
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
174 Ashford Center Road, Ashford, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the top of the existing 120-foot tower at 174 Ashford Center Road in Ashford, Connecticut (the “Property”). The tower is owned by American Tower Corporation (“ATC”). The Council approved Cellco’s use of this tower in 2007 (Docket No. 341). Cellco now intends to modify its facility by replacing all of its antennas with six (6) model LPA-80080/6CF, 850 MHz antennas; 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 six (6) remote radio heads (“RRHs”) and two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being sent to Michael J. Zambo, First Selectman of the Town of Ashford. A copy of this letter is also being sent to P&G Realty 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).

15680493-v1

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1. The proposed modifications will not result in an increase in the height of the existing structure. Cellco's new antennas and RRHs will be installed on its existing platform at the top of the 120-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 General Power Density table for Cellco's modified facility is included in Attachment 2.

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

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

A copy of the 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. Zambo, Ashford First Selectman

P&G Realty LLC

ATC

Tim Parks

ATTACHMENT 1

Mechanical specifications

Length	1800 mm	70.9 in
Width	140 mm	5.5 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
Weight ⁴⁾	9.5 kg	21.0 lbs
Wind Area Fore/Aft ⁶⁾	0.25 m ²	2.7 ft ²
Wind Area Side ⁶⁾	0.61 m ²	6.6 ft ²
Max Wind Survivability ⁶⁾	>201 km/hr	>125 mph
Wind Load @ 100 mph (161 km/hr) ⁶⁾		
Fore/Aft	415 N	93 lbf
Side	878 N	198 lbf

Antenna consisting of aluminum alloy with brass feedlines covered by a gray, UV safe fiberglass radome. RoHS compliant.

Mounting & Downtilting

Mounting hardware attaches to pipe diameter Ø50-102 mm; Ø2.0-4.0 in. If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in).

Mechanical downtilt angle 0-22°

Mounting & Downtilt Bracket Kit 21700000

Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
Connector ³⁾	NE or E-DIN Female 1 port / Center
VSWR ¹⁾	≤ 1.4:1
Polarization	Vertical
Gain ¹⁾	14 dBd
Power Rating ²⁾	500 W
Half Power Angle ¹⁾	
Horizontal Beamwidth	80°
Vertical Beamwidth	10°
Electrical downtilt ⁵⁾	0°
Null fill ¹⁾	10%
Lightning protection	Direct ground

1) Typical values.

2) Power rating limited by connector only.

3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.

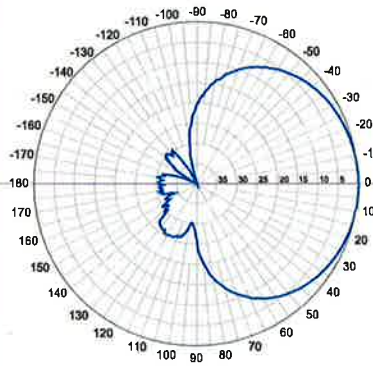
4) Antenna weight does not include brackets.

5) Add'l downtilts may be available. Check website for details.

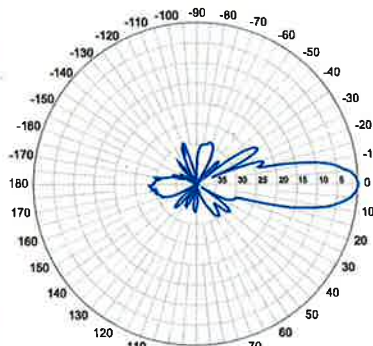
6) Values reflect installation with all three brackets utilized.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation-pattern⁹⁾



Horizontal



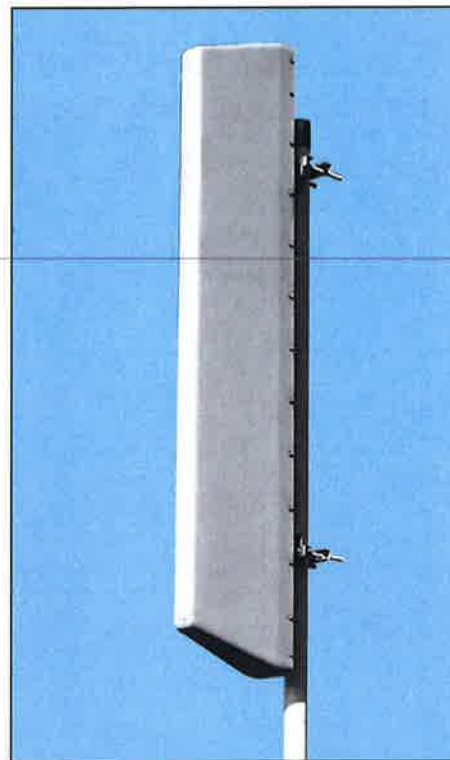
Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the front-to-back ratio.

LPA-80080/6CF

When ordering replace " _ " with connector type.



Featuring our Exclusive
3T Technology™
Antenna Design:

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

Warranty:

This antenna is under a five-year limited warranty for repair or replacement.

Revision Date: 08/18/08

806-960 MHz



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
	0° 14.6	0° 14.5	0° 17.4	0° 17.8	0° 18.1	0° 18.2
Gain by Beam Tilt, average, dBi	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

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

RoHS 2011/65/EU
China RoHS SJ/T 11364-2006
ISO 9001:2008

Classification

Compliant by Exemption
Above Maximum Concentration Value (MCV)
Designed, manufactured and/or distributed under this quality management system



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.

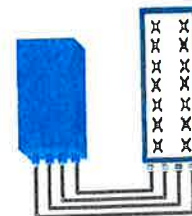


FEATURES

- 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

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.)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)
Volume in L	38 (with solar shield)
Weight in kg (lb) (w/o mounting HW)	26 (57.2) (with solar shield)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions	-40°C (-40°F) / +55°C (+131°F)
Wind load (@150km/h or 93mph)	IP65 Frontal: <math>< 200</math>N / Lateral : <math>< 150</math>N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR <math>< 1.5</math>
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

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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.

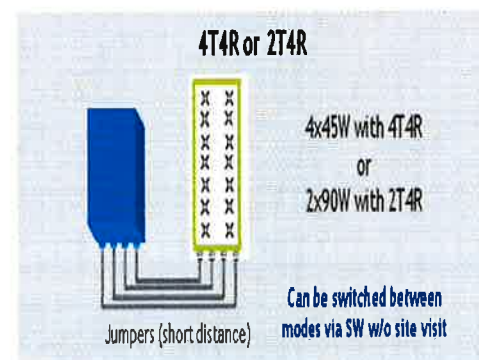
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the 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.)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield)
Volume in Liters	35.5 (with solar shield) 29.7 (without solar shield)
Weight in kg (lb) (w/o mounting HW)	25.8kg (56.8lb) (with solar shield)
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) UL50E Type 4 Enclosure
Wind load (@150km/h or 93mph)	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

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HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics - minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding - eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design - Decreases tower loading
- Robust cabling - eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH - Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable - Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket - Ensures long-lasting cable protection

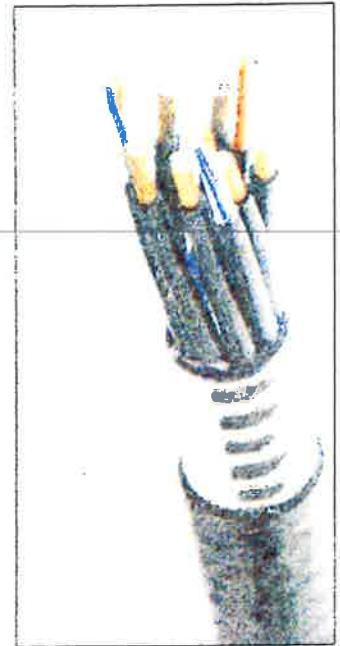


Figure 1: HYBRIFLEX Series

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	(mm (in))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		(kg/m (lb/ft))	1.9 (1.30)
Minimum Bending Radius, Single Bending		(mm (in))	200 (8)
Minimum Bending Radius, Repeated Bending		(mm (in))	500 (20)
Recommended/Maximum Clamp Spacing		(m (ft))	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	0.68 (0.205)
DC-Resistance Power Cable, 8 4mm ² (8AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		(μm)	50/125
Primary Coating (Acrylate)		(μm)	245
Buffer Diameter, Nominal		(μm)	900
Secondary Protection, Jacket, Nominal		(mm (in))	2.0 (0.08)
Minimum Bending Radius		(mm (in))	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL34-V0, UL1666 RoHS Compliant
Size (Power)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		(mm (in))	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE 1202/FT4 RoHS Compliant
Installation Temperature		(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature		(°C (°F))	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

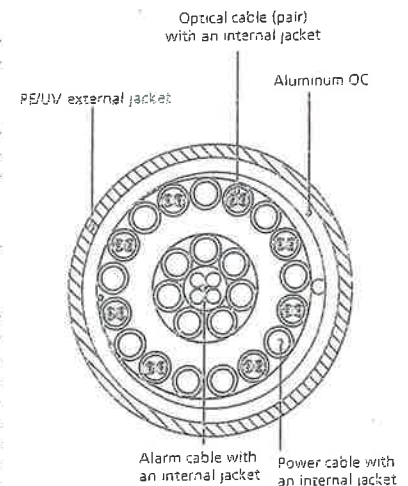


Figure 2: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

ATTACHMENT 2

General Power Density

Site Name: Ashford North, CT
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm ²)	Maximum Permissible Exposure* (mW/cm ²)	Fraction of MPE (%)
VZW PCS	1970	11	451	4964.925	120	0.1240	1.0	12.40%
VZW Cellular	869	9	381	3433.148	120	0.0857	0.5793333333	14.80%
VZW AWS	2145	1	6907	6907	120	0.1725	1.0	17.25%
VZW 700	746	1	1714	1714	120	0.0428	0.4973333333	8.61%

Total Percentage of Maximum Permissible Exposure

53.05%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
 mW/cm² = milliwatts per square centimeter
 ERP = Effective Radiated Power

Absolute worst case maximum values used.

ATTACHMENT 3



AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by



Structural Analysis Report

Structure : 119 ft Monopole
ATC Site Name : Ashford North CT, CT
ATC Site Number : 414867
Engineering Number : OAA686373_C3_03
Proposed Carrier : Verizon
Carrier Site Name : Ashford North CT
Carrier Site Number : 169106
Site Location : 174 Ashford Center Road
Ashford, CT 06278-1421
41.868272,-72.145844
County : Windham
Date : October 6, 2016
Max Usage : 27%
Result : Pass

Prepared By:
Jeff Sparks
CLS

Reviewed By:



Oct 7 2016 4:29 PM



COA: PEC.0001553



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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 119 ft monopole to reflect the change in loading by Verizon.

Supporting Documents

Tower Drawings	EI Project #15269, dated February 14, 2008
Foundation Drawing	EI Project #15269, dated February 8, 2008
Geotechnical Report	Dewberry Site: Ashford, Connecticut, dated January 2008

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:	101 mph (3-Second Gust, V_{asd}) / 130 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	$S_s = 0.17, S_1 = 0.06$
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					
117.0	117.0	1	VZW Reserve 208.5 sq ft	Low Profile Platform	(12) 1 5/8" Coax	Verizon

Equipment to be Removed

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
117.0	117.0	3	48" x 12" Panel		(6) 1 5/8" Coax	Verizon
		6	48" x 4" Panel			
		3	48" x 8" Panel			

Proposed Equipment

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
117.0	120.0	6	Commscope SBNHH-1D65B	Low Profile Platform	(2) 1.25" Hybrid	Verizon
		6	Antel LPA-80080/6CF			
	117.0	3	Alcatel-Lucent B13 RRH4x30-4R			
		3	Alcatel-Lucent B66A RRH 4x45			
		2	RFS DB-T1-6Z-8AB-0Z			

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

Install proposed coax inside the pole shaft.



Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	20%	Pass
Shaft	27%	Pass
Base Plate	20%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	6,803.1	9,184.3	2,306.8	25%
Shear (Kips)	65.1	87.9	24.5	28%

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

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

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
117.0	Alcatel-Lucent B13 RRH4x30-4R	Verizon	0.407	0.388
	Alcatel-Lucent B66A RRH 4x45			
	RFS DB-T1-6Z-8AB-0Z			
	Commscope SBNHH-1D65B			
	Antel LPA-80080/6CF			

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



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:

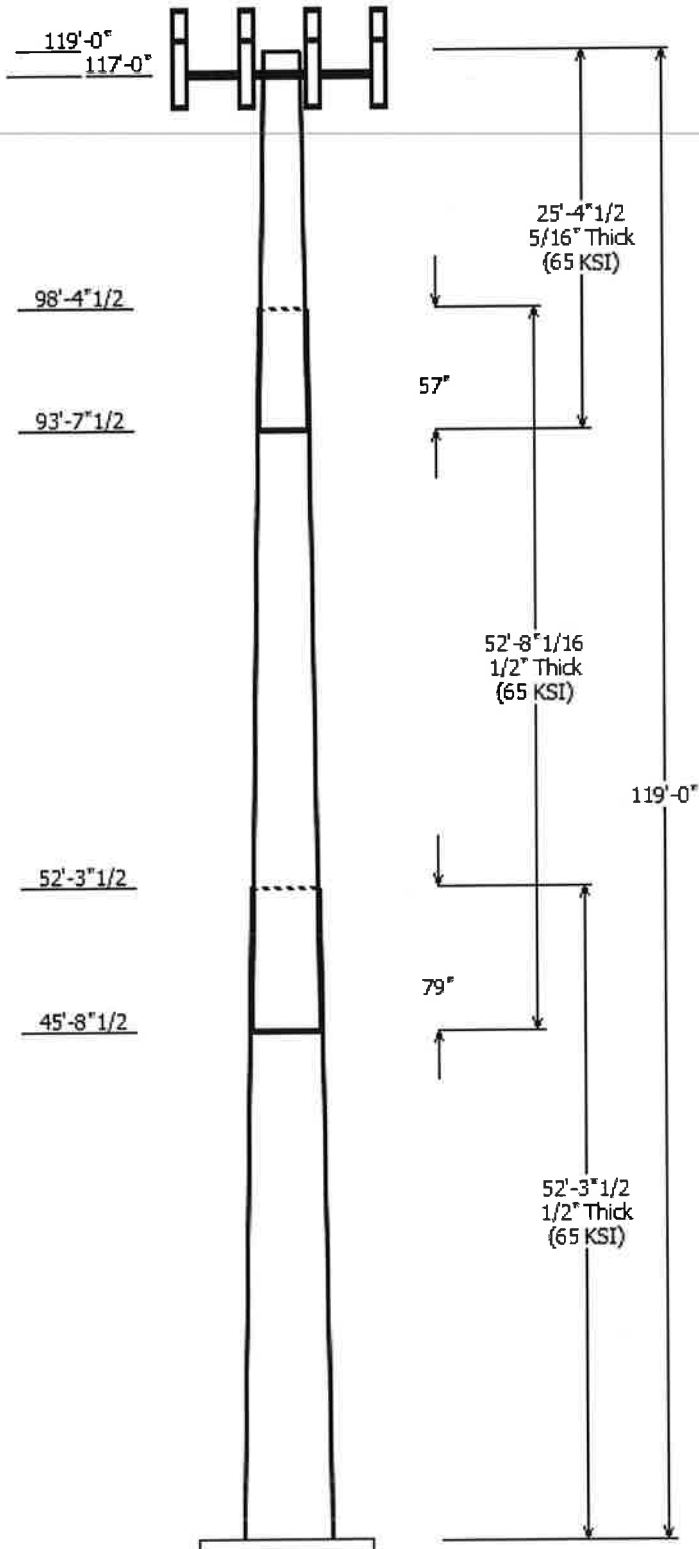
- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements 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.

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Job Information	
Pole : 414867	Code: ANSI/TIA-222-G
Description : 119 ft Monopole	
Client : Verizon Wireless	Struct Class : II
Location : Ashford North CT, CT	
Shape : 18 Sides	Exposure : B
Height : 119.00 (ft)	Topo : 1
Base Elev (ft): 0.00	
Taper: 0.320723(in/ft)	

Sections Properties								
Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
		Across Flats Top	Across Flats Bottom					
1	52.290	45.22	62.00	0.500		0.000	0.320700	65
2	52.670	31.44	48.34	0.500	Slip Joint	79.000	0.320700	65
3	25.373	25.45	33.59	0.313	Slip Joint	57.000	0.320700	65

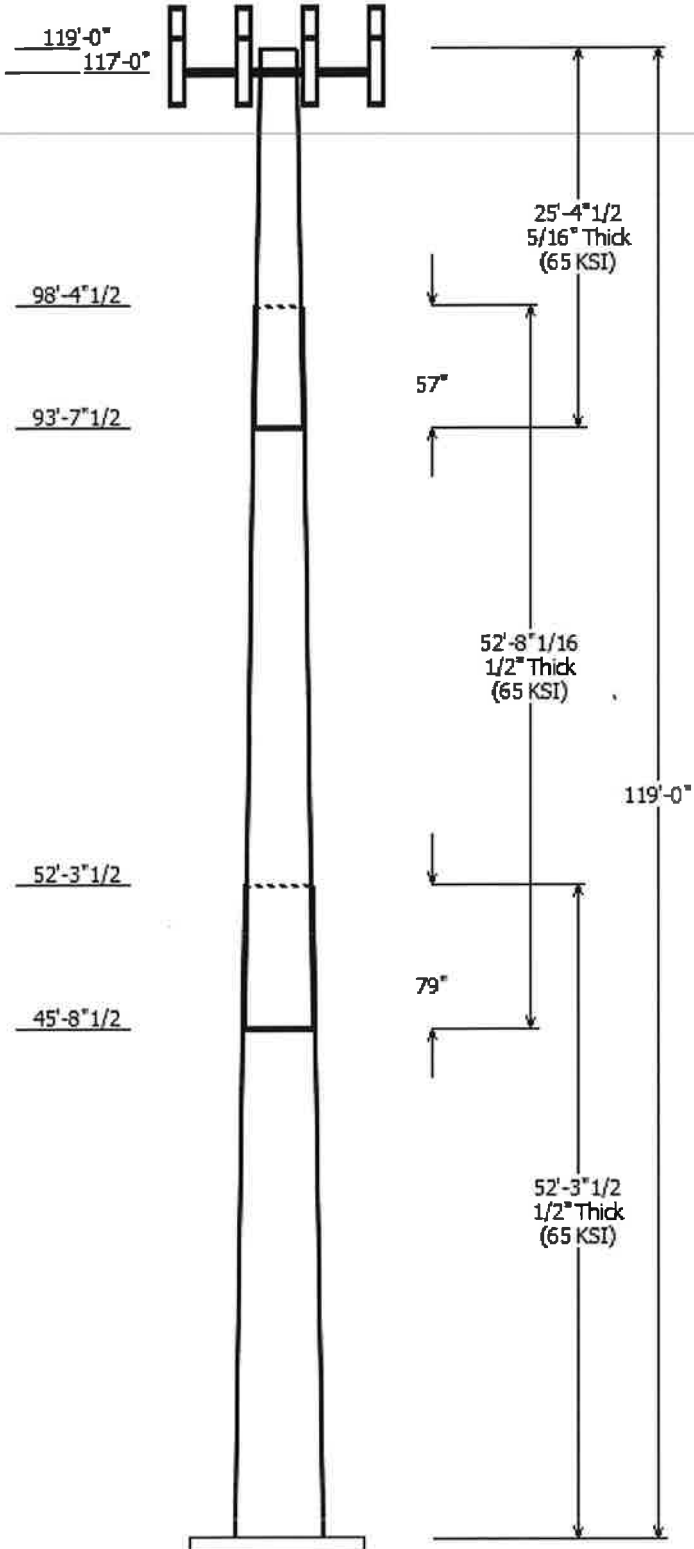
Discrete Appurtenance				
Attach Elev (ft)	Force Elev (ft)	Qty	Description	
117.000	117.000	1	VZW Reserve 208.5 sq ft	
117.000	117.000	2	RFS DB-T1-6Z-8AB-0Z	
117.000	117.000	3	Alcatel-Lucent B66A RRH 4x45	
117.000	117.000	3	Alcatel-Lucent B13 RRH4x30-4R	
117.000	120.000	6	Antel LPA-80080/6CF	
117.000	117.000	1	Flat Low Profile Platform	
117.000	120.000	6	Commscope SBNHH-1D65B	

Linear Appurtenance			
From Elev (ft)	To Elev (ft)	Description	Exposed To Wind
0.000	117.0	1 5/8" Coax	No
0.000	117.0	1.25" Hybrid	No

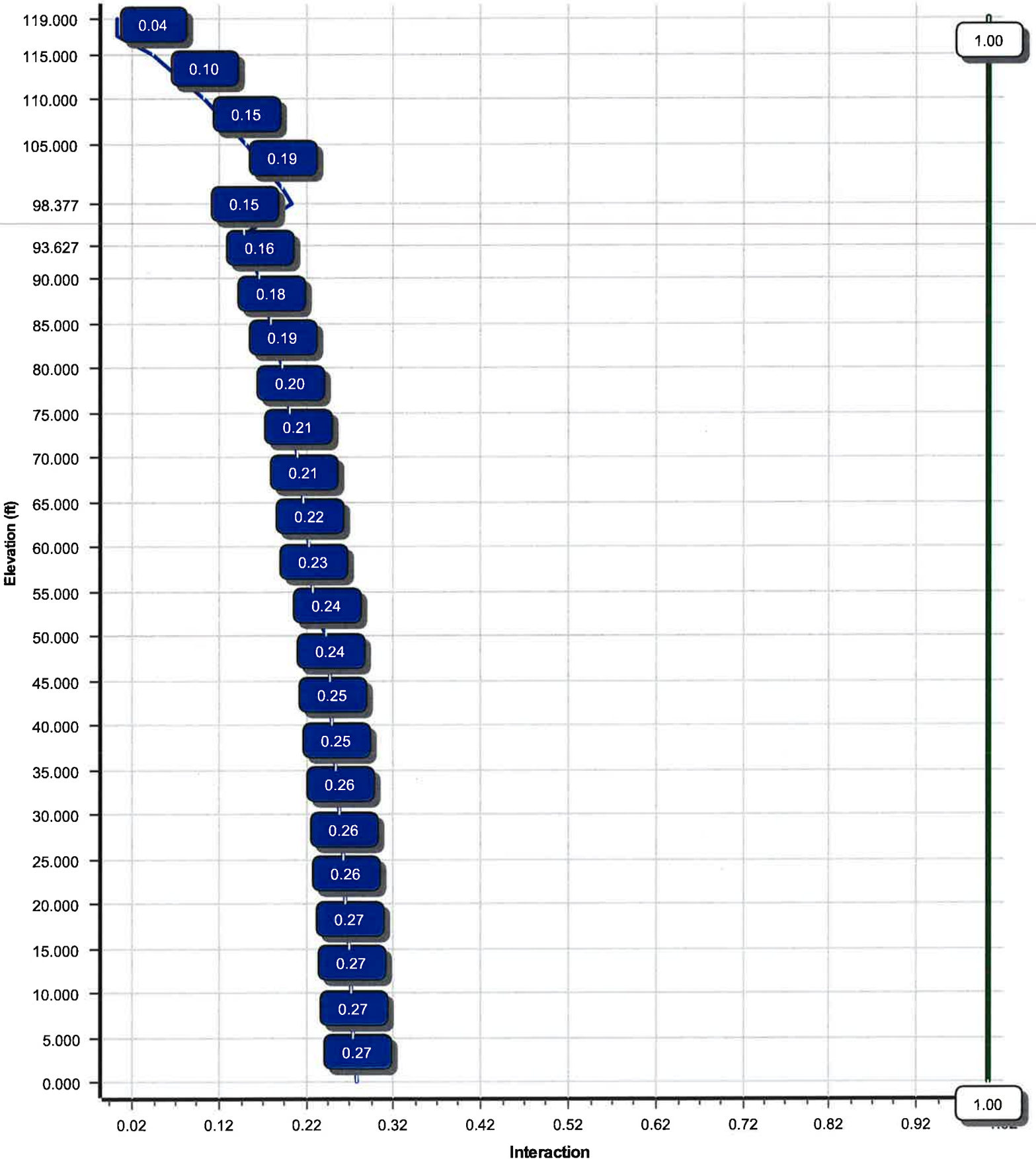
Load Cases	
1.2D + 1.6W	101 mph with No Ice
0.9D + 1.6W	101 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	2306.76	24.50	41.95
0.9D + 1.6W	2299.56	24.49	31.46
1.2D + 1.0Di + 1.0Wi	644.34	6.94	62.24
(1.2 + 0.2Sds) * DL + E ELFM	247.61	2.87	41.15
(1.2 + 0.2Sds) * DL + E EMAM	267.53	2.78	41.15
(0.9 - 0.2Sds) * DL + E ELFM	246.80	2.87	28.72
(0.9 - 0.2Sds) * DL + E EMAM	266.58	2.78	28.72
1.0D + 1.0W	507.76	5.40	34.97

