Robinson+Cole

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Also admitted in Massachusetts

November 10, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
150 Mattatuck Heights, Waterbury, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 110-foot level of the existing 133-foot tower at 150 Mattatuck Heights in Waterbury, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 1999. Cellco now intends to modify its facility by replacing six (6) of its antennas with three (3) model SBNHH-1D65B, 1900 MHz antennas and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads ("RRHs") and install three (3) new RRHs. Included in Attachment 1 are specifications for Cellco's replacement antennas and RRHs.

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 Neil M. O'Leary, Mayor for the City of Waterbury. A copy of this letter is also being sent to Waterbury Twin LLC & 150 MH LLC, the owner of the Property and Crown, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. Cellco's new antennas and RRHs will be installed at a centerline height of 110 feet on the 133-foot tower.

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

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

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

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

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

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

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Neil M. O'Leary, Mayor
Waterbury Twin LLC & 150 MH LLC
Crown
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65B

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

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

Electrical Specifications

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

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

Array Layout

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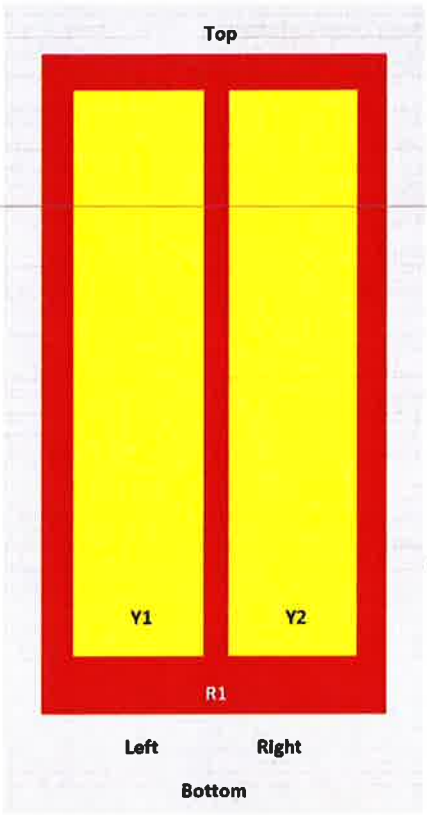
Product Specifications

SBNHH-1D65B

SBNHH 6S



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

View from the front of the antenna

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

General Specifications

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

Mechanical Specifications

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

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Product Specifications

SBNHH-1D65B

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

Dimensions

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

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

Length	2025.0 mm | 79.7 in
Width	390.0 mm | 15.4 in
Depth	296.0 mm | 11.7 in
Shipping Weight	31.0 kg | 68.3 lb

Regulatory Compliance/Certifications

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

Included Products

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Product Specifications

SBNHH-1D65B

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

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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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.

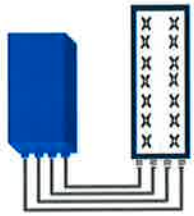
Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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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.

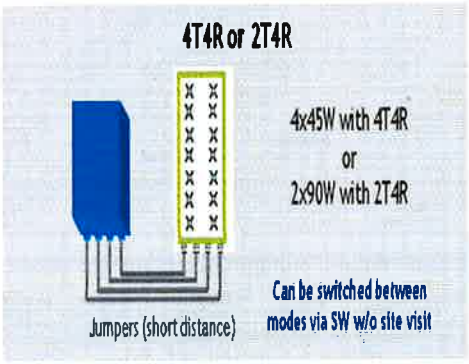
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

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

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ATTACHMENT 2

	General	Power	Density					
Site Name: Waterbury S								
Tower Height: Verizon @ 110ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*MetroPCS CDMA	3	727	90	0.0968	2135	1.0000	9.68%	
*MetroPCS LTE	1	1200	90	0.0533	2130	1.0000	5.33%	
*T-Mobile GSM	8	161	100	0.0463	1945	1.0000	4.63%	
*T-Mobile UMTS	2	707	100	0.0508	2100	1.0000	5.08%	
*Clearwire	2	153	131	0.0064	2496	1.0000	0.64%	
*Clearwire	1	211	131	0.0044	11 GHz	1.0000	0.44%	
*Sprint	11	122	130	0.0286	1962.5	1.0000	2.86%	
*Nextel	9	100	120	0.0225	851	0.5673	3.96%	
Verizon PCS	**1**	**4778**	**110**	**0.1420**	**1970**	**1.0000**	**14.20%**	
Verizon Cellular	**9**	**390**	**110**	**0.1043**	**869**	**0.5793**	**18.01%**	
Verizon AWS	**1**	**7166**	**110**	**0.2129**	**2145**	**1.0000**	**21.29%**	
Verizon 700	**1**	**2133**	**110**	**0.0634**	**746**	**0.4973**	**12.75%**	
								98.87%
* Source: Siting Council								

ATTACHMENT 3

Date: **September 29, 2016**

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

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
770-701-2500

Subject: **Structural Analysis Report**

Carrier Designation: ***Verizon Wireless* Co-Locate**
Carrier Site Name: WATERBURY SOUTH CT

Crown Castle Designation:

Crown Castle BU Number:	876317
Crown Castle Site Name:	WATERBURY
Crown Castle JDE Job Number:	397966
Crown Castle Work Order Number:	1304365
Crown Castle Application Number:	362370 Rev. 0

Engineering Firm Designation: **Jacobs Engineering Group, Inc. Project Number:** 1304365

Site Data: **150 Mattatuck Heights, WATERBURY, New Haven County, CT**
Latitude *41° 32' 16.3"*, Longitude *-72° 59' 6.1"*
133 Foot - Monopole Tower

Dear Charles McGuirt,

Jacobs Engineering Group, Inc. 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 951897, in accordance with application 362370, revision 0.

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.

The analysis has been performed in accordance with the TIA-222-G, as allowed by Sections 104.10 and 104.11 of the 2005 CT State Building Code with 2009 Amendments, based upon a wind speed of 95 mph 3-second gust, exposure category B with topographic category 1 and crest height of 0 feet.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *Jacobs Engineering Group, Inc.* 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:

Kristi Holder, E.I.
Tower Structural Engineer

Reviewed by:

Matthew E. Watkins, P.E.
Engineering Project Manager

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 133-ft Monopole tower designed by VALMONT in April of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 95 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

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
110.0	110.0	3	alcatel lucent	RRH2X60-PCS	-	-	-
		3	alcatel lucent	RRH4X45-AWS4 B66			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		6	commscope	CBC78-DF			

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
133.0	135.0	1	andrew	VHLP2-18	3 3	1-1/4 7983A	1
		2	andrew	VHLP2-23			
	133.0	6	alcatel lucent	1900MHz RRH (65MHz)			
		3	alcatel lucent	800MHZ RRH			
		4	rfs/celwave	IBC1900HB-2			
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	TD-RRH8x20-25			
		1	crown mounts	Platform Mount [LP 602-1]			
		12	rfs celwave	ACU-A20-N			
		2	rfs celwave	PD2DE-700/2700			
	130.0	4	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	113.0	1	trimble	BULLET III	-	-	1
	110.0	3	rymsa wireless	MG D3-800Tx	-	-	3
		6	rfs/celwave	FD9R6004/2C-3L			
		3	alcatel lucent	RRH2x40-AWS			
		3	antel	BXA-171063/12CF w/ Mount Pipe			
		3	antel	BXA-80063/4CF w/ Mount Pipe	13 1	1-5/8 1/2	1
		3	antel	BXA-70063/6CF-2 w/ Mount Pipe			
		1	crown mounts	Platform Mount [LP 602-1]			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
100.0	100.0	3	rfs celwave	ATMAA1412D-1A20	6 6	7/8 1-1/4	1
		1	commscope	MC-PK12S-B Mount	1	1-5/8	2
		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	RRUS 11 B12			
90.0	90.0	1	crown mounts	Pipe Mount [PM 601-3]	6	1-5/8	1
		3	rfs celwave	APXV18-206517S-C			
50.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	50.0	1	crown mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not 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)
130.0	130.0	12	Decibel	DB980H	-	-
110.0	110.0	12	Decibel	DB980H	-	-
90.0	90.0	2	Generic	Omni	-	-
50.0	50.0	1	Generic	GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Velocitel	1529737	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	1630930	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	1530953	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions	2381113	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3315244	CCISITES
4-POST-MODIFICATION INSPECTION	JTec Enterprises, Inc.	1956508	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions	2381112	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3770745	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. Jacobs Engineering Group, Inc. 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	133 - 128	Pole	TP14.48x13.48x0.1875	Note 1	Note 1	Note 1	14.6%	Pass
L2	128 - 123	Pole	TP15.479x14.48x0.1875	Note 1	Note 1	Note 1	26.5%	Pass
L3	123 - 118	Pole	TP16.479x15.479x0.1875	Note 1	Note 1	Note 1	36.1%	Pass
L4	118 - 113	Pole	TP17.478x16.479x0.1875	Note 1	Note 1	Note 1	44.6%	Pass
L5	113 - 108	Pole	TP18.478x17.478x0.1875	Note 1	Note 1	Note 1	55.7%	Pass
L6	108 - 104.75	Pole	TP19.127x18.478x0.1875	Note 1	Note 1	Note 1	64.8%	Pass
L7	104.75 - 104.5	Pole + Reinf.	TP19.177x19.127x0.425	Note 1	Note 1	Note 1	37.8%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L8	104.5 - 99.5	Pole + Reinf.	TP20.177x19.177x0.4063	Note 1	Note 1	Note 1	45.8%	Pass
L9	99.5 - 98.75	Pole + Reinf.	TP20.327x20.177x0.4063	Note 1	Note 1	Note 1	47.2%	Pass
L10	98.75 - 98.5	Pole + Reinf.	TP20.377x20.327x0.675	Note 1	Note 1	Note 1	43.8%	Pass
L11	98.5 - 95	Pole + Reinf.	TP21.81x20.377x0.6625	Note 1	Note 1	Note 1	50.0%	Pass
L12	95 - 90	Pole + Reinf.	TP21.7x20.701x0.7125	Note 1	Note 1	Note 1	54.2%	Pass
L13	90 - 89.25	Pole + Reinf.	TP21.85x21.7x0.7	Note 1	Note 1	Note 1	55.3%	Pass
L14	89.25 - 89	Pole + Reinf.	TP21.9x21.85x0.85	Note 1	Note 1	Note 1	39.9%	Pass
L15	89 - 88.25	Pole + Reinf.	TP22.05x21.9x0.8375	Note 1	Note 1	Note 1	40.7%	Pass
L16	88.25 - 88	Pole + Reinf.	TP22.1x22.05x0.6125	Note 1	Note 1	Note 1	54.2%	Pass
L17	88 - 83	Pole + Reinf.	TP23.099x22.1x0.5875	Note 1	Note 1	Note 1	60.6%	Pass
L18	83 - 78	Pole + Reinf.	TP24.097x23.099x0.575	Note 1	Note 1	Note 1	66.4%	Pass
L19	78 - 77	Pole + Reinf.	TP24.297x24.097x0.575	Note 1	Note 1	Note 1	67.5%	Pass
L20	77 - 76.75	Pole + Reinf.	TP24.347x24.297x0.7625	Note 1	Note 1	Note 1	51.8%	Pass
L21	76.75 - 71.75	Pole + Reinf.	TP25.346x24.347x0.7375	Note 1	Note 1	Note 1	56.0%	Pass
L22	71.75 - 66.75	Pole + Reinf.	TP26.345x25.346x0.7125	Note 1	Note 1	Note 1	59.8%	Pass
L23	66.75 - 61.75	Pole + Reinf.	TP27.344x26.345x0.6875	Note 1	Note 1	Note 1	63.3%	Pass
L24	61.75 - 60.5	Pole + Reinf.	TP27.593x27.344x0.6875	Note 1	Note 1	Note 1	64.1%	Pass
L25	60.5 - 60.25	Pole + Reinf.	TP27.643x27.593x0.6875	Note 1	Note 1	Note 1	64.3%	Pass
L26	60.25 - 59.5	Pole + Reinf.	TP27.793x27.643x0.6875	Note 1	Note 1	Note 1	64.8%	Pass
L27	59.5 - 59.25	Pole + Reinf.	TP27.843x27.793x0.75	Note 1	Note 1	Note 1	57.1%	Pass
L28	59.25 - 54.25	Pole + Reinf.	TP28.842x27.843x0.725	Note 1	Note 1	Note 1	59.9%	Pass
L29	54.25 - 50	Pole + Reinf.	TP30.64x28.842x0.7	Note 1	Note 1	Note 1	62.3%	Pass
L30	50 - 45	Pole + Reinf.	TP30.192x29.191x0.7625	Note 1	Note 1	Note 1	60.8%	Pass
L31	45 - 40	Pole + Reinf.	TP31.193x30.192x0.75	Note 1	Note 1	Note 1	63.0%	Pass
L32	40 - 39	Pole + Reinf.	TP31.393x31.193x0.7375	Note 1	Note 1	Note 1	63.5%	Pass
L33	39 - 38.75	Pole + Reinf.	TP31.443x31.393x0.7375	Note 1	Note 1	Note 1	63.5%	Pass
L34	38.75 - 34	Pole + Reinf.	TP32.394x31.443x0.725	Note 1	Note 1	Note 1	65.5%	Pass
L35	34 - 33.75	Pole + Reinf.	TP32.444x32.394x0.6875	Note 1	Note 1	Note 1	70.0%	Pass
L36	33.75 - 29.75	Pole + Reinf.	TP33.245x32.444x0.6875	Note 1	Note 1	Note 1	71.7%	Pass
L37	29.75 - 29.5	Pole + Reinf.	TP33.295x33.245x0.6875	Note 1	Note 1	Note 1	70.1%	Pass
L38	29.5 - 24.5	Pole + Reinf.	TP34.296x33.295x0.675	Note 1	Note 1	Note 1	72.0%	Pass
L39	24.5 - 19.5	Pole + Reinf.	TP35.297x34.296x0.6625	Note 1	Note 1	Note 1	73.8%	Pass
L40	19.5 - 14.5	Pole + Reinf.	TP36.297x35.297x0.65	Note 1	Note 1	Note 1	75.6%	Pass
L41	14.5 - 12.5	Pole + Reinf.	TP36.698x36.297x0.65	Note 1	Note 1	Note 1	76.2%	Pass
L42	12.5 - 12.25	Pole + Reinf.	TP36.748x36.698x0.5625	Note 1	Note 1	Note 1	86.1%	Pass
L43	12.25 - 10.75	Pole + Reinf.	TP37.048x36.748x0.5625	Note 1	Note 1	Note 1	86.6%	Pass
L44	10.75 - 10.5	Pole + Reinf.	TP37.098x37.048x0.6375	Note 1	Note 1	Note 1	79.8%	Pass
L45	10.5 - 5.5	Pole + Reinf.	TP38.099x37.098x0.625	Note 1	Note 1	Note 1	81.4%	Pass
L46	5.5 - 0.5	Pole + Reinf.	TP39.1x38.099x0.6125	Note 1	Note 1	Note 1	83.0%	Pass
L47	0.5 - 0	Pole + Reinf.	TP39.2x39.1x0.6125	Note 1	Note 1	Note 1	83.1%	Pass
							Summary	
						Pole	70.2%	Pass
						Reinforcement	86.6%	Pass
						Overall	86.6%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	67.2	Pass
1	Base Plate	0	45.3	Pass
1	Base Foundation Structural	0	13.7	Pass
1	Base Foundation Soil Interaction	0	44.7	Pass
Structure Rating (max from all components) =				**86.6%**

