Robinson + Cole

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Also admitted in Massachusetts

August 23, 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**
374 Three Mile Road, Glastonbury, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains fifteen (15) antennas at the top of the existing 145-foot tower at 374 Three Mile Road in Glastonbury, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 1996 (Docket No. 174). Cellco now intends to replace nine (9) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) existing remote radio heads ("RRHs") with three (3) newer model RRHs, and install six (6) additional RRHs and two (2) HYBRIFLEX™ fiber optic antenna cables. 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 Richard J. Johnson, Town Manager of the Town of Glastonbury; Khara Dodds, Glastonbury's Director of Land Use and Planning Services; Crown, the tower owner; and Josephine I. and John R. Flanagan, the owners 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. Cellco's antennas will maintain a centerline height of 148 feet above ground level.

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

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

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

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

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 and the owner of the Property 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:
Richard J. Johnson, Glastonbury Town Manager
Khara Dodds, Glastonbury Director of Land Use and Planning Services
Crown Castle
Josephine I. and John R. Flanagan
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
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

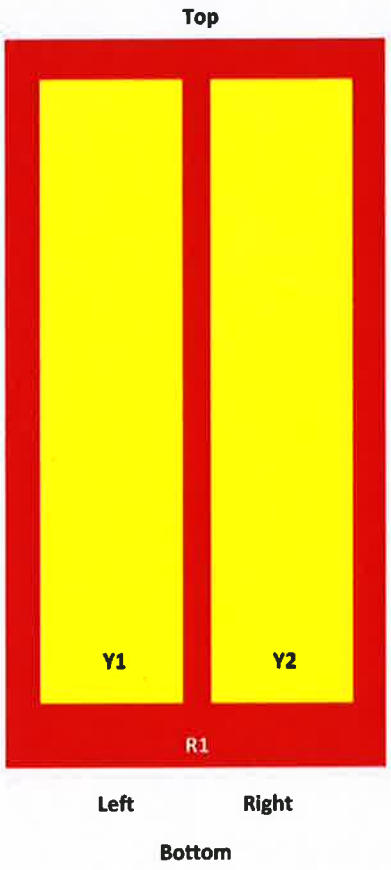
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

Product Specifications

SBNHH-1D65B

SBNHH 65



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

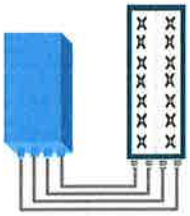
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

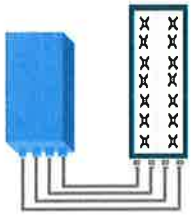
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

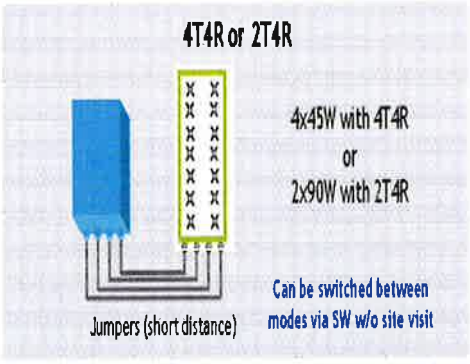
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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.

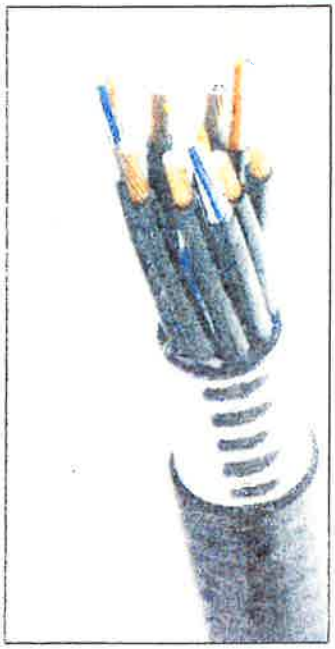


Figure 1: HYBRIFLEX Series

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)

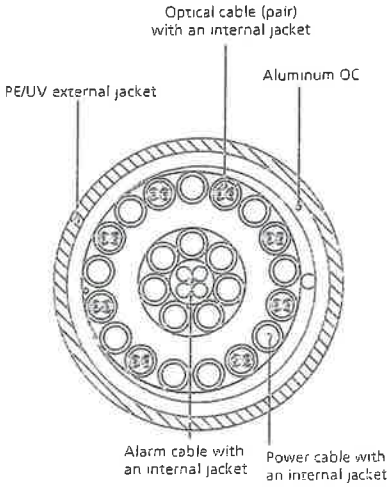


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: East Glastonbury								
Tower Height: 145Ft.								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Nextel	9	100	126	851	0.0225	0.5673	0.40%	
*T-Mobile	2	2334	117	1900	0.1363	1.0000	1.36%	
*T-Mobile	4	1167	117	1900	0.1363	1.0000	1.36%	
*T-Mobile	1	865	117	700	0.0253	0.4667	0.54%	
*AT&T-UMTS	2	414	141	850	0.0163	0.5667	0.29%	
*AT&T-PCS-UMTS	2	656	141	1900	0.0259	1.0000	0.26%	
*AT&T-LTE	2	1239	141	700	0.0489	0.4667	1.05%	
*AT&T-PCS-LTE	2	1876	141	1900	0.0740	1.0000	0.74%	
*AT&T-GSM	2	971	141	850	0.0383	0.5667	0.68%	
*AT&T-PCS-GSM	2	971	141	1900	0.0383	1.0000	0.38%	
*Sprint				1900	0.0042	1.0000	0.04%	
*XM Sat Radio	2	4552	99	2337	0.3785	1.0000	3.79%	
Verizon PCS	**1**	**5000**	**148**	**0.0821**	**1970**	**1.0000**	**8.21%**	
Verizon Cellular	**9**	**386**	**148**	**0.0570**	**869**	**0.5793**	**9.84%**	
Verizon AWS	**1**	**7400**	**148**	**0.1215**	**2145**	**1.0000**	**12.15%**	
Verizon 700	**1**	**2200**	**148**	**0.0361**	**746**	**0.4973**	**7.26%**	
								48.35%
* Source: Siting Council								

ATTACHMENT 3

Date: **June 23, 2017**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Black & Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-8145

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	119698
	Carrier Site Name:	East Glastonbury CT
Crown Castle Designation:	**Crown Castle BU Number:**	806368
	Crown Castle Site Name:	HRT 049B 943215
	Crown Castle JDE Job Number:	443994
	Crown Castle Work Order Number:	1419539
	Crown Castle Application Number:	394834 Rev. 3
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	194393
Site Data:	**374 Three Mile Rd., Glastonbury, Hartford County, CT** **Latitude *41° 41' 36.93"*, Longitude *-72° 32' 50.11"*** **144.813 Foot - Monopole Tower**	

Dear Charles McGuirt,

Black & Veatch Corp. 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 1049069, in accordance with application 394834, 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:

LC7: Existing + Reserved + 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 125 mph converted to a nominal 3-second gust wind speed of 97 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, K_{zt}, of 1.0 and Risk Category II were used in this analysis. Seismic forces have been evaluated on Site Class D with spectral response factors S_s of 0.179g and S_1 of 0.063g.

We at *Black & Veatch Corp.* 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.

Structural analysis prepared by: Sanyukta R. Arvikar / Sumit Bhujbal

Respectfully submitted by:

Ping Jiang, P.E

Professional Engineer

Jun 23, 2017

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 144.813 ft Monopole tower designed by Engineered Endeavors, Inc. in January of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

The tower has been modified as per reinforcement drawings prepared by GPD Associates in March of 2005. Reinforcement consists of addition of base plate stiffeners to base plate. In this analysis we found that the existing base plate without modifications has adequate capacity and therefore did not consider the existing base plate stiffeners in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet. Seismic forces have been evaluated on Site Class D with spectral response factors S_s of 0.179g and S_1 of 0.063g.

