Aaron Meyers, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (774) 420-4202
ameyers@clinellc.com

DATE May 10, 2018

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

RE: Notice of Exempt Modification // Site Number: CT2012
15 Dwight Street, North Haven. CT 06473 (Site Name: North Haven)
N 41.20800 // W -72.848800

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains nine (9) antennas at the 153-foot level of the existing 150-foot Monopole tower at 15 Dwight Street, North Haven, CT. The tower is owned by American Tower Corp.. The property is owned by 15 Dwight Street, LLC. AT&T now intends to swap three (3) antennas and (3) TMAs for its LTE upgrade. As well as add (3) Remote Radio Units, (1) Surge Arrestor, and (6) RETs. This equipment will be installed at the 153-foot level of the tower. AT&T also intends to remove three (3) additional TMAs.

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 Michael Freda, First Selectman of North Haven, CT, as well as the tower owner, American Tower Corp. and the ground owner, Neil F Carrano.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

Attached to accommodate this filing are construction drawings dated March 16, 2018 by Dewberry Engineers Inc., a structural analysis dated March 1, 2018 by American Tower Corporation and an Emissions Analysis Report dated February 27, 2018 by Centerline Communications, LLC.

1. The proposed modifications 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 modifications 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 as shown in the attached structural analysis by American Tower Corporation, dated February 1, 2018

For the foregoing reasons, AT&T 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,

_____

Aaron Meyers, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (774) 420-4202
ameyers@centerlincommunications.com

Attachments

cc: Michael Freda - as elected official
American Tower Corp. - as tower owner
Neil F Carrano - as property owner

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2012
FA#: 10034972

North Haven_Dwight Street
12 Dwight Street
North Haven, CT 06473

February 27, 2018

Centerline Communications Project Number: 950012-033

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**6.75 %**

February 27, 2018

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2012 – North Haven_Dwight Street**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **12 Dwight Street, North Haven, CT**, for the purpose of determining whether the emissions from the Proposed AT&T 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.

Population 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 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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 performed for the proposed AT&T Wireless antenna facility located at **12 Dwight Street, North Haven, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	1	30
LTE	2300 MHz (WCS)	4	30
LTE	700 MHz (Band 14)	4	40
LTE	700 MHz	2	40
LTE	1900 MHz (PCS)	4	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	153
A	2	Quintel QS66512-2	153
A	3	CCI OPA-65R-LCUU-H6	153
B	1	Powerwave 7770	153
B	2	Quintel QS66512-2	153
B	3	CCI OPA-65R-LCUU-H6	153
C	1	Powerwave 7770	153
C	2	Quintel QS66512-2	153
C	3	CCI OPA-65R-LCUU-H6	153

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz	11.4	1	30	414.12	0.12
Antenna A2	Quintel QS66512-2	2300 MHz (WCS) / 700 MHz (Band 14)	14.85 / 10.85	8	280	5,611.80	1.30
Antenna A3	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	6	240	6,057.62	1.23
						Sector A Composite MPE%	**2.65**
Antenna B1	Powerwave 7770	850 MHz	11.4	1	30	414.12	0.12
Antenna B2	Quintel QS66512-2	2300 MHz (WCS) / 700 MHz (Band 14)	14.85 / 10.85	8	280	5,611.80	1.30
Antenna B3	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	6	240	6,057.62	1.23
						Sector B Composite MPE%	**2.65**
Antenna C1	Powerwave 7770	850 MHz	11.4	1	30	414.12	0.12
Antenna C2	Quintel QS66512-2	2300 MHz (WCS) / 700 MHz (Band 14)	14.85 / 10.85	8	280	5,611.80	1.30
Antenna C3	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	6	240	6,057.62	1.23
						Sector C Composite MPE%	**2.65**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**2.65 %**
Clearwire	0.09 %
Verizon Wireless	4.01 %
Site Total MPE %:	**6.75 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	2.65 %
AT&T Sector B Total:	2.65 %
AT&T Sector C Total:	2.65 %
Site Total:	6.75 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS (Antenna 1)	1	414.12	153	0.69	850 MHz	567	0.12%
AT&T 2300 MHz (WCS) LTE (Antenna 2)	4	916.48	153	6.10	2300 MHz (WCS)	1000	0.61%
AT&T 700 MHz LTE – Band 14 (Antenna 2)	4	486.47	153	3.24	700 MHz	467	0.69%
AT&T 700 MHz LTE (Antenna 3)	2	584.87	153	1.95	700 MHz	467	0.42%
AT&T 1900 MHz (PCS) LTE (Antenna 3)	4	1,221.97	153	8.13	1900 MHz (PCS)	1000	0.81%
						Total:	**2.65%**

Table 6: AT&T Maximum Sector MPE Power Values

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 AT&T 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:

AT&T Sector	Power Density Value (%)
Sector A:	2.65 %
Sector B:	2.65 %
Sector C:	2.65 %
AT&T Maximum Total (per sector):	2.65 %
Site Total:	6.75 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.75 %** 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.

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

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Structural Analysis Report

Structure	:	**150 ft Monopole**
ATC Site Name	:	**North Haven CT 1, CT**
ATC Site Number	:	**302482**
Engineering Number	:	**OAA708185_C3_02**
Proposed Carrier	:	**Verizon Wireless**
Carrier Site Name	:	**North Haven 2**
Carrier Site Number	:	**-**
Site Location	:	**15 Dewight Street** **North Haven, CT 06473-1198** **41.420800,-72.848800**
County	:	**New Haven**
Date	:	**March 1, 2018**
Max Usage	:	**96%**
Result	:	**Pass**

Prepared By:
Aaron Black
Structural Engineer II

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32590
LICENSED
PROFESSIONAL ENGINEER

Mar 1 2018 5:42 PM cosign

COA: PEC.0001553

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Table of Contents

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 150 ft monopole to reflect the change in loading by Verizon Wireless.

Supporting Documents

Tower Drawings	ITT Meyer, Type "B", Spec. AT-8935, dated April 13, 1984
Foundation Drawing	Southern New England Telephone Job #3C032, dated September 18, 1984
Geotechnical Report	S&ME Job #1261-08-049O, dated April 24, 2008
Modifications	Spectrasite Communications File #CT-0018-M1, Rev. 4, dated October 15, 2002 ATC Project #41732832, dated June 30, 2008 ATC Project #43874133, dated September 1, 2009 ATC Project #60261734, dated January 19, 2015

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 = 0.18, 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					
150.0	153.0	6	Powerwave 7020.00 Dual Band RET	Platform w/ Handrails	(6) 1 1/4" Coax (4) 0.78" 8 AWG 6 (2) 0.51" Hybrid	AT&T Mobility
		3	Kaelus DBC0061F1V51-2			
		6	Powerwave LGP21401			
		2	Raycap DC6-48-60-18-8F			
		3	Ericsson RRUS A2 B2			
		3	Ericsson RRUS 32 (50.8 lbs)			
		3	Ericsson RRUS 11 (Band 7)			
		3	Ericsson RRUS 12			
		3	Powerwave 7770.00			
		3	Quintel QS66512-2			
		3	CCI OPA-65R-LCUU-H6			
142.0	148.0	3	DragonWave Horizon Compact	Side Arms	(6) 5/16" Coax (4) 1 1/4" Hybriflex (3) 1/2" Coax (1) 2" conduit	Clearwire
		1	DragonWave A-ANT-23G-1-C			
		1	DragonWave A-ANT-11G-2-C			
		1	DragonWave A-ANT-11G-2.5-C			
		3	KMW ETCR-654L12H6			
	142.0	6	Alcatel-Lucent RRH2x50-08			
		3	Alcatel-Lucent 1900MHz 4X45 RRH			
		3	Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield			
108.0	108.0	6	RFS FD9R6004/1C-3L	Low Profile Platform	(9) 1 5/8" Coax	Verizon Wireless
		6	RFS FD9R6004/2C-3L			
		3	Commscope HBX-6516DS-VTM			
		3	Commscope LNX-6514DS-VTM			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
108.0	108.0	3	Commscope HBX-6517DS-VTM	-	(3) 1 5/8" Coax	Verizon Wireless
		3	Antel BXA-70063/6CF_			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
108.0	108.0	3	Nokia B5 RRH4x40-850	Low Profile Platform	(2) 1 5/8" Hybriflex	Verizon Wireless
		3	Alcatel-Lucent RRH 2X60-1900			
		3	Alcatel-Lucent RRH2x60 700			
		3	Alcatel-Lucent B66 RRH4x45			
		2	RFS DB-T1-6Z-8AB-0Z			
		6	Commscope JAHH-65B-R3B			

[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	88%	Pass
Shaft	85%	Pass
Base Plate	62%	Pass
Flanges	22%	Pass
Reinforcement	87%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,739.8	96%
Axial (Kips)	38.1	68%
Shear (Kips)	27.2	30%

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

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
142.0	DragonWave A-ANT-23G-1-C	Clearwire	2.372	1.936
	DragonWave A-ANT-11G-2-C			
	DragonWave A-ANT-11G-2.5-C			
108.0	Nokia B5 RRH4x40-850	Verizon Wireless	1.401	1.398
	Alcatel-Lucent RRH 2X60-1900			
	Alcatel-Lucent RRH2x60 700			
	Alcatel-Lucent B66 RRH4x45			
	RFS DB-T1-6Z-8AB-0Z			
	Commscope JAHH-65B-R3B			

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

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Standard Conditions

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

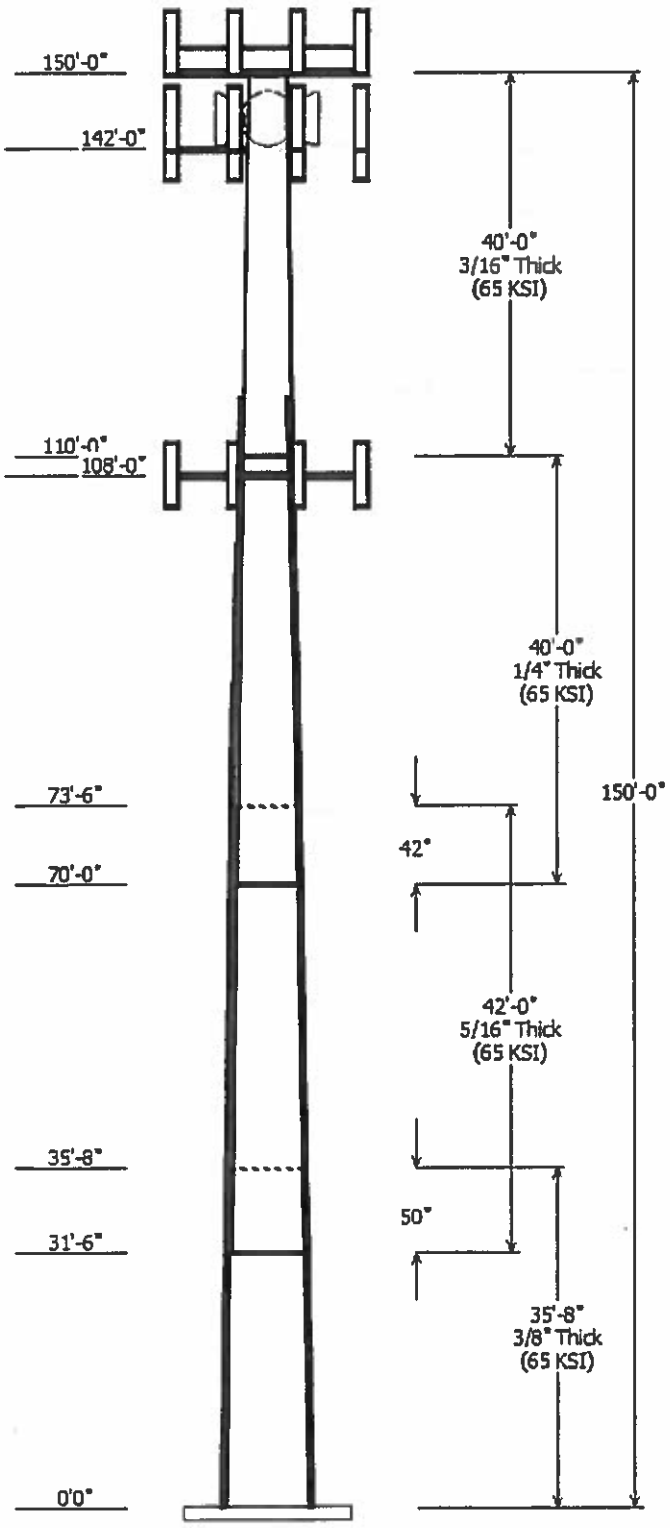
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

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

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

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

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



Job Information

Pole : 302482	Code: ANSI/TIA-222-G
Location : North Haven CT 1, CT	
Description : 150' ITT Meyer Type B Monopole	
Client : VERIZON WIRELESS	Struct Class : II
Shape : 12 Sides	Exposure : B
Height : 150.00 (ft)	Topo : 1
Base Elev (ft): 0.00	
Taper: 0.15666 (in/ft)	

Sections Properties

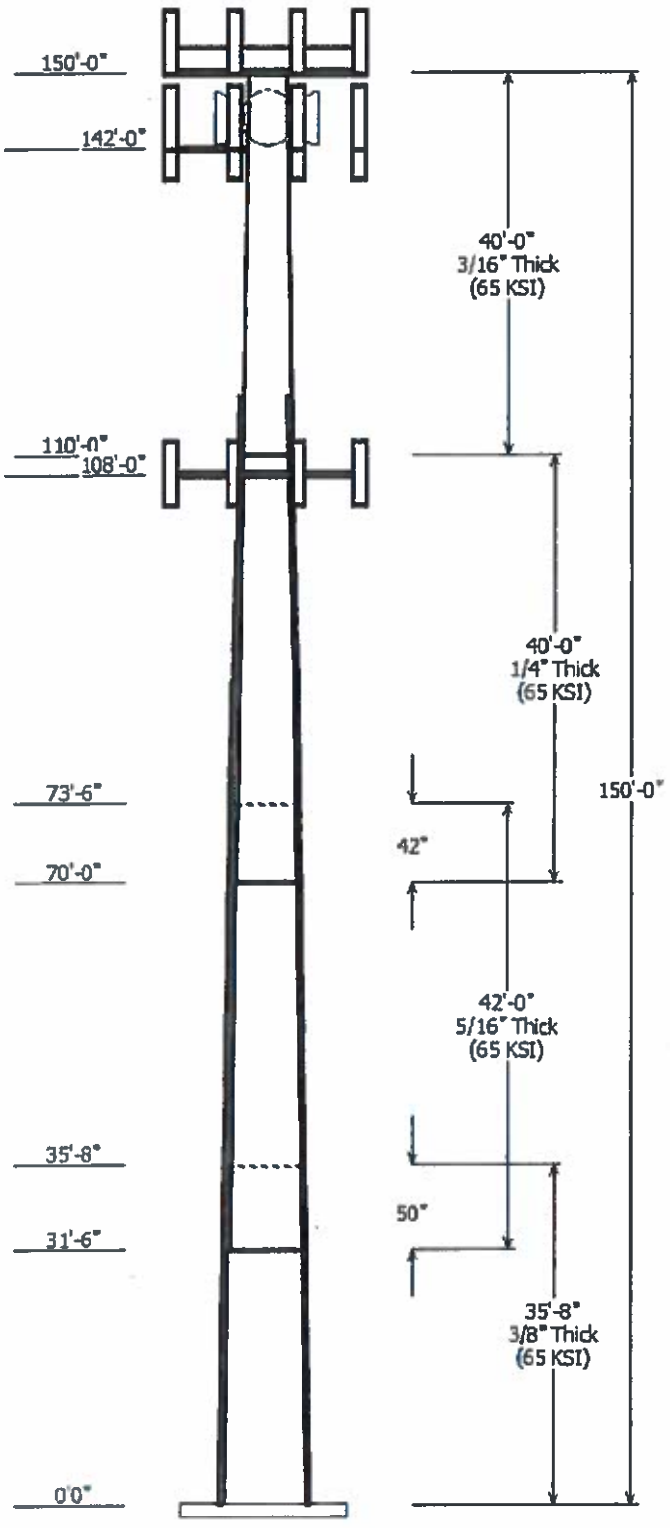
Shaft Section	Length (ft)	Diameter (in) Across Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	35.667	31.78	37.37	0.375		0.000	12 Sides	65
2	42.000	26.48	33.06	0.313	Slip Joint	50.000	12 Sides	65
3	40.000	21.26	27.53	0.250	Slip Joint	42.000	12 Sides	65
4	40.000	15.00	21.26	0.188	Butt Joint	0.000	12 Sides	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
150.000	153.000	3	Quintel QS66512-2
150.000	153.000	3	Ericsson RRUS 32 (50.8 lbs)
150.000	153.000	3	Kaelus DBC0061F1V51-2
150.000	153.000	6	Powerwave Allgon 7020.00
150.000	153.000	1	Raycap DC6-48-60-18-8F
150.000	153.000	3	CCI OPA-65R-LCUU-H6
150.000	153.000	3	Ericsson RRUS 12
150.000	153.000	3	Ericsson RRUS 11 (Band 7)
150.000	153.000	3	Ericsson RRUS A2 B2
150.000	153.000	1	Raycap DC6-48-60-18-8F
150.000	153.000	6	Powerwave LGP21401
150.000	153.000	3	Powerwave Allgon 7770.00
150.000	150.000	1	Round Platform w/ Handrails
142.000	148.000	3	KMW ETCR-654L12H6
142.000	148.000	1	DragonWave A-ANT-11G-2.5-C
142.000	142.000	1	Side Arms
142.000	148.000	1	DragonWave A-ANT-11G-2-C
142.000	142.000	3	Alcatel-Lucent TD-RRH8x20-25
142.000	142.000	3	Alcatel-Lucent 1900 MHz 4X45
142.000	148.000	1	DragonWave A-ANT-23G-1-C
142.000	148.000	3	DragonWave Horizon Compact
142.000	142.000	6	Alcatel-Lucent RRH2x50-08
108.000	108.000	6	RFS FD9R6004/1C-3L
108.000	108.000	6	RFS FD9R6004/2C-3L
108.000	108.000	3	Alcatel-Lucent B66 RRH4x45
108.000	108.000	3	Nokia B5 RRH4x40-850
108.000	108.000	3	Commscope HBX-6516DS-VTM
108.000	108.000	3	Commscope LNX-6514DS-VTM
108.000	108.000	2	RFS DB-T1-6Z-8AB-0Z
108.000	108.000	6	Commscope JAHH-65B-R3B
108.000	108.000	3	Alcatel-Lucent RRH 2X60-1900
108.000	108.000	3	Alcatel-Lucent RRH2x60 700
108.000	108.000	1	Round Low Profile Platform

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
101.0	121.0	Dywidag	Yes
6.000	108.0	1 5/8" Hybriflex	No
5.000	108.0	1 5/8" Coax	No
5.000	142.0	1 1/4" Hybriflex	No



5.000	142.0	1/2" Coax	Yes
5.000	142.0	2" conduit	Yes
5.000	142.0	5/16" (0.31"-	No
5.000	150.0	0.51" (13mm)	Yes
5.000	150.0	0.51" (13mm)	Yes
5.000	150.0	0.78" (19.7mm) 8	Yes
5.000	150.0	0.78" (19.7mm) 8	No
5.000	150.0	1 1/4" Coax	Yes
5.000	150.0	1 1/4" Coax	No
0.000	101.0	Dywidag	Yes

Load Cases

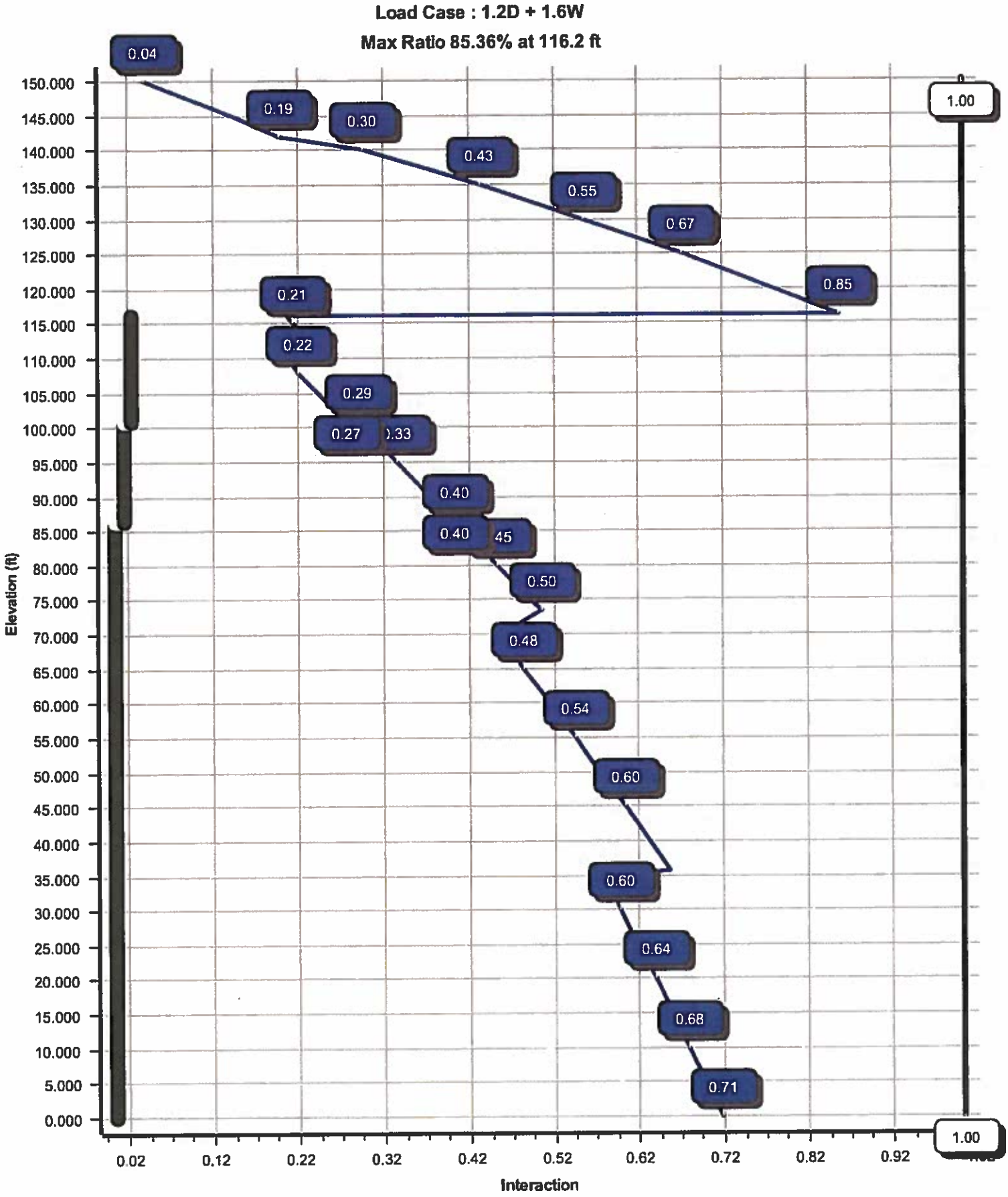
1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) 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	2739.76	27.24	38.08
0.9D + 1.6W	2698.49	27.21	28.54
1.2D + 1.0Di + 1.0Wi	684.93	6.27	62.96
(1.2 + 0.2Sds) * DL + E ELFM	156.66	1.24	38.05
(1.2 + 0.2Sds) * DL + E EMAM	252.08	2.00	38.05
(0.9 - 0.2Sds) * DL + E ELFM	153.60	1.24	26.43
(0.9 - 0.2Sds) * DL + E EMAM	246.71	2.00	26.43
1.0D + 1.0W	649.97	6.51	31.79

