Robinson+Cole

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October 2, 2017

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
266R Center Street, Manchester, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains fifteen (15) wireless telecommunications antennas at the top of the 115-foot tower (116-foot centerline height) at 266R Center Street in Manchester (the "Property"). The tower and underlying Property are owned Crown Castle. Cellco's use of the tower was approved by the Council in 1990 (Docket No. 129). Cellco now intends to modify its facility by replacing six (6) of its existing 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 three (3) remote radio heads ("RRHs"), install six (6) new RRHs and install two (2) HYBRIFLEX™ fiber optic antenna cables attached to the outside the monopole. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Scott Shanley, General Manager for the Town of Manchester; Gary Anderson, Manchester's Director of Planning and Economic Development; and Crown, the tower owner and owner of the Property.

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

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

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

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

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included 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 parcel map and property owner information is included in Attachment 4. A Certificate of Mailing verifying that this filing was sent to municipal officials is included in Attachment 5.

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:
Scott Shanley, Manchester General Manager
Gary Anderson, Manchester Director of Planning and Economic Development
Crown Atlantic Company (*via electronic mail*)
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65B

6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 65° HPBW, 2x 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
	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
Gain by Beam Tilt, average, dBi	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

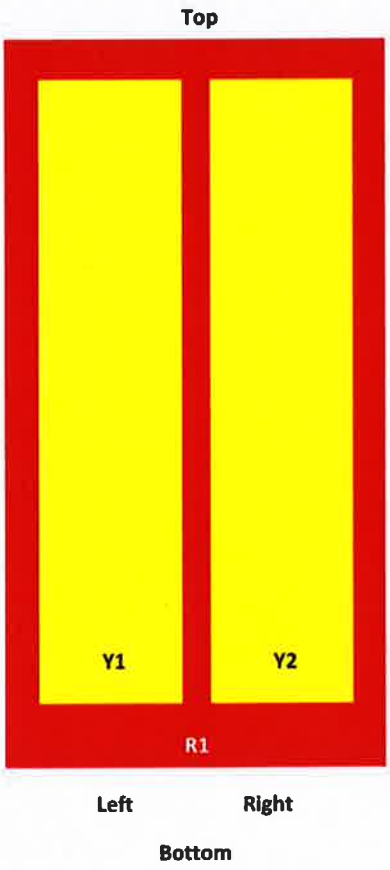
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D65B

SBNHH 6S



Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	ANxxxxxxxxxxxxxxxx.1
Y1	1695-2360	3-4	2	ANxxxxxxxxxxxxxxxx.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

Product Specifications

SBNHH-1D65B

Color	Light gray
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

Product Specifications

SBNHH-1D65B

Included Products

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

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

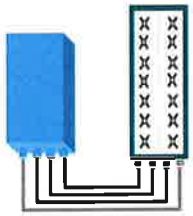
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): 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

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.

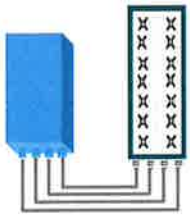
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

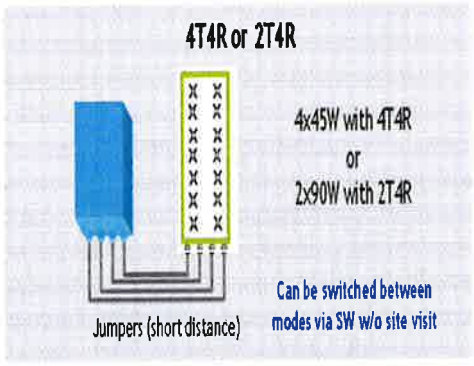
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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	[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-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)

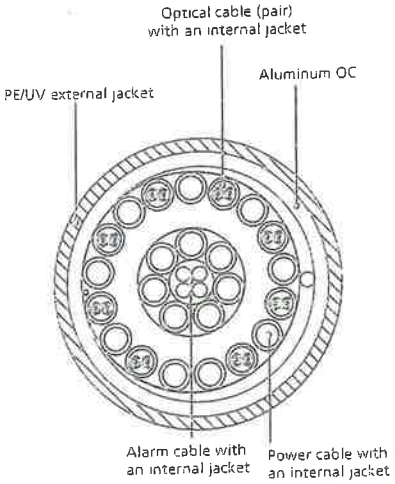


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Manchester								
Tower Height: 115Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*EYE Tower			78-85		Receive Only			
*Clearwire	2	153	110	2496	0.0102	1.0000	0.10%	
*Clearwire	1	211	110	18 GHz	0.0070	1.0000	0.07%	
*XM Sat Radio	2	3141	125	2337.49	0.1595	1.0000	1.60%	
Verizon PCS	**1**	**5000**	**116**	**0.1336**	**1970**	**1.0000**	**13.36%**	
Verizon Cellular	**9**	**406**	**116**	**0.0976**	**869**	**0.5793**	**16.85%**	
Verizon AWS	**1**	**7400**	**116**	**0.1977**	**2145**	**1.0000**	**19.77%**	
Verizon 700	**1**	**2200**	**116**	**0.0588**	**746**	**0.4973**	**11.82%**	
								63.58%
* Source: Siting Council								

ATTACHMENT 3

PJF PAUL J. FORD & COMPANY

Date: **September 20, 2017**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	468324
	Carrier Site Name:	Manchester, CT
Crown Castle Designation:	**Crown Castle BU Number:**	806372
	Crown Castle Site Name:	HRT 093 943228
	Crown Castle JDE Job Number:	450256
	Crown Castle Work Order Number:	1458114
	Crown Castle Application Number:	397764 Rev. 5
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37517-2563.002.7805
Site Data:	**266R Center Street, MANCHESTER, Hartford County, CT** **Latitude *41° 46' 19"*, Longitude *-72° 31' 48.8"*** **115 Foot - Monopole Tower**	

Dear Charles McGuirt,

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 1083451, in accordance with application 397764, revision 5.

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 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 124 mph converted to a nominal 3-second gust wind speed of 96 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category B and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1 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:

Jaime Acuna
Structural Designer

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

9-21-17

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 115 ft Monopole tower designed by VALMONT in June of 1990. The tower was originally designed for a wind speed of 90 mph per EIA-222-D.

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 124 mph converted to a nominal 3-second gust wind speed of 96 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category B and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1 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
115.0	115.0	3	alcatel lucent	B66A RRH4X45-4R	2	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 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
115.0	115.0	3	alcatel lucent	RRH2x40-AWS	5 1	1-5/8 1-1/4	2
		1	antel	BXA-171063-12BF w/ Mount Pipe			
		2	antel	BXA-171085-12BF-EDIN-2 w/ Mount Pipe			
		3	antel	BXA-185085-12CF-EDIN-2 w/ Mount Pipe			
		2	antel	BXA-70063-6CF-EDIN-4 w/ Mount Pipe	13	1-5/8	1
		1	antel	BXA-70063-6CF-EDIN-6 w/ Mount Pipe			
		6	decibel	DB844G65ZAXY w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		1	tower mounts	Platform Mount [LP 715-1]			
105.0	108.0	2	andrew	VHLP1-23	5 5 5	1/4 1/2 5/16	1
		1	andrew	VHLP2-11-2GR			
		4	dragonwave	HORIZON COMPACT			
		3	samsung telecommunications	WIMAX DAP HEAD			
	105.0	1	tower mounts	Platform Mount [LP 602-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
85.0	85.0	2	tower mounts	Side Arm Mount [SO 701-1]	5	13/32	1
		1	wade antenna	WH14-69/S			
		1	wade antenna	WL 14-69/S			
	83.0	2	wade antenna	WL 14-69/S			
	78.0	2	tower mounts	Side Arm Mount [SO 701-1]			
		1	wade antenna	J105-HI			

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	Testwell Craig Laboratories of CT, Inc, 04/12/1990	262174	CCISites
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH Engineering, 10-06100E N1, 06/21/2010	2668863	CCISites
4-TOWER MANUFACTURER DRAWINGS	Valmont, DC03902, 05/01/1990	262172	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.