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
147.0	148.0	3	alcatel lucent	B66A RRH4X45	2	1 5/8	1
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		9	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			

Note:
1) Refer Appendix B for Detailed Coax Layout

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
147.0	148.0	3	alcatel lucent	RRH2x40-AWS	-	-	2
		3	antel	BXA-171063-12CF-EDIN-2 w/ Mount Pipe			
		3	antel	BXA-171063-8BF-2 w/ Mount Pipe			
		1	antel	BXA-70063-6CF-EDIN-6 w/ Mount Pipe			
		2	swedcom	SLCP 2x6014 w/ Mount Pipe			
		2	antel	LPA-80063/6CF w/ Mount Pipe	1 12	1 1/4 1 5/8	1
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		4	swedcom	SC-E 6014 rev2 w/ Mount Pipe			
	147.0	1	cci tower mounts	Platform Mount [LP 1001-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	145.0	6	rfs celwave	FD9R6004/2C-3L			
137.0	138.0	3	ericsson	RRUS 32 B2	-	-	3
		6	powerwave technologies	7020.00			
		1	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2 1 12	3/8 3/4 1/2 1 1/4	1
		2	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe			
		3	communication components inc.	DTMABP7819VG12A			
		3	ericsson	RRUS-11			
		6	powerwave technologies	7020.00			
		4	powerwave technologies	7770.00 w/ Mount Pipe			
		2	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		3	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			
	137.0	1	cci tower mounts	Platform Mount [LP 1001-1]			
126.0	130.0	2	gps	GPS_A	2 12	1/2 1 1/4	4
	128.0	12	decibel	DB844G65ZAXY w/ Mount Pipe			
	126.0	1	cci tower mounts	Platform Mount [LP 601-1]			
116.0	116.0	1	cci tower mounts	Platform Mount [LP 601-1]	13	1 5/8	1
		3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
95.0	97.0	1	ems wireless	RR65-18-02DP w/ Mount Pipe	3	1 1/4	1
	96.0	1	repeater technologies	DA1900-39			
	95.0	2	cci tower mounts	Side Arm Mount [SO 701-1]			
87.0	87.0	3	allgon	7250.02 w/ Mount Pipe	6	1 1/4	4

Notes:
1) Existing Equipment
2) Existing Equipment To Be Removed; Not Considered In This Analysis
3) Reserved Equipment
4) Abandoned Equipment; Considered In This Analysis

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)
145	145	15	allgon	ALP 9212	-	-
140	140	15	allgon	ALP 11011	-	-
130	130	15	allgon	ALP 9212	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti	262197	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated	974245	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated	262188	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Associates	1037241	CCISITES
4-POST MODIFICATION INSPECTION	GPD Group	1090825	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Paul J. Ford and Company	6614660	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 wind loading Exposure Category for this site has been analyzed and determined by the tower owner. Black & Veatch does not assume any responsibility for its accuracy.
5) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. The existing/proposed loading on the structure is based on CAD level drawings and carrier applications provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

4.1) Wind 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	144.813 - 92.3333	Pole	TP35.6875x20.5x0.3438	1	-21.49	2652.09	52.9	Pass
L2	92.3333 - 44.5225	Pole	TP48.6563x33.5646x0.4375	2	-36.56	4487.73	56.5	Pass
L3	44.5225 - 0	Pole	TP60.5x45.8995x0.4688	3	-58.59	5701.25	61.3	Pass
							Summary	
						Pole (L3)	61.3	Pass
						Rating =	61.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	58.0	Pass
1	Base Plate		64.3	Pass
1, 2	Base Foundation (Compared w/ Design Loads)	0	62.2	Pass

4.2) Seismic Results

Tower and foundation have been analyzed based on the seismic criteria outlined in section 2 of this report. Based on the analysis, seismic loading is not governing the tower and foundation stress. Wind loading is governing the tower and foundation stress.

Structure Rating (max from all components) =	64.3%

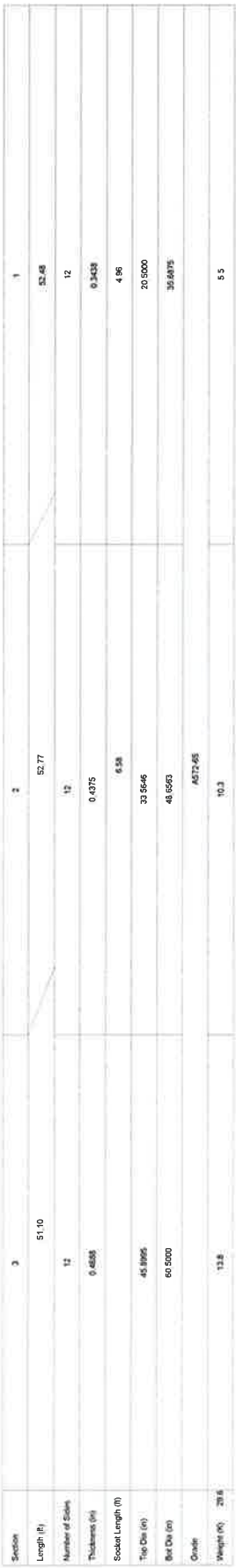
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Foundation capacity determined by comparing analysis reactions to original design reactions.

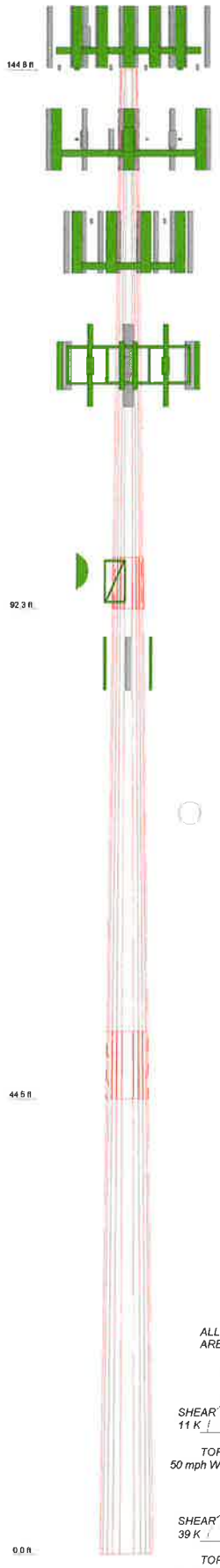
4.3) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT





ALL REACTIONS ARE FACTORED

AXIAL 115 K

SHEAR 11 K — *MOMENT 1252 kip-ft*

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

AXIAL 59 K

SHEAR 39 K — *MOMENT 4201 kip-ft*

TORQUE 5 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 1001-1]	147	TT19-08BP111-001	137
SC-E 6014 rev2 w/ Mount Pipe	147	TT19-08BP111-001	137
SC-E 6014 rev2 w/ Mount Pipe	147	TT19-08BP111-001	137
(2) LPA-80063/6CF w/ Mount Pipe	147	RRUS-11	137
SBNHH-1D65B w/ Mount Pipe	147	RRUS-11	137
SBNHH-1D65B w/ Mount Pipe	147	RRUS-11	137
SBNHH-1D65B w/ Mount Pipe	147	DTMABP7819VG12A	137
SBNHH-1D65B w/ Mount Pipe	147	DTMABP7819VG12A	137
SBNHH-1D65B w/ Mount Pipe	147	DTMABP7819VG12A	137
SBNHH-1D65B w/ Mount Pipe	147	RRUS 32 B2	137
SBNHH-1D65B w/ Mount Pipe	147	RRUS 32 B2	137
SBNHH-1D65B w/ Mount Pipe	147	RRUS 32 B2	137
SBNHH-1D65B w/ Mount Pipe	147	DC6-48-60-18-8F	137
SC-E 6014 rev2 w/ Mount Pipe	147	Platform Mount [LP 601-1]	126
SC-E 6014 rev2 w/ Mount Pipe	147	(4) DB844G65ZAXY w/ Mount Pipe	126
(2) FD9R6004/2C-3L	147	(4) DB844G65ZAXY w/ Mount Pipe	126
(2) FD9R6004/2C-3L	147	(4) DB844G65ZAXY w/ Mount Pipe	126
(2) FD9R6004/2C-3L	147	GPS_A	126
RRH2x60-700	147	GPS_A	126
RRH2x60-700	147	Transition Ladder	126
RRH2x60-700	147	Platform Mount [LP 601-1]	116
RRH2X60-PCS	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	116
RRH2X60-PCS	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	116
RRH2X60-PCS	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	116
B66A RRH4X45	147	LNX-6515DS-VTM w/ Mount Pipe	116
B66A RRH4X45	147	LNX-6515DS-VTM w/ Mount Pipe	116
B66A RRH4X45	147	LNX-6515DS-VTM w/ Mount Pipe	116
DB-T1-6Z-8AB-0Z	147	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	116
DB-T1-6Z-8AB-0Z	147	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	116
Platform Mount [LP 1001-1]	137	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	116
7770.00 w/ Mount Pipe	137	KRY 112 144/1	116
7770.00 w/ Mount Pipe	137	KRY 112 144/1	116
7770.00 w/ Mount Pipe	137	KRY 112 144/1	116
7770.00 w/ Mount Pipe	137	RRUS 11 B12	116
HPA-65R-BUU-H6 w/ Mount Pipe	137	RRUS 11 B12	116
HPA-65R-BUU-H8 w/ Mount Pipe	137	RRUS 11 B12	116
HPA-65R-BUU-H8 w/ Mount Pipe	137	Transition Ladder	116
P65-17-XLH-RR w/ Mount Pipe	137	Side Arm Mount [SO 701-1]	95
P65-17-XLH-RR w/ Mount Pipe	137	Side Arm Mount [SO 701-1]	95
(2) 7020.00	137	MR65-18-02DP w/ Mount Pipe	95
(2) 7020.00	137	Ice Shield 1.5' x 2.0'	95
(2) 7020.00	137	DA1900-39	95
(2) 7020.00	137	7250.02 w/ Mount Pipe	87
(2) 7020.00	137	7250.02 w/ Mount Pipe	87
(2) 7020.00	137	7250.02 w/ Mount Pipe	87

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 97 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 0.00 ft
8. TOWER RATING: 61.3%

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6800 W. 115th Street Suite 2292
Overland Park, KS 66211
Phone: (913) 458-8145
FAX: (913) 458-8136

Job: HRT 049B 943215 (BU# 806368)
Project: 194393 (806368.1419539)
Client: Crown Castle | Drawn by: Sanyukta R. Arvikar | App'd:
Code: TIA-222-G | Date: 06/23/17 | Scale: NTS
Path: | Dwg No. E-1

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) Basic wind speed of 97 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 1.0000 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56.00 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Deflections calculated using a wind speed of 60 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.
15) 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	144.81-92.33	52.48	4.96	12	20.5000	35.6875	0.3438	1.3750	A572-65 (65 ksi)
L2	92.33-44.52	52.77	6.58	12	33.5646	48.6563	0.4375	1.7500	A572-65 (65 ksi)
L3	44.52-0.00	51.10		12	45.8995	60.5000	0.4688	1.8750	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	21.2232	22.3104	1156.9477	7.2159	10.6190	108.9507	2344.2898	10.9805	4.5728	13.303
	36.9464	39.1211	6237.6702	12.6531	18.4861	337.4244	12639.2109	19.2542	8.6430	25.143
L2	36.2171	46.6678	6536.8589	11.8595	17.3864	375.9743	13245.4484	22.9685	7.8228	17.881
	50.3727	67.9282	20158.9414	17.2623	25.2039	799.8330	40847.4806	33.4322	11.8674	27.125
L3	49.4649	68.5720	18064.7455	16.2642	23.7759	759.7915	36604.0719	33.7490	11.0448	23.562
	62.6342	90.6097	41678.8054	21.4912	31.3390	1329.9341	84452.5593	44.5953	14.9578	31.91

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 144.81-92.33				1	1	1			
L2 92.33-44.52				1	1	1			
L3 44.52-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
HB114-21U3M12-XXXF(1-1/4)	C	Surface Ar (CaAa)	144.81 - 8.00	1	1	0.160 0.165	1.5400		1.22
HB158-1-08U8-S8J18(1-5/8)	C	Surface Ar (CaAa)	144.81 - 8.00	2	2	0.050 0.150	1.9800		1.30
95									
LDF6-50A(1-1/4)	B	Surface Ar (CaAa)	95.00 - 4.00	3	3	0.130 0.250	1.5500		0.60
87									
LDF6-50A(1-1/4)	B	Surface Ar (CaAa)	87.00 - 8.00	6	6	-0.300 0.125	1.5500		0.60
Safety Line 3/8	B	Surface Ar (CaAa)	144.81 - 10.00	1	1	-0.350 -0.340	0.3750		0.22

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 plf
147								
HJ7-50A(1-5/8)	C	No	Inside Pole	144.81 - 2.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
137								
2" innerduct conduit	C	No	Inside Pole	137.00 - 8.00	1	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20
						1" Ice	0.00	0.20
FB-L98B-002-75000(3/8)	C	No	Inside Pole	137.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	137.00 - 8.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
LCF12-50J(1/2)	C	No	Inside Pole	137.00 - 8.00	1	No Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LCF114-50J(1-1/4)	C	No	Inside Pole	137.00 - 8.00	12	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
126								
LDF4-50A(1/2)	A	No	Inside Pole	126.00 - 2.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF6-50A(1-1/4)	A	No	Inside Pole	126.00 - 2.00	12	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
116								
LDF7-50A(1-5/8)	A	No	Inside Pole	116.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
MLE Hybrid 9Power/18Fiber RL 2(1-5/8) **	A	No	Inside Pole	116.00 - 8.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07

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	144.81-92.33	A	0.000	0.000	0.000	0.000	0.51
		B	0.000	0.000	3.208	0.000	0.02
		C	0.000	0.000	28.864	0.000	1.30
L2	92.33-44.52	A	0.000	0.000	0.000	0.000	0.88
		B	0.000	0.000	63.529	0.000	0.25
		C	0.000	0.000	26.296	0.000	1.26
L3	44.52-0.00	A	0.000	0.000	0.000	0.000	0.72
		B	0.000	0.000	54.103	0.000	0.21
		C	0.000	0.000	20.087	0.000	1.03

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	144.81-92.33	A	2.269	0.000	0.000	0.000	0.000	0.51
		B		0.000	0.000	28.847	0.000	0.44
		C		0.000	0.000	87.645	0.000	2.67
L2	92.33-44.52	A	2.149	0.000	0.000	0.000	0.000	0.88
		B		0.000	0.000	151.879	0.000	2.46
		C		0.000	0.000	79.849	0.000	2.51
L3	44.52-0.00	A	1.917	0.000	0.000	0.000	0.000	0.72
		B		0.000	0.000	123.538	0.000	1.93
		C		0.000	0.000	59.024	0.000	1.92

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	144.81-92.33	-0.1151	0.6108	-0.1289	0.7383
L2	92.33-44.52	0.9661	-0.1014	1.0051	0.0047
L3	44.52-0.00	0.9718	-0.1469	1.1465	-0.0510

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	3	HB114-21U3M12-XXXF(1-1/4)	92.33 - 144.81	1.0000	1.0000
L1	4	HB158-1-08U8-S8J18(1-5/8)	92.33 - 144.81	1.0000	1.0000
L1	18	LDF6-50A(1-1/4)	92.33 - 95.00	1.0000	1.0000
L1	35	Safety Line 3/8	92.33 - 144.81	1.0000	1.0000
L1	20	LDF6-50A(1-1/4)	92.33 - 87.00	1.0000	1.0000
L2	3	HB114-21U3M12-XXXF(1-1/4)	44.52 - 92.33	1.0000	1.0000
L2	4	HB158-1-08U8-S8J18(1-5/8)	44.52 - 92.33	1.0000	1.0000
L2	18	LDF6-50A(1-1/4)	44.52 - 92.33	1.0000	1.0000
L2	20	LDF6-50A(1-1/4)	44.52 - 87.00	1.0000	1.0000
L2	35	Safety Line 3/8	44.52 - 92.33	1.0000	1.0000

