

November 16, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
202 North Wawecus Hill Road, Norwich, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 116-foot level of the existing 140-foot tower at 202 North Wawecus Hill Road in Norwich, Connecticut (the “Property”). The tower is owned by American Tower Corporation (“ATC”). The Council approved Cellco’s use of the tower in 2014. Cellco now intends to modify its facility by replacing nine (9) of its existing antennas with three (3) model LNX-6514DS, 700 MHz antennas; three (3) model HBXX-6517DS, 1900 MHz antennas; and three (3) model HBXX-6517DS, 2100 MHz antennas, all at the same 116-foot level on the tower. Cellco also intends to replace six (6) remote radio heads (“RRHs”) and install three (3) new RRHs behind its antennas and two (1) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Deb Hinchey, Mayor for the City of Norwich. A copy of this letter is also being sent to John J. Polaski, Jr., 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).

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1. The proposed modifications will not result in an increase in the height of the existing tower. The replacement antennas and RRHs will be located at the 116-foot level on the 140-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 modified facility 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 behind 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*).

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:

Deb Hinchey, Norwich Mayor
John J. Polaski, Jr.
ATC
Tim Parks

ATTACHMENT 1



LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	15.8	15.9
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Vertical, degrees	12.4	11.2
Beam Tilt, degrees	0–10	0–10
USLS (First Lobe), dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	23	23
CPR at Sector, dB	12	10
Isolation, dB	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896
Gain by all Beam Tilts, average, dBi	15.6	15.7
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.5
	0 ° 15.7	0 ° 15.9
Gain by Beam Tilt, average, dBi	5 ° 15.7	5 ° 15.8
	10 ° 15.3	10 ° 15.3
Beamwidth, Horizontal Tolerance, degrees	±0.9	±1.4
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6
USLS, beampeak to 20° above beampeak, dB	18	20
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	25	24
CPR at Sector, dB	15	12

* 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 Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® Teletilt®

LNX-6514DS-VTM

POWERED BY



Operating Frequency Band
Performance Note

698 – 896 MHz
Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Depth	180.5 mm 7.1 in
Length	1851.0 mm 72.9 in
Width	301.0 mm 11.9 in
Net Weight	14.2 kg 31.3 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	LNX-6514DS-A1M
RET System	Teletilt®

Packed Dimensions

Depth	284.0 mm 11.2 in
Length	2163.0 mm 85.2 in
Width	411.0 mm 16.2 in
Shipping Weight	32.3 kg 71.2 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



Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

Product Specifications

COMMScope®

INX-6514DS-VTM

POWERED BY



DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance
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HBXX-6517DS-VTM

Andrew® Quad Port Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
	0 ° 18.4	0 ° 18.4	0 ° 18.7
Gain by Beam Tilt, average, dBi	3 ° 18.7	3 ° 18.7	3 ° 18.9
	6 ° 18.4	6 ° 18.5	6 ° 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

* 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 Brand	Andrew®
Antenna Type	DualPol® quad
Band	Single band
Brand	DualPol® Teletilt®
Operating Frequency Band	1710 – 2180 MHz

HBXX-6517DS-VTM

POWERED BY



Performance Note

Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Depth	166.0 mm 6.5 in
Length	1903.0 mm 74.9 in
Width	305.0 mm 12.0 in
Net Weight	19.5 kg 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Packed Dimensions

Depth	292.0 mm 11.5 in
Length	2219.0 mm 87.4 in
Width	409.0 mm 16.1 in
Shipping Weight	29.3 kg 64.6 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



Included Products

600899A-2 — 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.

HBXX-6517DS-VTM



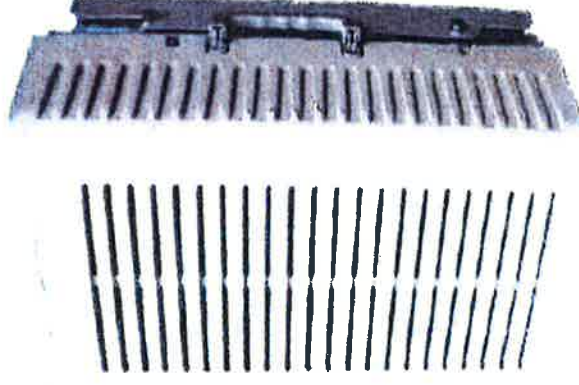
*** Footnotes**

Performance Note	Severe environmental conditions may degrade optimum performance
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PCS RF MODULES RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

RRH2x60	
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver	1900 HW version 1900A HW version
Features	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3 AISG 2.0 for RET/TMA
Power	Internal Smart Bias-T -48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



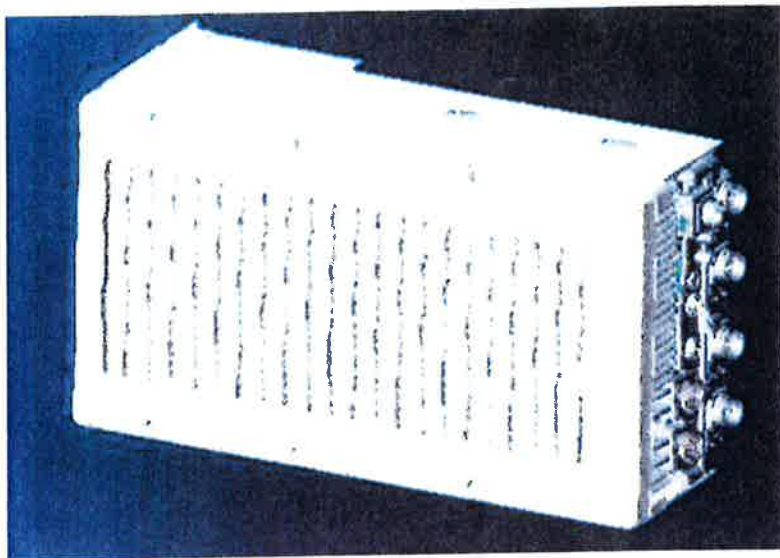
** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW

RRH2X60 - HW CHARACTERISTICS

LR14.3

RRH2X60	
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w) x 9.4" (d)**
Weight	55lb**



** - Includes solar shield but not mounting brackets (8 lbs.)

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.

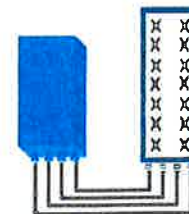


FEATURES

- 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: <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

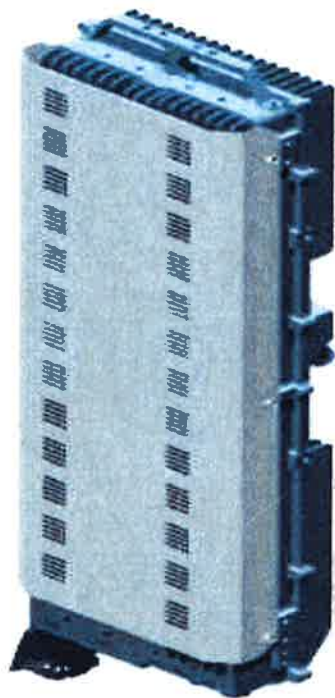
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ALCATEL-LUCENT

WIRELESS PRODUCT DATASHEET

RRH2X60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals

along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

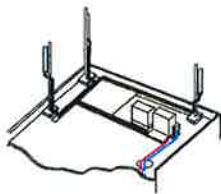
EASY INSTALLATION

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

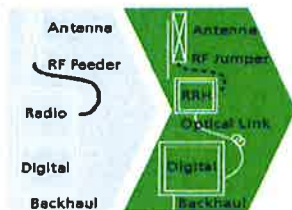
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

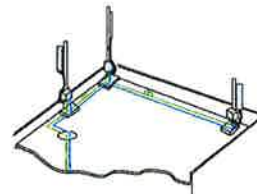
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and

silent solutions, with minimum impact on the neighborhood, which ease the deployment

- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisy chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

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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 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

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, 8.4mm² (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)	UL94-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), IEEE1202/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 1: HYBRIFLEX Series

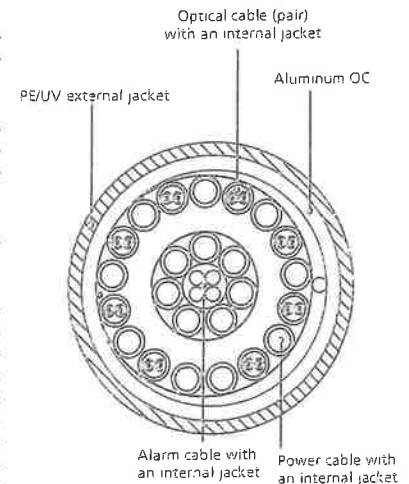


Figure 2: Construction Detail

ATTACHMENT 2

ATTACHMENT 3



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 140 ft Monopole
ATC Site Name : Norwich CT, CT
ATC Site Number : 311014
Engineering Number : 63173722
Proposed Carrier : Verizon
Carrier Site Name : Norwich West CT
Carrier Site Number : 161645
Site Location : 202 N Wawecus Hill Rd
Norwich, CT 06360-4071
41.527069,-72.122594
County : New London
Date : August 20, 2015
Max Usage : 35%
Result : Pass

Reviewed by:
Scott Wirgau, PE
Structural Team Leader

Prepared By:
Vivian Chung



Aug 21 2015 10:16 AM

COA: PEC.0001553



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Calculations	Attached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 140 ft monopole to reflect the change in loading by Verizon.

Supporting Documents

Tower Drawings	PennSummit, Paul J. Ford Job #29205-0119, dated June 1, 2005
Foundation Drawing	PennSummit, Paul J. Ford Job #29205-0119, dated June 1, 2005
Geotechnical Report	Clarence Welt Assoc. Geotechnical Study Report for Cell Tower 202 North Wawecus Hill Rd., dated October 3, 2005

Analysis

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

Basic Wind Speed:	110 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
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					
137.0	137.0	3	Ericsson KRY 112 144/1	Low Profile Platform	(12) 1 5/8" Coax (1) 1 5/8" Hybriflex	T-Mobile
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Ericsson AIR 21, 1.3M, B4A B2P			
126.0	127.0	6	Kathrein 800 10504	Low Profile Platform	(6) 1 5/8" Coax (1) 3/8" Coax	Metro PCS
	126.0	3	RCU			
116.0	116.0	1	RFS DB-T1-6Z-8AB-0Z	Low Profile Platform	(12) 1 5/8" Coax	Verizon
		3	Antel BXA-70063-6CF-EDIN-X			

Equipment to be Removed

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
116.0	116.0	3	Alcatel-Lucent RRH2x40-AWS	-	-	Verizon
		3	Alcatel-Lucent RRH2x40-07-U			
		3	Antel BXA-70063-6CF-EDIN-X			
		6	Antel BXA-171063-12CF-EDIN-X			

Proposed Equipment

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
116.0	116.0	3	Alcatel-Lucent RRH2x60 - AWS Band 4 (20" Height)	Low Profile Platform	(2) 1 5/8" Hybriflex	Verizon
		3	Alcatel-Lucent RRH2X60-1900A-4R			
		3	Alcatel-Lucent RRH2x60 700			
		1	RFS DB-T1-6Z-8AB-0Z			
		3	Commscope LNX-6514DS-A1M			
		6	Commscope HBXX-6517DS-A2M			

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	29%	Pass
Shaft	35%	Pass
Base Plate	18%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,343.3	22%
Axial (Kips)	44.9	8%
Shear (Kips)	25.1	13%

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

The foundation and anchorages for this tower have factors of safety exceeding 2.0 with respect to wind.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
116.0	Alcatel-Lucent RRH2X60-1900A-4R	Verizon	0.373	0.344
	Alcatel-Lucent RRH2x60 - AWS Band 4 (20" Height)			
	Alcatel-Lucent RRH2x60 700			
	Commscope LNX-6514DS-A1M			
	Commscope HBXX-6517DS-A2M			
	RFS DB-T1-6Z-8AB-OZ			