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	142.00	28.468	1.936
1.0D + 1.0W	142.00	28.468	1.936
1.0D + 1.0W	142.00	28.468	1.936


Load Case : 1.2D + 1.6W
Max Ratio 85.36% at 116.2 ft
0.04
0.19
0.30
0.43
0.55
0.67
0.85
0.21
0.22
0.29
0.27
0.33
0.40
0.40
45
0.50
0.48
0.54
0.60
0.60
0.64
0.68
0.71
1.00
1.00
150.000
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:	**302482**	**Code: ANSI/TIA-222-G**	
Site Name:	**North Haven CT 1, CT**	**Engineering Number:OAA708185_C3_02**	**3/1/2018 3:33:49 PM**
Customer:	**VERIZON WIRELESS**		

Analysis Parameters

Location :	**NEW HAVEN County, CT**	**Height (ft) :**	**150**
Code :	**ANSI/TIA-222-G**	**Base Diameter (in) :**	**37.38**
Shape :	**12 Sides**	**Top Diameter (in) :**	**15.00**
Pole Type :	**Taper**	**Taper (in/ft) :**	**0.157**
Pole Manfacturer :	**ITT Meyer**	**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):	**2.70**				
T_L (sec):	**6**	**p:**	**1.3**	**C_s:**	**0.030**
S_s:	**0.184**	**S_1:**	**0.062**	**C_s Max:**	**0.030**
F_a:	**1.600**	**F_v:**	**2.400**	**C_s Min:**	**0.030**
S_{ds}:	**0.196**	**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**

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)
1-12	35.667	0.3750	65		0.00	5,013	37.37	0.00	44.68	7806.9	24.03	99.67	31.78	35.67	37.93	4777.2	20.03	84.77	0.156667
2-12	42.000	0.3125	65	Slip	50.00	4,237	33.06	31.50	32.96	4512.6	25.67	105.81	26.48	73.50	26.34	2302.6	20.03	84.75	0.156667
3-12	40.000	0.2500	65	Slip	42.00	2,646	27.53	70.00	21.96	2086.8	26.83	110.13	21.26	110.00	16.92	953.8	20.11	85.07	0.156667
4-12	40.000	0.1875	65	Butt	0.00	1,475	21.26	110.00	12.73	721.8	27.71	113.42	15.00	150.00	8.94	250.5	18.76	80.00	0.156667
				Shaft Weight		13,371													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Distance From Face (ft)	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	Orientation Factor
150.00	CCI OPA-65R-LCUU-H6	3	0.000	3.000	73.00	9.660	0.66
150.00	Ericsson RRUS 11 (Band 7)	3	0.000	3.000	50.70	2.790	0.50
150.00	Ericsson RRUS 12	3	0.000	3.000	50.00	3.150	0.50
150.00	Ericsson RRUS 32 (50.8 lbs)	3	0.000	3.000	50.80	2.690	0.50
150.00	Ericsson RRUS A2 B2	3	0.000	3.000	22.00	2.060	0.50
150.00	Kaelus DBC0061F1V51-2	3	0.000	3.000	25.50	0.510	0.50
150.00	Powerwave Allgon 7020.00 Dual	6	0.000	3.000	2.20	0.400	0.50
150.00	Powerwave Allgon 7770.00	3	0.000	3.000	35.00	5.510	0.65
150.00	Powerwave LGP21401	6	0.000	3.000	14.10	1.100	0.50
150.00	Quintel QS66512-2	3	0.000	3.000	111.00	8.130	0.74
150.00	Raycap DC6-48-60-18-8F	1	0.000	3.000	20.00	1.110	1.00
150.00	Raycap DC6-48-60-18-8F	1	0.000	3.000	20.00	1.110	1.00
150.00	Round Platform w/ Handrails	1	0.000	0.000	2000.00	27.200	1.00
142.00	Alcatel-Lucent 1900 MHz 4X45 R	3	0.000	0.000	60.00	2.320	0.50
142.00	Alcatel-Lucent RRH2x50-08	6	0.000	0.000	52.90	1.700	0.50
142.00	Alcatel-Lucent TD-RRH8x20-25 w	3	0.000	0.000	70.00	4.050	0.50
142.00	DragonWave A-ANT-11G-2-C	1	0.000	6.000	27.00	4.690	0.71
142.00	DragonWave A-ANT-11G-2.5-C	1	0.000	6.000	47.60	8.670	0.98
142.00	DragonWave A-ANT-23G-1-C	1	0.000	6.000	15.00	1.610	0.60
142.00	DragonWave Horizon Compact	3	0.000	6.000	10.60	0.430	0.50
142.00	KMW ETCR-654L12H6	3	0.000	6.000	84.90	15.710	0.61
142.00	Side Arms	1	0.000	0.000	560.00	8.500	1.00
108.00	Alcatel-Lucent B66 RRH4x45	3	0.000	0.000	67.00	2.580	0.50
108.00	Alcatel-Lucent RRH 2X60-1900	3	0.000	0.000	39.60	1.880	0.50
108.00	Alcatel-Lucent RRH2x60 700	3	0.000	0.000	56.70	2.150	0.50
108.00	Commscope HBX-6516DS-VTM	3	0.000	0.000	10.40	3.320	0.68
108.00	Commscope JAHH-65B-R3B	6	0.000	0.000	60.60	9.110	0.69
108.00	Commscope LNX-6514DS-VTM	3	0.000	0.000	38.80	8.170	0.69
108.00	Nokia B5 RRH4x40-850	3	0.000	0.000	48.50	1.320	0.50
108.00	RFS DB-T1-6Z-8AB-0Z	2	0.000	0.000	44.00	4.800	0.50
108.00	RFS FD9R6004/1C-3L	6	0.000	0.000	3.10	0.370	0.50
108.00	RFS FD9R6004/2C-3L	6	0.000	0.000	2.60	0.370	0.50
108.00	Round Low Profile Platform	1	0.000	0.000	1500.00	21.700	1.00
Totals	Num Loadings:33	100			7804.10		

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
5.00	150.00	1	0.51" (13mm) Hybrid	0.51	0.14	N	0.00	Y	AT&T Mobility
5.00	150.00	1	0.51" (13mm) Hybrid	0.51	0.14	N	0.00	Y	AT&T Mobility
5.00	150.00	2	0.78" (19.7mm) 8	0.78	0.59	N	1.56	Y	AT&T Mobility
5.00	150.00	2	0.78" (19.7mm) 8	0.78	0.59	N	0.00	N	AT&T Mobility

5.00	150.00	2	1 1/4" Coax	1.55	0.63	N	3.10	Y	AT&T Mobility
5.00	150.00	4	1 1/4" Coax	1.55	0.63	N	0.00	N	AT&T Mobility
5.00	142.00	4	1 1/4" Hybriflex Cable	1.54	1.00	N	0.00	N	Clearwire
5.00	142.00	3	1/2" Coax	0.63	0.15	N	0.00	Y	Clearwire
5.00	142.00	1	2" conduit	2.38	3.65	N	0.00	Y	Clearwire
5.00	142.00	6	5/16" (0.31"-7.9mm)	0.31	0.05	N	0.00	N	Clearwire
101.00	121.00	3	Dywidag	2.50	0.00	N	1.34	Y	--
5.00	108.00	9	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
6.00	108.00	2	1 5/8" Hybriflex	1.98	1.30	N	0.00	N	Verizon
0.00	101.00	4	Dywidag	2.50	0.00	N	3.34	Y	--

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	— Intermediate Connections — Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	86.44	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	No
86.44	101.0	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	0.00	3.31	5/8" A36 U-Bolt	Yes
101.0	116.2	3	SOL #20 All Thread	80	5.15	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	No

Segment Properties (Max Len : 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)	Additional Reinforcing Area (in^2)	Additional Reinforcing Ix (in^4)	Additional Reinforcing Weight (lb)
0.00		0.3750	37.375	44.678	7,806.9	24.03	99.67	78.5	403.5	0.0	0.0	19.64	4,957	0.0
5.00		0.3750	36.592	43.732	7,321.5	23.47	97.58	79.1	386.5	0.0	752.1	19.64	4,780	334.0
10.00		0.3750	35.808	42.786	6,856.6	22.91	95.49	79.7	369.9	0.0	736.0	19.64	4,606	334.0
15.00		0.3750	35.025	41.840	6,411.8	22.35	93.40	80.3	353.7	0.0	719.9	19.64	4,435	334.0
20.00		0.3750	34.242	40.894	5,986.7	21.79	91.31	81.0	337.8	0.0	703.8	19.64	4,268	334.0
25.00		0.3750	33.458	39.948	5,580.9	21.23	89.22	81.6	322.2	0.0	687.7	19.64	4,104	334.0
30.00		0.3750	32.675	39.002	5,193.7	20.67	87.13	81.9	307.1	0.0	671.6	19.64	3,943	334.0
31.50	Bot - Section 2	0.3750	32.440	38.718	5,081.2	20.50	86.51	81.9	302.6	0.0	198.4	19.64	3,895	100.2
35.00		0.3750	31.892	38.056	4,825.0	20.11	85.04	81.9	292.3	0.0	846.4	19.64	3,910	233.8
35.67	Top - Section 1	0.3125	32.412	32.300	4,248.1	25.11	103.72	77.3	253.2	0.0	159.6	19.64	3,889	44.5
40.00		0.3125	31.733	31.617	3,984.2	24.53	101.55	78.0	242.6	0.0	471.2	19.64	3,753	289.5
45.00		0.3125	30.950	30.829	3,693.6	23.86	99.04	78.7	230.5	0.0	531.2	19.64	3,599	334.0
50.00		0.3125	30.167	30.041	3,417.5	23.19	96.53	79.4	218.9	0.0	517.8	19.64	3,449	334.0
55.00		0.3125	29.383	29.253	3,155.5	22.51	94.03	80.2	207.5	0.0	504.4	19.64	3,301	334.0
60.00		0.3125	28.600	28.464	2,907.2	21.84	91.52	80.9	196.4	0.0	491.0	19.64	3,157	334.0
65.00		0.3125	27.817	27.676	2,672.3	21.17	89.01	81.6	185.6	0.0	477.6	19.64	3,016	334.0
70.00	Bot - Section 3	0.3125	27.033	26.888	2,450.4	20.50	86.51	81.9	175.1	0.0	464.2	19.64	2,878	334.0
73.50	Top - Section 2	0.2500	26.985	21.522	1,963.5	26.24	107.94	76.1	140.6	0.0	575.9	19.64	2,870	233.8
75.00		0.2500	26.750	21.333	1,912.1	25.99	107.00	76.4	138.1	0.0	109.4	19.64	2,829	100.2
80.00		0.2500	25.967	20.702	1,747.5	25.15	103.87	77.3	130.0	0.0	357.6	19.64	2,696	334.0
85.00		0.2500	25.183	20.071	1,592.7	24.31	100.73	78.2	122.2	0.0	346.9	19.64	2,566	334.0
86.44	Reinf. Top Reinf	0.2500	24.958	19.890	1,549.8	24.07	99.83	78.5	120.0	0.0	97.9	19.64	2,529	96.2
90.00		0.2500	24.400	19.441	1,447.2	23.47	97.60	79.1	114.6	0.0	238.2	19.64	2,439	237.8
95.00		0.2500	23.617	18.810	1,310.9	22.63	94.47	80.0	107.2	0.0	325.4	19.64	2,315	334.0
100.0		0.2500	22.833	18.180	1,183.4	21.79	91.33	80.9	100.1	0.0	314.7	19.64	2,195	334.0
101.0	Reinf. Top Reinf	0.2500	22.677	18.053	1,159.0	21.63	90.71	81.1	98.7	0.0	61.6	19.64	2,171	66.8
105.0		0.2500	22.050	17.549	1,064.5	20.95	88.20	81.9	93.3	0.0	242.3	14.73	2,255	200.4
108.0		0.2500	21.580	17.171	997.1	20.45	86.32	81.9	89.3	0.0	177.2	14.73	2,193	150.3
110.0	Top - Section 3	0.2500	21.267	16.918	953.8	20.11	85.07	81.9	86.6	0.0	116.0	14.73	2,152	100.2
110.0	Bot - Section 4	0.1875	21.267	12.727	721.8	27.71	113.42	74.5	65.6	0.0		14.73	2,152	
115.0		0.1875	20.483	12.254	644.3	26.59	109.24	75.7	60.8	0.0	212.5	14.73	2,051	250.5
116.2	Reinf. Top	0.1875	20.294	12.139	626.4	26.32	108.23	76.0	59.6	0.0	50.2	14.73	2,027	60.6
120.0		0.1875	19.700	11.781	572.5	25.47	105.07	76.9	56.1	0.0	154.2			
125.0		0.1875	18.917	11.308	506.3	24.35	100.89	78.2	51.7	0.0	196.4			
130.0		0.1875	18.133	10.835	445.4	23.23	96.71	79.4	47.4	0.0	188.4			
135.0		0.1875	17.350	10.362	389.6	22.11	92.53	80.6	43.4	0.0	180.3			
140.0		0.1875	16.567	9.889	338.6	21.00	88.36	81.8	39.5	0.0	172.3			
142.0		0.1875	16.253	9.700	319.6	20.55	86.68	81.9	38.0	0.0	66.7			
145.0		0.1875	15.783	9.416	292.3	19.88	84.18	81.9	35.8	0.0	97.6			
150.0		0.1875	15.000	8.943	250.5	18.76	80.00	81.9	32.3	0.0	156.2			
											13,370.7			7,508.8

Load Case: 1.2D + 1.6W — 97 mph with No Ice — 27 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.60

Wind Importance Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		224.9	0.0					0.0	0.0	224.9	0.0	0.0	0.0
5.00		489.0	902.5					0.0	400.8	489.0	1,303.3	0.0	0.0
10.00		522.6	883.2					112.8	546.5	635.3	1,429.7	0.0	0.0
15.00		511.1	863.9					112.8	549.6	623.9	1,413.5	0.0	0.0
20.00		499.7	844.6					112.8	549.6	612.5	1,394.2	0.0	0.0
25.00		488.3	825.3					112.8	549.6	601.0	1,374.9	0.0	0.0
30.00		313.1	806.0					112.8	549.6	425.9	1,355.5	0.0	0.0
31.50	Bot - Section 2	244.5	238.0					34.1	164.9	278.6	402.9	0.0	0.0
35.00		205.7	1,015.7					81.4	384.7	287.1	1,400.4	0.0	0.0
35.67	Top - Section 1	250.0	191.5					15.8	73.3	265.8	264.8	0.0	0.0
40.00		469.7	565.5					104.5	476.3	574.2	1,041.8	0.0	0.0
45.00		507.3	637.5					124.7	549.6	632.0	1,187.1	0.0	0.0
50.00		509.6	621.4					128.7	549.6	638.3	1,171.0	0.0	0.0
55.00		510.1	605.3					132.4	549.6	642.5	1,154.9	0.0	0.0
60.00		509.0	589.2					135.9	549.6	644.9	1,138.8	0.0	0.0
65.00		506.6	573.1					139.2	549.6	645.7	1,122.7	0.0	0.0
70.00	Bot - Section 3	431.3	557.0					142.3	549.6	573.6	1,106.6	0.0	0.0
73.50	Top - Section 2	255.0	691.1					101.4	384.7	356.4	1,075.8	0.0	0.0
75.00		328.7	131.2					43.9	164.9	372.6	296.1	0.0	0.0
80.00		501.8	429.1					148.0	549.6	649.8	978.7	0.0	0.0
85.00		320.5	416.2					150.7	549.6	471.2	965.8	0.0	0.0
86.44	Reinf. Top Reinf	245.8	117.5					43.9	158.3	289.7	275.8	0.0	0.0
90.00		416.5	285.9					109.4	391.3	525.9	677.2	0.0	0.0
95.00		479.4	390.5					155.7	549.6	635.1	940.1	0.0	0.0
100.00		284.5	377.6					158.1	549.6	442.5	927.2	0.0	0.0
101.00	Reinf. Top Reinf	232.8	74.0					31.9	109.9	264.7	183.9	0.0	0.0
105.00		323.1	290.8					96.3	359.5	419.5	650.3	0.0	0.0
108.00	Appurtenance(s)	227.7	212.7	3,496.9	0.0	0.0	3,322.6	72.9	269.6	3,797.6	3,804.9	0.0	0.0
110.00	Top - Section 3	312.9	139.2					49.0	155.8	361.8	295.0	0.0	0.0
115.00		275.4	255.0					123.5	389.5	398.8	644.5	0.0	0.0
116.21	Reinf. Top	216.7	60.3					30.1	94.3	246.8	154.5	0.0	0.0
120.00		374.5	185.1					94.9	67.4	469.4	252.5	0.0	0.0
125.00		415.3	235.7					103.9	88.9	519.2	324.6	0.0	0.0
130.00		402.6	226.0					99.4	88.9	502.0	315.0	0.0	0.0
135.00		389.4	216.4					100.5	88.9	489.9	305.3	0.0	0.0
140.00		265.9	206.7					101.6	88.9	367.5	295.6	0.0	0.0
142.00	Appurtenance(s)	184.4	80.0	2,506.0	0.0	9,697.9	1,972.2	40.9	35.6	2,731.3	2,087.8	0.0	0.0
145.00		286.9	117.1					61.7	23.1	348.6	140.2	0.0	0.0
150.00	Appurtenance(s)	177.2	187.4	3,623.5	0.0	7,223.9	4,070.2	103.6	38.5	3,904.3	4,296.1	0.0	0.0
								Totals:		27,359.6	38,148.5	0.00	0.00

Site Number: 302482 Code: ANSI/TIA-222-G

Site Name: North Haven CT 1, CT Engineering Number:OAA708185_C3_02 3/1/2018 3:33:55 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W 97 mph with No Ice 27 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	-38.08	-27.24	0.00	-2,739.76	0.00	2,739.76	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.714
5.00	-36.63	-26.93	0.00	-2,603.58	0.00	2,603.58	3,114.09	1,557.04	4,644.49	2,293.74	0.16	-0.30	0.695
10.00	-35.07	-26.47	0.00	-2,468.91	0.00	2,468.91	3,070.24	1,535.12	4,479.04	2,212.03	0.63	-0.60	0.676
15.00	-33.53	-26.00	0.00	-2,336.56	0.00	2,336.56	3,025.35	1,512.68	4,314.96	2,131.00	1.42	-0.89	0.656
20.00	-32.02	-25.53	0.00	-2,206.55	0.00	2,206.55	2,979.43	1,489.71	4,152.36	2,050.69	2.51	-1.19	0.636
25.00	-30.53	-25.06	0.00	-2,078.89	0.00	2,078.89	2,932.46	1,466.23	3,991.34	1,971.17	3.92	-1.49	0.615
30.00	-29.10	-24.69	0.00	-1,953.61	0.00	1,953.61	2,874.86	1,437.43	3,819.25	1,886.18	5.64	-1.79	0.596
31.50	-28.64	-24.47	0.00	-1,916.57	0.00	1,916.57	2,853.94	1,426.97	3,763.56	1,858.68	6.21	-1.88	0.591
35.00	-27.20	-24.20	0.00	-1,830.91	0.00	1,830.91	2,805.14	1,402.57	3,635.21	1,795.29	7.67	-2.08	0.570
35.67	-26.89	-23.99	0.00	-1,814.78	0.00	1,814.78	2,247.90	1,123.95	2,973.33	1,468.42	7.96	-2.12	0.653
40.00	-25.76	-23.50	0.00	-1,710.83	0.00	1,710.83	2,218.43	1,109.21	2,871.69	1,418.22	10.00	-2.37	0.629
45.00	-24.48	-22.95	0.00	-1,593.32	0.00	1,593.32	2,183.45	1,091.72	2,755.25	1,360.71	12.65	-2.68	0.600
50.00	-23.22	-22.37	0.00	-1,478.59	0.00	1,478.59	2,147.43	1,073.71	2,639.81	1,303.70	15.62	-2.98	0.571
55.00	-21.99	-21.78	0.00	-1,366.73	0.00	1,366.73	2,110.37	1,055.18	2,525.48	1,247.24	18.89	-3.27	0.542
60.00	-20.79	-21.17	0.00	-1,257.84	0.00	1,257.84	2,072.27	1,036.13	2,412.36	1,191.37	22.47	-3.56	0.512
65.00	-19.61	-20.55	0.00	-1,151.98	0.00	1,151.98	2,033.13	1,016.56	2,300.54	1,136.15	26.35	-3.84	0.482
70.00	-18.47	-19.98	0.00	-1,049.23	0.00	1,049.23	1,981.90	990.95	2,177.99	1,075.63	30.52	-4.12	0.454
73.50	-17.38	-19.58	0.00	-979.31	0.00	979.31	1,473.88	736.94	1,624.33	802.19	33.61	-4.31	0.503
75.00	-17.05	-19.24	0.00	-949.94	0.00	949.94	1,466.20	733.10	1,601.53	790.93	34.98	-4.39	0.491
80.00	-16.04	-18.59	0.00	-853.73	0.00	853.73	1,439.92	719.96	1,525.89	753.58	39.72	-4.66	0.452
85.00	-15.06	-18.08	0.00	-760.78	0.00	760.78	1,412.60	706.30	1,450.91	716.55	44.73	-4.92	0.413
86.44	-14.78	-17.80	0.00	-734.74	0.00	734.74	1,404.54	702.27	1,429.45	705.95	46.22	-4.99	0.401
86.44	-14.78	-17.80	0.00	-734.74	0.00	734.74	1,404.54	702.27	1,429.45	705.95	46.22	-4.99	0.401
90.00	-14.09	-17.27	0.00	-671.36	0.00	671.36	1,384.24	692.12	1,376.67	679.88	50.01	-5.17	0.373
95.00	-13.14	-16.60	0.00	-585.01	0.00	585.01	1,354.85	677.42	1,303.28	643.64	55.54	-5.39	0.334
100.00	-12.23	-16.10	0.00	-502.00	0.00	502.00	1,324.41	662.20	1,230.84	607.87	61.29	-5.61	0.294
101.00	-12.04	-15.84	0.00	-485.90	0.00	485.90	1,318.20	659.10	1,216.47	600.77	62.47	-5.65	0.286
101.00	-12.04	-15.84	0.00	-485.90	0.00	485.90	1,318.20	659.10	1,216.47	600.77	62.47	-5.65	0.273
105.00	-11.40	-15.38	0.00	-422.55	0.00	422.55	1,292.93	646.47	1,159.45	572.61	67.27	-5.81	0.242
108.00	-7.99	-11.23	0.00	-376.40	0.00	376.40	1,265.65	632.82	1,110.24	548.30	70.94	-5.91	0.218
110.00	-7.71	-10.85	0.00	-353.95	0.00	353.95	1,247.06	623.53	1,077.67	532.22	73.43	-5.97	0.208
110.00	-7.71	-10.85	0.00	-353.95	0.00	353.95	853.21	426.60	741.71	366.30	73.43	-5.97	0.247
115.00	-7.10	-10.40	0.00	-299.69	0.00	299.69	834.97	417.48	698.64	345.03	79.75	-6.12	0.212
116.21	-6.96	-10.15	0.00	-287.11	0.00	287.11	830.40	415.20	688.27	339.91	81.31	-6.16	0.204
116.21	-6.96	-10.15	0.00	-287.11	0.00	287.11	830.40	415.20	688.27	339.91	81.31	-6.16	0.854
120.00	-6.70	-9.69	0.00	-248.66	0.00	248.66	815.69	407.84	655.93	323.94	86.24	-6.27	0.776
125.00	-6.35	-9.20	0.00	-200.20	0.00	200.20	795.37	397.68	613.66	303.07	93.09	-6.83	0.669
130.00	-6.03	-8.71	0.00	-154.21	0.00	154.21	774.01	387.00	571.96	282.47	100.50	-7.32	0.554
135.00	-5.74	-8.22	0.00	-110.66	0.00	110.66	751.61	375.80	530.91	262.20	108.38	-7.75	0.430
140.00	-5.47	-7.84	0.00	-69.56	0.00	69.56	728.17	364.08	490.63	242.30	116.65	-8.08	0.295
142.00	-3.78	-4.84	0.00	-44.19	0.00	44.19	714.97	357.48	472.41	233.31	120.05	-8.18	0.195
145.00	-3.68	-4.49	0.00	-29.65	0.00	29.65	694.05	347.03	445.02	219.78	125.21	-8.28	0.140
150.00	0.00	-3.90	0.00	-7.22	0.00	7.22	659.19	329.60	401.19	198.13	133.90	-8.37	0.037

