

April 4, 2017

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

Re: **Notice of Exempt Modification – Facility Modification  
1 Public Works Drive, East Hampton, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 160-foot level of an existing 180-foot tower at 1 Public Works Drive in East Hampton, Connecticut (the “Property”). The tower is owned by Crown Castle (“Crown”). The Council approved Cellco’s use of this tower in 2015 (PE1133-VER-20150806). Cellco now intends to replace its nine (9) remote radio heads (“RRHs”) with nine (9) newer model RRHs behind its existing antennas. Included in Attachment 1 are specifications for Cellco’s new 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 Michael Maniscalco, Town Manager of the Town of East Hampton; Jeremy DeCarli, East Hampton Planning and Zoning Official; and Crown, the tower owner. The Town of East Hampton is the Property 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 replacement RRHs will be installed behind Cellco’s antennas on its existing platform at the 160-foot level on the tower.

# Robinson+Cole

Melanie A. Bachman, Esq.  
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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 installation of new RRHs 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 East Hampton 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:

Michael Maniscalco, East Hampton Town Manager  
Jeremy DeCarli, East Hampton Planning and Zoning Official  
Crown Castle  
Tim Parks

# **ATTACHMENT 1**

# ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

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

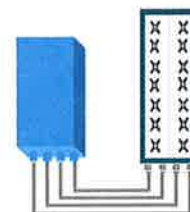


## FEATURES

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

## BENEFITS

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



4x30W with 4T4R  
or  
2x60W with 2T4R

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

## TECHNICAL SPECIFICATIONS

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

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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.

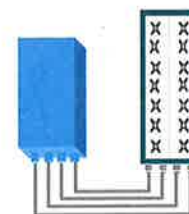


## FEATURES

- 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

## TECHNICAL SPECIFICATIONS

Features & performance	
<b>Number of TX/RX paths</b>	4 duplexed (either 4T4R or 2T4R by SW)
<b>Frequency band</b>	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
<b>Instantaneous bandwidth - #carriers</b>	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
<b>LTE carrier bandwidth</b>	3, 5, 10, 15 or 20 MHz
<b>RF output power</b>	2x60W or 4x30W (by SW)
<b>Noise figure (3GPP band 2)</b>	2.0 dB typ. (<2.5 dB max)
<b>RX Diversity scheme</b>	2 or 4 way Rx diversity
<b>Sizes (HxWxD)(w/ solar shield) in mm (in.)</b>	538 x 304 x 182 (21.2" x 12.0" x 7.2")
<b>Volume (w/ solar shield) in L</b>	30
<b>Weight (w/ solar shield) in kg (lb)</b>	24 (53)
<b>DC voltage range</b>	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
<b>DC power consumption</b>	580W typical @100% RF load
<b>Environmental conditions</b>	-40°C (-40°F) / +55°C (+131°F) IP65
<b>Wind load (@150km/h or 93mph)</b>	Frontal: <200N / Lateral : <150N
<b>Antenna ports</b>	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5 (> 14dB)
<b>CPRI ports</b>	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
<b>AISG interfaces</b>	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
<b>Misc. Interfaces</b>	1 external alarms connector (4 alarms) 4 RF Tx & 4 RF Rx monitor ports 1 DC connector (2 pins)
<b>Installation conditions</b>	Pole and wall mounting
<b>Regulatory compliance</b>	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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B25 RRH4x30

ALCATEL-LUCENT DATA SHEET REV1.1 – JANUARY 2015

# 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.

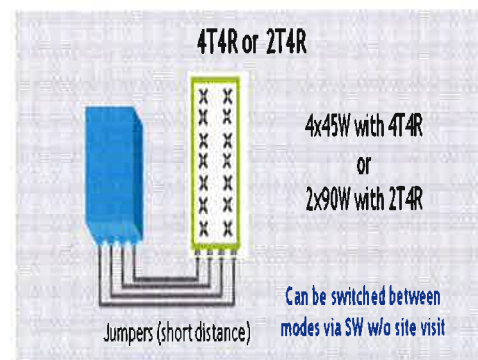
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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





## TECHNICAL SPECIFICATIONS

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

Site Name: East Hampton 3 Tower Height: 180'		General		Power		Density					
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total			
*Sprint	11	397	180	1962.5	0.0519	1.0000	0.52%				
*Town (PD-455)			125	453.637	0.0001	0.3024	0.00%				
*Town (Austin APC)			125	46.18	0.0028	0.2000	0.14%				
*AT&T	2	565	170	880	0.0151	0.5867	0.26%				
*AT&T	2	875	170	1900	0.0234	1.0000	0.23%				
*AT&T	1	283	170	880	0.0038	0.5867	0.06%				
*AT&T	4	525	170	1900	0.0281	1.0000	0.28%				
*AT&T	1	1313	170	734	0.0176	0.4893	0.36%				
*Nextel	12	100	151	851	0.0205	0.5673	0.36%				
Verizon	1	5000	160	0.0702	1970	1.0000	7.02%				
Verizon	9	389	160	0.0492	869	0.5793	8.49%				
Verizon	1	7400	160	0.1039	2145	1.0000	10.39%				
Verizon	1	2200	160	0.0309	746	0.4973	6.21%				
											34.3%
* Source: Siting Council											

# **ATTACHMENT 3**



February 16, 2017

Charles Trask  
Crown Castle  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277  
(980) 209-8228

B+T Group  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
btwo@btgrp.com

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Carrier Site Number:** 300025  
**Carrier Site Name:** Esat Hampton 3 CT

**Crown Castle Designation:** **Crown Castle BU Number:** 876368  
**Crown Castle Site Name:** Yankee Lake/East Hampton/Town  
**Crown Castle JDE Job Number:** 424262  
**Crown Castle Work Order Number:** 1362790  
**Crown Castle Application Number:** 378458 Rev. 0

**Engineering Firm Designation:** **B+T Group Project Number:** 79761.003.01

**Site Data:** **1 Public Works Dr., East Hampton, Middlesex County, CT**  
**Latitude 41° 33' 53.14", Longitude -72° 32' 35.18"**  
**180 Foot - Monopole Tower**

Dear Charles Trask,

B+T Group 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 1002207, in accordance with application 378458, 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 1 and Table 2 for the proposed and existing/reserved loading, respectively.

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

All 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 B+T Group appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:  
B+T Engineering, Inc.

Jason Brock, E.I.  
Project Engineer

Scott S. Vance, P.E.  
Engineer of Record  
COA: PEC.0001564 Expires: 02/10/2018



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tnxTower Output

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## 1) INTRODUCTION

This tower is a 180 ft. Monopole tower designed by Valmont in December of 1999. The tower was originally designed for a wind speed of 100 mph per TIA/EIA-222-F.

## 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 101 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
154.0	157.0	3	Alcatel Lucent	B13 RRH 4X30	--	--	--
		3	Alcatel Lucent	B25 RRH4X30			
		3	Alcatel Lucent	B66A RRH4X45			

**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
177.0	178.0	3	Rfs Celwave	APXVSP18-C-A20	6	5/16	2
		3	Rfs Celwave	FD9R6004/1C-3L			
	177.0	1	--	Platform Mount [LP 601-1]	6	1-5/8	1
168.0	170.0	3	Ericsson	RRUS 11 B12	12	1-5/8	1
		3	KMW	AM-X-CD-16-65-00T-RET			
		6	Powerwave Tech.	7770.00			
		6	Powerwave Tech.	LGP21401			
		6	Powerwave Tech.	LGP21901			
		1	Raycap	DC6-48-60-18-8F			
	168.0	1	--	Platform Mount [LP 303-1]			
154.0	157.0	3	Alcatel Lucent	RRH2X40-07-U	2	1-5/8	1
		3	Alcatel Lucent	RRH2X60-AWS			
		3	Alcatel Lucent	RRH2X60-PCS			
		6	Commscope	HBXX-6517DS-A2M			
		6	Commscope	LNx-6515DS-A1M			
	2	Rfs Celwave	DB-T1-6Z-8AB-0Z				
154.0	1	--	Platform Mount [LP 304-1]				
119.0	131.0	5	Decibel	DB264-A	9	1-1/4	1
	128.0	1	Decibel	DB420			
	124.0	1	Decibel	DB225-K			
	122.0	1	Decibel	DB230-E			
	120.0	1	Decibel	DB230-E			
	119.0	1	--	Platform Mount [LP 304-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
77.0	78.0	1	Lucent	KS24019-L112A	1	1/2	1
	77.0	1	--	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)
177	177	12	Dapa	48000	--	--
		1	Valmont	Platform W/ Rails		
167	167	12	Dapa	48000	--	--
		1	Valmont	Platform W/ Rails		
157	157	12	Dapa	48000	--	--
		1	Valmont	Platform W/ Rails		
147	147	12	Dapa	48000	--	--
		1	Valmont	Platform W/ Rails		
127	127	1	Generic	Whip Antenna	--	--
125	125	1	Generic	Low Profile Platform	--	--
75	75	1	Generic	GPS	--	--

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate Revision # 0	378458	CCI Sites
Tower Manufacturer Drawing	Valmont, Order No. 19739-83	1531979	CCI Sites
Foundation Drawing	Valmont, Order No. 19739-83	2069183	CCI Sites
Geotech Report	Dr. Clarence Welti, P.E., P.C., Date: 01/06/2003	1441254	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 02/13/2017	CCI Sites

#### 3.1) Analysis Method

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



### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Mount areas and weights are assumed based on photographs provided.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 140.083	Pole	TP31.67x24.16x0.219	1	-9.805	1402.890	38.0	Pass
L2	140.083 - 92.5	Pole	TP40.17x30.307x0.344	2	-21.066	3026.680	54.1	Pass
L3	92.5 - 45.5833	Pole	TP48.31x38.355x0.438	3	-35.327	4716.500	56.3	Pass
L4	45.5833 - 0	Pole	TP56x46.134x0.5	4	-57.076	6342.060	58.2	Pass
							Summary	
						Pole (L4)	58.2	Pass
						Rating =	58.2	Pass

**Table 6 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	51.2	Pass
1	Base Plate	Base	37.5	Pass
1	Base Foundation(Structure)	Base	46.4	Pass
1	Base Foundation (Soil Interaction)	Base	46.7	Pass

<b>Structure Rating (max from all components) =</b>	<b>58.2%</b>
-----------------------------------------------------	--------------

Notes:

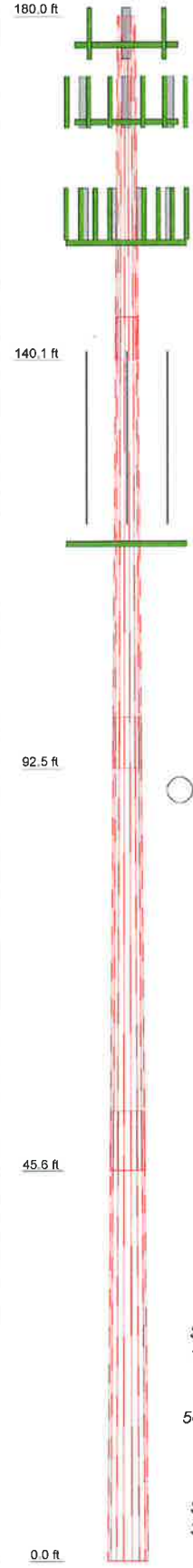
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

### 4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the final load configuration. No modifications are required at this time.