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	115 - 72.3334	Pole	TP30.45x21.91x0.219	1	-9.12	1268.89	51.2	Pass
L2	72.3334 - 29.3334	Pole	TP38.61x29.0779x0.313	2	-16.31	2448.72	55.7	Pass
L3	29.3334 - 0	Pole	TP43.85x36.8508x0.375	3	-25.14	3470.66	55.5	Pass
							Summary	
						Pole (L2)	55.7	Pass
						Rating =	55.7	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	52.0	Pass
1	Base Plate	0	30.9	Pass
1	Base Foundation Structural Steel	0	50.5	Pass
1	Base Foundation Soil Interaction	0	56.1	Pass

Structure Rating (max from all components) =	56.1%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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 Hartford County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 96 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	115.0000-72.3334	42.6666	4.67	12	21.9100	30.4500	0.2190	0.8760	A572-65 (65 ksi)
L2	72.3334-29.3334	47.6666	5.67	12	29.0779	38.6100	0.3130	1.2520	A572-65 (65 ksi)
L3	29.3334-0.0000	35.0000		12	36.8508	43.8500	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	22.6829	15.2961	918.5962	7.7654	11.3494	80.9380	1861.3250	7.5283	5.2850	24.132
	31.5242	21.3183	2486.8150	10.8227	15.7731	157.6618	5038.9614	10.4922	7.5737	34.583
L2	31.0698	28.9910	3061.8013	10.2979	15.0624	203.2748	6204.0395	14.2685	6.9541	22.217
	39.9720	38.5980	7225.7083	13.7103	20.0000	361.2858	14641.2440	18.9968	9.5086	30.379
L3	39.3239	44.0446	7479.7774	13.0583	19.0887	391.8426	15156.0568	21.6774	8.8710	23.656
	45.3969	52.4961	12664.6112	15.5641	22.7143	557.5611	25661.9358	25.8370	10.7468	28.658

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 115.0000-72.3334				1	1	1			
L2 72.3334-29.3334				1	1	1			
L3 29.3334-0.0000				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	115.0000 - 0.0000	12	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	CaAa (Out Of Face)	115.0000 - 0.0000	1	No Ice	0.1980	0.00
						1/2" Ice	0.2980	0.00
						1" Ice	0.3980	0.00
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	115.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
****								
FSJ1-50A(1/4)	C	No	Inside Pole	105.0000 - 0.0000	5	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
FSJ4-50B(1/2)	C	No	Inside Pole	105.0000 - 0.0000	5	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
9207(5/16)	C	No	Inside Pole	105.0000 - 0.0000	5	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	105.0000 - 0.0000	2	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
***								
1110(13/32)	C	No	CaAa (Out Of Face)	85.0000 - 0.0000	1	No Ice	0.0405	0.00
						1/2" Ice	0.1405	0.00
						1" Ice	0.2405	0.00
1110(13/32)	C	No	CaAa (Out Of Face)	85.0000 - 0.0000	4	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	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	115.0000-72.3334	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	8.961	0.66
L2	72.3334-29.3334	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	10.256	0.70
L3	29.3334-0.0000	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	6.996	0.48

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	115.0000-72.3334	A	2.218	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	33.507	2.65
L2	72.3334-29.3334	A	2.087	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	48.405	3.86
L3	29.3334-0.0000	A	1.840	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	31.487	2.37

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	115.0000-72.3334	-0.2427	0.1401	-0.6657	0.3843
L2	72.3334-29.3334	-0.2769	0.1599	-0.9384	0.5418
L3	29.3334-0.0000	-0.2803	0.1618	-0.9603	0.5544

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 ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	4.5782 4.9555 5.3404	4.8023 5.4160 6.0401	0.03 0.08 0.13
(2) DB844G65ZAXY w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	4.5782 4.9555 5.3404	4.8023 5.4160 6.0401	0.03 0.08 0.13
(2) DB844G65ZAXY w/	C	From Leg	4.0000	0.000	115.0000	No Ice	4.5782	4.8023	0.03

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
Mount Pipe			0.00 0.00			1/2" Ice 1" Ice	4.9555 5.3404	5.4160 6.0401	0.08 0.13
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	7.8065 8.3569 8.8720	5.3981 6.5465 7.4089	0.04 0.10 0.17
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	7.8065 8.3569 8.8720	5.3981 6.5465 7.4089	0.04 0.10 0.17
BXA-70063-6CF-EDIN-6 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	7.8065 8.3569 8.8720	5.8008 6.9529 7.8191	0.04 0.10 0.17
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	8.3995 8.9639 9.4943	7.0730 8.2637 9.1753	0.07 0.14 0.21
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	8.3995 8.9639 9.4943	7.0730 8.2637 9.1753	0.07 0.14 0.21
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	8.3995 8.9639 9.4943	7.0730 8.2637 9.1753	0.07 0.14 0.21
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	4.8000 5.0704 5.3481	2.0000 2.1926 2.3926	0.04 0.08 0.12
RRH2X60-PCS	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	2.2000 2.3926 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
RRH2X60-PCS	B	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	2.2000 2.3926 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
RRH2X60-PCS	C	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	2.2000 2.3926 2.5926	1.7233 1.9015 2.0870	0.06 0.08 0.10
RRH2x60-700	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	3.5002 3.7609 4.0285	1.8157 2.0519 2.2894	0.06 0.08 0.11
RRH2x60-700	B	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	3.5002 3.7609 4.0285	1.8157 2.0519 2.2894	0.06 0.08 0.11
RRH2x60-700	C	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	3.5002 3.7609 4.0285	1.8157 2.0519 2.2894	0.06 0.08 0.11
B66A RRH4X45-4R	A	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	2.5800 2.7937 3.0148	1.6296 1.8106 1.9986	0.08 0.10 0.12
B66A RRH4X45-4R	B	From Leg	4.0000 0.00 0.00	0.000	115.0000	No Ice 1/2" Ice 1" Ice	2.5800 2.7937 3.0148	1.6296 1.8106 1.9986	0.08 0.10 0.12
B66A RRH4X45-4R	C	From Leg	4.0000 0.00	0.000	115.0000	No Ice 1/2"	2.5800 2.7937	1.6296 1.8106	0.08 0.10