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 27.46% at 0.0 ft



Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Analysis Parameters

Location:	Windham County, CT	Height (ft):	119
Code:	ANSI/TIA-222-G	Base Diameter (in):	62.00
Shape:	18 Sides	Top Diameter (in):	25.46
Pole Type:	Taper	Taper (in/ft) :	0.321
Pole Manufacturer:			

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	101 mph
Exposure Category:	B	Design Wind Speed With Ice:	50 mph
Topographic Category:	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):	1.06		
T _L (sec):	6	p:	1.3
S _s :	0.173	S ₁ :	0.063
F _a :	1.600	F _v :	2.400
S _{ds} :	0.185	S _{d1} :	0.101
		C _s :	0.063
		C _s Max:	0.063
		C _s Min:	0.030

Load Cases

1.2D + 1.6W	101 mph with No Ice
0.9D + 1.6W	101 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2S _{ds}) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2S _{ds}) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2S _{ds}) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2S _{ds}) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip		Weight (lb)	Bottom							Top						
				Joint Type	Joint Len (in)		Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)	
1-18	52.290	0.5000	65		0.00	14,998	62.00	0.00	97.60	46638.0	20.45	124.00	45.22	52.29	70.98	17942.9	14.54	90.46	0.320723	
2-18	52.670	0.5000	65	Slip	79.00	11,205	48.34	45.71	75.92	21953.8	15.64	96.68	31.44	98.38	49.11	5943.3	9.68	62.90	0.320723	
3-18	25.373	0.3125	65	Slip	57.00	2,502	33.59	93.63	33.01	4620.7	17.55	107.51	25.45	119.00	24.94	1992.6	12.95	81.47	0.320723	
Shaft Weight						28,704														

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice			Ice			Distance From Face (ft)	Vert Ecc (ft)
			Weight (lb)	EPAa (sf)	Orientation Factor	Weight (lb)	EPAa (sf)	Orientation Factor		
117.00	Alcatel-Lucent B13 RRH4x30-	3	57.80	2.140	0.67	170.32	2.972	0.67	0.000	0.000
117.00	Alcatel-Lucent B66A RRH	3	67.00	2.580	0.67	186.16	3.513	0.67	0.000	0.000
117.00	Antel LPA-80080/6CF	6	21.00	8.630	1.00	289.39	10.372	1.00	0.000	3.000
117.00	Commscope SBNHH-1D65B	6	40.60	8.080	0.83	317.80	9.794	0.83	0.000	3.000
117.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,343.66	50.961	1.00	0.000	0.000
117.00	RFS DB-T1-6Z-8AB-0Z	2	44.00	4.800	0.67	240.92	5.958	0.67	0.000	0.000
117.00	VZW Reserve 208.5 sq ft	1	2500.00	208.50	1.00	4,767.90	397.643	1.00	0.000	0.000
Totals		22	4832.00			12,306.04			Number of Loadings : 7	

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Projected Width (in)	Exposed To Wind	Carrier	
0.00	117.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
0.00	117.00	2	1.25" Hybrid	1.25	1.21	N	0.00	N	Verizon

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in ³)	Z (in ³)	Weight (lb)
0.00		0.5000	62.000	97.597	46,638.0	20.45	124.00	77.3	1481.	0.0	0.0
5.00		0.5000	60.396	95.052	43,084.0	19.89	120.79	78.0	1405.	0.0	1,638.9
10.00		0.5000	58.793	92.507	39,715.3	19.32	117.59	78.7	1330.	0.0	1,595.6
15.00		0.5000	57.189	89.962	36,527.0	18.76	114.38	79.3	1258.	0.0	1,552.3
20.00		0.5000	55.586	87.418	33,514.1	18.19	111.17	80.0	1187.	0.0	1,509.0
25.00		0.5000	53.982	84.873	30,671.5	17.63	107.96	80.7	1119.	0.0	1,465.7
30.00		0.5000	52.378	82.328	27,994.4	17.06	104.76	81.3	1052.	0.0	1,422.4
35.00		0.5000	50.775	79.783	25,477.8	16.50	101.55	82.0	988.3	0.0	1,379.1
40.00		0.5000	49.171	77.238	23,116.8	15.93	98.34	82.6	926.0	0.0	1,335.8
45.00		0.5000	47.567	74.693	20,906.3	15.36	95.13	82.6	865.7	0.0	1,292.5
45.71	Bot - Section 2	0.5000	47.341	74.334	20,605.7	15.28	94.68	82.6	857.3	0.0	179.2
50.00		0.5000	45.964	72.149	18,841.4	14.80	91.93	82.6	807.4	0.0	2,163.2
52.29	Top - Section 1	0.5000	46.229	72.570	19,173.5	14.89	92.46	82.6	816.9	0.0	1,127.7
55.00		0.5000	45.360	71.191	18,100.8	14.59	90.72	82.6	786.0	0.0	662.8
60.00		0.5000	43.757	68.646	16,228.2	14.02	87.51	82.6	730.5	0.0	1,189.6
65.00		0.5000	42.153	66.101	14,489.5	13.45	84.31	82.6	677.0	0.0	1,146.3
70.00		0.5000	40.549	63.556	12,879.6	12.89	81.10	82.6	625.6	0.0	1,103.0
75.00		0.5000	38.946	61.011	11,393.6	12.32	77.89	82.6	576.2	0.0	1,059.7
80.00		0.5000	37.342	58.466	10,026.5	11.76	74.68	82.6	528.8	0.0	1,016.4
85.00		0.5000	35.739	55.922	8,773.4	11.19	71.48	82.6	483.5	0.0	973.1
90.00		0.5000	34.135	53.377	7,629.3	10.63	68.27	82.6	440.2	0.0	929.8
93.63	Bot - Section 3	0.5000	32.972	51.531	6,864.9	10.22	65.94	82.6	410.1	0.0	647.3
95.00		0.5000	32.531	50.832	6,589.3	10.06	65.06	82.6	398.9	0.0	392.4
98.38	Top - Section 2	0.3125	32.073	31.502	4,014.8	16.69	102.63	81.8	246.6	0.0	942.3
100.0		0.3125	31.553	30.985	3,820.6	16.39	100.97	82.1	238.5	0.0	172.6
105.0		0.3125	29.949	29.395	3,262.0	15.49	95.84	82.6	214.5	0.0	513.6
110.0		0.3125	28.345	27.804	2,760.6	14.58	90.71	82.6	191.8	0.0	486.6
115.0		0.3125	26.742	26.214	2,313.4	13.68	85.57	82.6	170.4	0.0	459.5
117.0		0.3125	26.100	25.577	2,149.0	13.32	83.52	82.6	162.2	0.0	176.2
119.0		0.3125	25.459	24.941	1,992.6	12.95	81.47	82.6	154.2	0.0	171.9
											28,704.2

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case: 1.2D + 1.6W

101 mph with No Ice

17 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		Discrete Forces			Linear Forces		Sum of Forces				
		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		257.2	0.0					0.0	0.0	257.2	0.0	0.0	0.0
5.00		507.7	1,966.6					0.0	73.6	507.7	2,040.2	0.0	0.0
10.00		494.2	1,914.7					0.0	73.6	494.2	1,988.2	0.0	0.0
15.00		480.7	1,862.7					0.0	73.6	480.7	1,936.3	0.0	0.0
20.00		467.2	1,810.8					0.0	73.6	467.2	1,884.3	0.0	0.0
25.00		453.7	1,758.8					0.0	73.6	453.7	1,832.4	0.0	0.0
30.00		445.5	1,706.8					0.0	73.6	445.5	1,780.4	0.0	0.0
35.00		446.0	1,654.9					0.0	73.6	446.0	1,728.4	0.0	0.0
40.00		448.8	1,602.9					0.0	73.6	448.8	1,676.5	0.0	0.0
45.00		256.5	1,551.0					0.0	73.6	256.5	1,624.5	0.0	0.0
45.71	Bot - Section 2	228.4	215.0					0.0	10.4	228.4	225.4	0.0	0.0
50.00		301.2	2,595.8					0.0	63.2	301.2	2,659.0	0.0	0.0
52.29	Top - Section 1	227.8	1,353.2					0.0	33.7	227.8	1,386.9	0.0	0.0
55.00		349.0	795.4					0.0	39.9	349.0	835.3	0.0	0.0
60.00		448.6	1,427.5					0.0	73.6	448.6	1,501.1	0.0	0.0
65.00		442.1	1,375.5					0.0	73.6	442.1	1,449.1	0.0	0.0
70.00		434.4	1,323.6					0.0	73.6	434.4	1,397.1	0.0	0.0
75.00		425.6	1,271.6					0.0	73.6	425.6	1,345.2	0.0	0.0
80.00		415.6	1,219.7					0.0	73.6	415.6	1,293.2	0.0	0.0
85.00		404.7	1,167.7					0.0	73.6	404.7	1,241.3	0.0	0.0
90.00		340.5	1,115.8					0.0	73.6	340.5	1,189.3	0.0	0.0
93.63	Bot - Section 3	194.4	776.8					0.0	53.4	194.4	830.1	0.0	0.0
95.00		182.9	470.9					0.0	20.2	182.9	491.1	0.0	0.0
98.38	Top - Section 2	190.6	1,130.8					0.0	49.7	190.6	1,180.5	0.0	0.0
100.00		244.9	207.1					0.0	23.9	244.9	231.0	0.0	0.0
105.00		360.3	616.4					0.0	73.6	360.3	689.9	0.0	0.0
110.00		345.6	583.9					0.0	73.6	345.6	657.5	0.0	0.0
115.00		234.4	551.4					0.0	73.6	234.4	625.0	0.0	0.0
117.00	Appertunance(s)	129.6	211.5	14,508.4	0.0	10,038.9	5,798.4	0.0	29.4	14,638.0	6,039.3	0.0	0.0
119.00		64.1	206.3					0.0	0.0	64.1	206.3	0.0	0.0
Totals:										24,730.6	41,964.7	0.00	0.00