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
Platform Mount [LP 1001-1]	C	None		0.0000	147.00	No Ice 1/2" Ice 1" Ice	47.70 59.50 71.30	47.70 59.50 71.30	3.02 3.62 4.22
SC-E 6014 rev2 w/ Mount Pipe	A	From Face	4.00 -7.00 1.00	40.0000	147.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
SC-E 6014 rev2 w/ Mount Pipe	B	From Face	4.00 -7.00 1.00	20.0000	147.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
(2) LPA-80063/6CF w/ Mount Pipe	C	From Face	4.00 0.00 1.00	-10.0000	147.00	No Ice 1/2" Ice 1" Ice	9.83 10.40 10.93	10.22 11.38 12.27	0.05 0.14 0.25
SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00 -2.50 1.00	40.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00 0.00 1.00	40.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22

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
SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00 2.50 1.00	40.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00 -2.50 1.00	20.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00 0.00 1.00	20.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00 2.50 1.00	20.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00 -2.50 1.00	-10.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00 0.00 1.00	-10.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00 2.50 1.00	-10.0000	147.00	No Ice 1/2" Ice 1" Ice	8.43 8.99 9.52	7.10 8.29 9.20	0.07 0.14 0.22
SC-E 6014 rev2 w/ Mount Pipe	A	From Face	4.00 7.00 1.00	40.0000	147.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
SC-E 6014 rev2 w/ Mount Pipe	B	From Face	4.00 7.00 1.00	20.0000	147.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
(2) FD9R6004/2C-3L	A	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) FD9R6004/2C-3L	B	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) FD9R6004/2C-3L	C	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
RRH2x60-700	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2x60-700	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2x60-700	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-PCS	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	B	From Face	4.00	0.0000	147.00	No Ice	2.20	1.72	0.06

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" Ice	2.39	1.90	0.08
			1.00			1" Ice	2.59	2.09	0.10
RRH2X60-PCS	C	From Face	4.00	0.0000	147.00	No Ice	2.20	1.72	0.06
			0.00			1/2" Ice	2.39	1.90	0.08
			1.00			1" Ice	2.59	2.09	0.10
B66A RRH4X45	A	From Face	4.00	0.0000	147.00	No Ice	2.58	1.63	0.06
			0.00			1/2" Ice	2.79	1.81	0.08
			1.00			1" Ice	3.01	2.00	0.10
B66A RRH4X45	B	From Face	4.00	0.0000	147.00	No Ice	2.58	1.63	0.06
			0.00			1/2" Ice	2.79	1.81	0.08
			1.00			1" Ice	3.01	2.00	0.10
B66A RRH4X45	C	From Face	4.00	0.0000	147.00	No Ice	2.58	1.63	0.06
			0.00			1/2" Ice	2.79	1.81	0.08
			1.00			1" Ice	3.01	2.00	0.10
DB-T1-6Z-8AB-0Z	A	From Face	4.00	0.0000	147.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			1.00			1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	A	From Face	4.00	0.0000	147.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			1.00			1" Ice	5.35	2.39	0.12
***									
Platform Mount [LP 1001-1]	C	None		0.0000	137.00	No Ice	47.70	47.70	3.02
						1/2" Ice	59.50	59.50	3.62
						1" Ice	71.30	71.30	4.22
7770.00 w/ Mount Pipe	A	From Face	4.00	22.0000	137.00	No Ice	5.75	4.25	0.06
			-7.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	A	From Face	4.00	22.0000	137.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	B	From Face	4.00	19.0000	137.00	No Ice	5.75	4.25	0.06
			-7.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	C	From Face	4.00	16.0000	137.00	No Ice	5.75	4.25	0.06
			-7.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Face	4.00	22.0000	137.00	No Ice	9.90	8.11	0.08
			7.00			1/2" Ice	10.47	9.30	0.16
			1.00			1" Ice	11.01	10.21	0.25
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Face	4.00	19.0000	137.00	No Ice	13.21	9.58	0.10
			7.00			1/2" Ice	13.90	11.05	0.20
			1.00			1" Ice	14.59	12.50	0.30
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Face	4.00	16.0000	137.00	No Ice	13.21	9.58	0.10
			7.00			1/2" Ice	13.90	11.05	0.20
			1.00			1" Ice	14.59	12.50	0.30
P65-17-XLH-RR w/ Mount Pipe	B	From Face	4.00	19.0000	137.00	No Ice	11.70	8.94	0.09
			0.00			1/2" Ice	12.42	10.45	0.18
			1.00			1" Ice	13.15	11.99	0.27
P65-17-XLH-RR w/ Mount	C	From Face	4.00	16.0000	137.00	No Ice	11.70	8.94	0.09

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
Pipe			0.00			1/2"	12.42	10.45	0.18
			1.00			Ice	13.15	11.99	0.27
						1" Ice			
(2) 7020.00	A	From Face	4.00	0.0000	137.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			1.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	A	From Face	4.00	0.0000	137.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			1.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	B	From Face	4.00	0.0000	137.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			1.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	B	From Face	4.00	0.0000	137.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			1.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	C	From Face	4.00	0.0000	137.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			1.00			Ice	0.20	0.31	0.01
						1" Ice			
(2) 7020.00	C	From Face	4.00	0.0000	137.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			1.00			Ice	0.20	0.31	0.01
						1" Ice			
TT19-08BP111-001	A	From Face	4.00	0.0000	137.00	No Ice	0.55	0.45	0.02
			0.00			1/2"	0.65	0.53	0.02
			1.00			Ice	0.75	0.63	0.03
						1" Ice			
TT19-08BP111-001	B	From Face	4.00	0.0000	137.00	No Ice	0.55	0.45	0.02
			0.00			1/2"	0.65	0.53	0.02
			1.00			Ice	0.75	0.63	0.03
						1" Ice			
TT19-08BP111-001	C	From Face	4.00	0.0000	137.00	No Ice	0.55	0.45	0.02
			0.00			1/2"	0.65	0.53	0.02
			1.00			Ice	0.75	0.63	0.03
						1" Ice			
RRUS-11	A	From Face	4.00	0.0000	137.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
						1" Ice			
RRUS-11	B	From Face	4.00	0.0000	137.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
						1" Ice			
RRUS-11	C	From Face	4.00	0.0000	137.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			1.00			Ice	3.21	1.49	0.09
						1" Ice			
DTMABP7819VG12A	A	From Face	4.00	0.0000	137.00	No Ice	1.14	0.39	0.02
			0.00			1/2"	1.28	0.49	0.03
			1.00			Ice	1.44	0.59	0.04
						1" Ice			
DTMABP7819VG12A	B	From Face	4.00	0.0000	137.00	No Ice	1.14	0.39	0.02
			0.00			1/2"	1.28	0.49	0.03
			1.00			Ice	1.44	0.59	0.04
						1" Ice			
DTMABP7819VG12A	C	From Face	4.00	0.0000	137.00	No Ice	1.14	0.39	0.02
			0.00			1/2"	1.28	0.49	0.03
			1.00			Ice	1.44	0.59	0.04
						1" Ice			
RRUS 32 B2	A	From Face	4.00	0.0000	137.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07

