Robinson+Cole

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May 12, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
**605 Willard Avenue, Newington, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 110-foot level on an existing 179-foot self-monopole tower at 605 Willard Avenue in Newington, Connecticut (the "Property"). The tower is owned by American Tower Corporation. Cellco's use of the tower was approved by the Council in 2002. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 1900 MHz antennas and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same 110-foot level on the tower. Cellco also intends to add six (6) remote radio heads ("RRHs"), one (1) each behind its 1900 MHz and 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable inside the monopole tower. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

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 Stephen Woods, Mayor for the Town of Newington. The Town of Newington is the owner of the Property.

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 installed on Cellco's existing antenna platform at the 110-foot level on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table with 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).

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:
Stephen Woods, Newington Mayor
Tim Parks

# ATTACHMENT 1

# Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

## SBNHH-1D65B

**Andrew® Tri-band 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 | 1920–2180 | 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, dB | 14 | 13 | 15 | 15 | 15 | 13 |
| Front-to-Back Ratio at 180°, dB | 27 | 29 | 28 | 28 | 28 | 27 |
| CPR at Boresight, dB | 20 | 23 | 20 | 20 | 17 | 21 |
| CPR at Sector, dB | 14 | 10 | 12 | 10 | 9 | 1 |
| 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 | 1920–2180 | 2300–2360 |
|---|---|---|---|---|---|---|
| Gain by all Beam Tilts, average, dBi | 14.5 | 14.3 | 17.4 | 17.9 | 18.2 | 18.3 |
| Gain by all Beam Tilts Tolerance, dB | ±0.5 | ±0.8 | ±0.4 | ±0.3 | ±0.5 | ±0.3 |
| Gain by Beam Tilt, average, dBi | 0 ° \| 14.6 | 0 ° \| 14.5 | 0 ° \| 17.4 | 0 ° \| 17.8 | 0 ° \| 18.1 | 0 ° \| 18.2 |
| | 7 ° \| 14.6 | 7 ° \| 14.4 | 3 ° \| 17.5 | 3 ° \| 17.9 | 3 ° \| 18.3 | 3 ° \| 18.4 |
| | 14 ° \| 14.2 | 14 ° \| 13.6 | 7 ° \| 17.4 | 7 ° \| 17.9 | 7 ° \| 18.2 | 7 ° \| 18.4 |
| Beamwidth, Horizontal Tolerance, degrees | ±2.2 | ±3.4 | ±2 | ±4.6 | ±5.7 | ±4.3 |
| Beamwidth, Vertical Tolerance, degrees | ±0.8 | ±1 | ±0.3 | ±0.2 | ±0.3 | ±0.2 |
| USLS, 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 Brand | Andrew® |
| Antenna Type | DualPol® multiband with internal RET |
| Band | Multiband |
| Brand | DualPol® \| Teletilt® |
| Operating Frequency Band | 1695 – 2360 MHz \| 698 – 896 MHz |
| Performance Note | Outdoor usage |

# Product Specifications

SBNHH-1D65B

## Mechanical Specifications

| | |
|---|---|
| Color | Light gray |
| Lightning Protection | dc Ground |
| 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, maximum | 617.7 N @ 150 km/h<br>138.9 lbf @ 150 km/h |
| Wind Speed, maximum | 241.4 km/h \| 150.0 mph |

## Dimensions

| | |
|---|---|
| Depth | 181.0 mm \| 7.1 in |
| Length | 1851.0 mm \| 72.9 in |
| Width | 301.0 mm \| 11.9 in |
| Net Weight | 18.4 kg \| 40.6 lb |

## Remote Electrical Tilt (RET) Information

| | |
|---|---|
| Input Voltage | 10–30 Vdc |
| 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 |
| RET System | Teletilt® |

## Regulatory Compliance/Certifications

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

## Included Products

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

## * Footnotes

| | |
|---|---|
| Performance Note | Severe environmental conditions may degrade optimum performance |

# ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

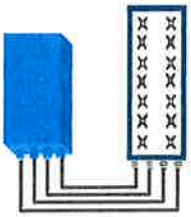
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

## FEATURES

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

## BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

| Features & performance | |
|---|---|
| Number of TX/RX paths | 4 duplexed (either 4T4R or 2T4R by SW) |
| Frequency band | U700 (C) (3GPP bands 13):<br>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.)<br>Volume in L<br>Weight in kg (lb) (w/o mounting HW) | 550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)<br>38 (with solar shield)<br>26 (57.2) (with solar shield) |
| DC voltage range<br>DC power consumption | -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption<br>550W typical @100% RF load ( in 2Tx or 4TX mode) |
| Environmental conditions<br><br>Wind load (@150km/h or 93mph) | -40°C (-40°F) /+55°C (+131°F)<br>IP65<br>Frontal:<200N / Lateral :<150N |
| Antenna ports | 4 ports 7/16 DIN female (50 ohms)<br>VSWR < 1.5 |
| CPRI ports | 2 CPRI ports (HW ready for Rate7, 9.8 Gbps)<br>SFP single mode dual fiber |
| AISG interfaces | 1 AISG2.0 output (RS485)<br>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 |

# PCS RF MODULES

## RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

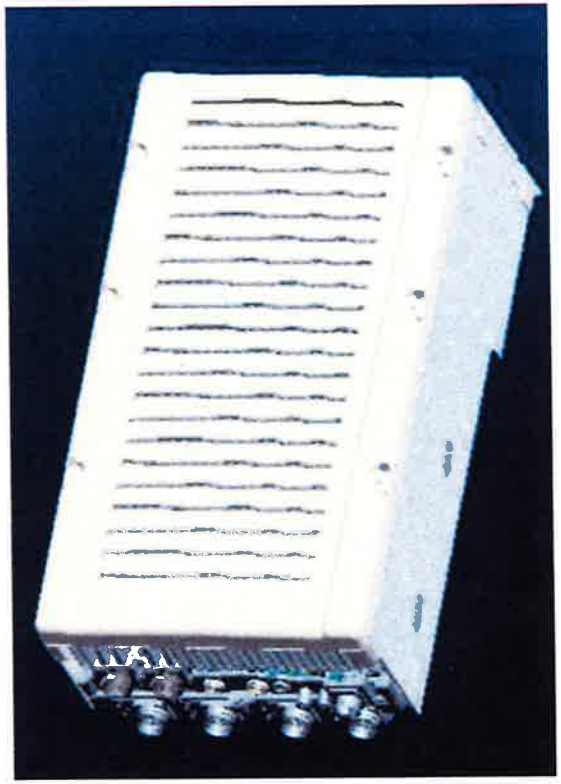
| | | RRH2x60 |
|---|---|---|
| RF Output Power | | 2x60W |
| Instantaneous Bandwidth | | 20MHz |
| Transmitter | | 2 TX |
| Receiver | 1900 HW version | 2 Branch RX – LA6.0.1 |
| | 1900A HW version | 4 Branch RX – LR13.3 |
| Features | | AISG 2.0 for RET/TMA |
| | | Internal Smart Bias-T |
| Power | | -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.)

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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.

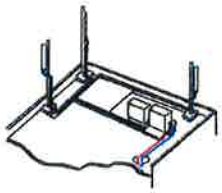
### EASY INSTALLATION

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.

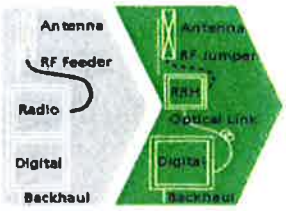
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

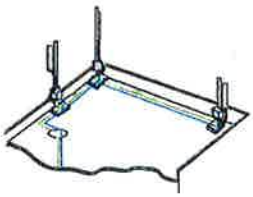
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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 daisychaining 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



AT THE SPEED OF IDEAS™

Alcatel·Lucent

# Product Data Sheet HB158-1-08U8-S8J18

## 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.

Figure 1: HYBRIFLEX Series

### 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

### 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)] | 068 (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<br>RoHS Compliant |
| Size (Power) | | [mm² (AWG)] | 8.4 (8) |
| Quantity, Wire Count (Power) | | | 16 (8 pairs) |
| Size (Alarm) | | [mm² (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<br>UL Type XHHW-2, UL 44<br>UL-LS Limited Smoke, UL VW-1<br>IEEE-383 (1974), IEEE1202/FT4<br>RoHS Compliant |
| Installation Temperature | | [°C (°F)] | -40 to +65 (-40 to149) |
| Operation Temperature | | [°C (°F)] | -40 to +65 (-40 to149) |

* This data is provisional and subject to change

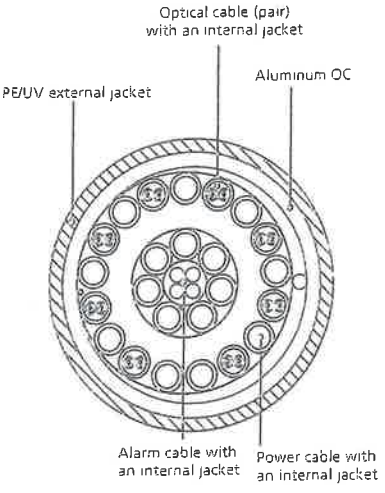



Figure 2: Construction Detail

# ATTACHMENT 2

| | General | Power | Density | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Site Name:** West Farms (Newington) | | | | | | | | |
| **Tower Height:** 179Ft. | | | | | | | | |
| **CARRIER** | **# OF CHAN.** | **WATTS ERP** | **HEIGHT** | **CALC. POWER DENS** | **FREQ.** | **MAX. PERMISS. EXP.** | **FRACTION MPE** | **Total** |
| *Nextel | 9 | 100 | 120 | 0.0225 | 851 | 0.5673 | 3.96% | |
| *Town of Newington | 1 | 80 | 185 | 0.0008 | 460 | 0.3067 | 0.27% | |
| *Clearwire | 2 | 153 | 160 | 0.0043 | 2496 | 1.0000 | 0.43% | |
| *Clearwire | 1 | 211 | 160 | 0.0030 | 11 GHz | 1.0000 | 0.30% | |
| *MetroPCS (T-Mobile) GSM/UMTS | 2 | 12 | 170 | 0.0003 | 1950 | 1.0000 | 0.03% | |
| *MetroPCS (T-Mobile) LTE | 2 | 24 | 170 | 0.0006 | 2100 | 1.0000 | 0.06% | |
| *MetroPCS (T-Mobile) UMTS | 2 | 12 | 170 | 0.0003 | 2100 | 1.0000 | 0.03% | |
| *AT&T UMTS | 2 | 1077 | 157 | 0.0314 | 1900 | 1.0000 | 3.14% | |
| *AT&T UMTS | 2 | 565 | 157 | 0.0165 | 880 | 0.5867 | 2.81% | |
| *AT&T GSM | 1 | 283 | 157 | 0.0041 | 880 | 0.5867 | 0.70% | |
| *AT&T GSM | 4 | 646 | 157 | 0.0377 | 1900 | 1.0000 | 3.77% | |
| *AT&T LTE | 1 | 1615 | 155 | 0.0242 | 734 | 0.4893 | 4.94% | |
| *Sprint CDMA/LTE | 3 | 693 | 140 | 0.0381 | 1900 | 1.0000 | 3.81% | |
| *Sprint CDMA/LTE | 1 | 390 | 140 | 0.0072 | 850 | 0.5667 | 1.26% | |
| *Sprint CDMA/LTE | 2 | 693 | 140 | 0.0254 | 2500 | 1.0000 | 2.54% | |
| **Verizon PCS** | **11** | **449** | **110** | **0.1468** | **1970** | **1.0000** | **14.68%** | |
| **Verizon Cellular** | **9** | **409** | **110** | **0.1094** | **869** | **0.5793** | **18.88%** | |
| **Verizon AWS** | **1** | **1750** | **110** | **0.0520** | **2145** | **1.0000** | **5.20%** | |
| **Verizon 700** | **1** | **1050** | **110** | **0.0312** | **746** | **0.4973** | **6.27%** | |
| | | | | | | | | **73.10%** |
| | | | | | | | | |
| * Source: Siting Council | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

# ATTACHMENT 3

AMERICAN TOWER®
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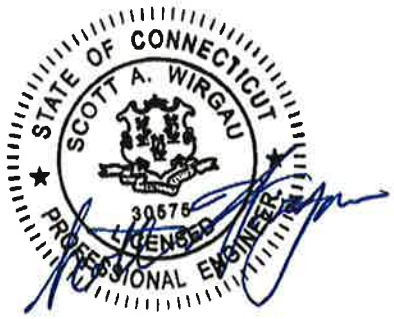
# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **179 ft Monopole** |
| **ATC Site Name** | : | **Newington CT, CT** |
| **ATC Site Number** | : | **370627** |
| **Engineering Number** | : | **62041821** |
| **Proposed Carrier** | : | **Verizon** |
| **Carrier Site Name** | : | **Westfarms** |
| **Carrier Site Number** | : | **N/A** |
| **Site Location** | : | **605 Willard Avenue**<br>**Newington, CT 06111-0000**<br>**41.698372,-72.737147** |
| **County** | : | **Hartford** |
| **Date** | : | **May 1, 2015** |
| **Max Usage** | : | **73%** |
| **Result** | : | **Pass** |

Reviewed by:
Scott Wirgau, PE
Structural Team Leader




Prepared By:
Alireza Mashhadi Ali, E.I.

May 1 2015 5:20 PM

**COA: PEC.0001553**

AMERICAN TOWER CORPORATION

## Table of Contents

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## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 179 ft monopole to reflect the change in loading by Verizon.

## Supporting Documents

| | |
|---|---|
| **Tower Drawings** | PiRod Engineering File #A-118092, dated August 10, 2001 |
| **Foundation Drawing** | PiRod Engineering File #A-118092, dated August 10, 2001 |
| **Geotechnical Report** | Clarence Welti, dated August 1, 2001 |

## 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/EIA-222.

| | |
|---|---|
| **Basic Wind Speed:** | 80 mph (Fastest Mile) |
| **Basic Wind Speed w/ Ice:** | 69 mph (Fastest Mile)w/ 1/2" radial ice concurrent |
| **Code:** | ANSI/TIA/EIA-222-F / 2003 IBC , Sec. 1609.1.1, Exception (5) & Sec. 3108.4 w/ 2005 CT Supplement & 2009 CT Amendment |

## 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 | | | | | |
| 180.0 | 190.0 | 1 | 20' Dipole | Low Profile Platform | (3) 7/8" Coax | Town Of Newington |
| | 180.0 | 1 | 8' Yagi | | | |
| 170.0 | 170.0 | 3 | Ericsson KRY 112 144/1 | Low Profile Platform | (12) 1 5/8" Coax<br>(1) 1" Hybrid | Metro PCS |
| | | 3 | Ericsson AIR 21, 1.3 M, B2A B4P | | | |
| | | 3 | Ericsson AIR 21, 1.3M, B4A B2P | | | |
| 160.0 | 160.0 | 3 | RCU | Side Arms | (3) 0.28" Fiber<br>(3) 5/8" Coax<br>(2) 2" Conduit<br>(3) 1/2" Coax<br>(1) 0.32" Cable | Clearwire |
| | | 3 | DragonWave Horizon Compact | | | |
| | | 3 | Samsung U-RAS Premium-F FRH | | | |
| | | 3 | DragonWave A-ANT-18G-2-C | | | |
| | | 3 | Argus LLPX310R | | | |
| 154.0 | 154.0 | 6 | Powerwave LGP21401 | T-Arms | (6) 1 5/8" Coax<br>(2) 0.78" 8 AWG 6<br>(1) 0.39" Fiber Trunk<br>(1) 3" Conduit | AT&T Mobility |
| | | 1 | Raycap DC6-48-60-18-8F | | | |
| | | 6 | Ericsson RRUS 11 (Band 12) | | | |
| | | 3 | Ericsson RRUS 12 w/ RRUS A2 | | | |
| | | 3 | Powerwave 7770.00 | | | |
| | | 3 | CCI OPA-65R-LCUU-H8 | | | |
| 140.0 | 140.0 | 3 | Alcatel-Lucent 800MHz 2X50W RRH w/ Filter | Low Profile Platform | (4) 1 1/4" Hybriflex | Sprint Nextel |
| | | 3 | Alcatel-Lucent 1900MHz RRH | | | |
| | | 3 | Alcatel-Lucent TD-RRH8x20 | | | |
| | | 3 | RFS APXVTM14-C-I20 | | | |
| | | 1 | RFS APXV9ERR18-C-A20 | | | |
| | | 2 | RFS APXVSPP18-C-A20 | | | |
| 108.0 | 110.0 | 3 | Antel BXA-80063/4CF ___ 5° | Low Profile Platform | (12) 1 5/8" Coax<br>(1) 1 5/8" Hybriflex | Verizon |
| | | 1 | RFS DB-T1-6Z-8AB-0Z | | | |
| | | 3 | Antel BXA-70063-6CF-EDIN-X | | | |

## Equipment to be Removed

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| 108.0 | 110.0 | 3 | Alcatel-Lucent RRH2x40-AWS | - | - | Verizon |
| | | 6 | RFS FD9R6004/2C-3L | | | |
| | | 3 | Antel BXA-171063/12CF | | | |
| | | 3 | Antel BXA-171063/8CF | | | |

## Proposed Equipment

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| 108.0 | 110.0 | 3 | Alcatel-Lucent RRH2X60-1900 | Low Profile Platform | (1) 1 5/8" Fiber | Verizon |
| | | 3 | Alcatel-Lucent RRH2X60-AWS | | | |
| | | 3 | Alcatel-Lucent RRH2x60 700 | | | |
| | | 6 | Commscope SBNHH-1D65B | | | |

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

Install proposed coax inside the pole shaft.

## Structure Usages

| Structural Component | Controlling Usage | Pass/Fail |
|---|---|---|
| Anchor Bolts | 67% | Pass |
| Shaft | 73% | Pass |
| Base Plate | 16% | Pass |

## Foundations

| Reaction Component | Analysis Reactions | % of Usage |
|---|---|---|
| Moment (Kips-Ft) | 3,398.2 | 46% |
| Axial (Kips) | 43.4 | 41% |
| Shear (Kips) | 27.9 | 36% |

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. Foundations/anchorages have a factor of safety greater than or equal to 2.0.

