Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

February 11, 2019

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

Notice of Exempt Modification
668 Jones Hill Road, West Haven, CT 06516
Latitude- 41.25637800
Longitude- -72.97244600

Dear Ms. Bachman,

T-Mobile currently maintains (6) existing antennas at the 143' level of the existing 149' monopole located at 668 Jones Hill Road in West Haven, CT. The property and tower are owned by American Tower Corporation. T-Mobile now intends to remove (3) existing antennas, and add (6) new 600/700/1900/2100 MHz antennas. These antennas would be installed at the same 143' level of the tower. T-Mobile also intends to install (2) new hybrid cables and swap (3) remote radio heads.

This facility was approved by the Council in Docket No. 293. on May 11, 2005. This approval included conditions, none of which would be violated by this modification. This modification complies with the conditions of 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 Nancy R. Rossi, Mayor for the City of West Haven, Fred A. Messore, Commissioner of Planning and Development for the City of West Haven, as well as the property/tower 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: Nancy R. Rossi- as elected official
Fred A. Messore- as zoning official
American Tower Corporation- as tower and property owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Monday, February 11, 2019 11:13 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11821E CSC Owner

You have a package coming.

Scheduled Delivery Date: Tuesday, 02/12/2019

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:	1ZV257424295085017
Ship To:	Dana Widstrand American Tower Corporation 10 Presidential Way WOBURN, MA 018011053 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	02/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11821E CSC Owner

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Monday, February 11, 2019 11:15 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11821E CSC EO

You have a package coming.

Scheduled Delivery Date: Tuesday, 02/12/2019

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:	1ZV257424295135025
Ship To:	Nancy R. Rossi City of West Haven 355 Main Street 3rd Floor WEST HAVEN, CT 065164310 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	02/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11821E CSC EO

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Monday, February 11, 2019 11:17 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11821E CSC ZO

You have a package coming.

Scheduled Delivery Date: Tuesday, 02/12/2019

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:	1ZV257424295205039
Ship To:	Fred Messore City of West Haven 355 Main Street 1st Floor WEST HAVEN, CT 065164310 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	02/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11821E CSC ZO

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City of West Haven, CT
Property Listing Report

Parcel ID	019-0001-0-000A-C	Account	00019113

Property Information

Owner	AMERICAN TOWERS INC.
Co-Owner	ATTN TAX DEPT
Address	668 JONES HILL RD
Mailing Address	PO BOX 723597 ATLANTA GA 31139
Land Use	431V TEL REL TW MDL-00
Land Class	I

Vision ID	102767
Census Tract	
Neighborhood	
Zoning Code	
Acreage	0
Utilities	

Photo

Sketch

Primary Construction Details

Actual Year Built		Bedrooms		Exterior Walls	
Effective Year Built		Full Bathrooms		Interior Walls	
Stories		Half Bathrooms		Heating Type	
Building Style		Bath Style		Heating Fuel	
Building Use		Kitchen Style		AC Type	
Building Condition		Roof Style		Gross Bldg Area	
Total Rooms		Roof Cover		Total Living Area	0

Report Created On 2/8/2019

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Outbuildings	431800	302260
Improvements	431800	302260
Extras	0	0
Land	0	0
Total	431800	302260

Outbuilding and Extra Items

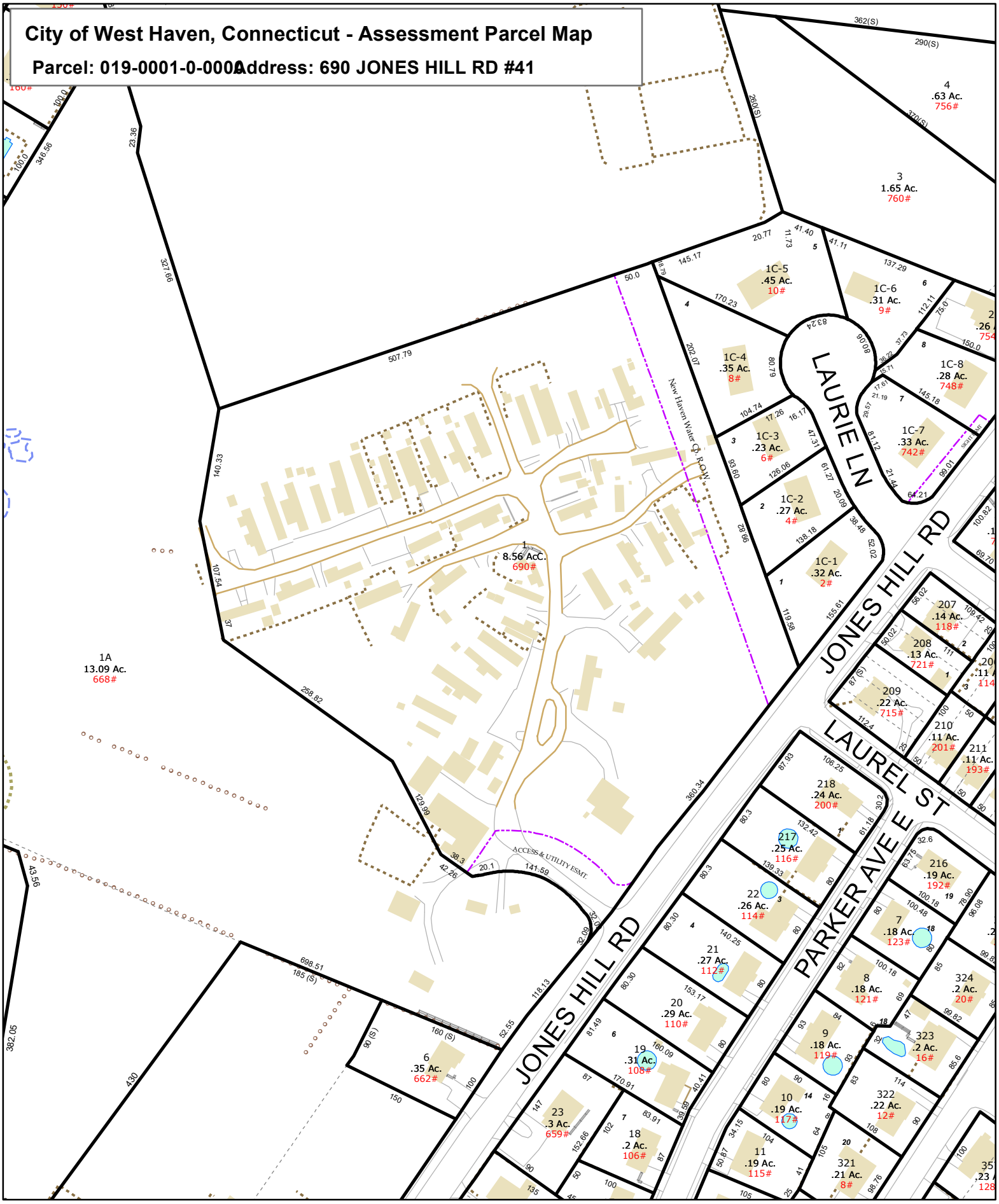
Description	Units
FENCE-6' CHAIN	200 L.F.
TOWER	2 SITES
CELL SHED	288 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
AMERICAN TOWERS INC.	000/ 000	10/1/2010	0


City of West Haven, Connecticut - Assessment Parcel Map
Parcel: 019-0001-0-000A Address: 690 JONES HILL RD #41
1
8.56 Ac.
690#
1A
13.09 Ac.
668#
3
1.65 Ac.
760#
4
.63 Ac.
756#
1C-1
.32 Ac.
2#
1C-2
.27 Ac.
4#
1C-3
.23 Ac.
6#
1C-4
.35 Ac.
8#
1C-5
.45 Ac.
10#
1C-6
.31 Ac.
9#
1C-7
.33 Ac.
742#
1C-8
.28 Ac.
748#
LAURIE LN
JONES HILL RD
LAUREL ST
PARKER AVE E
New Haven Water Co. R.O.W.
ACCESS & UTILITY ESMT.
6
.35 Ac.
662#
7
.18 Ac.
123#
8
.18 Ac.
121#
9
.18 Ac.
119#
10
.19 Ac.
117#
11
.19 Ac.
115#
18
.2 Ac.
106#
19
.31 Ac.
108#
20
.29 Ac.
110#
21
.27 Ac.
112#
22
.26 Ac.
114#
23
.3 Ac.
659#
207
.14 Ac.
118#
208
.13 Ac.
721#
209
.22 Ac.
715#
210
.11 Ac.
201#
211
.11 Ac.
193#
216
.19 Ac.
192#
217
.25 Ac.
116#
218
.24 Ac.
200#
321
.21 Ac.
8#
322
.22 Ac.
12#
323
.2 Ac.
16#
324
.2 Ac.
20#
N
Approximate Scale: 1 inch = 150 feet
0 45 90 180 270 360
Feet
Map Produced: January 2017
Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The City of West Haven and its mapping contractors
assume no legal responsibility for the information
contained herein.

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: CT11821E

CT821/D&B Flower Farm
668 Jones Hill Road
West Haven, CT 06516

November 21, 2018

EBI Project Number: 6218007222

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.47 %

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

EBI Consulting
environmental | engineering | due diligence

November 21, 2018

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

Emissions Analysis for Site: **CT11821E – CT821/D&B Flower Farm**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **668 Jones Hill Road, West Haven, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **668 Jones Hill Road, West Haven, 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 (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 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.

4) 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.

5) 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.

6) 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.

7) 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.

8) 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.

9) 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.

10) The antennas used in this modeling are the **Ericsson AIR32 B2A/B66AA** & **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antenna mounting height centerline of the proposed antennas is **143 feet** above ground level (AGL).

12) 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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	143 feet	Height (AGL):	143 feet	Height (AGL):	143 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**1.49**	Antenna B1 MPE%	**1.49**	Antenna C1 MPE%	**1.49**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	143 feet	Height (AGL):	143 feet	Height (AGL):	143 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power(W):	95	Total TX Power(W):	95	Total TX Power(W):	95
ERP (W):	4,052.51	ERP (W):	4,052.51	ERP (W):	4,052.51
Antenna A2 MPE%	**0.78**	Antenna B2 MPE%	**0.78**	Antenna C2 MPE%	**0.78**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	143 feet	Height (AGL):	143 feet	Height (AGL):	143 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**1.11**	Antenna B3 MPE%	**1.11**	Antenna C3 MPE%	**1.11**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.38 %**
Clearwire	**0.12** %
MetroPCS	**1.06** %
Computer Hospital	**0.19** %
Verizon Wireless	**2.42** %
AT&T	**4.30** %
Site Total MPE %:	**11.47 %**

T-Mobile Sector A Total:	3.38 %
T-Mobile Sector B Total:	3.38 %
T-Mobile Sector C Total:	3.38 %
Site Total:	11.47 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	143	5.96	PCS - 1900 MHz	1000.00	0.60%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	143	8.94	AWS - 2100 MHz	1000.00	0.89%
T-Mobile PCS - 1900 MHz GSM	1	639.87	143	1.23	PCS - 1900 MHz	1000.00	0.12%
T-Mobile PCS - 1900 MHz UMTS	1	1,706.32	143	3.27	PCS - 1900 MHz	1000.00	0.33%
T-Mobile AWS - 2100 MHz UMTS	1	1,706.32	143	3.27	AWS - 2100 MHz	1000.00	0.33%
T-Mobile 600 MHz LTE	2	788.97	143	3.02	600 MHz	400.00	0.76%
T-Mobile 700 MHz LTE	2	432.54	143	1.66	700 MHz	467.00	0.35%
						Total:	**3.38%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	3.38 %
Sector B:	3.38 %
Sector C:	3.38 %
T-Mobile Maximum MPE % (Per Sector):	3.38 %
Site Total:	11.47 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.47%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**149 ft Monopole**
ATC Site Name	:	**West Haven & Rt 162 CT, CT**
ATC Site Number	:	**243036**
Engineering Number	:	**12605172_C3_02**
Proposed Carrier	:	**T-Mobile**
Carrier Site Name	:	**CT821/D&B Flower Farm**
Carrier Site Number	:	**CT11821E**
Site Location	:	**668 Jones Hill Road** **West Haven, CT 06516-6311** **41.256400,-72.972400**
County	:	**New Haven**
Date	:	**October 23, 2018**
Max Usage	:	**87%**
Result	:	**Pass**

Prepared By:
Christiana Lancaster
Structural Engineer I

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32593
LICENSED
PROFESSIONAL ENGINEER

Authorized by "EOR"
Oct 25 2018 5:27 PM cosign

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 149 ft monopole to reflect the change in loading by T-Mobile.

Supporting Documents

Tower Drawings	Sabre Job #06-08204, dated August 19, 2005
Foundation Drawing	Sabre Job #06-10095, dated October 12, 2005
Geotechnical Report	EBI Project #61051509, dated July 12, 2005

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:	97 mph (3-Second Gust, V_{asd})/ 125 mph (3-second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.19, S_1 = 0.06
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					
149.0	151.0	3	DragonWave Horizon Compact	T-Arms	(3) 1 1/4" Hybriflex (3) 1/2" Coax (1) 1.7" Hybrid	Clearwire
		1	DragonWave A-ANT-23G-1-C			
		6	Alcatel-Lucent RRH2x50-08			
		3	Alcatel-Lucent 1900MHz 4x45 RRH			
		3	Nokia 2.5G MAA - AAHC(64T64R)			
		2	DragonWave A-ANT-11G-2-C			
		3	RFS APXVFRR12X-C-I20			
142.0	143.0	3	Ericsson KRY 112 489/1	-	(12) 1 5/8" Coax	T-Mobile
		3	Ericsson AIR-32 B2A/B66Aa			
136.0	137.0	3	Alcatel-Lucent RRH2x40-AWS	Low Profile Platform	(12) 1 5/8" Coax (1) 1 5/8" Fiber	Verizon
		3	Antel BXA-171063-12BF-EDIN-X			
		3	Antel BXA-185085/12CF ___			
		3	Andrew DB854DG65ESX			
		3	Commscope LNX-6514DS-A1M			
	136.0	6	RFS FD9R6004/2C-3L			
		1	RFS DB-T1-6Z-8AB-0Z			
126.0	126.0	1	Raycap DC6-48-60-0-8F	Platform w/ Handrails	(2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk (1) 3" Conduit	AT&T Mobility
		3	Ericsson RRUS-11 800MHz			
		3	Ericsson RRUS 32			
		3	CCI CCI-HPA-65R-BUU-H8			
115.0	115.0	3	RFS APXV18-206517S-C	Flush	(6) 1 5/8" Coax	Metro PCS
106.0	106.0	1	Proxim 5054-R-LR	Side Arm	(1) 0.28" RG-6	Other
		1	3' Dish w/ Radome			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
142.0	143.0	3	Commscope SBNHH-1D65A	Low Profile Platform	(1) 7/8" Fiber	T-Mobile
		3	Ericsson KRY 112 14			
		3	Kathrein Smart Bias Tee			
		3	Ericsson RRUS 11 B12			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
142.0	143.0	3	Ericsson KRY 112 144/2	Platform w/ Handrails	(3) 1 1/4" Hybriflex (3) 1 5/8" Coax	T-Mobile
		3	Ericsson Radio 4449 B12,B71			
		3	RFS APX16DWV-16DWVS-E-A20			
		3	RFS APXVAARR24_43-U-NA20			

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

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	51%	Pass
Shaft	87%	Pass
Base Plate	42%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	2,840.0	3,834.0	2,569.7	67%
Shear (Kips)	26.3	35.5	22.5	63%

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

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

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
149.0	DragonWave A-ANT-23G-1-C	Clearwire	2.068	1.628
	DragonWave A-ANT-11G-2-C			
142.0	Ericsson KRY 112 144/2	T-Mobile	1.870	1.616
	Ericsson Radio 4449 B12,B71			
	RFS APX16DWV-16DWVS-E-A20			
	RFS APXVAARR24_43-U-NA20			
106.0	3' Dish w/ Radome	Other	0.968	1.154

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

AMERICAN TOWER®
CORPORATION

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:

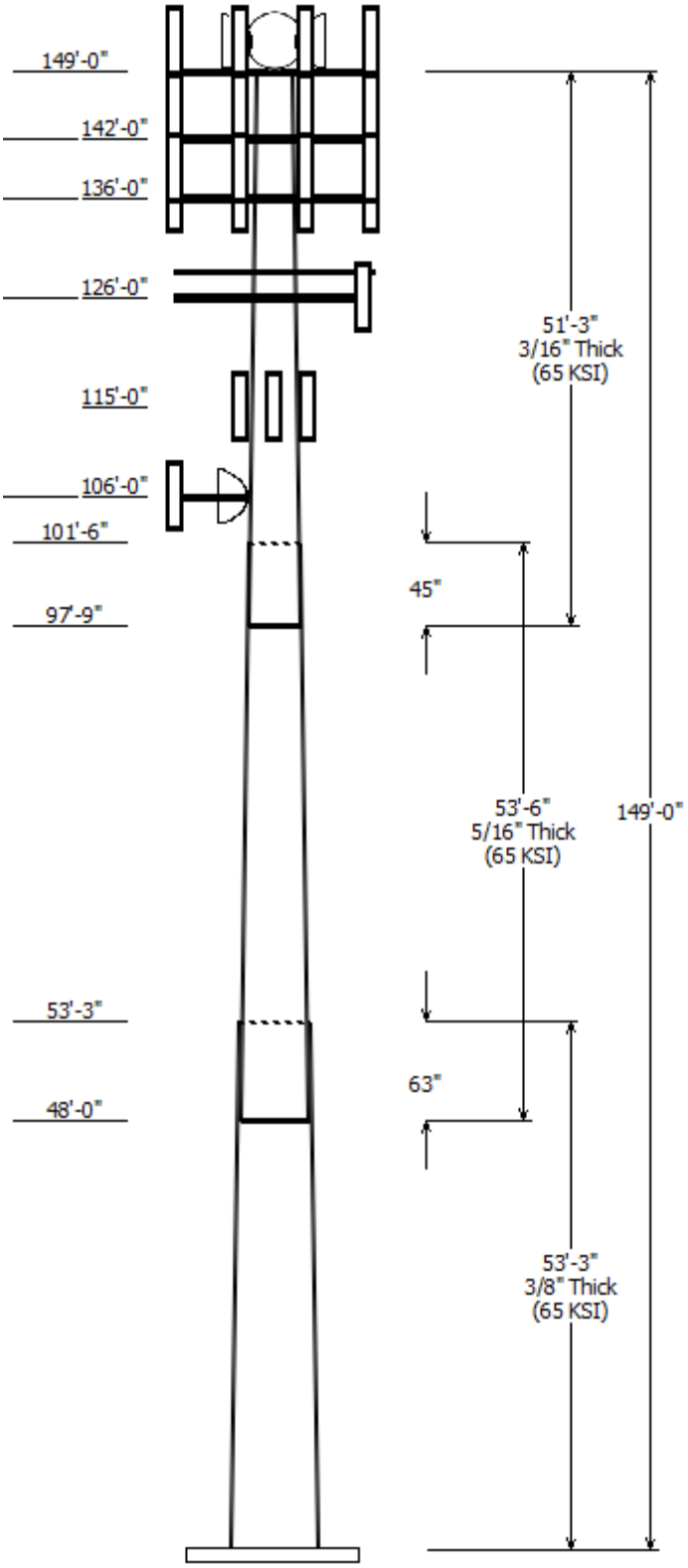
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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 :	243036	Code:	ANSI/TIA-222-G
Location :	WEST HAVEN & RT 162 CT, CT		
Description :	Tower Model Verified: 12/13/2012		
Client :	T-MOBILE	Struct Class :	II
Shape :	18 Sides	Exposure :	B
Height :	149.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.234964 (in/ft)		

