Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

November 16, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
53 Westminster Drive, Canterbury, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 170-foot level of the existing 180-foot tower at 53 Westminster Drive in Canterbury, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 2010. Cellco now intends to modify its facility by replacing six (6) of its antennas with three (3) model SBNHH-1D65B, 700/1900 MHz antennas and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace six (6) remote radio heads ("RRHs") and install three (3) new RRHs and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ fiber optic antenna cable . Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and antenna 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 Roy A. Piper, First Selectman for the Town of Canterbury. A copy of this letter is also being sent to John Lemire, the owner of the Property and Crown, 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 structure. Cellco's new antennas and RRHs will be installed at a centerline height of 170 feet on the 180-foot tower.

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

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

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

A copy of the Town Assessor's Parcel Map and property owner information is included in Attachment 4.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Roy A. Piper, Canterbury First Selectman
John Lemire
Crown
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65B

Multiband Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
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, 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

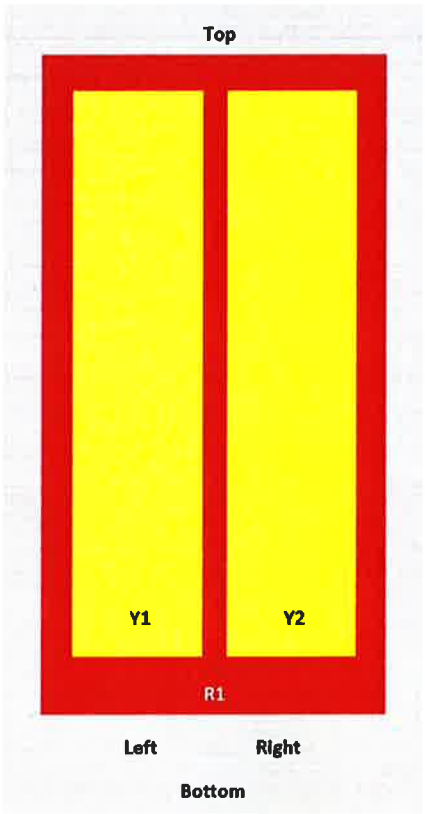
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D65B

SBNHH 65



Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	AR[illegible] 1
Y1	1695-2360	3-4	2	AR[illegible] 2
Y2	1695-2360	5-6		

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	6
RF Connector Quantity, low band	2
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female
Color	Light gray

Product Specifications

SBNHH-1D65B

Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Depth	180.0 mm | 7.1 in
Net Weight, without mounting kit	18.4 kg | 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (1) | Low band (1)
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

Length	2025.0 mm | 79.7 in
Width	390.0 mm | 15.4 in
Depth	296.0 mm | 11.7 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.

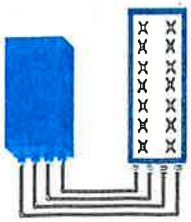
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

Alcatel·Lucent

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 KW)	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

ALCATEL-LUCENT B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new 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 B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 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, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

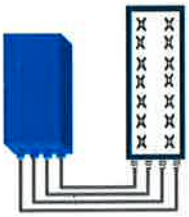
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options (Pole or Wall)



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) RX Diversity scheme	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.) Volume (w/ solar shield) in L Weight (w/ solar shield) in kg (lb)	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
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 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 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

ALCATEL-LUCENT B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

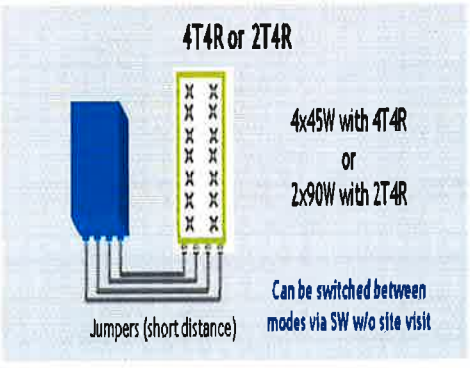
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports



BENEFITS

- Compact to reduce additional footprint when adding LTE in AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.) Volume in Liters Weight in kg (lb) (w/o mounting HW)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield) 35.5 (with solar shield) 29.7 (without solar shield) 25.8kg (56.8lb) (with solar shield)
DC voltage range DC power consumption	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) UL50E Type 4 Enclosure 250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

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		
Jacket	Polyethylene, PE	[mm (in)]	46.5 (1.83)
UV-Protection	Individual and External Jacket	[mm (in)]	50.3 (1.98)
			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-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

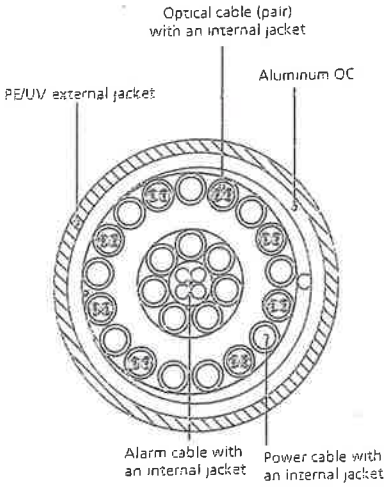


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Canterbury								
Tower Height: Verizon @ 180ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	11	122	180	1962	0.0159	1.0000	0.16%	
*AT&T	2	565	161	880	0.0169	0.5867	0.29%	
*AT&T	2	875	161	1900	0.0262	1.0000	0.26%	
*AT&T	1	1771	161	734	0.0265	0.4893	0.54%	
*AT&T	4	525	161	1900	0.0314	1.0000	0.31%	
*AT&T	1	283	161	880	0.0042	0.5867	0.07%	
Verizon PCS	**11**	**401**	**170**	**0.0549**	**1970**	**1.0000**	**5.49%**	
Verizon Cellular	**9**	**397**	**170**	**0.0445**	**869**	**0.5793**	**7.68%**	
Verizon AWS	**1**	**6907**	**170**	**0.0859**	**2145**	**1.0000**	**8.59%**	
Verizon 700	**1**	**2472**	**170**	**0.0308**	**746**	**0.4973**	**6.18%**	
								29.59%
* Source: Siting Council								

ATTACHMENT 3

PJF PAUL J. FORD & COMPANY

Date: **October 28, 2016**

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
(614) 221-6679
mclopez@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876375
	Crown Castle Site Name:	CANTERBURY / LEMIRE
	Crown Castle JDE Job Number:	400001
	Crown Castle Work Order Number:	1309624
	Crown Castle Application Number:	363876 Rev. 3
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-3420.001.7805 (Revised Exp. B)
Site Data:	**53 Westminster Rd., CANTERBURY, Windham County, CT** **Latitude *41° 42' 7.15"*, Longitude *-71° 58' 50.11"*** **180 Foot - Monopole Tower**	

Dear Sean Dempsey,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 959756, in accordance with application 363876, revision 3.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/were used in this analysis.

We at *Paul J. Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Maria C. Lopez, P.E., P. Eng.
Project Manager

tnxTower Report - version 7.0.5.1

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

10-28-16

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Antenna and Cable Information
Table 2 - Existing and Reserved Antenna and Cable Information
Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE
Table 4 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 5 - Section Capacity (Summary)
Table 6 – Tower Components vs. Capacity
4.1) Recommendations

5) APPENDIX A
tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 180 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in April of 2010. The tower was originally designed per TIA/EIA-222-F. The original design wind speed is unknown

