Robinson+Cole

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Also admitted in Massachusetts

November 10, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
50 Devine Street, North Haven, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the top of the existing 129-foot tower at 50 Devine Street in North Haven, Connecticut (the "Property"). The tower is owned by American Tower Corporation ("ATC"). The Council approved Cellco's use of this tower in 2014 (Petition No. 1089). 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, all at the same level on the tower. Cellco also intends to install nine (9) remote radio heads ("RRHs"). Included in Attachment 1 are specifications for Cellco's replacement antennas and RRHs.

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 Michael J. Freda, First Selectman of the Town of North Haven. A copy of this letter is also being sent to 424 Chapel St LLC, 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 tower. Cellco's replacement antennas and RRHs will be installed at the top of the 129-foot 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 operation of the replacement antennas 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 can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

A copy of the Town Assessor's 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:
Michael J. Freda, North Haven First Selectman
424 Chapel St LLC
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.

General Specifications

Antenna Type	Sector with internal RET
Band	Multiband
Brand	DualPol®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground

Product Specifications

SBNHH-1D65B

Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
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

Depth	180.0 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 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

Depth	296.0 mm | 11.7 in
Length	2025.0 mm | 79.7 in
Width	390.0 mm | 15.4 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.

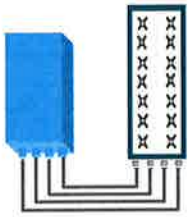
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the 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 B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new 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 B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 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, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

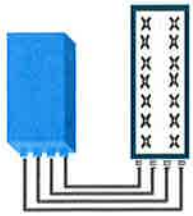
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx 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	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) RX Diversity scheme	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.) Volume (w/ solar shield) in L Weight (w/ solar shield) in kg (lb)	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
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 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 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.

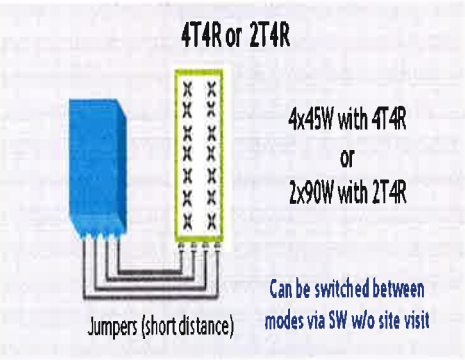
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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

TECHNICAL SPECIFICATIONS

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

Alcatel·Lucent

ATTACHMENT 2

	General	Power	Density					
Site Name: North Haven W								
Tower Height: 129Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*T-Mobile	2	953	117	1900	0.0556	1.0000	0.56%	
*T-Mobile	4	477	117	2100	0.0556	1.0000	0.56%	
*T-Mobile	1	445	117	700	0.0130	0.4667	0.28%	
*AT&T	2	500	107	880	0.0353	0.5867	0.60%	
*AT&T	1	500	107	1900	0.0176	1.0000	0.18%	
*AT&T	1	500	107	700	0.0176	0.4667	0.38%	
*AT&T	1	500	107	1900	0.0176	1.0000	0.18%	
*AT&T	1	500	107	2300	0.0176	1.0000	0.18%	
Verizon PCS	**1**	**2306**	**130**	**0.0491**	**1970**	**1.0000**	**4.91%**	
Verizon Cellular	**9**	**397**	**130**	**0.0760**	**869**	**0.5793**	**13.12%**	
Verizon AWS	**1**	**3460**	**130**	**0.0736**	**2145**	**1.0000**	**7.36%**	
Verizon 700	**1**	**1048**	**130**	**0.0223**	**746**	**0.4973**	**4.48%**	
								32.77%
* Source: Siting Council								

ATTACHMENT 3

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**129 ft Monopole**
ATC Site Name	:	**North Haven CT, CT**
ATC Site Number	:	**283418**
Engineering Number	:	**OAA686159_C3_01**
Proposed Carrier	:	**Verizon Wireless**
Carrier Site Name	:	**New Haven West**
Carrier Site Number	:	**N/A**
Site Location	:	**50 Devine Street** **North Haven, CT 06473-2204** **41.377778,-72.876158**
County	:	**New Haven**
Date	:	**September 28, 2016**
Max Usage	:	**57%**
Result	:	**Pass**

Prepared By:
Steffen Schilstra

Steffen Schilstra

Reviewed By:

Reviewed by:
William Garrett, PE
Chief Engineer

STATE OF CONNECTICUT
WILLIAM GARRETT
No. 23235
LICENSED
PROFESSIONAL ENGINEER

Sep 28 2016 5:26 PM

cosign

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

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Calculations ..... Attached

AMERICAN TOWER®
CORPORATION

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 129 ft monopole to reflect the change in loading by Verizon Wireless.

Supporting Documents

Tower Drawings	Florida Tower Partners Job #40913-015, dated January 31, 2014
Foundation Drawing	Sabre Job #11-05062, dated May 12, 2010
Geotechnical Report	Terracon Project #J2105136, deated April 20, 2010

Analysis

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

Basic Wind Speed:	97 mph (3-Second Gust, Vasd) / 125 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	C
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					
130.0	130.0	3	Antel BXA-171063-12CF	Low Profile Platform	(8) 1 5/8" Coax (4) 1 5/8" Hybriflex	Verizon Wireless
		1	RFS DB-T1-6Z-8AB-0Z			
		1	Antel BXA-80080-6CF-EDIN-X			
		2	Antel BXA-70063-6BF-EDIN-X			
121.0	121.0	9	Ericsson AIR 21	T-Arms	(11) 1 5/8" Coax (1) 1 5/8" Hybriflex	Metro PCS
114.0	114.0	4	Raycap DC6-48-60-18-8F	Platform w/ Handrails	(6) 3" Conduit (8) 0.78" 8 AWG 6 (2) 0.51" Hybrid	AT&T Mobility
		6	Ericsson mRRUS			
		6	Ericsson RRUS-11 (50 lbs.)			
		6	Ericsson RRUS-12 B2			
		6	Ericsson RRUS-32 (77 lbs)			
		12	CCI CCI-HPA-65R-BUU-H8			
107.0	-	-	-	-	(3) 3/8" RET Control Cable	

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
130.0	130.0	1	Antel BXA-70080-8CF-EDIN-2	-	-	Verizon Wireless
		3	RRH			
		3	Alcatel-Lucent RRH2x40-AWS			
		2	Antel BXA-70063-6BF-EDIN-X			
		3	Antel BXA-171063-12CF			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
130.0	130.0	1	RFS DB-T1-6Z-8AB-0Z	Low Profile Platform	-	Verizon Wireless
		6	Commscope SBNHH-1D65B			
		3	Alcatel-Lucent RRH2x60 700			
		3	Alcatel-Lucent PCS B25 RRH2x60/4x30			
		3	Alcatel-Lucent B66A RRH 4x45			

[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).

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	46%	Pass
Shaft	57%	Pass
Base Plate	38%	Pass
Flange	18%	Pass

Foundations

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Moment (Kips-Ft)	4,535.0	2,678.2	59%
Shear (Kips)	44.0	26.5	60%

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

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
130.0	Alcatel-Lucent RRH2x60 700	Verizon Wireless	1.454	1.223
	Alcatel-Lucent PCS B25 RRH2x60/4x30			
	Alcatel-Lucent B66A RRH 4x45			
	RFS DB-T1-6Z-8AB-0Z			
	Commscope SBNHH-1D65B			

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

AMERICAN TOWER®
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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:

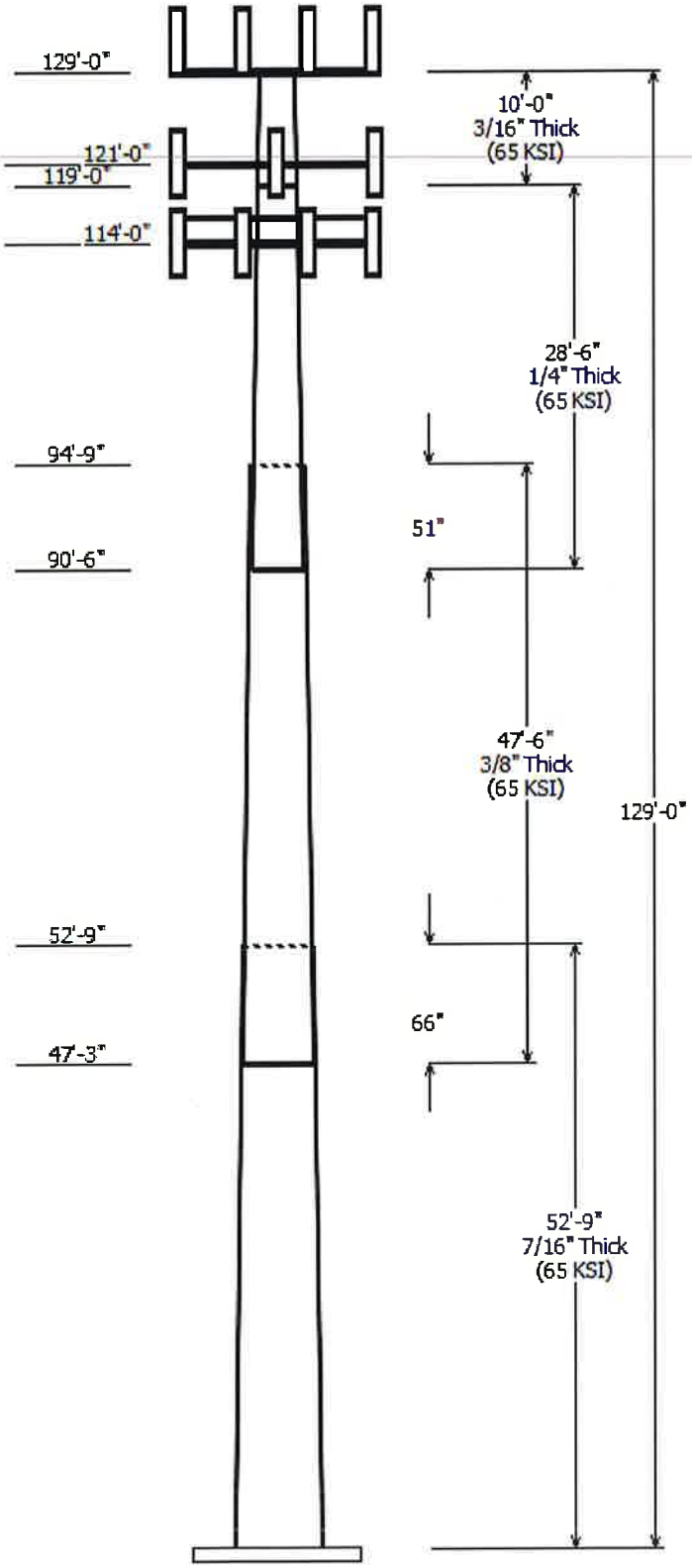
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- 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 :	283418	Code:	ANSI/TIA-222-G
Description :			
Client :	Verizon Wireless	Struct Class :	II
Location :	NORTH HAVEN CT, CT		
Shape :	18 Sides	Exposure :	C
Height :	129.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.225969 (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	52.750	36.88	48.80	0.438		0.000	0.226000	65
2	47.500	28.13	38.87	0.375	Slip Joint	66.000	0.226000	65
3	28.500	23.16	29.60	0.250	Slip Joint	51.000	0.226000	65
4	10.000	20.90	23.16	0.188	Butt Joint	0.000	0.226000	65

Discrete Appurtenance

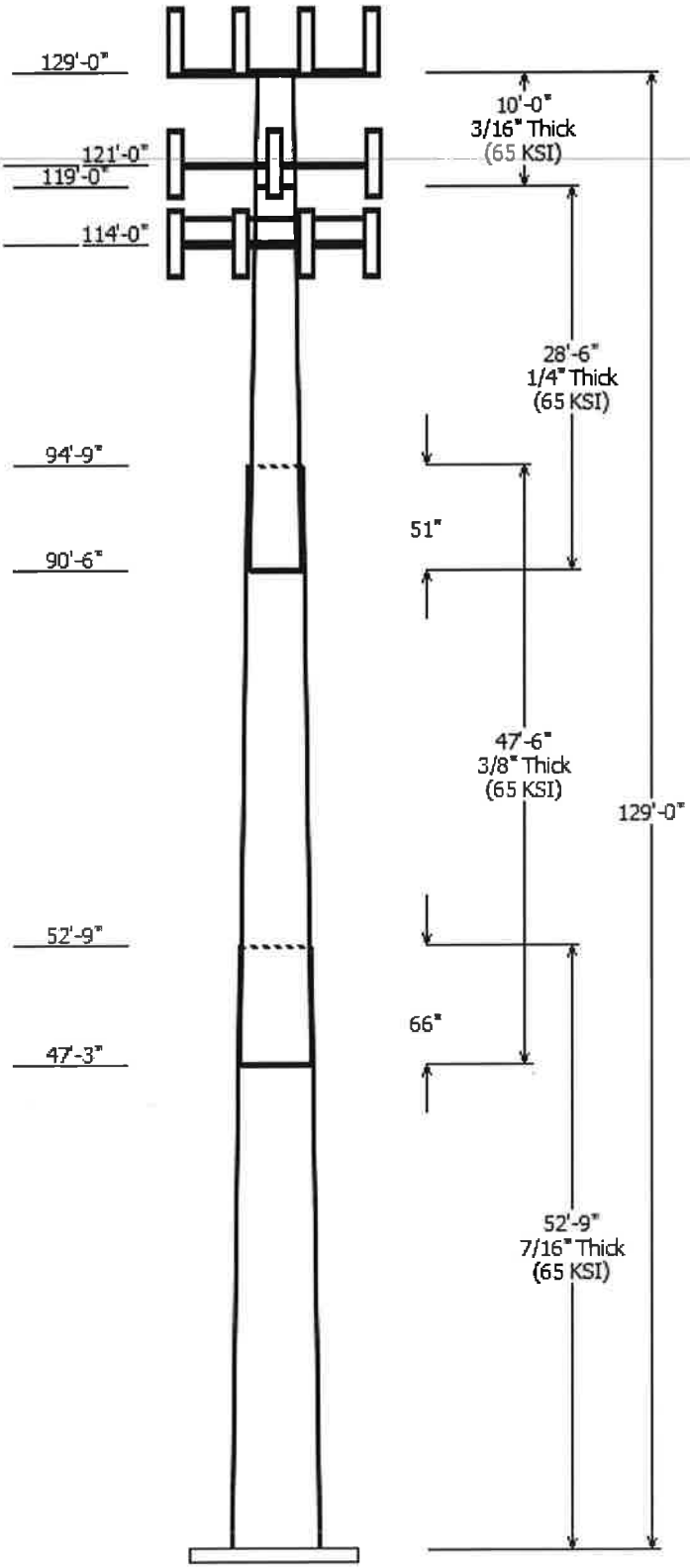
Attach Elev (ft)	Force Elev (ft)	Qty	Description
129.000	133.000	1	RFS DB-T1-6Z-8AB-0Z
129.000	133.000	3	Amphenol Antel BXA-171063-
129.000	129.000	1	Round Low Profile Platform
129.000	130.000	3	Alcatel-Lucent B66A RRH 4x45
129.000	130.000	3	Alcatel-Lucent PCS B25
129.000	130.000	3	Alcatel-Lucent RRH2x60 700
129.000	133.000	6	Commscope SBNHH-1D65B
129.000	133.000	2	Amphenol Antel BXA-70063-
129.000	133.000	1	Amphenol Antel BXA-80080-
129.000	133.000	1	RFS DB-T1-6Z-8AB-0Z
121.000	121.000	3	Round T-Arm
121.000	121.000	9	Ericsson AIR 21
114.000	114.000	1	Round Platform w/ Handrails
114.000	114.000	12	CCI CCI-HPA-65R-BUU-H8
114.000	114.000	6	Ericsson RRUS-32 (77 lbs)
114.000	114.000	6	Ericsson RRUS-12 B2
114.000	114.000	6	Ericsson RRUS-11 (50 lbs.)
114.000	114.000	6	Ericsson mRRUS
114.000	114.000	4	Raycap DC6-48-60-18-8F

