Robinson+Cole

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Also admitted in Massachusetts

April 7, 2017

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
New Hartford Road/Rust Road, Barkhamsted, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 131-foot level of an existing 144.5-foot tower off New Hartford Road and Rust Road in Barkhamsted, Connecticut (the "Property"). The tower is owned by American Tower Corporation ("ATC"). The Council approved Cellco's use of this tower in 2004. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/1900 MHz antennas and three (3) model SBNHH-1D65B, 2100 MHz antennas. Cellco also intends to install six (6) remote radio heads ("RRHs") behind its antennas and two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs, and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 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 Donald S. Stein, First Selectman of the Town of Barkhamsted; Debra Brydon, Barkhamsted Zoning and Inland Wetlands Officer; Regional Refuse Disposal District #1, the owner of the Property; and ATC, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. Cellco's replacement antennas and RRHs will be installed on its existing platform at the 131-foot level on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, 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 installation of new RRHs will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

A copy of the Barkhamsted parcel map and property owner information is included in Attachment 4.

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Donald S. Stein, Barkhamsted First Selectman
Debra Brydon, Barkhamsted Zoning and Inland Wetlands Officer
Regional Refuse Disposal District #1
ATC
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65B

Multiband Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

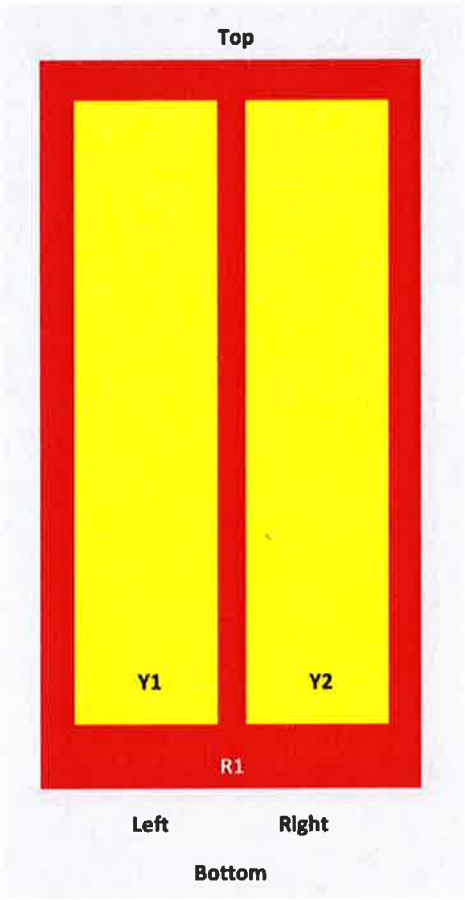
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D65B

SBNHH 6S



Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	ANxxxxxxxxxxxxxxxxx.1
Y1	1695-2360	3-4	2	ANxxxxxxxxxxxxxxxxx.2
Y2	1695-2360	5-6		

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	6
RF Connector Quantity, low band	2
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female

Product Specifications

SBNHH-1D65B

Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Depth	180.0 mm | 7.1 in
Net Weight, without mounting kit	18.4 kg | 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (1) | Low band (1)
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

Length	2025.0 mm | 79.7 in
Width	390.0 mm | 15.4 in
Depth	296.0 mm | 11.7 in
Shipping Weight	31.0 kg | 68.3 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Product Specifications

SBNHH-1D65B

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

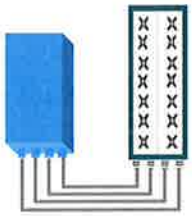
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

Alcatel·Lucent

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.) **Volume in L** **Weight in kg (lb) (w/o mounting HW)**	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range **DC power consumption**	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions **Wind load (@150km/h or 93mph)**	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<200N / Lateral :<150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

ALCATEL-LUCENT B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

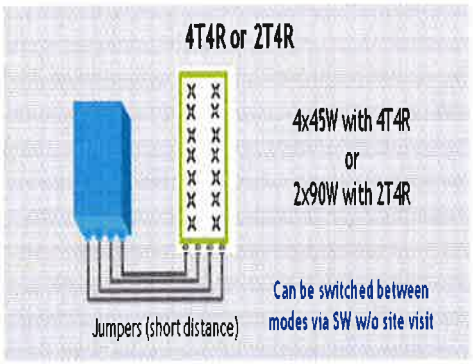
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports



BENEFITS

- Compact to reduce additional footprint when adding LTE in AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme **Receiver Sensivity (FRC A1-3)**	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.) **Volume in Liters** **Weight in kg (lb) (w/o mounting HW)**	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield) 35.5 (with solar shield) 29.7 (without solar shield) 25.8kg (56.8lb) (with solar shield)
DC voltage range **DC power consumption**	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions **Wind load (@150km/h or 93mph)**	-40°C (-40°F) /+55°C (+131°F) UL50E Type 4 Enclosure 250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

ATTACHMENT 2

	General	Power	Density					
Site Name: Barkhamsted S								
Tower Height: 144.5'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T	2	565	114	880	0.0348	0.5867	0.59%	
*AT&T	2	875	114	1900	0.0540	1.0000	0.54%	
*AT&T	1	283	114	880	0.0087	0.5867	0.15%	
*AT&T	4	525	114	1900	0.0647	1.0000	0.65%	
*AT&T	1	1313	114	734	0.0405	0.4893	0.83%	
*Pocket (now MetroPCS)	3	631	93	2130	0.0899	1.0000	0.90%	
*T-Mobile	1	445	102	700	0.0174	0.4667	0.37%	
*T-Mobile	6	639	102	1900	0.1496	1.0000	1.50%	
*Sprint	2	693	140	1900	0.0278	1.0000	0.28%	
*Sprint	1	390	140	850	0.0078	0.5667	0.14%	
*Sprint	2	693	140	2500	0.0278	1.0000	0.28%	
*Nextel	9	100	127	851	0.0221	0.5673	0.39%	
Verizon	**1**	**4889**	**131**	**0.1024**	**1970**	**1.0000**	**10.24%**	
Verizon	**9**	**416**	**131**	**0.0784**	**869**	**0.5793**	**13.54%**	
Verizon	**1**	**7332**	**131**	**0.1536**	**2145**	**1.0000**	**15.36%**	
Verizon	**1**	**2184**	**131**	**0.0458**	**746**	**0.4973**	**9.20%**	
								55.0%
* Source: Siting Council								

ATTACHMENT 3

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**144.5 ft Monopole**
ATC Site Name	:	**Barkhamstead CT, CT**
ATC Site Number	:	**411181**
Engineering Number	:	**OAA696964_C3_01**
Proposed Carrier	:	**Verizon**
Carrier Site Name	:	**Barkhamsted S, CT**
Carrier Site Number	:	**117789**
Site Location	:	**50 Rust Road** **BARKHAMSTED, CT 06063-3314** **41.893800, -72.996500**
County	:	**LITCHFIELD**
Date	:	**March 2, 2017**
Max Usage	:	**61%**
Result	:	**Pass**

Prepared By:
Isaac P. Dodson
Structural Engineer II

Isaac P. Dodson

Reviewed By:

STATE OF CONNECTICUT
SCOTT A. WIRGAU
30575
LICENSED
PROFESSIONAL ENGINEER

Mar 2 2017 11:37 AM cosign

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

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Calculations ..... Attached

AMERICAN TOWER®
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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 144.5 ft monopole to reflect the change in loading by Verizon.

Supporting Documents

Tower Drawings	Summit, PJF Job #29200-1316, dated September 5, 2000 Mapping by Geostructural Site #411181, dated February 22, 2016
Foundation Drawing	Summit, PJF Job #29200-1316, dated September 5, 2000
Geotechnical Report	Clarence Welti Project: AT&T Tower Site, dated March 27, 2000

Analysis

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

Basic Wind Speed:	93 mph (3-Second Gust, Vasd) / 120 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	40 mph (3-Second Gust) w/ 1" 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					
144.0	147.0	3	Alcatel-Lucent 800MHz RRH w/ Notch Filter	T-Arms	(15) 1 5/8" Coax (3) 1 1/4" Hybriflex (3) 1 1/4" Coax (1) 5/8" Hybriflex	Sprint Nextel
		3	Alcatel-Lucent 1900MHz RRH			
		15	Decibel DB980F90E-M			
		3	RFS APXVSPP18-C-A20			
133.0	-	-	-	-	(12) 1 5/8" Coax	Verizon
131.0	131.0	2	Antel LPA-80080/4CF ___	T-Arms	-	
		4	Antel LPA-80063/4CF			
		1	VZW Unused Reserve: 18,069 sq in			
120.0	120.0	1	Andrew ABT-DMDF-ADBH	T-Arms	(12) 1 1/4" Coax (2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk (1) 3" Conduit	AT&T Mobility
		3	Spinner Bias-T			
		6	Powerwave LGP21901			
		6	Powerwave LGP21401			
		1	Raycap DC6-48-60-18-8F (32.8 lb)			
		6	Ericsson RRUS-11 (50 lbs.)			
		6	Powerwave 7770.00			
		1	Kathrein 800 10764			
		2	KMW AM-X-CD-16-65-00T-RET			
104.0	104.0	1	E-911 GPS	T-Arms	(18) 1 5/8" Coax (1) 1/2" Coax	T-Mobile
		3	Ericsson KRY 112 71			
		3	RFS ATMAP1412D-1A20			
		6	RFS APX16DWV-16DWV-S-E-ACU			
		3	Commscope LNX-6515DS-A1M (50.3 lb)			
93.0	93.0	3	RFS APXV18-206517S-C	Flush	(3) 1 5/8" Coax	Pocket Comm.
50.0	50.0	1	PCTEL GPS-TMG-HR-26N	Flush	(1) 1/2" Coax	Sprint Nextel

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
133.0	133.0	3	Antel BXA-70063-6CF-EDIN-X	-	-	Verizon
131.0	131.0	3	Antel BXA-171085-8BF-EDIN-X	-	-	
		6	7" x 6" x 3" Diplexer			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
133.0	133.0	3	Commscope SBNHH-1D65B (72.9")	T-Arms	-	Verizon
131.0	131.0	3	Alcatel-Lucent B13 RRH4X30-4R w/ Solar Shield (57.2 lbs)		(2) 1 5/8" Hybriflex	
		3	Alcatel-Lucent B66A RRH4x45-4R w/ Solar Shield			
		2	Raycap RC2DC-3315-PF-48			
		3	Commscope SBNHH-1D65B (72.9")			

[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	60%	Pass
Shaft	61%	Pass
Base Plate	45%	Pass
Flanges	28%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	5,724.1	46%
Axial (Kips)	107.6	32%
Shear (Kips)	52.8	28%

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) (°)
133.0	Commscope SBNHH-1D65B (72.9")	Verizon	1.212	0.944
131.0	Alcatel-Lucent B13 RRH4X30-4R w/ Solar Shield (57.2 lbs)		1.179	0.941
	Alcatel-Lucent B66A RRH4x45-4R w/ Solar Shield			
	Raycap RC2DC-3315-PF-48			
	Commscope SBNHH-1D65B (72.9")			

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

AMERICAN TOWER®
CORPORATION

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

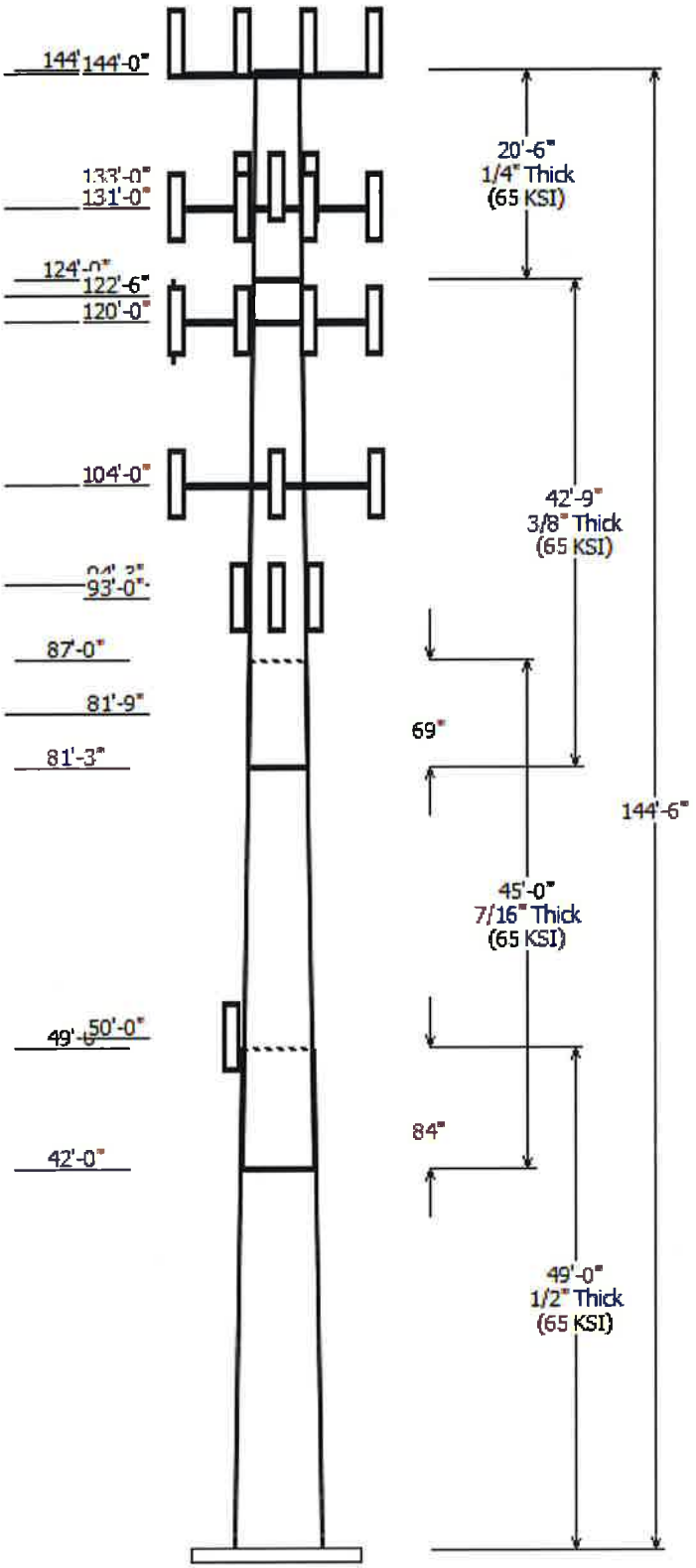
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

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. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

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 we supply.



Job Information

Pole :	411181	Code:	ANSI/TIA-222-G
Description :			
Client :	VERIZON WIRELESS	Struct Class :	II
Location :	Barkhamstead CT, CT		
Shape :	18 Sides	Exposure :	B
Height :	144.50 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.283669 in/ft)		