Sections Properties

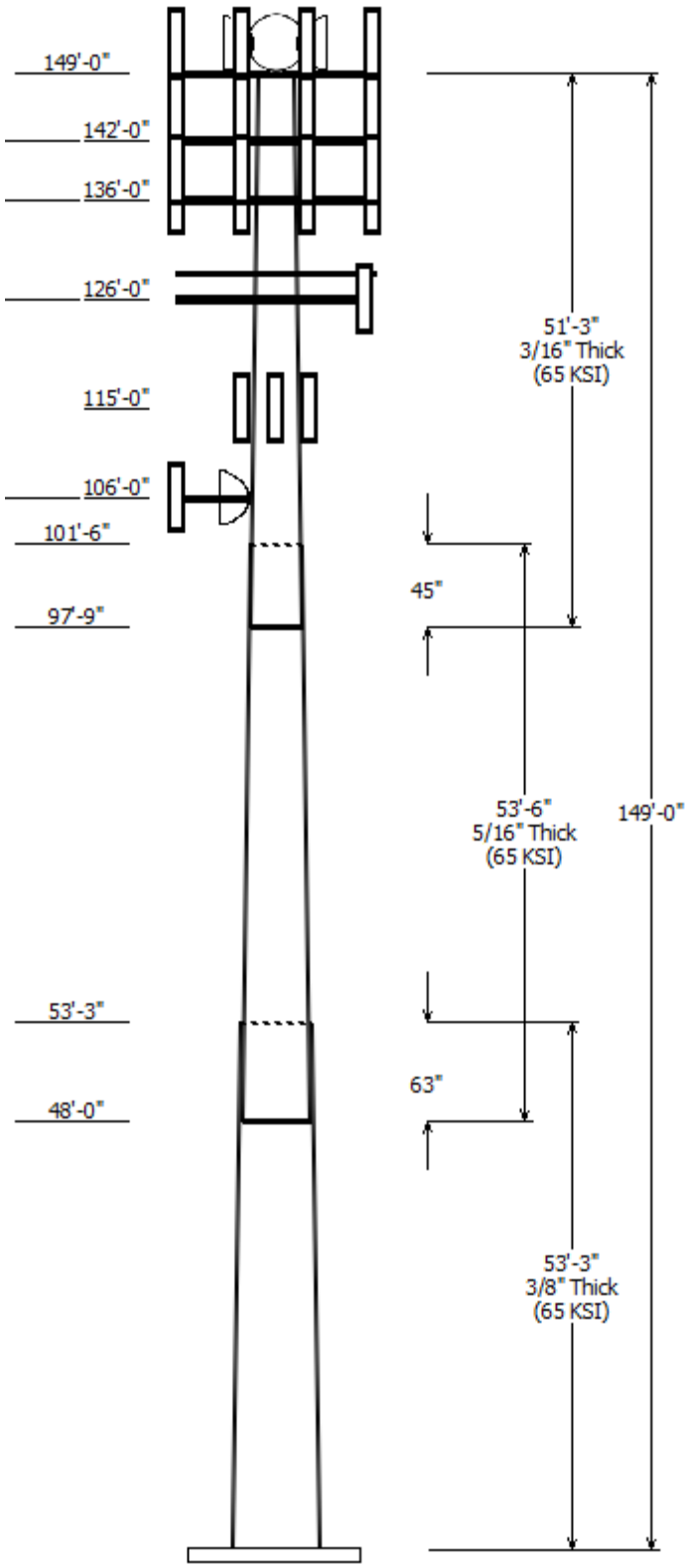
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	53.250	39.49	52.01	0.375		0.000	18 Sides	65
2	53.500	28.78	41.35	0.313	Slip Joint	63.000	18 Sides	65
3	51.250	18.00	30.04	0.188	Slip Joint	45.000	18 Sides	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
149.000	151.000	3	RFS APXVFRR12X-C-I20
149.000	149.000	3	Flat T-Arm
149.000	151.000	3	Nokia 2.5G MAA -
149.000	151.000	3	Alcatel-Lucent 1900 MHz 4x45
149.000	151.000	6	Alcatel-Lucent RRH2x50-08
149.000	151.000	1	DragonWave A-ANT-23G-1-C
149.000	151.000	3	DragonWave Horizon Compact
149.000	151.000	2	DragonWave A-ANT-11G-2-C
142.000	142.000	1	Flat Platform w/ Handrails
142.000	143.000	3	RFS APXVAARR24_43-U-NA20
142.000	143.000	3	RFS APX16DWV-16DWVS-E-A20
142.000	143.000	3	Ericsson AIR-32 B2A/B66Aa
142.000	143.000	3	Ericsson Radio 4449 B12,B71
142.000	143.000	3	Ericsson KRY 112 489/1
142.000	143.000	3	Ericsson KRY 112 144/2
136.000	136.000	1	Round Low Profile Platform
136.000	137.000	3	Commscope LNX-6514DS-A1M
136.000	137.000	3	Andrew DB854DG65ESX
136.000	136.000	1	RFS DB-T1-6Z-8AB-0Z
136.000	137.000	3	Antel BXA-185085/12CF ___
136.000	137.000	3	Amphenol Antel BXA-171063-
136.000	137.000	3	Alcatel-Lucent RRH2x40-AWS
136.000	136.000	6	RFS FD9R6004/2C-3L
126.000	126.000	1	Round Platform w/ Handrails
126.000	126.000	3	CCI CCI-HPA-65R-BUU-H8
126.000	126.000	3	Ericsson RRUS 32
126.000	126.000	3	Ericsson RRUS-11 800 MHz
126.000	126.000	1	Raycap DC6-48-60-0-8F
115.000	115.000	3	RFS APXV18-206517S-C
106.000	106.000	1	Flat Side Arm
106.000	106.000	1	Proxim 5054-R-LR
106.000	106.000	1	3' Dish w/ Radome

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
4.000	106.0	0.28" RG-6	No
4.000	115.0	1 5/8" Coax	No
4.000	126.0	0.39" Fiber Trunk	No
4.000	126.0	0.78" 8 AWG 6	No
4.000	126.0	3" Conduit	No
4.000	136.0	1 5/8" (1.63"-	No



4.000	136.0	1 5/8" Coax	No
4.000	142.0	1 1/4" Hybriflex	Yes
4.000	142.0	1 5/8" Coax	No
4.000	142.0	1 5/8" Coax	No
4.000	149.0	1 1/4" Hybriflex	No
4.000	149.0	1.7" (43.2mm)	No
4.000	149.0	1/2" Coax	No

Load Cases

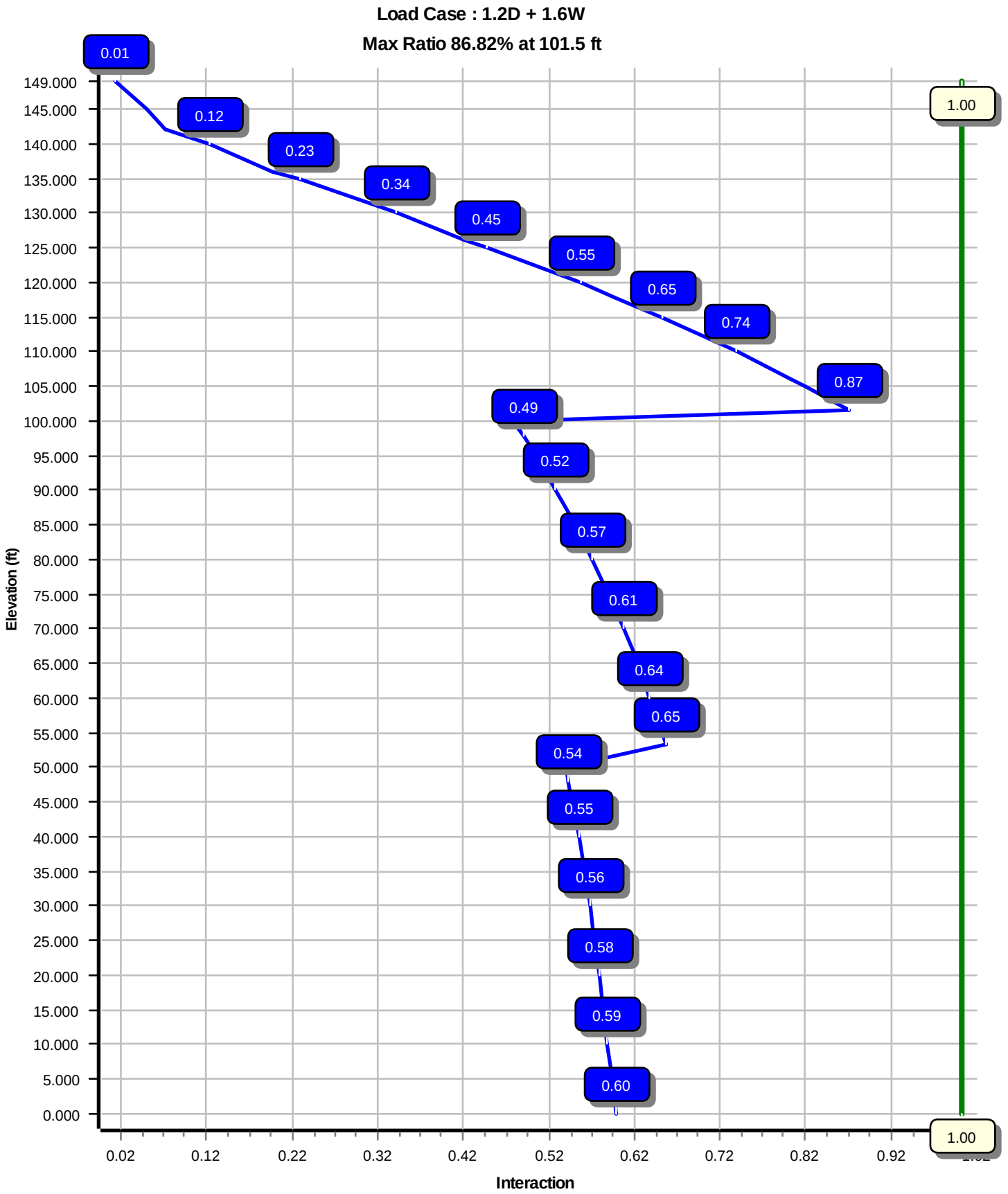
1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) 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	2569.75	22.52	41.21
0.9D + 1.6W	2532.77	22.50	30.90
1.2D + 1.0Di + 1.0Wi	749.88	6.48	64.89
(1.2 + 0.2Sds) * DL + E ELFM	172.61	1.34	41.29
(1.2 + 0.2Sds) * DL + E EMAM	317.11	2.56	41.29
(0.9 - 0.2Sds) * DL + E ELFM	169.52	1.34	28.63
(0.9 - 0.2Sds) * DL + E EMAM	311.07	2.55	28.63
1.0D + 1.0W	609.53	5.38	34.37

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	106.00	11.619	1.154
1.0D + 1.0W	149.00	24.821	1.628
1.0D + 1.0W	149.00	24.821	1.628


Load Case : 1.2D + 1.6W
Max Ratio 86.82% at 101.5 ft
0.01
0.12
0.23
0.34
0.45
0.55
0.65
0.74
0.87
0.49
0.52
0.57
0.61
0.64
0.65
0.54
0.55
0.56
0.58
0.59
0.60
1.00
1.00
149.000
145.000
140.000
135.000
130.000
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: 243036 **Code:** ANSI/TIA-222-G

Site Name: WEST HAVEN & RT 162 CT, CT **Engineering Number:**12605172_C3_02 **10/23/2018 5:37:05 PM**

Customer: T-MOBILE

Analysis Parameters

Location :	NEW HAVEN County, CT	**Height (ft) :**	149
Code :	ANSI/TIA-222-G	**Base Diameter (in) :**	52.01
Shape :	18 Sides	**Top Diameter (in) :**	18.00
Pole Type :	Taper	**Taper (in/ft) :**	0.235
Pole Manfacturer :	Sabre	**Rotation (deg) :**	0.00

Ice & Wind Parameters

Structure Class:	II	**Design Wind Speed Without Ice:**	97 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): 2.63

T_L (sec):	6	**p:**	1.3	**C_s:**	0.030
S_s:	0.188	**S_1:**	0.062	**C_s Max:**	0.030
F_a:	1.600	**F_v:**	2.400	**C_s Min:**	0.030
S_{ds}:	0.201	**S_{d1}:**	0.099		

Load Cases

1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 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: 243036 **Code:** ANSI/TIA-222-G

Site Name: WEST HAVEN & RT 162 CT, CT **Engineering Number:**12605172_C3_02 **10/23/2018 5:37:05 PM**

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	53.250	0.3750	65		0.00	9,787	52.01	0.00	61.46	20701.4	22.69	138.69	39.49	53.25	46.56	9004.7	16.81	105.33	0.234964
2-18	53.500	0.3125	65	Slip	63.00	6,276	41.35	48.00	40.71	8664.4	21.57	132.34	28.78	101.50	28.24	2892.7	14.48	92.11	0.234964
3-18	51.250	0.1875	65	Slip	45.00	2,473	30.04	97.75	17.77	2000.7	26.49	160.22	18.00	149.00	10.60	424.9	15.16	96.00	0.234964
				Shaft Weight		18,536													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Distance From Face (ft)	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor
149.00	Alcatel-Lucent 1900 MHz 4x45 R	3	0.000	2.000	60.00	2.320	0.50
149.00	Alcatel-Lucent RRH2x50-08	6	0.000	2.000	52.90	1.700	0.50
149.00	DragonWave A-ANT-11G-2-C	2	0.000	2.000	27.00	4.690	1.00
149.00	DragonWave A-ANT-23G-1-C	1	0.000	2.000	15.00	1.610	1.00
149.00	DragonWave Horizon Compact	3	0.000	2.000	10.60	0.840	0.50
149.00	Flat T-Arm	3	0.000	0.000	250.00	12.900	0.67
149.00	Nokia 2.5G MAA - AAHC(64T64R)	3	0.000	2.000	103.60	4.200	0.64
149.00	RFS APXVFRR12X-C-I20	3	0.000	2.000	46.00	4.990	0.71
142.00	Ericsson AIR-32 B2A/B66Aa	3	0.000	1.000	132.20	6.510	0.71
142.00	Ericsson KRY 112 144/2	3	0.000	1.000	9.70	0.560	0.50
142.00	Ericsson KRY 112 489/1	3	0.000	1.000	15.40	0.650	0.50
142.00	Ericsson Radio 4449 B12,B71	3	0.000	1.000	74.00	1.640	0.50
142.00	Flat Platform w/ Handrails	1	0.000	0.000	2000.00	42.400	1.00
142.00	RFS APX16DWV-16DWVS-E-A20	3	0.000	1.000	40.70	6.590	0.60
142.00	RFS APXVAARR24_43-U-NA20	3	0.000	1.000	127.90	20.240	0.63
136.00	Alcatel-Lucent RRH2x40-AWS	3	0.000	1.000	44.00	2.160	0.50
136.00	Amphenol Antel BXA-171063-	3	0.000	1.000	15.00	4.730	0.72
136.00	Andrew DB854DG65ESX	3	0.000	1.000	18.50	5.250	0.65
136.00	Antel BXA-185085/12CF ___	3	0.000	1.000	13.00	4.790	0.72
136.00	Commscope LNX-6514DS-A1M	3	0.000	1.000	38.80	8.170	0.69
136.00	RFS DB-T1-6Z-8AB-0Z	1	0.000	0.000	44.00	4.800	0.50
136.00	RFS FD9R6004/2C-3L	6	0.000	0.000	2.60	0.370	0.50
136.00	Round Low Profile Platform	1	0.000	0.000	1500.00	21.700	1.00
126.00	CCI CCI-HPA-65R-BUU-H8	3	0.000	0.000	68.00	12.980	0.67
126.00	Ericsson RRUS 32	3	0.000	0.000	50.80	2.690	0.50
126.00	Ericsson RRUS-11 800 MHz	3	0.000	0.000	54.00	2.520	0.50
126.00	Raycap DC6-48-60-0-8F	1	0.000	0.000	32.80	1.280	1.00
126.00	Round Platform w/ Handrails	1	0.000	0.000	2000.00	27.200	1.00
115.00	RFS APXV18-206517S-C	3	0.000	0.000	26.40	5.160	0.68
106.00	3' Dish w/ Radome	1	0.000	0.000	100.00	6.100	1.00
106.00	Flat Side Arm	1	0.000	0.000	150.00	6.300	1.00
106.00	Proxim 5054-R-LR	1	0.000	0.000	6.00	1.320	1.00
Totals	Num Loadings:32	83			9830.60		

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
4.00	149.00	3	1 1/4" Hybriflex Cable	1.54	1.00	N	0.00	N	Clearwire
4.00	149.00	1	1.7" (43.2mm) Hybrid	1.70	1.78	N	0.00	N	Clearwire
4.00	149.00	3	1/2" Coax	0.63	0.15	N	0.00	N	Clearwire
4.00	142.00	3	1 1/4" Hybriflex Cable	1.54	1.00	N	1.54	Y	T-Mobile
4.00	142.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	T-Mobile

4.00	142.00	3	1 5/8" Coax	1.98	0.82	N	0.00	N	T-Mobile
4.00	136.00	1	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0.00	N	Verizon
4.00	136.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
4.00	126.00	1	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
4.00	126.00	2	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
4.00	126.00	1	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
4.00	115.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	Metro PCS
4.00	106.00	1	0.28" RG-6	0.28	0.03	N	0.00	N	-

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.3750	52.010	61.456	20,701.4	22.69	138.69	74.7	784.0	0.0	0.0
5.00		0.3750	50.835	60.058	19,320.3	22.14	135.56	75.4	748.6	0.0	1,033.7
10.00		0.3750	49.660	58.659	18,002.0	21.59	132.43	76.0	714.0	0.0	1,009.9
15.00		0.3750	48.485	57.261	16,745.1	21.03	129.29	76.7	680.2	0.0	986.1
20.00		0.3750	47.310	55.863	15,548.1	20.48	126.16	77.3	647.3	0.0	962.3
25.00		0.3750	46.136	54.465	14,409.6	19.93	123.03	78.0	615.2	0.0	938.5
30.00		0.3750	44.961	53.066	13,328.0	19.38	119.90	78.6	583.9	0.0	914.8
35.00		0.3750	43.786	51.668	12,301.9	18.83	116.76	79.3	553.4	0.0	891.0
40.00		0.3750	42.611	50.270	11,329.9	18.27	113.63	79.9	523.7	0.0	867.2
45.00		0.3750	41.436	48.871	10,410.6	17.72	110.50	80.6	494.9	0.0	843.4
48.00	Bot - Section 2	0.3750	40.731	48.032	9,883.6	17.39	108.62	80.9	477.9	0.0	494.6
50.00		0.3750	40.261	47.473	9,542.3	17.17	107.36	81.2	466.8	0.0	600.4
53.25	Top - Section 1	0.3125	40.123	39.485	7,906.5	20.88	128.39	76.8	388.1	0.0	960.8
55.00		0.3125	39.712	39.078	7,664.0	20.64	127.08	77.1	380.1	0.0	233.9
60.00		0.3125	38.537	37.912	6,998.6	19.98	123.32	77.9	357.7	0.0	654.9
65.00		0.3125	37.362	36.747	6,373.0	19.32	119.56	78.7	336.0	0.0	635.1
70.00		0.3125	36.187	35.582	5,785.7	18.66	115.80	79.5	314.9	0.0	615.3
75.00		0.3125	35.012	34.417	5,235.7	17.99	112.04	80.2	294.5	0.0	595.5
80.00		0.3125	33.838	33.251	4,721.7	17.33	108.28	81.0	274.8	0.0	575.6
85.00		0.3125	32.663	32.086	4,242.5	16.67	104.52	81.8	255.8	0.0	555.8
90.00		0.3125	31.488	30.921	3,796.9	16.00	100.76	82.6	237.5	0.0	536.0
95.00		0.3125	30.313	29.756	3,383.6	15.34	97.00	82.6	219.9	0.0	516.2
97.75	Bot - Section 3	0.3125	29.667	29.115	3,169.7	14.98	94.93	82.6	210.4	0.0	275.4
100.0		0.3125	29.138	28.591	3,001.5	14.68	93.24	82.6	202.9	0.0	355.7
101.5	Top - Section 2	0.1875	29.161	17.242	1,828.7	25.66	155.52	71.2	123.5	0.0	233.6
105.0		0.1875	28.338	16.753	1,677.4	24.89	151.14	72.1	116.6	0.0	202.4
106.0		0.1875	28.103	16.613	1,635.7	24.67	149.89	72.4	114.6	0.0	56.8
110.0		0.1875	27.164	16.054	1,476.0	23.78	144.87	73.4	107.0	0.0	222.3
115.0		0.1875	25.989	15.354	1,291.4	22.68	138.61	74.7	97.9	0.0	267.2
117.9		0.1875	25.299	14.944	1,190.5	22.03	134.93	75.5	92.7	0.0	151.4
120.0		0.1875	24.814	14.655	1,122.9	21.57	132.34	76.0	89.1	0.0	103.9
125.0		0.1875	23.639	13.956	969.8	20.47	126.08	77.3	80.8	0.0	243.4
126.0		0.1875	23.404	13.816	940.9	20.25	124.82	77.6	79.2	0.0	47.3
130.0		0.1875	22.464	13.257	831.2	19.36	119.81	78.6	72.9	0.0	184.2
135.0		0.1875	21.290	12.558	706.5	18.26	113.54	79.9	65.4	0.0	219.6
136.0		0.1875	21.055	12.418	683.2	18.04	112.29	80.2	63.9	0.0	42.5
140.0		0.1875	20.115	11.859	595.0	17.15	107.28	81.2	58.3	0.0	165.2
142.0		0.1875	19.645	11.579	553.8	16.71	104.77	81.7	55.5	0.0	79.8
145.0		0.1875	18.940	11.160	495.8	16.05	101.01	82.5	51.6	0.0	116.1
149.0		0.1875	18.000	10.600	424.9	15.16	96.00	82.6	46.5	0.0	148.1
											18,536.1

Load Case: 1.2D + 1.6W — 97 mph with No Ice — 26 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

