56 Prospect Street
P.O. Box 270
Hartford, CT 06103

Kathleen M. Shanley
Manager – Transmission Siting
Tel: (860) 728-4527

July 6, 2018

Robert Stein, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: TS-EVER-032-180613
400 Riley Mountain Rd., Coventry

Dear Chairman Stein:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") submitted on June 13, 2018 a Request for Tower Sharing seeking the CT Siting Council ("Council") approval of the tower sharing of an existing telecommunications tower in Coventry, Connecticut pursuant to the exemption provided under Sections 16-50j-88 to 16-50j-90 of the Regulations of Connecticut State Agencies.

In response to correspondence dated June 20, 2018 from Ms. Melanie Bachman, Executive Director of the Council the attached are the original and 15 copies of the following:

- Updated RF Report, dated June 26, 2018 prepared by C Squared Systems, LLC that accounts for AT&T's approved equipment.
- Copy of AT&T's structural report prepared by Crown Castle, dated December 13, 2017 that includes AT&T's approved equipment and other entities that are collocated at this facility.
- Letter of Authorization from Crown Castle, dated June 25, 2018 granting Eversource the right to use AT&T's structural report, dated December 13, 2017 in its Request for Tower Sharing.
- Approval from AT&T, dated June 26, 2018 allowing Eversource to use AT&T's structural report, dated December 13, 2017 in its Request for Tower Sharing.

If you have any questions or comments, please call me at (860) 728-4527.

Sincerely,

Kathleen M. Shanley

Attachments

cc: John Elsesser, Town Manager, Town of Coventry
Trustee of James L. and Concetta Wallbeoff

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

EVERSOURCE ENERGY

400 Riley Mountain Road

Coventry, CT 06238

June 26, 2018

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed addition of an Eversource antenna on the existing monopole tower located at 400 Riley Mountain Road in Coventry, CT. The coordinates of the tower are 41° 47' 56.21" N, 72° 19' 55.88" W.

Eversource is proposing to install the following:

1) Install one omnidirectional antenna to accommodate two 935 MHz channels.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached “FCC Limits for Maximum Permissible Exposure (MPE)” in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times \text{EIRP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final site configuration.

4. Calculation Results

Table 1 below outlines the power density information for the site. The proposed Eversource omnidirectional antenna has a relatively narrow vertical beamwidth which causes the majority of the RF power to be focused out towards the horizon, with respect to the vertical plane. As a result, there will be less RF power directed below the antenna relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed Eversource antenna. The calculated results in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antenna. For clarity, Eversource's proposed parameters and contribution are highlighted in blue below.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Eversource	*162*	*935*	*1*	*240*	*0.0035*	*0.6233*	*0.06%*
AT&T	120	850	1	414	0.0115	0.5667	0.20%
AT&T	120	1900	1	656	0.0182	1.0000	0.18%
AT&T	120	700	4	906	0.1003	0.4667	2.15%
AT&T	120	2300	4	1181	0.1308	1.0000	1.31%
AT&T	120	700	2	627	0.0347	0.4667	0.74%
AT&T	120	1900	4	1194	0.1322	1.0000	1.32%
Pocket (now MetroPCS)	107	2130	3	631	0.0668	1.0000	0.67%
Sprint	147	1962.5	11	384	0.0764	1.0000	0.76%
T-Mobile	136	1900	6	1102	0.1408	1.0000	1.41%
T-Mobile	136	700	1	865	0.0184	0.4667	0.39%
Verizon	126	1970	11	194	0.0533	1.0000	0.53%
Verizon	126	869	9	378	0.0850	0.5793	1.47%
Verizon	126	2145	1	2302	0.0575	1.0000	0.57%
Verizon	126	746	1	850	0.0212	0.4973	0.43%
Eversource	162	935	2	240	0.0071	0.6233	0.11%
						Total	**12.25%**

Table 1: Carrier Information[1] [2]

[1] The power density information for all other operators was taken directly from the CSC database dated 06/25/2018. Please note that the existing CSC filing for Eversource shown in grey italics above are not included in the total, and should be replace with the values highlighted in blue above.