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			Ice	3.0148	1.9986	0.12
						1" Ice			
DB-T1-6Z-8AB-0Z	C	From Leg	4.0000	0.000	115.0000	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			
Platform Mount [LP 715-1]	C	None		0.000	115.0000	No Ice	44.2100	44.2100	1.77
						1/2"	53.9700	53.9700	2.32
						Ice	63.7300	63.7300	2.87
						1" Ice			
****									
HORIZON COMPACT	A	From Leg	1.0000	0.000	105.0000	No Ice	0.7208	0.3681	0.01
			0.00			1/2"	0.8278	0.4499	0.02
			3.00			Ice	0.9422	0.5391	0.03
						1" Ice			
HORIZON COMPACT	B	From Leg	1.0000	0.000	105.0000	No Ice	0.7208	0.3681	0.01
			0.00			1/2"	0.8278	0.4499	0.02
			3.00			Ice	0.9422	0.5391	0.03
						1" Ice			
(2) HORIZON COMPACT	C	From Leg	1.0000	0.000	105.0000	No Ice	0.7208	0.3681	0.01
			0.00			1/2"	0.8278	0.4499	0.02
			3.00			Ice	0.9422	0.5391	0.03
						1" Ice			
WIMAX DAP HEAD	A	From Leg	1.0000	0.000	105.0000	No Ice	1.5467	0.6840	0.03
			0.00			1/2"	1.7037	0.7999	0.04
			3.00			Ice	1.8681	0.9228	0.06
						1" Ice			
WIMAX DAP HEAD	B	From Leg	1.0000	0.000	105.0000	No Ice	1.5467	0.6840	0.03
			0.00			1/2"	1.7037	0.7999	0.04
			3.00			Ice	1.8681	0.9228	0.06
						1" Ice			
WIMAX DAP HEAD	C	From Leg	1.0000	0.000	105.0000	No Ice	1.5467	0.6840	0.03
			0.00			1/2"	1.7037	0.7999	0.04
			3.00			Ice	1.8681	0.9228	0.06
						1" Ice			
Platform Mount [LP 602-1]	C	None		0.000	105.0000	No Ice	32.0300	32.0300	1.34
						1/2"	38.7100	38.7100	1.80
						Ice	45.3900	45.3900	2.26
						1" Ice			
(2) 2.375" OD x 6' Mount Pipe	A	From Leg	4.0000	0.000	105.0000	No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice			
(2) 2.375" OD x 6' Mount Pipe	B	From Leg	4.0000	0.000	105.0000	No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice			
(2) 2.375" OD x 6' Mount Pipe	C	From Leg	4.0000	0.000	105.0000	No Ice	1.4250	1.4250	0.03
			0.00			1/2"	1.9250	1.9250	0.04
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice			
***									
WH14-69/S	A	From Leg	4.0000	0.000	85.0000	No Ice	1.9201	1.9201	0.01
			0.00			1/2"	2.7029	2.7029	0.03
			0.00			Ice	3.0540	3.0540	0.06
						1" Ice			
WL 14-69/S	A	From Leg	4.0000	0.000	85.0000	No Ice	0.2869	4.1479	0.01
			0.00			1/2"	0.3655	4.4641	0.03
			-2.00			Ice	0.4511	4.7877	0.06
						1" Ice			
WL 14-69/S	B	From Leg	4.0000	0.000	85.0000	No Ice	0.2869	4.1479	0.01
			0.00			1/2"	0.3655	4.4641	0.03
			0.00			Ice	0.4511	4.7877	0.06
						1" Ice			
WL 14-69/S	B	From Leg	4.0000	0.000	85.0000	No Ice	0.2869	4.1479	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.3655	4.4641	0.03
			-2.00			1" Ice	0.4511	4.7877	0.06
J105-HI	A	From Leg	4.0000	0.000	85.0000	No Ice	3.2500	3.2500	0.02
			0.00			1/2" Ice	0.0000	0.0000	0.03
			-7.00			1" Ice	8.4790	8.4790	0.03
Side Arm Mount [SO 701-1]	A	From Leg	4.0000	0.000	85.0000	No Ice	0.8500	1.6700	0.07
			0.00			1/2" Ice	1.1400	2.3400	0.08
			0.00			1" Ice	1.4300	3.0100	0.09
Side Arm Mount [SO 701-1]	A	From Leg	4.0000	0.000	85.0000	No Ice	0.8500	1.6700	0.07
			0.00			1/2" Ice	1.1400	2.3400	0.08
			-7.00			1" Ice	1.4300	3.0100	0.09
Side Arm Mount [SO 701-1]	B	From Leg	4.0000	0.000	85.0000	No Ice	0.8500	1.6700	0.07
			0.00			1/2" Ice	1.1400	2.3400	0.08
			0.00			1" Ice	1.4300	3.0100	0.09
Side Arm Mount [SO 701-1]	B	From Leg	4.0000	0.000	85.0000	No Ice	0.8500	1.6700	0.07
			0.00			1/2" Ice	1.1400	2.3400	0.08
			-7.00			1" Ice	1.4300	3.0100	0.09
2.375" OD x 8' Mount Pipe	A	From Leg	4.0000	0.000	85.0000	No Ice	1.9000	1.9000	0.03
			0.00			1/2" Ice	2.7281	2.7281	0.04
			0.00			1" Ice	3.4009	3.4009	0.06
2.375" OD x 8' Mount Pipe	B	From Leg	4.0000	0.000	85.0000	No Ice	1.9000	1.9000	0.03
			0.00			1/2" Ice	2.7281	2.7281	0.04
			0.00			1" Ice	3.4009	3.4009	0.06
*****									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-23	A	Paraboloid w/o Radome	From Leg	1.0000	0.000		105.0000	1.2750	No Ice	1.2800	0.01
				0.00					1/2" Ice	1.4500	0.02
				3.00					1" Ice	1.6200	0.03
VHLP1-23	C	Paraboloid w/o Radome	From Leg	1.0000	0.000		105.0000	1.2750	No Ice	1.2800	0.01
				0.00					1/2" Ice	1.4500	0.02
				3.00					1" Ice	1.6200	0.03
VHLP2-11-2GR	C	Paraboloid w/o Radome	From Leg	1.0000	0.000		105.0000	2.1750	No Ice	3.7200	0.03
				0.00					1/2" Ice	4.0100	0.05
				3.00					1" Ice	4.3000	0.07

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 115.0000-72.3334	92.8535	0.968	21.633	96.368	A	0.000	96.368	96.368	100.00	0.000	0.000
					B	0.000	96.368		100.00	0.000	0.000
					C	0.000	96.368		100.00	0.000	8.961
L2 72.3334-29.3334	50.5952	0.813	18.078	127.283	A	0.000	127.283	127.283	100.00	0.000	0.000
					B	0.000	127.283		100.00	0.000	0.000
					C	0.000	127.283		100.00	0.000	10.256
L3 29.3334-0.0000	14.3163	0.7	15.689	103.548	A	0.000	103.548	103.548	100.00	0.000	0.000
					B	0.000	103.548		100.00	0.000	0.000
					C	0.000	103.548		100.00	0.000	6.996

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 115.0000-72.3334	92.8535	0.968	5.868	2.2180	112.140	A	0.000	112.140	112.140	100.00	0.000	0.000
						B	0.000	112.140		100.00	0.000	0.000
						C	0.000	112.140		100.00	0.000	33.507
L2 72.3334-29.3334	50.5952	0.813	4.904	2.0873	143.179	A	0.000	143.179	143.179	100.00	0.000	0.000
						B	0.000	143.179		100.00	0.000	0.000
						C	0.000	143.179		100.00	0.000	48.405
L3 29.3334-0.0000	14.3163	0.7	4.256	1.8398	113.753	A	0.000	113.753	113.753	100.00	0.000	0.000
						B	0.000	113.753		100.00	0.000	0.000
						C	0.000	113.753		100.00	0.000	31.487