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		199.3	0.0					0.0	0.0	199.3	0.0	0.0	0.0
5.00		394.1	1,240.5					0.0	54.9	394.1	1,295.4	0.0	0.0
10.00		385.0	1,211.9					0.0	274.5	385.0	1,486.4	0.0	0.0
15.00		375.9	1,183.4					0.0	274.5	375.9	1,457.9	0.0	0.0
20.00		366.8	1,154.8					0.0	274.5	366.8	1,429.3	0.0	0.0
25.00		357.7	1,126.3					0.0	274.5	357.7	1,400.8	0.0	0.0
30.00		352.7	1,097.7					0.0	274.5	352.7	1,372.2	0.0	0.0
35.00		354.8	1,069.2					0.0	274.5	354.8	1,343.7	0.0	0.0
40.00		358.7	1,040.6					0.0	274.5	358.7	1,315.1	0.0	0.0
45.00		288.5	1,012.1					0.0	274.5	288.5	1,286.6	0.0	0.0
48.00	Bot - Section 2	181.8	593.5					0.0	164.7	181.8	758.2	0.0	0.0
50.00		192.7	720.5					0.0	109.8	192.7	830.3	0.0	0.0
53.25	Top - Section 1	183.4	1,153.0					0.0	178.4	183.4	1,331.4	0.0	0.0
55.00		247.0	280.7					0.0	96.1	247.0	376.8	0.0	0.0
60.00		364.4	785.9					0.0	274.5	364.4	1,060.4	0.0	0.0
65.00		361.5	762.1					0.0	274.5	361.5	1,036.6	0.0	0.0
70.00		357.6	738.4					0.0	274.5	357.6	1,012.9	0.0	0.0
75.00		352.9	714.6					0.0	274.5	352.9	989.1	0.0	0.0
80.00		347.4	690.8					0.0	274.5	347.4	965.3	0.0	0.0
85.00		341.2	667.0					0.0	274.5	341.2	941.5	0.0	0.0
90.00		334.3	643.2					0.0	274.5	334.3	917.7	0.0	0.0
95.00		254.7	619.4					0.0	274.5	254.7	893.9	0.0	0.0
97.75	Bot - Section 3	162.4	330.5					0.0	151.0	162.4	481.5	0.0	0.0
100.00		121.4	426.9					0.0	123.5	121.4	550.4	0.0	0.0
101.50	Top - Section 2	159.4	280.3					0.0	82.4	159.4	362.6	0.0	0.0
105.00		142.5	242.9					0.0	192.2	142.5	435.1	0.0	0.0
106.00	Appurtenance(s)	155.0	68.1	555.2	0.0	0.0	307.2	0.0	54.9	710.3	430.2	0.0	0.0
110.00		274.1	266.8					0.0	219.5	274.1	486.2	0.0	0.0
115.00	Appurtenance(s)	236.5	320.6	436.0	0.0	0.0	95.0	0.0	274.3	672.6	690.0	0.0	0.0
117.94		145.6	181.7					0.0	143.8	145.6	325.5	0.0	0.0
120.00		199.9	124.6					0.0	101.0	199.9	225.6	0.0	0.0
125.00		168.0	292.1					0.0	244.8	168.0	536.9	0.0	0.0
126.00	Appurtenance(s)	135.2	56.7	2,281.1	0.0	0.0	3,061.4	0.0	49.0	2,416.3	3,167.1	0.0	0.0
130.00		237.5	221.1					0.0	153.5	237.5	374.6	0.0	0.0
135.00		155.0	263.5					0.0	191.9	155.0	455.4	0.0	0.0
136.00	Appurtenance(s)	124.1	51.0	2,840.0	0.0	1,775.0	2,337.0	0.0	38.4	2,964.1	2,426.4	0.0	0.0
140.00		146.8	198.3					0.0	98.5	146.8	296.8	0.0	0.0
142.00	Appurtenance(s)	118.2	95.7	4,272.4	0.0	2,407.1	3,839.6	0.0	49.3	4,390.7	3,984.6	0.0	0.0
145.00		160.5	139.3					0.0	18.8	160.5	158.1	0.0	0.0
149.00	Appurtenance(s)	90.3	177.7	2,381.4	0.0	3,028.1	2,156.4	0.0	25.1	2,471.7	2,359.2	0.0	0.0
								Totals:		22,651.1	41,247.7	0.00	0.00

Load Case: 1.2D + 1.6W — 97 mph with No Ice — 26 Iterations

Gust Response Factor :1.10 — Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.21	-22.52	0.00	-2,569.75	0.00	2,569.75	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.595
5.00	-39.85	-22.24	0.00	-2,457.18	0.00	2,457.18	4,073.39	2,036.69	8,449.37	4,230.97	0.09	-0.17	0.591
10.00	-38.30	-21.97	0.00	-2,345.97	0.00	2,345.97	4,012.85	2,006.43	8,128.58	4,070.33	0.37	-0.35	0.586
15.00	-36.77	-21.70	0.00	-2,236.13	0.00	2,236.13	3,950.68	1,975.34	7,810.43	3,911.02	0.83	-0.53	0.581
20.00	-35.28	-21.43	0.00	-2,127.64	0.00	2,127.64	3,886.87	1,943.43	7,495.19	3,753.17	1.49	-0.72	0.576
25.00	-33.81	-21.17	0.00	-2,020.48	0.00	2,020.48	3,821.43	1,910.71	7,183.08	3,596.88	2.34	-0.91	0.571
30.00	-32.37	-20.90	0.00	-1,914.64	0.00	1,914.64	3,754.35	1,877.17	6,874.35	3,442.28	3.39	-1.10	0.565
35.00	-30.97	-20.63	0.00	-1,810.13	0.00	1,810.13	3,685.64	1,842.82	6,569.23	3,289.50	4.65	-1.30	0.559
40.00	-29.59	-20.34	0.00	-1,706.99	0.00	1,706.99	3,615.29	1,807.64	6,267.96	3,138.64	6.12	-1.50	0.552
45.00	-28.25	-20.10	0.00	-1,605.27	0.00	1,605.27	3,543.30	1,771.65	5,970.78	2,989.83	7.80	-1.71	0.545
48.00	-27.46	-19.95	0.00	-1,544.96	0.00	1,544.96	3,499.33	1,749.66	5,794.53	2,901.57	8.92	-1.84	0.540
50.00	-26.60	-19.78	0.00	-1,505.06	0.00	1,505.06	3,469.68	1,734.84	5,677.92	2,843.18	9.71	-1.93	0.537
53.25	-25.24	-19.60	0.00	-1,440.77	0.00	1,440.77	2,730.90	1,365.45	4,467.29	2,236.97	11.07	-2.07	0.654
55.00	-24.81	-19.41	0.00	-1,406.47	0.00	1,406.47	2,712.29	1,356.15	4,390.67	2,198.60	11.84	-2.15	0.649
60.00	-23.68	-19.11	0.00	-1,309.40	0.00	1,309.40	2,658.02	1,329.01	4,173.50	2,089.85	14.23	-2.40	0.636
65.00	-22.58	-18.81	0.00	-1,213.84	0.00	1,213.84	2,602.11	1,301.05	3,959.12	1,982.50	16.88	-2.66	0.621
70.00	-21.50	-18.50	0.00	-1,119.80	0.00	1,119.80	2,544.56	1,272.28	3,747.77	1,876.67	19.80	-2.92	0.605
75.00	-20.45	-18.19	0.00	-1,027.30	0.00	1,027.30	2,485.39	1,242.69	3,539.70	1,772.48	23.00	-3.18	0.588
80.00	-19.42	-17.88	0.00	-936.35	0.00	936.35	2,424.57	1,212.29	3,335.13	1,670.04	26.47	-3.45	0.569
85.00	-18.42	-17.57	0.00	-846.96	0.00	846.96	2,362.12	1,181.06	3,134.31	1,569.49	30.22	-3.72	0.548
90.00	-17.44	-17.25	0.00	-759.14	0.00	759.14	2,297.27	1,148.64	2,936.51	1,470.44	34.26	-3.99	0.524
95.00	-16.51	-16.99	0.00	-672.87	0.00	672.87	2,210.70	1,105.35	2,718.30	1,361.17	38.57	-4.25	0.502
97.75	-16.00	-16.83	0.00	-626.14	0.00	626.14	2,163.09	1,081.54	2,601.88	1,302.87	41.07	-4.40	0.488
100.00	-15.43	-16.70	0.00	-588.27	0.00	588.27	2,124.13	1,062.07	2,508.52	1,256.12	43.17	-4.53	0.476
101.50	-15.05	-16.54	0.00	-563.22	0.00	563.22	1,105.19	552.59	1,317.56	659.76	44.60	-4.61	0.868
105.00	-14.59	-16.40	0.00	-505.31	0.00	505.31	1,087.53	543.77	1,259.48	630.68	48.05	-4.79	0.816
106.00	-14.16	-15.71	0.00	-488.91	0.00	488.91	1,082.34	541.17	1,242.93	622.39	49.06	-4.88	0.799
110.00	-13.61	-15.48	0.00	-426.08	0.00	426.08	1,060.92	530.46	1,177.04	589.40	53.28	-5.20	0.737
115.00	-12.91	-14.81	0.00	-348.71	0.00	348.71	1,032.68	516.34	1,095.47	548.55	58.92	-5.57	0.649
117.94	-12.55	-14.67	0.00	-305.22	0.00	305.22	1,015.32	507.66	1,048.03	524.80	62.41	-5.78	0.595
120.00	-12.29	-14.50	0.00	-274.96	0.00	274.96	1,002.79	501.40	1,014.98	508.24	64.93	-5.92	0.554
125.00	-11.73	-14.31	0.00	-202.49	0.00	202.49	971.28	485.64	935.83	468.61	71.29	-6.23	0.445
126.00	-8.82	-11.58	0.00	-188.18	0.00	188.18	964.78	482.39	920.18	460.77	72.60	-6.28	0.418
130.00	-8.44	-11.33	0.00	-141.87	0.00	141.87	938.12	469.06	858.24	429.76	77.94	-6.48	0.340
135.00	-7.98	-11.14	0.00	-85.21	0.00	85.21	903.33	451.67	782.47	391.82	84.83	-6.68	0.227
136.00	-5.91	-7.92	0.00	-72.29	0.00	72.29	896.18	448.09	767.56	384.35	86.23	-6.71	0.195
140.00	-5.62	-7.75	0.00	-40.61	0.00	40.61	866.91	433.46	708.75	354.90	91.88	-6.80	0.121
142.00	-2.19	-2.91	0.00	-22.71	0.00	22.71	851.88	425.94	679.88	340.45	94.73	-6.83	0.069
145.00	-2.05	-2.74	0.00	-13.97	0.00	13.97	828.85	414.43	637.31	319.13	99.03	-6.86	0.046
149.00	0.00	-2.47	0.00	-3.03	0.00	3.03	787.55	393.77	574.90	287.88	104.77	-6.88	0.011

Load Case: 0.9D + 1.6W — 97 mph with No Ice (Reduced DL) — 25 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Applied Segment Forces Summary

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		199.3	0.0					0.0	0.0	199.3	0.0	0.0	0.0
5.00		394.1	930.3					0.0	41.2	394.1	971.5	0.0	0.0
10.00		385.0	908.9					0.0	205.9	385.0	1,114.8	0.0	0.0
15.00		375.9	887.5					0.0	205.9	375.9	1,093.4	0.0	0.0
20.00		366.8	866.1					0.0	205.9	366.8	1,072.0	0.0	0.0
25.00		357.7	844.7					0.0	205.9	357.7	1,050.6	0.0	0.0
30.00		352.7	823.3					0.0	205.9	352.7	1,029.2	0.0	0.0
35.00		354.8	801.9					0.0	205.9	354.8	1,007.7	0.0	0.0
40.00		358.7	780.5					0.0	205.9	358.7	986.3	0.0	0.0
45.00		288.5	759.0					0.0	205.9	288.5	964.9	0.0	0.0
48.00	Bot - Section 2	181.8	445.2					0.0	123.5	181.8	568.7	0.0	0.0
50.00		192.7	540.4					0.0	82.3	192.7	622.8	0.0	0.0
53.25	Top - Section 1	183.4	864.8					0.0	133.8	183.4	998.6	0.0	0.0
55.00		247.0	210.5					0.0	72.1	247.0	282.6	0.0	0.0
60.00		364.4	589.5					0.0	205.9	364.4	795.3	0.0	0.0
65.00		361.5	571.6					0.0	205.9	361.5	777.5	0.0	0.0
70.00		357.6	553.8					0.0	205.9	357.6	759.6	0.0	0.0
75.00		352.9	535.9					0.0	205.9	352.9	741.8	0.0	0.0
80.00		347.4	518.1					0.0	205.9	347.4	724.0	0.0	0.0
85.00		341.2	500.2					0.0	205.9	341.2	706.1	0.0	0.0
90.00		334.3	482.4					0.0	205.9	334.3	688.3	0.0	0.0
95.00		254.7	464.6					0.0	205.9	254.7	670.4	0.0	0.0
97.75	Bot - Section 3	162.4	247.9					0.0	113.2	162.4	361.1	0.0	0.0
100.00		121.4	320.2					0.0	92.6	121.4	412.8	0.0	0.0
101.50	Top - Section 2	159.4	210.2					0.0	61.8	159.4	272.0	0.0	0.0
105.00		142.5	182.2					0.0	144.1	142.5	326.3	0.0	0.0
106.00	Appurtenance(s)	155.0	51.1	555.2	0.0	0.0	230.4	0.0	41.2	710.3	322.7	0.0	0.0
110.00		274.1	200.1					0.0	164.6	274.1	364.7	0.0	0.0
115.00	Appurtenance(s)	236.5	240.5	436.0	0.0	0.0	71.3	0.0	205.7	672.6	517.5	0.0	0.0
117.94		145.6	136.3					0.0	107.9	145.6	244.1	0.0	0.0
120.00		199.9	93.5					0.0	75.7	199.9	169.2	0.0	0.0
125.00		168.0	219.1					0.0	183.6	168.0	402.7	0.0	0.0
126.00	Appurtenance(s)	135.2	42.5	2,281.1	0.0	0.0	2,296.1	0.0	36.7	2,416.3	2,375.3	0.0	0.0
130.00		237.5	165.8					0.0	115.1	237.5	281.0	0.0	0.0
135.00		155.0	197.6					0.0	143.9	155.0	341.6	0.0	0.0
136.00	Appurtenance(s)	124.1	38.2	2,840.0	0.0	1,775.0	1,752.7	0.0	28.8	2,964.1	1,819.8	0.0	0.0
140.00		146.8	148.7					0.0	73.9	146.8	222.6	0.0	0.0
142.00	Appurtenance(s)	118.2	71.8	4,272.4	0.0	2,407.1	2,879.7	0.0	37.0	4,390.7	2,988.5	0.0	0.0
145.00		160.5	104.5					0.0	14.1	160.5	118.6	0.0	0.0
149.00	Appurtenance(s)	90.3	133.3	2,381.4	0.0	3,028.1	1,617.3	0.0	18.8	2,471.7	1,769.4	0.0	0.0
								Totals:		22,651.1	30,935.7	0.00	0.00

Load Case: 0.9D + 1.6W — 97 mph with No Ice (Reduced DL) — 25 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	-30.90	-22.50	0.00	-2,532.77	0.00	2,532.77	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.584
5.00	-29.86	-22.19	0.00	-2,420.29	0.00	2,420.29	4,073.39	2,036.69	8,449.37	4,230.97	0.09	-0.17	0.579
10.00	-28.68	-21.89	0.00	-2,309.33	0.00	2,309.33	4,012.85	2,006.43	8,128.58	4,070.33	0.36	-0.34	0.575
15.00	-27.53	-21.59	0.00	-2,199.88	0.00	2,199.88	3,950.68	1,975.34	7,810.43	3,911.02	0.82	-0.52	0.570
20.00	-26.39	-21.30	0.00	-2,091.92	0.00	2,091.92	3,886.87	1,943.43	7,495.19	3,753.17	1.46	-0.70	0.564
25.00	-25.27	-21.01	0.00	-1,985.42	0.00	1,985.42	3,821.43	1,910.71	7,183.08	3,596.88	2.30	-0.89	0.559
30.00	-24.18	-20.72	0.00	-1,880.37	0.00	1,880.37	3,754.35	1,877.17	6,874.35	3,442.28	3.34	-1.08	0.553
35.00	-23.11	-20.43	0.00	-1,776.77	0.00	1,776.77	3,685.64	1,842.82	6,569.23	3,289.50	4.58	-1.28	0.547
40.00	-22.06	-20.12	0.00	-1,674.64	0.00	1,674.64	3,615.29	1,807.64	6,267.96	3,138.64	6.02	-1.48	0.540
45.00	-21.05	-19.87	0.00	-1,574.03	0.00	1,574.03	3,543.30	1,771.65	5,970.78	2,989.83	7.68	-1.68	0.533
48.00	-20.45	-19.71	0.00	-1,514.43	0.00	1,514.43	3,499.33	1,749.66	5,794.53	2,901.57	8.77	-1.81	0.528
50.00	-19.80	-19.53	0.00	-1,475.02	0.00	1,475.02	3,469.68	1,734.84	5,677.92	2,843.18	9.55	-1.89	0.525
53.25	-18.77	-19.35	0.00	-1,411.54	0.00	1,411.54	2,730.90	1,365.45	4,467.29	2,236.97	10.89	-2.03	0.638
55.00	-18.44	-19.15	0.00	-1,377.68	0.00	1,377.68	2,712.29	1,356.15	4,390.67	2,198.60	11.65	-2.11	0.634
60.00	-17.58	-18.83	0.00	-1,281.95	0.00	1,281.95	2,658.02	1,329.01	4,173.50	2,089.85	13.99	-2.36	0.620
65.00	-16.73	-18.51	0.00	-1,187.82	0.00	1,187.82	2,602.11	1,301.05	3,959.12	1,982.50	16.59	-2.61	0.606
70.00	-15.91	-18.18	0.00	-1,095.29	0.00	1,095.29	2,544.56	1,272.28	3,747.77	1,876.67	19.46	-2.86	0.590
75.00	-15.11	-17.86	0.00	-1,004.36	0.00	1,004.36	2,485.39	1,242.69	3,539.70	1,772.48	22.59	-3.12	0.573
80.00	-14.33	-17.54	0.00	-915.06	0.00	915.06	2,424.57	1,212.29	3,335.13	1,670.04	26.00	-3.38	0.554
85.00	-13.56	-17.22	0.00	-827.36	0.00	827.36	2,362.12	1,181.06	3,134.31	1,569.49	29.68	-3.64	0.533
90.00	-12.82	-16.90	0.00	-741.27	0.00	741.27	2,297.27	1,148.64	2,936.51	1,470.44	33.64	-3.91	0.510
95.00	-12.11	-16.64	0.00	-656.78	0.00	656.78	2,210.70	1,105.35	2,718.30	1,361.17	37.87	-4.17	0.488
97.75	-11.72	-16.48	0.00	-611.02	0.00	611.02	2,163.09	1,081.54	2,601.88	1,302.87	40.31	-4.32	0.475
100.00	-11.29	-16.35	0.00	-573.94	0.00	573.94	2,124.13	1,062.07	2,508.52	1,256.12	42.37	-4.44	0.462
101.50	-11.00	-16.19	0.00	-549.42	0.00	549.42	1,105.19	552.59	1,317.56	659.76	43.78	-4.52	0.844
105.00	-10.65	-16.05	0.00	-492.76	0.00	492.76	1,087.53	543.77	1,259.48	630.68	47.15	-4.69	0.792
106.00	-10.33	-15.35	0.00	-476.71	0.00	476.71	1,082.34	541.17	1,242.93	622.39	48.14	-4.78	0.776
110.00	-9.90	-15.10	0.00	-415.32	0.00	415.32	1,060.92	530.46	1,177.04	589.40	52.28	-5.09	0.715
115.00	-9.38	-14.43	0.00	-339.81	0.00	339.81	1,032.68	516.34	1,095.47	548.55	57.80	-5.45	0.629
117.94	-9.11	-14.29	0.00	-297.41	0.00	297.41	1,015.32	507.66	1,048.03	524.80	61.21	-5.66	0.576
120.00	-8.90	-14.11	0.00	-267.94	0.00	267.94	1,002.79	501.40	1,014.98	508.24	63.68	-5.80	0.537
125.00	-8.48	-13.93	0.00	-197.39	0.00	197.39	971.28	485.64	935.83	468.61	69.91	-6.09	0.431
126.00	-6.35	-11.28	0.00	-183.46	0.00	183.46	964.78	482.39	920.18	460.77	71.19	-6.15	0.405
130.00	-6.06	-11.04	0.00	-138.33	0.00	138.33	938.12	469.06	858.24	429.76	76.42	-6.34	0.329
135.00	-5.72	-10.86	0.00	-83.14	0.00	83.14	903.33	451.67	782.47	391.82	83.15	-6.53	0.219
136.00	-4.24	-7.71	0.00	-70.50	0.00	70.50	896.18	448.09	767.56	384.35	84.52	-6.56	0.188
140.00	-4.03	-7.54	0.00	-39.67	0.00	39.67	866.91	433.46	708.75	354.90	90.05	-6.65	0.117
142.00	-1.57	-2.83	0.00	-22.18	0.00	22.18	851.88	425.94	679.88	340.45	92.84	-6.69	0.067
145.00	-1.47	-2.66	0.00	-13.68	0.00	13.68	828.85	414.43	637.31	319.13	97.04	-6.71	0.045
149.00	0.00	-2.47	0.00	-3.03	0.00	3.03	787.55	393.77	574.90	287.88	102.66	-6.73	0.011