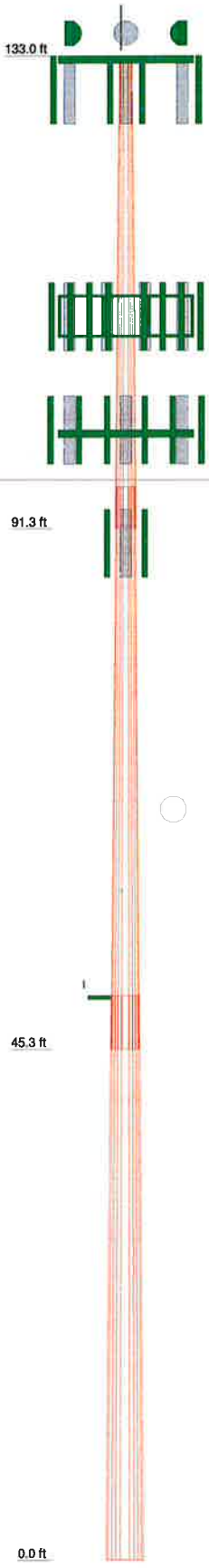
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT



Section	1	2	3
Length (ft)	41.67	49.75	50.00
Number of Sides	12	12	12
Thickness (in)	0.1875	0.2500	0.3125
Socket Length (ft)	3.67	4.75	
Top Dia (in)	13.4800	20.7014	29.1911
Bot Dia (in)	21.9100	30.6400	39.2000
Grade		A572-65	
Weight (K)	1.5	3.5	5.8

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 1"x5'	133	RRH4X45-AWS4 B66	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	133	RRH4X45-AWS4 B66	110
APXVSPP18-C-A20 w/ Mount Pipe	133	RRH2X60-PCS	110
APXVSPP18-C-A20 w/ Mount Pipe	133	RRH2X60-PCS	110
APXVTM14-C-120 w/ Mount Pipe	133	RRH2X60-PCS	110
APXVTM14-C-120 w/ Mount Pipe	133	(2) CBC78-DF	110
APXVTM14-C-120 w/ Mount Pipe	133	(2) CBC78-DF	110
(6) ACU-A20-N	133	(2) CBC78-DF	110
(3) ACU-A20-N	133	Platform Mount [LP 602-1]	110
(3) ACU-A20-N	133	BXA-70063/6CF-2 w/ Mount Pipe	110
(2) 800MHZ RRH	133	BXA-70063/6CF-2 w/ Mount Pipe	110
800MHZ RRH	133	BXA-70063/6CF-2 w/ Mount Pipe	110
(2) IBC1900HB-2	133	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
IBC1900HB-2	133		
IBC1900HB-2	133	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
(4) 1900MHz RRH (65MHz)	133	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
(2) 1900MHz RRH (65MHz)	133		
(2) 800 EXTERNAL NOTCH FILTER	133	LNX-6515DS-VTM w/ Mount Pipe	100
800 EXTERNAL NOTCH FILTER	133	LNX-6515DS-VTM w/ Mount Pipe	100
TD-RRH8x20-25	133	LNX-6515DS-VTM w/ Mount Pipe	100
TD-RRH8x20-25	133	RRUS 11 B12	100
TD-RRH8x20-25	133	RRUS 11 B12	100
PD2DE-700/2700	133	RRUS 11 B12	100
PD2DE-700/2700	133	ATMAA1412D-1A20	100
Platform Mount [LP 602-1]	133	ATMAA1412D-1A20	100
(2) 6' x 2" Mount Pipe	133	ATMAA1412D-1A20	100
(2) 6' x 2" Mount Pipe	133	MC-PK12S-B Mount	100
(2) 6' x 2" Mount Pipe	133	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
VHLP2-23	133		
VHLP2-23	133	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
VHLP2-18	133		
BXA-80063/4CF w/ Mount Pipe	110	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
BXA-80063/4CF w/ Mount Pipe	110		
BXA-80063/4CF w/ Mount Pipe	110	Pipe Mount [PM 601-3]	90
BULLET III	110	APXV18-206517S-C	90
DB-T1-6Z-8AB-0Z	110	APXV18-206517S-C	90
(2) SBNHH-1D65B w/ Mount Pipe	110	APXV18-206517S-C	90
(2) SBNHH-1D65B w/ Mount Pipe	110	Side Arm Mount [SO 701-1]	50
(2) SBNHH-1D65B w/ Mount Pipe	110	KS24019-L112A	50
RRH4X45-AWS4 B66	110		

MATERIAL STRENGTH

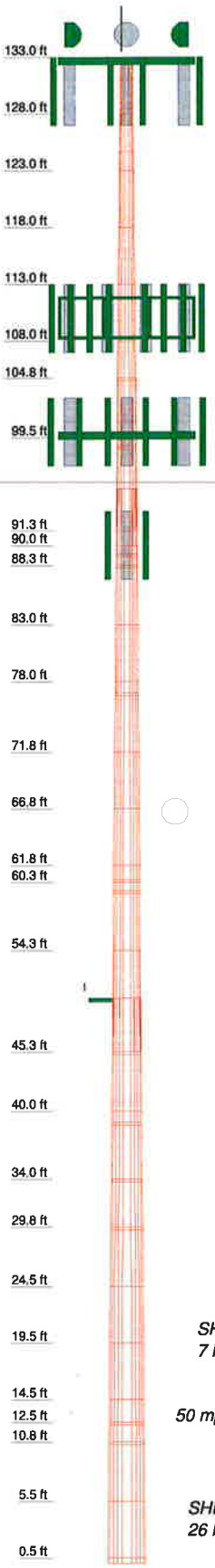
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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

Jacobs Engineering Group, Inc.
JACOBS
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: **WATERBURY**			
Project: ***BU876317_WO1304365***			
Client: Crown Castle	Drawn by: HolderKG	App'd:	
Code: TIA-222-G	Date: 09/29/16	Scale: N	
Path: \\RALFIL03\Telecom\876317 WATERBURY\WO1304365\ANALYSIS\MODEL\876317_1304365_LC7.eri		Dwg No.	



Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	0.25	5.00	0.25	5.00	5.00	5.00	0.25	5.00	0.25	5.00	5.00	5.00	0.25	5.00	0.25	5.00	5.00	5.00	0.25	5.00	0.25	5.00	5.00	5.00	0.25	5.00	0.25	4.75	0.25	5.00	0.25	5.00	5.00	5.00	0.25	2.50	0.25	5.00	5.00	0.50	5.00
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.6625	0.6625	0.6250	0.5750	0.5000	0.4375	0.3750	0.3125	0.2500	0.2500	0.2500	0.7125	0.6875	0.6250	0.5625	0.5000	0.4375	0.3750	0.7000	0.7625	0.7500	0.7375	0.7250	0.7000	0.6625	0.6250	0.5875	0.5500	0.5125	0.4750	0.4375	0.4000	0.3750	0.3500	0.3250	0.3125	0.2500
Socket Length (ft)											3.67																		4.75																				
Top Dia (in)	13.4800	14.4795	15.4790	16.4786	17.4781	18.4776	19.4772	20.4768	21.4763	22.4759	23.4754	24.4750	25.4746	26.4741	27.4737	28.4732	29.4728	30.4723	31.4719	32.4714	33.4710	34.4705	35.4701	36.4696	37.4692	38.4687	39.4683	40.4678	41.4674	42.4669	43.4665	44.4660	45.4656	46.4651	47.4647	48.4642	49.4638	50.4633	51.4629	52.4624	53.4620	54.4615	55.4611	56.4606	57.4602	58.4597	59.4593
Bot Dia (in)	14.4795	15.4790	16.4786	17.4781	18.4776	19.4772	20.4768	21.4763	22.4759	23.4754	24.4750	25.4746	26.4741	27.4737	28.4732	29.4728	30.4723	31.4719	32.4714	33.4710	34.4705	35.4701	36.4696	37.4692	38.4687	39.4683	40.4678	41.4674	42.4669	43.4665	44.4660	45.4656	46.4651	47.4647	48.4642	49.4638	50.4633	51.4629	52.4624	53.4620	54.4615	55.4611	56.4606	57.4602	58.4597	59.4593	60.4588
Grade	A572-65																																															
Weight (K)	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.4	0.0	0.1	0.9	0.7	0.0	0.6	0.0	0.7	0.1	0.9	0.0	0.9	0.0	0.9	0.9	0.9	0.0	1.0	0.0	1.0	1.9	1.1	0.0	1.1	0.0	1.2	0.0	1.2	0.0	1.2	1.2	1.2	0.0	0.5	0.0	1.2	1.2	0.1	1.2

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 1"x5'	133	RRH4X45-AWS4 B66	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	133	RRH4X45-AWS4 B66	110
APXVSPP18-C-A20 w/ Mount Pipe	133	RRH2X60-PCS	110
APXVSPP18-C-A20 w/ Mount Pipe	133	RRH2X60-PCS	110
APXVTM14-C-120 w/ Mount Pipe	133	RRH2X60-PCS	110
APXVTM14-C-120 w/ Mount Pipe	133	(2) CBC78-DF	110
APXVTM14-C-120 w/ Mount Pipe	133	(2) CBC78-DF	110
(6) ACU-A20-N	133	(2) CBC78-DF	110
(3) ACU-A20-N	133	Platform Mount [LP 602-1]	110
(3) ACU-A20-N	133	BXA-70063/6CF-2 w/ Mount Pipe	110
(2) 800MHZ RRH	133	BXA-70063/6CF-2 w/ Mount Pipe	110
800MHZ RRH	133	BXA-70063/6CF-2 w/ Mount Pipe	110
(2) IBC1900HB-2	133	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
IBC1900HB-2	133		
IBC1900HB-2	133	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
(4) 1900MHz RRH (65MHz)	133		
(2) 1900MHz RRH (65MHz)	133	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
(2) 800 EXTERNAL NOTCH FILTER	133		
800 EXTERNAL NOTCH FILTER	133	LNX-6515DS-VTM w/ Mount Pipe	100
TD-RRH8x20-25	133	LNX-6515DS-VTM w/ Mount Pipe	100
TD-RRH8x20-25	133	LNX-6515DS-VTM w/ Mount Pipe	100
TD-RRH8x20-25	133	RRUS 11 B12	100
PD2DE-700/2700	133	RRUS 11 B12	100
PD2DE-700/2700	133	RRUS 11 B12	100
Platform Mount [LP 602-1]	133	ATMAA1412D-1A20	100
(2) 6' x 2" Mount Pipe	133	ATMAA1412D-1A20	100
(2) 6' x 2" Mount Pipe	133	ATMAA1412D-1A20	100
(2) 6' x 2" Mount Pipe	133	MC-PK12S-B Mount	100
VHLP2-23	133	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
VHLP2-23	133	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
VHLP2-18	133		
BXA-80063/4CF w/ Mount Pipe	110	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
BXA-80063/4CF w/ Mount Pipe	110		
BXA-80063/4CF w/ Mount Pipe	110	Pipe Mount [PM 601-3]	90
BULLET III	110	APXV18-206517S-C	90
DB-T1-6Z-8AB-0Z	110	APXV18-206517S-C	90
(2) SBNHH-1D65B w/ Mount Pipe	110	APXV18-206517S-C	90
(2) SBNHH-1D65B w/ Mount Pipe	110	Side Arm Mount [SO 701-1]	50
(2) SBNHH-1D65B w/ Mount Pipe	110	KS24019-L112A	50
RRH4X45-AWS4 B66	110		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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

ALL REACTIONS ARE FACTORED

AXIAL 73 K

SHEAR 7 K *MOMENT 653 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 40 K

SHEAR 26 K *MOMENT 2305 kip-ft*

TORQUE 4 kip-ft
REACTIONS - 95 mph WIND

Jacobs Engineering Group, Inc.
JACOBS
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: **WATERBURY**			
Project: **BU876317_WO1304365**			
Client: Crown Castle	Drawn by: HolderKG	App'd:	
Code: TIA-222-G	Date: 09/29/16	Scale: N	
Path:		Dwg No.	