**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	39'11"	16	0.219	4'11"	24.160	31.670	A572-65	2.6
2	52'6"	16	0.344	6'	30.307	40.170	A572-65	6.8
3	52'11"	16	0.438	6'11"	38.355	48.310	A572-65	10.8
4	52'6"	16	0.500	46.134	56.000		A572-65	14.4
								34.5



**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe (R)	177	(2) LNX-6515DS-A1M w/ Mount Pipe (E)	154
APXVSPP18-C-A20 w/ Mount Pipe (R)	177	(2) LNX-6515DS-A1M w/ Mount Pipe (E)	154
APXVSPP18-C-A20 w/ Mount Pipe (R)	177	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	154
FD9R6004/1C-3L (R)	177	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	154
FD9R6004/1C-3L (R)	177	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	154
FD9R6004/1C-3L (R)	177	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	154
(2) 7' x 2" Pipe Mount (E)	177	(2) DB-T1-6Z-8AB-0Z (E)	154
(2) 7' x 2" Pipe Mount (E)	177	B13 RRH 4X30 (P)	154
(2) 7' x 2" Pipe Mount (E)	177	B13 RRH 4X30 (P)	154
Platform Mount [LP 601-1] (E)	177	B13 RRH 4X30 (P)	154
(2) 7770.00 w/ Mount Pipe (E)	168	B25 RRH4X30 (P)	154
(2) 7770.00 w/ Mount Pipe (E)	168	B25 RRH4X30 (P)	154
(2) 7770.00 w/ Mount Pipe (E)	168	B25 RRH4X30 (P)	154
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	168	B66A RRH4X45 (P)	154
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	168	B66A RRH4X45 (P)	154
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	168	B66A RRH4X45 (P)	154
(2) LGP21401 (E)	168	Platform Mount [LP 304-1] (E)	154
(2) LGP21401 (E)	168	DB225-K (E)	119
(2) LGP21401 (E)	168	(2) DB264-A (E)	119
DC6-48-60-18-8F (E)	168	DB264-A (E)	119
RRUS 11 B12 (E)	168	(2) DB264-A (E)	119
RRUS 11 B12 (E)	168	DB230-E (E)	119
RRUS 11 B12 (E)	168	DB230-E (E)	119
(2) LGP21901 (E)	168	DB420 (E)	119
(2) LGP21901 (E)	168	(3) 5' x 2" Pipe Mount (E)	119
(2) LGP21901 (E)	168	(4) 5' x 2" Pipe Mount (E)	119
8' x 2" Pipe Mount (E)	168	(3) 5' x 2" Pipe Mount (E)	119
8' x 2" Pipe Mount (E)	168	Platform Mount [LP 304-1] (E)	119
8' x 2" Pipe Mount (E)	168	KS24019-L112A (E)	77
4' x 2" Pipe Mount (E)	168	Side Arm Mount [SO 701-1] (E)	77
Platform Mount [LP 303-1] (E)	168		
(2) LNX-6515DS-A1M w/ Mount Pipe (E)	154		

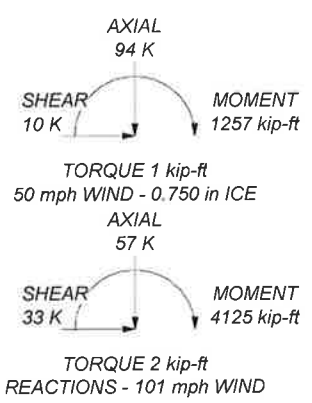
**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 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'
8. TOWER RATING: 58.2%

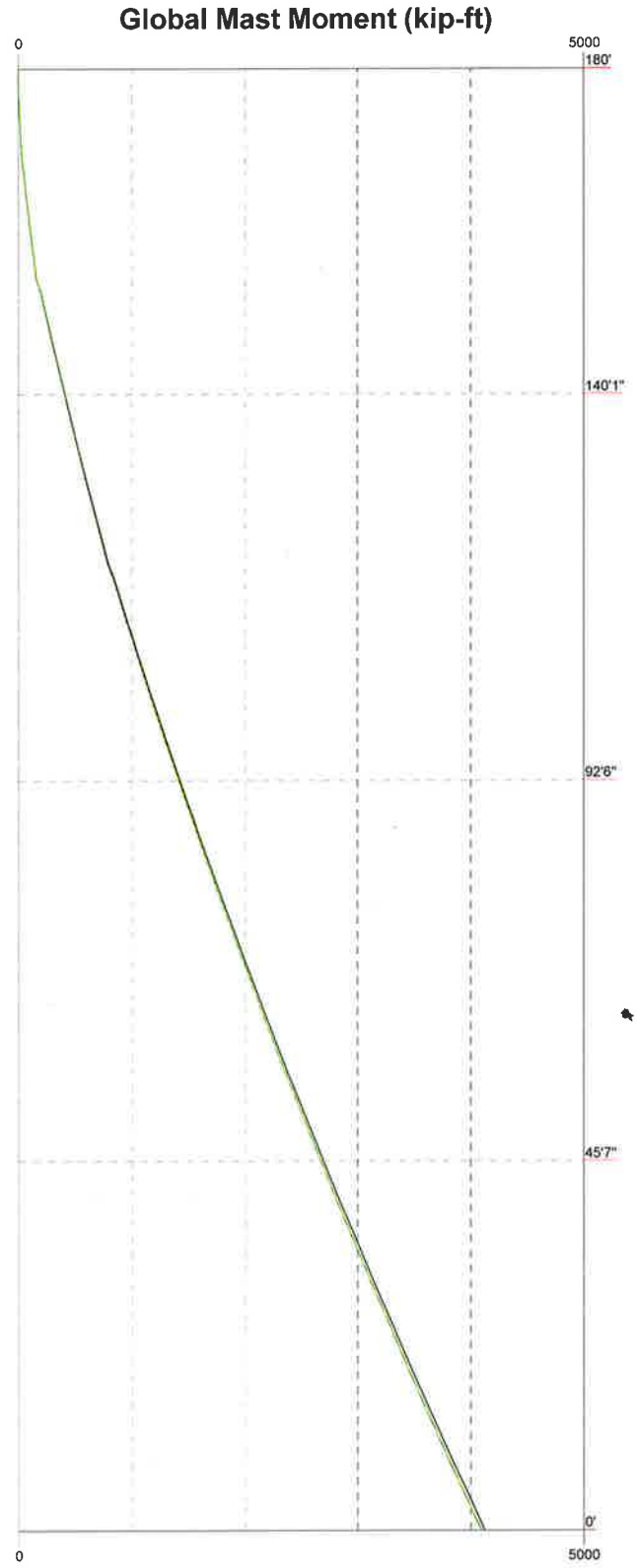
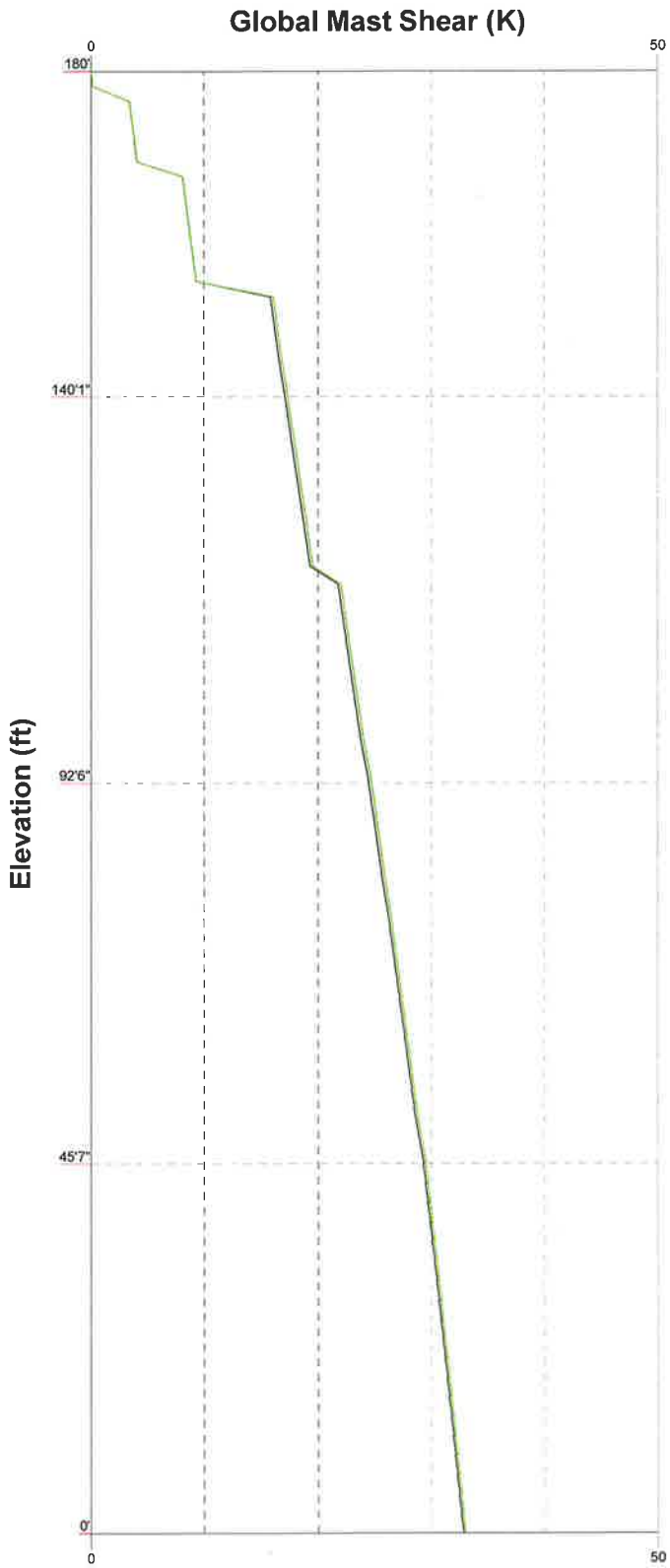
ALL REACTIONS ARE FACTORED