Site Number: 302482 | Code: ANSI/TIA-222-G |

Site Name: North Haven CT 1, CT | Engineering Number:OAA708185_C3_02 | 3/1/2018 3:33:55 PM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W — 97 mph with No Ice (Reduced DL) — 26 Iterations

Gust Response Factor :1.10 | Wind Importance Factor :1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		224.9	0.0					0.0	0.0	224.9	0.0	0.0	0.0
5.00		489.0	676.9					0.0	300.6	489.0	977.5	0.0	0.0
10.00		522.6	662.4					112.8	409.9	635.3	1,072.3	0.0	0.0
15.00		511.1	647.9					112.8	412.2	623.9	1,060.1	0.0	0.0
20.00		499.7	633.4					112.8	412.2	612.5	1,045.6	0.0	0.0
25.00		488.3	618.9					112.8	412.2	601.0	1,031.1	0.0	0.0
30.00		313.1	604.5					112.8	412.2	425.9	1,016.7	0.0	0.0
31.50	Bot - Section 2	244.5	178.5					34.1	123.7	278.6	302.2	0.0	0.0
35.00		205.7	761.8					81.4	288.5	287.1	1,050.3	0.0	0.0
35.67	Top - Section 1	250.0	143.6					15.8	55.0	265.8	198.6	0.0	0.0
40.00		469.7	424.1					104.5	357.2	574.2	781.4	0.0	0.0
45.00		507.3	478.1					124.7	412.2	632.0	890.3	0.0	0.0
50.00		509.6	466.0					128.7	412.2	638.3	878.2	0.0	0.0
55.00		510.1	454.0					132.4	412.2	642.5	866.2	0.0	0.0
60.00		509.0	441.9					135.9	412.2	644.9	854.1	0.0	0.0
65.00		506.6	429.8					139.2	412.2	645.7	842.0	0.0	0.0
70.00	Bot - Section 3	431.3	417.8					142.3	412.2	573.6	829.9	0.0	0.0
73.50	Top - Section 2	255.0	518.3					101.4	288.5	356.4	806.8	0.0	0.0
75.00		328.7	98.4					43.9	123.7	372.6	222.1	0.0	0.0
80.00		501.8	321.8					148.0	412.2	649.8	734.0	0.0	0.0
85.00		320.5	312.2					150.7	412.2	471.2	724.4	0.0	0.0
86.44	Reinf. Top Reinf	245.8	88.1					43.9	118.7	289.7	206.8	0.0	0.0
90.00		416.5	214.4					109.4	293.5	525.9	507.9	0.0	0.0
95.00		479.4	292.9					155.7	412.2	635.1	705.0	0.0	0.0
100.00		284.5	283.2					158.1	412.2	442.5	695.4	0.0	0.0
101.00	Reinf. Top Reinf	232.8	55.5					31.9	82.4	264.7	137.9	0.0	0.0
105.00		323.1	218.1					96.3	269.6	419.5	487.7	0.0	0.0
108.00	Appurtenance(s)	227.7	159.5	3,496.9	0.0	0.0	2,491.9	72.9	202.2	3,797.6	2,853.6	0.0	0.0
110.00	Top - Section 3	312.9	104.4					49.0	116.9	361.8	221.3	0.0	0.0
115.00		275.4	191.3					123.5	292.1	398.8	483.4	0.0	0.0
116.21	Reinf. Top	216.7	45.2					30.1	70.7	246.8	115.9	0.0	0.0
120.00		374.5	138.8					94.9	50.5	469.4	189.4	0.0	0.0
125.00		415.3	176.8					103.9	66.7	519.2	243.5	0.0	0.0
130.00		402.6	169.5					99.4	66.7	502.0	236.2	0.0	0.0
135.00		389.4	162.3					100.5	66.7	489.9	229.0	0.0	0.0
140.00		265.9	155.0					101.6	66.7	367.5	221.7	0.0	0.0
142.00	Appurtenance(s)	184.4	60.0	2,506.0	0.0	9,697.9	1,479.1	40.9	26.7	2,731.3	1,565.8	0.0	0.0
145.00		286.9	87.8					61.7	17.3	348.6	105.1	0.0	0.0
150.00	Appurtenance(s)	177.2	140.6	3,623.5	0.0	7,223.9	3,052.6	103.6	28.9	3,904.3	3,222.1	0.0	0.0
								Totals:		27,359.6	28,611.4	0.00	0.00

Site Number: 302482 | Code: ANSI/TIA-222-G |

Site Name: North Haven CT 1, CT | Engineering Number:OAA708185_C3_02 | 3/1/2018 3:34:00 PM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W — 97 mph with No Ice (Reduced DL) — 26 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	-28.54	-27.21	0.00	-2,698.49	0.00	2,698.49	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.701
5.00	-27.43	-26.86	0.00	-2,562.45	0.00	2,562.45	3,114.09	1,557.04	4,644.49	2,293.74	0.16	-0.29	0.682
10.00	-26.22	-26.35	0.00	-2,428.16	0.00	2,428.16	3,070.24	1,535.12	4,479.04	2,212.03	0.62	-0.59	0.663
15.00	-25.04	-25.84	0.00	-2,296.42	0.00	2,296.42	3,025.35	1,512.68	4,314.96	2,131.00	1.39	-0.88	0.643
20.00	-23.88	-25.33	0.00	-2,167.23	0.00	2,167.23	2,979.43	1,489.71	4,152.36	2,050.69	2.47	-1.17	0.623
25.00	-22.73	-24.82	0.00	-2,040.58	0.00	2,040.58	2,932.46	1,466.23	3,991.34	1,971.17	3.86	-1.46	0.602
30.00	-21.65	-24.44	0.00	-1,916.47	0.00	1,916.47	2,874.86	1,437.43	3,819.25	1,886.18	5.55	-1.75	0.583
31.50	-21.30	-24.21	0.00	-1,879.81	0.00	1,879.81	2,853.94	1,426.97	3,763.56	1,858.68	6.11	-1.84	0.578
35.00	-20.21	-23.93	0.00	-1,795.09	0.00	1,795.09	2,805.14	1,402.57	3,635.21	1,795.29	7.54	-2.05	0.557
35.67	-19.96	-23.70	0.00	-1,779.14	0.00	1,779.14	2,247.90	1,123.95	2,973.33	1,468.42	7.83	-2.09	0.638
40.00	-19.09	-23.19	0.00	-1,676.43	0.00	1,676.43	2,218.43	1,109.21	2,871.69	1,418.22	9.84	-2.33	0.614
45.00	-18.11	-22.61	0.00	-1,560.48	0.00	1,560.48	2,183.45	1,091.72	2,755.25	1,360.71	12.44	-2.63	0.586
50.00	-17.15	-22.02	0.00	-1,447.42	0.00	1,447.42	2,147.43	1,073.71	2,639.81	1,303.70	15.35	-2.92	0.558
55.00	-16.21	-21.41	0.00	-1,337.32	0.00	1,337.32	2,110.37	1,055.18	2,525.48	1,247.24	18.56	-3.21	0.529
60.00	-15.30	-20.80	0.00	-1,230.25	0.00	1,230.25	2,072.27	1,036.13	2,412.36	1,191.37	22.08	-3.49	0.500
65.00	-14.40	-20.17	0.00	-1,126.27	0.00	1,126.27	2,033.13	1,016.56	2,300.54	1,136.15	25.88	-3.77	0.470
70.00	-13.54	-19.59	0.00	-1,025.44	0.00	1,025.44	1,981.90	990.95	2,177.99	1,075.63	29.97	-4.04	0.443
73.50	-12.71	-19.21	0.00	-956.88	0.00	956.88	1,473.88	736.94	1,624.33	802.19	33.00	-4.22	0.490
75.00	-12.46	-18.86	0.00	-928.07	0.00	928.07	1,466.20	733.10	1,601.53	790.93	34.34	-4.30	0.478
80.00	-11.70	-18.20	0.00	-833.79	0.00	833.79	1,439.92	719.96	1,525.89	753.58	38.99	-4.57	0.440
85.00	-10.97	-17.71	0.00	-742.77	0.00	742.77	1,412.60	706.30	1,450.91	716.55	43.90	-4.82	0.402
86.44	-10.75	-17.42	0.00	-717.27	0.00	717.27	1,404.54	702.27	1,429.45	705.95	45.37	-4.89	0.391
86.44	-10.75	-17.42	0.00	-717.27	0.00	717.27	1,404.54	702.27	1,429.45	705.95	45.37	-4.89	0.391
90.00	-10.23	-16.89	0.00	-655.25	0.00	655.25	1,384.24	692.12	1,376.67	679.88	49.07	-5.06	0.363
95.00	-9.52	-16.23	0.00	-570.80	0.00	570.80	1,354.85	677.42	1,303.28	643.64	54.49	-5.29	0.325
100.00	-8.84	-15.74	0.00	-489.65	0.00	489.65	1,324.41	662.20	1,230.84	607.87	60.13	-5.49	0.286
101.00	-8.70	-15.48	0.00	-473.90	0.00	473.90	1,318.20	659.10	1,216.47	600.77	61.29	-5.53	0.278
101.00	-8.70	-15.48	0.00	-473.90	0.00	473.90	1,318.20	659.10	1,216.47	600.77	61.29	-5.53	0.265
105.00	-8.22	-15.03	0.00	-411.98	0.00	411.98	1,292.93	646.47	1,159.45	572.61	65.98	-5.69	0.235
108.00	-5.75	-10.98	0.00	-366.87	0.00	366.87	1,265.65	632.82	1,110.24	548.30	69.58	-5.79	0.212
110.00	-5.55	-10.61	0.00	-344.92	0.00	344.92	1,247.06	623.53	1,077.67	532.22	72.02	-5.85	0.202
110.00	-5.55	-10.61	0.00	-344.92	0.00	344.92	853.21	426.60	741.71	366.30	72.02	-5.85	0.240
115.00	-5.09	-10.17	0.00	-291.88	0.00	291.88	834.97	417.48	698.64	345.03	78.21	-5.99	0.206
116.21	-4.99	-9.92	0.00	-279.58	0.00	279.58	830.40	415.20	688.27	339.91	79.73	-6.03	0.197
116.21	-4.99	-9.92	0.00	-279.58	0.00	279.58	830.40	415.20	688.27	339.91	79.73	-6.03	0.829
120.00	-4.80	-9.46	0.00	-242.00	0.00	242.00	815.69	407.84	655.93	323.94	84.56	-6.14	0.753
125.00	-4.53	-8.96	0.00	-194.71	0.00	194.71	795.37	397.68	613.66	303.07	91.27	-6.68	0.649
130.00	-4.29	-8.46	0.00	-149.93	0.00	149.93	774.01	387.00	571.96	282.47	98.51	-7.16	0.537
135.00	-4.08	-7.97	0.00	-107.61	0.00	107.61	751.61	375.80	530.91	262.20	106.22	-7.58	0.416
140.00	-3.88	-7.59	0.00	-67.75	0.00	67.75	728.17	364.08	490.63	242.30	114.32	-7.90	0.285
142.00	-2.70	-4.68	0.00	-42.86	0.00	42.86	714.97	357.48	472.41	233.31	117.64	-8.00	0.188
145.00	-2.64	-4.32	0.00	-28.83	0.00	28.83	694.05	347.03	445.02	219.78	122.68	-8.09	0.135
150.00	0.00	-3.90	0.00	-7.22	0.00	7.22	659.19	329.60	401.19	198.13	131.18	-8.18	0.037

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 26 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		47.5	0.0					0.0	0.0	47.5	0.0	0.0	0.0
5.00		94.4	1,185.8					0.0	464.5	94.4	1,650.3	0.0	0.0
10.00		93.0	1,193.9					36.9	734.4	129.9	1,928.3	0.0	0.0
15.00		91.4	1,184.5					37.8	750.5	129.2	1,935.0	0.0	0.0
20.00		89.7	1,169.5					38.5	759.6	128.2	1,929.0	0.0	0.0
25.00		87.9	1,151.4					39.0	766.7	126.9	1,918.1	0.0	0.0
30.00		56.5	1,131.5					39.4	772.6	95.9	1,904.1	0.0	0.0
31.50	Bot - Section 2	44.2	336.1					12.0	232.8	56.2	569.0	0.0	0.0
35.00		37.2	1,247.0					28.7	544.9	65.9	1,791.9	0.0	0.0
35.67	Top - Section 1	45.3	235.7					5.6	104.0	50.9	339.8	0.0	0.0
40.00		85.3	849.1					37.2	678.1	122.4	1,527.3	0.0	0.0
45.00		92.4	960.9					44.6	786.2	137.0	1,747.1	0.0	0.0
50.00		93.1	940.7					46.3	789.8	139.4	1,730.5	0.0	0.0
55.00		93.5	920.0					47.9	793.1	141.4	1,713.1	0.0	0.0
60.00		93.6	898.9					49.4	796.1	143.0	1,695.0	0.0	0.0
65.00		93.5	877.4					50.8	799.0	144.3	1,676.4	0.0	0.0
70.00	Bot - Section 3	79.8	855.6					52.2	801.6	132.0	1,657.2	0.0	0.0
73.50	Top - Section 2	47.2	901.1					37.3	562.6	84.5	1,463.7	0.0	0.0
75.00		61.1	220.8					16.2	241.5	77.3	462.3	0.0	0.0
80.00		93.5	720.8					54.7	806.5	148.2	1,527.3	0.0	0.0
85.00		59.9	701.5					55.9	808.7	115.7	1,510.2	0.0	0.0
86.44	Reinf. Top Reinf	46.1	199.3					16.3	233.3	62.4	432.6	0.0	0.0
90.00		78.3	484.4					40.7	577.5	119.0	1,062.0	0.0	0.0
95.00		90.5	662.3					58.1	812.9	148.6	1,475.2	0.0	0.0
100.00		53.8	642.5					59.2	814.8	113.0	1,457.3	0.0	0.0
101.00	Reinf. Top Reinf	44.3	126.8					12.0	163.2	56.2	290.0	0.0	0.0
105.00		61.5	497.1					42.9	558.1	104.4	1,055.2	0.0	0.0
108.00	Appurtenance(s)	43.5	364.9	833.9	0.0	0.0	6,315.0	32.5	419.3	910.0	7,099.2	0.0	0.0
110.00	Top - Section 3	60.0	239.6					21.9	255.9	81.9	495.5	0.0	0.0
115.00		52.9	498.2					55.3	641.0	108.2	1,139.1	0.0	0.0
116.21	Reinf. Top	41.9	118.8					13.5	155.4	55.4	274.1	0.0	0.0
120.00		72.7	363.8					42.6	259.3	115.3	623.1	0.0	0.0
125.00		81.0	463.7					43.6	283.0	124.6	746.7	0.0	0.0
130.00		79.1	446.3					40.8	269.0	119.9	715.3	0.0	0.0
135.00		77.1	428.8					41.4	270.1	118.5	698.9	0.0	0.0
140.00		53.0	411.3					41.9	271.2	94.9	682.4	0.0	0.0
142.00	Appurtenance(s)	37.0	160.6	544.3	0.0	1,866.6	4,672.6	16.9	108.8	598.1	4,941.9	0.0	0.0
145.00		57.9	235.1					25.5	92.0	83.4	327.1	0.0	0.0
150.00	Appurtenance(s)	35.9	375.8	878.0	0.0	1,484.0	8,244.5	42.9	153.9	956.8	8,774.2	0.0	0.0
								Totals:		6,280.90	62,965.6	0.00	0.00

Site Number: 302482 Code: ANSI/TIA-222-G

Site Name: North Haven CT 1, CT Engineering Number:OAA708185_C3_02 3/1/2018 3:34:06 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 26 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	-62.96	-6.27	0.00	-684.93	0.00	684.93	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.190
5.00	-61.30	-6.26	0.00	-653.55	0.00	653.55	3,114.09	1,557.04	4,644.49	2,293.74	0.04	-0.07	0.186
10.00	-59.37	-6.20	0.00	-622.26	0.00	622.26	3,070.24	1,535.12	4,479.04	2,212.03	0.16	-0.15	0.182
15.00	-57.42	-6.14	0.00	-591.24	0.00	591.24	3,025.35	1,512.68	4,314.96	2,131.00	0.36	-0.22	0.177
20.00	-55.49	-6.08	0.00	-560.53	0.00	560.53	2,979.43	1,489.71	4,152.36	2,050.69	0.63	-0.30	0.172
25.00	-53.56	-6.01	0.00	-530.13	0.00	530.13	2,932.46	1,466.23	3,991.34	1,971.17	0.99	-0.38	0.167
30.00	-51.65	-5.95	0.00	-500.07	0.00	500.07	2,874.86	1,437.43	3,819.25	1,886.18	1.42	-0.45	0.163
31.50	-51.08	-5.92	0.00	-491.15	0.00	491.15	2,853.94	1,426.97	3,763.56	1,858.68	1.57	-0.47	0.161
35.00	-49.29	-5.87	0.00	-470.43	0.00	470.43	2,805.14	1,402.57	3,635.21	1,795.29	1.93	-0.53	0.156
35.67	-48.94	-5.84	0.00	-466.52	0.00	466.52	2,247.90	1,123.95	2,973.33	1,468.42	2.01	-0.54	0.179
40.00	-47.41	-5.77	0.00	-441.19	0.00	441.19	2,218.43	1,109.21	2,871.69	1,418.22	2.53	-0.60	0.173
45.00	-45.66	-5.67	0.00	-412.37	0.00	412.37	2,183.45	1,091.72	2,755.25	1,360.71	3.20	-0.68	0.166
50.00	-43.92	-5.57	0.00	-384.01	0.00	384.01	2,147.43	1,073.71	2,639.81	1,303.70	3.96	-0.76	0.159
55.00	-42.20	-5.46	0.00	-356.17	0.00	356.17	2,110.37	1,055.18	2,525.48	1,247.24	4.79	-0.84	0.152
60.00	-40.50	-5.34	0.00	-328.87	0.00	328.87	2,072.27	1,036.13	2,412.36	1,191.37	5.71	-0.91	0.144
65.00	-38.82	-5.22	0.00	-302.15	0.00	302.15	2,033.13	1,016.56	2,300.54	1,136.15	6.70	-0.99	0.136
70.00	-37.16	-5.10	0.00	-276.04	0.00	276.04	1,981.90	990.95	2,177.99	1,075.63	7.77	-1.06	0.129
73.50	-35.70	-5.01	0.00	-258.19	0.00	258.19	1,473.88	736.94	1,624.33	802.19	8.57	-1.11	0.143
75.00	-35.23	-4.95	0.00	-250.68	0.00	250.68	1,466.20	733.10	1,601.53	790.93	8.92	-1.13	0.140
80.00	-33.70	-4.81	0.00	-225.92	0.00	225.92	1,439.92	719.96	1,525.89	753.58	10.14	-1.20	0.130
85.00	-32.19	-4.69	0.00	-201.85	0.00	201.85	1,412.60	706.30	1,450.91	716.55	11.43	-1.27	0.119
86.44	-31.76	-4.64	0.00	-195.10	0.00	195.10	1,404.54	702.27	1,429.45	705.95	11.82	-1.29	0.116
86.44	-31.76	-4.64	0.00	-195.10	0.00	195.10	1,404.54	702.27	1,429.45	705.95	11.82	-1.29	0.116
90.00	-30.70	-4.52	0.00	-178.59	0.00	178.59	1,384.24	692.12	1,376.67	679.88	12.80	-1.33	0.109
95.00	-29.22	-4.37	0.00	-155.98	0.00	155.98	1,354.85	677.42	1,303.28	643.64	14.23	-1.40	0.098
100.00	-27.76	-4.24	0.00	-134.14	0.00	134.14	1,324.41	662.20	1,230.84	607.87	15.72	-1.45	0.087
101.00	-27.47	-4.18	0.00	-129.90	0.00	129.90	1,318.20	659.10	1,216.47	600.77	16.03	-1.46	0.085
101.00	-27.47	-4.18	0.00	-129.90	0.00	129.90	1,318.20	659.10	1,216.47	600.77	16.03	-1.46	0.083
105.00	-26.42	-4.07	0.00	-113.17	0.00	113.17	1,292.93	646.47	1,159.45	572.61	17.27	-1.51	0.075
108.00	-19.35	-2.98	0.00	-100.96	0.00	100.96	1,265.65	632.82	1,110.24	548.30	18.23	-1.53	0.066
110.00	-18.85	-2.89	0.00	-95.00	0.00	95.00	1,247.06	623.53	1,077.67	532.22	18.87	-1.55	0.063
110.00	-18.85	-2.89	0.00	-95.00	0.00	95.00	853.21	426.60	741.71	366.30	18.87	-1.55	0.075
115.00	-17.71	-2.76	0.00	-80.54	0.00	80.54	834.97	417.48	698.64	345.03	20.52	-1.59	0.065
116.21	-17.44	-2.70	0.00	-77.20	0.00	77.20	830.40	415.20	688.27	339.91	20.92	-1.60	0.063
116.21	-17.44	-2.70	0.00	-77.20	0.00	77.20	830.40	415.20	688.27	339.91	20.92	-1.60	0.248
120.00	-16.82	-2.60	0.00	-66.95	0.00	66.95	815.69	407.84	655.93	323.94	22.20	-1.63	0.227
125.00	-16.07	-2.49	0.00	-53.96	0.00	53.96	795.37	397.68	613.66	303.07	23.99	-1.78	0.198
130.00	-15.35	-2.38	0.00	-41.50	0.00	41.50	774.01	387.00	571.96	282.47	25.93	-1.91	0.167
135.00	-14.65	-2.27	0.00	-29.59	0.00	29.59	751.61	375.80	530.91	262.20	28.00	-2.03	0.132
140.00	-13.97	-2.16	0.00	-18.27	0.00	18.27	728.17	364.08	490.63	242.30	30.17	-2.11	0.095
142.00	-9.06	-1.38	0.00	-12.08	0.00	12.08	714.97	357.48	472.41	233.31	31.06	-2.14	0.064
145.00	-8.73	-1.29	0.00	-7.94	0.00	7.94	694.05	347.03	445.02	219.78	32.42	-2.17	0.049
150.00	0.00	-0.96	0.00	-1.48	0.00	1.48	659.19	329.60	401.19	198.13	34.70	-2.19	0.007

