

March 29, 2016

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

Re: **Notice of Exempt Modification – Facility Modification  
77 Springbrook Road, Old Saybrook, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the top of the existing 175-foot tower at 77 Springbrook Road in Old Saybrook, Connecticut (the “Property”). The tower is owned by American Tower Corporation (“ATC”). The Council approved Cellco’s use of the tower in 2008. Cellco now intends to modify its facility by replacing nine (9) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads (“RRHs”) and install six (6) new RRHs and one (1) HYBRIFLEX™ fiber optic antenna cable. 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 Carl Fortuna, First Selectman of the Town of Old Saybrook. A copy of this letter is also being sent to Crossroads Communications of Old Saybrook LLC, the owner of the Property and ATC, the tower owner.

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


# Robinson+Cole

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1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed on its existing antenna platform at the top of the 175-foot tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six (6) decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support Cellco's proposed modifications. (*See Structural Analysis 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:

Carl Fortuna, Old Saybrook First Selectman  
Communications of Old Saybrook LLC  
ATC  
Tim Parks

# **ATTACHMENT 1**



## 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	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
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	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
	0°   14.6	0°   14.5	0°   17.4	0°   17.8	0°   18.1	0°   18.2
Gain by Beam Tilt, average, dBi	7°   14.6	7°   14.4	3°   17.5	3°   17.9	3°   18.3	3°   18.4
	14°   14.2	14°   13.6	7°   17.4	7°   17.9	7°   18.2	7°   18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

### General Specifications

Antenna 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

SBNHH-1D65B

POWERED BY



## 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 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h   150 mph

## Dimensions

Depth	180.0 mm   7.1 in
Length	1851.0 mm   72.9 in
Width	301.0 mm   11.9 in
Net Weight	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®

## Packed Dimensions

Depth	299.0 mm   11.8 in
Length	1970.0 mm   77.6 in
Width	409.0 mm   16.1 in
Shipping Weight	31.0 kg   68.3 lb

## Regulatory Compliance/Certifications

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



## Included Products

# Product Specifications

COMMSCOPE®

SBNHH-1D65B

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

## \* Footnotes

Performance Note      Severe environmental conditions may degrade optimum performance

# ALCATEL-LUCENT B13 RRH4X30-4R

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

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



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

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

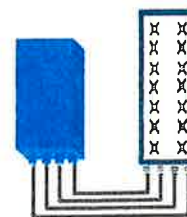
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

## FEATURES

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

## BENEFITS

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



4x30W with 4T4R  
or  
2x60W with 2T4R  
Can be switched between  
modes via SW w/o site  
visit

# TECHNICAL SPECIFICATIONS

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

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# ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET RRH2X60-1900A-4R FOR BAND 2/25 APPLICATIONS

The Alcatel-Lucent RRH2x60-1900A-4R is a high power, small form factor Remote Radio Head operating in the PCS 1900MHz frequency band for WCDMA and LTE technologies. 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 RRH2x60-1900A-4R 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 RRH2x60-1900A-4R integrates all the latest technologies. This allows operators 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.

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 RRH2x60-1900A-4R 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).

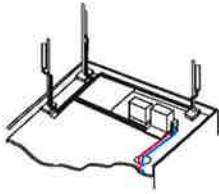
The Alcatel-Lucent RRH2x60-1900A-4R is a very cost-effective solution to deploy LTE MIMO.

### **EASY INSTALLATION**

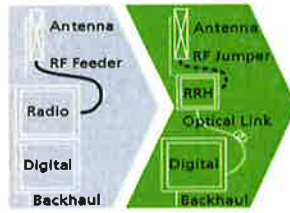
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-1900A-4R installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-1900A-4R is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

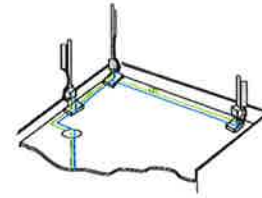
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-190A-4R is compact and weighs about 21 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

**FEATURES**

- RRH2x60-1900A-4R integrates two power amplifiers of 60W rating (at each antenna connector)
- RRH2x60-1900A-4R can operate WCDMA only, LTE only or a mix of WCDMA and LTE
- RRH2x60-1900A-4R offers the possibility for WCDMA (non MIMO) to operate the two radio chains independently (2 blocks of 20 MHz anywhere in the band)

- RRH2x60-1900A-4R is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

**BENEFITS**

- MIMO deployment and/or WCDMA and LTE simultaneous 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 : 500x285x208 mm (30l with solar shield)
- Weight : 21 kg (46 lbs) (with solar shield)

**Electrical Data**

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption: 460W typ. @2x60W (100%RF)

**RF Characteristics**

- Supported spectrum: DL 1930-1990 / UL 1850-1910
- Frequency band: 3GPP band 2/25
- Output power: 2x60W at antenna connectors
- Technology supported: W-CDMA and LTE
- Instantaneous bandwidth: 20 MHz (MIMO) or 2x20 MHz (non MIMO)
- Rx diversity: 2-way and 4-way uplink reception

- Typical sensitivity without Rx diversity: -124.8dBm for WCDMA and -105 dBm for LTE

**Connectivity**

- Two CPRI optical ports for daisy chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 15km 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: ETS300-019-1-4 class4.1E
- 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
- Safety : IEC60950-1, EN 60825-1
- Regulatory: CE Mark-European Directive 2002/95/EC (RoHS), 2002/96/EC (WEEE), 1999/5/EC (R&TTE)
- Health : EN 50385

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# B66A RRH 4X45 - PHYSICAL CHARACTERISTICS- TARGET 15.1



B4 RRH4x45-4R (AWS-Extension Band)	
Frequency Band	LR15.1 – B4 / LR16.1 B66 (AWS 1 and 3 only)
RF Output Power	2x90W/4x45W (SW configurable)
Operational range	2110-2180 MHz, DL/ 1710-1780 MHz UL
Instantaneous Bandwidth	70MHz
Configuration (HW readiness)	LTE: 2T2R, 2T4R, 4T4R
Carrier Bandwidths	5, 10, 15 and 20 MHz
Interfaces	2x CPRI Rate 7 Ports Antenna Connectors 4.3-10
AISG Support	AISG 2.0 for RET Internal Smart Bias T
Monitor Ports	NA (Spec An to replace ports)
Environmental	GR487 Compliance / GR3178 Compliance (with exceptions)
Mounting options	Pole/Wall
Connectors location	All bottom
External Alarms	4
Annual Return Rate (Target)	<2%
Operating Temperature	-40 C to +55 C (without solar load)

- Commercial Product Will include B66 support of AWS 1 and 3.
- Lower AWS 3 UL Not in 3GPP Band 66 Definition

Physical Dimensions – Not to Exceed		
	W/O Solar Shield	With Solar Shield
Dimensions HxWxD	H = 26in (H=660mm) W = 11.4in (W=290mm) D = 5.9in (D=150mm)	H = 26.6in (H=675mm) W = 12in (W=304mm) D = 6.8in (D=173mm)
Volume	29l	35.5l
Weight		64lbs / 29kg



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

**Product Description**

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

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

**Features/Benefits**

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

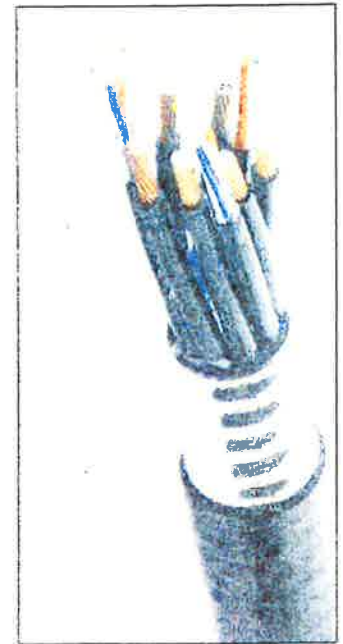


Figure 1: HYBRIFLEX Series

**Technical Specifications**

Outer Conductor Armor	Corrugated Aluminum	(mm (in))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
<b>Weight and Bending</b>			
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)
<b>DC-Resistance Properties</b>			
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	0.68 (0.205)
DC-Resistance Power Cable, 8.4mm <sup>2</sup> (8AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
<b>Optical Properties</b>			
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		(μm)	50/125
Primary Coating (Acrylate)		(μm)	245
Buffer Diameter, Nominal		(μm)	900
Secondary Protection, Jacket, Nominal		(mm (in))	2.0 (0.08)
Minimum Bending Radius		(mm (in))	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL34-V0, UL1666 RoHS Compliant
<b>Power Properties</b>			
Size (Power)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		(mm (in))	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA 5-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
<b>Temperature</b>			
Installation Temperature		(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature		(°C (°F))	-40 to +65 (-40 to 149)

\* This data is provisional and subject to change

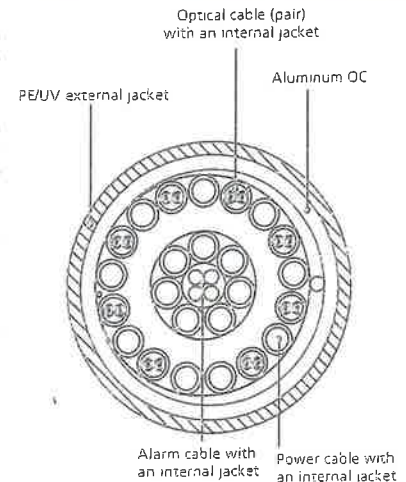


Figure 2: Construction Detail

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

# **ATTACHMENT 2**

		General		Power		Density							
Site Name: Old Saybrook East Relo Tower Height: 175ft													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	PERMISS. EXP.	FRACTION MPE	Total					
*T-Mobile	2	24	162	0.0007	2300	1.0000	0.01%						
*T-Mobile	2	12	162	0.0004	1950	1.0000	0.00%						
*T-Mobile	2	12	162	0.0004	2100	1.0000	0.00%						
Verizon PCS	1	2349	173	0.0282	1970	1.0000	2.82%						
Verizon Cellular	9	260	173	0.0281	869	0.5793	4.85%						
Verizon AWS	1	2306	173	0.0277	2145	1.0000	2.77%						
Verizon 700	1	1036	173	0.0124	746	0.4973	2.50%	12.96%					
* Source: Siting Council													

# **ATTACHMENT 3**



**AMERICAN TOWER®**  
CORPORATION

This report was prepared for American Tower Corporation by



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## Structural Analysis Report

**Structure** : 175 ft Monopole  
**ATC Site Name** : Old Saybrook, CT  
**ATC Site Number** : 370625  
**Engineering Number** : 63601422  
**Proposed Carrier** : Verizon Wireless  
**Carrier Site Name** : Old Saybrook East CT RELO  
**Carrier Site Number** : 184355  
**Site Location** : 77 Springbrook Road  
Old Saybrook, CT 06475-0000  
41.31383, -72.36403  
**County** : Middlesex  
**Date** : October 7, 2015  
**Max Usage** : 78%  
**Result** : Pass

Courtney Fuhrer  
SES Structural Engineer I







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Foundations .....	3
Deflection, Twist, and Sway.....	3
Standard Conditions .....	4
Calculations .....	Attached



## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 175 ft monopole to reflect the change in loading by Verizon Wireless.