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 25 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		63.8	0.0					0.0	0.0	63.8	0.0	0.0	0.0
5.00		126.6	1,617.9					0.0	61.3	126.6	1,679.2	0.0	0.0
10.00		124.3	1,624.7					0.0	310.9	124.3	1,935.7	0.0	0.0
15.00		121.7	1,608.4					0.0	313.2	121.7	1,921.6	0.0	0.0
20.00		119.1	1,584.4					0.0	314.9	119.1	1,899.3	0.0	0.0
25.00		116.5	1,556.5					0.0	316.1	116.5	1,872.6	0.0	0.0
30.00		115.2	1,526.1					0.0	317.2	115.2	1,843.3	0.0	0.0
35.00		116.2	1,494.0					0.0	318.1	116.2	1,812.0	0.0	0.0
40.00		117.8	1,460.6					0.0	318.9	117.8	1,779.4	0.0	0.0
45.00		94.9	1,426.2					0.0	319.6	94.9	1,745.7	0.0	0.0
48.00	Bot - Section 2	59.9	840.2					0.0	192.0	59.9	1,032.2	0.0	0.0
50.00		63.6	886.5					0.0	128.2	63.6	1,014.6	0.0	0.0
53.25	Top - Section 1	60.6	1,419.2					0.0	208.4	60.6	1,627.7	0.0	0.0
55.00		81.7	423.3					0.0	112.3	81.7	535.7	0.0	0.0
60.00		120.8	1,184.4					0.0	321.3	120.8	1,505.7	0.0	0.0
65.00		120.2	1,152.3					0.0	321.8	120.2	1,474.1	0.0	0.0
70.00		119.3	1,119.8					0.0	322.3	119.3	1,442.1	0.0	0.0
75.00		118.1	1,086.9					0.0	322.7	118.1	1,409.6	0.0	0.0
80.00		116.7	1,053.7					0.0	323.1	116.7	1,376.8	0.0	0.0
85.00		115.0	1,020.2					0.0	323.5	115.0	1,343.7	0.0	0.0
90.00		113.1	986.4					0.0	323.9	113.1	1,310.3	0.0	0.0
95.00		86.5	952.4					0.0	324.2	86.5	1,276.6	0.0	0.0
97.75	Bot - Section 3	55.3	510.7					0.0	178.5	55.3	689.2	0.0	0.0
100.00		41.4	574.0					0.0	146.1	41.4	720.1	0.0	0.0
101.50	Top - Section 2	54.5	377.4					0.0	97.4	54.5	474.9	0.0	0.0
105.00		48.7	464.1					0.0	227.5	48.7	691.6	0.0	0.0
106.00	Appurtenance(s)	53.2	131.0	119.1	0.0	0.0	460.5	0.0	65.0	172.4	656.5	0.0	0.0
110.00		94.4	510.8					0.0	260.0	94.4	770.9	0.0	0.0
115.00	Appurtenance(s)	81.8	614.5	89.4	0.0	0.0	435.1	0.0	325.3	171.2	1,375.0	0.0	0.0
117.94		50.5	350.7					0.0	173.9	50.5	524.6	0.0	0.0
120.00		69.7	241.4					0.0	122.2	69.7	363.6	0.0	0.0
125.00		58.7	563.5					0.0	296.4	58.7	859.8	0.0	0.0
126.00	Appurtenance(s)	47.5	110.6	587.7	0.0	0.0	5,172.5	0.0	59.3	635.2	5,342.4	0.0	0.0
130.00		83.9	429.1					0.0	195.0	83.9	624.1	0.0	0.0
135.00		54.9	511.8					0.0	244.0	54.9	755.8	0.0	0.0
136.00	Appurtenance(s)	44.3	100.3	695.3	0.0	375.0	4,693.1	0.0	48.8	739.6	4,842.2	0.0	0.0
140.00		52.6	387.6					0.0	140.4	52.6	528.0	0.0	0.0
142.00	Appurtenance(s)	42.6	188.5	917.8	0.0	455.5	7,383.8	0.0	70.3	960.4	7,642.6	0.0	0.0
145.00		58.2	274.2					0.0	18.8	58.2	293.0	0.0	0.0
149.00	Appurtenance(s)	32.8	349.9	784.8	0.0	1,098.9	5,527.7	0.0	25.1	817.6	5,902.7	0.0	0.0
								Totals:		6,510.52	64,894.8	0.00	0.00

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 25 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	-64.89	-6.48	0.00	-749.88	0.00	749.88	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.186
5.00	-63.21	-6.40	0.00	-717.50	0.00	717.50	4,073.39	2,036.69	8,449.37	4,230.97	0.03	-0.05	0.185
10.00	-61.27	-6.33	0.00	-685.48	0.00	685.48	4,012.85	2,006.43	8,128.58	4,070.33	0.11	-0.10	0.184
15.00	-59.34	-6.26	0.00	-653.81	0.00	653.81	3,950.68	1,975.34	7,810.43	3,911.02	0.24	-0.15	0.182
20.00	-57.43	-6.19	0.00	-622.50	0.00	622.50	3,886.87	1,943.43	7,495.19	3,753.17	0.43	-0.21	0.181
25.00	-55.56	-6.12	0.00	-591.54	0.00	591.54	3,821.43	1,910.71	7,183.08	3,596.88	0.68	-0.26	0.179
30.00	-53.71	-6.05	0.00	-560.92	0.00	560.92	3,754.35	1,877.17	6,874.35	3,442.28	0.99	-0.32	0.177
35.00	-51.89	-5.98	0.00	-530.66	0.00	530.66	3,685.64	1,842.82	6,569.23	3,289.50	1.36	-0.38	0.175
40.00	-50.10	-5.90	0.00	-500.77	0.00	500.77	3,615.29	1,807.64	6,267.96	3,138.64	1.79	-0.44	0.173
45.00	-48.35	-5.83	0.00	-471.27	0.00	471.27	3,543.30	1,771.65	5,970.78	2,989.83	2.28	-0.50	0.171
48.00	-47.32	-5.79	0.00	-453.77	0.00	453.77	3,499.33	1,749.66	5,794.53	2,901.57	2.61	-0.54	0.170
50.00	-46.30	-5.74	0.00	-442.19	0.00	442.19	3,469.68	1,734.84	5,677.92	2,843.18	2.84	-0.56	0.169
53.25	-44.67	-5.69	0.00	-423.52	0.00	423.52	2,730.90	1,365.45	4,467.29	2,236.97	3.24	-0.61	0.206
55.00	-44.13	-5.64	0.00	-413.56	0.00	413.56	2,712.29	1,356.15	4,390.67	2,198.60	3.46	-0.63	0.204
60.00	-42.62	-5.56	0.00	-385.35	0.00	385.35	2,658.02	1,329.01	4,173.50	2,089.85	4.16	-0.70	0.200
65.00	-41.14	-5.48	0.00	-357.55	0.00	357.55	2,602.11	1,301.05	3,959.12	1,982.50	4.94	-0.78	0.196
70.00	-39.69	-5.39	0.00	-330.17	0.00	330.17	2,544.56	1,272.28	3,747.77	1,876.67	5.80	-0.86	0.192
75.00	-38.28	-5.30	0.00	-303.23	0.00	303.23	2,485.39	1,242.69	3,539.70	1,772.48	6.74	-0.93	0.186
80.00	-36.90	-5.21	0.00	-276.72	0.00	276.72	2,424.57	1,212.29	3,335.13	1,670.04	7.76	-1.01	0.181
85.00	-35.55	-5.12	0.00	-250.66	0.00	250.66	2,362.12	1,181.06	3,134.31	1,569.49	8.86	-1.09	0.175
90.00	-34.23	-5.03	0.00	-225.05	0.00	225.05	2,297.27	1,148.64	2,936.51	1,470.44	10.05	-1.17	0.168
95.00	-32.95	-4.95	0.00	-199.90	0.00	199.90	2,210.70	1,105.35	2,718.30	1,361.17	11.32	-1.25	0.162
97.75	-32.26	-4.91	0.00	-186.28	0.00	186.28	2,163.09	1,081.54	2,601.88	1,302.87	12.05	-1.30	0.158
100.00	-31.54	-4.86	0.00	-175.24	0.00	175.24	2,124.13	1,062.07	2,508.52	1,256.12	12.67	-1.33	0.154
101.50	-31.07	-4.82	0.00	-167.95	0.00	167.95	1,105.19	552.59	1,317.56	659.76	13.09	-1.36	0.283
105.00	-30.37	-4.78	0.00	-151.08	0.00	151.08	1,087.53	543.77	1,259.48	630.68	14.11	-1.41	0.268
106.00	-29.71	-4.62	0.00	-146.30	0.00	146.30	1,082.34	541.17	1,242.93	622.39	14.41	-1.44	0.263
110.00	-28.94	-4.56	0.00	-127.83	0.00	127.83	1,060.92	530.46	1,177.04	589.40	15.65	-1.53	0.244
115.00	-27.56	-4.39	0.00	-105.04	0.00	105.04	1,032.68	516.34	1,095.47	548.55	17.32	-1.64	0.218
117.94	-27.04	-4.35	0.00	-92.14	0.00	92.14	1,015.32	507.66	1,048.03	524.80	18.35	-1.71	0.202
120.00	-26.67	-4.30	0.00	-83.17	0.00	83.17	1,002.79	501.40	1,014.98	508.24	19.10	-1.75	0.190
125.00	-25.81	-4.24	0.00	-61.67	0.00	61.67	971.28	485.64	935.83	468.61	20.98	-1.84	0.158
126.00	-20.49	-3.45	0.00	-57.43	0.00	57.43	964.78	482.39	920.18	460.77	21.37	-1.86	0.146
130.00	-19.86	-3.36	0.00	-43.65	0.00	43.65	938.12	469.06	858.24	429.76	22.96	-1.92	0.123
135.00	-19.11	-3.29	0.00	-26.84	0.00	26.84	903.33	451.67	782.47	391.82	25.00	-1.98	0.090
136.00	-14.29	-2.39	0.00	-23.17	0.00	23.17	896.18	448.09	767.56	384.35	25.42	-1.99	0.076
140.00	-13.76	-2.33	0.00	-13.60	0.00	13.60	866.91	433.46	708.75	354.90	27.10	-2.02	0.054
142.00	-6.16	-1.10	0.00	-8.50	0.00	8.50	851.88	425.94	679.88	340.45	27.95	-2.03	0.032
145.00	-5.87	-1.03	0.00	-5.21	0.00	5.21	828.85	414.43	637.31	319.13	29.23	-2.04	0.023
149.00	0.00	-0.82	0.00	-1.10	0.00	1.10	787.55	393.77	574.90	287.88	30.95	-2.05	0.004

Load Case: 1.0D + 1.0W Serviceability 60 mph 24 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

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		47.7	0.0					0.0	0.0	47.7	0.0	0.0	0.0
5.00		94.2	1,033.7					0.0	45.8	94.2	1,079.5	0.0	0.0
10.00		92.1	1,009.9					0.0	228.8	92.1	1,238.7	0.0	0.0
15.00		89.9	986.1					0.0	228.8	89.9	1,214.9	0.0	0.0
20.00		87.7	962.3					0.0	228.8	87.7	1,191.1	0.0	0.0
25.00		85.5	938.5					0.0	228.8	85.5	1,167.3	0.0	0.0
30.00		84.3	914.8					0.0	228.8	84.3	1,143.5	0.0	0.0
35.00		84.8	891.0					0.0	228.8	84.8	1,119.7	0.0	0.0
40.00		85.8	867.2					0.0	228.8	85.8	1,095.9	0.0	0.0
45.00		69.0	843.4					0.0	228.8	69.0	1,072.1	0.0	0.0
48.00	Bot - Section 2	43.5	494.6					0.0	137.3	43.5	631.9	0.0	0.0
50.00		46.1	600.4					0.0	91.5	46.1	691.9	0.0	0.0
53.25	Top - Section 1	43.9	960.8					0.0	148.7	43.9	1,109.5	0.0	0.0
55.00		59.1	233.9					0.0	80.1	59.1	314.0	0.0	0.0
60.00		87.1	654.9					0.0	228.8	87.1	883.7	0.0	0.0
65.00		86.4	635.1					0.0	228.8	86.4	863.9	0.0	0.0
70.00		85.5	615.3					0.0	228.8	85.5	844.0	0.0	0.0
75.00		84.4	595.5					0.0	228.8	84.4	824.2	0.0	0.0
80.00		83.1	575.6					0.0	228.8	83.1	804.4	0.0	0.0
85.00		81.6	555.8					0.0	228.8	81.6	784.6	0.0	0.0
90.00		80.0	536.0					0.0	228.8	80.0	764.7	0.0	0.0
95.00		60.9	516.2					0.0	228.8	60.9	744.9	0.0	0.0
97.75	Bot - Section 3	38.8	275.4					0.0	125.8	38.8	401.3	0.0	0.0
100.00		29.0	355.7					0.0	102.9	29.0	458.7	0.0	0.0
101.50	Top - Section 2	38.1	233.6					0.0	68.6	38.1	302.2	0.0	0.0
105.00		34.1	202.4					0.0	160.1	34.1	362.6	0.0	0.0
106.00	Appurtenance(s)	37.1	56.8	132.8	0.0	0.0	256.0	0.0	45.8	169.8	358.5	0.0	0.0
110.00		65.5	222.3					0.0	182.9	65.5	405.2	0.0	0.0
115.00	Appurtenance(s)	56.6	267.2	104.3	0.0	0.0	79.2	0.0	228.6	160.8	575.0	0.0	0.0
117.94		34.8	151.4					0.0	119.9	34.8	271.3	0.0	0.0
120.00		47.8	103.9					0.0	84.1	47.8	188.0	0.0	0.0
125.00		40.2	243.4					0.0	204.0	40.2	447.4	0.0	0.0
126.00	Appurtenance(s)	32.3	47.3	545.5	0.0	0.0	2,551.2	0.0	40.8	577.8	2,639.3	0.0	0.0
130.00		56.8	184.2					0.0	127.9	56.8	312.2	0.0	0.0
135.00		37.1	219.6					0.0	159.9	37.1	379.5	0.0	0.0
136.00	Appurtenance(s)	29.7	42.5	679.1	0.0	424.5	1,947.5	0.0	32.0	708.8	2,022.0	0.0	0.0
140.00		35.1	165.2					0.0	82.1	35.1	247.3	0.0	0.0
142.00	Appurtenance(s)	28.3	79.8	1,021.7	0.0	575.6	3,199.7	0.0	41.1	1,050.0	3,320.5	0.0	0.0
145.00		38.4	116.1					0.0	15.7	38.4	131.8	0.0	0.0
149.00	Appurtenance(s)	21.6	148.1	569.5	0.0	724.1	1,797.0	0.0	20.9	591.1	1,966.0	0.0	0.0
								Totals:		5,416.64	34,373.0	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 24 Iterations

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-34.37	-5.38	0.00	-609.53	0.00	609.53	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.147
5.00	-33.29	-5.31	0.00	-582.62	0.00	582.62	4,073.39	2,036.69	8,449.37	4,230.97	0.02	-0.04	0.146
10.00	-32.05	-5.24	0.00	-556.07	0.00	556.07	4,012.85	2,006.43	8,128.58	4,070.33	0.09	-0.08	0.145
15.00	-30.83	-5.17	0.00	-529.87	0.00	529.87	3,950.68	1,975.34	7,810.43	3,911.02	0.20	-0.13	0.143
20.00	-29.63	-5.10	0.00	-504.02	0.00	504.02	3,886.87	1,943.43	7,495.19	3,753.17	0.35	-0.17	0.142
25.00	-28.46	-5.04	0.00	-478.50	0.00	478.50	3,821.43	1,910.71	7,183.08	3,596.88	0.55	-0.21	0.140
30.00	-27.31	-4.97	0.00	-453.31	0.00	453.31	3,754.35	1,877.17	6,874.35	3,442.28	0.80	-0.26	0.139
35.00	-26.19	-4.90	0.00	-428.46	0.00	428.46	3,685.64	1,842.82	6,569.23	3,289.50	1.10	-0.31	0.137
40.00	-25.09	-4.83	0.00	-403.96	0.00	403.96	3,615.29	1,807.64	6,267.96	3,138.64	1.45	-0.36	0.136
45.00	-24.02	-4.77	0.00	-379.80	0.00	379.80	3,543.30	1,771.65	5,970.78	2,989.83	1.85	-0.41	0.134
48.00	-23.38	-4.73	0.00	-365.49	0.00	365.49	3,499.33	1,749.66	5,794.53	2,901.57	2.11	-0.44	0.133
50.00	-22.69	-4.69	0.00	-356.02	0.00	356.02	3,469.68	1,734.84	5,677.92	2,843.18	2.30	-0.46	0.132
53.25	-21.58	-4.65	0.00	-340.77	0.00	340.77	2,730.90	1,365.45	4,467.29	2,236.97	2.62	-0.49	0.160
55.00	-21.26	-4.60	0.00	-332.64	0.00	332.64	2,712.29	1,356.15	4,390.67	2,198.60	2.81	-0.51	0.159
60.00	-20.37	-4.53	0.00	-309.62	0.00	309.62	2,658.02	1,329.01	4,173.50	2,089.85	3.37	-0.57	0.156
65.00	-19.51	-4.45	0.00	-286.98	0.00	286.98	2,602.11	1,301.05	3,959.12	1,982.50	4.00	-0.63	0.152
70.00	-18.66	-4.38	0.00	-264.71	0.00	264.71	2,544.56	1,272.28	3,747.77	1,876.67	4.69	-0.69	0.148
75.00	-17.83	-4.30	0.00	-242.82	0.00	242.82	2,485.39	1,242.69	3,539.70	1,772.48	5.45	-0.75	0.144
80.00	-17.02	-4.23	0.00	-221.30	0.00	221.30	2,424.57	1,212.29	3,335.13	1,670.04	6.27	-0.82	0.140
85.00	-16.23	-4.15	0.00	-200.16	0.00	200.16	2,362.12	1,181.06	3,134.31	1,569.49	7.16	-0.88	0.134
90.00	-15.47	-4.08	0.00	-179.40	0.00	179.40	2,297.27	1,148.64	2,936.51	1,470.44	8.11	-0.94	0.129
95.00	-14.72	-4.02	0.00	-159.01	0.00	159.01	2,210.70	1,105.35	2,718.30	1,361.17	9.14	-1.01	0.123
97.75	-14.32	-3.98	0.00	-147.96	0.00	147.96	2,163.09	1,081.54	2,601.88	1,302.87	9.73	-1.04	0.120
100.00	-13.86	-3.95	0.00	-139.01	0.00	139.01	2,124.13	1,062.07	2,508.52	1,256.12	10.22	-1.07	0.117
101.50	-13.55	-3.91	0.00	-133.09	0.00	133.09	1,105.19	552.59	1,317.56	659.76	10.56	-1.09	0.214
105.00	-13.19	-3.88	0.00	-119.40	0.00	119.40	1,087.53	543.77	1,259.48	630.68	11.38	-1.13	0.201
106.00	-12.83	-3.71	0.00	-115.52	0.00	115.52	1,082.34	541.17	1,242.93	622.39	11.62	-1.15	0.198
110.00	-12.42	-3.66	0.00	-100.67	0.00	100.67	1,060.92	530.46	1,177.04	589.40	12.62	-1.23	0.183
115.00	-11.85	-3.50	0.00	-82.40	0.00	82.40	1,032.68	516.34	1,095.47	548.55	13.95	-1.32	0.162
117.94	-11.57	-3.46	0.00	-72.13	0.00	72.13	1,015.32	507.66	1,048.03	524.80	14.78	-1.37	0.149
120.00	-11.38	-3.42	0.00	-64.98	0.00	64.98	1,002.79	501.40	1,014.98	508.24	15.38	-1.40	0.139
125.00	-10.93	-3.38	0.00	-47.88	0.00	47.88	971.28	485.64	935.83	468.61	16.89	-1.47	0.113
126.00	-8.31	-2.74	0.00	-44.50	0.00	44.50	964.78	482.39	920.18	460.77	17.20	-1.49	0.105
130.00	-8.00	-2.68	0.00	-33.55	0.00	33.55	938.12	469.06	858.24	429.76	18.46	-1.53	0.087
135.00	-7.62	-2.63	0.00	-20.16	0.00	20.16	903.33	451.67	782.47	391.82	20.09	-1.58	0.060
136.00	-5.62	-1.87	0.00	-17.10	0.00	17.10	896.18	448.09	767.56	384.35	20.43	-1.59	0.051
140.00	-5.37	-1.83	0.00	-9.61	0.00	9.61	866.91	433.46	708.75	354.90	21.77	-1.61	0.033
142.00	-2.08	-0.69	0.00	-5.38	0.00	5.38	851.88	425.94	679.88	340.45	22.44	-1.62	0.018
145.00	-1.95	-0.65	0.00	-3.31	0.00	3.31	828.85	414.43	637.31	319.13	23.46	-1.62	0.013
149.00	0.00	-0.59	0.00	-0.72	0.00	0.72	787.55	393.77	574.90	287.88	24.82	-1.63	0.003