Load Case: 1.0D + 1.0W Serviceability 60 mph 25 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		53.8	0.0					0.0	0.0	53.8	0.0	0.0	0.0
5.00		116.9	752.1					0.0	334.0	116.9	1,086.1	0.0	0.0
10.00		125.0	736.0					27.0	455.4	151.9	1,191.4	0.0	0.0
15.00		122.2	719.9					27.0	458.0	149.2	1,177.9	0.0	0.0
20.00		119.5	703.8					27.0	458.0	146.5	1,161.8	0.0	0.0
25.00		116.8	687.7					27.0	458.0	143.7	1,145.7	0.0	0.0
30.00		74.9	671.6					27.0	458.0	101.8	1,129.6	0.0	0.0
31.50	Bot - Section 2	58.5	198.4					8.2	137.4	66.6	335.7	0.0	0.0
35.00		49.2	846.4					19.5	320.6	68.7	1,167.0	0.0	0.0
35.67	Top - Section 1	59.8	159.6					3.8	61.1	63.6	220.6	0.0	0.0
40.00		112.3	471.2					25.0	396.9	137.3	868.2	0.0	0.0
45.00		121.3	531.2					29.8	458.0	151.1	989.2	0.0	0.0
50.00		121.9	517.8					30.8	458.0	152.6	975.8	0.0	0.0
55.00		122.0	504.4					31.7	458.0	153.7	962.4	0.0	0.0
60.00		121.7	491.0					32.5	458.0	154.2	949.0	0.0	0.0
65.00		121.1	477.6					33.3	458.0	154.4	935.6	0.0	0.0
70.00	Bot - Section 3	103.1	464.2					34.0	458.0	137.2	922.2	0.0	0.0
73.50	Top - Section 2	61.0	575.9					24.2	320.6	85.2	896.5	0.0	0.0
75.00		78.6	109.4					10.5	137.4	89.1	246.8	0.0	0.0
80.00		120.0	357.6					35.4	458.0	155.4	815.6	0.0	0.0
85.00		76.6	346.9					36.0	458.0	112.7	804.8	0.0	0.0
86.44	Reinf. Top Reinf	58.8	97.9					10.5	131.9	69.3	229.8	0.0	0.0
90.00		99.6	238.2					26.2	326.1	125.7	564.3	0.0	0.0
95.00		114.6	325.4					37.2	458.0	151.9	783.4	0.0	0.0
100.00		68.0	314.7					37.8	458.0	105.8	772.7	0.0	0.0
101.00	Reinf. Top Reinf	55.7	61.6					7.6	91.6	63.3	153.2	0.0	0.0
105.00		77.3	242.3					23.0	299.6	100.3	541.9	0.0	0.0
108.00	Appurtenance(s)	54.5	177.2	836.2	0.0	0.0	2,768.8	17.4	224.7	908.1	3,170.7	0.0	0.0
110.00	Top - Section 3	74.8	116.0					11.7	129.8	86.5	245.8	0.0	0.0
115.00		65.8	212.5					29.5	324.6	95.4	537.1	0.0	0.0
116.21	Reinf. Top	51.8	50.2					7.2	78.6	59.0	128.8	0.0	0.0
120.00		89.6	154.2					22.7	56.2	112.3	210.4	0.0	0.0
125.00		99.3	196.4					24.9	74.1	124.2	270.5	0.0	0.0
130.00		96.3	188.4					23.8	74.1	120.0	262.5	0.0	0.0
135.00		93.1	180.3					24.0	74.1	117.1	254.4	0.0	0.0
140.00		63.6	172.3					24.3	74.1	87.9	246.4	0.0	0.0
142.00	Appurtenance(s)	44.1	66.7	599.3	0.0	2,319.1	1,643.5	9.8	29.6	653.1	1,739.8	0.0	0.0
145.00		68.6	97.6					14.8	19.3	83.4	116.8	0.0	0.0
150.00	Appurtenance(s)	42.4	156.2	866.5	0.0	1,727.5	3,391.8	24.8	32.1	933.6	3,580.1	0.0	0.0
								Totals:		6,542.59	31,790.4	0.00	0.00

Site Number: 302482 Code: ANSI/TIA-222-G

Site Name: North Haven CT 1, CT Engineering Number:OAA708185_C3_02 3/1/2018 3:34:11 PM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W Serviceability 60 mph 25 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	-31.79	-6.51	0.00	-649.97	0.00	649.97	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.174
5.00	-30.69	-6.43	0.00	-617.43	0.00	617.43	3,114.09	1,557.04	4,644.49	2,293.74	0.04	-0.07	0.170
10.00	-29.49	-6.31	0.00	-585.28	0.00	585.28	3,070.24	1,535.12	4,479.04	2,212.03	0.15	-0.14	0.165
15.00	-28.31	-6.19	0.00	-553.73	0.00	553.73	3,025.35	1,512.68	4,314.96	2,131.00	0.34	-0.21	0.160
20.00	-27.14	-6.07	0.00	-522.77	0.00	522.77	2,979.43	1,489.71	4,152.36	2,050.69	0.60	-0.28	0.155
25.00	-25.99	-5.96	0.00	-492.40	0.00	492.40	2,932.46	1,466.23	3,991.34	1,971.17	0.93	-0.35	0.150
30.00	-24.85	-5.87	0.00	-462.62	0.00	462.62	2,874.86	1,437.43	3,819.25	1,886.18	1.34	-0.42	0.145
31.50	-24.52	-5.81	0.00	-453.82	0.00	453.82	2,853.94	1,426.97	3,763.56	1,858.68	1.47	-0.44	0.144
35.00	-23.35	-5.75	0.00	-433.47	0.00	433.47	2,805.14	1,402.57	3,635.21	1,795.29	1.82	-0.49	0.139
35.67	-23.12	-5.69	0.00	-429.64	0.00	429.64	2,247.90	1,123.95	2,973.33	1,468.42	1.89	-0.50	0.159
40.00	-22.25	-5.57	0.00	-404.97	0.00	404.97	2,218.43	1,109.21	2,871.69	1,418.22	2.37	-0.56	0.153
45.00	-21.25	-5.44	0.00	-377.09	0.00	377.09	2,183.45	1,091.72	2,755.25	1,360.71	3.00	-0.63	0.146
50.00	-20.27	-5.30	0.00	-349.89	0.00	349.89	2,147.43	1,073.71	2,639.81	1,303.70	3.70	-0.71	0.139
55.00	-19.31	-5.16	0.00	-323.39	0.00	323.39	2,110.37	1,055.18	2,525.48	1,247.24	4.48	-0.77	0.132
60.00	-18.36	-5.01	0.00	-297.60	0.00	297.60	2,072.27	1,036.13	2,412.36	1,191.37	5.33	-0.84	0.125
65.00	-17.42	-4.86	0.00	-272.54	0.00	272.54	2,033.13	1,016.56	2,300.54	1,136.15	6.25	-0.91	0.118
70.00	-16.49	-4.73	0.00	-248.23	0.00	248.23	1,981.90	990.95	2,177.99	1,075.63	7.23	-0.98	0.111
73.50	-15.59	-4.63	0.00	-231.68	0.00	231.68	1,473.88	736.94	1,624.33	802.19	7.97	-1.02	0.123
75.00	-15.35	-4.55	0.00	-224.73	0.00	224.73	1,466.20	733.10	1,601.53	790.93	8.29	-1.04	0.120
80.00	-14.53	-4.40	0.00	-201.97	0.00	201.97	1,439.92	719.96	1,525.89	753.58	9.41	-1.10	0.111
85.00	-13.72	-4.28	0.00	-179.98	0.00	179.98	1,412.60	706.30	1,450.91	716.55	10.60	-1.16	0.101
86.44	-13.49	-4.21	0.00	-173.82	0.00	173.82	1,404.54	702.27	1,429.45	705.95	10.96	-1.18	0.098
86.44	-13.49	-4.21	0.00	-173.82	0.00	173.82	1,404.54	702.27	1,429.45	705.95	10.96	-1.18	0.098
90.00	-12.93	-4.08	0.00	-158.83	0.00	158.83	1,384.24	692.12	1,376.67	679.88	11.85	-1.22	0.092
95.00	-12.14	-3.93	0.00	-138.41	0.00	138.41	1,354.85	677.42	1,303.28	643.64	13.16	-1.28	0.082
100.00	-11.37	-3.81	0.00	-118.77	0.00	118.77	1,324.41	662.20	1,230.84	607.87	14.53	-1.33	0.073
101.00	-11.22	-3.75	0.00	-114.96	0.00	114.96	1,318.20	659.10	1,216.47	600.77	14.81	-1.34	0.071
101.00	-11.22	-3.75	0.00	-114.96	0.00	114.96	1,318.20	659.10	1,216.47	600.77	14.81	-1.34	0.068
105.00	-10.68	-3.64	0.00	-99.97	0.00	99.97	1,292.93	646.47	1,159.45	572.61	15.94	-1.37	0.060
108.00	-7.53	-2.66	0.00	-89.05	0.00	89.05	1,265.65	632.82	1,110.24	548.30	16.82	-1.40	0.054
110.00	-7.28	-2.57	0.00	-83.74	0.00	83.74	1,247.06	623.53	1,077.67	532.22	17.41	-1.41	0.051
110.00	-7.28	-2.57	0.00	-83.74	0.00	83.74	853.21	426.60	741.71	366.30	17.41	-1.41	0.061
115.00	-6.75	-2.46	0.00	-70.90	0.00	70.90	834.97	417.48	698.64	345.03	18.91	-1.45	0.053
116.21	-6.62	-2.40	0.00	-67.92	0.00	67.92	830.40	415.20	688.27	339.91	19.27	-1.46	0.051
116.21	-6.62	-2.40	0.00	-67.92	0.00	67.92	830.40	415.20	688.27	339.91	19.27	-1.46	0.208
120.00	-6.41	-2.29	0.00	-58.81	0.00	58.81	815.69	407.84	655.93	323.94	20.44	-1.48	0.189
125.00	-6.14	-2.18	0.00	-47.34	0.00	47.34	795.37	397.68	613.66	303.07	22.07	-1.62	0.164
130.00	-5.88	-2.06	0.00	-36.47	0.00	36.47	774.01	387.00	571.96	282.47	23.83	-1.73	0.137
135.00	-5.62	-1.94	0.00	-26.17	0.00	26.17	751.61	375.80	530.91	262.20	25.70	-1.83	0.107
140.00	-5.38	-1.85	0.00	-16.46	0.00	16.46	728.17	364.08	490.63	242.30	27.66	-1.91	0.075
142.00	-3.66	-1.14	0.00	-10.43	0.00	10.43	714.97	357.48	472.41	233.31	28.47	-1.94	0.050
145.00	-3.55	-1.06	0.00	-7.01	0.00	7.01	694.05	347.03	445.02	219.78	29.69	-1.96	0.037
150.00	0.00	-0.93	0.00	-1.73	0.00	1.73	659.19	329.60	401.19	198.13	31.76	-1.98	0.009

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.18	
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):	2.70	
Redundancy Factor (p):	1.30	
Seismic Force Distribution Exponent (k):	2.00	
Total Unfactored Dead Load:	31.79	k
Seismic Base Shear (E):	1.24	k

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

Segment	Height Above Base (ft)	Weight (lb)	W_x (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
38	147.50	188	4,096	0.016	20	233
37	143.50	117	2,406	0.010	12	145
36	141.00	96	1,914	0.008	9	119
35	137.50	246	4,658	0.018	23	305
34	132.50	254	4,467	0.018	22	315
33	127.50	262	4,267	0.017	21	325
32	122.50	271	4,059	0.016	20	335
31	118.10	210	2,935	0.012	14	261
30	115.60	129	1,721	0.007	8	160
29	112.50	537	6,798	0.027	33	666
28	109.00	246	2,921	0.012	14	305
27	106.50	402	4,559	0.018	22	498
26	103.00	542	5,749	0.023	28	672
25	100.50	153	1,548	0.006	8	190
24	97.50	773	7,345	0.029	36	958
23	92.50	783	6,703	0.026	33	971
22	88.22	564	4,392	0.017	22	699
21	85.72	230	1,689	0.007	8	285
20	82.50	805	5,478	0.022	27	997
19	77.50	816	4,899	0.019	24	1,011
18	74.25	247	1,360	0.005	7	306
17	71.75	896	4,615	0.018	23	1,111
16	67.50	922	4,202	0.017	21	1,143

15	62.50	936	3,655	0.014	18	1,159
14	57.50	949	3,138	0.012	15	1,176
13	52.50	962	2,653	0.010	13	1,193
12	47.50	976	2,202	0.009	11	1,209
11	42.50	989	1,787	0.007	9	1,226
10	37.83	868	1,243	0.005	6	1,076
9	35.33	221	275	0.001	1	273
8	33.25	1,167	1,290	0.005	6	1,446
7	30.75	336	317	0.001	2	416
6	27.50	1,130	854	0.003	4	1,400
5	22.50	1,146	580	0.002	3	1,420
4	17.50	1,162	356	0.001	2	1,440
3	12.50	1,178	184	0.001	1	1,460
2	7.50	1,191	67	0.000	0	1,476
1	2.50	1,086	7	0.000	0	1,346
Powerwave Allgon 702	150.00	13	297	0.001	1	16
Kaelus DBC0061F1V51-	150.00	76	1,721	0.007	8	95
Powerwave LGP21401	150.00	85	1,904	0.008	9	105
Raycap DC6-48-60-18-	150.00	20	450	0.002	2	25
Raycap DC6-48-60-18-	150.00	20	450	0.002	2	25
Ericsson RRUS A2 B2	150.00	66	1,485	0.006	7	82
Ericsson RRUS 32 (50	150.00	152	3,429	0.014	17	189
Ericsson RRUS 11 (Ba	150.00	152	3,422	0.014	17	188
Ericsson RRUS 12	150.00	150	3,375	0.013	17	186
Powerwave Allgon 777	150.00	105	2,363	0.009	12	130
Quintel QS66512-2	150.00	333	7,493	0.030	37	413
CCI OPA-65R-LCUU-H6	150.00	219	4,928	0.019	24	271
Round Platform w/ Ha	150.00	2,000	45,000	0.178	220	2,479
DragonWave Horizon C	142.00	32	641	0.003	3	39
DragonWave A-ANT-23G	142.00	15	302	0.001	1	19
Alcatel-Lucent RRH2x	142.00	317	6,400	0.025	31	393
Alcatel-Lucent 1900	142.00	180	3,630	0.014	18	223
Alcatel-Lucent TD-RR	142.00	210	4,234	0.017	21	260
DragonWave A-ANT-11G	142.00	27	544	0.002	3	33
Side Arms	142.00	560	11,292	0.045	55	694
DragonWave A-ANT-11G	142.00	48	960	0.004	5	59
KMW ETCR-654L12H6	142.00	255	5,136	0.020	25	316
RFS FD9R6004/2C-3L	108.00	16	182	0.001	1	19
RFS FD9R6004/1C-3L	108.00	19	217	0.001	1	23
Nokia B5 RRH4x40-850	108.00	146	1,697	0.007	8	180
Alcatel-Lucent RRH 2	108.00	119	1,386	0.005	7	147
Alcatel-Lucent RRH2x	108.00	170	1,984	0.008	10	211
Alcatel-Lucent B66 R	108.00	201	2,344	0.009	11	249
Commscope HBX-6516DS	108.00	31	364	0.001	2	39
RFS DB-T1-6Z-8AB-0Z	108.00	88	1,026	0.004	5	109
Commscope LNX-6514DS	108.00	116	1,358	0.005	7	144
Commscope JAHH-65B-R	108.00	364	4,241	0.017	21	451
Round Low Profile Pl	108.00	1,500	17,496	0.069	86	1,859
		31,790	253,136	1.000	1,240	39,396

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)
38	147.50	188	4,096	0.016	20	162
37	143.50	117	2,406	0.010	12	101
36	141.00	96	1,914	0.008	9	83
35	137.50	246	4,658	0.018	23	212
34	132.50	254	4,467	0.018	22	219
33	127.50	262	4,267	0.017	21	226

32	122.50	271	4,059	0.016	20	233
31	118.10	210	2,935	0.012	14	181
30	115.60	129	1,721	0.007	8	111
29	112.50	537	6,798	0.027	33	462
28	109.00	246	2,921	0.012	14	212
27	106.50	402	4,559	0.018	22	346
26	103.00	542	5,749	0.023	28	466
25	100.50	153	1,548	0.006	8	132
24	97.50	773	7,345	0.029	36	665
23	92.50	783	6,703	0.026	33	674
22	88.22	564	4,392	0.017	22	486
21	85.72	230	1,689	0.007	8	198
20	82.50	805	5,478	0.022	27	693
19	77.50	816	4,899	0.019	24	702
18	74.25	247	1,360	0.005	7	212
17	71.75	896	4,615	0.018	23	772
16	67.50	922	4,202	0.017	21	794
15	62.50	936	3,655	0.014	18	805
14	57.50	949	3,138	0.012	15	817
13	52.50	962	2,653	0.010	13	828
12	47.50	976	2,202	0.009	11	840
11	42.50	989	1,787	0.007	9	851
10	37.83	868	1,243	0.005	6	747
9	35.33	221	275	0.001	1	190
8	33.25	1,167	1,290	0.005	6	1,004
7	30.75	336	317	0.001	2	289
6	27.50	1,130	854	0.003	4	972
5	22.50	1,146	580	0.002	3	986
4	17.50	1,162	356	0.001	2	1,000
3	12.50	1,178	184	0.001	1	1,014
2	7.50	1,191	67	0.000	0	1,025
1	2.50	1,086	7	0.000	0	935
Powerwave Allgon 702	150.00	13	297	0.001	1	11
Kaelus DBC0061F1V51-	150.00	76	1,721	0.007	8	66
Powerwave LGP21401	150.00	85	1,904	0.008	9	73
Raycap DC6-48-60-18-	150.00	20	450	0.002	2	17
Raycap DC6-48-60-18-	150.00	20	450	0.002	2	17
Ericsson RRUS A2 B2	150.00	66	1,485	0.006	7	57
Ericsson RRUS 32 (50	150.00	152	3,429	0.014	17	131
Ericsson RRUS 11 (Ba	150.00	152	3,422	0.014	17	131
Ericsson RRUS 12	150.00	150	3,375	0.013	17	129
Powerwave Allgon 777	150.00	105	2,363	0.009	12	90
Quintel QS66512-2	150.00	333	7,493	0.030	37	287
CCI OPA-65R-LCUU-H6	150.00	219	4,928	0.019	24	189
Round Platform w/ Ha	150.00	2,000	45,000	0.178	220	1,721
DragonWave Horizon C	142.00	32	641	0.003	3	27
DragonWave A-ANT-23G	142.00	15	302	0.001	1	13
Alcatel-Lucent RRH2x	142.00	317	6,400	0.025	31	273
Alcatel-Lucent 1900	142.00	180	3,630	0.014	18	155
Alcatel-Lucent TD-RR	142.00	210	4,234	0.017	21	181
DragonWave A-ANT-11G	142.00	27	544	0.002	3	23
Side Arms	142.00	560	11,292	0.045	55	482
DragonWave A-ANT-11G	142.00	48	960	0.004	5	41
KMW ETCR-654L12H6	142.00	255	5,136	0.020	25	219
RFS FD9R6004/2C-3L	108.00	16	182	0.001	1	13
RFS FD9R6004/1C-3L	108.00	19	217	0.001	1	16
Nokia B5 RRH4x40-850	108.00	146	1,697	0.007	8	125
Alcatel-Lucent RRH 2	108.00	119	1,386	0.005	7	102
Alcatel-Lucent RRH2x	108.00	170	1,984	0.008	10	146
Alcatel-Lucent B66 R	108.00	201	2,344	0.009	11	173
Commscope HBX-6516DS	108.00	31	364	0.001	2	27
RFS DB-T1-6Z-8AB-0Z	108.00	88	1,026	0.004	5	76
Commscope LNX-6514DS	108.00	116	1,358	0.005	7	100
Commscope JAHH-65B-R	108.00	364	4,241	0.017	21	313

Round Low Profile Pl	108.00	1,500	17,496	0.069	86	1,291
		31,790	253,136	1.000	1,240	27,364