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case: 1.2D + 1.6W

101 mph with No Ice

17 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.95	-24.50	0.00	-2,306.76	0.00	2,306.76	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.275
5.00	-39.88	-24.04	0.00	-2,184.26	0.00	2,184.26	6,673.37	3,336.69	16,416.2	8,220.32	0.04	-0.07	0.272
10.00	-37.86	-23.59	0.00	-2,064.07	0.00	2,064.07	6,550.08	3,275.04	15,677.9	7,850.64	0.15	-0.14	0.269
15.00	-35.90	-23.15	0.00	-1,946.14	0.00	1,946.14	6,423.74	3,211.87	14,949.0	7,485.62	0.33	-0.21	0.266
20.00	-33.99	-22.72	0.00	-1,830.41	0.00	1,830.41	6,294.36	3,147.18	14,229.9	7,125.55	0.59	-0.28	0.262
25.00	-32.13	-22.29	0.00	-1,716.83	0.00	1,716.83	6,161.93	3,080.96	13,521.3	6,770.73	0.93	-0.36	0.259
30.00	-30.32	-21.88	0.00	-1,605.36	0.00	1,605.36	6,026.45	3,013.23	12,823.8	6,421.48	1.35	-0.44	0.255
35.00	-28.57	-21.46	0.00	-1,495.98	0.00	1,495.98	5,887.93	2,943.96	12,138.1	6,078.09	1.85	-0.52	0.251
40.00	-26.87	-21.03	0.00	-1,388.70	0.00	1,388.70	5,738.41	2,869.21	11,448.8	5,732.94	2.43	-0.60	0.247
45.00	-25.23	-20.78	0.00	-1,283.55	0.00	1,283.55	5,549.34	2,774.67	10,703.1	5,359.53	3.10	-0.68	0.244
45.71	-24.99	-20.56	0.00	-1,268.87	0.00	1,268.87	5,522.62	2,761.31	10,599.7	5,307.76	3.20	-0.69	0.244
50.00	-22.31	-20.25	0.00	-1,180.58	0.00	1,180.58	5,360.27	2,680.14	9,982.54	4,998.69	3.86	-0.76	0.240
52.29	-20.92	-20.02	0.00	-1,134.21	0.00	1,134.21	5,391.58	2,695.79	10,100.1	5,057.57	4.23	-0.80	0.228
55.00	-20.06	-19.68	0.00	-1,079.96	0.00	1,079.96	5,289.11	2,644.55	9,717.80	4,866.13	4.70	-0.85	0.226
60.00	-18.54	-19.24	0.00	-981.55	0.00	981.55	5,100.04	2,550.02	9,031.77	4,522.60	5.64	-0.93	0.221
65.00	-17.07	-18.79	0.00	-885.37	0.00	885.37	4,910.97	2,455.48	8,370.84	4,191.64	6.66	-1.01	0.215
70.00	-15.66	-18.36	0.00	-791.41	0.00	791.41	4,721.90	2,360.95	7,735.03	3,873.26	7.76	-1.10	0.208
75.00	-14.30	-17.92	0.00	-699.63	0.00	699.63	4,532.83	2,266.41	7,124.33	3,567.46	8.95	-1.18	0.199
80.00	-12.99	-17.50	0.00	-610.01	0.00	610.01	4,343.76	2,171.88	6,538.75	3,274.23	10.23	-1.26	0.189
85.00	-11.73	-17.08	0.00	-522.51	0.00	522.51	4,154.69	2,077.34	5,978.27	2,993.58	11.60	-1.34	0.177
90.00	-10.53	-16.73	0.00	-437.09	0.00	437.09	3,965.62	1,982.81	5,442.91	2,725.50	13.04	-1.42	0.163
93.63	-9.70	-16.52	0.00	-376.43	0.00	376.43	3,828.48	1,914.24	5,070.31	2,538.92	14.14	-1.47	0.151
95.00	-9.20	-16.33	0.00	-353.75	0.00	353.75	3,776.55	1,888.28	4,932.66	2,470.00	14.57	-1.49	0.146
98.38	-8.02	-16.11	0.00	-298.62	0.00	298.62	2,318.41	1,159.21	3,019.73	1,512.11	15.64	-1.54	0.201
100.00	-7.77	-15.87	0.00	-272.47	0.00	272.47	2,290.04	1,145.02	2,933.41	1,468.89	16.17	-1.56	0.189
105.00	-7.07	-15.50	0.00	-193.13	0.00	193.13	2,183.88	1,091.94	2,652.40	1,328.17	17.86	-1.65	0.149
110.00	-6.41	-15.14	0.00	-115.65	0.00	115.65	2,065.71	1,032.86	2,371.71	1,187.62	19.62	-1.72	0.101
115.00	-5.79	-14.89	0.00	-39.95	0.00	39.95	1,947.54	973.77	2,106.72	1,054.92	21.45	-1.76	0.041
117.00	-0.20	-0.07	0.00	-0.14	0.00	0.14	1,900.28	950.14	2,005.11	1,004.05	22.19	-1.76	0.000
119.00	0.00	-0.06	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	22.93	-1.76	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

10/6/2016 3:12:08 PM

Customer: Verizon Wireless

Load Case: 0.9D + 1.6W

101 mph with No Ice (Reduced DL)

17 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		Discrete Forces			Linear Forces		Sum of Forces				
		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		257.2	0.0					0.0	0.0	257.2	0.0	0.0	0.0
5.00		507.7	1,475.0					0.0	55.2	507.7	1,530.1	0.0	0.0
10.00		494.2	1,436.0					0.0	55.2	494.2	1,491.2	0.0	0.0
15.00		480.7	1,397.0					0.0	55.2	480.7	1,452.2	0.0	0.0
20.00		467.2	1,358.1					0.0	55.2	467.2	1,413.2	0.0	0.0
25.00		453.7	1,319.1					0.0	55.2	453.7	1,374.3	0.0	0.0
30.00		445.5	1,280.1					0.0	55.2	445.5	1,335.3	0.0	0.0
35.00		446.0	1,241.2					0.0	55.2	446.0	1,296.3	0.0	0.0
40.00		448.8	1,202.2					0.0	55.2	448.8	1,257.4	0.0	0.0
45.00		256.5	1,163.2					0.0	55.2	256.5	1,218.4	0.0	0.0
45.71	Bot - Section 2	228.4	161.3					0.0	7.8	228.4	169.1	0.0	0.0
50.00		301.2	1,946.9					0.0	47.4	301.2	1,994.2	0.0	0.0
52.29	Top - Section 1	227.8	1,014.9					0.0	25.3	227.8	1,040.2	0.0	0.0
55.00		349.0	596.6					0.0	29.9	349.0	626.5	0.0	0.0
60.00		448.6	1,070.6					0.0	55.2	448.6	1,125.8	0.0	0.0
65.00		442.1	1,031.7					0.0	55.2	442.1	1,086.8	0.0	0.0
70.00		434.4	992.7					0.0	55.2	434.4	1,047.9	0.0	0.0
75.00		425.6	953.7					0.0	55.2	425.6	1,008.9	0.0	0.0
80.00		415.6	914.8					0.0	55.2	415.6	969.9	0.0	0.0
85.00		404.7	875.8					0.0	55.2	404.7	931.0	0.0	0.0
90.00		340.5	836.8					0.0	55.2	340.5	892.0	0.0	0.0
93.63	Bot - Section 3	194.4	582.6					0.0	40.0	194.4	622.6	0.0	0.0
95.00		182.9	353.2					0.0	15.2	182.9	368.3	0.0	0.0
98.38	Top - Section 2	190.6	848.1					0.0	37.3	190.6	885.3	0.0	0.0
100.00		244.9	155.3					0.0	17.9	244.9	173.2	0.0	0.0
105.00		360.3	462.3					0.0	55.2	360.3	517.5	0.0	0.0
110.00		345.6	437.9					0.0	55.2	345.6	493.1	0.0	0.0
115.00		234.4	413.6					0.0	55.2	234.4	468.7	0.0	0.0
117.00	Appertunance(s)	129.6	158.6	14,508.4	0.0	10,038.9	4,348.8	0.0	22.1	14,638.0	4,529.5	0.0	0.0
119.00		64.1	154.7					0.0	0.0	64.1	154.7	0.0	0.0
Totals:										24,730.6	31,473.5	0.00	0.00

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

10/6/2016 3:12:08 PM

Customer: Verizon Wireless

Load Case: 0.9D + 1.6W

101 mph with No Ice (Reduced DL)

17 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Calculated Forces

Seg	Pu	Vu	Tu	Mu	Mu	Resultant	phi	phi	phi	phi	Total	Rotation	
Elev	FY (-)	FX (-)	MY	MZ	MX	Moment	Pn	Vn	Tn	Mn	Deflect	(deg)	Ratio
(ft)	(kips)	(kips)	(ft-kips)	(ft-kips)	(ft-kips)	(ft-kips)	(kips)	(kips)	(ft-kips)	(ft-kips)	(in)		
0.00	-31.46	-24.49	0.00	-2,299.56	0.00	2,299.56	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.272
5.00	-29.90	-24.02	0.00	-2,177.10	0.00	2,177.10	6,673.37	3,336.69	16,416.2	8,220.32	0.04	-0.07	0.269
10.00	-28.38	-23.56	0.00	-2,057.01	0.00	2,057.01	6,550.08	3,275.04	15,677.9	7,850.64	0.15	-0.14	0.266
15.00	-26.90	-23.11	0.00	-1,939.22	0.00	1,939.22	6,423.74	3,211.87	14,949.0	7,485.62	0.33	-0.21	0.263
20.00	-25.46	-22.67	0.00	-1,823.68	0.00	1,823.68	6,294.36	3,147.18	14,229.9	7,125.55	0.59	-0.28	0.260
25.00	-24.06	-22.24	0.00	-1,710.35	0.00	1,710.35	6,161.93	3,080.96	13,521.3	6,770.73	0.93	-0.36	0.257
30.00	-22.70	-21.81	0.00	-1,599.17	0.00	1,599.17	6,026.45	3,013.23	12,823.8	6,421.48	1.34	-0.43	0.253
35.00	-21.37	-21.39	0.00	-1,490.10	0.00	1,490.10	5,887.93	2,943.96	12,138.1	6,078.09	1.84	-0.51	0.249
40.00	-20.09	-20.95	0.00	-1,383.17	0.00	1,383.17	5,738.41	2,869.21	11,448.8	5,732.94	2.42	-0.59	0.245
45.00	-18.86	-20.70	0.00	-1,278.40	0.00	1,278.40	5,549.34	2,774.67	10,703.1	5,359.53	3.09	-0.68	0.242
45.71	-18.68	-20.48	0.00	-1,263.78	0.00	1,263.78	5,522.62	2,761.31	10,599.7	5,307.76	3.19	-0.69	0.242
50.00	-16.67	-20.17	0.00	-1,175.84	0.00	1,175.84	5,360.27	2,680.14	9,982.54	4,998.69	3.84	-0.76	0.238
52.29	-15.62	-19.94	0.00	-1,129.65	0.00	1,129.65	5,391.58	2,695.79	10,100.1	5,057.57	4.22	-0.80	0.226
55.00	-14.97	-19.60	0.00	-1,075.60	0.00	1,075.60	5,289.11	2,644.55	9,717.80	4,866.13	4.68	-0.85	0.224
60.00	-13.83	-19.15	0.00	-977.60	0.00	977.60	5,100.04	2,550.02	9,031.77	4,522.60	5.62	-0.93	0.219
65.00	-12.72	-18.71	0.00	-881.83	0.00	881.83	4,910.97	2,455.48	8,370.84	4,191.64	6.63	-1.01	0.213
70.00	-11.66	-18.28	0.00	-788.26	0.00	788.26	4,721.90	2,360.95	7,735.03	3,873.26	7.73	-1.09	0.206
75.00	-10.63	-17.85	0.00	-696.89	0.00	696.89	4,532.83	2,266.41	7,124.33	3,567.46	8.92	-1.17	0.198
80.00	-9.64	-17.42	0.00	-607.66	0.00	607.66	4,343.76	2,171.88	6,538.75	3,274.23	10.19	-1.25	0.188
85.00	-8.70	-17.01	0.00	-520.55	0.00	520.55	4,154.69	2,077.34	5,978.27	2,993.58	11.55	-1.33	0.176
90.00	-7.80	-16.66	0.00	-435.50	0.00	435.50	3,965.62	1,982.81	5,442.91	2,725.50	12.99	-1.41	0.162
93.63	-7.17	-16.45	0.00	-375.10	0.00	375.10	3,828.48	1,914.24	5,070.31	2,538.92	14.09	-1.47	0.150
95.00	-6.79	-16.26	0.00	-352.50	0.00	352.50	3,776.55	1,888.28	4,932.66	2,470.00	14.51	-1.49	0.145
98.38	-5.91	-16.05	0.00	-297.59	0.00	297.59	2,318.41	1,159.21	3,019.73	1,512.11	15.58	-1.54	0.200
100.00	-5.72	-15.81	0.00	-271.53	0.00	271.53	2,290.04	1,145.02	2,933.41	1,468.89	16.11	-1.56	0.188
105.00	-5.20	-15.44	0.00	-192.49	0.00	192.49	2,183.88	1,091.94	2,652.40	1,328.17	17.79	-1.64	0.148
110.00	-4.70	-15.09	0.00	-115.28	0.00	115.28	2,065.71	1,032.86	2,371.71	1,187.62	19.55	-1.71	0.100
115.00	-4.23	-14.84	0.00	-39.85	0.00	39.85	1,947.54	973.77	2,106.72	1,054.92	21.37	-1.75	0.040
117.00	-0.15	-0.07	0.00	-0.14	0.00	0.14	1,900.28	950.14	2,005.11	1,004.05	22.10	-1.76	0.000
119.00	0.00	-0.06	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	22.84	-1.76	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