## Deflection and Sway*

| Antenna Elevation (ft) | Antenna | Carrier | Deflection (ft) | Sway (Rotation) (°) |
|---|---|---|---|---|
| 160.0 | DragonWave A-ANT-18G-2-C | Clearwire | 3.014 | 2.360 |
| 109.0 | Alcatel-Lucent RRH2X60-AWS | Verizon | 1.289 | 1.494 |
| | Alcatel-Lucent RRH2x60 700 | | | |
| | Alcatel-Lucent RRH2X60-1900 | | | |
| 107.0 | Commscope SBNHH-1D65B | | 1.237 | 1.459 |

***Deflection and Sway was evaluated considering a design wind speed of 50 mph (Fastest Mile) per ANSI/TIA/EIA-222-F.**

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## Standard Conditions

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

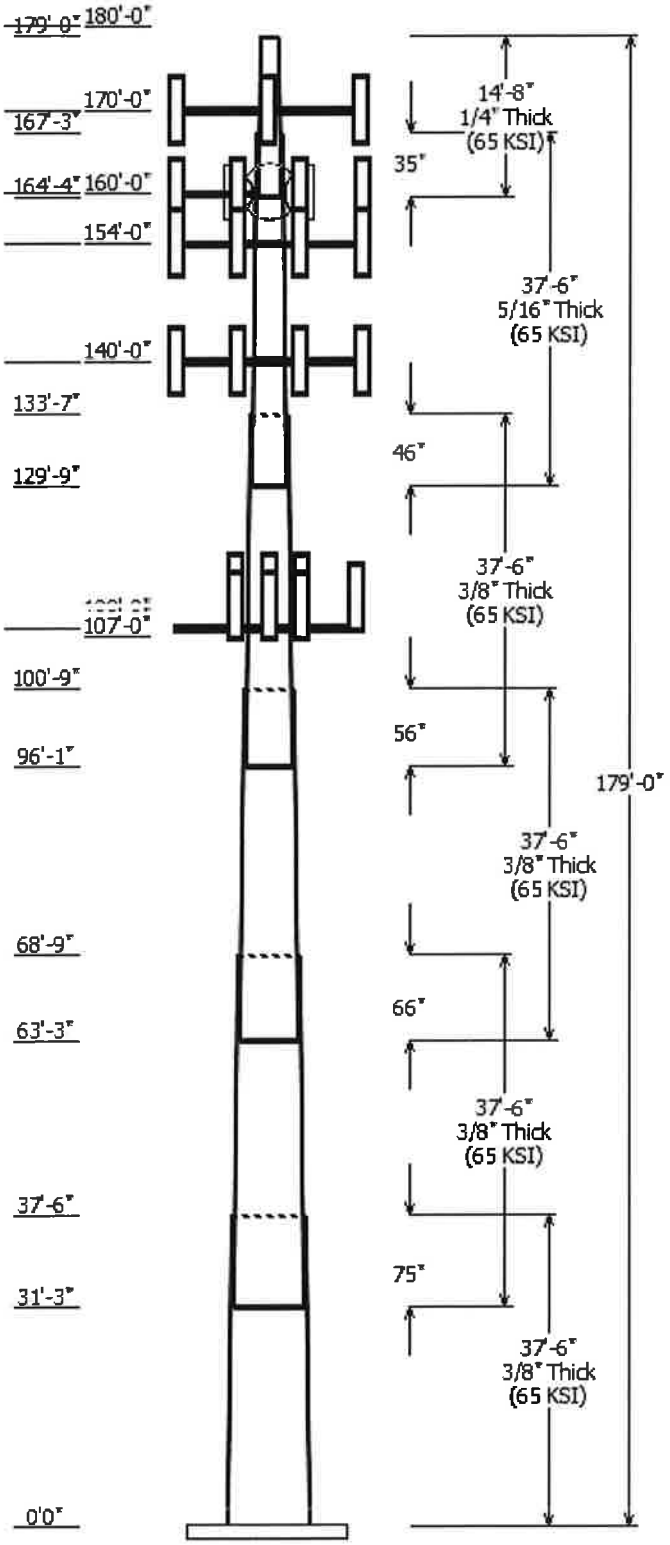
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

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

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

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

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




## Job Information

| | |
|---|---|
| Pole : | 370627 |
| Description : | 179' Pirod Monopole |
| Client : | Verizon Wireless |
| Location : | Newington CT, CT |
| Shape : | 18 Sides |
| Height : | 179.00 (ft) |
| Base Elev (ft): | 0.00 |
| Taper: | 0.30377 (in/ft) |

Code: TIA/EIA-222-F

## Sections Properties

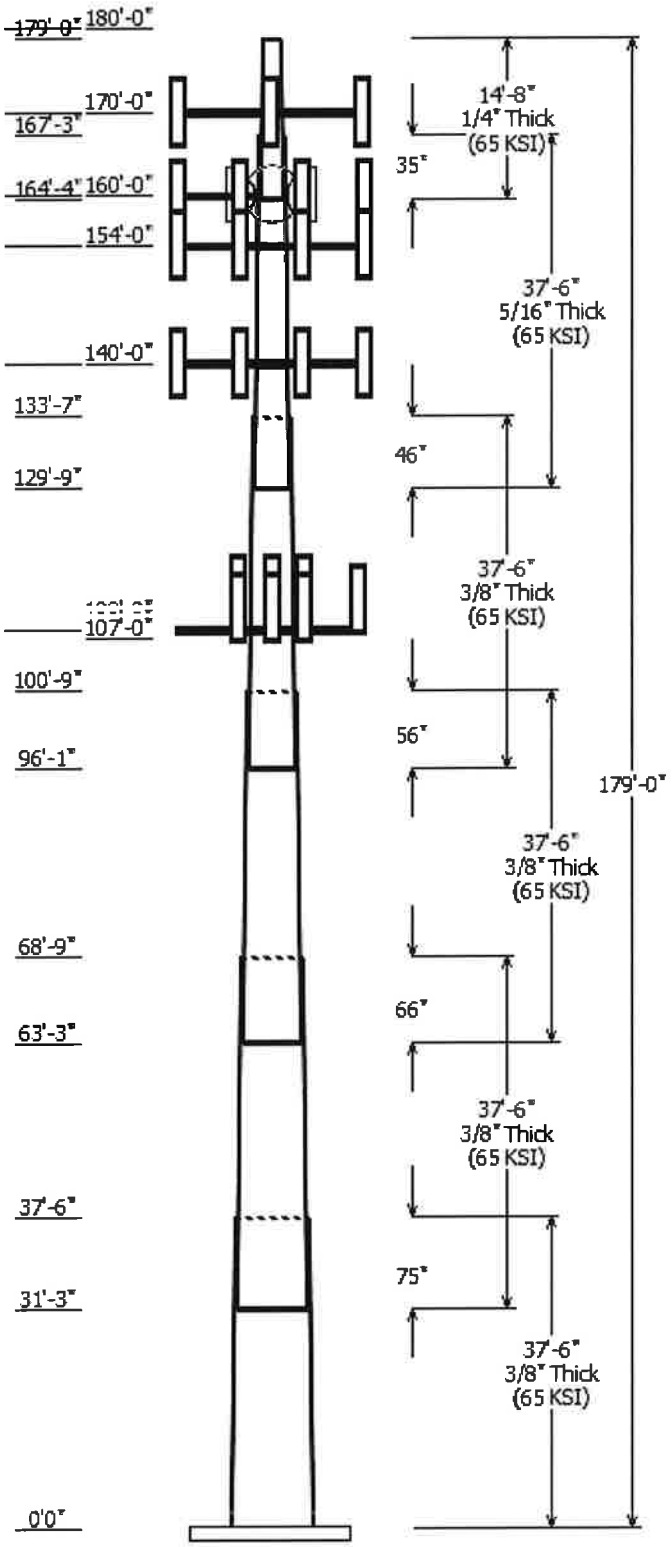
| Shaft Section | Length (ft) | Diameter (in) Accross Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Taper (in/ft) | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 37.500 | 51.60 | 63.00 | 0.375 | | 0.000 | 0.303771 | 65 |
| 2 | 37.500 | 42.86 | 54.25 | 0.375 | Slip Joint | 75.000 | 0.303771 | 65 |
| 3 | 37.500 | 33.89 | 45.28 | 0.375 | Slip Joint | 66.000 | 0.303771 | 65 |
| 4 | 37.500 | 24.67 | 36.06 | 0.375 | Slip Joint | 56.000 | 0.303771 | 65 |
| 5 | 37.500 | 15.06 | 26.46 | 0.313 | Slip Joint | 46.000 | 0.303771 | 65 |
| 6 | 14.667 | 12.00 | 16.45 | 0.250 | Slip Joint | 35.000 | 0.303771 | 65 |

## Discrete Appurtenance

| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 180.000 | 190.000 | 1 | 20' Dipole |
| 180.000 | 180.000 | 1 | 8' Yagi |
| 180.000 | 180.000 | 1 | Round Low Profile Platform |
| 170.000 | 170.000 | 3 | Ericsson AIR 21, 1.3M, B4A B2P |
| 170.000 | 170.000 | 3 | Ericsson AIR 21, 1.3 M, B2A B4 |
| 170.000 | 170.000 | 3 | Ericsson KRY 112 144/1 |
| 170.000 | 170.000 | 1 | Flat Low Profile Platform |
| 160.000 | 160.000 | 3 | Argus LLPX310R |
| 160.000 | 160.000 | 3 | Samsung U-RAS Premium-F |
| 160.000 | 160.000 | 3 | DragonWave A-ANT-18G-2-C |
| 160.000 | 160.000 | 3 | DragonWave Horizon Compact |
| 160.000 | 160.000 | 3 | RCU |
| 160.000 | 160.000 | 1 | Side Arms |
| 154.000 | 154.000 | 3 | CCI OPA-65R-LCUU-H8 |
| 154.000 | 154.000 | 3 | Ericsson RRUS 12 w/ RRUS A2 |
| 154.000 | 154.000 | 3 | Powerwave 7770.00 |
| 154.000 | 154.000 | 6 | Ericsson RRUS 11 (Band 12) |
| 154.000 | 154.000 | 1 | Raycap DC6-48-60-18-8F |
| 154.000 | 154.000 | 6 | Powerwave LGP21401 |
| 154.000 | 154.000 | 3 | Round T-Arm |
| 140.000 | 140.000 | 3 | RFS APXVTM14-C-I20 |
| 140.000 | 140.000 | 3 | Alcatel-Lucent TD-RRH8x20 |
| 140.000 | 140.000 | 2 | RFS APXVSPP18-C-A20 |
| 140.000 | 140.000 | 1 | RFS APXV9ERR18-C-A20 |
| 140.000 | 140.000 | 3 | Alcatel-Lucent 1900MHz RRH |
| 140.000 | 140.000 | 3 | Alcatel-Lucent 800 MHz 2X50W |
| 140.000 | 140.000 | 1 | Round Low Profile Platform |
| 109.000 | 110.000 | 3 | Alcatel-Lucent RRH2X60-1900 |
| 109.000 | 110.000 | 3 | Alcatel-Lucent RRH2x60 700 |
| 109.000 | 110.000 | 3 | Alcatel-Lucent RRH2X60-AWS |
| 108.000 | 110.000 | 3 | Antel BXA-70063-6CF-EDIN-X |
| 108.000 | 110.000 | 3 | Antel BXA-80063/4CF ___ 5° |
| 108.000 | 110.000 | 1 | RFS DB-T1-6Z-8AB-0Z |
| 108.000 | 108.000 | 1 | Flat Low Profile Platform |
| 107.000 | 110.000 | 6 | Commscope SBNHH-1D65B |

## Linear Appurtenance

| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 0.000 | 108.0 | 1 5/8" Coax | No |




| | | | |
|---|---|---|---|
| 0.000 | 108.0 | 1 5/8" Fiber | No |
| 0.000 | 108.0 | 1 5/8" Hybriflex | No |
| 0.000 | 140.0 | 1 1/4" Hybriflex | No |
| 0.000 | 154.0 | 0.39" Fiber Trunk | No |
| 0.000 | 154.0 | 0.78" 8 AWG 6 | No |
| 0.000 | 154.0 | 1 5/8" Coax | No |
| 0.000 | 154.0 | 3" Conduit | No |
| 0.000 | 160.0 | 0.28" Fiber | No |
| 0.000 | 160.0 | 0.32" Cable | No |
| 0.000 | 160.0 | 1/2" Coax | No |
| 0.000 | 160.0 | 2" Conduit | No |
| 0.000 | 160.0 | 5/8" Coax | No |
| 0.000 | 170.0 | 1 5/8" Coax | No |
| 0.000 | 170.0 | 1" Hybrid | No |
| 0.000 | 180.0 | 7/8" Coax | No |

## Load Cases

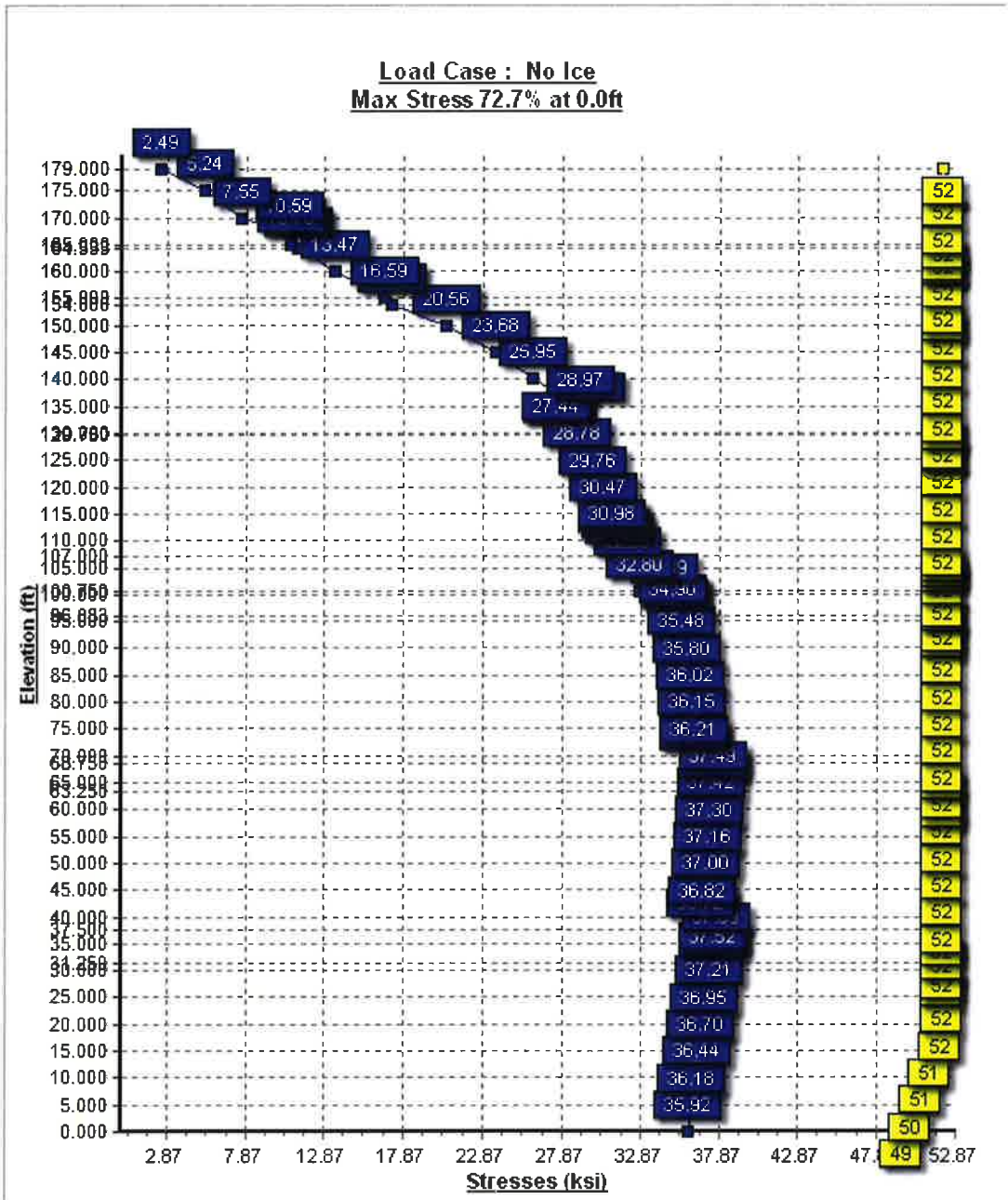
| | |
|---|---|
| No Ice | 80.00 mph Wind with No Ice |
| Ice | 69.28 mph Wind with Ice |
| Twist/Sway | 50.00 mph Wind with No Ice |

## Reactions

| Load Case | Moment (kip-ft) | Shear (kip) | Axial (kip) |
|---|---|---|---|
| No Ice | 3398.16 | 27.89 | 43.40 |
| Ice | 2935.83 | 23.24 | 50.94 |
| Twist/Sway | 1328.82 | 10.89 | 43.43 |

## Dish Deflections

| Load Case | Attach Elev (ft) | Deflection (in) | Rotation (deg) |
|---|---|---|---|
| Twist/Sway | 160.00 | 36.162 | 2.360 |


Load Case : No Ice
Max Stress 72.7% at 0.0ft
Elevation (ft)
Stresses (ksi)
2.87
7.87
12.87
17.87
22.87
27.87
32.87
37.87
42.87
52.87
2.49
5.24
16.59
20.56
23.68
25.95
28.97
29.76
30.47
30.98
35.46
35.80
36.02
36.15
36.21
37.30
37.16
37.00
36.82
37.21
36.95
36.70
36.44
36.18
35.92
52
51
50
49

| | | | |
|---|---|---|---|
| **Site Number:** | **370627** | **Code: TIA/EIA-222-F** |  |
| **Site Name:** | **Newington CT, CT** | **Engineering Number: 62041821** | **5/1/2015 11:45:32 AM** |
| **Customer:** | **Verizon Wireless** | | |

## Analysis Parameters

| | | | |
|---|---|---|---|
| **Location:** | **Hartford County, CT** | | |
| **Code:** | **TIA/EIA-222-F** | **Height (ft):** | **179** |
| **Shape:** | **18 Sides** | **Base Diameter (in):** | **63.00** |
| **Pole Type:** | **Taper** | **Top Diameter (in):** | **12.00** |
| **Pole Manfacturer:** | **Pirod** | **Taper (in/ft) :** | **0.304** |

## Load Cases

| | |
|---|---|
| **No Ice** | **80.00 mph Wind with No Ice** |
| **Ice** | **69.28 mph Wind with Ice** |
| **Twist/Sway** | **50.00 mph Wind with No Ice** |

Site Number: 370627 | Code: TIA/EIA-222-F | 

Site Name: Newington CT, CT | Engineering Number: 62041821 | 5/1/2015 11:45:32 AM