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	107.0	3/8" RET Control	No
0.000	114.0	0.51" Hybrid	No
0.000	114.0	0.78" 8 AWG 6	No
0.000	114.0	3" Conduit	No
0.000	121.0	1 5/8" Coax	No
0.000	121.0	1 5/8" Hybriflex	No
0.000	129.0	1 5/8" Coax	No
0.000	129.0	1 5/8" Hybriflex	No

Load Cases

1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral



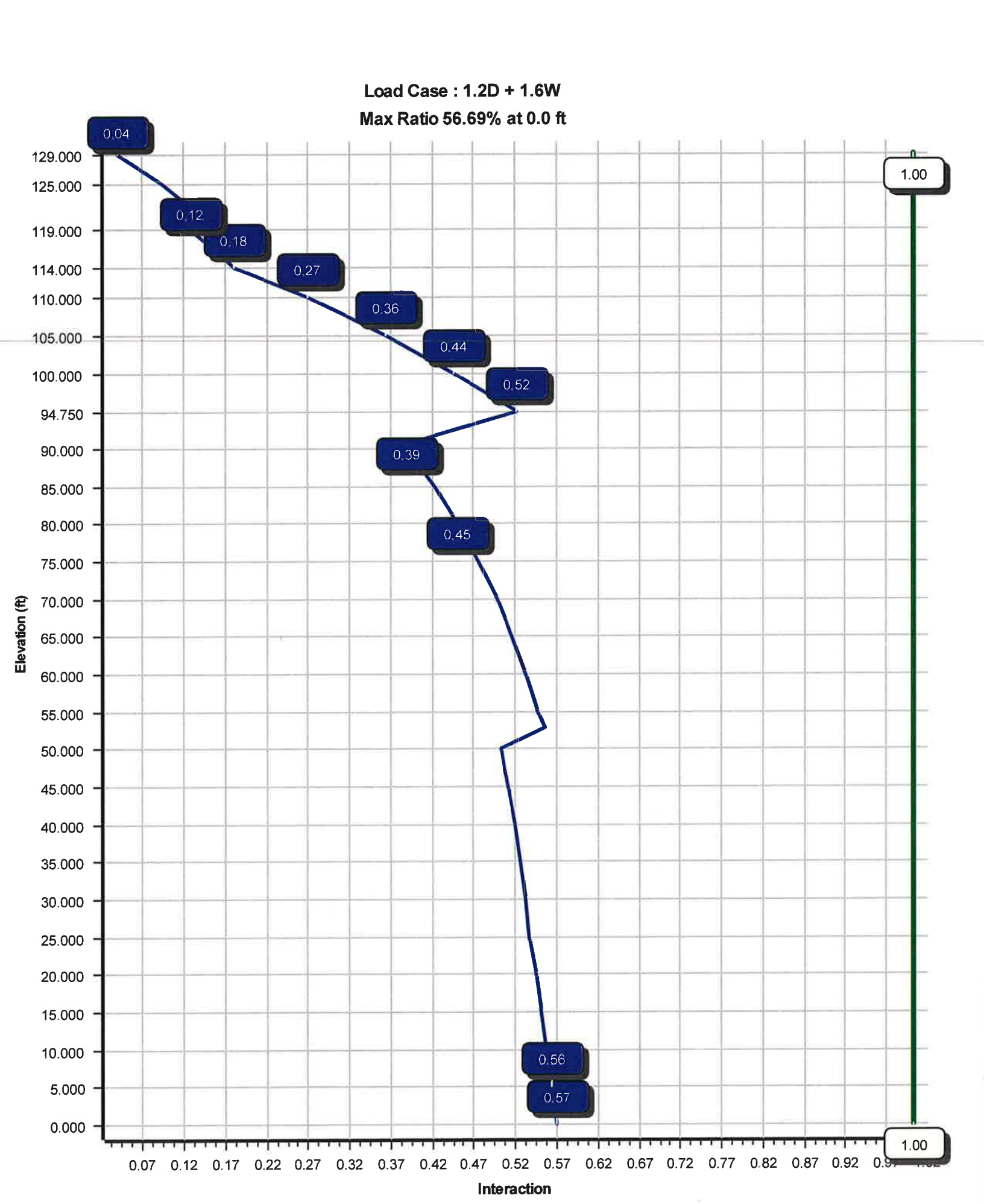
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	2678.17	26.51	43.42
0.9D + 1.6W	2651.62	26.49	32.55
1.2D + 1.0Di + 1.0Wi	700.71	7.13	64.14
(1.2 + 0.2Sds) * DL + E ELFM	162.98	1.56	43.03
(1.2 + 0.2Sds) * DL + E EMAM	258.99	2.47	43.03
(0.9 - 0.2Sds) * DL + E ELFM	161.10	1.56	29.89
(0.9 - 0.2Sds) * DL + E EMAM	255.81	2.47	29.89
1.0D + 1.0W	636.84	6.34	36.22

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 56.69% at 0.0 ft
0.04
0.12
0.18
0.27
0.36
0.44
0.52
0.39
0.45
0.56
0.57
1.00
1.00
129.000
125.000
119.000
114.000
110.000
105.000
100.000
94.750
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.07
0.12
0.17
0.22
0.27
0.32
0.37
0.42
0.47
0.52
0.57
0.62
0.67
0.72
0.77
0.82
0.87
0.92
Interaction

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:38 PM

Customer: Verizon Wireless

Analysis Parameters

Location:	New Haven County, CT		
Code:	ANSI/TIA-222-G	Height (ft):	129
Shape:	18 Sides	Base Diameter (in):	48.80
Pole Type:	Taper	Top Diameter (in):	20.90
Pole Manfacturer:		Taper (in/ft) :	0.226

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	97 mph
Exposure Catagory:	C	Design Wind Speed With Ice:	50 mph
Topographic Catagory:	1	Operational Wind Speed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	0.50 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	2.00				
T_L (sec):	6	p:	1.3	C_s:	0.033
S_s:	0.184	S_1:	0.062	C_s Max:	0.033
F_a:	1.600	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.196	S_{d1}:	0.099		

Load Cases

1.2D + 1.6W	97 mph with No Ice
0.9D + 1.6W	97 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-18	52.750	0.4375	65		0.00	10,569	48.80	0.00	67.15	19844.9	18.26	111.54	36.88	52.75	50.60	8490.9	13.45	84.30	0.225969
2-18	47.500	0.3750	65	Slip	66.00	6,374	38.87	47.25	45.82	8580.0	16.87	103.66	28.13	94.75	33.05	3218.4	11.82	75.04	0.225969
3-18	28.500	0.2500	65	Slip	51.00	2,011	29.60	90.50	23.29	2534.5	19.47	118.40	23.16	119.00	18.18	1205.4	14.92	92.64	0.225969
4-18	10.000	0.1875	65	Butt	0.00	442	23.16	119.00	13.67	911.5	20.37	123.52	20.90	129.00	12.33	668.1	18.24	111.47	0.225969
				Shaft Weight		19,395													

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)
129.00	Alcatel-Lucent B66A RRH	3	67.00	2.580	0.67	150.68	3.268	0.67	0.000	1.000
129.00	Alcatel-Lucent PCS B25	3	55.00	2.200	0.67	124.86	3.201	0.67	0.000	1.000
129.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.150	0.67	136.43	2.764	0.67	0.000	1.000
129.00	Amphenol Antel BXA-171063-	3	12.80	4.800	0.88	130.63	5.978	0.88	0.000	4.000
129.00	Amphenol Antel BXA-70063-	2	19.20	7.260	0.78	202.41	8.183	0.78	0.000	4.000
129.00	Amphenol Antel BXA-80080-	1	18.00	5.770	0.90	166.77	6.987	0.90	0.000	4.000
129.00	Commscope SBNHH-1D65B	6	50.70	8.170	0.83	250.15	9.455	0.83	0.000	4.000
129.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	4.800	0.67	179.22	5.658	0.67	0.000	4.000
129.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	4.800	0.67	179.22	5.658	0.67	0.000	4.000
129.00	Round Low Profile Platform	1	1500.00	21.700	1.00	2,138.50	40.621	1.00	0.000	0.000
121.00	Ericsson AIR 21	9	91.00	6.050	0.86	255.68	7.123	0.86	0.000	0.000
121.00	Round T-Arm	3	250.00	9.700	0.67	454.89	17.782	0.67	0.000	0.000
114.00	Ericsson RRUS-11 (50 lbs.)	6	50.00	2.570	0.67	128.61	3.200	0.67	0.000	0.000
114.00	CCI CCI-HPA-65R-BUU-H8	12	68.00	12.980	0.79	369.75	14.896	0.79	0.000	0.000
114.00	Ericsson mRRUS	6	22.00	1.350	0.50	97.71	2.122	0.50	0.000	0.000
114.00	Ericsson RRUS-12 B2	6	58.00	3.150	0.67	136.73	4.280	0.67	0.000	0.000
114.00	Ericsson RRUS-32 (77 lbs)	6	77.00	3.310	0.67	171.65	4.558	0.67	0.000	0.000
114.00	Raycap DC6-48-60-18-8F	4	20.00	1.110	1.00	97.65	2.502	1.00	0.000	0.000
114.00	Round Platform w/ Handrails	1	2000.00	27.200	1.00	3,261.06	50.989	1.00	0.000	0.000
	Totals	77	8230.10			21,159.89			Number of Loadings :	19

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	129.00	8	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon Wireless
0.00	129.00	4	1 5/8" Hybriflex Cable	1.98	1.30	N	0.00	N	Verizon Wireless
0.00	121.00	11	1 5/8" Coax	1.98	0.82	N	0.00	N	Metro PCS
0.00	121.00	1	1 5/8" Hybriflex Cable	1.98	1.30	N	0.00	N	Metro PCS
0.00	114.00	2	0.51" Hybrid	0.51	0.14	N	0.00	N	AT&T Mobility
0.00	114.00	8	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	114.00	6	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
0.00	107.00	3	3/8" RET Control Cable	0.38	0.23	N	0.00	N	AT&T Mobility

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		0.4375	48.800	67.155	19,844.9	18.26	111.54	79.9	801.0	0.0	0.0
5.00		0.4375	47.670	65.586	18,486.3	17.80	108.96	80.5	763.8	0.0	1,129.2
10.00		0.4375	46.540	64.017	17,191.1	17.35	106.38	81.0	727.5	0.0	1,102.5
15.00		0.4375	45.410	62.448	15,957.9	16.89	103.80	81.5	692.2	0.0	1,075.8
20.00		0.4375	44.281	60.879	14,785.2	16.44	101.21	82.1	657.6	0.0	1,049.1
25.00		0.4375	43.151	59.311	13,671.3	15.98	98.63	82.6	624.0	0.0	1,022.5
30.00		0.4375	42.021	57.742	12,614.9	15.53	96.05	82.6	591.3	0.0	995.8
35.00		0.4375	40.891	56.173	11,614.3	15.07	93.47	82.6	559.4	0.0	969.1
40.00		0.4375	39.761	54.604	10,668.1	14.61	90.88	82.6	528.5	0.0	942.4
45.00		0.4375	38.631	53.035	9,774.7	14.16	88.30	82.6	498.4	0.0	915.7
47.25	Bot - Section 2	0.4375	38.123	52.329	9,389.5	13.95	87.14	82.6	485.1	0.0	403.3
50.00		0.4375	37.502	51.466	8,932.7	13.70	85.72	82.6	469.2	0.0	911.0
52.75	Top - Section 1	0.3750	37.630	44.341	7,775.6	16.28	100.35	82.2	407.0	0.0	896.0
55.00		0.3750	37.122	43.736	7,461.6	16.04	98.99	82.5	395.9	0.0	337.2
60.00		0.3750	35.992	42.391	6,794.3	15.51	95.98	82.6	371.8	0.0	732.7
65.00		0.3750	34.862	41.047	6,168.0	14.98	92.97	82.6	348.5	0.0	709.8
70.00		0.3750	33.732	39.702	5,581.4	14.45	89.95	82.6	325.9	0.0	686.9
75.00		0.3750	32.602	38.357	5,033.2	13.92	86.94	82.6	304.1	0.0	664.0
80.00		0.3750	31.472	37.012	4,522.2	13.39	83.93	82.6	283.0	0.0	641.2
85.00		0.3750	30.343	35.668	4,047.0	12.86	80.91	82.6	262.7	0.0	618.3
90.00		0.3750	29.213	34.323	3,606.3	12.33	77.90	82.6	243.1	0.0	595.4
90.50	Bot - Section 3	0.3750	29.100	34.188	3,564.1	12.27	77.60	82.6	241.2	0.0	58.3
94.75	Top - Section 2	0.2500	28.639	22.526	2,293.8	18.79	114.56	79.3	157.8	0.0	817.4
95.00		0.2500	28.583	22.481	2,280.1	18.75	114.33	79.3	157.1	0.0	19.1
100.0		0.2500	27.453	21.585	2,018.1	17.95	109.81	80.3	144.8	0.0	374.9
105.0		0.2500	26.323	20.688	1,776.9	17.16	105.29	81.2	133.0	0.0	359.6
110.0		0.2500	25.193	19.792	1,555.8	16.36	100.77	82.2	121.6	0.0	344.4
114.0		0.2500	24.290	19.075	1,392.7	15.72	97.16	82.6	112.9	0.0	264.5
115.0		0.2500	24.064	18.895	1,353.8	15.56	96.25	82.6	110.8	0.0	64.6
119.0	Top - Section 3	0.2500	23.160	18.178	1,205.4	14.92	92.64	82.6	102.5	0.0	252.3
119.0	Bot - Section 4	0.1875	23.160	13.671	911.5	20.37	123.52	77.4	77.5	0.0	
120.0		0.1875	22.934	13.536	884.9	20.16	122.31	77.7	76.0	0.0	46.3
121.0		0.1875	22.708	13.402	858.7	19.94	121.11	77.9	74.5	0.0	45.8
125.0		0.1875	21.804	12.864	759.4	19.09	116.29	78.9	68.6	0.0	178.8
129.0		0.1875	20.900	12.326	668.1	18.24	111.47	79.9	63.0	0.0	171.4
											19,395.2