10/6/2016 3:12:09 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 1.00 in Radial Ice

16 Iterations

Gust Response Factor :1.10

Ice Dead Load Factor :1.00

Wind Importance Factor :1.00

Dead Load Factor :1.20

Ice Importance Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		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		76.3	0.0					0.0	0.0	76.3	0.0	0.0	0.0
5.00		151.2	2,566.2					0.0	73.6	151.2	2,639.7	0.0	0.0
10.00		148.0	2,568.4					0.0	73.6	148.0	2,642.0	0.0	0.0
15.00		144.6	2,533.5					0.0	73.6	144.6	2,607.1	0.0	0.0
20.00		141.0	2,486.4					0.0	73.6	141.0	2,559.9	0.0	0.0
25.00		137.4	2,432.8					0.0	73.6	137.4	2,506.4	0.0	0.0
30.00		135.4	2,375.3					0.0	73.6	135.4	2,448.8	0.0	0.0
35.00		136.0	2,314.9					0.0	73.6	136.0	2,388.5	0.0	0.0
40.00		137.3	2,252.5					0.0	73.6	137.3	2,326.0	0.0	0.0
45.00		78.6	2,188.4					0.0	73.6	78.6	2,261.9	0.0	0.0
45.71	Bot - Section 2	70.1	305.3					0.0	10.4	70.1	315.7	0.0	0.0
50.00		92.6	3,143.2					0.0	63.2	92.6	3,206.4	0.0	0.0
52.29	Top - Section 1	70.2	1,642.8					0.0	33.7	70.2	1,676.5	0.0	0.0
55.00		107.8	1,133.6					0.0	39.9	107.8	1,173.5	0.0	0.0
60.00		139.0	2,034.8					0.0	73.6	139.0	2,108.4	0.0	0.0
65.00		137.5	1,966.7					0.0	73.6	137.5	2,040.3	0.0	0.0
70.00		135.7	1,898.0					0.0	73.6	135.7	1,971.5	0.0	0.0
75.00		133.6	1,828.6					0.0	73.6	133.6	1,902.2	0.0	0.0
80.00		131.1	1,758.7					0.0	73.6	131.1	1,832.2	0.0	0.0
85.00		128.3	1,688.3					0.0	73.6	128.3	1,761.8	0.0	0.0
90.00		108.5	1,617.4					0.0	73.6	108.5	1,691.0	0.0	0.0
93.63	Bot - Section 3	62.1	1,130.8					0.0	53.4	62.1	1,184.1	0.0	0.0
95.00		58.6	606.1					0.0	20.2	58.6	626.3	0.0	0.0
98.38	Top - Section 2	61.2	1,453.7					0.0	49.7	61.2	1,503.4	0.0	0.0
100.00		79.1	360.4					0.0	23.9	79.1	384.3	0.0	0.0
105.00		116.9	1,067.8					0.0	73.6	116.9	1,141.3	0.0	0.0
110.00		113.0	1,015.0					0.0	73.6	113.0	1,088.5	0.0	0.0
115.00		77.1	961.9					0.0	73.6	77.1	1,035.4	0.0	0.0
117.00	Appertunance(s)	42.9	372.6	3,835.5	0.0	1,854.9	12,447.4	0.0	29.4	3,878.4	12,849.4	0.0	0.0
119.00		21.3	364.0					0.0	0.0	21.3	364.0	0.0	0.0
Totals:										7,008.03	62,236.6	0.00	0.00

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

10/6/2016 3:12:09 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 1.00 in Radial Ice

16 Iterations

Gust Response Factor :1.10

Ice Dead Load Factor :1.00

Wind Importance Factor :1.00

Dead Load Factor :1.20

Ice Importance Factor :1.00

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-62.24	-6.94	0.00	-644.34	0.00	644.34	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.084
5.00	-59.59	-6.81	0.00	-609.63	0.00	609.63	6,673.37	3,336.69	16,416.2	8,220.32	0.01	-0.02	0.083
10.00	-56.95	-6.68	0.00	-575.58	0.00	575.58	6,550.08	3,275.04	15,677.9	7,850.64	0.04	-0.04	0.082
15.00	-54.34	-6.55	0.00	-542.18	0.00	542.18	6,423.74	3,211.87	14,949.0	7,485.62	0.09	-0.06	0.081
20.00	-51.78	-6.43	0.00	-509.42	0.00	509.42	6,294.36	3,147.18	14,229.9	7,125.55	0.17	-0.08	0.080
25.00	-49.27	-6.30	0.00	-477.28	0.00	477.28	6,161.93	3,080.96	13,521.3	6,770.73	0.26	-0.10	0.078
30.00	-46.82	-6.18	0.00	-445.76	0.00	445.76	6,026.45	3,013.23	12,823.8	6,421.48	0.38	-0.12	0.077
35.00	-44.43	-6.06	0.00	-414.85	0.00	414.85	5,887.93	2,943.96	12,138.1	6,078.09	0.52	-0.14	0.076
40.00	-42.10	-5.93	0.00	-384.56	0.00	384.56	5,738.41	2,869.21	11,448.8	5,732.94	0.68	-0.17	0.074
45.00	-39.84	-5.85	0.00	-354.91	0.00	354.91	5,549.34	2,774.67	10,703.1	5,359.53	0.86	-0.19	0.073
45.71	-39.52	-5.79	0.00	-350.77	0.00	350.77	5,522.62	2,761.31	10,599.7	5,307.76	0.89	-0.19	0.073
50.00	-36.31	-5.70	0.00	-325.91	0.00	325.91	5,360.27	2,680.14	9,982.54	4,998.69	1.07	-0.21	0.072
52.29	-34.64	-5.63	0.00	-312.87	0.00	312.87	5,391.58	2,695.79	10,100.1	5,057.57	1.18	-0.22	0.068
55.00	-33.46	-5.53	0.00	-297.61	0.00	297.61	5,289.11	2,644.55	9,717.80	4,866.13	1.31	-0.24	0.067
60.00	-31.35	-5.39	0.00	-269.99	0.00	269.99	5,100.04	2,550.02	9,031.77	4,522.60	1.57	-0.26	0.066
65.00	-29.31	-5.25	0.00	-243.04	0.00	243.04	4,910.97	2,455.48	8,370.84	4,191.64	1.85	-0.28	0.064
70.00	-27.34	-5.12	0.00	-216.77	0.00	216.77	4,721.90	2,360.95	7,735.03	3,873.26	2.16	-0.30	0.062
75.00	-25.43	-4.99	0.00	-191.17	0.00	191.17	4,532.83	2,266.41	7,124.33	3,567.46	2.49	-0.33	0.059
80.00	-23.60	-4.85	0.00	-166.25	0.00	166.25	4,343.76	2,171.88	6,538.75	3,274.23	2.84	-0.35	0.056
85.00	-21.84	-4.72	0.00	-141.98	0.00	141.98	4,154.69	2,077.34	5,978.27	2,993.58	3.22	-0.37	0.053
90.00	-20.15	-4.61	0.00	-118.38	0.00	118.38	3,965.62	1,982.81	5,442.91	2,725.50	3.62	-0.39	0.049
93.63	-18.96	-4.54	0.00	-101.67	0.00	101.67	3,828.48	1,914.24	5,070.31	2,538.92	3.92	-0.41	0.045
95.00	-18.33	-4.48	0.00	-95.43	0.00	95.43	3,776.55	1,888.28	4,932.66	2,470.00	4.04	-0.41	0.043
98.38	-16.83	-4.41	0.00	-80.30	0.00	80.30	2,318.41	1,159.21	3,019.73	1,512.11	4.33	-0.42	0.060
100.00	-16.45	-4.33	0.00	-73.14	0.00	73.14	2,290.04	1,145.02	2,933.41	1,468.89	4.48	-0.43	0.057
105.00	-15.30	-4.21	0.00	-51.47	0.00	51.47	2,183.88	1,091.94	2,652.40	1,328.17	4.94	-0.45	0.046
110.00	-14.22	-4.10	0.00	-30.40	0.00	30.40	2,065.71	1,032.86	2,371.71	1,187.62	5.43	-0.47	0.032
115.00	-13.18	-4.01	0.00	-9.93	0.00	9.93	1,947.54	973.77	2,106.72	1,054.92	5.93	-0.48	0.016
117.00	-0.36	-0.02	0.00	-0.05	0.00	0.05	1,900.28	950.14	2,005.11	1,004.05	6.13	-0.48	0.000
119.00	0.00	-0.02	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	6.34	-0.48	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case: 1.0D + 1.0W

Serviceability 60 mph

16 Iterations

Gust Response Factor :1.10

Wind Importance Factor :1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		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		56.7	0.0					0.0	0.0	56.7	0.0	0.0	0.0
5.00		112.0	1,638.9					0.0	61.3	112.0	1,700.2	0.0	0.0
10.00		109.0	1,595.6					0.0	61.3	109.0	1,656.9	0.0	0.0
15.00		106.0	1,552.3					0.0	61.3	106.0	1,613.6	0.0	0.0
20.00		103.1	1,509.0					0.0	61.3	103.1	1,570.3	0.0	0.0
25.00		100.1	1,465.7					0.0	61.3	100.1	1,527.0	0.0	0.0
30.00		98.3	1,422.4					0.0	61.3	98.3	1,483.7	0.0	0.0
35.00		98.4	1,379.1					0.0	61.3	98.4	1,440.4	0.0	0.0
40.00		99.0	1,335.8					0.0	61.3	99.0	1,397.1	0.0	0.0
45.00		56.6	1,292.5					0.0	61.3	56.6	1,353.8	0.0	0.0
45.71	Bot - Section 2	50.4	179.2					0.0	8.7	50.4	187.8	0.0	0.0
50.00		66.4	2,163.2					0.0	52.6	66.4	2,215.8	0.0	0.0
52.29	Top - Section 1	50.2	1,127.7					0.0	28.1	50.2	1,155.8	0.0	0.0
55.00		77.0	662.8					0.0	33.2	77.0	696.1	0.0	0.0
60.00		98.9	1,189.6					0.0	61.3	98.9	1,250.9	0.0	0.0
65.00		97.5	1,146.3					0.0	61.3	97.5	1,207.6	0.0	0.0
70.00		95.8	1,103.0					0.0	61.3	95.8	1,164.3	0.0	0.0
75.00		93.9	1,059.7					0.0	61.3	93.9	1,121.0	0.0	0.0
80.00		91.7	1,016.4					0.0	61.3	91.7	1,077.7	0.0	0.0
85.00		89.3	973.1					0.0	61.3	89.3	1,034.4	0.0	0.0
90.00		75.1	929.8					0.0	61.3	75.1	991.1	0.0	0.0
93.63	Bot - Section 3	42.9	647.3					0.0	44.5	42.9	691.8	0.0	0.0
95.00		40.3	392.4					0.0	16.8	40.3	409.3	0.0	0.0
98.38	Top - Section 2	42.0	942.3					0.0	41.4	42.0	983.7	0.0	0.0
100.00		54.0	172.6					0.0	19.9	54.0	192.5	0.0	0.0
105.00		79.5	513.6					0.0	61.3	79.5	574.9	0.0	0.0
110.00		76.2	486.6					0.0	61.3	76.2	547.9	0.0	0.0
115.00		51.7	459.5					0.0	61.3	51.7	520.8	0.0	0.0
117.00	Appertunance(s)	28.6	176.2	3,200.1	0.0	2,214.2	4,832.0	0.0	24.5	3,228.6	5,032.8	0.0	0.0
119.00		14.1	171.9					0.0	0.0	14.1	171.9	0.0	0.0
Totals:										5,454.76	34,970.6	0.00	0.00