Customer: Verizon Wireless

## Shaft Section Properties

| Sect Info | Length (ft) | Thick (in) | Fy (ksi) | Slip Joint Type | Slip Joint Len (in) | Weight (lb) | Bottom Dia (in) | Bottom Elev (ft) | Bottom Area (in²) | Bottom Ix (in⁴) | Bottom W/t Ratio | Bottom D/t Ratio | Top Dia (in) | Top Elev (ft) | Top Area (in²) | Top Ix (in⁴) | Top W/t Ratio | Top D/t Ratio | Taper (in/ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-18 | 37.500 | 0.3750 | 65 | | 0.00 | 8,646 | 63.00 | 0.00 | 74.54 | 36933.4 | 27.86 | 168.00 | 51.60 | 37.50 | 60.98 | 20222.7 | 22.50 | 137.62 | 0.303771 |
| 2-18 | 37.500 | 0.3750 | 65 | Slip | 75.00 | 7,318 | 54.25 | 31.25 | 64.13 | 23524.0 | 23.75 | 144.69 | 42.86 | 68.75 | 50.57 | 11536.1 | 18.39 | 114.31 | 0.303771 |
| 3-18 | 37.500 | 0.3750 | 65 | Slip | 66.00 | 5,956 | 45.28 | 63.25 | 53.45 | 13622.2 | 19.53 | 120.76 | 33.89 | 100.75 | 39.90 | 5663.6 | 14.17 | 90.39 | 0.303771 |
| 4-18 | 37.500 | 0.3750 | 65 | Slip | 56.00 | 4,555 | 36.06 | 96.08 | 42.48 | 6834.9 | 15.19 | 96.17 | 24.67 | 133.58 | 28.92 | 2156.7 | 9.84 | 65.79 | 0.303771 |
| 5-18 | 37.500 | 0.3125 | 65 | Slip | 46.00 | 2,589 | 26.46 | 129.75 | 25.93 | 2240.4 | 13.17 | 84.67 | 15.06 | 167.25 | 14.64 | 402.7 | 6.74 | 48.22 | 0.303771 |
| 6-18 | 14.667 | 0.2500 | 65 | Slip | 35.00 | 554 | 16.45 | 164.33 | 12.86 | 426.6 | 9.84 | 65.82 | 12.00 | 179.00 | 9.32 | 162.6 | 6.70 | 48.00 | 0.303771 |
| | | | | Shaft Weight | | 29,617 | | | | | | | | | | | | | |

## Discrete Appurtenance Properties

| Attach Elev (ft) | Description | Qty | No Ice Weight (lb) | No Ice EPAa (sf) | No Ice Orientation Factor | Ice Weight (lb) | Ice EPAa (sf) | Ice Orientation Factor | Distance From Face (ft) | Vert Ecc (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 180.00 | 20' Dipole | 1 | 60.00 | 7.520 | 1.00 | 147.40 | 11.630 | 1.00 | 0.000 | 10.000 |
| 180.00 | 8' Yagi | 1 | 30.00 | 12.000 | 1.00 | 127.20 | 21.590 | 1.00 | 0.000 | 0.000 |
| 180.00 | Round Low Profile Platform | 1 | 1500.00 | 21.700 | 1.00 | 1,700.00 | 27.200 | 1.00 | 0.000 | 0.000 |
| 170.00 | Ericsson AIR 21, 1.3 M, B2A | 3 | 83.00 | 6.530 | 0.69 | 132.60 | 7.200 | 0.69 | 0.000 | 0.000 |
| 170.00 | Ericsson AIR 21, 1.3M, B4A | 3 | 81.50 | 6.590 | 0.69 | 132.60 | 7.200 | 0.69 | 0.000 | 0.000 |
| 170.00 | Ericsson KRY 112 144/1 | 3 | 11.00 | 0.410 | 0.50 | 14.10 | 0.550 | 0.50 | 0.000 | 0.000 |
| 170.00 | Flat Low Profile Platform | 1 | 1500.00 | 26.100 | 1.00 | 1,700.00 | 31.600 | 1.00 | 0.000 | 0.000 |
| 160.00 | Argus LLPX310R | 3 | 28.60 | 4.820 | 0.62 | 54.60 | 5.360 | 0.62 | 0.000 | 0.000 |
| 160.00 | DragonWave A-ANT-18G-2-C | 3 | 27.10 | 4.690 | 1.00 | 55.10 | 5.050 | 1.00 | 0.000 | 0.000 |
| 160.00 | DragonWave Horizon | 3 | 11.50 | 0.840 | 0.50 | 17.90 | 1.030 | 0.50 | 0.000 | 0.000 |
| 160.00 | RCU | 3 | 1.00 | 0.160 | 0.50 | 2.50 | 0.260 | 0.50 | 0.000 | 0.000 |
| 160.00 | Samsung U-RAS Premium-F | 3 | 33.00 | 1.820 | 0.50 | 45.00 | 2.100 | 0.50 | 0.000 | 0.000 |
| 160.00 | Side Arms | 1 | 560.00 | 8.500 | 1.00 | 680.00 | 10.500 | 1.00 | 0.000 | 0.000 |
| 154.00 | CCI OPA-65R-LCUU-H8 | 3 | 88.00 | 13.300 | 0.66 | 141.77 | 14.350 | 0.66 | 0.000 | 0.000 |
| 154.00 | Ericsson RRUS 11 (Band 12) | 6 | 55.00 | 2.940 | 0.50 | 74.30 | 3.290 | 0.50 | 0.000 | 0.000 |
| 154.00 | Ericsson RRUS 12 w/ RRUS | 3 | 71.40 | 3.670 | 0.50 | 80.99 | 4.060 | 0.50 | 0.000 | 0.000 |
| 154.00 | Powerwave 7770.00 | 3 | 35.00 | 5.880 | 0.64 | 67.63 | 6.530 | 0.64 | 0.000 | 0.000 |
| 154.00 | Powerwave LGP21401 | 6 | 14.10 | 1.290 | 0.50 | 7.70 | 0.340 | 0.50 | 0.000 | 0.000 |
| 154.00 | Raycap DC6-48-60-18-8F | 1 | 31.80 | 1.470 | 1.00 | 49.50 | 1.670 | 1.00 | 0.000 | 0.000 |
| 154.00 | Round T-Arm | 3 | 250.00 | 9.700 | 0.67 | 314.00 | 12.100 | 0.67 | 0.000 | 0.000 |
| 140.00 | Alcatel-Lucent 1900MHz RRH | 3 | 44.00 | 3.800 | 0.50 | 75.20 | 4.200 | 0.50 | 0.000 | 0.000 |
| 140.00 | Alcatel-Lucent 800 MHz | 3 | 64.00 | 2.400 | 0.50 | 71.30 | 2.720 | 0.50 | 0.000 | 0.000 |
| 140.00 | Alcatel-Lucent TD-RRH8x20 | 3 | 66.10 | 4.300 | 0.50 | 82.70 | 4.430 | 0.50 | 0.000 | 0.000 |
| 140.00 | RFS APXV9ERR18-C-A20 | 1 | 62.00 | 8.260 | 0.70 | 113.90 | 9.080 | 0.70 | 0.000 | 0.000 |
| 140.00 | RFS APXVSPP18-C-A20 | 2 | 57.00 | 8.260 | 0.68 | 106.50 | 9.080 | 0.68 | 0.000 | 0.000 |
| 140.00 | RFS APXVTM14-C-I20 | 3 | 56.20 | 6.900 | 0.65 | 92.40 | 7.580 | 0.65 | 0.000 | 0.000 |
| 140.00 | Round Low Profile Platform | 1 | 1500.00 | 21.700 | 1.00 | 1,700.00 | 27.200 | 1.00 | 0.000 | 0.000 |
| 109.00 | Alcatel-Lucent RRH2x60 700 | 3 | 56.70 | 2.510 | 0.50 | 61.40 | 2.870 | 0.50 | 0.000 | 1.000 |
| 109.00 | Alcatel-Lucent RRH2X60- | 3 | 43.00 | 2.190 | 0.50 | 61.40 | 2.870 | 0.50 | 0.000 | 1.000 |
| 109.00 | Alcatel-Lucent RRH2X60- | 3 | 44.00 | 2.190 | 0.50 | 61.40 | 2.870 | 0.50 | 0.000 | 1.000 |
| 108.00 | Antel BXA-70063-6CF-EDIN-X | 3 | 17.00 | 7.730 | 0.66 | 58.00 | 8.540 | 0.66 | 0.000 | 2.000 |
| 108.00 | Antel BXA-80063/4CF ___ 5° | 3 | 9.90 | 5.160 | 0.63 | 37.73 | 5.741 | 0.63 | 0.000 | 2.000 |
| 108.00 | Flat Low Profile Platform | 1 | 1500.00 | 26.100 | 1.00 | 1,700.00 | 31.600 | 1.00 | 0.000 | 0.000 |
| 108.00 | RFS DB-T1-6Z-8AB-0Z | 1 | 44.00 | 5.600 | 0.50 | 144.50 | 6.080 | 0.50 | 0.000 | 2.000 |
| 107.00 | Commscope SBNHH-1D65B | 6 | 40.60 | 8.330 | 0.69 | 97.61 | 9.240 | 0.69 | 0.000 | 3.000 |
| | Totals | 93 | 10926.00 | | | 14,334.11 | | | Number of Loadings : | 35 |

## Linear Appurtenance Properties

| Elev From (ft) | Elev To (ft) | Qty | Description | No Ice Weight (lb/ft) | No Ice CaAa (sf/ft) | Ice Weight (lb/ft) | Ice CaAa (sf/ft) | Exposed To Wind |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 180.00 | 3 | 7/8" Coax | 0.33 | 0.00 | 0.00 | 0.00 | N |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 170.00 | 12 | 1 5/8" Coax | 0.82 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 170.00 | 1 | 1" Hybrid | 0.65 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 160.00 | 3 | 0.28" Fiber | 0.03 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 160.00 | 1 | 0.32" Cable | 0.06 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 160.00 | 3 | 1/2" Coax | 0.15 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 160.00 | 2 | 2" Conduit | 3.65 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 160.00 | 3 | 5/8" Coax | 0.15 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 154.00 | 1 | 0.39" Fiber Trunk | 0.07 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 154.00 | 2 | 0.78" 8 AWG 6 | 0.59 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 154.00 | 6 | 1 5/8" Coax | 0.82 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 154.00 | 1 | 3" Conduit | 7.58 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 140.00 | 4 | 1 1/4" Hybriflex Cable | 1.00 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 108.00 | 12 | 1 5/8" Coax | 0.82 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 108.00 | 1 | 1 5/8" Fiber | 1.61 | 0.00 | 0.00 | 0.00 | N |
| 0.00 | 108.00 | 1 | 1 5/8" Hybriflex | 1.30 | 0.00 | 0.00 | 0.00 | N |
| | | | Total Weight | 2,893.78 (lb) | | 0.00 (lb) | | |

## 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) | Fb (ksi) | Fa (ksi) | Weight (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.3750 | 63.000 | 74.537 | 36,933.4 | 27.86 | 168.00 | 65 | 49 | 0 | 0.0 |
| 5.00 | | 0.3750 | 61.481 | 72.729 | 34,310.8 | 27.15 | 163.95 | 65 | 50 | 0 | 1,252.8 |
| 10.00 | | 0.3750 | 59.962 | 70.921 | 31,815.3 | 26.43 | 159.90 | 65 | 51 | 0 | 1,222.0 |
| 15.00 | | 0.3750 | 58.443 | 69.113 | 29,443.9 | 25.72 | 155.85 | 65 | 51 | 0 | 1,191.3 |
| 20.00 | | 0.3750 | 56.925 | 67.306 | 27,193.4 | 25.00 | 151.80 | 65 | 52 | 0 | 1,160.5 |
| 25.00 | | 0.3750 | 55.406 | 65.498 | 25,060.6 | 24.29 | 147.75 | 65 | 52 | 0 | 1,129.8 |
| 30.00 | | 0.3750 | 53.887 | 63.690 | 23,042.3 | 23.57 | 143.70 | 65 | 52 | 0 | 1,099.0 |
| 31.25 | Bot - Section 2 | 0.3750 | 53.507 | 63.238 | 22,555.3 | 23.40 | 142.69 | 65 | 52 | 0 | 269.9 |
| 35.00 | | 0.3750 | 52.368 | 61.882 | 21,135.4 | 22.86 | 139.65 | 65 | 52 | 0 | 1,608.0 |
| 37.50 | Top - Section 1 | 0.3750 | 52.359 | 61.871 | 21,123.9 | 22.86 | 139.62 | 65 | 52 | 0 | 1,052.8 |
| 40.00 | | 0.3750 | 51.599 | 60.967 | 20,211.6 | 22.50 | 137.60 | 65 | 52 | 0 | 522.5 |
| 45.00 | | 0.3750 | 50.080 | 59.160 | 18,466.5 | 21.78 | 133.55 | 65 | 52 | 0 | 1,021.9 |
| 50.00 | | 0.3750 | 48.561 | 57.352 | 16,824.8 | 21.07 | 129.50 | 65 | 52 | 0 | 991.2 |
| 55.00 | | 0.3750 | 47.043 | 55.544 | 15,283.5 | 20.36 | 125.45 | 65 | 52 | 0 | 960.4 |
| 60.00 | | 0.3750 | 45.524 | 53.736 | 13,839.3 | 19.64 | 121.40 | 65 | 52 | 0 | 929.6 |
| 63.25 | Bot - Section 3 | 0.3750 | 44.536 | 52.561 | 12,951.1 | 19.18 | 118.76 | 65 | 52 | 0 | 587.8 |
| 65.00 | | 0.3750 | 44.005 | 51.929 | 12,489.0 | 18.93 | 117.35 | 65 | 52 | 0 | 627.5 |
| 68.75 | Top - Section 2 | 0.3750 | 43.616 | 51.465 | 12,157.8 | 18.75 | 116.31 | 65 | 52 | 0 | 1,319.4 |
| 70.00 | | 0.3750 | 43.236 | 51.014 | 11,840.3 | 18.57 | 115.30 | 65 | 52 | 0 | 217.9 |
| 75.00 | | 0.3750 | 41.717 | 49.206 | 10,625.7 | 17.85 | 111.25 | 65 | 52 | 0 | 852.6 |
| 80.00 | | 0.3750 | 40.198 | 47.398 | 9,497.0 | 17.14 | 107.20 | 65 | 52 | 0 | 821.8 |
| 85.00 | | 0.3750 | 38.679 | 45.590 | 8,451.3 | 16.42 | 103.15 | 65 | 52 | 0 | 791.0 |
| 90.00 | | 0.3750 | 37.161 | 43.783 | 7,485.3 | 15.71 | 99.09 | 65 | 52 | 0 | 760.3 |
| 95.00 | | 0.3750 | 35.642 | 41.975 | 6,595.9 | 15.00 | 95.04 | 65 | 52 | 0 | 729.5 |
| 96.08 | Bot - Section 4 | 0.3750 | 35.313 | 41.583 | 6,412.9 | 14.84 | 94.17 | 65 | 52 | 0 | 154.0 |
| 100.0 | | 0.3750 | 34.123 | 40.167 | 5,779.8 | 14.28 | 90.99 | 65 | 52 | 0 | 1,101.4 |
| 100.7 | Top - Section 3 | 0.3750 | 34.645 | 40.788 | 6,052.3 | 14.53 | 92.39 | 65 | 52 | 0 | 206.6 |
| 105.0 | | 0.3750 | 33.354 | 39.252 | 5,393.7 | 13.92 | 88.94 | 65 | 52 | 0 | 578.8 |
| 107.0 | | 0.3750 | 32.747 | 38.529 | 5,101.1 | 13.63 | 87.32 | 65 | 52 | 0 | 264.7 |
| 108.0 | | 0.3750 | 32.443 | 38.167 | 4,958.8 | 13.49 | 86.51 | 65 | 52 | 0 | 130.5 |
| 109.0 | | 0.3750 | 32.139 | 37.806 | 4,819.3 | 13.35 | 85.70 | 65 | 52 | 0 | 129.3 |
| 110.0 | | 0.3750 | 31.835 | 37.444 | 4,682.3 | 13.21 | 84.89 | 65 | 52 | 0 | 128.0 |
| 115.0 | | 0.3750 | 30.316 | 35.636 | 4,036.4 | 12.49 | 80.84 | 65 | 52 | 0 | 621.7 |
| 120.0 | | 0.3750 | 28.797 | 33.829 | 3,452.7 | 11.78 | 76.79 | 65 | 52 | 0 | 590.9 |
| 125.0 | | 0.3750 | 27.279 | 32.021 | 2,928.3 | 11.06 | 72.74 | 65 | 52 | 0 | 560.2 |
| 129.7 | Bot - Section 5 | 0.3750 | 25.836 | 30.304 | 2,481.9 | 10.38 | 68.90 | 65 | 52 | 0 | 503.7 |
| 130.0 | | 0.3750 | 25.760 | 30.213 | 2,459.8 | 10.35 | 68.69 | 65 | 52 | 0 | 47.8 |
| 133.5 | Top - Section 4 | 0.3125 | 25.296 | 24.780 | 1,954.2 | 12.51 | 80.95 | 65 | 52 | 0 | 669.2 |
| 135.0 | | 0.3125 | 24.866 | 24.353 | 1,854.9 | 12.27 | 79.57 | 65 | 52 | 0 | 118.4 |
| 140.0 | | 0.3125 | 23.347 | 22.847 | 1,531.6 | 11.41 | 74.71 | 65 | 52 | 0 | 401.5 |
| 145.0 | | 0.3125 | 21.828 | 21.340 | 1,248.1 | 10.55 | 69.85 | 65 | 52 | 0 | 375.9 |
| 150.0 | | 0.3125 | 20.309 | 19.834 | 1,002.0 | 9.70 | 64.99 | 65 | 52 | 0 | 350.3 |
| 154.0 | | 0.3125 | 19.094 | 18.629 | 830.2 | 9.01 | 61.10 | 65 | 52 | 0 | 261.8 |
| 155.0 | | 0.3125 | 18.791 | 18.327 | 790.6 | 8.84 | 60.13 | 65 | 52 | 0 | 62.9 |
| 160.0 | | 0.3125 | 17.272 | 16.821 | 611.2 | 7.98 | 55.27 | 65 | 52 | 0 | 299.0 |
| 164.3 | Bot - Section 6 | 0.3125 | 15.955 | 15.515 | 479.7 | 7.24 | 51.06 | 65 | 52 | 0 | 238.4 |
| 165.0 | | 0.3125 | 15.753 | 15.314 | 461.3 | 7.13 | 50.41 | 65 | 52 | 0 | 64.0 |
| 167.2 | Top - Section 5 | 0.2500 | 15.569 | 12.155 | 360.4 | 9.22 | 62.28 | 65 | 52 | 0 | 209.8 |
| 170.0 | | 0.2500 | 14.734 | 11.493 | 304.6 | 8.63 | 58.94 | 65 | 52 | 0 | 110.6 |
| 175.0 | | 0.2500 | 13.215 | 10.287 | 218.5 | 7.56 | 52.86 | 65 | 52 | 0 | 185.3 |
| 179.0 | | 0.2500 | 12.000 | 9.323 | 162.6 | 6.70 | 48.00 | 65 | 52 | 0 | 133.5 |
| | | | | | | | | | | | 29,617.5 |

Site Number: 370627 | Code: TIA/EIA-222-F | 

Site Name: Newington CT, CT | Engineering Number: 62041821 | 5/1/2015 11:45:32 AM