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



Standard Conditions

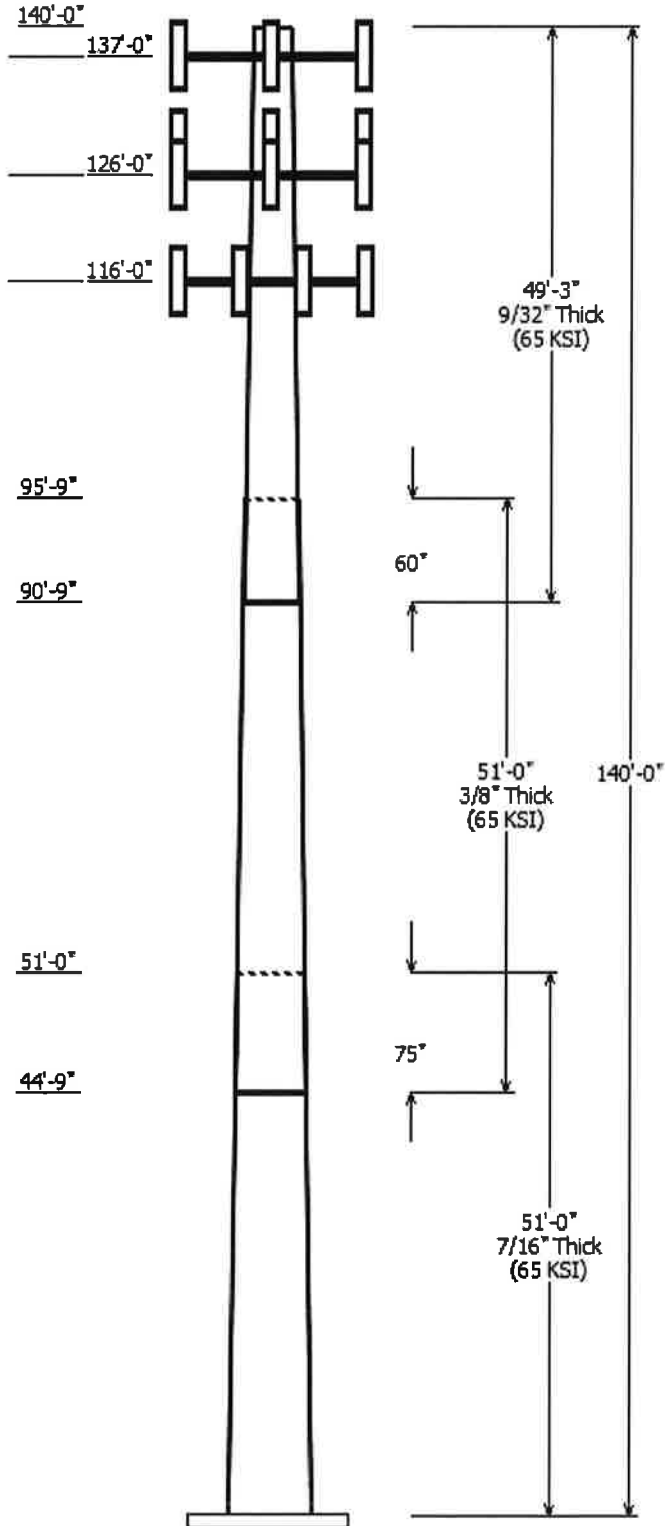
All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- 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.



Job Information

Pole : 311014 Code: ANSI/TIA-222-G
 Description : 140 ft PennSummit Monopole
 Client : VERIZON WIRELESS Struct Class : II
 Location : Norwich CT, CT
 Shape : 18 Sides Exposure : B
 Height : 140.00 (ft) Topo : 1
 Base Elev (ft): 0.00
 Taper: 0.23420(in/ft)

Sections Properties

Shaft Section	Length (ft)	Diameter (in)		Thick Joint	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
		Top	Bottom	(in) Type			
1	51.000	48.21	60.16	0.438	0.000	0.234203	65
2	51.000	38.48	50.42	0.375 Slip Joint	75.000	0.234203	65
3	49.250	28.68	40.21	0.281 Slip Joint	60.000	0.234203	65

Discrete Appurtenance

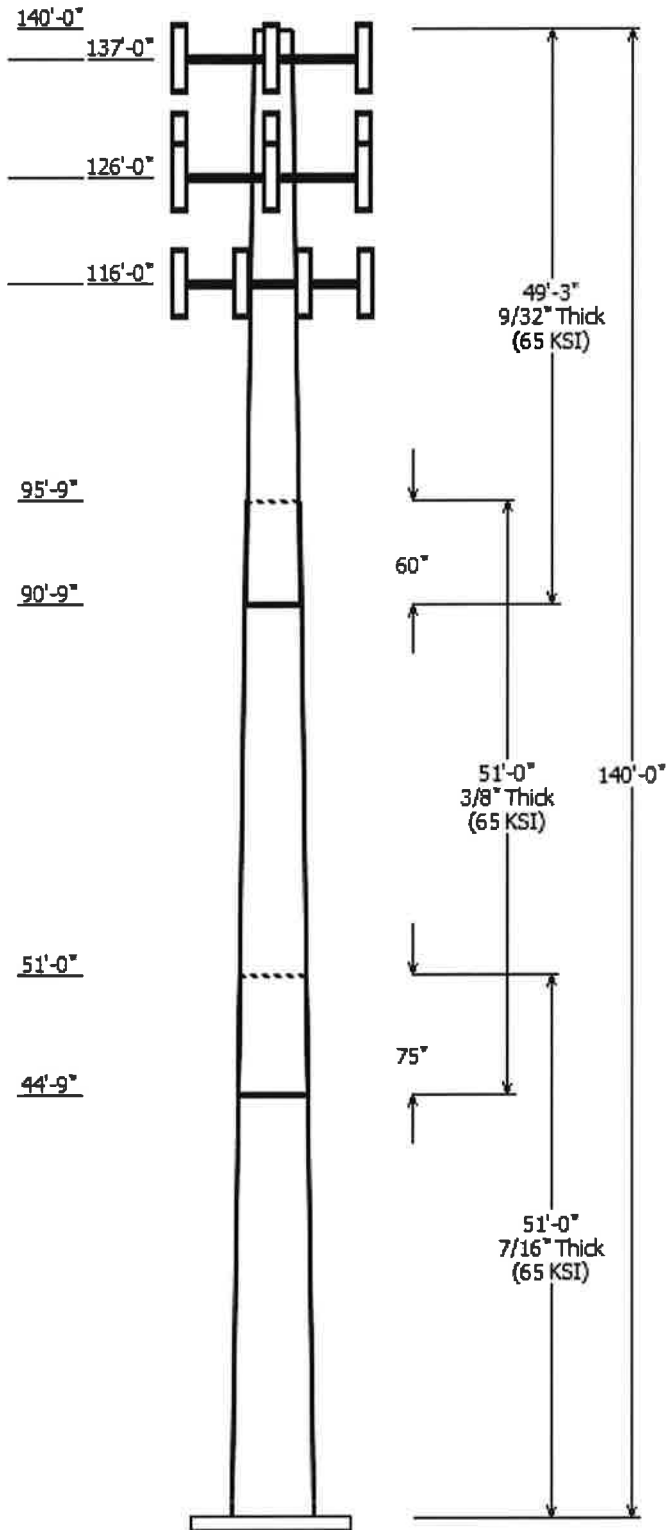
Attach Elev (ft)	Force Elev (ft)	Qty	Description
137.000	137.000	3	Ericsson KRY 112 144/1
137.000	137.000	3	Ericsson AIR 21, 1.3 M, B2A B4
137.000	137.000	1	Flat Low Profile Platform
137.000	137.000	3	Ericsson AIR 21, 1.3M, B4A B2P
126.000	126.000	3	RCU
126.000	127.000	6	Kathrein 800 10504
126.000	126.000	1	Flat Low Profile Platform
116.000	116.000	1	RFS DB-T1-6Z-8AB-0Z
116.000	116.000	1	RFS DB-T1-6Z-8AB-0Z
116.000	116.000	6	Commscope HBXX-6517DS-
116.000	116.000	3	Commscope LNX-6514DS-A1M
116.000	116.000	3	Alcatel-Lucent RRH2x60 700
116.000	116.000	3	Alcatel-Lucent RRH2x60 - AWS
116.000	116.000	3	Alcatel-Lucent RRH2X60-1900A-
116.000	116.000	3	Antel BXA-70063-6CF-EDIN-X
116.000	116.000	1	Round Low Profile Platform

Linear Appurtenance

Elev (ft)		Description	Exposed To Wind
From	To		
5.000	116.0	1 5/8" Coax	No
5.000	116.0	1 5/8" Hybriflex	No
5.000	126.0	1 5/8" Coax	Yes
5.000	126.0	3/8" Coax	Yes
5.000	137.0	1 5/8" Coax	No
5.000	137.0	1 5/8" Hybriflex	No

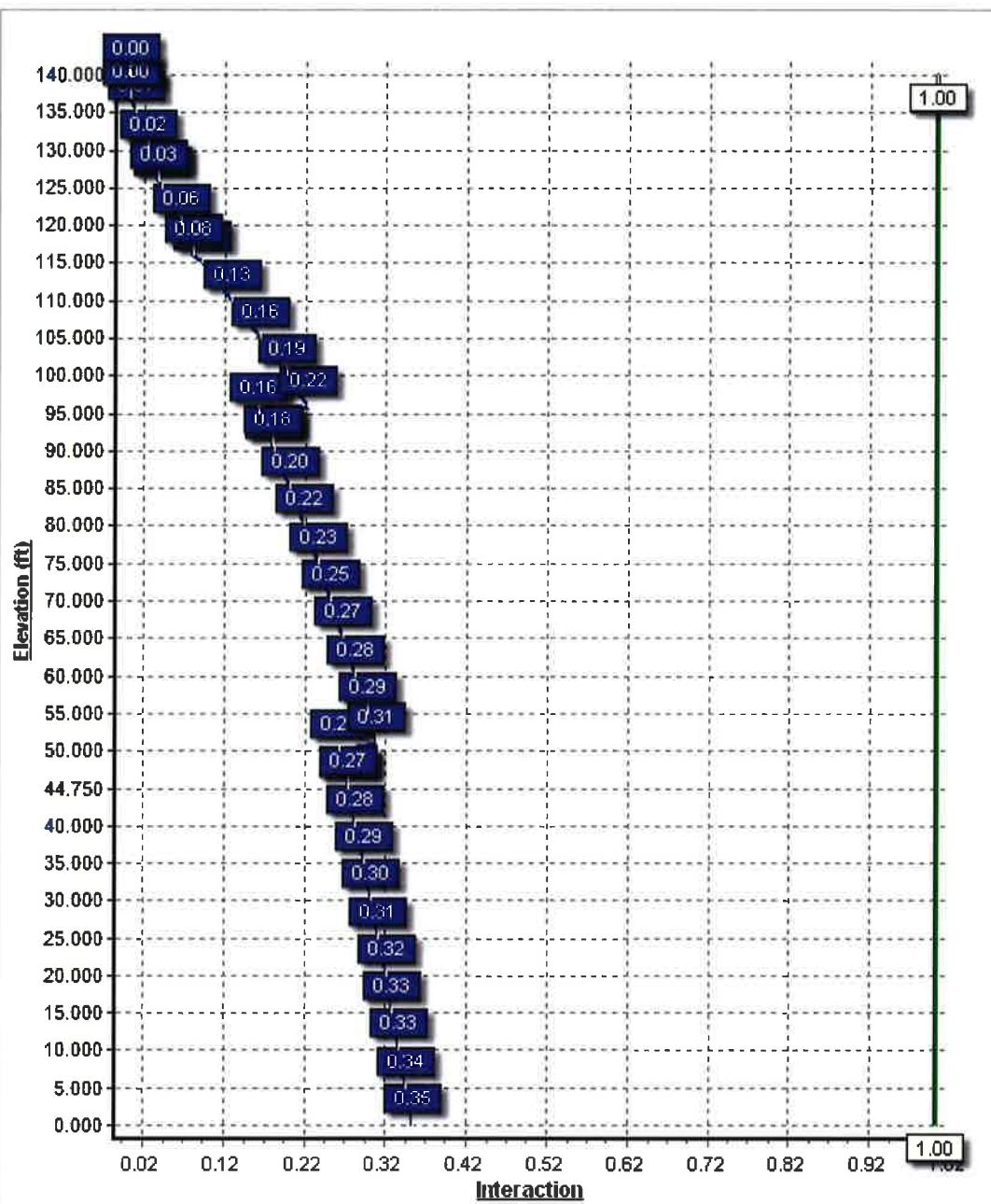
Load Cases

1.2D + 1.6W	110 mph with No Ice
0.9D + 1.6W	110 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	2343.29	25.12	44.93
0.9D + 1.6W	2331.81	25.11	33.70
1.2D + 1.0Di + 1.0Wi	514.49	5.68	66.22
(1.2 + 0.2Sds) * DL + E E LFM	216.82	2.11	44.57
(1.2 + 0.2Sds) * DL + E EMAM	211.82	2.03	44.57
(0.9 - 0.2Sds) * DL + E E LFM	215.58	2.11	31.17
(0.9 - 0.2Sds) * DL + E EMAM	210.53	2.03	31.17
1.0D + 1.0W	434.34	4.67	37.46