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	-38.05	-1.24	0.00	-156.66	0.00	156.66	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.049
5.00	-36.57	-1.26	0.00	-150.43	0.00	150.43	3,114.09	1,557.04	4,644.49	2,293.74	0.01	-0.02	0.048
10.00	-35.11	-1.26	0.00	-144.16	0.00	144.16	3,070.24	1,535.12	4,479.04	2,212.03	0.04	-0.03	0.047
15.00	-33.67	-1.27	0.00	-137.83	0.00	137.83	3,025.35	1,512.68	4,314.96	2,131.00	0.08	-0.05	0.046
20.00	-32.25	-1.28	0.00	-131.47	0.00	131.47	2,979.43	1,489.71	4,152.36	2,050.69	0.15	-0.07	0.045
25.00	-30.85	-1.28	0.00	-125.09	0.00	125.09	2,932.46	1,466.23	3,991.34	1,971.17	0.23	-0.09	0.044
30.00	-30.44	-1.29	0.00	-118.68	0.00	118.68	2,874.86	1,437.43	3,819.25	1,886.18	0.33	-0.11	0.043
31.50	-28.99	-1.28	0.00	-116.75	0.00	116.75	2,853.94	1,426.97	3,763.56	1,858.68	0.36	-0.11	0.042
35.00	-28.72	-1.28	0.00	-112.27	0.00	112.27	2,805.14	1,402.57	3,635.21	1,795.29	0.45	-0.12	0.041
35.67	-27.64	-1.28	0.00	-111.42	0.00	111.42	2,247.90	1,123.95	2,973.33	1,468.42	0.47	-0.13	0.047
40.00	-26.41	-1.27	0.00	-105.88	0.00	105.88	2,218.43	1,109.21	2,871.69	1,418.22	0.59	-0.14	0.046
45.00	-25.20	-1.27	0.00	-99.50	0.00	99.50	2,183.45	1,091.72	2,755.25	1,360.71	0.75	-0.16	0.044
50.00	-24.01	-1.26	0.00	-93.16	0.00	93.16	2,147.43	1,073.71	2,639.81	1,303.70	0.92	-0.18	0.042
55.00	-22.84	-1.25	0.00	-86.86	0.00	86.86	2,110.37	1,055.18	2,525.48	1,247.24	1.12	-0.20	0.041
60.00	-21.68	-1.23	0.00	-80.62	0.00	80.62	2,072.27	1,036.13	2,412.36	1,191.37	1.34	-0.22	0.039
65.00	-20.53	-1.21	0.00	-74.45	0.00	74.45	2,033.13	1,016.56	2,300.54	1,136.15	1.57	-0.23	0.037
70.00	-19.42	-1.19	0.00	-68.38	0.00	68.38	1,981.90	990.95	2,177.99	1,075.63	1.83	-0.25	0.035
73.50	-19.12	-1.19	0.00	-64.20	0.00	64.20	1,473.88	736.94	1,624.33	802.19	2.02	-0.26	0.039
75.00	-18.10	-1.16	0.00	-62.42	0.00	62.42	1,466.20	733.10	1,601.53	790.93	2.10	-0.27	0.038
80.00	-17.11	-1.14	0.00	-56.61	0.00	56.61	1,439.92	719.96	1,525.89	753.58	2.40	-0.29	0.036
85.00	-16.82	-1.13	0.00	-50.93	0.00	50.93	1,412.60	706.30	1,450.91	716.55	2.71	-0.30	0.033
86.44	-16.12	-1.11	0.00	-49.30	0.00	49.30	1,404.54	702.27	1,429.45	705.95	2.80	-0.31	0.032
86.44	-16.12	-1.11	0.00	-49.30	0.00	49.30	1,404.54	702.27	1,429.45	705.95	2.80	-0.31	0.032
90.00	-15.15	-1.07	0.00	-45.36	0.00	45.36	1,384.24	692.12	1,376.67	679.88	3.03	-0.32	0.030
95.00	-14.19	-1.03	0.00	-40.00	0.00	40.00	1,354.85	677.42	1,303.28	643.64	3.38	-0.34	0.028
100.00	-14.00	-1.03	0.00	-34.83	0.00	34.83	1,324.41	662.20	1,230.84	607.87	3.74	-0.35	0.025
101.00	-13.33	-1.00	0.00	-33.80	0.00	33.80	1,318.20	659.10	1,216.47	600.77	3.81	-0.35	0.024
101.00	-13.33	-1.00	0.00	-33.80	0.00	33.80	1,318.20	659.10	1,216.47	600.77	3.81	-0.35	0.024
105.00	-12.83	-0.97	0.00	-29.82	0.00	29.82	1,292.93	646.47	1,159.45	572.61	4.12	-0.37	0.022
108.00	-9.10	-0.78	0.00	-26.89	0.00	26.89	1,265.65	632.82	1,110.24	548.30	4.35	-0.37	0.019
110.00	-8.43	-0.74	0.00	-25.34	0.00	25.34	1,247.06	623.53	1,077.67	532.22	4.51	-0.38	0.018
110.00	-8.43	-0.74	0.00	-25.34	0.00	25.34	853.21	426.60	741.71	366.30	4.51	-0.38	0.022
115.00	-8.27	-0.73	0.00	-21.63	0.00	21.63	834.97	417.48	698.64	345.03	4.91	-0.39	0.019
116.21	-8.01	-0.72	0.00	-20.74	0.00	20.74	830.40	415.20	688.27	339.91	5.01	-0.39	0.019
116.21	-8.01	-0.72	0.00	-20.74	0.00	20.74	830.40	415.20	688.27	339.91	5.01	-0.39	0.071
120.00	-7.68	-0.70	0.00	-18.02	0.00	18.02	815.69	407.84	655.93	323.94	5.32	-0.40	0.065
125.00	-7.35	-0.68	0.00	-14.53	0.00	14.53	795.37	397.68	613.66	303.07	5.76	-0.44	0.057
130.00	-7.04	-0.66	0.00	-11.13	0.00	11.13	774.01	387.00	571.96	282.47	6.24	-0.48	0.048
135.00	-6.73	-0.64	0.00	-7.82	0.00	7.82	751.61	375.80	530.91	262.20	6.75	-0.51	0.039
140.00	-6.61	-0.63	0.00	-4.63	0.00	4.63	728.17	364.08	490.63	242.30	7.30	-0.53	0.028
142.00	-4.43	-0.44	0.00	-3.38	0.00	3.38	714.97	357.48	472.41	233.31	7.52	-0.54	0.021
145.00	-4.20	-0.41	0.00	-2.07	0.00	2.07	694.05	347.03	445.02	219.78	7.86	-0.54	0.015
150.00	0.00	-0.37	0.00	0.00	0.00	0.00	659.19	329.60	401.19	198.13	8.43	-0.55	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	-26.43	-1.24	0.00	-153.60	0.00	153.60	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.045
5.00	-25.40	-1.25	0.00	-147.38	0.00	147.38	3,114.09	1,557.04	4,644.49	2,293.74	0.01	-0.02	0.045
10.00	-24.39	-1.26	0.00	-141.13	0.00	141.13	3,070.24	1,535.12	4,479.04	2,212.03	0.04	-0.03	0.044
15.00	-23.39	-1.26	0.00	-134.85	0.00	134.85	3,025.35	1,512.68	4,314.96	2,131.00	0.08	-0.05	0.043
20.00	-22.40	-1.26	0.00	-128.55	0.00	128.55	2,979.43	1,489.71	4,152.36	2,050.69	0.14	-0.07	0.042
25.00	-21.43	-1.26	0.00	-122.23	0.00	122.23	2,932.46	1,466.23	3,991.34	1,971.17	0.22	-0.09	0.041
30.00	-21.14	-1.27	0.00	-115.91	0.00	115.91	2,874.86	1,437.43	3,819.25	1,886.18	0.32	-0.10	0.040
31.50	-20.13	-1.26	0.00	-114.01	0.00	114.01	2,853.94	1,426.97	3,763.56	1,858.68	0.36	-0.11	0.039
35.00	-19.94	-1.26	0.00	-109.60	0.00	109.60	2,805.14	1,402.57	3,635.21	1,795.29	0.44	-0.12	0.038
35.67	-19.20	-1.26	0.00	-108.75	0.00	108.75	2,247.90	1,123.95	2,973.33	1,468.42	0.46	-0.12	0.044
40.00	-18.35	-1.25	0.00	-103.30	0.00	103.30	2,218.43	1,109.21	2,871.69	1,418.22	0.58	-0.14	0.043
45.00	-17.51	-1.25	0.00	-97.04	0.00	97.04	2,183.45	1,091.72	2,755.25	1,360.71	0.73	-0.16	0.041
50.00	-16.68	-1.24	0.00	-90.82	0.00	90.82	2,147.43	1,073.71	2,639.81	1,303.70	0.90	-0.17	0.039
55.00	-15.86	-1.22	0.00	-84.64	0.00	84.64	2,110.37	1,055.18	2,525.48	1,247.24	1.10	-0.19	0.038
60.00	-15.05	-1.21	0.00	-78.53	0.00	78.53	2,072.27	1,036.13	2,412.36	1,191.37	1.31	-0.21	0.036
65.00	-14.26	-1.19	0.00	-72.50	0.00	72.50	2,033.13	1,016.56	2,300.54	1,136.15	1.54	-0.23	0.034
70.00	-13.49	-1.16	0.00	-66.57	0.00	66.57	1,981.90	990.95	2,177.99	1,075.63	1.79	-0.25	0.032
73.50	-13.28	-1.16	0.00	-62.49	0.00	62.49	1,473.88	736.94	1,624.33	802.19	1.97	-0.26	0.036
75.00	-12.57	-1.13	0.00	-60.75	0.00	60.75	1,466.20	733.10	1,601.53	790.93	2.06	-0.26	0.035
80.00	-11.88	-1.11	0.00	-55.08	0.00	55.08	1,439.92	719.96	1,525.89	753.58	2.34	-0.28	0.033
85.00	-11.68	-1.10	0.00	-49.55	0.00	49.55	1,412.60	706.30	1,450.91	716.55	2.64	-0.30	0.031
86.44	-11.20	-1.08	0.00	-47.96	0.00	47.96	1,404.54	702.27	1,429.45	705.95	2.73	-0.30	0.030
86.44	-11.20	-1.08	0.00	-47.96	0.00	47.96	1,404.54	702.27	1,429.45	705.95	2.73	-0.30	0.030
90.00	-10.52	-1.04	0.00	-44.12	0.00	44.12	1,384.24	692.12	1,376.67	679.88	2.96	-0.31	0.028
95.00	-9.86	-1.01	0.00	-38.90	0.00	38.90	1,354.85	677.42	1,303.28	643.64	3.30	-0.33	0.025
100.00	-9.73	-1.00	0.00	-33.87	0.00	33.87	1,324.41	662.20	1,230.84	607.87	3.65	-0.34	0.023
101.00	-9.26	-0.97	0.00	-32.87	0.00	32.87	1,318.20	659.10	1,216.47	600.77	3.73	-0.35	0.022
101.00	-9.26	-0.97	0.00	-32.87	0.00	32.87	1,318.20	659.10	1,216.47	600.77	3.73	-0.35	0.022
105.00	-8.91	-0.95	0.00	-28.99	0.00	28.99	1,292.93	646.47	1,159.45	572.61	4.02	-0.36	0.020
108.00	-6.32	-0.76	0.00	-26.15	0.00	26.15	1,265.65	632.82	1,110.24	548.30	4.25	-0.36	0.018
110.00	-5.86	-0.72	0.00	-24.63	0.00	24.63	1,247.06	623.53	1,077.67	532.22	4.40	-0.37	0.017
110.00	-5.86	-0.72	0.00	-24.63	0.00	24.63	853.21	426.60	741.71	366.30	4.40	-0.37	0.020
115.00	-5.75	-0.71	0.00	-21.01	0.00	21.01	834.97	417.48	698.64	345.03	4.79	-0.38	0.018
116.21	-5.56	-0.70	0.00	-20.15	0.00	20.15	830.40	415.20	688.27	339.91	4.89	-0.38	0.017
116.21	-5.56	-0.70	0.00	-20.15	0.00	20.15	830.40	415.20	688.27	339.91	4.89	-0.38	0.066
120.00	-5.33	-0.68	0.00	-17.50	0.00	17.50	815.69	407.84	655.93	323.94	5.19	-0.39	0.061
125.00	-5.11	-0.66	0.00	-14.09	0.00	14.09	795.37	397.68	613.66	303.07	5.62	-0.43	0.053
130.00	-4.89	-0.64	0.00	-10.78	0.00	10.78	774.01	387.00	571.96	282.47	6.09	-0.46	0.044
135.00	-4.67	-0.62	0.00	-7.58	0.00	7.58	751.61	375.80	530.91	262.20	6.59	-0.49	0.035
140.00	-4.59	-0.61	0.00	-4.49	0.00	4.49	728.17	364.08	490.63	242.30	7.12	-0.51	0.025
142.00	-3.08	-0.42	0.00	-3.27	0.00	3.27	714.97	357.48	472.41	233.31	7.34	-0.52	0.018
145.00	-2.92	-0.40	0.00	-2.00	0.00	2.00	694.05	347.03	445.02	219.78	7.67	-0.53	0.013
150.00	0.00	-0.37	0.00	0.00	0.00	0.00	659.19	329.60	401.19	198.13	8.22	-0.53	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):	0.18
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):	2.70
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)
38	147.50	188	1.828	1.667	1.025	0.330	54	233
37	143.50	117	1.730	1.238	0.861	0.269	27	145
36	141.00	96	1.670	1.012	0.769	0.234	20	119
35	137.50	246	1.588	0.742	0.654	0.189	40	305
34	132.50	254	1.475	0.441	0.513	0.131	29	315
33	127.50	262	1.366	0.222	0.397	0.080	18	325
32	122.50	271	1.261	0.069	0.302	0.038	9	335
31	118.10	210	1.172	-0.020	0.234	0.008	1	261
30	115.60	129	1.123	-0.056	0.201	-0.007	-1	160
29	112.50	537	1.063	-0.088	0.165	-0.022	-10	666
28	109.00	246	0.998	-0.110	0.130	-0.036	-8	305
27	106.50	402	0.953	-0.119	0.109	-0.044	-15	498
26	103.00	542	0.891	-0.122	0.084	-0.051	-24	672
25	100.50	153	0.848	-0.119	0.069	-0.054	-7	190
24	97.50	773	0.799	-0.112	0.053	-0.055	-37	958
23	92.50	783	0.719	-0.092	0.034	-0.050	-34	971
22	88.22	564	0.654	-0.072	0.022	-0.040	-20	699
21	85.72	230	0.617	-0.059	0.017	-0.032	-6	285
20	82.50	805	0.572	-0.043	0.012	-0.020	-14	997
19	77.50	816	0.505	-0.018	0.007	0.000	0	1,011
18	74.25	247	0.463	-0.003	0.006	0.013	3	306
17	71.75	896	0.432	0.008	0.006	0.022	17	1,111
16	67.50	922	0.383	0.023	0.007	0.035	28	1,143
15	62.50	936	0.328	0.039	0.010	0.046	38	1,159
14	57.50	949	0.278	0.050	0.014	0.053	43	1,176
13	52.50	962	0.232	0.058	0.019	0.056	47	1,193
12	47.50	976	0.190	0.064	0.025	0.057	48	1,209
11	42.50	989	0.152	0.068	0.030	0.056	48	1,226
10	37.83	868	0.120	0.070	0.034	0.055	42	1,076
9	35.33	221	0.105	0.071	0.037	0.055	10	273
8	33.25	1,167	0.093	0.071	0.038	0.054	55	1,446
7	30.75	336	0.079	0.072	0.040	0.053	16	416
6	27.50	1,130	0.064	0.072	0.041	0.053	51	1,400
5	22.50	1,146	0.043	0.070	0.042	0.051	51	1,420

4	17.50	1,162	0.026	0.067	0.040	0.049	49	1,440
3	12.50	1,178	0.013	0.059	0.034	0.044	45	1,460
2	7.50	1,191	0.005	0.044	0.025	0.035	36	1,476
1	2.50	1,086	0.001	0.018	0.010	0.017	16	1,346
Powerwave Allgon 702	150.00	13	1.890	1.980	1.140	0.370	4	16
Kaelus DBC0061F1V51-	150.00	76	1.890	1.980	1.140	0.370	25	95
Powerwave LGP21401	150.00	85	1.890	1.980	1.140	0.370	27	105
Raycap DC6-48-60-18-	150.00	20	1.890	1.980	1.140	0.370	6	25
Raycap DC6-48-60-18-	150.00	20	1.890	1.980	1.140	0.370	6	25
Ericsson RRUS A2 B2	150.00	66	1.890	1.980	1.140	0.370	21	82
Ericsson RRUS 32 (50	150.00	152	1.890	1.980	1.140	0.370	49	189
Ericsson RRUS 11 (Ba	150.00	152	1.890	1.980	1.140	0.370	49	188
Ericsson RRUS 12	150.00	150	1.890	1.980	1.140	0.370	48	186
Powerwave Allgon 777	150.00	105	1.890	1.980	1.140	0.370	34	130
Quintel QS66512-2	150.00	333	1.890	1.980	1.140	0.370	107	413
CCI OPA-65R-LCUU-H6	150.00	219	1.890	1.980	1.140	0.370	70	271
Round Platform w/ Ha	150.00	2,000	1.890	1.980	1.140	0.370	642	2,479
DragonWave Horizon C	142.00	32	1.694	1.099	0.805	0.248	7	39
DragonWave A-ANT-23G	142.00	15	1.694	1.099	0.805	0.248	3	19
Alcatel-Lucent RRH2x	142.00	317	1.694	1.099	0.805	0.248	68	393
Alcatel-Lucent 1900	142.00	180	1.694	1.099	0.805	0.248	39	223
Alcatel-Lucent TD-RR	142.00	210	1.694	1.099	0.805	0.248	45	260
DragonWave A-ANT-11G	142.00	27	1.694	1.099	0.805	0.248	6	33
Side Arms	142.00	560	1.694	1.099	0.805	0.248	120	694
DragonWave A-ANT-11G	142.00	48	1.694	1.099	0.805	0.248	10	59
KMW ETCR-654L12H6	142.00	255	1.694	1.099	0.805	0.248	55	316
RFS FD9R6004/2C-3L	108.00	16	0.980	-0.114	0.122	-0.040	-1	19
RFS FD9R6004/1C-3L	108.00	19	0.980	-0.114	0.122	-0.040	-1	23
Nokia B5 RRH4x40-850	108.00	146	0.980	-0.114	0.122	-0.040	-5	180
Alcatel-Lucent RRH 2	108.00	119	0.980	-0.114	0.122	-0.040	-4	147
Alcatel-Lucent RRH2x	108.00	170	0.980	-0.114	0.122	-0.040	-6	211
Alcatel-Lucent B66 R	108.00	201	0.980	-0.114	0.122	-0.040	-7	249
Commscope HBX-	108.00	31	0.980	-0.114	0.122	-0.040	-1	39
RFS DB-T1-6Z-8AB-0Z	108.00	88	0.980	-0.114	0.122	-0.040	-3	109
Commscope LNX-	108.00	116	0.980	-0.114	0.122	-0.040	-4	144
Commscope JAHH-65B-	108.00	364	0.980	-0.114	0.122	-0.040	-13	451
Round Low Profile Pl	108.00	1,500	0.980	-0.114	0.122	-0.040	-52	1,859
		31,790	75.424	39.652	29.519	8.280	2,011	39,396

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)
38	147.50	188	1.828	1.667	1.025	0.330	54	162
37	143.50	117	1.730	1.238	0.861	0.269	27	101
36	141.00	96	1.670	1.012	0.769	0.234	20	83
35	137.50	246	1.588	0.742	0.654	0.189	40	212
34	132.50	254	1.475	0.441	0.513	0.131	29	219
33	127.50	262	1.366	0.222	0.397	0.080	18	226
32	122.50	271	1.261	0.069	0.302	0.038	9	233
31	118.10	210	1.172	-0.020	0.234	0.008	1	181
30	115.60	129	1.123	-0.056	0.201	-0.007	-1	111
29	112.50	537	1.063	-0.088	0.165	-0.022	-10	462
28	109.00	246	0.998	-0.110	0.130	-0.036	-8	212
27	106.50	402	0.953	-0.119	0.109	-0.044	-15	346
26	103.00	542	0.891	-0.122	0.084	-0.051	-24	466
25	100.50	153	0.848	-0.119	0.069	-0.054	-7	132
24	97.50	773	0.799	-0.112	0.053	-0.055	-37	665
23	92.50	783	0.719	-0.092	0.034	-0.050	-34	674

22	88.22	564	0.654	-0.072	0.022	-0.040	-20	486
21	85.72	230	0.617	-0.059	0.017	-0.032	-6	198
20	82.50	805	0.572	-0.043	0.012	-0.020	-14	693
19	77.50	816	0.505	-0.018	0.007	0.000	0	702
18	74.25	247	0.463	-0.003	0.006	0.013	3	212
17	71.75	896	0.432	0.008	0.006	0.022	17	772
16	67.50	922	0.383	0.023	0.007	0.035	28	794
15	62.50	936	0.328	0.039	0.010	0.046	38	805
14	57.50	949	0.278	0.050	0.014	0.053	43	817
13	52.50	962	0.232	0.058	0.019	0.056	47	828
12	47.50	976	0.190	0.064	0.025	0.057	48	840
11	42.50	989	0.152	0.068	0.030	0.056	48	851
10	37.83	868	0.120	0.070	0.034	0.055	42	747
9	35.33	221	0.105	0.071	0.037	0.055	10	190
8	33.25	1,167	0.093	0.071	0.038	0.054	55	1,004
7	30.75	336	0.079	0.072	0.040	0.053	16	289
6	27.50	1,130	0.064	0.072	0.041	0.053	51	972
5	22.50	1,146	0.043	0.070	0.042	0.051	51	986
4	17.50	1,162	0.026	0.067	0.040	0.049	49	1,000
3	12.50	1,178	0.013	0.059	0.034	0.044	45	1,014
2	7.50	1,191	0.005	0.044	0.025	0.035	36	1,025
1	2.50	1,086	0.001	0.018	0.010	0.017	16	935
Powerwave Allgon 702	150.00	13	1.890	1.980	1.140	0.370	4	11
Kaelus DBC0061F1V51-	150.00	76	1.890	1.980	1.140	0.370	25	66
Powerwave LGP21401	150.00	85	1.890	1.980	1.140	0.370	27	73
Raycap DC6-48-60-18-	150.00	20	1.890	1.980	1.140	0.370	6	17
Raycap DC6-48-60-18-	150.00	20	1.890	1.980	1.140	0.370	6	17
Ericsson RRUS A2 B2	150.00	66	1.890	1.980	1.140	0.370	21	57
Ericsson RRUS 32 (50	150.00	152	1.890	1.980	1.140	0.370	49	131
Ericsson RRUS 11 (Ba	150.00	152	1.890	1.980	1.140	0.370	49	131
Ericsson RRUS 12	150.00	150	1.890	1.980	1.140	0.370	48	129
Powerwave Allgon 777	150.00	105	1.890	1.980	1.140	0.370	34	90
Quintel QS66512-2	150.00	333	1.890	1.980	1.140	0.370	107	287
CCI OPA-65R-LCUU-H6	150.00	219	1.890	1.980	1.140	0.370	70	189
Round Platform w/ Ha	150.00	2,000	1.890	1.980	1.140	0.370	642	1,721
DragonWave Horizon C	142.00	32	1.694	1.099	0.805	0.248	7	27
DragonWave A-ANT-23G	142.00	15	1.694	1.099	0.805	0.248	3	13
Alcatel-Lucent RRH2x	142.00	317	1.694	1.099	0.805	0.248	68	273
Alcatel-Lucent 1900	142.00	180	1.694	1.099	0.805	0.248	39	155
Alcatel-Lucent TD-RR	142.00	210	1.694	1.099	0.805	0.248	45	181
DragonWave A-ANT-11G	142.00	27	1.694	1.099	0.805	0.248	6	23
Side Arms	142.00	560	1.694	1.099	0.805	0.248	120	482
DragonWave A-ANT-11G	142.00	48	1.694	1.099	0.805	0.248	10	41
KMW ETCR-654L12H6	142.00	255	1.694	1.099	0.805	0.248	55	219
RFS FD9R6004/2C-3L	108.00	16	0.980	-0.114	0.122	-0.040	-1	13
RFS FD9R6004/1C-3L	108.00	19	0.980	-0.114	0.122	-0.040	-1	16
Nokia B5 RRH4x40-850	108.00	146	0.980	-0.114	0.122	-0.040	-5	125
Alcatel-Lucent RRH 2	108.00	119	0.980	-0.114	0.122	-0.040	-4	102
Alcatel-Lucent RRH2x	108.00	170	0.980	-0.114	0.122	-0.040	-6	146
Alcatel-Lucent B66 R	108.00	201	0.980	-0.114	0.122	-0.040	-7	173
Commscope HBX-	108.00	31	0.980	-0.114	0.122	-0.040	-1	27
RFS DB-T1-6Z-8AB-0Z	108.00	88	0.980	-0.114	0.122	-0.040	-3	76
Commscope LNX-	108.00	116	0.980	-0.114	0.122	-0.040	-4	100
Commscope JAHH-65B-	108.00	364	0.980	-0.114	0.122	-0.040	-13	313
Round Low Profile Pl	108.00	1,500	0.980	-0.114	0.122	-0.040	-52	1,291
		31,790	75.424	39.652	29.519	8.280	2,011	27,364