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
			1.00			Ice	3.18	2.05	0.10
						1" Ice			
RRUS 32 B2	B	From Face	4.00	0.0000	137.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			1.00			Ice	3.18	2.05	0.10
						1" Ice			
RRUS 32 B2	C	From Face	4.00	0.0000	137.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			1.00			Ice	3.18	2.05	0.10
						1" Ice			
DC6-48-60-18-8F	A	From Face	1.00	0.0000	137.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			1.00			Ice	1.64	1.64	0.06
						1" Ice			
***									
***									
Platform Mount [LP 601-1]	C	None		0.0000	126.00	No Ice	28.47	28.47	1.12
						1/2"	33.59	33.59	1.51
						Ice	38.71	38.71	1.91
						1" Ice			
(4) DB844G65ZAXY w/ Mount Pipe	A	From Face	3.00	0.0000	126.00	No Ice	4.58	4.80	0.03
			0.00			1/2"	4.96	5.42	0.08
			2.00			Ice	5.34	6.04	0.13
						1" Ice			
(4) DB844G65ZAXY w/ Mount Pipe	B	From Face	3.00	0.0000	126.00	No Ice	4.58	4.80	0.03
			0.00			1/2"	4.96	5.42	0.08
			2.00			Ice	5.34	6.04	0.13
						1" Ice			
(4) DB844G65ZAXY w/ Mount Pipe	C	From Face	3.00	0.0000	126.00	No Ice	4.58	4.80	0.03
			0.00			1/2"	4.96	5.42	0.08
			2.00			Ice	5.34	6.04	0.13
						1" Ice			
GPS_A	A	From Face	3.00	0.0000	126.00	No Ice	0.26	0.26	0.00
			0.00			1/2"	0.32	0.32	0.00
			4.00			Ice	0.39	0.39	0.01
						1" Ice			
GPS_A	B	From Face	3.00	-90.0000	126.00	No Ice	0.26	0.26	0.00
			0.00			1/2"	0.32	0.32	0.00
			4.00			Ice	0.39	0.39	0.01
						1" Ice			
Transition Ladder	C	From Leg	2.00	0.0000	126.00	No Ice	6.00	6.00	0.16
			0.00			1/2"	8.00	8.00	0.24
			-4.00			Ice	10.00	10.00	0.32
						1" Ice			
***									
Platform Mount [LP 601-1]	C	None		0.0000	116.00	No Ice	28.47	28.47	1.12
						1/2"	33.59	33.59	1.51
						Ice	38.71	38.71	1.91
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	3.00	-10.0000	116.00	No Ice	6.33	5.64	0.11
			-6.00			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	3.00	-20.0000	116.00	No Ice	6.33	5.64	0.11
			-6.00			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	3.00	0.0000	116.00	No Ice	6.33	5.64	0.11
			-6.00			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	3.00	-10.0000	116.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			0.00			Ice	13.14	12.91	0.27
						1" Ice			

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
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	-20.0000	116.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	3.00 6.00 0.00	-10.0000	116.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.41 7.12	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	3.00 6.00 0.00	-20.0000	116.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.41 7.12	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	3.00 6.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.41 7.12	0.11 0.17 0.23
KRY 112 144/1	A	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
RRUS 11 B12	A	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	3.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
Transition Ladder	C	From Leg	2.00 0.00 -4.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	6.00 8.00 10.00	6.00 8.00 10.00	0.16 0.24 0.32
***									
Side Arm Mount [SO 701-1]	A	From Leg	0.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
Side Arm Mount [SO 701-1]	C	From Leg	0.00 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
RR65-18-02DP w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	60.0000	95.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.03 0.07 0.12
Ice Shield 1.5' x 2.0'	C	From Leg	3.00 0.00 4.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.30 0.41 0.54	0.40 0.55 0.70	0.03 0.04 0.06

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
***									
7250.02 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	-30.0000	87.00	No Ice 1/2" Ice 1" Ice	4.24 4.71 5.17	3.32 4.30 5.05	0.04 0.07 0.12
7250.02 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	-30.0000	87.00	No Ice 1/2" Ice 1" Ice	4.24 4.71 5.17	3.32 4.30 5.05	0.04 0.07 0.12
7250.02 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	-30.0000	87.00	No Ice 1/2" Ice 1" Ice	4.24 4.71 5.17	3.32 4.30 5.05	0.04 0.07 0.12
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
DA1900-39	C	Paraboloid w/o Radome	From Leg	3.00 0.00 1.00	-30.0000		95.00	3.54	No Ice 1/2" Ice 1" Ice	9.85 10.32 10.79	0.05 0.10 0.15

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

Comb. No.	Description
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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	144.813 - 92.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.70	4.99	-6.79
			Max. Mx	20	-21.50	947.64	4.84
			Max. My	14	-21.50	-4.50	-946.61
			Max. Vy	8	26.66	-944.92	-6.54
			Max. Vx	2	-26.61	7.11	944.42
			Max. Torque	11			-4.51
L2	92.3333 - 44.5225	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.53	4.60	-7.16
			Max. Mx	8	-36.56	-2346.33	11.94
			Max. My	2	-36.56	-2.53	2347.34
			Max. Vy	8	33.20	-2346.33	11.94
			Max. Vx	2	-33.23	-2.53	2347.34
			Max. Torque	25			5.38
L3	44.5225 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-115.40	1.27	-7.30
			Max. Mx	8	-58.59	-4193.66	33.18
			Max. My	2	-58.59	-14.22	4195.84
			Max. Vy	8	39.05	-4193.66	33.18
			Max. Vx	2	-39.09	-14.22	4195.84
			Max. Torque	25			5.37

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	31	115.40	-9.29	-5.34
	Max. H_x	20	58.62	38.86	0.03
	Max. H_z	2	58.62	-0.22	39.05
	Max. M_x	2	4195.84	-0.22	39.05

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_z	8	4193.66	-39.02	0.41
	Max. Torsion	25	5.37	19.15	34.02
	Min. Vert	23	43.96	33.61	19.41
	Min. H_x	8	58.62	-39.02	0.41
	Min. H_z	14	58.62	-0.07	-38.87
	Min. M_x	14	-4180.93	-0.07	-38.87
	Min. M_z	20	-4180.44	38.86	0.03
	Min. Torsion	13	-4.93	-19.45	-33.66

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	48.85	0.00	0.00	1.13	0.93	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	58.62	0.22	-39.05	-4195.84	-14.22	-3.64
0.9 Dead+1.6 Wind 0 deg - No Ice	43.96	0.22	-39.05	-4159.16	-14.50	-3.65
1.2 Dead+1.6 Wind 30 deg - No Ice	58.62	19.53	-33.85	-3633.15	-2092.85	-1.78
0.9 Dead+1.6 Wind 30 deg - No Ice	43.96	19.53	-33.85	-3601.47	-2074.72	-1.78
1.2 Dead+1.6 Wind 60 deg - No Ice	58.62	33.69	-19.72	-2110.57	-3618.48	0.22
0.9 Dead+1.6 Wind 60 deg - No Ice	43.96	33.69	-19.72	-2092.38	-3586.84	0.22
1.2 Dead+1.6 Wind 90 deg - No Ice	58.62	39.02	-0.41	-33.18	-4193.66	2.12
0.9 Dead+1.6 Wind 90 deg - No Ice	43.96	39.02	-0.41	-33.37	-4156.95	2.13
1.2 Dead+1.6 Wind 120 deg - No Ice	58.62	33.60	19.42	2094.85	-3616.28	4.70
0.9 Dead+1.6 Wind 120 deg - No Ice	43.96	33.60	19.42	2075.94	-3584.59	4.71
1.2 Dead+1.6 Wind 150 deg - No Ice	58.62	19.45	33.66	3623.85	-2096.17	4.92
0.9 Dead+1.6 Wind 150 deg - No Ice	43.96	19.45	33.66	3591.44	-2077.90	4.93
1.2 Dead+1.6 Wind 180 deg - No Ice	58.62	0.07	38.87	4180.93	-12.29	3.73
0.9 Dead+1.6 Wind 180 deg - No Ice	43.96	0.07	38.87	4143.63	-12.45	3.73
1.2 Dead+1.6 Wind 210 deg - No Ice	58.62	-19.43	33.68	3619.62	2085.79	1.32
0.9 Dead+1.6 Wind 210 deg - No Ice	43.96	-19.43	33.68	3587.30	2067.08	1.32
1.2 Dead+1.6 Wind 240 deg - No Ice	58.62	-33.68	19.37	2079.52	3619.95	-1.67
0.9 Dead+1.6 Wind 240 deg - No Ice	43.96	-33.68	19.37	2060.81	3587.67	-1.67
1.2 Dead+1.6 Wind 270 deg - No Ice	58.62	-38.86	-0.03	-7.53	4180.44	-3.69
0.9 Dead+1.6 Wind 270 deg - No Ice	43.96	-38.86	-0.03	-7.77	4143.19	-3.69
1.2 Dead+1.6 Wind 300 deg - No Ice	58.62	-33.61	-19.41	-2091.26	3619.11	-4.65
0.9 Dead+1.6 Wind 300 deg - No Ice	43.96	-33.61	-19.41	-2073.09	3586.78	-4.66
1.2 Dead+1.6 Wind 330 deg - No Ice	58.62	-19.15	-34.02	-3656.32	2068.65	-5.36
0.9 Dead+1.6 Wind 330 deg - No Ice	43.96	-19.15	-34.02	-3624.41	2049.96	-5.37
1.2 Dead+1.0 Ice	115.40	-0.00	0.00	7.30	1.27	-0.00
1.2 Dead+1.0 Wind 0	115.40	0.05	-9.85	-1155.00	-3.58	-0.76