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



Site Number: 311014**Code: ANSI/TIA-222-G**

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Site Name: Norwich CT, CT**Engineering Number: 63173722****8/20/2015 5:45:33 PM****Customer: VERIZON WIRELESS**

Analysis Parameters

Location:	New London County, CT	Height (ft):	140
Code:	ANSI/TIA-222-G	Base Diameter (in):	60.16
Shape:	18 Sides	Top Diameter (in):	28.68
Pole Type:	Taper	Taper (in/ft) :	0.234
Pole Manufacturer:	PennSummit Tub		

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	110 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):	1.48		
T_L (sec):	6	p:	1.3
S_s:	0.168	S₁:	0.060
F_a:	1.600	F_v:	2.400
S_{ds}:	0.179	S_{d1}:	0.096
		C_s:	0.043
		C_s Max:	0.043
		C_s Min:	0.030

Load Cases

1.2D + 1.6W	110 mph with No Ice
0.9D + 1.6W	110 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2S_{ds}) * DL + EELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2S_{ds}) * DL + EEMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2S_{ds}) * DL + EELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2S_{ds}) * DL + EEMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:33 PM

Customer: VERIZON WIRELESS

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom				Top				W/t Ratio	D/t Ratio	Taper (in/ft)
							Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)			
1-18	51.000	0.4375	65	Slip	0.00	12,952	60.16	0.00	82.93	37371.0	22.84	137.51	48.21	51.00	66.34	19134.1	0.234203
2-18	51.000	0.3750	65	Slip	75.00	9,105	50.42	44.75	59.58	18858.2	22.30	134.48	38.48	95.75	45.36	8323.2	0.234203
3-18	49.250	0.2813	65	Slip	60.00	5,112	40.21	90.75	35.65	7184.1	23.80	143.00	28.68	140.00	25.35	2584.2	0.234203
Shaft Weight						27,169											

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		
137.00	Ericsson AIR 21, 1.3 M, B2A	3	83.00	6.050	0.86	250.08	7.137	0.86	0.000	0.000
137.00	Ericsson AIR 21, 1.3M, B4A	3	81.50	6.090	0.85	248.53	7.181	0.85	0.000	0.000
137.00	Ericsson KRY 112 144/1	3	11.00	0.410	0.50	27.15	0.631	0.50	0.000	0.000
137.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,142.89	45.044	1.00	0.000	0.000
126.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,137.75	44.893	1.00	0.000	0.000
126.00	Kathrein 800 10504	6	17.60	3.340	0.78	97.47	4.281	0.78	0.000	1.000
126.00	RCU	3	1.00	0.160	0.50	10.88	0.357	0.50	0.000	0.000
116.00	Alcatel-Lucent RRH2x60 -	3	44.00	1.870	0.50	109.58	2.443	0.50	0.000	0.000
116.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.150	0.67	135.50	2.758	0.67	0.000	0.000
116.00	Alcatel-Lucent RRH2X60-	3	46.00	1.870	0.50	112.73	2.443	0.50	0.000	0.000
116.00	Antel BXA-70063-6CF-EDIN-X	3	17.00	7.570	0.77	185.84	8.801	0.77	0.000	0.000
116.00	Commscope HBXX-6517DS-	6	40.80	8.530	0.81	238.32	9.819	0.81	0.000	0.000
116.00	Commscope LNX-6514DS-	3	38.80	8.170	0.83	236.01	9.442	0.83	0.000	0.000
116.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	4.800	0.67	183.38	5.650	0.67	0.000	0.000
116.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	4.800	0.67	183.38	5.650	0.67	0.000	0.000
116.00	Round Low Profile Platform	1	1500.00	21.700	1.00	2,132.47	40.442	1.00	0.000	0.000
Totals		44	6075.40			12,743.40			Number of Loadings : 16	

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
5.00	137.00	12	1 5/8" Coax	1.98	1.30	N	0.00	N	T-Mobile
5.00	137.00	1	1 5/8" Hybriflex	1.98	1.30	N	0.00	N	T-Mobile
5.00	126.00	6	1 5/8" Coax	1.98	0.82	N	1.98	Y	Metro PCS
5.00	126.00	1	3/8" Coax	0.44	0.08	N	0.00	Y	Metro PCS
5.00	116.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Verizon
5.00	116.00	2	1 5/8" Hybriflex	1.98	1.30	N	0.00	N	Verizon

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:33 PM

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	Fy (ksi)	S (in ³)	Z (in ³)	Weight (lb)
0.00		0.4375	60.160	82.929	37,371.0	22.84	137.51	74.5	1223.	0.0	0.0
5.00		0.4375	58.989	81.303	35,215.5	22.36	134.83	75.1	1175.	0.0	1,397.1
10.00		0.4375	57.818	79.677	33,144.6	21.89	132.16	75.7	1129.	0.0	1,369.4
15.00		0.4375	56.647	78.051	31,156.5	21.42	129.48	76.2	1083.	0.0	1,341.8
20.00		0.4375	55.476	76.425	29,249.5	20.95	126.80	76.8	1038.	0.0	1,314.1
25.00		0.4375	54.305	74.799	27,422.0	20.48	124.13	77.3	994.6	0.0	1,286.5
30.00		0.4375	53.134	73.173	25,672.2	20.00	121.45	77.9	951.6	0.0	1,258.8
35.00		0.4375	51.963	71.547	23,998.5	19.53	118.77	78.4	909.6	0.0	1,231.1
40.00		0.4375	50.792	69.921	22,399.2	19.06	116.10	79.0	868.6	0.0	1,203.5
44.75	Bot - Section 2	0.4375	49.679	68.376	20,947.1	18.61	113.55	79.5	830.5	0.0	1,117.7
45.00		0.4375	49.621	68.295	20,872.5	18.59	113.42	79.5	828.5	0.0	108.8
50.00		0.4375	48.450	66.669	19,416.8	18.12	110.74	80.1	789.3	0.0	2,148.7
51.00	Top - Section 1	0.3750	48.966	57.833	17,251.7	21.61	130.57	76.0	693.9	0.0	423.6
55.00		0.3750	48.029	56.718	16,273.0	21.17	128.08	76.5	667.3	0.0	779.6
60.00		0.3750	46.858	55.324	15,102.6	20.62	124.95	77.1	634.8	0.0	953.1
65.00		0.3750	45.687	53.930	13,989.7	20.07	121.83	77.8	603.1	0.0	929.4
70.00		0.3750	44.516	52.537	12,932.8	19.52	118.71	78.4	572.2	0.0	905.7
75.00		0.3750	43.345	51.143	11,930.6	18.97	115.59	79.1	542.1	0.0	882.0
80.00		0.3750	42.174	49.749	10,981.5	18.42	112.46	79.7	512.9	0.0	858.3
85.00		0.3750	41.003	48.355	10,084.2	17.87	109.34	80.4	484.4	0.0	834.6
90.00		0.3750	39.832	46.962	9,237.1	17.32	106.22	81.0	456.8	0.0	810.9
90.75	Bot - Section 3	0.3750	39.656	46.753	9,114.3	17.24	105.75	81.1	452.7	0.0	119.6
95.00		0.3750	38.661	45.568	8,438.8	16.77	103.10	81.7	429.9	0.0	1,176.7
95.75	Top - Section 2	0.2813	39.047	34.605	6,570.5	23.07	138.84	74.3	331.4	0.0	204.5
100.0		0.2813	38.052	33.716	6,077.3	22.45	135.30	75.0	314.6	0.0	494.0
105.0		0.2813	36.881	32.671	5,529.4	21.71	131.13	75.9	295.3	0.0	564.8
110.0		0.2813	35.710	31.626	5,015.4	20.98	126.97	76.7	276.6	0.0	547.0
115.0		0.2813	34.539	30.580	4,534.4	20.24	122.81	77.6	258.6	0.0	529.2
116.0		0.2813	34.305	30.371	4,442.0	20.10	121.97	77.8	255.0	0.0	103.7
120.0		0.2813	33.368	29.535	4,085.1	19.51	118.64	78.5	241.1	0.0	407.7
125.0		0.2813	32.197	28.490	3,666.5	18.78	114.48	79.3	224.3	0.0	493.6
126.0		0.2813	31.963	28.281	3,586.4	18.63	113.65	79.5	221.0	0.0	96.6
130.0		0.2813	31.026	27.444	3,277.6	18.04	110.31	80.2	208.1	0.0	379.2
135.0		0.2813	29.855	26.399	2,917.1	17.31	106.15	81.0	192.5	0.0	458.0
137.0		0.2813	29.387	25.981	2,780.7	17.01	104.49	81.4	186.4	0.0	178.2
140.0		0.2813	28.684	25.354	2,584.2	16.57	101.99	81.9	177.4	0.0	262.0
											27,169.4

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:33 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W

