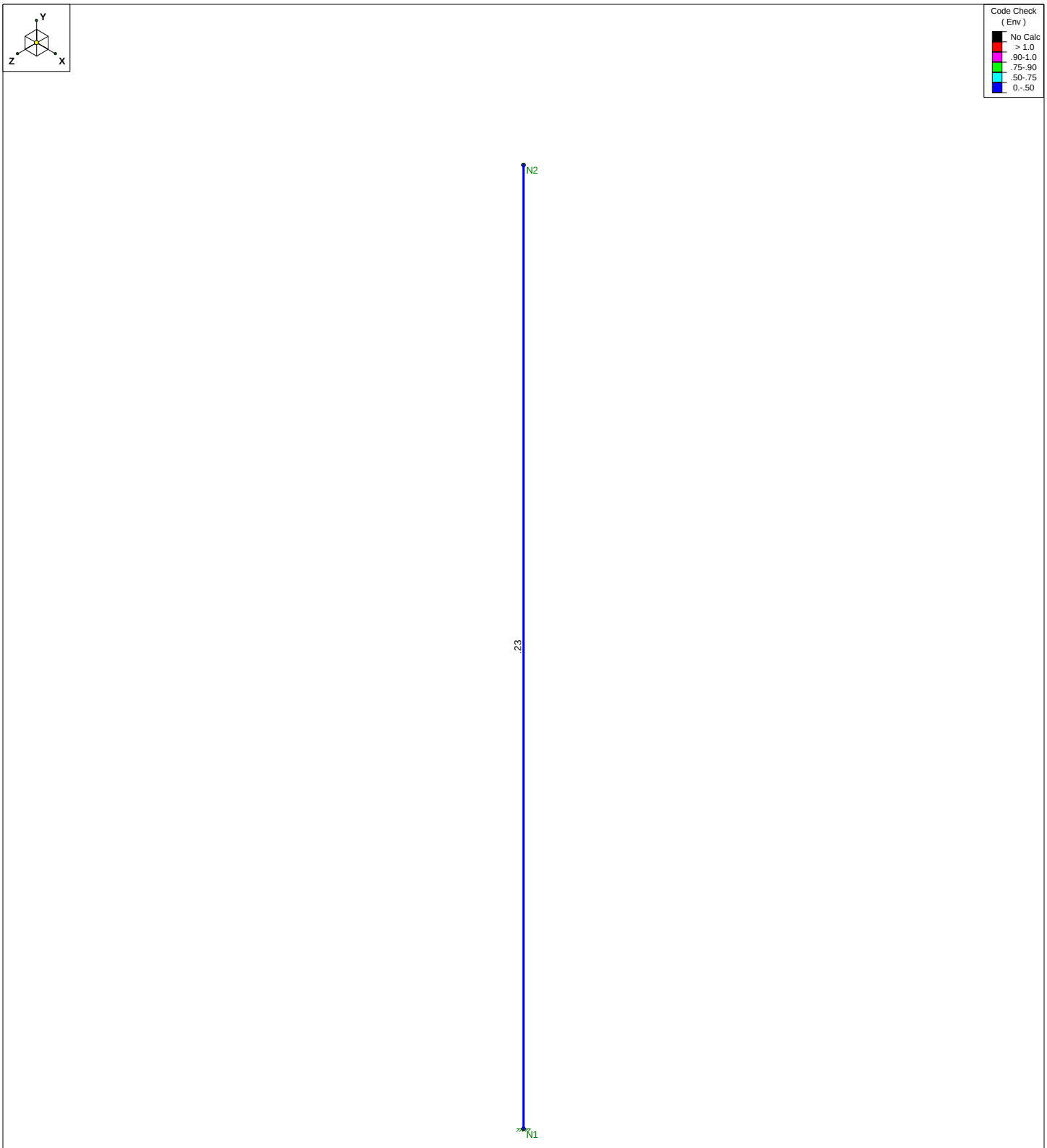
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	4	2.408	3	0	1	0	1	0	1	12.568	1
2		min	-3.139	1	.831	2	-3.139	4	-12.568	4	0	1	0	4
3	Totals:	max	0	4	2.408	3	0	1						
4		min	-3.139	1	.831	2	-3.139	4						

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	1	0	2	0	4	0	4	0	1	0	4
2		min	0	4	0	3	0	1	0	1	0	1	0	1
3	N2	max	.248	1	0	2	.248	4	3.581e-03	4	0	1	0	4
4		min	0	4	0	3	0	1	0	1	0	1	-3.581e-03	1

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	PIPE_8.0	.233	0	1	.042	0	1	234.189	247.275	54.6	54.6	2	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11373A - Mount	July 5, 2018 at 10:33 AM
18058.60	Unity Check	Mount.r3d

CENTEK engineering
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Branford, CT 06405 F: (203) 488-8587

Subject:	Mast Connection
Location:	Stamford, CT
Rev. 0: 7/5/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18058.60

Mast Connection:

Design Reactions at Brace:

Axial =	Axial := 1.1·kips	(User Input)
Shear =	Shear := 3.2·kips	(User Input)
Moment =	Moment := 12.6·kips·ft	(User Input)

Anchor Bolt Data:

Bolt Grade =	A325	(User Input)
Design Shear Stress =	$F_v := 40.5 \cdot ksi$	(User Input)
Design Tension Stress =	$F_T := 67.5 \cdot ksi$	(User Input)
Total Number of Bolts =	$n_b := 4$	(User Input)
Number of Bolts Tension Side Parallel =	$n_{b.par} := 2$	(User Input)
Number of Bolts Tension Side Diagonal =	$n_{b.diag} := 1$	(User Input)
Bolt Diameter =	$d_b := 0.625in$	(User Input)
Bolt Spacing X Direction =	$S_x := 9 \cdot in$	(User Input)
Bolt Spacing Z Direction =	$S_z := 9 \cdot in$	(User Input)