## Supporting Documents

<b>Tower Drawings</b>	DaVinci, Valmont Job #08242-1120, dated April 17, 2008
<b>Foundation Drawing</b>	DaVinci, Valmont Job #08242-1120, dated April 17, 2008
<b>Geotechnical Report</b>	JGI Project #J2085121, dated March 12, 2008

## Analysis

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

<b>Basic Wind Speed:</b>	85 mph (Fastest Mile)
<b>Basic Wind Speed w/ Ice:</b>	74 mph (Fastest Mile)w/ 1/2" radial ice concurrent
<b>Code:</b>	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](mailto: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 <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
173.0	173.0	3	Andrew LNX-8513DS-VTM	Platform w/ Handrails	(18) 1 5/8" Coax (1) 1 5/8" Fiber	Verizon Wireless
	172.0	1	RFS DB-T1-6Z-8AB-OZ			
162.0	162.0	3	Ericsson AIR 21, 1.3M, B2A B4P	T-Arms	(12) 1 5/8" Coax (1) 1 5/8" Hybriflex	Metro PCS, Inc.
		3	Ericsson AIR 21, 1.3M, B4A B2P			
161.0		3	RCU	Flush	(1) 0.39" Cable	
152.0	153.0	3	RFS APXV18-206517-C	Flush	(6) 1 5/8" Coax	
100.0	-	-	-	-	(1) 7/8" Coax	American Messaging Services, Inc.
98.0	102.0	1	6' Omni	Stand-Off	-	
15.0	15.0	1	4' Dish w/ Radome	Leg	(1) 0.28" RG-6	

### Equipment to be Removed

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
173.0	173.0	3	Amphenol Antel BXA-70063-6CF-EDIN-2	-	-	Verizon Wireless
		3	Antel BXA-171063/12CF			
		3	Amphenol Antel BXA-171085-12BF-EDIN-X			
		3	Alcatel-Lucent RRH2x40-AWS			

### Proposed Equipment

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
173.0	172.0	3	Alcatel-Lucent RRH2x60 700	Existing Platform w/ Handrails	(1) 1 5/8" Fiber	Verizon Wireless
		3	Alcatel-Lucent RRH4x45-B66 w/ Solar Shield			
		9	Andrew SBNHH-1D65B			
		1	RFS DB-T1-6Z-8AB-OZ			
		3	Alcatel-Lucent PCS B25 RRH2x60/4x30			

<sup>1</sup>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 alongside existing Verizon Wireless coax.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	48%	Pass
Shaft	78%	Pass
Base Plate	40%	Pass

**Foundations**

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Moment (Kips-Ft)	5,400.0	3,341.0	62%
Shear (Kips)	48.0	30.2	63%

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

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
173.0	RFS DB-T1-6Z-8AB-0Z	Verizon Wireless	2.587	1.852
	Alcatel-Lucent RRH4x45-B66 w/ Solar Shield			
	Alcatel-Lucent RRH2x60 700			
15.0	4' Dish w/ Radome	American Messaging Services, Inc.	0.016	0.123

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



## 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 Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings 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.

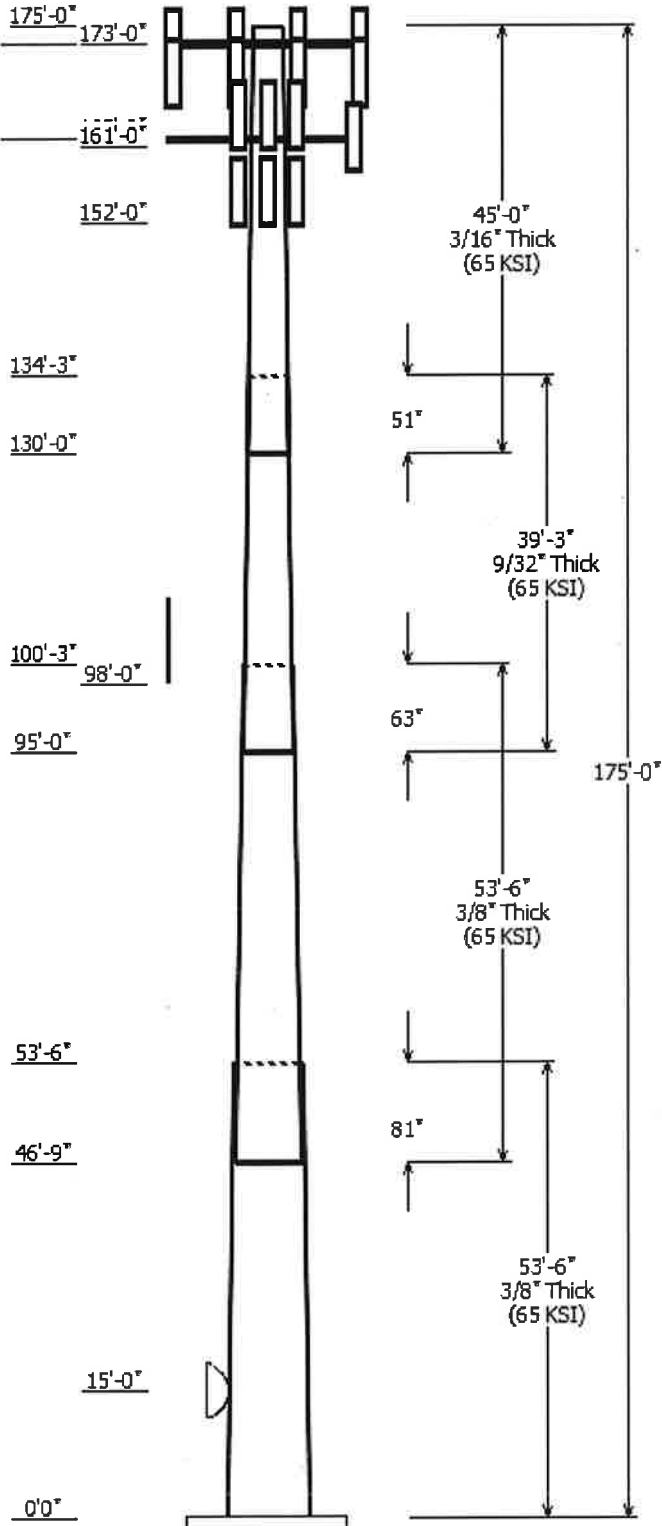
Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort 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. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

**SEMAAN ENGINEERING SOLUTIONS, LLC**

1079 N.205th Street  
Elkhorn, NE 68022  
Phone: 402-289-1888  
Fax: 402-289-1861

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Job Information	
Pole :	370625
Code:	TIA/EIA-222-F
Description :	175 ft Monopole
Client :	Verizon Wireless
Location :	Old Saybrook, CT
Shape :	18 Sides
Height :	175.00 (ft)
Base Elev (ft):	0.00
Taper:	0.26500(in/ft)

Sections Properties								
Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
		Across Top	Flats Bottom					
1	53.500	50.51	64.69	0.375		0.000	0.265000	65
2	53.500	38.87	53.05	0.375	Slip Joint	81.000	0.265000	65
3	39.250	30.42	40.82	0.281	Slip Joint	63.000	0.265000	65
4	45.000	20.00	31.92	0.188	Slip Joint	51.000	0.265000	65

Discrete Appurtenance				
Attach Elev (ft)	Force Elev (ft)	Qty	Description	
173.000	172.000	1	RFS DB-T1-6Z-8AB-0Z	
173.000	172.000	1	RFS DB-T1-6Z-8AB-0Z	
173.000	173.000	1	Flat Platform w/ Handrails	
173.000	173.000	3	Andrew LNX-8513DS-VTM	
173.000	173.000	9	Andrew SBNHH-1D65B	
173.000	172.000	3	Alcatel-Lucent PCS B25	
173.000	172.000	3	Alcatel-Lucent RRH2x60 700	
173.000	172.000	3	Alcatel-Lucent RRH4x45-B66	
162.000	162.000	3	Round T-Arm	
162.000	162.000	3	Ericsson AIR 21, 1.3M, B4A B2P	
162.000	162.000	3	Ericsson AIR 21, 1.3M, B2A B4P	
161.000	162.000	3	RCU	
152.000	153.000	3	RFS APXV18-206517-C	
98.000	102.000	1	6' Omni	
15.000	15.000	1	4' Dish w/ Radome	

Linear Appurtenance			
Elev (ft)	From	To	Exposed To Wind
0.000	15.000	0.28" RG-6	No
0.000	100.0	7/8" Coax	Yes
0.000	152.0	1 5/8" Coax	No
0.000	161.0	0.39" Cable	No
0.000	162.0	1 5/8" Coax	No
0.000	162.0	1 5/8" Hybriflex	No
0.000	173.0	1 5/8" Coax	No
0.000	173.0	1 5/8" Fiber	No
0.000	173.0	1 5/8" Fiber	No