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	**0.19**	
Spectral Response Acceleration at 1.0 Second Period (S_1):	**0.06**	
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}):	**0.20**	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	**0.10**	
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):	**2.63**	
Redundancy Factor (p):	**1.30**	
Seismic Force Distribution Exponent (k):	**2.00**	
Total Unfactored Dead Load:	**34.37**	**k**
Seismic Base Shear (E):	**1.34**	**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	147.00	169	3,652	0.012	16	210
38	143.50	132	2,713	0.009	12	163
37	141.00	121	2,402	0.008	11	150
36	138.00	247	4,710	0.016	21	307
35	135.50	74	1,367	0.005	6	92
34	132.50	380	6,663	0.022	29	471
33	128.00	312	5,115	0.017	23	387
32	125.50	88	1,387	0.005	6	109
31	122.50	447	6,714	0.022	30	555
30	118.97	188	2,661	0.009	12	233
29	116.47	271	3,680	0.012	16	336
28	112.50	496	6,275	0.021	28	615
27	108.00	405	4,726	0.016	21	502
26	105.50	103	1,141	0.004	5	127
25	103.25	363	3,865	0.013	17	450
24	100.75	302	3,068	0.010	14	375
23	98.88	459	4,484	0.015	20	569
22	96.38	401	3,727	0.012	16	498
21	92.50	745	6,374	0.021	28	924
20	87.50	765	5,855	0.019	26	948
19	82.50	785	5,340	0.018	24	973
18	77.50	804	4,831	0.016	21	998
17	72.50	824	4,332	0.014	19	1,022

16	67.50	844	3,846	0.013	17	1,047
15	62.50	864	3,375	0.011	15	1,071
14	57.50	884	2,922	0.010	13	1,096
13	54.13	314	920	0.003	4	389
12	51.63	1,110	2,957	0.010	13	1,376
11	49.00	692	1,661	0.005	7	858
10	46.50	632	1,366	0.004	6	784
9	42.50	1,072	1,937	0.006	9	1,330
8	37.50	1,096	1,541	0.005	7	1,359
7	32.50	1,120	1,183	0.004	5	1,389
6	27.50	1,144	865	0.003	4	1,418
5	22.50	1,167	591	0.002	3	1,448
4	17.50	1,191	365	0.001	2	1,477
3	12.50	1,215	190	0.001	1	1,507
2	7.50	1,239	70	0.000	0	1,536
1	2.50	1,079	7	0.000	0	1,339
DragonWave Horizon C	149.00	32	706	0.002	3	39
DragonWave A-ANT-23G	149.00	15	333	0.001	1	19
Alcatel-Lucent RRH2x	149.00	317	7,047	0.023	31	394
Alcatel-Lucent 1900	149.00	180	3,996	0.013	18	223
Nokia 2.5G MAA - AAH	149.00	311	6,900	0.023	30	385
DragonWave A-ANT-11G	149.00	54	1,199	0.004	5	67
RFS APXVFRR12X-C-I20	149.00	138	3,064	0.010	14	171
Flat T-Arm	149.00	750	16,651	0.055	73	930
Ericsson KRY 112 144	142.00	29	587	0.002	3	36
Ericsson KRY 112 489	142.00	46	932	0.003	4	57
Ericsson Radio 4449	142.00	222	4,476	0.015	20	275
Ericsson AIR-32 B2A/	142.00	397	7,997	0.026	35	492
RFS APX16DWV-16DWVS-	142.00	122	2,462	0.008	11	151
RFS APXVAARR24_43-U-	142.00	384	7,737	0.025	34	476
Flat Platform w/ Han	142.00	2,000	40,328	0.133	178	2,480
RFS FD9R6004/2C-3L	136.00	16	289	0.001	1	19
Alcatel-Lucent RRH2x	136.00	132	2,441	0.008	11	164
Amphenol Antel BXA-	136.00	45	832	0.003	4	56
Antel BXA-185085/12C	136.00	39	721	0.002	3	48
RFS DB-T1-6Z-8AB-0Z	136.00	44	814	0.003	4	55
Andrew DB854DG65ESX	136.00	56	1,027	0.003	5	69
Commscope LNX-6514DS	136.00	116	2,153	0.007	10	144
Round Low Profile Pl	136.00	1,500	27,744	0.091	122	1,860
Raycap DC6-48-60-0-8	126.00	33	521	0.002	2	41
Ericsson RRUS-11 800	126.00	162	2,572	0.008	11	201
Ericsson RRUS 32	126.00	152	2,420	0.008	11	189
CCI CCI-HPA-65R-BUU-	126.00	204	3,239	0.011	14	253
Round Platform w/ Ha	126.00	2,000	31,752	0.105	140	2,480
RFS APXV18-206517S-C	115.00	79	1,047	0.003	5	98
Proxim 5054-R-LR	106.00	6	67	0.000	0	7
3' Dish w/ Radome	106.00	100	1,124	0.004	5	124
Flat Side Arm	106.00	150	1,685	0.006	7	186
		34,373	303,737	1.000	1,341	42,626

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	147.00	169	3,652	0.012	16	145
38	143.50	132	2,713	0.009	12	113
37	141.00	121	2,402	0.008	11	104
36	138.00	247	4,710	0.016	21	213
35	135.50	74	1,367	0.005	6	64
34	132.50	380	6,663	0.022	29	326

33	128.00	312	5,115	0.017	23	268
32	125.50	88	1,387	0.005	6	76
31	122.50	447	6,714	0.022	30	385
30	118.97	188	2,661	0.009	12	162
29	116.47	271	3,680	0.012	16	233
28	112.50	496	6,275	0.021	28	426
27	108.00	405	4,726	0.016	21	348
26	105.50	103	1,141	0.004	5	88
25	103.25	363	3,865	0.013	17	312
24	100.75	302	3,068	0.010	14	260
23	98.88	459	4,484	0.015	20	394
22	96.38	401	3,727	0.012	16	345
21	92.50	745	6,374	0.021	28	641
20	87.50	765	5,855	0.019	26	658
19	82.50	785	5,340	0.018	24	675
18	77.50	804	4,831	0.016	21	692
17	72.50	824	4,332	0.014	19	709
16	67.50	844	3,846	0.013	17	726
15	62.50	864	3,375	0.011	15	743
14	57.50	884	2,922	0.010	13	760
13	54.13	314	920	0.003	4	270
12	51.63	1,110	2,957	0.010	13	954
11	49.00	692	1,661	0.005	7	595
10	46.50	632	1,366	0.004	6	543
9	42.50	1,072	1,937	0.006	9	922
8	37.50	1,096	1,541	0.005	7	942
7	32.50	1,120	1,183	0.004	5	963
6	27.50	1,144	865	0.003	4	983
5	22.50	1,167	591	0.002	3	1,004
4	17.50	1,191	365	0.001	2	1,024
3	12.50	1,215	190	0.001	1	1,045
2	7.50	1,239	70	0.000	0	1,065
1	2.50	1,079	7	0.000	0	928
DragonWave Horizon C	149.00	32	706	0.002	3	27
DragonWave A-ANT-23G	149.00	15	333	0.001	1	13
Alcatel-Lucent RRH2x	149.00	317	7,047	0.023	31	273
Alcatel-Lucent 1900	149.00	180	3,996	0.013	18	155
Nokia 2.5G MAA - AAH	149.00	311	6,900	0.023	30	267
DragonWave A-ANT-11G	149.00	54	1,199	0.004	5	46
RFS APXVFRR12X-C-I20	149.00	138	3,064	0.010	14	119
Flat T-Arm	149.00	750	16,651	0.055	73	645
Ericsson KRY 112 144	142.00	29	587	0.002	3	25
Ericsson KRY 112 489	142.00	46	932	0.003	4	40
Ericsson Radio 4449	142.00	222	4,476	0.015	20	191
Ericsson AIR-32 B2A/	142.00	397	7,997	0.026	35	341
RFS APX16DWV-16DWVS-	142.00	122	2,462	0.008	11	105
RFS APXVAARR24_43-U-	142.00	384	7,737	0.025	34	330
Flat Platform w/ Han	142.00	2,000	40,328	0.133	178	1,720
RFS FD9R6004/2C-3L	136.00	16	289	0.001	1	13
Alcatel-Lucent RRH2x	136.00	132	2,441	0.008	11	114
Amphenol Antel BXA-	136.00	45	832	0.003	4	39
Antel BXA-185085/12C	136.00	39	721	0.002	3	34
RFS DB-T1-6Z-8AB-0Z	136.00	44	814	0.003	4	38
Andrew DB854DG65ESX	136.00	56	1,027	0.003	5	48
Commscope LNX-6514DS	136.00	116	2,153	0.007	10	100
Round Low Profile Pl	136.00	1,500	27,744	0.091	122	1,290
Raycap DC6-48-60-0-8	126.00	33	521	0.002	2	28
Ericsson RRUS-11 800	126.00	162	2,572	0.008	11	139
Ericsson RRUS 32	126.00	152	2,420	0.008	11	131
CCI CCI-HPA-65R-BUU-	126.00	204	3,239	0.011	14	175
Round Platform w/ Ha	126.00	2,000	31,752	0.105	140	1,720
RFS APXV18-206517S-C	115.00	79	1,047	0.003	5	68
Proxim 5054-R-LR	106.00	6	67	0.000	0	5
3' Dish w/ Radome	106.00	100	1,124	0.004	5	86

Flat Side Arm	**106.00**	**150**	**1,685**	**0.006**	**7**	**129**
		34,373	**303,737**	**1.000**	**1,341**	**29,557**

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.29	-1.34	0.00	-172.61	0.00	172.61	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.049
5.00	-39.75	-1.35	0.00	-165.89	0.00	165.89	4,073.39	2,036.69	8,449.37	4,230.97	0.01	-0.01	0.049
10.00	-38.24	-1.36	0.00	-159.13	0.00	159.13	4,012.85	2,006.43	8,128.58	4,070.33	0.02	-0.02	0.049
15.00	-36.77	-1.36	0.00	-152.34	0.00	152.34	3,950.68	1,975.34	7,810.43	3,911.02	0.06	-0.04	0.048
20.00	-35.32	-1.37	0.00	-145.52	0.00	145.52	3,886.87	1,943.43	7,495.19	3,753.17	0.10	-0.05	0.048
25.00	-33.90	-1.37	0.00	-138.67	0.00	138.67	3,821.43	1,910.71	7,183.08	3,596.88	0.16	-0.06	0.047
30.00	-32.51	-1.37	0.00	-131.82	0.00	131.82	3,754.35	1,877.17	6,874.35	3,442.28	0.23	-0.07	0.047
35.00	-31.15	-1.37	0.00	-124.96	0.00	124.96	3,685.64	1,842.82	6,569.23	3,289.50	0.32	-0.09	0.046
40.00	-29.82	-1.37	0.00	-118.11	0.00	118.11	3,615.29	1,807.64	6,267.96	3,138.64	0.42	-0.10	0.046
45.00	-29.04	-1.37	0.00	-111.27	0.00	111.27	3,543.30	1,771.65	5,970.78	2,989.83	0.53	-0.12	0.045
48.00	-28.18	-1.36	0.00	-107.18	0.00	107.18	3,499.33	1,749.66	5,794.53	2,901.57	0.61	-0.13	0.045
50.00	-26.80	-1.35	0.00	-104.46	0.00	104.46	3,469.68	1,734.84	5,677.92	2,843.18	0.66	-0.13	0.044
53.25	-26.41	-1.35	0.00	-100.08	0.00	100.08	2,730.90	1,365.45	4,467.29	2,236.97	0.76	-0.14	0.054
55.00	-25.32	-1.34	0.00	-97.72	0.00	97.72	2,712.29	1,356.15	4,390.67	2,198.60	0.81	-0.15	0.054
60.00	-24.25	-1.33	0.00	-91.04	0.00	91.04	2,658.02	1,329.01	4,173.50	2,089.85	0.97	-0.17	0.053
65.00	-23.20	-1.31	0.00	-84.42	0.00	84.42	2,602.11	1,301.05	3,959.12	1,982.50	1.15	-0.18	0.051
70.00	-22.18	-1.30	0.00	-77.85	0.00	77.85	2,544.56	1,272.28	3,747.77	1,876.67	1.36	-0.20	0.050
75.00	-21.18	-1.28	0.00	-71.37	0.00	71.37	2,485.39	1,242.69	3,539.70	1,772.48	1.58	-0.22	0.049
80.00	-20.21	-1.26	0.00	-64.98	0.00	64.98	2,424.57	1,212.29	3,335.13	1,670.04	1.82	-0.24	0.047
85.00	-19.26	-1.23	0.00	-58.69	0.00	58.69	2,362.12	1,181.06	3,134.31	1,569.49	2.07	-0.26	0.046
90.00	-18.33	-1.21	0.00	-52.51	0.00	52.51	2,297.27	1,148.64	2,936.51	1,470.44	2.35	-0.28	0.044
95.00	-17.84	-1.19	0.00	-46.47	0.00	46.47	2,210.70	1,105.35	2,718.30	1,361.17	2.65	-0.29	0.042
97.75	-17.27	-1.17	0.00	-43.19	0.00	43.19	2,163.09	1,081.54	2,601.88	1,302.87	2.82	-0.30	0.041
100.00	-16.89	-1.16	0.00	-40.55	0.00	40.55	2,124.13	1,062.07	2,508.52	1,256.12	2.97	-0.31	0.040
101.50	-16.44	-1.14	0.00	-38.81	0.00	38.81	1,105.19	552.59	1,317.56	659.76	3.07	-0.32	0.074
105.00	-16.32	-1.14	0.00	-34.81	0.00	34.81	1,087.53	543.77	1,259.48	630.68	3.31	-0.33	0.070
106.00	-15.50	-1.11	0.00	-33.67	0.00	33.67	1,082.34	541.17	1,242.93	622.39	3.38	-0.34	0.068
110.00	-14.88	-1.08	0.00	-29.25	0.00	29.25	1,060.92	530.46	1,177.04	589.40	3.67	-0.36	0.064
115.00	-14.45	-1.06	0.00	-23.85	0.00	23.85	1,032.68	516.34	1,095.47	548.55	4.06	-0.38	0.057
117.94	-14.21	-1.05	0.00	-20.73	0.00	20.73	1,015.32	507.66	1,048.03	524.80	4.30	-0.40	0.053
120.00	-13.66	-1.02	0.00	-18.56	0.00	18.56	1,002.79	501.40	1,014.98	508.24	4.47	-0.41	0.050
125.00	-13.55	-1.02	0.00	-13.45	0.00	13.45	971.28	485.64	935.83	468.61	4.91	-0.43	0.043
126.00	-10.00	-0.79	0.00	-12.43	0.00	12.43	964.78	482.39	920.18	460.77	5.00	-0.43	0.037
130.00	-9.53	-0.76	0.00	-9.27	0.00	9.27	938.12	469.06	858.24	429.76	5.37	-0.45	0.032
135.00	-9.44	-0.75	0.00	-5.47	0.00	5.47	903.33	451.67	782.47	391.82	5.84	-0.46	0.024
136.00	-6.71	-0.55	0.00	-4.71	0.00	4.71	896.18	448.09	767.56	384.35	5.94	-0.46	0.020
140.00	-6.57	-0.54	0.00	-2.50	0.00	2.50	866.91	433.46	708.75	354.90	6.33	-0.47	0.015
142.00	-2.44	-0.21	0.00	-1.41	0.00	1.41	851.88	425.94	679.88	340.45	6.52	-0.47	0.007
145.00	-2.23	-0.19	0.00	-0.78	0.00	0.78	828.85	414.43	637.31	319.13	6.82	-0.47	0.005
149.00	0.00	-0.18	0.00	0.00	0.00	0.00	787.55	393.77	574.90	287.88	7.21	-0.47	0.000

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-28.63	-1.34	0.00	-169.52	0.00	169.52	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.046
5.00	-27.56	-1.35	0.00	-162.81	0.00	162.81	4,073.39	2,036.69	8,449.37	4,230.97	0.01	-0.01	0.045
10.00	-26.52	-1.35	0.00	-156.07	0.00	156.07	4,012.85	2,006.43	8,128.58	4,070.33	0.02	-0.02	0.045
15.00	-25.49	-1.36	0.00	-149.31	0.00	149.31	3,950.68	1,975.34	7,810.43	3,911.02	0.06	-0.04	0.045
20.00	-24.49	-1.36	0.00	-142.53	0.00	142.53	3,886.87	1,943.43	7,495.19	3,753.17	0.10	-0.05	0.044
25.00	-23.51	-1.36	0.00	-135.75	0.00	135.75	3,821.43	1,910.71	7,183.08	3,596.88	0.16	-0.06	0.044
30.00	-22.54	-1.36	0.00	-128.96	0.00	128.96	3,754.35	1,877.17	6,874.35	3,442.28	0.23	-0.07	0.043
35.00	-21.60	-1.35	0.00	-122.17	0.00	122.17	3,685.64	1,842.82	6,569.23	3,289.50	0.31	-0.09	0.043
40.00	-20.68	-1.35	0.00	-115.40	0.00	115.40	3,615.29	1,807.64	6,267.96	3,138.64	0.41	-0.10	0.042
45.00	-20.13	-1.35	0.00	-108.66	0.00	108.66	3,543.30	1,771.65	5,970.78	2,989.83	0.52	-0.11	0.042
48.00	-19.54	-1.34	0.00	-104.62	0.00	104.62	3,499.33	1,749.66	5,794.53	2,901.57	0.60	-0.12	0.042
50.00	-18.59	-1.33	0.00	-101.94	0.00	101.94	3,469.68	1,734.84	5,677.92	2,843.18	0.65	-0.13	0.041
53.25	-18.32	-1.32	0.00	-97.63	0.00	97.63	2,730.90	1,365.45	4,467.29	2,236.97	0.74	-0.14	0.050
55.00	-17.56	-1.31	0.00	-95.31	0.00	95.31	2,712.29	1,356.15	4,390.67	2,198.60	0.79	-0.14	0.050
60.00	-16.81	-1.30	0.00	-88.74	0.00	88.74	2,658.02	1,329.01	4,173.50	2,089.85	0.95	-0.16	0.049
65.00	-16.09	-1.29	0.00	-82.23	0.00	82.23	2,602.11	1,301.05	3,959.12	1,982.50	1.13	-0.18	0.048
70.00	-15.38	-1.27	0.00	-75.80	0.00	75.80	2,544.56	1,272.28	3,747.77	1,876.67	1.33	-0.20	0.046
75.00	-14.68	-1.25	0.00	-69.44	0.00	69.44	2,485.39	1,242.69	3,539.70	1,772.48	1.54	-0.21	0.045
80.00	-14.01	-1.23	0.00	-63.18	0.00	63.18	2,424.57	1,212.29	3,335.13	1,670.04	1.78	-0.23	0.044
85.00	-13.35	-1.21	0.00	-57.03	0.00	57.03	2,362.12	1,181.06	3,134.31	1,569.49	2.03	-0.25	0.042
90.00	-12.71	-1.18	0.00	-51.01	0.00	51.01	2,297.27	1,148.64	2,936.51	1,470.44	2.30	-0.27	0.040
95.00	-12.37	-1.16	0.00	-45.11	0.00	45.11	2,210.70	1,105.35	2,718.30	1,361.17	2.59	-0.29	0.039
97.75	-11.97	-1.14	0.00	-41.92	0.00	41.92	2,163.09	1,081.54	2,601.88	1,302.87	2.76	-0.30	0.038
100.00	-11.71	-1.13	0.00	-39.34	0.00	39.34	2,124.13	1,062.07	2,508.52	1,256.12	2.90	-0.30	0.037
101.50	-11.40	-1.11	0.00	-37.65	0.00	37.65	1,105.19	552.59	1,317.56	659.76	3.00	-0.31	0.067
105.00	-11.31	-1.11	0.00	-33.75	0.00	33.75	1,087.53	543.77	1,259.48	630.68	3.23	-0.32	0.064
106.00	-10.74	-1.08	0.00	-32.64	0.00	32.64	1,082.34	541.17	1,242.93	622.39	3.30	-0.33	0.062
110.00	-10.32	-1.05	0.00	-28.34	0.00	28.34	1,060.92	530.46	1,177.04	589.40	3.58	-0.35	0.058
115.00	-10.01	-1.03	0.00	-23.10	0.00	23.10	1,032.68	516.34	1,095.47	548.55	3.96	-0.37	0.052
117.94	-9.85	-1.02	0.00	-20.07	0.00	20.07	1,015.32	507.66	1,048.03	524.80	4.20	-0.39	0.048
120.00	-9.47	-0.99	0.00	-17.97	0.00	17.97	1,002.79	501.40	1,014.98	508.24	4.37	-0.40	0.045
125.00	-9.39	-0.98	0.00	-13.02	0.00	13.02	971.28	485.64	935.83	468.61	4.80	-0.42	0.037
126.00	-6.93	-0.77	0.00	-12.04	0.00	12.04	964.78	482.39	920.18	460.77	4.88	-0.42	0.033
130.00	-6.61	-0.74	0.00	-8.97	0.00	8.97	938.12	469.06	858.24	429.76	5.24	-0.43	0.028
135.00	-6.54	-0.73	0.00	-5.29	0.00	5.29	903.33	451.67	782.47	391.82	5.70	-0.45	0.021
136.00	-4.66	-0.54	0.00	-4.56	0.00	4.56	896.18	448.09	767.56	384.35	5.80	-0.45	0.017
140.00	-4.55	-0.52	0.00	-2.42	0.00	2.42	866.91	433.46	708.75	354.90	6.17	-0.45	0.012
142.00	-1.69	-0.21	0.00	-1.37	0.00	1.37	851.88	425.94	679.88	340.45	6.36	-0.46	0.006
145.00	-1.54	-0.19	0.00	-0.75	0.00	0.75	828.85	414.43	637.31	319.13	6.65	-0.46	0.004
149.00	0.00	-0.18	0.00	0.00	0.00	0.00	787.55	393.77	574.90	287.88	7.03	-0.46	0.000