Base Plate Data:

Base Plate Steel =	A36	(User Input)
Allowable Yield Stress =	$F_y := 36 \cdot ksi$	(User Input)
Base Plate Width =	$Pl_w := 16 \cdot in$	(User Input)
Base Plate Thickness =	$Pl_t := 1 \cdot in$	(User Input)
Bolt Edge Distance =	$B_E := 1.5 \cdot in$	(User Input)
Pole Diameter =	$D_p := 8.625 \cdot in$	(User Input)

Base Plate Data:

Weld Grade	E70XX	(User Input)
Weld Yield Stress =	$F_{yw} := 70 \cdot ksi$	(User Input)
Weld Size =	$sw := 0.3125 \cdot in$	(User Input)

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:	Mast Connection
Location:	Stamford, CT
Rev. 0: 7/5/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18058.60

Anchor Bolt Check:

Bolt Area = $a_b := \frac{1}{4}\cdot\pi\cdot d_b^{\,2} = 0.307\cdot in^2$

Bolt Spacing Diag. Direction = $S_{diag} := \sqrt{S_x^{\,2} + S_z^{\,2}} = 12.73\cdot in$

Tension Load per Bolt Parallel = $T_{par} := \frac{Moment}{S_x \cdot n_{b.par}} - \frac{Axial}{n_b} = 8.13\cdot kips$

Tension Load per Bolt Diagonal = $T_{diag} := \frac{Moment}{S_{diag} \cdot n_{b.diag}} - \frac{Axial}{n_b} = 11.6\cdot kips$

Tension per bolt = $T := if\left(T_{par} > T_{diag}, T_{par}, T_{diag}\right) = 11.604\cdot kips$

Actual Tensile Stress = $f_t := \frac{T}{a_b} = 37.82\cdot ksi$

$Condition1 := if\left(f_t < F_T, "OK", "Overstressed"\right)$

Condition1 = "OK"

Base Plate Check:

Design Bending Stress = $F_b := 0.9\cdot F_y = 32.4\cdot ksi$

Plate Bending Width = $Z := 13\cdot in$

Moment Arm = $K := \frac{\left(S_{diag} - D_p\right)}{2} = 2.05\cdot in$

Moment in Base Plate = $M := K\cdot T = 23.81\cdot kips\cdot in$

Section Modulus = $S_Z := \frac{1}{6}\cdot Z\cdot Pl_t^{\,2} = 2.17\cdot in^3$

Bending Stress = $f_b := \frac{M}{S_Z} = 10.99\cdot ksi$

$Condition2 := if\left(f_b < F_b, "OK", "Overstressed"\right)$

Condition2 = "OK"

Base Plate to PCS Mast Weld Check:

Design Weld Stress = $F_w := 0.45 \cdot F_{yw} = 31.5 \cdot ksi$

Weld Area = $A_w := \frac{\pi}{4} \cdot \left[\left(D_p + 2sw \cdot 0.707 \right)^2 - D_p^2 \right] = 6.14 \cdot in^2$

Weld Moment of Inertia = $I_w := \frac{\pi}{64} \cdot \left[\left(D_p + 2sw \cdot 0.707 \right)^4 - D_p^4 \right] = 60.09 \cdot in^4$

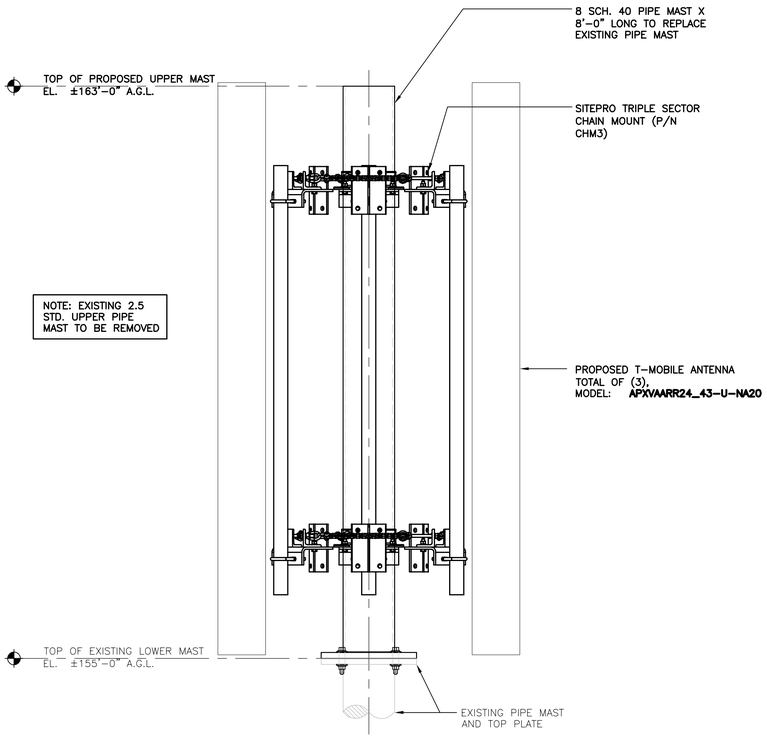
$c := \frac{D_p}{2} + sw \cdot 0.707 = 4.53 \cdot in$