Sections Properties

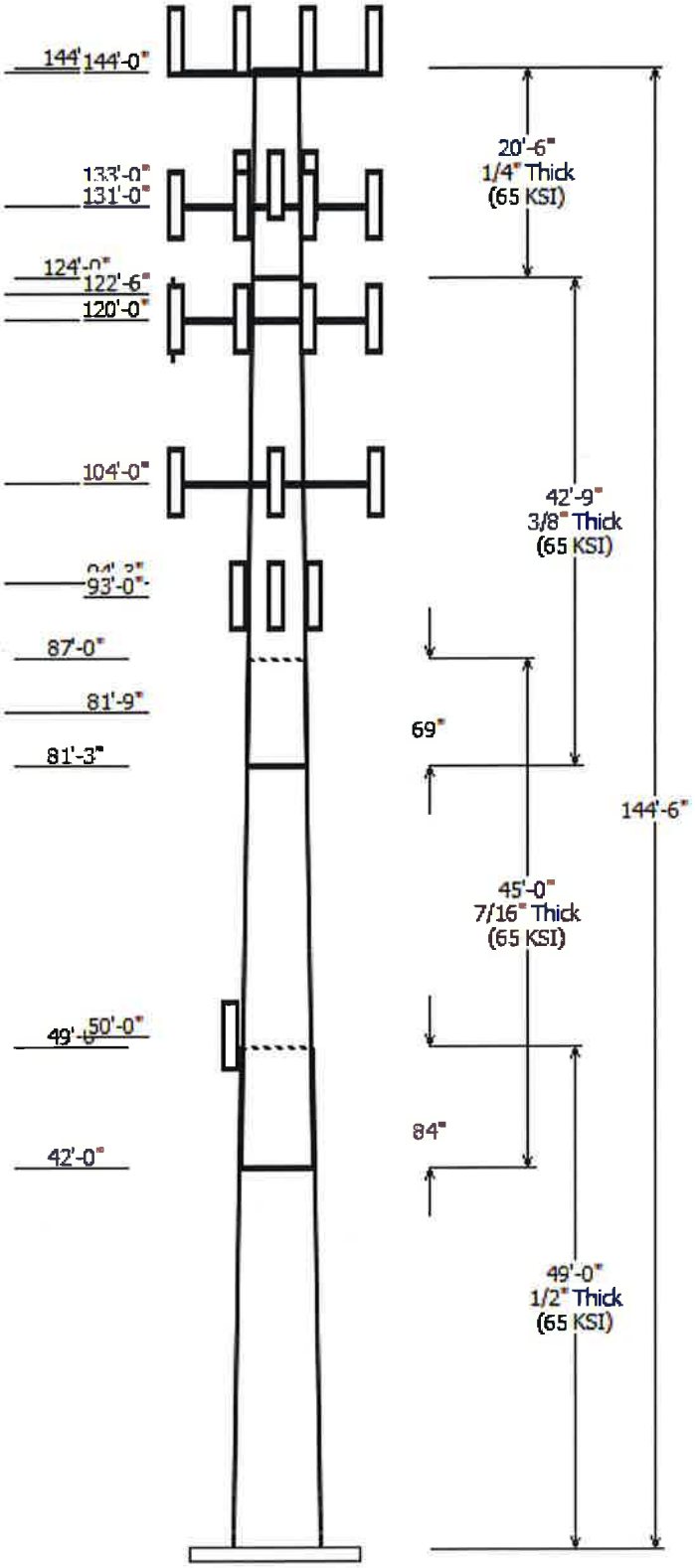
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	49.000	52.15	66.05	0.500		0.000	0.283700	65
2	45.000	42.24	55.01	0.438	Slip Joint	84.000	0.283700	65
3	42.750	32.50	44.62	0.375	Slip Joint	69.000	0.283700	65
4	20.500	24.00	32.50	0.250	Butt Joint	0.000	0.414600	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
144.500	144.500	1	Pine Tree Branches
144.000	144.000	3	Round T-Arm
144.000	147.000	3	RFS APXVSPP18-C-A20
144.000	147.000	15	Decibel DB980F90E-M
144.000	147.000	3	Alcatel-Lucent 1900MHz RRH
144.000	147.000	3	Alcatel-Lucent 800 MHz RRH
133.000	133.000	3	Commscope SBNHH-1D65B
131.000	131.000	2	Raycap RC2DC-3315-PF-48
131.000	131.000	3	Alcatel-Lucent B66A RRH4x45-
131.000	131.000	1	VZW Unused Reserve: 18,069
131.000	131.000	4	Antel LPA-80063/4CF
131.000	131.000	2	Antel LPA-80080/4CF ___
131.000	131.000	3	Alcatel-Lucent B13 RRH4X30-
131.000	131.000	3	Commscope SBNHH-1D65B
131.000	131.000	3	Round T-Arm
122.500	122.500	1	Pine Tree Branches
120.000	120.000	3	Flat T-Arm
120.000	120.000	2	KMW AM-X-CD-16-65-00T-RET
120.000	120.000	1	Kathrein 800 10764
120.000	120.000	6	Powerwave 7770.00
120.000	120.000	6	Ericsson RRUS-11 (50 lbs.)
120.000	120.000	1	Raycap DC6-48-60-18-8F (32.8 l
120.000	120.000	6	Powerwave LGP21401
120.000	120.000	6	Powerwave LGP21901
120.000	120.000	3	Spinner Bias-T
120.000	120.000	1	Andrew ABT-DMDF-ADBH
104.000	104.000	3	Flat T-Arm
104.000	104.000	3	Commscope LNX-6515DS-A1M
104.000	104.000	6	RFS APX16DWV-16DWV-S-E-
104.000	104.000	3	RFS ATMAP1412D-1A20
104.000	104.000	3	Ericsson KRY 112 71
104.000	104.000	1	E-911 GPS
94.250	94.250	1	Pine Tree Branches
93.000	93.000	3	RFS APXV18-206517S-C
81.750	81.750	1	Pine Tree Branches
50.000	50.000	1	PCTEL GPS-TMG-HR-26N

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	50.000	1/2" Coax	No
0.000	93.000	1 5/8" Coax	No



0.000	104.0	1 5/8" Coax	Yes
0.000	104.0	1 5/8" Coax	No
0.000	104.0	1/2" Coax	No
0.000	120.0	0.39" Fiber Trunk	No
0.000	120.0	0.78" 8 AWG 6	No
0.000	120.0	1 1/4" Coax	No
0.000	120.0	3" Conduit	No
0.000	131.0	1 5/8" Hybriflex	No
0.000	133.0	1 5/8" Coax	No
0.000	144.0	1 1/4" Coax	No
0.000	144.0	1 1/4" Hybriflex	No
0.000	144.0	1 5/8" Coax	No
0.000	144.0	5/8" Hybriflex	No

Load Cases

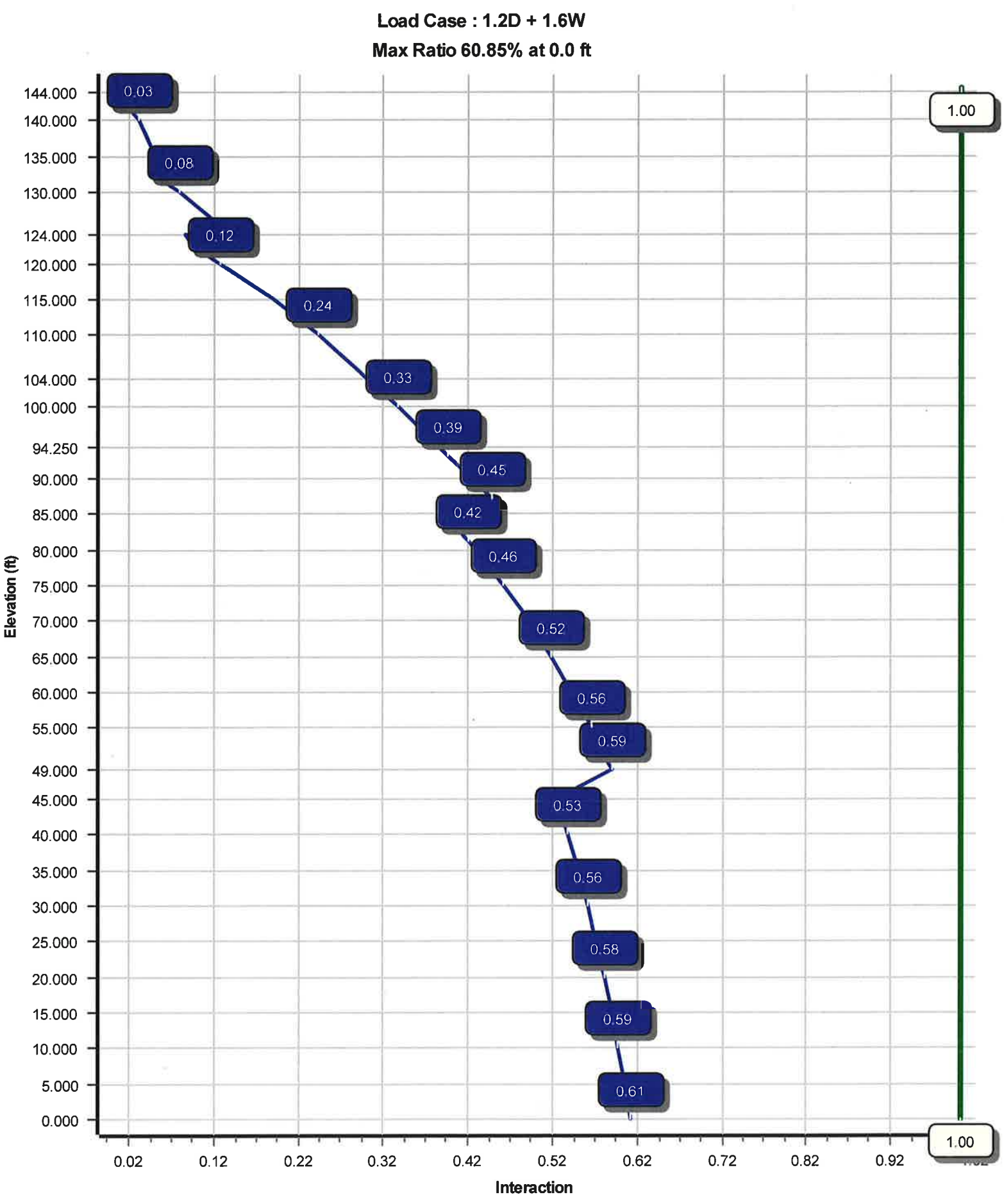
1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) 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	5724.14	52.85	65.81
0.9D + 1.6W	5691.97	52.82	49.34
1.2D + 1.0Di + 1.0Wi	1212.99	11.12	107.62
(1.2 + 0.2Sds) * DL + E ELFM	334.73	3.15	65.40
(1.2 + 0.2Sds) * DL + E EMAM	302.05	2.85	65.40
(0.9 - 0.2Sds) * DL + E ELFM	332.54	3.15	45.54
(0.9 - 0.2Sds) * DL + E EMAM	299.94	2.84	45.54
1.0D + 1.0W	1484.28	13.74	54.89

Dish Deflections

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


Load Case : 1.2D + 1.6W
Max Ratio 60.85% at 0.0 ft
144.000
140.000
135.000
130.000
124.000
120.000
115.000
110.000
104.000
100.000
94.250
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
49.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.03
0.08
0.12
0.24
0.33
0.39
0.45
0.42
0.46
0.52
0.56
0.59
0.53
0.56
0.58
0.59
0.61
1.00
1.00
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number:OAA696964_C3_01 3/2/2017 11:01:41 AM

Customer: VERIZON WIRELESS

Analysis Parameters

Location:	LITCHFIELD County, CT	Height (ft):	144.
Code:	ANSI/TIA-222-G	Base Diameter (in):	66.05
Shape:	18 Sides. Sect 4: 16 Sides	Top Diameter (in):	24.00
Pole Type:	Custom	Taper (in/ft) :	0.284
Pole Manfacturer:	Summit Manuf	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	93 mph
Exposure Category:	B	Design Wind Speed With Ice:	40 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	1.00 in

Seismic Parameters

Analysis Method: Equivalent Modal Analysis & Equivalent Lateral Force Methods

Site Class: D - Stiff Soil

Period Based on Rayleigh Method (sec): 1.57

T_L (sec):	6	p:	1.3	C_s:	0.044
S_s:	0.178	S_1:	0.065	C_s Max:	0.044
F_a:	1.600	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.190	S_{d1}:	0.104		

Load Cases

1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number:OAA696964_C3_01 3/2/2017 11:01:41 AM

Customer: VERIZON WIRELESS

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-18	49.000	0.5000	65		0.00	15,506	66.05	0.00	104.02	56471.9	21.88	132.10	52.15	49.00	81.97	27626.8	16.98	104.30	0.283669
2-18	45.000	0.4375	65	Slip	84.00	10,247	55.01	42.00	75.78	28514.5	20.76	125.74	42.24	87.00	58.05	12820.6	15.62	96.56	0.283669
3-18	42.750	0.3750	65	Slip	69.00	6,612	44.62	81.25	52.67	13030.8	19.57	119.00	32.50	124.00	38.24	4985.5	13.87	86.67	0.283669
4-16	20.500	0.2500	65	Butt	0.00	1,558	32.50	124.00	25.72	3379.4	24.27	130.00	24.00	144.50	18.94	1349.7	17.50	96.00	0.414634
				Shaft Weight		33,922													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
144.50	Pine Tree Branches	1	337.50	11.700	1.00	650.41	22.548	1.00	0.000	0.000
144.00	Alcatel-Lucent 1900MHz RRH	3	44.00	3.260	0.67	178.82	5.168	0.67	0.000	3.000
144.00	Alcatel-Lucent 800 MHz RRH	3	61.80	2.500	0.67	166.68	2.481	0.67	0.000	3.000
144.00	Decibel DB980F90E-M	15	9.50	3.750	0.68	145.08	3.238	0.68	0.000	3.000
144.00	RFS APXVSPP18-C-A20	3	57.00	8.020	0.69	338.68	9.774	0.69	0.000	3.000
144.00	Round T-Arm	3	250.00	9.700	0.75	527.71	20.654	0.75	0.000	0.000
133.00	Commscope SBNHH-1D65B	3	40.60	8.200	0.69	506.82	12.141	0.69	0.000	0.000
131.00	Alcatel-Lucent B13 RRH4X30-	3	57.20	2.150	0.67	172.94	3.012	0.67	0.000	0.000
131.00	Alcatel-Lucent B66A	3	56.80	2.540	0.67	176.06	3.478	0.67	0.000	0.000
131.00	Antel LPA-80063/4CF	4	20.00	6.140	0.76	304.94	7.537	0.76	0.000	0.000
131.00	Antel LPA-80080/4CF ___	2	12.00	5.400	0.64	202.06	3.756	0.64	0.000	0.000
131.00	Commscope SBNHH-1D65B	3	40.60	8.200	0.69	325.26	9.961	0.69	0.000	0.000
131.00	Raycap RC2DC-3315-PF-48	2	32.00	3.780	0.67	208.51	4.882	0.67	0.000	0.000
131.00	Round T-Arm	3	250.00	9.700	0.67	525.37	20.562	0.67	0.000	0.000
131.00	VZW Unused Reserve:	1	1746.40	125.58	1.00	3,349.44	240.851	1.00	0.000	0.000
122.50	Pine Tree Branches	1	3300.00	383.24	1.00	6,306.91	732.443	1.00	0.000	0.000
120.00	Andrew ABT-DMDF-ADBH	1	1.10	0.050	0.50	10.43	0.196	0.50	0.000	0.000
120.00	Ericsson RRUS-11 (50 lbs.)	6	50.00	2.570	0.67	163.83	3.441	0.67	0.000	0.000
120.00	Flat T-Arm	3	250.00	12.900	0.67	522.50	23.563	0.67	0.000	0.000
120.00	Kathrein 800 10764	1	40.80	5.870	0.77	247.67	7.298	0.77	0.000	0.000
120.00	KMW AM-X-CD-16-65-00T-	2	48.50	8.020	0.78	309.31	9.738	0.78	0.000	0.000
120.00	Powerwave 7770.00	6	35.00	5.510	0.75	223.11	6.913	0.75	0.000	0.000
120.00	Powerwave LGP21401	6	14.10	1.100	0.50	63.18	1.725	0.50	0.000	0.000
120.00	Powerwave LGP21901	6	5.50	0.230	0.50	25.17	0.521	0.50	0.000	0.000
120.00	Raycap DC6-48-60-18-8F	1	32.80	1.280	1.00	162.11	2.156	1.00	0.000	0.000
120.00	Spinner Bias-T	3	1.50	0.170	0.50	17.12	0.391	0.50	0.000	0.000
104.00	Commscope LNX-6515DS-	3	50.30	11.450	0.65	406.11	13.589	0.65	0.000	0.000
104.00	E-911 GPS	1	5.00	0.580	0.50	56.65	1.451	0.50	0.000	0.000
104.00	Ericsson KRY 112 71	3	13.20	0.680	0.50	50.11	1.073	0.50	0.000	0.000
104.00	Flat T-Arm	3	250.00	12.900	0.67	518.67	23.413	0.67	0.000	0.000
104.00	RFS APX16DWV-16DWV-S-E-	6	39.60	6.080	0.50	217.21	7.488	0.50	0.000	0.000
104.00	RFS ATMAP1412D-1A20	3	13.00	1.000	0.50	62.99	1.576	0.50	0.000	0.000
94.25	Pine Tree Branches	1	937.50	138.58	1.00	1,769.93	261.629	1.00	0.000	0.000
93.00	RFS APXV18-206517S-C	3	26.40	5.160	1.00	187.83	6.768	1.00	0.000	0.000
81.75	Pine Tree Branches	1	937.50	146.25	1.00	1,758.47	274.321	1.00	0.000	0.000
50.00	PCTEL GPS-TMG-HR-26N	1	0.60	0.090	1.00	15.05	0.384	1.00	0.000	0.000
	Totals	113	12999.10			37,368.88			Number of Loadings :	36

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	144.00	3	1 1/4" Coax	1.55	0.63	N	0.00	N	Sprint Nextel

0.00	144.00	3	1 1/4" Hybriflex Cable	1.54	1.00	N	0.00	N	Sprint Nextel
0.00	144.00	15	1 5/8" Coax	1.98	0.82	N	0.00	N	Sprint Nextel
0.00	144.00	1	5/8" Hybriflex	0.84	0.70	N	0.00	N	Sprint Nextel
0.00	133.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
0.00	131.00	2	1 5/8" Hybriflex Cable	1.98	1.30	N	0.00	N	Verizon
0.00	120.00	1	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
0.00	120.00	2	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	120.00	12	1 1/4" Coax	1.55	0.63	N	0.00	N	AT&T Mobility
0.00	120.00	1	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
0.00	104.00	6	1 5/8" Coax	1.98	0.82	N	1.98	Y	T-Mobile
0.00	104.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	T-Mobile
0.00	104.00	1	1/2" Coax	0.63	0.15	N	0.00	N	T-Mobile
0.00	93.00	3	1 5/8" Coax	1.98	0.82	N	0.00	N	Pocket Communications
0.00	50.00	1	1/2" Coax	0.63	0.15	N	0.00	N	Sprint Nextel