Equivalent Modal Forces Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.19
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
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}):	0.20
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	2.63
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	147.00	169	1.840	1.725	1.047	0.345	51	210
38	143.50	132	1.753	1.334	0.899	0.290	33	163
37	141.00	121	1.692	1.094	0.803	0.253	26	150
36	138.00	247	1.621	0.846	0.699	0.211	45	307
35	135.50	74	1.563	0.669	0.621	0.179	12	92
34	132.50	380	1.495	0.488	0.536	0.143	47	471
33	128.00	312	1.395	0.274	0.426	0.095	26	387
32	125.50	88	1.341	0.181	0.373	0.072	5	109
31	122.50	447	1.278	0.091	0.317	0.046	18	555
30	118.97	188	1.205	0.009	0.258	0.019	3	233
29	116.47	271	1.155	-0.034	0.222	0.003	1	336
28	112.50	496	1.077	-0.082	0.173	-0.019	-8	615
27	108.00	405	0.993	-0.112	0.128	-0.038	-13	502
26	105.50	103	0.948	-0.119	0.107	-0.045	-4	127
25	103.25	363	0.908	-0.122	0.090	-0.051	-16	450
24	100.75	302	0.864	-0.120	0.074	-0.054	-14	375
23	98.88	459	0.832	-0.117	0.064	-0.056	-22	569
22	96.38	401	0.791	-0.110	0.051	-0.056	-19	498
21	92.50	745	0.728	-0.095	0.036	-0.052	-34	924
20	87.50	765	0.652	-0.071	0.021	-0.040	-27	948
19	82.50	785	0.579	-0.045	0.012	-0.023	-15	973
18	77.50	804	0.511	-0.020	0.008	-0.002	-1	998
17	72.50	824	0.447	0.002	0.006	0.018	13	1,022
16	67.50	844	0.388	0.022	0.007	0.035	25	1,047
15	62.50	864	0.333	0.037	0.010	0.046	35	1,071
14	57.50	884	0.281	0.049	0.014	0.053	41	1,096
13	54.13	314	0.249	0.055	0.017	0.056	15	389
12	51.63	1,110	0.227	0.059	0.020	0.057	55	1,376
11	49.00	692	0.204	0.062	0.023	0.058	35	858
10	46.50	632	0.184	0.065	0.025	0.058	32	784
9	42.50	1,072	0.154	0.068	0.030	0.057	53	1,330
8	37.50	1,096	0.120	0.070	0.034	0.056	53	1,359
7	32.50	1,120	0.090	0.071	0.038	0.055	53	1,389
6	27.50	1,144	0.064	0.072	0.041	0.054	53	1,418

5	22.50	1,167	0.043	0.071	0.042	0.052	53	1,448
4	17.50	1,191	0.026	0.067	0.040	0.050	51	1,477
3	12.50	1,215	0.013	0.059	0.034	0.045	47	1,507
2	7.50	1,239	0.005	0.044	0.025	0.036	39	1,536
1	2.50	1,079	0.001	0.018	0.010	0.017	16	1,339
DragonWave Horizon C	149.00	32	1.890	1.980	1.140	0.379	10	39
DragonWave A-ANT-23G	149.00	15	1.890	1.980	1.140	0.379	5	19
Alcatel-Lucent RRH2x	149.00	317	1.890	1.980	1.140	0.379	104	394
Alcatel-Lucent 1900	149.00	180	1.890	1.980	1.140	0.379	59	223
Nokia 2.5G MAA - AAH	149.00	311	1.890	1.980	1.140	0.379	102	385
DragonWave A-ANT-11G	149.00	54	1.890	1.980	1.140	0.379	18	67
RFS APXVFRR12X-C-I20	149.00	138	1.890	1.980	1.140	0.379	45	171
Flat T-Arm	149.00	750	1.890	1.980	1.140	0.379	246	930
Ericsson KRY 112 144	142.00	29	1.717	1.186	0.840	0.267	7	36
Ericsson KRY 112 489	142.00	46	1.717	1.186	0.840	0.267	11	57
Ericsson Radio 4449	142.00	222	1.717	1.186	0.840	0.267	51	275
Ericsson AIR-32 B2A/	142.00	397	1.717	1.186	0.840	0.267	92	492
RFS APX16DWV-	142.00	122	1.717	1.186	0.840	0.267	28	151
RFS APXVAARR24_43-U-	142.00	384	1.717	1.186	0.840	0.267	89	476
Flat Platform w/ Han	142.00	2,000	1.717	1.186	0.840	0.267	463	2,480
RFS FD9R6004/2C-3L	136.00	16	1.575	0.702	0.636	0.185	3	19
Alcatel-Lucent RRH2x	136.00	132	1.575	0.702	0.636	0.185	21	164
Amphenol Antel BXA-	136.00	45	1.575	0.702	0.636	0.185	7	56
Antel BXA-185085/12C	136.00	39	1.575	0.702	0.636	0.185	6	48
RFS DB-T1-6Z-8AB-0Z	136.00	44	1.575	0.702	0.636	0.185	7	55
Andrew DB854DG65ESX	136.00	56	1.575	0.702	0.636	0.185	9	69
Commscope LNX-	136.00	116	1.575	0.702	0.636	0.185	19	144
Round Low Profile Pl	136.00	1,500	1.575	0.702	0.636	0.185	241	1,860
Raycap DC6-48-60-0-8	126.00	33	1.352	0.198	0.384	0.076	2	41
Ericsson RRUS-11 800	126.00	162	1.352	0.198	0.384	0.076	11	201
Ericsson RRUS 32	126.00	152	1.352	0.198	0.384	0.076	10	189
CCI CCI-HPA-65R-BUU-	126.00	204	1.352	0.198	0.384	0.076	13	253
Round Platform w/ Ha	126.00	2,000	1.352	0.198	0.384	0.076	132	2,480
RFS APXV18-206517S-C	115.00	79	1.126	-0.054	0.203	-0.006	0	98
Proxim 5054-R-LR	106.00	6	0.957	-0.118	0.111	-0.044	0	7
3' Dish w/ Radome	106.00	100	0.957	-0.118	0.111	-0.044	-4	124
Flat Side Arm	106.00	150	0.957	-0.118	0.111	-0.044	-6	186
		34,373	78.536	36.895	29.926	8.651	2,565	42,626

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	147.00	169	1.840	1.725	1.047	0.345	51	145
38	143.50	132	1.753	1.334	0.899	0.290	33	113
37	141.00	121	1.692	1.094	0.803	0.253	26	104
36	138.00	247	1.621	0.846	0.699	0.211	45	213
35	135.50	74	1.563	0.669	0.621	0.179	12	64
34	132.50	380	1.495	0.488	0.536	0.143	47	326
33	128.00	312	1.395	0.274	0.426	0.095	26	268
32	125.50	88	1.341	0.181	0.373	0.072	5	76
31	122.50	447	1.278	0.091	0.317	0.046	18	385
30	118.97	188	1.205	0.009	0.258	0.019	3	162
29	116.47	271	1.155	-0.034	0.222	0.003	1	233
28	112.50	496	1.077	-0.082	0.173	-0.019	-8	426
27	108.00	405	0.993	-0.112	0.128	-0.038	-13	348
26	105.50	103	0.948	-0.119	0.107	-0.045	-4	88
25	103.25	363	0.908	-0.122	0.090	-0.051	-16	312
24	100.75	302	0.864	-0.120	0.074	-0.054	-14	260

23	98.88	459	0.832	-0.117	0.064	-0.056	-22	394
22	96.38	401	0.791	-0.110	0.051	-0.056	-19	345
21	92.50	745	0.728	-0.095	0.036	-0.052	-34	641
20	87.50	765	0.652	-0.071	0.021	-0.040	-27	658
19	82.50	785	0.579	-0.045	0.012	-0.023	-15	675
18	77.50	804	0.511	-0.020	0.008	-0.002	-1	692
17	72.50	824	0.447	0.002	0.006	0.018	13	709
16	67.50	844	0.388	0.022	0.007	0.035	25	726
15	62.50	864	0.333	0.037	0.010	0.046	35	743
14	57.50	884	0.281	0.049	0.014	0.053	41	760
13	54.13	314	0.249	0.055	0.017	0.056	15	270
12	51.63	1,110	0.227	0.059	0.020	0.057	55	954
11	49.00	692	0.204	0.062	0.023	0.058	35	595
10	46.50	632	0.184	0.065	0.025	0.058	32	543
9	42.50	1,072	0.154	0.068	0.030	0.057	53	922
8	37.50	1,096	0.120	0.070	0.034	0.056	53	942
7	32.50	1,120	0.090	0.071	0.038	0.055	53	963
6	27.50	1,144	0.064	0.072	0.041	0.054	53	983
5	22.50	1,167	0.043	0.071	0.042	0.052	53	1,004
4	17.50	1,191	0.026	0.067	0.040	0.050	51	1,024
3	12.50	1,215	0.013	0.059	0.034	0.045	47	1,045
2	7.50	1,239	0.005	0.044	0.025	0.036	39	1,065
1	2.50	1,079	0.001	0.018	0.010	0.017	16	928
DragonWave Horizon C	149.00	32	1.890	1.980	1.140	0.379	10	27
DragonWave A-ANT-23G	149.00	15	1.890	1.980	1.140	0.379	5	13
Alcatel-Lucent RRH2x	149.00	317	1.890	1.980	1.140	0.379	104	273
Alcatel-Lucent 1900	149.00	180	1.890	1.980	1.140	0.379	59	155
Nokia 2.5G MAA - AAH	149.00	311	1.890	1.980	1.140	0.379	102	267
DragonWave A-ANT-11G	149.00	54	1.890	1.980	1.140	0.379	18	46
RFS APXVFRR12X-C-I20	149.00	138	1.890	1.980	1.140	0.379	45	119
Flat T-Arm	149.00	750	1.890	1.980	1.140	0.379	246	645
Ericsson KRY 112 144	142.00	29	1.717	1.186	0.840	0.267	7	25
Ericsson KRY 112 489	142.00	46	1.717	1.186	0.840	0.267	11	40
Ericsson Radio 4449	142.00	222	1.717	1.186	0.840	0.267	51	191
Ericsson AIR-32 B2A/	142.00	397	1.717	1.186	0.840	0.267	92	341
RFS APX16DWV-	142.00	122	1.717	1.186	0.840	0.267	28	105
RFS APXVAARR24_43-U-	142.00	384	1.717	1.186	0.840	0.267	89	330
Flat Platform w/ Han	142.00	2,000	1.717	1.186	0.840	0.267	463	1,720
RFS FD9R6004/2C-3L	136.00	16	1.575	0.702	0.636	0.185	3	13
Alcatel-Lucent RRH2x	136.00	132	1.575	0.702	0.636	0.185	21	114
Amphenol Antel BXA-	136.00	45	1.575	0.702	0.636	0.185	7	39
Antel BXA-185085/12C	136.00	39	1.575	0.702	0.636	0.185	6	34
RFS DB-T1-6Z-8AB-0Z	136.00	44	1.575	0.702	0.636	0.185	7	38
Andrew DB854DG65ESX	136.00	56	1.575	0.702	0.636	0.185	9	48
Commscope LNX-	136.00	116	1.575	0.702	0.636	0.185	19	100
Round Low Profile Pl	136.00	1,500	1.575	0.702	0.636	0.185	241	1,290
Raycap DC6-48-60-0-8	126.00	33	1.352	0.198	0.384	0.076	2	28
Ericsson RRUS-11 800	126.00	162	1.352	0.198	0.384	0.076	11	139
Ericsson RRUS 32	126.00	152	1.352	0.198	0.384	0.076	10	131
CCI CCI-HPA-65R-BUU-	126.00	204	1.352	0.198	0.384	0.076	13	175
Round Platform w/ Ha	126.00	2,000	1.352	0.198	0.384	0.076	132	1,720
RFS APXV18-206517S-C	115.00	79	1.126	-0.054	0.203	-0.006	0	68
Proxim 5054-R-LR	106.00	6	0.957	-0.118	0.111	-0.044	0	5
3' Dish w/ Radome	106.00	100	0.957	-0.118	0.111	-0.044	-4	86
Flat Side Arm	106.00	150	0.957	-0.118	0.111	-0.044	-6	129
		34,373	78.536	36.895	29.926	8.651	2,565	29,557

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.29	-2.56	0.00	-317.11	0.00	317.11	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.082
5.00	-39.75	-2.53	0.00	-304.33	0.00	304.33	4,073.39	2,036.69	8,449.37	4,230.97	0.01	-0.02	0.082
10.00	-38.24	-2.50	0.00	-291.67	0.00	291.67	4,012.85	2,006.43	8,128.58	4,070.33	0.05	-0.04	0.081
15.00	-36.76	-2.46	0.00	-279.18	0.00	279.18	3,950.68	1,975.34	7,810.43	3,911.02	0.10	-0.07	0.081
20.00	-35.32	-2.42	0.00	-266.88	0.00	266.88	3,886.87	1,943.43	7,495.19	3,753.17	0.18	-0.09	0.080
25.00	-33.90	-2.38	0.00	-254.77	0.00	254.77	3,821.43	1,910.71	7,183.08	3,596.88	0.29	-0.11	0.080
30.00	-32.51	-2.34	0.00	-242.88	0.00	242.88	3,754.35	1,877.17	6,874.35	3,442.28	0.42	-0.14	0.079
35.00	-31.15	-2.29	0.00	-231.19	0.00	231.19	3,685.64	1,842.82	6,569.23	3,289.50	0.58	-0.16	0.079
40.00	-29.82	-2.25	0.00	-219.72	0.00	219.72	3,615.29	1,807.64	6,267.96	3,138.64	0.76	-0.19	0.078
45.00	-29.03	-2.23	0.00	-208.47	0.00	208.47	3,543.30	1,771.65	5,970.78	2,989.83	0.98	-0.22	0.078
48.00	-28.17	-2.20	0.00	-201.79	0.00	201.79	3,499.33	1,749.66	5,794.53	2,901.57	1.12	-0.23	0.078
50.00	-26.80	-2.14	0.00	-197.40	0.00	197.40	3,469.68	1,734.84	5,677.92	2,843.18	1.22	-0.24	0.077
53.25	-26.41	-2.13	0.00	-190.44	0.00	190.44	2,730.90	1,365.45	4,467.29	2,236.97	1.39	-0.26	0.095
55.00	-25.31	-2.10	0.00	-186.71	0.00	186.71	2,712.29	1,356.15	4,390.67	2,198.60	1.49	-0.27	0.094
60.00	-24.24	-2.07	0.00	-176.23	0.00	176.23	2,658.02	1,329.01	4,173.50	2,089.85	1.79	-0.31	0.093
65.00	-23.19	-2.05	0.00	-165.88	0.00	165.88	2,602.11	1,301.05	3,959.12	1,982.50	2.13	-0.34	0.093
70.00	-22.17	-2.05	0.00	-155.62	0.00	155.62	2,544.56	1,272.28	3,747.77	1,876.67	2.51	-0.38	0.092
75.00	-21.17	-2.06	0.00	-145.38	0.00	145.38	2,485.39	1,242.69	3,539.70	1,772.48	2.92	-0.41	0.091
80.00	-20.20	-2.08	0.00	-135.10	0.00	135.10	2,424.57	1,212.29	3,335.13	1,670.04	3.38	-0.45	0.089
85.00	-19.25	-2.11	0.00	-124.71	0.00	124.71	2,362.12	1,181.06	3,134.31	1,569.49	3.87	-0.49	0.088
90.00	-18.32	-2.15	0.00	-114.16	0.00	114.16	2,297.27	1,148.64	2,936.51	1,470.44	4.41	-0.53	0.086
95.00	-17.82	-2.17	0.00	-103.42	0.00	103.42	2,210.70	1,105.35	2,718.30	1,361.17	4.99	-0.57	0.084
97.75	-17.25	-2.20	0.00	-97.44	0.00	97.44	2,163.09	1,081.54	2,601.88	1,302.87	5.33	-0.60	0.083
100.00	-16.88	-2.21	0.00	-92.50	0.00	92.50	2,124.13	1,062.07	2,508.52	1,256.12	5.61	-0.62	0.082
101.50	-16.42	-2.23	0.00	-89.19	0.00	89.19	1,105.19	552.59	1,317.56	659.76	5.81	-0.63	0.150
105.00	-16.30	-2.24	0.00	-81.39	0.00	81.39	1,087.53	543.77	1,259.48	630.68	6.28	-0.66	0.144
106.00	-15.48	-2.26	0.00	-79.15	0.00	79.15	1,082.34	541.17	1,242.93	622.39	6.42	-0.67	0.141
110.00	-14.86	-2.27	0.00	-70.12	0.00	70.12	1,060.92	530.46	1,177.04	589.40	7.00	-0.72	0.133
115.00	-14.42	-2.28	0.00	-58.74	0.00	58.74	1,032.68	516.34	1,095.47	548.55	7.79	-0.78	0.121
117.94	-14.19	-2.28	0.00	-52.04	0.00	52.04	1,015.32	507.66	1,048.03	524.80	8.29	-0.82	0.113
120.00	-13.63	-2.27	0.00	-47.34	0.00	47.34	1,002.79	501.40	1,014.98	508.24	8.65	-0.85	0.107
125.00	-13.52	-2.27	0.00	-36.01	0.00	36.01	971.28	485.64	935.83	468.61	9.56	-0.90	0.091
126.00	-9.97	-2.02	0.00	-33.74	0.00	33.74	964.78	482.39	920.18	460.77	9.75	-0.91	0.084
130.00	-9.50	-1.97	0.00	-25.67	0.00	25.67	938.12	469.06	858.24	429.76	10.53	-0.94	0.070
135.00	-9.41	-1.96	0.00	-15.81	0.00	15.81	903.33	451.67	782.47	391.82	11.54	-0.98	0.051
136.00	-6.69	-1.56	0.00	-13.85	0.00	13.85	896.18	448.09	767.56	384.35	11.74	-0.99	0.044
140.00	-6.54	-1.53	0.00	-7.62	0.00	7.62	866.91	433.46	708.75	354.90	12.58	-1.00	0.029
142.00	-2.43	-0.68	0.00	-4.57	0.00	4.57	851.88	425.94	679.88	340.45	13.00	-1.01	0.016
145.00	-2.22	-0.63	0.00	-2.52	0.00	2.52	828.85	414.43	637.31	319.13	13.64	-1.01	0.011
149.00	0.00	-0.59	0.00	0.00	0.00	0.00	787.55	393.77	574.90	287.88	14.49	-1.02	0.000