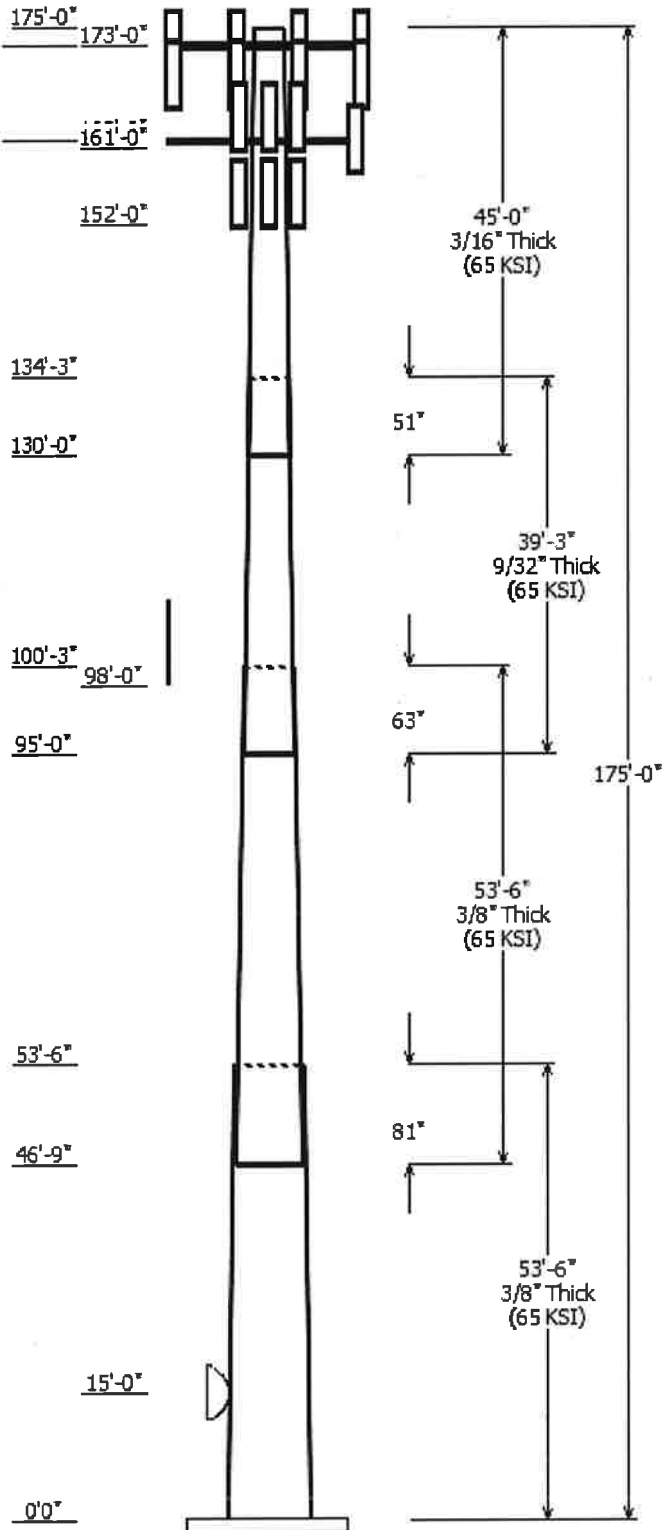
Load Cases	
No Ice	85.00 m ph Wind with No Ice
Ice	73.61 m ph Wind with Ice
Twist/Sway	50.00 m ph Wind with No Ice

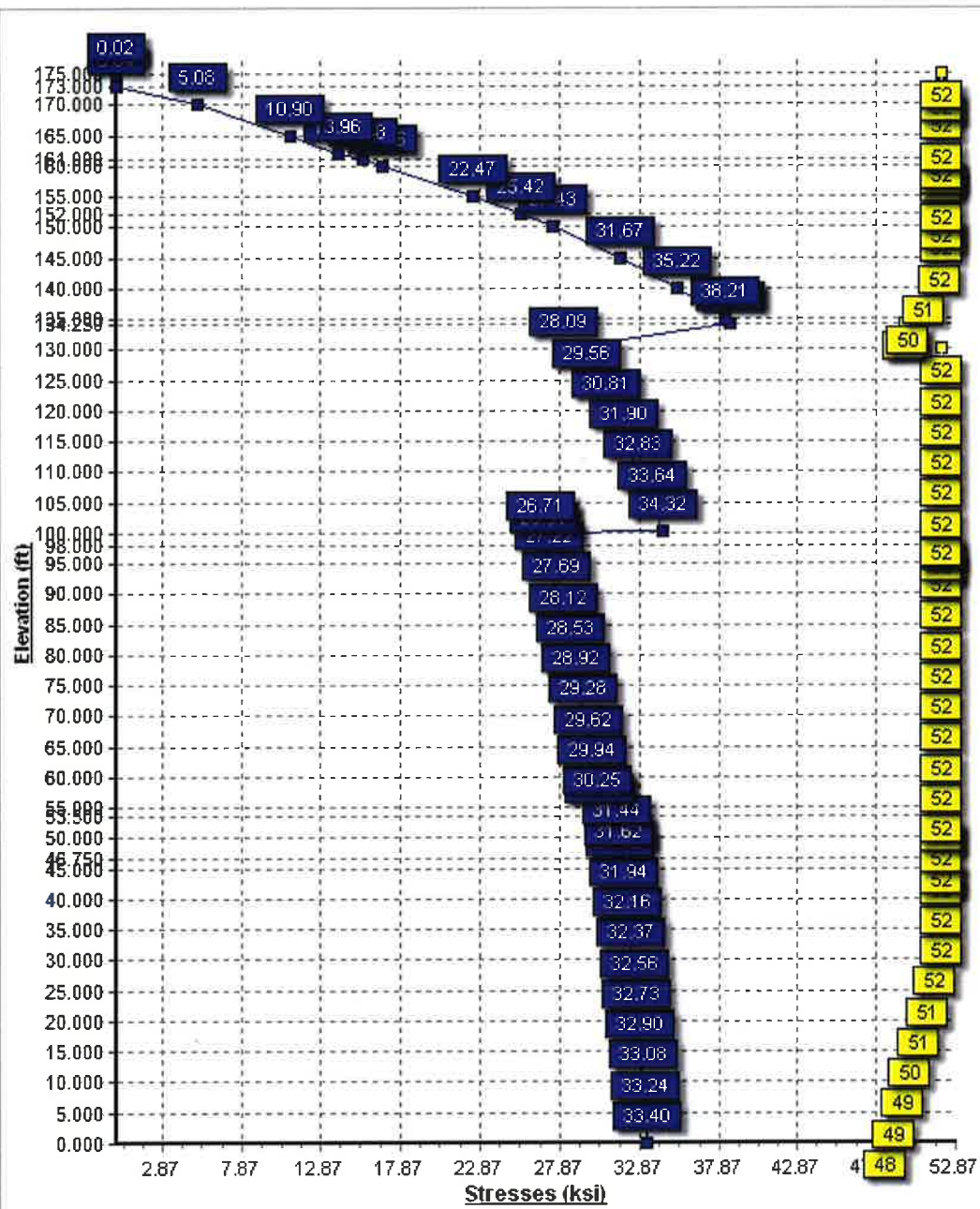
Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
No Ice	3340.97	30.18	34.69

Ice	2688.37	21.75	40.90
Twist/Sway	1156.91	10.44	34.72

### Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
Twist/Sway	15.00	0.193	0.123







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Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

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Customer: Verizon Wireless

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### Analysis Parameters

Location:	Middlesex County, CT	Height (ft):	175
Code:	TIA/EIA-222-F	Base Diameter (in):	64.69
Shape:	18 Sides	Top Diameter (in):	20.00
Pole Type:	Taper	Taper (in/ft) :	0.265
Pole Manufacturer:	Valmont		

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### Load Cases

No Ice	85.00 m ph Wind with No Ice
Ice	73.61 m ph Wind with Ice
Twist/Sway	50.00 m ph Wind with No Ice

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

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Customer: Verizon Wireless

**Shaft Section Properties**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip		Weight (lb)	Bottom						Top						
				Joint Type	Joint Len (in)		Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	53.500	0.3750	65		0.00	12,400	64.69	0.00	76.55	40004.8	29.01	172.51	50.51	53.50	59.67	18952.4	22.34	134.70	0.265000
2-18	53.500	0.3750	65	Slip	81.00	9,878	53.05	46.75	62.70	21979.6	23.53	141.47	38.87	100.25	45.82	8580.6	16.87	103.66	0.265000
3-18	39.250	0.2812	65	Slip	63.00	4,213	40.82	95.00	36.19	7516.4	24.19	145.19	30.42	134.25	26.90	3088.9	17.67	108.20	0.265000
4-18	45.000	0.1875	65	Slip	51.00	2,349	31.92	130.00	18.89	2404.2	28.61	170.28	20.00	175.00	11.79	585.0	17.40	106.68	0.265000
Shaft Weight						28,839													

**Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	No Ice			Ice			Distance From Face (ft)	Vert Ecc (ft)
			Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor		
173.00	Alcatel-Lucent PCS B25	3	55.00	2.570	0.67	75.30	2.910	0.67	0.000	-1.000
173.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.510	0.67	60.40	2.860	0.67	0.000	-1.000
173.00	Alcatel-Lucent RRH4x45-B66	3	64.00	3.100	0.50	83.90	3.150	0.50	0.000	-1.000
173.00	Andrew LNX-8513DS-VTM	3	26.30	8.410	0.83	96.80	9.240	0.83	0.000	0.000
173.00	Andrew SBNHH-1D65B	9	50.70	8.380	0.83	76.20	12.320	0.83	0.000	0.000
173.00	Flat Platform w/ Handrails	1	2000.00	42.400	1.00	2,450.00	48.400	1.00	0.000	0.000
173.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	5.600	0.67	44.30	3.280	0.67	0.000	-1.000
173.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	5.600	0.67	44.30	3.280	0.67	0.000	-1.000
162.00	Ericsson AIR 21, 1.3M, B2A	3	90.40	6.580	0.83	132.60	7.200	0.83	0.000	0.000
162.00	Ericsson AIR 21, 1.3M, B4A	3	91.50	6.580	0.82	132.60	7.200	0.82	0.000	0.000
162.00	Round T-Arm	3	250.00	9.700	0.67	314.00	12.100	0.67	0.000	0.000
161.00	RCU	3	1.00	0.160	1.00	2.50	0.260	1.00	0.000	1.000
152.00	RFS APXV18-206517-C	3	26.40	5.170	0.80	53.13	5.850	0.80	0.000	1.000
98.00	6' Omni	1	25.00	1.760	1.00	38.24	2.130	1.00	0.000	4.000
15.00	4' Dish w/ Radome	1	120.00	10.850	1.00	211.70	11.310	1.00	0.000	0.000
Totals		41	4673.20			6,328.03			Number of Loadings : 15	

**Linear Appurtenance Properties**

Elev From (ft)	Elev To (ft)	Qty	Description	No Ice		Ice		Exposed To Wind
				Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	
0.00	173.00	18	1 5/8" Coax	0.82	0.00	0.00	0.00	N
0.00	173.00	1	1 5/8" Fiber	1.61	0.00	0.00	0.00	N
0.00	173.00	1	1 5/8" Fiber	1.61	0.00	0.00	0.00	N
0.00	162.00	12	1 5/8" Coax	0.82	0.00	0.00	0.00	N
0.00	162.00	1	1 5/8" Hybriflex	1.30	0.00	0.00	0.00	N
0.00	161.00	1	0.39" Cable	0.07	0.00	0.00	0.00	N
0.00	152.00	6	1 5/8" Coax	0.82	0.00	0.00	0.00	N
0.00	100.00	1	7/8" Coax	0.33	1.09	0.00	0.00	Y
0.00	15.00	1	0.28" RG-6	0.03	0.00	0.00	0.00	N
Total Weight				1,211.72 (lb)		0.00 (lb)		