[2] The total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

5. Conclusion

The above analysis verifies that RF emissions at ground level from the site, after the proposed installations have been completed, will be well below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed antenna configuration is below the limits for the general public. The highest cumulative expected percent of Maximum Permissible Exposure at ground level is calculated to be **12.25% of the FCC General Population/Uncontrolled limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the final site configuration.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Daniel Brown
RF Engineer
C Squared Systems, LLC

June 26, 2018
Date

Reviewed/Approved By: Keith Vellante
RF Manager
C Squared Systems, LLC

June 27, 2018
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

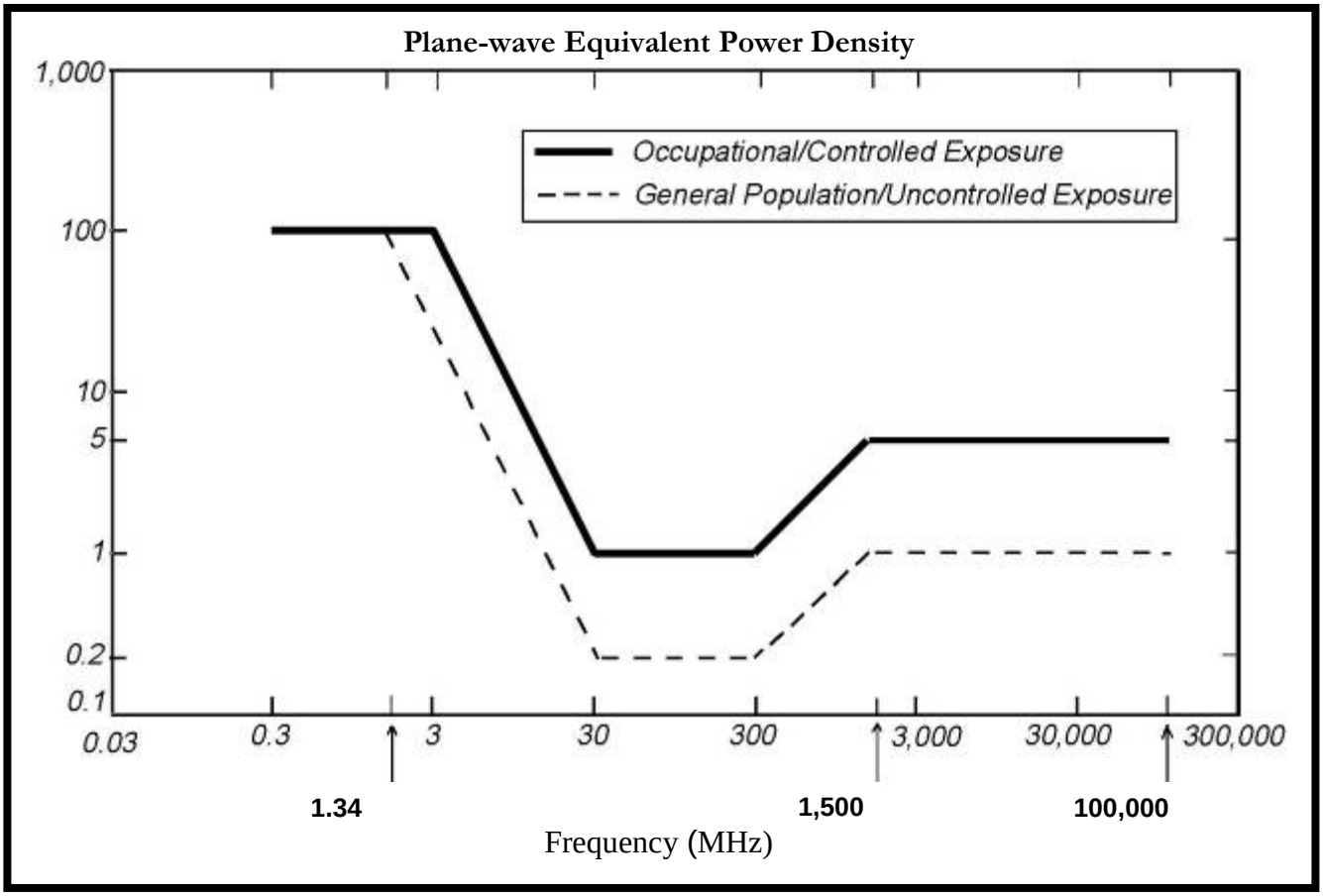
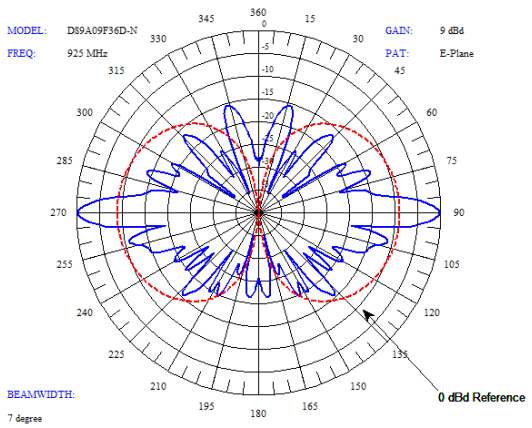