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:38 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.6W 97 mph with No Ice 22 Iterations

Gust Response Factor :1.10 Wind Importance Factor :1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		227.1	0.0					0.0	0.0	227.1	0.0	0.0	0.0
5.00		448.8	1,355.1					0.0	439.5	448.8	1,794.6	0.0	0.0
10.00		438.1	1,323.0					0.0	439.5	438.1	1,762.5	0.0	0.0
15.00		434.2	1,291.0					0.0	439.5	434.2	1,730.5	0.0	0.0
20.00		441.6	1,259.0					0.0	439.5	441.6	1,698.5	0.0	0.0
25.00		451.3	1,226.9					0.0	439.5	451.3	1,666.4	0.0	0.0
30.00		456.8	1,194.9					0.0	439.5	456.8	1,634.4	0.0	0.0
35.00		459.2	1,162.9					0.0	439.5	459.2	1,602.4	0.0	0.0
40.00		459.3	1,130.8					0.0	439.5	459.3	1,570.3	0.0	0.0
45.00		332.3	1,098.8					0.0	439.5	332.3	1,538.3	0.0	0.0
47.25	Bot - Section 2	230.6	484.0					0.0	197.8	230.6	681.8	0.0	0.0
50.00		254.8	1,093.1					0.0	241.7	254.8	1,334.9	0.0	0.0
52.75	Top - Section 1	230.6	1,075.1					0.0	241.7	230.6	1,316.9	0.0	0.0
55.00		331.5	404.6					0.0	197.8	331.5	602.4	0.0	0.0
60.00		452.9	879.2					0.0	439.5	452.9	1,318.7	0.0	0.0
65.00		446.2	851.8					0.0	439.5	446.2	1,291.3	0.0	0.0
70.00		438.5	824.3					0.0	439.5	438.5	1,263.8	0.0	0.0
75.00		430.1	796.9					0.0	439.5	430.1	1,236.4	0.0	0.0
80.00		420.8	769.4					0.0	439.5	420.8	1,208.9	0.0	0.0
85.00		410.9	741.9					0.0	439.5	410.9	1,181.4	0.0	0.0
90.00		222.9	714.5					0.0	439.5	222.9	1,154.0	0.0	0.0
90.50	Bot - Section 3	190.7	69.9					0.0	44.0	190.7	113.9	0.0	0.0
94.75	Top - Section 2	180.6	980.9					0.0	373.6	180.6	1,354.5	0.0	0.0
95.00		205.2	23.0					0.0	22.0	205.2	44.9	0.0	0.0
100.00		384.8	449.8					0.0	439.5	384.8	889.3	0.0	0.0
105.00		372.7	431.5					0.0	439.5	372.7	871.0	0.0	0.0
110.00		325.4	413.2					0.0	437.0	325.4	850.3	0.0	0.0
114.00	Appertunance(s)	176.9	317.4	8,020.9	0.0	0.0	4,965.6	0.0	348.3	8,197.8	5,631.3	0.0	0.0
115.00		171.7	77.5					0.0	26.5	171.7	104.0	0.0	0.0
119.00	Top - Section 3	170.4	302.8					0.0	106.0	170.4	408.8	0.0	0.0
120.00		66.8	55.5					0.0	26.5	66.8	82.0	0.0	0.0
121.00	Appertunance(s)	163.6	55.0	2,763.5	0.0	0.0	1,882.8	0.0	26.5	2,927.1	1,964.3	0.0	0.0
125.00		256.2	214.5					0.0	56.4	256.2	271.0	0.0	0.0
129.00	Appertunance(s)	125.9	205.7	5,071.4	0.0	13,817.0	3,027.7	0.0	56.4	5,197.3	3,289.9	0.0	0.0
								Totals:		26,665.4	43,463.5	0.00	0.00

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:39 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.6W 97 mph with No Ice 22 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	-43.42	-26.51	0.00	-2,678.17	0.00	2,678.17	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.567
5.00	-41.54	-26.20	0.00	-2,545.62	0.00	2,545.62	4,749.48	2,374.74	9,204.97	4,609.33	0.10	-0.19	0.561
10.00	-39.69	-25.88	0.00	-2,414.65	0.00	2,414.65	4,666.73	2,333.36	8,826.25	4,419.68	0.40	-0.38	0.555
15.00	-37.88	-25.56	0.00	-2,285.24	0.00	2,285.24	4,582.46	2,291.23	8,452.48	4,232.52	0.90	-0.57	0.548
20.00	-36.10	-25.23	0.00	-2,157.42	0.00	2,157.42	4,496.68	2,248.34	8,083.87	4,047.94	1.61	-0.77	0.541
25.00	-34.35	-24.87	0.00	-2,031.28	0.00	2,031.28	4,406.48	2,203.24	7,715.56	3,863.51	2.52	-0.97	0.534
30.00	-32.64	-24.50	0.00	-1,906.92	0.00	1,906.92	4,289.92	2,144.96	7,310.76	3,660.81	3.65	-1.18	0.529
35.00	-30.96	-24.12	0.00	-1,784.40	0.00	1,784.40	4,173.36	2,086.68	6,916.87	3,463.58	4.99	-1.39	0.523
40.00	-29.31	-23.73	0.00	-1,663.79	0.00	1,663.79	4,056.80	2,028.40	6,533.89	3,271.80	6.56	-1.60	0.516
45.00	-27.72	-23.43	0.00	-1,545.13	0.00	1,545.13	3,940.24	1,970.12	6,161.81	3,085.49	8.34	-1.81	0.508
47.25	-27.00	-23.23	0.00	-1,492.42	0.00	1,492.42	3,887.79	1,943.89	5,997.94	3,003.43	9.22	-1.91	0.504
50.00	-25.63	-22.98	0.00	-1,428.54	0.00	1,428.54	3,823.68	1,911.84	5,800.65	2,904.64	10.36	-2.03	0.499
52.75	-24.27	-22.75	0.00	-1,365.34	0.00	1,365.34	3,282.31	1,641.15	5,013.65	2,510.55	11.56	-2.15	0.551
55.00	-23.62	-22.47	0.00	-1,314.15	0.00	1,314.15	3,248.58	1,624.29	4,893.74	2,450.51	12.60	-2.25	0.544
60.00	-22.23	-22.05	0.00	-1,201.81	0.00	1,201.81	3,149.47	1,574.74	4,597.09	2,301.96	15.09	-2.49	0.529
65.00	-20.87	-21.64	0.00	-1,091.54	0.00	1,091.54	3,049.56	1,524.78	4,308.58	2,157.49	17.83	-2.73	0.513
70.00	-19.54	-21.22	0.00	-983.36	0.00	983.36	2,949.66	1,474.83	4,029.43	2,017.71	20.82	-2.97	0.494
75.00	-18.24	-20.80	0.00	-877.28	0.00	877.28	2,849.75	1,424.87	3,759.63	1,882.61	24.07	-3.21	0.473
80.00	-16.98	-20.37	0.00	-773.30	0.00	773.30	2,749.84	1,374.92	3,499.17	1,752.19	27.55	-3.44	0.448
85.00	-15.75	-19.95	0.00	-671.43	0.00	671.43	2,649.93	1,324.97	3,248.06	1,626.45	31.28	-3.67	0.419
90.00	-14.57	-19.68	0.00	-571.67	0.00	571.67	2,550.02	1,275.01	3,006.31	1,505.39	35.24	-3.89	0.386
90.50	-14.43	-19.51	0.00	-561.83	0.00	561.83	2,540.03	1,270.02	2,982.64	1,493.54	35.65	-3.91	0.382
94.75	-13.06	-19.26	0.00	-478.90	0.00	478.90	1,607.72	803.86	1,873.69	938.24	39.21	-4.09	0.519
95.00	-12.99	-19.08	0.00	-474.09	0.00	474.09	1,605.47	802.74	1,867.31	935.04	39.43	-4.10	0.516
100.00	-12.05	-18.69	0.00	-378.68	0.00	378.68	1,559.66	779.83	1,741.06	871.82	43.86	-4.37	0.443
105.00	-11.14	-18.29	0.00	-285.25	0.00	285.25	1,512.33	756.17	1,617.47	809.94	48.56	-4.60	0.360
110.00	-10.27	-17.92	0.00	-193.82	0.00	193.82	1,463.49	731.75	1,496.76	749.49	53.48	-4.79	0.266
114.00	-5.34	-9.28	0.00	-122.14	0.00	122.14	1,417.15	708.58	1,396.33	699.20	57.55	-4.91	0.179
115.00	-5.25	-9.11	0.00	-112.85	0.00	112.85	1,403.83	701.92	1,370.07	686.05	58.58	-4.93	0.168
119.00	-4.85	-8.91	0.00	-76.43	0.00	76.43	1,350.55	675.27	1,267.52	634.70	62.74	-5.01	0.124
119.00	-4.85	-8.91	0.00	-76.43	0.00	76.43	952.84	476.42	899.15	450.24	62.74	-5.01	0.175
120.00	-4.77	-8.83	0.00	-67.52	0.00	67.52	946.51	473.26	884.32	442.82	63.79	-5.03	0.158
121.00	-3.06	-5.75	0.00	-58.69	0.00	58.69	940.12	470.06	869.55	435.42	64.84	-5.05	0.138
125.00	-2.81	-5.47	0.00	-35.70	0.00	35.70	913.97	456.98	811.15	406.18	69.10	-5.11	0.091
129.00	0.00	-5.20	0.00	-13.82	0.00	13.82	886.84	443.42	753.88	377.50	73.39	-5.15	0.037

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:39 PM

Customer: Verizon Wireless

Load Case: 0.9D + 1.6W 97 mph with No Ice (Reduced DL) 22 Iterations

Gust Response Factor :1.10 Wind Importance Factor :1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		227.1	0.0					0.0	0.0	227.1	0.0	0.0	0.0
5.00		448.8	1,016.3					0.0	329.6	448.8	1,345.9	0.0	0.0
10.00		438.1	992.3					0.0	329.6	438.1	1,321.9	0.0	0.0
15.00		434.2	968.3					0.0	329.6	434.2	1,297.9	0.0	0.0
20.00		441.6	944.2					0.0	329.6	441.6	1,273.9	0.0	0.0
25.00		451.3	920.2					0.0	329.6	451.3	1,249.8	0.0	0.0
30.00		456.8	896.2					0.0	329.6	456.8	1,225.8	0.0	0.0
35.00		459.2	872.2					0.0	329.6	459.2	1,201.8	0.0	0.0
40.00		459.3	848.1					0.0	329.6	459.3	1,177.8	0.0	0.0
45.00		332.3	824.1					0.0	329.6	332.3	1,153.7	0.0	0.0
47.25	Bot - Section 2	230.6	363.0					0.0	148.3	230.6	511.3	0.0	0.0
50.00		254.8	819.9					0.0	181.3	254.8	1,001.1	0.0	0.0
52.75	Top - Section 1	230.6	806.4					0.0	181.3	230.6	987.7	0.0	0.0
55.00		331.5	303.5					0.0	148.3	331.5	451.8	0.0	0.0
60.00		452.9	659.4					0.0	329.6	452.9	989.0	0.0	0.0
65.00		446.2	638.8					0.0	329.6	446.2	968.4	0.0	0.0
70.00		438.5	618.2					0.0	329.6	438.5	947.9	0.0	0.0
75.00		430.1	597.6					0.0	329.6	430.1	927.3	0.0	0.0
80.00		420.8	577.0					0.0	329.6	420.8	906.7	0.0	0.0
85.00		410.9	556.5					0.0	329.6	410.9	886.1	0.0	0.0
90.00		222.9	535.9					0.0	329.6	222.9	865.5	0.0	0.0
90.50	Bot - Section 3	190.7	52.5					0.0	33.0	190.7	85.4	0.0	0.0
94.75	Top - Section 2	180.6	735.7					0.0	280.2	180.6	1,015.9	0.0	0.0
95.00		205.2	17.2					0.0	16.5	205.2	33.7	0.0	0.0
100.00		384.8	337.4					0.0	329.6	384.8	667.0	0.0	0.0
105.00		372.7	323.7					0.0	329.6	372.7	653.3	0.0	0.0
110.00		325.4	309.9					0.0	327.8	325.4	637.7	0.0	0.0
114.00	Appertunance(s)	176.9	238.1	8,020.9	0.0	0.0	3,724.2	0.0	261.2	8,197.8	4,223.5	0.0	0.0
115.00		171.7	58.1					0.0	19.9	171.7	78.0	0.0	0.0
119.00	Top - Section 3	170.4	227.1					0.0	79.5	170.4	306.6	0.0	0.0
120.00		66.8	41.7					0.0	19.9	66.8	61.5	0.0	0.0
121.00	Appertunance(s)	163.6	41.2	2,763.5	0.0	0.0	1,412.1	0.0	19.9	2,927.1	1,473.2	0.0	0.0
125.00		256.2	160.9					0.0	42.3	256.2	203.2	0.0	0.0
129.00	Appertunance(s)	125.9	154.3	5,071.4	0.0	13,817.0	2,270.8	0.0	42.3	5,197.3	2,467.4	0.0	0.0
								Totals:		26,665.4	32,597.6	0.00	0.00