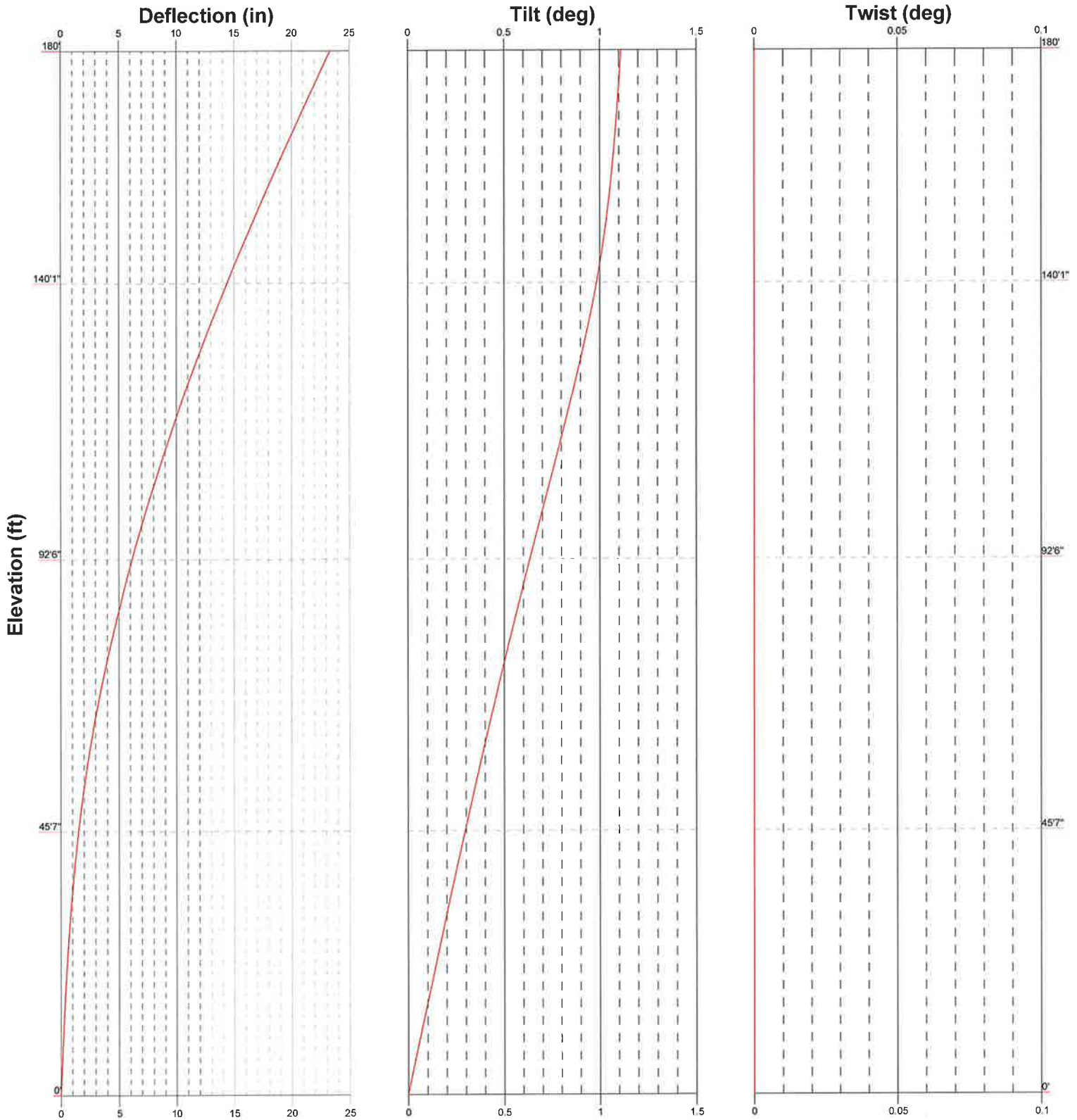
<p><b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<b>Job: 79761.003.01 - YANKEE LAKE EAST HAMPTON TOWN, CT (BU# 876)</b>		
	<b>Project:</b>	<b>Client: Crown Castle</b>	
	<b>Code: TIA-222-G</b>	<b>Drawn by: Pavan Pai</b>	<b>App'd:</b>
	<b>Path:</b>	<b>Date: 02/15/17</b>	<b>Scale: NTS</b>
			<b>Dwg No E-1</b>

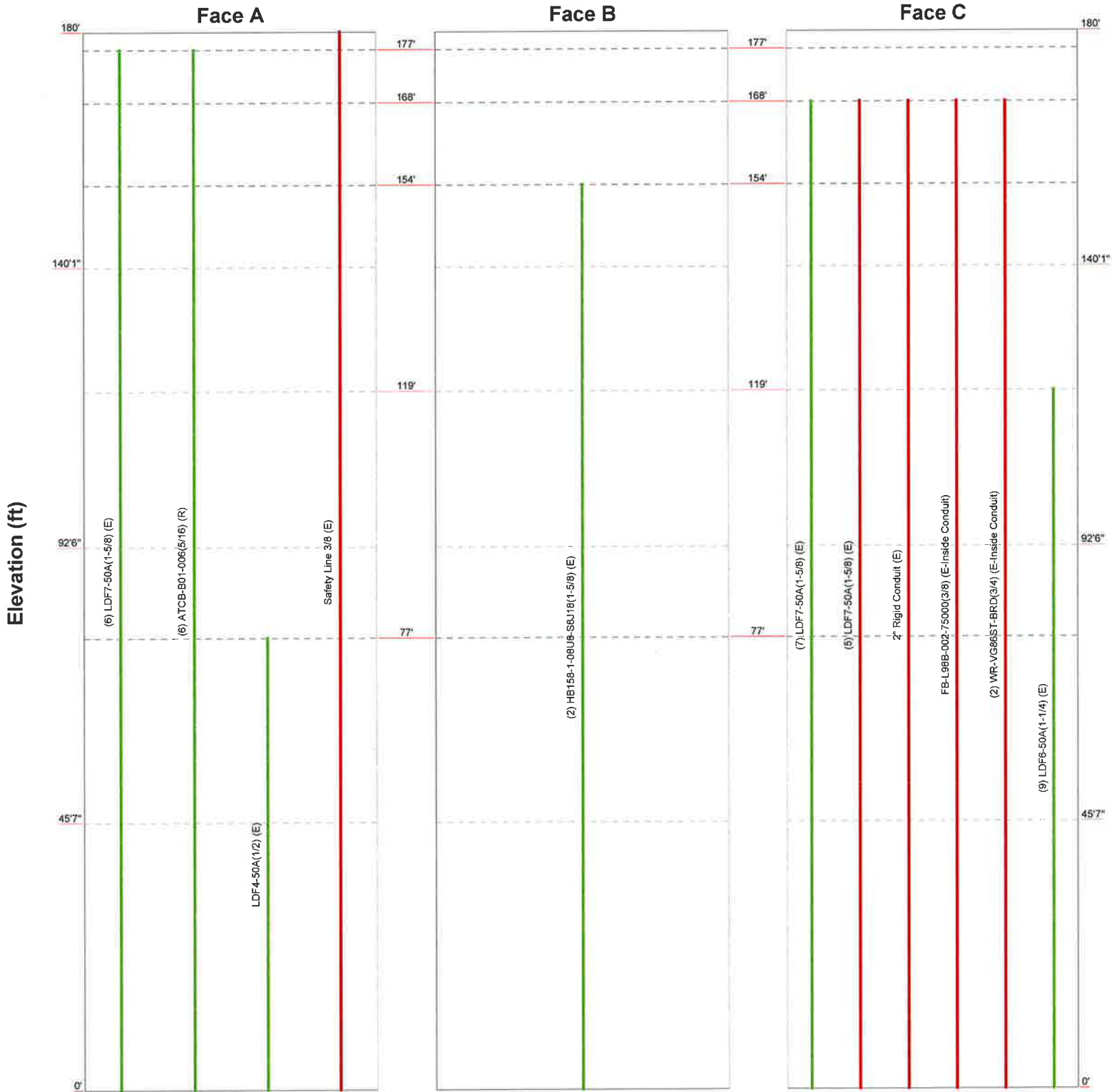
Vx Vz

Mx Mz



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	Project:		
	Client: Crown Castle	Drawn by: Pavan Pai	App'd:
	Code: TIA-222-G	Date: 02/15/17	Scale: NTS
	Path:		Dwg No: E-4





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	<p>Project:</p>		
	<p>Client: Crown Castle</p>	<p>Drawn by: Pavan Pai</p>	<p>App'd:</p>
	<p>Code: TIA-222-G</p>	<p>Date: 02/15/17</p>	<p>Scale: NTS</p>
	<p>Path:</p>	<p>Dwg No E-7</p>	

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	<b>Project</b>	<b>Date</b> 12:58:52 02/15/17
	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

## 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 Middlesex County, Connecticut.

Basic wind speed of 101 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0'.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50.000 °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

<ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul>	<ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> </ul>	<ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-G Bracing Resist. Exemption</li> <li>Use TIA-222-G Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul>
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## Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	180'-140'1"	39'11"	4'11"	16	24.160	31.670	0.219	0.875	A572-65 (65 ksi)
L2	140'1"-92'6"	52'6"	6'	16	30.307	40.170	0.344	1.375	A572-65 (65 ksi)

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	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