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
168.0	170.0	3	alcatel lucent	B66A RRH4X45	12	1-5/8	-
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		6	commscope	SBNHH-1D65B w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	183.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	1
	180.0	1	tower mounts	Platform Mount [LP 601-1]			
170.0	170.0	1	rfs celwave	TMA-DB-T1-6Z-8AB-0Z	-	-	1
168.0	170.0	3	alcatel lucent	RRH2X40-07-U	-	-	2
		3	alcatel lucent	RRH2x40-AWS			
		3	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe			
		3	antel	BXA-70063-6CF-EDIN-4 w/ Mount Pipe			
		3	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe	2	1-5/8	1
		3	antel	BXA-70063-6CF-EDIN-4 w/ Mount Pipe			
	168.0	1	tower mounts	Platform Mount [LP 303-1]			
160.0	161.0	3	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe	12 1 2 1	1-1/4 3/8 7/16 Conduit	1
		6	powerwave	7770.00 w/ Mount Pipe			
	160.0	6	powerwave	LGP21401			
		6	powerwave	LGP21901			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
158.0	159.0	3	ericsson	TME-RRUS-11	-	-	1
	158.0	1	tower mounts	Side Arm Mount [SO 102-3]			
78.0	79.0	1	spectracom	8225	1	1/2	1
	78.0	1	tower mounts	Side Arm Mount [SO 901-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Welti, 1/24/2000	1615348	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 37509-0930, 7/21/2009	2464622	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 131001.876375, 5/14/2013	3841077	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH, 09-04033E N1, 4/15/2009	1615408	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FDH, 09-04023T T1, 5/4/2009	2428368	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) The existing monopole shaft has been reinforced using a Crown-approved system in accordance with the above referenced documents. However, in this analysis we found that due to the change from the EIA/TIA-222-F Standard (the Standard used in the original reinforcing design) to the TIA-222-G-2 Standard (the most current Standard) the shaft reinforcing was found to be ineffective and, therefore, not considered in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 134	Pole	TP26.374x17.62x0.25	1	-9.42	1496.24	64.6	Pass
L2	134 - 88.5	Pole	TP34.533x25.2555x0.3125	2	-16.88	2419.83	80.0	Pass
L3	88.5 - 43	Pole	TP42.567x33.0992x0.375	3	-27.74	3553.29	77.3	Pass
L4	43 - 0	Pole	TP50x40.8179x0.375	4	-41.96	4033.20	86.8	Pass
							Summary	
						Pole (L4)	86.8	Pass
						RATING =	**86.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	70.2	Pass
1	Base Plate	0	72.4	Pass
1	Base Foundation Steel	0	68.5	Pass
1	Base Foundation Soil Interaction	0	22.5	Pass

Structure Rating (max from all components) =	86.8%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 99% are considered acceptable based on analysis methods used.

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Windham County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 101 mph.
4) Structure Class II.
5) Exposure Category B.
6) Topographic Category 1.
7) Crest Height 0.0000 ft.
8) Nominal ice thickness of 1.0000 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Temperature drop of 50 °F.
13) Deflections calculated using a wind speed of 60 mph.
14) A non-linear (P-delta) analysis was used.
15) Pressures are calculated at each section.
16) Stress ratio used in pole design is 1.
17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	180.0000-134.0000	46.0000	3.25	18	17.6200	26.3740	0.2500	1.0000	A572-65 (65 ksi)
L2	134.0000-88.5000	48.7500	4.25	18	25.2555	34.5330	0.3125	1.2500	A572-65 (65 ksi)
L3	88.5000-43.0000	49.7500	5.25	18	33.0992	42.5670	0.3750	1.5000	A572-65 (65 ksi)
L4	43.0000-0.0000	48.2500		18	40.8179	50.0000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	17.8918	13.7831	525.3925	6.1664	8.9510	58.6968	1051.4762	6.8929	2.6611	10.644
	26.7809	20.7294	1787.3245	9.2740	13.3980	133.4024	3577.0008	10.3667	4.2018	16.807
L2	26.2732	24.7403	1944.6481	8.8548	12.8298	151.5728	3891.8551	12.3725	3.8950	12.464
	35.0657	33.9425	5021.7310	12.1483	17.5428	286.2565	10050.0698	16.9745	5.5278	17.689
L3	34.4311	38.9500	5269.6586	11.6171	16.8144	313.4017	10546.2511	19.4787	5.1655	13.775
	43.2237	50.2190	11294.4732	14.9782	21.6240	522.3111	22603.8079	25.1143	6.8318	18.218
L4	42.4621	48.1371	9947.2269	14.3572	20.7355	479.7200	19907.5427	24.0731	6.5239	17.397
	50.7713	59.0662	18377.1094	17.6169	25.4000	723.5082	36778.3998	29.5387	8.1400	21.707

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.0000-134.0000				1	1	1			
L2 134.0000-88.5000				1	1	1			
L3 88.5000-43.0000				1	1	1			
L4 43.0000-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
**										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8")	C	No	Inside Pole	180.0000 - 0.0000	6	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
**								
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	168.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
LCF158-50JA-A7(1-5/8")	C	No	Inside Pole	168.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
LDF7-50A(1-5/8")	C	No	Inside Pole	168.0000 - 0.0000	6	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	168.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.0000	0.00
LCF158-50JA-A7(1-5/8")	C	No	Inside Pole	168.0000 - 0.0000	5	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
**								
LDF6-50A(1-1/4")	C	No	Inside Pole	160.0000 - 0.0000	12	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
FB-L98B-002-75000(3/8")	C	No	Inside Pole	160.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
WR-VG122ST-BRDA(7/16)	C	No	Inside Pole	160.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
2" (Nominal) Conduit	C	No	Inside Pole	160.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
**								
LDF4-50A(1/2")	C	No	Inside Pole	78.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
**								
Aero MP3-05	C	No	CaAa (Out Of Face)	40.5000 - 0.0000	1	No Ice	0.3478	0.00
						1/2" Ice	0.4001	0.00
						1" Ice	0.6566	0.00
Aero MP3-05	C	No	CaAa (Out Of Face)	56.0000 - 36.0000	1	No Ice	0.3478	0.00
						1/2" Ice	0.4001	0.00
						1" Ice	0.6566	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	82.2500 - 52.2500	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	109.2500 - 79.2500	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
Aero MP3-03	C	No	CaAa (Out Of Face)	121.7500 - 106.7500	1	No Ice	0.2625	0.00
						1/2" Ice	0.3736	0.00
						1" Ice	0.4847	0.00
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.0000-134.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.86
L2	134.0000-88.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.519	1.17
L3	88.5000-43.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	15.081	1.18
L4	43.0000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	16.520	1.11

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.0000-	A	2.336	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
	134.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.86
L2	134.0000-88.5000	A	2.257	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	28.075	1.17
L3	88.5000-43.0000	A	2.142	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	42.411	1.18
L4	43.0000-0.0000	A	1.911	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	43.238	1.11

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.0000-134.0000	0.0000	0.0000	0.0000	0.0000
L2	134.0000-88.5000	-0.2568	0.1482	-0.5876	0.3393
L3	88.5000-43.0000	-0.3867	0.2233	-0.8525	0.4922
L4	43.0000-0.0000	-0.4443	0.2565	-0.9461	0.5462

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
5/8" X 5' Lightning Rod **	C	From Leg	0.0000 0.00 2.50	0.00	180.0000	No Ice 1/2" Ice 1" Ice	0.3125 0.8260 1.3216	0.3125 0.8260 1.3216	0.01 0.01 0.02
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice	4.0361 4.4987 4.9468	3.6194 4.4808 5.2186	0.03 0.07 0.11
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice	4.0361 4.4987 4.9468	3.6194 4.4808 5.2186	0.03 0.07 0.11
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice	4.0361 4.4987 4.9468	3.6194 4.4808 5.2186	0.03 0.07 0.11
Platform Mount [LP 601-1]	C	None		0.00	180.0000	No Ice 1/2" Ice	28.4700 33.5900 38.7100	28.4700 33.5900 38.7100	1.12 1.51 1.91