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:40 PM

Customer: Verizon Wireless

Load Case: 0.9D + 1.6W — 97 mph with No Ice (Reduced DL) — 22 Iterations

Gust Response Factor :1.10 Wind Importance Factor :1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-32.55	-26.49	0.00	-2,651.62	0.00	2,651.62	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.559
5.00	-31.12	-26.14	0.00	-2,519.16	0.00	2,519.16	4,749.48	2,374.74	9,204.97	4,609.33	0.10	-0.19	0.553
10.00	-29.72	-25.80	0.00	-2,388.45	0.00	2,388.45	4,666.73	2,333.36	8,826.25	4,419.68	0.39	-0.37	0.547
15.00	-28.34	-25.45	0.00	-2,259.47	0.00	2,259.47	4,582.46	2,291.23	8,452.48	4,232.52	0.89	-0.57	0.540
20.00	-26.98	-25.08	0.00	-2,132.23	0.00	2,132.23	4,496.68	2,248.34	8,083.87	4,047.94	1.59	-0.76	0.533
25.00	-25.65	-24.70	0.00	-2,006.81	0.00	2,006.81	4,406.48	2,203.24	7,715.56	3,863.51	2.49	-0.96	0.525
30.00	-24.35	-24.31	0.00	-1,883.29	0.00	1,883.29	4,289.92	2,144.96	7,310.76	3,660.81	3.61	-1.16	0.520
35.00	-23.07	-23.91	0.00	-1,761.73	0.00	1,761.73	4,173.36	2,086.68	6,916.87	3,463.58	4.94	-1.37	0.514
40.00	-21.82	-23.50	0.00	-1,642.18	0.00	1,642.18	4,056.80	2,028.40	6,533.89	3,271.80	6.48	-1.58	0.507
45.00	-20.62	-23.19	0.00	-1,524.68	0.00	1,524.68	3,940.24	1,970.12	6,161.81	3,085.49	8.25	-1.79	0.500
47.25	-20.07	-22.98	0.00	-1,472.50	0.00	1,472.50	3,887.79	1,943.89	5,997.94	3,003.43	9.12	-1.89	0.496
50.00	-19.03	-22.73	0.00	-1,409.30	0.00	1,409.30	3,823.68	1,911.84	5,800.65	2,904.64	10.24	-2.01	0.490
52.75	-18.01	-22.50	0.00	-1,346.79	0.00	1,346.79	3,282.31	1,641.15	5,013.65	2,510.55	11.43	-2.13	0.542
55.00	-17.50	-22.20	0.00	-1,296.16	0.00	1,296.16	3,248.58	1,624.29	4,893.74	2,450.51	12.46	-2.23	0.535
60.00	-16.44	-21.78	0.00	-1,185.14	0.00	1,185.14	3,149.47	1,574.74	4,597.09	2,301.96	14.92	-2.46	0.520
65.00	-15.41	-21.35	0.00	-1,076.24	0.00	1,076.24	3,049.56	1,524.78	4,308.58	2,157.49	17.62	-2.70	0.504
70.00	-14.40	-20.93	0.00	-969.47	0.00	969.47	2,949.66	1,474.83	4,029.43	2,017.71	20.58	-2.94	0.486
75.00	-13.41	-20.50	0.00	-864.83	0.00	864.83	2,849.75	1,424.87	3,759.63	1,882.61	23.78	-3.17	0.464
80.00	-12.45	-20.08	0.00	-762.31	0.00	762.31	2,749.84	1,374.92	3,499.17	1,752.19	27.22	-3.40	0.440
85.00	-11.52	-19.66	0.00	-661.91	0.00	661.91	2,649.93	1,324.97	3,248.06	1,626.45	30.90	-3.62	0.412
90.00	-10.63	-19.40	0.00	-563.60	0.00	563.60	2,550.02	1,275.01	3,006.31	1,505.39	34.81	-3.84	0.379
90.50	-10.52	-19.23	0.00	-553.90	0.00	553.90	2,540.03	1,270.02	2,982.64	1,493.54	35.22	-3.86	0.375
94.75	-9.49	-18.99	0.00	-472.19	0.00	472.19	1,607.72	803.86	1,873.69	938.24	38.73	-4.04	0.510
95.00	-9.42	-18.81	0.00	-467.44	0.00	467.44	1,605.47	802.74	1,867.31	935.04	38.94	-4.05	0.506
100.00	-8.71	-18.41	0.00	-373.40	0.00	373.40	1,559.66	779.83	1,741.06	871.82	43.32	-4.31	0.434
105.00	-8.02	-18.02	0.00	-281.34	0.00	281.34	1,512.33	756.17	1,617.47	809.94	47.96	-4.54	0.353
110.00	-7.36	-17.66	0.00	-191.24	0.00	191.24	1,463.49	731.75	1,496.76	749.49	52.82	-4.73	0.261
114.00	-3.83	-9.15	0.00	-120.58	0.00	120.58	1,417.15	708.58	1,396.33	699.20	56.83	-4.84	0.175
115.00	-3.76	-8.97	0.00	-111.44	0.00	111.44	1,403.83	701.92	1,370.07	686.05	57.84	-4.87	0.165
119.00	-3.46	-8.78	0.00	-75.55	0.00	75.55	1,350.55	675.27	1,267.52	634.70	61.95	-4.94	0.122
119.00	-3.46	-8.78	0.00	-75.55	0.00	75.55	952.84	476.42	899.15	450.24	61.95	-4.94	0.172
120.00	-3.40	-8.71	0.00	-66.77	0.00	66.77	946.51	473.26	884.32	442.82	62.99	-4.96	0.155
121.00	-2.18	-5.67	0.00	-58.06	0.00	58.06	940.12	470.06	869.55	435.42	64.03	-4.98	0.136
125.00	-2.00	-5.39	0.00	-35.40	0.00	35.40	913.97	456.98	811.15	406.18	68.23	-5.04	0.089
129.00	0.00	-5.20	0.00	-13.82	0.00	13.82	886.84	443.42	753.88	377.50	72.46	-5.08	0.037

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:40 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 21 Iterations

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

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		72.9	0.0					0.0	0.0	72.9	0.0	0.0	0.0
5.00		144.6	1,709.5					0.0	439.5	144.6	2,149.0	0.0	0.0
10.00		141.9	1,710.6					0.0	439.5	141.9	2,150.1	0.0	0.0
15.00		141.1	1,689.8					0.0	439.5	141.1	2,129.3	0.0	0.0
20.00		144.0	1,661.9					0.0	439.5	144.0	2,101.4	0.0	0.0
25.00		147.6	1,630.2					0.0	439.5	147.6	2,069.7	0.0	0.0
30.00		149.8	1,596.2					0.0	439.5	149.8	2,035.7	0.0	0.0
35.00		151.0	1,560.5					0.0	439.5	151.0	2,000.0	0.0	0.0
40.00		151.5	1,523.7					0.0	439.5	151.5	1,963.2	0.0	0.0
45.00		109.8	1,485.9					0.0	439.5	109.8	1,925.4	0.0	0.0
47.25	Bot - Section 2	76.3	657.4					0.0	197.8	76.3	855.2	0.0	0.0
50.00		84.4	1,307.0					0.0	241.7	84.4	1,548.7	0.0	0.0
52.75	Top - Section 1	76.5	1,286.8					0.0	241.7	76.5	1,528.6	0.0	0.0
55.00		110.2	576.4					0.0	197.8	110.2	774.2	0.0	0.0
60.00		151.0	1,252.4					0.0	439.5	151.0	1,691.9	0.0	0.0
65.00		149.2	1,216.9					0.0	439.5	149.2	1,656.4	0.0	0.0
70.00		147.1	1,180.9					0.0	439.5	147.1	1,620.4	0.0	0.0
75.00		144.8	1,144.7					0.0	439.5	144.8	1,584.2	0.0	0.0
80.00		142.3	1,108.1					0.0	439.5	142.3	1,547.6	0.0	0.0
85.00		139.5	1,071.2					0.0	439.5	139.5	1,510.7	0.0	0.0
90.00		75.8	1,034.1					0.0	439.5	75.8	1,473.6	0.0	0.0
90.50	Bot - Section 3	65.0	101.9					0.0	44.0	65.0	145.8	0.0	0.0
94.75	Top - Section 2	61.6	1,249.1					0.0	373.6	61.6	1,622.7	0.0	0.0
95.00		70.3	38.8					0.0	22.0	70.3	60.7	0.0	0.0
100.00		132.1	754.7					0.0	439.5	132.1	1,194.2	0.0	0.0
105.00		128.7	726.1					0.0	439.5	128.7	1,165.6	0.0	0.0
110.00		112.9	697.3					0.0	437.0	112.9	1,134.3	0.0	0.0
114.00	Appertunance(s)	61.6	538.0	1,787.9	0.0	0.0	11,417.3	0.0	348.3	1,849.5	12,303.5	0.0	0.0
115.00		60.1	132.3					0.0	26.5	60.1	158.8	0.0	0.0
119.00	Top - Section 3	59.7	514.7					0.0	106.0	59.7	620.7	0.0	0.0
120.00		23.5	108.2					0.0	26.5	23.5	134.7	0.0	0.0
121.00	Appertunance(s)	57.7	107.2	624.8	0.0	0.0	3,787.6	0.0	26.5	682.5	3,921.3	0.0	0.0
125.00		90.7	416.0					0.0	56.4	90.7	472.4	0.0	0.0
129.00	Appertunance(s)	44.7	400.1	1,139.2	0.0	2,707.1	6,440.9	0.0	56.4	1,183.9	6,897.5	0.0	0.0
								Totals:		7,171.82	64,147.4	0.00	0.00

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:41 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 21 Iterations

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

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-64.14	-7.13	0.00	-700.71	0.00	700.71	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.159
5.00	-61.99	-7.03	0.00	-665.08	0.00	665.08	4,749.48	2,374.74	9,204.97	4,609.33	0.03	-0.05	0.157
10.00	-59.83	-6.94	0.00	-629.91	0.00	629.91	4,666.73	2,333.36	8,826.25	4,419.68	0.10	-0.10	0.155
15.00	-57.70	-6.85	0.00	-595.21	0.00	595.21	4,582.46	2,291.23	8,452.48	4,232.52	0.23	-0.15	0.153
20.00	-55.59	-6.75	0.00	-560.97	0.00	560.97	4,496.68	2,248.34	8,083.87	4,047.94	0.42	-0.20	0.151
25.00	-53.52	-6.64	0.00	-527.23	0.00	527.23	4,406.48	2,203.24	7,715.56	3,863.51	0.66	-0.25	0.149
30.00	-51.48	-6.53	0.00	-494.03	0.00	494.03	4,289.92	2,144.96	7,310.76	3,660.81	0.95	-0.31	0.147
35.00	-49.47	-6.41	0.00	-461.39	0.00	461.39	4,173.36	2,086.68	6,916.87	3,463.58	1.30	-0.36	0.145
40.00	-47.50	-6.29	0.00	-429.32	0.00	429.32	4,056.80	2,028.40	6,533.89	3,271.80	1.71	-0.41	0.143
45.00	-45.57	-6.20	0.00	-397.85	0.00	397.85	3,940.24	1,970.12	6,161.81	3,085.49	2.17	-0.47	0.141
47.25	-44.72	-6.14	0.00	-383.90	0.00	383.90	3,887.79	1,943.89	5,997.94	3,003.43	2.40	-0.50	0.139
50.00	-43.16	-6.07	0.00	-367.01	0.00	367.01	3,823.68	1,911.84	5,800.65	2,904.64	2.70	-0.53	0.138
52.75	-41.63	-6.00	0.00	-350.33	0.00	350.33	3,282.31	1,641.15	5,013.65	2,510.55	3.01	-0.56	0.152
55.00	-40.86	-5.91	0.00	-336.84	0.00	336.84	3,248.58	1,624.29	4,893.74	2,450.51	3.28	-0.58	0.150
60.00	-39.16	-5.78	0.00	-307.30	0.00	307.30	3,149.47	1,574.74	4,597.09	2,301.96	3.92	-0.65	0.146
65.00	-37.50	-5.65	0.00	-278.39	0.00	278.39	3,049.56	1,524.78	4,308.58	2,157.49	4.63	-0.71	0.141
70.00	-35.87	-5.52	0.00	-250.13	0.00	250.13	2,949.66	1,474.83	4,029.43	2,017.71	5.40	-0.77	0.136
75.00	-34.29	-5.39	0.00	-222.52	0.00	222.52	2,849.75	1,424.87	3,759.63	1,882.61	6.24	-0.83	0.130
80.00	-32.74	-5.26	0.00	-195.56	0.00	195.56	2,749.84	1,374.92	3,499.17	1,752.19	7.14	-0.89	0.124
85.00	-31.22	-5.13	0.00	-169.26	0.00	169.26	2,649.93	1,324.97	3,248.06	1,626.45	8.10	-0.94	0.116
90.00	-29.75	-5.04	0.00	-143.63	0.00	143.63	2,550.02	1,275.01	3,006.31	1,505.39	9.12	-1.00	0.107
90.50	-29.60	-4.99	0.00	-141.11	0.00	141.11	2,540.03	1,270.02	2,982.64	1,493.54	9.23	-1.01	0.106
94.75	-27.98	-4.91	0.00	-119.91	0.00	119.91	1,607.72	803.86	1,873.69	938.24	10.14	-1.05	0.145
95.00	-27.92	-4.85	0.00	-118.69	0.00	118.69	1,605.47	802.74	1,867.31	935.04	10.20	-1.05	0.144
100.00	-26.72	-4.73	0.00	-94.42	0.00	94.42	1,559.66	779.83	1,741.06	871.82	11.33	-1.12	0.125
105.00	-25.55	-4.60	0.00	-70.78	0.00	70.78	1,512.33	756.17	1,617.47	809.94	12.54	-1.18	0.104
110.00	-24.42	-4.48	0.00	-47.78	0.00	47.78	1,463.49	731.75	1,496.76	749.49	13.80	-1.22	0.080
114.00	-12.16	-2.37	0.00	-29.87	0.00	29.87	1,417.15	708.58	1,396.33	699.20	14.84	-1.25	0.051
115.00	-12.00	-2.31	0.00	-27.50	0.00	27.50	1,403.83	701.92	1,370.07	686.05	15.10	-1.26	0.049
119.00	-11.38	-2.24	0.00	-18.28	0.00	18.28	1,350.55	675.27	1,267.52	634.70	16.16	-1.28	0.037
119.00	-11.38	-2.24	0.00	-18.28	0.00	18.28	952.84	476.42	899.15	450.24	16.16	-1.28	0.053
120.00	-11.24	-2.21	0.00	-16.04	0.00	16.04	946.51	473.26	884.32	442.82	16.43	-1.28	0.048
121.00	-7.34	-1.44	0.00	-13.83	0.00	13.83	940.12	470.06	869.55	435.42	16.70	-1.29	0.040
125.00	-6.87	-1.34	0.00	-8.07	0.00	8.07	913.97	456.98	811.15	406.18	17.79	-1.30	0.027
129.00	0.00	-1.18	0.00	-2.71	0.00	2.71	886.84	443.42	753.88	377.50	18.88	-1.31	0.007