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 115.0000-72.3334	92.8535	0.968	7.561	96.368	A	0.000	96.368	96.368	100.00	0.000	0.000
					B	0.000	96.368		100.00	0.000	0.000
					C	0.000	96.368		100.00	0.000	8.961
L2 72.3334-29.3334	50.5952	0.813	6.318	127.283	A	0.000	127.283	127.283	100.00	0.000	0.000
					B	0.000	127.283		100.00	0.000	0.000
					C	0.000	127.283		100.00	0.000	10.256
L3 29.3334-0.0000	14.3163	0.7	5.484	103.548	A	0.000	103.548	103.548	100.00	0.000	0.000
					B	0.000	103.548		100.00	0.000	0.000
					C	0.000	103.548		100.00	0.000	6.996

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	115 - 72.3334	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.78	0.40	1.50
			Max. Mx	8	-9.14	-377.43	8.37
			Max. My	2	-9.14	-11.36	378.99
			Max. Vy	8	12.87	-377.43	8.37
			Max. Vx	2	-12.87	-11.36	378.99
			Max. Torque	10			1.71

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	72.3334 - 29.3334	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.02	4.40	-0.75
			Max. Mx	8	-16.32	-1006.05	22.51
			Max. My	2	-16.32	-29.72	1007.75
			Max. Vy	8	17.02	-1006.05	22.51
			Max. Vx	2	-17.02	-29.72	1007.75
			Max. Torque	10			1.62
L3	29.3334 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.77	7.89	-2.79
			Max. Mx	8	-25.14	-1659.43	34.07
			Max. My	2	-25.14	-44.71	1661.24
			Max. Vy	8	20.31	-1659.43	34.07
			Max. Vx	2	-20.31	-44.71	1661.24
			Max. Torque	10			1.22

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	56.77	-0.00	0.00
	Max. H_x	21	18.87	20.21	-0.18
	Max. H_z	3	18.87	-0.43	20.30
	Max. M_x	2	1661.24	-0.43	20.30
	Max. M_z	8	1659.43	-20.30	0.33
	Max. Torsion	10	0.93	-17.57	-9.84
	Min. Vert	15	18.87	0.20	-20.24
	Min. H_x	9	18.87	-20.30	0.33
	Min. H_z	15	18.87	0.20	-20.24
	Min. M_x	14	-1653.99	0.20	-20.24
	Min. M_z	20	-1648.96	20.21	-0.18
	Min. Torsion	22	-0.81	17.40	9.93

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	20.96	0.00	-0.00	-0.34	-0.01	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	25.15	0.43	-20.30	-1661.24	-44.71	0.46
0.9 Dead+1.6 Wind 0 deg - No Ice	18.87	0.43	-20.30	-1649.84	-44.38	0.45
1.2 Dead+1.6 Wind 30 deg - No Ice	25.15	10.45	-17.63	-1442.61	-860.04	0.02
0.9 Dead+1.6 Wind 30 deg - No Ice	18.87	10.45	-17.63	-1432.69	-854.18	0.01
1.2 Dead+1.6 Wind 60 deg - No Ice	25.15	17.71	-10.34	-849.81	-1450.12	-0.51
0.9 Dead+1.6 Wind 60 deg - No Ice	18.87	17.71	-10.34	-843.91	-1440.25	-0.50
1.2 Dead+1.6 Wind 90 deg - No Ice	25.15	20.30	-0.33	-34.07	-1659.43	-0.89
0.9 Dead+1.6 Wind 90 deg - No Ice	18.87	20.30	-0.33	-33.71	-1648.16	-0.88
1.2 Dead+1.6 Wind 120 deg - No Ice	25.15	17.57	9.84	797.66	-1437.75	-0.93
0.9 Dead+1.6 Wind 120 deg - No Ice	18.87	17.57	9.84	792.35	-1427.96	-0.92
1.2 Dead+1.6 Wind 150 deg - No Ice	25.15	9.89	17.41	1420.58	-803.82	-0.68
0.9 Dead+1.6 Wind 150 deg - No Ice	18.87	9.89	17.41	1411.03	-798.35	-0.67

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
1.2 Dead+1.6 Wind 180 deg - No Ice	25.15	-0.20	20.24	1653.99	19.42	-0.31
0.9 Dead+1.6 Wind 180 deg - No Ice	18.87	-0.20	20.24	1642.91	19.30	-0.30
1.2 Dead+1.6 Wind 210 deg - No Ice	25.15	-10.25	17.66	1445.61	837.94	0.13
0.9 Dead+1.6 Wind 210 deg - No Ice	18.87	-10.25	17.66	1435.89	832.26	0.14
1.2 Dead+1.6 Wind 240 deg - No Ice	25.15	-17.61	10.36	850.20	1439.34	0.47
0.9 Dead+1.6 Wind 240 deg - No Ice	18.87	-17.62	10.36	844.52	1429.57	0.47
1.2 Dead+1.6 Wind 270 deg - No Ice	25.15	-20.21	0.18	16.31	1648.96	0.69
0.9 Dead+1.6 Wind 270 deg - No Ice	18.87	-20.21	0.18	16.31	1637.81	0.68
1.2 Dead+1.6 Wind 300 deg - No Ice	25.15	-17.40	-9.93	-809.10	1418.46	0.81
0.9 Dead+1.6 Wind 300 deg - No Ice	18.87	-17.40	-9.93	-803.49	1408.83	0.80
1.2 Dead+1.6 Wind 330 deg - No Ice	25.15	-9.92	-17.37	-1416.77	806.62	0.74
0.9 Dead+1.6 Wind 330 deg - No Ice	18.87	-9.92	-17.37	-1407.03	801.14	0.72
1.2 Dead+1.0 Ice+1.0 Temp	56.77	0.00	-0.00	2.79	7.89	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	56.77	0.11	-5.60	-485.51	-3.37	-0.22
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	56.77	2.88	-4.86	-421.11	-244.20	-0.16
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	56.77	4.89	-2.85	-246.27	-418.70	-0.08
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	56.77	5.61	-0.08	-5.86	-480.80	0.02
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	56.77	4.85	2.72	238.87	-415.37	0.15
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	56.77	2.74	4.81	421.38	-229.59	0.24
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	56.77	-0.05	5.59	489.66	13.20	0.26
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	56.77	-2.83	4.87	427.89	254.75	0.20
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	56.77	-4.87	2.85	252.47	432.16	0.07
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	56.77	-5.59	0.05	7.22	494.41	-0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	56.77	-4.81	-2.74	-235.68	426.75	-0.18
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	56.77	-2.75	-4.80	-414.39	246.63	-0.23
Dead+Wind 0 deg - Service	20.96	0.09	-4.43	-361.66	-9.74	0.32
Dead+Wind 30 deg - Service	20.96	2.28	-3.85	-314.10	-187.11	0.13
Dead+Wind 60 deg - Service	20.96	3.87	-2.26	-185.14	-315.48	-0.11
Dead+Wind 90 deg - Service	20.96	4.43	-0.07	-7.68	-361.01	-0.32
Dead+Wind 120 deg - Service	20.96	3.84	2.15	173.25	-312.78	-0.43
Dead+Wind 150 deg - Service	20.96	2.16	3.80	308.76	-174.87	-0.40
Dead+Wind 180 deg - Service	20.96	-0.04	4.42	359.57	4.21	-0.29
Dead+Wind 210 deg - Service	20.96	-2.24	3.86	314.21	182.27	-0.10
Dead+Wind 240 deg - Service	20.96	-3.85	2.26	184.68	313.10	0.10
Dead+Wind 270 deg - Service	20.96	-4.41	0.04	3.28	358.73	0.28
Dead+Wind 300 deg - Service	20.96	-3.80	-2.17	-176.27	308.55	0.40
Dead+Wind 330 deg - Service	20.96	-2.17	-3.79	-308.46	175.45	0.42