110 mph with No Ice

20 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg			Dead		Torsion	Moment	Dead		Dead		Dead	Torsion	Moment
Elev		Wind FX	Load	Wind FX	MY	MZ	Load	Wind FX	Load	Wind FX	Load	MY	MZ
(ft)	Description	(lb)	(lb)	(lb)	(lb-ft)	(lb-ft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb-ft)	(lb)
0.00		297.0	0.0					0.0	0.0	297.0	0.0	0.0	0.0
5.00		588.1	1,676.5					0.0	0.0	588.1	1,676.5	0.0	0.0
10.00		576.5	1,643.3					0.0	206.0	576.5	1,849.4	0.0	0.0
15.00		564.8	1,610.1					0.0	206.0	564.8	1,816.2	0.0	0.0
20.00		553.1	1,576.9					0.0	206.0	553.1	1,783.0	0.0	0.0
25.00		541.4	1,543.7					0.0	206.0	541.4	1,749.8	0.0	0.0
30.00		536.0	1,510.5					0.0	206.0	536.0	1,716.6	0.0	0.0
35.00		541.5	1,477.3					0.0	206.0	541.5	1,683.4	0.0	0.0
40.00		536.0	1,444.1					0.0	206.0	536.0	1,650.2	0.0	0.0
44.75	Bot - Section 2	276.9	1,341.2					0.0	195.7	276.9	1,536.9	0.0	0.0
45.00		297.4	130.5					0.0	10.3	297.4	140.8	0.0	0.0
50.00		340.1	2,578.4					0.0	206.0	340.1	2,784.5	0.0	0.0
51.00	Top - Section 1	284.6	508.3					0.0	41.2	284.6	549.5	0.0	0.0
55.00		512.8	935.5					0.0	164.8	512.8	1,100.3	0.0	0.0
60.00		569.8	1,143.8					0.0	206.0	569.8	1,349.8	0.0	0.0
65.00		568.4	1,115.3					0.0	206.0	568.4	1,321.3	0.0	0.0
70.00		565.7	1,086.8					0.0	206.0	565.7	1,292.9	0.0	0.0
75.00		561.8	1,058.4					0.0	206.0	561.8	1,264.4	0.0	0.0
80.00		556.8	1,029.9					0.0	206.0	556.8	1,236.0	0.0	0.0
85.00		550.8	1,001.5					0.0	206.0	550.8	1,207.5	0.0	0.0
90.00		314.6	973.0					0.0	206.0	314.6	1,179.1	0.0	0.0
90.75	Bot - Section 3	273.4	143.5					0.0	30.9	273.4	174.4	0.0	0.0
95.00		273.4	1,412.0					0.0	175.1	273.4	1,587.2	0.0	0.0
95.75	Top - Section 2	270.0	245.4					0.0	30.9	270.0	276.4	0.0	0.0
100.00		494.8	592.8					0.0	175.1	494.8	768.0	0.0	0.0
105.00		526.3	677.7					0.0	206.0	526.3	883.7	0.0	0.0
110.00		516.4	656.4					0.0	206.0	516.4	862.4	0.0	0.0
115.00		306.2	635.0					0.0	206.0	306.2	841.1	0.0	0.0
116.00	Appertunance(s)	250.2	124.4	5,244.9	0.0	0.0	2,928.4	0.0	41.2	5,495.1	3,094.0	0.0	0.0
120.00		444.2	489.2					0.0	105.1	444.2	594.4	0.0	0.0
125.00		292.7	592.3					0.0	131.4	292.7	723.7	0.0	0.0
126.00	Appertunance(s)	238.5	115.9	2,122.8	0.0	685.3	1,930.3	0.0	26.3	2,361.3	2,072.5	0.0	0.0
130.00		422.5	455.1					0.0	81.1	422.5	536.2	0.0	0.0
135.00		323.2	549.7					0.0	101.4	323.2	651.1	0.0	0.0
137.00	Appertunance(s)	225.6	213.9	2,884.1	0.0	0.0	2,431.8	0.0	40.6	3,109.7	2,686.2	0.0	0.0
140.00		134.6	314.4					0.0	0.0	134.6	314.4	0.0	0.0
Totals:										25,377.9	44,953.7	0.00	0.00

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:34 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.6W

110 mph with No Ice

20 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-44.93	-25.12	0.00	-2,343.29	0.00	2,343.29	5,563.50	2,781.75	13,660.1	6,840.21	0.00	0.00	0.351
5.00	-43.22	-24.59	0.00	-2,217.72	0.00	2,217.72	5,495.04	2,747.52	13,225.5	6,622.59	0.05	-0.09	0.343
10.00	-41.34	-24.07	0.00	-2,094.76	0.00	2,094.76	5,424.94	2,712.47	12,793.7	6,406.38	0.19	-0.17	0.335
15.00	-39.49	-23.56	0.00	-1,974.39	0.00	1,974.39	5,353.22	2,676.61	12,365.0	6,191.70	0.41	-0.26	0.326
20.00	-37.67	-23.06	0.00	-1,856.58	0.00	1,856.58	5,279.88	2,639.94	11,939.5	5,978.66	0.74	-0.35	0.318
25.00	-35.89	-22.56	0.00	-1,741.30	0.00	1,741.30	5,204.91	2,602.46	11,517.6	5,767.39	1.15	-0.44	0.309
30.00	-34.14	-22.06	0.00	-1,628.51	0.00	1,628.51	5,128.32	2,564.16	11,099.4	5,557.99	1.65	-0.52	0.300
35.00	-32.43	-21.55	0.00	-1,518.20	0.00	1,518.20	5,050.10	2,525.05	10,685.3	5,350.59	2.25	-0.61	0.290
40.00	-30.76	-21.04	0.00	-1,410.45	0.00	1,410.45	4,970.26	2,485.13	10,275.3	5,145.31	2.94	-0.70	0.280
44.75	-29.21	-20.77	0.00	-1,310.50	0.00	1,310.50	4,892.90	2,446.45	9,890.02	4,952.36	3.67	-0.78	0.271
45.00	-29.06	-20.49	0.00	-1,305.31	0.00	1,305.31	4,888.79	2,444.40	9,869.86	4,942.27	3.71	-0.78	0.270
50.00	-26.26	-20.13	0.00	-1,202.86	0.00	1,202.86	4,805.70	2,402.85	9,469.07	4,741.57	4.58	-0.87	0.259
51.00	-25.70	-19.86	0.00	-1,182.72	0.00	1,182.72	3,954.70	1,977.35	7,897.06	3,954.40	4.76	-0.89	0.306
55.00	-24.58	-19.36	0.00	-1,103.28	0.00	1,103.28	3,904.91	1,952.45	7,646.13	3,828.75	5.54	-0.96	0.295
60.00	-23.21	-18.81	0.00	-1,006.46	0.00	1,006.46	3,841.19	1,920.60	7,335.11	3,673.01	6.59	-1.05	0.280
65.00	-21.87	-18.25	0.00	-912.42	0.00	912.42	3,775.86	1,887.93	7,027.24	3,518.84	7.73	-1.14	0.265
70.00	-20.57	-17.69	0.00	-821.18	0.00	821.18	3,708.90	1,854.45	6,722.77	3,366.38	8.97	-1.23	0.250
75.00	-19.29	-17.13	0.00	-732.74	0.00	732.74	3,640.31	1,820.16	6,421.93	3,215.74	10.30	-1.31	0.233
80.00	-18.04	-16.57	0.00	-647.11	0.00	647.11	3,570.10	1,785.05	6,124.95	3,067.03	11.72	-1.39	0.216
85.00	-16.83	-16.01	0.00	-564.29	0.00	564.29	3,498.27	1,749.13	5,832.07	2,920.37	13.22	-1.47	0.198
90.00	-15.65	-15.67	0.00	-484.25	0.00	484.25	3,424.81	1,712.40	5,543.53	2,775.89	14.81	-1.55	0.179
90.75	-15.47	-15.40	0.00	-472.50	0.00	472.50	3,413.65	1,706.82	5,500.64	2,754.41	15.05	-1.56	0.176
95.00	-13.88	-15.10	0.00	-407.03	0.00	407.03	3,349.72	1,674.86	5,259.57	2,633.69	16.46	-1.62	0.159
95.75	-13.61	-14.83	0.00	-395.71	0.00	395.71	2,312.98	1,156.49	3,686.59	1,846.04	16.72	-1.63	0.220
100.00	-12.84	-14.32	0.00	-332.70	0.00	332.70	2,275.87	1,137.93	3,533.62	1,769.44	18.19	-1.68	0.194
105.00	-11.95	-13.78	0.00	-261.09	0.00	261.09	2,230.70	1,115.35	3,355.32	1,680.15	19.99	-1.75	0.161
110.00	-11.10	-13.25	0.00	-192.17	0.00	192.17	2,183.90	1,091.95	3,179.03	1,591.88	21.85	-1.81	0.126
115.00	-10.26	-12.92	0.00	-125.92	0.00	125.92	2,135.49	1,067.74	3,004.99	1,504.73	23.77	-1.85	0.089
116.00	-7.34	-7.33	0.00	-113.00	0.00	113.00	2,125.61	1,062.80	2,970.48	1,487.45	24.16	-1.86	0.079
120.00	-6.76	-6.87	0.00	-83.67	0.00	83.67	2,085.44	1,042.72	2,833.45	1,418.83	25.73	-1.88	0.062
125.00	-6.05	-6.56	0.00	-49.31	0.00	49.31	2,033.77	1,016.89	2,664.63	1,334.29	27.71	-1.91	0.040
126.00	-4.05	-4.13	0.00	-42.07	0.00	42.07	2,023.25	1,011.62	2,631.21	1,317.56	28.11	-1.91	0.034
130.00	-3.53	-3.69	0.00	-25.56	0.00	25.56	1,980.48	990.24	2,498.77	1,251.24	29.72	-1.92	0.022
135.00	-2.89	-3.34	0.00	-7.12	0.00	7.12	1,925.56	962.78	2,336.10	1,169.79	31.74	-1.93	0.008
137.00	-0.31	-0.15	0.00	-0.44	0.00	0.44	1,903.14	951.57	2,271.99	1,137.68	32.54	-1.93	0.001
140.00	0.00	-0.13	0.00	0.00	0.00	0.00	1,869.02	934.51	2,176.88	1,090.06	33.76	-1.93	0.000

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:34 PM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W**110 mph with No Ice (Reduced DL)****20 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		297.0	0.0					0.0	0.0	297.0	0.0	0.0	0.0
5.00		588.1	1,257.4					0.0	0.0	588.1	1,257.4	0.0	0.0
10.00		576.5	1,232.5					0.0	154.5	576.5	1,387.0	0.0	0.0
15.00		564.8	1,207.6					0.0	154.5	564.8	1,362.1	0.0	0.0
20.00		553.1	1,182.7					0.0	154.5	553.1	1,337.2	0.0	0.0
25.00		541.4	1,157.8					0.0	154.5	541.4	1,312.3	0.0	0.0
30.00		536.0	1,132.9					0.0	154.5	536.0	1,287.4	0.0	0.0
35.00		541.5	1,108.0					0.0	154.5	541.5	1,262.5	0.0	0.0
40.00		536.0	1,083.1					0.0	154.5	536.0	1,237.6	0.0	0.0
44.75	Bot - Section 2	276.9	1,005.9					0.0	146.8	276.9	1,152.7	0.0	0.0
45.00		297.4	97.9					0.0	7.7	297.4	105.6	0.0	0.0
50.00		340.1	1,933.8					0.0	154.5	340.1	2,088.3	0.0	0.0
51.00	Top - Section 1	284.6	381.2					0.0	30.9	284.6	412.1	0.0	0.0
55.00		512.8	701.6					0.0	123.6	512.8	825.2	0.0	0.0
60.00		569.8	857.8					0.0	154.5	569.8	1,012.4	0.0	0.0
65.00		568.4	836.5					0.0	154.5	568.4	991.0	0.0	0.0
70.00		565.7	815.1					0.0	154.5	565.7	969.7	0.0	0.0
75.00		561.8	793.8					0.0	154.5	561.8	948.3	0.0	0.0
80.00		556.8	772.5					0.0	154.5	556.8	927.0	0.0	0.0
85.00		550.8	751.1					0.0	154.5	550.8	905.6	0.0	0.0
90.00		314.6	729.8					0.0	154.5	314.6	884.3	0.0	0.0
90.75	Bot - Section 3	273.4	107.6					0.0	23.2	273.4	130.8	0.0	0.0
95.00		273.4	1,059.0					0.0	131.4	273.4	1,190.4	0.0	0.0
95.75	Top - Section 2	270.0	184.1					0.0	23.2	270.0	207.3	0.0	0.0
100.00		494.8	444.6					0.0	131.4	494.8	576.0	0.0	0.0
105.00		526.3	508.3					0.0	154.5	526.3	662.8	0.0	0.0
110.00		516.4	492.3					0.0	154.5	516.4	646.8	0.0	0.0
115.00		306.2	476.3					0.0	154.5	306.2	630.8	0.0	0.0
116.00	Appertunance(s)	250.2	93.3	5,244.9	0.0	0.0	2,196.3	0.0	30.9	5,495.1	2,320.5	0.0	0.0
120.00		444.2	366.9					0.0	78.8	444.2	445.8	0.0	0.0
125.00		292.7	444.3					0.0	98.5	292.7	542.8	0.0	0.0
126.00	Appertunance(s)	238.5	86.9	2,122.8	0.0	685.3	1,447.7	0.0	19.7	2,361.3	1,554.4	0.0	0.0
130.00		422.5	341.3					0.0	60.8	422.5	402.2	0.0	0.0
135.00		323.2	412.2					0.0	76.0	323.2	488.3	0.0	0.0
137.00	Appertunance(s)	225.6	160.4	2,884.1	0.0	0.0	1,823.8	0.0	30.4	3,109.7	2,014.7	0.0	0.0
140.00		134.6	235.8					0.0	0.0	134.6	235.8	0.0	0.0
Totals:										25,377.9	33,715.3	0.00	0.00