Site Number: 302482 Code: ANSI/TIA-222-G

Site Name: North Haven CT 1, CT Engineering Number:OAA708185_C3_02 3/1/2018 3:34:12 PM

Customer: VERIZON WIRELESS

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	-38.05	-2.00	0.00	-252.08	0.00	252.08	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.073
5.00	-36.57	-1.98	0.00	-242.07	0.00	242.07	3,114.09	1,557.04	4,644.49	2,293.74	0.01	-0.03	0.072
10.00	-35.11	-1.95	0.00	-232.15	0.00	232.15	3,070.24	1,535.12	4,479.04	2,212.03	0.06	-0.06	0.071
15.00	-33.67	-1.92	0.00	-222.38	0.00	222.38	3,025.35	1,512.68	4,314.96	2,131.00	0.13	-0.08	0.069
20.00	-32.25	-1.88	0.00	-212.77	0.00	212.77	2,979.43	1,489.71	4,152.36	2,050.69	0.23	-0.11	0.068
25.00	-30.85	-1.84	0.00	-203.35	0.00	203.35	2,932.46	1,466.23	3,991.34	1,971.17	0.37	-0.14	0.067
30.00	-30.43	-1.84	0.00	-194.13	0.00	194.13	2,874.86	1,437.43	3,819.25	1,886.18	0.53	-0.17	0.066
31.50	-28.99	-1.79	0.00	-191.37	0.00	191.37	2,853.94	1,426.97	3,763.56	1,858.68	0.59	-0.18	0.065
35.00	-28.71	-1.78	0.00	-185.12	0.00	185.12	2,805.14	1,402.57	3,635.21	1,795.29	0.72	-0.20	0.064
35.67	-27.64	-1.74	0.00	-183.93	0.00	183.93	2,247.90	1,123.95	2,973.33	1,468.42	0.75	-0.20	0.073
40.00	-26.41	-1.70	0.00	-176.37	0.00	176.37	2,218.43	1,109.21	2,871.69	1,418.22	0.95	-0.23	0.071
45.00	-25.20	-1.66	0.00	-167.85	0.00	167.85	2,183.45	1,091.72	2,755.25	1,360.71	1.21	-0.26	0.070
50.00	-24.01	-1.63	0.00	-159.53	0.00	159.53	2,147.43	1,073.71	2,639.81	1,303.70	1.50	-0.29	0.068
55.00	-22.83	-1.59	0.00	-151.40	0.00	151.40	2,110.37	1,055.18	2,525.48	1,247.24	1.82	-0.33	0.066
60.00	-21.67	-1.56	0.00	-143.46	0.00	143.46	2,072.27	1,036.13	2,412.36	1,191.37	2.18	-0.36	0.064
65.00	-20.53	-1.53	0.00	-135.68	0.00	135.68	2,033.13	1,016.56	2,300.54	1,136.15	2.57	-0.39	0.062
70.00	-19.42	-1.52	0.00	-128.01	0.00	128.01	1,981.90	990.95	2,177.99	1,075.63	3.00	-0.42	0.060
73.50	-19.11	-1.52	0.00	-122.70	0.00	122.70	1,473.88	736.94	1,624.33	802.19	3.32	-0.45	0.069
75.00	-18.10	-1.52	0.00	-120.43	0.00	120.43	1,466.20	733.10	1,601.53	790.93	3.46	-0.46	0.068
80.00	-17.10	-1.53	0.00	-112.84	0.00	112.84	1,439.92	719.96	1,525.89	753.58	3.96	-0.49	0.065
85.00	-16.81	-1.54	0.00	-105.17	0.00	105.17	1,412.60	706.30	1,450.91	716.55	4.49	-0.53	0.062
86.44	-16.11	-1.56	0.00	-102.95	0.00	102.95	1,404.54	702.27	1,429.45	705.95	4.65	-0.54	0.061
86.44	-16.11	-1.56	0.00	-102.95	0.00	102.95	1,404.54	702.27	1,429.45	705.95	4.65	-0.54	0.061
90.00	-15.14	-1.60	0.00	-97.39	0.00	97.39	1,384.24	692.12	1,376.67	679.88	5.06	-0.56	0.059
95.00	-14.18	-1.63	0.00	-89.41	0.00	89.41	1,354.85	677.42	1,303.28	643.64	5.67	-0.60	0.055
100.00	-13.99	-1.64	0.00	-81.26	0.00	81.26	1,324.41	662.20	1,230.84	607.87	6.31	-0.63	0.052
101.00	-13.32	-1.66	0.00	-79.61	0.00	79.61	1,318.20	659.10	1,216.47	600.77	6.45	-0.64	0.051
101.00	-13.32	-1.66	0.00	-79.61	0.00	79.61	1,318.20	659.10	1,216.47	600.77	6.45	-0.64	0.049
105.00	-12.82	-1.68	0.00	-72.97	0.00	72.97	1,292.93	646.47	1,159.45	572.61	6.99	-0.66	0.046
108.00	-9.08	-1.74	0.00	-67.94	0.00	67.94	1,265.65	632.82	1,110.24	548.30	7.41	-0.68	0.043
110.00	-8.42	-1.74	0.00	-64.46	0.00	64.46	1,247.06	623.53	1,077.67	532.22	7.70	-0.69	0.041
110.00	-8.42	-1.74	0.00	-64.46	0.00	64.46	853.21	426.60	741.71	366.30	7.70	-0.69	0.049
115.00	-8.26	-1.74	0.00	-55.75	0.00	55.75	834.97	417.48	698.64	345.03	8.44	-0.72	0.043
116.21	-8.00	-1.74	0.00	-53.64	0.00	53.64	830.40	415.20	688.27	339.91	8.62	-0.73	0.042
116.21	-8.00	-1.74	0.00	-53.64	0.00	53.64	830.40	415.20	688.27	339.91	8.62	-0.73	0.167
120.00	-7.66	-1.74	0.00	-47.03	0.00	47.03	815.69	407.84	655.93	323.94	9.21	-0.75	0.155
125.00	-7.33	-1.73	0.00	-38.35	0.00	38.35	795.37	397.68	613.66	303.07	10.05	-0.85	0.136
130.00	-7.01	-1.70	0.00	-29.71	0.00	29.71	774.01	387.00	571.96	282.47	11.00	-0.95	0.114
135.00	-6.71	-1.67	0.00	-21.19	0.00	21.19	751.61	375.80	530.91	262.20	12.04	-1.03	0.090
140.00	-6.59	-1.65	0.00	-12.85	0.00	12.85	728.17	364.08	490.63	242.30	13.15	-1.09	0.062
142.00	-4.41	-1.23	0.00	-9.55	0.00	9.55	714.97	357.48	472.41	233.31	13.61	-1.11	0.047
145.00	-4.18	-1.17	0.00	-5.86	0.00	5.86	694.05	347.03	445.02	219.78	14.32	-1.13	0.033
150.00	0.00	-1.09	0.00	0.00	0.00	0.00	659.19	329.60	401.19	198.13	15.52	-1.15	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	-26.43	-2.00	0.00	-246.71	0.00	246.71	3,156.90	1,578.45	4,811.22	2,376.08	0.00	0.00	0.069
5.00	-25.40	-1.98	0.00	-236.71	0.00	236.71	3,114.09	1,557.04	4,644.49	2,293.74	0.01	-0.03	0.068
10.00	-24.39	-1.94	0.00	-226.83	0.00	226.83	3,070.24	1,535.12	4,479.04	2,212.03	0.06	-0.05	0.067
15.00	-23.39	-1.90	0.00	-217.13	0.00	217.13	3,025.35	1,512.68	4,314.96	2,131.00	0.13	-0.08	0.065
20.00	-22.40	-1.86	0.00	-207.62	0.00	207.62	2,979.43	1,489.71	4,152.36	2,050.69	0.23	-0.11	0.064
25.00	-21.43	-1.82	0.00	-198.31	0.00	198.31	2,932.46	1,466.23	3,991.34	1,971.17	0.36	-0.14	0.063
30.00	-21.14	-1.81	0.00	-189.22	0.00	189.22	2,874.86	1,437.43	3,819.25	1,886.18	0.52	-0.17	0.062
31.50	-20.13	-1.76	0.00	-186.51	0.00	186.51	2,853.94	1,426.97	3,763.56	1,858.68	0.57	-0.17	0.061
35.00	-19.94	-1.75	0.00	-180.36	0.00	180.36	2,805.14	1,402.57	3,635.21	1,795.29	0.71	-0.20	0.060
35.67	-19.19	-1.71	0.00	-179.19	0.00	179.19	2,247.90	1,123.95	2,973.33	1,468.42	0.74	-0.20	0.069
40.00	-18.34	-1.67	0.00	-171.78	0.00	171.78	2,218.43	1,109.21	2,871.69	1,418.22	0.93	-0.22	0.067
45.00	-17.50	-1.63	0.00	-163.45	0.00	163.45	2,183.45	1,091.72	2,755.25	1,360.71	1.18	-0.25	0.066
50.00	-16.67	-1.58	0.00	-155.32	0.00	155.32	2,147.43	1,073.71	2,639.81	1,303.70	1.46	-0.29	0.064
55.00	-15.85	-1.54	0.00	-147.40	0.00	147.40	2,110.37	1,055.18	2,525.48	1,247.24	1.78	-0.32	0.062
60.00	-15.05	-1.51	0.00	-139.68	0.00	139.68	2,072.27	1,036.13	2,412.36	1,191.37	2.13	-0.35	0.061
65.00	-14.25	-1.49	0.00	-132.12	0.00	132.12	2,033.13	1,016.56	2,300.54	1,136.15	2.51	-0.38	0.059
70.00	-13.48	-1.47	0.00	-124.69	0.00	124.69	1,981.90	990.95	2,177.99	1,075.63	2.93	-0.41	0.057
73.50	-13.27	-1.47	0.00	-119.55	0.00	119.55	1,473.88	736.94	1,624.33	802.19	3.24	-0.44	0.065
75.00	-12.57	-1.47	0.00	-117.34	0.00	117.34	1,466.20	733.10	1,601.53	790.93	3.38	-0.45	0.064
80.00	-11.87	-1.48	0.00	-110.00	0.00	110.00	1,439.92	719.96	1,525.89	753.58	3.86	-0.48	0.062
85.00	-11.67	-1.49	0.00	-102.58	0.00	102.58	1,412.60	706.30	1,450.91	716.55	4.38	-0.51	0.059
86.44	-11.19	-1.51	0.00	-100.43	0.00	100.43	1,404.54	702.27	1,429.45	705.95	4.54	-0.52	0.058
86.44	-11.19	-1.51	0.00	-100.43	0.00	100.43	1,404.54	702.27	1,429.45	705.95	4.54	-0.52	0.058
90.00	-10.51	-1.55	0.00	-95.04	0.00	95.04	1,384.24	692.12	1,376.67	679.88	4.94	-0.55	0.056
95.00	-9.85	-1.58	0.00	-87.31	0.00	87.31	1,354.85	677.42	1,303.28	643.64	5.53	-0.58	0.053
100.00	-9.71	-1.59	0.00	-79.40	0.00	79.40	1,324.41	662.20	1,230.84	607.87	6.16	-0.61	0.049
101.00	-9.25	-1.61	0.00	-77.81	0.00	77.81	1,318.20	659.10	1,216.47	600.77	6.29	-0.62	0.048
101.00	-9.25	-1.61	0.00	-77.81	0.00	77.81	1,318.20	659.10	1,216.47	600.77	6.29	-0.62	0.047
105.00	-8.90	-1.63	0.00	-71.36	0.00	71.36	1,292.93	646.47	1,159.45	572.61	6.82	-0.65	0.044
108.00	-6.30	-1.70	0.00	-66.48	0.00	66.48	1,265.65	632.82	1,110.24	548.30	7.23	-0.66	0.041
110.00	-5.84	-1.71	0.00	-63.07	0.00	63.07	1,247.06	623.53	1,077.67	532.22	7.51	-0.68	0.039
110.00	-5.84	-1.71	0.00	-63.07	0.00	63.07	853.21	426.60	741.71	366.30	7.51	-0.68	0.046
115.00	-5.73	-1.71	0.00	-54.52	0.00	54.52	834.97	417.48	698.64	345.03	8.23	-0.70	0.041
116.21	-5.55	-1.71	0.00	-52.45	0.00	52.45	830.40	415.20	688.27	339.91	8.41	-0.71	0.039
116.21	-5.55	-1.71	0.00	-52.45	0.00	52.45	830.40	415.20	688.27	339.91	8.41	-0.71	0.161
120.00	-5.31	-1.70	0.00	-45.98	0.00	45.98	815.69	407.84	655.93	323.94	8.98	-0.73	0.148
125.00	-5.09	-1.69	0.00	-37.46	0.00	37.46	795.37	397.68	613.66	303.07	9.80	-0.83	0.130
130.00	-4.86	-1.67	0.00	-29.01	0.00	29.01	774.01	387.00	571.96	282.47	10.73	-0.93	0.109
135.00	-4.65	-1.63	0.00	-20.69	0.00	20.69	751.61	375.80	530.91	262.20	11.74	-1.01	0.085
140.00	-4.57	-1.61	0.00	-12.55	0.00	12.55	728.17	364.08	490.63	242.30	12.83	-1.07	0.058
142.00	-3.06	-1.20	0.00	-9.33	0.00	9.33	714.97	357.48	472.41	233.31	13.28	-1.08	0.044
145.00	-2.90	-1.15	0.00	-5.73	0.00	5.73	694.05	347.03	445.02	219.78	13.97	-1.10	0.030
150.00	0.00	-1.09	0.00	0.00	0.00	0.00	659.19	329.60	401.19	198.13	15.14	-1.12	0.000

Analysis Summary

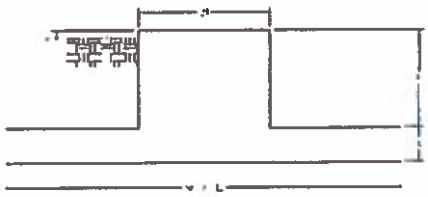
Load Case	Reactions Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Max Usage Elev (ft)	Interaction Ratio
1.2D + 1.6W	27.24	0.00	38.08	0.00	0.00	2739.76	116.21	0.85
0.9D + 1.6W	27.21	0.00	28.54	0.00	0.00	2698.49	116.21	0.83
1.2D + 1.0Di + 1.0Wi	6.27	0.00	62.96	0.00	0.00	684.93	116.21	0.25
(1.2 + 0.2Sds) * DL + E ELFM	1.24	0.00	38.05	0.00	0.00	156.66	116.21	0.07
(1.2 + 0.2Sds) * DL + E EMAM	2.00	0.00	38.05	0.00	0.00	252.08	116.21	0.17
(0.9 - 0.2Sds) * DL + E ELFM	1.24	0.00	26.43	0.00	0.00	153.60	116.21	0.07
(0.9 - 0.2Sds) * DL + E EMAM	2.00	0.00	26.43	0.00	0.00	246.71	116.21	0.16
1.0D + 1.0W	6.51	0.00	31.79	0.00	0.00	649.97	116.21	0.21

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	Upper Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Lower Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Max Member Pu (kip)	phiPn (kip)	Ratio
0.00	86.4	(4) SOL-#20 All Thre	344.6	10.3	16.8	0.0	12.0	0	12	0.0	12.0	0	0	286.8	330.5	0.868
86.4	101.	(4) SOL-#20 All Thre	0.0	0.0	16.8	127.6	12.0	11	16	0.0	12.0	0	0	171.9	353.5	0.486
101.	116.	(3) SOL-#20 All Thre	397.6	11.9	16.8	105.6	12.0	9	12	145.7	12.0	13	14	147.5	330.5	0.446

Site Name:	North Haven CT 1, CT
Site Number:	302482
Engineering Number:	OAA708185
Engineer:	Aaron.Black
Date:	03/01/18
Tower Type:	MP

Program Last Updated: *5/13/2014*



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

Design / Analysis / Mapping:	Analysis			
Compression/Leg:	38.1	k	Concrete Strength (f'_c):	3000 psi
Uplift/Leg:	0.0	k	Pad Tension Steel Depth:	32.00 in
Total Shear:	27.2	k	ϕ_{Shear}:	0.75
Moment:	2739.8	k-ft	$\phi_{Flexure\ /\ Tension}$:	0.90
Tower + Appurtenance Weight:	38.1	k	$\phi_{Compression}$:	0.65
Depth to Base of Foundation (l + t - h):	10.50	ft	β:	0.85
Diameter of Pier (d):	6.00	ft	Bottom Pad Rebar Size #:	10
Height of Pier above Ground (h):	0.50		# of Bottom Pad Rebar:	36
Width of Pad (W):	18.00	ft	Pad Bottom Steel Area:	45.72 in^2
Length of Pad (L):	22.00	ft	Pad Steel F_y:	60000 psi
Thickness of Pad (t):	3.00	ft	Top Pad Rebar Size #:	5
Tower Leg Center to Center:	0.00	ft	# of Top Pad Rebar:	36
Number of Tower Legs:	1.0	(1 if MP or GT)	Pad Top Steel Area:	11.16 in^2
Tower Center from Mat Center:	0.00	ft	Pier Rebar Size #:	11
Depth Below Ground Surface to Water Table:	7.00	ft	Pier Steel Area (Single Bar):	1.56 in^2
Unit Weight of Concrete:	150.0	pcf	# of Pier Rebar:	14
Unit Weight of Soil Above Water Table:	125.0	pcf	Pier Steel F_y:	60000 psi
Unit Weight of Water:	62.4	pcf	Pier Cage Diameter:	64.0 in
Unit Weight of Soil Below Water Table:	62.6	pcf	Rebar Strain Limit:	0.008
Friction Angle of Uplift:	15.0	Degrees	Steel Elastic Modulus:	29000 ksi
Ultimate Coefficient of Shear Friction:	0.35		Tie Rebar Size #:	4
Ultimate Compressive Bearing Pressure:	8000.0	psf	Tie Steel Area (Single Bar):	0.20 in^2
Ultimate Passive Pressure on Pad Face:	0.0	psf	Tie Spacing:	12 in
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9		Tie Steel F_y:	60000 psi
ϕ_{Soil}:	0.75			

Overturning Moment Usage

Design OTM:	3039.4	k-ft
OTM Resistance:	4721.1	k-ft
Design OTM / OTM Resistance:	0.64	Result: OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	4102	psf
Factored Nominal Bearing Pressure:	6000	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.68	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

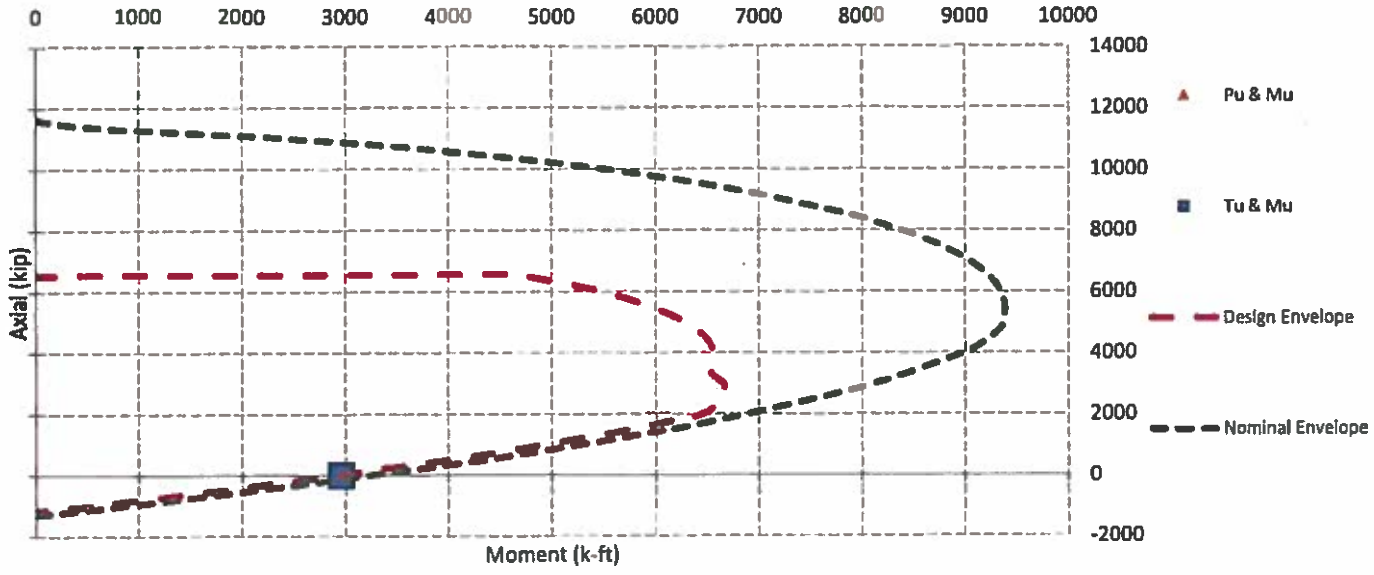
Sliding Factor of Safety

Total Factored Sliding Resistance:	131.8	k
Sliding Design / Sliding Resistance:	0.21	Result: OK