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.5000	66.050	104.024	56,471.9	21.88	132.10	75.7	1684.	0.0	0.0
5.00		0.5000	64.632	101.773	52,884.9	21.38	129.26	76.3	1611.	0.0	1,750.7
10.00		0.5000	63.213	99.522	49,453.1	20.88	126.43	76.8	1540.	0.0	1,712.4
15.00		0.5000	61.795	97.272	46,173.1	20.38	123.59	77.4	1471.	0.0	1,674.1
20.00		0.5000	60.377	95.021	43,041.4	19.88	120.75	78.0	1404.	0.0	1,635.8
25.00		0.5000	58.958	92.770	40,054.6	19.38	117.92	78.6	1338.	0.0	1,597.5
30.00		0.5000	57.540	90.519	37,209.3	18.88	115.08	79.2	1273.	0.0	1,559.2
35.00		0.5000	56.122	88.268	34,502.0	18.38	112.24	79.8	1210.	0.0	1,520.9
40.00		0.5000	54.703	86.017	31,929.3	17.88	109.41	80.4	1149.	0.0	1,482.6
42.00	Bot - Section 2	0.5000	54.136	85.117	30,937.2	17.68	108.27	80.6	1125.	0.0	582.3
45.00		0.5000	53.285	83.767	29,487.8	17.38	106.57	81.0	1090.	0.0	1,629.6
49.00	Top - Section 1	0.4375	53.025	73.022	25,513.8	19.96	121.20	77.9	947.7	0.0	2,132.5
50.00		0.4375	52.742	72.628	25,103.1	19.85	120.55	78.1	937.5	0.0	247.8
55.00		0.4375	51.323	70.659	23,115.8	19.27	117.31	78.7	887.1	0.0	1,218.9
60.00		0.4375	49.905	68.689	21,236.3	18.70	114.07	79.4	838.1	0.0	1,185.4
65.00		0.4375	48.486	66.720	19,461.5	18.13	110.83	80.1	790.6	0.0	1,151.9
70.00		0.4375	47.068	64.750	17,788.4	17.56	107.58	80.7	744.4	0.0	1,118.4
75.00		0.4375	45.650	62.781	16,214.1	16.99	104.34	81.4	699.6	0.0	1,084.9
80.00		0.4375	44.231	60.811	14,735.5	16.42	101.10	82.1	656.2	0.0	1,051.4
81.25	Bot - Section 3	0.4375	43.877	60.319	14,380.5	16.27	100.29	82.3	645.5	0.0	257.6
81.75		0.4375	43.735	60.122	14,240.1	16.22	99.97	82.3	641.3	0.0	191.9
85.00		0.4375	42.813	58.842	13,349.7	15.84	97.86	82.6	614.2	0.0	1,232.3
87.00	Top - Section 2	0.3750	42.996	50.728	11,642.3	18.81	114.66	79.3	533.3	0.0	745.3
90.00		0.3750	42.145	49.715	10,958.8	18.41	112.39	79.8	512.2	0.0	512.7
93.00		0.3750	41.294	48.702	10,302.5	18.01	110.12	80.2	491.4	0.0	502.3
94.25		0.3750	40.939	48.280	10,037.0	17.84	109.17	80.4	482.9	0.0	206.3
95.00		0.3750	40.726	48.027	9,879.9	17.74	108.60	80.5	477.8	0.0	122.9
100.0		0.3750	39.308	46.338	8,874.2	17.07	104.82	81.3	444.7	0.0	802.8
104.0		0.3750	38.173	44.988	8,120.7	16.54	101.80	81.9	419.0	0.0	621.5
105.0		0.3750	37.890	44.650	7,939.3	16.41	101.04	82.1	412.7	0.0	152.5
110.0		0.3750	36.471	42.962	7,072.4	15.74	97.26	82.6	381.9	0.0	745.3
115.0		0.3750	35.053	41.274	6,271.0	15.07	93.47	82.6	352.4	0.0	716.6
120.0		0.3750	33.635	39.586	5,532.6	14.40	89.69	82.6	324.0	0.0	687.9
122.5		0.3750	32.926	38.742	5,186.2	14.07	87.80	82.6	310.2	0.0	333.2
124.0	Top - Section 3	0.3750	32.500	38.235	4,985.5	13.87	86.67	82.6	302.1	0.0	196.5
124.0	Bot - Section 4	0.2500	32.500	25.719	3,379.4	24.27	130.00	75.1	204.0	0.0	
125.0		0.2500	32.085	25.389	3,250.7	23.94	128.34	75.5	198.7	0.0	87.0
130.0		0.2500	30.012	23.735	2,656.1	22.29	120.05	77.4	173.6	0.0	417.9
131.0		0.2500	29.598	23.405	2,546.6	21.96	118.39	77.7	168.8	0.0	80.2
133.0		0.2500	28.768	22.743	2,336.8	21.30	115.07	78.5	159.3	0.0	157.0
135.0		0.2500	27.939	22.082	2,138.8	20.64	111.76	79.2	150.2	0.0	152.5
140.0		0.2500	25.866	20.429	1,693.4	18.99	103.46	81.1	128.4	0.0	361.6
144.0		0.2500	24.207	19.106	1,385.4	17.67	96.83	82.6	112.3	0.0	269.1
144.5		0.2500	24.000	18.941	1,349.7	17.50	96.00	82.6	110.3	0.0	32.4
											33,921.8

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number:OAA696964_C3_01 3/2/2017 11:01:41 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W 93 mph with No Ice 20 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	-65.81	-52.85	0.00	-5,724.14	0.00	5,724.14	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.609
5.00	-63.20	-52.54	0.00	-5,459.92	0.00	5,459.92	6,984.34	3,492.17	18,406.1	9,216.76	0.08	-0.14	0.602
10.00	-60.63	-52.23	0.00	-5,197.23	0.00	5,197.23	6,882.57	3,441.28	17,733.7	8,880.03	0.30	-0.28	0.594
15.00	-58.10	-51.93	0.00	-4,936.08	0.00	4,936.08	6,778.41	3,389.20	17,067.2	8,546.29	0.68	-0.43	0.586
20.00	-55.62	-51.62	0.00	-4,676.45	0.00	4,676.45	6,671.87	3,335.93	16,407.0	8,215.74	1.21	-0.58	0.578
25.00	-53.19	-51.31	0.00	-4,418.36	0.00	4,418.36	6,562.95	3,281.47	15,753.7	7,888.59	1.90	-0.73	0.568
30.00	-50.80	-51.00	0.00	-4,161.79	0.00	4,161.79	6,451.64	3,225.82	15,107.6	7,565.05	2.74	-0.88	0.558
35.00	-48.46	-50.68	0.00	-3,906.78	0.00	3,906.78	6,337.95	3,168.97	14,469.1	7,245.34	3.75	-1.03	0.547
40.00	-46.21	-50.43	0.00	-3,653.38	0.00	3,653.38	6,221.87	3,110.94	13,838.7	6,929.66	4.92	-1.19	0.535
42.00	-45.29	-50.26	0.00	-3,552.52	0.00	3,552.52	6,174.78	3,087.39	13,588.9	6,804.56	5.43	-1.25	0.530
45.00	-43.01	-49.99	0.00	-3,401.74	0.00	3,401.74	6,103.42	3,051.71	13,216.8	6,618.22	6.25	-1.35	0.521
49.00	-40.08	-49.76	0.00	-3,201.78	0.00	3,201.78	5,121.13	2,560.57	11,060.8	5,538.67	7.44	-1.48	0.586
50.00	-39.62	-49.56	0.00	-3,152.02	0.00	3,152.02	5,102.30	2,551.15	10,960.2	5,488.28	7.75	-1.51	0.582
55.00	-37.64	-49.18	0.00	-2,904.23	0.00	2,904.23	5,006.69	2,503.35	10,460.8	5,238.20	9.43	-1.68	0.562
60.00	-35.71	-48.80	0.00	-2,658.32	0.00	2,658.32	4,908.70	2,454.35	9,967.80	4,991.31	11.28	-1.85	0.540
65.00	-33.81	-48.41	0.00	-2,414.32	0.00	2,414.32	4,808.33	2,404.17	9,481.57	4,747.83	13.32	-2.02	0.516
70.00	-31.96	-48.01	0.00	-2,172.27	0.00	2,172.27	4,705.57	2,352.79	9,002.57	4,507.98	15.53	-2.19	0.489
75.00	-30.16	-47.61	0.00	-1,932.21	0.00	1,932.21	4,600.44	2,300.22	8,531.23	4,271.95	17.91	-2.36	0.459
80.00	-28.45	-47.32	0.00	-1,694.18	0.00	1,694.18	4,492.91	2,246.46	8,067.95	4,039.97	20.47	-2.51	0.426
81.25	-28.02	-47.25	0.00	-1,635.02	0.00	1,635.02	4,465.66	2,232.83	7,953.44	3,982.63	21.13	-2.55	0.417
81.75	-26.82	-42.01	0.00	-1,611.40	0.00	1,611.40	4,454.72	2,227.36	7,907.79	3,959.77	21.40	-2.57	0.413
85.00	-25.04	-41.74	0.00	-1,474.87	0.00	1,474.87	4,371.64	2,185.82	7,593.43	3,802.36	23.18	-2.67	0.394
87.00	-23.95	-41.52	0.00	-1,391.39	0.00	1,391.39	3,619.56	1,809.78	6,333.02	3,171.22	24.32	-2.73	0.446
90.00	-23.05	-41.27	0.00	-1,266.83	0.00	1,266.83	3,568.35	1,784.17	6,117.67	3,063.38	26.06	-2.82	0.421
93.00	-22.12	-40.52	0.00	-1,143.03	0.00	1,143.03	3,516.28	1,758.14	5,904.48	2,956.63	27.87	-2.91	0.393
94.25	-20.89	-35.40	0.00	-1,092.38	0.00	1,092.38	3,494.33	1,747.16	5,816.31	2,912.48	28.63	-2.95	0.381
95.00	-20.65	-35.19	0.00	-1,065.83	0.00	1,065.83	3,481.08	1,740.54	5,763.60	2,886.09	29.10	-2.98	0.376
100.00	-19.27	-34.80	0.00	-889.90	0.00	889.90	3,391.44	1,695.72	5,415.99	2,712.02	32.29	-3.12	0.334
104.00	-16.85	-32.49	0.00	-750.69	0.00	750.69	3,318.00	1,659.00	5,142.82	2,575.23	34.95	-3.22	0.297
105.00	-16.58	-32.26	0.00	-718.21	0.00	718.21	3,299.41	1,649.70	5,075.23	2,541.39	35.63	-3.25	0.288
110.00	-15.37	-31.85	0.00	-556.89	0.00	556.89	3,191.87	1,595.94	4,722.36	2,364.69	39.09	-3.36	0.241
115.00	-14.21	-31.43	0.00	-397.65	0.00	397.65	3,066.45	1,533.23	4,356.70	2,181.59	42.67	-3.46	0.187
120.00	-11.39	-28.47	0.00	-240.48	0.00	240.48	2,941.04	1,470.52	4,005.78	2,005.87	46.33	-3.53	0.124
122.50	-7.87	-13.23	0.00	-169.31	0.00	169.31	2,878.33	1,439.16	3,835.85	1,920.77	48.19	-3.56	0.091
124.00	-7.59	-13.12	0.00	-149.47	0.00	149.47	2,840.70	1,420.35	3,735.65	1,870.60	49.31	-3.57	0.083
124.00	-7.59	-13.12	0.00	-149.47	0.00	149.47	1,738.67	869.33	2,314.52	1,149.03	49.31	-3.57	0.135
125.00	-7.45	-12.88	0.00	-136.35	0.00	136.35	1,724.85	862.42	2,266.37	1,125.12	50.05	-3.58	0.126
130.00	-6.78	-12.61	0.00	-71.95	0.00	71.95	1,652.39	826.19	2,028.68	1,007.12	53.83	-3.62	0.076
131.00	-3.37	-4.92	0.00	-59.34	0.00	59.34	1,637.23	818.62	1,981.83	983.86	54.59	-3.63	0.062
133.00	-3.01	-4.22	0.00	-49.49	0.00	49.49	1,606.25	803.12	1,888.92	937.74	56.11	-3.64	0.055
135.00	-2.80	-3.96	0.00	-41.06	0.00	41.06	1,574.38	787.19	1,797.14	892.18	57.64	-3.65	0.048
140.00	-2.28	-3.62	0.00	-21.27	0.00	21.27	1,490.81	745.41	1,573.20	781.00	61.47	-3.67	0.029
144.00	-0.41	-0.52	0.00	-0.26	0.00	0.26	1,419.96	709.98	1,400.47	695.25	64.55	-3.68	0.001
144.50	0.00	-0.49	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	64.94	-3.68	0.000

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number: OAA696964_C3_01 3/2/2017 11:01:44 AM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 20 Iterations

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

Wind Importance 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	-49.34	-52.82	0.00	-5,691.97	0.00	5,691.97	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.603
5.00	-47.35	-52.48	0.00	-5,427.86	0.00	5,427.86	6,984.34	3,492.17	18,406.1	9,216.76	0.08	-0.14	0.596
10.00	-45.39	-52.13	0.00	-5,165.47	0.00	5,165.47	6,882.57	3,441.28	17,733.7	8,880.03	0.30	-0.28	0.589
15.00	-43.46	-51.79	0.00	-4,904.80	0.00	4,904.80	6,778.41	3,389.20	17,067.2	8,546.29	0.67	-0.43	0.581
20.00	-41.57	-51.46	0.00	-4,645.83	0.00	4,645.83	6,671.87	3,335.93	16,407.0	8,215.74	1.20	-0.57	0.572
25.00	-39.72	-51.12	0.00	-4,388.55	0.00	4,388.55	6,562.95	3,281.47	15,753.7	7,888.59	1.88	-0.72	0.563
30.00	-37.90	-50.78	0.00	-4,132.95	0.00	4,132.95	6,451.64	3,225.82	15,107.6	7,565.05	2.72	-0.88	0.552
35.00	-36.11	-50.43	0.00	-3,879.04	0.00	3,879.04	6,337.95	3,168.97	14,469.1	7,245.34	3.72	-1.03	0.541
40.00	-34.40	-50.17	0.00	-3,626.87	0.00	3,626.87	6,221.87	3,110.94	13,838.7	6,929.66	4.89	-1.18	0.529
42.00	-33.69	-49.99	0.00	-3,526.53	0.00	3,526.53	6,174.78	3,087.39	13,588.9	6,804.56	5.40	-1.25	0.524
45.00	-31.96	-49.71	0.00	-3,376.55	0.00	3,376.55	6,103.42	3,051.71	13,216.8	6,618.22	6.21	-1.34	0.516
49.00	-29.75	-49.48	0.00	-3,177.70	0.00	3,177.70	5,121.13	2,560.57	11,060.8	5,538.67	7.39	-1.47	0.580
50.00	-29.39	-49.27	0.00	-3,128.22	0.00	3,128.22	5,102.30	2,551.15	10,960.2	5,488.28	7.70	-1.50	0.576
55.00	-27.87	-48.88	0.00	-2,881.89	0.00	2,881.89	5,006.69	2,503.35	10,460.8	5,238.20	9.37	-1.67	0.556
60.00	-26.39	-48.48	0.00	-2,637.52	0.00	2,637.52	4,908.70	2,454.35	9,967.80	4,991.31	11.21	-1.84	0.534
65.00	-24.94	-48.08	0.00	-2,395.13	0.00	2,395.13	4,808.33	2,404.17	9,481.57	4,747.83	13.23	-2.01	0.510
70.00	-23.52	-47.67	0.00	-2,154.75	0.00	2,154.75	4,705.57	2,352.79	9,002.57	4,507.98	15.42	-2.18	0.483
75.00	-22.14	-47.26	0.00	-1,916.41	0.00	1,916.41	4,600.44	2,300.22	8,531.23	4,271.95	17.79	-2.34	0.454
80.00	-20.84	-46.98	0.00	-1,680.11	0.00	1,680.11	4,492.91	2,246.46	8,067.95	4,039.97	20.33	-2.50	0.421
81.25	-20.52	-46.90	0.00	-1,621.39	0.00	1,621.39	4,465.66	2,232.83	7,953.44	3,982.63	20.99	-2.54	0.412
81.75	-19.66	-41.67	0.00	-1,597.94	0.00	1,597.94	4,454.72	2,227.36	7,907.79	3,959.77	21.25	-2.55	0.408
85.00	-18.32	-41.42	0.00	-1,462.50	0.00	1,462.50	4,371.64	2,185.82	7,593.43	3,802.36	23.03	-2.65	0.389
87.00	-17.49	-41.20	0.00	-1,379.66	0.00	1,379.66	3,619.56	1,809.78	6,333.02	3,171.22	24.15	-2.71	0.440
90.00	-16.80	-40.95	0.00	-1,256.07	0.00	1,256.07	3,568.35	1,784.17	6,117.67	3,063.38	25.88	-2.80	0.415
93.00	-16.10	-40.20	0.00	-1,133.22	0.00	1,133.22	3,516.28	1,758.14	5,904.48	2,956.63	27.67	-2.89	0.388
94.25	-15.24	-35.10	0.00	-1,082.97	0.00	1,082.97	3,494.33	1,747.16	5,816.31	2,912.48	28.44	-2.93	0.377
95.00	-15.05	-34.88	0.00	-1,056.65	0.00	1,056.65	3,481.08	1,740.54	5,763.60	2,886.09	28.90	-2.95	0.371
100.00	-14.00	-34.50	0.00	-882.24	0.00	882.24	3,391.44	1,695.72	5,415.99	2,712.02	32.07	-3.09	0.330
104.00	-12.20	-32.22	0.00	-744.23	0.00	744.23	3,318.00	1,659.00	5,142.82	2,575.23	34.71	-3.20	0.293
105.00	-12.00	-31.99	0.00	-712.01	0.00	712.01	3,299.41	1,649.70	5,075.23	2,541.39	35.38	-3.22	0.284
110.00	-11.08	-31.59	0.00	-552.05	0.00	552.05	3,191.87	1,595.94	4,722.36	2,364.69	38.82	-3.34	0.237
115.00	-10.20	-31.18	0.00	-394.12	0.00	394.12	3,066.45	1,533.23	4,356.70	2,181.59	42.37	-3.43	0.184
120.00	-8.13	-28.26	0.00	-238.20	0.00	238.20	2,941.04	1,470.52	4,005.78	2,005.87	46.00	-3.50	0.122
122.50	-5.71	-13.09	0.00	-167.54	0.00	167.54	2,878.33	1,439.16	3,835.85	1,920.77	47.84	-3.53	0.089
124.00	-5.50	-12.99	0.00	-147.91	0.00	147.91	2,840.70	1,420.35	3,735.65	1,870.60	48.95	-3.54	0.081
124.00	-5.50	-12.99	0.00	-147.91	0.00	147.91	1,738.67	869.33	2,314.52	1,149.03	48.95	-3.54	0.132
125.00	-5.40	-12.75	0.00	-134.92	0.00	134.92	1,724.85	862.42	2,266.37	1,125.12	49.70	-3.55	0.123
130.00	-4.90	-12.49	0.00	-71.18	0.00	71.18	1,652.39	826.19	2,028.68	1,007.12	53.44	-3.60	0.074
131.00	-2.46	-4.86	0.00	-58.70	0.00	58.70	1,637.23	818.62	1,981.83	983.86	54.19	-3.60	0.061
133.00	-2.20	-4.16	0.00	-48.97	0.00	48.97	1,606.25	803.12	1,888.92	937.74	55.70	-3.61	0.054
135.00	-2.04	-3.91	0.00	-40.65	0.00	40.65	1,574.38	787.19	1,797.14	892.18	57.22	-3.63	0.047
140.00	-1.66	-3.58	0.00	-21.10	0.00	21.10	1,490.81	745.41	1,573.20	781.00	61.03	-3.65	0.028
144.00	-0.30	-0.51	0.00	-0.26	0.00	0.26	1,419.96	709.98	1,400.47	695.25	64.08	-3.66	0.001
144.50	0.00	-0.49	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	64.47	-3.66	0.000