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-20.96	0.00	-0.00	20.96	0.00	0.000%
2	0.43	-25.15	-20.30	-0.43	25.15	20.30	0.002%
3	0.43	-18.87	-20.30	-0.43	18.87	20.30	0.001%
4	10.45	-25.15	-17.63	-10.45	25.15	17.63	0.000%
5	10.45	-18.87	-17.63	-10.45	18.87	17.63	0.000%
6	17.71	-25.15	-10.34	-17.71	25.15	10.34	0.000%
7	17.71	-18.87	-10.34	-17.71	18.87	10.34	0.000%
8	20.30	-25.15	-0.33	-20.30	25.15	0.33	0.002%
9	20.30	-18.87	-0.33	-20.30	18.87	0.33	0.001%
10	17.57	-25.15	9.84	-17.57	25.15	-9.84	0.000%
11	17.57	-18.87	9.84	-17.57	18.87	-9.84	0.000%
12	9.89	-25.15	17.41	-9.89	25.15	-17.41	0.000%
13	9.89	-18.87	17.41	-9.89	18.87	-17.41	0.000%
14	-0.20	-25.15	20.25	0.20	25.15	-20.24	0.006%
15	-0.20	-18.87	20.25	0.20	18.87	-20.24	0.005%
16	-10.25	-25.15	17.66	10.25	25.15	-17.66	0.000%
17	-10.25	-18.87	17.66	10.25	18.87	-17.66	0.000%
18	-17.62	-25.15	10.36	17.61	25.15	-10.36	0.000%
19	-17.62	-18.87	10.36	17.62	18.87	-10.36	0.000%
20	-20.21	-25.15	0.18	20.21	25.15	-0.18	0.005%
21	-20.21	-18.87	0.18	20.21	18.87	-0.18	0.004%
22	-17.40	-25.15	-9.93	17.40	25.15	9.93	0.000%
23	-17.40	-18.87	-9.93	17.40	18.87	9.93	0.000%
24	-9.92	-25.15	-17.37	9.92	25.15	17.37	0.000%
25	-9.92	-18.87	-17.37	9.92	18.87	17.37	0.000%
26	0.00	-56.77	0.00	-0.00	56.77	0.00	0.002%
27	0.11	-56.77	-5.60	-0.11	56.77	5.60	0.001%
28	2.88	-56.77	-4.86	-2.88	56.77	4.86	0.001%
29	4.89	-56.77	-2.85	-4.89	56.77	2.85	0.001%
30	5.61	-56.77	-0.08	-5.61	56.77	0.08	0.001%
31	4.85	-56.77	2.72	-4.85	56.77	-2.72	0.001%
32	2.74	-56.77	4.81	-2.74	56.77	-4.81	0.001%
33	-0.05	-56.77	5.59	0.05	56.77	-5.59	0.001%
34	-2.83	-56.77	4.87	2.83	56.77	-4.87	0.001%
35	-4.87	-56.77	2.85	4.87	56.77	-2.85	0.001%
36	-5.59	-56.77	0.05	5.59	56.77	-0.05	0.001%
37	-4.81	-56.77	-2.74	4.81	56.77	2.74	0.001%
38	-2.75	-56.77	-4.80	2.75	56.77	4.80	0.001%
39	0.09	-20.96	-4.43	-0.09	20.96	4.43	0.005%
40	2.28	-20.96	-3.85	-2.28	20.96	3.85	0.005%
41	3.87	-20.96	-2.26	-3.87	20.96	2.26	0.005%
42	4.43	-20.96	-0.07	-4.43	20.96	0.07	0.005%
43	3.84	-20.96	2.15	-3.84	20.96	-2.15	0.005%
44	2.16	-20.96	3.80	-2.16	20.96	-3.80	0.005%
45	-0.04	-20.96	4.42	0.04	20.96	-4.42	0.005%
46	-2.24	-20.96	3.86	2.24	20.96	-3.86	0.005%
47	-3.85	-20.96	2.26	3.85	20.96	-2.26	0.005%
48	-4.41	-20.96	0.04	4.41	20.96	-0.04	0.005%
49	-3.80	-20.96	-2.17	3.80	20.96	2.17	0.005%
50	-2.17	-20.96	-3.79	2.17	20.96	3.79	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00000001	0.00006696
3	Yes	12	0.00000001	0.00005388
4	Yes	13	0.00000001	0.00014231
5	Yes	13	0.00000001	0.00010906
6	Yes	13	0.00000001	0.00014362
7	Yes	13	0.00000001	0.00011009
8	Yes	12	0.00000001	0.00007087

9	Yes	12	0.00000001	0.00005694
10	Yes	13	0.00000001	0.00012266
11	Yes	13	0.00000001	0.00009431
12	Yes	13	0.00000001	0.00013349
13	Yes	13	0.00000001	0.00010289
14	Yes	11	0.00007276	0.00014370
15	Yes	11	0.00000001	0.00012003
16	Yes	13	0.00000001	0.00013738
17	Yes	13	0.00000001	0.00010548
18	Yes	13	0.00000001	0.00013587
19	Yes	13	0.00000001	0.00010426
20	Yes	11	0.00007277	0.00014886
21	Yes	11	0.00000001	0.00012401
22	Yes	13	0.00000001	0.00013479
23	Yes	13	0.00000001	0.00010385
24	Yes	13	0.00000001	0.00012277
25	Yes	13	0.00000001	0.00009447
26	Yes	7	0.00000001	0.00001575
27	Yes	12	0.00000001	0.00011326
28	Yes	12	0.00000001	0.00013071
29	Yes	12	0.00000001	0.00013068
30	Yes	12	0.00000001	0.00011173
31	Yes	12	0.00000001	0.00012653
32	Yes	12	0.00000001	0.00012632
33	Yes	12	0.00000001	0.00011307
34	Yes	12	0.00000001	0.00013335
35	Yes	12	0.00000001	0.00013366
36	Yes	12	0.00000001	0.00011438
37	Yes	12	0.00000001	0.00013002
38	Yes	12	0.00000001	0.00012900
39	Yes	10	0.00000001	0.00012706
40	Yes	10	0.00000001	0.00011140
41	Yes	10	0.00000001	0.00011191
42	Yes	10	0.00000001	0.00012683
43	Yes	10	0.00000001	0.00010782
44	Yes	10	0.00000001	0.00011348
45	Yes	10	0.00000001	0.00012520
46	Yes	10	0.00000001	0.00010925
47	Yes	10	0.00000001	0.00010852
48	Yes	10	0.00000001	0.00012497
49	Yes	10	0.00000001	0.00011353
50	Yes	10	0.00000001	0.00010693

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	115 - 72.3334	11.37	40	0.865	0.002
L2	77 - 29.3334	5.14	41	0.632	0.002
L3	35 - 0	1.06	41	0.271	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
115.0000	(2) DB844G65ZAXY w/ Mount Pipe	40	11.37	0.865	0.002	46841
108.0000	VHLP1-23	40	10.14	0.827	0.002	33458
105.0000	HORIZON COMPACT	40	9.61	0.810	0.002	23420
85.0000	WH14-69/S	41	6.31	0.689	0.002	7806