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
deg+1.0 Ice						
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	115.40	4.96	-8.54	-1000.02	-584.66	-0.27
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	115.40	8.55	-4.97	-578.01	-1010.41	0.22
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	115.40	10.26	-0.09	-1.44	-1216.04	0.64
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	115.40	9.29	5.34	629.22	-1082.75	1.15
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	115.40	4.93	8.50	1010.81	-582.41	1.13
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	115.40	0.01	9.82	1166.30	0.22	0.79
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	115.40	-4.94	8.51	1011.61	585.37	0.18
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	115.40	-8.55	4.90	585.93	1012.91	-0.52
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	115.40	-10.23	0.00	7.34	1215.45	-0.97
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	115.40	-9.29	-5.34	-614.03	1085.54	-1.15
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	115.40	-4.87	-8.57	-1003.19	578.84	-1.21
Dead+Wind 0 deg - Service	48.85	0.05	-8.36	-892.37	-2.29	-0.78
Dead+Wind 30 deg - Service	48.85	4.18	-7.24	-772.58	-444.81	-0.38
Dead+Wind 60 deg - Service	48.85	7.21	-4.22	-448.44	-769.59	0.04
Dead+Wind 90 deg - Service	48.85	8.35	-0.09	-6.19	-892.05	0.45
Dead+Wind 120 deg - Service	48.85	7.19	4.16	446.85	-769.12	1.01
Dead+Wind 150 deg - Service	48.85	4.16	7.20	772.36	-445.50	1.06
Dead+Wind 180 deg - Service	48.85	0.02	8.32	890.96	-1.87	0.81
Dead+Wind 210 deg - Service	48.85	-4.16	7.21	771.46	444.78	0.29
Dead+Wind 240 deg - Service	48.85	-7.21	4.14	443.59	771.38	-0.36
Dead+Wind 270 deg - Service	48.85	-8.31	-0.01	-0.71	890.71	-0.80
Dead+Wind 300 deg - Service	48.85	-7.19	-4.15	-444.31	771.21	-1.01
Dead+Wind 330 deg - Service	48.85	-4.10	-7.28	-777.51	441.13	-1.15

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-48.85	0.00	0.00	48.85	0.00	0.000%
2	0.22	-58.62	-39.05	-0.22	58.62	39.05	0.000%
3	0.22	-43.96	-39.05	-0.22	43.96	39.05	0.000%
4	19.53	-58.62	-33.85	-19.53	58.62	33.85	0.000%
5	19.53	-43.96	-33.85	-19.53	43.96	33.85	0.000%
6	33.69	-58.62	-19.72	-33.69	58.62	19.72	0.000%
7	33.69	-43.96	-19.72	-33.69	43.96	19.72	0.000%
8	39.02	-58.62	-0.41	-39.02	58.62	0.41	0.000%
9	39.02	-43.96	-0.41	-39.02	43.96	0.41	0.000%
10	33.60	-58.62	19.42	-33.60	58.62	-19.42	0.000%
11	33.60	-43.96	19.42	-33.60	43.96	-19.42	0.000%
12	19.45	-58.62	33.66	-19.45	58.62	-33.66	0.000%
13	19.45	-43.96	33.66	-19.45	43.96	-33.66	0.000%
14	0.07	-58.62	38.87	-0.07	58.62	-38.87	0.000%
15	0.07	-43.96	38.87	-0.07	43.96	-38.87	0.000%
16	-19.43	-58.62	33.68	19.43	58.62	-33.68	0.000%
17	-19.43	-43.96	33.68	19.43	43.96	-33.68	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
18	-33.68	-58.62	19.37	33.68	58.62	-19.37	0.000%
19	-33.68	-43.96	19.37	33.68	43.96	-19.37	0.000%
20	-38.86	-58.62	-0.03	38.86	58.62	0.03	0.000%
21	-38.86	-43.96	-0.03	38.86	43.96	0.03	0.000%
22	-33.61	-58.62	-19.41	33.61	58.62	19.41	0.000%
23	-33.61	-43.96	-19.41	33.61	43.96	19.41	0.000%
24	-19.15	-58.62	-34.02	19.15	58.62	34.02	0.000%
25	-19.15	-43.96	-34.02	19.15	43.96	34.02	0.000%
26	0.00	-115.40	0.00	0.00	115.40	-0.00	0.000%
27	0.05	-115.40	-9.85	-0.05	115.40	9.85	0.000%
28	4.96	-115.40	-8.54	-4.96	115.40	8.54	0.000%
29	8.55	-115.40	-4.97	-8.55	115.40	4.97	0.000%
30	10.26	-115.40	-0.09	-10.26	115.40	0.09	0.000%
31	9.29	-115.40	5.34	-9.29	115.40	-5.34	0.000%
32	4.93	-115.40	8.50	-4.93	115.40	-8.50	0.000%
33	0.01	-115.40	9.82	-0.01	115.40	-9.82	0.000%
34	-4.94	-115.40	8.51	4.94	115.40	-8.51	0.000%
35	-8.55	-115.40	4.90	8.55	115.40	-4.90	0.000%
36	-10.23	-115.40	0.00	10.23	115.40	-0.00	0.000%
37	-9.29	-115.40	-5.34	9.29	115.40	5.34	0.000%
38	-4.87	-115.40	-8.57	4.87	115.40	8.57	0.000%
39	0.05	-48.85	-8.36	-0.05	48.85	8.36	0.000%
40	4.18	-48.85	-7.24	-4.18	48.85	7.24	0.000%
41	7.21	-48.85	-4.22	-7.21	48.85	4.22	0.000%
42	8.35	-48.85	-0.09	-8.35	48.85	0.09	0.000%
43	7.19	-48.85	4.16	-7.19	48.85	-4.16	0.000%
44	4.16	-48.85	7.20	-4.16	48.85	-7.20	0.000%
45	0.02	-48.85	8.32	-0.02	48.85	-8.32	0.000%
46	-4.16	-48.85	7.21	4.16	48.85	-7.21	0.000%
47	-7.21	-48.85	4.14	7.21	48.85	-4.14	0.000%
48	-8.31	-48.85	-0.01	8.31	48.85	0.01	0.000%
49	-7.19	-48.85	-4.15	7.19	48.85	4.15	0.000%
50	-4.10	-48.85	-7.28	4.10	48.85	7.28	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00054084
3	Yes	4	0.00000001	0.00034110
4	Yes	5	0.00000001	0.00023988
5	Yes	5	0.00000001	0.00010754
6	Yes	5	0.00000001	0.00024193
7	Yes	5	0.00000001	0.00010852
8	Yes	4	0.00000001	0.00043775
9	Yes	4	0.00000001	0.00027345
10	Yes	5	0.00000001	0.00026729
11	Yes	5	0.00000001	0.00012076
12	Yes	5	0.00000001	0.00023137
13	Yes	5	0.00000001	0.00010319
14	Yes	4	0.00000001	0.00052101
15	Yes	4	0.00000001	0.00032899
16	Yes	5	0.00000001	0.00024765
17	Yes	5	0.00000001	0.00011127
18	Yes	5	0.00000001	0.00025181
19	Yes	5	0.00000001	0.00011334
20	Yes	4	0.00000001	0.00063047
21	Yes	4	0.00000001	0.00040066
22	Yes	5	0.00000001	0.00023087
23	Yes	5	0.00000001	0.00010299
24	Yes	5	0.00000001	0.00026844
25	Yes	5	0.00000001	0.00012119
26	Yes	4	0.00000001	0.00001291
27	Yes	4	0.00017105	0.00034290