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) 5'x2 1/2" Pipe Mount	A	From Leg	4.0000	0.00	180.0000	No Ice	1.3275	1.3275	0.03
			0.00			1/2"	1.6321	1.6321	0.04
			3.00			Ice	1.9459	1.9459	0.05
						1" Ice			
(2) 5'x2 1/2" Pipe Mount	B	From Leg	4.0000	0.00	180.0000	No Ice	1.3275	1.3275	0.03
			0.00			1/2"	1.6321	1.6321	0.04
			3.00			Ice	1.9459	1.9459	0.05
						1" Ice			
(2) 5'x2 1/2" Pipe Mount	C	From Leg	4.0000	0.00	180.0000	No Ice	1.3275	1.3275	0.03
			0.00			1/2"	1.6321	1.6321	0.04
			3.00			Ice	1.9459	1.9459	0.05
						1" Ice			
***									
TMA-DB-T1-6Z-8AB-0Z	A	From Leg	0.5000	0.00	170.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2"	5.0704	2.1926	0.08
			0.00			Ice	5.3481	2.3926	0.12
						1" Ice			
Pipe Mount [PM 601-3]	C	None		0.00	170.0000	No Ice	4.3900	4.3900	0.20
						1/2"	5.4800	5.4800	0.24
						Ice	6.5700	6.5700	0.28
						1" Ice			
***									
BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Leg	4.0000	0.00	168.0000	No Ice	5.0290	5.2887	0.04
			0.00			1/2"	5.5830	6.4594	0.09
			2.00			Ice	6.1033	7.3479	0.14
						1" Ice			
BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000	0.00	168.0000	No Ice	5.0290	5.2887	0.04
			0.00			1/2"	5.5830	6.4594	0.09
			2.00			Ice	6.1033	7.3479	0.14
						1" Ice			
BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000	0.00	168.0000	No Ice	5.0290	5.2887	0.04
			0.00			1/2"	5.5830	6.4594	0.09
			2.00			Ice	6.1033	7.3479	0.14
						1" Ice			
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	A	From Leg	4.0000	0.00	168.0000	No Ice	7.8065	5.3981	0.04
			0.00			1/2"	8.3569	6.5465	0.10
			2.00			Ice	8.8720	7.4089	0.17
						1" Ice			
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	B	From Leg	4.0000	0.00	168.0000	No Ice	7.8065	5.3981	0.04
			0.00			1/2"	8.3569	6.5465	0.10
			2.00			Ice	8.8720	7.4089	0.17
						1" Ice			
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	C	From Leg	4.0000	0.00	168.0000	No Ice	7.8065	5.3981	0.04
			0.00			1/2"	8.3569	6.5465	0.10
			2.00			Ice	8.8720	7.4089	0.17
						1" Ice			
B66A RRH4X45	A	From Leg	4.0000	0.00	168.0000	No Ice	2.5800	1.6296	0.07
			0.00			1/2"	2.7937	1.8106	0.09
			2.00			Ice	3.0148	1.9986	0.11
						1" Ice			
B66A RRH4X45	B	From Leg	4.0000	0.00	168.0000	No Ice	2.5800	1.6296	0.07
			0.00			1/2"	2.7937	1.8106	0.09
			2.00			Ice	3.0148	1.9986	0.11
						1" Ice			
B66A RRH4X45	C	From Leg	4.0000	0.00	168.0000	No Ice	2.5800	1.6296	0.07
			0.00			1/2"	2.7937	1.8106	0.09
			2.00			Ice	3.0148	1.9986	0.11
						1" Ice			
RRH2x60-700	A	From Leg	4.0000	0.00	168.0000	No Ice	3.5002	1.8157	0.06
			0.00			1/2"	3.7609	2.0519	0.08
			2.00			Ice	4.0285	2.2894	0.11
						1" Ice			
RRH2x60-700	B	From Leg	4.0000	0.00	168.0000	No Ice	3.5002	1.8157	0.06
			0.00			1/2"	3.7609	2.0519	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			Ice	4.0285	2.2894	0.11
						1" Ice			
RRH2x60-700	C	From Leg	4.0000	0.00	168.0000	No Ice	3.5002	1.8157	0.06
			0.00			1/2"	3.7609	2.0519	0.08
			2.00			Ice	4.0285	2.2894	0.11
						1" Ice			
RRH2X60-PCS	A	From Leg	4.0000	0.00	168.0000	No Ice	2.2000	1.7233	0.06
			0.00			1/2"	2.3926	1.9015	0.08
			2.00			Ice	2.5926	2.0870	0.10
						1" Ice			
RRH2X60-PCS	B	From Leg	4.0000	0.00	168.0000	No Ice	2.2000	1.7233	0.06
			0.00			1/2"	2.3926	1.9015	0.08
			2.00			Ice	2.5926	2.0870	0.10
						1" Ice			
RRH2X60-PCS	C	From Leg	4.0000	0.00	168.0000	No Ice	2.2000	1.7233	0.06
			0.00			1/2"	2.3926	1.9015	0.08
			2.00			Ice	2.5926	2.0870	0.10
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000	0.00	168.0000	No Ice	8.3995	7.0730	0.07
			0.00			1/2"	8.9639	8.2637	0.14
			2.00			Ice	9.4943	9.1753	0.21
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000	0.00	168.0000	No Ice	8.3995	7.0730	0.07
			0.00			1/2"	8.9639	8.2637	0.14
			2.00			Ice	9.4943	9.1753	0.21
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000	0.00	168.0000	No Ice	8.3995	7.0730	0.07
			0.00			1/2"	8.9639	8.2637	0.14
			2.00			Ice	9.4943	9.1753	0.21
						1" Ice			
Platform Mount [LP 303-1]	C	None		0.00	168.0000	No Ice	14.6600	14.6600	1.25
						1/2"	18.8700	18.8700	1.48
						Ice	23.0800	23.0800	1.71
						1" Ice			
DB-T1-6Z-8AB-0Z	C	From Leg	4.0000	0.00	168.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2"	5.0704	2.1926	0.08
			2.00			Ice	5.3481	2.3926	0.12
						1" Ice			
***									
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000	0.00	160.0000	No Ice	5.8196	4.6651	0.09
			0.00			1/2"	6.2677	5.5082	0.14
			1.00			Ice	6.6966	6.2127	0.21
						1" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000	0.00	160.0000	No Ice	5.8196	4.6651	0.09
			0.00			1/2"	6.2677	5.5082	0.14
			1.00			Ice	6.6966	6.2127	0.21
						1" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000	0.00	160.0000	No Ice	5.8196	4.6651	0.09
			0.00			1/2"	6.2677	5.5082	0.14
			1.00			Ice	6.6966	6.2127	0.21
						1" Ice			
AM-X-CD-17-65-00T-RET w/ Mount Pipe	A	From Leg	4.0000	0.00	160.0000	No Ice	11.5486	8.9375	0.09
			0.00			1/2"	12.2673	10.4499	0.18
			1.00			Ice	12.9953	11.9863	0.27
						1" Ice			
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Leg	4.0000	0.00	160.0000	No Ice	11.5486	8.9375	0.09
			0.00			1/2"	12.2673	10.4499	0.18
			1.00			Ice	12.9953	11.9863	0.27
						1" Ice			
AM-X-CD-17-65-00T-RET w/ Mount Pipe	C	From Leg	4.0000	0.00	160.0000	No Ice	11.5486	8.9375	0.09
			0.00			1/2"	12.2673	10.4499	0.18
			1.00			Ice	12.9953	11.9863	0.27
						1" Ice			
(2) LGP21401	A	From Leg	4.0000	0.00	160.0000	No Ice	1.1040	0.3471	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2"	1.2388	0.4422	0.02
			0.00			Ice	1.3810	0.5444	0.03
						1" Ice			
(2) LGP21401	B	From Leg	4.0000	0.00	160.0000	No Ice	1.1040	0.3471	0.01
			0.00			1/2"	1.2388	0.4422	0.02
			0.00			Ice	1.3810	0.5444	0.03
						1" Ice			
(2) LGP21401	C	From Leg	4.0000	0.00	160.0000	No Ice	1.1040	0.3471	0.01
			0.00			1/2"	1.2388	0.4422	0.02
			0.00			Ice	1.3810	0.5444	0.03
						1" Ice			
(2) LGP21901	A	From Leg	4.0000	0.00	160.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			0.00			Ice	0.3647	0.2756	0.01
						1" Ice			
(2) LGP21901	B	From Leg	4.0000	0.00	160.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			0.00			Ice	0.3647	0.2756	0.01
						1" Ice			
(2) LGP21901	C	From Leg	4.0000	0.00	160.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2"	0.2941	0.2129	0.01
			0.00			Ice	0.3647	0.2756	0.01
						1" Ice			
DC6-48-60-18-8F	B	From Leg	4.0000	0.00	160.0000	No Ice	0.9167	0.9167	0.02
			0.00			1/2"	1.4583	1.4583	0.04
			0.00			Ice	1.6431	1.6431	0.06
						1" Ice			
Platform Mount [LP 303-1]	C	None		0.00	160.0000	No Ice	14.6600	14.6600	1.25
						1/2"	18.8700	18.8700	1.48
						Ice	23.0800	23.0800	1.71
						1" Ice			
***									
TME-RRUS-11	A	From Leg	1.5000	0.00	158.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			1.00			Ice	3.2066	1.4897	0.09
						1" Ice			
TME-RRUS-11	B	From Leg	1.5000	0.00	158.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			1.00			Ice	3.2066	1.4897	0.09
						1" Ice			
TME-RRUS-11	C	From Leg	1.5000	0.00	158.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			1.00			Ice	3.2066	1.4897	0.09
						1" Ice			
Side Arm Mount [SO 102-3]	C	None		0.00	158.0000	No Ice	3.0000	3.0000	0.08
						1/2"	3.4800	3.4800	0.11
						Ice	3.9600	3.9600	0.14
						1" Ice			
***									
8225	B	From Leg	1.0000	0.00	78.0000	No Ice	0.8937	0.8937	0.00
			0.00			1/2"	1.0597	1.0597	0.01
			1.00			Ice	1.2296	1.2296	0.02
						1" Ice			
Side Arm Mount [SO 901-1]	C	None		0.00	78.0000	No Ice	0.5000	0.8800	0.11
						1/2"	0.6800	1.1300	0.11
						Ice	0.8600	1.3800	0.11
						1" Ice			
**									

