Robinson+Cole

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Also admitted in Massachusetts

October 8, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
260 Beckley Road, Berlin, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains fifteen (15) antennas at the 116-foot level of the existing 162-foot tower at 260 Beckley Road in Berlin, Connecticut (the "Property"). The tower is owned by American Tower Corporation. The Council approved Cellco's shared use of this tower 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 116-foot level on the tower. Cellco also intends to replace three (3) remote radio heads ("RRHs"), and install six (6) new RRHs behind its antennas and attach one (1) HYBRIFLEX™ antenna cable to the outside of the monopole. 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 Denise M. McNair, Town Manager for the Town of Berlin. A copy of this letter is also being sent to Elaine and John Matulis, the owners of the Property and ATC, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be installed on its existing antenna platform at the 116-foot level.

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

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

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.

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

6. The tower and its foundation can support 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:
Denise M. McNair, Berlin Town Manager
Elaine and John Matulis
Alex Ignachuck, ATC
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	1920–2200	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, 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
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 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®

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

SBNHH-1D65B

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.

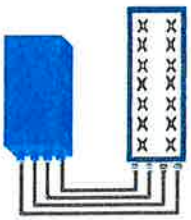
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

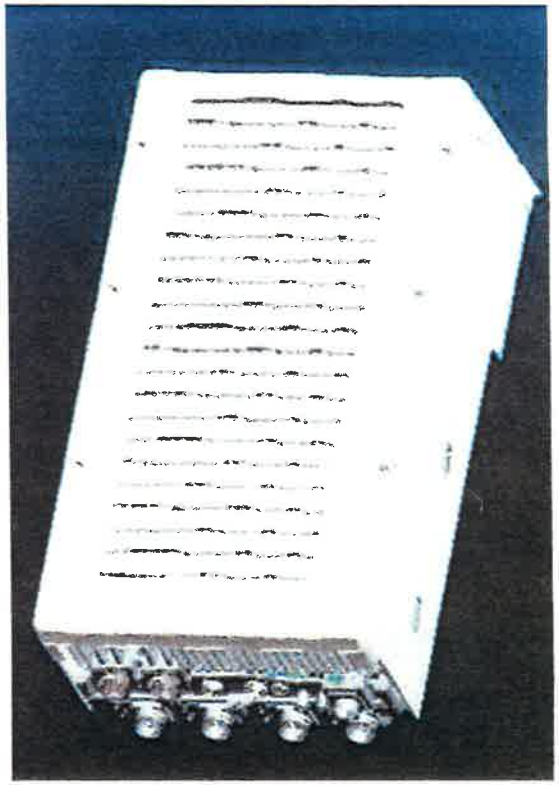
		RRH2x60
RF Output Power		2x60W
Instantaneous Bandwidth		20MHz
Transmitter		2 TX
Receiver	1900 HW version	2 Branch RX – LA6.0.1
	1900A HW version	4 Branch RX – LR13.3
Features		AISG 2.0 for RET/TMA
		Internal Smart Bias-T
Power		-48VDC
CPRI Ports		2 CPRI Rate 3 Ports
External Alarms		4 External User Alarms
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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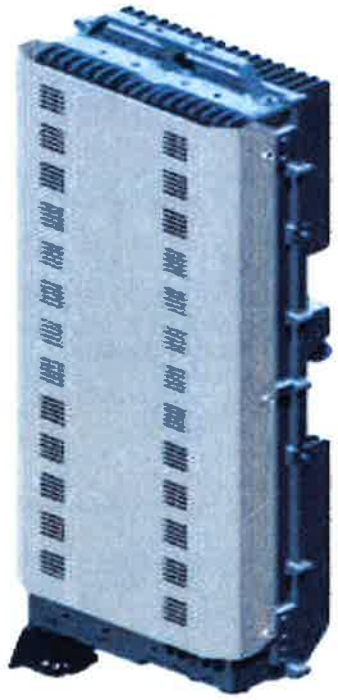
ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET

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.

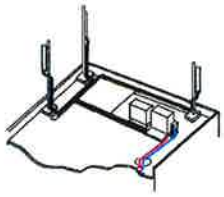
EASY INSTALLATION

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.

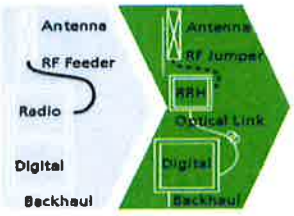
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

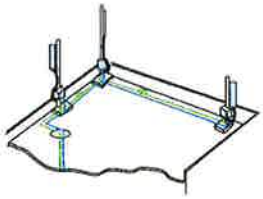
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

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.

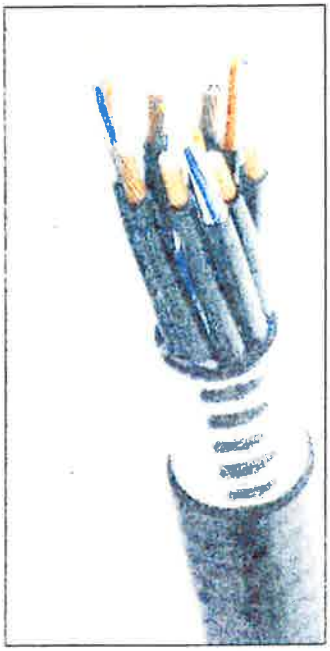


Figure 1: HYBRIFLEX Series

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 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-93-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

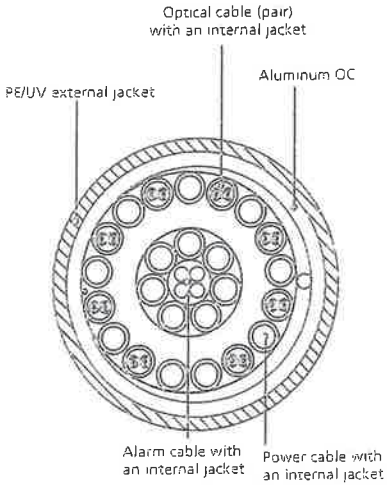


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Berlin 2								
Tower Height: 162'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	152	0.0191	880	0.5867	0.32%	
*AT&T UMTS	2	875	152	0.0295	1900	1.0000	0.30%	
*AT&T GSM	1	283	152	0.0048	880	0.5867	0.08%	
*AT&T GSM	4	525	152	0.0354	1900	1.0000	0.35%	
*AT&T LTE	1	1313	152	0.0222	734	0.4893	0.45%	
*MetroPCS CDMA	3	727	142	0.0424	2135	1.0000	0.42%	
*MetroPCS LTE	1	1200	142	0.0233	2130	1.0000	0.23%	
*Berlin FD	1	25	94.5	0.0012	953.55	0.6357	0.02%	
*T-Mobile GSM	8	171	162	0.0202	1945	1.0000	0.20%	
*T-Mobile UMTS	2	683	162	0.0202	2100	1.0000	0.20%	
*Sprint CDMA/LTE	5	551	127	0.0677	1900	1.0000	0.68%	
*Sprint CDMA/LTE	1	276	127	0.0068	850	0.5667	0.12%	
*Sprint CDMA/LTE	2	693	127	0.0340	2500	1.0000	0.34%	
Nextel	12	100	90	0.0612	851	0.5673	1.08%	
Verizon	**11**	**442**	**116**	**0.1299**	**1970**	**1.0000**	**12.99%**	
Verizon	**9**	**406**	**116**	**0.0976**	**869**	**0.5793**	**16.85%**	
Verizon	**1**	**3500**	**116**	**0.0935**	**2145**	**1.0000**	**9.35%**	
Verizon	**1**	**2100**	**116**	**0.0561**	**746**	**0.4973**	**11.28%**	
								55.3%
* Source: Siting Council								

ATTACHMENT 3

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Structural Analysis Report

Structure	:	**162 ft Monopole**
ATC Site Name	:	**Brln - Berlin, CT**
ATC Site Number	:	**302483**
Engineering Number	:	**63150121**
Proposed Carrier	:	**Verizon Wireless**
Carrier Site Name	:	**Berlin 2**
Carrier Site Number	:	**119616**
Site Location	:	**260 Beckley Road** **Kensington, CT 06037-2419** **41.631722,-72.729900**
County	:	**Hartford**
Date	:	**August 21, 2015**
Max Usage	:	**97%**
Result	:	**Pass**

Reviewed by:
Scott Wirgau, PE
Structural Team Leader

Prepared By:
Robert D. Barrett, E.I.
Structural Engineer I

Robert D. Barrett

Aug 22 2015 12:06 PM

COA: PEC.0001553

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 162 ft monopole to reflect the change in loading by Verizon Wireless.

Supporting Documents

Tower Drawings	ITT Meyer Type "B", dated July 21, 2001 Mapping by Smith Cullum Acq. #CT-0019, dated July 21, 2001
Foundation Drawing	SpectraSite Project #CT-0019, dated May 29, 2003
Geotechnical Report	Daniel G. Loucks Project #CT-0019, dated December 21, 2001
Modifications	Scientel Project #Berlin-CT0019, dated July 30, 2002

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					
163.0	163.0	3	Ericsson KRY 112 144/1	Canister	(12) 1 5/8" Coax (1) 1 5/8" Fiber	T-Mobile
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
152.0	152.0	1	Raycap DC6-48-60-18-8F	Platform w/ Handrails	(12) 1 1/4" Coax (2) 0.78" 8 AWG 6 (1) 0.39" Cable (1) 3" Conduit	AT&T Mobility
		6	Powerwave LGP21401			
		6	Ericsson RRUS 11 (Band 12)			
		3	Powerwave 7770.00			
		6	KMW AM-X-CD-16-65-00T-RET			
142.0	142.0	3	RFS APXV18-206517LS-C	Flush	(6) 1 5/8" Coax	Metro PCS
127.0	127.0	3	Alcatel-Lucent 800MHz 2X50W RRH w/ Filter	Low Profile Platform	(4) 1 1/4" Hybriflex Cable	Sprint Nextel
		6	Alcatel-Lucent 4X40W RRH			
		3	Alcatel-Lucent TD-RRH8x20			
		3	RFS APXVTM14-C-I20			
		1	RFS APXV9ERR18-C-A20			
		2	RFS APXVSPP18-C-A20			
116.0	116.0	1	RFS DB-T1-6Z-8AB-0Z	Low Profile Platform	(12) 1 5/8" Coax (1) 1 5/8" Fiber	Verizon Wireless
		3	Commscope LNX-6514DS-A1M			
		6	Antel LPA-80063-6CF-EDIN-X			
106.0	109.0	3	48" x 6" Panel	Flush	(6) 1 1/4" Coax	AT&T Mobility
96.0	96.0	12	Decibel 844G65VTZASX	Low Profile Platform	(15) 1 5/8" Coax	Sprint Nextel

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
116.0	116.0	3	Alcatel-Lucent RRH2x40-AWS	-	(6) 1 5/8" Coax	Verizon Wireless
		6	Antel BXA-171063-8CF-EDIN-X			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
116.0	116.0	1	RFS DB-T1-6Z-8AB-0Z	Low Profile Platform	(1) 1 5/8" Fiber	Verizon Wireless
	115.0	3	Alcatel-Lucent RRH2X60-1900			
		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 outside the pole shaft. Stacking coax is not allowed.