Customer: Verizon Wireless

**Load Case:** No Ice — 80.00 mph Wind with No Ice — 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Applied Segment Forces Summary

| Seg Elev (ft) | Description | Shaft Forces Wind FX (lb) | Shaft Forces Dead Load (lb) | Discrete Forces Wind FX (lb) | Discrete Forces Torsion MY (lb-ft) | Discrete Forces Moment MZ (lb-ft) | Discrete Forces Dead Load (lb) | Linear Forces Wind FX (lb) | Linear Forces Dead Load (lb) | Sum of Forces Wind FX (lb) | Sum of Forces Dead Load (lb) | Sum of Forces Torsion MY (lb-ft) | Sum of Forces Moment MZ (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 233.4 | 0.0 | | | | | 0.0 | 0.0 | 233.4 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 461.1 | 1,252.8 | | | | | 0.0 | 98.2 | 461.1 | 1,350.9 | 0.0 | 0.0 |
| 10.00 | | 449.7 | 1,222.0 | | | | | 0.0 | 98.2 | 449.7 | 1,320.2 | 0.0 | 0.0 |
| 15.00 | | 438.3 | 1,191.3 | | | | | 0.0 | 98.2 | 438.3 | 1,289.4 | 0.0 | 0.0 |
| 20.00 | | 426.9 | 1,160.5 | | | | | 0.0 | 98.2 | 426.9 | 1,258.7 | 0.0 | 0.0 |
| 25.00 | | 415.5 | 1,129.8 | | | | | 0.0 | 98.2 | 415.5 | 1,227.9 | 0.0 | 0.0 |
| 30.00 | | 255.2 | 1,099.0 | | | | | 0.0 | 98.2 | 255.2 | 1,197.1 | 0.0 | 0.0 |
| 31.25 | Bot - Section 2 | 201.5 | 269.9 | | | | | 0.0 | 24.5 | 201.5 | 294.5 | 0.0 | 0.0 |
| 35.00 | | 252.7 | 1,608.0 | | | | | 0.0 | 73.6 | 252.7 | 1,681.6 | 0.0 | 0.0 |
| 37.50 | Top - Section 1 | 203.6 | 1,052.8 | | | | | 0.0 | 49.1 | 203.6 | 1,101.8 | 0.0 | 0.0 |
| 40.00 | | 306.9 | 522.5 | | | | | 0.0 | 49.1 | 306.9 | 571.6 | 0.0 | 0.0 |
| 45.00 | | 410.1 | 1,021.9 | | | | | 0.0 | 98.2 | 410.1 | 1,120.1 | 0.0 | 0.0 |
| 50.00 | | 409.9 | 991.2 | | | | | 0.0 | 98.2 | 409.9 | 1,089.3 | 0.0 | 0.0 |
| 55.00 | | 408.0 | 960.4 | | | | | 0.0 | 98.2 | 408.0 | 1,058.5 | 0.0 | 0.0 |
| 60.00 | | 334.6 | 929.6 | | | | | 0.0 | 98.2 | 334.6 | 1,027.8 | 0.0 | 0.0 |
| 63.25 | Bot - Section 3 | 202.6 | 587.8 | | | | | 0.0 | 63.8 | 202.6 | 651.6 | 0.0 | 0.0 |
| 65.00 | | 223.5 | 627.5 | | | | | 0.0 | 34.4 | 223.5 | 661.9 | 0.0 | 0.0 |
| 68.75 | Top - Section 2 | 202.4 | 1,319.4 | | | | | 0.0 | 73.6 | 202.4 | 1,393.0 | 0.0 | 0.0 |
| 70.00 | | 249.8 | 217.9 | | | | | 0.0 | 24.5 | 249.8 | 242.5 | 0.0 | 0.0 |
| 75.00 | | 395.4 | 852.6 | | | | | 0.0 | 98.2 | 395.4 | 950.7 | 0.0 | 0.0 |
| 80.00 | | 388.1 | 821.8 | | | | | 0.0 | 98.2 | 388.1 | 920.0 | 0.0 | 0.0 |
| 85.00 | | 380.0 | 791.0 | | | | | 0.0 | 98.2 | 380.0 | 889.2 | 0.0 | 0.0 |
| 90.00 | | 371.1 | 760.3 | | | | | 0.0 | 98.2 | 371.1 | 858.4 | 0.0 | 0.0 |
| 95.00 | | 222.3 | 729.5 | | | | | 0.0 | 98.2 | 222.3 | 827.7 | 0.0 | 0.0 |
| 96.08 | Bot - Section 4 | 181.2 | 154.0 | | | | | 0.0 | 21.3 | 181.2 | 175.3 | 0.0 | 0.0 |
| 100.00 | | 169.1 | 1,101.4 | | | | | 0.0 | 76.9 | 169.1 | 1,178.3 | 0.0 | 0.0 |
| 100.75 | Top - Section 3 | 176.8 | 206.6 | | | | | 0.0 | 14.7 | 176.8 | 221.3 | 0.0 | 0.0 |
| 105.00 | | 219.1 | 578.8 | | | | | 0.0 | 83.4 | 219.1 | 662.2 | 0.0 | 0.0 |
| 107.00 | Appertunance(s) | 103.4 | 264.7 | 1,346.9 | 0.0 | 4,040.8 | 243.6 | 0.0 | 39.3 | 1,450.4 | 547.5 | 0.0 | 0.0 |
| 108.00 | Appertunance(s) | 68.3 | 130.5 | 2,102.1 | 0.0 | 2,176.1 | 1,624.7 | 0.0 | 19.6 | 2,170.4 | 1,774.8 | 0.0 | 0.0 |
| 109.00 | Appertunance(s) | 67.8 | 129.3 | 403.7 | 0.0 | 403.7 | 431.1 | 0.0 | 15.9 | 471.5 | 576.3 | 0.0 | 0.0 |
| 110.00 | | 199.2 | 128.0 | | | | | 0.0 | 15.9 | 199.2 | 143.9 | 0.0 | 0.0 |
| 115.00 | | 324.7 | 621.7 | | | | | 0.0 | 79.5 | 324.7 | 701.2 | 0.0 | 0.0 |
| 120.00 | | 312.2 | 590.9 | | | | | 0.0 | 79.5 | 312.2 | 670.4 | 0.0 | 0.0 |
| 125.00 | | 292.1 | 560.2 | | | | | 0.0 | 79.5 | 292.1 | 639.7 | 0.0 | 0.0 |
| 129.75 | Bot - Section 5 | 146.5 | 503.7 | | | | | 0.0 | 75.5 | 146.5 | 579.2 | 0.0 | 0.0 |
| 130.00 | | 110.5 | 47.8 | | | | | 0.0 | 4.0 | 110.5 | 51.7 | 0.0 | 0.0 |
| 133.58 | Top - Section 4 | 142.9 | 669.2 | | | | | 0.0 | 57.0 | 142.9 | 726.2 | 0.0 | 0.0 |
| 135.00 | | 175.7 | 118.4 | | | | | 0.0 | 22.5 | 175.7 | 141.0 | 0.0 | 0.0 |
| 140.00 | Appertunance(s) | 264.5 | 401.5 | 2,842.0 | 0.0 | 0.0 | 2,366.9 | 0.0 | 79.5 | 3,106.5 | 2,847.9 | 0.0 | 0.0 |
| 145.00 | | 249.8 | 375.9 | | | | | 0.0 | 74.5 | 249.8 | 450.4 | 0.0 | 0.0 |
| 150.00 | | 212.6 | 350.3 | | | | | 0.0 | 74.5 | 212.6 | 424.8 | 0.0 | 0.0 |
| 154.00 | Appertunance(s) | 113.5 | 261.8 | 3,301.6 | 0.0 | 0.0 | 1,779.6 | 0.0 | 59.6 | 3,415.2 | 2,101.0 | 0.0 | 0.0 |
| 155.00 | | 127.7 | 62.9 | | | | | 0.0 | 5.8 | 127.7 | 68.7 | 0.0 | 0.0 |
| 160.00 | Appertunance(s) | 190.7 | 299.0 | 1,554.7 | 0.0 | 0.0 | 863.6 | 0.0 | 29.2 | 1,745.5 | 1,191.8 | 0.0 | 0.0 |
| 164.33 | Bot - Section 6 | 98.0 | 238.4 | | | | | 0.0 | 7.8 | 98.0 | 246.2 | 0.0 | 0.0 |
| 165.00 | | 55.5 | 64.0 | | | | | 0.0 | 1.2 | 55.5 | 65.2 | 0.0 | 0.0 |
| 167.25 | Top - Section 5 | 92.4 | 209.8 | | | | | 0.0 | 4.1 | 92.4 | 213.8 | 0.0 | 0.0 |

| | | | |
|---|---|---|---|
| **Site Number:** | **370627** | **Code: TIA/EIA-222-F** |  |
| **Site Name:** | **Newington CT, CT** | **Engineering Number: 62041821** | **5/1/2015 11:45:35 AM** |
| **Customer:** | **Verizon Wireless** | | |

**Load Case:** No Ice — 80.00 mph Wind with No Ice — 27 Iterations

**Gust Response Factor : 1.69**
**Dead Load Factor : 1.00**
**Wind Load Factor : 1.00**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 170.00 | Appertunance(s) | 133.8 | 110.6 | 2,382.8 | 0.0 | 0.0 | 2,026.5 | 0.0 | 4.9 | 2,516.7 | 2,142.1 | 0.0 | 0.0 |
| 175.00 | | 145.2 | 185.3 | | | | | 0.0 | 1.7 | 145.2 | 186.9 | 0.0 | 0.0 |
| 179.00 | | 61.1 | 133.5 | | | | | 0.0 | 1.3 | 61.1 | 134.8 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 26,210.9 | 41,846.9 | 0.00 | 0.00 |

Site Number: 370627 | Code: TIA/EIA-222-F | 

Site Name: Newington CT, CT | Engineering Number: 62041821 | 5/1/2015 11:45:35 AM

Customer: Verizon Wireless

**Load Case:** No Ice | 80.00 mph Wind with No Ice | 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Shaft Forces and Deflections

| Seg Elev (ft) | Lateral FX (-) (kips) | Axial FY (-) (kips) | Lateral FZ (kips) | Moment MX (ft-kips) | Torsion MY (ft-kips) | Moment MZ (ft-kips) | X Deflect (in) | Z Deflect (in) | Total Deflect (in) | Rotation (deg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -27.885 | -43.405 | 0.000 | 0.000 | 0.000 | -3,398.156 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.00 | -27.518 | -41.992 | 0.000 | 0.000 | 0.000 | -3,258.732 | -0.069 | 0.000 | 0.069 | -0.128 |
| 10.00 | -27.160 | -40.610 | 0.000 | 0.000 | 0.000 | -3,121.143 | -0.275 | 0.000 | 0.275 | -0.260 |
| 15.00 | -26.809 | -39.258 | 0.000 | 0.000 | 0.000 | -2,985.349 | -0.621 | 0.000 | 0.621 | -0.397 |
| 20.00 | -26.467 | -37.937 | 0.000 | 0.000 | 0.000 | -2,851.306 | -1.113 | 0.000 | 1.113 | -0.538 |
| 25.00 | -26.133 | -36.646 | 0.000 | 0.000 | 0.000 | -2,718.975 | -1.755 | 0.000 | 1.755 | -0.684 |
| 30.00 | -25.921 | -35.409 | 0.000 | 0.000 | 0.000 | -2,588.312 | -2.552 | 0.000 | 2.552 | -0.834 |
| 31.25 | -25.763 | -35.082 | 0.000 | 0.000 | 0.000 | -2,555.912 | -2.776 | 0.000 | 2.776 | -0.874 |
| 35.00 | -25.542 | -33.361 | 0.000 | 0.000 | 0.000 | -2,459.301 | -3.510 | 0.000 | 3.510 | -0.993 |
| 37.50 | -25.364 | -32.226 | 0.000 | 0.000 | 0.000 | -2,395.448 | -4.052 | 0.000 | 4.052 | -1.074 |
| 40.00 | -25.114 | -31.607 | 0.000 | 0.000 | 0.000 | -2,332.039 | -4.637 | 0.000 | 4.637 | -1.157 |
| 45.00 | -24.766 | -30.426 | 0.000 | 0.000 | 0.000 | -2,206.472 | -5.935 | 0.000 | 5.935 | -1.317 |
| 50.00 | -24.416 | -29.276 | 0.000 | 0.000 | 0.000 | -2,082.645 | -7.404 | 0.000 | 7.404 | -1.482 |
| 55.00 | -24.064 | -28.156 | 0.000 | 0.000 | 0.000 | -1,960.570 | -9.048 | 0.000 | 9.048 | -1.653 |
| 60.00 | -23.769 | -27.077 | 0.000 | 0.000 | 0.000 | -1,840.250 | -10.874 | 0.000 | 10.874 | -1.830 |
| 63.25 | -23.588 | -26.394 | 0.000 | 0.000 | 0.000 | -1,763.004 | -12.162 | 0.000 | 12.162 | -1.951 |
| 65.00 | -23.389 | -25.698 | 0.000 | 0.000 | 0.000 | -1,721.726 | -12.890 | 0.000 | 12.890 | -2.017 |
| 68.75 | -23.177 | -24.274 | 0.000 | 0.000 | 0.000 | -1,634.019 | -14.532 | 0.000 | 14.532 | -2.161 |
| 70.00 | -22.968 | -23.994 | 0.000 | 0.000 | 0.000 | -1,605.049 | -15.105 | 0.000 | 15.105 | -2.211 |
| 75.00 | -22.610 | -22.985 | 0.000 | 0.000 | 0.000 | -1,490.213 | -17.519 | 0.000 | 17.519 | -2.397 |
| 80.00 | -22.257 | -22.007 | 0.000 | 0.000 | 0.000 | -1,377.165 | -20.132 | 0.000 | 20.132 | -2.589 |
| 85.00 | -21.910 | -21.060 | 0.000 | 0.000 | 0.000 | -1,265.879 | -22.949 | 0.000 | 22.949 | -2.787 |
| 90.00 | -21.569 | -20.144 | 0.000 | 0.000 | 0.000 | -1,156.330 | -25.976 | 0.000 | 25.976 | -2.990 |
| 95.00 | -21.345 | -19.282 | 0.000 | 0.000 | 0.000 | -1,048.487 | -29.219 | 0.000 | 29.219 | -3.200 |
| 96.08 | -21.191 | -19.076 | 0.000 | 0.000 | 0.000 | -1,025.363 | -29.951 | 0.000 | 29.951 | -3.248 |
| 100.0 | -20.986 | -17.873 | 0.000 | 0.000 | 0.000 | -942.364 | -32.687 | 0.000 | 32.687 | -3.419 |
| 100.7 | -20.831 | -17.621 | 0.000 | 0.000 | 0.000 | -926.625 | -33.227 | 0.000 | 33.227 | -3.454 |
| 105.0 | -20.611 | -16.925 | 0.000 | 0.000 | 0.000 | -838.095 | -36.386 | 0.000 | 36.386 | -3.642 |
| 107.0 | -19.147 | -16.450 | 0.000 | 0.000 | 0.000 | -792.832 | -37.930 | 0.000 | 37.930 | -3.728 |
| 108.0 | -16.877 | -14.808 | 0.000 | 0.000 | 0.000 | -771.509 | -38.715 | 0.000 | 38.715 | -3.772 |
| 109.0 | -16.379 | -14.252 | 0.000 | 0.000 | 0.000 | -754.229 | -39.509 | 0.000 | 39.509 | -3.816 |
| 110.0 | -16.203 | -14.085 | 0.000 | 0.000 | 0.000 | -737.850 | -40.313 | 0.000 | 40.313 | -3.860 |
| 115.0 | -15.880 | -13.349 | 0.000 | 0.000 | 0.000 | -656.838 | -44.466 | 0.000 | 44.466 | -4.072 |
| 120.0 | -15.569 | -12.643 | 0.000 | 0.000 | 0.000 | -577.436 | -48.845 | 0.000 | 48.845 | -4.289 |
| 125.0 | -15.274 | -11.970 | 0.000 | 0.000 | 0.000 | -499.593 | -53.453 | 0.000 | 53.453 | -4.511 |
| 129.7 | -15.103 | -11.375 | 0.000 | 0.000 | 0.000 | -427.042 | -58.047 | 0.000 | 58.047 | -4.725 |
| 130.0 | -15.007 | -11.309 | 0.000 | 0.000 | 0.000 | -423.266 | -58.294 | 0.000 | 58.294 | -4.737 |
| 133.5 | -14.825 | -10.568 | 0.000 | 0.000 | 0.000 | -369.492 | -61.909 | 0.000 | 61.909 | -4.901 |
| 135.0 | -14.666 | -10.402 | 0.000 | 0.000 | 0.000 | -348.491 | -63.373 | 0.000 | 63.373 | -4.969 |
| 140.0 | -11.351 | -7.795 | 0.000 | 0.000 | 0.000 | -275.162 | -68.701 | 0.000 | 68.701 | -5.208 |
| 145.0 | -11.089 | -7.327 | 0.000 | 0.000 | 0.000 | -218.408 | -74.273 | 0.000 | 74.273 | -5.437 |
| 150.0 | -10.859 | -6.889 | 0.000 | 0.000 | 0.000 | -162.964 | -80.079 | 0.000 | 80.079 | -5.654 |
| 154.0 | -7.259 | -5.128 | 0.000 | 0.000 | 0.000 | -119.529 | -84.880 | 0.000 | 84.880 | -5.815 |
| 155.0 | -7.135 | -5.059 | 0.000 | 0.000 | 0.000 | -112.269 | -86.100 | 0.000 | 86.100 | -5.854 |
| 160.0 | -5.286 | -4.041 | 0.000 | 0.000 | 0.000 | -76.594 | -92.316 | 0.000 | 92.316 | -6.024 |
| 164.3 | -5.167 | -3.800 | 0.000 | 0.000 | 0.000 | -53.688 | -97.837 | 0.000 | 97.837 | -6.156 |
| 165.0 | -5.108 | -3.737 | 0.000 | 0.000 | 0.000 | -50.244 | -98.697 | 0.000 | 98.697 | -6.176 |
| 167.2 | -4.997 | -3.529 | 0.000 | 0.000 | 0.000 | -38.751 | -101.617 | 0.000 | 101.617 | -6.238 |
| 170.0 | -2.263 | -1.672 | 0.000 | 0.000 | 0.000 | -25.010 | -105.223 | 0.000 | 105.223 | -6.300 |
| 175.0 | -2.100 | -1.499 | 0.000 | 0.000 | 0.000 | -13.693 | -111.859 | 0.000 | 111.859 | -6.390 |
| 179.0 | -1.920 | 0.000 | 0.000 | 0.000 | 0.000 | -5.292 | -117.226 | 0.000 | 117.226 | -6.440 |