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Antenna Data Sheet and Electrical Pattern

935 MHz

Manufacturer:	dbSpectra
Model #:	DS9A09F36D-N
Frequency Band:	890-960 MHz
Gain:	9.0 dBd
Vertical Beamwidth:	8°
Horizontal Beamwidth:	360°
Polarization:	Dual-Polarization
Length:	230.4”



Date: **December 13, 2017**

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

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT1106
	Carrier Site Name:	Coventry - Riley Mountain
Crown Castle Designation:	**Crown Castle BU Number:**	876385
	Crown Castle Site Name:	N. COVENTRY / WALLBEOFF
	Crown Castle JDE Job Number:	474269
	Crown Castle Work Order Number:	1497620
	Crown Castle Application Number:	418267 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1497620
Site Data:	**Reilly Mtn. Rd., COVENTRY, Tolland County, CT** **Latitude *41° 47' 56.21"*, Longitude *-72° 19' 55.88"*** **152 Foot - Monopole Tower**	

Dear Charles McGuirt,

Crown Castle 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 1497620, in accordance with application 418267, revision 1.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 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 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 *Crown Castle* 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: Carol Ng / VDL

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED
PROFESSIONAL ENGINEER

12/13/2017

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 152 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in September of 2000. The tower was originally designed for a wind speed of 90 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 1 inch ice thickness and 60 mph under service loads, exposure category B.

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
116.0	120.0	2	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2 1	3/8 3/4 Conduit	-
		1	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 4478 B14			
		2	kathrein	80010965 w/ Mount Pipe			
		1	kathrein	80010966 w/ Mount Pipe			
		6	powerwave technologies	7020.00			
		1	raycap	DC6-48-60-18-8F			

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
152.0	162.0	1	dbspectra	DS9A09F36D-N	2 1	1-5/8 1/2	2
	152.0	1	bird technologies group	430-94C-09168-M-110/48			
		1	tower mounts	Pipe Mount [PM 601-1]			
150.0	152.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	4	1-1/4	2
		6	alcatel lucent	RRH2X50-800			
		3	alcatel lucent	TD-RRH8x20-25			
		3	kmw communications	ETCR-654L12H6 w/ Mount Pipe			
	150.0	1	tower mounts	Miscellaneous [NA 507-1]			
		1	tower mounts	Miscellaneous [NA 509-3]			
		1	tower mounts	Platform Mount [LP 601-1]	-	-	1
133.0	136.0	3	commscope	ATBT-BOTTOM-24V	12	1-5/8	1
		3	commscope	LNX-6515DS-VTM 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
		3	ems wireless	RR90-17-02DP w/ Mount Pipe			
		3	ericsson	KRY 112 71/2			
	133.0	3	ericsson	KRY 112 71/2			
		1	tower mounts	Platform Mount [LP 304-1]			
124.0	126.0	3	alcatel lucent	RRH2X60-PCS	2	1-5/8	2
		3	alcatel lucent	RRH2x60-700			
		3	alcatel lucent	RRH4X45-AWS4 B66			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	antel	LPA-171080-12CF-EDIN-2 w/ Mount Pipe	18	1-5/8	1
		6	antel	LPA-80080/6CF w/ Mount Pipe			
	124.0	1	tower mounts	Platform Mount [LP 304-1]			
116.0	120.0	2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	-	-	3
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe	1 2 1 12	3/8 3/4 Conduit 1-1/4	1
		3	ericsson	RRUS-11			
		2	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	116.0	4	powerwave technologies	LGP21401			
		1	tower mounts	Platform Mount [LP 1201-1]			
		6	powerwave technologies	LGP21903	-	-	3
107.0	107.0	3	kathrein	742 213	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
74.0	75.0	1	lucent	KS24019-L112A	1	1/2	1
	74.0	1	tower 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)
191.5	191.5	12	dapa	48000	-	-
181.5	181.5	12	dapa	48000	-	-
171.5	171.5	12	dapa	48000	-	-
161.5	161.5	12	dapa	48000	-	-
150.0	150.0	12	dapa	48000	-	-
140.0	140.0	12	dapa	48000	-	-
130.0	130.0	12	dapa	48000	-	-
120.0	120.0	12	dapa	48000	-	-
110.0	110.0	12	dapa	48000	-	-
100.0	100.0	12	dapa	48000	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea, Inc.	1531969	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors, Inc.	1441268	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors, Inc.	1614566	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. Crown Castle 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	152 - 137.42	Pole	TP37.31x33.03x0.313	1	-4.648	2526.220	3.1	Pass
L2	137.42 - 91.09	Pole	TP50.15x35.167x0.375	2	-26.500	3935.810	22.2	Pass
L3	91.09 - 44.79	Pole	TP62.86x47.413x0.438	3	-44.639	5613.010	31.3	Pass
L4	44.79 - 0	Pole	TP75x59.537x0.5	4	-74.281	7706.060	34.2	Pass
							Summary	
						Pole (L4)	34.2	Pass
						Rating =	34.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	32.5	Pass
1	Base Plate	0	43.0	Pass
1	Base Foundation (Structure)	0	39.5	Pass
1	Base Foundation (Soil Interaction)	0	30.4	Pass