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-28.63	-2.55	0.00	-311.07	0.00	311.07	4,132.29	2,066.14	8,772.59	4,392.82	0.00	0.00	0.078
5.00	-27.56	-2.52	0.00	-298.30	0.00	298.30	4,073.39	2,036.69	8,449.37	4,230.97	0.01	-0.02	0.077
10.00	-26.52	-2.49	0.00	-285.68	0.00	285.68	4,012.85	2,006.43	8,128.58	4,070.33	0.04	-0.04	0.077
15.00	-25.49	-2.44	0.00	-273.24	0.00	273.24	3,950.68	1,975.34	7,810.43	3,911.02	0.10	-0.06	0.076
20.00	-24.49	-2.40	0.00	-261.02	0.00	261.02	3,886.87	1,943.43	7,495.19	3,753.17	0.18	-0.09	0.076
25.00	-23.50	-2.36	0.00	-249.02	0.00	249.02	3,821.43	1,910.71	7,183.08	3,596.88	0.28	-0.11	0.075
30.00	-22.54	-2.31	0.00	-237.24	0.00	237.24	3,754.35	1,877.17	6,874.35	3,442.28	0.41	-0.13	0.075
35.00	-21.60	-2.26	0.00	-225.69	0.00	225.69	3,685.64	1,842.82	6,569.23	3,289.50	0.57	-0.16	0.074
40.00	-20.67	-2.22	0.00	-214.38	0.00	214.38	3,615.29	1,807.64	6,267.96	3,138.64	0.75	-0.18	0.074
45.00	-20.13	-2.19	0.00	-203.30	0.00	203.30	3,543.30	1,771.65	5,970.78	2,989.83	0.95	-0.21	0.074
48.00	-19.53	-2.16	0.00	-196.72	0.00	196.72	3,499.33	1,749.66	5,794.53	2,901.57	1.09	-0.23	0.073
50.00	-18.58	-2.10	0.00	-192.41	0.00	192.41	3,469.68	1,734.84	5,677.92	2,843.18	1.19	-0.24	0.073
53.25	-18.31	-2.09	0.00	-185.57	0.00	185.57	2,730.90	1,365.45	4,467.29	2,236.97	1.36	-0.26	0.090
55.00	-17.55	-2.05	0.00	-181.91	0.00	181.91	2,712.29	1,356.15	4,390.67	2,198.60	1.46	-0.27	0.089
60.00	-16.80	-2.03	0.00	-171.64	0.00	171.64	2,658.02	1,329.01	4,173.50	2,089.85	1.75	-0.30	0.088
65.00	-16.08	-2.01	0.00	-161.51	0.00	161.51	2,602.11	1,301.05	3,959.12	1,982.50	2.08	-0.33	0.088
70.00	-15.37	-2.00	0.00	-151.48	0.00	151.48	2,544.56	1,272.28	3,747.77	1,876.67	2.45	-0.37	0.087
75.00	-14.67	-2.00	0.00	-141.49	0.00	141.49	2,485.39	1,242.69	3,539.70	1,772.48	2.86	-0.40	0.086
80.00	-14.00	-2.02	0.00	-131.47	0.00	131.47	2,424.57	1,212.29	3,335.13	1,670.04	3.30	-0.44	0.084
85.00	-13.34	-2.05	0.00	-121.35	0.00	121.35	2,362.12	1,181.06	3,134.31	1,569.49	3.78	-0.48	0.083
90.00	-12.70	-2.09	0.00	-111.08	0.00	111.08	2,297.27	1,148.64	2,936.51	1,470.44	4.31	-0.52	0.081
95.00	-12.35	-2.11	0.00	-100.62	0.00	100.62	2,210.70	1,105.35	2,718.30	1,361.17	4.87	-0.56	0.080
97.75	-11.96	-2.14	0.00	-94.81	0.00	94.81	2,163.09	1,081.54	2,601.88	1,302.87	5.20	-0.58	0.078
100.00	-11.70	-2.15	0.00	-90.00	0.00	90.00	2,124.13	1,062.07	2,508.52	1,256.12	5.48	-0.60	0.077
101.50	-11.38	-2.17	0.00	-86.78	0.00	86.78	1,105.19	552.59	1,317.56	659.76	5.67	-0.61	0.142
105.00	-11.29	-2.18	0.00	-79.19	0.00	79.19	1,087.53	543.77	1,259.48	630.68	6.13	-0.64	0.136
106.00	-10.72	-2.20	0.00	-77.01	0.00	77.01	1,082.34	541.17	1,242.93	622.39	6.26	-0.65	0.134
110.00	-10.29	-2.21	0.00	-68.22	0.00	68.22	1,060.92	530.46	1,177.04	589.40	6.83	-0.70	0.125
115.00	-9.99	-2.22	0.00	-57.17	0.00	57.17	1,032.68	516.34	1,095.47	548.55	7.61	-0.76	0.114
117.94	-9.83	-2.22	0.00	-50.66	0.00	50.66	1,015.32	507.66	1,048.03	524.80	8.09	-0.80	0.106
120.00	-9.44	-2.20	0.00	-46.09	0.00	46.09	1,002.79	501.40	1,014.98	508.24	8.44	-0.82	0.100
125.00	-9.37	-2.20	0.00	-35.10	0.00	35.10	971.28	485.64	935.83	468.61	9.33	-0.88	0.085
126.00	-6.91	-1.97	0.00	-32.90	0.00	32.90	964.78	482.39	920.18	460.77	9.51	-0.89	0.079
130.00	-6.58	-1.92	0.00	-25.04	0.00	25.04	938.12	469.06	858.24	429.76	10.27	-0.92	0.065
135.00	-6.52	-1.91	0.00	-15.44	0.00	15.44	903.33	451.67	782.47	391.82	11.26	-0.95	0.047
136.00	-4.63	-1.52	0.00	-13.53	0.00	13.53	896.18	448.09	767.56	384.35	11.46	-0.96	0.040
140.00	-4.53	-1.49	0.00	-7.46	0.00	7.46	866.91	433.46	708.75	354.90	12.27	-0.98	0.026
142.00	-1.68	-0.67	0.00	-4.47	0.00	4.47	851.88	425.94	679.88	340.45	12.68	-0.98	0.015
145.00	-1.53	-0.62	0.00	-2.47	0.00	2.47	828.85	414.43	637.31	319.13	13.30	-0.99	0.010
149.00	0.00	-0.59	0.00	0.00	0.00	0.00	787.55	393.77	574.90	287.88	14.13	-0.99	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	22.52	0.00	41.21	0.00	0.00	2569.75	101.50	0.87
0.9D + 1.6W	22.50	0.00	30.90	0.00	0.00	2532.77	101.50	0.84
1.2D + 1.0Di + 1.0Wi	6.48	0.00	64.89	0.00	0.00	749.88	101.50	0.28
(1.2 + 0.2Sds) * DL + E ELFM	1.34	0.00	41.29	0.00	0.00	172.61	101.50	0.07
(1.2 + 0.2Sds) * DL + E EMAM	2.56	0.00	41.29	0.00	0.00	317.11	101.50	0.15
(0.9 - 0.2Sds) * DL + E ELFM	1.34	0.00	28.63	0.00	0.00	169.52	101.50	0.07
(0.9 - 0.2Sds) * DL + E EMAM	2.55	0.00	28.63	0.00	0.00	311.07	101.50	0.14
1.0D + 1.0W	5.38	0.00	34.37	0.00	0.00	609.53	101.50	0.21

Base Plate & Anchor Rod Analysis

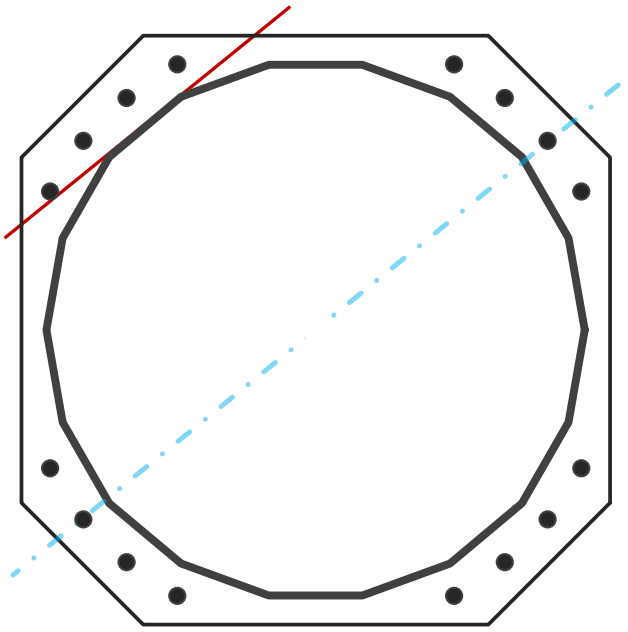
Pole Dimensions		
Number of Sides	18	-
Diameter	52.01	in
Thickness	0.375	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	2569.8	k-ft
Axial, Pu	41.2	k
Shear, Vu	22.5	k
Neutral Axis	39	°

Report Capacities		
Component	Capacity	Result
Base Plate	42%	Pass
Anchor Rods	51%	Pass
Dwyidag	-	-

Base Plate		
Shape	Square	-
Width	58	in
Thickness	2 3/4	in
Grade	Other	-
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	80	ksi
Clip	12	in
Orientation Offset	0	°
Anchor Rod Detail	d	η=0.5
Clear Distance	3	in
Applied Moment, Mu	1282.9	k
Bending Stress, ϕMn	3038.8	k

Original Anchor Rods		
Arrangement	Cluster	-
Quantity	16	-
Diameter, ø	2 1/4	in
Bolt Circle	59	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset	0	°
Applied Force, Pu	133.2	k
Anchor Rods, ϕPn	259.8	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	22.5	2569.8	1.00
Anchor Rod Forces	22.5	2569.8	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	60.5227	3.3624	0.1582		20173.34
Bolt	3.9761	3.2477	0.8393	4.5	22623.84
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate		
Shape	Square	-
Width, W	58	in
Thickness, t	2.75	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	80	ksi
Base Plate Chord	25.670	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	3	-

Anchor Rods		
Anchor Rod Quantity, N	16	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	59	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	133.2	k
Applied Shear, Vu	0.0	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.513	OK
Interaction Capacity	0.513	OK

External Base Plate		
Chord Length AA	29.764	in
Additional AA	0.000	in
Section Modulus, Z	56.273	in^3
Applied Moment, Mu	1282.9	k-ft
Bending Capacity, ϕMn	3038.8	k-ft
Capacity, Mu/ϕMn	0.422	OK
Chord Length AB	28.958	in
Additional AB	0.000	in
Section Modulus, Z	54.749	in^3
Applied Moment, Mu	1074.7	k-ft
Bending Capacity, ϕMn	2956.5	k-ft
Capacity, Mu/ϕMn	0.364	OK
Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in^3
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

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		

VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: WEST HAVEN & RT 162 CT
ATC SITE NUMBER: 243036
T-MOBILE SITE ID: CT11821E
SITE ADDRESS: 668 JONES HILL ROAD
WEST HAVEN, CT 06516

LOCATION MAP

T-MOBILE ANTENNA AMENDMENT
67D94DB CONFIGURATION

COMPLIANCE CODE

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

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

UTILITY COMPANIES

POWER COMPANY: UNITED ILLUMINATING
PHONE: (203) 499-3333

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

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

PROJECT SUMMARY

SITE ADDRESS:

668 JONES HILL ROAD
WEST HAVEN, CT 06516
COUNTY: NEW HAVEN

GEOGRAPHIC COORDINATES:

LATITUDE: 41.25640278

LONGITUDE: -72.97236111

GROUND ELEVATION: 135' 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:

NEWKIRK ROBERT E
668 JONES HILL RD
WEST HAVEN, CT 06516

APPLICANT:

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

CARRIER CONTACT:

ANDREW WISSEL
(443) 562-4397

PROJECT DESCRIPTION

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

REMOVE (3) PANELS AND (3) RRUs

INSTALL (6) NEW PANELS, (3) RRUs, (1) 1.25" 6X12 HYBRID CABLE AND HANDRAIL KIT

EXISTING (3) PANELS, (6) TTAs, (12) 1-5/8" COAX CABLES AND (1) 1.25" 6X12 HYBRID CABLE 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 BOSTON, MA:

TAKE I 95 SOUTH INTO CT AND FOLLOW TO EXIT # 42 . TAKE RIGHT ONTO RT 162 AND FOLLOW INTO WEST HAVEN - STAY ON RT 162 AND FOLLOW TO 668 JOHNS HILL ROAD

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	0	11/01/18	JMB
G-002	GENERAL NOTES	0	11/01/18	JMB
C-101	DETAILED SITE PLAN & TOWER ELEVATION	0	11/01/18	JMB
C-501	ANTENNA INFORMATION & SCHEDULE	0	11/01/18	JMB
E-501	GROUNDING DETAILS	0	11/01/18	JMB
R-601	SUPPLEMENTAL			
R-602	SUPPLEMENTAL			

AMERICAN TOWER®
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SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	JMB	11/01/18

ATC SITE NUMBER:
243036

ATC SITE NAME:
WEST HAVEN & RT 162 CT

SITE ADDRESS:
668 JONES HILL ROAD
WEST HAVEN, CT 06516

SEAL:

Authorized by "EOR"
Nov 2 2018 8:45 AM cosign

T-Mobile

DRAWN BY:	JMB
APPROVED BY:	KRF
DATE DRAWN:	11/01/18
ATC JOB NO:	12623597

TITLE SHEET

SHEET NUMBER: G-001

REVISION: 0

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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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	JMB	11/01/18

ATC SITE NUMBER:
243036

ATC SITE NAME:
WEST HAVEN & RT 162 CT

SITE ADDRESS:
668 JONES HILL ROAD
WEST HAVEN, CT 06516

SEAL:

Authorized by "EOR"
Nov 2 2018 8:45 AM cosign

T-Mobile

DRAWN BY:	JMB
APPROVED BY:	KRF
DATE DRAWN:	11/01/18
ATC JOB NO:	12623597

GENERAL NOTES

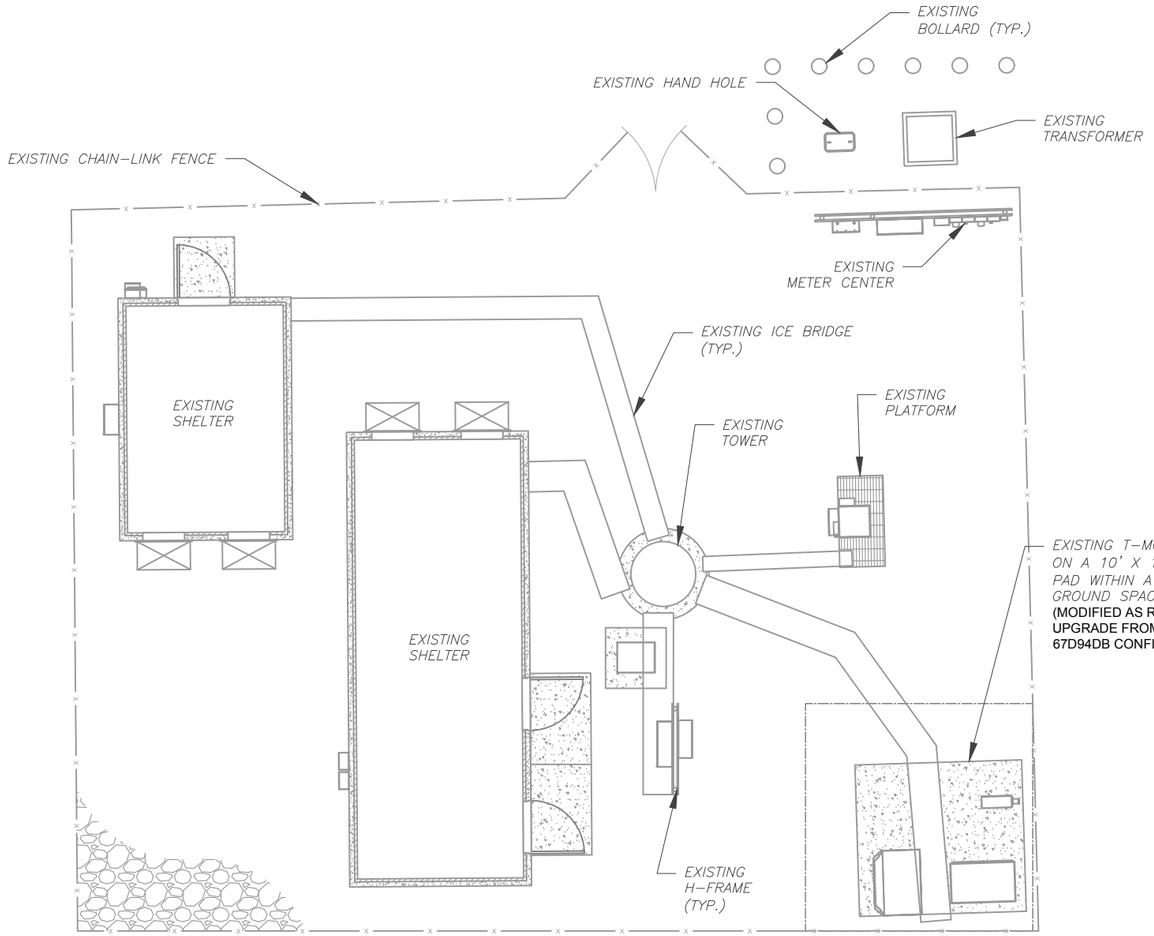
SHEET NUMBER:	REVISION:
G-002	0

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.

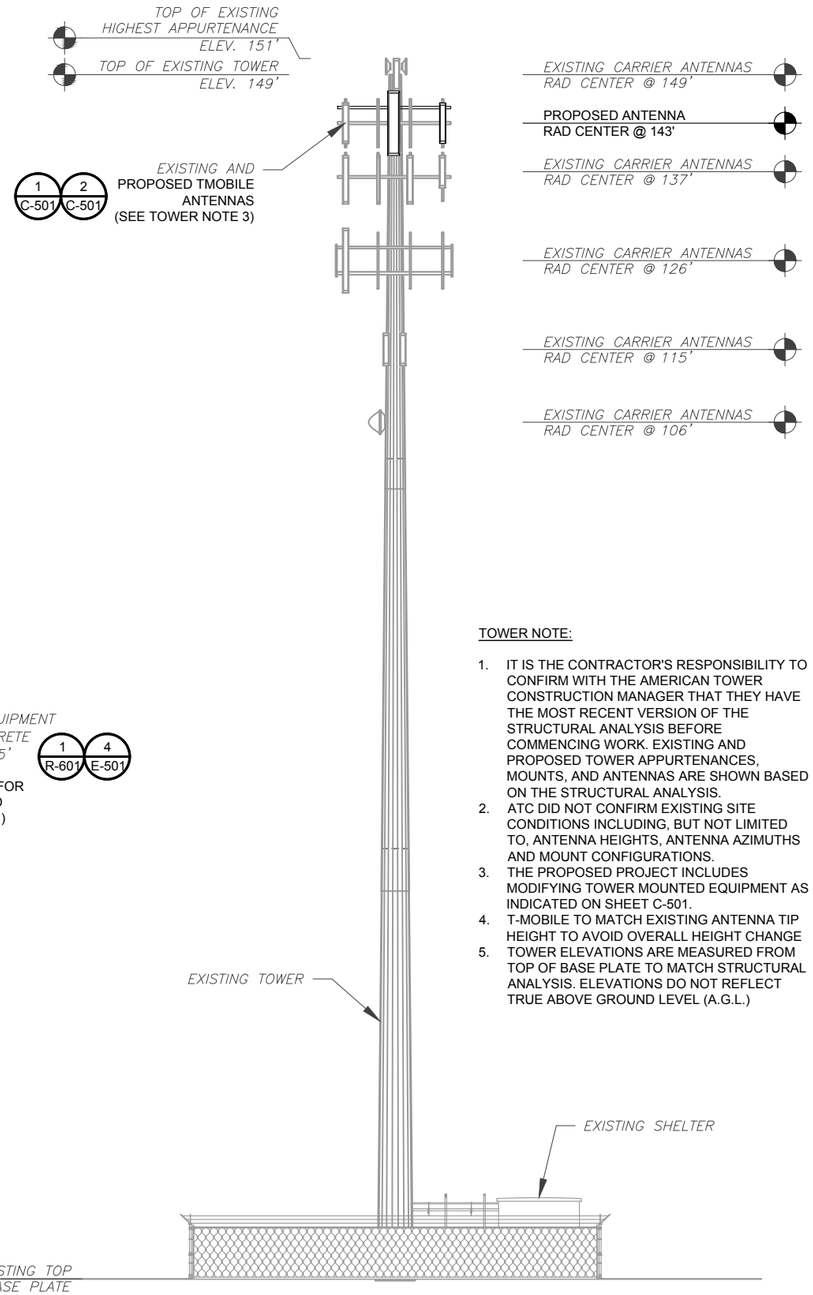
3. THIS PROJECT INCLUDES NO INSTALL OR MODIFICATION AT GRADE.