28	Yes	4	0.00017046	0.00063747
29	Yes	4	0.00017054	0.00062568
30	Yes	4	0.00017089	0.00038465
31	Yes	4	0.00017013	0.00087328
32	Yes	4	0.00017121	0.00062441
33	Yes	4	0.00017186	0.00036073
34	Yes	4	0.00017148	0.00070073
35	Yes	4	0.00017152	0.00074713
36	Yes	4	0.00017160	0.00041590
37	Yes	4	0.00017038	0.00070124
38	Yes	4	0.00017085	0.00074964
39	Yes	4	0.00000001	0.00003268
40	Yes	4	0.00000001	0.00007025
41	Yes	4	0.00000001	0.00007159
42	Yes	4	0.00000001	0.00002944
43	Yes	4	0.00000001	0.00010099
44	Yes	4	0.00000001	0.00006833
45	Yes	4	0.00000001	0.00003329
46	Yes	4	0.00000001	0.00007911
47	Yes	4	0.00000001	0.00008445
48	Yes	4	0.00000001	0.00003824
49	Yes	4	0.00000001	0.00006843
50	Yes	4	0.00000001	0.00010309

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.813 - 92.3333	15.960	50	1.0495	0.0071
L2	97.2933 - 44.5225	6.867	50	0.7059	0.0022
L3	51.1025 - 0	1.804	50	0.3300	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.00	Platform Mount [LP 1001-1]	50	15.960	1.0495	0.0072	52090
137.00	Platform Mount [LP 1001-1]	50	14.334	0.9955	0.0062	33338
126.00	Platform Mount [LP 601-1]	50	12.087	0.9187	0.0048	13844
116.00	Platform Mount [LP 601-1]	50	10.132	0.8474	0.0037	9039
96.00	DA1900-39	50	6.666	0.6956	0.0023	5558
95.00	Side Arm Mount [SO 701-1]	50	6.513	0.6876	0.0022	5552
87.00	7250.02 w/ Mount Pipe	50	5.367	0.6224	0.0018	5726

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.813 - 92.3333	75.033	24	4.9368	0.0331
L2	97.2933 - 44.5225	32.294	24	3.3224	0.0102
L3	51.1025 - 0	8.483	24	1.5524	0.0031

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.00	Platform Mount [LP 1001-1]	24	75.033	4.9368	0.0335	11241
137.00	Platform Mount [LP 1001-1]	24	67.390	4.6841	0.0289	7194
126.00	Platform Mount [LP 601-1]	24	56.827	4.3243	0.0226	2986
116.00	Platform Mount [LP 601-1]	24	47.642	3.9885	0.0174	1947
96.00	DA1900-39	24	31.349	3.2739	0.0104	1194
95.00	Side Arm Mount [SO 701-1]	24	30.630	3.2363	0.0101	1193
87.00	7250.02 w/ Mount Pipe	24	25.239	2.9289	0.0082	1228

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	144.813 - 92.3333 (1)	TP35.6875x20.5x0.3438	52.48	0.00	0.0	37.532 3	-21.49	2652.09	0.008
L2	92.3333 - 44.5225 (2)	TP48.6563x33.5646x0.4375	52.77	0.00	0.0	65.277 2	-36.56	4487.73	0.008
L3	44.5225 - 0 (3)	TP60.5x45.8995x0.4688	51.10	0.00	0.0	90.609 7	-58.59	5701.25	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	144.813 - 92.3333 (1)	TP35.6875x20.5x0.3438	951.71	1828.05	0.521	0.00	1828.05	0.000
L2	92.3333 - 44.5225 (2)	TP48.6563x33.5646x0.4375	2353.19	4230.07	0.556	0.00	4230.07	0.000
L3	44.5225 - 0 (3)	TP60.5x45.8995x0.4688	4200.94	6973.40	0.602	0.00	6973.40	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	144.813 - 92.3333 (1)	TP35.6875x20.5x0.3438	26.73	1326.04	0.020	4.47	3706.72	0.001
L2	92.3333 - 44.5225 (2)	TP48.6563x33.5646x0.4375	33.22	2243.87	0.015	5.37	8577.25	0.001
L3	44.5225 - 0 (3)	TP60.5x45.8995x0.4688	39.08	2850.62	0.014	5.36	14139.83	0.000

Pole Interaction Design Data

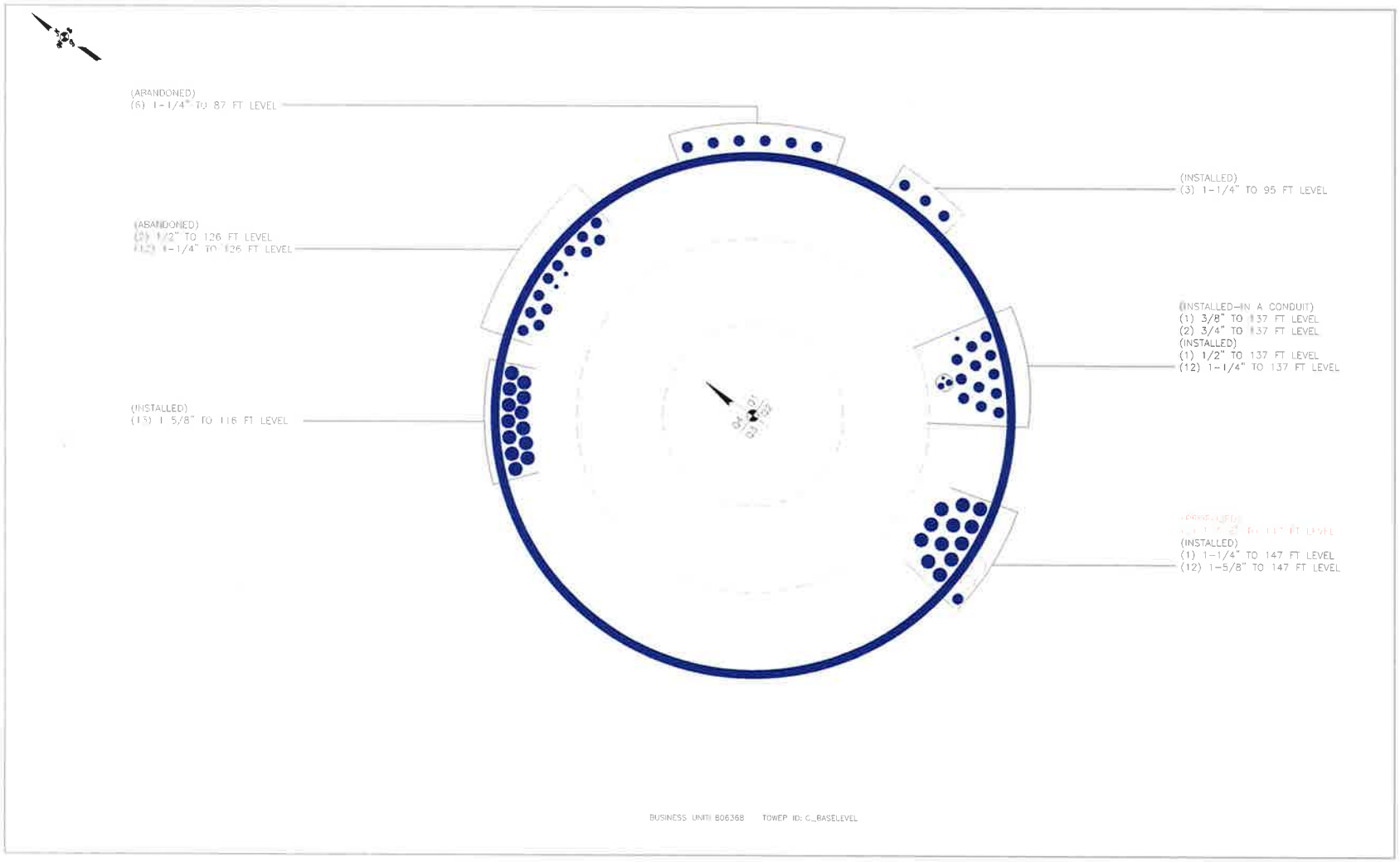
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	144.813 - 92.3333 (1)	0.008	0.521	0.000	0.020	0.001	0.529	1.000	4.8.2
L2	92.3333 - 44.5225 (2)	0.008	0.556	0.000	0.015	0.001	0.565	1.000	4.8.2
L3	44.5225 - 0 (3)	0.010	0.602	0.000	0.014	0.000	0.613	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	144.813 - 92.3333	Pole	TP35.6875x20.5x0.3438	1	-21.49	2652.09	52.9	Pass
L2	92.3333 - 44.5225	Pole	TP48.6563x33.5646x0.4375	2	-36.56	4487.73	56.5	Pass
L3	44.5225 - 0	Pole	TP60.5x45.8995x0.4688	3	-58.59	5701.25	61.3	Pass
							Summary	
						Pole (L3)	61.3	Pass
						RATING =	**61.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(ABANDONED)
(6) 1-1/4" TO 87 FT LEVEL
(INSTALLED)
(3) 1-1/4" TO 95 FT LEVEL
(ABANDONED)
(1) 1/2" TO 126 FT LEVEL
(12) 1-1/4" TO 126 FT LEVEL
(INSTALLED-IN A CONDUIT)
(1) 3/8" TO 137 FT LEVEL
(2) 3/4" TO 137 FT LEVEL
(INSTALLED)
(1) 1/2" TO 137 FT LEVEL
(12) 1-1/4" TO 137 FT LEVEL
(INSTALLED)
(15) 1 5/8" TO 116 FT LEVEL
(INSTALLED)
(1) 1-1/4" TO 147 FT LEVEL
(12) 1-5/8" TO 147 FT LEVEL
BUSINESS UNIT: 806368 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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#: *806368*
Site Name: *HRT 049B 943215*
App #: *394834 Rev 3*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	70	in