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	115 - 72.3334	52.17	6	3.975	0.005
L2	77 - 29.3334	23.62	6	2.904	0.005
L3	35 - 0	4.86	6	1.244	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
115.0000	(2) DB844G65ZAXY w/ Mount Pipe	6	52.17	3.975	0.008	10299
108.0000	VHLP1-23	6	46.53	3.799	0.008	7356
105.0000	HORIZON COMPACT	6	44.13	3.722	0.007	5149
85.0000	WH14-69/S	6	28.99	3.165	0.007	1714

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	115 - 72.3334 (1)	TP30.45x21.91x0.219	42.6666	0.0000	0.0	20.6596	-9.12	1268.89	0.007
L2	72.3334 - 29.3334 (2)	TP38.61x29.0779x0.313	47.6666	0.0000	0.0	37.4559	-16.31	2448.72	0.007
L3	29.3334 - 0 (3)	TP43.85x36.8508x0.375	35.0000	0.0000	0.0	52.4961	-25.14	3470.66	0.007

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	115 - 72.3334 (1)	TP30.45x21.91x0.219	382.44	757.68	0.505	0.00	757.68	0.000
L2	72.3334 - 29.3334 (2)	TP38.61x29.0779x0.313	1019.98	1853.08	0.550	0.00	1853.08	0.000
L3	29.3334 - 0 (3)	TP43.85x36.8508x0.375	1680.78	3071.83	0.547	0.00	3071.83	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	115 - 72.3334 (1)	TP30.45x21.91x0.219	13.07	634.45	0.021	0.45	1536.35	0.000
L2	72.3334 - 29.3334 (2)	TP38.61x29.0779x0.313	17.24	1224.36	0.014	0.51	3757.45	0.000
L3	29.3334 - 0 (3)	TP43.85x36.8508x0.375	20.52	1735.33	0.012	0.51	6228.71	0.000

Pole Interaction Design Data

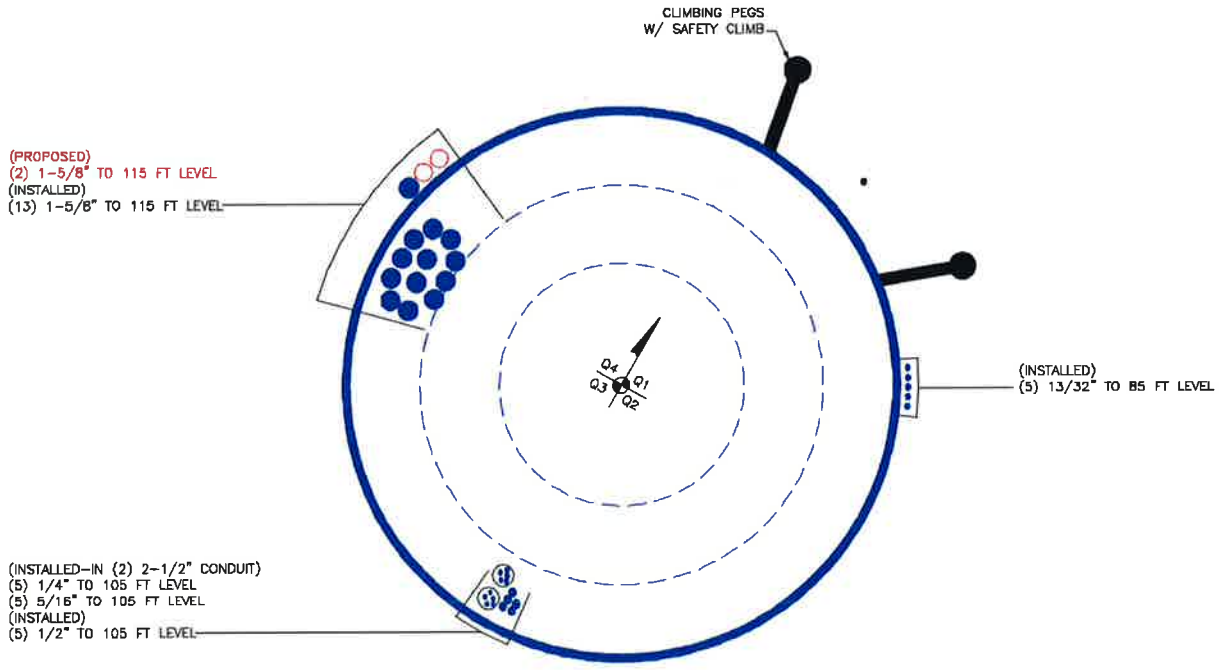
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	115 - 72.3334 (1)	0.007	0.505	0.000	0.021	0.000	0.512	1.000	4.8.2
L2	72.3334 - 29.3334 (2)	0.007	0.550	0.000	0.014	0.000	0.557	1.000	4.8.2
L3	29.3334 - 0 (3)	0.007	0.547	0.000	0.012	0.000	0.555	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	115 - 72.3334	Pole	TP30.45x21.91x0.219	1	-9.12	1268.89	51.2	Pass
L2	72.3334 - 29.3334	Pole	TP38.61x29.0779x0.313	2	-16.31	2448.72	55.7	Pass
L3	29.3334 - 0	Pole	TP43.85x36.8508x0.375	3	-25.14	3470.66	55.5	Pass
							Summary	
						Pole (L2)	55.7	Pass
						RATING =	**55.7**	**Pass**

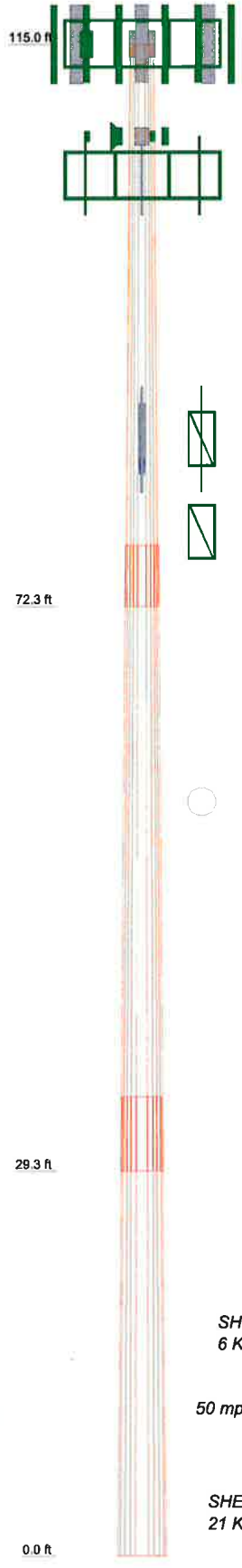
APPENDIX B

BASE LEVEL DRAWING


CLIMBING PEGS
W/ SAFETY CLIMB
(PROPOSED)
(2) 1-5/8" TO 115 FT LEVEL
(INSTALLED)
(13) 1-5/8" TO 115 FT LEVEL
(INSTALLED)
(5) 13/32" TO 85 FT LEVEL
(INSTALLED-IN (2) 2-1/2" CONDUIT)
(5) 1/4" TO 105 FT LEVEL
(5) 5/16" TO 105 FT LEVEL
(INSTALLED)
(5) 1/2" TO 105 FT LEVEL
Q4
Q1
Q3
Q2