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case: 1.0D + 1.0W

Serviceability 60 mph

16 Iterations

Gust Response Factor :1.10

Wind Importance Factor 1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-34.97	-5.40	0.00	-507.76	0.00	507.76	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.064
5.00	-33.27	-5.30	0.00	-480.75	0.00	480.75	6,673.37	3,336.69	16,416.2	8,220.32	0.01	-0.02	0.063
10.00	-31.61	-5.20	0.00	-454.26	0.00	454.26	6,550.08	3,275.04	15,677.9	7,850.64	0.03	-0.03	0.063
15.00	-30.00	-5.10	0.00	-428.27	0.00	428.27	6,423.74	3,211.87	14,949.0	7,485.62	0.07	-0.05	0.062
20.00	-28.42	-5.00	0.00	-402.77	0.00	402.77	6,294.36	3,147.18	14,229.9	7,125.55	0.13	-0.06	0.061
25.00	-26.90	-4.91	0.00	-377.76	0.00	377.76	6,161.93	3,080.96	13,521.3	6,770.73	0.20	-0.08	0.060
30.00	-25.41	-4.82	0.00	-353.22	0.00	353.22	6,026.45	3,013.23	12,823.8	6,421.48	0.30	-0.10	0.059
35.00	-23.97	-4.72	0.00	-329.14	0.00	329.14	5,887.93	2,943.96	12,138.1	6,078.09	0.41	-0.11	0.058
40.00	-22.57	-4.63	0.00	-305.53	0.00	305.53	5,738.41	2,869.21	11,448.8	5,732.94	0.53	-0.13	0.057
45.00	-21.22	-4.57	0.00	-282.39	0.00	282.39	5,549.34	2,774.67	10,703.1	5,359.53	0.68	-0.15	0.057
45.71	-21.03	-4.52	0.00	-279.16	0.00	279.16	5,522.62	2,761.31	10,599.7	5,307.76	0.70	-0.15	0.056
50.00	-18.81	-4.46	0.00	-259.74	0.00	259.74	5,360.27	2,680.14	9,982.54	4,998.69	0.85	-0.17	0.055
52.29	-17.65	-4.40	0.00	-249.54	0.00	249.54	5,391.58	2,695.79	10,100.1	5,057.57	0.93	-0.18	0.053
55.00	-16.96	-4.33	0.00	-237.61	0.00	237.61	5,289.11	2,644.55	9,717.80	4,866.13	1.03	-0.19	0.052
60.00	-15.71	-4.23	0.00	-215.96	0.00	215.96	5,100.04	2,550.02	9,031.77	4,522.60	1.24	-0.20	0.051
65.00	-14.50	-4.13	0.00	-194.80	0.00	194.80	4,910.97	2,455.48	8,370.84	4,191.64	1.46	-0.22	0.049
70.00	-13.33	-4.04	0.00	-174.14	0.00	174.14	4,721.90	2,360.95	7,735.03	3,873.26	1.71	-0.24	0.048
75.00	-12.21	-3.94	0.00	-153.95	0.00	153.95	4,532.83	2,266.41	7,124.33	3,567.46	1.97	-0.26	0.046
80.00	-11.13	-3.85	0.00	-134.24	0.00	134.24	4,343.76	2,171.88	6,538.75	3,274.23	2.25	-0.28	0.044
85.00	-10.10	-3.76	0.00	-114.99	0.00	114.99	4,154.69	2,077.34	5,978.27	2,993.58	2.55	-0.29	0.041
90.00	-9.11	-3.68	0.00	-96.20	0.00	96.20	3,965.62	1,982.81	5,442.91	2,725.50	2.87	-0.31	0.038
93.63	-8.41	-3.63	0.00	-82.86	0.00	82.86	3,828.48	1,914.24	5,070.31	2,538.92	3.11	-0.32	0.035
95.00	-8.00	-3.59	0.00	-77.87	0.00	77.87	3,776.55	1,888.28	4,932.66	2,470.00	3.21	-0.33	0.034
98.38	-7.02	-3.55	0.00	-65.74	0.00	65.74	2,318.41	1,159.21	3,019.73	1,512.11	3.44	-0.34	0.047
100.00	-6.83	-3.49	0.00	-59.98	0.00	59.98	2,290.04	1,145.02	2,933.41	1,468.89	3.56	-0.34	0.044
105.00	-6.25	-3.41	0.00	-42.52	0.00	42.52	2,183.88	1,091.94	2,652.40	1,328.17	3.93	-0.36	0.035
110.00	-5.70	-3.33	0.00	-25.46	0.00	25.46	2,065.71	1,032.86	2,371.71	1,187.62	4.32	-0.38	0.024
115.00	-5.18	-3.28	0.00	-8.80	0.00	8.80	1,947.54	973.77	2,106.72	1,054.92	4.72	-0.39	0.011
117.00	-0.17	-0.02	0.00	-0.03	0.00	0.03	1,900.28	950.14	2,005.11	1,004.05	4.88	-0.39	0.000
119.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	5.05	-0.39	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_g):	0.17
Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.06
Long-Period Transition Period (T_L):	6
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}):	0.18
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Seismic Response Coefficient (C_s):	0.06
Upper Limit C_s	0.06
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	1.06
Redundancy Factor (ρ):	1.30
Seismic Force Distribution Exponent (k):	1.28
Total Unfactored Dead Load:	34.97 k
Seismic Base Shear (E):	2.87 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)
29	118.00	172	78	0.011	32	213
28	116.00	201	89	0.013	36	248
27	112.50	521	221	0.031	91	644
26	107.50	548	220	0.031	90	678
25	102.50	575	217	0.031	89	711
24	99.19	192	70	0.010	28	238
23	96.69	984	345	0.049	141	1,217
22	94.31	409	139	0.020	57	506
21	91.81	692	227	0.032	93	856
20	87.50	991	305	0.043	125	1,226
19	82.50	1,034	296	0.042	121	1,279
18	77.50	1,078	284	0.040	116	1,333
17	72.50	1,121	271	0.039	111	1,387
16	67.50	1,164	257	0.037	105	1,440
15	62.50	1,208	242	0.034	99	1,494
14	57.50	1,251	225	0.032	92	1,547
13	53.65	696	115	0.016	47	861
12	51.15	1,156	179	0.025	73	1,430
11	47.85	2,216	315	0.045	129	2,741
10	45.35	188	25	0.004	10	232
9	42.50	1,354	165	0.024	68	1,674
8	37.50	1,397	145	0.021	59	1,728
7	32.50	1,440	125	0.018	51	1,782

Site Number: 414867

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

6	27.50	1,484	104	0.015	42	1,835
5	22.50	1,527	83	0.012	34	1,889
4	17.50	1,570	62	0.009	25	1,942
3	12.50	1,614	41	0.006	17	1,996
2	7.50	1,657	22	0.003	9	2,049
1	2.50	1,700	6	0.001	2	2,103
Alcatel-Lucent B13 R	117.00	173	78	0.011	32	214
Alcatel-Lucent B66A	117.00	201	90	0.013	37	249
RFS DB-T1-6Z-8AB-0Z	117.00	88	39	0.006	16	109
Commscope SBNHH-1D65	117.00	244	109	0.015	45	301
Antel LPA-80080/6CF	117.00	126	56	0.008	23	156
Flat Low Profile Pla	117.00	1,500	671	0.095	274	1,855
VZW Reserve 208.5 sq	117.00	2,500	1,118	0.159	457	3,092
		34,971	7,031	1.000	2,874	43,255

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)
29	118.00	172	78	0.011	32	148
28	116.00	201	89	0.013	36	173
27	112.50	521	221	0.031	91	450
26	107.50	548	220	0.031	90	473
25	102.50	575	217	0.031	89	496
24	99.19	192	70	0.010	28	166
23	96.69	984	345	0.049	141	849
22	94.31	409	139	0.020	57	353
21	91.81	692	227	0.032	93	597
20	87.50	991	305	0.043	125	855
19	82.50	1,034	296	0.042	121	893
18	77.50	1,078	284	0.040	116	930
17	72.50	1,121	271	0.039	111	968
16	67.50	1,164	257	0.037	105	1,005
15	62.50	1,208	242	0.034	99	1,042
14	57.50	1,251	225	0.032	92	1,080
13	53.65	696	115	0.016	47	601
12	51.15	1,156	179	0.025	73	998
11	47.85	2,216	315	0.045	129	1,912
10	45.35	188	25	0.004	10	162
9	42.50	1,354	165	0.024	68	1,168
8	37.50	1,397	145	0.021	59	1,206
7	32.50	1,440	125	0.018	51	1,243
6	27.50	1,484	104	0.015	42	1,281
5	22.50	1,527	83	0.012	34	1,318
4	17.50	1,570	62	0.009	25	1,355
3	12.50	1,614	41	0.006	17	1,393
2	7.50	1,657	22	0.003	9	1,430
1	2.50	1,700	6	0.001	2	1,467
Alcatel-Lucent B13 R	117.00	173	78	0.011	32	150
Alcatel-Lucent B66A	117.00	201	90	0.013	37	173
RFS DB-T1-6Z-8AB-0Z	117.00	88	39	0.006	16	76
Commscope SBNHH-1D65	117.00	244	109	0.015	45	210
Antel LPA-80080/6CF	117.00	126	56	0.008	23	109
Flat Low Profile Pla	117.00	1,500	671	0.095	274	1,295
VZW Reserve 208.5 sq	117.00	2,500	1,118	0.159	457	2,158
		34,971	7,031	1.000	2,874	30,183

Site Number: 414867

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

10/6/2016 3:12:10 PM

Customer: Verizon Wireless

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

10/6/2016 3:12:10 PM

Customer: Verizon Wireless

Load Case (1.2 + 0.2Sds) * DL + E ELFM

Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.15	-2.87	0.00	-247.61	0.00	247.61	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.035
5.00	-39.10	-2.87	0.00	-233.24	0.00	233.24	6,673.37	3,336.69	16,416.2	8,220.32	0.00	-0.01	0.034
10.00	-37.11	-2.86	0.00	-218.89	0.00	218.89	6,550.08	3,275.04	15,677.9	7,850.64	0.02	-0.01	0.034
15.00	-35.16	-2.84	0.00	-204.60	0.00	204.60	6,423.74	3,211.87	14,949.0	7,485.62	0.04	-0.02	0.033
20.00	-33.27	-2.81	0.00	-190.42	0.00	190.42	6,294.36	3,147.18	14,229.9	7,125.55	0.06	-0.03	0.032
25.00	-31.44	-2.77	0.00	-176.39	0.00	176.39	6,161.93	3,080.96	13,521.3	6,770.73	0.10	-0.04	0.031
30.00	-29.66	-2.72	0.00	-162.55	0.00	162.55	6,026.45	3,013.23	12,823.8	6,421.48	0.14	-0.05	0.030
35.00	-27.93	-2.66	0.00	-148.96	0.00	148.96	5,887.93	2,943.96	12,138.1	6,078.09	0.19	-0.05	0.029
40.00	-26.25	-2.60	0.00	-135.65	0.00	135.65	5,738.41	2,869.21	11,448.8	5,732.94	0.26	-0.06	0.028
45.00	-26.02	-2.59	0.00	-122.67	0.00	122.67	5,549.34	2,774.67	10,703.1	5,359.53	0.32	-0.07	0.028
45.71	-23.28	-2.46	0.00	-120.84	0.00	120.84	5,522.62	2,761.31	10,599.7	5,307.76	0.33	-0.07	0.027
50.00	-21.85	-2.38	0.00	-110.29	0.00	110.29	5,360.27	2,680.14	9,982.54	4,998.69	0.40	-0.08	0.026
52.29	-20.99	-2.34	0.00	-104.83	0.00	104.83	5,391.58	2,695.79	10,100.1	5,057.57	0.44	-0.08	0.025
55.00	-19.44	-2.25	0.00	-98.49	0.00	98.49	5,289.11	2,644.55	9,717.80	4,866.13	0.49	-0.09	0.024
60.00	-17.95	-2.15	0.00	-87.26	0.00	87.26	5,100.04	2,550.02	9,031.77	4,522.60	0.58	-0.09	0.023
65.00	-16.51	-2.04	0.00	-76.53	0.00	76.53	4,910.97	2,455.48	8,370.84	4,191.64	0.68	-0.10	0.022
70.00	-15.12	-1.93	0.00	-66.32	0.00	66.32	4,721.90	2,360.95	7,735.03	3,873.26	0.79	-0.11	0.020
75.00	-13.79	-1.81	0.00	-56.67	0.00	56.67	4,532.83	2,266.41	7,124.33	3,567.46	0.91	-0.11	0.019
80.00	-12.51	-1.69	0.00	-47.61	0.00	47.61	4,343.76	2,171.88	6,538.75	3,274.23	1.03	-0.12	0.017
85.00	-11.28	-1.56	0.00	-39.16	0.00	39.16	4,154.69	2,077.34	5,978.27	2,993.58	1.16	-0.13	0.016
90.00	-10.43	-1.47	0.00	-31.34	0.00	31.34	3,965.62	1,982.81	5,442.91	2,725.50	1.30	-0.13	0.014
93.63	-9.92	-1.41	0.00	-26.00	0.00	26.00	3,828.48	1,914.24	5,070.31	2,538.92	1.40	-0.14	0.013
95.00	-8.71	-1.27	0.00	-24.06	0.00	24.06	3,776.55	1,888.28	4,932.66	2,470.00	1.44	-0.14	0.012
98.38	-8.47	-1.24	0.00	-19.77	0.00	19.77	2,318.41	1,159.21	3,019.73	1,512.11	1.54	-0.14	0.017
100.00	-7.76	-1.15	0.00	-17.76	0.00	17.76	2,290.04	1,145.02	2,933.41	1,468.89	1.58	-0.14	0.015
105.00	-7.08	-1.06	0.00	-12.01	0.00	12.01	2,183.88	1,091.94	2,652.40	1,328.17	1.74	-0.15	0.012
110.00	-6.44	-0.97	0.00	-6.70	0.00	6.70	2,065.71	1,032.86	2,371.71	1,187.62	1.89	-0.15	0.009
115.00	-6.19	-0.93	0.00	-1.86	0.00	1.86	1,947.54	973.77	2,106.72	1,054.92	2.05	-0.15	0.005
117.00	0.00	0.00	0.00	0.00	0.00	0.00	1,900.28	950.14	2,005.11	1,004.05	2.12	-0.15	0.000
119.00	0.00	0.00	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	2.18	-0.15	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case (0.9 - 0.2Sds) * DL + E ELMF

Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-28.72	-2.87	0.00	-246.80	0.00	246.80	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.033
5.00	-27.28	-2.87	0.00	-232.43	0.00	232.43	6,673.37	3,336.69	16,416.2	8,220.32	0.00	-0.01	0.032
10.00	-25.89	-2.85	0.00	-218.09	0.00	218.09	6,550.08	3,275.04	15,677.9	7,850.64	0.02	-0.01	0.032
15.00	-24.54	-2.83	0.00	-203.82	0.00	203.82	6,423.74	3,211.87	14,949.0	7,485.62	0.04	-0.02	0.031
20.00	-23.22	-2.80	0.00	-189.66	0.00	189.66	6,294.36	3,147.18	14,229.9	7,125.55	0.06	-0.03	0.030
25.00	-21.94	-2.76	0.00	-175.66	0.00	175.66	6,161.93	3,080.96	13,521.3	6,770.73	0.10	-0.04	0.030
30.00	-20.69	-2.71	0.00	-161.86	0.00	161.86	6,026.45	3,013.23	12,823.8	6,421.48	0.14	-0.05	0.029
35.00	-19.49	-2.65	0.00	-148.31	0.00	148.31	5,887.93	2,943.96	12,138.1	6,078.09	0.19	-0.05	0.028
40.00	-18.32	-2.59	0.00	-135.04	0.00	135.04	5,738.41	2,869.21	11,448.8	5,732.94	0.25	-0.06	0.027
45.00	-18.16	-2.58	0.00	-122.10	0.00	122.10	5,549.34	2,774.67	10,703.1	5,359.53	0.32	-0.07	0.026
45.71	-16.24	-2.45	0.00	-120.28	0.00	120.28	5,522.62	2,761.31	10,599.7	5,307.76	0.33	-0.07	0.026
50.00	-15.25	-2.38	0.00	-109.77	0.00	109.77	5,360.27	2,680.14	9,982.54	4,998.69	0.40	-0.08	0.025
52.29	-14.65	-2.33	0.00	-104.33	0.00	104.33	5,391.58	2,695.79	10,100.1	5,057.57	0.44	-0.08	0.023
55.00	-13.57	-2.24	0.00	-98.02	0.00	98.02	5,289.11	2,644.55	9,717.80	4,866.13	0.49	-0.09	0.023
60.00	-12.52	-2.14	0.00	-86.84	0.00	86.84	5,100.04	2,550.02	9,031.77	4,522.60	0.58	-0.09	0.022
65.00	-11.52	-2.03	0.00	-76.15	0.00	76.15	4,910.97	2,455.48	8,370.84	4,191.64	0.68	-0.10	0.021
70.00	-10.55	-1.92	0.00	-65.99	0.00	65.99	4,721.90	2,360.95	7,735.03	3,873.26	0.79	-0.11	0.019
75.00	-9.62	-1.80	0.00	-56.38	0.00	56.38	4,532.83	2,266.41	7,124.33	3,567.46	0.90	-0.11	0.018
80.00	-8.73	-1.68	0.00	-47.37	0.00	47.37	4,343.76	2,171.88	6,538.75	3,274.23	1.03	-0.12	0.016
85.00	-7.87	-1.56	0.00	-38.95	0.00	38.95	4,154.69	2,077.34	5,978.27	2,993.58	1.15	-0.13	0.015
90.00	-7.28	-1.46	0.00	-31.17	0.00	31.17	3,965.62	1,982.81	5,442.91	2,725.50	1.29	-0.13	0.013
93.63	-6.92	-1.41	0.00	-25.87	0.00	25.87	3,828.48	1,914.24	5,070.31	2,538.92	1.39	-0.14	0.012
95.00	-6.07	-1.26	0.00	-23.94	0.00	23.94	3,776.55	1,888.28	4,932.66	2,470.00	1.43	-0.14	0.011
98.38	-5.91	-1.23	0.00	-19.67	0.00	19.67	2,318.41	1,159.21	3,019.73	1,512.11	1.53	-0.14	0.016
100.00	-5.41	-1.15	0.00	-17.67	0.00	17.67	2,290.04	1,145.02	2,933.41	1,468.89	1.58	-0.14	0.014
105.00	-4.94	-1.05	0.00	-11.94	0.00	11.94	2,183.88	1,091.94	2,652.40	1,328.17	1.73	-0.15	0.011
110.00	-4.49	-0.96	0.00	-6.67	0.00	6.67	2,065.71	1,032.86	2,371.71	1,187.62	1.88	-0.15	0.008
115.00	-4.32	-0.93	0.00	-1.85	0.00	1.85	1,947.54	973.77	2,106.72	1,054.92	2.04	-0.15	0.004
117.00	0.00	0.00	0.00	0.00	0.00	0.00	1,900.28	950.14	2,005.11	1,004.05	2.11	-0.15	0.000
119.00	0.00	0.00	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	2.17	-0.15	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

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):	0.17
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}):	0.18
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	1.06
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)
29	118.00	172	1.858	1.817	1.081	0.367	55	213
28	116.00	201	1.796	1.520	0.970	0.331	58	248
27	112.50	521	1.689	1.082	0.798	0.274	123	644
26	107.50	548	1.542	0.611	0.595	0.203	96	678
25	102.50	575	1.402	0.288	0.434	0.145	72	711
24	99.19	192	1.313	0.139	0.348	0.115	19	238
23	96.69	984	1.248	0.054	0.292	0.095	81	1,217
22	94.31	409	1.187	-0.007	0.245	0.079	28	506
21	91.81	692	1.125	-0.055	0.203	0.065	39	856
20	87.50	991	1.022	-0.104	0.142	0.048	41	1,226
19	82.50	1,034	0.908	-0.122	0.091	0.037	33	1,279
18	77.50	1,078	0.802	-0.112	0.054	0.033	30	1,333
17	72.50	1,121	0.702	-0.087	0.030	0.033	32	1,387
16	67.50	1,164	0.608	-0.056	0.015	0.037	37	1,440
15	62.50	1,208	0.521	-0.024	0.008	0.040	42	1,494
14	57.50	1,251	0.441	0.005	0.006	0.043	47	1,547
13	53.65	696	0.384	0.023	0.007	0.044	27	861
12	51.15	1,156	0.349	0.033	0.009	0.044	44	1,430
11	47.85	2,216	0.306	0.044	0.012	0.044	84	2,741
10	45.35	188	0.275	0.051	0.015	0.043	7	232
9	42.50	1,354	0.241	0.057	0.018	0.042	49	1,674
8	37.50	1,397	0.188	0.064	0.025	0.039	47	1,728
7	32.50	1,440	0.141	0.069	0.031	0.036	45	1,782
6	27.50	1,484	0.101	0.071	0.037	0.033	42	1,835
5	22.50	1,527	0.068	0.072	0.041	0.030	40	1,889
4	17.50	1,570	0.041	0.070	0.042	0.027	37	1,942
3	12.50	1,614	0.021	0.065	0.038	0.024	33	1,996
2	7.50	1,657	0.008	0.051	0.029	0.018	26	2,049
1	2.50	1,700	0.001	0.022	0.012	0.008	12	2,103
Alcatel-Lucent B13 R	117.00	173	1.827	1.664	1.024	0.349	52	214
Alcatel-Lucent B66A	117.00	201	1.827	1.664	1.024	0.349	61	249
RFS DB-T1-6Z-8AB-0Z	117.00	88	1.827	1.664	1.024	0.349	27	109
Commscope SBNHH-	117.00	244	1.827	1.664	1.024	0.349	74	301
Antel LPA-80080/6CF	117.00	126	1.827	1.664	1.024	0.349	38	156

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Flat Low Profile Pla	117.00	1,500	1.827	1.664	1.024	0.349	454	1,855
VZW Reserve 208.5 sq	117.00	2,500	1.827	1.664	1.024	0.349	756	3,092
		34,971	33.076	17.289	12.799	4.818	2,788	43,255

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)
29	118.00	172	1.858	1.817	1.081	0.367	55	148
28	116.00	201	1.796	1.520	0.970	0.331	58	173
27	112.50	521	1.689	1.082	0.798	0.274	123	450
26	107.50	548	1.542	0.611	0.595	0.203	96	473
25	102.50	575	1.402	0.288	0.434	0.145	72	496
24	99.19	192	1.313	0.139	0.348	0.115	19	166
23	96.69	984	1.248	0.054	0.292	0.095	81	849
22	94.31	409	1.187	-0.007	0.245	0.079	28	353
21	91.81	692	1.125	-0.055	0.203	0.065	39	597
20	87.50	991	1.022	-0.104	0.142	0.048	41	855
19	82.50	1,034	0.908	-0.122	0.091	0.037	33	893
18	77.50	1,078	0.802	-0.112	0.054	0.033	30	930
17	72.50	1,121	0.702	-0.087	0.030	0.033	32	968
16	67.50	1,164	0.608	-0.056	0.015	0.037	37	1,005
15	62.50	1,208	0.521	-0.024	0.008	0.040	42	1,042
14	57.50	1,251	0.441	0.005	0.006	0.043	47	1,080
13	53.65	696	0.384	0.023	0.007	0.044	27	601
12	51.15	1,156	0.349	0.033	0.009	0.044	44	998
11	47.85	2,216	0.306	0.044	0.012	0.044	84	1,912
10	45.35	188	0.275	0.051	0.015	0.043	7	162
9	42.50	1,354	0.241	0.057	0.018	0.042	49	1,168
8	37.50	1,397	0.188	0.064	0.025	0.039	47	1,206
7	32.50	1,440	0.141	0.069	0.031	0.036	45	1,243
6	27.50	1,484	0.101	0.071	0.037	0.033	42	1,281
5	22.50	1,527	0.068	0.072	0.041	0.030	40	1,318
4	17.50	1,570	0.041	0.070	0.042	0.027	37	1,355
3	12.50	1,614	0.021	0.065	0.038	0.024	33	1,393
2	7.50	1,657	0.008	0.051	0.029	0.018	26	1,430
1	2.50	1,700	0.001	0.022	0.012	0.008	12	1,467
Alcatel-Lucent B13 R	117.00	173	1.827	1.664	1.024	0.349	52	150
Alcatel-Lucent B66A	117.00	201	1.827	1.664	1.024	0.349	61	173
RFS DB-T1-6Z-8AB-0Z	117.00	88	1.827	1.664	1.024	0.349	27	76
Commscope SBNHH-	117.00	244	1.827	1.664	1.024	0.349	74	210
Antel LPA-80080/6CF	117.00	126	1.827	1.664	1.024	0.349	38	109
Flat Low Profile Pla	117.00	1,500	1.827	1.664	1.024	0.349	454	1,295
VZW Reserve 208.5 sq	117.00	2,500	1.827	1.664	1.024	0.349	756	2,158
		34,971	33.076	17.289	12.799	4.818	2,788	30,183