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	92'6"-45'7"	52'11"	6'11"	16	38.355	48.310	0.438	1.750	A572-65 (65 ksi)
L4	45'7"-0'	52'6"		16	46.134	56.000	0.500	2.000	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	24.633	16.707	1209.744	8.523	12.322	98.181	2437.806	8.260	4.373	19.989
	32.290	21.947	2742.628	11.197	16.152	169.804	5526.782	10.852	5.867	26.821
L2	31.843	32.857	3726.790	10.667	15.457	241.110	7510.008	16.246	5.347	15.555
	40.957	43.672	8750.966	14.178	20.487	427.154	17634.432	21.593	7.310	21.265
L3	40.258	52.919	9612.013	13.499	19.561	491.381	19369.564	26.166	6.762	15.456
	49.256	66.812	19343.784	17.043	24.638	785.117	38980.456	33.035	8.743	19.984
L4	48.363	72.786	19148.561	16.246	23.528	813.854	38587.056	35.989	8.186	16.371
	57.097	88.522	34447.206	19.758	28.560	1206.135	69415.984	43.770	10.149	20.298

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180'-140'1"				1	1	1			
L2 140'1"-92'6"				1	1	1			
L3 92'6"-45'7"				1	1	1			
L4 45'7"-0'				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 klf
LDF7-50A(1-5/8) (E)	C	Surface Ar (CaAa)	168' - 0'	5	5	0.150 0.400	1.980		0.001
2" Rigid Conduit (E)	C	Surface Ar (CaAa)	168' - 0'	1	1	0.410 0.450	2.000		0.003
FB-L98B-002-75000(3/8) (E-Inside Conduit)	C	Surface Ar (CaAa)	168' - 0'	1	1	0.410 0.450	0.000		0.000
WR-VG86ST-BRD(3/4) (E-Inside Conduit)	C	Surface Ar (CaAa)	168' - 0'	2	2	0.410 0.450	0.000		0.001
**/>*** Safety Line 3/8 (E)	A	Surface Ar (CaAa)	180' - 0'	1	1	-0.310 -0.300	0.375		0.000
**/>***									

### Feed Line/Linear Appurtenances - Entered As Area



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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>1</sub>		Weight klf
							ft <sup>2</sup> /ft	
LDF7-50A(1-5/8) (E)	A	No	Inside Pole	177' - 0'	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
ATCB-B01-006(5/16) (R)	A	No	Inside Pole	177' - 0'	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
**/>***								
LDF7-50A(1-5/8) (E)	C	No	Inside Pole	168' - 0'	7	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
**/>***								
HB158-1-08U8-S8J18(1-5/8) (E)	B	No	Inside Pole	154' - 0'	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
**/>***								
LDF6-50A(1-1/4) (E)	C	No	Inside Pole	119' - 0'	9	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
**/>***								
LDF4-50A(1/2) (E)	A	No	Inside Pole	77' - 0'	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
**/>***								

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>1</sub> In Face	C <sub>A</sub> A <sub>1</sub> Out Face	Weight K
			ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	
L1	180'-140'1"	A	0.000	0.000	1.497	0.000	0.205
		B	0.000	0.000	0.000	0.000	0.036
		C	0.000	0.000	33.221	0.000	0.387
L2	140'1"-92'6"	A	0.000	0.000	1.784	0.000	0.264
		B	0.000	0.000	0.000	0.000	0.124
		C	0.000	0.000	56.624	0.000	0.803
L3	92'6"-45'7"	A	0.000	0.000	1.759	0.000	0.265
		B	0.000	0.000	0.000	0.000	0.122
		C	0.000	0.000	55.831	0.000	0.904
L4	45'7"-0'	A	0.000	0.000	1.709	0.000	0.260
		B	0.000	0.000	0.000	0.000	0.119
		C	0.000	0.000	54.244	0.000	0.878

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>1</sub> In Face	C <sub>A</sub> A <sub>1</sub> Out Face	Weight K
				ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	
L1	180'-140'1"	A	1.756	0.000	0.000	15.514	0.000	0.388
		B		0.000	0.000	0.000	0.000	0.036
		C		0.000	0.000	84.244	0.000	1.384
L2	140'1"-92'6"	A	1.700	0.000	0.000	18.493	0.000	0.481
		B		0.000	0.000	0.000	0.000	0.124
		C		0.000	0.000	143.592	0.000	2.503
L3	92'6"-45'7"	A	1.614	0.000	0.000	17.715	0.000	0.467
		B		0.000	0.000	0.000	0.000	0.122

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L4	45'7"-0"	C	1.443	0.000	0.000	139.242	0.000	2.508
		A		0.000	0.000	16.428	0.000	0.439
		B		0.000	0.000	0.000	0.000	0.119
		C		0.000	0.000	131.758	0.000	2.330

### Feed Line Center of Pressure

Section	Elevation ft	$CP_X$ in	$CP_Z$ in	$CP_X$ Ice in	$CP_Z$ Ice in
L1	180'-140'1"	-0.623	0.803	-1.107	1.033
L2	140'1"-92'6"	-0.809	1.060	-1.380	1.352
L3	92'6"-45'7"	-0.847	1.109	-1.536	1.510
L4	45'7"-0"	-0.874	1.145	-1.646	1.629

### Shielding Factor $K_a$

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L1	5	LDF7-50A(1-5/8)	140.08 - 168.00	1.0000	1.0000
L1	6	2" Rigid Conduit	140.08 - 168.00	1.0000	1.0000
L1	7	FB-L98B-002-75000(3/8)	140.08 - 168.00	1.0000	1.0000
L1	8	WR-VG86ST-BRD(3/4)	140.08 - 168.00	1.0000	1.0000
L1	16	Safety Line 3/8	140.08 - 180.00	1.0000	1.0000
L2	5	LDF7-50A(1-5/8)	92.50 - 140.08	1.0000	1.0000
L2	6	2" Rigid Conduit	92.50 - 140.08	1.0000	1.0000
L2	7	FB-L98B-002-75000(3/8)	92.50 - 140.08	1.0000	1.0000
L2	8	WR-VG86ST-BRD(3/4)	92.50 - 140.08	1.0000	1.0000
L2	16	Safety Line 3/8	92.50 - 140.08	1.0000	1.0000
L3	5	LDF7-50A(1-5/8)	45.58 - 92.50	1.0000	1.0000
L3	6	2" Rigid Conduit	45.58 - 92.50	1.0000	1.0000
L3	7	FB-L98B-002-75000(3/8)	45.58 - 92.50	1.0000	1.0000
L3	8	WR-VG86ST-BRD(3/4)	45.58 - 92.50	1.0000	1.0000
L3	16	Safety Line 3/8	45.58 - 92.50	1.0000	1.0000

### Discrete Tower Loads

<b>tnxTower</b>  <b>B+T Group</b> 1717 S.Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 79761.003.01 - YANKEE LAKEEAST HAMPTONTOWN, CT (BU# 876368)	<b>Page</b> 5 of 16
	<b>Project</b>	<b>Date</b> 12:58:52 02/15/17
	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub>		Weight K
			Horz ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>	
**/>***									
APXVSP18-C-A20 w/ Mount Pipe (R)	A	From Leg	4.000 0' 1'	0.000	177'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSP18-C-A20 w/ Mount Pipe (R)	B	From Leg	4.000 0' 1'	0.000	177'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSP18-C-A20 w/ Mount Pipe (R)	C	From Leg	4.000 0' 1'	0.000	177'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
FD9R6004/1C-3L (R)	A	From Leg	4.000 0' 1'	0.000	177'	No Ice 1/2" Ice 1" Ice	0.314 0.386 0.466	0.076 0.119 0.169	0.003 0.005 0.008
FD9R6004/1C-3L (R)	B	From Leg	4.000 0' 1'	0.000	177'	No Ice 1/2" Ice 1" Ice	0.314 0.386 0.466	0.076 0.119 0.169	0.003 0.005 0.008
FD9R6004/1C-3L (R)	C	From Leg	4.000 0' 1'	0.000	177'	No Ice 1/2" Ice 1" Ice	0.314 0.386 0.466	0.076 0.119 0.169	0.003 0.005 0.008
(2) 7' x 2" Pipe Mount (E)	A	From Leg	4.000 0' 0'	0.000	177'	No Ice 1/2" Ice 1" Ice	1.663 2.391 2.825	1.663 2.391 2.825	0.026 0.038 0.055
(2) 7' x 2" Pipe Mount (E)	B	From Leg	4.000 0' 0'	0.000	177'	No Ice 1/2" Ice 1" Ice	1.663 2.391 2.825	1.663 2.391 2.825	0.026 0.038 0.055
(2) 7' x 2" Pipe Mount (E)	C	From Leg	4.000 0' 0'	0.000	177'	No Ice 1/2" Ice 1" Ice	1.663 2.391 2.825	1.663 2.391 2.825	0.026 0.038 0.055
Platform Mount [LP 601-1] (E)	C	None		0.000	177'	No Ice 1/2" Ice 1" Ice	28.470 33.590 38.710	28.470 33.590 38.710	1.122 1.514 1.905
**/>***									
(2) 7770.00 w/ Mount Pipe (E)	A	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157
(2) 7770.00 w/ Mount Pipe (E)	B	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157
(2) 7770.00 w/ Mount Pipe (E)	C	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.304 7.479 8.368	0.074 0.139 0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	B	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.304 7.479 8.368	0.074 0.139 0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	C	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.304 7.479 8.368	0.074 0.139 0.212
(2) LGP21401 (E)	A	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	1.104 1.239 1.381	0.207 0.274 0.348	0.014 0.021 0.030
(2) LGP21401 (E)	B	From Leg	4.000 0' 2'	0.000	168'	No Ice 1/2" Ice 1" Ice	1.104 1.239 1.381	0.207 0.274 0.348	0.014 0.021 0.030
(2) LGP21401	C	From Leg	4.000	0.000	168'	No Ice	1.104	0.207	0.014