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

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Customer: Verizon Wireless

**Segment Properties** (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Fa (ksi)	Weight (lb)
0.00		0.3750	64.690	76.548	40,004.8	29.01	172.51	65	48	0	0.0
5.00		0.3750	63.365	74.971	37,582.9	28.38	168.97	65	49	0	1,289.0
10.00		0.3750	62.040	73.394	35,260.8	27.76	165.44	65	49	0	1,262.1
15.00		0.3750	60.715	71.817	33,036.3	27.14	161.91	65	50	0	1,235.3
20.00		0.3750	59.390	70.240	30,907.4	26.51	158.37	65	51	0	1,208.5
25.00		0.3750	58.065	68.663	28,872.0	25.89	154.84	65	51	0	1,181.6
30.00		0.3750	56.740	67.086	26,928.0	25.27	151.31	65	52	0	1,154.8
35.00		0.3750	55.415	65.509	25,073.3	24.65	147.77	65	52	0	1,128.0
40.00		0.3750	54.090	63.932	23,305.7	24.02	144.24	65	52	0	1,101.1
45.00		0.3750	52.765	62.355	21,623.2	23.40	140.71	65	52	0	1,074.3
46.75	Bot - Section 2	0.3750	52.301	61.803	21,054.1	23.18	139.47	65	52	0	369.7
50.00		0.3750	51.440	60.778	20,023.8	22.78	137.17	65	52	0	1,365.5
53.50	Top - Section 1	0.3750	51.263	60.567	19,815.7	22.69	136.70	65	52	0	1,445.2
55.00		0.3750	50.865	60.094	19,354.9	22.51	135.64	65	52	0	307.9
60.00		0.3750	49.540	58.517	17,870.8	21.88	132.11	65	52	0	1,009.0
65.00		0.3750	48.215	56.940	16,464.5	21.26	128.57	65	52	0	982.2
70.00		0.3750	46.890	55.362	15,134.0	20.64	125.04	65	52	0	955.3
75.00		0.3750	45.565	53.785	13,877.2	20.01	121.51	65	52	0	928.5
80.00		0.3750	44.240	52.208	12,692.0	19.39	117.97	65	52	0	901.7
85.00		0.3750	42.915	50.631	11,576.3	18.77	114.44	65	52	0	874.9
90.00		0.3750	41.590	49.054	10,527.9	18.15	110.91	65	52	0	848.0
95.00	Bot - Section 3	0.3750	40.265	47.477	9,544.8	17.52	107.37	65	52	0	821.2
98.00		0.3750	39.470	46.531	8,985.4	17.15	105.25	65	52	0	845.6
100.0		0.3750	38.940	45.900	8,624.9	16.90	103.84	65	52	0	554.4
100.2	Top - Section 2	0.2812	39.436	34.946	6,768.9	23.32	140.24	65	52	0	68.8
105.0		0.2812	38.177	33.822	6,136.9	22.53	135.77	65	52	0	555.8
110.0		0.2812	36.852	32.640	5,515.4	21.70	131.05	65	52	0	565.4
115.0		0.2812	35.527	31.457	4,937.4	20.87	126.34	65	52	0	545.3
120.0		0.2812	34.202	30.275	4,401.2	20.04	121.63	65	52	0	525.1
125.0		0.2812	32.877	29.092	3,905.4	19.21	116.92	65	52	0	505.0
130.0	Bot - Section 4	0.2812	31.552	27.909	3,448.2	18.37	112.21	65	52	0	484.9
134.2	Top - Section 3	0.1875	30.801	18.218	2,157.2	27.56	164.27	65	50	0	664.7
135.0		0.1875	30.602	18.100	2,115.5	27.37	163.21	65	50	0	46.3
140.0		0.1875	29.277	17.312	1,850.9	26.12	156.15	65	51	0	301.2
145.0		0.1875	27.952	16.523	1,609.3	24.88	149.08	65	52	0	287.8
150.0		0.1875	26.627	15.734	1,389.7	23.63	142.01	65	52	0	274.4
152.0		0.1875	26.097	15.419	1,307.8	23.13	139.19	65	52	0	106.0
155.0		0.1875	25.302	14.946	1,191.1	22.38	134.95	65	52	0	155.0
160.0		0.1875	23.977	14.157	1,012.3	21.14	127.88	65	52	0	247.6
161.0		0.1875	23.712	14.000	978.9	20.89	126.47	65	52	0	47.9
162.0		0.1875	23.447	13.842	946.2	20.64	125.05	65	52	0	47.4
165.0		0.1875	22.652	13.369	852.4	19.89	120.81	65	52	0	138.9
170.0		0.1875	21.327	12.580	710.3	18.65	113.75	65	52	0	220.7
173.0		0.1875	20.532	12.107	633.2	17.90	109.51	65	52	0	126.0
175.0		0.1875	20.002	11.792	585.0	17.40	106.68	65	52	0	81.3
											28,839.4

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:49 AM

Customer: Verizon Wireless

**Load Case:** No Ice

85.00 mph Wind with No Ice

25 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		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		271.0	0.0					0.0	0.0	271.0	0.0	0.0	0.0
5.00		536.4	1,289.0					170.4	37.1	706.8	1,326.0	0.0	0.0
10.00		525.2	1,262.1					170.4	37.1	695.6	1,299.2	0.0	0.0
15.00	Appertunance(s)	514.0	1,235.3	339.2	0.0	0.0	120.0	170.4	37.1	1,023.5	1,392.4	0.0	0.0
20.00		502.8	1,208.5					170.4	36.9	673.1	1,245.4	0.0	0.0
25.00		491.6	1,181.6					170.4	36.9	661.9	1,218.5	0.0	0.0
30.00		480.3	1,154.8					170.4	36.9	650.7	1,191.7	0.0	0.0
35.00		477.8	1,128.0					170.4	36.9	648.1	1,164.9	0.0	0.0
40.00		483.5	1,101.1					176.7	36.9	660.2	1,138.0	0.0	0.0
45.00		328.6	1,074.3					183.1	36.9	511.7	1,111.2	0.0	0.0
46.75	Bot - Section 2	247.0	369.7					65.5	12.9	312.5	382.6	0.0	0.0
50.00		335.8	1,365.5					123.5	24.0	459.3	1,389.5	0.0	0.0
53.50	Top - Section 1	249.0	1,445.2					135.6	25.8	384.6	1,471.0	0.0	0.0
55.00		323.8	307.9					58.9	11.1	382.7	319.0	0.0	0.0
60.00		497.3	1,009.0					199.6	36.9	697.0	1,045.9	0.0	0.0
65.00		495.3	982.2					204.5	36.9	699.7	1,019.1	0.0	0.0
70.00		492.0	955.3					209.0	36.9	701.0	992.2	0.0	0.0
75.00		487.6	928.5					213.3	36.9	700.9	965.4	0.0	0.0
80.00		482.2	901.7					217.4	36.9	699.7	938.6	0.0	0.0
85.00		476.0	874.9					221.3	36.9	697.3	911.8	0.0	0.0
90.00		468.9	848.0					225.1	36.9	694.0	884.9	0.0	0.0
95.00	Bot - Section 3	372.1	821.2					228.7	36.9	600.8	858.1	0.0	0.0
98.00	Appertunance(s)	231.7	845.6	75.9	0.0	303.8	25.0	138.9	22.1	446.5	892.8	0.0	0.0
100.00		103.6	554.4					93.3	14.8	196.9	569.1	0.0	0.0
100.25	Top - Section 2	227.3	68.8					0.0	1.8	227.3	70.5	0.0	0.0
105.00		438.3	555.8					0.0	33.5	438.3	589.2	0.0	0.0
110.00		440.0	565.4					0.0	35.3	440.0	600.6	0.0	0.0
115.00		429.6	545.3					0.0	35.3	429.6	580.5	0.0	0.0
120.00		418.6	525.1					0.0	35.3	418.6	560.4	0.0	0.0
125.00		407.1	505.0					0.0	35.3	407.1	540.3	0.0	0.0
130.00	Bot - Section 4	368.4	484.9					0.0	35.3	368.4	520.2	0.0	0.0
134.25	Top - Section 3	196.9	664.7					0.0	30.0	196.9	694.6	0.0	0.0
135.00		219.7	46.3					0.0	5.3	219.7	51.6	0.0	0.0
140.00		374.5	301.2					0.0	35.3	374.5	336.5	0.0	0.0
145.00		361.2	287.8					0.0	35.3	361.2	323.1	0.0	0.0
150.00		246.1	274.4					0.0	35.3	246.1	309.7	0.0	0.0
152.00	Appertunance(s)	170.2	106.0	601.2	0.0	601.2	79.2	0.0	14.1	771.4	199.3	0.0	0.0
155.00		264.3	155.0					0.0	18.7	264.3	173.7	0.0	0.0
160.00		194.7	247.6					0.0	31.2	194.7	278.7	0.0	0.0
161.00	Appertunance(s)	63.1	47.9	23.6	0.0	23.6	3.0	0.0	6.2	86.8	57.1	0.0	0.0
162.00	Appertunance(s)	123.9	47.4	2,564.3	0.0	0.0	1,295.7	0.0	6.2	2,688.2	1,349.2	0.0	0.0
165.00		240.5	138.9					0.0	12.1	240.5	151.0	0.0	0.0
170.00		233.2	220.7					0.0	20.2	233.2	240.9	0.0	0.0
173.00	Appertunance(s)	140.3	126.0	7,440.3	0.0	-1,120.4	3,150.3	0.0	12.1	7,580.6	3,288.4	0.0	0.0
175.00		55.2	81.3					0.0	0.0	55.2	81.3	0.0	0.0
<b>Totals:</b>										30,418.0	34,724.3	0.00	0.00