Structure Rating (max from all components) =	43.0%

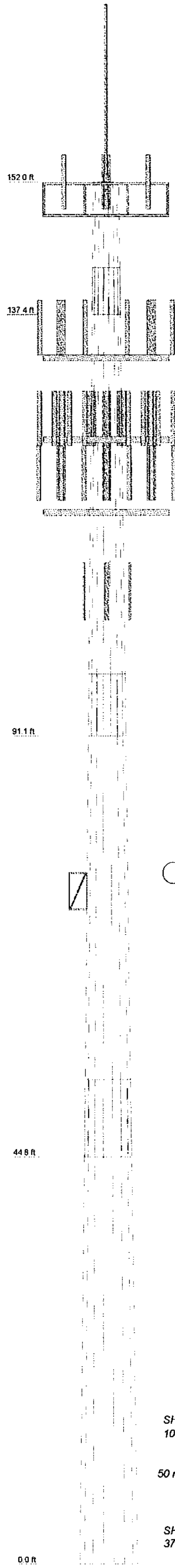
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed 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	14.580	18	0.313	5.170	33.030	37.310	A572-65	1.7
2	51.500	18	0.375	6.830	35.167	50.150		8.8
3	53.130	18	0.438	8.420	47.413	62.880		13.7
4	53.210	18	0.500		59.537	75.000		19.2
								43.5

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
OS9A09F36D-N	152	RRH2x60-700	124
430-94C-09168-M-110/48	152	RRH4X45-AWS4 B66	124
Pipe Mount [PM 601-1]	152	RRH4X45-AWS4 B66	124
ETCR-654L12H6 w/ Mount Pipe	150	RRH4X45-AWS4 B66	124
ETCR-654L12H6 w/ Mount Pipe	150	RRH2X60-PCS	124
ETCR-654L12H6 w/ Mount Pipe	150	RRH2X60-PCS	124
(2) RRH2X50-800	150	RRH2X60-PCS	124
(2) RRH2X50-800	150	6' x 2' Mount Pipe	124
(2) RRH2X50-800	150	6' x 2' Mount Pipe	124
TD-RRH8x20-25	150	6' x 2' Mount Pipe	124
TD-RRH8x20-25	150	Platform Mount [LP 304-1]	124
TD-RRH8x20-25	150	7770.00 w/ Mount Pipe	116
PCS 1900MHz 4x45W-65MHz	150	7770.00 w/ Mount Pipe	116
PCS 1900MHz 4x45W-65MHz	150	7770.00 w/ Mount Pipe	116
PCS 1900MHz 4x45W-65MHz	150	80010965 w/ Mount Pipe	116
8' x 2' Pipe Mount	150	80010965 w/ Mount Pipe	116
8' x 2' Pipe Mount	150	80010966 w/ Mount Pipe	116
8' x 2' Pipe Mount	150	HPA-65R-BUU-H6 w/ Mount Pipe	116
Miscellaneous [NA 507-1]	150	HPA-65R-BUU-H6 w/ Mount Pipe	116
Miscellaneous [NA 509-3]	150	HPA-65R-BUU-H8 w/ Mount Pipe	116
Platform Mount [LP 601-1]	150	(2) LGP21401	116
RR90-17-02DP w/ Mount Pipe	133	(2) LGP21401	116
RR90-17-02DP w/ Mount Pipe	133	(2) LGP21401	116
RR90-17-02DP w/ Mount Pipe	133	RRUS-11	116
LNX-6515DS-VTM w/ Mount Pipe	133	RRUS-11	116
LNX-6515DS-VTM w/ Mount Pipe	133	RRUS-11	116
LNX-6515DS-VTM w/ Mount Pipe	133	DC6-48-60-18-8F	116
KRY 112 71/2	133	(2) 7020.00	116
KRY 112 71/2	133	(2) 7020.00	116
KRY 112 71/2	133	(2) 7020.00	116
KRY 112 71/2	133	RRUS 4478 B14	116
KRY 112 71/2	133	RRUS 4478 B14	116
KRY 112 71/2	133	RRUS 4478 B14	116
ATBT-BOTTOM-24V	133	RRUS 32	116
ATBT-BOTTOM-24V	133	RRUS 32	116
ATBT-BOTTOM-24V	133	RRUS 32	116
6' x 2' Mount Pipe	133	RRUS 32 B2	116
6' x 2' Mount Pipe	133	RRUS 32 B2	116
6' x 2' Mount Pipe	133	RRUS 32 B2	116
Platform Mount [LP 304-1]	133	DC6-48-60-18-8F	116
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	124	Side Arm Mount [SO 701-3]	116
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	124	Platform Mount [LP 1201-1]	116
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	124	4' x 2' Pipe Mount	116
(2) LPA-80080/6CF w/ Mount Pipe	124	4' x 2' Pipe Mount	116
(2) LPA-80080/6CF w/ Mount Pipe	124	4' x 2' Pipe Mount	116
(2) LPA-80080/6CF w/ Mount Pipe	124	742 213	107
(2) SBNHH-1D65B w/ Mount Pipe	124	742 213	107
(2) SBNHH-1D65B w/ Mount Pipe	124	742 213	107
(2) SBNHH-1D65B w/ Mount Pipe	124	Pipe Mount [PM 601-3]	107
(2) DB-T1-6Z-8AB-0Z	124	KS24019-L112A	74
RRH2x60-700	124	Side Arm Mount [SO 701-1]	74
RRH2x60-700	124		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 34.2%