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Structure Usages*

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	62%	Pass
Shaft	97%	Pass
Base Plate	68%	Pass

***A factor of safety of 2 or greater is included for the anchor bolts.**

Foundations*

Reaction Component	Analysis Reactions
Moment (Kips-Ft)	3,645.6
Axial (Kips)	63.9
Shear (Kips)	36.4

***A factor of safety of 2 or greater is included for the foundations.**

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.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
116.0	Alcatel-Lucent RRH2X60-1900	Verizon Wireless	1.229	1.202
	Alcatel-Lucent RRH2X60-AWS			
	Alcatel-Lucent RRH2x60 700			
	Commscope SBNHH-1D65B			
	RFS DB-T1-6Z-8AB-0Z			

***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:

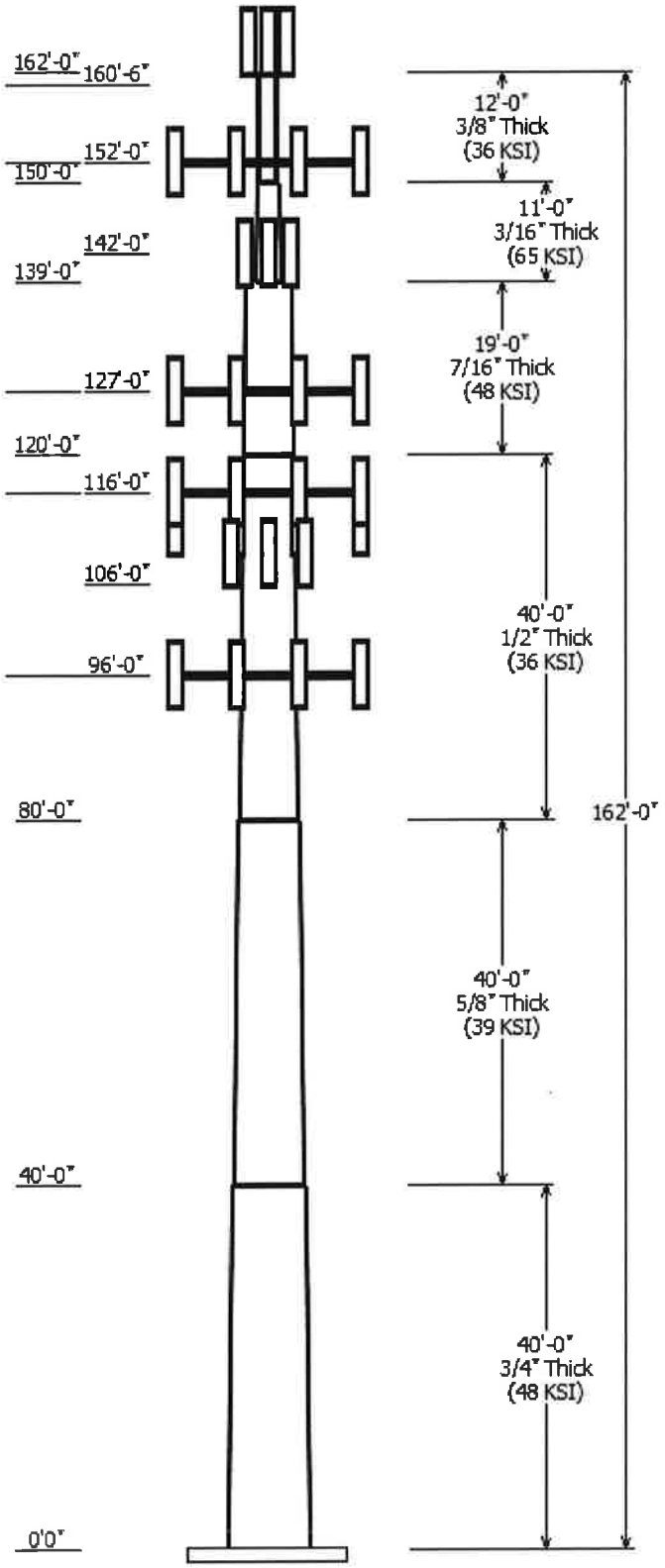
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- 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 :	302483 Code: TIA/EIA-222-F
Description :	150 ft ITT Meyer Monopole
Client :	VERIZON WIRELESS
Location :	Brln - Berlin, CT
Shape :	12 Sides
Height :	162.00 (ft)
Base Elev (ft):	0.00
Taper:	0.18970 (in/ft)

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Across Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	40.000	43.71	51.30	0.750		0.000	0.189701	48
2	40.000	36.09	43.68	0.625	Butt Joint	0.000	0.189701	39
3	40.000	28.50	36.09	0.500	Butt Joint	0.000	0.189701	36
4	19.000	24.90	28.50	0.438	Butt Joint	0.000	0.189701	48
5	11.000	15.00	16.72	0.188	Butt Joint	0.000	0.156364	65
6	12.000	12.00	12.00	0.375	Butt Joint	0.000	0.000000	36

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
162.000	163.000	3	Ericsson AIR 21, 1.3 M, B2A B4
162.000	163.000	3	Ericsson KRY 112 144/1
160.500	160.500	1	Concealment Canister
152.000	152.000	6	Powerwave LGP21401
152.000	152.000	3	Powerwave 7770.00
152.000	152.000	1	Flat Platform w/ Handrails
152.000	152.000	6	KMW AM-X-CD-16-65-00T-RET
152.000	152.000	6	Ericsson RRUS 11 (Band 12)
152.000	152.000	1	Raycap DC6-48-60-18-8F
142.000	142.000	3	RFS APXV18-206517LS-C
127.000	127.000	3	RFS APXVTM14-C-I20
127.000	127.000	3	Alcatel-Lucent TD-RRH8x20
127.000	127.000	1	Flat Low Profile Platform
127.000	127.000	1	RFS APXV9ERR18-C-A20
127.000	127.000	2	RFS APXVSPP18-C-A20
127.000	127.000	6	Alcatel-Lucent 4X40W RRH
127.000	127.000	3	Alcatel-Lucent 800 MHz 2X50W
116.000	116.000	1	RFS DB-T1-6Z-8AB-0Z
116.000	115.000	6	Commscope SBNHH-1D65B
116.000	115.000	3	Alcatel-Lucent RRH2x60 700
116.000	115.000	3	Alcatel-Lucent RRH2X60-AWS
116.000	115.000	3	Alcatel-Lucent RRH2X60-1900
116.000	116.000	3	Commscope LNX-6514DS-A1M
116.000	116.000	1	RFS DB-T1-6Z-8AB-0Z
116.000	116.000	6	Amphenol Antel LPA-80063-
116.000	116.000	1	Round Low Profile Platform
106.000	109.000	3	48" x 6" Panel
96.000	96.000	1	Flat Low Profile Platform
96.000	96.000	12	Decibel 844G65VTZASX

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
5.000	96.000	1 5/8" Coax	Yes
5.000	96.000	1 5/8" Coax	No
5.000	106.0	1 1/4" Coax	No
5.000	116.0	1 5/8" Coax	Yes
5.000	116.0	1 5/8" Fiber	Yes
5.000	116.0	1 5/8" Fiber	Yes

5.000	127.0	1 1/4" Hybriflex	No
5.000	127.0	1 1/4" Hybriflex	No
5.000	142.0	1 5/8" Coax	Yes
5.000	152.0	0.39" Cable	No
5.000	152.0	0.78" 8 AWG 6	No
5.000	152.0	1 1/4" Coax	No
5.000	152.0	3" Conduit	No
5.000	162.0	1 5/8" Coax	No
5.000	162.0	1 5/8" Fiber	Yes

Load Cases

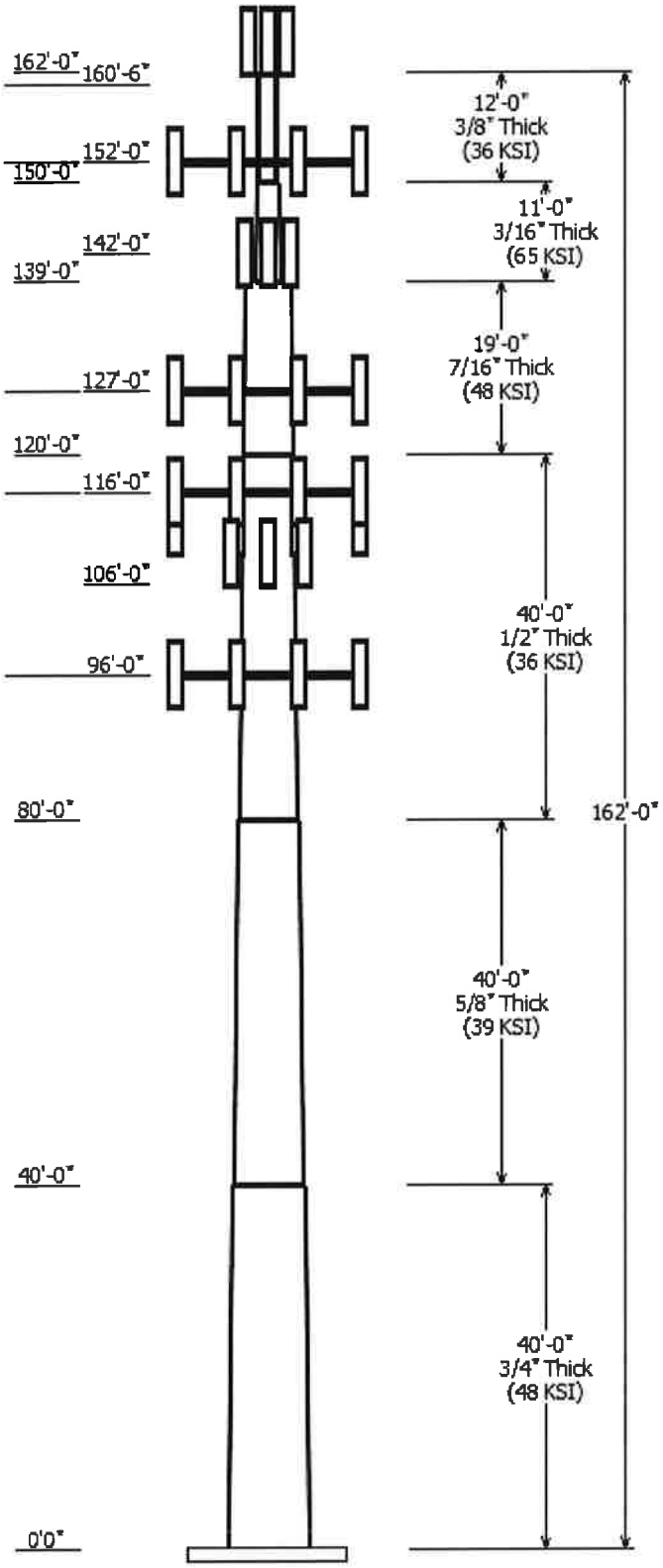
No Ice	80.00 mph Wind with No Ice
Ice	69.28 mph Wind with Ice
Twist/Sway	50.00 mph Wind with No Ice