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:41 PM

Customer: Verizon Wireless

Load Case: 1.0D + 1.0W Serviceability 60 mph 21 Iterations

Gust Response Factor :1.10 Wind Importance Factor :1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		54.3	0.0					0.0	0.0	54.3	0.0	0.0	0.0
5.00		107.3	1,129.2					0.0	366.2	107.3	1,495.5	0.0	0.0
10.00		104.8	1,102.5					0.0	366.2	104.8	1,468.8	0.0	0.0
15.00		103.8	1,075.8					0.0	366.2	103.8	1,442.1	0.0	0.0
20.00		105.6	1,049.1					0.0	366.2	105.6	1,415.4	0.0	0.0
25.00		107.9	1,022.5					0.0	366.2	107.9	1,388.7	0.0	0.0
30.00		109.2	995.8					0.0	366.2	109.2	1,362.0	0.0	0.0
35.00		109.8	969.1					0.0	366.2	109.8	1,335.3	0.0	0.0
40.00		109.8	942.4					0.0	366.2	109.8	1,308.6	0.0	0.0
45.00		79.5	915.7					0.0	366.2	79.5	1,281.9	0.0	0.0
47.25	Bot - Section 2	55.1	403.3					0.0	164.8	55.1	568.2	0.0	0.0
50.00		60.9	911.0					0.0	201.4	60.9	1,112.4	0.0	0.0
52.75	Top - Section 1	55.1	896.0					0.0	201.4	55.1	1,097.4	0.0	0.0
55.00		79.3	337.2					0.0	164.8	79.3	502.0	0.0	0.0
60.00		108.3	732.7					0.0	366.2	108.3	1,098.9	0.0	0.0
65.00		106.7	709.8					0.0	366.2	106.7	1,076.1	0.0	0.0
70.00		104.9	686.9					0.0	366.2	104.9	1,053.2	0.0	0.0
75.00		102.8	664.0					0.0	366.2	102.8	1,030.3	0.0	0.0
80.00		100.6	641.2					0.0	366.2	100.6	1,007.4	0.0	0.0
85.00		98.3	618.3					0.0	366.2	98.3	984.5	0.0	0.0
90.00		53.3	595.4					0.0	366.2	53.3	961.7	0.0	0.0
90.50	Bot - Section 3	45.6	58.3					0.0	36.6	45.6	94.9	0.0	0.0
94.75	Top - Section 2	43.2	817.4					0.0	311.3	43.2	1,128.8	0.0	0.0
95.00		49.1	19.1					0.0	18.3	49.1	37.5	0.0	0.0
100.00		92.0	374.9					0.0	366.2	92.0	741.1	0.0	0.0
105.00		89.1	359.6					0.0	366.2	89.1	725.9	0.0	0.0
110.00		77.8	344.4					0.0	364.2	77.8	708.5	0.0	0.0
114.00	Appertunance(s)	42.3	264.5	1,918.1	0.0	0.0	4,138.0	0.0	290.2	1,960.4	4,692.7	0.0	0.0
115.00		41.1	64.6					0.0	22.1	41.1	86.7	0.0	0.0
119.00	Top - Section 3	40.7	252.3					0.0	88.3	40.7	340.6	0.0	0.0
120.00		16.0	46.3					0.0	22.1	16.0	68.4	0.0	0.0
121.00	Appertunance(s)	39.1	45.8	660.8	0.0	0.0	1,569.0	0.0	22.1	700.0	1,636.9	0.0	0.0
125.00		61.3	178.8					0.0	47.0	61.3	225.8	0.0	0.0
129.00	Appertunance(s)	30.1	171.4	1,212.7	0.0	3,304.1	2,523.1	0.0	47.0	1,242.8	2,741.6	0.0	0.0
								Totals:		6,376.59	36,219.6	0.00	0.00

Site Number: 283418 Code: ANSI/TIA-222-G

Site Name: NORTH HAVEN CT, CT Engineering Number:OAA686159_C3_01 9/28/2016 1:53:42 PM

Customer: Verizon Wireless

Load Case: 1.0D + 1.0W Serviceability 60 mph 21 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	-36.22	-6.34	0.00	-636.84	0.00	636.84	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.140
5.00	-34.72	-6.26	0.00	-605.16	0.00	605.16	4,749.48	2,374.74	9,204.97	4,609.33	0.02	-0.04	0.139
10.00	-33.24	-6.18	0.00	-573.89	0.00	573.89	4,666.73	2,333.36	8,826.25	4,419.68	0.09	-0.09	0.137
15.00	-31.80	-6.09	0.00	-543.01	0.00	543.01	4,582.46	2,291.23	8,452.48	4,232.52	0.21	-0.14	0.135
20.00	-30.38	-6.01	0.00	-512.54	0.00	512.54	4,496.68	2,248.34	8,083.87	4,047.94	0.38	-0.18	0.133
25.00	-28.98	-5.92	0.00	-482.49	0.00	482.49	4,406.48	2,203.24	7,715.56	3,863.51	0.60	-0.23	0.131
30.00	-27.62	-5.83	0.00	-452.88	0.00	452.88	4,289.92	2,144.96	7,310.76	3,660.81	0.87	-0.28	0.130
35.00	-26.28	-5.74	0.00	-423.73	0.00	423.73	4,173.36	2,086.68	6,916.87	3,463.58	1.19	-0.33	0.129
40.00	-24.96	-5.64	0.00	-395.05	0.00	395.05	4,056.80	2,028.40	6,533.89	3,271.80	1.56	-0.38	0.127
45.00	-23.68	-5.57	0.00	-366.85	0.00	366.85	3,940.24	1,970.12	6,161.81	3,085.49	1.98	-0.43	0.125
47.25	-23.11	-5.52	0.00	-354.33	0.00	354.33	3,887.79	1,943.89	5,997.94	3,003.43	2.19	-0.45	0.124
50.00	-21.99	-5.46	0.00	-339.16	0.00	339.16	3,823.68	1,911.84	5,800.65	2,904.64	2.46	-0.48	0.123
52.75	-20.89	-5.40	0.00	-324.14	0.00	324.14	3,282.31	1,641.15	5,013.65	2,510.55	2.75	-0.51	0.135
55.00	-20.39	-5.33	0.00	-311.98	0.00	311.98	3,248.58	1,624.29	4,893.74	2,450.51	2.99	-0.54	0.134
60.00	-19.29	-5.23	0.00	-285.31	0.00	285.31	3,149.47	1,574.74	4,597.09	2,301.96	3.59	-0.59	0.130
65.00	-18.21	-5.13	0.00	-259.14	0.00	259.14	3,049.56	1,524.78	4,308.58	2,157.49	4.24	-0.65	0.126
70.00	-17.15	-5.03	0.00	-233.47	0.00	233.47	2,949.66	1,474.83	4,029.43	2,017.71	4.95	-0.71	0.122
75.00	-16.12	-4.93	0.00	-208.30	0.00	208.30	2,849.75	1,424.87	3,759.63	1,882.61	5.72	-0.76	0.116
80.00	-15.11	-4.83	0.00	-183.63	0.00	183.63	2,749.84	1,374.92	3,499.17	1,752.19	6.55	-0.82	0.110
85.00	-14.12	-4.73	0.00	-159.46	0.00	159.46	2,649.93	1,324.97	3,248.06	1,626.45	7.43	-0.87	0.103
90.00	-13.16	-4.67	0.00	-135.79	0.00	135.79	2,550.02	1,275.01	3,006.31	1,505.39	8.37	-0.92	0.095
90.50	-13.06	-4.63	0.00	-133.46	0.00	133.46	2,540.03	1,270.02	2,982.64	1,493.54	8.47	-0.93	0.095
94.75	-11.93	-4.57	0.00	-113.78	0.00	113.78	1,607.72	803.86	1,873.69	938.24	9.32	-0.97	0.129
95.00	-11.89	-4.53	0.00	-112.63	0.00	112.63	1,605.47	802.74	1,867.31	935.04	9.37	-0.97	0.128
100.00	-11.15	-4.44	0.00	-89.98	0.00	89.98	1,559.66	779.83	1,741.06	871.82	10.42	-1.04	0.110
105.00	-10.42	-4.34	0.00	-67.80	0.00	67.80	1,512.33	756.17	1,617.47	809.94	11.54	-1.09	0.091
110.00	-9.71	-4.26	0.00	-46.08	0.00	46.08	1,463.49	731.75	1,496.76	749.49	12.71	-1.14	0.068
114.00	-5.06	-2.21	0.00	-29.05	0.00	29.05	1,417.15	708.58	1,396.33	699.20	13.68	-1.17	0.045
115.00	-4.97	-2.16	0.00	-26.84	0.00	26.84	1,403.83	701.92	1,370.07	686.05	13.92	-1.17	0.043
119.00	-4.63	-2.12	0.00	-18.19	0.00	18.19	1,350.55	675.27	1,267.52	634.70	14.91	-1.19	0.032
119.00	-4.63	-2.12	0.00	-18.19	0.00	18.19	952.84	476.42	899.15	450.24	14.91	-1.19	0.045
120.00	-4.56	-2.10	0.00	-16.07	0.00	16.07	946.51	473.26	884.32	442.82	15.16	-1.19	0.041
121.00	-2.94	-1.37	0.00	-13.97	0.00	13.97	940.12	470.06	869.55	435.42	15.41	-1.20	0.035
125.00	-2.71	-1.30	0.00	-8.51	0.00	8.51	913.97	456.98	811.15	406.18	16.42	-1.21	0.024
129.00	0.00	-1.24	0.00	-3.30	0.00	3.30	886.84	443.42	753.88	377.50	17.45	-1.22	0.009

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.18
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Long-Period Transition Period (T_L):	6
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coeffiecient F_v:	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.20
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Seismic Response Coefficient (C_s):	0.03
Upper Limit C_s	0.03
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	2.00
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.75
Total Unfactored Dead Load:	36.22 k
Seismic Base Shear (E):	1.56 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)
33	127.00	218	1,040	0.014	23	271
32	123.00	226	1,016	0.014	22	280
31	120.50	68	295	0.004	6	84
30	119.50	68	293	0.004	6	85
29	117.00	341	1,405	0.020	30	422
28	114.50	87	344	0.005	7	107
27	112.00	555	2,120	0.029	46	687
26	107.50	709	2,520	0.035	55	878
25	102.50	726	2,376	0.033	52	900
24	97.50	741	2,222	0.031	48	918
23	94.88	37	107	0.001	2	46
22	92.63	1,129	3,095	0.043	67	1,399
21	90.25	95	249	0.003	5	118
20	87.50	962	2,387	0.033	52	1,192
19	82.50	985	2,205	0.031	48	1,220
18	77.50	1,007	2,022	0.028	44	1,248
17	72.50	1,030	1,841	0.026	40	1,277
16	67.50	1,053	1,661	0.023	36	1,305
15	62.50	1,076	1,483	0.021	32	1,334
14	57.50	1,099	1,309	0.018	28	1,362
13	53.88	502	534	0.007	12	622
12	51.38	1,097	1,074	0.015	23	1,360
11	48.63	1,112	989	0.014	21	1,379

10	46.13	568	460	0.006	10	704
9	42.50	1,282	900	0.013	20	1,589
8	37.50	1,309	738	0.010	16	1,622
7	32.50	1,335	587	0.008	13	1,655
6	27.50	1,362	447	0.006	10	1,688
5	22.50	1,389	321	0.004	7	1,721
4	17.50	1,415	211	0.003	5	1,754
3	12.50	1,442	119	0.002	3	1,787
2	7.50	1,469	50	0.001	1	1,820
1	2.50	1,495	7	0.000	0	1,853
Alcatel-Lucent RRH2x	129.00	170	832	0.012	18	211
Alcatel-Lucent PCS B	129.00	165	807	0.011	18	204
Alcatel-Lucent B66A	129.00	201	983	0.014	21	249
Amphenol Antel BXA-1	129.00	38	188	0.003	4	48
RFS DB-T1-6Z-8AB-0Z	129.00	44	215	0.003	5	55
RFS DB-T1-6Z-8AB-0Z	129.00	44	215	0.003	5	55
Amphenol Antel BXA-8	129.00	18	88	0.001	2	22
Amphenol Antel BXA-7	129.00	38	188	0.003	4	48
Commscope SBNHH-1D65	129.00	304	1,488	0.021	32	377
Round Low Profile Pl	129.00	1,500	7,338	0.102	159	1,859
Ericsson AIR 21	121.00	819	3,582	0.050	78	1,015
Round T-Arm	121.00	750	3,280	0.046	71	929
Raycap DC6-48-60-18-	114.00	80	315	0.004	7	99
Ericsson mRRUS	114.00	132	520	0.007	11	164
Ericsson RRUS-11 (5	114.00	300	1,182	0.016	26	372
Ericsson RRUS-12 B2	114.00	348	1,372	0.019	30	431
Ericsson RRUS-32 (77	114.00	462	1,821	0.025	39	573
CCI CCI-HPA-65R-BUU-	114.00	816	3,216	0.045	70	1,011
Round Platform w/ Ha	114.00	2,000	7,883	0.110	171	2,479
		36,220	71,940	1.000	1,560	44,885

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)
33	127.00	218	1,040	0.014	23	188
32	123.00	226	1,016	0.014	22	194
31	120.50	68	295	0.004	6	58
30	119.50	68	293	0.004	6	59
29	117.00	341	1,405	0.020	30	293
28	114.50	87	344	0.005	7	75
27	112.00	555	2,120	0.029	46	477
26	107.50	709	2,520	0.035	55	610
25	102.50	726	2,376	0.033	52	625
24	97.50	741	2,222	0.031	48	638
23	94.88	37	107	0.001	2	32
22	92.63	1,129	3,095	0.043	67	972
21	90.25	95	249	0.003	5	82
20	87.50	962	2,387	0.033	52	828
19	82.50	985	2,205	0.031	48	847
18	77.50	1,007	2,022	0.028	44	867
17	72.50	1,030	1,841	0.026	40	887
16	67.50	1,053	1,661	0.023	36	907
15	62.50	1,076	1,483	0.021	32	926
14	57.50	1,099	1,309	0.018	28	946
13	53.88	502	534	0.007	12	432
12	51.38	1,097	1,074	0.015	23	945
11	48.63	1,112	989	0.014	21	957
10	46.13	568	460	0.006	10	489
9	42.50	1,282	900	0.013	20	1,103

8	37.50	1,309	738	0.010	16	1,126
7	32.50	1,335	587	0.008	13	1,149
6	27.50	1,362	447	0.006	10	1,172
5	22.50	1,389	321	0.004	7	1,195
4	17.50	1,415	211	0.003	5	1,218
3	12.50	1,442	119	0.002	3	1,241
2	7.50	1,469	50	0.001	1	1,264
1	2.50	1,495	7	0.000	0	1,287
Alcatel-Lucent RRH2x	129.00	170	832	0.012	18	146
Alcatel-Lucent PCS B	129.00	165	807	0.011	18	142
Alcatel-Lucent B66A	129.00	201	983	0.014	21	173
Amphenol Antel BXA-1	129.00	38	188	0.003	4	33
RFS DB-T1-6Z-8AB-0Z	129.00	44	215	0.003	5	38
RFS DB-T1-6Z-8AB-0Z	129.00	44	215	0.003	5	38
Amphenol Antel BXA-8	129.00	18	88	0.001	2	15
Amphenol Antel BXA-7	129.00	38	188	0.003	4	33
Commscope SBNHH-1D65	129.00	304	1,488	0.021	32	262
Round Low Profile Pl	129.00	1,500	7,338	0.102	159	1,291
Ericsson AIR 21	121.00	819	3,582	0.050	78	705
Round T-Arm	121.00	750	3,280	0.046	71	646
Raycap DC6-48-60-18-	114.00	80	315	0.004	7	69
Ericsson mRRUS	114.00	132	520	0.007	11	114
Ericsson RRUS-11 (5	114.00	300	1,182	0.016	26	258
Ericsson RRUS-12 B2	114.00	348	1,372	0.019	30	300
Ericsson RRUS-32 (77	114.00	462	1,821	0.025	39	398
CCI CCI-HPA-65R-BUU-	114.00	816	3,216	0.045	70	702
Round Platform w/ Ha	114.00	2,000	7,883	0.110	171	1,721
		36,220	71,940	1.000	1,560	31,176