**Load Case:** No Ice — 80.00 mph Wind with No Ice — 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Stresses

| Seg Elev (ft) | Applied Stresses | | | | | | | Allowable Stress (Fb) (ksi) | Allowable Stress (Fa) (ksi) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | Axial (Y) (ksi) | Shear (X) (ksi) | Shear (Z) (ksi) | Torsion (ksi) | Bending (X) (ksi) | Bending (Z) (ksi) | Combined (ksi) | | | |
| 0.00 | 0.58 | 0.75 | 0.00 | 0.00 | 0.00 | 35.32 | 35.92 | 49.4 | 0.0 | 0.727 |
| 5.00 | 0.58 | 0.76 | 0.00 | 0.00 | 0.00 | 35.58 | 36.18 | 50.0 | 0.0 | 0.724 |
| 10.00 | 0.57 | 0.77 | 0.00 | 0.00 | 0.00 | 35.84 | 36.44 | 50.6 | 0.0 | 0.720 |
| 15.00 | 0.57 | 0.78 | 0.00 | 0.00 | 0.00 | 36.10 | 36.70 | 51.2 | 0.0 | 0.717 |
| 20.00 | 0.56 | 0.79 | 0.00 | 0.00 | 0.00 | 36.36 | 36.95 | 51.8 | 0.0 | 0.713 |
| 25.00 | 0.56 | 0.80 | 0.00 | 0.00 | 0.00 | 36.62 | 37.21 | 52.0 | 0.0 | 0.716 |
| 30.00 | 0.56 | 0.82 | 0.00 | 0.00 | 0.00 | 36.88 | 37.46 | 52.0 | 0.0 | 0.721 |
| 31.25 | 0.55 | 0.82 | 0.00 | 0.00 | 0.00 | 36.94 | 37.52 | 52.0 | 0.0 | 0.722 |
| 35.00 | 0.54 | 0.83 | 0.00 | 0.00 | 0.00 | 37.13 | 37.69 | 52.0 | 0.0 | 0.725 |
| 37.50 | 0.52 | 0.83 | 0.00 | 0.00 | 0.00 | 36.17 | 36.72 | 52.0 | 0.0 | 0.706 |
| 40.00 | 0.52 | 0.83 | 0.00 | 0.00 | 0.00 | 36.27 | 36.82 | 52.0 | 0.0 | 0.708 |
| 45.00 | 0.51 | 0.84 | 0.00 | 0.00 | 0.00 | 36.46 | 37.00 | 52.0 | 0.0 | 0.712 |
| 50.00 | 0.51 | 0.86 | 0.00 | 0.00 | 0.00 | 36.62 | 37.16 | 52.0 | 0.0 | 0.715 |
| 55.00 | 0.51 | 0.87 | 0.00 | 0.00 | 0.00 | 36.77 | 37.30 | 52.0 | 0.0 | 0.718 |
| 60.00 | 0.50 | 0.89 | 0.00 | 0.00 | 0.00 | 36.88 | 37.42 | 52.0 | 0.0 | 0.720 |
| 63.25 | 0.50 | 0.90 | 0.00 | 0.00 | 0.00 | 36.94 | 37.47 | 52.0 | 0.0 | 0.721 |
| 65.00 | 0.49 | 0.91 | 0.00 | 0.00 | 0.00 | 36.96 | 37.49 | 52.0 | 0.0 | 0.721 |
| 68.75 | 0.47 | 0.91 | 0.00 | 0.00 | 0.00 | 35.71 | 36.22 | 52.0 | 0.0 | 0.697 |
| 70.00 | 0.47 | 0.91 | 0.00 | 0.00 | 0.00 | 35.71 | 36.21 | 52.0 | 0.0 | 0.697 |
| 75.00 | 0.47 | 0.93 | 0.00 | 0.00 | 0.00 | 35.65 | 36.15 | 52.0 | 0.0 | 0.695 |
| 80.00 | 0.46 | 0.95 | 0.00 | 0.00 | 0.00 | 35.51 | 36.02 | 52.0 | 0.0 | 0.693 |
| 85.00 | 0.46 | 0.97 | 0.00 | 0.00 | 0.00 | 35.30 | 35.80 | 52.0 | 0.0 | 0.689 |
| 90.00 | 0.46 | 0.99 | 0.00 | 0.00 | 0.00 | 34.97 | 35.48 | 52.0 | 0.0 | 0.682 |
| 95.00 | 0.46 | 1.02 | 0.00 | 0.00 | 0.00 | 34.52 | 35.02 | 52.0 | 0.0 | 0.674 |
| 96.08 | 0.46 | 1.03 | 0.00 | 0.00 | 0.00 | 34.40 | 34.90 | 52.0 | 0.0 | 0.671 |
| 100.00 | 0.44 | 1.05 | 0.00 | 0.00 | 0.00 | 33.90 | 34.39 | 52.0 | 0.0 | 0.662 |
| 100.75 | 0.43 | 1.03 | 0.00 | 0.00 | 0.00 | 32.32 | 32.80 | 52.0 | 0.0 | 0.631 |
| 105.00 | 0.43 | 1.06 | 0.00 | 0.00 | 0.00 | 31.58 | 32.06 | 52.0 | 0.0 | 0.617 |
| 107.00 | 0.43 | 1.00 | 0.00 | 0.00 | 0.00 | 31.01 | 31.48 | 52.0 | 0.0 | 0.606 |
| 108.00 | 0.39 | 0.89 | 0.00 | 0.00 | 0.00 | 30.75 | 31.18 | 52.0 | 0.0 | 0.600 |
| 109.00 | 0.38 | 0.87 | 0.00 | 0.00 | 0.00 | 30.64 | 31.06 | 52.0 | 0.0 | 0.598 |
| 110.00 | 0.38 | 0.87 | 0.00 | 0.00 | 0.00 | 30.56 | 30.98 | 52.0 | 0.0 | 0.596 |
| 115.00 | 0.37 | 0.90 | 0.00 | 0.00 | 0.00 | 30.06 | 30.47 | 52.0 | 0.0 | 0.586 |
| 120.00 | 0.37 | 0.93 | 0.00 | 0.00 | 0.00 | 29.34 | 29.76 | 52.0 | 0.0 | 0.573 |
| 125.00 | 0.37 | 0.96 | 0.00 | 0.00 | 0.00 | 28.36 | 28.78 | 52.0 | 0.0 | 0.554 |
| 129.75 | 0.38 | 1.00 | 0.00 | 0.00 | 0.00 | 27.08 | 27.51 | 52.0 | 0.0 | 0.529 |
| 130.00 | 0.37 | 1.00 | 0.00 | 0.00 | 0.00 | 27.01 | 27.44 | 52.0 | 0.0 | 0.528 |
| 133.58 | 0.43 | 1.21 | 0.00 | 0.00 | 0.00 | 29.14 | 29.64 | 52.0 | 0.0 | 0.570 |
| 135.00 | 0.43 | 1.21 | 0.00 | 0.00 | 0.00 | 28.46 | 28.97 | 52.0 | 0.0 | 0.557 |
| 140.00 | 0.34 | 1.00 | 0.00 | 0.00 | 0.00 | 25.56 | 25.95 | 52.0 | 0.0 | 0.499 |
| 145.00 | 0.34 | 1.05 | 0.00 | 0.00 | 0.00 | 23.27 | 23.68 | 52.0 | 0.0 | 0.456 |
| 150.00 | 0.35 | 1.10 | 0.00 | 0.00 | 0.00 | 20.12 | 20.56 | 52.0 | 0.0 | 0.396 |
| 154.00 | 0.28 | 0.79 | 0.00 | 0.00 | 0.00 | 16.75 | 17.08 | 52.0 | 0.0 | 0.329 |
| 155.00 | 0.28 | 0.78 | 0.00 | 0.00 | 0.00 | 16.26 | 16.59 | 52.0 | 0.0 | 0.319 |
| 160.00 | 0.24 | 0.63 | 0.00 | 0.00 | 0.00 | 13.19 | 13.47 | 52.0 | 0.0 | 0.259 |
| 164.33 | 0.24 | 0.67 | 0.00 | 0.00 | 0.00 | 10.88 | 11.19 | 52.0 | 0.0 | 0.215 |
| 165.00 | 0.24 | 0.67 | 0.00 | 0.00 | 0.00 | 10.45 | 10.76 | 52.0 | 0.0 | 0.207 |
| 167.25 | 0.29 | 0.83 | 0.00 | 0.00 | 0.00 | 10.20 | 10.59 | 52.0 | 0.0 | 0.204 |
| 170.00 | 0.15 | 0.40 | 0.00 | 0.00 | 0.00 | 7.37 | 7.55 | 52.0 | 0.0 | 0.145 |
| 175.00 | 0.15 | 0.41 | 0.00 | 0.00 | 0.00 | 5.05 | 5.24 | 52.0 | 0.0 | 0.101 |
| 179.00 | 0.00 | 0.41 | 0.00 | 0.00 | 0.00 | 2.38 | 2.49 | 52.0 | 0.0 | 0.048 |

Site Number: 370627 Code: TIA/EIA-222-F 

Site Name: Newington CT, CT Engineering Number: 62041821 5/1/2015 11:45:35 AM

Customer: Verizon Wireless

**Load Case:** Ice 69.28 mph Wind with Ice 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 177.8 | 0.0 | | | | | 0.0 | 0.0 | 177.8 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 351.4 | 1,444.0 | | | | | 0.0 | 98.2 | 351.4 | 1,542.2 | 0.0 | 0.0 |
| 10.00 | | 342.9 | 1,408.6 | | | | | 0.0 | 98.2 | 342.9 | 1,506.7 | 0.0 | 0.0 |
| 15.00 | | 334.3 | 1,373.2 | | | | | 0.0 | 98.2 | 334.3 | 1,471.3 | 0.0 | 0.0 |
| 20.00 | | 325.8 | 1,337.7 | | | | | 0.0 | 98.2 | 325.8 | 1,435.9 | 0.0 | 0.0 |
| 25.00 | | 317.2 | 1,302.3 | | | | | 0.0 | 98.2 | 317.2 | 1,400.4 | 0.0 | 0.0 |
| 30.00 | | 194.9 | 1,266.8 | | | | | 0.0 | 98.2 | 194.9 | 1,365.0 | 0.0 | 0.0 |
| 31.25 | Bot - Section 2 | 153.9 | 311.6 | | | | | 0.0 | 24.5 | 153.9 | 336.1 | 0.0 | 0.0 |
| 35.00 | | 193.1 | 1,732.1 | | | | | 0.0 | 73.6 | 193.1 | 1,805.7 | 0.0 | 0.0 |
| 37.50 | Top - Section 1 | 155.6 | 1,134.3 | | | | | 0.0 | 49.1 | 155.6 | 1,183.4 | 0.0 | 0.0 |
| 40.00 | | 234.7 | 602.9 | | | | | 0.0 | 49.1 | 234.7 | 651.9 | 0.0 | 0.0 |
| 45.00 | | 313.7 | 1,178.0 | | | | | 0.0 | 98.2 | 313.7 | 1,276.1 | 0.0 | 0.0 |
| 50.00 | | 313.7 | 1,142.5 | | | | | 0.0 | 98.2 | 313.7 | 1,240.7 | 0.0 | 0.0 |
| 55.00 | | 312.5 | 1,107.1 | | | | | 0.0 | 98.2 | 312.5 | 1,205.3 | 0.0 | 0.0 |
| 60.00 | | 256.4 | 1,071.7 | | | | | 0.0 | 98.2 | 256.4 | 1,169.8 | 0.0 | 0.0 |
| 63.25 | Bot - Section 3 | 155.3 | 678.1 | | | | | 0.0 | 63.8 | 155.3 | 741.9 | 0.0 | 0.0 |
| 65.00 | | 171.4 | 676.4 | | | | | 0.0 | 34.4 | 171.4 | 710.8 | 0.0 | 0.0 |
| 68.75 | Top - Section 2 | 155.2 | 1,421.4 | | | | | 0.0 | 73.6 | 155.2 | 1,495.1 | 0.0 | 0.0 |
| 70.00 | | 191.7 | 251.7 | | | | | 0.0 | 24.5 | 191.7 | 276.2 | 0.0 | 0.0 |
| 75.00 | | 303.7 | 982.8 | | | | | 0.0 | 98.2 | 303.7 | 1,081.0 | 0.0 | 0.0 |
| 80.00 | | 298.3 | 947.4 | | | | | 0.0 | 98.2 | 298.3 | 1,045.5 | 0.0 | 0.0 |
| 85.00 | | 292.4 | 911.9 | | | | | 0.0 | 98.2 | 292.4 | 1,010.1 | 0.0 | 0.0 |
| 90.00 | | 285.8 | 876.5 | | | | | 0.0 | 98.2 | 285.8 | 974.6 | 0.0 | 0.0 |
| 95.00 | | 171.3 | 841.1 | | | | | 0.0 | 98.2 | 171.3 | 939.2 | 0.0 | 0.0 |
| 96.08 | Bot - Section 4 | 139.8 | 178.0 | | | | | 0.0 | 21.3 | 139.8 | 199.2 | 0.0 | 0.0 |
| 100.00 | | 130.4 | 1,186.9 | | | | | 0.0 | 76.9 | 130.4 | 1,263.8 | 0.0 | 0.0 |
| 100.75 | Top - Section 3 | 136.5 | 222.9 | | | | | 0.0 | 14.7 | 136.5 | 237.6 | 0.0 | 0.0 |
| 105.00 | | 169.2 | 667.6 | | | | | 0.0 | 83.4 | 169.2 | 751.0 | 0.0 | 0.0 |
| 107.00 | Appertunance(s) | 79.9 | 305.7 | 1,120.5 | 0.0 | 3,361.5 | 585.7 | 0.0 | 39.3 | 1,200.4 | 930.6 | 0.0 | 0.0 |
| 108.00 | Appertunance(s) | 52.8 | 150.8 | 1,822.9 | 0.0 | 1,804.3 | 2,131.7 | 0.0 | 19.6 | 1,875.7 | 2,302.1 | 0.0 | 0.0 |
| 109.00 | Appertunance(s) | 52.4 | 149.4 | 378.3 | 0.0 | 378.3 | 552.6 | 0.0 | 15.9 | 430.7 | 717.9 | 0.0 | 0.0 |
| 110.00 | | 154.2 | 148.0 | | | | | 0.0 | 15.9 | 154.2 | 163.9 | 0.0 | 0.0 |
| 115.00 | | 251.6 | 716.8 | | | | | 0.0 | 79.5 | 251.6 | 796.3 | 0.0 | 0.0 |
| 120.00 | | 242.3 | 681.3 | | | | | 0.0 | 79.5 | 242.3 | 760.8 | 0.0 | 0.0 |
| 125.00 | | 227.1 | 645.9 | | | | | 0.0 | 79.5 | 227.1 | 725.4 | 0.0 | 0.0 |
| 129.75 | Bot - Section 5 | 114.0 | 580.9 | | | | | 0.0 | 75.5 | 114.0 | 656.4 | 0.0 | 0.0 |
| 130.00 | | 86.0 | 51.9 | | | | | 0.0 | 4.0 | 86.0 | 55.9 | 0.0 | 0.0 |
| 133.58 | Top - Section 4 | 111.4 | 726.3 | | | | | 0.0 | 57.0 | 111.4 | 783.2 | 0.0 | 0.0 |
| 135.00 | | 137.2 | 140.6 | | | | | 0.0 | 22.5 | 137.2 | 163.1 | 0.0 | 0.0 |
| 140.00 | Appertunance(s) | 206.9 | 475.1 | 2,438.6 | 0.0 | 0.0 | 2,991.7 | 0.0 | 79.5 | 2,645.5 | 3,546.3 | 0.0 | 0.0 |
| 145.00 | | 195.9 | 444.8 | | | | | 0.0 | 74.5 | 195.9 | 519.3 | 0.0 | 0.0 |
| 150.00 | | 167.2 | 414.5 | | | | | 0.0 | 74.5 | 167.2 | 489.0 | 0.0 | 0.0 |
| 154.00 | Appertunance(s) | 89.5 | 310.1 | 2,706.2 | 0.0 | 0.0 | 2,354.7 | 0.0 | 59.6 | 2,795.7 | 2,724.4 | 0.0 | 0.0 |
| 155.00 | | 101.1 | 74.8 | | | | | 0.0 | 5.8 | 101.1 | 80.6 | 0.0 | 0.0 |
| 160.00 | Appertunance(s) | 151.3 | 353.8 | 1,327.0 | 0.0 | 0.0 | 1,205.3 | 0.0 | 29.2 | 1,478.3 | 1,588.3 | 0.0 | 0.0 |
| 164.33 | Bot - Section 6 | 77.9 | 282.4 | | | | | 0.0 | 7.8 | 77.9 | 290.2 | 0.0 | 0.0 |
| 165.00 | | 44.3 | 70.8 | | | | | 0.0 | 1.2 | 44.3 | 72.0 | 0.0 | 0.0 |
| 167.25 | Top - Section 5 | 73.8 | 232.1 | | | | | 0.0 | 4.1 | 73.8 | 236.2 | 0.0 | 0.0 |

**Load Case:** Ice — 69.28 mph Wind with Ice — 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 170.00 | Appertunance(s) | 107.4 | 136.5 | 2,064.3 | 0.0 | 0.0 | 2,537.9 | 0.0 | 4.9 | 2,171.7 | 2,679.3 | 0.0 | 0.0 |
| 175.00 | | 117.0 | 227.6 | | | | | 0.0 | 1.7 | 117.0 | 229.3 | 0.0 | 0.0 |
| 179.00 | | 49.5 | 164.3 | | | | | 0.0 | 1.3 | 49.5 | 165.6 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 21,327.1 | 48,992.9 | 0.00 | 0.00 |