Section Modulus of Weld = $S_w := \frac{I_w}{c} = 13.26 \cdot in^3$

Weld Stress = $f_w := \frac{Moment}{S_w} + \frac{Shear}{A_w} = 11.93 \cdot ksi$

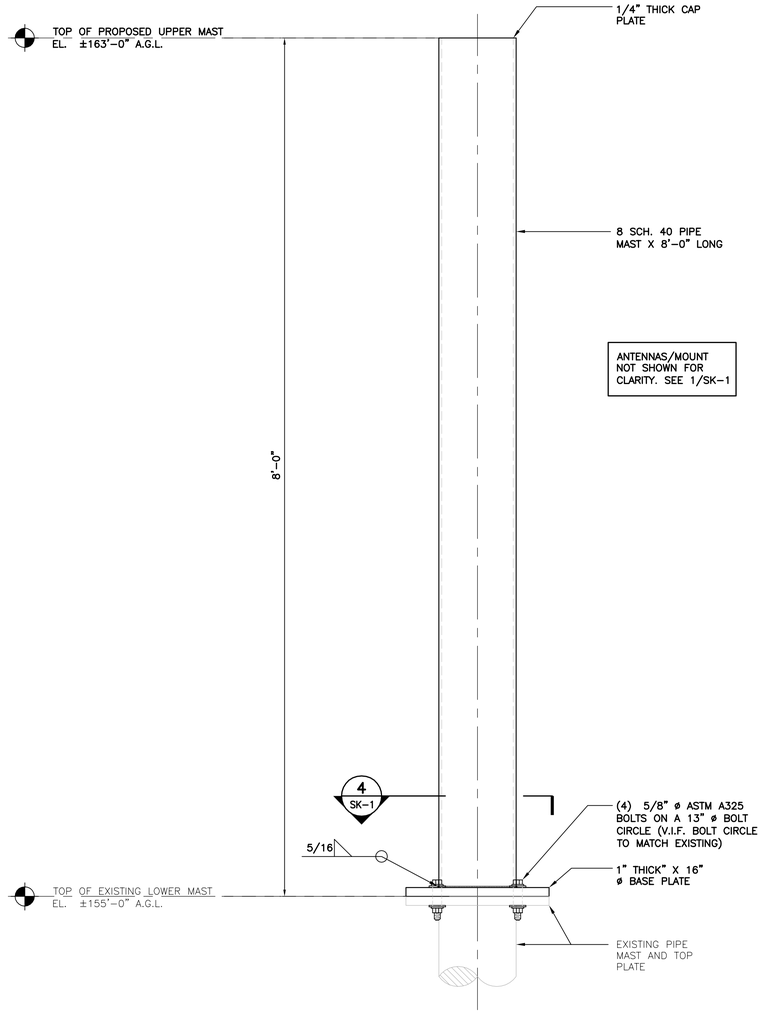
$Condition3 := if\left(f_w < F_w, "OK", "Overstressed" \right)$

Condition3 = "OK"



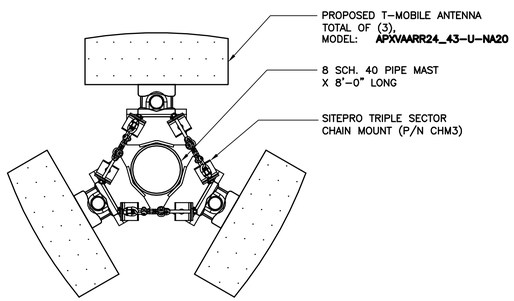
1 SK-1 PIPE MAST REPLACEMENT ELEVATION

SCALE: 3/4" = 1'-0"



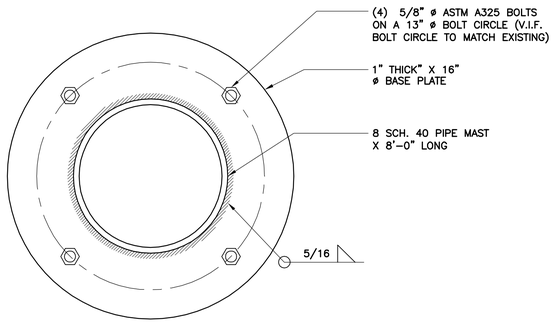
3 SK-1 PIPE MAST DETAIL

SCALE: 1-1/2" = 1'-0"



2 SK-1 ANTENNA MOUNT DETAIL

SCALE: 3" = 1'-0"



4 SK-1 PLATE DETAIL

SCALE: 3" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/06/18	TJL	CAG	MOUNT MODIFICATION SKETCH – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
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(203) 488-0580
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63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE

CT11373A

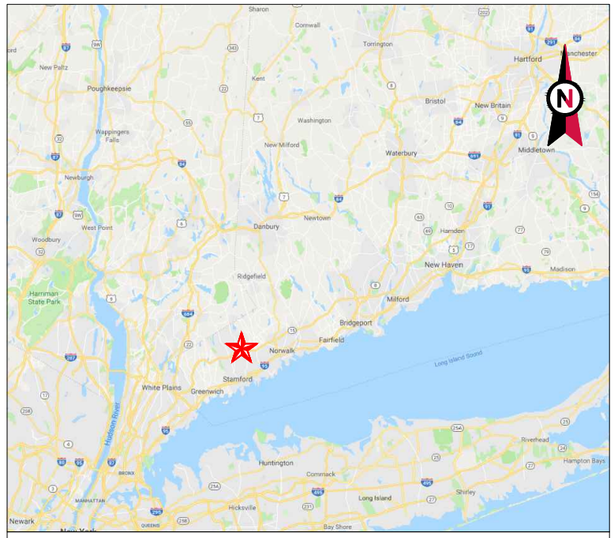
1590 NEWFIELD AVE
STAMFORD, CT 06905

DATE: 07/06/18
SCALE: AS NOTED
JOB NO. 18058.60

PIPE MAST REPLACEMENT DETAILS

SK-1

Sheet No. 1 of 1

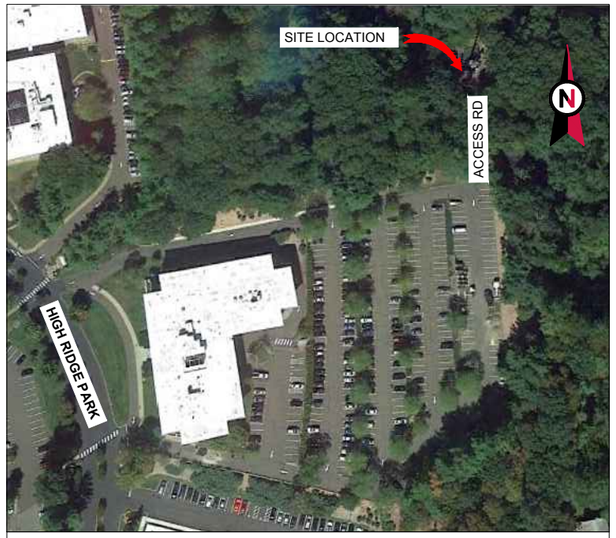


VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: SMFR - NORTH
ATC SITE NUMBER: 302515
T-MOBILE SITE ID: CT11373A
SITE ADDRESS: 1590 NEWFIELD AVE
STAMFORD, CT 06905

T-MOBILE ANTENNA AMENDMENT
67D94B CONFIGURATION



LOCATION MAP

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: (877) 659-6326

TELEPHONE COMPANY: FRONTIER COMMUNICATIONS
PHONE: (800) 376-6843

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

PROJECT SUMMARY

SITE ADDRESS:

1590 NEWFIELD AVE
STAMFORD, CT 06905
COUNTY: FAIRFIELD

GEOGRAPHIC COORDINATES:

LATITUDE: 41.11275

LONGITUDE: -73.53835278

GROUND ELEVATION: 227' 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:

BELL ATLANTIC
PO BOX 64498
BALTIMORE, MD 21264

PROJECT DESCRIPTION

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

REMOVE (3) PANELS

INSTALL (3) NEW PANELS AND (6) 1-5/8" COAX CABLES

EXISTING (6) TTAs, (3) SMART BIAS Ts, AND (18) 1-5/8" COAX 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 HARTFORD, CT:

TAKE I-91 SOUTH TO EXIT 16 FOR WILBUR CROSS PARKWAY (THIS TURNS IN MERRITT PARKWAY). STAY ON MERRITT TO EXIT 35. TURN RIGHT OFF EXIT, GO TO FIRST LIGHT AND TURN LEFT ON BUXTON FARMS RD. GO TO STOP SIGN AND TURN LEFT ON TURN OF RIVER ROAD. FOLLOW TO FIVE HIGH RIDGE PARK AND TURN LEFT. ACCESS ROAD ENTRANCE IS AT REAR LEFT OF PARKING LOT.

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	3	10/10/18	KL
G-002	GENERAL NOTES	0	08/29/18	KTL
C-101	DETAILED SITE PLAN & TOWER ELEVATION	2	09/06/18	KL
C-102	GROUND DETAILS	2	09/06/18	KL
C-501	ANTENNA INFORMATION & SCHEDULE	3	10/10/18	KL
E-501	GROUNDING DETAILS	0	08/29/18	KTL
R-601	SUPPLEMENTAL			

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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	KTL	08/29/18
1	REMOVED TTAS/RRUS	KL	09/04/18
2	ADDED GROUND RRUS	KL	09/06/18
3	REVISED APPLICATION	KL	10/10/18

ATC SITE NUMBER:
302515

ATC SITE NAME:
SMFR - NORTH

SITE ADDRESS:
1590 NEWFIELD AVE
STAMFORD, CT 06905

SEAL:

Authorized by "EOR"
Oct 11 2018 2:43 PM cosign

T-Mobile

DRAWN BY:	KTL
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607176

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	3

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.

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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	KTL	08/29/18

ATC SITE NUMBER:
302515

ATC SITE NAME:
SMFR - NORTH

SITE ADDRESS:
1590 NEWFIELD AVE
STAMFORD, CT 06905

SEAL:

Authorized by "EOR"
Oct 11 2018 2:44 PM cosign

T-Mobile

DRAWN BY:	KTL
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607176

GENERAL NOTES

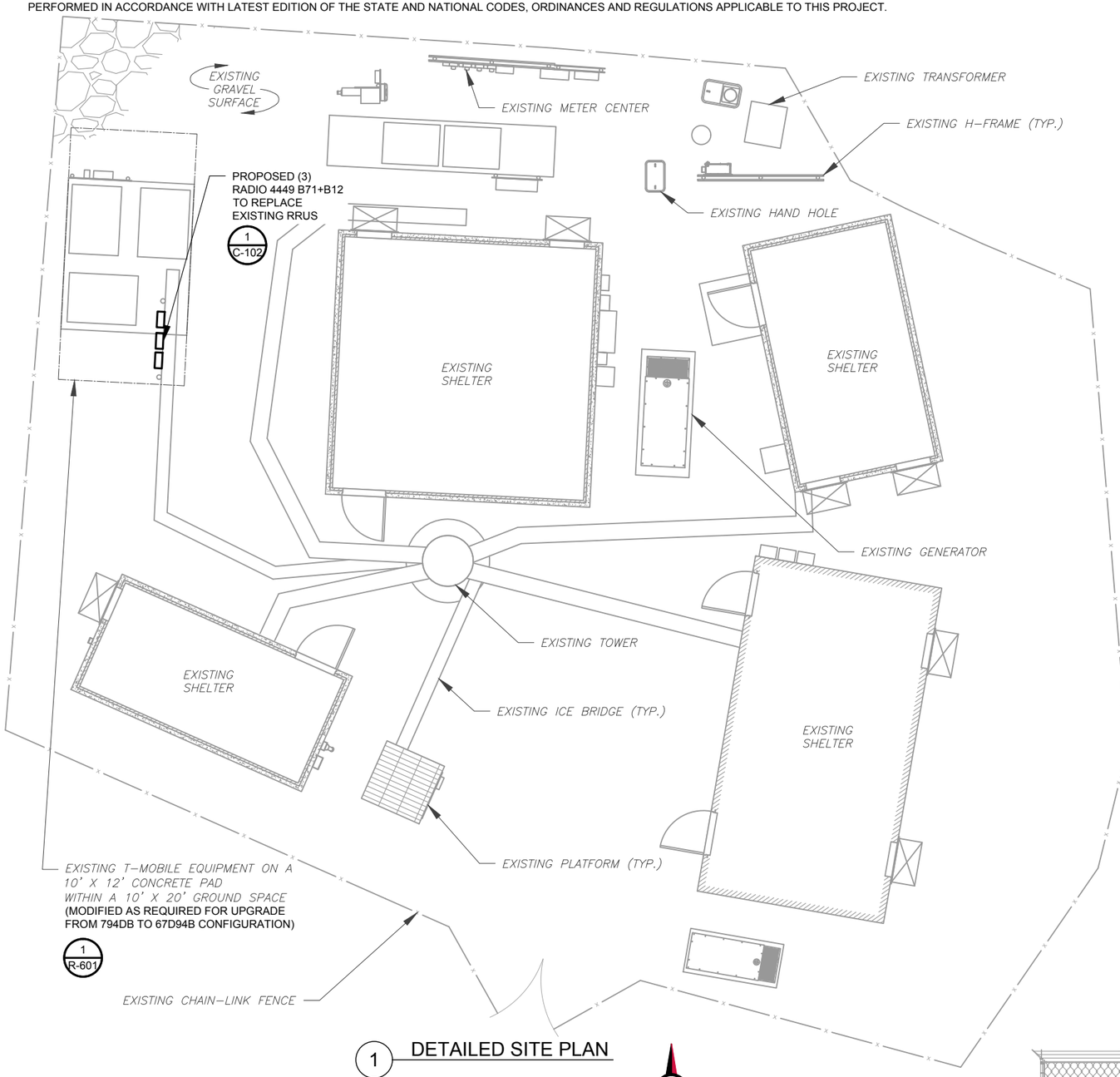
SHEET NUMBER:	REVISION:
G-002	0

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.

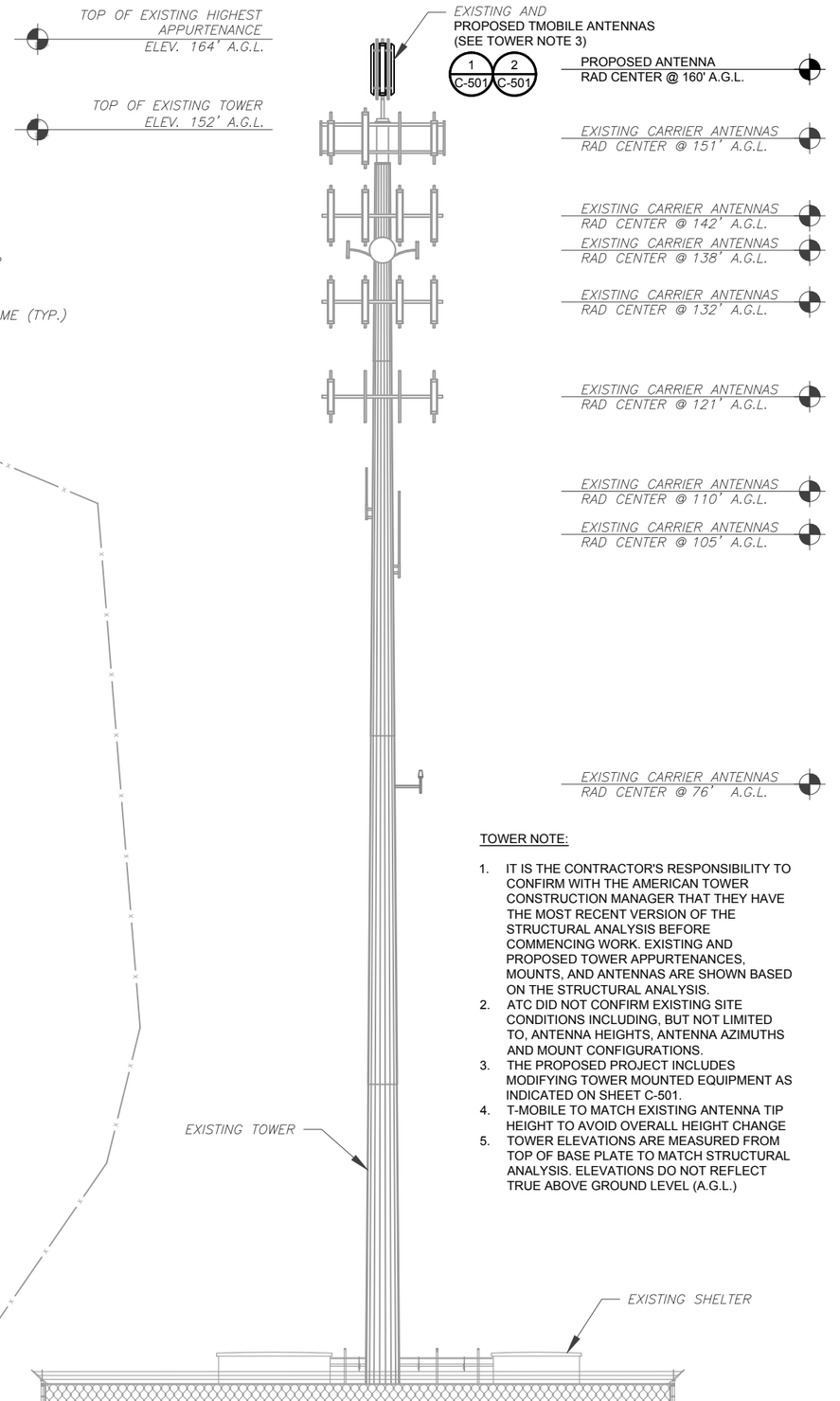
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH 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. T-MOBILE TO MATCH EXISTING ANTENNA TIP HEIGHT TO AVOID OVERALL HEIGHT CHANGE
5. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