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	-43.03	-1.56	0.00	-162.98	0.00	162.98	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.043
5.00	-41.21	-1.57	0.00	-155.16	0.00	155.16	4,749.48	2,374.74	9,204.97	4,609.33	0.01	-0.01	0.042
10.00	-39.42	-1.58	0.00	-147.31	0.00	147.31	4,666.73	2,333.36	8,826.25	4,419.68	0.02	-0.02	0.042
15.00	-37.67	-1.58	0.00	-139.43	0.00	139.43	4,582.46	2,291.23	8,452.48	4,232.52	0.05	-0.03	0.041
20.00	-35.95	-1.58	0.00	-131.54	0.00	131.54	4,496.68	2,248.34	8,083.87	4,047.94	0.10	-0.05	0.040
25.00	-34.26	-1.57	0.00	-123.65	0.00	123.65	4,406.48	2,203.24	7,715.56	3,863.51	0.15	-0.06	0.040
30.00	-32.60	-1.57	0.00	-115.79	0.00	115.79	4,289.92	2,144.96	7,310.76	3,660.81	0.22	-0.07	0.039
35.00	-30.98	-1.55	0.00	-107.96	0.00	107.96	4,173.36	2,086.68	6,916.87	3,463.58	0.30	-0.08	0.039
40.00	-29.39	-1.54	0.00	-100.19	0.00	100.19	4,056.80	2,028.40	6,533.89	3,271.80	0.40	-0.10	0.038
45.00	-28.69	-1.53	0.00	-92.49	0.00	92.49	3,940.24	1,970.12	6,161.81	3,085.49	0.51	-0.11	0.037
47.25	-27.31	-1.51	0.00	-89.04	0.00	89.04	3,887.79	1,943.89	5,997.94	3,003.43	0.56	-0.12	0.037
50.00	-25.95	-1.49	0.00	-84.89	0.00	84.89	3,823.68	1,911.84	5,800.65	2,904.64	0.63	-0.12	0.036
52.75	-25.33	-1.48	0.00	-80.79	0.00	80.79	3,282.31	1,641.15	5,013.65	2,510.55	0.70	-0.13	0.040
55.00	-23.97	-1.45	0.00	-77.46	0.00	77.46	3,248.58	1,624.29	4,893.74	2,450.51	0.77	-0.14	0.039
60.00	-22.63	-1.42	0.00	-70.21	0.00	70.21	3,149.47	1,574.74	4,597.09	2,301.96	0.92	-0.15	0.038
65.00	-21.33	-1.39	0.00	-63.10	0.00	63.10	3,049.56	1,524.78	4,308.58	2,157.49	1.08	-0.16	0.036
70.00	-20.05	-1.35	0.00	-56.17	0.00	56.17	2,949.66	1,474.83	4,029.43	2,017.71	1.26	-0.18	0.035
75.00	-18.80	-1.30	0.00	-49.43	0.00	49.43	2,849.75	1,424.87	3,759.63	1,882.61	1.46	-0.19	0.033
80.00	-17.58	-1.26	0.00	-42.90	0.00	42.90	2,749.84	1,374.92	3,499.17	1,752.19	1.66	-0.20	0.031
85.00	-16.39	-1.20	0.00	-36.62	0.00	36.62	2,649.93	1,324.97	3,248.06	1,626.45	1.88	-0.22	0.029
90.00	-16.27	-1.20	0.00	-30.60	0.00	30.60	2,550.02	1,275.01	3,006.31	1,505.39	2.12	-0.23	0.027
90.50	-14.87	-1.13	0.00	-30.00	0.00	30.00	2,540.03	1,270.02	2,982.64	1,493.54	2.14	-0.23	0.026
94.75	-14.83	-1.13	0.00	-25.21	0.00	25.21	1,607.72	803.86	1,873.69	938.24	2.35	-0.24	0.036
95.00	-13.91	-1.08	0.00	-24.92	0.00	24.92	1,605.47	802.74	1,867.31	935.04	2.36	-0.24	0.035
100.00	-13.01	-1.02	0.00	-19.54	0.00	19.54	1,559.66	779.83	1,741.06	871.82	2.62	-0.25	0.031
105.00	-12.13	-0.97	0.00	-14.42	0.00	14.42	1,512.33	756.17	1,617.47	809.94	2.90	-0.27	0.026
110.00	-11.44	-0.92	0.00	-9.57	0.00	9.57	1,463.49	731.75	1,496.76	749.49	3.18	-0.28	0.021
114.00	-6.21	-0.53	0.00	-5.89	0.00	5.89	1,417.15	708.58	1,396.33	699.20	3.41	-0.28	0.013
115.00	-5.79	-0.50	0.00	-5.36	0.00	5.36	1,403.83	701.92	1,370.07	686.05	3.47	-0.28	0.012
119.00	-5.70	-0.50	0.00	-3.35	0.00	3.35	1,350.55	675.27	1,267.52	634.70	3.71	-0.29	0.009
119.00	-5.70	-0.50	0.00	-3.35	0.00	3.35	952.84	476.42	899.15	450.24	3.71	-0.29	0.013
120.00	-5.62	-0.49	0.00	-2.85	0.00	2.85	946.51	473.26	884.32	442.82	3.77	-0.29	0.012
121.00	-3.40	-0.31	0.00	-2.36	0.00	2.36	940.12	470.06	869.55	435.42	3.83	-0.29	0.009
125.00	-3.13	-0.28	0.00	-1.13	0.00	1.13	913.97	456.98	811.15	406.18	4.07	-0.29	0.006
129.00	0.00	-0.27	0.00	0.00	0.00	0.00	886.84	443.42	753.88	377.50	4.32	-0.29	0.000

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-29.89	-1.56	0.00	-161.10	0.00	161.10	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.040
5.00	-28.62	-1.57	0.00	-153.29	0.00	153.29	4,749.48	2,374.74	9,204.97	4,609.33	0.01	-0.01	0.039
10.00	-27.38	-1.57	0.00	-145.46	0.00	145.46	4,666.73	2,333.36	8,826.25	4,419.68	0.02	-0.02	0.039
15.00	-26.16	-1.57	0.00	-137.61	0.00	137.61	4,582.46	2,291.23	8,452.48	4,232.52	0.05	-0.03	0.038
20.00	-24.97	-1.57	0.00	-129.76	0.00	129.76	4,496.68	2,248.34	8,083.87	4,047.94	0.10	-0.05	0.038
25.00	-23.80	-1.56	0.00	-121.93	0.00	121.93	4,406.48	2,203.24	7,715.56	3,863.51	0.15	-0.06	0.037
30.00	-22.65	-1.55	0.00	-114.12	0.00	114.12	4,289.92	2,144.96	7,310.76	3,660.81	0.22	-0.07	0.036
35.00	-21.52	-1.54	0.00	-106.37	0.00	106.37	4,173.36	2,086.68	6,916.87	3,463.58	0.30	-0.08	0.036
40.00	-20.42	-1.52	0.00	-98.67	0.00	98.67	4,056.80	2,028.40	6,533.89	3,271.80	0.39	-0.10	0.035
45.00	-19.93	-1.51	0.00	-91.06	0.00	91.06	3,940.24	1,970.12	6,161.81	3,085.49	0.50	-0.11	0.035
47.25	-18.97	-1.49	0.00	-87.65	0.00	87.65	3,887.79	1,943.89	5,997.94	3,003.43	0.55	-0.11	0.034
50.00	-18.02	-1.47	0.00	-83.54	0.00	83.54	3,823.68	1,911.84	5,800.65	2,904.64	0.62	-0.12	0.033
52.75	-17.59	-1.46	0.00	-79.50	0.00	79.50	3,282.31	1,641.15	5,013.65	2,510.55	0.69	-0.13	0.037
55.00	-16.65	-1.43	0.00	-76.21	0.00	76.21	3,248.58	1,624.29	4,893.74	2,450.51	0.76	-0.13	0.036
60.00	-15.72	-1.40	0.00	-69.05	0.00	69.05	3,149.47	1,574.74	4,597.09	2,301.96	0.90	-0.15	0.035
65.00	-14.81	-1.37	0.00	-62.04	0.00	62.04	3,049.56	1,524.78	4,308.58	2,157.49	1.07	-0.16	0.034
70.00	-13.93	-1.33	0.00	-55.21	0.00	55.21	2,949.66	1,474.83	4,029.43	2,017.71	1.24	-0.18	0.032
75.00	-13.06	-1.28	0.00	-48.57	0.00	48.57	2,849.75	1,424.87	3,759.63	1,882.61	1.43	-0.19	0.030
80.00	-12.21	-1.24	0.00	-42.15	0.00	42.15	2,749.84	1,374.92	3,499.17	1,752.19	1.64	-0.20	0.028
85.00	-11.38	-1.18	0.00	-35.97	0.00	35.97	2,649.93	1,324.97	3,248.06	1,626.45	1.86	-0.21	0.026
90.00	-11.30	-1.18	0.00	-30.05	0.00	30.05	2,550.02	1,275.01	3,006.31	1,505.39	2.09	-0.23	0.024
90.50	-10.33	-1.11	0.00	-29.46	0.00	29.46	2,540.03	1,270.02	2,982.64	1,493.54	2.11	-0.23	0.024
94.75	-10.30	-1.11	0.00	-24.75	0.00	24.75	1,607.72	803.86	1,873.69	938.24	2.32	-0.24	0.033
95.00	-9.66	-1.06	0.00	-24.47	0.00	24.47	1,605.47	802.74	1,867.31	935.04	2.33	-0.24	0.032
100.00	-9.03	-1.01	0.00	-19.18	0.00	19.18	1,559.66	779.83	1,741.06	871.82	2.58	-0.25	0.028
105.00	-8.42	-0.95	0.00	-14.15	0.00	14.15	1,512.33	756.17	1,617.47	809.94	2.85	-0.26	0.023
110.00	-7.95	-0.90	0.00	-9.40	0.00	9.40	1,463.49	731.75	1,496.76	749.49	3.13	-0.27	0.018
114.00	-4.31	-0.52	0.00	-5.79	0.00	5.79	1,417.15	708.58	1,396.33	699.20	3.36	-0.28	0.011
115.00	-4.02	-0.49	0.00	-5.26	0.00	5.26	1,403.83	701.92	1,370.07	686.05	3.42	-0.28	0.011
119.00	-3.96	-0.49	0.00	-3.29	0.00	3.29	1,350.55	675.27	1,267.52	634.70	3.66	-0.28	0.008
119.00	-3.96	-0.49	0.00	-3.29	0.00	3.29	952.84	476.42	899.15	450.24	3.66	-0.28	0.011
120.00	-3.90	-0.48	0.00	-2.80	0.00	2.80	946.51	473.26	884.32	442.82	3.71	-0.28	0.010
121.00	-2.36	-0.30	0.00	-2.32	0.00	2.32	940.12	470.06	869.55	435.42	3.77	-0.28	0.008
125.00	-2.17	-0.28	0.00	-1.11	0.00	1.11	913.97	456.98	811.15	406.18	4.01	-0.29	0.005
129.00	0.00	-0.27	0.00	0.00	0.00	0.00	886.84	443.42	753.88	377.50	4.25	-0.29	0.000

Equivalent Modal Forces Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.18
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.20
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	2.00
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)
33	127.00	218	1.832	1.687	1.033	0.338	64	271
32	123.00	226	1.718	1.193	0.843	0.269	53	280
31	120.50	68	1.649	0.939	0.739	0.229	13	84
30	119.50	68	1.622	0.848	0.700	0.214	13	85
29	117.00	341	1.555	0.645	0.610	0.178	53	422
28	114.50	87	1.489	0.474	0.530	0.145	11	107
27	112.00	555	1.425	0.332	0.458	0.115	55	687
26	107.50	709	1.312	0.138	0.347	0.068	42	878
25	102.50	726	1.193	-0.002	0.250	0.026	17	900
24	97.50	741	1.080	-0.081	0.175	-0.005	-3	918
23	94.88	37	1.022	-0.104	0.143	-0.016	-1	46
22	92.63	1,129	0.974	-0.115	0.119	-0.024	-24	1,399
21	90.25	95	0.925	-0.121	0.097	-0.030	-2	118
20	87.50	962	0.870	-0.121	0.076	-0.034	-28	1,192
19	82.50	985	0.773	-0.106	0.046	-0.034	-29	1,220
18	77.50	1,007	0.682	-0.081	0.027	-0.024	-21	1,248
17	72.50	1,030	0.597	-0.052	0.014	-0.010	-9	1,277
16	67.50	1,053	0.517	-0.023	0.008	0.008	7	1,305
15	62.50	1,076	0.444	0.004	0.006	0.024	22	1,334
14	57.50	1,099	0.376	0.026	0.007	0.036	35	1,362
13	53.88	502	0.330	0.038	0.010	0.043	19	622
12	51.38	1,097	0.300	0.045	0.012	0.046	44	1,360
11	48.63	1,112	0.269	0.052	0.015	0.048	46	1,379
10	46.13	568	0.242	0.057	0.018	0.049	24	704
9	42.50	1,282	0.205	0.062	0.023	0.050	56	1,589
8	37.50	1,309	0.160	0.067	0.029	0.050	56	1,622
7	32.50	1,335	0.120	0.070	0.034	0.049	56	1,655
6	27.50	1,362	0.086	0.071	0.039	0.047	56	1,688
5	22.50	1,389	0.057	0.071	0.041	0.045	55	1,721
4	17.50	1,415	0.035	0.069	0.041	0.043	53	1,754
3	12.50	1,442	0.018	0.063	0.037	0.039	49	1,787
2	7.50	1,469	0.006	0.048	0.027	0.032	40	1,820
1	2.50	1,495	0.001	0.021	0.011	0.015	19	1,853
Alcatel-Lucent RRH2x	129.00	170	1.890	1.980	1.140	0.376	55	211

Alcatel-Lucent PCS B	129.00	165	1.890	1.980	1.140	0.376	54	204
Alcatel-Lucent B66A	129.00	201	1.890	1.980	1.140	0.376	65	249
Amphenol Antel BXA-1	129.00	38	1.890	1.980	1.140	0.376	13	48
RFS DB-T1-6Z-8AB-0Z	129.00	44	1.890	1.980	1.140	0.376	14	55
RFS DB-T1-6Z-8AB-0Z	129.00	44	1.890	1.980	1.140	0.376	14	55
Amphenol Antel BXA-8	129.00	18	1.890	1.980	1.140	0.376	6	22
Amphenol Antel BXA-7	129.00	38	1.890	1.980	1.140	0.376	13	48
Commscope SBNHH-	129.00	304	1.890	1.980	1.140	0.376	99	377
Round Low Profile Pl	129.00	1,500	1.890	1.980	1.140	0.376	489	1,859
Ericsson AIR 21	121.00	819	1.663	0.986	0.759	0.236	168	1,015
Round T-Arm	121.00	750	1.663	0.986	0.759	0.236	154	929
Raycap DC6-48-60-18-	114.00	80	1.476	0.444	0.515	0.139	10	99
Ericsson mRRUS	114.00	132	1.476	0.444	0.515	0.139	16	164
Ericsson RRUS-11 (5	114.00	300	1.476	0.444	0.515	0.139	36	372
Ericsson RRUS-12 B2	114.00	348	1.476	0.444	0.515	0.139	42	431
Ericsson RRUS-32 (77	114.00	462	1.476	0.444	0.515	0.139	56	573
CCI CCI-HPA-65R-BUU-	114.00	816	1.476	0.444	0.515	0.139	98	1,011
Round Platform w/ Ha	114.00	2,000	1.476	0.444	0.515	0.139	241	2,479
		36,220	56.440	31.095	23.087	7.232	2,482	44,885