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 95 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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	133.00-91.33	41.67	3.67	12	13.4800	21.8100	0.1875	0.7500	A572-65 (65 ksi)
L2	91.33-45.25	49.75	4.75	12	20.7014	30.6400	0.2500	1.0000	A572-65 (65 ksi)

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
L3	45.25-0.00	50.00		12	29.1911	39.2000	0.3125	1.2500	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	13.9555	8.0253	180.9936	4.7587	6.9826	25.9205	366.7420	3.9498	3.1101	16.587
	22.5794	13.0546	779.0419	7.7409	11.2976	68.9565	1578.5501	6.4251	5.3426	28.494
L2	22.1906	16.4633	878.9171	7.3216	10.7233	81.9633	1780.9243	8.1028	4.8780	19.512
	31.7209	24.4640	2883.8584	10.8796	15.8715	181.7002	5843.4790	12.0404	7.5415	30.166
L3	31.2052	29.0591	3093.2821	10.3385	15.1210	204.5689	6267.8282	14.3020	6.9857	22.354
	40.5828	39.1305	7553.0423	13.9217	20.3056	371.9684	15304.5114	19.2589	9.6681	30.938

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 133.00-91.33				1	1	1			
L2 91.33-45.25				1	1	1			
L3 45.25-0.00				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
* 133' *									
7983A(ELLIPTICAL)	A	Surface Ar (CaAa)	133.00 - 0.00	2	2	0.300 0.330	0.5730		0.08
7983A(ELLIPTICAL)	A	Surface Ar (CaAa)	100.00 - 0.00	1	1	0.340 0.350	0.5730		0.08
7983A(ELLIPTICAL)	A	Surface Ar (CaAa)	133.00 - 100.00	1	1	0.360 0.370	0.5730		0.08
MLE Hybrid 9Power/18Fiber RL 2(1 5/8") ***	C	Surface Ar (CaAa)	100.00 - 0.00	1	1	0.000 0.000	1.6250		1.07
Safety Line 3/8	A	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.400 0.500	0.3750		0.22
* EXISTING MODS *									
6.875" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	12.00 - 0.00	1	1	0.000 0.000	6.8750	27.5000	0.00
6.875" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	12.00 - 0.00	1	1	0.400 0.500	6.8750	27.5000	0.00
*									
6.875" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	29.75 - 7.25	1	1	0.000 0.000	6.8750	27.5000	0.00
6.875" x 1.25" Flat Plate (G)	B	Surface Af (CaAa)	29.75 - 0.00	1	1	0.000 0.000	6.8750	27.5000	0.00
6.875" x 1.25" Flat Plate (G)	C	Surface Af	29.75 - 0.00	1	1	0.000	6.8750	27.5000	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
		(CaAa)				0.000			
*									
6.625" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	59.50 - 29.75	1	1	0.000 0.000	6.6250	26.5000	0.00
6.625" x 1.25" Flat Plate (G)	B	Surface Af (CaAa)	59.50 - 29.75	1	1	0.000 0.000	6.6250	26.5000	0.00
6.625" x 1.25" Flat Plate (G)	C	Surface Af (CaAa)	59.50 - 29.75	1	1	0.000 0.000	6.6250	26.5000	0.00
*									
5.5" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	89.25 - 59.50	1	1	0.000 0.000	5.5000	13.5000	0.00
5.5" x 1.25" Flat Plate (G)	B	Surface Af (CaAa)	89.25 - 59.50	1	1	0.000 0.000	5.5000	13.5000	0.00
5.5" x 1.25" Flat Plate (G)	C	Surface Af (CaAa)	89.25 - 59.50	1	1	0.000 0.000	5.5000	13.5000	0.00
*									
3.625" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	100.00 - 89.25	1	1	0.000 0.000	3.6250	14.5000	0.00
3.625" x 1.25" Flat Plate (G)	B	Surface Af (CaAa)	100.00 - 89.25	1	1	0.000 0.000	3.6250	14.5000	0.00
3.625" x 1.25" Flat Plate (G)	C	Surface Af (CaAa)	100.00 - 89.25	1	1	0.000 0.000	3.6250	14.5000	0.00
***									
4" x 1" Flat Plate (G)	A	Surface Af (CaAa)	40.75 - 10.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	Surface Af (CaAa)	35.75 - 10.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	Surface Af (CaAa)	35.75 - 10.75	1	1	0.000 0.000	4.0000	10.0000	0.00
*									
4" x 1" Flat Plate (G)	A	Surface Af (CaAa)	62.25 - 32.25	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	Surface Af (CaAa)	35.75 - 32.25	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	Surface Af (CaAa)	62.25 - 35.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	Surface Af (CaAa)	62.25 - 32.25	1	1	0.000 0.000	4.0000	10.0000	0.00
*									
4" x 1" Flat Plate (G)	A	Surface Af (CaAa)	78.75 - 58.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	Surface Af (CaAa)	62.25 - 58.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	Surface Af (CaAa)	78.75 - 62.25	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	Surface Af (CaAa)	78.75 - 58.75	1	1	0.000 0.000	4.0000	10.0000	0.00
*									
4" x 1" Flat Plate (G)	A	Surface Af (CaAa)	106.50 - 86.50	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	Surface Af (CaAa)	106.50 - 86.50	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	Surface Af (CaAa)	106.50 - 86.50	1	1	0.000 0.000	4.0000	10.0000	0.00
***									

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
HB114-1-0813U4-M5J(1 1/4")	A	No	Inside Pole	133.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
* 110' *								
LDF4-50A(1/2")	B	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF7-50A(1-5/8)	B	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	B	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
* 100' *								
LDF5-50A(7/8)	C	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF6-50A(1-1/4)	C	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
* 90' * (TBR)								
* 50' *								
LDF4-50A(1/2")	B	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
***								

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	133.00-91.33	A	0.000	0.000	24.077	0.000	0.17
		B	0.000	0.000	15.351	0.000	0.21
		C	0.000	0.000	16.760	0.000	0.06
L2	91.33-45.25	A	0.000	0.000	81.798	0.000	0.19
		B	0.000	0.000	72.149	0.000	0.52
		C	0.000	0.000	79.637	0.000	0.31
L3	45.25-0.00	A	0.000	0.000	108.538	0.000	0.18
		B	0.000	0.000	76.536	0.000	0.52
		C	0.000	0.000	83.890	0.000	0.30

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	133.00-91.33	A	1.693	0.000	0.000	78.636	0.000	1.05
		B		0.000	0.000	22.857	0.000	0.49
		C		0.000	0.000	27.202	0.000	0.40
L2	91.33-45.25	A	1.611	0.000	0.000	163.478	0.000	2.03
		B		0.000	0.000	100.691	0.000	1.70
		C		0.000	0.000	124.887	0.000	1.80
L3	45.25-0.00	A	1.439	0.000	0.000	185.785	0.000	2.51
		B		0.000	0.000	102.294	0.000	1.84

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
		C		0.000	0.000	125.299	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	133.00-91.33	-0.0506	-0.1237	-0.1552	-0.4837
L2	91.33-45.25	-0.0298	-0.0130	-0.1165	-0.2139
L3	45.25-0.00	-0.0010	-0.2737	-0.1024	-0.4359

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	7983A(ELLIPTICAL)	91.33 - 133.00	1.0000	1.0000
L1	3	7983A(ELLIPTICAL)	91.33 - 100.00	1.0000	1.0000
L1	4	7983A(ELLIPTICAL)	100.00 - 133.00	1.0000	1.0000
L1	16	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	91.33 - 100.00	1.0000	1.0000
L1	23	Safety Line 3/8	91.33 - 133.00	1.0000	1.0000
L1	40	3.625" x 1.25" Flat Plate (G)	91.33 - 100.00	1.0000	1.0000
L1	41	3.625" x 1.25" Flat Plate (G)	91.33 - 100.00	1.0000	1.0000
L1	42	3.625" x 1.25" Flat Plate (G)	91.33 - 100.00	1.0000	1.0000
L1	58	4" x 1" Flat Plate (G)	91.33 - 106.50	1.0000	1.0000
L1	59	4" x 1" Flat Plate (G)	91.33 - 106.50	1.0000	1.0000
L1	60	4" x 1" Flat Plate (G)	91.33 - 106.50	1.0000	1.0000
L1	32	6.625" x 1.25" Flat Plate (G)	91.33 - 59.50	1.0000	1.0000
L1	33	6.625" x 1.25" Flat Plate (G)	91.33 - 59.50	1.0000	1.0000
L1	34	6.625" x 1.25" Flat Plate (G)	91.33 - 59.50	1.0000	1.0000
L1	36	5.5" x 1.25" Flat Plate (G)	91.33 - 89.25	1.0000	1.0000
L1	37	5.5" x 1.25" Flat Plate (G)	91.33 - 89.25	1.0000	1.0000
L1	38	5.5" x 1.25" Flat Plate (G)	91.33 - 89.25	1.0000	1.0000
L1	48	4" x 1" Flat Plate (G)	91.33 - 62.25	1.0000	1.0000
L1	50	4" x 1" Flat Plate (G)	91.33 - 62.25	1.0000	1.0000
L1	51	4" x 1" Flat Plate (G)	91.33 - 62.25	1.0000	1.0000
L1	53	4" x 1" Flat Plate (G)	91.33 - 78.75	1.0000	1.0000
L1	54	4" x 1" Flat Plate (G)	91.33 - 62.25	1.0000	1.0000
L1	55	4" x 1" Flat Plate (G)	91.33 - 78.75	1.0000	1.0000
L1	56	4" x 1" Flat Plate (G)	91.33 - 78.75	1.0000	1.0000
L2	2	7983A(ELLIPTICAL)	45.25 - 91.33	1.0000	1.0000
L2	3	7983A(ELLIPTICAL)	45.25 - 91.33	1.0000	1.0000
L2	16	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	45.25 - 91.33	1.0000	1.0000
L2	23	Safety Line 3/8	45.25 - 91.33	1.0000	1.0000
L2	25	6.875" x 1.25" Flat Plate (G)	45.25 - 12.00	1.0000	1.0000
L2	26	6.875" x 1.25" Flat Plate (G)	45.25 - 12.00	1.0000	1.0000
L2	28	6.875" x 1.25" Flat Plate (G)	45.25 - 29.75	1.0000	1.0000
L2	29	6.875" x 1.25" Flat Plate (G)	45.25 - 29.75	1.0000	1.0000
L2	30	6.875" x 1.25" Flat Plate (G)	45.25 - 29.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	32	6.625" x 1.25" Flat Plate (G)	45.25 - 59.50	1.0000	1.0000
L2	33	6.625" x 1.25" Flat Plate (G)	45.25 - 59.50	1.0000	1.0000
L2	34	6.625" x 1.25" Flat Plate (G)	45.25 - 59.50	1.0000	1.0000
L2	44	4" x 1" Flat Plate (G)	45.25 - 40.75	1.0000	1.0000
L2	45	4" x 1" Flat Plate (G)	45.25 - 35.75	1.0000	1.0000
L2	46	4" x 1" Flat Plate (G)	45.25 - 35.75	1.0000	1.0000
L2	48	4" x 1" Flat Plate (G)	45.25 - 62.25	1.0000	1.0000
L2	49	4" x 1" Flat Plate (G)	45.25 - 35.75	1.0000	1.0000
L2	50	4" x 1" Flat Plate (G)	45.25 - 62.25	1.0000	1.0000
L2	51	4" x 1" Flat Plate (G)	45.25 - 62.25	1.0000	1.0000

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
Lightning Rod 1"x5'	C	From Leg	0.00 0.00 2.50	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.50 1.02 1.43	0.50 1.02 1.43	0.03 0.03 0.04
* 133' *									
(2) APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
(6) ACU-A20-N	A	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	B	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	C	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(2) 800MHZ RRH	A	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
800MHZ RRH	B	From Leg	4.00	0.0000	133.00	No Ice	2.13	1.77	0.05