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:50 AM

Customer: Verizon Wireless

Load Case: No Ice

85.00 mph Wind with No Ice

25 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	-30.183	-34.693	0.000	0.000	0.000	-3,340.975	0.000	0.000	0.000	0.000
5.00	-29.543	-33.307	0.000	0.000	0.000	-3,190.064	-0.063	0.000	0.063	-0.116
10.00	-28.909	-31.950	0.000	0.000	0.000	-3,042.354	-0.248	0.000	0.248	-0.234
15.00	-27.943	-30.504	0.000	0.000	0.000	-2,897.809	-0.558	0.000	0.558	-0.354
20.00	-27.323	-29.205	0.000	0.000	0.000	-2,758.096	-0.995	0.000	0.995	-0.476
25.00	-26.711	-27.935	0.000	0.000	0.000	-2,621.481	-1.560	0.000	1.560	-0.599
30.00	-26.106	-26.693	0.000	0.000	0.000	-2,487.927	-2.256	0.000	2.256	-0.725
35.00	-25.499	-25.480	0.000	0.000	0.000	-2,357.401	-3.084	0.000	3.084	-0.853
40.00	-24.876	-24.296	0.000	0.000	0.000	-2,229.907	-4.048	0.000	4.048	-0.983
45.00	-24.381	-23.156	0.000	0.000	0.000	-2,105.526	-5.150	0.000	5.150	-1.116
46.75	-24.088	-22.751	0.000	0.000	0.000	-2,062.860	-5.568	0.000	5.568	-1.164
50.00	-23.634	-21.333	0.000	0.000	0.000	-1,984.576	-6.392	0.000	6.392	-1.253
53.50	-23.240	-19.843	0.000	0.000	0.000	-1,901.859	-7.346	0.000	7.346	-1.349
55.00	-22.880	-19.498	0.000	0.000	0.000	-1,866.999	-7.777	0.000	7.777	-1.392
60.00	-22.200	-18.418	0.000	0.000	0.000	-1,752.601	-9.307	0.000	9.307	-1.525
65.00	-21.513	-17.368	0.000	0.000	0.000	-1,641.605	-10.976	0.000	10.976	-1.660
70.00	-20.822	-16.347	0.000	0.000	0.000	-1,534.041	-12.788	0.000	12.788	-1.797
75.00	-20.128	-15.356	0.000	0.000	0.000	-1,429.932	-14.745	0.000	14.745	-1.936
80.00	-19.431	-14.394	0.000	0.000	0.000	-1,329.295	-16.849	0.000	16.849	-2.078
85.00	-18.734	-13.462	0.000	0.000	0.000	-1,232.139	-19.101	0.000	19.101	-2.221
90.00	-18.038	-12.560	0.000	0.000	0.000	-1,138.468	-21.506	0.000	21.506	-2.367
95.00	-17.425	-11.692	0.000	0.000	0.000	-1,048.280	-24.063	0.000	24.063	-2.515
98.00	-16.954	-10.797	0.000	0.000	0.000	-995.701	-25.673	0.000	25.673	-2.606
100.0	-16.737	-10.228	0.000	0.000	0.000	-961.793	-26.777	0.000	26.777	-2.668
100.2	-16.520	-10.145	0.000	0.000	0.000	-957.609	-26.917	0.000	26.917	-2.676
105.0	-16.083	-9.530	0.000	0.000	0.000	-879.138	-29.653	0.000	29.653	-2.821
110.0	-15.643	-8.899	0.000	0.000	0.000	-798.725	-32.711	0.000	32.711	-3.015
115.0	-15.211	-8.291	0.000	0.000	0.000	-720.509	-35.973	0.000	35.973	-3.211
120.0	-14.787	-7.705	0.000	0.000	0.000	-644.454	-39.440	0.000	39.440	-3.408
125.0	-14.373	-7.142	0.000	0.000	0.000	-570.517	-43.113	0.000	43.113	-3.604
130.0	-13.992	-6.603	0.000	0.000	0.000	-498.655	-46.990	0.000	46.990	-3.799
134.2	-13.758	-5.900	0.000	0.000	0.000	-439.190	-50.445	0.000	50.445	-3.963
135.0	-13.551	-5.828	0.000	0.000	0.000	-428.871	-51.070	0.000	51.070	-3.993
140.0	-13.178	-5.459	0.000	0.000	0.000	-361.115	-55.394	0.000	55.394	-4.259
145.0	-12.815	-5.111	0.000	0.000	0.000	-295.224	-59.989	0.000	59.989	-4.511
150.0	-12.558	-4.787	0.000	0.000	0.000	-231.148	-64.837	0.000	64.837	-4.744
152.0	-11.782	-4.631	0.000	0.000	0.000	-205.430	-66.842	0.000	66.842	-4.833
155.0	-11.515	-4.451	0.000	0.000	0.000	-170.086	-69.917	0.000	69.917	-4.956
160.0	-11.304	-4.172	0.000	0.000	0.000	-112.510	-75.197	0.000	75.197	-5.124
161.0	-11.214	-4.117	0.000	0.000	0.000	-101.183	-76.272	0.000	76.272	-5.154
162.0	-8.418	-3.008	0.000	0.000	0.000	-89.969	-77.354	0.000	77.354	-5.182
165.0	-8.169	-2.869	0.000	0.000	0.000	-64.715	-80.630	0.000	80.630	-5.252
170.0	-7.916	-2.645	0.000	0.000	0.000	-23.873	-86.169	0.000	86.169	-5.326
173.0	-0.062	-0.076	0.000	0.000	0.000	-0.125	-89.518	0.000	89.518	-5.340
175.0	-0.055	0.000	0.000	0.000	0.000	0.000	-91.752	0.000	91.752	-5.340

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:50 AM

Customer: Verizon Wireless

Load Case: No Ice

85.00 mph Wind with No Ice

25 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	0.45	0.79	0.00	0.00	0.00	32.92	33.40	48.4	0.0	0.690
5.00	0.44	0.79	0.00	0.00	0.00	32.77	33.24	48.9	0.0	0.679
10.00	0.44	0.79	0.00	0.00	0.00	32.61	33.08	49.5	0.0	0.669
15.00	0.42	0.78	0.00	0.00	0.00	32.45	32.90	50.0	0.0	0.658
20.00	0.42	0.78	0.00	0.00	0.00	32.29	32.73	50.5	0.0	0.648
25.00	0.41	0.78	0.00	0.00	0.00	32.12	32.56	51.1	0.0	0.638
30.00	0.40	0.78	0.00	0.00	0.00	31.94	32.37	51.6	0.0	0.627
35.00	0.39	0.78	0.00	0.00	0.00	31.74	32.16	52.0	0.0	0.619
40.00	0.38	0.78	0.00	0.00	0.00	31.53	31.94	52.0	0.0	0.614
45.00	0.37	0.79	0.00	0.00	0.00	31.30	31.70	52.0	0.0	0.610
46.75	0.37	0.79	0.00	0.00	0.00	31.22	31.62	52.0	0.0	0.608
50.00	0.35	0.78	0.00	0.00	0.00	31.06	31.44	52.0	0.0	0.605
53.50	0.33	0.77	0.00	0.00	0.00	29.98	30.33	52.0	0.0	0.584
55.00	0.32	0.77	0.00	0.00	0.00	29.89	30.25	52.0	0.0	0.582
60.00	0.31	0.76	0.00	0.00	0.00	29.60	29.94	52.0	0.0	0.576
65.00	0.31	0.76	0.00	0.00	0.00	29.29	29.62	52.0	0.0	0.570
70.00	0.30	0.76	0.00	0.00	0.00	28.96	29.28	52.0	0.0	0.563
75.00	0.29	0.75	0.00	0.00	0.00	28.61	28.92	52.0	0.0	0.556
80.00	0.28	0.75	0.00	0.00	0.00	28.23	28.53	52.0	0.0	0.549
85.00	0.27	0.75	0.00	0.00	0.00	27.83	28.12	52.0	0.0	0.541
90.00	0.26	0.74	0.00	0.00	0.00	27.40	27.69	52.0	0.0	0.533
95.00	0.25	0.74	0.00	0.00	0.00	26.94	27.22	52.0	0.0	0.524
98.00	0.23	0.73	0.00	0.00	0.00	26.65	26.91	52.0	0.0	0.518
100.00	0.22	0.73	0.00	0.00	0.00	26.46	26.71	52.0	0.0	0.514
100.25	0.29	0.95	0.00	0.00	0.00	33.99	34.32	52.0	0.0	0.660
105.00	0.28	0.96	0.00	0.00	0.00	33.32	33.64	52.0	0.0	0.647
110.00	0.27	0.97	0.00	0.00	0.00	32.52	32.83	52.0	0.0	0.632
115.00	0.26	0.97	0.00	0.00	0.00	31.59	31.90	52.0	0.0	0.614
120.00	0.25	0.98	0.00	0.00	0.00	30.51	30.81	52.0	0.0	0.593
125.00	0.25	1.00	0.00	0.00	0.00	29.26	29.56	52.0	0.0	0.569
130.00	0.24	1.01	0.00	0.00	0.00	27.80	28.09	52.0	0.0	0.540
134.25	0.32	1.52	0.00	0.00	0.00	38.21	38.62	49.7	0.0	0.778
135.00	0.32	1.51	0.00	0.00	0.00	37.80	38.21	49.8	0.0	0.767
140.00	0.32	1.53	0.00	0.00	0.00	34.80	35.22	50.9	0.0	0.692
145.00	0.31	1.56	0.00	0.00	0.00	31.24	31.67	51.9	0.0	0.610
150.00	0.30	1.61	0.00	0.00	0.00	26.98	27.43	52.0	0.0	0.528
152.00	0.30	1.54	0.00	0.00	0.00	24.98	25.42	52.0	0.0	0.489
155.00	0.30	1.55	0.00	0.00	0.00	22.01	22.47	52.0	0.0	0.432
160.00	0.29	1.61	0.00	0.00	0.00	16.24	16.76	52.0	0.0	0.322
161.00	0.29	1.61	0.00	0.00	0.00	14.93	15.48	52.0	0.0	0.298
162.00	0.22	1.23	0.00	0.00	0.00	13.58	13.96	52.0	0.0	0.269
165.00	0.21	1.23	0.00	0.00	0.00	10.48	10.90	52.0	0.0	0.210
170.00	0.21	1.27	0.00	0.00	0.00	4.37	5.08	52.0	0.0	0.098
173.00	0.01	0.01	0.00	0.00	0.00	0.02	0.04	52.0	0.0	0.001
175.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	52.0	0.0	0.000