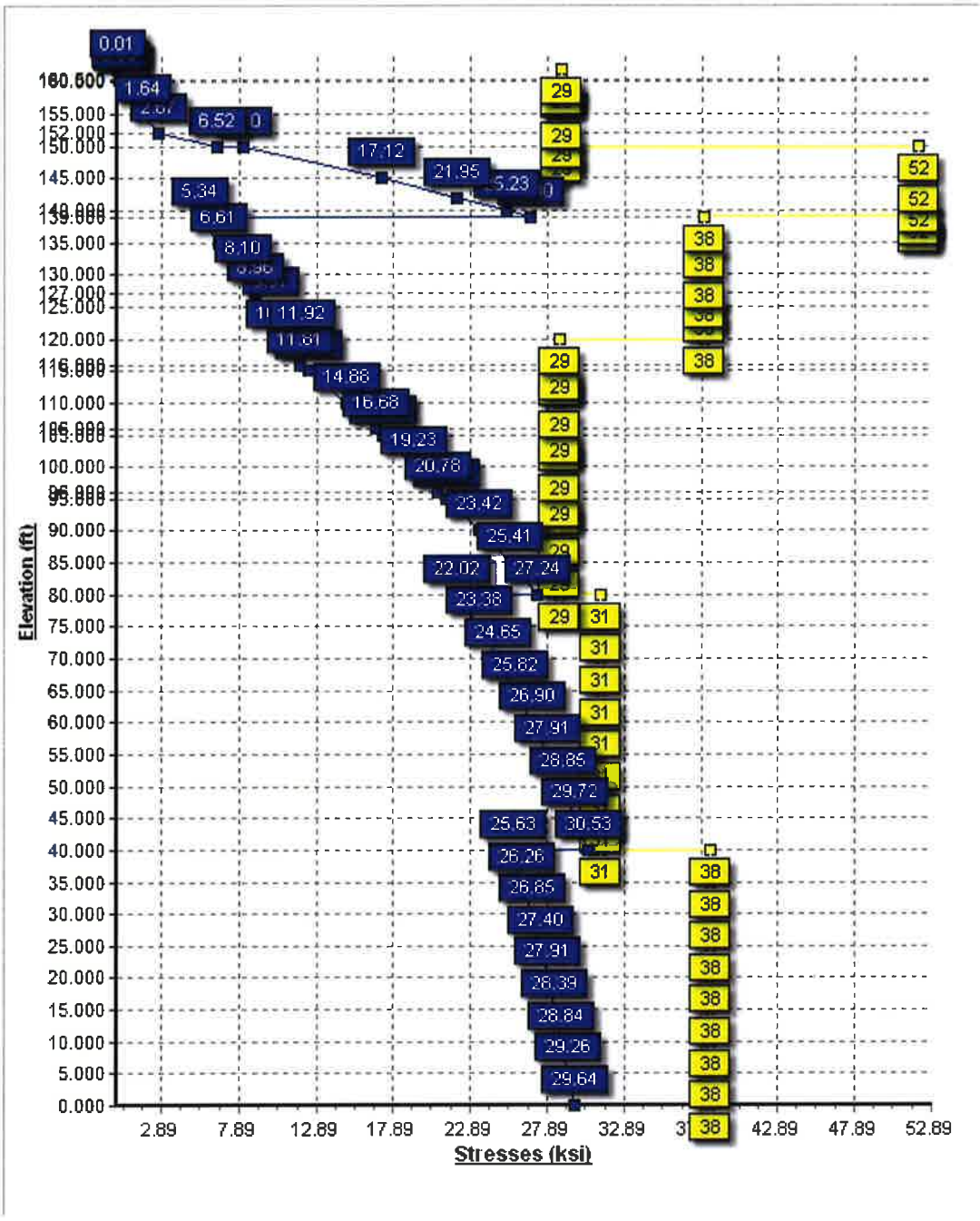
Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
No Ice	3645.56	36.35	54.75
Ice	3056.13	29.94	63.88
Twist/Sway	1425.14	14.20	54.78

Dish Deflections

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




Elevation (ft)
Stresses (ksi)
2.89
7.89
12.89
17.89
22.89
27.89
32.89
42.89
47.89
52.89
0.000
5.000
10.000
15.000
20.000
25.000
30.000
35.000
40.000
45.000
50.000
55.000
60.000
65.000
70.000
75.000
80.000
85.000
90.000
100.000
110.000
120.000
125.000
135.000
145.000
155.000
0.01
1.64
6.52
17.12
21.95
5.34
6.61
8.10
11.92
14.88
16.68
19.23
20.78
23.42
25.41
22.02
27.24
23.38
24.65
25.82
26.90
27.91
28.85
29.72
25.63
30.53
26.26
26.85
27.40
27.91
26.39
28.84
29.26
29.64

Site Number:	**302483**	**Code: TIA/EIA-222-F**	
Site Name:	**Brln - Berlin, CT**	**Engineering Number: 63150121**	**8/21/2015 6:07:42 PM**
Customer:	**VERIZON WIRELESS**		

Analysis Parameters

Location:	**Hartford County, CT**		
Code:	**TIA/EIA-222-F**	**Height (ft):**	**162**
Shape:	**12 Sides**	**Base Diameter (in):**	**51.30**
Pole Type:	**Custom**	**Top Diameter (in):**	**12.00**
Pole Manfacturer:	**ITT Meyer**	**Taper (in/ft) :**	**0.190**

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: 302483 Code: TIA/EIA-222-F

Site Name: Brln - Berlin, CT Engineering Number: 63150121 8/21/2015 6:07:42 PM

Customer: VERIZON WIRELESS

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	40.000	0.7500	48		0.00	15,369	51.30	0.00	122.08	39816.6	16.18	68.40	43.71	40.00	103.75	24442.9	13.47	58.28	0.189701
2-12	40.000	0.6250	39	Butt	0.00	10,755	43.68	40.00	86.65	20501.8	16.58	69.89	36.09	80.00	71.38	11460.3	13.33	57.75	0.189701
3-12	40.000	0.5000	36	Butt	0.00	6,968	36.09	80.00	57.30	9265.7	17.20	72.18	28.50	120.00	45.09	4513.2	13.13	57.01	0.189701
4-12	19.000	0.4375	48	Butt	0.00	2,392	28.50	120.00	39.54	3975.5	15.31	65.15	24.90	139.00	34.46	2632.2	13.11	56.91	0.189701
5-12	11.000	0.1875	65	Butt	0.00	354	16.72	139.00	9.98	348.2	21.75	89.17	15.00	150.00	8.94	250.4	19.29	80.00	0.156364
6-12	12.000	0.3750	36	Butt	0.00	573	12.00	150.00	14.04	242.1	6.43	32.00	12.00	162.00	14.04	242.1	6.43	32.00	0.000000
				Shaft Weight		36,411													

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)
162.00	Ericsson AIR 21, 1.3 M, B2A	3	83.00	6.530	0.01	124.90	7.200	0.01	0.000	1.000
162.00	Ericsson KRY 112 144/1	3	11.00	0.410	0.01	14.10	0.550	0.01	0.000	1.000
160.50	Concealment Canister	1	200.00	15.000	1.00	300.00	20.000	1.00	0.000	0.000
152.00	Ericsson RRUS 11 (Band 12)	6	55.00	2.940	0.50	74.30	3.290	0.50	0.000	0.000
152.00	Flat Platform w/ Handrails	1	2000.00	42.400	1.00	2,450.00	48.400	1.00	0.000	0.000
152.00	KMW AM-X-CD-16-65-00T-	6	48.50	8.260	0.66	95.00	9.080	0.66	0.000	0.000
152.00	Powerwave 7770.00	3	35.00	5.880	0.64	67.75	6.530	0.64	0.000	0.000
152.00	Powerwave LGP21401	6	14.10	1.290	0.50	21.20	1.530	0.50	0.000	0.000
152.00	Raycap DC6-48-60-18-8F	1	20.00	1.270	1.00	35.10	1.460	1.00	0.000	0.000
142.00	RFS APXV18-206517LS-C	3	22.00	5.020	0.68	48.13	5.700	0.68	0.000	0.000
127.00	Alcatel-Lucent 4X40W RRH	6	88.00	2.910	0.50	119.30	3.270	0.50	0.000	0.000
127.00	Alcatel-Lucent 800 MHz	3	64.00	2.400	0.50	86.10	2.720	0.50	0.000	0.000
127.00	Alcatel-Lucent TD-RRH8x20	3	66.10	4.300	0.50	90.10	4.750	0.50	0.000	0.000
127.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	1,700.00	31.600	1.00	0.000	0.000
127.00	RFS APXV9ERR18-C-A20	1	62.00	8.260	0.70	113.90	9.080	0.70	0.000	0.000
127.00	RFS APXVSPP18-C-A20	2	57.00	8.260	0.68	106.50	9.080	0.68	0.000	0.000
127.00	RFS APXVTM14-C-I20	3	56.20	6.900	0.65	95.70	7.580	0.65	0.000	0.000
116.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.510	0.50	76.20	2.840	0.50	0.000	-1.000
116.00	Alcatel-Lucent RRH2X60-	3	43.00	2.190	0.50	58.90	2.500	0.50	0.000	-1.000
116.00	Alcatel-Lucent RRH2X60-	3	44.00	2.190	0.50	60.30	2.500	0.50	0.000	-1.000
116.00	Amphenol Antel LPA-80063-	6	27.00	10.500	0.75	101.90	11.350	0.75	0.000	0.000
116.00	Commscope LNX-6514DS-	3	38.80	8.410	0.69	89.30	9.240	0.69	0.000	0.000
116.00	Commscope SBNHH-1D65B	6	50.70	8.410	0.69	101.00	9.210	0.69	0.000	-1.000
116.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	5.600	0.50	80.10	6.080	0.50	0.000	0.000
116.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	5.600	0.50	80.10	6.080	0.50	0.000	0.000
116.00	Round Low Profile Platform	1	1500.00	21.700	1.00	1,700.00	27.200	1.00	0.000	0.000
106.00	48" x 6" Panel	3	20.00	2.870	0.67	36.40	3.330	0.67	0.000	3.000
96.00	Decibel 844G65VTZASX	12	16.00	5.890	0.69	55.00	6.500	0.69	0.000	0.000
96.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	1,700.00	31.600	1.00	0.000	0.000
	Totals	95	10495.20			14,652.03			Number of Loadings :	29

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
5.00	162.00	12	1 5/8" Coax	4.92	0.00	0.00	0.00	N
5.00	162.00	1	1 5/8" Fiber	1.61	0.00	0.00	0.00	Y
5.00	152.00	1	0.39" Cable	0.07	0.00	0.00	0.00	N
5.00	152.00	2	0.78" 8 AWG 6	1.18	0.00	0.00	0.00	N
5.00	152.00	12	1 1/4" Coax	12.00	0.00	0.00	0.00	N
5.00	152.00	1	3" Conduit	7.58	0.00	0.00	0.00	N
5.00	142.00	6	1 5/8" Coax	4.92	0.20	9.46	0.25	Y