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 180.0000-134.0000	155.7126	1.122	27.796	85.623	A	0.000	85.623	85.623	100.00	0.000	0.000
					B	0.000	85.623		100.00	0.000	0.000
					C	0.000	85.623		100.00	0.000	0.000
L2 134.0000-88.5000	110.4950	1.017	25.177	116.288	A	0.000	116.288	116.288	100.00	0.000	0.000
					B	0.000	116.288		100.00	0.000	0.000
					C	0.000	116.288		100.00	0.000	9.519
L3 88.5000-43.0000	65.4593	0.876	21.600	147.220	A	0.000	147.220	147.220	100.00	0.000	0.000
					B	0.000	147.220		100.00	0.000	0.000
					C	0.000	147.220		100.00	0.000	15.081
L4 43.0000-0.0000	20.9687	0.7	17.534	167.043	A	0.000	167.043	167.043	100.00	0.000	0.000
					B	0.000	167.043		100.00	0.000	0.000
					C	0.000	167.043		100.00	0.000	16.520

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 180.0000-134.0000	155.7126	1.122	6.812	2.3357	103.529	A	0.000	103.529	103.529	100.00	0.000	0.000
						B	0.000	103.529		100.00	0.000	0.000
						C	0.000	103.529		100.00	0.000	0.000
L2 134.0000-88.5000	110.4950	1.017	6.170	2.2569	134.000	A	0.000	134.000	134.000	100.00	0.000	0.000
						B	0.000	134.000		100.00	0.000	0.000
						C	0.000	134.000		100.00	0.000	28.075
L3 88.5000-43.0000	65.4593	0.876	5.294	2.1418	164.335	A	0.000	164.335	164.335	100.00	0.000	0.000
						B	0.000	164.335		100.00	0.000	0.000
						C	0.000	164.335		100.00	0.000	42.411
L4 43.0000-0.0000	20.9687	0.7	4.297	1.9113	182.393	A	0.000	182.393	182.393	100.00	0.000	0.000
						B	0.000	182.393		100.00	0.000	0.000
						C	0.000	182.393		100.00	0.000	43.238

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 180.0000-134.0000	155.7126	1.122	8.777	85.623	A	0.000	85.623	85.623	100.00	0.000	0.000
					B	0.000	85.623		100.00	0.000	0.000
					C	0.000	85.623		100.00	0.000	0.000
L2 134.0000-88.5000	110.4950	1.017	7.950	116.288	A	0.000	116.288	116.288	100.00	0.000	0.000
					B	0.000	116.288		100.00	0.000	0.000
					C	0.000	116.288		100.00	0.000	9.519
L3 88.5000-43.0000	65.4593	0.876	6.820	147.220	A	0.000	147.220	147.220	100.00	0.000	0.000
					B	0.000	147.220		100.00	0.000	0.000
					C	0.000	147.220		100.00	0.000	15.081
L4 43.0000-0.0000	20.9687	0.7	5.536	167.043	A	0.000	167.043	167.043	100.00	0.000	0.000
					B	0.000	167.043		100.00	0.000	0.000
					C	0.000	167.043		100.00	0.000	16.520

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 134	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.00	0.68	-0.74
			Max. Mx	20	-9.46	496.70	-1.87
			Max. My	14	-9.43	1.87	-499.66
			Max. Vy	20	-16.37	496.70	-1.87
			Max. Vx	14	16.46	1.87	-499.66

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	3			0.34
L2	134 - 88.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.13	0.69	-0.75
			Max. Mx	20	-16.91	1306.63	-4.28
			Max. My	14	-16.89	4.27	-1313.67
			Max. Vy	20	-20.04	1306.63	-4.28
			Max. Vx	14	20.13	4.27	-1313.67
			Max. Torque	25			0.71
L3	88.5 - 43	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.42	0.55	-0.80
			Max. Mx	20	-27.75	2285.68	-6.64
			Max. My	14	-27.74	6.63	-2296.81
			Max. Vy	20	-23.83	2285.68	-6.64
			Max. Vx	14	23.92	6.63	-2296.81
			Max. Torque	25			1.52
L4	43 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.54	0.53	-0.77
			Max. Mx	20	-41.96	3511.89	-9.08
			Max. My	14	-41.96	9.05	-3527.25
			Max. Vy	20	-26.86	3511.89	-9.08
			Max. Vx	14	26.95	9.05	-3527.25
			Max. Torque	25			2.59

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	77.54	-0.00	0.00
	Max. H_x	20	41.99	26.82	-0.05
	Max. H_z	2	41.99	-0.05	26.90
	Max. M_x	2	3526.99	-0.05	26.90
	Max. M_z	8	3511.66	-26.82	0.05
	Max. Torsion	25	2.59	13.37	23.28
	Min. Vert	15	31.49	0.05	-26.90
	Min. H_x	8	41.99	-26.82	0.05
	Min. H_z	14	41.99	0.05	-26.90
	Min. M_x	14	-3527.25	0.05	-26.90
	Min. M_z	20	-3511.89	26.82	-0.05
	Min. Torsion	13	-2.59	-13.37	-23.28

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	34.99	-0.00	0.00	0.10	0.08	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	41.99	0.05	-26.90	-3526.99	-8.88	-2.18
0.9 Dead+1.6 Wind 0 deg - No Ice	31.49	0.05	-26.90	-3458.72	-8.71	-2.19
1.2 Dead+1.6 Wind 30 deg - No Ice	41.99	13.45	-23.33	-3059.50	-1763.79	-1.19
0.9 Dead+1.6 Wind 30 deg - No Ice	31.50	13.45	-23.33	-3000.33	-1729.70	-1.19
1.2 Dead+1.6 Wind 60 deg - No Ice	41.99	23.25	-13.50	-1771.58	-3046.15	0.13
0.9 Dead+1.6 Wind 60 deg - No Ice	31.50	23.25	-13.50	-1737.32	-2987.27	0.12
1.2 Dead+1.6 Wind 90 deg - No Ice	41.99	26.82	-0.05	-8.85	-3511.66	1.41