One Way Shear, Flexual Capacity, and Punching Shear

Factored One Way Shear (V_u):	132.7	k
One Way Shear Capacity (ϕV_c):	445.5	k - ACI11.3.1.1
$V_u / \phi V_c$:	0.30	Result: OK
Load Direction Controling Shear Capacity:	Diagonal to Pad Edge	
Lower Steel Pad Factored Moment (M_u):	801.9	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	5335.9	k-ft - ACI10.3
$M_u / \phi M_n$:	0.15	Result: OK
Load Direction Controling Flexural Capacity:	Diagonal to Pad Edge	
Upper Steel Pad Factored Moment (M_u):	688.2	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	1585.8	k-ft
$M_u / \phi M_n$:	0.43	Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0054	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0013	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	7	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Reinforcement Spacing:	7	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear (V_u):	0.0	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	1718.0	k - ACI11.12.2.1
$V_u / \phi V_c$:	0.00	Result: OK
Factored Moment in Pier (M_u):	2957.7	k-ft
Pier Moment Capacity (ϕM_n):	3087.5	k-ft
$M_u / \phi M_n$:	0.96	Result: OK
Factored Shear in Pier (V_u):	27.2	k
Pier Shear Capacity (ϕV_n):	336.1	k
$V_u / \phi V_c$:	0.08	Result: OK
Pier Shear Reinforcement Ratio:	0.0005	No Ties Necessary for Shear - ACI11.5.6.1
Factored Tension in Pier (T_u):	0.0	k
Pier Tension Capacity (ϕT_n):	1179.4	k
$T_u / \phi T_n$:	0.00	Result: OK
Factored Compression in Pier (P_u):	38.1	k
Pier Compression Capacity (ϕP_n):	5369.9	k - ACI10.3.6.2
$P_u / \phi P_n$:	0.01	Result: OK
Pier Compression Reinforcement Ratio:	0.005	OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.96	Result: OK

Nominal and Design Moment Capacity and Factored Design Loads



Base Plate & Anchor Rod Analysis

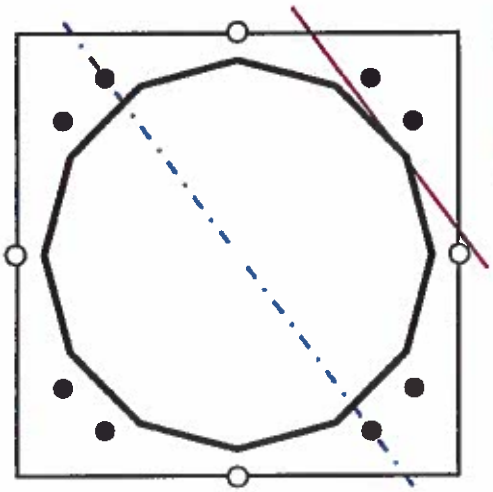
Pole Dimensions		
Number of Sides	12	-
Diameter	37.38	in
Thickness	0.375	in
Orientation Offset		°

Base Reactions		
Moment, Mu	2739.8	k-ft
Axial, Pu	38.1	k
Shear, Vu	27.2	k
Neutral Axis	307	°

Report Capacities		
Component	Capacity	Result
Base Plate	62%	Pass
Anchor Rods	88%	Pass
Dwyidag	61%	Pass

Base Plate		
Shape	Square	-
Width	44	in
Thickness	2 1/2	in
Grade	A572-60	-
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip		in
Orientation Offset	0	°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	1303.5	k
Bending Stress, ϕMn	2096.8	k

Dywidag Reinforcement		
Quantity	4	-
Bar Size	#20	in
Diameter, ø	2.5	in
Bracket Type	Angle	-
Circle	44.26	in
Orientation Offset	0	°
Applied Force, Pu	237.7	k
Dywidag Bar, ϕPn	392.7	k



Original Anchor Rods		
Arrangement	Cluster	-
Quantity	8	-
Diameter, ø	2 1/4	in
Bolt Circle	44	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset	0	°
Applied Force, Pu	228.7	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	27.2	1657.7	0.61
Anchor Rod Forces	27.2	1657.7	0.61
Additional Bolt (Grp1) Forces			
Additional Bolt (Grp2) Forces			
Dywidag Forces		1082.0	0.39
Stiffener Forces			

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	43.0934	3.5911	0.1692		7376.38
Bolt	3.9761	3.2477	0.8393	4.5	6294.24
Bolt1					
Bolt2					
Dywidag	4.9087	4.9087	1.9175		4814.56
Stiffener					

Base Plate		
Shape	Square	-
Width, W	44	in
Thickness, t	2.5	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	23.219	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

External Base Plate		
Chord Length AA	24.850	in
Additional AA	0.000	in
Section Modulus, Z	38.829	in^3
Applied Moment, Mu	1303.5	k-ft
Bending Capacity, ϕMn	2096.8	k-ft
Capacity, Mu/ϕMn	0.622	OK
Chord Length AB	23.532	in
Additional AB	0.000	in
Section Modulus, Z	36.769	in^3
Applied Moment, Mu	1007.6	k-ft
Bending Capacity, ϕMn	1985.5	k-ft
Capacity, Mu/ϕMn	0.507	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		

Anchor Rods		
Anchor Rod Quantity, N	8	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	44	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	228.7	k
Applied Shear, Vu	0.0	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.880	OK
Interaction Capacity	0.880	OK

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

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

Dywidag Reinforcement		
Dywidag Quantity, N	4	-
Dywidag Diameter, d	2.5	in
Bolt Circle, BC	44.255	in
Yield Strength, Fy	80	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	237.7	k
Compressive Capacity, ϕPn	392.7	k
Capacity, Pu/ϕPn	0.605	OK

Base Plate Stiffeners		
Applied Axial Force, Pu	0.0	k
Applied Horizontal Force, Vu	0.00	k
Vertical Weld		
Vert.-to-Stiffener $a=e_w/l$	#DIV/0!	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Compressive Capacity, ϕPn	#DIV/0!	k
Vert.-to-Plate $a=e_w/l$	#DIV/0!	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Shear Capacity, ϕVn	#DIV/0!	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$		
Horizontal Weld		
Horz.-to-Stiffener $a=e_w/l$	0.000	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Effective Fillet	0.000	in
Compressive Capacity, ϕPn	#DIV/0!	k
Horz.-to-Pole $a=e_w/l$	#DIV/0!	-
Spacing Ratio, k	#DIV/0!	-
Weld Coefficient, C	#DIV/0!	-
Shear Capacity, ϕVn	#DIV/0!	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$		
Plate Tension		
Gross Cross Section	0.000	in^2
Net Cross Section	0.000	in^2
Tensile Capacity, ϕTn	0.0	k
Capacity, Tu/ϕTn		
Plate Compression		
Radius of Gyration	#DIV/0!	in^3
kl/r	#DIV/0!	-
$4.71\sqrt{(E/Fy)}$	0.00	-
Buckling Stress(Fe)	0.0	-
Crit. Buckling Stress(Fcr)	0.0	ksi
Compressive Capacity, ϕPn	0.0	k
Capacity, Pu/ϕPn		

Base/Flange Plate	Plate Type	*Flange @ 110.0 ft*
	Pole Diameter	21.25 in
	Pole Thickness	0.1875 in
	Plate Diameter	28.5 in
	Plate Thickness	1 in
	Plate Fy	50 ksi
	Weld Length	0.1875 in
	ϕ_s Resistance	117.26 k-in
	Applied	17.51 k-in
Stiffeners	#	*12* *Show*
	Thickness	0.5 in
	Length	4 in
	Height	3 in
	Chamfer	0.25 in
	Offset Angle	0 °
	Fy	36 ksi

Bolts	#	*12*
	Bolt Circle	25.75 in
	(R)adial / (S)quare	R
	Diameter	1 in
	Hole Diameter	1.25 in
	Type	A325
	Fy	92 ksi
	Fu	120 ksi
	ϕ_s Resistance	54.52 k
	Applied	12.18 k
Reinforcement	#	*3*
	DYW. Circle	35 in
	Offset Angle	°
	Type	#20
	Diameter	2.5 in
	Fu	100 ksi
	ϕ_s Resistance	392.70 k
	Applied	107.16 k
Extra Bolts 0	#	*0*

Code Rev. G

Moment 354.0 k-ft

Axial 7.7 k

Date 3/1/2018

Engineer Aaron.Black

Site # 302482

Carrier VERIZON WIRELESS

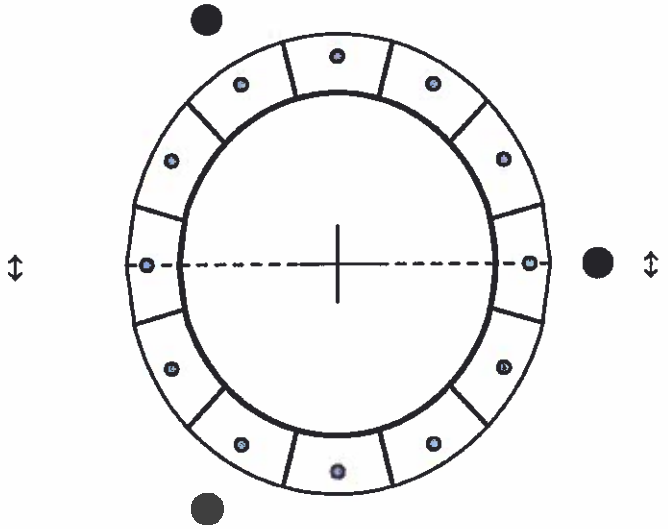


Plate Stress Ratio:

0.15 (Pass)

Bolt Stress Ratio:

0.22 (Pass)

Reinforcement Stress Ratio:

0.27 (Pass)

PROJECT INFORMATION

SCOPE OF WORK: TOWER – DECOM GSM ANTENNA. RELOCATE OCTOPORT TO POSITION 4 AND ADD (3) 6' QUINTEL 12PORT ANTENNAS TO POSITION 3. INSTALL (3) RRUS 32 (WCS) RADIOS TO NEW 12PORT. INSTALL (3) LOW BAND COMBINERS TO NEW 12PORT AND RECONNECT GSM COAX FOR GROUND MOUNTED 700 RADIOS. SURGE: INSTALL (1) DC/FIBER SQUID WITH (1) 18PAIR FIBER, (2) DC TRUNKS AND (1) ALARM CABLE, NEW PORTS NEEDED AT HATCH.

GROUND – ACTIVATE SECOND HALF OF EXISTING DC12 IN LTE RACK FOR 2ND SQUID. INSTALL (1) FIBER BOX ON ICE BRIDGE POST AND INSTALL (1) FIBER TRAY IN LTE RACK. INSTALL (2) B14 RADIOS AND (8) SURGE ARRESTORS TO EXISTING RACK WITH UMTS RADIOS; REPLACE GSM DIPLEXERS WITH (3) LOW BAND COMBINERS AND CONNECT TO EXISTING GSM COAX GOING TO NEW 12PORT ANTENNA. SWAP DUS TO 5216. INSTALL (5) 30 AMP BREAKERS IN EXISTING INFINITY PLANT.

SITE ADDRESS: 12 DWIGHT STREET
NORTH HAVEN, CT 06473

LATITUDE: 41° 25' 14.87" N (NAD 83)*
LONGITUDE: 72° 50' 55.69" W (NAD 83)*
*PER EXISTING AT&T PLANS

NAME OF APPLICANT: AT&T MOBILITY
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

TOWER OWNER: AMERICAN TOWER CORPORATION
TOWER SITE NAME: NORTH HAVEN, CT
TOWER SITE NO.: 302482

DRAWING INDEX

		REV
T01	TITLE SHEET	0
G01	GENERAL NOTES	0
C01	PROPOSED SITE PLAN & SHELTER PLAN	0
C02	PROPOSED ELEVATION & CONSTRUCTION DETAILS	0
C03	EQUIPMENT PLUMBING DIAGRAM	0
E01	GROUNDING NOTES & DETAILS	0

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STRUCTURAL NOTE:

1. AS REQUIRED UNDER TIA/EIA 222H – STANDARD, CENTERLINE COMMUNICATIONS SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED CONNECTICUT STRUCTURAL ENGINEER CERTIFYING THAT, THE EXISTING TOWER & ANY REQUIRED IMPROVEMENTS & REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING & PROPOSED ANTENNAS, SUPPORTS & APPURTENANCES & COMPLIES WITH THE CURRENT CONNECTICUT STATE BUILDING CODE & EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS & REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS & APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

CONTACT INFORMATION

CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	BENJAMIN REVETTE, P.E.	DEWBERRY ENGINEERS INC.	(617) 531-0800
SAC:	TYLER RAMSDEN	CENTERLINE COMMUNICATIONS	(781) 708-3952

at&t Mobility

SITE NAME: NORTH HAVEN CT 3C/4C
SITE NUMBER: CT2012
PACE NO.: MRCTB025244 (3C) / MRCTB026642 (4C)

VICINITY MAP

DIRECTIONS: TAKE I-495 S. FOLLOW SIGNS FOR I-90W. MERGE ONTO I-90W AND CONTINUE TO I-84 TOWARD US-20/HARTFORD/NEW YORK CITY. CONTINUE ONTO I-84. USE THE LEFT TWO LANES TO TAKE EXIT 57 FOR CT-15S TOWARD I-91 S/CHARTER OAK BRIDGE/N.Y.CITY. CONTINUE ONTO CT-15 S/US-5S. TAKE EXIT 86 TO MERGE ONTO I-91 S TOWARD NEW HAVEN/NEW YORK CITY. TAKE EXIT 13 TOWARD US-5/WALLINGFORD/NORTH HAVEN. TURN LEFT ONTO S COLONY ROAD. CONTINUE ONTO WASHINGTON AVE. TURN RIGHT ONTO DEFCO PARK ROAD. TURN RIGHT ONTO DODGE AVE. THE SITE WILL BE ON THE LEFT.

APPLICABLE BUILDING CODES & STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARD NOTES, SYMBOLS & DETAILS (SEE DRAWING INDEX FOR STANDARD NOTES & DETAILS INCLUDED WITH TYPICAL DRAWING PACKAGE). CONTRACTOR WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, & LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES & STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:
INTERNATIONAL BUILDING CODE (IBC)

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE (NEC)

CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS.
AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER & ANTENNA SUPPORTING STRUCTURES:
TIA 607, COMMERCIAL BUILDING GROUNDING & BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, & EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING & GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" & "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES & STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT & A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

Dewberry
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280 SUMMER STREET
10TH FLOOR
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95 RYAN DRIVE, SUITE 1
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at&t Mobility
500 ENTERPRISE DRIVE
SUITE 3A
ROCKY HILL, CT 06067

NORTH HAVEN, CT 3C/4C
SITE NO. CT2012

12 DWIGHT STREET
NORTH HAVEN, CT 06473

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/16/18	ISSUED FOR CONSTRUCTION	NS	KB	BBR
A	01/22/18	ISSUED FOR REVIEW	NS	KB	BBR

SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: NS

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
28911
PROFESSIONAL ENGINEER

AT&T MOBILITY
ROCKY HILL, CT

TITLE SHEET

DEWBERRY NO.	DRAWING NUMBER	REV
50093723/50096232	T01	0

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – CENTERLINE COMMUNICATIONS
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS & TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED & INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, & ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES & COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, & LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL & UTILITY COMPANY SPECIFICATIONS & LOCAL JURISDICTIONAL CODES, ORDINANCES & APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED & ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, & LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT & MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER & T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING & TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING & PROPOSED IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING & STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY & PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES & OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE & DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, & PROCEDURES & FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF & WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS & CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS & RECOMMENDATIONS & SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE & PPM & CONSTRUCTION DEVICES SUCH AS WELDING & FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, & OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, & WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
   A) FALL PROTECTION
   B) CONFINED SPACE
   C) ELECTRICAL SAFETY
   D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS & PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL & OTHER REFUSE SHALL BE REMOVED FROM THE SITE & DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC & OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE AT&T SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT & TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED & BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK & NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, & STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION & SEDIMENT CONTROL.

CONCRETE & REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 & THE DESIGN & CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" & ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 & LARGER .....2 IN.
   #5 & SMALLER & WWF .....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB & WALL .....3/4 IN.
   BEAMS & COLUMNS .....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT.
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY & THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION & BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES & WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE 3/4"Ø CONNECTIONS & SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION & TOPSOIL EXPOSE UNDISTURBED NATURAL SUBGRADE & PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION & WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATIVE TO INSPECTION & WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
4. COMPACTED SUBBASE SHALL BE UNIFORM & LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.
5. AS AN ALTERNATIVE TO ITEMS 2 & 3 PROOFROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED & REPLACED WITH A WELL-GRADED GRANULAR FILL, & COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, AT&T ANTENNA PLATFORM LOCATION & ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK & PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH & INSTALL CABLE LADDER RACK, CABLE TRAY, & CONDUIT AS REQUIRED TO SUPPORT CABLES TO ANY NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC & ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF & TRANSPORT CABLING TO NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY & SUPPORT METHODS & MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC & TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED & MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC & TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, & T1 CONDUCTOR & CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, & MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, & BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD & CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) & INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, & EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET & DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION & RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA & MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET & DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION & RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER & CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET & DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER & POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS & WIRENUTS BY THOMAS & BETTS (OR EQUAL). LUGS & WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY & CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, & NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS & OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT & TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE & APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, & WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, & NEC.
26. CABINETS, BOXES, & WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY-COATED (GRAY) & INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); & RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, & PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, & RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, & DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A & NEMA OS 1; & RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, & DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; & RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY & OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES & DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES & STANDARDS TO SAFEGUARD AGAINST LIFE & PROPERTY.

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SITE NO. CT2012

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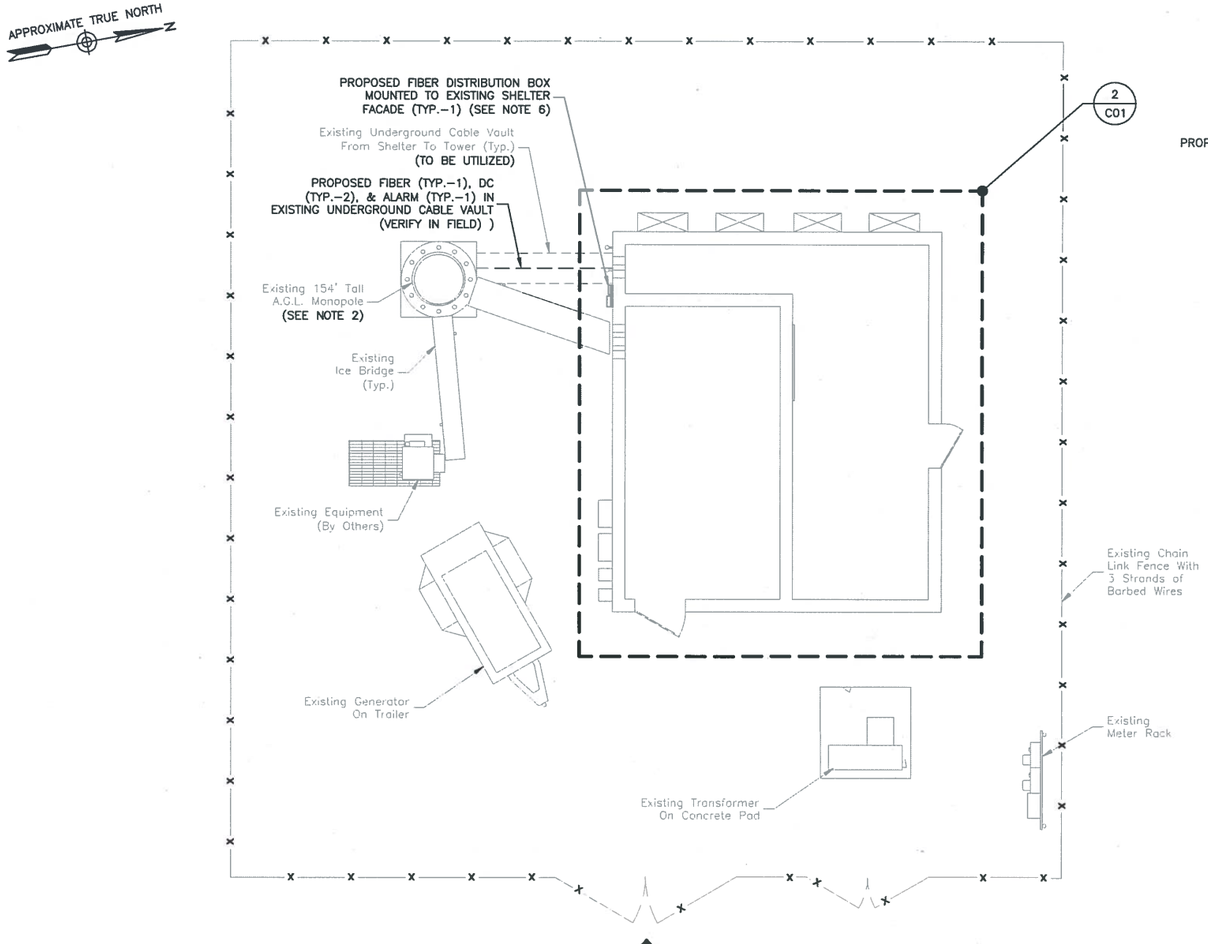
BENJAMIN B. REVETTE
2897
PROFESSIONAL ENGINEER

AT&T MOBILITY
ROCKY HILL, CT

GENERAL NOTES

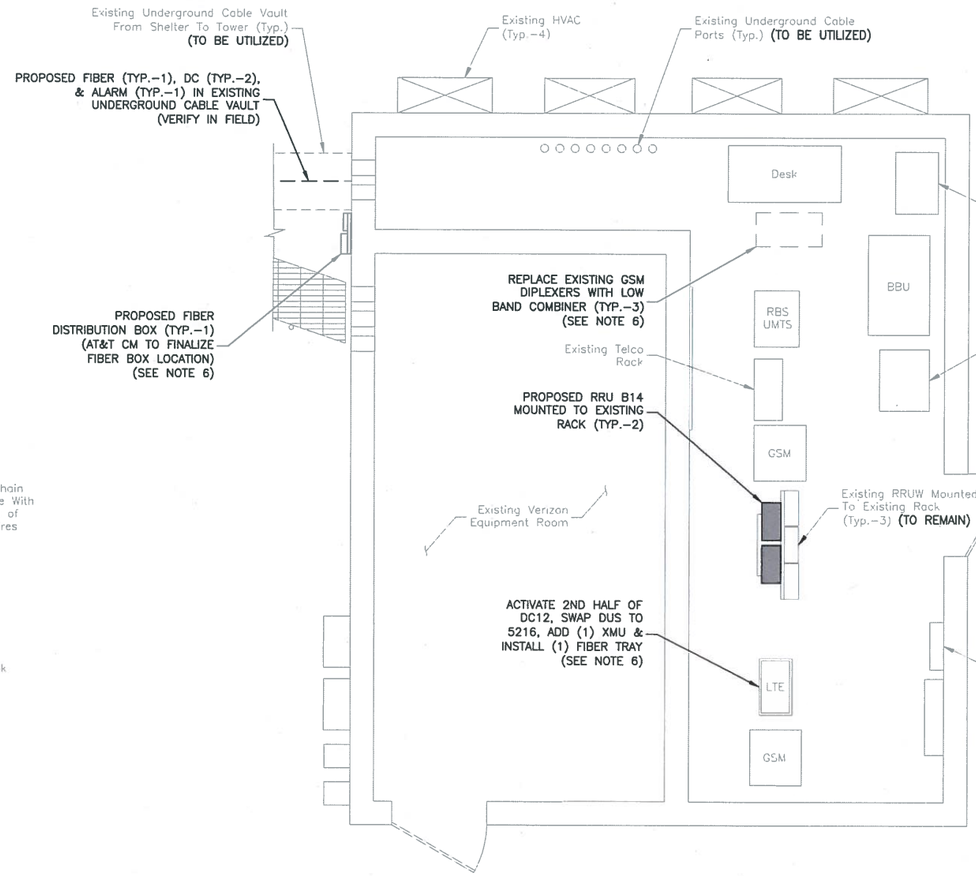
DEWBERRY NO.	DRAWING NUMBER	REV
50093723/50096232	G01	0



PROPOSED SITE PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

0' 5' 10'



PROPOSED SHELTER PLAN 2

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

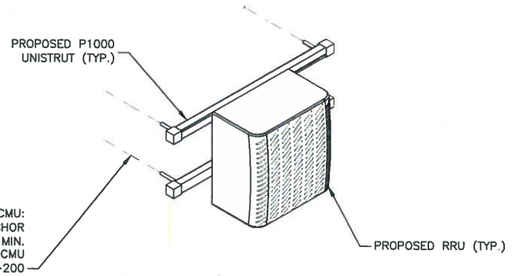
0' 2' 4' 6'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS (BY OTHERS).
3. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
4. MOUNT ALL EXISTNG & PROPOSED ANTENNAS & EQUIPMENT ON EXISTING ANTENNA MOUNT ACCORDING TO MOUNT ANALYSIS BY DEWBERRY ENGINEERS INC, 03-09-18.
5. NOT ALL INFORMATION SHOWN FOR CLARITY.
6. EQUIPMENT MODIFICATION SCOPE:

TOWER – DECOM GSM ANTENNA. RELOCATE OCTOPORT TO POSITION 4 AND ADD (3) 6' QUINTEL 12 PORT ANTENNAS TO POSITION 3. INSTALL (3) RRUS 32 (WCS) RADIOS TO NEW 12PORT. INSTALL (3) LOW BAND COMBINERS TO NEW 12 PORT AND RECONNECT GSM COAX FOR GROUND MOUNTED 700 RADIOS. INSTALL (1) DC/FIBER SQUID WITH (1) 18 PAIR FIBER, (2) DC TRUNKS AND (1) ALARM CABLE, NEW PORTS NEEDED AT HATCH.