5.00	127.00	3	1 1/4" Hybriflex Cable	3.00	0.16	3.77	0.21	N
5.00	127.00	1	1 1/4" Hybriflex Cable	1.00	0.00	0.00	0.00	N
5.00	116.00	12	1 5/8" Coax	9.84	0.40	18.93	0.50	Y
5.00	116.00	1	1 5/8" Fiber	1.61	0.00	0.00	0.00	Y
5.00	116.00	1	1 5/8" Fiber	1.61	0.00	0.00	0.00	Y
5.00	106.00	6	1 1/4" Coax	0.63	0.00	0.00	0.00	N
5.00	96.00	6	1 5/8" Coax	4.92	0.39	9.46	0.44	Y
5.00	96.00	9	1 5/8" Coax	7.38	0.00	0.00	0.00	N
			Total Weight	7,881.85 (lb)		4,718.05 (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		0.7500	51.300	122.078	39,816.6	16.18	68.40	48	38	0	0.0
5.00		0.7500	50.351	119.787	37,617.1	15.85	67.14	48	38	0	2,057.5
10.00		0.7500	49.403	117.497	35,500.1	15.51	65.87	48	38	0	2,018.6
15.00		0.7500	48.454	115.206	33,464.0	15.17	64.61	48	38	0	1,979.6
20.00		0.7500	47.506	112.915	31,507.4	14.83	63.34	48	38	0	1,940.6
25.00		0.7500	46.557	110.625	29,628.5	14.49	62.08	48	38	0	1,901.6
30.00		0.7500	45.609	108.334	27,825.8	14.15	60.81	48	38	0	1,862.7
35.00		0.7500	44.660	106.044	26,097.8	13.81	59.55	48	38	0	1,823.7
40.00	Top - Section 1	0.7500	43.712	103.753	24,442.9	13.47	58.28	48	38	0	1,784.7
40.00	Bot - Section 2	0.6250	43.680	86.648	20,501.8	16.58	69.89	39	31	0	
45.00		0.6250	42.731	84.739	19,176.5	16.18	68.37	39	31	0	1,458.0
50.00		0.6250	41.783	82.830	17,909.5	15.77	66.85	39	31	0	1,425.5
55.00		0.6250	40.834	80.922	16,699.7	15.36	65.34	39	31	0	1,393.0
60.00		0.6250	39.886	79.013	15,545.5	14.96	63.82	39	31	0	1,360.6
65.00		0.6250	38.937	77.104	14,445.8	14.55	62.30	39	31	0	1,328.1
70.00		0.6250	37.989	75.195	13,399.3	14.14	60.78	39	31	0	1,295.6
75.00		0.6250	37.040	73.286	12,404.5	13.74	59.26	39	31	0	1,263.1
80.00	Top - Section 2	0.6250	36.092	71.377	11,460.3	13.33	57.75	39	31	0	1,230.6
80.00	Bot - Section 3	0.5000	36.092	57.303	9,265.7	17.20	72.18	36	29	0	
85.00		0.5000	35.144	55.776	8,544.5	16.69	70.29	36	29	0	962.0
90.00		0.5000	34.195	54.249	7,861.7	16.18	68.39	36	29	0	936.0
95.00		0.5000	33.247	52.722	7,216.3	15.67	66.49	36	29	0	910.0
96.00		0.5000	33.057	52.417	7,091.6	15.57	66.11	36	29	0	178.9
100.0		0.5000	32.298	51.195	6,607.2	15.16	64.60	36	29	0	705.1
105.0		0.5000	31.350	49.668	6,033.4	14.66	62.70	36	29	0	858.0
106.0		0.5000	31.160	49.363	5,922.8	14.55	62.32	36	29	0	168.5
110.0		0.5000	30.401	48.141	5,493.9	14.15	60.80	36	29	0	663.6
115.0		0.5000	29.453	46.614	4,987.4	13.64	58.91	36	29	0	806.1
116.0		0.5000	29.263	46.308	4,890.0	13.54	58.53	36	29	0	158.1
120.0	Top - Section 3	0.5000	28.504	45.087	4,513.2	13.13	57.01	36	29	0	622.0
120.0	Bot - Section 4	0.4375	28.504	39.539	3,975.5	15.31	65.15	48	38	0	
125.0		0.4375	27.556	38.203	3,585.9	14.73	62.98	48	38	0	661.3
127.0		0.4375	27.176	37.668	3,437.5	14.50	62.12	48	38	0	258.2
130.0		0.4375	26.607	36.866	3,222.6	14.15	60.82	48	38	0	380.4
135.0		0.4375	25.659	35.530	2,884.8	13.57	58.65	48	38	0	615.9
139.0	Top - Section 4	0.4375	24.900	34.461	2,632.2	13.11	56.91	48	38	0	476.3
139.0	Bot - Section 5	0.1875	16.720	9.981	348.2	21.75	89.17	65	52	0	
140.0		0.1875	16.564	9.887	338.4	21.53	88.34	65	52	0	33.8
142.0		0.1875	16.251	9.698	319.4	21.08	86.67	65	52	0	66.6
145.0		0.1875	15.782	9.415	292.2	20.41	84.17	65	52	0	97.6
150.0	Top - Section 5	0.1875	15.000	8.943	250.4	19.29	80.00	65	52	0	156.2
150.0	Bot - Section 6	0.3750	12.000	14.037	242.1	6.43	32.00	36	29	0	
152.0		0.3750	12.000	14.037	242.1	6.43	32.00	36	29	0	95.5
155.0		0.3750	12.000	14.037	242.1	6.43	32.00	36	29	0	143.3
160.0		0.3750	12.000	14.037	242.1	6.43	32.00	36	29	0	238.8
160.5		0.3750	12.000	14.037	242.1	6.43	32.00	36	29	0	23.9
162.0		0.3750	12.000	14.037	242.1	6.43	32.00	36	29	0	71.6
											36,411.3

Load Case: No Ice — 80.00 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

		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		302.0	0.0					0.0	0.0	302.0	0.0	0.0	0.0
5.00		598.3	2,057.5					0.0	0.0	598.3	2,057.5	0.0	0.0
10.00		587.1	2,018.6					137.1	311.4	724.1	2,329.9	0.0	0.0
15.00		575.8	1,979.6					137.1	311.4	712.9	2,290.9	0.0	0.0
20.00		564.5	1,940.6					137.1	311.4	701.6	2,252.0	0.0	0.0
25.00		553.2	1,901.6					137.1	311.4	690.3	2,213.0	0.0	0.0
30.00		542.0	1,862.7					137.1	311.4	679.0	2,174.0	0.0	0.0
35.00		540.5	1,823.7					137.1	311.4	677.5	2,135.0	0.0	0.0
40.00	Top - Section 1	548.3	1,784.7					142.2	311.4	690.4	2,096.1	0.0	0.0
45.00		554.6	1,458.0					147.3	311.4	701.9	1,769.3	0.0	0.0
50.00		558.9	1,425.5					152.1	311.4	711.0	1,736.9	0.0	0.0
55.00		561.3	1,393.0					156.5	311.4	717.8	1,704.4	0.0	0.0
60.00		562.1	1,360.6					160.6	311.4	722.7	1,671.9	0.0	0.0
65.00		561.4	1,328.1					164.5	311.4	725.9	1,639.4	0.0	0.0
70.00		559.5	1,295.6					168.2	311.4	727.6	1,606.9	0.0	0.0
75.00		556.4	1,263.1					171.6	311.4	728.0	1,574.5	0.0	0.0
80.00	Top - Section 2	552.2	1,230.6					174.9	311.4	727.2	1,542.0	0.0	0.0
85.00		547.1	962.0					178.1	311.4	725.2	1,273.3	0.0	0.0
90.00		541.1	936.0					181.1	311.4	722.2	1,247.3	0.0	0.0
95.00		322.3	910.0					184.0	311.4	506.3	1,221.4	0.0	0.0
96.00	Appertunance(s)	265.4	178.9	2,812.6	0.0	0.0	1,692.0	37.1	62.3	3,115.1	1,933.2	0.0	0.0
100.00		473.4	705.1					90.7	199.9	564.1	905.0	0.0	0.0
105.00		313.2	858.0					114.8	249.9	428.0	1,107.9	0.0	0.0
106.00	Appertunance(s)	257.1	168.5	224.7	0.0	674.2	60.0	23.2	50.0	504.9	278.5	0.0	0.0
110.00		457.7	663.6					93.2	197.4	551.0	860.9	0.0	0.0
115.00		302.3	806.1					117.9	246.7	420.3	1,052.8	0.0	0.0
116.00	Appertunance(s)	247.5	158.1	5,432.6	0.0	-1,786.1	2,601.7	23.8	49.3	5,703.9	2,809.1	0.0	0.0
120.00	Top - Section 3	439.8	622.0					31.9	145.1	471.7	767.1	0.0	0.0
125.00		337.6	661.3					40.3	181.4	377.9	842.7	0.0	0.0
127.00	Appertunance(s)	236.7	258.2	3,066.3	0.0	0.0	2,762.9	16.2	72.6	3,319.3	3,093.6	0.0	0.0
130.00		372.3	380.4					24.5	96.8	396.8	477.3	0.0	0.0
135.00		411.4	615.9					41.2	161.4	452.6	777.3	0.0	0.0
139.00	Top - Section 4	210.3	476.3					33.3	129.1	243.6	605.5	0.0	0.0
140.00		88.9	33.8					8.4	32.3	97.3	66.1	0.0	0.0
142.00	Appertunance(s)	145.9	66.6	430.2	0.0	0.0	66.0	16.8	64.6	593.0	197.2	0.0	0.0
145.00		227.2	97.6					0.0	82.1	227.2	179.6	0.0	0.0
150.00	Top - Section 5	184.3	156.2					0.0	136.8	184.3	293.0	0.0	0.0
152.00	Appertunance(s)	110.4	95.5	4,299.2	0.0	0.0	2,830.6	0.0	54.7	4,409.6	2,980.9	0.0	0.0
155.00		177.8	143.3					0.0	19.6	177.8	162.9	0.0	0.0
160.00		122.6	238.8					0.0	32.7	122.6	271.5	0.0	0.0
160.50	Appertunance(s)	44.9	23.9	652.6	0.0	0.0	200.0	0.0	3.3	697.5	227.1	0.0	0.0
162.00	Appertunance(s)	33.7	71.6	9.1	0.0	9.1	282.0	0.0	9.8	42.8	363.4	0.0	0.0
									Totals:	36,593.2	54,788.3	0.00	0.00