**Load Case: Ice**

73.61 mph Wind with Ice

25 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		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		206.4	0.0					0.0	0.0	206.4	0.0	0.0	0.0
5.00		408.7	1,486.0					0.0	35.4	408.7	1,521.4	0.0	0.0
10.00		400.2	1,455.1					0.0	35.4	400.2	1,490.5	0.0	0.0
15.00	Appertunance(s)	391.8	1,424.2	265.1	0.0	0.0	211.7	0.0	35.4	657.0	1,671.3	0.0	0.0
20.00		383.4	1,393.3					0.0	35.3	383.4	1,428.5	0.0	0.0
25.00		375.0	1,362.4					0.0	35.3	375.0	1,397.6	0.0	0.0
30.00		366.6	1,331.4					0.0	35.3	366.6	1,366.7	0.0	0.0
35.00		364.8	1,300.5					0.0	35.3	364.8	1,335.8	0.0	0.0
40.00		369.3	1,269.6					0.0	35.3	369.3	1,304.8	0.0	0.0
45.00		251.1	1,238.7					0.0	35.3	251.1	1,273.9	0.0	0.0
46.75	Bot - Section 2	188.8	426.7					0.0	12.3	188.8	439.0	0.0	0.0
50.00		256.7	1,471.2					0.0	22.9	256.7	1,494.1	0.0	0.0
53.50	Top - Section 1	190.4	1,557.0					0.0	24.7	190.4	1,581.7	0.0	0.0
55.00		247.6	355.5					0.0	10.6	247.6	366.1	0.0	0.0
60.00		380.5	1,163.4					0.0	35.3	380.5	1,198.7	0.0	0.0
65.00		379.1	1,132.5					0.0	35.3	379.1	1,167.7	0.0	0.0
70.00		376.8	1,101.6					0.0	35.3	376.8	1,136.8	0.0	0.0
75.00		373.7	1,070.7					0.0	35.3	373.7	1,105.9	0.0	0.0
80.00		369.8	1,039.7					0.0	35.3	369.8	1,075.0	0.0	0.0
85.00		365.3	1,008.8					0.0	35.3	365.3	1,044.1	0.0	0.0
90.00		360.1	977.9					0.0	35.3	360.1	1,013.1	0.0	0.0
95.00	Bot - Section 3	285.9	947.0					0.0	35.3	285.9	982.2	0.0	0.0
98.00	Appertunance(s)	178.1	920.7	68.9	0.0	275.7	38.2	0.0	21.1	247.0	980.1	0.0	0.0
100.00		79.7	603.7					0.0	14.1	79.7	617.8	0.0	0.0
100.25	Top - Section 2	174.8	74.9					0.0	1.8	174.8	76.7	0.0	0.0
105.00		337.3	669.1					0.0	33.5	337.3	702.6	0.0	0.0
110.00		338.9	680.6					0.0	35.3	338.9	715.9	0.0	0.0
115.00		331.3	656.4					0.0	35.3	331.3	691.7	0.0	0.0
120.00		323.1	632.2					0.0	35.3	323.1	667.5	0.0	0.0
125.00		314.6	608.0					0.0	35.3	314.6	643.3	0.0	0.0
130.00	Bot - Section 4	284.9	583.8					0.0	35.3	284.9	619.1	0.0	0.0
134.25	Top - Section 3	152.4	746.8					0.0	30.0	152.4	776.7	0.0	0.0
135.00		170.2	60.7					0.0	5.3	170.2	66.0	0.0	0.0
140.00		290.5	393.1					0.0	35.3	290.5	428.4	0.0	0.0
145.00		280.5	375.6					0.0	35.3	280.5	410.9	0.0	0.0
150.00		191.4	358.1					0.0	35.3	191.4	393.4	0.0	0.0
152.00	Appertunance(s)	132.6	138.8	510.2	0.0	510.2	159.4	0.0	14.1	642.7	312.3	0.0	0.0
155.00		206.1	202.8					0.0	18.7	206.1	221.4	0.0	0.0
160.00		152.0	323.1					0.0	31.2	152.0	354.3	0.0	0.0
161.00	Appertunance(s)	49.4	62.8	28.8	0.0	28.8	7.5	0.0	6.2	78.2	76.6	0.0	0.0
162.00	Appertunance(s)	96.9	62.1	2,214.6	0.0	0.0	1,737.6	0.0	6.2	2,311.5	1,805.9	0.0	0.0
165.00		188.4	181.8					0.0	12.1	188.4	193.9	0.0	0.0
170.00		183.0	288.1					0.0	20.2	183.0	308.3	0.0	0.0
173.00	Appertunance(s)	110.3	165.0	6,929.2	0.0	-778.4	4,173.6	0.0	12.1	7,039.6	4,350.7	0.0	0.0
175.00		43.4	106.6					0.0	0.0	43.4	106.6	0.0	0.0
<b>Totals:</b>										21,918.8	40,915.0	0.00	0.00

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:51 AM

Customer: Verizon Wireless

**Load Case:** Ice

73.61 mph Wind with Ice

25 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	-21.746	-40.897	0.000	0.000	0.000	-2,688.370	0.000	0.000	0.000	0.000
5.00	-21.401	-39.340	0.000	0.000	0.000	-2,579.641	-0.051	0.000	0.051	-0.094
10.00	-21.061	-37.815	0.000	0.000	0.000	-2,472.637	-0.200	0.000	0.200	-0.189
15.00	-20.459	-36.112	0.000	0.000	0.000	-2,367.333	-0.451	0.000	0.451	-0.287
20.00	-20.129	-34.650	0.000	0.000	0.000	-2,265.038	-0.805	0.000	0.805	-0.387
25.00	-19.803	-33.220	0.000	0.000	0.000	-2,164.397	-1.265	0.000	1.265	-0.489
30.00	-19.482	-31.821	0.000	0.000	0.000	-2,065.385	-1.833	0.000	1.833	-0.593
35.00	-19.159	-30.453	0.000	0.000	0.000	-1,967.978	-2.511	0.000	2.511	-0.699
40.00	-18.829	-29.117	0.000	0.000	0.000	-1,872.184	-3.302	0.000	3.302	-0.808
45.00	-18.595	-27.823	0.000	0.000	0.000	-1,778.041	-4.208	0.000	4.208	-0.920
46.75	-18.427	-27.368	0.000	0.000	0.000	-1,745.500	-4.553	0.000	4.553	-0.960
50.00	-18.180	-25.854	0.000	0.000	0.000	-1,685.613	-5.234	0.000	5.234	-1.036
53.50	-17.985	-24.257	0.000	0.000	0.000	-1,621.985	-6.024	0.000	6.024	-1.118
55.00	-17.761	-23.873	0.000	0.000	0.000	-1,595.008	-6.381	0.000	6.381	-1.154
60.00	-17.401	-22.648	0.000	0.000	0.000	-1,506.201	-7.651	0.000	7.651	-1.268
65.00	-17.039	-21.454	0.000	0.000	0.000	-1,419.196	-9.041	0.000	9.041	-1.384
70.00	-16.677	-20.292	0.000	0.000	0.000	-1,334.001	-10.555	0.000	10.555	-1.503
75.00	-16.314	-19.162	0.000	0.000	0.000	-1,250.619	-12.195	0.000	12.195	-1.625
80.00	-15.952	-18.064	0.000	0.000	0.000	-1,169.051	-13.963	0.000	13.963	-1.749
85.00	-15.592	-16.997	0.000	0.000	0.000	-1,089.291	-15.862	0.000	15.862	-1.875
90.00	-15.234	-15.962	0.000	0.000	0.000	-1,011.332	-17.895	0.000	17.895	-2.004
95.00	-14.941	-14.963	0.000	0.000	0.000	-935.163	-20.065	0.000	20.065	-2.136
98.00	-14.673	-13.975	0.000	0.000	0.000	-890.066	-21.433	0.000	21.433	-2.218
100.0	-14.577	-13.353	0.000	0.000	0.000	-860.720	-22.374	0.000	22.374	-2.273
100.2	-14.415	-13.266	0.000	0.000	0.000	-857.076	-22.493	0.000	22.493	-2.280
105.0	-14.083	-12.540	0.000	0.000	0.000	-788.606	-24.828	0.000	24.828	-2.410
110.0	-13.749	-11.798	0.000	0.000	0.000	-718.193	-27.445	0.000	27.445	-2.584
115.0	-13.420	-11.081	0.000	0.000	0.000	-649.449	-30.246	0.000	30.246	-2.761
120.0	-13.097	-10.390	0.000	0.000	0.000	-582.348	-33.232	0.000	33.232	-2.938
125.0	-12.779	-9.725	0.000	0.000	0.000	-516.867	-36.404	0.000	36.404	-3.116
130.0	-12.485	-9.087	0.000	0.000	0.000	-452.975	-39.761	0.000	39.761	-3.292
134.2	-12.300	-8.302	0.000	0.000	0.000	-399.913	-42.759	0.000	42.759	-3.442
135.0	-12.146	-8.217	0.000	0.000	0.000	-390.688	-43.302	0.000	43.302	-3.469
140.0	-11.862	-7.759	0.000	0.000	0.000	-329.957	-47.066	0.000	47.066	-3.712
145.0	-11.583	-7.322	0.000	0.000	0.000	-270.650	-51.077	0.000	51.077	-3.942
150.0	-11.382	-6.915	0.000	0.000	0.000	-212.736	-55.321	0.000	55.321	-4.156
152.0	-10.729	-6.632	0.000	0.000	0.000	-189.463	-57.079	0.000	57.079	-4.238
155.0	-10.523	-6.401	0.000	0.000	0.000	-157.275	-59.778	0.000	59.778	-4.352
160.0	-10.353	-6.044	0.000	0.000	0.000	-104.663	-64.421	0.000	64.421	-4.508
161.0	-10.272	-5.969	0.000	0.000	0.000	-94.281	-65.367	0.000	65.367	-4.536
162.0	-7.828	-4.346	0.000	0.000	0.000	-84.009	-66.320	0.000	66.320	-4.562
165.0	-7.630	-4.158	0.000	0.000	0.000	-60.526	-69.206	0.000	69.206	-4.627
170.0	-7.425	-3.861	0.000	0.000	0.000	-22.378	-74.090	0.000	74.090	-4.696
173.0	-0.052	-0.103	0.000	0.000	0.000	-0.104	-77.044	0.000	77.044	-4.710
175.0	-0.043	0.000	0.000	0.000	0.000	0.000	-79.015	0.000	79.015	-4.710



Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:51 AM

Customer: Verizon Wireless

**Load Case: Ice**

73.61 mph Wind with Ice

25 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	0.53	0.57	0.00	0.00	0.00	26.49	27.04	48.4	0.0	0.558
5.00	0.52	0.58	0.00	0.00	0.00	26.50	27.04	48.9	0.0	0.552
10.00	0.52	0.58	0.00	0.00	0.00	26.51	27.04	49.5	0.0	0.547
15.00	0.50	0.57	0.00	0.00	0.00	26.51	27.03	50.0	0.0	0.541
20.00	0.49	0.58	0.00	0.00	0.00	26.52	27.03	50.5	0.0	0.535
25.00	0.48	0.58	0.00	0.00	0.00	26.52	27.02	51.1	0.0	0.529
30.00	0.47	0.59	0.00	0.00	0.00	26.51	27.01	51.6	0.0	0.524
35.00	0.46	0.59	0.00	0.00	0.00	26.50	26.98	52.0	0.0	0.519
40.00	0.46	0.59	0.00	0.00	0.00	26.47	26.95	52.0	0.0	0.518
45.00	0.45	0.60	0.00	0.00	0.00	26.43	26.90	52.0	0.0	0.518
46.75	0.44	0.60	0.00	0.00	0.00	26.42	26.88	52.0	0.0	0.517
50.00	0.43	0.60	0.00	0.00	0.00	26.38	26.83	52.0	0.0	0.516
53.50	0.40	0.60	0.00	0.00	0.00	25.56	25.99	52.0	0.0	0.500
55.00	0.40	0.60	0.00	0.00	0.00	25.54	25.96	52.0	0.0	0.499
60.00	0.39	0.60	0.00	0.00	0.00	25.44	25.85	52.0	0.0	0.497
65.00	0.38	0.60	0.00	0.00	0.00	25.32	25.72	52.0	0.0	0.495
70.00	0.37	0.61	0.00	0.00	0.00	25.18	25.57	52.0	0.0	0.492
75.00	0.36	0.61	0.00	0.00	0.00	25.02	25.40	52.0	0.0	0.489
80.00	0.35	0.62	0.00	0.00	0.00	24.83	25.20	52.0	0.0	0.485
85.00	0.34	0.62	0.00	0.00	0.00	24.60	24.96	52.0	0.0	0.480
90.00	0.33	0.63	0.00	0.00	0.00	24.34	24.69	52.0	0.0	0.475
95.00	0.32	0.63	0.00	0.00	0.00	24.04	24.38	52.0	0.0	0.469
98.00	0.30	0.64	0.00	0.00	0.00	23.82	24.15	52.0	0.0	0.465
100.00	0.29	0.64	0.00	0.00	0.00	23.68	23.99	52.0	0.0	0.462
100.25	0.38	0.83	0.00	0.00	0.00	30.42	30.84	52.0	0.0	0.593
105.00	0.37	0.84	0.00	0.00	0.00	29.89	30.30	52.0	0.0	0.583
110.00	0.36	0.85	0.00	0.00	0.00	29.24	29.63	52.0	0.0	0.570
115.00	0.35	0.86	0.00	0.00	0.00	28.47	28.86	52.0	0.0	0.555
120.00	0.34	0.87	0.00	0.00	0.00	27.57	27.96	52.0	0.0	0.538
125.00	0.33	0.89	0.00	0.00	0.00	26.51	26.89	52.0	0.0	0.517
130.00	0.33	0.90	0.00	0.00	0.00	25.25	25.63	52.0	0.0	0.493
134.25	0.46	1.36	0.00	0.00	0.00	34.79	35.32	49.7	0.0	0.711
135.00	0.45	1.35	0.00	0.00	0.00	34.43	34.97	49.8	0.0	0.702
140.00	0.45	1.38	0.00	0.00	0.00	31.80	32.34	50.9	0.0	0.636
145.00	0.44	1.41	0.00	0.00	0.00	28.64	29.19	51.9	0.0	0.562
150.00	0.44	1.46	0.00	0.00	0.00	24.83	25.40	52.0	0.0	0.489
152.00	0.43	1.40	0.00	0.00	0.00	23.03	23.59	52.0	0.0	0.454
155.00	0.43	1.42	0.00	0.00	0.00	20.36	20.93	52.0	0.0	0.403
160.00	0.43	1.47	0.00	0.00	0.00	15.10	15.74	52.0	0.0	0.303
161.00	0.43	1.48	0.00	0.00	0.00	13.91	14.57	52.0	0.0	0.280
162.00	0.31	1.14	0.00	0.00	0.00	12.68	13.15	52.0	0.0	0.253
165.00	0.31	1.15	0.00	0.00	0.00	9.80	10.30	52.0	0.0	0.198
170.00	0.31	1.19	0.00	0.00	0.00	4.09	4.86	52.0	0.0	0.093
173.00	0.01	0.01	0.00	0.00	0.00	0.02	0.03	52.0	0.0	0.001
175.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	52.0	0.0	0.000

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:51 AM

Customer: Verizon Wireless

**Load Case: Twist/Sway**

50.00 mph Wind with No Ice

24 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		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		93.8	0.0					0.0	0.0	93.8	0.0	0.0	0.0
5.00		185.6	1,289.0					58.9	37.1	244.6	1,326.0	0.0	0.0
10.00		181.7	1,262.1					58.9	37.1	240.7	1,299.2	0.0	0.0
15.00	Appertunance(s)	177.9	1,235.3	117.4	0.0	0.0	120.0	58.9	37.1	354.2	1,392.4	0.0	0.0
20.00		174.0	1,208.5					58.9	36.9	232.9	1,245.4	0.0	0.0
25.00		170.1	1,181.6					58.9	36.9	229.0	1,218.5	0.0	0.0
30.00		166.2	1,154.8					58.9	36.9	225.2	1,191.7	0.0	0.0
35.00		165.3	1,128.0					58.9	36.9	224.3	1,164.9	0.0	0.0
40.00		167.3	1,101.1					61.1	36.9	228.4	1,138.0	0.0	0.0
45.00		113.7	1,074.3					63.4	36.9	177.1	1,111.2	0.0	0.0
46.75	Bot - Section 2	85.5	369.7					22.7	12.9	108.1	382.6	0.0	0.0
50.00		116.2	1,365.5					42.7	24.0	158.9	1,389.5	0.0	0.0
53.50	Top - Section 1	86.2	1,445.2					46.9	25.8	133.1	1,471.0	0.0	0.0
55.00		112.0	307.9					20.4	11.1	132.4	319.0	0.0	0.0
60.00		172.1	1,009.0					69.1	36.9	241.2	1,045.9	0.0	0.0
65.00		171.4	982.2					70.7	36.9	242.1	1,019.1	0.0	0.0
70.00		170.2	955.3					72.3	36.9	242.6	992.2	0.0	0.0
75.00		168.7	928.5					73.8	36.9	242.5	965.4	0.0	0.0
80.00		166.9	901.7					75.2	36.9	242.1	938.6	0.0	0.0
85.00		164.7	874.9					76.6	36.9	241.3	911.8	0.0	0.0
90.00		162.2	848.0					77.9	36.9	240.1	884.9	0.0	0.0
95.00	Bot - Section 3	128.7	821.2					79.1	36.9	207.9	858.1	0.0	0.0
98.00	Appertunance(s)	80.2	845.6	26.3	0.0	105.1	25.0	48.1	22.1	154.5	892.8	0.0	0.0
100.00		35.9	554.4					32.3	14.8	68.1	569.1	0.0	0.0
100.25	Top - Section 2	78.6	68.8					0.0	1.8	78.6	70.5	0.0	0.0
105.00		151.7	555.8					0.0	33.5	151.7	589.2	0.0	0.0
110.00		152.2	565.4					0.0	35.3	152.2	600.6	0.0	0.0
115.00		148.7	545.3					0.0	35.3	148.7	580.5	0.0	0.0
120.00		144.9	525.1					0.0	35.3	144.9	560.4	0.0	0.0
125.00		140.9	505.0					0.0	35.3	140.9	540.3	0.0	0.0
130.00	Bot - Section 4	127.5	484.9					0.0	35.3	127.5	520.2	0.0	0.0
134.25	Top - Section 3	68.1	664.7					0.0	30.0	68.1	694.6	0.0	0.0
135.00		76.0	46.3					0.0	5.3	76.0	51.6	0.0	0.0
140.00		129.6	301.2					0.0	35.3	129.6	336.5	0.0	0.0
145.00		125.0	287.8					0.0	35.3	125.0	323.1	0.0	0.0
150.00		85.2	274.4					0.0	35.3	85.2	309.7	0.0	0.0
152.00	Appertunance(s)	58.9	106.0	208.0	0.0	208.0	79.2	0.0	14.1	266.9	199.3	0.0	0.0
155.00		91.4	155.0					0.0	18.7	91.4	173.7	0.0	0.0
160.00		67.4	247.6					0.0	31.2	67.4	278.7	0.0	0.0
161.00	Appertunance(s)	21.8	47.9	8.2	0.0	8.2	3.0	0.0	6.2	30.0	57.1	0.0	0.0
162.00	Appertunance(s)	42.9	47.4	887.3	0.0	0.0	1,295.7	0.0	6.2	930.2	1,349.2	0.0	0.0
165.00		83.2	138.9					0.0	12.1	83.2	151.0	0.0	0.0
170.00		80.7	220.7					0.0	20.2	80.7	240.9	0.0	0.0
173.00	Appertunance(s)	48.5	126.0	2,574.5	0.0	-387.7	3,150.3	0.0	12.1	2,623.0	3,288.4	0.0	0.0
175.00		19.1	81.3					0.0	0.0	19.1	81.3	0.0	0.0
<b>Totals:</b>										10,525.2	34,724.3	0.00	0.00