Site Number: 370627 Code: TIA/EIA-222-F 

Site Name: Newington CT, CT Engineering Number: 62041821 5/1/2015 11:45:38 AM

Customer: Verizon Wireless

**Load Case:** Ice 69.28 mph Wind with Ice 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Shaft Forces and Deflections

| Seg Elev (ft) | Lateral FX (-) (kips) | Axial FY (-) (kips) | Lateral FZ (kips) | Moment MX (ft-kips) | Torsion MY (ft-kips) | Moment MZ (ft-kips) | X Deflect (in) | Z Deflect (in) | Total Deflect (in) | Rotation (deg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -23.243 | -50.944 | 0.000 | 0.000 | 0.000 | -2,935.828 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.00 | -22.987 | -49.357 | 0.000 | 0.000 | 0.000 | -2,819.617 | -0.060 | 0.000 | 0.060 | -0.111 |
| 10.00 | -22.737 | -47.806 | 0.000 | 0.000 | 0.000 | -2,704.685 | -0.237 | 0.000 | 0.237 | -0.225 |
| 15.00 | -22.493 | -46.289 | 0.000 | 0.000 | 0.000 | -2,591.004 | -0.537 | 0.000 | 0.537 | -0.344 |
| 20.00 | -22.254 | -44.807 | 0.000 | 0.000 | 0.000 | -2,478.543 | -0.963 | 0.000 | 0.963 | -0.466 |
| 25.00 | -22.022 | -43.360 | 0.000 | 0.000 | 0.000 | -2,367.275 | -1.520 | 0.000 | 1.520 | -0.593 |
| 30.00 | -21.871 | -41.966 | 0.000 | 0.000 | 0.000 | -2,257.169 | -2.211 | 0.000 | 2.211 | -0.724 |
| 31.25 | -21.764 | -41.606 | 0.000 | 0.000 | 0.000 | -2,229.830 | -2.406 | 0.000 | 2.406 | -0.759 |
| 35.00 | -21.606 | -39.770 | 0.000 | 0.000 | 0.000 | -2,148.218 | -3.044 | 0.000 | 3.044 | -0.862 |
| 37.50 | -21.480 | -38.562 | 0.000 | 0.000 | 0.000 | -2,094.206 | -3.515 | 0.000 | 3.515 | -0.934 |
| 40.00 | -21.305 | -37.875 | 0.000 | 0.000 | 0.000 | -2,040.507 | -4.023 | 0.000 | 4.023 | -1.006 |
| 45.00 | -21.058 | -36.552 | 0.000 | 0.000 | 0.000 | -1,933.985 | -5.152 | 0.000 | 5.152 | -1.146 |
| 50.00 | -20.809 | -35.265 | 0.000 | 0.000 | 0.000 | -1,828.697 | -6.431 | 0.000 | 6.431 | -1.291 |
| 55.00 | -20.559 | -34.013 | 0.000 | 0.000 | 0.000 | -1,724.654 | -7.864 | 0.000 | 7.864 | -1.441 |
| 60.00 | -20.346 | -32.804 | 0.000 | 0.000 | 0.000 | -1,621.862 | -9.457 | 0.000 | 9.457 | -1.597 |
| 63.25 | -20.216 | -32.038 | 0.000 | 0.000 | 0.000 | -1,555.739 | -10.581 | 0.000 | 10.581 | -1.703 |
| 65.00 | -20.074 | -31.300 | 0.000 | 0.000 | 0.000 | -1,520.362 | -11.217 | 0.000 | 11.217 | -1.762 |
| 68.75 | -19.915 | -29.781 | 0.000 | 0.000 | 0.000 | -1,445.087 | -12.652 | 0.000 | 12.652 | -1.889 |
| 70.00 | -19.769 | -29.475 | 0.000 | 0.000 | 0.000 | -1,420.194 | -13.153 | 0.000 | 13.153 | -1.933 |
| 75.00 | -19.510 | -28.349 | 0.000 | 0.000 | 0.000 | -1,321.353 | -15.266 | 0.000 | 15.266 | -2.098 |
| 80.00 | -19.255 | -27.257 | 0.000 | 0.000 | 0.000 | -1,223.804 | -17.554 | 0.000 | 17.554 | -2.268 |
| 85.00 | -19.003 | -26.201 | 0.000 | 0.000 | 0.000 | -1,127.533 | -20.024 | 0.000 | 20.024 | -2.444 |
| 90.00 | -18.756 | -25.179 | 0.000 | 0.000 | 0.000 | -1,032.520 | -22.681 | 0.000 | 22.681 | -2.626 |
| 95.00 | -18.588 | -24.212 | 0.000 | 0.000 | 0.000 | -938.743 | -25.532 | 0.000 | 25.532 | -2.814 |
| 96.08 | -18.480 | -23.988 | 0.000 | 0.000 | 0.000 | -918.607 | -26.175 | 0.000 | 26.175 | -2.857 |
| 100.0 | -18.322 | -22.704 | 0.000 | 0.000 | 0.000 | -846.227 | -28.583 | 0.000 | 28.583 | -3.010 |
| 100.7 | -18.213 | -22.441 | 0.000 | 0.000 | 0.000 | -832.486 | -29.058 | 0.000 | 29.058 | -3.041 |
| 105.0 | -18.049 | -21.662 | 0.000 | 0.000 | 0.000 | -755.084 | -31.842 | 0.000 | 31.842 | -3.211 |
| 107.0 | -16.819 | -20.784 | 0.000 | 0.000 | 0.000 | -715.626 | -33.204 | 0.000 | 33.204 | -3.288 |
| 108.0 | -14.826 | -18.584 | 0.000 | 0.000 | 0.000 | -697.003 | -33.896 | 0.000 | 33.896 | -3.328 |
| 109.0 | -14.367 | -17.882 | 0.000 | 0.000 | 0.000 | -681.799 | -34.598 | 0.000 | 34.598 | -3.368 |
| 110.0 | -14.239 | -17.699 | 0.000 | 0.000 | 0.000 | -667.433 | -35.307 | 0.000 | 35.307 | -3.407 |
| 115.0 | -13.997 | -16.872 | 0.000 | 0.000 | 0.000 | -596.237 | -38.977 | 0.000 | 38.977 | -3.599 |
| 120.0 | -13.763 | -16.080 | 0.000 | 0.000 | 0.000 | -526.253 | -42.850 | 0.000 | 42.850 | -3.797 |
| 125.0 | -13.540 | -15.325 | 0.000 | 0.000 | 0.000 | -457.441 | -46.934 | 0.000 | 46.934 | -4.000 |
| 129.7 | -13.405 | -14.654 | 0.000 | 0.000 | 0.000 | -393.127 | -51.011 | 0.000 | 51.011 | -4.196 |
| 130.0 | -13.337 | -14.586 | 0.000 | 0.000 | 0.000 | -389.776 | -51.231 | 0.000 | 51.231 | -4.207 |
| 133.5 | -13.193 | -13.789 | 0.000 | 0.000 | 0.000 | -341.986 | -54.445 | 0.000 | 54.445 | -4.359 |
| 135.0 | -13.078 | -13.603 | 0.000 | 0.000 | 0.000 | -323.297 | -55.747 | 0.000 | 55.747 | -4.421 |
| 140.0 | -10.200 | -10.238 | 0.000 | 0.000 | 0.000 | -257.907 | -60.495 | 0.000 | 60.495 | -4.644 |
| 145.0 | -9.997 | -9.700 | 0.000 | 0.000 | 0.000 | -206.910 | -65.471 | 0.000 | 65.471 | -4.860 |
| 150.0 | -9.817 | -9.196 | 0.000 | 0.000 | 0.000 | -156.925 | -70.669 | 0.000 | 70.669 | -5.067 |
| 154.0 | -6.799 | -6.723 | 0.000 | 0.000 | 0.000 | -117.656 | -74.978 | 0.000 | 74.978 | -5.223 |
| 155.0 | -6.704 | -6.639 | 0.000 | 0.000 | 0.000 | -110.856 | -76.075 | 0.000 | 76.075 | -5.262 |
| 160.0 | -5.098 | -5.182 | 0.000 | 0.000 | 0.000 | -77.336 | -81.672 | 0.000 | 81.672 | -5.431 |
| 164.3 | -4.999 | -4.894 | 0.000 | 0.000 | 0.000 | -55.247 | -86.659 | 0.000 | 86.659 | -5.565 |
| 165.0 | -4.951 | -4.823 | 0.000 | 0.000 | 0.000 | -51.914 | -87.437 | 0.000 | 87.437 | -5.586 |
| 167.2 | -4.860 | -4.590 | 0.000 | 0.000 | 0.000 | -40.774 | -90.081 | 0.000 | 90.081 | -5.651 |
| 170.0 | -2.437 | -2.135 | 0.000 | 0.000 | 0.000 | -27.409 | -93.352 | 0.000 | 93.352 | -5.717 |
| 175.0 | -2.300 | -1.916 | 0.000 | 0.000 | 0.000 | -15.225 | -99.386 | 0.000 | 99.386 | -5.816 |
| 179.0 | -2.093 | 0.000 | 0.000 | 0.000 | 0.000 | -6.026 | -104.277 | 0.000 | 104.277 | -5.872 |

Site Number: 370627 | Code: TIA/EIA-222-F | 

Site Name: Newington CT, CT | Engineering Number: 62041821 | 5/1/2015 11:45:38 AM

Customer: Verizon Wireless

**Load Case:** Ice | 69.28 mph Wind with Ice | 27 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Stresses

| Seg Elev (ft) | Applied Stresses | | | | | | | Allowable Stress (Fb) (ksi) | Allowable Stress (Fa) (ksi) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | Axial (Y) (ksi) | Shear (X) (ksi) | Shear (Z) (ksi) | Torsion (ksi) | Bending (X) (ksi) | Bending (Z) (ksi) | Combined (ksi) | | | |
| 0.00 | 0.68 | 0.63 | 0.00 | 0.00 | 0.00 | 30.51 | 31.21 | 49.4 | 0.0 | 0.632 |
| 5.00 | 0.68 | 0.64 | 0.00 | 0.00 | 0.00 | 30.78 | 31.48 | 50.0 | 0.0 | 0.630 |
| 10.00 | 0.67 | 0.65 | 0.00 | 0.00 | 0.00 | 31.06 | 31.75 | 50.6 | 0.0 | 0.627 |
| 15.00 | 0.67 | 0.66 | 0.00 | 0.00 | 0.00 | 31.33 | 32.02 | 51.2 | 0.0 | 0.625 |
| 20.00 | 0.67 | 0.67 | 0.00 | 0.00 | 0.00 | 31.61 | 32.30 | 51.8 | 0.0 | 0.623 |
| 25.00 | 0.66 | 0.68 | 0.00 | 0.00 | 0.00 | 31.89 | 32.57 | 52.0 | 0.0 | 0.627 |
| 30.00 | 0.66 | 0.69 | 0.00 | 0.00 | 0.00 | 32.16 | 32.84 | 52.0 | 0.0 | 0.632 |
| 31.25 | 0.66 | 0.69 | 0.00 | 0.00 | 0.00 | 32.23 | 32.91 | 52.0 | 0.0 | 0.633 |
| 35.00 | 0.64 | 0.70 | 0.00 | 0.00 | 0.00 | 32.43 | 33.09 | 52.0 | 0.0 | 0.637 |
| 37.50 | 0.62 | 0.70 | 0.00 | 0.00 | 0.00 | 31.63 | 32.27 | 52.0 | 0.0 | 0.621 |
| 40.00 | 0.62 | 0.70 | 0.00 | 0.00 | 0.00 | 31.74 | 32.38 | 52.0 | 0.0 | 0.623 |
| 45.00 | 0.62 | 0.72 | 0.00 | 0.00 | 0.00 | 31.95 | 32.60 | 52.0 | 0.0 | 0.627 |
| 50.00 | 0.61 | 0.73 | 0.00 | 0.00 | 0.00 | 32.16 | 32.80 | 52.0 | 0.0 | 0.631 |
| 55.00 | 0.61 | 0.75 | 0.00 | 0.00 | 0.00 | 32.34 | 32.98 | 52.0 | 0.0 | 0.634 |
| 60.00 | 0.61 | 0.76 | 0.00 | 0.00 | 0.00 | 32.50 | 33.14 | 52.0 | 0.0 | 0.638 |
| 63.25 | 0.61 | 0.78 | 0.00 | 0.00 | 0.00 | 32.59 | 33.23 | 52.0 | 0.0 | 0.639 |
| 65.00 | 0.60 | 0.78 | 0.00 | 0.00 | 0.00 | 32.64 | 33.27 | 52.0 | 0.0 | 0.640 |
| 68.75 | 0.58 | 0.78 | 0.00 | 0.00 | 0.00 | 31.59 | 32.19 | 52.0 | 0.0 | 0.619 |
| 70.00 | 0.58 | 0.78 | 0.00 | 0.00 | 0.00 | 31.60 | 32.20 | 52.0 | 0.0 | 0.620 |
| 75.00 | 0.58 | 0.80 | 0.00 | 0.00 | 0.00 | 31.61 | 32.21 | 52.0 | 0.0 | 0.620 |
| 80.00 | 0.58 | 0.82 | 0.00 | 0.00 | 0.00 | 31.56 | 32.17 | 52.0 | 0.0 | 0.619 |
| 85.00 | 0.57 | 0.84 | 0.00 | 0.00 | 0.00 | 31.44 | 32.05 | 52.0 | 0.0 | 0.617 |
| 90.00 | 0.58 | 0.86 | 0.00 | 0.00 | 0.00 | 31.23 | 31.84 | 52.0 | 0.0 | 0.613 |
| 95.00 | 0.58 | 0.89 | 0.00 | 0.00 | 0.00 | 30.91 | 31.52 | 52.0 | 0.0 | 0.606 |
| 96.08 | 0.58 | 0.90 | 0.00 | 0.00 | 0.00 | 30.82 | 31.43 | 52.0 | 0.0 | 0.605 |
| 100.00 | 0.57 | 0.92 | 0.00 | 0.00 | 0.00 | 30.44 | 31.04 | 52.0 | 0.0 | 0.597 |
| 100.75 | 0.55 | 0.90 | 0.00 | 0.00 | 0.00 | 29.03 | 29.62 | 52.0 | 0.0 | 0.570 |
| 105.00 | 0.55 | 0.93 | 0.00 | 0.00 | 0.00 | 28.45 | 29.04 | 52.0 | 0.0 | 0.559 |
| 107.00 | 0.54 | 0.88 | 0.00 | 0.00 | 0.00 | 27.99 | 28.57 | 52.0 | 0.0 | 0.550 |
| 108.00 | 0.49 | 0.78 | 0.00 | 0.00 | 0.00 | 27.78 | 28.30 | 52.0 | 0.0 | 0.544 |
| 109.00 | 0.47 | 0.77 | 0.00 | 0.00 | 0.00 | 27.70 | 28.21 | 52.0 | 0.0 | 0.543 |
| 110.00 | 0.47 | 0.77 | 0.00 | 0.00 | 0.00 | 27.65 | 28.15 | 52.0 | 0.0 | 0.542 |
| 115.00 | 0.47 | 0.79 | 0.00 | 0.00 | 0.00 | 27.28 | 27.79 | 52.0 | 0.0 | 0.535 |
| 120.00 | 0.48 | 0.82 | 0.00 | 0.00 | 0.00 | 26.74 | 27.25 | 52.0 | 0.0 | 0.524 |
| 125.00 | 0.48 | 0.85 | 0.00 | 0.00 | 0.00 | 25.96 | 26.48 | 52.0 | 0.0 | 0.509 |
| 129.75 | 0.48 | 0.89 | 0.00 | 0.00 | 0.00 | 24.93 | 25.46 | 52.0 | 0.0 | 0.490 |
| 130.00 | 0.48 | 0.89 | 0.00 | 0.00 | 0.00 | 24.87 | 25.40 | 52.0 | 0.0 | 0.489 |
| 133.58 | 0.56 | 1.07 | 0.00 | 0.00 | 0.00 | 26.97 | 27.59 | 52.0 | 0.0 | 0.531 |
| 135.00 | 0.56 | 1.08 | 0.00 | 0.00 | 0.00 | 26.40 | 27.03 | 52.0 | 0.0 | 0.520 |
| 140.00 | 0.45 | 0.90 | 0.00 | 0.00 | 0.00 | 23.95 | 24.45 | 52.0 | 0.0 | 0.470 |
| 145.00 | 0.45 | 0.94 | 0.00 | 0.00 | 0.00 | 22.05 | 22.56 | 52.0 | 0.0 | 0.434 |
| 150.00 | 0.46 | 1.00 | 0.00 | 0.00 | 0.00 | 19.38 | 19.92 | 52.0 | 0.0 | 0.383 |
| 154.00 | 0.36 | 0.74 | 0.00 | 0.00 | 0.00 | 16.49 | 16.89 | 52.0 | 0.0 | 0.325 |
| 155.00 | 0.36 | 0.74 | 0.00 | 0.00 | 0.00 | 16.05 | 16.46 | 52.0 | 0.0 | 0.317 |
| 160.00 | 0.31 | 0.61 | 0.00 | 0.00 | 0.00 | 13.31 | 13.66 | 52.0 | 0.0 | 0.263 |
| 164.33 | 0.32 | 0.65 | 0.00 | 0.00 | 0.00 | 11.20 | 11.57 | 52.0 | 0.0 | 0.223 |
| 165.00 | 0.31 | 0.65 | 0.00 | 0.00 | 0.00 | 10.80 | 11.17 | 52.0 | 0.0 | 0.215 |
| 167.25 | 0.38 | 0.81 | 0.00 | 0.00 | 0.00 | 10.73 | 11.20 | 52.0 | 0.0 | 0.215 |
| 170.00 | 0.19 | 0.43 | 0.00 | 0.00 | 0.00 | 8.08 | 8.30 | 52.0 | 0.0 | 0.160 |
| 175.00 | 0.19 | 0.45 | 0.00 | 0.00 | 0.00 | 5.61 | 5.85 | 52.0 | 0.0 | 0.113 |
| 179.00 | 0.00 | 0.45 | 0.00 | 0.00 | 0.00 | 2.71 | 2.82 | 52.0 | 0.0 | 0.054 |