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A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
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COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	KTL	08/29/18
1	REMOVED TTAS/RRUS	KL	09/04/18
2	ADDED GROUND RRUS	KL	09/06/18

ATC SITE NUMBER:
302515

ATC SITE NAME:
SMFR - NORTH

SITE ADDRESS:
1590 NEWFIELD AVE
STAMFORD, CT 06905

SEAL:

STATE OF CONNECTICUT
PATRICK P. BARRY
28959
LICENSED
PROFESSIONAL ENGINEER

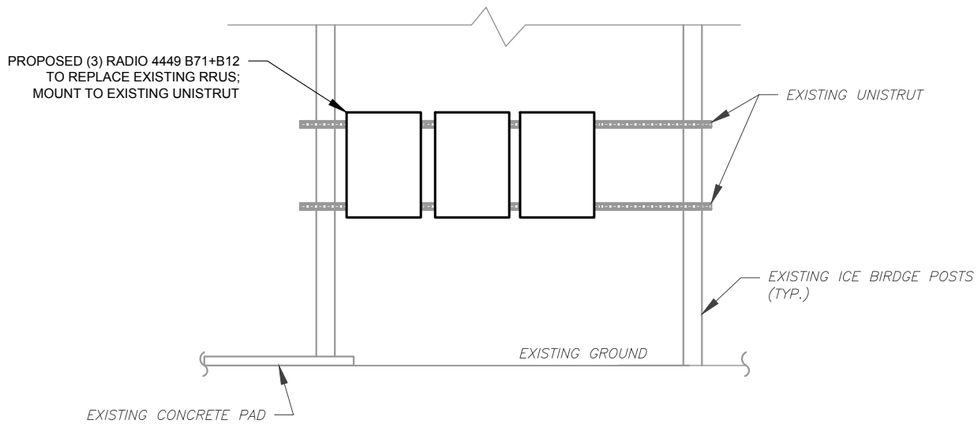
Authorized by "EOR"
Oct 11 2018 2:44 PM cosign

T-Mobile

DRAWN BY:	KTL
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607176

DETAILED SITE PLAN & TOWER ELEVATION

SHEET NUMBER:	REVISION:
C-101	2



1 GROUND DETAIL
SCALE: NOT TO SCALE

1 EXISTING RRU LOCATION
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	KTL	08/29/18
1	REMOVED TTAS/RRUS	KL	09/04/18
2	ADDED GROUND RRUS	KL	09/06/18

ATC SITE NUMBER:
302515

ATC SITE NAME:
SMFR - NORTH

SITE ADDRESS:
1590 NEWFIELD AVE
STAMFORD, CT 06905

SEAL:

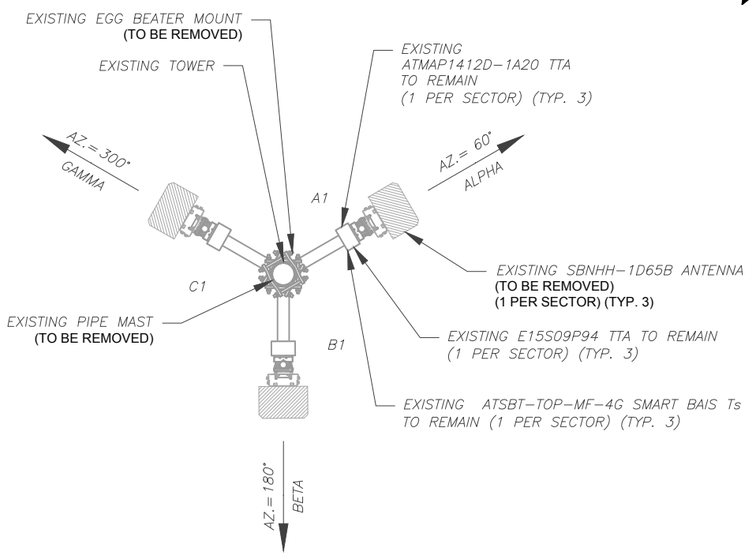
Authorized by "EOR"
Oct 11 2018 2:44 PM cosign