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 90 deg - No Ice	31.49	26.82	-0.05	-8.69	-3443.71	1.41
1.2 Dead+1.6 Wind 120 deg - No Ice	41.99	23.21	13.41	1756.37	-3037.36	2.31
0.9 Dead+1.6 Wind 120 deg - No Ice	31.50	23.21	13.41	1722.38	-2978.65	2.31
1.2 Dead+1.6 Wind 150 deg - No Ice	41.99	13.37	23.28	3050.95	-1748.37	2.58
0.9 Dead+1.6 Wind 150 deg - No Ice	31.50	13.37	23.28	2991.89	-1714.60	2.59
1.2 Dead+1.6 Wind 180 deg - No Ice	41.99	-0.05	26.90	3527.25	9.05	2.17
0.9 Dead+1.6 Wind 180 deg - No Ice	31.49	-0.05	26.90	3458.91	8.83	2.17
1.2 Dead+1.6 Wind 210 deg - No Ice	41.99	-13.45	23.33	3059.77	1763.99	1.18
0.9 Dead+1.6 Wind 210 deg - No Ice	31.50	-13.45	23.33	3000.53	1729.84	1.18
1.2 Dead+1.6 Wind 240 deg - No Ice	41.99	-23.25	13.50	1771.84	3046.37	-0.12
0.9 Dead+1.6 Wind 240 deg - No Ice	31.50	-23.25	13.50	1737.50	2987.43	-0.12
1.2 Dead+1.6 Wind 270 deg - No Ice	41.99	-26.82	0.05	9.08	3511.89	-1.39
0.9 Dead+1.6 Wind 270 deg - No Ice	31.49	-26.82	0.05	8.85	3443.87	-1.39
1.2 Dead+1.6 Wind 300 deg - No Ice	41.99	-23.21	-13.41	-1756.16	3037.55	-2.29
0.9 Dead+1.6 Wind 300 deg - No Ice	31.50	-23.21	-13.41	-1722.22	2978.79	-2.30
1.2 Dead+1.6 Wind 330 deg - No Ice	41.99	-13.37	-23.28	-3050.71	1748.54	-2.59
0.9 Dead+1.6 Wind 330 deg - No Ice	31.50	-13.37	-23.28	-2991.73	1714.72	-2.59
1.2 Dead+1.0 Ice+1.0 Temp	77.54	0.00	-0.00	0.77	0.53	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	77.54	0.01	-8.52	-1250.11	-1.52	-0.87
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	77.54	4.26	-7.39	-1083.61	-625.49	-0.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	77.54	7.38	-4.27	-626.49	-1081.66	0.09
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	77.54	8.51	-0.01	-1.22	-1247.81	0.61
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	77.54	7.37	4.25	624.65	-1079.42	0.96
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	77.54	4.25	7.38	1083.43	-621.60	1.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	77.54	-0.01	8.52	1252.18	2.98	0.87
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	77.54	-4.26	7.39	1085.68	626.95	0.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	77.54	-7.38	4.27	628.56	1083.13	-0.09
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	77.54	-8.51	0.01	3.28	1249.28	-0.61
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	77.54	-7.37	-4.25	-622.60	1080.88	-0.96
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	77.54	-4.25	-7.38	-1081.37	623.05	-1.06
Dead+Wind 0 deg - Service	34.99	0.01	-5.31	-690.16	-1.66	-0.02
Dead+Wind 30 deg - Service	34.99	2.65	-4.60	-598.55	-345.04	0.00
Dead+Wind 60 deg - Service	34.99	4.59	-2.66	-346.54	-595.94	0.03
Dead+Wind 90 deg - Service	34.99	5.29	-0.01	-1.64	-687.13	0.04
Dead+Wind 120 deg - Service	34.99	4.58	2.65	343.73	-594.19	0.04
Dead+Wind 150 deg - Service	34.99	2.64	4.59	597.02	-342.00	0.04
Dead+Wind 180 deg - Service	34.99	-0.01	5.31	690.38	1.85	0.02

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 210 deg - Service	34.99	-2.65	4.60	598.77	345.23	-0.00
Dead+Wind 240 deg - Service	34.99	-4.59	2.66	346.76	596.13	-0.03
Dead+Wind 270 deg - Service	34.99	-5.29	0.01	1.86	687.33	-0.04
Dead+Wind 300 deg - Service	34.99	-4.58	-2.65	-343.51	594.38	-0.04
Dead+Wind 330 deg - Service	34.99	-2.64	-4.59	-596.80	342.19	-0.04

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-34.99	0.00	0.00	34.99	-0.00	0.000%
2	0.05	-41.99	-26.91	-0.05	41.99	26.90	0.009%
3	0.05	-31.50	-26.91	-0.05	31.49	26.90	0.013%
4	13.45	-41.99	-23.33	-13.45	41.99	23.33	0.000%
5	13.45	-31.50	-23.33	-13.45	31.50	23.33	0.000%
6	23.25	-41.99	-13.50	-23.25	41.99	13.50	0.000%
7	23.25	-31.50	-13.50	-23.25	31.50	13.50	0.000%
8	26.82	-41.99	-0.05	-26.82	41.99	0.05	0.009%
9	26.82	-31.50	-0.05	-26.82	31.49	0.05	0.013%
10	23.21	-41.99	13.41	-23.21	41.99	-13.41	0.000%
11	23.21	-31.50	13.41	-23.21	31.50	-13.41	0.000%
12	13.37	-41.99	23.28	-13.37	41.99	-23.28	0.000%
13	13.37	-31.50	23.28	-13.37	31.50	-23.28	0.000%
14	-0.05	-41.99	26.91	0.05	41.99	-26.90	0.009%
15	-0.05	-31.50	26.91	0.05	31.49	-26.90	0.013%
16	-13.45	-41.99	23.33	13.45	41.99	-23.33	0.000%
17	-13.45	-31.50	23.33	13.45	31.50	-23.33	0.000%
18	-23.25	-41.99	13.50	23.25	41.99	-13.50	0.000%
19	-23.25	-31.50	13.50	23.25	31.50	-13.50	0.000%
20	-26.82	-41.99	0.05	26.82	41.99	-0.05	0.009%
21	-26.82	-31.50	0.05	26.82	31.49	-0.05	0.013%
22	-23.21	-41.99	-13.41	23.21	41.99	13.41	0.000%
23	-23.21	-31.50	-13.41	23.21	31.50	13.41	0.000%
24	-13.37	-41.99	-23.28	13.37	41.99	23.28	0.000%
25	-13.37	-31.50	-23.28	13.37	31.50	23.28	0.000%
26	0.00	-77.54	0.00	-0.00	77.54	0.00	0.001%
27	0.01	-77.54	-8.52	-0.01	77.54	8.52	0.002%
28	4.27	-77.54	-7.39	-4.26	77.54	7.39	0.002%
29	7.38	-77.54	-4.27	-7.38	77.54	4.27	0.002%
30	8.51	-77.54	-0.01	-8.51	77.54	0.01	0.002%
31	7.37	-77.54	4.25	-7.37	77.54	-4.25	0.002%
32	4.25	-77.54	7.38	-4.25	77.54	-7.38	0.002%
33	-0.01	-77.54	8.52	0.01	77.54	-8.52	0.002%
34	-4.27	-77.54	7.39	4.26	77.54	-7.39	0.002%
35	-7.38	-77.54	4.27	7.38	77.54	-4.27	0.002%
36	-8.51	-77.54	0.01	8.51	77.54	-0.01	0.002%
37	-7.37	-77.54	-4.25	7.37	77.54	4.25	0.002%
38	-4.25	-77.54	-7.38	4.25	77.54	7.38	0.002%
39	0.01	-34.99	-5.31	-0.01	34.99	5.31	0.004%
40	2.66	-34.99	-4.60	-2.65	34.99	4.60	0.004%
41	4.59	-34.99	-2.66	-4.59	34.99	2.66	0.004%
42	5.29	-34.99	-0.01	-5.29	34.99	0.01	0.004%
43	4.58	-34.99	2.65	-4.58	34.99	-2.65	0.004%
44	2.64	-34.99	4.59	-2.64	34.99	-4.59	0.004%
45	-0.01	-34.99	5.31	0.01	34.99	-5.31	0.004%
46	-2.66	-34.99	4.60	2.65	34.99	-4.60	0.004%
47	-4.59	-34.99	2.66	4.59	34.99	-2.66	0.004%
48	-5.29	-34.99	0.01	5.29	34.99	-0.01	0.004%
49	-4.58	-34.99	-2.65	4.58	34.99	2.65	0.004%
50	-2.64	-34.99	-4.59	2.64	34.99	4.59	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	19	0.00008932	0.00009763
3	Yes	18	0.00009924	0.00013040
4	Yes	25	0.00000001	0.00010870
5	Yes	24	0.00000001	0.00012535
6	Yes	25	0.00000001	0.00010889
7	Yes	24	0.00000001	0.00012563
8	Yes	19	0.00008948	0.00009530
9	Yes	18	0.00009942	0.00012728
10	Yes	25	0.00000001	0.00010842
11	Yes	24	0.00000001	0.00012522
12	Yes	25	0.00000001	0.00010677
13	Yes	24	0.00000001	0.00012315
14	Yes	19	0.00008931	0.00011341
15	Yes	18	0.00009924	0.00014952
16	Yes	25	0.00000001	0.00010955
17	Yes	24	0.00000001	0.00012639
18	Yes	25	0.00000001	0.00010909
19	Yes	24	0.00000001	0.00012586
20	Yes	19	0.00008946	0.00010672
21	Yes	18	0.00009941	0.00014097
22	Yes	25	0.00000001	0.00010673
23	Yes	24	0.00000001	0.00012315
24	Yes	25	0.00000001	0.00010864
25	Yes	24	0.00000001	0.00012546
26	Yes	10	0.00000001	0.00000857
27	Yes	23	0.00011713	0.00002717
28	Yes	23	0.00011635	0.00011664
29	Yes	23	0.00011636	0.00011665
30	Yes	23	0.00011714	0.00002708
31	Yes	23	0.00011638	0.00011806
32	Yes	23	0.00011639	0.00011494
33	Yes	23	0.00011715	0.00002736
34	Yes	23	0.00011637	0.00011903
35	Yes	23	0.00011637	0.00011880
36	Yes	23	0.00011715	0.00002725
37	Yes	23	0.00011639	0.00011475
38	Yes	23	0.00011638	0.00011810
39	Yes	18	0.00013619	0.00004253
40	Yes	18	0.00013590	0.00004586
41	Yes	18	0.00013590	0.00004548
42	Yes	18	0.00013619	0.00004232
43	Yes	18	0.00013590	0.00004572
44	Yes	18	0.00013591	0.00004486
45	Yes	18	0.00013620	0.00004257
46	Yes	18	0.00013591	0.00004621
47	Yes	18	0.00013591	0.00004602
48	Yes	18	0.00013620	0.00004236
49	Yes	18	0.00013591	0.00004455
50	Yes	18	0.00013591	0.00004598