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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243036

ATC SITE NAME:
WEST HAVEN & RT 162 CT

SITE ADDRESS:
668 JONES HILL ROAD
WEST HAVEN, CT 06516

SEAL:

STATE OF CONNECTICUT
PATRICK P. BARRY
28959
LICENSED
PROFESSIONAL ENGINEER

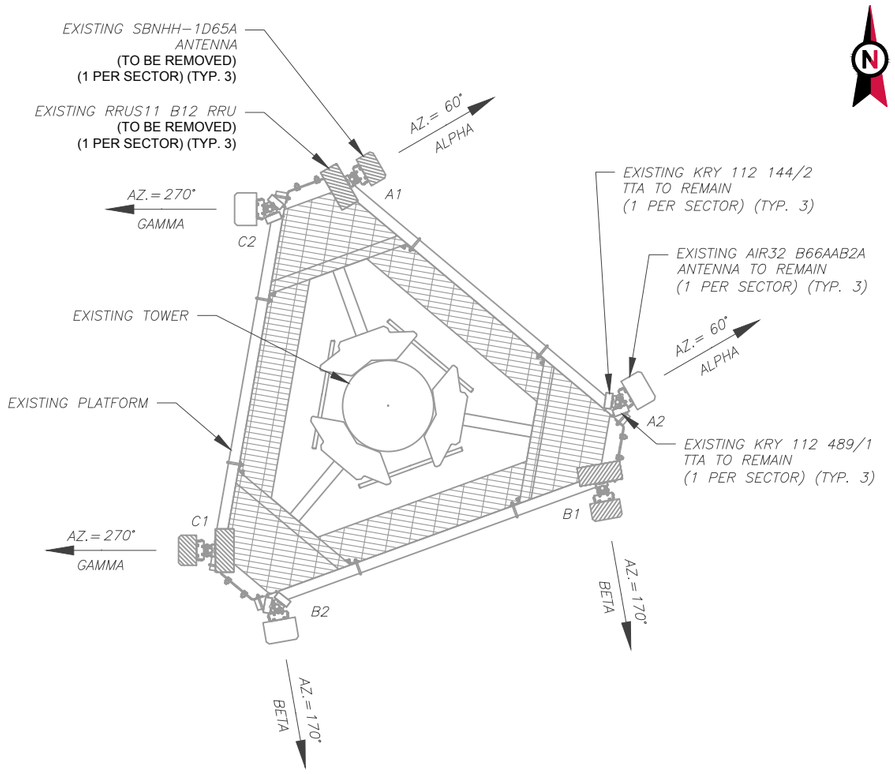
Authorized by "EOR"
Nov 2 2018 8:45 AM cosign

T-Mobile

DRAWN BY:	JMB
APPROVED BY:	KRF
DATE DRAWN:	11/01/18
ATC JOB NO:	12623597

DETAILED SITE PLAN & TOWER ELEVATION

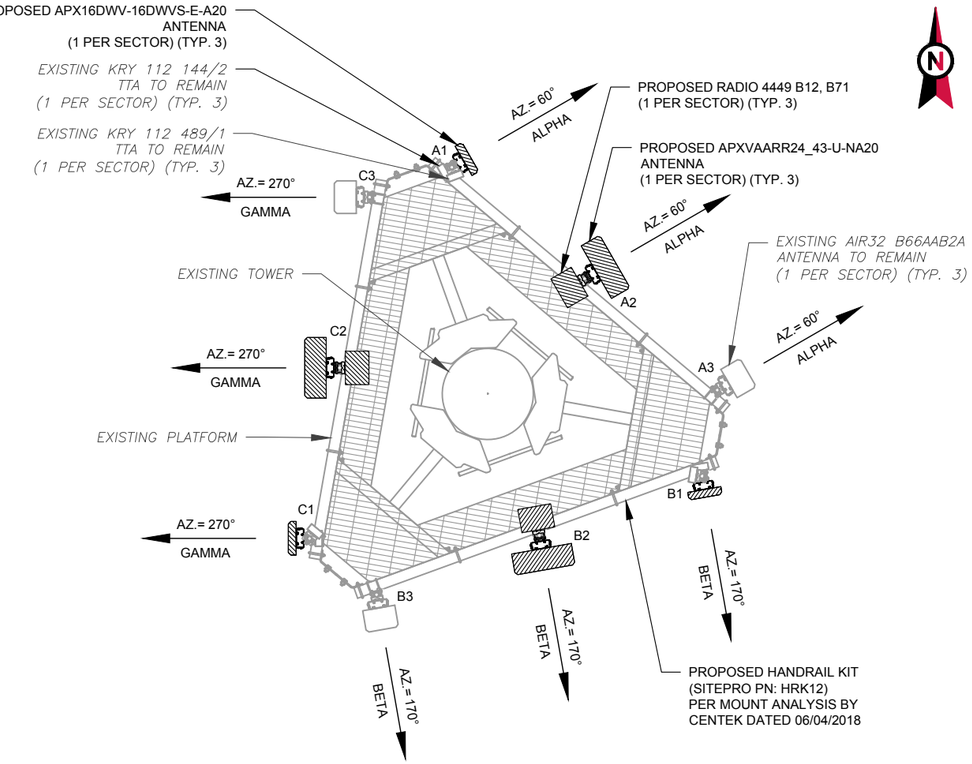
SHEET NUMBER:	REVISION:
C-101	0



1 EXISTING ANTENNA PLAN

NOTES:

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



2 FINAL ANTENNA PLAN

NOTES:

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

EXISTING ANTENNA/ COAX SCHEDULE

SECTOR	ANT.	MANUFACTURER (MODEL #)	RAD CENTER	AZIMUTH (TN)	MECH. D-TILT	ELEC. D-TILT	ADDITIONAL TOWER MOUNTED EQUIPMENT	ANTENNA COAX DESCRIPTION
ALPHA	A1	SBNHH-1D65A	143'-0"	60°	0°	2°	RRUS11 B12 KRY 112 144/2 KRY 112 489/1	(4) 1-5/8"
ALPHA	A2	AIR32 B66AAB2A	143'-0"	60°	0°	2°	-	SEE NOTE 1
BETA	B1	SBNHH-1D65A	143'-0"	170°	0°	2°	RRUS11 B12 KRY 112 144/2 KRY 112 489/1	-
BETA	B2	AIR32 B66AAB2A	143'-0"	170°	0°	2°	-	SEE NOTE 1
GAMMA	C1	SBNHH-1D65A	143'-0"	270°	0°	2°	RRUS11 B12 KRY 112 144/2 KRY 112 489/1	(4) 1-5/8"
GAMMA	C2	AIR32 B66AAB2A	143'-0"	270°	0°	2°	-	SEE NOTE 1

1. (1) EXISTING 1.25" 6X12 HYBRID CABLE TO REMAIN

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	APX16DWV-16DWVS-E-A20	143'-0"	60°	0°	2°	KRY 112 489/1 KRY 112 144/2	(4) 1-5/8"
ALPHA	A2	APXVAARR24_43-U-NA20	143'-0"	60°	0°	2°	RADIO 4449 B12, B71	SEE NOTE 2
ALPHA	A3	AIR32 B66AAB2A	143'-0"	60°	0°	2°	-	
BETA	B1	APX16DWV-16DWVS-E-A20	143'-0"	170°	0°	2°	KRY 112 489/1 KRY 112 144/2	(4) 1-5/8"
BETA	B2	APXVAARR24_43-U-NA20	143'-0"	170°	0°	2°	RADIO 4449 B12, B71	SEE NOTE 2
BETA	B3	AIR32 B66AAB2A	143'-0"	170°	0°	2°	-	
GAMMA	C1	APX16DWV-16DWVS-E-A20	143'-0"	270°	0°	2°	KRY 112 489/1 KRY 112 144/2	(4) 1-5/8"
GAMMA	C2	APXVAARR24_43-U-NA20	143'-0"	270°	0°	2°	RADIO 4449 B12, B71	SEE NOTE 2
GAMMA	C3	AIR32 B66AAB2A	143'-0"	270°	0°	2°	-	

1. BASED ON APPROVED ATC APPLICATION 12605172, DATED 10-10-2018. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS.
2. (2) PROPOSED 1.25" 6X12 HYBRID CABLES (200'±)
3. (1) EXISTING 1.25" 6X12 HYBRID CABLE TO REMAIN

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	JMB	11/01/18

ATC SITE NUMBER:
243036

ATC SITE NAME:
WEST HAVEN & RT 162 CT

SITE ADDRESS:
668 JONES HILL ROAD
WEST HAVEN, CT 06516

SEAL:

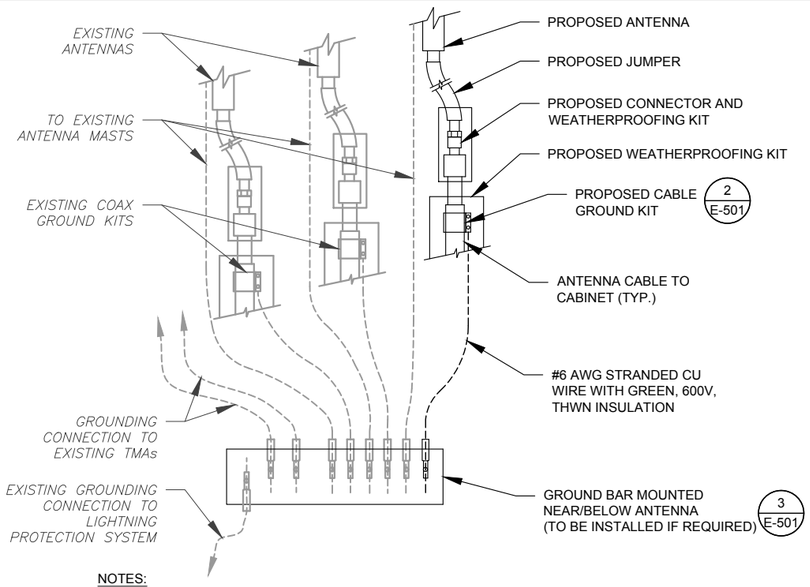
Authorized by "EOR"
Nov 2 2018 8:45 AM cosign

T-Mobile

DRAWN BY:	JMB
APPROVED BY:	KRF
DATE DRAWN:	11/01/18
ATC JOB NO:	12623597

ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-501	0

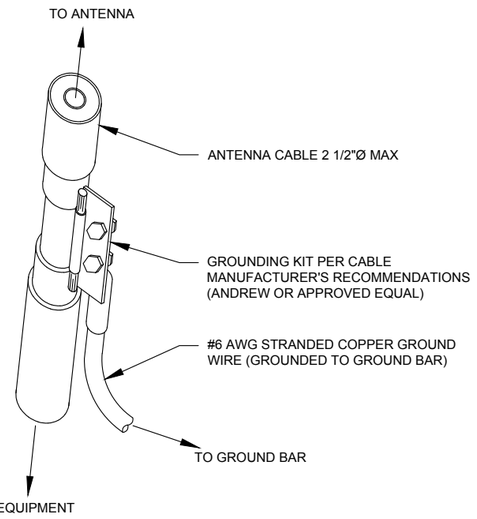


NOTES:

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

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: NOT TO SCALE

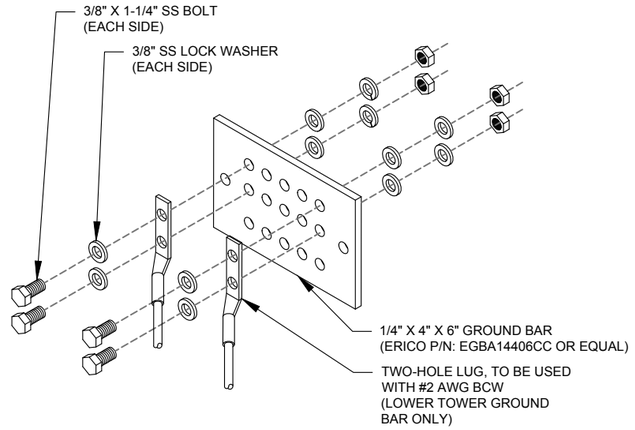


GROUND KIT NOTES:

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

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: NOT TO SCALE



GROUND BAR NOTES:

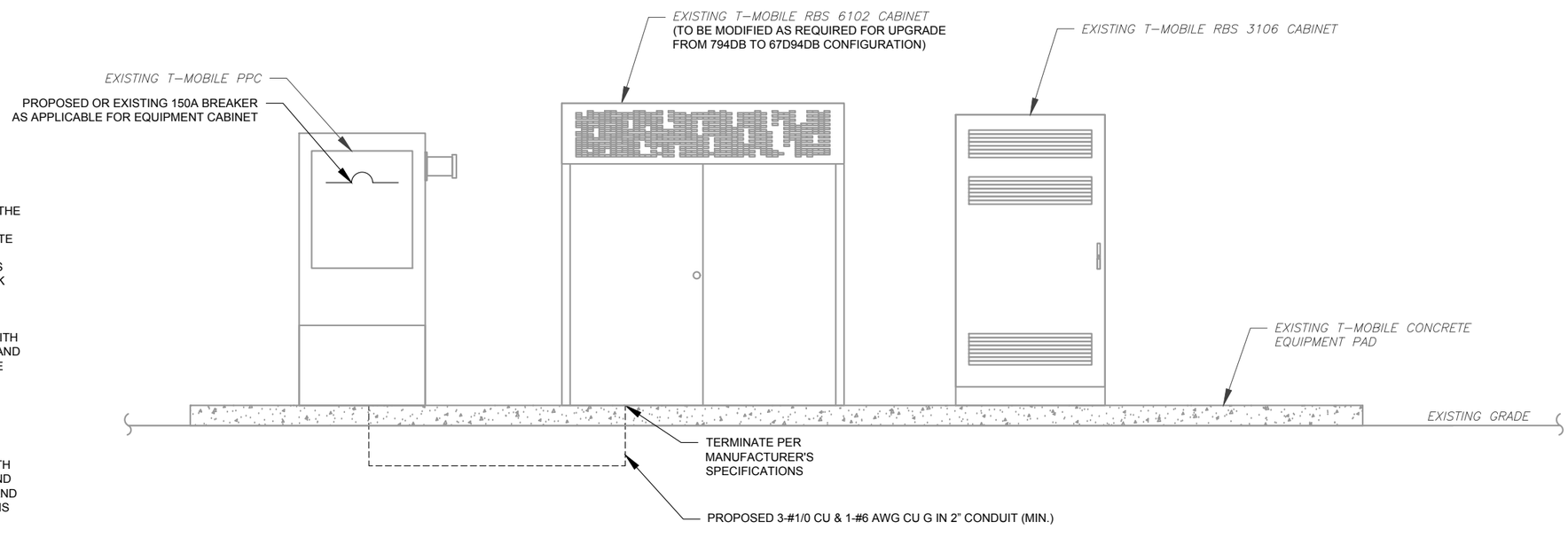
1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

3 TOWER GROUND BAR DETAIL

SCALE: NOT TO SCALE

ELECTRICAL NOTES:

1. THIS DIAGRAM 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. 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.
3. ATC HAS NOT YET VERIFIED ANY EXISTING T-MOBILE GROUND EQUIPMENT OR ELECTRICAL LOADING. PROPOSED WORK BASED ON INSTALLATION CONFIGURATION PROVIDED BY T-MOBILE. CONTRACTOR TO VERIFY EXISTING T-MOBILE PANEL HAS SUFFICIENT SPACE FOR PROPOSED BREAKER.



4 ELECTRICAL UPGRADE DIAGRAM

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	JMB	11/01/18

ATC SITE NUMBER:
243036

ATC SITE NAME:
WEST HAVEN & RT 162 CT

SITE ADDRESS:
668 JONES HILL ROAD
WEST HAVEN, CT 06516

SEAL:

Authorized by "EOR"
Nov 2 2018 8:45 AM cosign

T-Mobile

DRAWN BY:	JMB
APPROVED BY:	KRF
DATE DRAWN:	11/01/18
ATC JOB NO:	12623597

GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-501	0

5/8/2018 CT11821E_L600_2.1_draft_2018-05-08

RAN Template:	A&L Template:	Power System Template:
67D94DB Hybrid (evolved from 4B)	67D94DB_1xAIR+1QP+1OP	Custom

CT11821E_L600_2.1_draft

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 794DB Outdoor (evolved from 4A)

Enclosure	1	2	3
Enclosure Type	RBS 6102	RBS 3106	Ancillary Equipment
Baseband	DUS41 (x2), DUW30, DUG20	DUW30 U2100	
Hybrid Cable System			Ericsson 6x12 HCS "Select Length & AWG" (x2)
Multiplexer	XMU		
Radio	RUS01 B2 (x3) G1900; RUS01 B2 (x3) U1900	RU22 (x6)	

Proposed RAN Equipment

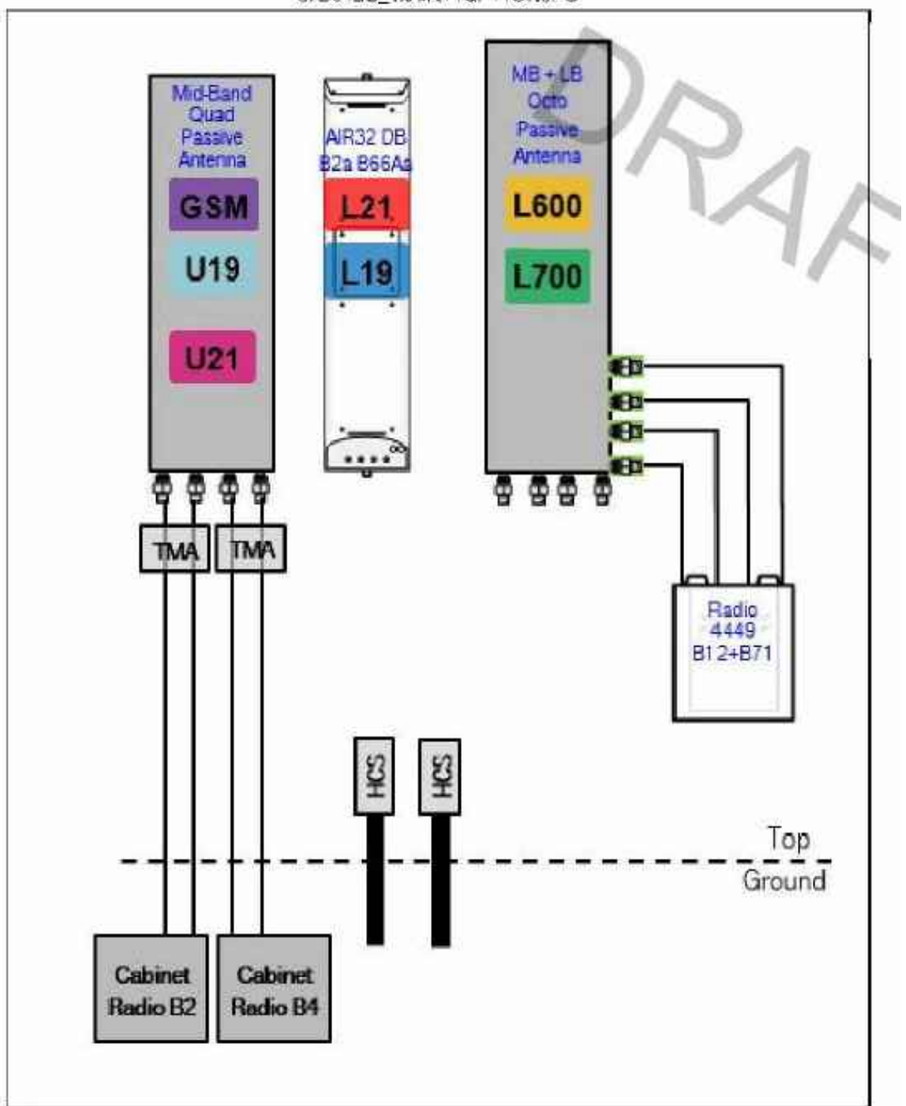
Template: 67D94DB Hybrid (evolved from 4B)

Enclosure	1	2	3
Enclosure Type	RBS 6102	Ancillary Equipment	RBS 3106
Baseband	BB 5216 L2100, L1900, L700, L600; DUW30 U1900; DUG20 G1900	DUW30 U2100	
Hybrid Cable System		Ericsson 6x12 HCS "Select Length & AWG" (x3)	
Multiplexer	XMU		
Radio	RUS01 B2 (x3) G1900; RUS01 B2 (x3) U1900	RU22 (x6) U2100	

RAN Scope of Work:

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE

67D94DB_1xAIR+1QP+1OP.JPG



Notes:

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

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

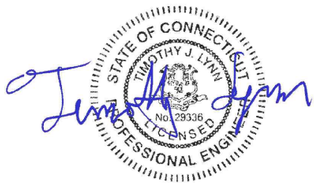
T-Mobile Site #: CT11821E

668 Jones Hill Road
West Haven, CT 06516

Centek Project No. 18058.41

Date: June 4, 2018

Max Stress Ratio = 63.3%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

CENTEK engineering

Centered on Solutions℠

June 4, 2018

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11821E
668 Jones Hill Road
West Haven, CT 06516

Centek Project No. 18058.41

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) 12-ft platform 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:**
  Platform: Three (3) Ericsson AIR32 panel antennas, three (3) RFS APX16DWV-16DWVS-E-A20 panel antennas, three (3) RFS APXVAARR24-43-NA20 panel antennas, six (6) KRY112 TMAs and three (3) Ericsson 4449 B71_B12 remote radio units mounted on one (1) proposed low profile platform with a RAD center elevation of 143-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 97 mph for West Haven 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 **existing antenna platform is structurally inadequate to support the proposed antenna configuration. Installation of one (1) SitePro handrail (p/n HRK12) is required.** If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

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

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-602	0