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	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
(2) IBC1900HB-2	A	From Leg	4.00	0.0000	133.00	No Ice	1.13	0.71	0.04
			0.00			1/2" Ice	1.27	0.84	0.05
			0.00			1" Ice	1.42	0.97	0.06
IBC1900HB-2	B	From Leg	4.00	0.0000	133.00	No Ice	1.13	0.71	0.04
			0.00			1/2" Ice	1.27	0.84	0.05
			0.00			1" Ice	1.42	0.97	0.06
IBC1900HB-2	C	From Leg	4.00	0.0000	133.00	No Ice	1.13	0.71	0.04
			0.00			1/2" Ice	1.27	0.84	0.05
			0.00			1" Ice	1.42	0.97	0.06
(4) 1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	133.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
(2) 1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	133.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
(2) 800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	133.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	133.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
TD-RRH8x20-25	A	From Leg	4.00	0.0000	133.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	4.00	0.0000	133.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	4.00	0.0000	133.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
PD2DE-700/2700	B	From Leg	4.00	0.0000	133.00	No Ice	0.11	0.11	0.00
			0.00			1/2" Ice	0.18	0.18	0.00
			0.00			1" Ice	0.25	0.25	0.00
PD2DE-700/2700	C	From Leg	4.00	0.0000	133.00	No Ice	0.11	0.11	0.00
			0.00			1/2" Ice	0.18	0.18	0.00
			0.00			1" Ice	0.25	0.25	0.00
Platform Mount [LP 602-1]	C	None		0.0000	133.00	No Ice	32.03	32.03	1.34
						1/2" Ice	38.71	38.71	1.80
						1" Ice	45.39	45.39	2.26
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	133.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
(2) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	133.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
(2) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	133.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
* 110' *									
BXA-70063/6CF-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	110.00	No Ice	7.81	5.40	0.04
			0.00			1/2" Ice	8.36	6.55	0.10
			0.00			1" Ice	8.87	7.41	0.17
BXA-70063/6CF-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	110.00	No Ice	7.81	5.40	0.04
			0.00			1/2" Ice	8.36	6.55	0.10
			0.00			1" Ice	8.87	7.41	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063/6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.40 6.55 7.41	0.04 0.10 0.17
BXA-80063/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	4.95 5.32 5.71	3.42 4.02 4.64	0.03 0.07 0.12
BXA-80063/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	4.95 5.32 5.71	3.42 4.02 4.64	0.03 0.07 0.12
BXA-80063/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	4.95 5.32 5.71	3.42 4.02 4.64	0.03 0.07 0.12
BULLET III	C	From Leg	4.00 0.00 3.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.14	0.07 0.10 0.14	0.00 0.00 0.00
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	8.62 9.28 9.91	7.30 8.58 9.72	0.07 0.14 0.22
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	8.62 9.28 9.91	7.30 8.58 9.72	0.07 0.14 0.22
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	8.62 9.28 9.91	7.30 8.58 9.72	0.07 0.14 0.22
RRH4X45-AWS4 B66	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.66 2.88 3.10	1.59 1.77 1.96	0.06 0.08 0.11
RRH4X45-AWS4 B66	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.66 2.88 3.10	1.59 1.77 1.96	0.06 0.08 0.11
RRH4X45-AWS4 B66	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.66 2.88 3.10	1.59 1.77 1.96	0.06 0.08 0.11
RRH2X60-PCS	A	From Leg	4.00 0.00 0.00	0.0000	110.00	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 Leg	4.00 0.00 0.00	0.0000	110.00	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	C	From Leg	4.00 0.00 0.00	0.0000	110.00	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
(2) CBC78-DF	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.39 0.47 0.56	0.17 0.23 0.30	0.01 0.01 0.01
(2) CBC78-DF	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.39 0.47 0.56	0.17 0.23 0.30	0.01 0.01 0.01
(2) CBC78-DF	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.39 0.47 0.56	0.17 0.23 0.30	0.01 0.01 0.01
Platform Mount [LP 602-1]	C	None		0.0000	110.00	No Ice 1/2" Ice 1" Ice	32.03 38.71 45.39	32.03 38.71 45.39	1.34 1.80 2.26

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
* 100' *									
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	100.00	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	B	From Leg	4.00 0.00 0.00	0.0000	100.00	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	4.00 0.00 0.00	0.0000	100.00	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
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	100.00	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	4.00 0.00 0.00	0.0000	100.00	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	4.00 0.00 0.00	0.0000	100.00	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
ATMAA1412D-1A20	A	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.00 1.13 1.26	0.41 0.50 0.59	0.01 0.02 0.03
ATMAA1412D-1A20	B	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.00 1.13 1.26	0.41 0.50 0.59	0.01 0.02 0.03
ATMAA1412D-1A20	C	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.00 1.13 1.26	0.41 0.50 0.59	0.01 0.02 0.03
MC-PK12S-B Mount	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
* 90' * (TBR)									
APXV18-206517S-C	A	From Leg	1.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
APXV18-206517S-C	B	From Leg	1.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
APXV18-206517S-C	C	From Leg	1.00	0.0000	90.00	No Ice	5.17	3.04	0.03

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	5.62	3.47	0.05
			0.00			1" Ice	6.08	3.91	0.09
Pipe Mount [PM 601-3]	C	None		0.0000	90.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
* 50' *									
KS24019-L112A	C	From Leg	3.00	0.0000	50.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01
			1.00			1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	50.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
***									

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
* 133' *											
VHLP2-23	A	Paraboloid w/Shroud (HP)	From Leg	4.00	0.0000		133.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.05
				2.00					1" Ice	4.30	0.07
VHLP2-23	B	Paraboloid w/Shroud (HP)	From Leg	4.00	-30.0000		133.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.05
				2.00					1" Ice	4.30	0.07
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	4.00	-60.0000		133.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.05
				2.00					1" Ice	4.30	0.07
***											

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

Comb. No.	Description
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	133 - 91.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.61	-2.41	8.95
			Max. Mx	8	-8.66	-342.34	1.76
			Max. My	2	-8.66	-1.15	350.54
			Max. Vy	20	-16.19	342.19	2.53
			Max. Vx	2	-16.33	-1.15	350.54
			Max. Torque	20			-3.46
L2	91.33 - 45.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.29	-2.61	11.08
			Max. Mx	20	-15.05	1192.65	3.38
			Max. My	2	-15.24	-1.63	1173.30
			Max. Vy	20	-21.28	1192.65	3.38
			Max. Vx	2	-19.74	-1.63	1173.30
			Max. Torque	20			-3.43

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	45.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.44	-2.19	12.48
			Max. Mx	20	-25.61	2395.82	4.33
			Max. My	2	-25.61	-1.29	2277.03
			Max. Vy	20	-26.84	2395.82	4.33
			Max. Vx	2	-24.54	-1.29	2277.03
			Max. Torque	20			-3.50

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	59.44	-6.88	-0.01
	Max. H_x	21	19.24	26.79	0.02
	Max. H_z	2	25.66	0.00	24.49
	Max. M_x	2	2277.03	0.00	24.49
	Max. M_z	8	2391.75	-26.76	-0.02
	Max. Torsion	8	3.46	-26.76	-0.02
	Min. Vert	25	19.24	12.40	21.65
	Min. H_x	9	19.24	-26.76	-0.02
	Min. H_z	14	25.66	-0.04	-24.49
	Min. M_x	14	-2272.06	-0.04	-24.49
	Min. M_z	20	-2395.82	26.79	0.02
	Min. Torsion	20	-3.50	26.79	0.02

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	21.38	0.00	-0.00	-2.07	-0.60	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	25.66	-0.00	-24.49	-2277.03	-1.28	0.67
0.9 Dead+1.6 Wind 0 deg - No Ice	19.24	-0.00	-24.49	-2231.29	-1.06	0.63
1.2 Dead+1.6 Wind 30 deg - No Ice	25.66	12.40	-21.75	-2005.58	-1135.75	-1.23
0.9 Dead+1.6 Wind 30 deg - No Ice	19.24	12.40	-21.75	-1965.46	-1113.27	-1.21
1.2 Dead+1.6 Wind 60 deg - No Ice	25.66	21.42	-12.57	-1158.50	-1952.69	-3.00
0.9 Dead+1.6 Wind 60 deg - No Ice	19.24	21.42	-12.57	-1134.98	-1914.12	-2.93
1.2 Dead+1.6 Wind 90 deg - No Ice	25.66	26.76	0.02	-0.49	-2391.75	-3.46
0.9 Dead+1.6 Wind 90 deg - No Ice	19.24	26.76	0.02	0.15	-2345.45	-3.34
1.2 Dead+1.6 Wind 120 deg - No Ice	25.66	21.02	12.36	1146.36	-1936.17	-2.97
0.9 Dead+1.6 Wind 120 deg - No Ice	19.24	21.02	12.36	1124.25	-1897.77	-2.86
1.2 Dead+1.6 Wind 150 deg -	25.66	12.37	21.66	2000.04	-1137.56	-2.15

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
No Ice 0.9 Dead+1.6 Wind 150 deg - No Ice	19.24	12.37	21.66	1961.29	-1115.04	-2.05
1.2 Dead+1.6 Wind 180 deg - No Ice	25.66	0.04	24.49	2272.06	-5.13	-0.74
0.9 Dead+1.6 Wind 180 deg - No Ice	19.24	0.04	24.49	2227.73	-4.82	-0.70
1.2 Dead+1.6 Wind 210 deg - No Ice	25.66	-12.43	21.74	1999.02	1139.60	1.04
0.9 Dead+1.6 Wind 210 deg - No Ice	19.24	-12.43	21.74	1960.34	1117.42	1.02
1.2 Dead+1.6 Wind 240 deg - No Ice	25.66	-21.46	12.58	1154.93	1956.89	2.54
0.9 Dead+1.6 Wind 240 deg - No Ice	19.24	-21.46	12.58	1132.75	1918.62	2.47
1.2 Dead+1.6 Wind 270 deg - No Ice	25.66	-26.79	-0.02	-4.33	2395.82	3.50
0.9 Dead+1.6 Wind 270 deg - No Ice	19.24	-26.79	-0.02	-3.61	2349.80	3.39
1.2 Dead+1.6 Wind 300 deg - No Ice	25.66	-21.06	-12.37	-1152.53	1940.48	3.00
0.9 Dead+1.6 Wind 300 deg - No Ice	19.24	-21.06	-12.37	-1129.01	1902.35	2.88
1.2 Dead+1.6 Wind 330 deg - No Ice	25.66	-12.40	-21.65	-2003.36	1141.51	1.89
0.9 Dead+1.6 Wind 330 deg - No Ice	19.24	-12.40	-21.65	-1963.25	1119.26	1.79
1.2 Dead+1.0 Ice+1.0 Temp	59.44	0.00	-0.00	-12.48	-2.19	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	59.44	-0.00	-5.86	-671.70	-2.25	0.24
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	59.44	3.04	-5.32	-600.65	-337.21	-0.40
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	59.44	5.79	-3.38	-380.93	-629.18	-1.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	59.44	6.88	0.01	-11.86	-739.05	-1.29
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	59.44	5.26	3.08	329.03	-581.27	-1.08
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	59.44	3.03	5.29	575.66	-337.87	-0.77
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	59.44	0.01	5.86	646.75	-3.44	-0.25
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	59.44	-3.05	5.31	575.27	334.24	0.37
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	59.44	-5.80	3.39	356.35	626.32	0.94
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	59.44	-6.89	-0.01	-13.06	736.16	1.31
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	59.44	-5.27	-3.08	-354.33	578.42	1.07
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	59.44	-3.04	-5.29	-600.19	334.91	0.71
Dead+Wind 0 deg - Service	21.38	-0.00	-5.46	-506.05	-0.73	0.15
Dead+Wind 30 deg - Service	21.38	2.77	-4.85	-445.94	-252.10	-0.26
Dead+Wind 60 deg - Service	21.38	4.78	-2.80	-258.20	-433.03	-0.65
Dead+Wind 90 deg - Service	21.38	5.97	0.00	-1.67	-530.52	-0.74
Dead+Wind 120 deg - Service	21.38	4.69	2.76	252.39	-429.35	-0.66
Dead+Wind 150 deg - Service	21.38	2.76	4.83	441.62	-252.51	-0.48
Dead+Wind 180 deg - Service	21.38	0.01	5.46	501.86	-1.58	-0.17
Dead+Wind 210 deg - Service	21.38	-2.77	4.85	441.40	252.07	0.22
Dead+Wind 240 deg - Service	21.38	-4.79	2.81	254.31	433.10	0.56

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+Wind 270 deg - Service	21.38	-5.98	-0.00	-2.52	530.56	0.75
Dead+Wind 300 deg - Service	21.38	-4.70	-2.76	-256.87	429.43	0.65
Dead+Wind 330 deg - Service	21.38	-2.77	-4.83	-445.45	252.49	0.41