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:53 AM

Customer: Verizon Wireless

**Load Case:** Twist/Sway

50.00 mph Wind with No Ice

24 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	-10.443	-34.721	0.000	0.000	0.000	-1,156.912	0.000	0.000	0.000	0.000
5.00	-10.222	-33.387	0.000	0.000	0.000	-1,104.697	-0.022	0.000	0.022	-0.040
10.00	-10.003	-32.081	0.000	0.000	0.000	-1,053.589	-0.086	0.000	0.086	-0.081
15.00	-9.669	-30.683	0.000	0.000	0.000	-1,003.576	-0.193	0.000	0.193	-0.123
20.00	-9.454	-29.431	0.000	0.000	0.000	-955.234	-0.345	0.000	0.345	-0.165
25.00	-9.243	-28.206	0.000	0.000	0.000	-907.963	-0.540	0.000	0.540	-0.208
30.00	-9.033	-27.008	0.000	0.000	0.000	-861.751	-0.781	0.000	0.781	-0.251
35.00	-8.824	-25.838	0.000	0.000	0.000	-816.585	-1.068	0.000	1.068	-0.296
40.00	-8.609	-24.694	0.000	0.000	0.000	-772.466	-1.402	0.000	1.402	-0.341
45.00	-8.437	-23.579	0.000	0.000	0.000	-729.424	-1.784	0.000	1.784	-0.386
46.75	-8.336	-23.194	0.000	0.000	0.000	-714.659	-1.928	0.000	1.928	-0.403
50.00	-8.179	-21.801	0.000	0.000	0.000	-687.568	-2.214	0.000	2.214	-0.434
53.50	-8.043	-20.328	0.000	0.000	0.000	-658.941	-2.544	0.000	2.544	-0.467
55.00	-7.919	-20.006	0.000	0.000	0.000	-646.876	-2.694	0.000	2.694	-0.482
60.00	-7.684	-18.956	0.000	0.000	0.000	-607.283	-3.223	0.000	3.223	-0.528
65.00	-7.447	-17.933	0.000	0.000	0.000	-568.866	-3.802	0.000	3.802	-0.575
70.00	-7.208	-16.937	0.000	0.000	0.000	-531.633	-4.430	0.000	4.430	-0.622
75.00	-6.968	-15.969	0.000	0.000	0.000	-495.595	-5.108	0.000	5.108	-0.671
80.00	-6.727	-15.027	0.000	0.000	0.000	-460.756	-5.836	0.000	5.836	-0.720
85.00	-6.487	-14.113	0.000	0.000	0.000	-427.119	-6.617	0.000	6.617	-0.770
90.00	-6.246	-13.226	0.000	0.000	0.000	-394.686	-7.450	0.000	7.450	-0.820
95.00	-6.034	-12.367	0.000	0.000	0.000	-363.456	-8.337	0.000	8.337	-0.871
98.00	-5.871	-11.474	0.000	0.000	0.000	-345.248	-8.894	0.000	8.894	-0.903
100.0	-5.797	-10.905	0.000	0.000	0.000	-333.506	-9.277	0.000	9.277	-0.924
100.2	-5.722	-10.833	0.000	0.000	0.000	-332.056	-9.326	0.000	9.326	-0.927
105.0	-5.571	-10.240	0.000	0.000	0.000	-304.878	-10.274	0.000	10.274	-0.977
110.0	-5.420	-9.636	0.000	0.000	0.000	-277.023	-11.334	0.000	11.334	-1.045
115.0	-5.271	-9.052	0.000	0.000	0.000	-249.926	-12.465	0.000	12.465	-1.113
120.0	-5.125	-8.489	0.000	0.000	0.000	-223.572	-13.667	0.000	13.667	-1.181
125.0	-4.982	-7.946	0.000	0.000	0.000	-197.948	-14.941	0.000	14.941	-1.249
130.0	-4.851	-7.423	0.000	0.000	0.000	-173.039	-16.285	0.000	16.285	-1.317
134.2	-4.771	-6.728	0.000	0.000	0.000	-152.422	-17.484	0.000	17.484	-1.374
135.0	-4.699	-6.674	0.000	0.000	0.000	-148.844	-17.700	0.000	17.700	-1.384
140.0	-4.571	-6.333	0.000	0.000	0.000	-125.347	-19.200	0.000	19.200	-1.476
145.0	-4.447	-6.007	0.000	0.000	0.000	-102.490	-20.795	0.000	20.795	-1.564
150.0	-4.359	-5.696	0.000	0.000	0.000	-80.256	-22.477	0.000	22.477	-1.645
152.0	-4.090	-5.502	0.000	0.000	0.000	-71.331	-23.173	0.000	23.173	-1.676
155.0	-3.998	-5.327	0.000	0.000	0.000	-59.063	-24.240	0.000	24.240	-1.718
160.0	-3.925	-5.048	0.000	0.000	0.000	-39.073	-26.073	0.000	26.073	-1.777
161.0	-3.894	-4.992	0.000	0.000	0.000	-35.140	-26.446	0.000	26.446	-1.787
162.0	-2.923	-3.671	0.000	0.000	0.000	-31.246	-26.822	0.000	26.822	-1.797
165.0	-2.837	-3.522	0.000	0.000	0.000	-22.477	-27.959	0.000	27.959	-1.821
170.0	-2.750	-3.283	0.000	0.000	0.000	-8.292	-29.882	0.000	29.882	-1.847
173.0	-0.022	-0.081	0.000	0.000	0.000	-0.043	-31.045	0.000	31.045	-1.852
175.0	-0.019	0.000	0.000	0.000	0.000	0.000	-31.821	0.000	31.821	-1.852

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:53 AM

Customer: Verizon Wireless

Load Case: Twist/Sway

50.00 mph Wind with No Ice

24 Iterations

Gust Response Factor : 1.69

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Calculated Stresses

Seg Elev (ft)	Applied Stresses							Combined (ksi)	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)					
0.00	0.45	0.27	0.00	0.00	0.00	11.40	11.86	48.4	0.0	0.245	
5.00	0.45	0.27	0.00	0.00	0.00	11.35	11.80	48.9	0.0	0.241	
10.00	0.44	0.27	0.00	0.00	0.00	11.29	11.74	49.5	0.0	0.237	
15.00	0.43	0.27	0.00	0.00	0.00	11.24	11.67	50.0	0.0	0.233	
20.00	0.42	0.27	0.00	0.00	0.00	11.18	11.61	50.5	0.0	0.230	
25.00	0.41	0.27	0.00	0.00	0.00	11.13	11.55	51.1	0.0	0.226	
30.00	0.40	0.27	0.00	0.00	0.00	11.06	11.48	51.6	0.0	0.222	
35.00	0.39	0.27	0.00	0.00	0.00	11.00	11.40	52.0	0.0	0.219	
40.00	0.39	0.27	0.00	0.00	0.00	10.92	11.32	52.0	0.0	0.218	
45.00	0.38	0.27	0.00	0.00	0.00	10.84	11.23	52.0	0.0	0.216	
46.75	0.38	0.27	0.00	0.00	0.00	10.82	11.20	52.0	0.0	0.215	
50.00	0.36	0.27	0.00	0.00	0.00	10.76	11.13	52.0	0.0	0.214	
53.50	0.34	0.27	0.00	0.00	0.00	10.39	10.73	52.0	0.0	0.206	
55.00	0.33	0.27	0.00	0.00	0.00	10.36	10.70	52.0	0.0	0.206	
60.00	0.32	0.26	0.00	0.00	0.00	10.26	10.59	52.0	0.0	0.204	
65.00	0.31	0.26	0.00	0.00	0.00	10.15	10.47	52.0	0.0	0.202	
70.00	0.31	0.26	0.00	0.00	0.00	10.04	10.35	52.0	0.0	0.199	
75.00	0.30	0.26	0.00	0.00	0.00	9.91	10.22	52.0	0.0	0.197	
80.00	0.29	0.26	0.00	0.00	0.00	9.78	10.08	52.0	0.0	0.194	
85.00	0.28	0.26	0.00	0.00	0.00	9.65	9.94	52.0	0.0	0.191	
90.00	0.27	0.26	0.00	0.00	0.00	9.50	9.78	52.0	0.0	0.188	
95.00	0.26	0.26	0.00	0.00	0.00	9.34	9.61	52.0	0.0	0.185	
98.00	0.25	0.25	0.00	0.00	0.00	9.24	9.50	52.0	0.0	0.183	
100.00	0.24	0.25	0.00	0.00	0.00	9.17	9.42	52.0	0.0	0.181	
100.25	0.31	0.33	0.00	0.00	0.00	11.79	12.11	52.0	0.0	0.233	
105.00	0.30	0.33	0.00	0.00	0.00	11.56	11.87	52.0	0.0	0.228	
110.00	0.30	0.33	0.00	0.00	0.00	11.28	11.59	52.0	0.0	0.223	
115.00	0.29	0.34	0.00	0.00	0.00	10.96	11.26	52.0	0.0	0.217	
120.00	0.28	0.34	0.00	0.00	0.00	10.59	10.88	52.0	0.0	0.209	
125.00	0.27	0.35	0.00	0.00	0.00	10.15	10.44	52.0	0.0	0.201	
130.00	0.27	0.35	0.00	0.00	0.00	9.65	9.93	52.0	0.0	0.191	
134.25	0.37	0.53	0.00	0.00	0.00	13.26	13.66	49.7	0.0	0.275	
135.00	0.37	0.52	0.00	0.00	0.00	13.12	13.52	49.8	0.0	0.271	
140.00	0.37	0.53	0.00	0.00	0.00	12.08	12.48	50.9	0.0	0.245	
145.00	0.36	0.54	0.00	0.00	0.00	10.85	11.25	51.9	0.0	0.217	
150.00	0.36	0.56	0.00	0.00	0.00	9.37	9.78	52.0	0.0	0.188	
152.00	0.36	0.53	0.00	0.00	0.00	8.67	9.08	52.0	0.0	0.175	
155.00	0.36	0.54	0.00	0.00	0.00	7.64	8.05	52.0	0.0	0.155	
160.00	0.36	0.56	0.00	0.00	0.00	5.64	6.07	52.0	0.0	0.117	
161.00	0.36	0.56	0.00	0.00	0.00	5.19	5.63	52.0	0.0	0.108	
162.00	0.27	0.43	0.00	0.00	0.00	4.72	5.04	52.0	0.0	0.097	
165.00	0.26	0.43	0.00	0.00	0.00	3.64	3.97	52.0	0.0	0.076	
170.00	0.26	0.44	0.00	0.00	0.00	1.52	1.93	52.0	0.0	0.037	
173.00	0.01	0.00	0.00	0.00	0.00	0.01	0.02	52.0	0.0	0.000	
175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	52.0	0.0	0.000	

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:53 AM

Customer: Verizon Wireless

**Analysis Summary**

Load Case	Reactions						Max Stresses			
	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	30.2	0.00	34.69	0.00	0.00	3340.97	38.62	49.7	134.25	0.778
Ice	21.7	0.00	40.90	0.00	0.00	2688.37	35.32	49.7	134.25	0.711
Twist/Sway	10.4	0.00	34.72	0.00	0.00	1156.91	13.66	49.7	134.25	0.275

Site Number: 370625

Code: TIA/EIA-222-F

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Site Name: Old Saybrook, CT

Engineering Number: 63601422

10/7/2015 10:28:53 AM

Customer: Verizon Wireless

**Base Summary**

**Reactions**

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
5,400.00	52.00	48.00	3,340.97	40.90	30.18	61.87

**Base Plate**

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Moment (kip-in)	Allow Stress (ksi)	Applied Stress (ksi)	Stress Ratio
50.0	2.750	72.000	Clipped	0	16.00	8.555	215.55	50.00	19.99	0.40

**Anchor Bolts**

Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Start Angle (deg)	Compression			Tension		
									Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
72.00	24	2.25" 18J	2.25	75.00	100.00	Clustered	6.00	45.0	94.51	195.00	0.48	91.10	195.00	0.47