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 134	41.82	46	2.15	0.00
L2	137.25 - 88.5	23.76	46	1.76	0.00
L3	92.75 - 43	10.36	46	1.09	0.00
L4	48.25 - 0	2.76	46	0.53	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.0000	5/8" X 5' Lightning Rod	46	41.82	2.15	0.00	29572
170.0000	TMA-DB-T1-6Z-8AB-0Z	46	37.36	2.07	0.00	14786
168.0000	BXA-171063-12CF-EDIN-X w/ Mount Pipe	46	36.48	2.06	0.00	12321
160.0000	(2) 7770.00 w/ Mount Pipe	46	32.98	1.99	0.00	7392
158.0000	TME-RRUS-11	46	32.12	1.98	0.00	6720
78.0000	8225	46	7.21	0.88	0.00	4217

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 134	212.76	14	10.96	0.01
L2	137.25 - 88.5	121.09	14	8.99	0.01
L3	92.75 - 43	52.93	16	5.56	0.00
L4	48.25 - 0	14.10	16	2.72	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.0000	5/8" X 5' Lightning Rod	14	212.76	10.96	0.01	6200
170.0000	TMA-DB-T1-6Z-8AB-0Z	14	190.14	10.58	0.01	3098
168.0000	BXA-171063-12CF-EDIN-X w/ Mount Pipe	14	185.65	10.51	0.01	2580
160.0000	(2) 7770.00 w/ Mount Pipe	14	167.93	10.18	0.01	1545
158.0000	TME-RRUS-11	14	163.58	10.09	0.01	1403
78.0000	8225	16	36.85	4.52	0.00	836

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 134 (1)	TP26.374x17.62x0.25	46.0000	0.0000	0.0	20.2386	-9.42	1496.24	0.006
L2	134 - 88.5 (2)	TP34.533x25.2555x0.3125	48.7500	0.0000	0.0	33.1402	-16.88	2419.83	0.007
L3	88.5 - 43 (3)	TP42.567x33.0992x0.375	49.7500	0.0000	0.0	49.0298	-27.74	3553.29	0.008
L4	43 - 0 (4)	TP50x40.8179x0.375	48.2500	0.0000	0.0	59.0662	-41.96	4033.20	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 134 (1)	TP26.374x17.62x0.25	500.51	783.23	0.639	0.00	783.23	0.000
L2	134 - 88.5 (2)	TP34.533x25.2555x0.3125	1315.72	1660.09	0.793	0.00	1660.09	0.000
L3	88.5 - 43 (3)	TP42.567x33.0992x0.375	2300.10	3006.14	0.765	0.00	3006.14	0.000
L4	43 - 0 (4)	TP50x40.8179x0.375	3531.83	4116.93	0.858	0.00	4116.93	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 134 (1)	TP26.374x17.62x0.25	16.49	748.12	0.022	0.06	1568.38	0.000
L2	134 - 88.5 (2)	TP34.533x25.2555x0.3125	20.17	1209.91	0.017	0.30	3324.24	0.000
L3	88.5 - 43 (3)	TP42.567x33.0992x0.375	23.95	1776.64	0.013	0.64	6019.63	0.000
L4	43 - 0 (4)	TP50x40.8179x0.375	26.97	2016.60	0.013	1.18	8243.93	0.000

Pole Interaction Design Data

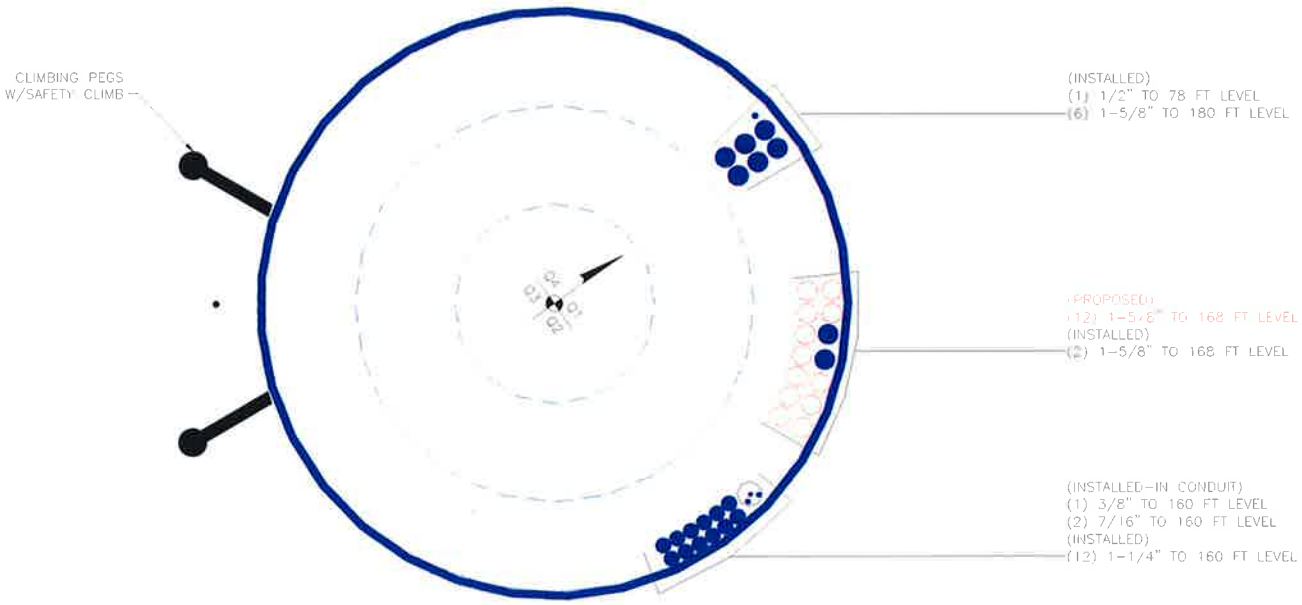
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 134 (1)	0.006	0.639	0.000	0.022	0.000	0.646 ✔	1.000	4.8.2 ✔
L2	134 - 88.5 (2)	0.007	0.793	0.000	0.017	0.000	0.800 ✔	1.000	4.8.2 ✔
L3	88.5 - 43 (3)	0.008	0.765	0.000	0.013	0.000	0.773 ✔	1.000	4.8.2 ✔
L4	43 - 0 (4)	0.010	0.858	0.000	0.013	0.000	0.868 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	180 - 134	Pole	TP26.374x17.62x0.25	1	-9.42	1496.24	64.6	Pass
L2	134 - 88.5	Pole	TP34.533x25.2555x0.3125	2	-16.88	2419.83	80.0	Pass
L3	88.5 - 43	Pole	TP42.567x33.0992x0.375	3	-27.74	3553.29	77.3	Pass
L4	43 - 0	Pole	TP50x40.8179x0.375	4	-41.96	4033.20	86.8	Pass
							Summary	
						Pole (L4)	86.8	Pass
						RATING =	**86.8**	**Pass**