Load Case: No Ice — 80.00 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	-36.353	-54.747	0.000	0.000	0.000	-3,645.564	0.000	0.000	0.000	0.000
5.00	-35.869	-52.611	0.000	0.000	0.000	-3,463.803	-0.068	0.000	0.068	-0.127
10.00	-35.249	-50.205	0.000	0.000	0.000	-3,284.459	-0.270	0.000	0.270	-0.255
15.00	-34.631	-47.840	0.000	0.000	0.000	-3,108.215	-0.605	0.000	0.605	-0.383
20.00	-34.014	-45.518	0.000	0.000	0.000	-2,935.063	-1.075	0.000	1.075	-0.511
25.00	-33.399	-43.237	0.000	0.000	0.000	-2,764.995	-1.680	0.000	1.680	-0.640
30.00	-32.785	-40.998	0.000	0.000	0.000	-2,598.004	-2.419	0.000	2.419	-0.769
35.00	-32.164	-38.801	0.000	0.000	0.000	-2,434.081	-3.293	0.000	3.293	-0.897
40.00	-31.520	-36.646	0.000	0.000	0.000	-2,273.265	-4.302	0.000	4.302	-1.025
45.00	-30.870	-34.815	0.000	0.000	0.000	-2,115.667	-5.445	0.000	5.445	-1.153
50.00	-30.208	-33.015	0.000	0.000	0.000	-1,961.321	-6.734	0.000	6.734	-1.304
55.00	-29.531	-31.252	0.000	0.000	0.000	-1,810.281	-8.181	0.000	8.181	-1.454
60.00	-28.840	-29.526	0.000	0.000	0.000	-1,662.628	-9.783	0.000	9.783	-1.602
65.00	-28.136	-27.838	0.000	0.000	0.000	-1,518.431	-11.539	0.000	11.539	-1.748
70.00	-27.422	-26.187	0.000	0.000	0.000	-1,377.752	-13.447	0.000	13.447	-1.890
75.00	-26.700	-24.575	0.000	0.000	0.000	-1,240.642	-15.501	0.000	15.501	-2.029
80.00	-25.970	-23.001	0.000	0.000	0.000	-1,107.146	-17.699	0.000	17.699	-2.164
85.00	-25.249	-21.695	0.000	0.000	0.000	-977.300	-20.035	0.000	20.035	-2.293
90.00	-24.528	-20.415	0.000	0.000	0.000	-851.057	-22.519	0.000	22.519	-2.445
95.00	-23.997	-19.182	0.000	0.000	0.000	-728.416	-25.158	0.000	25.158	-2.588
96.00	-20.818	-17.368	0.000	0.000	0.000	-704.420	-25.703	0.000	25.703	-2.617
100.0	-20.245	-16.449	0.000	0.000	0.000	-621.149	-27.941	0.000	27.941	-2.723
105.0	-19.783	-15.339	0.000	0.000	0.000	-519.923	-30.859	0.000	30.859	-2.846
106.0	-19.280	-15.066	0.000	0.000	0.000	-499.466	-31.458	0.000	31.458	-2.870
110.0	-18.709	-14.204	0.000	0.000	0.000	-422.346	-33.900	0.000	33.900	-2.958
115.0	-18.247	-13.157	0.000	0.000	0.000	-328.800	-37.051	0.000	37.051	-3.056
116.0	-12.409	-10.648	0.000	0.000	0.000	-310.553	-37.693	0.000	37.693	-3.074
120.0	-11.909	-9.893	0.000	0.000	0.000	-260.917	-40.296	0.000	40.296	-3.140
125.0	-11.493	-9.062	0.000	0.000	0.000	-201.373	-43.624	0.000	43.624	-3.213
127.0	-8.008	-6.156	0.000	0.000	0.000	-178.388	-44.976	0.000	44.976	-3.243
130.0	-7.590	-5.695	0.000	0.000	0.000	-154.364	-47.027	0.000	47.027	-3.285
135.0	-7.097	-4.939	0.000	0.000	0.000	-116.414	-50.498	0.000	50.498	-3.344
139.0	-6.821	-4.346	0.000	0.000	0.000	-88.024	-53.317	0.000	53.317	-3.385
140.0	-6.725	-4.277	0.000	0.000	0.000	-81.204	-54.026	0.000	54.026	-3.394
142.0	-6.131	-4.101	0.000	0.000	0.000	-67.754	-55.475	0.000	55.475	-3.519
145.0	-5.905	-3.919	0.000	0.000	0.000	-49.360	-57.738	0.000	57.738	-3.676
150.0	-5.708	-3.629	0.000	0.000	0.000	-19.835	-61.687	0.000	61.687	-3.844
152.0	-1.108	-0.952	0.000	0.000	0.000	-8.420	-63.305	0.000	63.305	-3.876
155.0	-0.920	-0.801	0.000	0.000	0.000	-5.097	-65.747	0.000	65.747	-3.900
160.0	-0.779	-0.539	0.000	0.000	0.000	-0.500	-69.839	0.000	69.839	-3.916
160.5	-0.067	-0.360	0.000	0.000	0.000	-0.110	-70.249	0.000	70.249	-3.916
162.0	-0.043	0.000	0.000	0.000	0.000	-0.009	-71.478	0.000	71.478	-3.917

Load Case: No Ice — 80.00 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							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	0.61	0.00	0.00	0.00	29.18	29.64	38.5	0.0	0.770
5.00	0.44	0.61	0.00	0.00	0.00	28.80	29.26	38.5	0.0	0.760
10.00	0.43	0.61	0.00	0.00	0.00	28.39	28.84	38.5	0.0	0.749
15.00	0.42	0.61	0.00	0.00	0.00	27.96	28.39	38.5	0.0	0.738
20.00	0.40	0.61	0.00	0.00	0.00	27.49	27.91	38.5	0.0	0.725
25.00	0.39	0.61	0.00	0.00	0.00	26.99	27.40	38.5	0.0	0.712
30.00	0.38	0.61	0.00	0.00	0.00	26.45	26.85	38.5	0.0	0.698
35.00	0.37	0.62	0.00	0.00	0.00	25.87	26.26	38.5	0.0	0.682
40.00	0.35	0.62	0.00	0.00	0.00	25.25	25.63	38.5	0.0	0.666
40.00	0.42	0.74	0.00	0.00	0.00	30.08	30.53	31.4	0.0	0.974
45.00	0.41	0.74	0.00	0.00	0.00	29.28	29.72	31.4	0.0	0.948
50.00	0.40	0.74	0.00	0.00	0.00	28.42	28.85	31.4	0.0	0.920
55.00	0.39	0.74	0.00	0.00	0.00	27.50	27.91	31.4	0.0	0.890
60.00	0.37	0.74	0.00	0.00	0.00	26.50	26.90	31.4	0.0	0.858
65.00	0.36	0.74	0.00	0.00	0.00	25.42	25.82	31.4	0.0	0.823
70.00	0.35	0.74	0.00	0.00	0.00	24.26	24.65	31.4	0.0	0.786
75.00	0.34	0.74	0.00	0.00	0.00	23.01	23.38	31.4	0.0	0.746
80.00	0.32	0.74	0.00	0.00	0.00	21.66	22.02	31.4	0.0	0.702
80.00	0.40	0.92	0.00	0.00	0.00	26.79	27.24	28.7	0.0	0.948
85.00	0.39	0.92	0.00	0.00	0.00	24.97	25.41	28.7	0.0	0.885
90.00	0.38	0.92	0.00	0.00	0.00	22.99	23.42	28.7	0.0	0.816
95.00	0.36	0.92	0.00	0.00	0.00	20.85	21.27	28.7	0.0	0.741
96.00	0.33	0.81	0.00	0.00	0.00	20.40	20.78	28.7	0.0	0.723
100.00	0.32	0.80	0.00	0.00	0.00	18.86	19.23	28.7	0.0	0.670
105.00	0.31	0.81	0.00	0.00	0.00	16.78	17.15	28.7	0.0	0.597
106.00	0.31	0.79	0.00	0.00	0.00	16.32	16.68	28.7	0.0	0.581
110.00	0.30	0.79	0.00	0.00	0.00	14.52	14.88	28.7	0.0	0.518
115.00	0.28	0.80	0.00	0.00	0.00	12.06	12.42	28.7	0.0	0.432
116.00	0.23	0.54	0.00	0.00	0.00	11.54	11.81	28.7	0.0	0.411
120.00	0.22	0.54	0.00	0.00	0.00	10.24	10.50	28.7	0.0	0.365
120.00	0.25	0.61	0.00	0.00	0.00	11.62	11.92	38.1	0.0	0.313
125.00	0.24	0.61	0.00	0.00	0.00	9.61	9.91	38.1	0.0	0.260
127.00	0.16	0.43	0.00	0.00	0.00	8.76	8.96	38.1	0.0	0.235
130.00	0.15	0.42	0.00	0.00	0.00	7.92	8.10	38.1	0.0	0.213
135.00	0.14	0.41	0.00	0.00	0.00	6.43	6.61	38.1	0.0	0.174
139.00	0.13	0.40	0.00	0.00	0.00	5.17	5.34	38.1	0.0	0.140
139.00	0.44	1.39	0.00	0.00	0.00	26.25	26.80	52.0	0.0	0.515
140.00	0.43	1.38	0.00	0.00	0.00	24.69	25.23	52.0	0.0	0.485
142.00	0.42	1.28	0.00	0.00	0.00	21.41	21.95	52.0	0.0	0.422
145.00	0.42	1.27	0.00	0.00	0.00	16.56	17.12	52.0	0.0	0.329
150.00	0.41	1.30	0.00	0.00	0.00	7.38	8.10	52.0	0.0	0.156
150.00	0.26	0.83	0.00	0.00	0.00	6.11	6.52	28.8	0.0	0.227
152.00	0.07	0.16	0.00	0.00	0.00	2.59	2.67	28.8	0.0	0.093
155.00	0.06	0.13	0.00	0.00	0.00	1.57	1.64	28.8	0.0	0.057
160.00	0.04	0.11	0.00	0.00	0.00	0.15	0.27	28.8	0.0	0.010
160.50	0.03	0.01	0.00	0.00	0.00	0.03	0.06	28.8	0.0	0.002
162.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	28.8	0.0	0.000

Site Number: 302483 Code: TIA/EIA-222-F

Site Name: Brln - Berlin, CT Engineering Number: 63150121 8/21/2015 6:07:45 PM

Customer: VERIZON WIRELESS

Load Case: Ice 69.28 mph Wind with Ice 24 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		230.9	0.0					0.0	0.0	230.9	0.0	0.0	0.0
5.00		457.6	2,216.7					0.0	0.0	457.6	2,216.7	0.0	0.0
10.00		449.2	2,174.8					123.6	378.1	572.7	2,552.8	0.0	0.0
15.00		440.7	2,132.8					123.6	378.1	564.3	2,510.9	0.0	0.0
20.00		432.3	2,090.9					123.6	378.1	555.8	2,469.0	0.0	0.0
25.00		423.8	2,049.0					123.6	378.1	547.4	2,427.0	0.0	0.0
30.00		415.4	2,007.0					123.6	378.1	538.9	2,385.1	0.0	0.0
35.00		414.4	1,965.1					123.6	378.1	538.0	2,343.1	0.0	0.0
40.00	Top - Section 1	420.6	1,923.1					128.2	378.1	548.7	2,301.2	0.0	0.0
45.00		425.6	1,593.3					132.8	378.1	558.5	1,971.4	0.0	0.0
50.00		429.2	1,557.9					137.1	378.1	566.3	1,935.9	0.0	0.0
55.00		431.3	1,522.4					141.1	378.1	572.3	1,900.5	0.0	0.0
60.00		432.1	1,487.0					144.8	378.1	576.9	1,865.0	0.0	0.0
65.00		431.9	1,451.5					148.3	378.1	580.1	1,829.6	0.0	0.0
70.00		430.6	1,416.1					151.6	378.1	582.2	1,794.1	0.0	0.0
75.00		428.5	1,380.6					154.7	378.1	583.2	1,758.7	0.0	0.0
80.00	Top - Section 2	425.6	1,345.2					157.7	378.1	583.3	1,723.2	0.0	0.0
85.00		422.0	1,073.5					160.5	378.1	582.5	1,451.6	0.0	0.0
90.00		417.7	1,044.6					163.3	378.1	581.0	1,422.6	0.0	0.0
95.00		248.9	1,015.6					165.9	378.1	414.8	1,393.7	0.0	0.0
96.00	Appertunance(s)	205.1	199.9	2,406.6	0.0	0.0	2,360.0	33.5	75.6	2,645.2	2,635.5	0.0	0.0
100.00		366.0	787.3					85.0	235.1	451.1	1,022.4	0.0	0.0
105.00		242.3	957.7					107.6	293.9	349.9	1,251.6	0.0	0.0
106.00	Appertunance(s)	199.0	188.3	195.5	0.0	586.6	109.2	21.7	58.8	416.3	356.3	0.0	0.0
110.00		354.6	741.0					87.4	232.6	442.0	973.5	0.0	0.0
115.00		234.3	899.8					110.5	290.7	344.9	1,190.5	0.0	0.0
116.00	Appertunance(s)	192.0	176.7	4,557.4	0.0	-1,480.0	3,931.7	22.3	58.1	4,771.7	4,166.6	0.0	0.0
120.00	Top - Section 3	341.5	694.6					29.9	156.8	371.4	851.5	0.0	0.0
125.00		262.3	749.2					37.8	196.1	300.1	945.2	0.0	0.0
127.00	Appertunance(s)	184.1	292.8	2,627.7	0.0	0.0	3,558.4	15.2	78.4	2,827.0	3,929.6	0.0	0.0
130.00		289.8	431.4					23.0	105.6	312.8	537.0	0.0	0.0
135.00		320.5	697.8					38.6	176.1	359.2	873.8	0.0	0.0
139.00	Top - Section 4	164.4	539.9					31.2	140.8	195.6	680.8	0.0	0.0
140.00		70.7	44.5					7.8	35.2	78.6	79.7	0.0	0.0
142.00	Appertunance(s)	116.2	87.6	366.4	0.0	0.0	144.4	15.7	70.4	498.3	302.4	0.0	0.0
145.00		181.3	128.1					0.0	77.2	181.3	205.4	0.0	0.0
150.00	Top - Section 5	147.8	204.7					0.0	128.8	147.8	333.4	0.0	0.0
152.00	Appertunance(s)	89.7	111.2	3,624.3	0.0	0.0	3,831.3	0.0	51.5	3,714.0	3,994.0	0.0	0.0
155.00		144.5	166.8					0.0	14.8	144.5	181.5	0.0	0.0
160.00		99.6	278.0					0.0	24.6	99.6	302.6	0.0	0.0
160.50	Appertunance(s)	36.4	27.8	652.6	0.0	0.0	300.0	0.0	2.5	689.0	330.3	0.0	0.0
162.00	Appertunance(s)	27.3	83.4	7.6	0.0	7.6	417.0	0.0	7.4	35.0	507.8	0.0	0.0
									Totals:	30,110.6	63,903.6	0.00	0.00