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	<b>Project</b>	<b>Date</b> 12:58:52 02/15/17
	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
(E)			0'		1/2" Ice	1.239	0.274	0.021
			2'		1" Ice	1.381	0.348	0.030
DC6-48-60-18-8F	A	From Leg	4.000	0.000	168'	No Ice	0.917	0.019
(E)			0'		1/2" Ice	1.458	1.458	0.037
			2'		1" Ice	1.643	1.643	0.057
RRUS 11 B12	A	From Leg	4.000	0.000	168'	No Ice	2.833	1.182
(E)			0'		1/2" Ice	3.043	1.330	0.072
			2'		1" Ice	3.259	1.485	0.095
RRUS 11 B12	B	From Leg	4.000	0.000	168'	No Ice	2.833	1.182
(E)			0'		1/2" Ice	3.043	1.330	0.072
			2'		1" Ice	3.259	1.485	0.095
RRUS 11 B12	C	From Leg	4.000	0.000	168'	No Ice	2.833	1.182
(E)			0'		1/2" Ice	3.043	1.330	0.072
			2'		1" Ice	3.259	1.485	0.095
(2) LGP21901	A	From Leg	4.000	0.000	168'	No Ice	0.231	0.158
(E)			0'		1/2" Ice	0.294	0.213	0.008
			2'		1" Ice	0.365	0.276	0.011
(2) LGP21901	B	From Leg	4.000	0.000	168'	No Ice	0.231	0.158
(E)			0'		1/2" Ice	0.294	0.213	0.008
			2'		1" Ice	0.365	0.276	0.011
(2) LGP21901	C	From Leg	4.000	0.000	168'	No Ice	0.231	0.158
(E)			0'		1/2" Ice	0.294	0.213	0.008
			2'		1" Ice	0.365	0.276	0.011
8' x 2" Pipe Mount	A	From Leg	4.000	0.000	168'	No Ice	1.900	1.900
(E)			0'		1/2" Ice	2.728	2.728	0.044
			2'		1" Ice	3.401	3.401	0.063
8' x 2" Pipe Mount	B	From Leg	4.000	0.000	168'	No Ice	1.900	1.900
(E)			0'		1/2" Ice	2.728	2.728	0.044
			2'		1" Ice	3.401	3.401	0.063
8' x 2" Pipe Mount	C	From Leg	4.000	0.000	168'	No Ice	1.900	1.900
(E)			0'		1/2" Ice	2.728	2.728	0.044
			2'		1" Ice	3.401	3.401	0.063
4' x 2" Pipe Mount	A	From Leg	4.000	0.000	168'	No Ice	0.785	0.785
(E)			0'		1/2" Ice	1.028	1.028	0.035
			2'		1" Ice	1.281	1.281	0.044
Platform Mount [LP 303-1]	C	None		0.000	168'	No Ice	14.660	14.660
(E)					1/2" Ice	18.870	18.870	1.481
					1" Ice	23.080	23.080	1.713
**/>**								
(2) LNX-6515DS-A1M w/	A	From Leg	4.000	0.000	154'	No Ice	11.683	9.842
Mount Pipe			0'		1/2" Ice	12.404	11.366	0.173
(E)			3'		1" Ice	13.135	12.914	0.273
(2) LNX-6515DS-A1M w/	B	From Leg	4.000	0.000	154'	No Ice	11.683	9.842
Mount Pipe			0'		1/2" Ice	12.404	11.366	0.173
(E)			3'		1" Ice	13.135	12.914	0.273
(2) LNX-6515DS-A1M w/	C	From Leg	4.000	0.000	154'	No Ice	11.683	9.842
Mount Pipe			0'		1/2" Ice	12.404	11.366	0.173
(E)			3'		1" Ice	13.135	12.914	0.273
(2) HBXX-6517DS-A2M w/	A	From Leg	4.000	0.000	154'	No Ice	8.765	6.963
Mount Pipe			0'		1/2" Ice	9.342	8.182	0.137
(E)			3'		1" Ice	9.889	9.144	0.215
(2) HBXX-6517DS-A2M w/	B	From Leg	4.000	0.000	154'	No Ice	8.765	6.963
Mount Pipe			0'		1/2" Ice	9.342	8.182	0.137
(E)			3'		1" Ice	9.889	9.144	0.215
(2) HBXX-6517DS-A2M w/	C	From Leg	4.000	0.000	154'	No Ice	8.765	6.963
Mount Pipe			0'		1/2" Ice	9.342	8.182	0.137
(E)			3'		1" Ice	9.889	9.144	0.215

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	<b>Project</b>	<b>Date</b> 12:58:52 02/15/17
	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
(2) DB-T1-6Z-8AB-0Z (E)	A	From Leg	4.000 0' 3'	0.000	154'	No Ice 4.800 1/2" Ice 5.070 1" Ice 5.348	2.000 2.193 2.393	0.044 0.080 0.120
B13 RRH 4X30 (P)	A	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.055 1/2" Ice 2.241 1" Ice 2.433	1.320 1.475 1.638	0.056 0.073 0.093
B13 RRH 4X30 (P)	B	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.055 1/2" Ice 2.241 1" Ice 2.433	1.320 1.475 1.638	0.056 0.073 0.093
B13 RRH 4X30 (P)	C	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.055 1/2" Ice 2.241 1" Ice 2.433	1.320 1.475 1.638	0.056 0.073 0.093
B25 RRH4X30 (P)	A	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.200 1/2" Ice 2.393 1" Ice 2.593	1.742 1.920 2.106	0.055 0.075 0.099
B25 RRH4X30 (P)	B	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.200 1/2" Ice 2.393 1" Ice 2.593	1.742 1.920 2.106	0.055 0.075 0.099
B25 RRH4X30 (P)	C	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.200 1/2" Ice 2.393 1" Ice 2.593	1.742 1.920 2.106	0.055 0.075 0.099
B66A RRH4X45 (P)	A	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.537 1/2" Ice 2.750 1" Ice 2.970	1.610 1.791 1.978	0.057 0.077 0.100
B66A RRH4X45 (P)	B	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.537 1/2" Ice 2.750 1" Ice 2.970	1.610 1.791 1.978	0.057 0.077 0.100
B66A RRH4X45 (P)	C	From Leg	4.000 0' 3'	0.000	154'	No Ice 2.537 1/2" Ice 2.750 1" Ice 2.970	1.610 1.791 1.978	0.057 0.077 0.100
Platform Mount [LP 304-1] (E)	C	None		0.000	154'	No Ice 17.460 1/2" Ice 22.440 1" Ice 27.420	17.460 22.440 27.420	1.349 1.625 1.900
**/>***								
DB225-K (E)	A	From Leg	4.000 0' 5'	0.000	119'	No Ice 0.450 1/2" Ice 0.810 1" Ice 1.170	0.450 0.810 1.170	0.003 0.004 0.005
(2) DB264-A (E)	A	From Leg	4.000 0' 12'	0.000	119'	No Ice 3.160 1/2" Ice 5.688 1" Ice 8.216	3.160 5.688 8.216	0.036 0.047 0.058
DB264-A (E)	B	From Leg	4.000 0' 12'	0.000	119'	No Ice 3.160 1/2" Ice 5.688 1" Ice 8.216	3.160 5.688 8.216	0.036 0.047 0.058
(2) DB264-A (E)	C	From Leg	4.000 0' 12'	0.000	119'	No Ice 3.160 1/2" Ice 5.688 1" Ice 8.216	3.160 5.688 8.216	0.036 0.047 0.058
DB230-E (E)	A	From Leg	4.000 0' 1'	0.000	119'	No Ice 0.500 1/2" Ice 0.900 1" Ice 1.300	0.500 0.900 1.300	0.027 0.035 0.043
DB230-E (E)	A	From Leg	4.000 0' 3'	0.000	119'	No Ice 0.500 1/2" Ice 0.900 1" Ice 1.300	0.500 0.900 1.300	0.027 0.035 0.043
DB420 (E)	B	From Leg	4.000 0' 9'	0.000	119'	No Ice 3.330 1/2" Ice 5.994 1" Ice 8.658	3.330 5.994 8.658	0.034 0.044 0.054
(3) 5' x 2" Pipe Mount (E)	A	From Leg	4.000 0'	0.000	119'	No Ice 1.000 1/2" Ice 1.393	1.000 1.393	0.029 0.037

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	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
(4) 5' x 2" Pipe Mount (E)	B	From Leg	0'	0.000	119'	1" Ice	1.703	1.703	0.048
			4.000			No Ice	1.000	1.000	0.029
			0'			1/2" Ice	1.393	1.393	0.037
(3) 5' x 2" Pipe Mount (E)	C	From Leg	0'	0.000	119'	1" Ice	1.703	1.703	0.048
			4.000			No Ice	1.000	1.000	0.029
			0'			1/2" Ice	1.393	1.393	0.037
Platform Mount [LP 304-1] (E)	C	None	0'	0.000	119'	1" Ice	1.703	1.703	0.048
			4.000			No Ice	17.460	17.460	1.349
			0'			1/2" Ice	22.440	22.440	1.625
**/>*** KS24019-L112A (E)	A	From Leg	0'	0.000	77'	1" Ice	1.703	1.703	0.048
			3.000			No Ice	0.141	0.141	0.005
			0'			1/2" Ice	0.198	0.198	0.007
Side Arm Mount [SO 701-1] (E)	A	From Leg	1'	0.000	77'	1" Ice	0.262	0.262	0.009
			1.500			No Ice	0.850	1.670	0.065
			0'			1/2" Ice	1.140	2.340	0.079
**/>***			0'			1" Ice	1.430	3.010	0.093

## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp

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Comb. No.	Description
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 140.083	Pole	Max Tension	2	0.000	0.000	-0.000
			Max. Compression	26	-26.892	1.260	1.858
			Max. Mx	20	-9.839	323.644	0.558
			Max. My	2	-9.805	0.219	326.834
			Max. Vy	20	-16.577	323.644	0.558
			Max. Vx	2	-16.804	0.219	326.834
			Max. Torque	8			1.168
L2	140.083 - 92.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45.559	3.632	-0.101
			Max. Mx	20	-21.093	1265.972	0.395
			Max. My	2	-21.066	0.564	1279.330
			Max. Vy	20	-23.744	1265.972	0.395
			Max. Vx	2	-23.975	0.564	1279.330
			Max. Torque	8			1.416
L3	92.5 - 45.5833	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.776	6.726	-2.571
			Max. Mx	20	-35.340	2472.991	0.079
			Max. My	2	-35.327	1.162	2495.255
			Max. Vy	20	-28.559	2472.991	0.079
			Max. Vx	14	28.755	1.162	-2495.073
			Max. Torque	8			1.668
L4	45.5833 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-94.187	10.304	-6.186
			Max. Mx	20	-57.076	4092.946	-0.747
			Max. My	14	-57.076	1.949	-4125.194
			Max. Vy	20	-32.923	4092.946	-0.747
			Max. Vx	14	33.110	1.949	-4125.194
			Max. Torque	8			1.666