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number: OAA696964_C3_01 3/2/2017 11:01:47 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 20 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	-107.62	-11.12	0.00	-1,212.99	0.00	1,212.99	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.142
5.00	-104.40	-11.07	0.00	-1,157.41	0.00	1,157.41	6,984.34	3,492.17	18,406.1	9,216.76	0.02	-0.03	0.141
10.00	-101.14	-11.02	0.00	-1,102.07	0.00	1,102.07	6,882.57	3,441.28	17,733.7	8,880.03	0.06	-0.06	0.139
15.00	-97.90	-10.97	0.00	-1,046.99	0.00	1,046.99	6,778.41	3,389.20	17,067.2	8,546.29	0.14	-0.09	0.137
20.00	-94.70	-10.92	0.00	-992.15	0.00	992.15	6,671.87	3,335.93	16,407.0	8,215.74	0.26	-0.12	0.135
25.00	-91.54	-10.86	0.00	-937.57	0.00	937.57	6,562.95	3,281.47	15,753.7	7,888.59	0.40	-0.15	0.133
30.00	-88.42	-10.81	0.00	-883.25	0.00	883.25	6,451.64	3,225.82	15,107.6	7,565.05	0.58	-0.19	0.130
35.00	-85.35	-10.75	0.00	-829.20	0.00	829.20	6,337.95	3,168.97	14,469.1	7,245.34	0.79	-0.22	0.128
40.00	-82.33	-10.71	0.00	-775.44	0.00	775.44	6,221.87	3,110.94	13,838.7	6,929.66	1.04	-0.25	0.125
42.00	-81.13	-10.68	0.00	-754.03	0.00	754.03	6,174.78	3,087.39	13,588.9	6,804.56	1.15	-0.27	0.124
45.00	-78.43	-10.63	0.00	-722.00	0.00	722.00	6,103.42	3,051.71	13,216.8	6,618.22	1.33	-0.29	0.122
49.00	-74.88	-10.58	0.00	-679.50	0.00	679.50	5,121.13	2,560.57	11,060.8	5,538.67	1.58	-0.31	0.137
50.00	-74.32	-10.54	0.00	-668.92	0.00	668.92	5,102.30	2,551.15	10,960.2	5,488.28	1.64	-0.32	0.136
55.00	-71.63	-10.47	0.00	-616.21	0.00	616.21	5,006.69	2,503.35	10,460.8	5,238.20	2.00	-0.36	0.132
60.00	-69.00	-10.40	0.00	-563.85	0.00	563.85	4,908.70	2,454.35	9,967.80	4,991.31	2.39	-0.39	0.127
65.00	-66.41	-10.32	0.00	-511.86	0.00	511.86	4,808.33	2,404.17	9,481.57	4,747.83	2.82	-0.43	0.122
70.00	-63.88	-10.24	0.00	-460.25	0.00	460.25	4,705.57	2,352.79	9,002.57	4,507.98	3.29	-0.46	0.116
75.00	-61.40	-10.16	0.00	-409.05	0.00	409.05	4,600.44	2,300.22	8,531.23	4,271.95	3.80	-0.50	0.109
80.00	-58.98	-10.10	0.00	-358.26	0.00	358.26	4,492.91	2,246.46	8,067.95	4,039.97	4.34	-0.53	0.102
81.25	-58.38	-10.08	0.00	-345.64	0.00	345.64	4,465.66	2,232.83	7,953.44	3,982.63	4.48	-0.54	0.100
81.75	-56.33	-8.94	0.00	-340.60	0.00	340.60	4,454.72	2,227.36	7,907.79	3,959.77	4.54	-0.55	0.099
85.00	-54.10	-8.88	0.00	-311.54	0.00	311.54	4,371.64	2,185.82	7,593.43	3,802.36	4.92	-0.57	0.094
87.00	-52.75	-8.84	0.00	-293.78	0.00	293.78	3,619.56	1,809.78	6,333.02	3,171.22	5.16	-0.58	0.107
90.00	-51.45	-8.78	0.00	-267.27	0.00	267.27	3,568.35	1,784.17	6,117.67	3,063.38	5.53	-0.60	0.102
93.00	-49.59	-8.65	0.00	-240.93	0.00	240.93	3,516.28	1,758.14	5,904.48	2,956.63	5.91	-0.62	0.096
94.25	-47.35	-7.52	0.00	-230.12	0.00	230.12	3,494.33	1,747.16	5,816.31	2,912.48	6.07	-0.63	0.093
95.00	-47.03	-7.48	0.00	-224.48	0.00	224.48	3,481.08	1,740.54	5,763.60	2,886.09	6.17	-0.63	0.091
100.00	-44.97	-7.39	0.00	-187.09	0.00	187.09	3,391.44	1,695.72	5,415.99	2,712.02	6.85	-0.66	0.082
104.00	-38.84	-6.95	0.00	-157.53	0.00	157.53	3,318.00	1,659.00	5,142.82	2,575.23	7.41	-0.68	0.073
105.00	-38.49	-6.90	0.00	-150.58	0.00	150.58	3,299.41	1,649.70	5,075.23	2,541.39	7.56	-0.69	0.071
110.00	-36.77	-6.80	0.00	-116.09	0.00	116.09	3,191.87	1,595.94	4,722.36	2,364.69	8.29	-0.71	0.061
115.00	-35.10	-6.70	0.00	-82.09	0.00	82.09	3,066.45	1,533.23	4,356.70	2,181.59	9.05	-0.73	0.049
120.00	-27.86	-6.12	0.00	-48.58	0.00	48.58	2,941.04	1,470.52	4,005.78	2,005.87	9.82	-0.75	0.034
122.50	-21.02	-2.72	0.00	-33.28	0.00	33.28	2,878.33	1,439.16	3,835.85	1,920.77	10.22	-0.75	0.025
124.00	-20.58	-2.69	0.00	-29.20	0.00	29.20	2,840.70	1,420.35	3,735.65	1,870.60	10.45	-0.75	0.023
124.00	-20.58	-2.69	0.00	-29.20	0.00	29.20	1,738.67	869.33	2,314.52	1,149.03	10.45	-0.75	0.037
125.00	-20.34	-2.64	0.00	-26.51	0.00	26.51	1,724.85	862.42	2,266.37	1,125.12	10.61	-0.76	0.035
130.00	-19.19	-2.58	0.00	-13.32	0.00	13.32	1,652.39	826.19	2,028.68	1,007.12	11.41	-0.76	0.025
131.00	-10.94	-0.95	0.00	-10.75	0.00	10.75	1,637.23	818.62	1,981.83	983.86	11.57	-0.77	0.018
133.00	-9.02	-0.80	0.00	-8.84	0.00	8.84	1,606.25	803.12	1,888.92	937.74	11.89	-0.77	0.015
135.00	-8.62	-0.75	0.00	-7.24	0.00	7.24	1,574.38	787.19	1,797.14	892.18	12.21	-0.77	0.014
140.00	-7.67	-0.67	0.00	-3.51	0.00	3.51	1,490.81	745.41	1,573.20	781.00	13.02	-0.77	0.010
144.00	-1.06	-0.12	0.00	-0.06	0.00	0.06	1,419.96	709.98	1,400.47	695.25	13.67	-0.78	0.001
144.50	0.00	-0.11	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	13.75	-0.78	0.000

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number: OAA696964_C3_01 3/2/2017 11:01:49 AM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W Serviceability 60 mph 19 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	-54.89	-13.74	0.00	-1,484.28	0.00	1,484.28	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.163
5.00	-52.81	-13.66	0.00	-1,415.57	0.00	1,415.57	6,984.34	3,492.17	18,406.1	9,216.76	0.02	-0.04	0.161
10.00	-50.77	-13.57	0.00	-1,347.29	0.00	1,347.29	6,882.57	3,441.28	17,733.7	8,880.03	0.08	-0.07	0.159
15.00	-48.77	-13.48	0.00	-1,279.44	0.00	1,279.44	6,778.41	3,389.20	17,067.2	8,546.29	0.18	-0.11	0.157
20.00	-46.80	-13.40	0.00	-1,212.02	0.00	1,212.02	6,671.87	3,335.93	16,407.0	8,215.74	0.31	-0.15	0.155
25.00	-44.87	-13.32	0.00	-1,145.02	0.00	1,145.02	6,562.95	3,281.47	15,753.7	7,888.59	0.49	-0.19	0.152
30.00	-42.99	-13.23	0.00	-1,078.45	0.00	1,078.45	6,451.64	3,225.82	15,107.6	7,565.05	0.71	-0.23	0.149
35.00	-41.13	-13.14	0.00	-1,012.29	0.00	1,012.29	6,337.95	3,168.97	14,469.1	7,245.34	0.97	-0.27	0.146
40.00	-39.32	-13.08	0.00	-946.58	0.00	946.58	6,221.87	3,110.94	13,838.7	6,929.66	1.27	-0.31	0.143
42.00	-38.61	-13.03	0.00	-920.43	0.00	920.43	6,174.78	3,087.39	13,588.9	6,804.56	1.41	-0.33	0.142
45.00	-36.78	-12.96	0.00	-881.34	0.00	881.34	6,103.42	3,051.71	13,216.8	6,618.22	1.62	-0.35	0.139
49.00	-34.39	-12.90	0.00	-829.50	0.00	829.50	5,121.13	2,560.57	11,060.8	5,538.67	1.93	-0.38	0.157
50.00	-34.07	-12.85	0.00	-816.60	0.00	816.60	5,102.30	2,551.15	10,960.2	5,488.28	2.01	-0.39	0.155
55.00	-32.52	-12.75	0.00	-752.38	0.00	752.38	5,006.69	2,503.35	10,460.8	5,238.20	2.44	-0.44	0.150
60.00	-31.01	-12.65	0.00	-688.65	0.00	688.65	4,908.70	2,454.35	9,967.80	4,991.31	2.92	-0.48	0.144
65.00	-29.53	-12.54	0.00	-625.42	0.00	625.42	4,808.33	2,404.17	9,481.57	4,747.83	3.45	-0.52	0.138
70.00	-28.08	-12.44	0.00	-562.71	0.00	562.71	4,705.57	2,352.79	9,002.57	4,507.98	4.02	-0.57	0.131
75.00	-26.67	-12.33	0.00	-500.52	0.00	500.52	4,600.44	2,300.22	8,531.23	4,271.95	4.64	-0.61	0.123
80.00	-25.29	-12.26	0.00	-438.85	0.00	438.85	4,492.91	2,246.46	8,067.95	4,039.97	5.30	-0.65	0.114
81.25	-24.95	-12.24	0.00	-423.53	0.00	423.53	4,465.66	2,232.83	7,953.44	3,982.63	5.48	-0.66	0.112
81.75	-23.80	-10.88	0.00	-417.41	0.00	417.41	4,454.72	2,227.36	7,907.79	3,959.77	5.55	-0.67	0.111
85.00	-22.36	-10.81	0.00	-382.05	0.00	382.05	4,371.64	2,185.82	7,593.43	3,802.36	6.01	-0.69	0.106
87.00	-21.48	-10.76	0.00	-360.42	0.00	360.42	3,619.56	1,809.78	6,333.02	3,171.22	6.30	-0.71	0.120
90.00	-20.77	-10.69	0.00	-328.15	0.00	328.15	3,568.35	1,784.17	6,117.67	3,063.38	6.76	-0.73	0.113
93.00	-20.00	-10.50	0.00	-296.08	0.00	296.08	3,516.28	1,758.14	5,904.48	2,956.63	7.22	-0.76	0.106
94.25	-18.79	-9.17	0.00	-282.96	0.00	282.96	3,494.33	1,747.16	5,816.31	2,912.48	7.42	-0.77	0.103
95.00	-18.62	-9.11	0.00	-276.08	0.00	276.08	3,481.08	1,740.54	5,763.60	2,886.09	7.54	-0.77	0.101
100.00	-17.51	-9.01	0.00	-230.52	0.00	230.52	3,391.44	1,695.72	5,415.99	2,712.02	8.37	-0.81	0.090
104.00	-15.42	-8.42	0.00	-194.47	0.00	194.47	3,318.00	1,659.00	5,142.82	2,575.23	9.06	-0.83	0.080
105.00	-15.22	-8.36	0.00	-186.05	0.00	186.05	3,299.41	1,649.70	5,075.23	2,541.39	9.24	-0.84	0.078
110.00	-14.24	-8.25	0.00	-144.26	0.00	144.26	3,191.87	1,595.94	4,722.36	2,364.69	10.13	-0.87	0.065
115.00	-13.29	-8.15	0.00	-103.00	0.00	103.00	3,066.45	1,533.23	4,356.70	2,181.59	11.06	-0.90	0.052
120.00	-10.82	-7.38	0.00	-62.26	0.00	62.26	2,941.04	1,470.52	4,005.78	2,005.87	12.01	-0.91	0.035
122.50	-7.18	-3.42	0.00	-43.81	0.00	43.81	2,878.33	1,439.16	3,835.85	1,920.77	12.49	-0.92	0.025
124.00	-6.94	-3.40	0.00	-38.67	0.00	38.67	2,840.70	1,420.35	3,735.65	1,870.60	12.78	-0.92	0.023
124.00	-6.94	-3.40	0.00	-38.67	0.00	38.67	1,738.67	869.33	2,314.52	1,149.03	12.78	-0.92	0.038
125.00	-6.82	-3.33	0.00	-35.28	0.00	35.28	1,724.85	862.42	2,266.37	1,125.12	12.97	-0.93	0.035
130.00	-6.25	-3.26	0.00	-18.61	0.00	18.61	1,652.39	826.19	2,028.68	1,007.12	13.95	-0.94	0.022
131.00	-3.04	-1.27	0.00	-15.35	0.00	15.35	1,637.23	818.62	1,981.83	983.86	14.15	-0.94	0.017
133.00	-2.71	-1.09	0.00	-12.80	0.00	12.80	1,606.25	803.12	1,888.92	937.74	14.54	-0.94	0.015
135.00	-2.53	-1.02	0.00	-10.62	0.00	10.62	1,574.38	787.19	1,797.14	892.18	14.94	-0.95	0.014
140.00	-2.08	-0.94	0.00	-5.51	0.00	5.51	1,490.81	745.41	1,573.20	781.00	15.93	-0.95	0.008
144.00	-0.37	-0.13	0.00	-0.07	0.00	0.07	1,419.96	709.98	1,400.47	695.25	16.73	-0.95	0.000
144.50	0.00	-0.13	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	16.83	-0.95	0.000

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}):	0.19	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10	
Seismic Response Coefficient (C_s):	0.04	
Upper Limit C_s	0.04	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	1.57	
Redundancy Factor (p):	1.30	
Seismic Force Distribution Exponent (k):	1.53	
Total Unfactored Dead Load:	54.90	k
Seismic Base Shear (E):	3.15	k

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

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
42	144.25	32	67	0.001	5	40
41	142.00	341	685	0.015	48	422
40	137.50	451	864	0.019	60	558
39	134.00	188	347	0.008	24	233
38	132.00	212	382	0.008	27	263
37	130.50	111	195	0.004	14	137
36	127.50	570	971	0.022	68	705
35	124.50	117	193	0.004	14	145
34	123.25	242	392	0.009	27	300
33	121.25	409	646	0.014	45	506
32	117.50	921	1,386	0.031	97	1,141
31	112.50	950	1,337	0.030	94	1,176
30	107.50	979	1,285	0.029	90	1,212
29	104.50	199	250	0.006	18	247
28	102.00	868	1,051	0.023	74	1,075
27	97.50	1,111	1,255	0.028	88	1,375
26	94.63	169	182	0.004	13	209
25	93.63	283	301	0.007	21	351
24	91.50	695	712	0.016	50	860
23	88.50	705	686	0.015	48	873
22	86.00	873	814	0.018	57	1,081
21	83.38	1,441	1,280	0.028	90	1,783
20	81.50	224	192	0.004	13	277