Plate Data		
Diam:	76.5	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	9.73	in

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

Pole Data		
Diam:	60.5	in
Thick:	0.46875	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	4201	ft-kips
Axial, Pu:	59	kips
Shear, Vu:	39	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):	150.9 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	58.0% Pass	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	34.7 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	64.3% Pass	Y.L. Length:
		35.21

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

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Phone: (913) 458-2000

Client:	Crown Castle International	*Design:*	Sanyukta
Project:	194393	*Date:*	6/23/2017
Site:	806368.1419539	*Verify:*	BSP
Title:	Tower Foundation Capacity Comparison	*Date:*	6/23/2017
		Code:	TIA-222-G

Foundation Reaction Comparison to Original Tower Reactions per TIA-222-G 15.5.1

Original Tower Design Reactions:

			Factored reactions per TIA-222-G 15.5.1	
Tower Base:				
Shear:	44.6	kips	60.2	kips
Moment:	5004.4	kips-ft	6755.9	kips-ft

TnxTower Reactions:

Tower Base:		
Shear:	39.0	Kip
Moment:	4201.0	Kip

Stress Ratio:

Tower Base:	
Shear:	64.8%
Moment:	62.2%

Conclusion: Calculated reactions are less than those for which the foundation was originally designed. Therefore, the existing foundation is considered to have been designed and constructed with adequate capacity to support the existing and proposed loads.

Controlling Foundation Stress Ratio: 62.2%

NOTE: Although the shear capacity is at 64.8%, the moment reaction is the governing criteria for a monopole drilled shaft foundation. Therefore, the overall capacity for this foundation is 62.2%.

ATTACHMENT 4

Town of Glastonbury GIS

703 0 352 703 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

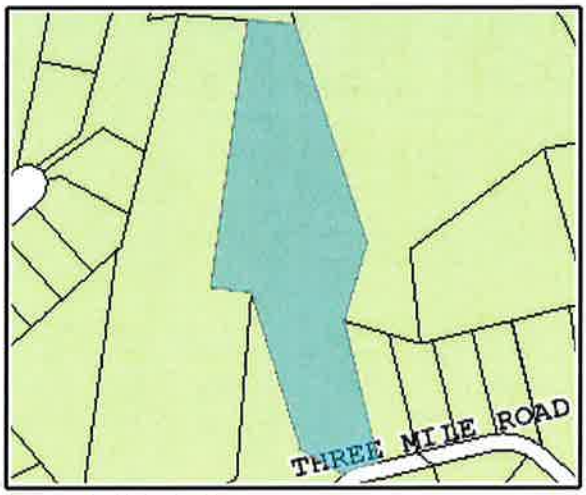
Town of Glastonbury GIS Parcel Report

Report Generated 8/22/2017 8:06:08 AM

Owner of Record

GIS ID: 70600374
Owner: FLANAGAN JOSEPHINE I + JOHN R
Co-Owner:
Address: 366 THREE MILE RD
City, State ZIP: GLASTONBURY, CT 06033

Account Number: 70600374
Property Address: 374 THREE MILE RD



Property highlighted in blue

Parcel Information

Map/Street/Lot I8 / 7060 / S0035 **Property ID:** 13664
Developer Lot ID: 72 **Water:** Well
Parcel Acreage: 9.08 **Sewer:** Septic
Zoning Code: RR **Census:** 5204

Valuation Summary

Item	Appraised Value	Assessed Value
Buildings	0	0
Land	804200	515600
Appurtenances	173300	121300
Total	**977500**	**636900**

Building Picture Not Applicable

Owner of Record	Deed / Page	Sale Date	Sale Price
FLANAGAN JOSEPHINE I + JOHN R	2725/0212	12/31/2009	0
FLANAGAN JOSEPHINE I TRUSTEE	2725/0205	12/31/2009	0
FLANAGAN JOSEPHINE I TRUSTEE	2725/ 210	12/31/2009	0
FLANAGAN JOSEPHINE I TRUSTEE	1884/0085	07/30/2003	0
FLANAGAN JOSEPHINE I TR+JOSEPHINE I	1828/0149	06/02/2003	0
FLANAGAN JOSEPHINE I TR+JAMES F	1828/0145	06/02/2003	0
FLANAGAN JOSEPHINE+JAMES F	0251/1107	12/31/1980	0

Building Information

Building ID 0

Year Constructed :
Building Type :
Style :
Occupany :
Stories :
Building Zone :
Roof Type :
Roof Material :
Est. Gross S.F. :
Est. Living S.F. :

Number of Rooms :
Number of Bedrooms :
Number of Bathrooms :
Number of Half-Baths :
Exterior Wall :
Interior Wall :
Interior Floor :
Interior Floor #2 :
Air Conditioning Type :
Heat Type :
Fuel Type :

Building Sketch Not Applicable

Subarea Type	Est. Gross S.F.	Est. Living S.F.

Outbuilding Type	Est. Gross S.F.	Comments
Cell Shed	924.00	

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	3	3	neopost* 06/23/2017 US POSTAGE $002.38⁰ ZIP 06103 041L12203380
	Postmaster, per *(name of receiving employee)*		

ANN STREET STATION 06103
AUG 23 2017
U.S.P.S.

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Richard J. Johnson, Town Manger Town of Glastonbury 2155 Main Street Glastonbury, CT 06033				
2.	Khara Dodds, Director Glastonbury Land Use and Planning Services 2155 Main Street Glastonbury, CT 06033				
3.	Josephine I. and John R. Flanagan 366 Three Mile Road Glastonbury, CT 06033				
4.					
5.					
6.					