APPENDIX C

ADDITIONAL CALCULATIONS



Section	1	2	3
Length (ft)	42.6666	47.6666	35.0000
Number of Sides	12	12	12
Thickness (in)	0.2190	0.3130	0.3750
Socket Length (ft)	4.6666	5.6666	
Top Dia (in)	21.9100	29.0779	36.8508
Bot Dia (in)	30.4500	38.6100	43.8500
Grade		A572-65	
Weight (K)	2.7	5.5	5.7

13.9

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB844G65ZAXY w/ Mount Pipe	115	HORIZON COMPACT	105
(2) DB844G65ZAXY w/ Mount Pipe	115	HORIZON COMPACT	105
(2) DB844G65ZAXY w/ Mount Pipe	115	(2) HORIZON COMPACT	105
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	115	WIMAX DAP HEAD	105
		WIMAX DAP HEAD	105
BXA-70063-6CF-EDIN-4 w/ Mount Pipe	115	WIMAX DAP HEAD	105
		Platform Mount [LP 602-1]	105
BXA-70063-6CF-EDIN-6 w/ Mount Pipe	115	(2) 2.375" OD x 6' Mount Pipe	105
		(2) 2.375" OD x 6' Mount Pipe	105
(2) SBNHH-1D65B w/ Mount Pipe	115	(2) 2.375" OD x 6' Mount Pipe	105
(2) SBNHH-1D65B w/ Mount Pipe	115	VHLP1-23	105
(2) SBNHH-1D65B w/ Mount Pipe	115	VHLP1-23	105
DB-T1-6Z-8AB-0Z	115	VHLP2-11-2GR	105
RRH2X60-PCS	115	WL 14-69/S	85
RRH2X60-PCS	115	J105-HI	85
RRH2X60-PCS	115	Side Arm Mount [SO 701-1]	85
RRH2x60-700	115	Side Arm Mount [SO 701-1]	85
RRH2x60-700	115	Side Arm Mount [SO 701-1]	85
RRH2x60-700	115	Side Arm Mount [SO 701-1]	85
B66A RRH4X45-4R	115	2.375" OD x 8' Mount Pipe	85
B66A RRH4X45-4R	115	2.375" OD x 8' Mount Pipe	85
B66A RRH4X45-4R	115	WH14-69/S	85
DB-T1-6Z-8AB-0Z	115	WL 14-69/S	85
Platform Mount [LP 715-1]	115	WL 14-69/S	85

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 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: 55.7%

ALL REACTIONS ARE FACTORED

AXIAL 57 K

SHEAR 6 K *MOMENT 501 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 25 K

SHEAR 21 K *MOMENT 1681 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 96 mph WIND

Paul J. Ford and Company
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Columbus, OH 43215
Phone: (614) 221-6679
FAX:
PJF

Job: **HRT 093 943228**
Project: **PJF # 37517-2563.002.7805 / BU# 806372**
Client: CCI | Drawn by: Jaime Acuna | App'd:
Code: TIA-222-G | Date: 09/20/17 | 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#: *806372*
Site Name: *HRT 093 943228*
App #:

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	51.9	in

Plate Data		
Diam:	57.9	in
Thick:	2.625	in
Grade:	60	ksi
Single-Rod B-eff:	11.75	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	43.85	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	1681	ft-kips
Axial, Pu:	25	kips
Shear, Vu:	21	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ή):	135.1 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	52.0% **Pass**	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	16.7 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	30.9% **Pass**	Y.L. Length: 27.76

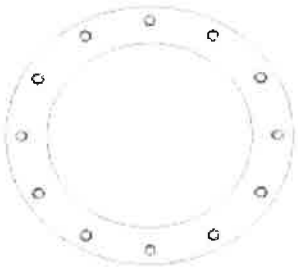
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

PAUL J. FORD & COMPANY
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Job Number: 37517-2563.002.7805
Site Number: 806372
Site Name: HRT 093 943228

By: JAB
Date: 9/20/2017

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	1681.0		k-ft
Shear, Vu =	25.0		kips
Axial Load, Pu1 =	21.0		kips (from 1.2D + 1.6W)*
Axial Load, Pu2 =	15.8	0.0	kips (from 0.9D + 1.6W)**
OTMu =	1691.0	0.0	k-ft @ Ground

*Axial Load, Pu1 will be used for Soil Compression Analysis.
**Axial Load, Pu2 will be used for Steel Analysis.

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-08
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

Drilled Pier Parameters

Diameter =	6	ft
Height Above Grade =	0.4	ft
Depth Below Grade =	21.1	ft
fc' =	3	ksi
εc =	0.003	in/in
L / D Ratio =	3.58	
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA-222-G

1. (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
2. (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Steel Parameters

Number of Bars =	22	
Rebar Size =	#10	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#4	
Side Clear Cover to Ties =	5	in

Soil Parameters

Water Table Depth =	99.00	ft
Depth to Ignore Soil =	5.00	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?*	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	110.0%
Maximum Steel Ratio =	105.0%

*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	5	90		30	Sand				5
2	9	90		39	Sand				14
3	4	90		30	Sand				18
4	20	90		34	Sand	6000			38
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	14.78	ft, from Grade
Bending Moment, Mu =	2060.47	k-ft, from COR
Resisting Moment, ΦMn =	3675.16	k-ft, from COR

MOMENT RATIO = 56.1% OK

Shear, Vu =	25.00	kips
Resisting Shear, ΦVn =	44.59	kips

SHEAR RATIO = 56.1% OK

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	82.07	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, Cu =	21.00	kips
Comp. Capacity, ΦCn =	82.24	kips

COMPRESSION RATIO = 25.5% OK

Steel Results (ACI 318-08):

Minimum Steel Area =	13.57	sq in
Actual Steel Area =	27.94	sq in
Axial, ΦPn (min) =	-1508.76	kips, Where ΦMn = 0 k-ft
Axial, ΦPn (max) =	6233.49	kips, Where ΦMn = 0 k-ft

Axial Load, Pu =	41.13	kips @ 6.25 ft Below Grade
Moment, Mu =	1834.58	k-ft @ 6.25 ft Below Grade
Moment, ΦMn =	3632.10	k-ft

MOMENT RATIO = 50.5% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *806372*
Site Name: *HRT 093 943228*
App #:

Loads Already Factored		
For M (WL)	1	<----Disregard
For P (DL)	1	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	6.0	ft
Concrete Area =	4071.5	in^2

Reinforcement:

Clear Cover to **Tie**=	5.00	in
Horiz. **Tie** Bar Size=	4	
Vert. Cage Diameter =	4.98	ft
Vert. Cage Diameter =	59.73	in
Vertical Bar Size =	10	
Bar Diameter =	1.27	in
Bar Area =	1.27	in^2
Number of Bars =	22	
As Total=	27.94	in^2
A s/ Aconc, Rho:	0.0069	0.69%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.69%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	6233.49	kips
at Mu=(ϕ=0.65)Mn=	3180.78	ft-kips
Max Tu, (φ=0.9) Tn =	1508.76	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	1834.58	ft-kips (* Note)
Max. Factored Shaft Pu:	41.13	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.00	Mu:	1834.58	ft-kips
1.00	Pu:	41.13	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code=	2008