19	80.63	338	285	0.006	20	418
18	77.50	1,372	1,090	0.024	76	1,698
17	72.50	1,405	1,008	0.022	71	1,740
16	67.50	1,439	925	0.021	65	1,781
15	62.50	1,472	841	0.019	59	1,823
14	57.50	1,506	756	0.017	53	1,864
13	52.50	1,539	673	0.015	47	1,906
12	49.50	312	125	0.003	9	386
11	47.00	2,389	881	0.020	62	2,958
10	43.50	1,822	597	0.013	42	2,256
9	41.00	711	212	0.005	15	880
8	37.50	1,804	470	0.010	33	2,233
7	32.50	1,842	385	0.009	27	2,280
6	27.50	1,880	304	0.007	21	2,328
5	22.50	1,919	228	0.005	16	2,375
4	17.50	1,957	158	0.004	11	2,423
3	12.50	1,995	96	0.002	7	2,470
2	7.50	2,034	45	0.001	3	2,517
1	2.50	2,072	8	0.000	1	2,565
Pine Tree Branches	144.50	338	698	0.015	49	418
Alcatel-Lucent 800 M	144.00	185	381	0.008	27	230
Alcatel-Lucent 1900M	144.00	132	271	0.006	19	163
Decibel DB980F90E-M	144.00	142	293	0.007	21	176
RFS APXVSPP18-C-A20	144.00	171	352	0.008	25	212
Round T-Arm	144.00	750	1,542	0.034	108	928
Commscope SBNHH-1D65	133.00	122	222	0.005	16	151
Alcatel-Lucent B13 R	131.00	172	305	0.007	21	212
Alcatel-Lucent B66A	131.00	170	303	0.007	21	211
Raycap RC2DC-3315-PF	131.00	64	114	0.003	8	79
Antel LPA-80080/4CF	131.00	24	43	0.001	3	30
Antel LPA-80063/4CF	131.00	80	142	0.003	10	99
Commscope SBNHH-1D65	131.00	122	217	0.005	15	151
Round T-Arm	131.00	750	1,334	0.030	93	928
VZW Unused Reserve:	131.00	1,746	3,105	0.069	217	2,162
Pine Tree Branches	122.50	3,300	5,293	0.118	371	4,085
Andrew ABT-DMDF-ADBH	120.00	1	2	0.000	0	1
Spinner Bias-T	120.00	4	7	0.000	0	6
Powerwave LGP21901	120.00	33	51	0.001	4	41
Powerwave LGP21401	120.00	85	131	0.003	9	105
Raycap DC6-48-60-18-	120.00	33	51	0.001	4	41
Ericsson RRUS-11 (50	120.00	300	466	0.010	33	371
Powerwave 7770.00	120.00	210	326	0.007	23	260
Kathrein 800 10764	120.00	41	63	0.001	4	51
KMW AM-X-CD-16-65-00	120.00	97	151	0.003	11	120
Flat T-Arm	120.00	750	1,166	0.026	82	928
E-911 GPS	104.00	5	6	0.000	0	6
Ericsson KRY 112 71	104.00	40	49	0.001	3	49
RFS ATMAP1412D-1A20	104.00	39	49	0.001	3	48
RFS APX16DWV-16DWV-S	104.00	238	296	0.007	21	294
Commscope LNX-6515DS	104.00	151	188	0.004	13	187
Flat T-Arm	104.00	750	936	0.021	66	928
Pine Tree Branches	94.25	938	1,006	0.022	70	1,161
RFS APXV18-206517S-C	93.00	79	83	0.002	6	98
Pine Tree Branches	81.75	938	808	0.018	57	1,161
PCTEL GPS-TMG-HR-26N	50.00	1	0	0.000	0	1
		54,899	45,014	1.000	3,152	67,963

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number: OAA696964_C3_01 3/2/2017 11:01:52 AM

Customer: VERIZON WIRELESS

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)
42	144.25	32	67	0.001	5	28
41	142.00	341	685	0.015	48	294
40	137.50	451	864	0.019	60	389
39	134.00	188	347	0.008	24	162
38	132.00	212	382	0.008	27	183
37	130.50	111	195	0.004	14	95
36	127.50	570	971	0.022	68	491
35	124.50	117	193	0.004	14	101
34	123.25	242	392	0.009	27	209
33	121.25	409	646	0.014	45	353
32	117.50	921	1,386	0.031	97	794
31	112.50	950	1,337	0.030	94	819
30	107.50	979	1,285	0.029	90	844
29	104.50	199	250	0.006	18	172
28	102.00	868	1,051	0.023	74	748
27	97.50	1,111	1,255	0.028	88	958
26	94.63	169	182	0.004	13	146
25	93.63	283	301	0.007	21	244
24	91.50	695	712	0.016	50	599
23	88.50	705	686	0.015	48	608
22	86.00	873	814	0.018	57	753
21	83.38	1,441	1,280	0.028	90	1,242
20	81.50	224	192	0.004	13	193
19	80.63	338	285	0.006	20	291
18	77.50	1,372	1,090	0.024	76	1,183
17	72.50	1,405	1,008	0.022	71	1,211
16	67.50	1,439	925	0.021	65	1,240
15	62.50	1,472	841	0.019	59	1,269
14	57.50	1,506	756	0.017	53	1,298
13	52.50	1,539	673	0.015	47	1,327
12	49.50	312	125	0.003	9	269
11	47.00	2,389	881	0.020	62	2,060
10	43.50	1,822	597	0.013	42	1,571
9	41.00	711	212	0.005	15	613
8	37.50	1,804	470	0.010	33	1,555
7	32.50	1,842	385	0.009	27	1,588
6	27.50	1,880	304	0.007	21	1,621
5	22.50	1,919	228	0.005	16	1,654
4	17.50	1,957	158	0.004	11	1,687
3	12.50	1,995	96	0.002	7	1,720
2	7.50	2,034	45	0.001	3	1,753
1	2.50	2,072	8	0.000	1	1,786
Pine Tree Branches	144.50	338	698	0.015	49	291
Alcatel-Lucent 800 M	144.00	185	381	0.008	27	160
Alcatel-Lucent 1900M	144.00	132	271	0.006	19	114
Decibel DB980F90E-M	144.00	142	293	0.007	21	123
RFS APXVSPP18-C-A20	144.00	171	352	0.008	25	147
Round T-Arm	144.00	750	1,542	0.034	108	647
Commscope SBNHH-1D65	133.00	122	222	0.005	16	105
Alcatel-Lucent B13 R	131.00	172	305	0.007	21	148
Alcatel-Lucent B66A	131.00	170	303	0.007	21	147
Raycap RC2DC-3315-PF	131.00	64	114	0.003	8	55
Antel LPA-80080/4CF	131.00	24	43	0.001	3	21
Antel LPA-80063/4CF	131.00	80	142	0.003	10	69
Commscope SBNHH-1D65	131.00	122	217	0.005	15	105
Round T-Arm	131.00	750	1,334	0.030	93	647
VZW Unused Reserve:	131.00	1,746	3,105	0.069	217	1,505

Pine Tree Branches	122.50	3,300	5,293	0.118	371	2,845
Andrew ABT-DMDF-ADBH	120.00	1	2	0.000	0	1
Spinner Bias-T	120.00	4	7	0.000	0	4
Powerwave LGP21901	120.00	33	51	0.001	4	28
Powerwave LGP21401	120.00	85	131	0.003	9	73
Raycap DC6-48-60-18-	120.00	33	51	0.001	4	28
Ericsson RRUS-11 (50	120.00	300	466	0.010	33	259
Powerwave 7770.00	120.00	210	326	0.007	23	181
Kathrein 800 10764	120.00	41	63	0.001	4	35
KMW AM-X-CD-16-65-00	120.00	97	151	0.003	11	84
Flat T-Arm	120.00	750	1,166	0.026	82	647
E-911 GPS	104.00	5	6	0.000	0	4
Ericsson KRY 112 71	104.00	40	49	0.001	3	34
RFS ATMAP1412D-1A20	104.00	39	49	0.001	3	34
RFS APX16DWV-16DWV-S	104.00	238	296	0.007	21	205
Commscope LNX-6515DS	104.00	151	188	0.004	13	130
Flat T-Arm	104.00	750	936	0.021	66	647
Pine Tree Branches	94.25	938	1,006	0.022	70	808
RFS APXV18-206517S-C	93.00	79	83	0.002	6	68
Pine Tree Branches	81.75	938	808	0.018	57	808
PCTEL GPS-TMG-HR-26N	50.00	1	0	0.000	0	1
		54,899	45,014	1.000	3,152	47,324

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	-65.40	-3.15	0.00	-334.73	0.00	334.73	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.044
5.00	-62.88	-3.16	0.00	-318.96	0.00	318.96	6,984.34	3,492.17	18,406.1	9,216.76	0.00	-0.01	0.044
10.00	-60.41	-3.16	0.00	-303.16	0.00	303.16	6,882.57	3,441.28	17,733.7	8,880.03	0.02	-0.02	0.043
15.00	-57.99	-3.16	0.00	-287.35	0.00	287.35	6,778.41	3,389.20	17,067.2	8,546.29	0.04	-0.03	0.042
20.00	-55.61	-3.15	0.00	-271.55	0.00	271.55	6,671.87	3,335.93	16,407.0	8,215.74	0.07	-0.03	0.041
25.00	-53.28	-3.14	0.00	-255.80	0.00	255.80	6,562.95	3,281.47	15,753.7	7,888.59	0.11	-0.04	0.041
30.00	-51.00	-3.11	0.00	-240.13	0.00	240.13	6,451.64	3,225.82	15,107.6	7,565.05	0.16	-0.05	0.040
35.00	-48.77	-3.09	0.00	-224.56	0.00	224.56	6,337.95	3,168.97	14,469.1	7,245.34	0.22	-0.06	0.039
40.00	-47.89	-3.08	0.00	-209.12	0.00	209.12	6,221.87	3,110.94	13,838.7	6,929.66	0.29	-0.07	0.038
42.00	-45.63	-3.04	0.00	-202.97	0.00	202.97	6,174.78	3,087.39	13,588.9	6,804.56	0.32	-0.07	0.037
45.00	-42.67	-2.97	0.00	-193.86	0.00	193.86	6,103.42	3,051.71	13,216.8	6,618.22	0.36	-0.08	0.036
49.00	-42.29	-2.97	0.00	-181.97	0.00	181.97	5,121.13	2,560.57	11,060.8	5,538.67	0.43	-0.09	0.041
50.00	-40.38	-2.92	0.00	-179.00	0.00	179.00	5,102.30	2,551.15	10,960.2	5,488.28	0.45	-0.09	0.041
55.00	-38.52	-2.87	0.00	-164.39	0.00	164.39	5,006.69	2,503.35	10,460.8	5,238.20	0.55	-0.10	0.039
60.00	-36.69	-2.82	0.00	-150.02	0.00	150.02	4,908.70	2,454.35	9,967.80	4,991.31	0.65	-0.11	0.038
65.00	-34.91	-2.75	0.00	-135.93	0.00	135.93	4,808.33	2,404.17	9,481.57	4,747.83	0.77	-0.12	0.036
70.00	-33.17	-2.69	0.00	-122.16	0.00	122.16	4,705.57	2,352.79	9,002.57	4,507.98	0.90	-0.13	0.034
75.00	-31.47	-2.61	0.00	-108.73	0.00	108.73	4,600.44	2,300.22	8,531.23	4,271.95	1.03	-0.13	0.032
80.00	-31.05	-2.59	0.00	-95.67	0.00	95.67	4,492.91	2,246.46	8,067.95	4,039.97	1.18	-0.14	0.031
81.25	-29.62	-2.52	0.00	-92.43	0.00	92.43	4,465.66	2,232.83	7,953.44	3,982.63	1.22	-0.15	0.030
81.75	-27.83	-2.43	0.00	-91.17	0.00	91.17	4,454.72	2,227.36	7,907.79	3,959.77	1.23	-0.15	0.029
85.00	-26.75	-2.37	0.00	-83.28	0.00	83.28	4,371.64	2,185.82	7,593.43	3,802.36	1.34	-0.15	0.028
87.00	-25.88	-2.32	0.00	-78.54	0.00	78.54	3,619.56	1,809.78	6,333.02	3,171.22	1.40	-0.16	0.032
90.00	-25.02	-2.27	0.00	-71.58	0.00	71.58	3,568.35	1,784.17	6,117.67	3,063.38	1.50	-0.16	0.030
93.00	-24.57	-2.24	0.00	-64.77	0.00	64.77	3,516.28	1,758.14	5,904.48	2,956.63	1.60	-0.17	0.029
94.25	-23.20	-2.16	0.00	-61.96	0.00	61.96	3,494.33	1,747.16	5,816.31	2,912.48	1.65	-0.17	0.028
95.00	-21.83	-2.07	0.00	-60.34	0.00	60.34	3,481.08	1,740.54	5,763.60	2,886.09	1.67	-0.17	0.027
100.00	-20.75	-1.99	0.00	-50.00	0.00	50.00	3,391.44	1,695.72	5,415.99	2,712.02	1.86	-0.18	0.025
104.00	-18.99	-1.87	0.00	-42.02	0.00	42.02	3,318.00	1,659.00	5,142.82	2,575.23	2.01	-0.18	0.022
105.00	-17.78	-1.77	0.00	-40.16	0.00	40.16	3,299.41	1,649.70	5,075.23	2,541.39	2.05	-0.19	0.021
110.00	-16.60	-1.68	0.00	-31.29	0.00	31.29	3,191.87	1,595.94	4,722.36	2,364.69	2.25	-0.19	0.018
115.00	-15.46	-1.58	0.00	-22.91	0.00	22.91	3,066.45	1,533.23	4,356.70	2,181.59	2.45	-0.20	0.016
120.00	-13.03	-1.36	0.00	-15.02	0.00	15.02	2,941.04	1,470.52	4,005.78	2,005.87	2.66	-0.20	0.012
122.50	-8.65	-0.94	0.00	-11.63	0.00	11.63	2,878.33	1,439.16	3,835.85	1,920.77	2.76	-0.20	0.009
124.00	-8.51	-0.93	0.00	-10.22	0.00	10.22	2,840.70	1,420.35	3,735.65	1,870.60	2.83	-0.20	0.008
124.00	-8.51	-0.93	0.00	-10.22	0.00	10.22	1,738.67	869.33	2,314.52	1,149.03	2.83	-0.20	0.014
125.00	-7.80	-0.86	0.00	-9.29	0.00	9.29	1,724.85	862.42	2,266.37	1,125.12	2.87	-0.20	0.013
130.00	-7.66	-0.84	0.00	-5.00	0.00	5.00	1,652.39	826.19	2,028.68	1,007.12	3.09	-0.21	0.010
131.00	-3.53	-0.41	0.00	-4.16	0.00	4.16	1,637.23	818.62	1,981.83	983.86	3.13	-0.21	0.006
133.00	-3.15	-0.37	0.00	-3.33	0.00	3.33	1,606.25	803.12	1,888.92	937.74	3.22	-0.21	0.006
135.00	-2.59	-0.31	0.00	-2.59	0.00	2.59	1,574.38	787.19	1,797.14	892.18	3.31	-0.21	0.005
140.00	-2.17	-0.26	0.00	-1.04	0.00	1.04	1,490.81	745.41	1,573.20	781.00	3.53	-0.21	0.003
144.00	0.00	0.00	0.00	0.00	0.00	0.00	1,419.96	709.98	1,400.47	695.25	3.70	-0.21	0.000
144.50	0.00	0.00	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	3.73	-0.21	0.000

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number: OAA696964_C3_01 3/2/2017 11:01:52 AM