APPENDIX B

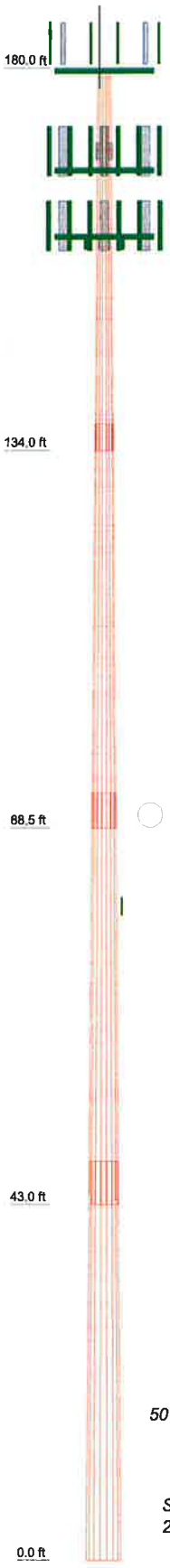
BASE LEVEL DRAWING


CLIMBING PEGS
W/SAFETY CLIMB
(INSTALLED)
(1) 1/2" TO 78 FT LEVEL
(6) 1-5/8" TO 180 FT LEVEL
(PROPOSED)
(12) 1-5/8" TO 168 FT LEVEL
(INSTALLED)
(2) 1-5/8" TO 168 FT LEVEL
(INSTALLED-IN CONDUIT)
(1) 3/8" TO 160 FT LEVEL
(2) 7/16" TO 160 FT LEVEL
(INSTALLED)
(12) 1-1/4" TO 160 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 7.0.5.1 - 2/1/2016 File:G:/TOWER/375_Crown_Castle/2016/37516-3420_876375_Canterbury - Lemire/37516-3420.001.7805_SA_1309624/37516-3420.001.7805 expB.eri



Section	1	2	3	4
Length (ft)	46.0000	48.7500	49.7500	48.2500
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.3750
Socket Length (ft)	3.2500	4.2500	5.2500	
Top Dia (in)	17.6200	25.2555	33.0992	40.8179
Bot Dia (in)	26.3740	34.5330	42.5670	50.0000
Grade		A572-65		
Weight (K)	2.7	4.9	7.5	8.8

23.9

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
5/8" X 5' Lightning Rod	180	RRH2X60-PCS	168
(2) DB980H90E-M w/ Mount Pipe	180	(2) SBNHH-1D65B w/ Mount Pipe	168
(2) DB980H90E-M w/ Mount Pipe	180	(2) SBNHH-1D65B w/ Mount Pipe	168
(2) DB980H90E-M w/ Mount Pipe	180	(2) SBNHH-1D65B w/ Mount Pipe	168
Platform Mount [LP 601-1]	180	Platform Mount [LP 303-1]	168
(2) 5'x2 1/2" Pipe Mount	180	DB-T1-6Z-8AB-0Z	168
(2) 5'x2 1/2" Pipe Mount	180	(2) 7770.00 w/ Mount Pipe	160
(2) 5'x2 1/2" Pipe Mount	180	(2) 7770.00 w/ Mount Pipe	160
TMA-DB-T1-6Z-8AB-0Z	170	(2) 7770.00 w/ Mount Pipe	160
Pipe Mount [PM 601-3]	170	AM-X-CD-17-65-00T-RET w/ Mount Pipe	160
BXA-171063-12CF-EDIN-X w/ Mount Pipe	168	AM-X-CD-17-65-00T-RET w/ Mount Pipe	160
BXA-171063-12CF-EDIN-X w/ Mount Pipe	168	AM-X-CD-17-65-00T-RET w/ Mount Pipe	160
BXA-171063-12CF-EDIN-X w/ Mount Pipe	168	(2) LGP21401	160
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	168	(2) LGP21401	160
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	168	(2) LGP21401	160
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	168	(2) LGP21901	160
B66A RRH4X45	168	(2) LGP21901	160
B66A RRH4X45	168	(2) LGP21901	160
B66A RRH4X45	168	DC6-48-60-18-8F	160
RRH2x60-700	168	Platform Mount [LP 303-1]	160
RRH2x60-700	168	TME-RRUS-11	158
RRH2x60-700	168	TME-RRUS-11	158
RRH2X60-PCS	168	TME-RRUS-11	158
RRH2X60-PCS	168	Side Arm Mount [SO 102-3]	158
		8225	78
		Side Arm Mount [SO 901-1]	78

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 86.8%

ALL REACTIONS ARE FACTORED

AXIAL 78 K

SHEAR 9 K *MOMENT 1254 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 42 K

SHEAR 27 K *MOMENT 3532 kip-ft*

TORQUE 3 kip-ft
REACTIONS - 101 mph WIND

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: (614) 221-6679
FAX: (614) 448-4105

Job: 180 Ft. Monopole / Canterbury, CT			
Project: PJF 37516-3420 / BU 876375			
Client: CCI	Drawn by: Maria C Lopez	App'd:	
Code: TIA-222-G	Date: 10/28/16	Scale: N	
Path:		Dwg No.	

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876375*
Site Name:
App #:
Pole Manufacturer: *Other*

Reactions		
Mu:	3532	ft-kips
Axial, Pu:	42	kips
Shear, Vu:	27	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: AISC LRFD <-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	60	in

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ń):	182.6 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	70.2% **Pass**	

Plate Data		
Diam:	65	in
Thick:	2	in
Grade:	50	ksi
Single-Rod B-eff:	9.92	in

Base Plate Results Flexural Check

		Stiffened
Base Plate Stress:	30.4 ksi	AISC LRFD
Allowable Plate Stress:	45.0 ksi	φ*Fy
Base Plate Stress Ratio:	67.5% **Pass**	Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.75	in
Fillet V. Weld:	0.375	in
Width:	6	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Stiffener Results

Horizontal Weld :	72.4% **Pass**
Vertical Weld:	48.2% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	15.4% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	57.6% **Pass**
Plate Comp. (AISC Bracket):	57.4% **Pass**

Pole Results

Pole Punching Shear Check:	14.5% **Pass**

Pole Data		
Diam:	50	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Factored Foundation Loads:

	LC1	LC2	
Factored Axial Load (+Comp, -Ten) =	42	31.5	kips
Factored Horiz. Load at Top of Pier =	27	27	kips
Factored OTM at Top of Pier =	3532	3532	kips

LRFD Resistance and Load Factors:

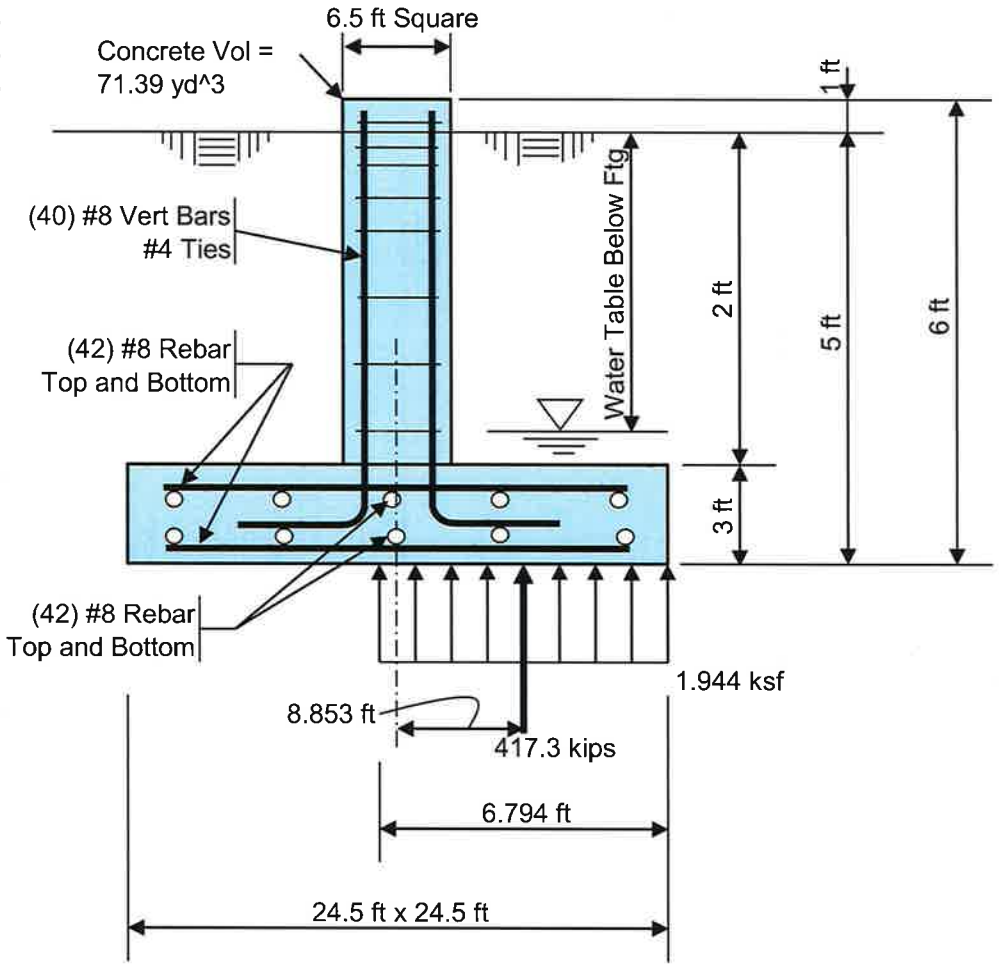
	Φ	Dead Load Factors	
Soil Bearing =	0.75		
Soil Weight =	0.75	1.2	0.9
Concrete Weight =	0.75	1.2	0.9

Soil Properties:

Depth to Water Table = 99 ft

Uplift Cone from Top of footing

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
6	125	0	15	12	6.00



Dimensions:

Pier Shape =	Square	
Pier Width =	6.5	ft Square
Pier Height above Grade =	1	ft
Depth to Bottom of Footing =	5	ft
Footing Thickness =	3	ft
Footing Width, B =	24.5	ft
Footing Length, L =	24.5	ft

Concrete:

Concrete Strength =	4	ksi
Rebar Strength =	60	ksi

Total Pad Reinf Stl =	66.36	in^2 >= 19.05 in^2 = Min Stl, OK
Total Pier Reinf Stl =	31.60	in^2 >= 30.42 in^2 = Min Stl, OK
Footing Thickness =	3.00	ft >= 1.36 ft = Min Ftg Thk, OK

Summary Results:

	Required		Available		
Maximum Net Soil Bearing =	2.022	ksf	9.000	ksf	Stress Ratio = 22.5% in Soil Bearing
Uplift =	0.0	kips	326.5	kips	Stress Ratio = 0.0% in Uplift
Punching Shear Stress =	0.040	ksi	0.190	ksi	Stress Ratio = 21.0% in Punching Shear
Bending Shear Stress =	260.4	kips	878.6	kips	Stress Ratio = 29.6% in Bending Shear
Bending Moment =	1715	k-ft	4554.6	k-ft	Stress Ratio = 37.7% in Bending Moment
Conc Pier Reinforcing Steel =	3613.0	k-ft	5272.9	k-ft	Stress Ratio = 68.5% in Pier Rebar

ATTACHMENT 4

neccog

ashford brooklyn canterbury chaplin eastford hampton killing
pomfret putnam scotland sterling thompson union voluntow

Search...

I want to...

CT-022-46-32

Parcel Report Abutters Report

Owner: LEMIRE JOHN R

Address: 53 WESTMINSTER RD

Town: Canterbury

View Additional Details | Run a Report | Edit Feature

47-24
41.13 ac

47-2A
68.24 ac

47-25A
26.27 ac

402 ft

46-14
40 ac

46-32
35.43 ac

46-29
21.5 ac

46-41
3.8 ac

46-34A
0.09 ac

46-32B
7 ac

46-31
3 ac

46-40
2.85 ac

46-32A
2 ac

46-33
9.35 ac

46-35
8.7 ac

37-25
3 ac

Canterbury

37-23
1.5 ac

46-30
2.4 ac

Westminster Rd 14

46-28A
0.64 ac

36-16
3.87 ac

36-14A
2.2 ac

46-22
1.4 ac

46-23
0.83 ac

46-24
1.8 ac

46-20
2.38 ac

46-43
1.45 ac

46-19
6.05 ac

46-18
3.6 ac

36-17
9.84 ac

36-26
11.75 ac

36-14
6.3 ac

46-25
12.3 ac

46-21

46-20B
34.28 ac

World Top...

0 300 600ft

53 WESTMINSTER RD

Location	53 WESTMINSTER RD	**Mblu**	46/ 32/ / /
Acct#	00144000	**Owner**	LEMIRE JOHN R
Assessment	$185,300	**Appraisal**	$302,010
PID	1715	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$21,300	$280,710	$302,010
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$15,000	$170,300	$185,300

Owner of Record

Owner	LEMIRE JOHN R	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	142 HANOVER VERSAILLES RD APT 1 BALTIC, CT 06330	**Book & Page**	85/ 331
		Sale Date	07/27/1988

Ownership History

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
LEMIRE JOHN R	$0		85/ 331	07/27/1988

Building Information

Building 1 : Section 1

Year Built: 1971
Living Area: 544
Replacement Cost: $40,721
Building Percent Good: 38
Replacement Cost Less Depreciation: $15,500

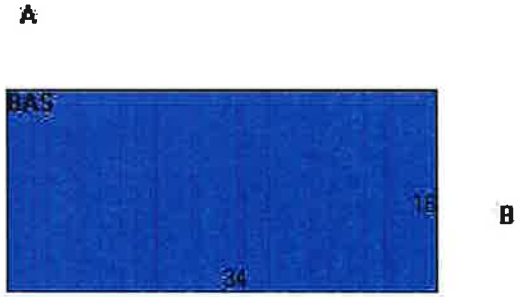
Building Attributes	
Field	**Description**
Style	Manufactured Home
Model	Residential
Grade:	D
Stories	1 Story
Occupancy	1
Exterior Wall 1	Pre-Fab Wood
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt

Building Photo

(http://images.vgsi.com/photos/CanterburyCTPhotos//\00\00\4

Interior Wall 1	Drywall
Interior Wall 2	Panelling
Interior Flr 1	Carpet
Interior Flr 2	Linoleum
Heat Fuel	Oil
Heat Type:	Forced Hot Air
AC Type:	None
Total Bedrooms:	1 Bedroom
Total Bthrms:	1
Total Half Baths:	0
Extra Fixtures	
Total Rooms:	2 Rooms
Bath Style:	Average
Kitchen Style:	Average
Fireplaces	0
Xtra Openings	0
Gas Fireplaces	0
Woodstove	
SF Fin Bsmt	
Fin Bsmt Qual	
Bsmt Gar	
Blocked FPL	0

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	544	544
		544	544

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	1030
Description	Manufactured Home
Zone	RD
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	35.43
Frontage	0
Depth	0
Assessed Value	$170,300
Appraised Value	$280,710

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHP2	Work Shop - Good			384 S.F	$5,800	1
SHDN	Shed N/V			96 S.F.	$0	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$21,300	$280,710	$302,010
2014	$28,200	$313,310	$341,510
2013	$28,200	$313,310	$341,510

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$15,000	$170,300	$185,300
2014	$19,800	$186,100	$205,900
2013	$19,800	$186,100	$205,900