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	-21.38	0.00	-0.00	21.38	0.00	0.000%
2	-0.00	-25.66	-24.49	0.00	25.66	24.49	0.000%
3	-0.00	-19.24	-24.49	0.00	19.24	24.49	0.000%
4	12.40	-25.66	-21.75	-12.40	25.66	21.75	0.000%
5	12.40	-19.24	-21.75	-12.40	19.24	21.75	0.000%
6	21.42	-25.66	-12.57	-21.42	25.66	12.57	0.000%
7	21.42	-19.24	-12.57	-21.42	19.24	12.57	0.000%
8	26.76	-25.66	0.02	-26.76	25.66	-0.02	0.000%
9	26.76	-19.24	0.02	-26.76	19.24	-0.02	0.000%
10	21.02	-25.66	12.36	-21.02	25.66	-12.36	0.000%
11	21.02	-19.24	12.36	-21.02	19.24	-12.36	0.000%
12	12.37	-25.66	21.66	-12.37	25.66	-21.66	0.000%
13	12.37	-19.24	21.66	-12.37	19.24	-21.66	0.000%
14	0.04	-25.66	24.49	-0.04	25.66	-24.49	0.000%
15	0.04	-19.24	24.49	-0.04	19.24	-24.49	0.000%
16	-12.43	-25.66	21.74	12.43	25.66	-21.74	0.000%
17	-12.43	-19.24	21.74	12.43	19.24	-21.74	0.000%
18	-21.46	-25.66	12.58	21.46	25.66	-12.58	0.000%
19	-21.46	-19.24	12.58	21.46	19.24	-12.58	0.000%
20	-26.79	-25.66	-0.02	26.79	25.66	0.02	0.000%
21	-26.79	-19.24	-0.02	26.79	19.24	0.02	0.000%
22	-21.06	-25.66	-12.37	21.06	25.66	12.37	0.000%
23	-21.06	-19.24	-12.37	21.06	19.24	12.37	0.000%
24	-12.40	-25.66	-21.65	12.40	25.66	21.65	0.000%
25	-12.40	-19.24	-21.65	12.40	19.24	21.65	0.000%
26	0.00	-59.44	0.00	-0.00	59.44	0.00	0.000%
27	-0.00	-59.44	-5.86	0.00	59.44	5.86	0.001%
28	3.04	-59.44	-5.32	-3.04	59.44	5.32	0.000%
29	5.79	-59.44	-3.38	-5.79	59.44	3.38	0.000%
30	6.88	-59.44	0.01	-6.88	59.44	-0.01	0.001%
31	5.26	-59.44	3.08	-5.26	59.44	-3.08	0.000%
32	3.03	-59.44	5.29	-3.03	59.44	-5.29	0.000%
33	0.01	-59.44	5.86	-0.01	59.44	-5.86	0.001%
34	-3.05	-59.44	5.31	3.05	59.44	-5.31	0.000%
35	-5.80	-59.44	3.39	5.80	59.44	-3.39	0.000%
36	-6.89	-59.44	-0.01	6.89	59.44	0.01	0.001%
37	-5.27	-59.44	-3.08	5.27	59.44	3.08	0.000%
38	-3.04	-59.44	-5.29	3.04	59.44	5.29	0.000%
39	-0.00	-21.38	-5.46	0.00	21.38	5.46	0.000%
40	2.77	-21.38	-4.85	-2.77	21.38	4.85	0.000%
41	4.78	-21.38	-2.80	-4.78	21.38	2.80	0.000%
42	5.97	-21.38	0.00	-5.97	21.38	-0.00	0.000%
43	4.69	-21.38	2.76	-4.69	21.38	-2.76	0.000%
44	2.76	-21.38	4.83	-2.76	21.38	-4.83	0.000%
45	0.01	-21.38	5.46	-0.01	21.38	-5.46	0.000%
46	-2.77	-21.38	4.85	2.77	21.38	-4.85	0.000%
47	-4.79	-21.38	2.81	4.79	21.38	-2.81	0.000%
48	-5.98	-21.38	-0.00	5.98	21.38	0.00	0.000%
49	-4.70	-21.38	-2.76	4.70	21.38	2.76	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
50	-2.77	-21.38	-4.83	2.77	21.38	4.83	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001076
2	Yes	5	0.00000001	0.00040224
3	Yes	5	0.00000001	0.00014781
4	Yes	7	0.00000001	0.00008877
5	Yes	6	0.00000001	0.00027460
6	Yes	7	0.00000001	0.00009847
7	Yes	6	0.00000001	0.00030896
8	Yes	6	0.00000001	0.00011989
9	Yes	5	0.00000001	0.00054645
10	Yes	7	0.00000001	0.00008288
11	Yes	6	0.00000001	0.00025483
12	Yes	7	0.00000001	0.00009731
13	Yes	6	0.00000001	0.00030489
14	Yes	5	0.00000001	0.00050224
15	Yes	5	0.00000001	0.00018731
16	Yes	7	0.00000001	0.00009323
17	Yes	6	0.00000001	0.00029110
18	Yes	7	0.00000001	0.00008385
19	Yes	6	0.00000001	0.00025794
20	Yes	6	0.00000001	0.00012680
21	Yes	5	0.00000001	0.00057802
22	Yes	7	0.00000001	0.00009846
23	Yes	6	0.00000001	0.00030905
24	Yes	7	0.00000001	0.00008613
25	Yes	6	0.00000001	0.00026583
26	Yes	5	0.00000001	0.00007750
27	Yes	6	0.00027328	0.00058716
28	Yes	7	0.00007223	0.00060286
29	Yes	7	0.00007131	0.00077790
30	Yes	6	0.00026993	0.00087282
31	Yes	7	0.00007228	0.00048894
32	Yes	7	0.00007201	0.00056994
33	Yes	6	0.00027163	0.00054153
34	Yes	7	0.00007198	0.00052717
35	Yes	7	0.00007136	0.00057673
36	Yes	6	0.00026923	0.00086613
37	Yes	7	0.00007200	0.00064799
38	Yes	7	0.00007221	0.00056635
39	Yes	5	0.00000001	0.00003211
40	Yes	5	0.00000001	0.00033101
41	Yes	5	0.00000001	0.00039888
42	Yes	5	0.00000001	0.00012667
43	Yes	5	0.00000001	0.00028643
44	Yes	5	0.00000001	0.00037725
45	Yes	5	0.00000001	0.00003497
46	Yes	5	0.00000001	0.00034271
47	Yes	5	0.00000001	0.00028972
48	Yes	5	0.00000001	0.00012901
49	Yes	5	0.00000001	0.00039501
50	Yes	5	0.00000001	0.00031537

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	133 - 131	TP21.81x13.48x0.1875	41.67	0.00	0.0	8.2667	-9.29	609.34	0.015
	131 - 129					8.5081	-2.56	627.13	0.004
	129 - 127					8.7495	-2.63	644.93	0.004
	127 - 125					8.9909	-2.71	662.72	0.004
	125 - 123					9.2323	-2.80	680.51	0.004
	123 - 121					9.4736	-2.88	698.30	0.004
	121 - 119					9.7150	-2.98	716.10	0.004
	119 - 117					9.9564	-3.07	731.54	0.004
	117 - 115					10.1978	-3.17	743.55	0.004
	115 - 113					10.4392	-3.27	755.30	0.004
	113 - 111					10.6806	-3.38	766.77	0.004
	111 - 109					10.9220	-5.41	777.97	0.007
	109 - 107					11.1633	-5.54	788.90	0.007
	107 - 105					11.4047	-5.68	799.57	0.007
	105 - 103					11.6461	-5.82	809.96	0.007
	103 - 101					11.8875	-5.96	820.08	0.007
	101 - 99					12.1289	-8.31	829.92	0.010
	99 - 97					12.3703	-8.48	839.50	0.010
	97 - 95					12.6116	-8.66	848.81	0.010
	95 - 91.33					13.0546	-3.98	865.18	0.005
L2	95 - 91.33	TP30.64x20.7014x0.25 4.8.2 (1.29 CR) - 2/19	49.75	0.00	0.0	17.0535	-5.19	1257.02	0.004
	91.33 - 89.0339					17.4228	-9.69	1284.23	0.008
		4.8.2 (1.29 CR) - 2/18							
	89.0339 - 86.7378					17.7920	-9.97	1305.12	0.008
		4.8.2 (1.29 CR) - 2/17							
	86.7378 - 84.4417					18.1613	-10.26	1323.44	0.008
		4.8.2 (1.29 CR) - 2/16							
	84.4417 - 82.1456					18.5305	-10.55	1341.40	0.008
		4.8.2 (1.29 CR) - 2/15							
	82.1456 - 79.8494					18.8998	-10.85	1359.01	0.008
		4.8.2 (1.29 CR) - 2/14							
	79.8494 - 77.5533					19.2690	-11.16	1376.26	0.008
		4.8.2 (1.29 CR) - 2/13							
	77.5533 - 75.2572					19.6383	-11.47	1393.15	0.008
		4.8.2 (1.29 CR) - 2/12							
	75.2572 - 72.9611					20.0076	-11.79	1409.69	0.008
		4.8.2 (1.29 CR) - 2/11							
	72.9611 - 70.665					20.3768	-12.11	1425.87	0.008
		4.8.2 (1.29 CR) - 2/10							

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	70.665 - 68.3689	4.8.2 (1.29 CR) - 2/9				20.7461	-12.40	1441.70	0.009
	68.3689 - 66.0728	4.8.2 (1.29 CR) - 2/8				21.1153	-12.73	1457.17	0.009
	66.0728 - 63.7767	4.8.2 (1.29 CR) - 2/7				21.4846	-12.94	1472.28	0.009
	63.7767 - 61.4806	4.8.2 (1.29 CR) - 2/6				21.8538	-13.28	1487.03	0.009
	61.4806 - 59.1844	4.8.2 (1.29 CR) - 2/5				22.2231	-13.62	1501.43	0.009
	59.1844 - 56.8883	4.8.2 (1.29 CR) - 2/4				22.5923	-13.97	1515.47	0.009
	56.8883 - 54.5922	4.8.2 (1.29 CR) - 2/3				22.9616	-14.32	1529.16	0.009
	54.5922 - 52.2961	4.8.2 (1.29 CR) - 2/2				23.3308	-14.68	1542.49	0.010
	52.2961 - 50	4.8.2 (1.29 CR) - 2				23.7001	-15.05	1555.46	0.010
	50 - 45.25	4.8.2 (1.29 CR) - 2				24.4639	-7.36	1581.17	0.005
L3	50 - 45.25	TP39.2x29.1911x0.3125	50.00	0.00	0.0	30.0159	-8.98	2146.14	0.004
	45.25 - 42.8684	4.8.2 (1.22 CR) - 3/19				30.4956	-16.78	2168.20	0.008
	42.8684 - 40.4868	4.8.2 (1.22 CR) - 3/18				30.9753	-17.22	2189.88	0.008
	40.4868 - 38.1053	4.8.2 (1.22 CR) - 3/17				31.4550	-17.67	2211.17	0.008
	38.1053 - 35.7237	4.8.2 (1.22 CR) - 3/16				31.9347	-18.12	2232.08	0.008
	35.7237 - 33.3421	4.8.2 (1.22 CR) - 3/15				32.4145	-18.58	2252.60	0.008
	33.3421 - 30.9605	4.8.2 (1.22 CR) - 3/14				32.8942	-19.04	2272.73	0.008
	30.9605 - 28.5789	4.8.2 (1.22 CR) - 3/13				33.3739	-19.51	2292.49	0.009
	28.5789 - 26.1974	4.8.2 (1.22 CR) - 3/12				33.8536	-19.98	2311.85	0.009
	26.1974 - 23.8158	4.8.2 (1.22 CR) - 3/11				34.3333	-20.46	2330.83	0.009
	23.8158 - 21.4342	4.8.2 (1.22 CR) - 3/10				34.8131	-20.95	2349.43	0.009
		4.8.2 (1.22 CR) - 3/9							

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	21.4342 - 19.0526	4.8.2 (1.22 CR) - 3/8				35.2928	-21.44	2367.64	0.009
	19.0526 - 16.6711	4.8.2 (1.22 CR) - 3/7				35.7725	-21.94	2385.47	0.009
	16.6711 - 14.2895	4.8.2 (1.22 CR) - 3/6				36.2522	-22.45	2402.91	0.009
	14.2895 - 11.9079	4.8.2 (1.22 CR) - 3/5				36.7319	-22.96	2419.96	0.009
	11.9079 - 9.52632	4.8.2 (1.22 CR) - 3/4				37.2117	-23.48	2436.63	0.010
	9.52632 - 7.14474	4.8.2 (1.22 CR) - 3/3				37.6914	-24.00	2452.92	0.010
	7.14474 - 4.76316	4.8.2 (1.22 CR) - 3/2				38.1711	-24.53	2468.82	0.010
	4.76316 - 2.38158	4.8.2 (1.22 CR) - 3				38.6508	-25.07	2484.33	0.010
	2.38158 - 0	4.8.2 (1.22 CR) - 3				39.1305	-25.61	2499.47	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	133 - 131	TP21.81x13.48x0.1875	9.42	169.01	0.056	0.00	169.01	0.000
	131 - 129		21.74	179.09	0.121	0.00	179.09	0.000
	129 - 127		33.80	189.46	0.178	0.00	189.46	0.000
	127 - 125		46.10	200.13	0.230	0.00	200.13	0.000
	125 - 123		58.63	211.09	0.278	0.00	211.09	0.000
	123 - 121		71.41	222.34	0.321	0.00	222.34	0.000
	121 - 119		84.44	233.88	0.361	0.00	233.88	0.000
	119 - 117		97.71	244.93	0.399	0.00	244.93	0.000
	117 - 115		111.24	255.06	0.436	0.00	255.06	0.000
	115 - 113		125.02	265.29	0.471	0.00	265.29	0.000
	113 - 111		139.06	275.61	0.505	0.00	275.61	0.000
	111 - 109		158.45	286.02	0.554	0.00	286.02	0.000
	109 - 107		182.74	296.52	0.616	0.00	296.52	0.000
	107 - 105		207.28	307.09	0.675	0.00	307.09	0.000
	105 - 103		232.07	317.73	0.730	0.00	317.73	0.000
	103 - 101		257.12	328.43	0.783	0.00	328.43	0.000
	101 - 99		285.78	339.19	0.843	0.00	339.19	0.000
	99 - 97		318.05	350.00	0.909	0.00	350.00	0.000
	97 - 95		350.55	360.84	0.971	0.00	360.84	0.000
	95 - 91.33		182.47	380.84	0.479	0.00	380.84	0.000
L2	95 - 91.33	TP30.64x20.7014x0.25	228.48	540.43	0.423	0.00	540.43	0.000
	91.33 - 89.0339		449.82	564.23	0.797	0.00	564.23	0.000
	89.0339 -		489.79	585.69	0.836	0.00	585.69	0.000