Load Case: Ice — 69.28 mph Wind with 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	-29.940	-63.875	0.000	0.000	0.000	-3,056.130	0.000	0.000	0.000	0.000
5.00	-29.595	-61.604	0.000	0.000	0.000	-2,906.432	-0.057	0.000	0.057	-0.107
10.00	-29.126	-58.998	0.000	0.000	0.000	-2,758.458	-0.226	0.000	0.226	-0.214
15.00	-28.656	-56.436	0.000	0.000	0.000	-2,612.831	-0.508	0.000	0.508	-0.321
20.00	-28.186	-53.918	0.000	0.000	0.000	-2,469.552	-0.902	0.000	0.902	-0.429
25.00	-27.715	-51.443	0.000	0.000	0.000	-2,328.625	-1.410	0.000	1.410	-0.538
30.00	-27.245	-49.012	0.000	0.000	0.000	-2,190.050	-2.032	0.000	2.032	-0.646
35.00	-26.766	-46.625	0.000	0.000	0.000	-2,053.828	-2.767	0.000	2.767	-0.755
40.00	-26.269	-44.282	0.000	0.000	0.000	-1,919.998	-3.615	0.000	3.615	-0.863
45.00	-25.766	-42.267	0.000	0.000	0.000	-1,788.656	-4.577	0.000	4.577	-0.971
50.00	-25.255	-40.286	0.000	0.000	0.000	-1,659.828	-5.662	0.000	5.662	-1.099
55.00	-24.728	-38.343	0.000	0.000	0.000	-1,533.557	-6.881	0.000	6.881	-1.225
60.00	-24.189	-36.439	0.000	0.000	0.000	-1,409.918	-8.232	0.000	8.232	-1.351
65.00	-23.637	-34.574	0.000	0.000	0.000	-1,288.976	-9.714	0.000	9.714	-1.474
70.00	-23.076	-32.748	0.000	0.000	0.000	-1,170.791	-11.323	0.000	11.323	-1.595
75.00	-22.505	-30.961	0.000	0.000	0.000	-1,055.414	-13.058	0.000	13.058	-1.714
80.00	-21.926	-29.214	0.000	0.000	0.000	-942.891	-14.914	0.000	14.914	-1.828
85.00	-21.354	-27.737	0.000	0.000	0.000	-833.263	-16.888	0.000	16.888	-1.938
90.00	-20.782	-26.290	0.000	0.000	0.000	-726.492	-18.989	0.000	18.989	-2.068
95.00	-20.347	-24.887	0.000	0.000	0.000	-622.584	-21.221	0.000	21.221	-2.190
96.00	-17.625	-22.338	0.000	0.000	0.000	-602.238	-21.683	0.000	21.683	-2.214
100.0	-17.171	-21.304	0.000	0.000	0.000	-531.739	-23.578	0.000	23.578	-2.305
105.0	-16.791	-20.050	0.000	0.000	0.000	-445.888	-26.049	0.000	26.049	-2.411
106.0	-16.377	-19.698	0.000	0.000	0.000	-428.510	-26.556	0.000	26.556	-2.431
110.0	-15.920	-18.722	0.000	0.000	0.000	-363.004	-28.626	0.000	28.626	-2.507
115.0	-15.537	-17.535	0.000	0.000	0.000	-283.406	-31.298	0.000	31.298	-2.591
116.0	-10.590	-13.582	0.000	0.000	0.000	-267.869	-31.843	0.000	31.843	-2.607
120.0	-10.193	-12.738	0.000	0.000	0.000	-225.511	-34.051	0.000	34.051	-2.664
125.0	-9.858	-11.800	0.000	0.000	0.000	-174.545	-36.875	0.000	36.875	-2.727
127.0	-6.851	-8.007	0.000	0.000	0.000	-154.829	-38.023	0.000	38.023	-2.753
130.0	-6.518	-7.480	0.000	0.000	0.000	-134.278	-39.765	0.000	39.765	-2.789
135.0	-6.121	-6.621	0.000	0.000	0.000	-101.688	-42.713	0.000	42.713	-2.841
139.0	-5.894	-5.948	0.000	0.000	0.000	-77.202	-45.109	0.000	45.109	-2.877
140.0	-5.818	-5.866	0.000	0.000	0.000	-71.308	-45.712	0.000	45.712	-2.885
142.0	-5.317	-5.578	0.000	0.000	0.000	-59.672	-46.945	0.000	46.945	-2.995
145.0	-5.140	-5.369	0.000	0.000	0.000	-43.720	-48.872	0.000	48.872	-3.133
150.0	-4.980	-5.038	0.000	0.000	0.000	-18.023	-52.243	0.000	52.243	-3.283
152.0	-1.043	-1.264	0.000	0.000	0.000	-8.063	-53.625	0.000	53.625	-3.313
155.0	-0.889	-1.091	0.000	0.000	0.000	-4.934	-55.714	0.000	55.714	-3.336
160.0	-0.772	-0.794	0.000	0.000	0.000	-0.490	-59.216	0.000	59.216	-3.352
160.5	-0.065	-0.505	0.000	0.000	0.000	-0.104	-59.566	0.000	59.566	-3.352
162.0	-0.035	0.000	0.000	0.000	0.000	-0.008	-60.619	0.000	60.619	-3.352

Load Case: Ice — 69.28 mph Wind with 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							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	0.52	0.50	0.00	0.00	0.00	24.46	25.00	38.5	0.0	0.650
5.00	0.51	0.50	0.00	0.00	0.00	24.17	24.70	38.5	0.0	0.642
10.00	0.50	0.50	0.00	0.00	0.00	23.84	24.36	38.5	0.0	0.633
15.00	0.49	0.51	0.00	0.00	0.00	23.50	24.01	38.5	0.0	0.624
20.00	0.48	0.51	0.00	0.00	0.00	23.13	23.62	38.5	0.0	0.614
25.00	0.47	0.51	0.00	0.00	0.00	22.73	23.21	38.5	0.0	0.603
30.00	0.45	0.51	0.00	0.00	0.00	22.30	22.77	38.5	0.0	0.592
35.00	0.44	0.51	0.00	0.00	0.00	21.83	22.29	38.5	0.0	0.579
40.00	0.43	0.51	0.00	0.00	0.00	21.33	21.77	38.5	0.0	0.566
40.00	0.51	0.62	0.00	0.00	0.00	25.41	25.94	31.4	0.0	0.827
45.00	0.50	0.62	0.00	0.00	0.00	24.76	25.28	31.4	0.0	0.806
50.00	0.49	0.62	0.00	0.00	0.00	24.05	24.56	31.4	0.0	0.783
55.00	0.47	0.62	0.00	0.00	0.00	23.29	23.79	31.4	0.0	0.759
60.00	0.46	0.62	0.00	0.00	0.00	22.47	22.96	31.4	0.0	0.732
65.00	0.45	0.62	0.00	0.00	0.00	21.58	22.06	31.4	0.0	0.703
70.00	0.44	0.62	0.00	0.00	0.00	20.62	21.08	31.4	0.0	0.672
75.00	0.42	0.62	0.00	0.00	0.00	19.58	20.03	31.4	0.0	0.639
80.00	0.41	0.62	0.00	0.00	0.00	18.45	18.89	31.4	0.0	0.602
80.00	0.51	0.78	0.00	0.00	0.00	22.81	23.36	28.7	0.0	0.813
85.00	0.50	0.78	0.00	0.00	0.00	21.29	21.83	28.7	0.0	0.760
90.00	0.48	0.78	0.00	0.00	0.00	19.63	20.16	28.7	0.0	0.702
95.00	0.47	0.78	0.00	0.00	0.00	17.82	18.34	28.7	0.0	0.639
96.00	0.43	0.68	0.00	0.00	0.00	17.44	17.90	28.7	0.0	0.623
100.00	0.42	0.68	0.00	0.00	0.00	16.15	16.60	28.7	0.0	0.578
105.00	0.40	0.69	0.00	0.00	0.00	14.39	14.84	28.7	0.0	0.517
106.00	0.40	0.67	0.00	0.00	0.00	14.00	14.45	28.7	0.0	0.503
110.00	0.39	0.67	0.00	0.00	0.00	12.48	12.92	28.7	0.0	0.450
115.00	0.38	0.68	0.00	0.00	0.00	10.40	10.84	28.7	0.0	0.377
116.00	0.29	0.46	0.00	0.00	0.00	9.96	10.28	28.7	0.0	0.358
120.00	0.28	0.46	0.00	0.00	0.00	8.85	9.16	28.7	0.0	0.319
120.00	0.32	0.52	0.00	0.00	0.00	10.04	10.41	38.1	0.0	0.273
125.00	0.31	0.52	0.00	0.00	0.00	8.33	8.69	38.1	0.0	0.228
127.00	0.21	0.37	0.00	0.00	0.00	7.60	7.84	38.1	0.0	0.206
130.00	0.20	0.36	0.00	0.00	0.00	6.89	7.12	38.1	0.0	0.187
135.00	0.19	0.35	0.00	0.00	0.00	5.62	5.84	38.1	0.0	0.153
139.00	0.17	0.35	0.00	0.00	0.00	4.54	4.75	38.1	0.0	0.125
139.00	0.60	1.20	0.00	0.00	0.00	23.03	23.71	52.0	0.0	0.456
140.00	0.59	1.20	0.00	0.00	0.00	21.68	22.37	52.0	0.0	0.430
142.00	0.58	1.11	0.00	0.00	0.00	18.86	19.53	52.0	0.0	0.376
145.00	0.57	1.11	0.00	0.00	0.00	14.67	15.36	52.0	0.0	0.295
150.00	0.56	1.13	0.00	0.00	0.00	6.71	7.53	52.0	0.0	0.145
150.00	0.36	0.72	0.00	0.00	0.00	5.55	6.04	28.8	0.0	0.210
152.00	0.09	0.15	0.00	0.00	0.00	2.48	2.59	28.8	0.0	0.090
155.00	0.08	0.13	0.00	0.00	0.00	1.52	1.61	28.8	0.0	0.056
160.00	0.06	0.11	0.00	0.00	0.00	0.15	0.28	28.8	0.0	0.010
160.50	0.04	0.01	0.00	0.00	0.00	0.03	0.07	28.8	0.0	0.002
162.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	28.8	0.0	0.000