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)
33	127.00	218	1.832	1.687	1.033	0.338	64	188
32	123.00	226	1.718	1.193	0.843	0.269	53	194
31	120.50	68	1.649	0.939	0.739	0.229	13	58
30	119.50	68	1.622	0.848	0.700	0.214	13	59
29	117.00	341	1.555	0.645	0.610	0.178	53	293
28	114.50	87	1.489	0.474	0.530	0.145	11	75
27	112.00	555	1.425	0.332	0.458	0.115	55	477
26	107.50	709	1.312	0.138	0.347	0.068	42	610
25	102.50	726	1.193	-0.002	0.250	0.026	17	625
24	97.50	741	1.080	-0.081	0.175	-0.005	-3	638
23	94.88	37	1.022	-0.104	0.143	-0.016	-1	32
22	92.63	1,129	0.974	-0.115	0.119	-0.024	-24	972
21	90.25	95	0.925	-0.121	0.097	-0.030	-2	82
20	87.50	962	0.870	-0.121	0.076	-0.034	-28	828
19	82.50	985	0.773	-0.106	0.046	-0.034	-29	847
18	77.50	1,007	0.682	-0.081	0.027	-0.024	-21	867
17	72.50	1,030	0.597	-0.052	0.014	-0.010	-9	887
16	67.50	1,053	0.517	-0.023	0.008	0.008	7	907
15	62.50	1,076	0.444	0.004	0.006	0.024	22	926
14	57.50	1,099	0.376	0.026	0.007	0.036	35	946
13	53.88	502	0.330	0.038	0.010	0.043	19	432
12	51.38	1,097	0.300	0.045	0.012	0.046	44	945
11	48.63	1,112	0.269	0.052	0.015	0.048	46	957
10	46.13	568	0.242	0.057	0.018	0.049	24	489
9	42.50	1,282	0.205	0.062	0.023	0.050	56	1,103
8	37.50	1,309	0.160	0.067	0.029	0.050	56	1,126
7	32.50	1,335	0.120	0.070	0.034	0.049	56	1,149
6	27.50	1,362	0.086	0.071	0.039	0.047	56	1,172
5	22.50	1,389	0.057	0.071	0.041	0.045	55	1,195
4	17.50	1,415	0.035	0.069	0.041	0.043	53	1,218
3	12.50	1,442	0.018	0.063	0.037	0.039	49	1,241
2	7.50	1,469	0.006	0.048	0.027	0.032	40	1,264
1	2.50	1,495	0.001	0.021	0.011	0.015	19	1,287
Alcatel-Lucent RRH2x	129.00	170	1.890	1.980	1.140	0.376	55	146
Alcatel-Lucent PCS B	129.00	165	1.890	1.980	1.140	0.376	54	142

Alcatel-Lucent B66A	129.00	201	1.890	1.980	1.140	0.376	65	173
Amphenol Antel BXA-1	129.00	38	1.890	1.980	1.140	0.376	13	33
RFS DB-T1-6Z-8AB-0Z	129.00	44	1.890	1.980	1.140	0.376	14	38
RFS DB-T1-6Z-8AB-0Z	129.00	44	1.890	1.980	1.140	0.376	14	38
Amphenol Antel BXA-8	129.00	18	1.890	1.980	1.140	0.376	6	15
Amphenol Antel BXA-7	129.00	38	1.890	1.980	1.140	0.376	13	33
Commscope SBNHH-	129.00	304	1.890	1.980	1.140	0.376	99	262
Round Low Profile Pl	129.00	1,500	1.890	1.980	1.140	0.376	489	1,291
Ericsson AIR 21	121.00	819	1.663	0.986	0.759	0.236	168	705
Round T-Arm	121.00	750	1.663	0.986	0.759	0.236	154	646
Raycap DC6-48-60-18-	114.00	80	1.476	0.444	0.515	0.139	10	69
Ericsson mRRUS	114.00	132	1.476	0.444	0.515	0.139	16	114
Ericsson RRUS-11 (5	114.00	300	1.476	0.444	0.515	0.139	36	258
Ericsson RRUS-12 B2	114.00	348	1.476	0.444	0.515	0.139	42	300
Ericsson RRUS-32 (77	114.00	462	1.476	0.444	0.515	0.139	56	398
CCI CCI-HPA-65R-BUU-	114.00	816	1.476	0.444	0.515	0.139	98	702
Round Platform w/ Ha	114.00	2,000	1.476	0.444	0.515	0.139	241	1,721
		36,220	56.440	31.095	23.087	7.232	2,482	31,176

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	-43.03	-2.47	0.00	-258.99	0.00	258.99	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.063
5.00	-41.21	-2.44	0.00	-246.65	0.00	246.65	4,749.48	2,374.74	9,204.97	4,609.33	0.01	-0.02	0.062
10.00	-39.42	-2.40	0.00	-234.44	0.00	234.44	4,666.73	2,333.36	8,826.25	4,419.68	0.04	-0.04	0.061
15.00	-37.67	-2.36	0.00	-222.42	0.00	222.42	4,582.46	2,291.23	8,452.48	4,232.52	0.09	-0.06	0.061
20.00	-35.95	-2.32	0.00	-210.61	0.00	210.61	4,496.68	2,248.34	8,083.87	4,047.94	0.16	-0.07	0.060
25.00	-34.26	-2.27	0.00	-199.02	0.00	199.02	4,406.48	2,203.24	7,715.56	3,863.51	0.24	-0.09	0.059
30.00	-32.60	-2.22	0.00	-187.67	0.00	187.67	4,289.92	2,144.96	7,310.76	3,660.81	0.35	-0.11	0.059
35.00	-30.98	-2.18	0.00	-176.55	0.00	176.55	4,173.36	2,086.68	6,916.87	3,463.58	0.49	-0.14	0.058
40.00	-29.39	-2.13	0.00	-165.67	0.00	165.67	4,056.80	2,028.40	6,533.89	3,271.80	0.64	-0.16	0.058
45.00	-28.69	-2.11	0.00	-155.04	0.00	155.04	3,940.24	1,970.12	6,161.81	3,085.49	0.81	-0.18	0.058
47.25	-27.31	-2.06	0.00	-150.30	0.00	150.30	3,887.79	1,943.89	5,997.94	3,003.43	0.90	-0.19	0.057
50.00	-25.95	-2.02	0.00	-144.63	0.00	144.63	3,823.68	1,911.84	5,800.65	2,904.64	1.01	-0.20	0.057
52.75	-25.32	-2.00	0.00	-139.07	0.00	139.07	3,282.31	1,641.15	5,013.65	2,510.55	1.13	-0.21	0.063
55.00	-23.96	-1.97	0.00	-134.56	0.00	134.56	3,248.58	1,624.29	4,893.74	2,450.51	1.23	-0.22	0.062
60.00	-22.63	-1.95	0.00	-124.71	0.00	124.71	3,149.47	1,574.74	4,597.09	2,301.96	1.48	-0.25	0.061
65.00	-21.32	-1.95	0.00	-114.94	0.00	114.94	3,049.56	1,524.78	4,308.58	2,157.49	1.75	-0.27	0.060
70.00	-20.04	-1.96	0.00	-105.19	0.00	105.19	2,949.66	1,474.83	4,029.43	2,017.71	2.05	-0.30	0.059
75.00	-18.79	-1.98	0.00	-95.39	0.00	95.39	2,849.75	1,424.87	3,759.63	1,882.61	2.38	-0.32	0.057
80.00	-17.57	-2.01	0.00	-85.47	0.00	85.47	2,749.84	1,374.92	3,499.17	1,752.19	2.73	-0.35	0.055
85.00	-16.38	-2.04	0.00	-75.40	0.00	75.40	2,649.93	1,324.97	3,248.06	1,626.45	3.11	-0.37	0.053
90.00	-16.26	-2.05	0.00	-65.20	0.00	65.20	2,550.02	1,275.01	3,006.31	1,505.39	3.51	-0.40	0.050
90.50	-14.86	-2.06	0.00	-64.17	0.00	64.17	2,540.03	1,270.02	2,982.64	1,493.54	3.55	-0.40	0.049
94.75	-14.82	-2.07	0.00	-55.40	0.00	55.40	1,607.72	803.86	1,873.69	938.24	3.92	-0.42	0.068
95.00	-13.90	-2.07	0.00	-54.89	0.00	54.89	1,605.47	802.74	1,867.31	935.04	3.94	-0.42	0.067
100.00	-13.00	-2.05	0.00	-44.55	0.00	44.55	1,559.66	779.83	1,741.06	871.82	4.40	-0.45	0.059
105.00	-12.12	-2.01	0.00	-34.30	0.00	34.30	1,512.33	756.17	1,617.47	809.94	4.89	-0.48	0.050
110.00	-11.43	-1.95	0.00	-24.26	0.00	24.26	1,463.49	731.75	1,496.76	749.49	5.41	-0.51	0.040
114.00	-6.20	-1.39	0.00	-16.47	0.00	16.47	1,417.15	708.58	1,396.33	699.20	5.84	-0.52	0.028
115.00	-5.78	-1.34	0.00	-15.07	0.00	15.07	1,403.83	701.92	1,370.07	686.05	5.95	-0.52	0.026
119.00	-5.69	-1.33	0.00	-9.72	0.00	9.72	1,350.55	675.27	1,267.52	634.70	6.39	-0.53	0.020
119.00	-5.69	-1.33	0.00	-9.72	0.00	9.72	952.84	476.42	899.15	450.24	6.39	-0.53	0.028
120.00	-5.61	-1.31	0.00	-8.39	0.00	8.39	946.51	473.26	884.32	442.82	6.51	-0.54	0.025
121.00	-3.39	-0.92	0.00	-7.08	0.00	7.08	940.12	470.06	869.55	435.42	6.62	-0.54	0.020
125.00	-3.12	-0.85	0.00	-3.41	0.00	3.41	913.97	456.98	811.15	406.18	7.07	-0.55	0.012
129.00	0.00	-0.82	0.00	0.00	0.00	0.00	886.84	443.42	753.88	377.50	7.53	-0.55	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	-29.89	-2.47	0.00	-255.81	0.00	255.81	4,830.72	2,415.36	9,588.44	4,801.34	0.00	0.00	0.059
5.00	-28.62	-2.44	0.00	-243.48	0.00	243.48	4,749.48	2,374.74	9,204.97	4,609.33	0.01	-0.02	0.059
10.00	-27.38	-2.39	0.00	-231.30	0.00	231.30	4,666.73	2,333.36	8,826.25	4,419.68	0.04	-0.04	0.058
15.00	-26.16	-2.35	0.00	-219.33	0.00	219.33	4,582.46	2,291.23	8,452.48	4,232.52	0.09	-0.05	0.058
20.00	-24.97	-2.30	0.00	-207.59	0.00	207.59	4,496.68	2,248.34	8,083.87	4,047.94	0.15	-0.07	0.057
25.00	-23.79	-2.25	0.00	-196.08	0.00	196.08	4,406.48	2,203.24	7,715.56	3,863.51	0.24	-0.09	0.056
30.00	-22.64	-2.20	0.00	-184.82	0.00	184.82	4,289.92	2,144.96	7,310.76	3,660.81	0.35	-0.11	0.056
35.00	-21.52	-2.15	0.00	-173.82	0.00	173.82	4,173.36	2,086.68	6,916.87	3,463.58	0.48	-0.13	0.055
40.00	-20.41	-2.10	0.00	-163.06	0.00	163.06	4,056.80	2,028.40	6,533.89	3,271.80	0.63	-0.15	0.055
45.00	-19.92	-2.08	0.00	-152.57	0.00	152.57	3,940.24	1,970.12	6,161.81	3,085.49	0.80	-0.17	0.055
47.25	-18.96	-2.03	0.00	-147.89	0.00	147.89	3,887.79	1,943.89	5,997.94	3,003.43	0.89	-0.18	0.054
50.00	-18.02	-1.99	0.00	-142.30	0.00	142.30	3,823.68	1,911.84	5,800.65	2,904.64	1.00	-0.20	0.054
52.75	-17.59	-1.97	0.00	-136.83	0.00	136.83	3,282.31	1,641.15	5,013.65	2,510.55	1.11	-0.21	0.060
55.00	-16.64	-1.94	0.00	-132.39	0.00	132.39	3,248.58	1,624.29	4,893.74	2,450.51	1.21	-0.22	0.059
60.00	-15.71	-1.92	0.00	-122.69	0.00	122.69	3,149.47	1,574.74	4,597.09	2,301.96	1.46	-0.24	0.058
65.00	-14.81	-1.92	0.00	-113.08	0.00	113.08	3,049.56	1,524.78	4,308.58	2,157.49	1.73	-0.27	0.057
70.00	-13.92	-1.93	0.00	-103.50	0.00	103.50	2,949.66	1,474.83	4,029.43	2,017.71	2.02	-0.29	0.056
75.00	-13.05	-1.95	0.00	-93.87	0.00	93.87	2,849.75	1,424.87	3,759.63	1,882.61	2.34	-0.32	0.054
80.00	-12.20	-1.98	0.00	-84.12	0.00	84.12	2,749.84	1,374.92	3,499.17	1,752.19	2.69	-0.34	0.052
85.00	-11.37	-2.01	0.00	-74.23	0.00	74.23	2,649.93	1,324.97	3,248.06	1,626.45	3.06	-0.37	0.050
90.00	-11.29	-2.01	0.00	-64.20	0.00	64.20	2,550.02	1,275.01	3,006.31	1,505.39	3.46	-0.39	0.047
90.50	-10.32	-2.03	0.00	-63.19	0.00	63.19	2,540.03	1,270.02	2,982.64	1,493.54	3.50	-0.40	0.046
94.75	-10.29	-2.03	0.00	-54.57	0.00	54.57	1,607.72	803.86	1,873.69	938.24	3.86	-0.42	0.065
95.00	-9.65	-2.03	0.00	-54.06	0.00	54.06	1,605.47	802.74	1,867.31	935.04	3.88	-0.42	0.064
100.00	-9.02	-2.02	0.00	-43.89	0.00	43.89	1,559.66	779.83	1,741.06	871.82	4.34	-0.45	0.056
105.00	-8.41	-1.97	0.00	-33.81	0.00	33.81	1,512.33	756.17	1,617.47	809.94	4.82	-0.47	0.047
110.00	-7.93	-1.92	0.00	-23.94	0.00	23.94	1,463.49	731.75	1,496.76	749.49	5.33	-0.50	0.037
114.00	-4.30	-1.38	0.00	-16.27	0.00	16.27	1,417.15	708.58	1,396.33	699.20	5.75	-0.51	0.026
115.00	-4.01	-1.32	0.00	-14.89	0.00	14.89	1,403.83	701.92	1,370.07	686.05	5.86	-0.52	0.025
119.00	-3.95	-1.31	0.00	-9.60	0.00	9.60	1,350.55	675.27	1,267.52	634.70	6.30	-0.53	0.018
119.00	-3.95	-1.31	0.00	-9.60	0.00	9.60	952.84	476.42	899.15	450.24	6.30	-0.53	0.025
120.00	-3.89	-1.30	0.00	-8.29	0.00	8.29	946.51	473.26	884.32	442.82	6.41	-0.53	0.023
121.00	-2.35	-0.91	0.00	-7.00	0.00	7.00	940.12	470.06	869.55	435.42	6.52	-0.53	0.019
125.00	-2.16	-0.84	0.00	-3.37	0.00	3.37	913.97	456.98	811.15	406.18	6.97	-0.54	0.011
129.00	0.00	-0.82	0.00	0.00	0.00	0.00	886.84	443.42	753.88	377.50	7.42	-0.54	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	26.51	0.00	43.42	0.00	0.00	2678.17	0.00	0.57
0.9D + 1.6W	26.49	0.00	32.55	0.00	0.00	2651.62	0.00	0.56
1.2D + 1.0Di + 1.0Wi	7.13	0.00	64.14	0.00	0.00	700.71	0.00	0.16
(1.2 + 0.2Sds) * DL + E ELFM	1.56	0.00	43.03	0.00	0.00	162.98	0.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	2.47	0.00	43.03	0.00	0.00	258.99	94.75	0.07
(0.9 - 0.2Sds) * DL + E ELFM	1.56	0.00	29.89	0.00	0.00	161.10	0.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	2.47	0.00	29.89	0.00	0.00	255.81	94.75	0.06
1.0D + 1.0W	6.34	0.00	36.22	0.00	0.00	636.84	0.00	0.14