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	<b>Client</b> Crown Castle	<b>Designed by</b> Pavan Pai

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	38	94.187	4.881	8.476
	Max. H <sub>x</sub>	20	57.100	32.882	0.000
	Max. H <sub>z</sub>	2	57.100	-0.000	33.069
	Max. M <sub>x</sub>	2	4123.725	-0.000	33.069
	Max. M <sub>z</sub>	8	4089.062	-32.882	0.000
	Max. Torsion	8	1.664	-32.882	0.000
	Min. Vert	7	42.825	-28.477	16.534
	Min. H <sub>x</sub>	8	57.100	-32.882	0.000
	Min. H <sub>z</sub>	14	57.100	-0.000	-33.069
	Min. M <sub>x</sub>	14	-4125.194	-0.000	-33.069
	Min. M <sub>z</sub>	20	-4092.946	32.882	0.000
	Min. Torsion	20	-1.664	32.882	0.000

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	47.583	0.000	0.000	0.617	1.556	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	57.100	0.000	-33.069	-4123.725	1.949	0.207
0.9 Dead+1.6 Wind 0 deg - No Ice	42.825	0.000	-33.069	-4078.039	1.445	0.206
1.2 Dead+1.6 Wind 30 deg - No Ice	57.100	16.441	-28.639	-3571.196	-2043.529	-0.660
0.9 Dead+1.6 Wind 30 deg - No Ice	42.825	16.441	-28.639	-3531.640	-2021.299	-0.658
1.2 Dead+1.6 Wind 60 deg - No Ice	57.100	28.477	-16.534	-2061.542	-3540.970	-1.345
0.9 Dead+1.6 Wind 60 deg - No Ice	42.825	28.477	-16.534	-2038.782	-3502.095	-1.340
1.2 Dead+1.6 Wind 90 deg - No Ice	57.100	32.882	-0.000	0.747	-4089.062	-1.664
0.9 Dead+1.6 Wind 90 deg - No Ice	42.825	32.882	-0.000	0.562	-4044.111	-1.658
1.2 Dead+1.6 Wind 120 deg - No Ice	57.100	28.477	16.534	2063.030	-3540.959	-1.537
0.9 Dead+1.6 Wind 120 deg - No Ice	42.825	28.477	16.534	2039.900	-3502.087	-1.532
1.2 Dead+1.6 Wind 150 deg - No Ice	57.100	16.441	28.639	3572.671	-2043.518	-1.004
0.9 Dead+1.6 Wind 150 deg - No Ice	42.825	16.441	28.639	3532.749	-2021.291	-1.000
1.2 Dead+1.6 Wind 180 deg - No Ice	57.100	0.000	33.069	4125.194	1.949	-0.207
0.9 Dead+1.6 Wind 180 deg - No Ice	42.825	0.000	33.069	4079.143	1.445	-0.206
1.2 Dead+1.6 Wind 210 deg - No Ice	57.100	-16.441	28.639	3572.664	2047.412	0.646
0.9 Dead+1.6 Wind 210 deg - No Ice	42.825	-16.441	28.639	3532.744	2024.179	0.644
1.2 Dead+1.6 Wind 240 deg - No Ice	57.100	-28.477	16.534	2063.024	3544.846	1.330



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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.6 Wind 240 deg - No Ice	42.825	-28.477	16.534	2039.896	3504.970	1.326
1.2 Dead+1.6 Wind 270 deg - No Ice	57.100	-32.882	-0.000	0.747	4092.946	1.664
0.9 Dead+1.6 Wind 270 deg - No Ice	42.825	-32.882	-0.000	0.562	4046.992	1.658
1.2 Dead+1.6 Wind 300 deg - No Ice	57.100	-28.477	-16.534	-2061.536	3544.857	1.552
0.9 Dead+1.6 Wind 300 deg - No Ice	42.825	-28.477	-16.534	-2038.777	3504.979	1.546
1.2 Dead+1.6 Wind 330 deg - No Ice	57.100	-16.441	-28.639	-3571.189	2047.424	1.018
0.9 Dead+1.6 Wind 330 deg - No Ice	42.825	-16.441	-28.639	-3531.635	2024.187	1.014
1.2 Dead+1.0 Ice+1.0 Temp	94.187	-0.000	0.000	6.186	10.304	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	94.187	-0.000	-8.722	-1123.315	10.515	0.079
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	94.187	4.349	-7.554	-971.976	-551.599	-0.209
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	94.187	7.533	-4.361	-558.508	-963.096	-0.440
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	94.187	8.698	0.000	6.302	-1113.714	-0.553
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	94.187	7.533	4.361	571.110	-963.093	-0.518
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	94.187	4.881	8.476	1096.077	-615.973	-0.345
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	94.187	-0.000	8.722	1135.912	10.515	-0.078
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	94.187	-4.349	7.554	984.572	572.625	0.208
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	94.187	-7.533	4.361	571.107	984.119	0.440
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	94.187	-8.698	0.000	6.302	1134.738	0.553
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	94.187	-7.533	-4.361	-558.505	984.122	0.519
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	94.187	-4.881	-8.476	-1083.476	637.004	0.346
Dead+Wind 0 deg - Service	47.583	0.000	-6.526	-808.387	1.613	0.041
Dead+Wind 30 deg - Service	47.583	3.245	-5.652	-700.002	-399.596	-0.130
Dead+Wind 60 deg - Service	47.583	5.620	-3.263	-403.888	-693.302	-0.266
Dead+Wind 90 deg - Service	47.583	6.489	-0.000	0.611	-800.806	-0.331
Dead+Wind 120 deg - Service	47.583	5.620	3.263	405.110	-693.302	-0.307
Dead+Wind 150 deg - Service	47.583	3.245	5.652	701.224	-399.596	-0.201
Dead+Wind 180 deg - Service	47.583	0.000	6.526	809.609	1.613	-0.041
Dead+Wind 210 deg - Service	47.583	-3.245	5.652	701.224	402.822	0.130
Dead+Wind 240 deg - Service	47.583	-5.620	3.263	405.110	696.528	0.266
Dead+Wind 270 deg - Service	47.583	-6.489	-0.000	0.611	804.032	0.331
Dead+Wind 300 deg - Service	47.583	-5.620	-3.263	-403.888	696.528	0.307
Dead+Wind 330 deg - Service	47.583	-3.245	-5.652	-700.002	402.823	0.201

### Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-47.583	0.000	0.000	47.583	0.000	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
2	0.000	-57.100	-33.069	-0.000	57.100	33.069	0.000%
3	0.000	-42.825	-33.069	-0.000	42.825	33.069	0.000%
4	16.441	-57.100	-28.639	-16.441	57.100	28.639	0.000%
5	16.441	-42.825	-28.639	-16.441	42.825	28.639	0.000%
6	28.477	-57.100	-16.534	-28.477	57.100	16.534	0.000%
7	28.477	-42.825	-16.534	-28.477	42.825	16.534	0.000%
8	32.882	-57.100	0.000	-32.882	57.100	0.000	0.000%
9	32.882	-42.825	0.000	-32.882	42.825	0.000	0.000%
10	28.477	-57.100	16.534	-28.477	57.100	-16.534	0.000%
11	28.477	-42.825	16.534	-28.477	42.825	-16.534	0.000%
12	16.441	-57.100	28.639	-16.441	57.100	-28.639	0.000%
13	16.441	-42.825	28.639	-16.441	42.825	-28.639	0.000%
14	0.000	-57.100	33.069	-0.000	57.100	-33.069	0.000%
15	0.000	-42.825	33.069	-0.000	42.825	-33.069	0.000%
16	-16.441	-57.100	28.639	16.441	57.100	-28.639	0.000%
17	-16.441	-42.825	28.639	16.441	42.825	-28.639	0.000%
18	-28.477	-57.100	16.534	28.477	57.100	-16.534	0.000%
19	-28.477	-42.825	16.534	28.477	42.825	-16.534	0.000%
20	-32.882	-57.100	0.000	32.882	57.100	0.000	0.000%
21	-32.882	-42.825	0.000	32.882	42.825	0.000	0.000%
22	-28.477	-57.100	-16.534	28.477	57.100	16.534	0.000%
23	-28.477	-42.825	-16.534	28.477	42.825	16.534	0.000%
24	-16.441	-57.100	-28.639	16.441	57.100	28.639	0.000%
25	-16.441	-42.825	-28.639	16.441	42.825	28.639	0.000%
26	0.000	-94.187	0.000	0.000	94.187	-0.000	0.000%
27	0.000	-94.187	-8.722	0.000	94.187	8.722	0.000%
28	4.349	-94.187	-7.554	-4.349	94.187	7.554	0.000%
29	7.533	-94.187	-4.361	-7.533	94.187	4.361	0.000%
30	8.698	-94.187	0.000	-8.698	94.187	-0.000	0.000%
31	7.533	-94.187	4.361	-7.533	94.187	-4.361	0.000%
32	4.881	-94.187	8.476	-4.881	94.187	-8.476	0.000%
33	0.000	-94.187	8.722	0.000	94.187	-8.722	0.000%
34	-4.349	-94.187	7.554	4.349	94.187	-7.554	0.000%
35	-7.533	-94.187	4.361	7.533	94.187	-4.361	0.000%
36	-8.698	-94.187	0.000	8.698	94.187	-0.000	0.000%
37	-7.533	-94.187	-4.361	7.533	94.187	4.361	0.000%
38	-4.881	-94.187	-8.476	4.881	94.187	8.476	0.000%
39	0.000	-47.583	-6.526	0.000	47.583	6.526	0.000%
40	3.245	-47.583	-5.652	-3.245	47.583	5.652	0.000%
41	5.620	-47.583	-3.263	-5.620	47.583	3.263	0.000%
42	6.489	-47.583	0.000	-6.489	47.583	0.000	0.000%
43	5.620	-47.583	3.263	-5.620	47.583	-3.263	0.000%
44	3.245	-47.583	5.652	-3.245	47.583	-5.652	0.000%
45	0.000	-47.583	6.526	0.000	47.583	-6.526	0.000%
46	-3.245	-47.583	5.652	3.245	47.583	-5.652	0.000%
47	-5.620	-47.583	3.263	5.620	47.583	-3.263	0.000%
48	-6.489	-47.583	0.000	6.489	47.583	0.000	0.000%
49	-5.620	-47.583	-3.263	5.620	47.583	3.263	0.000%
50	-3.245	-47.583	-5.652	3.245	47.583	5.652	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00038408