Load Case: Twist/Sway — 50.00 mph Wind with No Ice — 23 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		118.0	0.0					0.0	0.0	118.0	0.0	0.0	0.0
5.00		233.7	2,057.5					0.0	0.0	233.7	2,057.5	0.0	0.0
10.00		229.3	2,018.6					53.5	311.4	282.9	2,329.9	0.0	0.0
15.00		224.9	1,979.6					53.5	311.4	278.5	2,290.9	0.0	0.0
20.00		220.5	1,940.6					53.5	311.4	274.1	2,252.0	0.0	0.0
25.00		216.1	1,901.6					53.5	311.4	269.7	2,213.0	0.0	0.0
30.00		211.7	1,862.7					53.5	311.4	265.2	2,174.0	0.0	0.0
35.00		211.1	1,823.7					53.5	311.4	264.7	2,135.0	0.0	0.0
40.00	Top - Section 1	214.2	1,784.7					55.5	311.4	269.7	2,096.1	0.0	0.0
45.00		216.6	1,458.0					57.6	311.4	274.2	1,769.3	0.0	0.0
50.00		218.3	1,425.5					59.4	311.4	277.7	1,736.9	0.0	0.0
55.00		219.3	1,393.0					61.1	311.4	280.4	1,704.4	0.0	0.0
60.00		219.6	1,360.6					62.7	311.4	282.3	1,671.9	0.0	0.0
65.00		219.3	1,328.1					64.3	311.4	283.6	1,639.4	0.0	0.0
70.00		218.5	1,295.6					65.7	311.4	284.2	1,606.9	0.0	0.0
75.00		217.3	1,263.1					67.0	311.4	284.4	1,574.5	0.0	0.0
80.00	Top - Section 2	215.7	1,230.6					68.3	311.4	284.0	1,542.0	0.0	0.0
85.00		213.7	962.0					69.6	311.4	283.3	1,273.3	0.0	0.0
90.00		211.4	936.0					70.7	311.4	282.1	1,247.3	0.0	0.0
95.00		125.9	910.0					71.9	311.4	197.8	1,221.4	0.0	0.0
96.00	Appertunance(s)	103.7	178.9	1,098.7	0.0	0.0	1,692.0	14.5	62.3	1,216.8	1,933.2	0.0	0.0
100.00		184.9	705.1					35.4	199.9	220.3	905.0	0.0	0.0
105.00		122.3	858.0					44.9	249.9	167.2	1,107.9	0.0	0.0
106.00	Appertunance(s)	100.4	168.5	87.8	0.0	263.3	60.0	9.0	50.0	197.2	278.5	0.0	0.0
110.00		178.8	663.6					36.4	197.4	215.2	860.9	0.0	0.0
115.00		118.1	806.1					46.1	246.7	164.2	1,052.8	0.0	0.0
116.00	Appertunance(s)	96.7	158.1	2,122.1	0.0	-697.7	2,601.7	9.3	49.3	2,228.1	2,809.1	0.0	0.0
120.00	Top - Section 3	171.8	622.0					12.5	145.1	184.3	767.1	0.0	0.0
125.00		131.9	661.3					15.7	181.4	147.6	842.7	0.0	0.0
127.00	Appertunance(s)	92.5	258.2	1,197.8	0.0	0.0	2,762.9	6.3	72.6	1,296.6	3,093.6	0.0	0.0
130.00		145.4	380.4					9.6	96.8	155.0	477.3	0.0	0.0
135.00		160.7	615.9					16.1	161.4	176.8	777.3	0.0	0.0
139.00	Top - Section 4	82.2	476.3					13.0	129.1	95.2	605.5	0.0	0.0
140.00		34.7	33.8					3.3	32.3	38.0	66.1	0.0	0.0
142.00	Appertunance(s)	57.0	66.6	168.1	0.0	0.0	66.0	6.6	64.6	231.6	197.2	0.0	0.0
145.00		88.7	97.6					0.0	82.1	88.7	179.6	0.0	0.0
150.00	Top - Section 5	72.3	156.2					0.0	136.8	72.3	293.0	0.0	0.0
152.00	Appertunance(s)	43.9	95.5	1,679.4	0.0	0.0	2,830.6	0.0	54.7	1,723.3	2,980.9	0.0	0.0
155.00		70.6	143.3					0.0	19.6	70.6	162.9	0.0	0.0
160.00		48.6	238.8					0.0	32.7	48.6	271.5	0.0	0.0
160.50	Appertunance(s)	17.8	23.9	254.9	0.0	0.0	200.0	0.0	3.3	272.7	227.1	0.0	0.0
162.00	Appertunance(s)	13.3	71.6	3.6	0.0	3.6	282.0	0.0	9.8	16.9	363.4	0.0	0.0
								Totals:		14,297.5	54,788.3	0.00	0.00

Site Number: 302483 Code: TIA/EIA-222-F

Site Name: Brln - Berlin, CT Engineering Number: 63150121 8/21/2015 6:07:50 PM

Customer: VERIZON WIRELESS

Load Case: Twist/Sway 50.00 mph Wind with No Ice 23 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	-14.203	-54.782	0.000	0.000	0.000	-1,425.137	0.000	0.000	0.000	0.000
5.00	-14.014	-52.712	0.000	0.000	0.000	-1,354.122	-0.027	0.000	0.027	-0.050
10.00	-13.772	-50.371	0.000	0.000	0.000	-1,284.053	-0.106	0.000	0.106	-0.100
15.00	-13.531	-48.069	0.000	0.000	0.000	-1,215.193	-0.237	0.000	0.237	-0.150
20.00	-13.290	-45.806	0.000	0.000	0.000	-1,147.539	-0.420	0.000	0.420	-0.200
25.00	-13.050	-43.583	0.000	0.000	0.000	-1,081.090	-0.657	0.000	0.657	-0.250
30.00	-12.811	-41.399	0.000	0.000	0.000	-1,015.841	-0.946	0.000	0.946	-0.300
35.00	-12.568	-39.254	0.000	0.000	0.000	-951.788	-1.288	0.000	1.288	-0.351
40.00	-12.317	-37.149	0.000	0.000	0.000	-888.948	-1.682	0.000	1.682	-0.401
45.00	-12.064	-35.370	0.000	0.000	0.000	-827.362	-2.129	0.000	2.129	-0.451
50.00	-11.806	-33.624	0.000	0.000	0.000	-767.044	-2.633	0.000	2.633	-0.510
55.00	-11.542	-31.910	0.000	0.000	0.000	-708.015	-3.199	0.000	3.199	-0.569
60.00	-11.273	-30.230	0.000	0.000	0.000	-650.306	-3.825	0.000	3.825	-0.626
65.00	-10.998	-28.583	0.000	0.000	0.000	-593.944	-4.512	0.000	4.512	-0.683
70.00	-10.720	-26.970	0.000	0.000	0.000	-538.953	-5.258	0.000	5.258	-0.739
75.00	-10.438	-25.390	0.000	0.000	0.000	-485.353	-6.061	0.000	6.061	-0.794
80.00	-10.154	-23.843	0.000	0.000	0.000	-433.162	-6.921	0.000	6.921	-0.846
85.00	-9.873	-22.564	0.000	0.000	0.000	-382.394	-7.835	0.000	7.835	-0.897
90.00	-9.592	-21.312	0.000	0.000	0.000	-333.029	-8.807	0.000	8.807	-0.956
95.00	-9.385	-20.089	0.000	0.000	0.000	-285.069	-9.839	0.000	9.839	-1.012
96.00	-8.142	-18.174	0.000	0.000	0.000	-275.684	-10.052	0.000	10.052	-1.023
100.0	-7.919	-17.267	0.000	0.000	0.000	-243.114	-10.928	0.000	10.928	-1.065
105.0	-7.739	-16.159	0.000	0.000	0.000	-203.519	-12.069	0.000	12.069	-1.113
106.0	-7.543	-15.881	0.000	0.000	0.000	-195.517	-12.304	0.000	12.304	-1.122
110.0	-7.320	-15.020	0.000	0.000	0.000	-165.347	-13.259	0.000	13.259	-1.157
115.0	-7.140	-13.968	0.000	0.000	0.000	-128.748	-14.492	0.000	14.492	-1.195
116.0	-4.856	-11.205	0.000	0.000	0.000	-121.608	-14.743	0.000	14.743	-1.202
120.0	-4.661	-10.439	0.000	0.000	0.000	-102.183	-15.762	0.000	15.762	-1.228
125.0	-4.498	-9.598	0.000	0.000	0.000	-78.878	-17.064	0.000	17.064	-1.257
127.0	-3.136	-6.533	0.000	0.000	0.000	-69.881	-17.594	0.000	17.594	-1.269
130.0	-2.972	-6.059	0.000	0.000	0.000	-60.475	-18.396	0.000	18.396	-1.285
135.0	-2.780	-5.285	0.000	0.000	0.000	-45.615	-19.755	0.000	19.755	-1.308
139.0	-2.671	-4.681	0.000	0.000	0.000	-34.497	-20.858	0.000	20.858	-1.324
140.0	-2.634	-4.615	0.000	0.000	0.000	-31.825	-21.136	0.000	21.136	-1.328
142.0	-2.402	-4.421	0.000	0.000	0.000	-26.557	-21.703	0.000	21.703	-1.377
145.0	-2.314	-4.241	0.000	0.000	0.000	-19.351	-22.589	0.000	22.589	-1.438
150.0	-2.237	-3.948	0.000	0.000	0.000	-7.781	-24.135	0.000	24.135	-1.504
152.0	-0.436	-1.014	0.000	0.000	0.000	-3.307	-24.768	0.000	24.768	-1.517
155.0	-0.361	-0.853	0.000	0.000	0.000	-2.000	-25.724	0.000	25.724	-1.526
160.0	-0.305	-0.583	0.000	0.000	0.000	-0.196	-27.327	0.000	27.327	-1.533
160.5	-0.027	-0.363	0.000	0.000	0.000	-0.043	-27.487	0.000	27.487	-1.533
162.0	-0.017	0.000	0.000	0.000	0.000	-0.004	-27.969	0.000	27.969	-1.533