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 $\frac{M_{uy}}{\phi M_{ny}}$
	86.7378							
	86.7378 - 84.4417		530.10	606.38	0.874	0.00	606.38	0.000
	84.4417 - 82.1456		570.73	627.24	0.910	0.00	627.24	0.000
	82.1456 - 79.8494		611.70	648.27	0.944	0.00	648.27	0.000
	79.8494 - 77.5533		652.99	669.46	0.975	0.00	669.46	0.000
	77.5533 - 75.2572		694.60	690.80	1.005	0.00	690.80	0.000
	75.2572 - 72.9611		736.54	712.28	1.034	0.00	712.28	0.000
	72.9611 - 70.665		778.80	733.88	1.061	0.00	733.88	0.000
	70.665 - 68.3689		821.54	755.61	1.087	0.00	755.61	0.000
	68.3689 - 66.0728		864.92	777.44	1.113	0.00	777.44	0.000
	66.0728 - 63.7767		909.70	799.37	1.138	0.00	799.37	0.000
	63.7767 - 61.4806		955.52	821.38	1.163	0.00	821.38	0.000
	61.4806 - 59.1844		1001.88	843.48	1.188	0.00	843.48	0.000
	59.1844 - 56.8883		1048.77	865.64	1.212	0.00	865.64	0.000
	56.8883 - 54.5922		1096.19	887.86	1.235	0.00	887.86	0.000
	54.5922 - 52.2961		1144.16	910.13	1.257	0.00	910.13	0.000
	52.2961 - 50		1192.66	932.43	1.279	0.00	932.43	0.000
	50 - 45.25		594.11	978.65	0.607	0.00	978.65	0.000
L3	50 - 45.25	TP39.2x29.1911x0.3125	701.33	1300.93	0.539	0.00	1300.93	0.000
	45.25 - 42.8684		1347.90	1335.53	1.009	0.00	1335.53	0.000
	42.8684 - 40.4868		1400.95	1370.31	1.022	0.00	1370.31	0.000
	40.4868 - 38.1053		1454.59	1405.28	1.035	0.00	1405.28	0.000
	38.1053 - 35.7237		1508.83	1440.41	1.048	0.00	1440.41	0.000
	35.7237 - 33.3421		1563.68	1475.70	1.060	0.00	1475.70	0.000
	33.3421 - 30.9605		1619.13	1511.14	1.071	0.00	1511.14	0.000
	30.9605 - 28.5789		1675.18	1546.72	1.083	0.00	1546.72	0.000
	28.5789 - 26.1974		1731.83	1582.41	1.094	0.00	1582.41	0.000
	26.1974 - 23.8158		1789.09	1618.22	1.106	0.00	1618.22	0.000
	23.8158 - 21.4342		1846.97	1654.13	1.117	0.00	1654.13	0.000
	21.4342 - 19.0526		1905.47	1690.13	1.127	0.00	1690.13	0.000
	19.0526 - 16.6711		1964.58	1726.20	1.138	0.00	1726.20	0.000
	16.6711 - 14.2895		2024.30	1762.34	1.149	0.00	1762.34	0.000

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 $\frac{M_{uy}}{\phi M_{ny}}$
	14.2895 - 11.9079		2084.65	1798.53	1.159	0.00	1798.53	0.000
	11.9079 - 9.52632		2145.63	1834.78	1.169	0.00	1834.78	0.000
	9.52632 - 7.14474		2207.23	1871.05	1.180	0.00	1871.05	0.000
	7.14474 - 4.76316		2269.47	1907.35	1.190	0.00	1907.35	0.000
	4.76316 - 2.38158		2332.32	1943.65	1.200	0.00	1943.65	0.000
	2.38158 - 0		2395.82	1979.96	1.210	0.00	1979.96	0.000

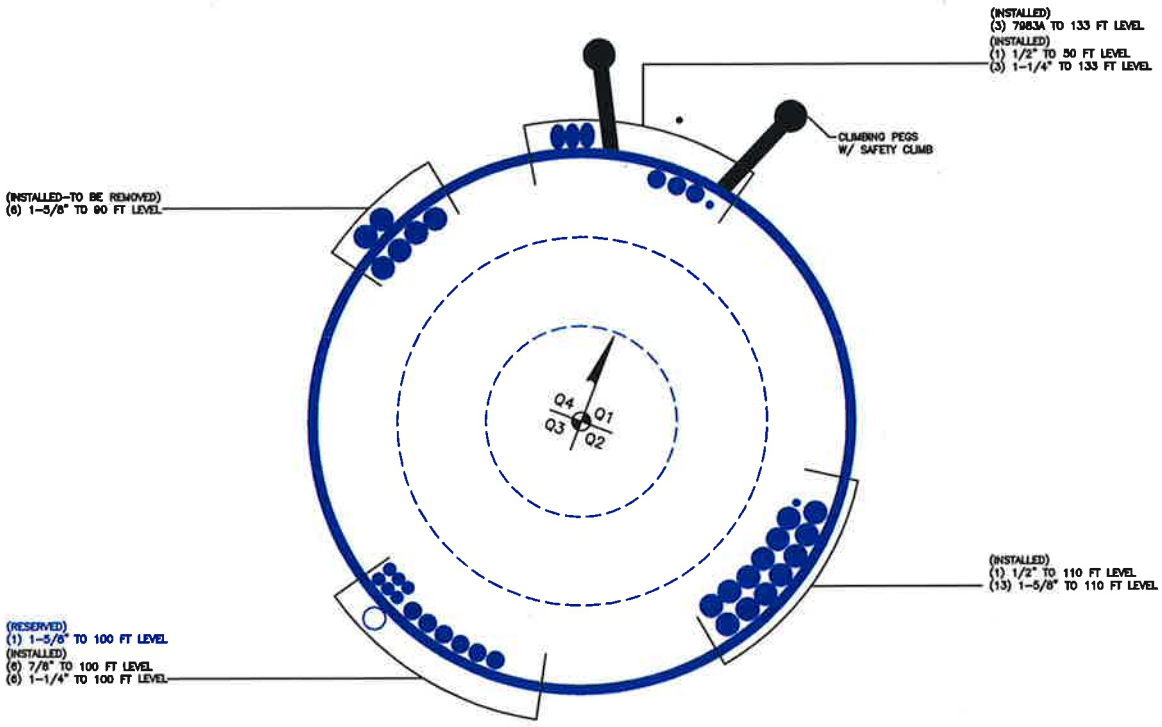
Pole Shear Design Data

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	133 - 131	TP21.81x13.48x0.1875	2.09	304.67	0.007	0.30	342.69	0.001
	131 - 129		5.97	313.57	0.019	0.86	363.14	0.002
	129 - 127		6.09	322.46	0.019	0.86	384.18	0.002
	127 - 125		6.21	331.36	0.019	0.86	405.80	0.002
	125 - 123		6.33	340.26	0.019	0.86	428.02	0.002
	123 - 121		6.45	349.15	0.018	0.86	450.84	0.002
	121 - 119		6.58	358.05	0.018	0.86	474.25	0.002
	119 - 117		6.70	365.77	0.018	0.86	496.65	0.002
	117 - 115		6.83	371.78	0.018	0.86	517.18	0.002
	115 - 113		6.96	377.65	0.018	0.86	537.92	0.002
	113 - 111		7.09	383.38	0.018	0.86	558.86	0.002
	111 - 109		12.09	388.99	0.031	0.86	579.97	0.001
	109 - 107		12.22	394.45	0.031	0.85	601.25	0.001
	107 - 105		12.34	399.78	0.031	0.85	622.68	0.001
	105 - 103		12.47	404.98	0.031	0.85	644.26	0.001
	103 - 101		12.60	410.04	0.031	0.85	665.96	0.001
	101 - 99		16.09	414.96	0.039	0.85	687.77	0.001
	99 - 97		16.21	419.75	0.039	0.85	709.68	0.001
	97 - 95		16.33	424.40	0.038	0.85	731.68	0.001
	95 - 91.33		7.46	432.59	0.017	0.38	772.22	0.000
L2	95 - 91.33	TP30.64x20.7014x0.25	9.17	628.51	0.015	0.47	1095.83	0.000
	91.33 - 89.0339		17.36	642.12	0.027	0.85	1144.08	0.001
	89.0339 - 86.7378		17.51	652.56	0.027	0.84	1187.60	0.001
	86.7378 - 84.4417		17.65	661.72	0.027	0.84	1229.54	0.001
	84.4417 - 82.1456		17.80	670.70	0.027	0.84	1271.85	0.001
	82.1456 - 79.8494		17.94	679.50	0.026	0.84	1314.49	0.001
	79.8494 - 77.5533		18.08	688.13	0.026	0.84	1357.47	0.001
	77.5533 - 75.2572		18.23	696.58	0.026	0.84	1400.73	0.001
	75.2572 - 72.9611		18.37	704.85	0.026	0.84	1444.28	0.001
	72.9611 - 70.665		18.51	712.94	0.026	0.84	1488.09	0.001

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 $\frac{T_u}{\phi T_n}$
	70.665 - 68.3689		18.84	720.85	0.026	2.02	1532.13	0.001
	68.3689 - 66.0728		19.01	728.58	0.026	2.01	1576.40	0.001
	66.0728 - 63.7767		19.87	736.14	0.027	3.39	1620.87	0.002
	63.7767 - 61.4806		20.11	743.52	0.027	3.39	1665.51	0.002
	61.4806 - 59.1844		20.34	750.72	0.027	3.39	1710.31	0.002
	59.1844 - 56.8883		20.57	757.74	0.027	3.38	1755.25	0.002
	56.8883 - 54.5922		20.81	764.58	0.027	3.38	1800.30	0.002
	54.5922 - 52.2961		21.04	771.25	0.027	3.38	1845.45	0.002
	52.2961 - 50		21.28	777.73	0.027	3.37	1890.68	0.002
	50 - 45.25		10.23	790.59	0.013	1.51	1984.39	0.001
L3	50 - 45.25	TP39.2x29.1911x0.3125	11.72	1073.07	0.011	1.78	2637.87	0.001
	45.25 - 42.8684		22.19	1084.10	0.020	3.29	2708.02	0.001
	42.8684 - 40.4868		22.44	1094.94	0.020	3.30	2778.56	0.001
	40.4868 - 38.1053		22.69	1105.59	0.021	3.31	2849.46	0.001
	38.1053 - 35.7237		22.94	1116.04	0.021	3.32	2920.70	0.001
	35.7237 - 33.3421		23.19	1126.30	0.021	3.33	2992.27	0.001
	33.3421 - 30.9605		23.45	1136.37	0.021	3.34	3064.13	0.001
	30.9605 - 28.5789		23.70	1146.24	0.021	3.35	3136.25	0.001
	28.5789 - 26.1974		23.96	1155.93	0.021	3.36	3208.63	0.001
	26.1974 - 23.8158		24.22	1165.42	0.021	3.37	3281.24	0.001
	23.8158 - 21.4342		24.47	1174.71	0.021	3.39	3354.05	0.001
	21.4342 - 19.0526		24.73	1183.82	0.021	3.40	3427.04	0.001
	19.0526 - 16.6711		24.99	1192.73	0.021	3.41	3500.19	0.001
	16.6711 - 14.2895		25.25	1201.45	0.021	3.42	3573.47	0.001
	14.2895 - 11.9079		25.52	1209.98	0.021	3.43	3646.88	0.001
	11.9079 - 9.52632		25.78	1218.32	0.021	3.45	3720.36	0.001
	9.52632 - 7.14474		26.04	1226.46	0.021	3.46	3793.91	0.001
	7.14474 - 4.76316		26.31	1234.41	0.021	3.47	3867.51	0.001
	4.76316 - 2.38158		26.58	1242.17	0.021	3.49	3941.13	0.001
	2.38158 - 0		26.84	1249.73	0.021	3.50	4014.73	0.001

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876317 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Additional Calculations

CCIpole

per TIA-222- G

Site BU: 876317

Work Order: 1304365

CROWN CASTLE

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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	133	41.67	3.67	12	13.48	21.81	0.1875	0.75	A572-65
2	95	49.75	4.75	12	20.70	30.64	0.25	1	A572-65
3	50	50	0	12	29.19	39.2	0.3125	1.25	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	29.75	plate	BAR #1	2				x								x
2	0	10.75	plate	BAR #1A	2							x		x			
3	10.75	29.75	plate	BAR #1B	1								x				
4	29.75	59.5	plate	BAR #2	3				x				x				x
5	59.5	89.25	plate	BAR #3	3				x				x				x
6	89.25	98.75	plate	BAR #4	3				x				x				x
7	12.5	34	plate	SR1	2						x				x		
8	12.5	39	plate	SR2	1	x											
9	34	60.5	plate	SR3	3			x				x				x	
10	60.5	77	plate	SR4	3		x				x				x		
11	88.25	104.75	plate	SR5	3		x				x				x		
12																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	6.875	1.25	8.59375	0.625	n/a	36.000	15.000	6.991	1.2200	A572-65
2	6.875	1.25	8.59375	0.625	n/a	42.000	15.000	6.991	1.2200	A572-65
3	6.875	1.25	8.59375	0.625	42.000	36.000	15.000	6.991	1.2200	A572-65
4	6.625	1.25	8.28125	0.625	3.000	30.000	18.000	6.678	1.2200	A572-65
5	5.5	1.25	6.875	0.625	3.000	18.000	18.000	5.272	1.2200	A572-65
6	3.625	1.25	4.53125	0.625	3.000	15.000	24.000	2.928	1.2200	A572-65
7	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
8	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
9	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
10	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
11	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	133 - 128	5		12	13.480	14.480	0.1875	A572-65	1.000
2	128 - 123	5		12	14.480	15.479	0.1875	A572-65	1.000
3	123 - 118	5		12	15.479	16.479	0.1875	A572-65	1.000
4	118 - 113	5		12	16.479	17.478	0.1875	A572-65	1.000
5	113 - 108	5		12	17.478	18.478	0.1875	A572-65	1.000
6	108 - 104.75	3.25		12	18.478	19.127	0.1875	A572-65	1.000
7	104.75 - 104.5	0.25		12	19.127	19.177	0.425	A572-65	0.915
8	104.5 - 99.5	5		12	19.177	20.177	0.40625	A572-65	0.931
9	99.5 - 98.75	0.75		12	20.177	20.327	0.40625	A572-65	0.928
10	98.75 - 98.5	0.25		12	20.327	20.377	0.675	A572-65	0.883
11	98.5 - 95	7.17	3.67	12	20.377	21.810	0.6625	A572-65	0.878
12	95 - 90	5		12	20.701	21.700	0.7125	A572-65	0.891
13	90 - 89.25	0.75		12	21.700	21.850	0.7	A572-65	0.902
14	89.25 - 89	0.25		12	21.850	21.900	0.85	A572-65	0.870
15	89 - 88.25	0.75		12	21.900	22.050	0.8375	A572-65	0.878
16	88.25 - 88	0.25		12	22.050	22.100	0.6125	A572-65	0.902
17	88 - 83	5		12	22.100	23.099	0.5875	A572-65	0.917
18	83 - 78	5		12	23.099	24.097	0.575	A572-65	0.915
19	78 - 77	1		12	24.097	24.297	0.575	A572-65	0.911
20	77 - 76.75	0.25		12	24.297	24.347	0.7625	A572-65	0.899
21	76.75 - 71.75	5		12	24.347	25.346	0.7375	A572-65	0.905
22	71.75 - 66.75	5		12	25.346	26.345	0.7125	A572-65	0.913
23	66.75 - 61.75	5		12	26.345	27.344	0.6875	A572-65	0.923
24	61.75 - 60.5	1.25		12	27.344	27.593	0.6875	A572-65	0.918
25	60.5 - 60.25	0.25		12	27.593	27.643	0.6875	A572-65	0.917
26	60.25 - 59.5	0.75		12	27.643	27.793	0.6875	A572-65	0.914
27	59.5 - 59.25	0.25		12	27.793	27.843	0.75	A572-65	0.903
28	59.25 - 54.25	5		12	27.843	28.842	0.725	A572-65	0.913
29	54.25 - 50	9	4.75	12	28.842	30.640	0.7	A572-65	0.927
30	50 - 45	5		12	29.191	30.192	0.7625	A572-65	0.927
31	45 - 40	5		12	30.192	31.193	0.75	A572-65	0.925
32	40 - 39	1		12	31.193	31.393	0.7375	A572-65	0.936
33	39 - 38.75	0.25		12	31.393	31.443	0.7375	A572-65	0.991
34	38.75 - 34	4.75		12	31.443	32.394	0.725	A572-65	0.990
35	34 - 33.75	0.25		12	32.394	32.444	0.6875	A572-65	0.985
36	33.75 - 29.75	4		12	32.444	33.245	0.6875	A572-65	0.972
37	29.75 - 29.5	0.25		12	33.245	33.295	0.6875	A572-65	0.984
38	29.5 - 24.5	5		12	33.295	34.296	0.675	A572-65	0.986
39	24.5 - 19.5	5		12	34.296	35.297	0.6625	A572-65	0.989
40	19.5 - 14.5	5		12	35.297	36.297	0.65	A572-65	0.992
41	14.5 - 12.5	2		12	36.297	36.698	0.65	A572-65	0.987
42	12.5 - 12.25	0.25		12	36.698	36.748	0.5625	A572-65	0.953
43	12.25 - 10.75	1.5		12	36.748	37.048	0.5625	A572-65	0.950
44	10.75 - 10.5	0.25		12	37.048	37.098	0.6375	A572-65	0.955
45	10.5 - 5.5	5		12	37.098	38.099	0.625	A572-65	0.961
46	5.5 - 0.5	5		12	38.099	39.100	0.6125	A572-65	0.968
47	0.5 - 0	0.5		12	39.100	39.200	0.6125	A572-65	0.967