GROUND – ACTIVATE SECOND HALF OF EXISTING DC12 IN LTE RACK FOR 2ND SQUID. INSTALL (1) FIBER BOX AND INSTALL (1) FIBER TRAY IN LTE RACK. INSTALL (2) B14 RADIOS AND (8) SURGE ARRESTORS TO EXISTING RACK WITH UMTS RADIOS; REPLACE GSM DIPLEXERS WITH (3) LOW BAND COMBINERS AND CONNECT TO EXISTING GSM COAX GOING TO NEW 12PORT ANTENNA. SWAP DUS TO 5216. INSTALL (5) 30 AMP BREAKERS IN EXISTING INFINITY PLANT.



NOTES:

1. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS, USE APPROPIATE MOUNTING HARDWARE FOR CONSTRUTION TYPE.
2. DETAIL IS SCHEMATIC.

UNISTRUT MOUNTING DETAIL 3

SCALE: N.T.S.

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SITE NO. CT2012

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A	01/22/18	ISSUED FOR REVIEW	NS	KB	BBR

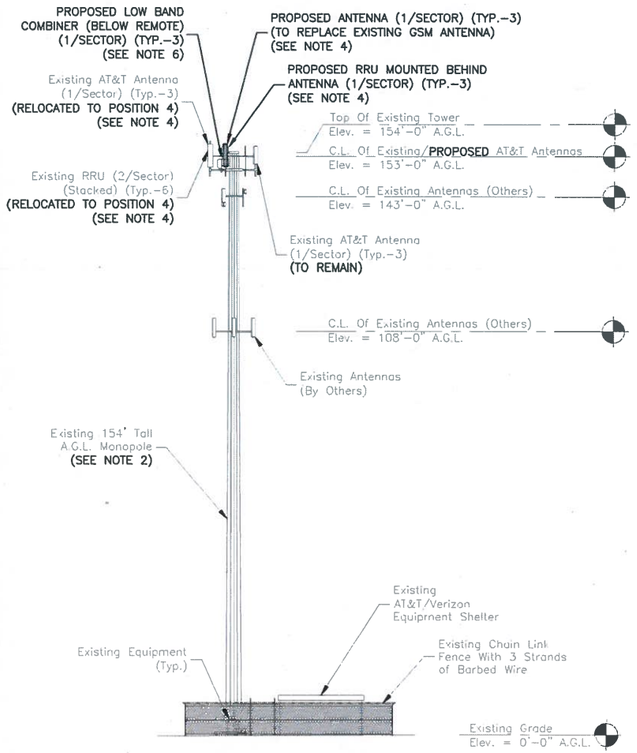
SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: NS

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
28971
LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
ROCKY HILL, CT

PROPOSED SITE PLAN & SHELTER PLAN

DEWBERRY NO.	DRAWING NUMBER	REV
50093723/50096232	C01	0

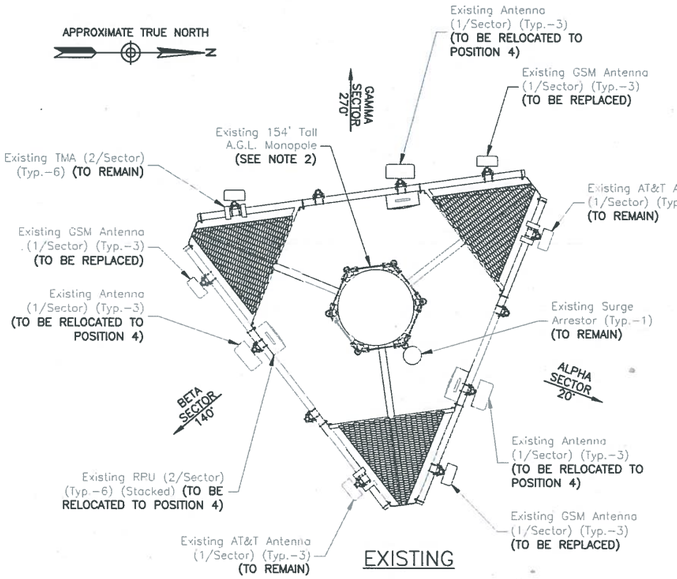


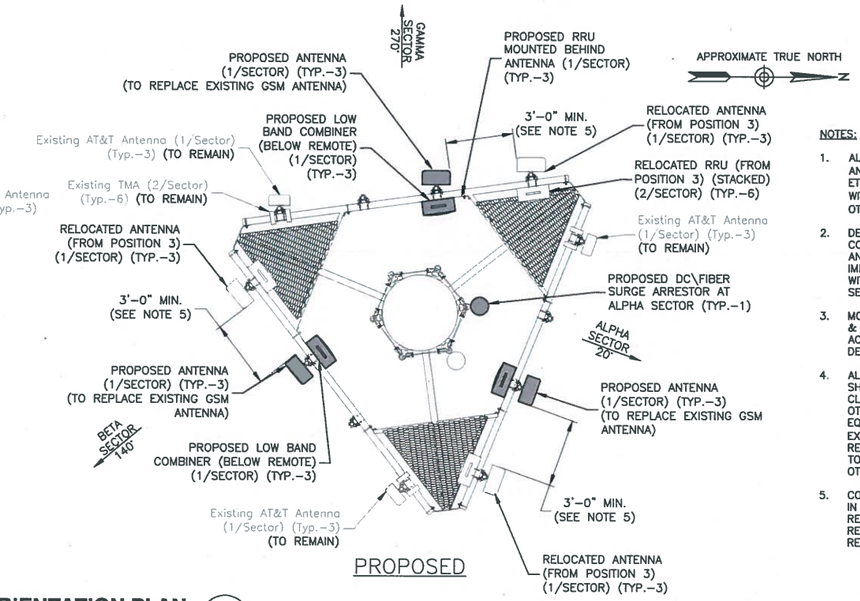
PROPOSED ELEVATION

1

SCALE: 1"=40' FOR 11"x17"
1"=20' FOR 22"x34"

0' 20' 40'





ANTENNA ORIENTATION PLAN

2

SCALE: N.T.S.

NOTES:

1. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS (BY OTHERS) & MANUFACTURER SPECIFICATIONS.
2. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
3. MOUNT ALL EXISTING & PROPOSED ANTENNAS & EQUIPMENT ON EXISTING ANTENNA MOUNT ACCORDING TO MOUNT ANALYSIS BY DEWBERRY ENGINEERS INC, 03–09–18.
4. ALL SPACING REQUIREMENTS FOR EQUIPMENT SHALL BE CONFIRMED & SHALL NOT IMPEDE CLIMBING PEGS, TIE OFF FEATURES, OR OTHER EXISTING SAFETY FEATURES. ALL EQUIPMENT SHALL MAINTAIN EXISTING/PROPOSED MANUFACTURER REQUIREMENTS & SHALL NOT EXCEED THE TOP OF THE TOWER OR INTERFERE WITH OTHER RAD CENTERS.
5. CONTRACTOR SHALL VERIFY ANTENNA SPACING IN FIELD & RELOCATE PIPE MASTS AS REQUIRED TO MEET ANTENNA SPACING REQUIREMENTS. THE ANTENNA SPACING REQUIREMENTS ARE AS FOLLOWS:
   - 3'–0" MINIMUM SEPARATION BETWEEN LTE ANTENNAS
   - 6'–0" MINIMUM SEPARATION BETWEEN 700BC & 700DE

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS (BY OTHERS).
3. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
4. MOUNT ALL EXISTNG & PROPOSED ANTENNAS & EQUIPMENT ON EXISTING ANTENNA MOUNT ACCORDING TO MOUNT ANALYSIS BY DEWBERRY ENGINEERS INC, 03–09–18.
5. NOT ALL INFORMATION SHOWN FOR CLARITY.
6. EQUIPMENT MODIFICATION SCOPE:

TOWER – DECOM GSM ANTENNA. RELOCATE OCTOPORT TO POSITION 4 AND ADD (3) 6' QUINTEL 12 PORT ANTENNAS TO POSITION 3. INSTALL (3) RRUS 32 (WCS) RADIOS TO NEW 12PORT. INSTALL (3) LOW BAND COMBINERS TO NEW 12 PORT AND RECONNECT GSM COAX FOR GROUND MOUNTED 700 RADIOS. INSTALL (1) DC/FIBER SQUID WITH (1) 18 PAIR FIBER, (2) DC TRUNKS AND (1) ALARM CABLE, NEW PORTS NEEDED AT HATCH.

GROUND – ACTIVATE SECOND HALF OF EXISTING DC12 IN LTE RACK FOR 2ND SQUID. INSTALL (1) FIBER BOX AND INSTALL (1) FIBER TRAY IN LTE RACK. INSTALL (2) B14 RADIOS AND (8) SURGE ARRESTORS TO EXISTING RACK WITH UMTS RADIOS; REPLACE GSM DIPLEXERS WITH (3) LOW BAND COMBINERS AND CONNECT TO EXISTING GSM COAX GOING TO NEW 12PORT ANTENNA. SWAP DUS TO 5216. INSTALL (5) 30 AMP BREAKERS IN EXISTING INFINITY PLANT.

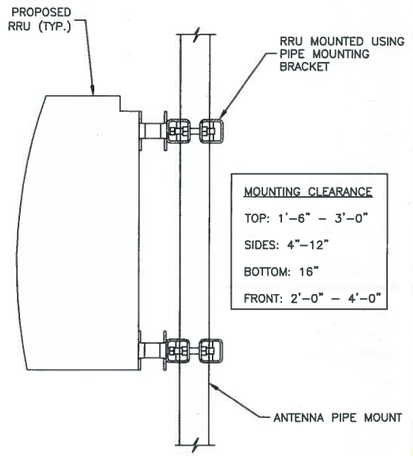
FINAL EQUIPMENT CONFIGURATION

SECTOR	BAND	ANTENNA	SIZE (INCHES) (LxWxD)	RAD. CENTER	AZIMUTH	TMA	COMBINERS	RRU	SIZE (INCHES) (LxWxD)	COAX	DC/FIBER
ALPHA	UMTS DB	(E) 7770	55.0x11.0x5.0	153'–0"	140°	(E) LPG21401 (E) LPG21401	–	–	–	(E) 4	–
	–	–	–	–	–	–	–	–	–	–	–
	LTE WCS/B14	(P) QUINTEL QS66512–2	72.0x12.0x9.6	153'–0"	20°	–	LOW–BAND COMBINERS (1 IN THE SHELTER, 1 ON THE TOWER)	(P) RRUS–32 B2 PCS (P) 4478 700D B14 (SHARED ALPHA/GAMMA) (AT GRADE)	27.2 x 12.1 x 7.0 15.0 x 13.2 x 7.4	(E) 4	(E) 1 (P) 1
	700 BC/PCS	(E) CCI OPA–65R–LCUU–H6	72.0x14.8x7.4	153'–0"	20°	–	–	(E) RRUS–11 (E) RRUS–12 (WITH A2)	19.7 x 17.0 x 7.2 18.1 x 10.4 x 5.5	(E) 4	–
BETA	UMTS DB	(E) 7770	55.0x11.0x5.0	153'–0"	270°	(E) LPG21401 (E) LPG21401	–	–	–	(E) 4	–
	–	–	–	–	–	–	–	–	–	–	–
	LTE WCS/B14	(P) QUINTEL QS66512–2	72.0x12.0x9.6	153'–0"	140°	–	LOW–BAND COMBINERS (1 IN THE SHELTER, 1 ON THE TOWER)	(P) RRUS–32 B2 PCS (P) 4478 700D B14 (SHARED ALPHA/GAMMA) (AT GRADE)	27.2 x 12.1 x 7.0 15.0 x 13.2 x 7.4	(E) 4	(E) 1 (P) 1
	700 BC/PCS	(E) CCI OPA–65R–LCUU–H6	72.0x14.8x7.4	153'–0"	140°	–	–	(E) RRUS–11 (E) RRUS–12 (WITH A2)	19.7 x 17.0 x 7.2 18.1 x 10.4 x 5.5	(E) 4	–
GAMMA	UMTS DB	(E) 7770	55.0x11.0x5.0	153'–0"	20°	(E) LPG21401 (E) LPG21401	–	–	–	(E) 4	–
	–	–	–	–	–	–	–	–	–	–	–
	LTE WCS/B14	(P) QUINTEL QS66512–2	72.0x12.0x9.6	153'–0"	270°	–	LOW–BAND COMBINERS (1 IN THE SHELTER, 1 ON THE TOWER)	(P) RRUS–32 B2 PCS (P) 4478 700D B14 (SHARED ALPHA/GAMMA) (AT GRADE)	27.2 x 12.1 x 7.0 15.0 x 13.2 x 7.4	(E) 4	(E) 1 (P) 1
	700 BC/PCS	(E) CCI OPA–65R–LCUU–H6	72.0x14.8x7.4	153'–0"	270°	–	–	(E) RRUS–11 (E) RRUS–12 (WITH A2)	19.7 x 17.0 x 7.2 18.1 x 10.4 x 5.5	(E) 4	–

FINAL EQUIPMENT CONFIGURATION

3

SCALE: N.T.S.



RRU ATTACHMENT DETAIL

4

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SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: NS

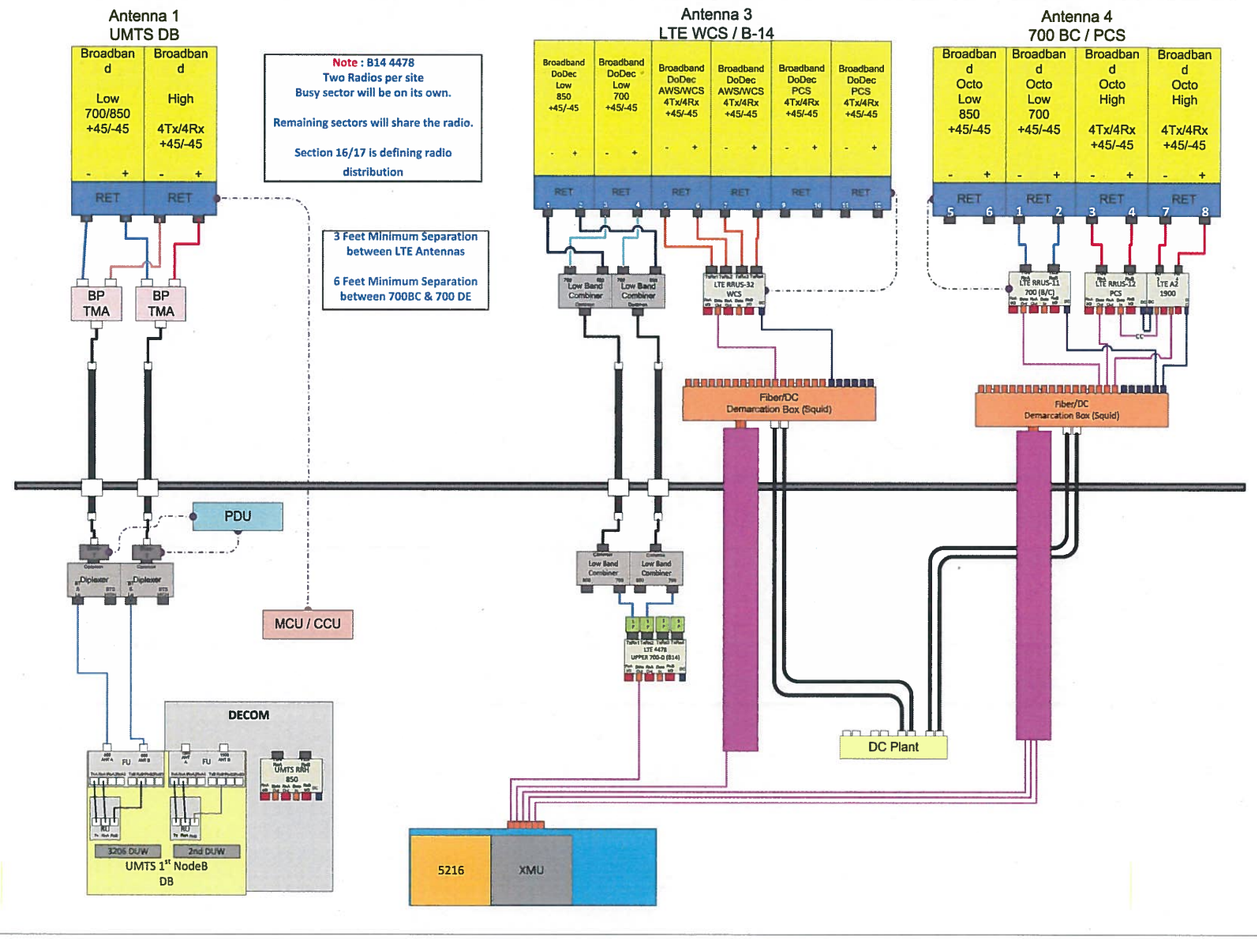
STATE OF CONNECTICUT BENJAMIN B. REVETTE 28971 PROFESSIONAL ENGINEER

AT&T MOBILITY
ROCKY HILL, CT

PROPOSED ELEVATION & CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50093723/50096232	C02	0

Diagram - Sector	A	Diagram File Name - CT2012_A_B_C_LTE_4C_B14_2T2R_Rev4.vsd					
Atoll Site Name -	CTU2012	Location Name -	NORTH HAVEN-DWIGHT ST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							



EQUIPMENT PLUMBING DIAGRAM

SCALE: N.T.S.

1

NOTES:

1. EQUIPMENT PLUMBING DIAGRAM PER RFDS VERSION 1 DATED 10/06/17.
2. CONTRACTOR TO VERIFY FINAL EQUIPMENT CONFIGURATION & SEPARATIONS WITH AT&T PRIOR TO CONSTRUCTION.

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SCALE: AS SHOWN | DESIGNED BY: KB | DRAWN BY: NS

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
PROFESSIONAL ENGINEER

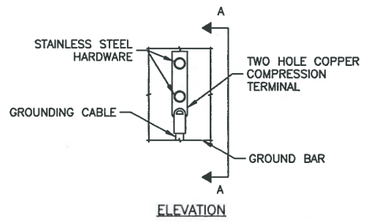
AT&T MOBILITY
ROCKY HILL, CT

EQUIPMENT PLUMBING DIAGRAM

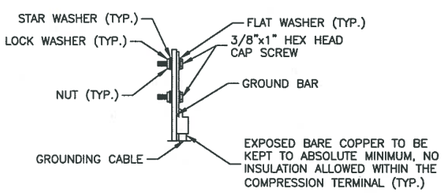
DEWBERRY NO.	DRAWING NUMBER	REV
50093723/50096232	C03	0

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW & INSPECT THE EXISTING FACILITY GROUNDING SYSTEM & LIGHTNING PROTECTION SYSTEM (AS DESIGNED & INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, & GENERAL COMPLIANCE WITH TELCORDIA & TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, & AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 & 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY CONTRACTOR IN WRITING.
4. THE CONTRACTOR SHALL FURNISH & INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES & 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE & ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING & UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT & TRAY SHALL BE GROUNDED & MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE & UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED & INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS & THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM CENTERLINE COMMUNICATIONS COMMUNICATIONS MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT & STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE & THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS & STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION & BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL & NON-ELECTRICAL METAL BOXES, FRAMES & SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND & LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.



ELEVATION

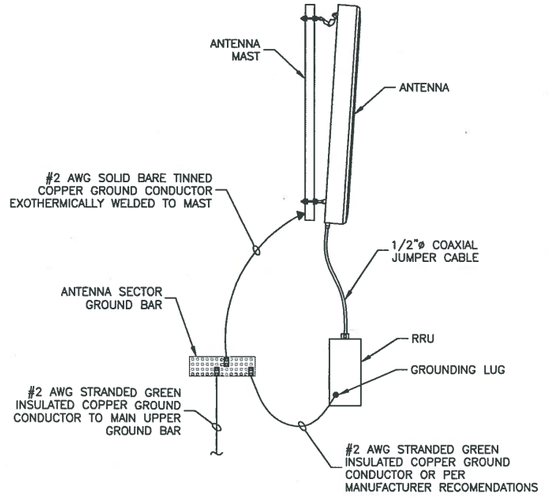


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 1

SCALE: N.T.S.



NOTES:

1. VERIFY EXISTING GROUNDING SYSTEM IS INSTALLED PER AT&T STANDARDS.
2. BOND NEW EQUIPMENT INTO EXISTING GROUND SYSTEM IN ACCORDANCE WITH AT&T STANDARDS & MANUFACTURER RECOMMENDATIONS.

TYPICAL ANTENNA/RRU GROUNDING DETAIL 2

SCALE: N.T.S

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AT&T MOBILITY
ROCKY HILL, CT

GROUNDING NOTES & DETAILS

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