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:35 PM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.6W

110 mph with No Ice (Reduced DL)

20 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	-33.70	-25.11	0.00	-2,331.81	0.00	2,331.81	5,563.50	2,781.75	13,660.1	6,840.21	0.00	0.00	0.347
5.00	-32.40	-24.57	0.00	-2,206.28	0.00	2,206.28	5,495.04	2,747.52	13,225.5	6,622.59	0.05	-0.09	0.339
10.00	-30.98	-24.03	0.00	-2,083.45	0.00	2,083.45	5,424.94	2,712.47	12,793.7	6,406.38	0.18	-0.17	0.331
15.00	-29.58	-23.51	0.00	-1,963.28	0.00	1,963.28	5,353.22	2,676.61	12,365.0	6,191.70	0.41	-0.26	0.323
20.00	-28.21	-22.99	0.00	-1,845.74	0.00	1,845.74	5,279.88	2,639.94	11,939.5	5,978.66	0.73	-0.35	0.314
25.00	-26.87	-22.48	0.00	-1,730.78	0.00	1,730.78	5,204.91	2,602.46	11,517.6	5,767.39	1.14	-0.43	0.305
30.00	-25.56	-21.97	0.00	-1,618.37	0.00	1,618.37	5,128.32	2,564.16	11,099.4	5,557.99	1.64	-0.52	0.296
35.00	-24.27	-21.46	0.00	-1,508.50	0.00	1,508.50	5,050.10	2,525.05	10,685.3	5,350.59	2.24	-0.61	0.287
40.00	-23.00	-20.94	0.00	-1,401.22	0.00	1,401.22	4,970.26	2,485.13	10,275.3	5,145.31	2.92	-0.69	0.277
44.75	-21.84	-20.66	0.00	-1,301.76	0.00	1,301.76	4,892.90	2,446.45	9,890.02	4,952.36	3.65	-0.78	0.267
45.00	-21.72	-20.38	0.00	-1,296.59	0.00	1,296.59	4,888.79	2,444.40	9,869.86	4,942.27	3.69	-0.78	0.267
50.00	-19.62	-20.03	0.00	-1,194.68	0.00	1,194.68	4,805.70	2,402.85	9,469.07	4,741.57	4.55	-0.86	0.256
51.00	-19.20	-19.75	0.00	-1,174.65	0.00	1,174.65	3,954.70	1,977.35	7,897.06	3,954.40	4.74	-0.88	0.302
55.00	-18.36	-19.25	0.00	-1,095.63	0.00	1,095.63	3,904.91	1,952.45	7,646.13	3,828.75	5.51	-0.95	0.291
60.00	-17.32	-18.69	0.00	-999.37	0.00	999.37	3,841.19	1,920.60	7,335.11	3,673.01	6.55	-1.04	0.277
65.00	-16.32	-18.13	0.00	-905.90	0.00	905.90	3,775.86	1,887.93	7,027.24	3,518.84	7.69	-1.13	0.262
70.00	-15.33	-17.57	0.00	-815.24	0.00	815.24	3,708.90	1,854.45	6,722.77	3,366.38	8.92	-1.22	0.246
75.00	-14.37	-17.01	0.00	-727.40	0.00	727.40	3,640.31	1,820.16	6,421.93	3,215.74	10.24	-1.30	0.230
80.00	-13.43	-16.45	0.00	-642.36	0.00	642.36	3,570.10	1,785.05	6,124.95	3,067.03	11.65	-1.38	0.213
85.00	-12.52	-15.89	0.00	-560.12	0.00	560.12	3,498.27	1,749.13	5,832.07	2,920.37	13.14	-1.46	0.195
90.00	-11.63	-15.56	0.00	-480.67	0.00	480.67	3,424.81	1,712.40	5,543.53	2,775.89	14.72	-1.54	0.177
90.75	-11.50	-15.29	0.00	-468.99	0.00	468.99	3,413.65	1,706.82	5,500.64	2,754.41	14.96	-1.55	0.174
95.00	-10.31	-14.99	0.00	-404.00	0.00	404.00	3,349.72	1,674.86	5,259.57	2,633.69	16.36	-1.60	0.157
95.75	-10.10	-14.72	0.00	-392.76	0.00	392.76	2,312.98	1,156.49	3,686.59	1,846.04	16.62	-1.61	0.217
100.00	-9.53	-14.22	0.00	-330.19	0.00	330.19	2,275.87	1,137.93	3,533.62	1,769.44	18.08	-1.67	0.191
105.00	-8.86	-13.69	0.00	-259.08	0.00	259.08	2,230.70	1,115.35	3,355.32	1,680.15	19.86	-1.74	0.158
110.00	-8.22	-13.16	0.00	-190.66	0.00	190.66	2,183.90	1,091.95	3,179.03	1,591.88	21.72	-1.79	0.124
115.00	-7.60	-12.83	0.00	-124.87	0.00	124.87	2,135.49	1,067.74	3,004.99	1,504.73	23.62	-1.84	0.087
116.00	-5.45	-7.27	0.00	-112.04	0.00	112.04	2,125.61	1,062.80	2,970.48	1,487.45	24.01	-1.85	0.078
120.00	-5.02	-6.81	0.00	-82.96	0.00	82.96	2,085.44	1,042.72	2,833.45	1,418.83	25.56	-1.87	0.061
125.00	-4.48	-6.50	0.00	-48.90	0.00	48.90	2,033.77	1,016.89	2,664.63	1,334.29	27.54	-1.89	0.039
126.00	-3.01	-4.09	0.00	-41.71	0.00	41.71	2,023.25	1,011.62	2,631.21	1,317.56	27.94	-1.90	0.033
130.00	-2.62	-3.66	0.00	-25.35	0.00	25.35	1,980.48	990.24	2,498.77	1,251.24	29.53	-1.91	0.022
135.00	-2.14	-3.32	0.00	-7.06	0.00	7.06	1,925.56	962.78	2,336.10	1,169.79	31.53	-1.92	0.007
137.00	-0.23	-0.14	0.00	-0.43	0.00	0.43	1,903.14	951.57	2,271.99	1,137.68	32.34	-1.92	0.000
140.00	0.00	-0.13	0.00	0.00	0.00	0.00	1,869.02	934.51	2,176.88	1,090.06	33.54	-1.92	0.000

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:35 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 0.75 in Radial Ice

19 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		73.5	0.0					0.0	0.0	73.5	0.0	0.0	0.0
5.00		146.0	2,113.2					0.0	0.0	146.0	2,113.2	0.0	0.0
10.00		143.6	2,122.3					0.0	298.3	143.6	2,420.7	0.0	0.0
15.00		141.1	2,104.8					0.0	303.8	141.1	2,408.6	0.0	0.0
20.00		138.5	2,078.6					0.0	307.6	138.5	2,386.2	0.0	0.0
25.00		135.9	2,047.9					0.0	310.6	135.9	2,358.5	0.0	0.0
30.00		134.8	2,014.4					0.0	313.0	134.8	2,327.4	0.0	0.0
35.00		136.5	1,978.9					0.0	315.1	136.5	2,294.0	0.0	0.0
40.00		135.4	1,942.0					0.0	316.9	135.4	2,258.9	0.0	0.0
44.75	Bot - Section 2	70.0	1,809.9					0.0	302.6	70.0	2,112.5	0.0	0.0
45.00		75.2	155.7					0.0	16.0	75.2	171.7	0.0	0.0
50.00		86.1	3,073.0					0.0	320.0	86.1	3,393.0	0.0	0.0
51.00	Top - Section 1	72.2	607.4					0.0	64.2	72.2	671.5	0.0	0.0
55.00		130.2	1,326.4					0.0	257.2	130.2	1,583.6	0.0	0.0
60.00		144.9	1,624.9					0.0	322.6	144.9	1,947.5	0.0	0.0
65.00		144.9	1,588.9					0.0	323.8	144.9	1,912.6	0.0	0.0
70.00		144.5	1,552.4					0.0	324.9	144.5	1,877.2	0.0	0.0
75.00		143.9	1,515.5					0.0	325.9	143.9	1,841.3	0.0	0.0
80.00		142.9	1,478.2					0.0	326.8	142.9	1,805.0	0.0	0.0
85.00		141.7	1,440.6					0.0	327.7	141.7	1,768.3	0.0	0.0
90.00		81.1	1,402.7					0.0	328.6	81.1	1,731.2	0.0	0.0
90.75	Bot - Section 3	70.6	207.9					0.0	49.4	70.6	257.2	0.0	0.0
95.00		70.6	1,774.1					0.0	280.0	70.6	2,054.1	0.0	0.0
95.75	Top - Section 2	69.8	309.2					0.0	49.5	69.8	358.7	0.0	0.0
100.00		128.2	946.5					0.0	280.7	128.2	1,227.1	0.0	0.0
105.00		136.8	1,083.4					0.0	330.9	136.8	1,414.3	0.0	0.0
110.00		134.6	1,051.7					0.0	331.6	134.6	1,383.3	0.0	0.0
115.00		80.0	1,019.8					0.0	332.3	80.0	1,352.1	0.0	0.0
116.00	Appertunance(s)	65.5	201.1	896.7	0.0	0.0	6,556.2	0.0	66.5	962.3	6,823.8	0.0	0.0
120.00		116.6	788.6					0.0	206.7	116.6	995.3	0.0	0.0
125.00		77.0	955.5					0.0	259.0	77.0	1,214.4	0.0	0.0
126.00	Appertunance(s)	62.9	188.2	433.4	0.0	113.4	2,876.9	0.0	51.9	496.3	3,117.0	0.0	0.0
130.00		111.8	736.8					0.0	81.1	111.8	818.0	0.0	0.0
135.00		85.7	890.5					0.0	101.4	85.7	991.9	0.0	0.0
137.00	Appertunance(s)	60.0	348.6	543.7	0.0	0.0	3,925.4	0.0	40.6	603.7	4,314.6	0.0	0.0
140.00		35.8	512.3					0.0	0.0	35.8	512.3	0.0	0.0
Totals:										5,742.65	66,217.0	0.00	0.00

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:36 PM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 0.75 in Radial Ice