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3	Yes	4	0.00000001	0.00013219
4	Yes	6	0.00000001	0.00005343
5	Yes	5	0.00000001	0.00049039
6	Yes	6	0.00000001	0.00005485
7	Yes	5	0.00000001	0.00050400
8	Yes	4	0.00000001	0.00093862
9	Yes	4	0.00000001	0.00057210
10	Yes	6	0.00000001	0.00005274
11	Yes	5	0.00000001	0.00048410
12	Yes	6	0.00000001	0.00005466
13	Yes	5	0.00000001	0.00050207
14	Yes	4	0.00000001	0.00038402
15	Yes	4	0.00000001	0.00013219
16	Yes	6	0.00000001	0.00005453
17	Yes	5	0.00000001	0.00050060
18	Yes	6	0.00000001	0.00005293
19	Yes	5	0.00000001	0.00048567
20	Yes	4	0.00000001	0.00093939
21	Yes	4	0.00000001	0.00057238
22	Yes	6	0.00000001	0.00005506
23	Yes	5	0.00000001	0.00050574
24	Yes	6	0.00000001	0.00005332
25	Yes	5	0.00000001	0.00048907
26	Yes	4	0.00000001	0.00003793
27	Yes	5	0.00000001	0.00040259
28	Yes	5	0.00000001	0.00053120
29	Yes	5	0.00000001	0.00053574
30	Yes	5	0.00000001	0.00039779
31	Yes	5	0.00000001	0.00053193
32	Yes	5	0.00000001	0.00062292
33	Yes	5	0.00000001	0.00040446
34	Yes	5	0.00000001	0.00055026
35	Yes	5	0.00000001	0.00054395
36	Yes	5	0.00000001	0.00040586
37	Yes	5	0.00000001	0.00054849
38	Yes	5	0.00000001	0.00062925
39	Yes	4	0.00000001	0.00002990
40	Yes	4	0.00000001	0.00021704
41	Yes	4	0.00000001	0.00023909
42	Yes	4	0.00000001	0.00004818
43	Yes	4	0.00000001	0.00020912
44	Yes	4	0.00000001	0.00023474
45	Yes	4	0.00000001	0.00002987
46	Yes	4	0.00000001	0.00023337
47	Yes	4	0.00000001	0.00021192
48	Yes	4	0.00000001	0.00004839
49	Yes	4	0.00000001	0.00024310
50	Yes	4	0.00000001	0.00021669

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 140.083	23.351	39	1.112	0.002
L2	145 - 92.5	15.412	39	1.009	0.001
L3	98.5 - 45.5833	7.004	45	0.679	0.001
L4	52.5 - 0	1.978	45	0.344	0.000



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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>u</sub> K	Ratio $\frac{P_u}{\phi P_u}$
L3	92.5 - 45.5833 (3)	TP48.31x38.355x0.438	52'11"	0'	0.0	64.996	-35.327	4716,500	0.007
L4	45.5833 - 0 (4)	TP56x46.134x0.5	52'6"	0'	0.0	88.522	-57.076	6342.060	0.009

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>ux</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M <sub>uy</sub> kip-ft	φM <sub>uy</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	180 - 140.083 (1)	TP31.67x24.16x0.219	326.834	877.725	0.372	0.000	877.725	0.000
L2	140.083 - 92.5 (2)	TP40.17x30.307x0.344	1279.333	2396.567	0.534	0.000	2396.567	0.000
L3	92.5 - 45.5833 (3)	TP48.31x38.355x0.438	2495.258	4492.008	0.555	0.000	4492.008	0.000
L4	45.5833 - 0 (4)	TP56x46.134x0.5	4125.192	7200.975	0.573	0.000	7200.975	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	φV <sub>u</sub> K	Ratio $\frac{V_u}{\phi V_u}$	Actual T <sub>u</sub> kip-ft	φT <sub>u</sub> kip-ft	Ratio $\frac{T_u}{\phi T_u}$
L1	180 - 140.083 (1)	TP31.67x24.16x0.219	16.804	701.444	0.024	0.000	1769.450	0.000
L2	140.083 - 92.5 (2)	TP40.17x30.307x0.344	23.975	1513.340	0.016	0.208	4831.367	0.000
L3	92.5 - 45.5833 (3)	TP48.31x38.355x0.438	28.755	2358.250	0.012	0.207	9055.667	0.000
L4	45.5833 - 0 (4)	TP56x46.134x0.5	33.110	3171.030	0.010	0.207	14516.833	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_u}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_u}$	Ratio $\frac{T_u}{\phi T_u}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 140.083 (1)	0.007	0.372	0.000	0.024	0.000	0.380	1.000	4.8.2 ✓
L2	140.083 - 92.5 (2)	0.007	0.534	0.000	0.016	0.000	0.541	1.000	4.8.2 ✓
L3	92.5 - 45.5833 (3)	0.007	0.555	0.000	0.012	0.000	0.563	1.000	4.8.2 ✓
L4	45.5833 - 0 (4)	0.009	0.573	0.000	0.010	0.000	0.582	1.000	4.8.2 ✓

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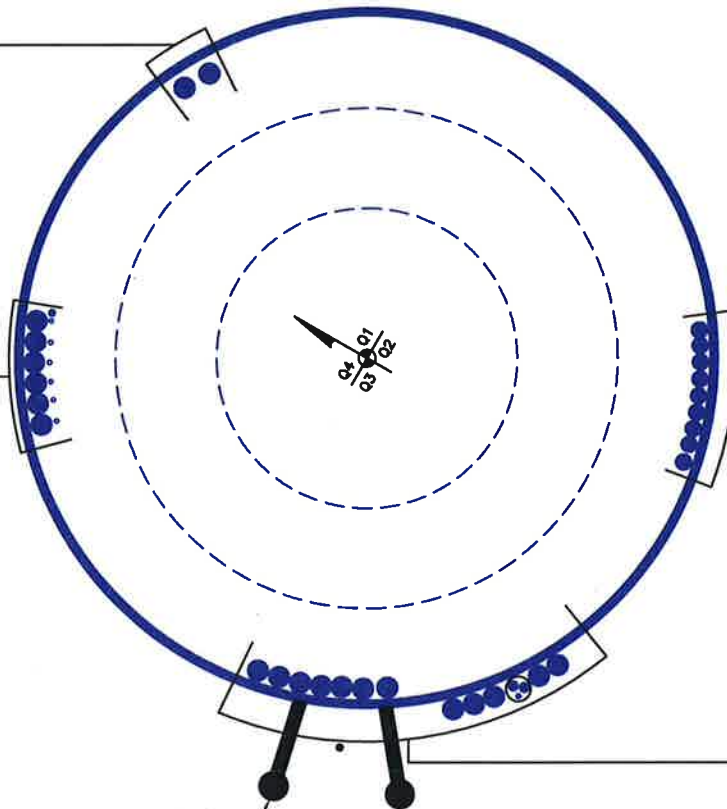
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\emptyset P_{allow}$ K	% Capacity	Pass Fail
L1	180 - 140.083	Pole	TP31.67x24.16x0.219	1	-9.805	1402.890	38.0	Pass
L2	140.083 - 92.5	Pole	TP40.17x30.307x0.344	2	-21.066	3026.680	54.1	Pass
L3	92.5 - 45.5833	Pole	TP48.31x38.355x0.438	3	-35.327	4716.500	56.3	Pass
L4	45.5833 - 0	Pole	TP56x46.134x0.5	4	-57.076	6342.060	58.2	Pass
Summary								
Pole (L4)							58.2	Pass
<b>RATING =</b>							<b>58.2</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**

(INSTALLED)  
(2) 1-5/8" TO 154 FT LEVEL

(RESERVED)  
(6) 5/16" TO 177 FT LEVEL  
(INSTALLED)  
(1) 1/2" TO 77 FT LEVEL  
(6) 1-5/8" TO 177 FT LEVEL



(INSTALLED)  
(9) 1-1/4" TO 119 FT LEVEL

(INSTALLED—IN 2" CONDUIT)  
(1) 3/8" TO 168 FT LEVEL  
(2) 3/4" TO 168 FT LEVEL  
(INSTALLED)  
(12) 1-5/8" TO 168 FT LEVEL

CLIMBING PEGS  
W/SAFETY CLIMB

BUSINESS UNIT: 876368



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

## Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

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

### Site Data

BU#: 876368
Site Name: YANKEE LAKE/EAST HAMPTON/T
App #: 378458 Revision # 0
Pole Manufacturer: <b>Other</b>

### Anchor Rod Data

Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	64.48	in

### Plate Data

Diam:	70.48	in
Thick:	3	in
Grade:	60	ksi
Single-Rod B-eff:	7.43	in

### Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

### Pole Data

Diam:	56	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	16	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

### Reactions

Mu:	4125	ft-kips
Axial, Pu:	57	kips
Shear, Vu:	33	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

### Anchor Rod Results

Max Rod (Cu+ Vu/η): 133.1 Kips  
 Allowable Axial, Φ\*Fu\*Anet: 260.0 Kips  
 Anchor Rod Stress Ratio: 51.2% **Pass**

Rigid
AISC LRFD
φ*Tn

### Base Plate Results

Base Plate Stress: 20.2 ksi  
 Allowable Plate Stress: 54.0 ksi  
 Base Plate Stress Ratio: 37.5% **Pass**