Customer: VERIZON WIRELESS

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	-45.54	-3.15	0.00	-332.54	0.00	332.54	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.041
5.00	-43.78	-3.16	0.00	-316.77	0.00	316.77	6,984.34	3,492.17	18,406.1	9,216.76	0.00	-0.01	0.041
10.00	-42.06	-3.16	0.00	-300.99	0.00	300.99	6,882.57	3,441.28	17,733.7	8,880.03	0.02	-0.02	0.040
15.00	-40.38	-3.15	0.00	-285.21	0.00	285.21	6,778.41	3,389.20	17,067.2	8,546.29	0.04	-0.02	0.039
20.00	-38.72	-3.14	0.00	-269.46	0.00	269.46	6,671.87	3,335.93	16,407.0	8,215.74	0.07	-0.03	0.039
25.00	-37.10	-3.12	0.00	-253.77	0.00	253.77	6,562.95	3,281.47	15,753.7	7,888.59	0.11	-0.04	0.038
30.00	-35.51	-3.10	0.00	-238.16	0.00	238.16	6,451.64	3,225.82	15,107.6	7,565.05	0.16	-0.05	0.037
35.00	-33.96	-3.07	0.00	-222.67	0.00	222.67	6,337.95	3,168.97	14,469.1	7,245.34	0.22	-0.06	0.036
40.00	-33.34	-3.06	0.00	-207.32	0.00	207.32	6,221.87	3,110.94	13,838.7	6,929.66	0.28	-0.07	0.035
42.00	-31.77	-3.02	0.00	-201.20	0.00	201.20	6,174.78	3,087.39	13,588.9	6,804.56	0.31	-0.07	0.035
45.00	-29.71	-2.96	0.00	-192.15	0.00	192.15	6,103.42	3,051.71	13,216.8	6,618.22	0.36	-0.08	0.034
49.00	-29.44	-2.95	0.00	-180.33	0.00	180.33	5,121.13	2,560.57	11,060.8	5,538.67	0.43	-0.08	0.038
50.00	-28.12	-2.90	0.00	-177.38	0.00	177.38	5,102.30	2,551.15	10,960.2	5,488.28	0.45	-0.09	0.038
55.00	-26.82	-2.85	0.00	-162.87	0.00	162.87	5,006.69	2,503.35	10,460.8	5,238.20	0.54	-0.10	0.036
60.00	-25.55	-2.80	0.00	-148.61	0.00	148.61	4,908.70	2,454.35	9,967.80	4,991.31	0.65	-0.11	0.035
65.00	-24.31	-2.73	0.00	-134.63	0.00	134.63	4,808.33	2,404.17	9,481.57	4,747.83	0.76	-0.12	0.033
70.00	-23.10	-2.66	0.00	-120.97	0.00	120.97	4,705.57	2,352.79	9,002.57	4,507.98	0.89	-0.12	0.032
75.00	-21.91	-2.59	0.00	-107.66	0.00	107.66	4,600.44	2,300.22	8,531.23	4,271.95	1.03	-0.13	0.030
80.00	-21.62	-2.57	0.00	-94.72	0.00	94.72	4,492.91	2,246.46	8,067.95	4,039.97	1.17	-0.14	0.028
81.25	-20.62	-2.50	0.00	-91.51	0.00	91.51	4,465.66	2,232.83	7,953.44	3,982.63	1.21	-0.14	0.028
81.75	-19.38	-2.41	0.00	-90.26	0.00	90.26	4,454.72	2,227.36	7,907.79	3,959.77	1.22	-0.15	0.027
85.00	-18.63	-2.35	0.00	-82.45	0.00	82.45	4,371.64	2,185.82	7,593.43	3,802.36	1.33	-0.15	0.026
87.00	-18.02	-2.30	0.00	-77.75	0.00	77.75	3,619.56	1,809.78	6,333.02	3,171.22	1.39	-0.15	0.029
90.00	-17.42	-2.25	0.00	-70.86	0.00	70.86	3,568.35	1,784.17	6,117.67	3,063.38	1.49	-0.16	0.028
93.00	-17.11	-2.22	0.00	-64.11	0.00	64.11	3,516.28	1,758.14	5,904.48	2,956.63	1.59	-0.17	0.027
94.25	-16.15	-2.14	0.00	-61.33	0.00	61.33	3,494.33	1,747.16	5,816.31	2,912.48	1.63	-0.17	0.026
95.00	-15.20	-2.05	0.00	-59.73	0.00	59.73	3,481.08	1,740.54	5,763.60	2,886.09	1.66	-0.17	0.025
100.00	-14.45	-1.97	0.00	-49.49	0.00	49.49	3,391.44	1,695.72	5,415.99	2,712.02	1.84	-0.18	0.023
104.00	-13.22	-1.85	0.00	-41.59	0.00	41.59	3,318.00	1,659.00	5,142.82	2,575.23	1.99	-0.18	0.020
105.00	-12.38	-1.75	0.00	-39.75	0.00	39.75	3,299.41	1,649.70	5,075.23	2,541.39	2.03	-0.18	0.019
110.00	-11.56	-1.66	0.00	-30.97	0.00	30.97	3,191.87	1,595.94	4,722.36	2,364.69	2.23	-0.19	0.017
115.00	-10.77	-1.56	0.00	-22.68	0.00	22.68	3,066.45	1,533.23	4,356.70	2,181.59	2.43	-0.20	0.014
120.00	-9.07	-1.34	0.00	-14.87	0.00	14.87	2,941.04	1,470.52	4,005.78	2,005.87	2.64	-0.20	0.011
122.50	-6.02	-0.93	0.00	-11.52	0.00	11.52	2,878.33	1,439.16	3,835.85	1,920.77	2.74	-0.20	0.008
124.00	-5.92	-0.92	0.00	-10.12	0.00	10.12	2,840.70	1,420.35	3,735.65	1,870.60	2.80	-0.20	0.007
124.00	-5.92	-0.92	0.00	-10.12	0.00	10.12	1,738.67	869.33	2,314.52	1,149.03	2.80	-0.20	0.012
125.00	-5.43	-0.85	0.00	-9.20	0.00	9.20	1,724.85	862.42	2,266.37	1,125.12	2.85	-0.20	0.011
130.00	-5.34	-0.84	0.00	-4.95	0.00	4.95	1,652.39	826.19	2,028.68	1,007.12	3.06	-0.21	0.008
131.00	-2.46	-0.41	0.00	-4.12	0.00	4.12	1,637.23	818.62	1,981.83	983.86	3.10	-0.21	0.006
133.00	-2.19	-0.37	0.00	-3.30	0.00	3.30	1,606.25	803.12	1,888.92	937.74	3.19	-0.21	0.005
135.00	-1.80	-0.31	0.00	-2.56	0.00	2.56	1,574.38	787.19	1,797.14	892.18	3.28	-0.21	0.004
140.00	-1.51	-0.26	0.00	-1.03	0.00	1.03	1,490.81	745.41	1,573.20	781.00	3.50	-0.21	0.002
144.00	0.00	0.00	0.00	0.00	0.00	0.00	1,419.96	709.98	1,400.47	695.25	3.67	-0.21	0.000
144.50	0.00	0.00	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	3.69	-0.21	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}):	0.19
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	1.57
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)
42	144.25	32	1.883	1.946	1.128	0.369	10	40
41	142.00	341	1.825	1.655	1.021	0.333	98	422
40	137.50	451	1.711	1.166	0.832	0.267	104	558
39	134.00	188	1.625	0.859	0.705	0.221	36	233
38	132.00	212	1.577	0.709	0.639	0.196	36	263
37	130.50	111	1.542	0.609	0.594	0.179	17	137
36	127.50	570	1.471	0.433	0.509	0.146	72	705
35	124.50	117	1.403	0.290	0.435	0.117	12	145
34	123.25	242	1.375	0.238	0.406	0.106	22	300
33	121.25	409	1.331	0.165	0.364	0.089	32	506
32	117.50	921	1.250	0.057	0.293	0.062	49	1,141
31	112.50	950	1.146	-0.041	0.216	0.032	27	1,176
30	107.50	979	1.046	-0.095	0.155	0.012	10	1,212
29	104.50	199	0.988	-0.113	0.126	0.003	1	247
28	102.00	868	0.942	-0.120	0.104	-0.002	-2	1,075
27	97.50	1,111	0.860	-0.120	0.073	-0.007	-6	1,375
26	94.63	169	0.810	-0.114	0.057	-0.007	-1	209
25	93.63	283	0.793	-0.111	0.052	-0.006	-2	351
24	91.50	695	0.758	-0.103	0.043	-0.005	-3	860
23	88.50	705	0.709	-0.090	0.032	-0.002	-1	873
22	86.00	873	0.669	-0.077	0.024	0.002	2	1,081
21	83.38	1,441	0.629	-0.063	0.018	0.007	8	1,783
20	81.50	224	0.601	-0.053	0.015	0.010	2	277
19	80.63	338	0.588	-0.049	0.013	0.012	3	418
18	77.50	1,372	0.544	-0.032	0.009	0.018	21	1,698
17	72.50	1,405	0.476	-0.007	0.006	0.027	33	1,740
16	67.50	1,439	0.412	0.014	0.006	0.034	43	1,781
15	62.50	1,472	0.354	0.032	0.008	0.039	50	1,823
14	57.50	1,506	0.299	0.045	0.012	0.042	55	1,864
13	52.50	1,539	0.249	0.055	0.017	0.044	58	1,906
12	49.50	312	0.222	0.060	0.020	0.044	12	386
11	47.00	2,389	0.200	0.063	0.023	0.043	90	2,958
10	43.50	1,822	0.171	0.066	0.027	0.043	67	2,256
9	41.00	711	0.152	0.068	0.030	0.042	26	880

8	37.50	1,804	0.127	0.070	0.033	0.041	64	2,233
7	32.50	1,842	0.096	0.071	0.038	0.039	63	2,280
6	27.50	1,880	0.068	0.072	0.041	0.038	61	2,328
5	22.50	1,919	0.046	0.071	0.042	0.036	60	2,375
4	17.50	1,957	0.028	0.067	0.040	0.033	57	2,423
3	12.50	1,995	0.014	0.060	0.035	0.029	51	2,470
2	7.50	2,034	0.005	0.045	0.025	0.023	40	2,517
1	2.50	2,072	0.001	0.019	0.010	0.010	18	2,565
Pine Tree Branches	144.50	338	1.890	1.980	1.140	0.374	109	418
Alcatel-Lucent 800 M	144.00	185	1.877	1.912	1.115	0.365	59	230
Alcatel-Lucent 1900M	144.00	132	1.877	1.912	1.115	0.365	42	163
Decibel DB980F90E-M	144.00	142	1.877	1.912	1.115	0.365	45	176
RFS APXVSPP18-C-A20	144.00	171	1.877	1.912	1.115	0.365	54	212
Round T-Arm	144.00	750	1.877	1.912	1.115	0.365	237	928
Commscope SBNHH-	133.00	122	1.601	0.782	0.672	0.208	22	151
Alcatel-Lucent B13 R	131.00	172	1.553	0.641	0.609	0.184	27	212
Alcatel-Lucent B66A	131.00	170	1.553	0.641	0.609	0.184	27	211
Raycap RC2DC-3315-PF	131.00	64	1.553	0.641	0.609	0.184	10	79
Antel LPA-80080/4CF	131.00	24	1.553	0.641	0.609	0.184	4	30
Antel LPA-80063/4CF	131.00	80	1.553	0.641	0.609	0.184	13	99
Commscope SBNHH-	131.00	122	1.553	0.641	0.609	0.184	19	151
Round T-Arm	131.00	750	1.553	0.641	0.609	0.184	120	928
VZW Unused Reserve:	131.00	1,746	1.553	0.641	0.609	0.184	279	2,162
Pine Tree Branches	122.50	3,300	1.358	0.210	0.390	0.099	285	4,085
Andrew ABT-DMDF-	120.00	1	1.303	0.125	0.339	0.079	0	1
Spinner Bias-T	120.00	4	1.303	0.125	0.339	0.079	0	6
Powerwave LGP21901	120.00	33	1.303	0.125	0.339	0.079	2	41
Powerwave LGP21401	120.00	85	1.303	0.125	0.339	0.079	6	105
Raycap DC6-48-60-18-	120.00	33	1.303	0.125	0.339	0.079	2	41
Ericsson RRUS-11 (50	120.00	300	1.303	0.125	0.339	0.079	21	371
Powerwave 7770.00	120.00	210	1.303	0.125	0.339	0.079	14	260
Kathrein 800 10764	120.00	41	1.303	0.125	0.339	0.079	3	51
KMW AM-X-CD-16-65-00	120.00	97	1.303	0.125	0.339	0.079	7	120
Flat T-Arm	120.00	750	1.303	0.125	0.339	0.079	52	928
E-911 GPS	104.00	5	0.979	-0.115	0.121	0.002	0	6
Ericsson KRY 112 71	104.00	40	0.979	-0.115	0.121	0.002	0	49
RFS ATMAP1412D-1A20	104.00	39	0.979	-0.115	0.121	0.002	0	48
RFS APX16DWV-16DWV-	104.00	238	0.979	-0.115	0.121	0.002	0	294
Commscope LNX-	104.00	151	0.979	-0.115	0.121	0.002	0	187
Flat T-Arm	104.00	750	0.979	-0.115	0.121	0.002	1	928
Pine Tree Branches	94.25	938	0.804	-0.113	0.055	-0.007	-5	1,161
RFS APXV18-206517S-C	93.00	79	0.783	-0.109	0.049	-0.006	0	98
Pine Tree Branches	81.75	938	0.605	-0.055	0.015	0.010	8	1,161
PCTEL GPS-TMG-HR-	50.00	1	0.226	0.059	0.020	0.044	0	1
		54,899	78.987	25.826	25.184	7.590	2,860	67,963

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)
42	144.25	32	1.883	1.946	1.128	0.369	10	28
41	142.00	341	1.825	1.655	1.021	0.333	98	294
40	137.50	451	1.711	1.166	0.832	0.267	104	389
39	134.00	188	1.625	0.859	0.705	0.221	36	162
38	132.00	212	1.577	0.709	0.639	0.196	36	183
37	130.50	111	1.542	0.609	0.594	0.179	17	95
36	127.50	570	1.471	0.433	0.509	0.146	72	491
35	124.50	117	1.403	0.290	0.435	0.117	12	101
34	123.25	242	1.375	0.238	0.406	0.106	22	209

33	121.25	409	1.331	0.165	0.364	0.089	32	353
32	117.50	921	1.250	0.057	0.293	0.062	49	794
31	112.50	950	1.146	-0.041	0.216	0.032	27	819
30	107.50	979	1.046	-0.095	0.155	0.012	10	844
29	104.50	199	0.988	-0.113	0.126	0.003	1	172
28	102.00	868	0.942	-0.120	0.104	-0.002	-2	748
27	97.50	1,111	0.860	-0.120	0.073	-0.007	-6	958
26	94.63	169	0.810	-0.114	0.057	-0.007	-1	146
25	93.63	283	0.793	-0.111	0.052	-0.006	-2	244
24	91.50	695	0.758	-0.103	0.043	-0.005	-3	599
23	88.50	705	0.709	-0.090	0.032	-0.002	-1	608
22	86.00	873	0.669	-0.077	0.024	0.002	2	753
21	83.38	1,441	0.629	-0.063	0.018	0.007	8	1,242
20	81.50	224	0.601	-0.053	0.015	0.010	2	193
19	80.63	338	0.588	-0.049	0.013	0.012	3	291
18	77.50	1,372	0.544	-0.032	0.009	0.018	21	1,183
17	72.50	1,405	0.476	-0.007	0.006	0.027	33	1,211
16	67.50	1,439	0.412	0.014	0.006	0.034	43	1,240
15	62.50	1,472	0.354	0.032	0.008	0.039	50	1,269
14	57.50	1,506	0.299	0.045	0.012	0.042	55	1,298
13	52.50	1,539	0.249	0.055	0.017	0.044	58	1,327
12	49.50	312	0.222	0.060	0.020	0.044	12	269
11	47.00	2,389	0.200	0.063	0.023	0.043	90	2,060
10	43.50	1,822	0.171	0.066	0.027	0.043	67	1,571
9	41.00	711	0.152	0.068	0.030	0.042	26	613
8	37.50	1,804	0.127	0.070	0.033	0.041	64	1,555
7	32.50	1,842	0.096	0.071	0.038	0.039	63	1,588
6	27.50	1,880	0.068	0.072	0.041	0.038	61	1,621
5	22.50	1,919	0.046	0.071	0.042	0.036	60	1,654
4	17.50	1,957	0.028	0.067	0.040	0.033	57	1,687
3	12.50	1,995	0.014	0.060	0.035	0.029	51	1,720
2	7.50	2,034	0.005	0.045	0.025	0.023	40	1,753
1	2.50	2,072	0.001	0.019	0.010	0.010	18	1,786
Pine Tree Branches	144.50	338	1.890	1.980	1.140	0.374	109	291
Alcatel-Lucent 800 M	144.00	185	1.877	1.912	1.115	0.365	59	160
Alcatel-Lucent 1900M	144.00	132	1.877	1.912	1.115	0.365	42	114
Decibel DB980F90E-M	144.00	142	1.877	1.912	1.115	0.365	45	123
RFS APXVSPP18-C-A20	144.00	171	1.877	1.912	1.115	0.365	54	147
Round T-Arm	144.00	750	1.877	1.912	1.115	0.365	237	647
Commscope SBNHH-	133.00	122	1.601	0.782	0.672	0.208	22	105
Alcatel-Lucent B13 R	131.00	172	1.553	0.641	0.609	0.184	27	148
Alcatel-Lucent B66A	131.00	170	1.553	0.641	0.609	0.184	27	147
Raycap RC2DC-3315-PF	131.00	64	1.553	0.641	0.609	0.184	10	55
Antel LPA-80080/4CF	131.00	24	1.553	0.641	0.609	0.184	4	21
Antel LPA-80063/4CF	131.00	80	1.553	0.641	0.609	0.184	13	69
Commscope SBNHH-	131.00	122	1.553	0.641	0.609	0.184	19	105
Round T-Arm	131.00	750	1.553	0.641	0.609	0.184	120	647
VZW Unused Reserve:	131.00	1,746	1.553	0.641	0.609	0.184	279	1,505
Pine Tree Branches	122.50	3,300	1.358	0.210	0.390	0.099	285	2,845
Andrew ABT-DMDF-	120.00	1	1.303	0.125	0.339	0.079	0	1
Spinner Bias-T	120.00	4	1.303	0.125	0.339	0.079	0	4
Powerwave LGP21901	120.00	33	1.303	0.125	0.339	0.079	2	28
Powerwave LGP21401	120.00	85	1.303	0.125	0.339	0.079	6	73
Raycap DC6-48-60-18-	120.00	33	1.303	0.125	0.339	0.079	2	28
Ericsson RRUS-11 (50	120.00	300	1.303	0.125	0.339	0.079	21	259
Powerwave 7770.00	120.00	210	1.303	0.125	0.339	0.079	14	181
Kathrein 800 10764	120.00	41	1.303	0.125	0.339	0.079	3	35
KMW AM-X-CD-16-65-00	120.00	97	1.303	0.125	0.339	0.079	7	84
Flat T-Arm	120.00	750	1.303	0.125	0.339	0.079	52	647
E-911 GPS	104.00	5	0.979	-0.115	0.121	0.002	0	4
Ericsson KRY 112 71	104.00	40	0.979	-0.115	0.121	0.002	0	34
RFS ATMAP1412D-1A20	104.00	39	0.979	-0.115	0.121	0.002	0	34
RFS APX16DWV-16DWV-	104.00	238	0.979	-0.115	0.121	0.002	0	205
Commscope LNX-	104.00	151	0.979	-0.115	0.121	0.002	0	130

Flat T-Arm	104.00	750	0.979	-0.115	0.121	0.002	1	647
Pine Tree Branches	94.25	938	0.804	-0.113	0.055	-0.007	-5	808
RFS APXV18-206517S-C	93.00	79	0.783	-0.109	0.049	-0.006	0	68
Pine Tree Branches	81.75	938	0.605	-0.055	0.015	0.010	8	808
PCTEL GPS-TMG-HR-	50.00	1	0.226	0.059	0.020	0.044	0	1
		54,899	78.987	25.826	25.184	7.590	2,860	47,324