19 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	-66.22	-5.68	0.00	-514.49	0.00	514.49	5,563.50	2,781.75	13,660.1	6,840.21	0.00	0.00	0.087
5.00	-64.10	-5.55	0.00	-486.09	0.00	486.09	5,495.04	2,747.52	13,225.5	6,622.59	0.01	-0.02	0.085
10.00	-61.68	-5.43	0.00	-458.32	0.00	458.32	5,424.94	2,712.47	12,793.7	6,406.38	0.04	-0.04	0.083
15.00	-59.27	-5.31	0.00	-431.17	0.00	431.17	5,353.22	2,676.61	12,365.0	6,191.70	0.09	-0.06	0.081
20.00	-56.88	-5.18	0.00	-404.63	0.00	404.63	5,279.88	2,639.94	11,939.5	5,978.66	0.16	-0.08	0.078
25.00	-54.52	-5.06	0.00	-378.71	0.00	378.71	5,204.91	2,602.46	11,517.6	5,767.39	0.25	-0.10	0.076
30.00	-52.19	-4.94	0.00	-353.39	0.00	353.39	5,128.32	2,564.16	11,099.4	5,557.99	0.36	-0.11	0.074
35.00	-49.90	-4.82	0.00	-328.68	0.00	328.68	5,050.10	2,525.05	10,685.3	5,350.59	0.49	-0.13	0.071
40.00	-47.64	-4.69	0.00	-304.60	0.00	304.60	4,970.26	2,485.13	10,275.3	5,145.31	0.64	-0.15	0.069
44.75	-45.52	-4.62	0.00	-282.32	0.00	282.32	4,892.90	2,446.45	9,890.02	4,952.36	0.80	-0.17	0.066
45.00	-45.35	-4.55	0.00	-281.17	0.00	281.17	4,888.79	2,444.40	9,869.86	4,942.27	0.81	-0.17	0.066
50.00	-41.96	-4.47	0.00	-258.40	0.00	258.40	4,805.70	2,402.85	9,469.07	4,741.57	1.00	-0.19	0.063
51.00	-41.29	-4.40	0.00	-253.93	0.00	253.93	3,954.70	1,977.35	7,897.06	3,954.40	1.04	-0.19	0.075
55.00	-39.70	-4.27	0.00	-236.34	0.00	236.34	3,904.91	1,952.45	7,646.13	3,828.75	1.21	-0.21	0.072
60.00	-37.75	-4.13	0.00	-214.97	0.00	214.97	3,841.19	1,920.60	7,335.11	3,673.01	1.44	-0.23	0.068
65.00	-35.84	-3.99	0.00	-194.30	0.00	194.30	3,775.86	1,887.93	7,027.24	3,518.84	1.68	-0.25	0.065
70.00	-33.96	-3.85	0.00	-174.33	0.00	174.33	3,708.90	1,854.45	6,722.77	3,366.38	1.95	-0.27	0.061
75.00	-32.12	-3.71	0.00	-155.07	0.00	155.07	3,640.31	1,820.16	6,421.93	3,215.74	2.24	-0.28	0.057
80.00	-30.31	-3.57	0.00	-136.53	0.00	136.53	3,570.10	1,785.05	6,124.95	3,067.03	2.55	-0.30	0.053
85.00	-28.55	-3.42	0.00	-118.70	0.00	118.70	3,498.27	1,749.13	5,832.07	2,920.37	2.87	-0.32	0.049
90.00	-26.82	-3.34	0.00	-101.59	0.00	101.59	3,424.81	1,712.40	5,543.53	2,775.89	3.21	-0.33	0.044
90.75	-26.56	-3.27	0.00	-99.09	0.00	99.09	3,413.65	1,706.82	5,500.64	2,754.41	3.26	-0.33	0.044
95.00	-24.50	-3.19	0.00	-85.20	0.00	85.20	3,349.72	1,674.86	5,259.57	2,633.69	3.57	-0.35	0.040
95.75	-24.15	-3.12	0.00	-82.81	0.00	82.81	2,312.98	1,156.49	3,686.59	1,846.04	3.62	-0.35	0.055
100.00	-22.92	-2.99	0.00	-69.56	0.00	69.56	2,275.87	1,137.93	3,533.62	1,769.44	3.94	-0.36	0.049
105.00	-21.50	-2.85	0.00	-54.62	0.00	54.62	2,230.70	1,115.35	3,355.32	1,680.15	4.32	-0.37	0.042
110.00	-20.12	-2.71	0.00	-40.39	0.00	40.39	2,183.90	1,091.95	3,179.03	1,591.88	4.72	-0.39	0.035
115.00	-18.77	-2.62	0.00	-26.86	0.00	26.86	2,135.49	1,067.74	3,004.99	1,504.73	5.13	-0.40	0.027
116.00	-11.95	-1.61	0.00	-24.24	0.00	24.24	2,125.61	1,062.80	2,970.48	1,487.45	5.22	-0.40	0.022
120.00	-10.96	-1.49	0.00	-17.80	0.00	17.80	2,085.44	1,042.72	2,833.45	1,418.83	5.55	-0.40	0.018
125.00	-9.74	-1.40	0.00	-10.36	0.00	10.36	2,033.77	1,016.89	2,664.63	1,334.29	5.98	-0.41	0.013
126.00	-6.63	-0.88	0.00	-8.84	0.00	8.84	2,023.25	1,011.62	2,631.21	1,317.56	6.07	-0.41	0.010
130.00	-5.81	-0.77	0.00	-5.30	0.00	5.30	1,980.48	990.24	2,498.77	1,251.24	6.41	-0.41	0.007
135.00	-4.82	-0.67	0.00	-1.47	0.00	1.47	1,925.56	962.78	2,336.10	1,169.79	6.84	-0.41	0.004
137.00	-0.51	-0.04	0.00	-0.12	0.00	0.12	1,903.14	951.57	2,271.99	1,137.68	7.01	-0.41	0.000
140.00	0.00	-0.04	0.00	0.00	0.00	0.00	1,869.02	934.51	2,176.88	1,090.06	7.27	-0.41	0.000

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:36 PM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W**Serviceability 60 mph****19 Iterations****Gust Response Factor : 1.10****Wind Importance Factor : 1.00****Dead Load Factor : 1.00****Wind Load Factor : 1.00****Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Dead Load (lb)	Linear Forces		Sum of Forces			
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		55.2	0.0					0.0	0.0	55.2	0.0	0.0	0.0
5.00		109.4	1,397.1					0.0	0.0	109.4	1,397.1	0.0	0.0
10.00		107.2	1,369.4					0.0	171.7	107.2	1,541.1	0.0	0.0
15.00		105.0	1,341.8					0.0	171.7	105.0	1,513.5	0.0	0.0
20.00		102.9	1,314.1					0.0	171.7	102.9	1,485.8	0.0	0.0
25.00		100.7	1,286.5					0.0	171.7	100.7	1,458.2	0.0	0.0
30.00		99.7	1,258.8					0.0	171.7	99.7	1,430.5	0.0	0.0
35.00		100.7	1,231.1					0.0	171.7	100.7	1,402.8	0.0	0.0
40.00		99.7	1,203.5					0.0	171.7	99.7	1,375.2	0.0	0.0
44.75	Bot - Section 2	51.5	1,117.7					0.0	163.1	51.5	1,280.8	0.0	0.0
45.00		55.3	108.8					0.0	8.6	55.3	117.4	0.0	0.0
50.00		63.2	2,148.7					0.0	171.7	63.2	2,320.4	0.0	0.0
51.00	Top - Section 1	52.9	423.6					0.0	34.3	52.9	457.9	0.0	0.0
55.00		95.4	779.6					0.0	137.4	95.4	916.9	0.0	0.0
60.00		106.0	953.1					0.0	171.7	106.0	1,124.8	0.0	0.0
65.00		105.7	929.4					0.0	171.7	105.7	1,101.1	0.0	0.0
70.00		105.2	905.7					0.0	171.7	105.2	1,077.4	0.0	0.0
75.00		104.5	882.0					0.0	171.7	104.5	1,053.7	0.0	0.0
80.00		103.5	858.3					0.0	171.7	103.5	1,030.0	0.0	0.0
85.00		102.4	834.6					0.0	171.7	102.4	1,006.3	0.0	0.0
90.00		58.5	810.9					0.0	171.7	58.5	982.6	0.0	0.0
90.75	Bot - Section 3	50.8	119.6					0.0	25.8	50.8	145.3	0.0	0.0
95.00		50.8	1,176.7					0.0	145.9	50.8	1,322.6	0.0	0.0
95.75	Top - Section 2	50.2	204.5					0.0	25.8	50.2	230.3	0.0	0.0
100.00		92.0	494.0					0.0	145.9	92.0	640.0	0.0	0.0
105.00		97.9	564.8					0.0	171.7	97.9	736.5	0.0	0.0
110.00		96.0	547.0					0.0	171.7	96.0	718.7	0.0	0.0
115.00		56.9	529.2					0.0	171.7	56.9	700.9	0.0	0.0
116.00	Appertunance(s)	46.5	103.7	975.3	0.0	0.0	2,440.3	0.0	34.3	1,021.8	2,578.3	0.0	0.0
120.00		82.6	407.7					0.0	87.6	82.6	495.3	0.0	0.0
125.00		54.4	493.6					0.0	109.5	54.4	603.1	0.0	0.0
126.00	Appertunance(s)	44.3	96.6	394.7	0.0	127.4	1,608.6	0.0	21.9	439.1	1,727.1	0.0	0.0
130.00		78.6	379.2					0.0	67.6	78.6	446.8	0.0	0.0
135.00		60.1	458.0					0.0	84.5	60.1	542.5	0.0	0.0
137.00	Appertunance(s)	42.0	178.2	536.3	0.0	0.0	2,026.5	0.0	33.8	578.3	2,238.5	0.0	0.0
140.00		25.0	262.0					0.0	0.0	25.0	262.0	0.0	0.0
Totals:										4,719.04	37,461.4	0.00	0.00

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

8/20/2015 5:45:37 PM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W

Serviceability 60 mph

19 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-37.46	-4.67	0.00	-434.34	0.00	434.34	5,563.50	2,781.75	13,660.1	6,840.21	0.00	0.00	0.070
5.00	-36.06	-4.57	0.00	-411.00	0.00	411.00	5,495.04	2,747.52	13,225.5	6,622.59	0.01	-0.02	0.069
10.00	-34.52	-4.47	0.00	-388.15	0.00	388.15	5,424.94	2,712.47	12,793.7	6,406.38	0.03	-0.03	0.067
15.00	-33.01	-4.37	0.00	-365.80	0.00	365.80	5,353.22	2,676.61	12,365.0	6,191.70	0.08	-0.05	0.065
20.00	-31.52	-4.28	0.00	-343.93	0.00	343.93	5,279.88	2,639.94	11,939.5	5,978.66	0.14	-0.06	0.063
25.00	-30.06	-4.19	0.00	-322.53	0.00	322.53	5,204.91	2,602.46	11,517.6	5,767.39	0.21	-0.08	0.062
30.00	-28.63	-4.09	0.00	-301.61	0.00	301.61	5,128.32	2,564.16	11,099.4	5,557.99	0.31	-0.10	0.060
35.00	-27.22	-4.00	0.00	-281.15	0.00	281.15	5,050.10	2,525.05	10,685.3	5,350.59	0.42	-0.11	0.058
40.00	-25.85	-3.90	0.00	-261.17	0.00	261.17	4,970.26	2,485.13	10,275.3	5,145.31	0.54	-0.13	0.056
44.75	-24.57	-3.85	0.00	-242.65	0.00	242.65	4,892.90	2,446.45	9,890.02	4,952.36	0.68	-0.14	0.054
45.00	-24.45	-3.80	0.00	-241.69	0.00	241.69	4,888.79	2,444.40	9,869.86	4,942.27	0.69	-0.15	0.054
50.00	-22.13	-3.73	0.00	-222.70	0.00	222.70	4,805.70	2,402.85	9,469.07	4,741.57	0.85	-0.16	0.052
51.00	-21.67	-3.68	0.00	-218.97	0.00	218.97	3,954.70	1,977.35	7,897.06	3,954.40	0.88	-0.16	0.061
55.00	-20.75	-3.59	0.00	-204.25	0.00	204.25	3,904.91	1,952.45	7,646.13	3,828.75	1.03	-0.18	0.059
60.00	-19.63	-3.48	0.00	-186.32	0.00	186.32	3,841.19	1,920.60	7,335.11	3,673.01	1.22	-0.19	0.056
65.00	-18.53	-3.38	0.00	-168.90	0.00	168.90	3,775.86	1,887.93	7,027.24	3,518.84	1.43	-0.21	0.053
70.00	-17.45	-3.27	0.00	-152.00	0.00	152.00	3,708.90	1,854.45	6,722.77	3,366.38	1.66	-0.23	0.050
75.00	-16.39	-3.17	0.00	-135.63	0.00	135.63	3,640.31	1,820.16	6,421.93	3,215.74	1.91	-0.24	0.047
80.00	-15.36	-3.07	0.00	-119.78	0.00	119.78	3,570.10	1,785.05	6,124.95	3,067.03	2.17	-0.26	0.043
85.00	-14.36	-2.96	0.00	-104.45	0.00	104.45	3,498.27	1,749.13	5,832.07	2,920.37	2.45	-0.27	0.040
90.00	-13.37	-2.90	0.00	-89.63	0.00	89.63	3,424.81	1,712.40	5,543.53	2,775.89	2.74	-0.29	0.036
90.75	-13.23	-2.85	0.00	-87.46	0.00	87.46	3,413.65	1,706.82	5,500.64	2,754.41	2.79	-0.29	0.036
95.00	-11.91	-2.79	0.00	-75.34	0.00	75.34	3,349.72	1,674.86	5,259.57	2,633.69	3.05	-0.30	0.032
95.75	-11.68	-2.74	0.00	-73.24	0.00	73.24	2,312.98	1,156.49	3,686.59	1,846.04	3.10	-0.30	0.045
100.00	-11.04	-2.65	0.00	-61.58	0.00	61.58	2,275.87	1,137.93	3,533.62	1,769.44	3.37	-0.31	0.040
105.00	-10.30	-2.55	0.00	-48.32	0.00	48.32	2,230.70	1,115.35	3,355.32	1,680.15	3.70	-0.32	0.033
110.00	-9.58	-2.45	0.00	-35.56	0.00	35.56	2,183.90	1,091.95	3,179.03	1,591.88	4.05	-0.33	0.027
115.00	-8.88	-2.39	0.00	-23.29	0.00	23.29	2,135.49	1,067.74	3,004.99	1,504.73	4.40	-0.34	0.020
116.00	-6.31	-1.36	0.00	-20.90	0.00	20.90	2,125.61	1,062.80	2,970.48	1,487.45	4.47	-0.34	0.017
120.00	-5.81	-1.27	0.00	-15.48	0.00	15.48	2,085.44	1,042.72	2,833.45	1,418.83	4.77	-0.35	0.014
125.00	-5.21	-1.21	0.00	-9.12	0.00	9.12	2,033.77	1,016.89	2,664.63	1,334.29	5.13	-0.35	0.009
126.00	-3.49	-0.76	0.00	-7.78	0.00	7.78	2,023.25	1,011.62	2,631.21	1,317.56	5.21	-0.35	0.008
130.00	-3.04	-0.68	0.00	-4.73	0.00	4.73	1,980.48	990.24	2,498.77	1,251.24	5.50	-0.36	0.005
135.00	-2.50	-0.62	0.00	-1.32	0.00	1.32	1,925.56	962.78	2,336.10	1,169.79	5.88	-0.36	0.002
137.00	-0.26	-0.03	0.00	-0.08	0.00	0.08	1,903.14	951.57	2,271.99	1,137.68	6.03	-0.36	0.000
140.00	0.00	-0.02	0.00	0.00	0.00	0.00	1,869.02	934.51	2,176.88	1,090.06	6.25	-0.36	0.000