Load Case: Twist/Sway — 50.00 mph Wind with No Ice — 23 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	0.24	0.00	0.00	0.00	11.41	11.86	38.5	0.0	0.308
5.00	0.44	0.24	0.00	0.00	0.00	11.26	11.71	38.5	0.0	0.304
10.00	0.43	0.24	0.00	0.00	0.00	11.10	11.54	38.5	0.0	0.300
15.00	0.42	0.24	0.00	0.00	0.00	10.93	11.35	38.5	0.0	0.295
20.00	0.41	0.24	0.00	0.00	0.00	10.75	11.16	38.5	0.0	0.290
25.00	0.39	0.24	0.00	0.00	0.00	10.55	10.95	38.5	0.0	0.285
30.00	0.38	0.24	0.00	0.00	0.00	10.34	10.73	38.5	0.0	0.279
35.00	0.37	0.24	0.00	0.00	0.00	10.12	10.50	38.5	0.0	0.273
40.00	0.36	0.24	0.00	0.00	0.00	9.87	10.24	38.5	0.0	0.266
40.00	0.43	0.29	0.00	0.00	0.00	11.76	12.20	31.4	0.0	0.389
45.00	0.42	0.29	0.00	0.00	0.00	11.45	11.88	31.4	0.0	0.379
50.00	0.41	0.29	0.00	0.00	0.00	11.12	11.53	31.4	0.0	0.368
55.00	0.39	0.29	0.00	0.00	0.00	10.75	11.16	31.4	0.0	0.356
60.00	0.38	0.29	0.00	0.00	0.00	10.36	10.76	31.4	0.0	0.343
65.00	0.37	0.29	0.00	0.00	0.00	9.94	10.33	31.4	0.0	0.329
70.00	0.36	0.29	0.00	0.00	0.00	9.49	9.86	31.4	0.0	0.315
75.00	0.35	0.29	0.00	0.00	0.00	9.00	9.36	31.4	0.0	0.299
80.00	0.33	0.29	0.00	0.00	0.00	8.47	8.82	31.4	0.0	0.281
80.00	0.42	0.36	0.00	0.00	0.00	10.48	10.91	28.7	0.0	0.380
85.00	0.40	0.36	0.00	0.00	0.00	9.77	10.19	28.7	0.0	0.355
90.00	0.39	0.36	0.00	0.00	0.00	9.00	9.41	28.7	0.0	0.328
95.00	0.38	0.36	0.00	0.00	0.00	8.16	8.56	28.7	0.0	0.298
96.00	0.35	0.32	0.00	0.00	0.00	7.98	8.35	28.7	0.0	0.291
100.00	0.34	0.31	0.00	0.00	0.00	7.38	7.74	28.7	0.0	0.269
105.00	0.33	0.32	0.00	0.00	0.00	6.57	6.92	28.7	0.0	0.241
106.00	0.32	0.31	0.00	0.00	0.00	6.39	6.73	28.7	0.0	0.234
110.00	0.31	0.31	0.00	0.00	0.00	5.68	6.02	28.7	0.0	0.210
115.00	0.30	0.31	0.00	0.00	0.00	4.72	5.05	28.7	0.0	0.176
116.00	0.24	0.21	0.00	0.00	0.00	4.52	4.78	28.7	0.0	0.166
120.00	0.23	0.21	0.00	0.00	0.00	4.01	4.26	28.7	0.0	0.148
120.00	0.26	0.24	0.00	0.00	0.00	4.55	4.83	38.1	0.0	0.127
125.00	0.25	0.24	0.00	0.00	0.00	3.77	4.04	38.1	0.0	0.106
127.00	0.17	0.17	0.00	0.00	0.00	3.43	3.62	38.1	0.0	0.095
130.00	0.16	0.16	0.00	0.00	0.00	3.10	3.28	38.1	0.0	0.086
135.00	0.15	0.16	0.00	0.00	0.00	2.52	2.68	38.1	0.0	0.070
139.00	0.14	0.16	0.00	0.00	0.00	2.03	2.18	38.1	0.0	0.057
139.00	0.47	0.54	0.00	0.00	0.00	10.29	10.80	52.0	0.0	0.208
140.00	0.47	0.54	0.00	0.00	0.00	9.68	10.19	52.0	0.0	0.196
142.00	0.46	0.50	0.00	0.00	0.00	8.39	8.89	52.0	0.0	0.171
145.00	0.45	0.50	0.00	0.00	0.00	6.49	7.00	52.0	0.0	0.135
150.00	0.44	0.51	0.00	0.00	0.00	2.89	3.45	52.0	0.0	0.066
150.00	0.28	0.32	0.00	0.00	0.00	2.40	2.73	28.8	0.0	0.095
152.00	0.07	0.06	0.00	0.00	0.00	1.02	1.10	28.8	0.0	0.038
155.00	0.06	0.05	0.00	0.00	0.00	0.62	0.68	28.8	0.0	0.024
160.00	0.04	0.04	0.00	0.00	0.00	0.06	0.13	28.8	0.0	0.004
160.50	0.03	0.00	0.00	0.00	0.00	0.01	0.04	28.8	0.0	0.001
162.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.8	0.0	0.000

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	36.4	0.00	54.75	0.00	0.00	3645.56	30.53	31.4	40.00	0.974
Ice	29.9	0.00	63.88	0.00	0.00	3056.13	25.94	31.4	40.00	0.827
Twist/Sway	14.2	0.00	54.78	0.00	0.00	1425.14	12.20	31.4	40.00	0.389

Base/Flange Plate	Plate Type	***Baseplate***	
	Pole Diameter	37.38	in
	Pole Thickness	0.75	in
	Plate Length	62	in
	Plate Thickness	2	in
	Plate Fy	60	ksi
	Weld Length	0.25	in
	Allowable	664.01	k-in
	Applied	449.55	k-in
Stiffeners	#	***0***	

Bolts	#	***8***	
	Bolt Circle	44	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
●	Diameter	2.25	in
	Hole Diameter	2.375	in
	Type	A615-75	
	Fy	75	ksi
	Fu	100	ksi
	Allowable	194.86	k
	Applied	120.04	k
Reinforcement ●	#	***0***	
Extra Bolts ○	#	***12***	
	Bolt Circle	55.5	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
	Offset Angle	30	°
	Diameter	1.75	in
	Type	R71	
	Fu	390	ksi
	Allowable	412.75	k
	Applied	106.85	k

Code Rev.	***F***	**Date**	8/21/2015
A.S.I.	1.33	**Engineer**	RDB
		Site #	30283
Moment *	2369.6 k-ft	**Carrier**	Verizon Wireless
Axial *	35.6 k		

* Factored by 0.65, see attached calcs

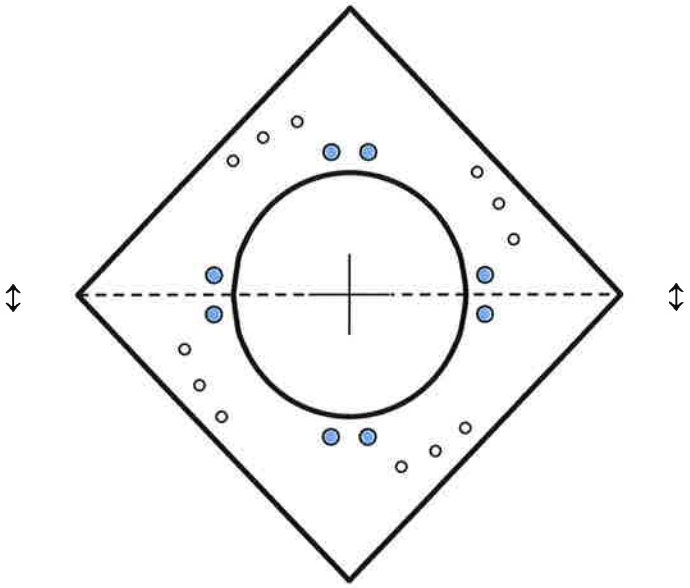


Plate Stress Ratio:
0.68 (Pass)

Bolt Stress Ratio:
0.62 (Pass)

Extra Bolt Stress Ratio:
0.26 (Pass)

8/21/2015

RDB

#302483

Foundation Check

M=3645.6 K-ft

V=36.40 K

P=54.8 K

Sliding Factor of Safety

V=36.40 K

Total Weight = Wt. of Concrete = Wt. of Soil + P = 86.7 + 47.8 + 54.8 = 189.3 K

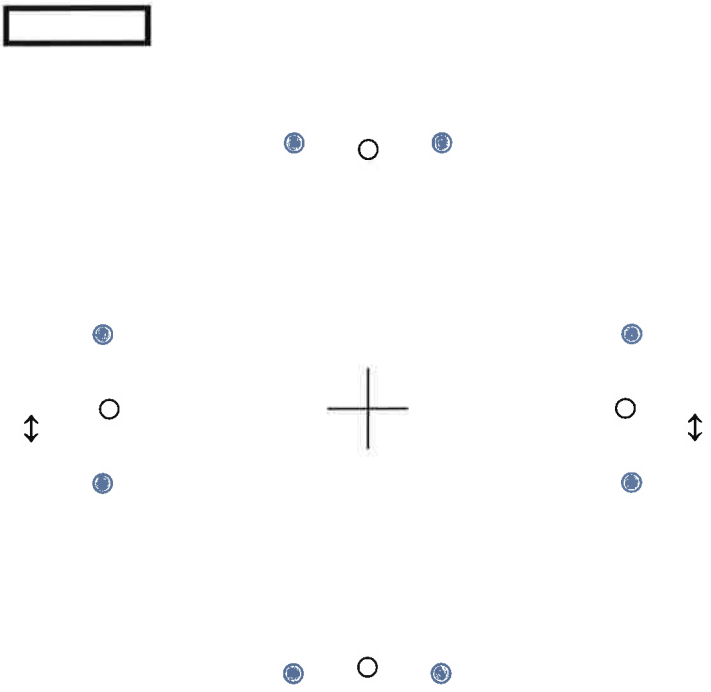
Ultimate friction resistance = 0.41 x (wt.) = 0.41x 189.3 = 77.613 K

Ultimate passive sliding resistance = 11' x 2.58' x 1.33 = 37.7 K

Factor of Safety = 113.93/37.7 = 3.02 ; OK

(12) R71 Williams 150ks rock anchor check (next page)

Code Rev.	F		Date	8/21/2015
A.S.I.	1.33		Engineer	RDB
			Site #	30283
Moment	3645.6 k-ft		Carrier	Verizon Wireless
Axial	54.8 k			



Bolts ●	#	8	
	Bolt Circle	44.25	in
	(R)adial / (S)quare	S	
	Bolt Gap	12	in
	Diameter	1.65	in
	Hole Diameter	3.625	in
	Type	R71 Williams	
	Fu	390	ksi
	Allowable	366.92	k
	Applied	310.88	k
Reinforcement ●	#	0	
Extra Bolts O	#	4	
	Bolt Circle	41.63	in
	(R)adial / (S)quare	R	
	Offset Angle	90	°
	Diameter	1.75	in
	Type	R71 Williams	
	Fu	390	ksi
	Allowable	412.75	k
	Applied	362.68	k

Bolt Stress Ratio:
0.85 (Pass)

Extra Bolt Stress Ratio:
0.88 (Pass)