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case (1.2 + 0.2Sds) * DL + E EMAM

Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.15	-2.78	0.00	-267.53	0.00	267.53	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.037
5.00	-39.10	-2.76	0.00	-253.64	0.00	253.64	6,673.37	3,336.69	16,416.2	8,220.32	0.00	-0.01	0.037
10.00	-37.11	-2.73	0.00	-239.85	0.00	239.85	6,550.08	3,275.04	15,677.9	7,850.64	0.02	-0.02	0.036
15.00	-35.16	-2.70	0.00	-226.19	0.00	226.19	6,423.74	3,211.87	14,949.0	7,485.62	0.04	-0.02	0.036
20.00	-33.27	-2.66	0.00	-212.70	0.00	212.70	6,294.36	3,147.18	14,229.9	7,125.55	0.07	-0.03	0.035
25.00	-31.44	-2.62	0.00	-199.39	0.00	199.39	6,161.93	3,080.96	13,521.3	6,770.73	0.11	-0.04	0.035
30.00	-29.66	-2.58	0.00	-186.27	0.00	186.27	6,026.45	3,013.23	12,823.8	6,421.48	0.16	-0.05	0.034
35.00	-27.93	-2.54	0.00	-173.36	0.00	173.36	5,887.93	2,943.96	12,138.1	6,078.09	0.21	-0.06	0.033
40.00	-26.25	-2.49	0.00	-160.67	0.00	160.67	5,738.41	2,869.21	11,448.8	5,732.94	0.28	-0.07	0.033
45.00	-26.02	-2.49	0.00	-148.21	0.00	148.21	5,549.34	2,774.67	10,703.1	5,359.53	0.36	-0.08	0.032
45.71	-23.28	-2.40	0.00	-146.45	0.00	146.45	5,522.62	2,761.31	10,599.7	5,307.76	0.37	-0.08	0.032
50.00	-21.85	-2.36	0.00	-136.15	0.00	136.15	5,360.27	2,680.14	9,982.54	4,998.69	0.45	-0.09	0.031
52.29	-20.99	-2.33	0.00	-130.75	0.00	130.75	5,391.58	2,695.79	10,100.1	5,057.57	0.49	-0.09	0.030
55.00	-19.44	-2.28	0.00	-124.43	0.00	124.43	5,289.11	2,644.55	9,717.80	4,866.13	0.55	-0.10	0.029
60.00	-17.95	-2.24	0.00	-113.01	0.00	113.01	5,100.04	2,550.02	9,031.77	4,522.60	0.65	-0.11	0.029
65.00	-16.51	-2.21	0.00	-101.80	0.00	101.80	4,910.97	2,455.48	8,370.84	4,191.64	0.77	-0.12	0.028
70.00	-15.12	-2.17	0.00	-90.78	0.00	90.78	4,721.90	2,360.95	7,735.03	3,873.26	0.90	-0.13	0.027
75.00	-13.79	-2.14	0.00	-79.92	0.00	79.92	4,532.83	2,266.41	7,124.33	3,567.46	1.04	-0.14	0.025
80.00	-12.51	-2.11	0.00	-69.21	0.00	69.21	4,343.76	2,171.88	6,538.75	3,274.23	1.19	-0.15	0.024
85.00	-11.28	-2.06	0.00	-58.68	0.00	58.68	4,154.69	2,077.34	5,978.27	2,993.58	1.34	-0.15	0.022
90.00	-10.43	-2.02	0.00	-48.35	0.00	48.35	3,965.62	1,982.81	5,442.91	2,725.50	1.51	-0.16	0.020
93.63	-9.92	-2.00	0.00	-41.01	0.00	41.01	3,828.48	1,914.24	5,070.31	2,538.92	1.64	-0.17	0.019
95.00	-8.70	-1.91	0.00	-38.27	0.00	38.27	3,776.55	1,888.28	4,932.66	2,470.00	1.69	-0.17	0.018
98.38	-8.46	-1.89	0.00	-31.82	0.00	31.82	2,318.41	1,159.21	3,019.73	1,512.11	1.81	-0.18	0.025
100.00	-7.75	-1.82	0.00	-28.75	0.00	28.75	2,290.04	1,145.02	2,933.41	1,468.89	1.87	-0.18	0.023
105.00	-7.08	-1.72	0.00	-19.66	0.00	19.66	2,183.88	1,091.94	2,652.40	1,328.17	2.06	-0.19	0.018
110.00	-6.43	-1.60	0.00	-11.05	0.00	11.05	2,065.71	1,032.86	2,371.71	1,187.62	2.26	-0.19	0.012
115.00	-6.18	-1.54	0.00	-3.07	0.00	3.07	1,947.54	973.77	2,106.72	1,054.92	2.47	-0.20	0.006
117.00	0.00	0.00	0.00	0.00	0.00	0.00	1,900.28	950.14	2,005.11	1,004.05	2.55	-0.20	0.000
119.00	0.00	0.00	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	2.64	-0.20	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Load Case (0.9 - 0.2Sds) * DL + E EMAM

Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-28.72	-2.78	0.00	-266.58	0.00	266.58	6,793.61	3,396.81	17,163.1	8,594.34	0.00	0.00	0.035
5.00	-27.28	-2.76	0.00	-252.69	0.00	252.69	6,673.37	3,336.69	16,416.2	8,220.32	0.00	-0.01	0.035
10.00	-25.89	-2.73	0.00	-238.91	0.00	238.91	6,550.08	3,275.04	15,677.9	7,850.64	0.02	-0.02	0.034
15.00	-24.54	-2.69	0.00	-225.28	0.00	225.28	6,423.74	3,211.87	14,949.0	7,485.62	0.04	-0.02	0.034
20.00	-23.22	-2.66	0.00	-211.81	0.00	211.81	6,294.36	3,147.18	14,229.9	7,125.55	0.07	-0.03	0.033
25.00	-21.94	-2.62	0.00	-198.53	0.00	198.53	6,161.93	3,080.96	13,521.3	6,770.73	0.11	-0.04	0.033
30.00	-20.69	-2.57	0.00	-185.45	0.00	185.45	6,026.45	3,013.23	12,823.8	6,421.48	0.16	-0.05	0.032
35.00	-19.49	-2.53	0.00	-172.58	0.00	172.58	5,887.93	2,943.96	12,138.1	6,078.09	0.21	-0.06	0.032
40.00	-18.32	-2.48	0.00	-159.94	0.00	159.94	5,738.41	2,869.21	11,448.8	5,732.94	0.28	-0.07	0.031
45.00	-18.16	-2.48	0.00	-147.53	0.00	147.53	5,549.34	2,774.67	10,703.1	5,359.53	0.36	-0.08	0.031
45.71	-16.24	-2.39	0.00	-145.78	0.00	145.78	5,522.62	2,761.31	10,599.7	5,307.76	0.37	-0.08	0.030
50.00	-15.25	-2.35	0.00	-135.52	0.00	135.52	5,360.27	2,680.14	9,982.54	4,998.69	0.45	-0.09	0.030
52.29	-14.64	-2.32	0.00	-130.15	0.00	130.15	5,391.58	2,695.79	10,100.1	5,057.57	0.49	-0.09	0.028
55.00	-13.57	-2.27	0.00	-123.86	0.00	123.86	5,289.11	2,644.55	9,717.80	4,866.13	0.54	-0.10	0.028
60.00	-12.52	-2.23	0.00	-112.50	0.00	112.50	5,100.04	2,550.02	9,031.77	4,522.60	0.65	-0.11	0.027
65.00	-11.52	-2.19	0.00	-101.34	0.00	101.34	4,910.97	2,455.48	8,370.84	4,191.64	0.77	-0.12	0.027
70.00	-10.55	-2.16	0.00	-90.37	0.00	90.37	4,721.90	2,360.95	7,735.03	3,873.26	0.90	-0.13	0.026
75.00	-9.62	-2.13	0.00	-79.56	0.00	79.56	4,532.83	2,266.41	7,124.33	3,567.46	1.03	-0.14	0.024
80.00	-8.73	-2.10	0.00	-68.91	0.00	68.91	4,343.76	2,171.88	6,538.75	3,274.23	1.18	-0.14	0.023
85.00	-7.87	-2.05	0.00	-58.42	0.00	58.42	4,154.69	2,077.34	5,978.27	2,993.58	1.34	-0.15	0.021
90.00	-7.27	-2.01	0.00	-48.15	0.00	48.15	3,965.62	1,982.81	5,442.91	2,725.50	1.50	-0.16	0.020
93.63	-6.92	-1.99	0.00	-40.84	0.00	40.84	3,828.48	1,914.24	5,070.31	2,538.92	1.63	-0.17	0.018
95.00	-6.07	-1.90	0.00	-38.11	0.00	38.11	3,776.55	1,888.28	4,932.66	2,470.00	1.68	-0.17	0.017
98.38	-5.90	-1.88	0.00	-31.68	0.00	31.68	2,318.41	1,159.21	3,019.73	1,512.11	1.80	-0.18	0.024
100.00	-5.41	-1.81	0.00	-28.63	0.00	28.63	2,290.04	1,145.02	2,933.41	1,468.89	1.86	-0.18	0.022
105.00	-4.94	-1.71	0.00	-19.57	0.00	19.57	2,183.88	1,091.94	2,652.40	1,328.17	2.05	-0.19	0.017
110.00	-4.49	-1.59	0.00	-11.01	0.00	11.01	2,065.71	1,032.86	2,371.71	1,187.62	2.25	-0.19	0.011
115.00	-4.31	-1.53	0.00	-3.06	0.00	3.06	1,947.54	973.77	2,106.72	1,054.92	2.46	-0.20	0.005
117.00	0.00	0.00	0.00	0.00	0.00	0.00	1,900.28	950.14	2,005.11	1,004.05	2.54	-0.20	0.000
119.00	0.00	0.00	0.00	0.00	0.00	0.00	1,853.01	926.50	1,906.02	954.43	2.62	-0.20	0.000

Site Number: 414867

Code: ANSI/TIA-222-G

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Analysis Summary

Load Case	Reactions						Max Usage	
	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	24.50	0.00	41.95	0.00	0.00	2306.76	0.00	0.27
0.9D + 1.6W	24.49	0.00	31.46	0.00	0.00	2299.56	0.00	0.27
1.2D + 1.0Di + 1.0Wi	6.94	0.00	62.24	0.00	0.00	644.34	0.00	0.08
(1.2 + 0.2Sds) * DL + E ELFM	2.87	0.00	41.15	0.00	0.00	247.61	0.00	0.03
(1.2 + 0.2Sds) * DL + E EMAM	2.78	0.00	41.15	0.00	0.00	267.53	0.00	0.04
(0.9 - 0.2Sds) * DL + E ELFM	2.87	0.00	28.72	0.00	0.00	246.80	0.00	0.03
(0.9 - 0.2Sds) * DL + E EMAM	2.78	0.00	28.72	0.00	0.00	266.58	0.00	0.04
1.0D + 1.0W	5.40	0.00	34.97	0.00	0.00	507.76	0.00	0.06

Site Number: 414867

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Site Name: Ashford North CT, CT

Engineering Number: OAA686373_C3_03

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Customer: Verizon Wireless

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
6,803.15	46.30	65.11	2,306.76	62.24	24.50	25.12

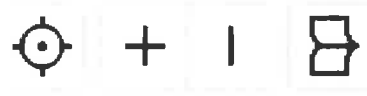
Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
50.0	3.250	76.000	Round	0	0.00	6.149	143.85	730.72	0.20

Anchor Bolts

Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Start Angle (deg)	Compression			Tension		
									Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
70.00	32	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	51.38	260.00	0.20	47.49	260.00	0.19

ATTACHMENT 4



35-B-2
19.37 ac

35-B-3
3.32 ac



35-C-7
1.77 ac

35-C-6
3.94 ac

35-C-42
16.93 ac

35-C-5+
20.1 ac