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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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_s):	0.17
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 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):	0.04
Upper Limit C_s	0.04
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	1.48
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.49
Total Unfactored Dead Load:	37.46 k
Seismic Base Shear (E):	2.11 k

Site Number: 311014

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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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):	1.48
Redundancy Factor (ρ):	1.30

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

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	S _{az}	Horizontal Force (lb)	Vertical Force (lb)
35	138.50	262	1.850	1.774	1.065	0.331	75	226
34	136.00	212	1.784	1.465	0.949	0.293	54	183
33	132.50	543	1.693	1.096	0.804	0.244	115	469
32	128.00	447	1.580	0.718	0.643	0.188	73	386
31	125.50	118	1.519	0.548	0.565	0.161	16	102
30	122.50	603	1.447	0.379	0.482	0.130	68	521
29	118.00	495	1.343	0.184	0.375	0.091	39	428
28	115.50	138	1.286	0.102	0.324	0.072	9	119
27	112.50	701	1.220	0.025	0.270	0.052	32	606
26	107.50	719	1.114	-0.061	0.196	0.027	17	621
25	102.50	736	1.013	-0.106	0.138	0.009	6	636
24	97.88	640	0.924	-0.121	0.097	0.000	0	553
23	95.38	230	0.877	-0.121	0.079	-0.002	0	199
22	92.88	1,323	0.832	-0.117	0.063	-0.003	-3	1,143
21	90.38	145	0.788	-0.110	0.050	-0.002	0	126
20	87.50	983	0.738	-0.098	0.038	0.000	0	849
19	82.50	1,006	0.656	-0.073	0.022	0.006	5	870
18	77.50	1,030	0.579	-0.045	0.012	0.015	13	890
17	72.50	1,054	0.507	-0.019	0.007	0.023	21	911
16	67.50	1,077	0.439	0.005	0.006	0.031	28	931
15	62.50	1,101	0.377	0.025	0.007	0.036	34	952
14	57.50	1,125	0.319	0.041	0.011	0.039	38	972
13	53.00	917	0.271	0.051	0.015	0.041	32	792
12	50.50	458	0.246	0.056	0.018	0.041	16	396
11	47.50	2,320	0.218	0.060	0.021	0.041	82	2,005
10	44.88	117	0.194	0.063	0.024	0.040	4	101
9	42.38	1,281	0.173	0.066	0.027	0.040	44	1,107
8	37.50	1,375	0.136	0.069	0.032	0.038	46	1,188
7	32.50	1,403	0.102	0.071	0.037	0.037	45	1,212
6	27.50	1,430	0.073	0.072	0.040	0.035	44	1,236
5	22.50	1,458	0.049	0.071	0.042	0.033	42	1,260
4	17.50	1,486	0.030	0.068	0.040	0.031	40	1,284
3	12.50	1,513	0.015	0.061	0.036	0.027	36	1,308
2	7.50	1,541	0.005	0.046	0.026	0.021	28	1,332

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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Customer: VERIZON WIRELESS

1	2.50	1,397	0.001	0.019	0.010	0.009	11	1,207
Ericsson AIR 21, 1.3	137.00	244	1.810	1.584	0.994	0.308	65	211
Flat Low Profile Pla	137.00	1,500	1.810	1.584	0.994	0.308	400	1,296
Ericsson AIR 21, 1.3	137.00	249	1.810	1.584	0.994	0.308	66	215
Ericsson KRY 112 144	137.00	33	1.810	1.584	0.994	0.308	9	29
Flat Low Profile Pla	126.00	1,500	1.531	0.580	0.580	0.166	216	1,296
Kathrein 800 10504	126.00	106	1.531	0.580	0.580	0.166	15	91
RCU	126.00	3	1.531	0.580	0.580	0.166	0	3
Antel BXA-70063-6CF-	116.00	51	1.298	0.117	0.334	0.076	3	44
Alcatel-Lucent RRH2X	116.00	138	1.298	0.117	0.334	0.076	9	119
Alcatel-Lucent RRH2x	116.00	132	1.298	0.117	0.334	0.076	9	114
Alcatel-Lucent RRH2x	116.00	170	1.298	0.117	0.334	0.076	11	147
Commscope LNX-	116.00	116	1.298	0.117	0.334	0.076	8	101
Commscope HBXX-	116.00	245	1.298	0.117	0.334	0.076	16	212
RFS DB-T1-6Z-8AB-0Z	116.00	44	1.298	0.117	0.334	0.076	3	38
RFS DB-T1-6Z-8AB-0Z	116.00	44	1.298	0.117	0.334	0.076	3	38
Round Low Profile PI	116.00	1,500	1.298	0.117	0.334	0.076	98	1,296
		37,461	47.906	15.393	15.296	4.587	2,043	32,373

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)
35	138.50	262	1.850	1.774	1.065	0.331	75	226
34	136.00	212	1.784	1.465	0.949	0.293	54	183
33	132.50	543	1.693	1.096	0.804	0.244	115	469
32	128.00	447	1.580	0.718	0.643	0.188	73	386
31	125.50	118	1.519	0.548	0.565	0.161	16	102
30	122.50	603	1.447	0.379	0.482	0.130	68	521
29	118.00	495	1.343	0.184	0.375	0.091	39	428
28	115.50	138	1.286	0.102	0.324	0.072	9	119
27	112.50	701	1.220	0.025	0.270	0.052	32	606
26	107.50	719	1.114	-0.061	0.196	0.027	17	621
25	102.50	736	1.013	-0.106	0.138	0.009	6	636
24	97.88	640	0.924	-0.121	0.097	0.000	0	553
23	95.38	230	0.877	-0.121	0.079	-0.002	0	199
22	92.88	1,323	0.832	-0.117	0.063	-0.003	-3	1,143
21	90.38	145	0.788	-0.110	0.050	-0.002	0	126
20	87.50	983	0.738	-0.098	0.038	0.000	0	849
19	82.50	1,006	0.656	-0.073	0.022	0.006	5	870
18	77.50	1,030	0.579	-0.045	0.012	0.015	13	890
17	72.50	1,054	0.507	-0.019	0.007	0.023	21	911
16	67.50	1,077	0.439	0.005	0.006	0.031	28	931
15	62.50	1,101	0.377	0.025	0.007	0.036	34	952
14	57.50	1,125	0.319	0.041	0.011	0.039	38	972
13	53.00	917	0.271	0.051	0.015	0.041	32	792
12	50.50	458	0.246	0.056	0.018	0.041	16	396
11	47.50	2,320	0.218	0.060	0.021	0.041	82	2,005
10	44.88	117	0.194	0.063	0.024	0.040	4	101
9	42.38	1,281	0.173	0.066	0.027	0.040	44	1,107
8	37.50	1,375	0.136	0.069	0.032	0.038	46	1,188
7	32.50	1,403	0.102	0.071	0.037	0.037	45	1,212
6	27.50	1,430	0.073	0.072	0.040	0.035	44	1,236
5	22.50	1,458	0.049	0.071	0.042	0.033	42	1,260
4	17.50	1,486	0.030	0.068	0.040	0.031	40	1,284
3	12.50	1,513	0.015	0.061	0.036	0.027	36	1,308
2	7.50	1,541	0.005	0.046	0.026	0.021	28	1,332
1	2.50	1,397	0.001	0.019	0.010	0.009	11	1,207
Ericsson AIR 21, 1.3	137.00	244	1.810	1.584	0.994	0.308	65	211
Flat Low Profile Pla	137.00	1,500	1.810	1.584	0.994	0.308	400	1,296

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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Customer: VERIZON WIRELESS

Ericsson AIR 21, 1.3	137.00	249	1.810	1.584	0.994	0.308	66	215
Ericsson KRY 112 144	137.00	33	1.810	1.584	0.994	0.308	9	29
Flat Low Profile Pla	126.00	1,500	1.531	0.580	0.580	0.166	216	1,296
Kathrein 800 10504	126.00	106	1.531	0.580	0.580	0.166	15	91
RCU	126.00	3	1.531	0.580	0.580	0.166	0	3
Antel BXA-70063-6CF-	116.00	51	1.298	0.117	0.334	0.076	3	44
Alcatel-Lucent RRH2X	116.00	138	1.298	0.117	0.334	0.076	9	119
Alcatel-Lucent RRH2x	116.00	132	1.298	0.117	0.334	0.076	9	114
Alcatel-Lucent RRH2x	116.00	170	1.298	0.117	0.334	0.076	11	147
Commscope LNX-	116.00	116	1.298	0.117	0.334	0.076	8	101
Commscope HBXX-	116.00	245	1.298	0.117	0.334	0.076	16	212
RFS DB-T1-6Z-8AB-0Z	116.00	44	1.298	0.117	0.334	0.076	3	38
RFS DB-T1-6Z-8AB-0Z	116.00	44	1.298	0.117	0.334	0.076	3	38
Round Low Profile PI	116.00	1,500	1.298	0.117	0.334	0.076	98	1,296
		37,461	47.906	15.393	15.296	4.587	2,043	32,373