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	133 - 128	3.2605	26.025	5.6738
2	128 - 123	3.4589	55.058	5.9455
3	123 - 118	3.6814	85.469	6.2247
4	118 - 113	3.9259	117.29	6.5118
5	113 - 108	6.7176	160.01	11.409
6	108 - 104.75	6.973	197.37	11.593
7	104.75 - 104.5	7.0131	200.27	11.603
8	104.5 - 99.5	10.176	260.67	15.04
9	99.5 - 98.75	10.278	271.97	15.098
10	98.75 - 98.5	10.329	275.74	15.116
11	98.5 - 95	10.967	329.16	15.417
12	95 - 90	12.539	407.49	15.91
13	90 - 89.25	13.001	419.85	16.522
14	89.25 - 89	13.064	423.98	16.539
15	89 - 88.25	13.238	436.41	16.599
16	88.25 - 88	13.288	440.56	16.615
17	88 - 83	14.224	525.21	17.181
18	83 - 78	15.212	611.95	17.533
19	78 - 77	15.414	629.51	17.603
20	77 - 76.75	15.482	633.91	17.619
21	76.75 - 71.75	16.714	722.93	18.001
22	71.75 - 66.75	17.972	813.83	18.378
23	66.75 - 61.75	19.253	906.61	18.75
24	61.75 - 60.5	19.576	930.09	18.849
25	60.5 - 60.25	19.649	934.8	18.862
26	60.25 - 59.5	19.842	948.97	18.922
27	59.5 - 59.25	19.915	953.7	18.951
28	59.25 - 54.25	21.29	1049.9	19.564
29	54.25 - 50	22.484	1134.1	20.062
30	50 - 45	25.26	1236.4	20.803
31	45 - 40	26.795	1342.2	21.789
32	40 - 39	27.111	1364	21.908
33	39 - 38.75	27.201	1369.5	21.93
34	38.75 - 34	28.781	1475	22.5
35	34 - 33.75	28.87	1480.6	22.519
36	33.75 - 29.75	30.159	1571.6	22.976
37	29.75 - 29.5	30.249	1577.3	22.994
38	29.5 - 24.5	31.903	1693.6	23.553
39	24.5 - 19.5	33.6	1812.7	24.1
40	19.5 - 14.5	35.3	1934.5	24.7
41	14.5 - 12.5	36.0	1984.0	24.9
42	12.5 - 12.25	36.1	1990.3	24.9
43	12.25 - 10.75	36.5	2027.7	25.1
44	10.75 - 10.5	36.6	2034.0	25.1
45	10.5 - 5.5	38.3	2161.2	25.8
46	5.5 - 0.5	40.0	2291.7	26.4
47	0.5 - 0	40.2	2304.9	26.5

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
133 - 128	Pole	TP14.48x13.48x0.1875	Pole	14.6%	Pass
128 - 123	Pole	TP15.479x14.48x0.1875	Pole	26.5%	Pass
123 - 118	Pole	TP16.479x15.479x0.1875	Pole	36.1%	Pass
118 - 113	Pole	TP17.478x16.479x0.1875	Pole	44.6%	Pass
113 - 108	Pole	TP18.478x17.478x0.1875	Pole	55.7%	Pass
108 - 104.75	Pole	TP19.127x18.478x0.1875	Pole	64.8%	Pass
104.75 - 104.5	Pole + Reinf.	TP19.177x19.127x0.425	Reinf. 11 Tension Rupture	37.8%	Pass
104.5 - 99.5	Pole + Reinf.	TP20.177x19.177x0.4063	Reinf. 11 Tension Rupture	45.8%	Pass
99.5 - 98.75	Pole + Reinf.	TP20.327x20.177x0.4063	Reinf. 11 Tension Rupture	47.2%	Pass
98.75 - 98.5	Pole + Reinf.	TP20.377x20.327x0.675	Reinf. 6 Tension Rupture	43.8%	Pass
98.5 - 95	Pole + Reinf.	TP21.81x20.377x0.6625	Reinf. 6 Tension Rupture	50.0%	Pass
95 - 90	Pole + Reinf.	TP21.7x20.701x0.7125	Reinf. 6 Tension Rupture	54.2%	Pass
90 - 89.25	Pole + Reinf.	TP21.85x21.7x0.7	Reinf. 6 Tension Rupture	55.3%	Pass
89.25 - 89	Pole + Reinf.	TP21.9x21.85x0.85	Reinf. 5 Tension Rupture	39.9%	Pass
89 - 88.25	Pole + Reinf.	TP22.05x21.9x0.8375	Reinf. 5 Tension Rupture	40.7%	Pass
88.25 - 88	Pole + Reinf.	TP22.1x22.05x0.6125	Reinf. 5 Tension Rupture	54.2%	Pass
88 - 83	Pole + Reinf.	TP23.099x22.1x0.5875	Reinf. 5 Tension Rupture	60.6%	Pass
83 - 78	Pole + Reinf.	TP24.097x23.099x0.575	Reinf. 5 Tension Rupture	66.4%	Pass
78 - 77	Pole + Reinf.	TP24.297x24.097x0.575	Reinf. 5 Tension Rupture	67.5%	Pass
77 - 76.75	Pole + Reinf.	TP24.347x24.297x0.7625	Reinf. 5 Tension Rupture	51.8%	Pass
76.75 - 71.75	Pole + Reinf.	TP25.346x24.347x0.7375	Reinf. 5 Tension Rupture	56.0%	Pass
71.75 - 66.75	Pole + Reinf.	TP26.345x25.346x0.7125	Reinf. 5 Tension Rupture	59.8%	Pass
66.75 - 61.75	Pole + Reinf.	TP27.344x26.345x0.6875	Reinf. 5 Tension Rupture	63.3%	Pass
61.75 - 60.5	Pole + Reinf.	TP27.593x27.344x0.6875	Reinf. 5 Tension Rupture	64.1%	Pass
60.5 - 60.25	Pole + Reinf.	TP27.643x27.593x0.6875	Reinf. 5 Tension Rupture	64.3%	Pass
60.25 - 59.5	Pole + Reinf.	TP27.793x27.643x0.6875	Reinf. 5 Tension Rupture	64.8%	Pass
59.5 - 59.25	Pole + Reinf.	TP27.843x27.793x0.75	Reinf. 4 Tension Rupture	57.1%	Pass
59.25 - 54.25	Pole + Reinf.	TP28.842x27.843x0.725	Reinf. 4 Tension Rupture	59.9%	Pass
54.25 - 50	Pole + Reinf.	TP30.64x28.842x0.7	Reinf. 4 Tension Rupture	62.3%	Pass
50 - 45	Pole + Reinf.	TP30.192x29.191x0.7625	Reinf. 4 Tension Rupture	60.8%	Pass
45 - 40	Pole + Reinf.	TP31.193x30.192x0.75	Reinf. 4 Tension Rupture	63.0%	Pass
40 - 39	Pole + Reinf.	TP31.393x31.193x0.7375	Reinf. 4 Tension Rupture	63.5%	Pass
39 - 38.75	Pole + Reinf.	TP31.443x31.393x0.7375	Reinf. 4 Tension Rupture	63.5%	Pass
38.75 - 34	Pole + Reinf.	TP32.394x31.443x0.725	Reinf. 4 Tension Rupture	65.5%	Pass
34 - 33.75	Pole + Reinf.	TP32.444x32.394x0.6875	Reinf. 4 Tension Rupture	70.0%	Pass
33.75 - 29.75	Pole + Reinf.	TP33.245x32.444x0.6875	Reinf. 4 Tension Rupture	71.7%	Pass
29.75 - 29.5	Pole + Reinf.	TP33.295x33.245x0.6875	Reinf. 1 Tension Rupture	70.1%	Pass
29.5 - 24.5	Pole + Reinf.	TP34.296x33.295x0.675	Reinf. 1 Tension Rupture	72.0%	Pass
24.5 - 19.5	Pole + Reinf.	TP35.297x34.296x0.6625	Reinf. 1 Tension Rupture	73.8%	Pass
19.5 - 14.5	Pole + Reinf.	TP36.297x35.297x0.65	Reinf. 1 Tension Rupture	75.6%	Pass
14.5 - 12.5	Pole + Reinf.	TP36.698x36.297x0.65	Reinf. 1 Tension Rupture	76.2%	Pass
12.5 - 12.25	Pole + Reinf.	TP36.748x36.698x0.5625	Reinf. 1 Tension Rupture	86.1%	Pass
12.25 - 10.75	Pole + Reinf.	TP37.048x36.748x0.5625	Reinf. 1 Tension Rupture	86.6%	Pass
10.75 - 10.5	Pole + Reinf.	TP37.098x37.048x0.6375	Reinf. 1 Tension Rupture	79.8%	Pass
10.5 - 5.5	Pole + Reinf.	TP38.099x37.098x0.625	Reinf. 1 Tension Rupture	81.4%	Pass
5.5 - 0.5	Pole + Reinf.	TP39.1x38.099x0.6125	Reinf. 1 Tension Rupture	83.0%	Pass
0.5 - 0	Pole + Reinf.	TP39.2x39.1x0.6125	Reinf. 1 Tension Rupture	83.1%	Pass
				Summary	
			Pole	70.2%	Pass
			Reinforcement	86.6%	Pass
			Overall	86.6%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
133 - 128	225	n/a	225	8.62	n/a	8.62	14.6%											
128 - 123	276	n/a	276	9.22	n/a	9.22	26.5%											
123 - 118	334	n/a	334	9.82	n/a	9.82	36.1%											
118 - 113	399	n/a	399	10.42	n/a	10.42	44.6%											
113 - 108	472	n/a	472	11.03	n/a	11.03	56.7%											
108 - 104.75	524	n/a	524	11.42	n/a	11.42	64.8%											
104.75 - 104.5	528	619	1148	11.45	12.00	23.45	34.9%											37.8%
104.5 - 99.5	616	681	1298	12.05	12.00	24.05	42.3%											45.8%
99.5 - 98.75	630	691	1321	12.14	12.00	24.14	43.7%											47.2%
98.75 - 98.5	635	1497	2132	12.17	25.59	37.77	27.6%						43.8%					29.6%
98.5 - 95	709	1595	2298	12.59	25.59	38.19	31.5%						50.0%					34.0%
95 - 90	1015	1685	2700	17.24	25.59	42.84	34.1%						54.2%					36.8%
90 - 89.25	1037	1707	2744	17.36	25.59	42.96	34.9%						55.3%					37.6%
89.25 - 89	1044	2204	3248	17.40	32.63	50.03	29.8%					39.9%						32.1%
89 - 88.25	1066	2232	3298	17.52	32.63	50.15	30.4%					40.7%						32.8%
88.25 - 88	1073	1433	2506	17.56	20.63	38.19	40.5%					54.2%						
88 - 83	1227	1556	2783	18.37	20.63	38.99	45.4%					60.6%						
83 - 78	1395	1684	3079	19.17	20.63	39.79	49.8%					66.4%						
78 - 77	1431	1710	3141	19.33	20.63	39.96	50.7%					67.5%						
77 - 76.75	1440	2689	4128	19.37	32.63	52.00	38.9%					51.8%					41.7%	
76.75 - 71.75	1626	2901	4527	20.17	32.63	52.80	42.1%					56.0%					45.1%	
71.75 - 66.75	1828	3121	4949	20.98	32.63	53.60	45.1%					59.8%					48.2%	
66.75 - 61.75	2046	3349	5395	21.78	32.63	54.40	47.8%					63.3%					51.0%	
61.75 - 60.5	2103	3407	5511	21.98	32.63	54.60	48.4%					64.1%					51.7%	
60.5 - 60.25	2115	3419	5534	22.02	32.63	54.65	48.6%					64.3%				51.8%		
60.25 - 59.5	2150	3454	5604	22.14	32.63	54.77	48.9%					64.8%				52.2%		
59.5 - 59.25	2162	3932	6094	22.18	36.84	59.02	45.3%				57.1%					48.4%		
59.25 - 54.25	2405	4203	6608	22.98	36.84	59.83	47.7%				59.9%					50.8%		
54.25 - 50	2626	4441	7067	23.67	36.84	60.51	49.6%				62.3%					52.8%		
50 - 45	3431	4585	8016	30.02	36.84	66.87	48.5%				60.8%					51.6%		
45 - 40	3787	4879	8666	31.03	36.84	67.87	50.3%				63.0%					53.5%		
40 - 39	3861	4939	8800	31.23	36.84	68.07	50.6%				63.5%					53.8%		
39 - 38.75	3880	4966	8847	31.28	40.84	72.12	51.8%				63.5%				45.9%	51.4%		
38.75 - 34	4247	5257	9503	32.24	40.84	73.08	53.5%				65.5%				47.4%	53.1%		
34 - 33.75	4274	4879	9152	32.29	36.84	69.13	57.2%				70.0%			56.2%	54.2%			
33.75 - 29.75	4601	5111	9712	33.09	36.84	69.93	58.6%				71.7%			57.6%	55.6%			
29.75 - 29.5	4622	5271	9893	33.14	37.78	70.92	67.8%	70.1%		67.5%				58.8%	54.9%			
29.5 - 24.5	5055	5578	10634	34.15	37.78	71.93	59.5%	72.0%		69.4%				58.4%	56.5%			
24.5 - 19.5	5515	5894	11409	35.15	37.78	72.93	61.0%	73.8%		71.2%				60.0%	58.0%			
19.5 - 14.5	6002	6219	12221	36.16	37.78	73.94	62.5%	75.6%		72.9%				61.4%	59.4%			
14.5 - 12.5	6204	6351	12555	36.56	37.78	74.34	63.1%	76.2%		73.5%				62.0%	60.0%			
12.5 - 12.25	6221	4705	10926	36.61	25.78	62.39	69.7%	86.1%		86.1%								
12.25 - 10.75	6376	4779	11155	36.91	25.78	62.69	70.1%	86.6%		86.6%								
10.75 - 10.5	6437	6287	12724	36.96	34.38	71.34	66.1%	79.8%	71.0%									
10.5 - 5.5	6975	6617	13592	37.97	34.38	72.34	67.7%	81.4%	72.6%									
5.5 - 0.5	7543	6955	14498	38.97	34.38	73.35	69.9%	83.0%	74.0%									
0.5 - 0	7602	6989	14591	39.07	34.38	73.45	70.2%	83.1%	74.2%									