Site Number: 411181 Code: ANSI/TIA-222-G

Site Name: Barkhamstead CT, CT Engineering Number: OAA696964_C3_01 3/2/2017 11:01:52 AM

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	-65.40	-2.85	0.00	-302.05	0.00	302.05	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.041
5.00	-62.88	-2.81	0.00	-287.82	0.00	287.82	6,984.34	3,492.17	18,406.1	9,216.76	0.00	-0.01	0.040
10.00	-60.41	-2.77	0.00	-273.75	0.00	273.75	6,882.57	3,441.28	17,733.7	8,880.03	0.02	-0.01	0.040
15.00	-57.99	-2.72	0.00	-259.90	0.00	259.90	6,778.41	3,389.20	17,067.2	8,546.29	0.04	-0.02	0.039
20.00	-55.61	-2.67	0.00	-246.30	0.00	246.30	6,671.87	3,335.93	16,407.0	8,215.74	0.06	-0.03	0.038
25.00	-53.28	-2.61	0.00	-232.96	0.00	232.96	6,562.95	3,281.47	15,753.7	7,888.59	0.10	-0.04	0.038
30.00	-51.00	-2.55	0.00	-219.90	0.00	219.90	6,451.64	3,225.82	15,107.6	7,565.05	0.14	-0.05	0.037
35.00	-48.77	-2.50	0.00	-207.12	0.00	207.12	6,337.95	3,168.97	14,469.1	7,245.34	0.20	-0.05	0.036
40.00	-47.89	-2.47	0.00	-194.64	0.00	194.64	6,221.87	3,110.94	13,838.7	6,929.66	0.26	-0.06	0.036
42.00	-45.63	-2.41	0.00	-189.70	0.00	189.70	6,174.78	3,087.39	13,588.9	6,804.56	0.29	-0.07	0.035
45.00	-42.67	-2.32	0.00	-182.47	0.00	182.47	6,103.42	3,051.71	13,216.8	6,618.22	0.33	-0.07	0.035
49.00	-42.29	-2.31	0.00	-173.20	0.00	173.20	5,121.13	2,560.57	11,060.8	5,538.67	0.39	-0.08	0.040
50.00	-40.38	-2.25	0.00	-170.89	0.00	170.89	5,102.30	2,551.15	10,960.2	5,488.28	0.41	-0.08	0.039
55.00	-38.52	-2.20	0.00	-159.63	0.00	159.63	5,006.69	2,503.35	10,460.8	5,238.20	0.50	-0.09	0.038
60.00	-36.69	-2.15	0.00	-148.63	0.00	148.63	4,908.70	2,454.35	9,967.80	4,991.31	0.60	-0.10	0.037
65.00	-34.91	-2.11	0.00	-137.86	0.00	137.86	4,808.33	2,404.17	9,481.57	4,747.83	0.71	-0.11	0.036
70.00	-33.17	-2.08	0.00	-127.30	0.00	127.30	4,705.57	2,352.79	9,002.57	4,507.98	0.82	-0.12	0.035
75.00	-31.47	-2.06	0.00	-116.88	0.00	116.88	4,600.44	2,300.22	8,531.23	4,271.95	0.95	-0.13	0.034
80.00	-31.06	-2.06	0.00	-106.57	0.00	106.57	4,492.91	2,246.46	8,067.95	4,039.97	1.09	-0.14	0.033
81.25	-29.62	-2.05	0.00	-103.99	0.00	103.99	4,465.66	2,232.83	7,953.44	3,982.63	1.13	-0.14	0.033
81.75	-27.83	-2.04	0.00	-102.97	0.00	102.97	4,454.72	2,227.36	7,907.79	3,959.77	1.14	-0.14	0.032
85.00	-26.75	-2.04	0.00	-96.34	0.00	96.34	4,371.64	2,185.82	7,593.43	3,802.36	1.24	-0.15	0.031
87.00	-25.88	-2.04	0.00	-92.26	0.00	92.26	3,619.56	1,809.78	6,333.02	3,171.22	1.31	-0.15	0.036
90.00	-25.02	-2.04	0.00	-86.15	0.00	86.15	3,568.35	1,784.17	6,117.67	3,063.38	1.40	-0.16	0.035
93.00	-24.57	-2.04	0.00	-80.03	0.00	80.03	3,516.28	1,758.14	5,904.48	2,956.63	1.50	-0.16	0.034
94.25	-23.20	-2.05	0.00	-77.47	0.00	77.47	3,494.33	1,747.16	5,816.31	2,912.48	1.55	-0.17	0.033
95.00	-21.83	-2.05	0.00	-75.93	0.00	75.93	3,481.08	1,740.54	5,763.60	2,886.09	1.57	-0.17	0.033
100.00	-20.75	-2.05	0.00	-65.67	0.00	65.67	3,391.44	1,695.72	5,415.99	2,712.02	1.76	-0.18	0.030
104.00	-18.99	-2.05	0.00	-57.46	0.00	57.46	3,318.00	1,659.00	5,142.82	2,575.23	1.91	-0.19	0.028
105.00	-17.78	-2.04	0.00	-55.41	0.00	55.41	3,299.41	1,649.70	5,075.23	2,541.39	1.95	-0.19	0.027
110.00	-16.60	-2.01	0.00	-45.23	0.00	45.23	3,191.87	1,595.94	4,722.36	2,364.69	2.15	-0.20	0.024
115.00	-15.46	-1.96	0.00	-35.20	0.00	35.20	3,066.45	1,533.23	4,356.70	2,181.59	2.36	-0.21	0.021
120.00	-13.03	-1.81	0.00	-25.41	0.00	25.41	2,941.04	1,470.52	4,005.78	2,005.87	2.58	-0.21	0.017
122.50	-8.65	-1.49	0.00	-20.89	0.00	20.89	2,878.33	1,439.16	3,835.85	1,920.77	2.69	-0.22	0.014
124.00	-8.50	-1.48	0.00	-18.66	0.00	18.66	2,840.70	1,420.35	3,735.65	1,870.60	2.76	-0.22	0.013
124.00	-8.50	-1.48	0.00	-18.66	0.00	18.66	1,738.67	869.33	2,314.52	1,149.03	2.76	-0.22	0.021
125.00	-7.80	-1.40	0.00	-17.18	0.00	17.18	1,724.85	862.42	2,266.37	1,125.12	2.81	-0.22	0.020
130.00	-7.66	-1.38	0.00	-10.18	0.00	10.18	1,652.39	826.19	2,028.68	1,007.12	3.04	-0.22	0.015
131.00	-3.53	-0.83	0.00	-8.80	0.00	8.80	1,637.23	818.62	1,981.83	983.86	3.09	-0.23	0.011
133.00	-3.14	-0.77	0.00	-7.13	0.00	7.13	1,606.25	803.12	1,888.92	937.74	3.18	-0.23	0.010
135.00	-2.59	-0.67	0.00	-5.59	0.00	5.59	1,574.38	787.19	1,797.14	892.18	3.28	-0.23	0.008
140.00	-2.17	-0.57	0.00	-2.26	0.00	2.26	1,490.81	745.41	1,573.20	781.00	3.52	-0.23	0.004
144.00	0.00	0.00	0.00	0.00	0.00	0.00	1,419.96	709.98	1,400.47	695.25	3.71	-0.23	0.000
144.50	0.00	0.00	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	3.74	-0.23	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	-45.54	-2.84	0.00	-299.94	0.00	299.94	7,083.73	3,541.86	19,084.1	9,556.26	0.00	0.00	0.038
5.00	-43.78	-2.81	0.00	-285.71	0.00	285.71	6,984.34	3,492.17	18,406.1	9,216.76	0.00	-0.01	0.037
10.00	-42.06	-2.76	0.00	-271.66	0.00	271.66	6,882.57	3,441.28	17,733.7	8,880.03	0.02	-0.01	0.037
15.00	-40.38	-2.71	0.00	-257.84	0.00	257.84	6,778.41	3,389.20	17,067.2	8,546.29	0.04	-0.02	0.036
20.00	-38.72	-2.66	0.00	-244.28	0.00	244.28	6,671.87	3,335.93	16,407.0	8,215.74	0.06	-0.03	0.036
25.00	-37.10	-2.60	0.00	-230.99	0.00	230.99	6,562.95	3,281.47	15,753.7	7,888.59	0.10	-0.04	0.035
30.00	-35.51	-2.54	0.00	-217.99	0.00	217.99	6,451.64	3,225.82	15,107.6	7,565.05	0.14	-0.05	0.034
35.00	-33.96	-2.48	0.00	-205.29	0.00	205.29	6,337.95	3,168.97	14,469.1	7,245.34	0.20	-0.05	0.034
40.00	-33.35	-2.46	0.00	-192.89	0.00	192.89	6,221.87	3,110.94	13,838.7	6,929.66	0.26	-0.06	0.033
42.00	-31.77	-2.39	0.00	-187.97	0.00	187.97	6,174.78	3,087.39	13,588.9	6,804.56	0.28	-0.07	0.033
45.00	-29.71	-2.30	0.00	-180.80	0.00	180.80	6,103.42	3,051.71	13,216.8	6,618.22	0.33	-0.07	0.032
49.00	-29.45	-2.29	0.00	-171.60	0.00	171.60	5,121.13	2,560.57	11,060.8	5,538.67	0.39	-0.08	0.037
50.00	-28.12	-2.23	0.00	-169.31	0.00	169.31	5,102.30	2,551.15	10,960.2	5,488.28	0.41	-0.08	0.036
55.00	-26.82	-2.18	0.00	-158.14	0.00	158.14	5,006.69	2,503.35	10,460.8	5,238.20	0.49	-0.09	0.036
60.00	-25.55	-2.13	0.00	-147.23	0.00	147.23	4,908.70	2,454.35	9,967.80	4,991.31	0.59	-0.10	0.035
65.00	-24.31	-2.09	0.00	-136.57	0.00	136.57	4,808.33	2,404.17	9,481.57	4,747.83	0.70	-0.11	0.034
70.00	-23.10	-2.06	0.00	-126.11	0.00	126.11	4,705.57	2,352.79	9,002.57	4,507.98	0.82	-0.12	0.033
75.00	-21.91	-2.04	0.00	-115.81	0.00	115.81	4,600.44	2,300.22	8,531.23	4,271.95	0.95	-0.13	0.032
80.00	-21.62	-2.04	0.00	-105.60	0.00	105.60	4,492.91	2,246.46	8,067.95	4,039.97	1.08	-0.14	0.031
81.25	-20.62	-2.03	0.00	-103.06	0.00	103.06	4,465.66	2,232.83	7,953.44	3,982.63	1.12	-0.14	0.030
81.75	-19.38	-2.02	0.00	-102.04	0.00	102.04	4,454.72	2,227.36	7,907.79	3,959.77	1.13	-0.14	0.030
85.00	-18.63	-2.02	0.00	-95.49	0.00	95.49	4,371.64	2,185.82	7,593.43	3,802.36	1.23	-0.15	0.029
87.00	-18.02	-2.02	0.00	-91.45	0.00	91.45	3,619.56	1,809.78	6,333.02	3,171.22	1.29	-0.15	0.034
90.00	-17.42	-2.02	0.00	-85.41	0.00	85.41	3,568.35	1,784.17	6,117.67	3,063.38	1.39	-0.16	0.033
93.00	-17.11	-2.02	0.00	-79.35	0.00	79.35	3,516.28	1,758.14	5,904.48	2,956.63	1.49	-0.16	0.032
94.25	-16.15	-2.03	0.00	-76.82	0.00	76.82	3,494.33	1,747.16	5,816.31	2,912.48	1.53	-0.17	0.031
95.00	-15.20	-2.03	0.00	-75.30	0.00	75.30	3,481.08	1,740.54	5,763.60	2,886.09	1.56	-0.17	0.030
100.00	-14.45	-2.03	0.00	-65.14	0.00	65.14	3,391.44	1,695.72	5,415.99	2,712.02	1.74	-0.18	0.028
104.00	-13.22	-2.03	0.00	-57.01	0.00	57.01	3,318.00	1,659.00	5,142.82	2,575.23	1.89	-0.19	0.026
105.00	-12.38	-2.02	0.00	-54.98	0.00	54.98	3,299.41	1,649.70	5,075.23	2,541.39	1.93	-0.19	0.025
110.00	-11.56	-1.99	0.00	-44.89	0.00	44.89	3,191.87	1,595.94	4,722.36	2,364.69	2.13	-0.20	0.023
115.00	-10.76	-1.94	0.00	-34.95	0.00	34.95	3,066.45	1,533.23	4,356.70	2,181.59	2.34	-0.20	0.020
120.00	-9.07	-1.80	0.00	-25.25	0.00	25.25	2,941.04	1,470.52	4,005.78	2,005.87	2.56	-0.21	0.016
122.50	-6.02	-1.48	0.00	-20.76	0.00	20.76	2,878.33	1,439.16	3,835.85	1,920.77	2.67	-0.21	0.013
124.00	-5.92	-1.47	0.00	-18.55	0.00	18.55	2,840.70	1,420.35	3,735.65	1,870.60	2.74	-0.22	0.012
124.00	-5.92	-1.47	0.00	-18.55	0.00	18.55	1,738.67	869.33	2,314.52	1,149.03	2.74	-0.22	0.020
125.00	-5.43	-1.39	0.00	-17.08	0.00	17.08	1,724.85	862.42	2,266.37	1,125.12	2.78	-0.22	0.018
130.00	-5.33	-1.37	0.00	-10.13	0.00	10.13	1,652.39	826.19	2,028.68	1,007.12	3.01	-0.22	0.013
131.00	-2.46	-0.83	0.00	-8.75	0.00	8.75	1,637.23	818.62	1,981.83	983.86	3.06	-0.22	0.010
133.00	-2.19	-0.77	0.00	-7.10	0.00	7.10	1,606.25	803.12	1,888.92	937.74	3.16	-0.23	0.009
135.00	-1.80	-0.66	0.00	-5.56	0.00	5.56	1,574.38	787.19	1,797.14	892.18	3.25	-0.23	0.007
140.00	-1.51	-0.56	0.00	-2.25	0.00	2.25	1,490.81	745.41	1,573.20	781.00	3.49	-0.23	0.004
144.00	0.00	0.00	0.00	0.00	0.00	0.00	1,419.96	709.98	1,400.47	695.25	3.68	-0.23	0.000
144.50	0.00	0.00	0.00	0.00	0.00	0.00	1,407.19	703.60	1,375.75	682.98	3.71	-0.23	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	52.85	0.00	65.81	0.00	0.00	5724.14	0.00	0.61
0.9D + 1.6W	52.82	0.00	49.34	0.00	0.00	5691.97	0.00	0.60
1.2D + 1.0Di + 1.0Wi	11.12	0.00	107.62	0.00	0.00	1212.99	0.00	0.14
(1.2 + 0.2Sds) * DL + E ELFM	3.15	0.00	65.40	0.00	0.00	334.73	0.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	2.85	0.00	65.40	0.00	0.00	302.05	0.00	0.04
(0.9 - 0.2Sds) * DL + E ELFM	3.15	0.00	45.54	0.00	0.00	332.54	0.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	2.84	0.00	45.54	0.00	0.00	299.94	0.00	0.04
1.0D + 1.0W	13.74	0.00	54.89	0.00	0.00	1484.28	0.00	0.16

Base/Flange Plate	Plate Type	***Baseplate***	
	Pole Diameter	66.05	in
	Pole Thickness	0.5	in
	Plate Length	74	in
	Plate Thickness	3.25	in
	Plate Fy	55	ksi
	Weld Length	0.3125	in
	ϕ_s Resistance	4963.98	k-in
	Applied	2212.04	k-in
Stiffeners	#	***0***	

Bolts	#	***24***	
	Bolt Circle	74	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
	Diameter	2.25	in
	Hole Diameter	2.625	in
	Type	A615-75	
	Fy	75	ksi
	Fu	100	ksi
	ϕ_s Resistance	259.82	k
	Applied	156.88	k
Reinforcement ●	#	***0***	
Extra Bolts O	#	***0***	

Code Rev. **G**

Moment 5724.1 k-ft
Axial 65.8 k

Date	3/2/2017
Engineer	isaac.dodson
Site #	411181
Carrier	VERIZON WIRELESS

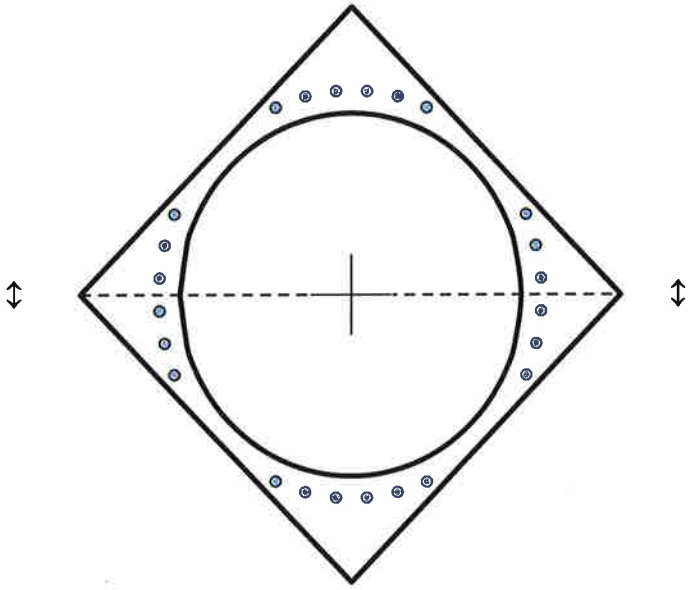


Plate Stress Ratio:
0.45 (Pass)