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

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
35	138.50	262	1.850	1.774	1.065	0.331	75	226
34	136.00	212	1.784	1.465	0.949	0.293	54	183
33	132.50	543	1.693	1.096	0.804	0.244	115	469
32	128.00	447	1.580	0.718	0.643	0.188	73	386
31	125.50	118	1.519	0.548	0.565	0.161	16	102
30	122.50	603	1.447	0.379	0.482	0.130	68	521
29	118.00	495	1.343	0.184	0.375	0.091	39	428
28	115.50	138	1.286	0.102	0.324	0.072	9	119
27	112.50	701	1.220	0.025	0.270	0.052	32	606
26	107.50	719	1.114	-0.061	0.196	0.027	17	621
25	102.50	736	1.013	-0.106	0.138	0.009	6	636
24	97.88	640	0.924	-0.121	0.097	0.000	0	553
23	95.38	230	0.877	-0.121	0.079	-0.002	0	199
22	92.88	1,323	0.832	-0.117	0.063	-0.003	-3	1,143
21	90.38	145	0.788	-0.110	0.050	-0.002	0	126
20	87.50	983	0.738	-0.098	0.038	0.000	0	849
19	82.50	1,006	0.656	-0.073	0.022	0.006	5	870
18	77.50	1,030	0.579	-0.045	0.012	0.015	13	890
17	72.50	1,054	0.507	-0.019	0.007	0.023	21	911
16	67.50	1,077	0.439	0.005	0.006	0.031	28	931
15	62.50	1,101	0.377	0.025	0.007	0.036	34	952
14	57.50	1,125	0.319	0.041	0.011	0.039	38	972
13	53.00	917	0.271	0.051	0.015	0.041	32	792
12	50.50	458	0.246	0.056	0.018	0.041	16	396
11	47.50	2,320	0.218	0.060	0.021	0.041	82	2,005
10	44.88	117	0.194	0.063	0.024	0.040	4	101
9	42.38	1,281	0.173	0.066	0.027	0.040	44	1,107
8	37.50	1,375	0.136	0.069	0.032	0.038	46	1,188
7	32.50	1,403	0.102	0.071	0.037	0.037	45	1,212
6	27.50	1,430	0.073	0.072	0.040	0.035	44	1,236
5	22.50	1,458	0.049	0.071	0.042	0.033	42	1,260
4	17.50	1,486	0.030	0.068	0.040	0.031	40	1,284
3	12.50	1,513	0.015	0.061	0.036	0.027	36	1,308
2	7.50	1,541	0.005	0.046	0.026	0.021	28	1,332
1	2.50	1,397	0.001	0.019	0.010	0.009	11	1,207
Ericsson AIR 21, 1.3	137.00	244	1.810	1.584	0.994	0.308	65	211
Flat Low Profile Pla	137.00	1,500	1.810	1.584	0.994	0.308	400	1,296
Ericsson AIR 21, 1.3	137.00	249	1.810	1.584	0.994	0.308	66	215
Ericsson KRY 112 144	137.00	33	1.810	1.584	0.994	0.308	9	29
Flat Low Profile Pla	126.00	1,500	1.531	0.580	0.580	0.166	216	1,296

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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Customer: VERIZON WIRELESS

Kathrein 800 10504	126.00	106	1.531	0.580	0.580	0.166	15	91
RCU	126.00	3	1.531	0.580	0.580	0.166	0	3
Antel BXA-70063-6CF-	116.00	51	1.298	0.117	0.334	0.076	3	44
Alcatel-Lucent RRH2X	116.00	138	1.298	0.117	0.334	0.076	9	119
Alcatel-Lucent RRH2x	116.00	132	1.298	0.117	0.334	0.076	9	114
Alcatel-Lucent RRH2x	116.00	170	1.298	0.117	0.334	0.076	11	147
Commscope LNX-	116.00	116	1.298	0.117	0.334	0.076	8	101
Commscope HBXX-	116.00	245	1.298	0.117	0.334	0.076	16	212
RFS DB-T1-6Z-8AB-0Z	116.00	44	1.298	0.117	0.334	0.076	3	38
RFS DB-T1-6Z-8AB-0Z	116.00	44	1.298	0.117	0.334	0.076	3	38
Round Low Profile PI	116.00	1,500	1.298	0.117	0.334	0.076	98	1,296
		37,461	47.906	15.393	15.296	4.587	2,043	32,373

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)
35	138.50	262	1.850	1.774	1.065	0.331	75	226
34	136.00	212	1.784	1.465	0.949	0.293	54	183
33	132.50	543	1.693	1.096	0.804	0.244	115	469
32	128.00	447	1.580	0.718	0.643	0.188	73	386
31	125.50	118	1.519	0.548	0.565	0.161	16	102
30	122.50	603	1.447	0.379	0.482	0.130	68	521
29	118.00	495	1.343	0.184	0.375	0.091	39	428
28	115.50	138	1.286	0.102	0.324	0.072	9	119
27	112.50	701	1.220	0.025	0.270	0.052	32	606
26	107.50	719	1.114	-0.061	0.196	0.027	17	621
25	102.50	736	1.013	-0.106	0.138	0.009	6	636
24	97.88	640	0.924	-0.121	0.097	0.000	0	553
23	95.38	230	0.877	-0.121	0.079	-0.002	0	199
22	92.88	1,323	0.832	-0.117	0.063	-0.003	-3	1,143
21	90.38	145	0.788	-0.110	0.050	-0.002	0	126
20	87.50	983	0.738	-0.098	0.038	0.000	0	849
19	82.50	1,006	0.656	-0.073	0.022	0.006	5	870
18	77.50	1,030	0.579	-0.045	0.012	0.015	13	890
17	72.50	1,054	0.507	-0.019	0.007	0.023	21	911
16	67.50	1,077	0.439	0.005	0.006	0.031	28	931
15	62.50	1,101	0.377	0.025	0.007	0.036	34	952
14	57.50	1,125	0.319	0.041	0.011	0.039	38	972
13	53.00	917	0.271	0.051	0.015	0.041	32	792
12	50.50	458	0.246	0.056	0.018	0.041	16	396
11	47.50	2,320	0.218	0.060	0.021	0.041	82	2,005
10	44.88	117	0.194	0.063	0.024	0.040	4	101
9	42.38	1,281	0.173	0.066	0.027	0.040	44	1,107
8	37.50	1,375	0.136	0.069	0.032	0.038	46	1,188
7	32.50	1,403	0.102	0.071	0.037	0.037	45	1,212
6	27.50	1,430	0.073	0.072	0.040	0.035	44	1,236
5	22.50	1,458	0.049	0.071	0.042	0.033	42	1,260
4	17.50	1,486	0.030	0.068	0.040	0.031	40	1,284
3	12.50	1,513	0.015	0.061	0.036	0.027	36	1,308
2	7.50	1,541	0.005	0.046	0.026	0.021	28	1,332
1	2.50	1,397	0.001	0.019	0.010	0.009	11	1,207
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Antel BXA-70063-6CF-	116.00	51	1.298	0.117	0.334	0.076	3	44

Site Number: 311014**Code: ANSI/TIA-222-G**

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Site Name: Norwich CT, CT**Engineering Number: 63173722****8/20/2015 5:45:37 PM****Customer: VERIZON WIRELESS**

Alcatel-Lucent RRH2X	116.00	138	1.298	0.117	0.334	0.076	9	119
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Alcatel-Lucent RRH2x	116.00	170	1.298	0.117	0.334	0.076	11	147
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Round Low Profile PI	116.00	1,500	1.298	0.117	0.334	0.076	98	1,296
		37,461	47.906	15.393	15.296	4.587	2,043	32,373

Site Number: 311014

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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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	25.12	0.00	44.93	0.00	0.00	2343.29	0.00	0.35
0.9D + 1.6W	25.11	0.00	33.70	0.00	0.00	2331.81	0.00	0.35
1.2D + 1.0Di + 1.0Wi	5.68	0.00	66.22	0.00	0.00	514.49	0.00	0.09
(1.2 + 0.2Sds) * DL + E ELFM	2.11	0.00	44.57	0.00	0.00	216.82	0.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	2.03	0.00	44.57	0.00	0.00	211.82	0.00	0.04
(0.9 - 0.2Sds) * DL + E ELFM	2.11	0.00	31.17	0.00	0.00	215.58	0.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	2.03	0.00	31.17	0.00	0.00	210.53	0.00	0.04
1.0D + 1.0W	4.67	0.00	37.46	0.00	0.00	434.34	0.00	0.07

Site Number: 311014

Code: ANSI/TIA-222-G

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Site Name: Norwich CT, CT

Engineering Number: 63173722

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Customer: VERIZON WIRELESS

Base Summary

Reactions

Original Design			Analysis			Moment Design %
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	
5,050.00	42.00	43.00	2,343.29	66.22	25.12	34.37

Base Plate

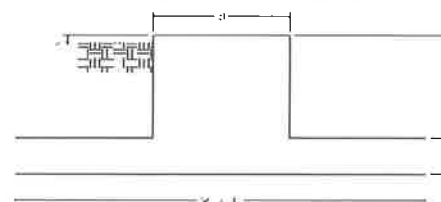
Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
50.0	3.000	69.000	Clipped	0	16.00	7.956	146.71	805.53	0.18

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
67.00	24	2.25" 18J	2.25	75.00	100.00	Clustered	6.00	45.0	72.71	260.00	0.29	67.19	260.00	0.27

Site Name: Norwich CT, CT
 Site Number: 311014
 Engineering Number: 63173722
 Engineer: V. Chung
 Date: 08/20/15
 Tower Type: MP

Program Last Updated: 5/13/2014



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

Design / Analysis / Mapping:

	Analysis
Compression/Leg:	44.9 k
Uplift/Leg:	0.0 k
Total Shear:	25.1 k
Moment:	2343.3 k-ft
Tower + Appurtenance Weight:	44.9 k
Depth to Base of Foundation (l + t - h):	4.00 ft
Diameter of Pier (d):	5.75 ft
Height of Pier above Ground (h):	0.00
Width of Pad (W):	32.50 ft
Length of Pad (L):	32.50 ft
Thickness of Pad (t):	4.50 ft
Tower Leg Center to Center:	0.00 ft
Number of Tower Legs:	1.0 (1 if MP or GT)
Tower Center from Mat Center:	0.00 ft
Depth Below Ground Surface to Water Table:	99.00 ft
Unit Weight of Concrete:	150.0 pcf
Unit Weight of Soil Above Water Table:	135.0 pcf
Unit Weight of Water:	62.4 pcf
Unit Weight of Soil Below Water Table:	72.0 pcf
Friction Angle of Uplift:	15.0 Degrees
Ultimate Coefficient of Shear Friction:	0.35
Ultimate Compressive Bearing Pressure:	12000.0 psf
Ultimate Passive Pressure on Pad Face:	0.0 psf
$\phi_{\text{Soil and Concrete Weight}}$:	0.9
ϕ_{Soil} :	0.75

Concrete Strength (f'_c):	3000 psi
Pad Tension Steel Depth:	50.00 in
ϕ_{Shear} :	0.75
$\phi_{\text{Flexure / Tension}}$:	0.90
$\phi_{\text{Compression}}$:	0.65
β :	0.85
Bottom Pad Rebar Size #:	10
# of Bottom Pad Rebar:	33
Pad Bottom Steel Area:	41.91 in ²
Pad Steel F_y :	60000 psi
Top Pad Rebar Size #:	10
# of Top Pad Rebar:	33
Pad Top Steel Area:	41.91 in ²

Overturning Moment Usage

Design OTM:	2443.8 k-ft
OTM Resistance:	11252.5 k-ft
Design OTM / OTM Resistance:	0.22 Result: OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	710 psf
Factored Nominal Bearing Pressure:	9000 psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.08 Result: OK
Load Direction Controlling Design Bearing Pressure:	Diagonal to Pad Edge

Sliding Factor of Safety

Total Factored Sliding Resistance:	197.0 k
Sliding Design / Sliding Resistance:	0.13 Result: OK

One Way Shear, Flexural Capacity, and Punching Shear

Factored One Way Shear (V_u):	137.0 k
One Way Shear Capacity (ϕV_c):	1602.1 k - ACI11.3.1.1
$V_u / \phi V_c$:	0.09 Result: OK
Load Direction Controlling Shear Capacity:	Parallel to Pad Edge
Lower Steel Pad Factored Moment (M_u):	1341.9 k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	9227.1 k-ft - ACI10.3
$M_u / \phi M_n$:	0.15 Result: OK
Load Direction Controlling Flexural Capacity:	Parallel to Pad Edge
Upper Steel Pad Factored Moment (M_u):	698.4 k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	9227.1 k-ft
$M_u / \phi M_n$:	0.08 Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0021 OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0021 OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	12 in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Reinforcement Spacing:	12 in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear (V_u):	18.5 k
Nominal Punching Shear Capacity ($\phi_c V_n$):	3071.5 k - ACI11.12.2.1
$V_u / \phi V_c$:	0.01 Result: OK

Nominal and Design Moment Capacity and Factored Design Loads