Flexural Check

Rigid
AISC LRFD
φ*Fy
Y.L. Length: 31.96

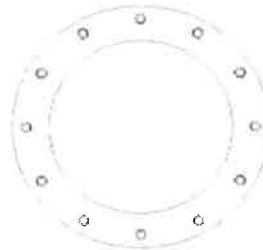
**n/a**

### Stiffener Results

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

### Pole Results

Pole Punching Shear Check: n/a



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

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

PROJECT	<b>876368 - YANKEE LAKE/EAST HAMPTON/TOWN, CT</b>		
SUBJECT	<b>Foundation Analysis</b>		
DATE	<b>02-15-17</b>	PAGE	1 OF 1



## Monopole Pad & Pier Foundation Analysis

Rev. Type: **G**

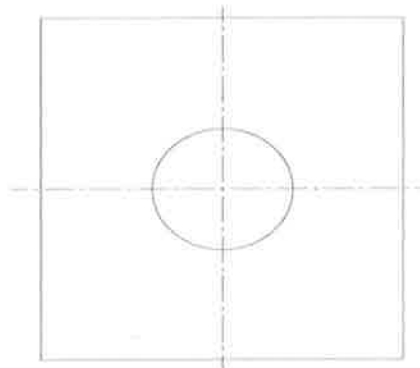
Design Loads:

	Input factored loads	
Shear:	<u>33.0</u>	kips
Moment:	<u>4,125.0</u>	ft-kips
Tower Height:	<u>190.0</u>	ft
Tower Weight:	<u>57.0</u>	kips

Pad & Pier Dimensions / Properties:

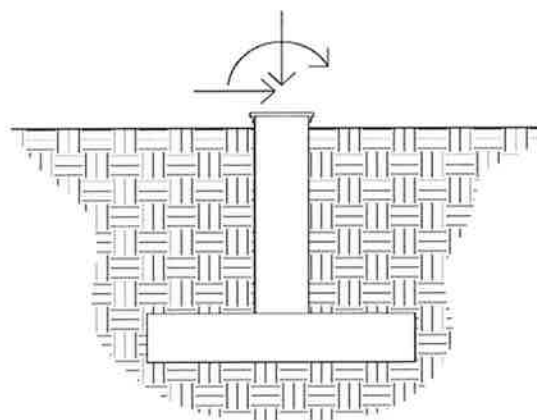
Pole Diameter at Base:	<u>56.00</u>	in
Bearing Depth:	<u>7.0</u>	ft
Pad Width:	<u>27.5</u>	ft
Neglected Depth:	<u>4.0</u>	ft
Thickness:	<u>3.0</u>	ft
Pier Diameter:	<u>8.0</u>	ft
Pier Height Above Grade:	<u>0.5</u>	ft
BP Dist. Above Pier:	<u>3.0</u>	in
Clear Cover:	<u>3.0</u>	in
Pier Rebar Size:	<u>11</u>	
Pier Rebar Quantity:	<u>36</u>	
Pad Rebar Size:	<u>9</u>	
Pad Rebar Quantity:	<u>36</u>	
Pier Tie Size:	<u>4</u>	
Tie Quantity:	<u>8</u>	
Rebar Yield Strength:	<u>60000</u>	psi
Concrete Strength:	<u>3000</u>	psi
Concrete Unit Weight:	<u>0.15</u>	kcf

27.5 FT



27.5 FT

Elevation Overview



Soil Data:

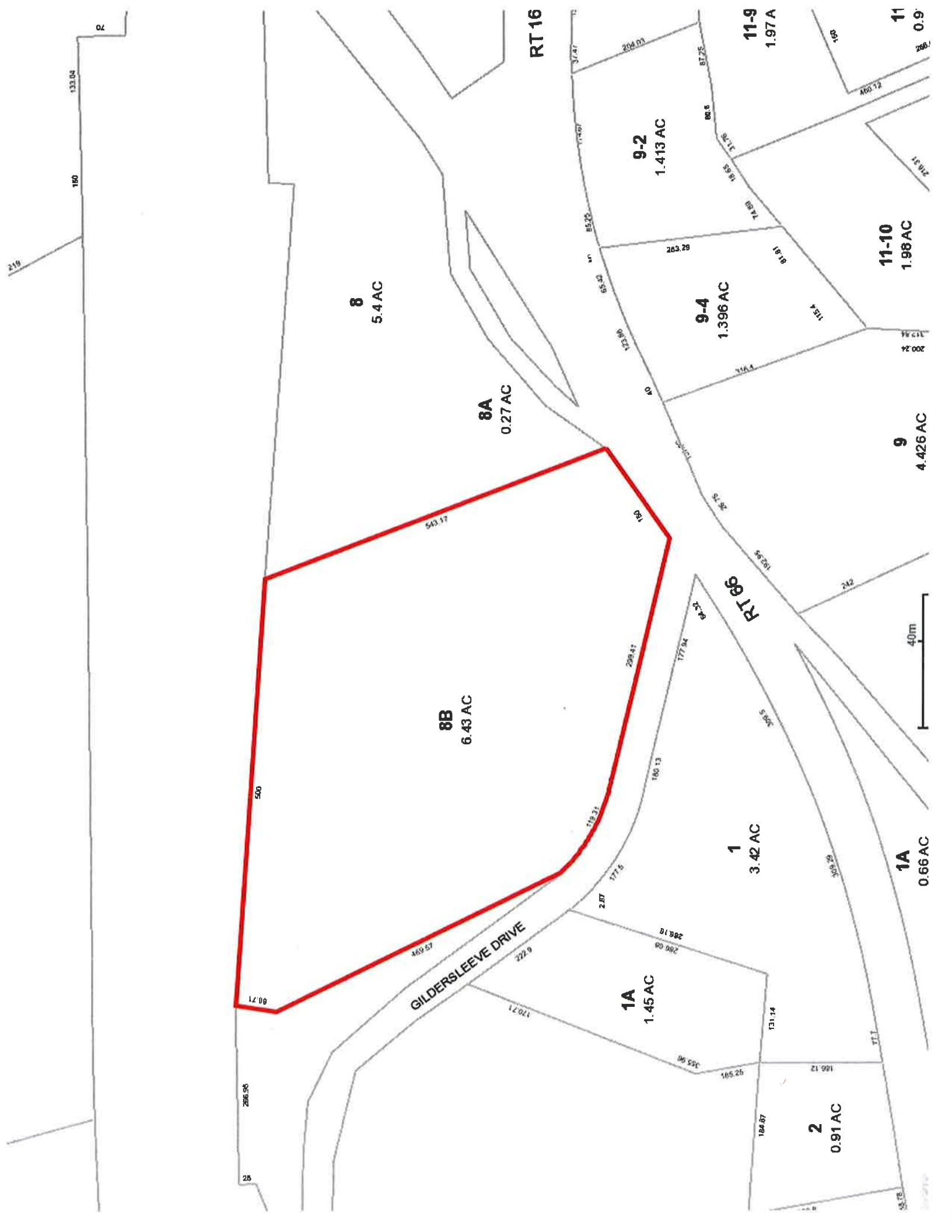
	Allowable Values	
Soil Unit Weight:	<u>0.130</u>	kcf
Ult. Bearing Capacity:	<u>8.000</u>	ksf
Angle of Friction:	<u>34.000</u>	deg
Cohesion:	<u>0.000</u>	ksf
Passive Pressure:	<u>0.000</u>	ksf
Base Friction:	<u>0.300</u>	

**\*\* Notes:**

### Summary of Results

Req'd Pier Diam.	OK
Overturning	46.7%
Shear Capacity	16.7%
Bearing	35.7%
Pad Shear - 1-way	46.4%
Pad Shear - 2-way	5.3%
Pad Moment Capacity	27.0%
Pier Moment Capacity	42.5%

# **ATTACHMENT 4**



**8**  
5.4 AC

**8A**  
0.27 AC

**8B**  
6.43 AC

**9-2**  
1.413 AC

**9-4**  
1.396 AC

**11-10**  
1.98 AC

**9**  
4.426 AC

**1**  
3.42 AC

**1A**  
1.45 AC

**1A**  
0.66 AC

**2**  
0.91 AC

**11-9**  
1.97 A

**11**  
0.9

**RT 16**

**RT 66**

**GILDERSLEEVE DRIVE**

40m

# 1 PUBLIC WORKS DR #CELL

**Location** 1 PUBLIC WORKS DR #CELL

**Mblu** 06/ 5A/ 8B/ /

**Acct#** R07102

**Owner** EAST HAMPTON TOWN OF

**Assessment** \$210,000

**Appraisal** \$300,000

**PID** 5538

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$100,000	\$200,000	\$300,000
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$70,000	\$140,000	\$210,000

## Owner of Record

**Owner** EAST HAMPTON TOWN OF  
**Co-Owner** %SPRINT SPECTRUM LP-PROPTY TAX  
**Address** PO BOX 8430 (CT33XC018);  
 KANSAS CITY, MO 64114

**Sale Price** \$0  
**Certificate**  
**Book & Page** 000/0000  
**Sale Date** 01/01/1900  
**Instrument** 29

## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
EAST HAMPTON TOWN OF	\$0		000/0000	29	01/01/1900

## Building Information

### Building 1 : Section 1

**Year Built:**  
**Living Area:** 0  
**Replacement Cost:** \$0  
**Building Percent**  
**Good:**  
**Replacement Cost**  
**Less Depreciation:** \$0

Building Attributes	
Field	Description

Style	Outbuildings
Model	
Grade:	
Story Height	
Foundation	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
# Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplace	
Fin Basement	
Fin Bsmt Qual	
Bsmt. Garages	
Gas Fireplace	

### Building Photo



(<http://images.vgsi.com/photos/EastHamptonCTPhotos//default>)

### Building Layout

Building Layout

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

### Extra Features

Extra Features	Legend
No Data for Extra Features	

### Land

#### Land Use

<b>Use Code</b>	200
<b>Description</b>	Commercial Vacant
<b>Zone</b>	C
<b>Neighborhood</b>	COM

#### Land Line Valuation

<b>Size (Acres)</b>	1
<b>Frontage</b>	
<b>Depth</b>	
<b>Assessed Value</b>	\$140,000

**Outbuildings**

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CEL	Cell Tower			1 UNITS	\$100,000	1

**Valuation History**

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$100,000	\$200,000	\$300,000
2014	\$100,000	\$200,000	\$300,000
2012	\$100,000	\$200,000	\$300,000

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$70,000	\$140,000	\$210,000
2014	\$70,000	\$140,000	\$210,000
2012	\$70,000	\$140,000	\$210,000