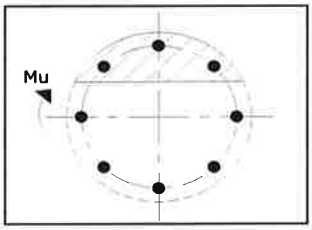
Seismic Properties

Seismic Design Category =	D
Seismic Risk =	**High**

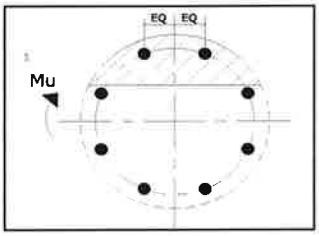
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**13.33**	in
Extreme Steel Strain, εt:	**0.0118**	
	εt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

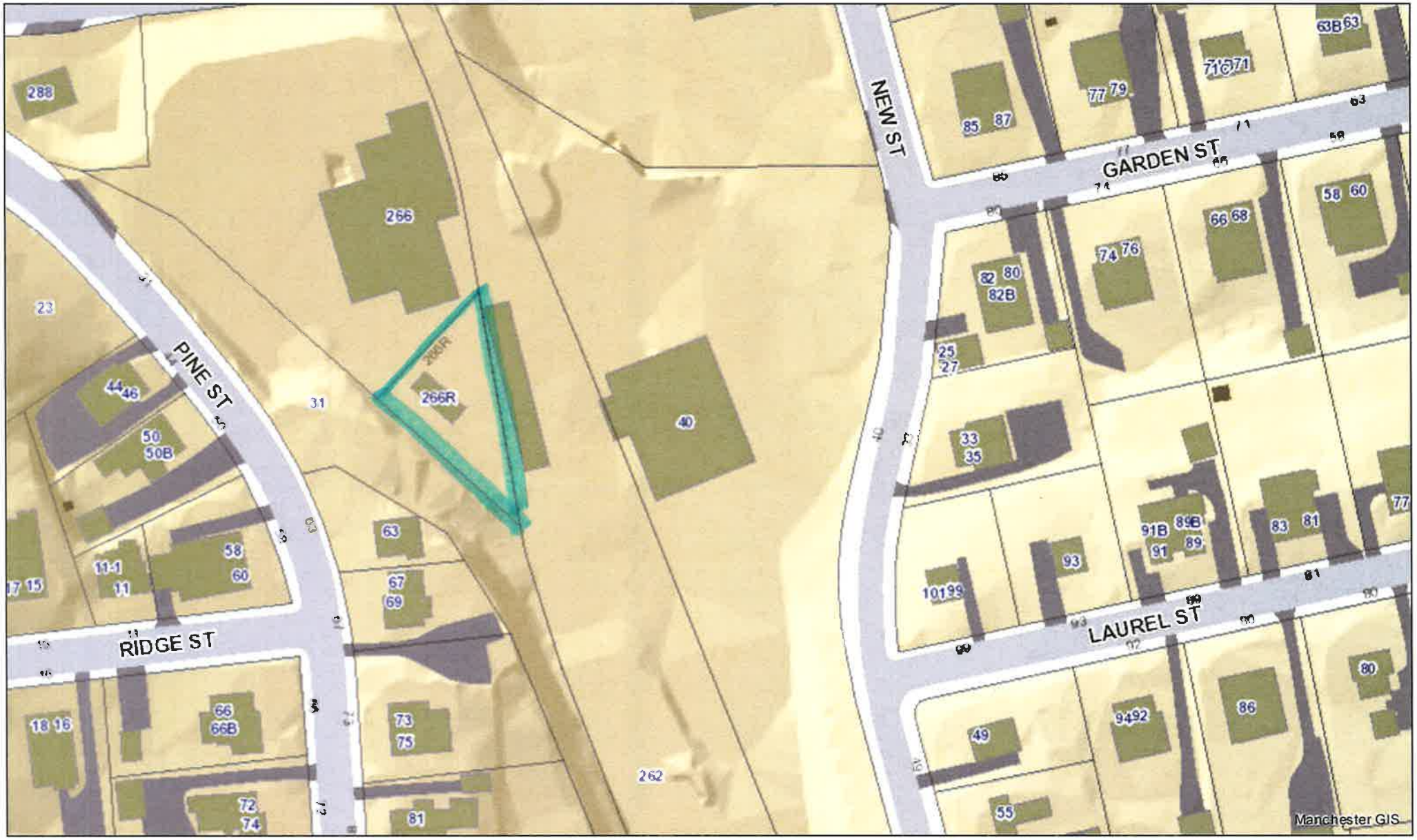
Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	41.13	kips
Drilled Shaft Moment Capacity, φMn:	**3632.09**	ft-kips
Drilled Shaft Superimposed Mu:	**1834.58**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**50.5%**

ATTACHMENT 4

Town of Manchester, CT



Town of Manchester, CT
DISCLAIMER: This map is compiled from other maps, deeds, dimensions and other sources of information. Not to be construed as accurate surveys and subject to final changes as a more accurate survey may disclose.
NOTES:Original planimetric and topographic data were compiled by stereophotogrammetric methods from photography dated April 1999 in accordance with ASPR accuracy standards for 1 inch = 40ft large scale Class I mapping. The updating of the GIS data is performed by the GIS/Maps & Records Unit on a continual basis utilizing the best and most appropriated sources available.

1 inch = 100 feet

Author:

N W E S

Date: 8/14/2017

266R CENTER STREET

Location	266R CENTER STREET	**Mblu**	62/ 1020/ 266/ /
Acct#	102000266R	**Owner**	CROWN ATLANTIC CO LLC
Assessment	$114,800	**Appraisal**	$163,900
PID	2635	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$81,700	$82,200	$163,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$57,300	$57,500	$114,800

Owner of Record

Owner CROWN ATLANTIC CO LLC
PMB 353-806372
Address 4017 WASHINGTON ROAD
MCMURRAY, PA 15317

Sale Price $0
Certificate C
Book & Page 2071/ 309
Sale Date 04/19/1999
Instrument 25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CROWN ATLANTIC CO LLC	$0	C	2071/ 309	25	04/19/1999
CELCO PARTNERSHIP	$0		1923/ 202	25	10/16/1997
METRO MOBILE	$0		1382_142		04/01/1990

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0

Building Photo

Replacement Cost: $0
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Extra Kitchens	
Whirlpool	
Fireplace	
Fin Basement	
Fin Bsmnt Qual	
Fin Bsmnt 2	
Fin Bsmnt2 Qual	
Bsmnt Garage	

(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\02\40/81.jpg)

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	302
Description	Ind Vac
Zone	IND
Neighborhood	4500
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.17
Frontage	0
Depth	0
Assessed Value	$57,500
Appraised Value	$82,200

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	Fence 8' Chain			264 L.F.	$4,000	1
PAV1	Paving Asphalt			14000 S.F.	$17,500	1
SHDT	Telephone Shed			720 S.F.	$59,400	1
LT1	Lights 1Fix			2 UNITS	$800	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$85,100	$82,200	$167,300
2010	$81,400	$86,500	$167,900
2005	$71,100	$61,800	$132,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$59,600	$57,500	$117,100
2010	$57,000	$60,600	$117,600
2005	$49,900	$43,300	$93,200

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	2	2	neopost 10/02/2017 US POSTAGE $002.38 ZIP 06103 041L12203380
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Scott Shanley, General Manager Town of Manchester 41 Center Street Manchester, CT 06045				
2.	Gary Anderson, Director of Planning and Economic Development Lincoln Center 494 Main Street Manchester, CT 06045				
3.		OLD STATE HOUSE STA 06103 2017 USPS			
4.					
5.					
6.					

PS Form **3665**, January 2017 (Page ___ of ___) PSN 7530-17-000-5549

See Reverse for Instructions