Note: Section capacity checked in 5 degree increments.

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#: *876317*
Site Name: *WATERBURY*
App #: *362370 Rev. 0*

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:	55.16	in

Plate Data		
Diam:	61.16	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	10.50	in

Stiffener Data (Welding at both sides)		
Config:	3	*
Weld Type:	Both	
Groove Depth:	0.3125	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	11	in
Height:	21.5	in
Thick:	0.625	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	80	ksi
Clear Space between Stiffeners (b):	7.5	in

Pole Data		
Diam:	39.2	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	2305	ft-kips
Axial, Pu:	40	kips
Shear, Vu:	26	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

		Stiffened
Max Rod (Cu+ Vu/ή):	174.8 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	67.2% **Pass**	

Base Plate Results Flexural Check

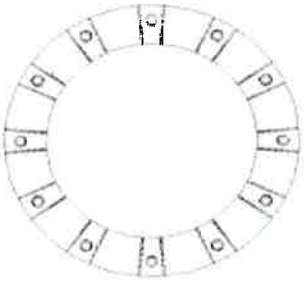
		Stiffened
Base Plate Stress:	14.8 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	27.5% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	29.4% **Pass**
Vertical Weld:	38.1% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	15.8% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	31.0% **Pass**
Plate Comp. (AISC Bracket):	45.3% **Pass**

Pole Results

Pole Punching Shear Check:	13.7% **Pass**



* 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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *876317*
Site Name: *WATERBURY*
App #: *362370 Rev. 0*

Loads Already Factored		
For P (DL)	1.2	<----Disregard
For P,V, and M (WL)	1.35	<----Disregard

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	12	in
Pad Bearing Depth, D:	6.75	ft
Pad Thickness, T:	6.75	ft
Pad Width=Length, L:	20	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	6.5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	42.25	ft^2
Pier Height:	1.00	ft
Soil (above pad) Height:	0.00	ft

Soil Parameters		
Unit Weight, γ:	135.0	pcf
Ultimate Bearing Capacity, qn:	30.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	40.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	22.50	ksf
Passive Pres. Coeff., Kp	4.60	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	26.0	kips
Pad Force Location Above D:	2.25	ft
ϕ(Passive Pressure Moment):	58.50	ft-kips
Factored O.T. M(WL), "1.6W":	1846.5	ft-kips
Factored OT (MW-Msoil), M1	1788.00	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	411.3	kips
Unfactored (Total ftg-soil Wt):	411.34	kips
1.2D. **No Soil Wedges.**	533.61	kips
0.9D. **With Soil Wedges**	400.20	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	G	<--Pull Down
Factored DL Axial, PDu:	40	kips
Factored WL Axial, PWu:	0	kips
Factored WL Shear, Vu:	26	kips
Factored WL Moment, Mu:	1645	ft-kips

Load Factor	Shaft Factored Loads		
1.00	1.2D+1.6W, Pu:	40	kips
0.90	0.9D+1.6W, Pu:	30	kips
1.00	Vu:	26	kips
	Mu:	1645	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	533.61	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	1788.00	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	3.35	ft
Orthogonal qu=	2.23	ksf
qu/ϕ*qn Ratio=	**9.90%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	2.37	ft
Diagonal qu=	2.29	ksf
qu/ϕ*qn Ratio=	**10.18%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	400.20	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	1788.00	ft-kips

Orthogonal ecc3 = M2/P2 =	4.47	ft
Ortho Non Bearing Length,NBL=	8.94	ft
Orthogonal qu=	1.89	ksf
Diagonal qu=	2.14	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	1645.00		
M Orthogonal:	3681.08	**44.69%**	**Pass**
M Diagonal:	3681.08	**44.69%**	**Pass**

Project Name:	WATERBURY	JACOBS® Jacobs Engineering Group, Inc.	Created On: 6/3/2014
Project Number:	BU#876317		Checked By: DW
Job Number:	WO#1304365		Revised On: 3/4/2015
Date:	9/29/2016		Revision No.: 1.6

Monopole Pad & Pier Foundation

Foundation Parameters

Load		
Code	G	
Axial	40	kips
Shear	26	kips
Moment	2305	k-ft
Soil Unit Weight	135	pcf
Friction Angle	40	
Cohesion	0	psf

Material		
Concrete Strength (F'c)	4000	psi
Concrete Density	150	pcf
Rebar Tensile (Fy)	60	ksi
Clear Cover	3	in

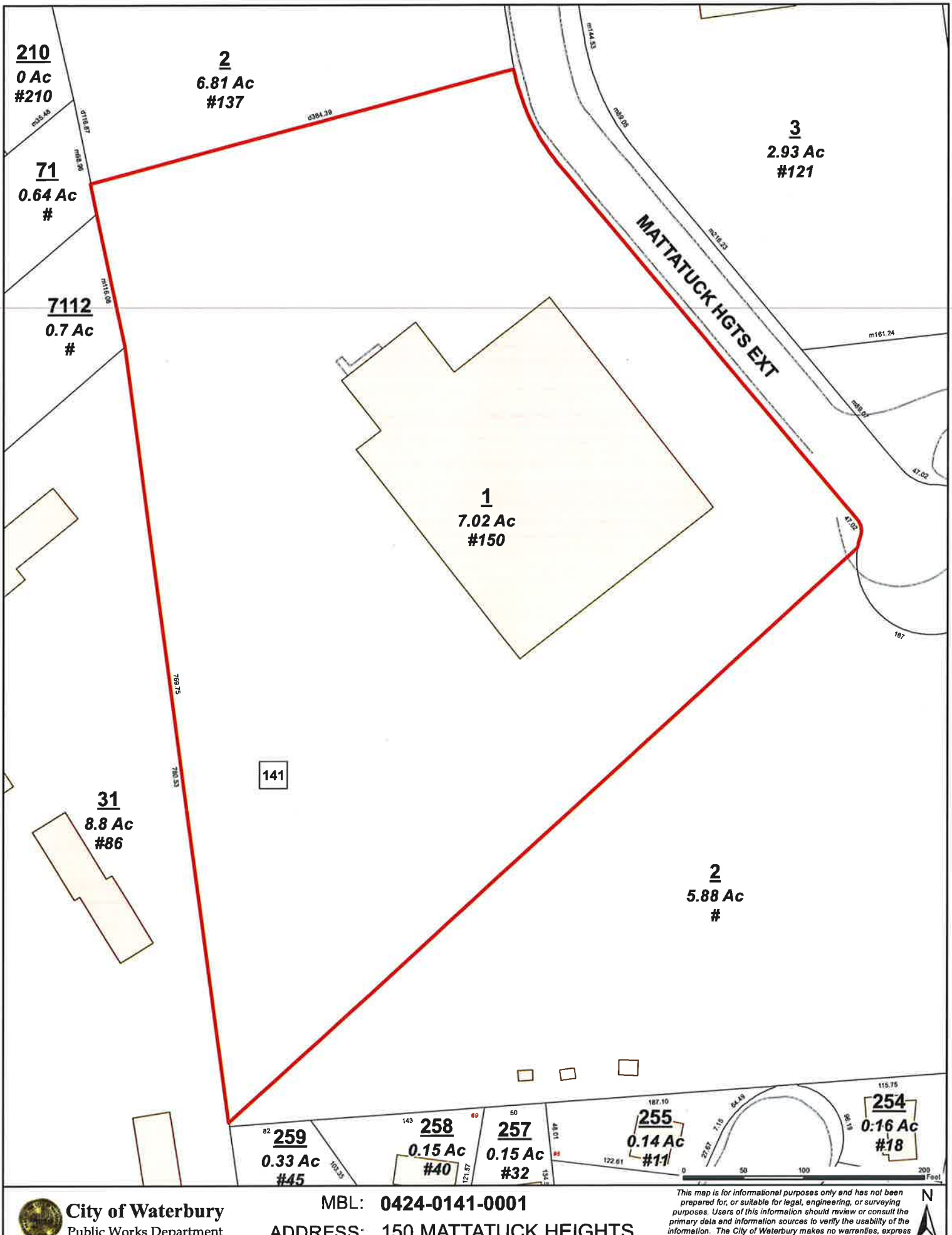
Pad		
Thickness	6.75	ft
Bearing Depth	6.75	ft
Width	20	ft
Rebar Size	10	
Rebar Quantity	21	

Structural Checks

Pad Beam Shear Capacity	1732.6	kips
Pad Beam Shear	166.1	kips
Pad Beam Shear Check	9.6%	Pass

Pad Bending Moment Capacity	9014.9	k-ft
Pad Bending Moment	1233.3	k-ft
Pad Bending Moment Check	13.7%	Pass

ATTACHMENT 4



City of Waterbury
Public Works Department

MBL: **0424-0141-0001**

ADDRESS: 150 MATTATUCK HEIGHTS

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Location: 150 MATTATUCK HEIGHTS **Owner:** WATERBURY TWIN LLC & 150 MH LLC

Property Information:			
Map Block Lot:	0424-0141-0001	**Acres:**	7.02
Primary Use:	Industrial - Flex	**Zone:**	IP
Neighborhood:	85000-Industrial Park	**Vol/Page:**	4647
Mailing Address:	WATERBURY TWIN LLC & 150 MH LLC 12 ISELIN TERRACE LARCHMONT NY 10538		

Property Values:		
	Appraised Value	**Assessed Value (70%)**
Building	1524049	1066830
Land	287048	200940
OutBuilding	88903	62230
Total	1900000	1330000

Building Information:			
Bldg Style:		**Living Area:**	48248sq.ft
Construction:	Average	**Year Built:**	1988
Exterior Wall:	Brick Solid	**Stories:**	1
Roof Cover:		**Heating:**	Package Unit
Condition:	Average	**Heat Fuel:**	
Rooms:	0	**Bedrooms:**	0
Full Baths:	0	**Half Baths:**	0

Outbuilding Information:			
Type	**Area (sq.ft)**	**Year Built**	**Condition**
Tanks Tanks	1sq.ft	1996	Average
Concrete Paving	390sq.ft	1996	Average
Concrete Paving	40sq.ft	1988	Average
Concrete Paving	40sq.ft	1988	Average
Asphalt Paving	46096sq.ft	1988	Average

Close