Base/Flange Plate	Plate Type	***Baseplate***
	Pole Diameter	48.8 in
	Pole Thickness	0.437 in
	Plate Length	58 in
	Plate Thickness	2.75 in
	Plate Fy	50 ksi
	Weld Length	0.125 in
	ϕ_s Resistance	2805.40 k-in
	Applied	1058.46 k-in
Stiffeners	#	***0***

Bolts	#	***20***
	Bolt Circle	55.25 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	118.43 k
Reinforcement ●	#	***0***
Extra Bolts O	#	***0***

Code Rev. ***G***

Moment 2678.2 k-ft

Axial 43.4 k

Date	9/28/2016
Engineer	SRS
Site #	283418
Carrier	Verizon Wireless

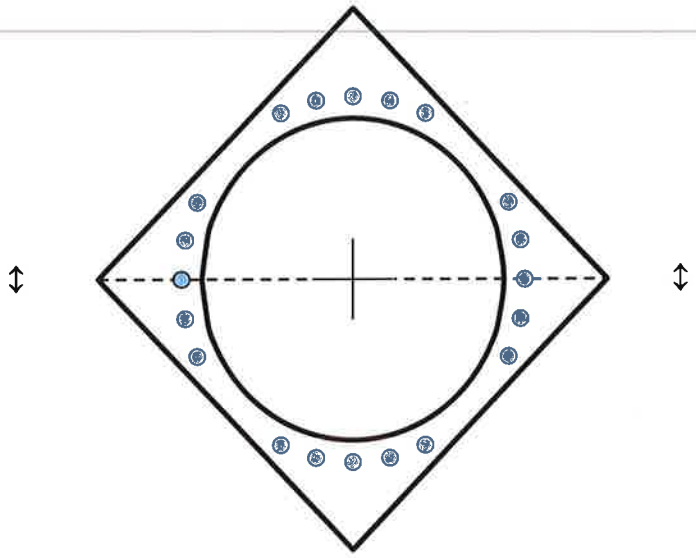


Plate Stress Ratio:

0.38 (Pass)

Bolt Stress Ratio:

0.46 (Pass)

Base/Flange Plate	Plate Type	***Flange @ 119.0 ft***
	Pole Diameter	23.16 in
	Pole Thickness	0.1875 in
	Plate Diameter	30.375 in
	Plate Thickness	1.25 in
	Plate Fy	60 ksi
	Weld Length	0.125 in
	ϕ_s Resistance	99.19 k-in
	Applied	7.69 k-in
Stiffeners	#	***0***

Bolts	#	***14***
	Bolt Circle	26.125 in
	(R)adial / (S)quare	R
	Diameter	1 in
	Hole Diameter	1.125 in
	Type	A325
	Fy	92 ksi
	Fu	120 ksi
	ϕ_s Resistance	54.52 k
	Applied	9.68 k
Reinforcement ●	#	***0***
Extra Bolts O	#	***0***

Code Rev. **G**

Moment 76.4 k-ft
Axial 4.9 k

Date	9/28/2016
Engineer	SRS
Site #	283418
Carrier	Verizon Wireless

Required Flange Thickness:
0.35 in OK

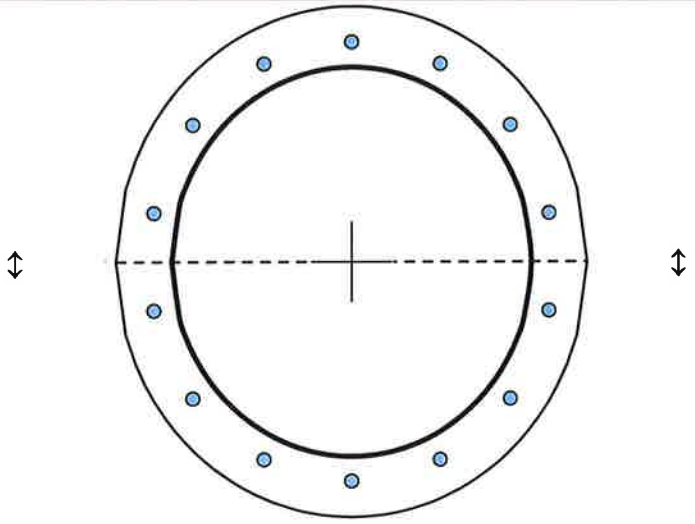
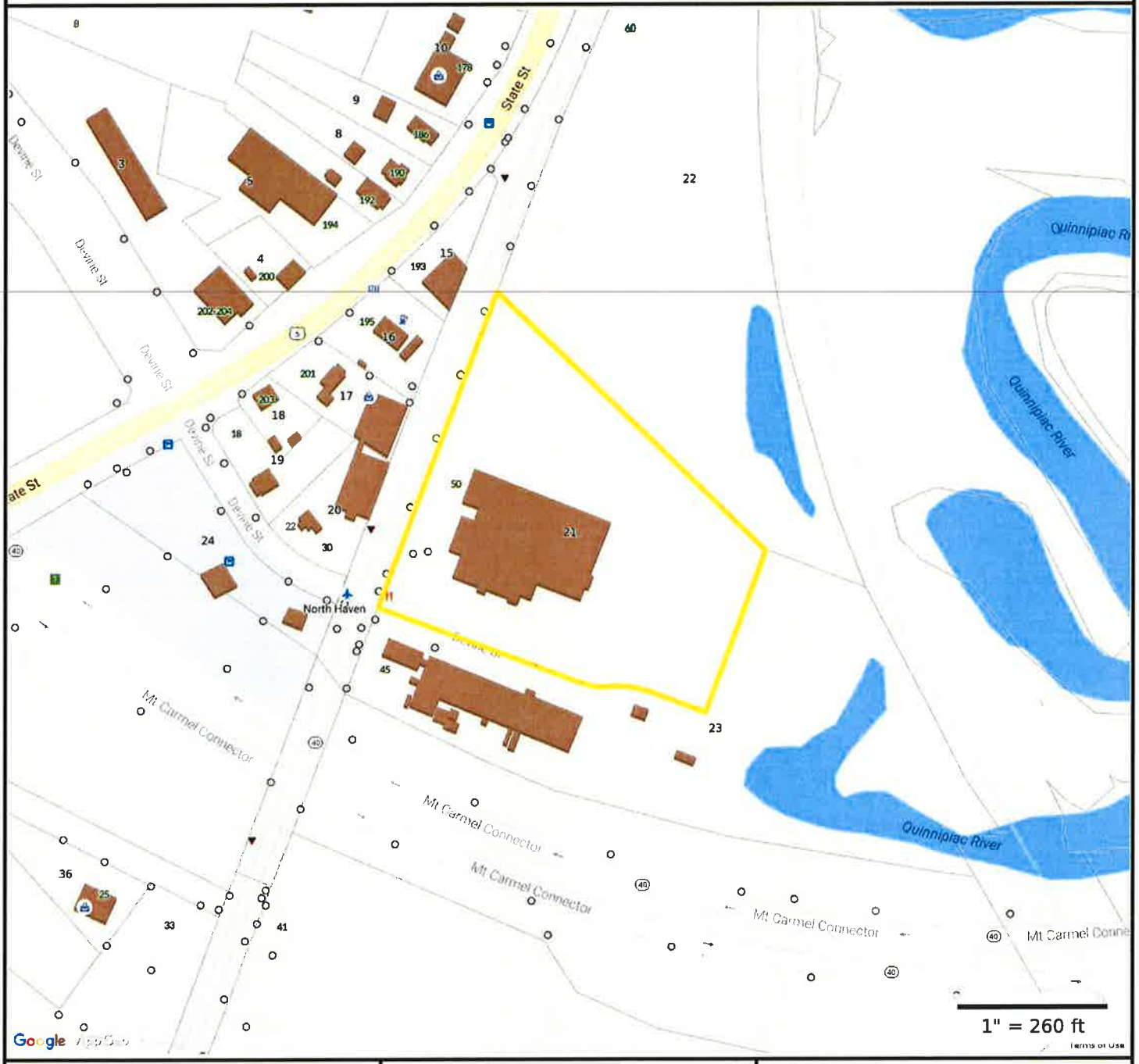


Plate Stress Ratio:
0.08 (Pass)

Bolt Stress Ratio:
0.18 (Pass)

ATTACHMENT 4



Property Information

Property ID	51/21
Location	50 DEVINE ST
Owner	424 CHAPEL STREET LLC

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

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

50 DEVINE ST

Location	50 DEVINE ST	**Mblu**	051/ / 021/ /
Acct#	256482	**Owner**	424 CHAPEL STREET LLC
Assessment	$1,287,160	**Appraisal**	$1,838,800
PID	8849	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$1,255,400	$583,400	$1,838,800
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$878,780	$408,380	$1,287,160

Owner of Record

Owner	424 CHAPEL STREET LLC	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	50 DEVINE ST NORTH HAVEN, CT 06473	**Book & Page**	832/ 52
		Sale Date	08/02/2010

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
424 CHAPEL STREET LLC	$0		832/ 52	08/02/2010
424 CHAPEL STREET LLC	$0	1	772/ 943	08/02/2007
PAPA ANTHONY S (RET ANN TRUST 1,2,3) &	$0	2	427/ 372	02/11/1992
PAPA ANTHONY S	$0	3	410/ 102	07/24/1990
PAPA ANTHONY S	$0	4	410/ 87	07/24/1990

Building Information

Building 1 : Section 1

Year Built:	1949
Living Area:	24,300
Replacement Cost:	$807,225
Building Percent Good:	80

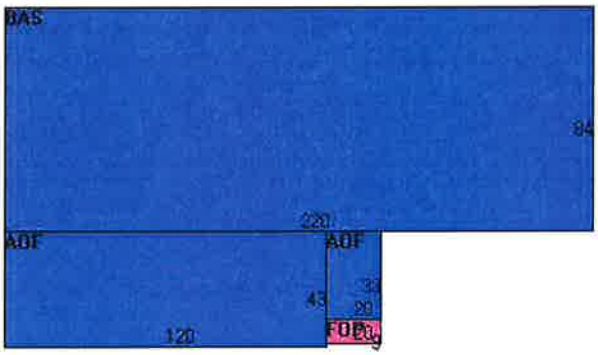
Replacement Cost Less Depreciation: $645,800

Building Attributes	
Field	**Description**
STYLE	Lt. Industrial
MODEL	Ind/Comm
Grade	C
Stories:	1
Occupancy	1
Exterior Wall 1	Brick
Exterior Wall 2	Metal
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	Minim/Masonry
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Unit Heat
AC Type	Central
Bldg Use	MANUFAC M96
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	HEAT/AC PKGS
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL/MN WL
Rooms/Prtns	AVERAGE
Wall Height	10
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/NorthHavenCTPhotos//\00\01\5

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	18,480	18,480
AOF	Office	5,820	5,820
FOP	Porch, Open	180	0
		24,480	24,300

Building 2 : Section 1

Year Built: 1984
Living Area: 18,228
Replacement Cost: $671,884
Building Percent Good: 80
Replacement Cost Less Depreciation: $537,500

Building Attributes : Bldg 2 of 2	
Field	**Description**

STYLE	Lt. Industrial
MODEL	Ind/Comm
Grade	C
Stories:	1
Occupancy	1
Exterior Wall 1	Metal
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Metal/Tin
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Unit Heat
AC Type	Partial
Bldg Use	MANUFAC M96
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	HEAT/AC PKGS
Frame Type	STEEL
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL/MN WL
Rooms/Prtns	AVERAGE
Wall Height	22
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/NorthHavenCTPhotos//\00\01\5

Building Layout

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	11,772	11,772
AOF	Office	6,456	6,456
		18,228	18,228

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
A/C	AIR CONDITION	52800 S.F.	$82,400	2
SPR1	SPRINKLERS-WET	0 S.F.	$0	2
SPR1	SPRINKLERS-WET	19202 S.F.	$13,800	1
LDL1	LOAD LEVELERS	3 UNITS	$7,000	1
MEZ1	MEZZANINE-UNF	2959 S.F.	$21,300	1

Land

Land Use

Use Code	4000
Description	MANUFAC M96
Zone	IG80
Neighborhood	305
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	5.97
Frontage	
Depth	
Assessed Value	$408,380
Appraised Value	$583,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			45000 S.F.	$6,100	1
TWR1	COMMU-TOWER			1 UNITS	$112,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$1,332,500	$657,800	$1,990,300
2008	$733,200	$688,200	$1,421,400
2007		$481,740	$994,980

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$932,750	$460,460	$1,393,210
2008	$526,390	$481,740	$1,008,130
2007		$481,740	$994,980