**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 26 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Applied Segment Forces Summary

| Seg Elev (ft) | Description | Shaft Forces Wind FX (lb) | Shaft Forces Dead Load (lb) | Discrete Forces Wind FX (lb) | Discrete Forces Torsion MY (lb-ft) | Discrete Forces Moment MZ (lb-ft) | Discrete Forces Dead Load (lb) | Linear Forces Wind FX (lb) | Linear Forces Dead Load (lb) | Sum of Forces Wind FX (lb) | Sum of Forces Dead Load (lb) | Sum of Forces Torsion MY (lb-ft) | Sum of Forces Moment MZ (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 91.2 | 0.0 | | | | | 0.0 | 0.0 | 91.2 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 180.1 | 1,252.8 | | | | | 0.0 | 98.2 | 180.1 | 1,350.9 | 0.0 | 0.0 |
| 10.00 | | 175.6 | 1,222.0 | | | | | 0.0 | 98.2 | 175.6 | 1,320.2 | 0.0 | 0.0 |
| 15.00 | | 171.2 | 1,191.3 | | | | | 0.0 | 98.2 | 171.2 | 1,289.4 | 0.0 | 0.0 |
| 20.00 | | 166.8 | 1,160.5 | | | | | 0.0 | 98.2 | 166.8 | 1,258.7 | 0.0 | 0.0 |
| 25.00 | | 162.3 | 1,129.8 | | | | | 0.0 | 98.2 | 162.3 | 1,227.9 | 0.0 | 0.0 |
| 30.00 | | 99.7 | 1,099.0 | | | | | 0.0 | 98.2 | 99.7 | 1,197.1 | 0.0 | 0.0 |
| 31.25 | Bot - Section 2 | 78.7 | 269.9 | | | | | 0.0 | 24.5 | 78.7 | 294.5 | 0.0 | 0.0 |
| 35.00 | | 98.7 | 1,608.0 | | | | | 0.0 | 73.6 | 98.7 | 1,681.6 | 0.0 | 0.0 |
| 37.50 | Top - Section 1 | 79.5 | 1,052.8 | | | | | 0.0 | 49.1 | 79.5 | 1,101.8 | 0.0 | 0.0 |
| 40.00 | | 119.9 | 522.5 | | | | | 0.0 | 49.1 | 119.9 | 571.6 | 0.0 | 0.0 |
| 45.00 | | 160.2 | 1,021.9 | | | | | 0.0 | 98.2 | 160.2 | 1,120.1 | 0.0 | 0.0 |
| 50.00 | | 160.1 | 991.2 | | | | | 0.0 | 98.2 | 160.1 | 1,089.3 | 0.0 | 0.0 |
| 55.00 | | 159.4 | 960.4 | | | | | 0.0 | 98.2 | 159.4 | 1,058.5 | 0.0 | 0.0 |
| 60.00 | | 130.7 | 929.6 | | | | | 0.0 | 98.2 | 130.7 | 1,027.8 | 0.0 | 0.0 |
| 63.25 | Bot - Section 3 | 79.1 | 587.8 | | | | | 0.0 | 63.8 | 79.1 | 651.6 | 0.0 | 0.0 |
| 65.00 | | 87.3 | 627.5 | | | | | 0.0 | 34.4 | 87.3 | 661.9 | 0.0 | 0.0 |
| 68.75 | Top - Section 2 | 79.1 | 1,319.4 | | | | | 0.0 | 73.6 | 79.1 | 1,393.0 | 0.0 | 0.0 |
| 70.00 | | 97.6 | 217.9 | | | | | 0.0 | 24.5 | 97.6 | 242.5 | 0.0 | 0.0 |
| 75.00 | | 154.5 | 852.6 | | | | | 0.0 | 98.2 | 154.5 | 950.7 | 0.0 | 0.0 |
| 80.00 | | 151.6 | 821.8 | | | | | 0.0 | 98.2 | 151.6 | 920.0 | 0.0 | 0.0 |
| 85.00 | | 148.4 | 791.0 | | | | | 0.0 | 98.2 | 148.4 | 889.2 | 0.0 | 0.0 |
| 90.00 | | 145.0 | 760.3 | | | | | 0.0 | 98.2 | 145.0 | 858.4 | 0.0 | 0.0 |
| 95.00 | | 86.8 | 729.5 | | | | | 0.0 | 98.2 | 86.8 | 827.7 | 0.0 | 0.0 |
| 96.08 | Bot - Section 4 | 70.8 | 154.0 | | | | | 0.0 | 21.3 | 70.8 | 175.3 | 0.0 | 0.0 |
| 100.00 | | 66.0 | 1,101.4 | | | | | 0.0 | 76.9 | 66.0 | 1,178.3 | 0.0 | 0.0 |
| 100.75 | Top - Section 3 | 69.1 | 206.6 | | | | | 0.0 | 14.7 | 69.1 | 221.3 | 0.0 | 0.0 |
| 105.00 | | 85.6 | 578.8 | | | | | 0.0 | 83.4 | 85.6 | 662.2 | 0.0 | 0.0 |
| 107.00 | Appertunance(s) | 40.4 | 264.7 | 526.1 | 0.0 | 1,578.4 | 243.6 | 0.0 | 39.3 | 566.6 | 547.5 | 0.0 | 0.0 |
| 108.00 | Appertunance(s) | 26.7 | 130.5 | 821.1 | 0.0 | 850.0 | 1,624.7 | 0.0 | 19.6 | 847.8 | 1,774.8 | 0.0 | 0.0 |
| 109.00 | Appertunance(s) | 26.5 | 129.3 | 157.7 | 0.0 | 157.7 | 431.1 | 0.0 | 15.9 | 184.2 | 576.3 | 0.0 | 0.0 |
| 110.00 | | 77.8 | 128.0 | | | | | 0.0 | 15.9 | 77.8 | 143.9 | 0.0 | 0.0 |
| 115.00 | | 126.8 | 621.7 | | | | | 0.0 | 79.5 | 126.8 | 701.2 | 0.0 | 0.0 |
| 120.00 | | 122.0 | 590.9 | | | | | 0.0 | 79.5 | 122.0 | 670.4 | 0.0 | 0.0 |
| 125.00 | | 114.1 | 560.2 | | | | | 0.0 | 79.5 | 114.1 | 639.7 | 0.0 | 0.0 |
| 129.75 | Bot - Section 5 | 57.2 | 503.7 | | | | | 0.0 | 75.5 | 57.2 | 579.2 | 0.0 | 0.0 |
| 130.00 | | 43.2 | 47.8 | | | | | 0.0 | 4.0 | 43.2 | 51.7 | 0.0 | 0.0 |
| 133.58 | Top - Section 4 | 55.8 | 669.2 | | | | | 0.0 | 57.0 | 55.8 | 726.2 | 0.0 | 0.0 |
| 135.00 | | 68.6 | 118.4 | | | | | 0.0 | 22.5 | 68.6 | 141.0 | 0.0 | 0.0 |
| 140.00 | Appertunance(s) | 103.3 | 401.5 | 1,110.2 | 0.0 | 0.0 | 2,366.9 | 0.0 | 79.5 | 1,213.5 | 2,847.9 | 0.0 | 0.0 |
| 145.00 | | 97.6 | 375.9 | | | | | 0.0 | 74.5 | 97.6 | 450.4 | 0.0 | 0.0 |
| 150.00 | | 83.0 | 350.3 | | | | | 0.0 | 74.5 | 83.0 | 424.8 | 0.0 | 0.0 |
| 154.00 | Appertunance(s) | 44.3 | 261.8 | 1,289.7 | 0.0 | 0.0 | 1,779.6 | 0.0 | 59.6 | 1,334.0 | 2,101.0 | 0.0 | 0.0 |
| 155.00 | | 49.9 | 62.9 | | | | | 0.0 | 5.8 | 49.9 | 68.7 | 0.0 | 0.0 |
| 160.00 | Appertunance(s) | 74.5 | 299.0 | 607.3 | 0.0 | 0.0 | 863.6 | 0.0 | 29.2 | 681.8 | 1,191.8 | 0.0 | 0.0 |
| 164.33 | Bot - Section 6 | 38.3 | 238.4 | | | | | 0.0 | 7.8 | 38.3 | 246.2 | 0.0 | 0.0 |
| 165.00 | | 21.7 | 64.0 | | | | | 0.0 | 1.2 | 21.7 | 65.2 | 0.0 | 0.0 |
| 167.25 | Top - Section 5 | 36.1 | 209.8 | | | | | 0.0 | 4.1 | 36.1 | 213.8 | 0.0 | 0.0 |

**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 26 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 170.00 | Appertunance(s) | 52.3 | 110.6 | 930.8 | 0.0 | 0.0 | 2,026.5 | 0.0 | 4.9 | 983.1 | 2,142.1 | 0.0 | 0.0 |
| 175.00 | | 56.7 | 185.3 | | | | | 0.0 | 1.7 | 56.7 | 186.9 | 0.0 | 0.0 |
| 179.00 | | 23.9 | 133.5 | | | | | 0.0 | 1.3 | 23.9 | 134.8 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 10,238.6 | 41,846.9 | 0.00 | 0.00 |

Site Number: 370627 | Code: TIA/EIA-222-F | 

Site Name: Newington CT, CT | Engineering Number: 62041821 | 5/1/2015 11:45:41 AM

Customer: Verizon Wireless

**Load Case:** Twist/Sway | 50.00 mph Wind with No Ice | 26 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Shaft Forces and Deflections

| Seg Elev (ft) | Lateral FX (-) (kips) | Axial FY (-) (kips) | Lateral FZ (kips) | Moment MX (ft-kips) | Torsion MY (ft-kips) | Moment MZ (ft-kips) | X Deflect (in) | Z Deflect (in) | Total Deflect (in) | Rotation (deg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -10.892 | -43.432 | 0.000 | 0.000 | 0.000 | -1,328.824 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.00 | -10.749 | -42.072 | 0.000 | 0.000 | 0.000 | -1,274.364 | -0.027 | 0.000 | 0.027 | -0.050 |
| 10.00 | -10.609 | -40.742 | 0.000 | 0.000 | 0.000 | -1,220.621 | -0.107 | 0.000 | 0.107 | -0.102 |
| 15.00 | -10.472 | -39.443 | 0.000 | 0.000 | 0.000 | -1,167.578 | -0.243 | 0.000 | 0.243 | -0.155 |
| 20.00 | -10.339 | -38.175 | 0.000 | 0.000 | 0.000 | -1,115.218 | -0.435 | 0.000 | 0.435 | -0.210 |
| 25.00 | -10.209 | -36.937 | 0.000 | 0.000 | 0.000 | -1,063.525 | -0.686 | 0.000 | 0.686 | -0.267 |
| 30.00 | -10.126 | -35.734 | 0.000 | 0.000 | 0.000 | -1,012.482 | -0.998 | 0.000 | 0.998 | -0.326 |
| 31.25 | -10.065 | -35.435 | 0.000 | 0.000 | 0.000 | -999.825 | -1.086 | 0.000 | 1.086 | -0.342 |
| 35.00 | -9.978 | -33.747 | 0.000 | 0.000 | 0.000 | -962.084 | -1.373 | 0.000 | 1.373 | -0.388 |
| 37.50 | -9.909 | -32.640 | 0.000 | 0.000 | 0.000 | -937.138 | -1.585 | 0.000 | 1.585 | -0.420 |
| 40.00 | -9.812 | -32.061 | 0.000 | 0.000 | 0.000 | -912.365 | -1.814 | 0.000 | 1.814 | -0.453 |
| 45.00 | -9.676 | -30.932 | 0.000 | 0.000 | 0.000 | -863.308 | -2.321 | 0.000 | 2.321 | -0.515 |
| 50.00 | -9.540 | -29.833 | 0.000 | 0.000 | 0.000 | -814.926 | -2.896 | 0.000 | 2.896 | -0.580 |
| 55.00 | -9.404 | -28.765 | 0.000 | 0.000 | 0.000 | -767.226 | -3.539 | 0.000 | 3.539 | -0.647 |
| 60.00 | -9.289 | -27.730 | 0.000 | 0.000 | 0.000 | -720.209 | -4.254 | 0.000 | 4.254 | -0.716 |
| 63.25 | -9.219 | -27.073 | 0.000 | 0.000 | 0.000 | -690.021 | -4.757 | 0.000 | 4.757 | -0.763 |
| 65.00 | -9.141 | -26.406 | 0.000 | 0.000 | 0.000 | -673.888 | -5.042 | 0.000 | 5.042 | -0.789 |
| 68.75 | -9.059 | -25.009 | 0.000 | 0.000 | 0.000 | -639.609 | -5.685 | 0.000 | 5.685 | -0.845 |
| 70.00 | -8.978 | -24.760 | 0.000 | 0.000 | 0.000 | -628.286 | -5.909 | 0.000 | 5.909 | -0.865 |
| 75.00 | -8.839 | -23.801 | 0.000 | 0.000 | 0.000 | -583.398 | -6.854 | 0.000 | 6.854 | -0.938 |
| 80.00 | -8.702 | -22.872 | 0.000 | 0.000 | 0.000 | -539.203 | -7.876 | 0.000 | 7.876 | -1.013 |
| 85.00 | -8.568 | -21.974 | 0.000 | 0.000 | 0.000 | -495.691 | -8.979 | 0.000 | 8.979 | -1.090 |
| 90.00 | -8.436 | -21.107 | 0.000 | 0.000 | 0.000 | -452.853 | -10.164 | 0.000 | 10.164 | -1.170 |
| 95.00 | -8.349 | -20.274 | 0.000 | 0.000 | 0.000 | -410.675 | -11.433 | 0.000 | 11.433 | -1.252 |
| 96.08 | -8.290 | -20.094 | 0.000 | 0.000 | 0.000 | -401.630 | -11.720 | 0.000 | 11.720 | -1.271 |
| 100.0 | -8.210 | -18.911 | 0.000 | 0.000 | 0.000 | -369.162 | -12.791 | 0.000 | 12.791 | -1.338 |
| 100.7 | -8.150 | -18.686 | 0.000 | 0.000 | 0.000 | -363.005 | -13.002 | 0.000 | 13.002 | -1.352 |
| 105.0 | -8.065 | -18.018 | 0.000 | 0.000 | 0.000 | -328.367 | -14.240 | 0.000 | 14.240 | -1.425 |
| 107.0 | -7.493 | -17.482 | 0.000 | 0.000 | 0.000 | -310.658 | -14.844 | 0.000 | 14.844 | -1.459 |
| 108.0 | -6.605 | -15.727 | 0.000 | 0.000 | 0.000 | -302.315 | -15.152 | 0.000 | 15.152 | -1.476 |
| 109.0 | -6.410 | -15.154 | 0.000 | 0.000 | 0.000 | -295.553 | -15.463 | 0.000 | 15.463 | -1.494 |
| 110.0 | -6.342 | -15.007 | 0.000 | 0.000 | 0.000 | -289.143 | -15.777 | 0.000 | 15.777 | -1.511 |
| 115.0 | -6.217 | -14.300 | 0.000 | 0.000 | 0.000 | -257.433 | -17.404 | 0.000 | 17.404 | -1.594 |
| 120.0 | -6.097 | -13.624 | 0.000 | 0.000 | 0.000 | -226.348 | -19.120 | 0.000 | 19.120 | -1.679 |
| 125.0 | -5.983 | -12.979 | 0.000 | 0.000 | 0.000 | -195.865 | -20.925 | 0.000 | 20.925 | -1.766 |
| 129.7 | -5.917 | -12.398 | 0.000 | 0.000 | 0.000 | -167.447 | -22.725 | 0.000 | 22.725 | -1.850 |
| 130.0 | -5.880 | -12.344 | 0.000 | 0.000 | 0.000 | -165.968 | -22.822 | 0.000 | 22.822 | -1.855 |
| 133.5 | -5.809 | -11.615 | 0.000 | 0.000 | 0.000 | -144.900 | -24.239 | 0.000 | 24.239 | -1.919 |
| 135.0 | -5.748 | -11.470 | 0.000 | 0.000 | 0.000 | -136.671 | -24.812 | 0.000 | 24.812 | -1.945 |
| 140.0 | -4.450 | -8.659 | 0.000 | 0.000 | 0.000 | -107.932 | -26.901 | 0.000 | 26.901 | -2.039 |
| 145.0 | -4.349 | -8.206 | 0.000 | 0.000 | 0.000 | -85.683 | -29.086 | 0.000 | 29.086 | -2.129 |
| 150.0 | -4.260 | -7.779 | 0.000 | 0.000 | 0.000 | -63.940 | -31.363 | 0.000 | 31.363 | -2.214 |
| 154.0 | -2.848 | -5.730 | 0.000 | 0.000 | 0.000 | -46.902 | -33.246 | 0.000 | 33.246 | -2.277 |
| 155.0 | -2.800 | -5.662 | 0.000 | 0.000 | 0.000 | -44.054 | -33.724 | 0.000 | 33.724 | -2.293 |
| 160.0 | -2.075 | -4.496 | 0.000 | 0.000 | 0.000 | -30.056 | -36.162 | 0.000 | 36.162 | -2.360 |
| 164.3 | -2.028 | -4.251 | 0.000 | 0.000 | 0.000 | -21.067 | -38.328 | 0.000 | 38.328 | -2.411 |
| 165.0 | -2.005 | -4.186 | 0.000 | 0.000 | 0.000 | -19.715 | -38.666 | 0.000 | 38.666 | -2.419 |
| 167.2 | -1.962 | -3.973 | 0.000 | 0.000 | 0.000 | -15.204 | -39.811 | 0.000 | 39.811 | -2.443 |
| 170.0 | -0.889 | -1.875 | 0.000 | 0.000 | 0.000 | -9.809 | -41.226 | 0.000 | 41.226 | -2.468 |
| 175.0 | -0.825 | -1.690 | 0.000 | 0.000 | 0.000 | -5.366 | -43.830 | 0.000 | 43.830 | -2.503 |
| 179.0 | -0.750 | 0.000 | 0.000 | 0.000 | 0.000 | -2.067 | -45.936 | 0.000 | 45.936 | -2.523 |