T-Mobile

DRAWN BY:	KTL
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607176

GROUND DETAILS

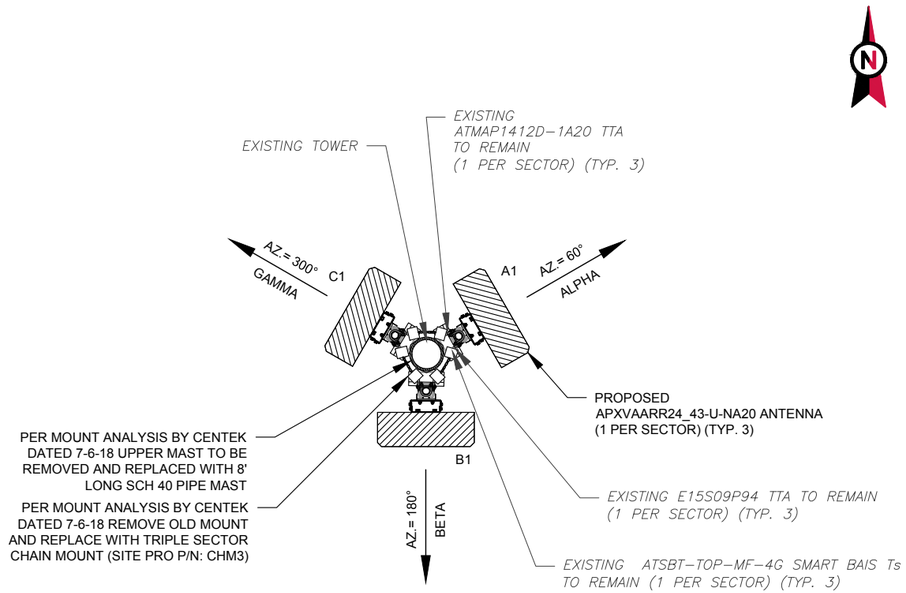
SHEET NUMBER:	REVISION:
C-102	2



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	SBNHH-1D65B	160'-0"	60°	0°	2°	ATMAP1412D-1A20 E15S09P94 ATSBT-TOP-MF-4G	(6) 1-5/8"
BETA	B1	SBNHH-1D65B	160'-0"	180°	0°	2°	ATMAP1412D-1A20 E15S09P94 ATSBT-TOP-MF-4G	(6) 1-5/8"
GAMMA	C1	SBNHH-1D65B	160'-0"	300°	0°	2°	ATMAP1412D-1A20 E15S09P94 ATSBT-TOP-MF-4G	(6) 1-5/8"

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	APXVAARR24_43-U-NA20	160'-0"	60°	0°	-	ATMAP1412D-1A20 E15S09P94 ATSBT-TOP-MF-4G	(6) 1-5/8" (2) 1-5/8"
BETA	B1	APXVAARR24_43-U-NA20	160'-0"	180°	0°	-	ATMAP1412D-1A20 E15S09P94 ATSBT-TOP-MF-4G	(6) 1-5/8" (2) 1-5/8"
GAMMA	C1	APXVAARR24_43-U-NA20	160'-0"	300°	0°	-	ATMAP1412D-1A20 E15S09P94 ATSBT-TOP-MF-4G	(6) 1-5/8" (2) 1-5/8"

1. BASED ON APPROVED ATC APPLICATION 12598483, DATED 08-23-2018. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS.

3 ANTENNA SCHEDULE

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	KTL	08/29/18
1	REMOVED TTAS/RRUS	KL	09/04/18
3	REVISED APPLICATION	KL	10/10/18

ATC SITE NUMBER:
302515

ATC SITE NAME:
SMFR - NORTH

SITE ADDRESS:
1590 NEWFIELD AVE
STAMFORD, CT 06905

SEAL:

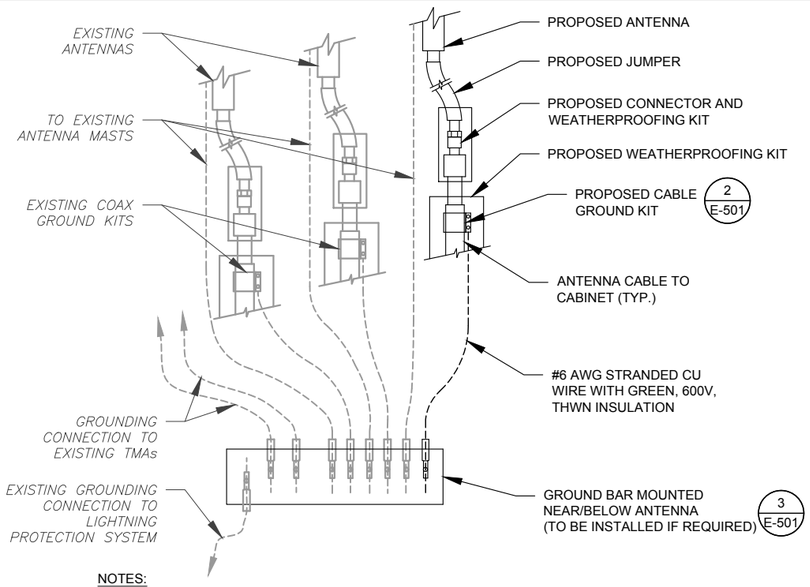
Authorized by "EOR"
Oct 11 2018 2:44 PM cosign

T-Mobile

DRAWN BY:	KTL
APPROVED BY:	KRF
DATE DRAWN:	08/29/18
ATC JOB NO:	12607176

ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-501	3

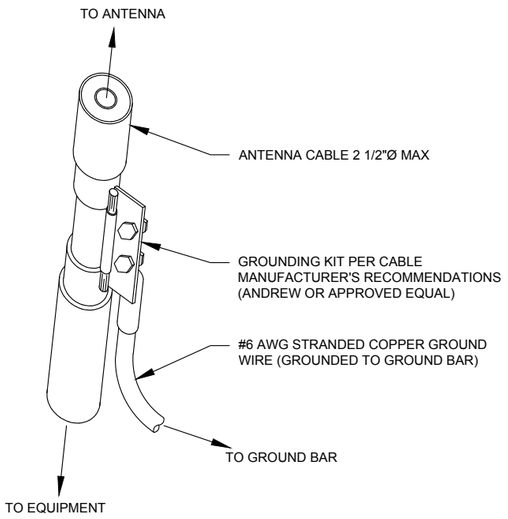


NOTES:

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

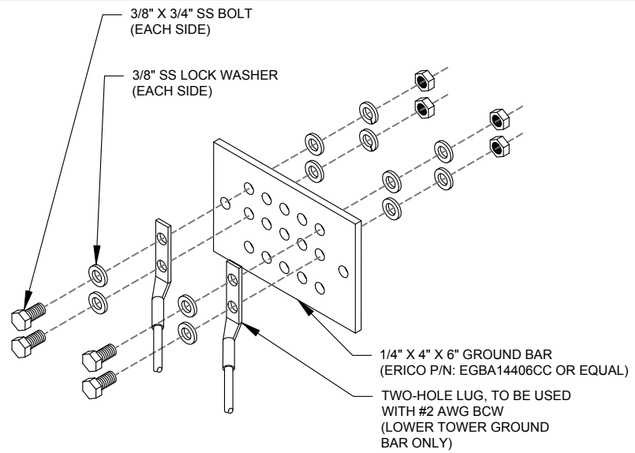


GROUND KIT NOTES:

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®
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3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	KTL	08/29/18

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ATC SITE NAME:
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ATC JOB NO:	12607176

GROUNDING DETAILS

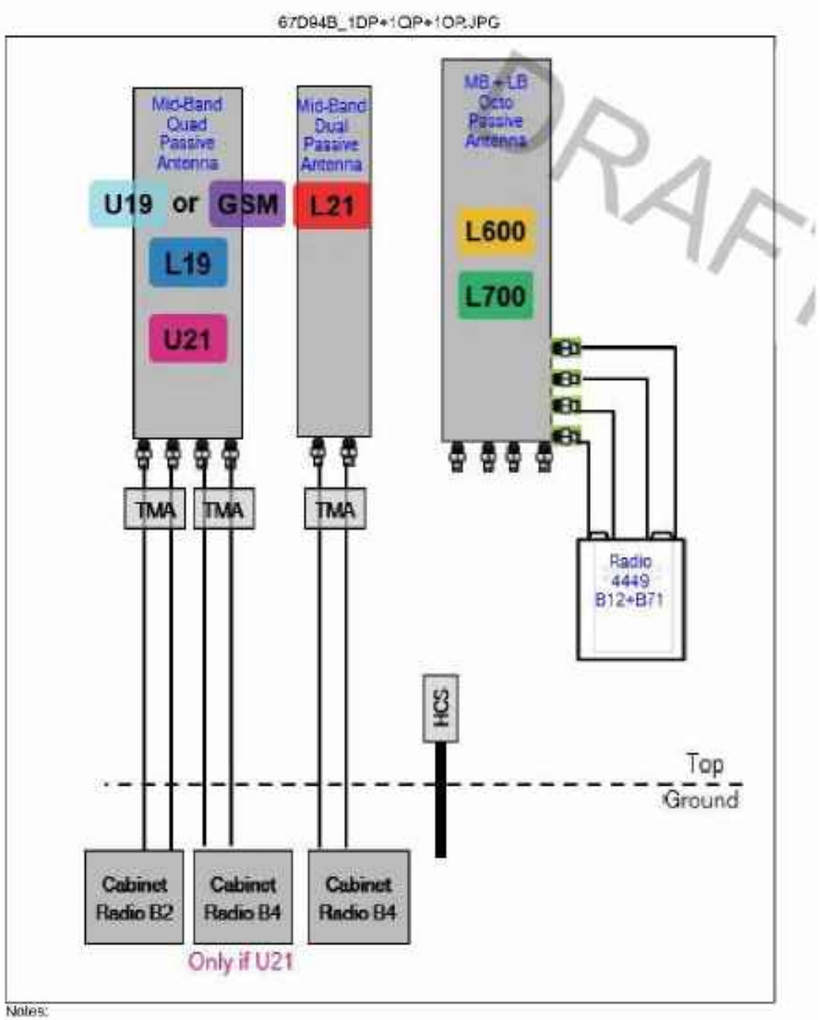
SHEET NUMBER:	REVISION:
E-501	0

Section 5 - RAN Equipment

Existing RAN Equipment		
Template: 7940B Outdoor (evolved from 4B)		
Enclosure	1	2
Enclosure Type	RBS 6102	Ground Mount
Baseband	DUS41 (L2100) DUW30 DUG20	
Multiplexer	XMU (L1900) (L700)	
Radio	RUS01 B2 (x3) (L1900) (G1900) RUS01 B2 (x3) (L1900) RUS01 B4 (x3) (U2100) RUS01 B4 (x3) (L2100)	RRUS11 B12 (x3) (L700)

Proposed RAN Equipment		
Template: 67D94B Outdoor		
Enclosure	1	2
Enclosure Type	RBS 6102	Ancillary Equipment
Baseband	BB 5216 (L2100) (L1900) (L700) (L600) DUW30 (U2100) DUG20 (G1900) DUW30 (U1900 (DECOMMISSIONED))	
Multiplexer	XMU	
Radio	RUS01 B2 (x3) (L1900) (G1900) RUS01 B2 (x3) (L1900) RUS01 B4 (x3) (U2100) RUS01 B4 (x3) (L2100)	
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: Friday, November 2, 2018 9:31 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11373A CSC TO

You have a package coming.

Scheduled Delivery Date: Monday, 11/05/2018

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424292378804
Ship To:	American Tower Corporation 10 Presidential Way WOBURN, MA 018011053 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	11/05/2018
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11373A CSC TO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Friday, November 2, 2018 9:33 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11373A CSC mayor

You have a package coming.

Scheduled Delivery Date: Monday, 11/05/2018

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424293904813
Ship To:	David Martin City of Stamford 888 Washington Boulevard 10th Floor STAMFORD, CT 069012902 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	11/05/2018
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11373A CSC mayor

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Friday, November 2, 2018 9:34 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11373A CSC ZO

You have a package coming.

Scheduled Delivery Date: Monday, 11/05/2018

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424290834823
Ship To:	Ralph Blessing City of Stamford 888 Washington Boulevard 7th Floor STAMFORD, CT 069012902 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	11/05/2018
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11373A CSC ZO

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☐ Return Receipt (electronic) $	$0.00
☐ Certified Mail Restricted Delivery $	$0.00
☐ Adult Signature Required $	$0.00
☐ Adult Signature Restricted Delivery $	
Postage $	$1.84
Total Postage and Fees $	$8.04

0690
14

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11/02/2018

Sent To Cellco Partnership

Street and Apt. No., or PO Box No. PO Box 2549

City, State, ZIP+4® Addison, TX 75001

PS Form 3800, April 2015 PSN 7530-02-000-9047 **See Reverse for Instructions**