Bolt Stress Ratio:
0.60 (Pass)

Base/Flange Plate	Plate Type	*Flange*	*@ 124.0 ft*
	Pole Diameter	32.508	in
	Pole Thickness	0.25	in
	Plate Diameter	41	in
	Plate Thickness	1.25	in
	Plate Fy	50	ksi
	Weld Length	0.1875	in
	ϕ_s Resistance	125.35	k-in
	Applied	23.71	k-in
Stiffeners	#	*0*	

Bolts	#	*12*	
	Bolt Circle	37	in
	(R)adial / (S)quare	R	
	Diameter	1	in
	Hole Diameter	1.0625	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	ϕ_s Resistance	54.52	k
	Applied	15.52	k
Reinforcement ●	#	*0*	
Extra Bolts O	#	*0*	

Code Rev. *G*

Moment 149.5 k-ft

Axial 7.6 k

Date	3/2/2017
Engineer	isaac.dodson
Site #	411181
Carrier	VERIZON WIRELESS

Required Flange Thickness:

0.54 in OK

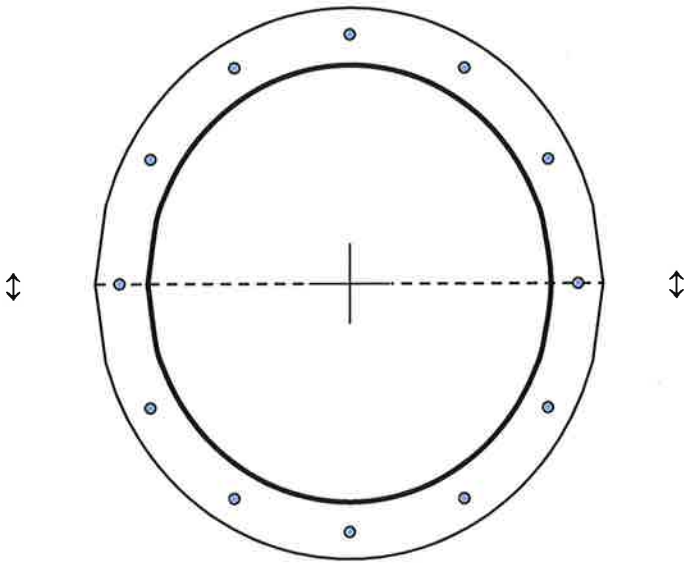


Plate Stress Ratio:

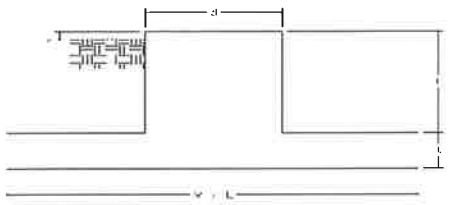
0.19 (Pass)

Bolt Stress Ratio:

0.28 (Pass)

Site Name:	Barkhamstead CT, CT
Site Number:	411181
Engineering Number:	OAA696964
Engineer:	isaac.dodson
Date:	03/02/17
Tower Type:	MP

Program Last Updated: *#REF!*



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

Design / Analysis / Mapping:	Analysis				
Compression/Leg:	0.0	k	Concrete Strength (f'_c):	3000	psi
Uplift/Leg:	0.0	k	Pad Tension Steel Depth:	44.00	in
Total Shear:	65.8	k	ϕ_{Shear}:	0.75	
Moment:	5724.1	k-ft	$\phi_{Flexure\ /\ Tension}$:	0.90	
Tower + Appurtenance Weight:	52.9	k	$\phi_{Compression}$:	0.65	
Depth to Base of Foundation (l + t - h):	9.00	ft	β:	0.85	
Diameter of Pier (d):	8.00	ft	Bottom Pad Rebar Size #:	11	
Height of Pier above Ground (h):	0.50		# of Bottom Pad Rebar:	47	
Width of Pad (W):	31.50	ft	Pad Bottom Steel Area:	73.32	in^2
Length of Pad (L):	31.50	ft	Pad Steel F_y:	60000	psi
Thickness of Pad (t):	4.00	ft	Top Pad Rebar Size #:	11	
Tower Leg Center to Center:	0.00	ft	# of Top Pad Rebar:	47	
Number of Tower Legs:	1.0	(1 if MP or GT)	Pad Top Steel Area:	73.32	in^2
Tower Center from Mat Center:	0.00	ft	Pier Rebar Size #:	11	
Depth Below Ground Surface to Water Table:	3.00	ft	Pier Steel Area (Single Bar):	1.56	in^2
Unit Weight of Concrete:	150.0	pcf	# of Pier Rebar:	60	
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:	88.0	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:	4	in
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9		Tie Steel F_y:	40000	psi
ϕ_{Soil}:	0.75				

Overturning Moment Usage

Design OTM:	6349.3	k-ft
OTM Resistance:	13697.3	k-ft
Design OTM / OTM Resistance:	0.46	Result: OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	1910	psf
Factored Nominal Bearing Pressure:	6000	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.32	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

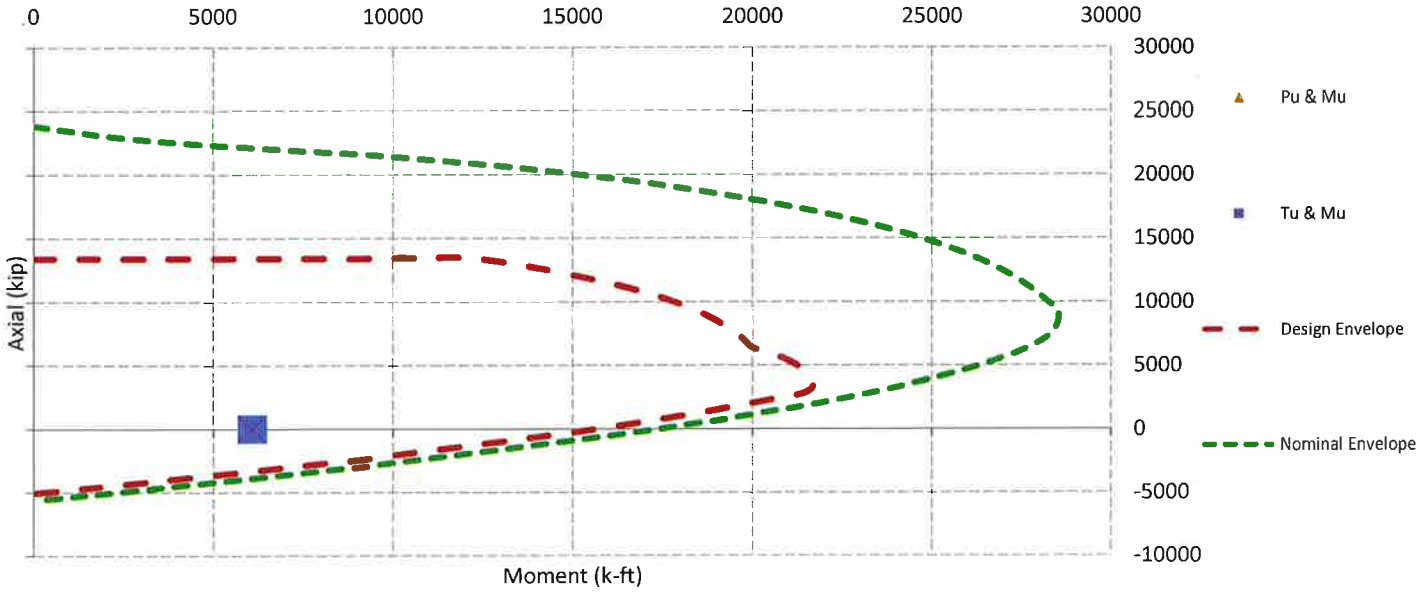
Sliding Factor of Safety

Total Factored Sliding Resistance:	235.8	k
Sliding Design / Sliding Resistance:	0.28	Result: OK

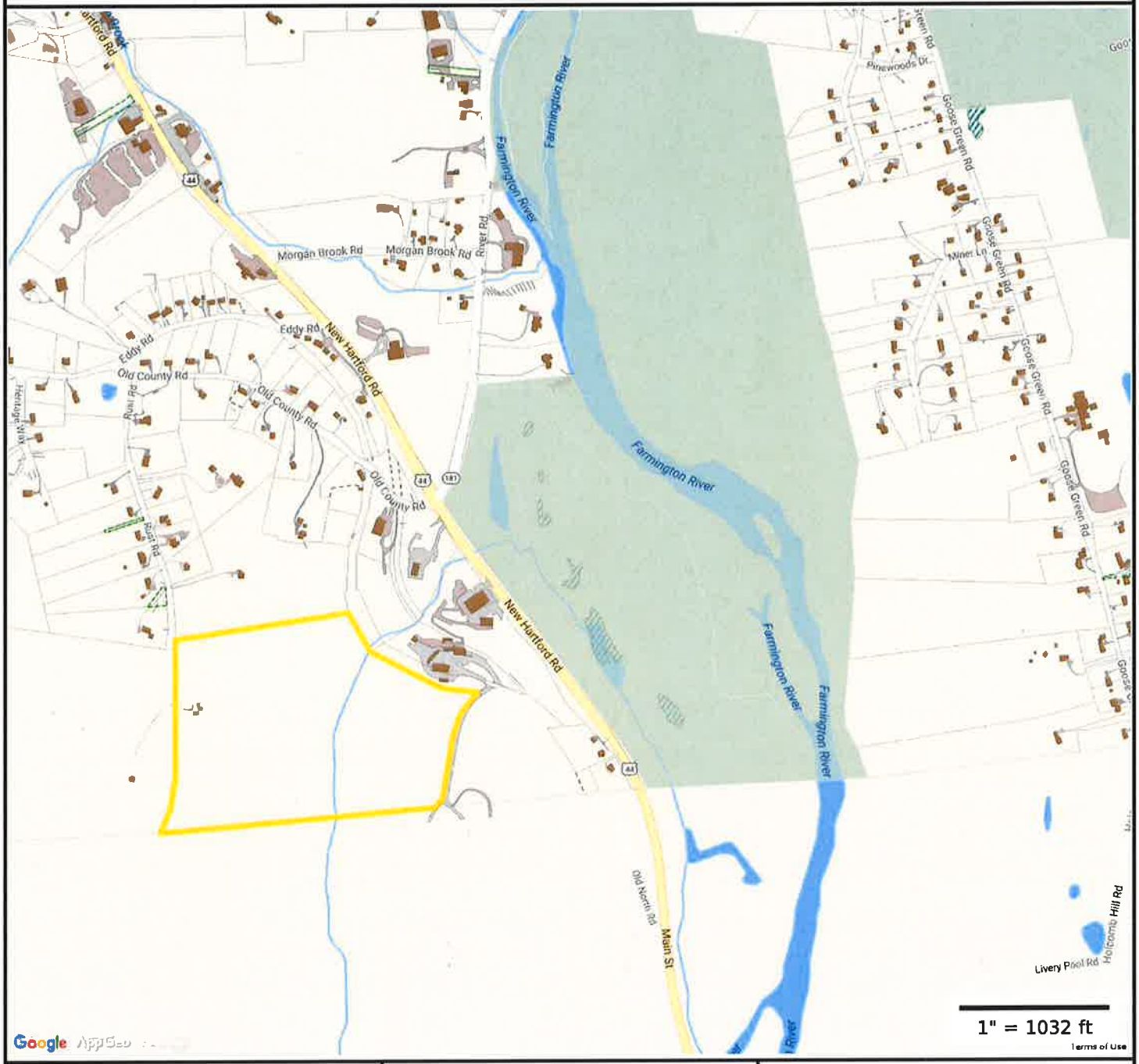
One Way Shear, Flexual Capacity, and Punching Shear

Factored One Way Shear (V_u):	293.2	k
One Way Shear Capacity (ϕV_c):	1366.5	k - ACI11.3.1.1
$V_u / \phi V_c$:	0.21	Result: OK
Load Direction Controling Shear Capacity:	Parallel to Pad Edge	
Lower Steel Pad Factored Moment (M_u):	2525.0	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	13877.4	k-ft - ACI10.3
$M_u / \phi M_n$:	0.18	Result: OK
Load Direction Controling Flexural Capacity:	Parallel to Pad Edge	
Upper Steel Pad Factored Moment (M_u):	1797.7	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	13877.4	k-ft
$M_u / \phi M_n$:	0.13	Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0044	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0044	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	8	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Reinforcement Spacing:	8	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear (V_u):	0.0	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	3179.9	k - ACI11.12.2.1
$V_u / \phi V_c$:	0.00	Result: OK
Factored Moment in Pier (M_u):	6086.1	k-ft
Pier Moment Capacity (ϕM_n):	18122.8	k-ft
$M_u / \phi M_n$:	0.34	Result: OK
Factored Shear in Pier (V_u):	65.8	k
Pier Shear Capacity (ϕV_n):	594.7	k
$V_u / \phi V_c$:	0.11	Result: OK
Pier Shear Reinforcement Ratio:	0.0003	No Ties Necessary for Shear - ACI11.5.6.1
Factored Tension in Pier (T_u):	0.0	k
Pier Tension Capacity (ϕT_n):	5054.4	k
$T_u / \phi T_n$:	0.00	Result: OK
Factored Compression in Pier (P_u):	0.0	k
Pier Compression Capacity (ϕP_n):	9473.8	k - ACI10.3.6.2
$P_u / \phi P_n$:	0.00	Result: OK
Pier Compression Reinforcement Ratio:	0.013	OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.34	Result: OK

Nominal and Design Moment Capacity and Factored Design Loads



ATTACHMENT 4



Property Information

Property ID	49-18-14R-B
Location	31 B NEW HARTFORD RD
Owner	REGIONAL REFUSE DISPOSAL DISTRICT 1

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Barkhamsted, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 10/1/2015
Properties updated 04/06/2017

sion ID: 1781 | Account #00178500 | Bldg #: 1 of 1 | Sec #: 1 of 1 | Card 1 of 1 | Print Date: 08/09/2014 17:56

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
GIONAL REFUSE DISPOSAL DISTR	4 Rolling			
MES HART				
NEW HARTFORD RD				
RKHAMSTED, CT 06063				
ditional Owners:				

SUPPLEMENTAL DATA

Other ID:	49-18-14R-B	DV Lot #	B
Sale Verific		Solar Energy	
Census Tr.		BAA	
Color		Callback	
100 Yr Flood		PA490 Date:	
DV Map #	942		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
IND LAND	3-1	375,000	262,500
VAC IN LN	5-3	1,154,120	807,880
	Total	1,529,120	1,070,380

6005
BARKHAMSTED, C

VISION

RECORD OF OWNERSHIP

	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
GIONAL REFUSE DISPOSAL DISTRICT 1	150/1047	08/15/2011	U	V		04
GIONAL REFUSE DISP DISTR #1	56/ 50	04/02/1974		V	0	

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2013	3-1	262,500	2013	3-1	262,500	2012	3-1	175,0
2013	5-3	807,880	2013	5-3	807,880	2012	5-3	953,0
	Total:	1,070,380		Total:	1,070,380		Total:	1,128,0

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

RCEL B 51.76AC ON ORIGINAL DEED/MAP#48
RCEL FKA 59AC FOR TOTAL OF ALL PARCELS
5/2011 NOTICE OF BOUNDARY LINE ADJUST
AP #942 PROPOSED ECONOMIC DEV ZONE
10 - LAND VALUED FOR CELL SITE
08 ASGN OF LEASE VOL 142/924
8/27/03 MAP 669 EASEMENT AREA
STATE LND USE LIMITATION
2001 AT&T & SNET TOWER LEASE V112/1020
12-8A/ACCESS VIA RUSTRD
8/2001 CL&P EASEMENT V112 P1015

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	
Appraised XF (B) Value (Bldg)	
Appraised OB (L) Value (Bldg)	
Appraised Land Value (Bldg)	1,529,1
Special Land Value	
Total Appraised Parcel Value	1,529,1
Valuation Method:	
Adjustment:	
Net Total Appraised Parcel Value	1,529,1

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date of CO	Comments
06-03-10		SH	Shed	0		100		STORAGE SHED
14-04-13	04/23/2014	OT	Other	7,500		0		replace 6 existing antennas & add 1 fiber cable
14-01-03	02/03/2014	GN	Generator	10,500		0		50 km generator
13-01-08	01/23/2013	OT	Other	30,000		100		3 antennas etc
12-06-30	06/15/2012	OT	Other	14,500		100		swap out 6 antennas on cell tower
2119	10/19/2010	EL	Electric	5,000		100		
10-09-64	10/05/2010	OT	Other	0		100	11/29/2010	co-locate T-Mobile on existing tower. This is a r

VISIT/ CHANGE HISTORY

Date	ID	Cd.	Purpose/Result
12/10/2008	DW	94	Vacant w/Outbldgs
04/07/2008	JQ	99	Vacant Land

LAND LINE VALUATION SECTION

Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
300	Industrial Vacant	I-1				2.00	AC	59,012.00	0.5714	5	0.60	NH	1.50	TOPO/USE			1.00		60,7
300	Industrial Vacant	I-1				51.34	AC	35,496.00	1.0000	0	0.60		0.00	TOPO/USE			1.00		1,093,4
350	Cell Tower	I-1				0.13	AC	0.00	1.0000	0	1.00		0.00	CELL TOWER SITE			1.00		375,0

Total Card Land Units: 53.47 AC | Parcel Total Land Area: 53.47 AC | Total Land Value: 1,529,1

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
del	00		Vacant

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
300	Industrial Vacant	100

COST/MARKET VALUATION

Adj. Base Rate:	0.00
Replace Cost	0
AYB	
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area