**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 26 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Stresses

| Seg Elev (ft) | Applied Stresses | | | | | | | Allowable Stress (Fb) (ksi) | Allowable Stress (Fa) (ksi) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | Axial (Y) (ksi) | Shear (X) (ksi) | Shear (Z) (ksi) | Torsion (ksi) | Bending (X) (ksi) | Bending (Z) (ksi) | Combined (ksi) | | | |
| 0.00 | 0.58 | 0.29 | 0.00 | 0.00 | 0.00 | 13.81 | 14.40 | 49.4 | 0.0 | 0.292 |
| 5.00 | 0.58 | 0.30 | 0.00 | 0.00 | 0.00 | 13.91 | 14.50 | 50.0 | 0.0 | 0.290 |
| 10.00 | 0.57 | 0.30 | 0.00 | 0.00 | 0.00 | 14.02 | 14.60 | 50.6 | 0.0 | 0.289 |
| 15.00 | 0.57 | 0.31 | 0.00 | 0.00 | 0.00 | 14.12 | 14.70 | 51.2 | 0.0 | 0.287 |
| 20.00 | 0.57 | 0.31 | 0.00 | 0.00 | 0.00 | 14.22 | 14.80 | 51.8 | 0.0 | 0.286 |
| 25.00 | 0.56 | 0.31 | 0.00 | 0.00 | 0.00 | 14.33 | 14.90 | 52.0 | 0.0 | 0.287 |
| 30.00 | 0.56 | 0.32 | 0.00 | 0.00 | 0.00 | 14.43 | 15.00 | 52.0 | 0.0 | 0.289 |
| 31.25 | 0.56 | 0.32 | 0.00 | 0.00 | 0.00 | 14.45 | 15.02 | 52.0 | 0.0 | 0.289 |
| 35.00 | 0.55 | 0.32 | 0.00 | 0.00 | 0.00 | 14.52 | 15.08 | 52.0 | 0.0 | 0.290 |
| 37.50 | 0.53 | 0.32 | 0.00 | 0.00 | 0.00 | 14.15 | 14.69 | 52.0 | 0.0 | 0.283 |
| 40.00 | 0.53 | 0.32 | 0.00 | 0.00 | 0.00 | 14.19 | 14.73 | 52.0 | 0.0 | 0.283 |
| 45.00 | 0.52 | 0.33 | 0.00 | 0.00 | 0.00 | 14.26 | 14.80 | 52.0 | 0.0 | 0.285 |
| 50.00 | 0.52 | 0.34 | 0.00 | 0.00 | 0.00 | 14.33 | 14.86 | 52.0 | 0.0 | 0.286 |
| 55.00 | 0.52 | 0.34 | 0.00 | 0.00 | 0.00 | 14.39 | 14.92 | 52.0 | 0.0 | 0.287 |
| 60.00 | 0.52 | 0.35 | 0.00 | 0.00 | 0.00 | 14.43 | 14.96 | 52.0 | 0.0 | 0.288 |
| 63.25 | 0.52 | 0.35 | 0.00 | 0.00 | 0.00 | 14.46 | 14.98 | 52.0 | 0.0 | 0.288 |
| 65.00 | 0.51 | 0.35 | 0.00 | 0.00 | 0.00 | 14.47 | 14.99 | 52.0 | 0.0 | 0.288 |
| 68.75 | 0.49 | 0.35 | 0.00 | 0.00 | 0.00 | 13.98 | 14.48 | 52.0 | 0.0 | 0.279 |
| 70.00 | 0.49 | 0.35 | 0.00 | 0.00 | 0.00 | 13.98 | 14.48 | 52.0 | 0.0 | 0.278 |
| 75.00 | 0.48 | 0.36 | 0.00 | 0.00 | 0.00 | 13.95 | 14.45 | 52.0 | 0.0 | 0.278 |
| 80.00 | 0.48 | 0.37 | 0.00 | 0.00 | 0.00 | 13.91 | 14.40 | 52.0 | 0.0 | 0.277 |
| 85.00 | 0.48 | 0.38 | 0.00 | 0.00 | 0.00 | 13.82 | 14.32 | 52.0 | 0.0 | 0.275 |
| 90.00 | 0.48 | 0.39 | 0.00 | 0.00 | 0.00 | 13.70 | 14.20 | 52.0 | 0.0 | 0.273 |
| 95.00 | 0.48 | 0.40 | 0.00 | 0.00 | 0.00 | 13.52 | 14.02 | 52.0 | 0.0 | 0.270 |
| 96.08 | 0.48 | 0.40 | 0.00 | 0.00 | 0.00 | 13.47 | 13.97 | 52.0 | 0.0 | 0.269 |
| 100.00 | 0.47 | 0.41 | 0.00 | 0.00 | 0.00 | 13.28 | 13.77 | 52.0 | 0.0 | 0.265 |
| 100.75 | 0.46 | 0.40 | 0.00 | 0.00 | 0.00 | 12.66 | 13.14 | 52.0 | 0.0 | 0.253 |
| 105.00 | 0.46 | 0.41 | 0.00 | 0.00 | 0.00 | 12.37 | 12.85 | 52.0 | 0.0 | 0.247 |
| 107.00 | 0.45 | 0.39 | 0.00 | 0.00 | 0.00 | 12.15 | 12.62 | 52.0 | 0.0 | 0.243 |
| 108.00 | 0.41 | 0.35 | 0.00 | 0.00 | 0.00 | 12.05 | 12.48 | 52.0 | 0.0 | 0.240 |
| 109.00 | 0.40 | 0.34 | 0.00 | 0.00 | 0.00 | 12.01 | 12.42 | 52.0 | 0.0 | 0.239 |
| 110.00 | 0.40 | 0.34 | 0.00 | 0.00 | 0.00 | 11.98 | 12.39 | 52.0 | 0.0 | 0.238 |
| 115.00 | 0.40 | 0.35 | 0.00 | 0.00 | 0.00 | 11.78 | 12.20 | 52.0 | 0.0 | 0.235 |
| 120.00 | 0.40 | 0.36 | 0.00 | 0.00 | 0.00 | 11.50 | 11.92 | 52.0 | 0.0 | 0.229 |
| 125.00 | 0.41 | 0.38 | 0.00 | 0.00 | 0.00 | 11.12 | 11.54 | 52.0 | 0.0 | 0.222 |
| 129.75 | 0.41 | 0.39 | 0.00 | 0.00 | 0.00 | 10.62 | 11.05 | 52.0 | 0.0 | 0.213 |
| 130.00 | 0.41 | 0.39 | 0.00 | 0.00 | 0.00 | 10.59 | 11.02 | 52.0 | 0.0 | 0.212 |
| 133.58 | 0.47 | 0.47 | 0.00 | 0.00 | 0.00 | 11.43 | 11.92 | 52.0 | 0.0 | 0.229 |
| 135.00 | 0.47 | 0.48 | 0.00 | 0.00 | 0.00 | 11.16 | 11.66 | 52.0 | 0.0 | 0.224 |
| 140.00 | 0.38 | 0.39 | 0.00 | 0.00 | 0.00 | 10.02 | 10.43 | 52.0 | 0.0 | 0.201 |
| 145.00 | 0.38 | 0.41 | 0.00 | 0.00 | 0.00 | 9.13 | 9.54 | 52.0 | 0.0 | 0.184 |
| 150.00 | 0.39 | 0.43 | 0.00 | 0.00 | 0.00 | 7.90 | 8.32 | 52.0 | 0.0 | 0.160 |
| 154.00 | 0.31 | 0.31 | 0.00 | 0.00 | 0.00 | 6.57 | 6.90 | 52.0 | 0.0 | 0.133 |
| 155.00 | 0.31 | 0.31 | 0.00 | 0.00 | 0.00 | 6.38 | 6.71 | 52.0 | 0.0 | 0.129 |
| 160.00 | 0.27 | 0.25 | 0.00 | 0.00 | 0.00 | 5.17 | 5.46 | 52.0 | 0.0 | 0.105 |
| 164.33 | 0.27 | 0.26 | 0.00 | 0.00 | 0.00 | 4.27 | 4.57 | 52.0 | 0.0 | 0.088 |
| 165.00 | 0.27 | 0.26 | 0.00 | 0.00 | 0.00 | 4.10 | 4.40 | 52.0 | 0.0 | 0.085 |
| 167.25 | 0.33 | 0.33 | 0.00 | 0.00 | 0.00 | 4.00 | 4.36 | 52.0 | 0.0 | 0.084 |
| 170.00 | 0.16 | 0.16 | 0.00 | 0.00 | 0.00 | 2.89 | 3.07 | 52.0 | 0.0 | 0.059 |
| 175.00 | 0.16 | 0.16 | 0.00 | 0.00 | 0.00 | 1.98 | 2.16 | 52.0 | 0.0 | 0.042 |
| 179.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.93 | 0.97 | 52.0 | 0.0 | 0.019 |

| | | | |
|---|---|---|---|
| **Site Number:** | **370627** | **Code: TIA/EIA-222-F** |  |
| **Site Name:** | **Newington CT, CT** | **Engineering Number: 62041821** | **5/1/2015 11:45:41 AM** |
| **Customer:** | **Verizon Wireless** | | |

**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 26 Iterations

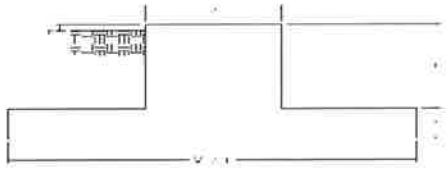
Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Analysis Summary

| | Reactions | | | | | | Max Stresses | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Load Case | Shear FX (kips) | Shear FZ (kips) | Axial FY (kips) | Moment MX (ft-kips) | Moment MY (ft-kips) | Moment MZ (ft-kips) | Combined Stress (ksi) | Allowable Stress (ksi) | Elev (ft) | Stress Ratio |
| No Ice | 27.9 | 0.00 | 43.40 | 0.00 | 0.00 | 3398.16 | 35.92 | 49.4 | 0.00 | 0.727 |
| Ice | 23.2 | 0.00 | 50.94 | 0.00 | 0.00 | 2935.83 | 33.27 | 52.0 | 65.00 | 0.640 |
| Twist/Sway | 10.9 | 0.00 | 43.43 | 0.00 | 0.00 | 1328.82 | 14.40 | 49.4 | 0.00 | 0.292 |

| | |
|---|---|
| Site Name: | Newington CT, CT |
| Site Number: | 370627 |
| Engineering Number: | 62041821 |
| Engineer: | Ali Mashhadi |
| Date: | 05/01/15 |
| Tower Type: | MP |

*Program Last Updated:* *5/13/2014*



**Design Loads (Unfactored)**

| | | | | | |
|---|---|---|---|---|---|
| Design / Analysis / Mapping: | Analysis | | Concrete Strength ($f'_c$): | 4000 | psi |
| Compression/Leg: | 43.4 | k | Pad Tension Steel Depth: | 26.00 | in |
| Uplift/Leg: | 0.0 | k | Wind Load Factor: | 1.3 | |
| Total Shear: | 27.9 | k | $\phi_{Shear}$: | 0.75 | |
| Moment: | 3398.2 | k-ft | $\phi_{Flexure\ /\ Tension}$: | 0.90 | |
| Tower + Appurtenance Weight: | 43.4 | k | $\phi_{Compression:}$ | 0.65 | |
| Depth to Base of Foundation: | 6.50 | ft | $\beta$: | 0.85 | |
| Diameter of Pier (d): | 7.50 | ft | Bottom Pad Rebar Size #: | 9 | |
| Height of Pier above Ground (h): | 0.50 | | # of Bottom Pad Rebar: | 36 | |
| Width of Pad (W): | 24.50 | ft | Pad Bottom Steel Area: | 36.00 | $in^2$ |
| Length of Pad (L): | 24.50 | ft | Pad Steel $F_y$: | 60000 | psi |
| Thickness of Pad (t): | 2.50 | ft | Top Pad Rebar Size #: | 9 | |
| Tower Leg Center to Center: | 0.00 | ft | # of Top Pad Rebar: | 36 | |
| Number of Tower Legs: | 1.0 | (1 if MP or GT) | Pad Top Steel Area: | 36.00 | $in^2$ |
| Tower Center from Mat Center: | 0.00 | ft | Pier Rebar Size #: | 9 | |
| Depth Below Ground Surface to Water Table: | 11.00 | ft | Pier Steel Area (Single Bar): | 1.00 | $in^2$ |
| Unit Weight of Concrete: | 150.0 | pcf | # of Pier Rebar: | 43 | |
| Unit Weight of Soil Above Water Table: | 135.0 | pcf | Pier Steel $F_y$: | 60000 | psi |
| Unit Weight of Water: | 62.4 | pcf | Pier Cage Diameter: | 82.0 | in |
| Unit Weight of Soil Below Water Table: | 75.0 | pcf | Rebar Strain Limit: | 0.008 | |
| Friction Angle of Uplift: | 15.00 | Degrees | Steel Elastic Modulus: | 29000 | ksi |
| Ultimate Coefficient of Shear Friction: | 0.35 | | Tie Rebar Size #: | 4 | |
| Allowable Compressive Bearing Pressure: | 6000.0 | psf | Tie Steel Area (Single Bar): | 0.20 | $in^2$ |
| Ultimate Passive Pressure on Pad Face: | 0.0 | psf | Tie Spacing: | 6 | in |
| Allowable Capacity Increase: | 1.00 | | Tie Steel $F_y$: | 60000 | psi |

**Overturning Factor of Safety**

| | | |
|---|---|---|
| Design OTM: | 3593.5 | k-ft |
| OTM Resistance: | 7802.3 | k-ft |
| OTM Resistance / Design OTM Factor of Safety: | 2.17 | Result: OK |

**Soil Bearing Pressure Usage:**

| | | |
|---|---|---|
| Net Bearing Pressure: | 2483 | psf |
| Allowable Bearing Pressure: | 6000 | psf |
| Net Bearing Pressure/Allowable Bearing Pressure: | 0.41 | Result: OK |
| Load Direction Controling Design Bearing Pressure: | Diagonal to Pad Edge | |

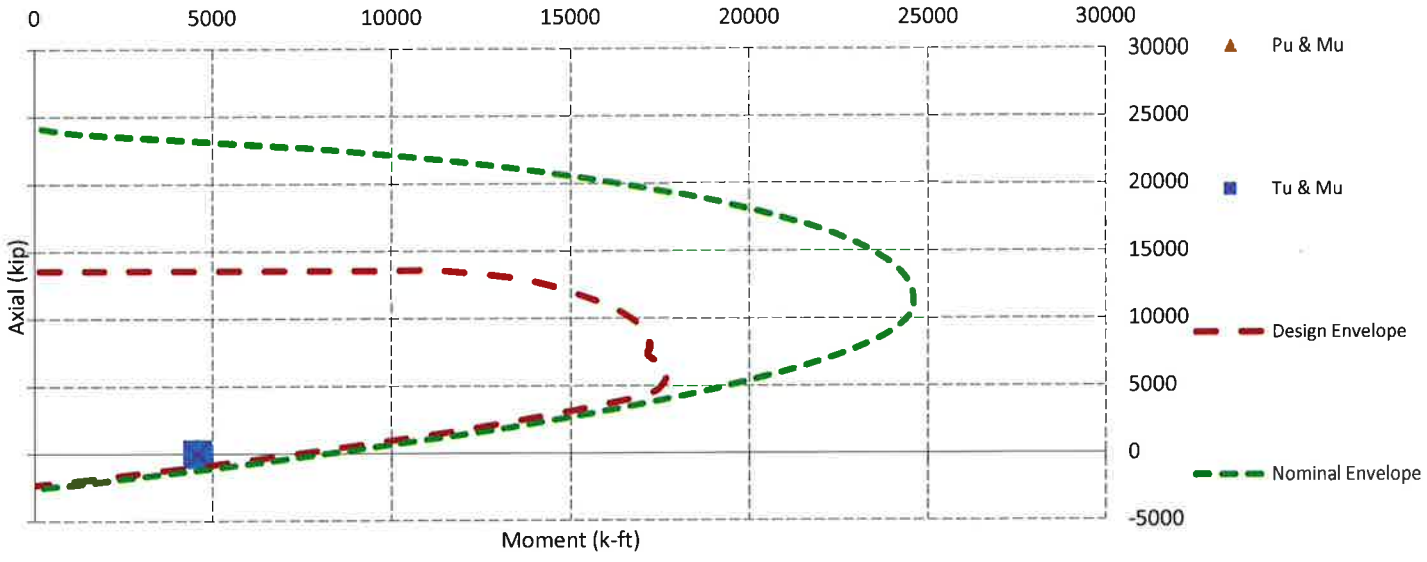
**Sliding Factor of Safety**

| | | |
|---|---|---|
| Total Ultimate Sliding Resistance: | 209.5 | k |
| Sliding Resistance/Sliding Design Factor of Safety: | 7.51 | Result: OK |

## One Way Shear, Flexual Capacity, and Punching Shear

| | | |
|---|---|---|
| Factored One Way Shear ($V_u$): | 260.6 | k |
| One Way Shear Capacity ($\phi V_c$): | 725.2 | k - ACI11.3.1.1 |
| $V_u / \phi V_c$: | 0.36 | Result: OK |
| Load Direction Controling Shear Capacity: | Parallel to Pad Edge | |
| Lower Pad Steel Factored Moment ($M_u$): | 1539.9 | k-ft |
| Lower Steel Pad Moment Capacity ($\phi M_n$): | 4063.2 | k-ft - ACI10.3 |
| $M_u / \phi M_n$: | 0.38 | Result: OK |
| Load Direction Controling Flexural Capacity: | Parallel to Pad Edge | |
| Upper Steel Pad Factored Moment ($M_u$): | 1218.1 | k-ft |
| Upper Steel Pad Moment Capacity ($\phi M_n$): | 4063.2 | k-ft |
| $M_u / \phi M_n$: | 0.30 | Result: OK |
| Lower Pad Flexural Reinforcement Ratio: | 0.0047 | OK - Minimum Reinforcement Ratio Met - ACI10.5.1 |
| Upper Pad Flexural Reinforcement Ratio: | 0.0047 | OK - Minimum Reinforcement Ratio Met - ACI10.5.1 |
| Lower Pad Reinforcement Spacing: | 8 | in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4 |
| Upper Pad Reinforcement Spacing: | 8 | in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4 |
| Factored Punching Shear ($V_u$): | 0.0 | k |
| Nominal Punching Shear Capacity ($\phi_c V_n$): | 1797.8 | k - ACI11.12.2.1 |
| $V_u / \phi V_c$: | 0.00 | Result: OK |
| Factored Moment in Pier ($M_u$): | 4580.8 | k-ft |
| Pier Moment Capacity ($\phi M_n$): | 7393.4 | k-ft |
| $M_u / \phi M_n$: | 0.62 | Result: OK |
| Factored Shear in Pier ($V_u$): | 36.3 | k |
| Pier Shear Capacity ($\phi V_n$): | 605.6 | k |
| $V_u / \phi V_c$: | 0.06 | Result: OK |
| Pier Shear Reinforcement Ratio: | 0.0003 | No Ties Necessary for Shear - ACI11.5.6.1 |
| Factored Tension in Pier ($T_u$): | 0.0 | k |
| Pier Tension Capacity ($\phi T_n$): | 2322.0 | k |
| $T_u / \phi T_n$: | 0.00 | Result: OK |
| Factored Compression in Pier ($P_u$): | 56.4 | k |
| Pier Compression Capacity ($\phi P_n$): | 11171.5 | k - ACI10.3.6.2 |
| $P_u / \phi P_n$: | 0.01 | Result: OK |
| Pier Compression Reinforcement Ratio: | 0.007 | OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4 |
| $M_u/\phi_B M_n + T_u/\phi_T T_n$: | 0.62 | Result: OK |

Nominal and Design Moment Capacity and Factored Design Loads



| | | | |
|---|---|---|---|
| Base/Flange Plate | Plate Type | ***Baseplate*** | |
| | Pole Diameter | 63 | in |
| | Pole Thickness | 0.375 | in |
| | Plate Diameter | 73 | in |
| | Plate Thickness | 1.5 | in |
| | Plate Fy | 50 | ksi |
| | Weld Length | 0.3125 | in |
| | Allowable | 514.47 | k-in |
| | Applied | 81.39 | k-in |
| Stiffeners | # | ***45*** | *Show* |
| | Thickness | 0.375 | in |
| | Length | 5 | in |
| | Height | 10 | in |
| | Chamfer | 0 | in |
| | Offset Angle | 0 | ° |
| | Fy | 36 | ksi |

| | | | |
|---|---|---|---|
| Bolts | # | ***45*** | |
| | Bolt Circle | 68 | in |
| | (R)adial / (S)quare | R | |
| | Diameter | 1.25 | in |
| | Hole Diameter | 1.375 | in |
| | Type | A687 | |
| | Fy | 105 | ksi |
| | Fu | 150 | ksi |
| | Allowable | 81.41 | k |
| | Applied | 54.26 | k |
| Reinforcement ● | # | ***0*** | |
| Extra Bolts O | # | ***0*** | |

| | | | |
|---|---|---|---|
| Code Rev. | ***F*** | **Date** | 4/24/2015 |
| A.S.I. | 1.33 | **Engineer** | AM |
| | | **Site #** | 370627 |
| Moment | 3398.2 k-ft | **Carrier** | Verizon |
| Axial | 43.4 k | | |

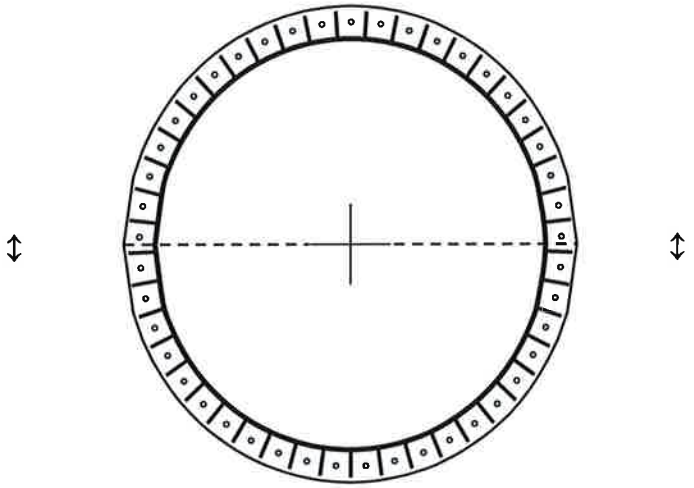


Plate Stress Ratio:
0.16 (Pass)

Bolt Stress Ratio:
0.67 (Pass)