ALL REACTIONS ARE FACTORED

AXIAL 133 K
SHEAR 10 K
MOMENT 1129 kip-ft
TORQUE 1 kip-ft
50 mph WIND - 1.000 in ICE

AXIAL 74 K
SHEAR 37 K
MOMENT 3930 kip-ft
TORQUE 2 kip-ft
REACTIONS - 101 mph WIND

CROWN CASTLE
The Foundation for a Wireless World

Crown Castle 2000 Corporate Dr. Canonsburg, PA 15317 Phone: (724) 416 - 2536 FAX: (724) 416 - 4536	Job: BU# 876385		
	Project:		
	Client: Crown Castle	Drawn by: vlarson	App'd:
	Code: TIA-222-G	Date: 12/13/17	Scale: NTS
	Path: [illegible]		Dwg No. E-1

Tower Input Data

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

4) Tower is located in Tolland County, Connecticut.
5) Basic wind speed of 101 mph.
6) Structure Class II.
7) Exposure Category B.
8) Topographic Category 1.
9) Crest Height 0.000 ft.
10) Nominal ice thickness of 1.000 in.
11) Ice thickness is considered to increase with height.
12) Ice density of 56.000 pcf.
13) A wind speed of 50 mph is used in combination with ice.
14) Temperature drop of 50.000 °F.
15) Deflections calculated using a wind speed of 60 mph.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.
19) 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	152.000-137.420	14.580	5.170	18	33.030	37.310	0.313	1.250	A572-65 (65 ksi)
L2	137.420-91.090	51.500	6.830	18	35.167	50.150	0.375	1.500	A572-65 (65 ksi)
L3	91.090-44.790	53.130	8.420	18	47.413	62.860	0.438	1.750	A572-65 (65 ksi)
L4	44.790-0.000	53.210		18	59.537	75.000	0.500	2.000	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	33.540	32.452	4388.688	11.615	16.779	261.555	8783.151	16.229	5.263	16.842
	37.886	36.697	6346.168	13.134	18.953	334.829	12700.685	18.352	6.017	19.253
L2	37.237	41.412	6333.245	12.351	17.865	354.506	12674.822	20.710	5.529	14.745
	50.924	59.245	18544.257	17.670	25.476	727.905	37112.916	29.628	8.166	21.777
L3	50.161	65.231	18185.953	16.676	24.086	755.049	36395.835	32.622	7.575	17.314
	63.830	86.681	42672.286	22.160	31.933	1336.312	85400.720	43.349	10.293	23.528
L4	62.940	93.692	41255.943	20.958	30.245	1364.068	82566.172	46.855	9.599	19.197
	76.157	118.232	82905.472	26.448	38.100	2175.997	165920.03 3	59.127	12.320	24.64

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 152.000-137.420				1	1	1			
L2 137.420-91.090				1	1	1			
L3 91.090-44.790				1	1	1			
L4 44.790-0.000				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
*** 152 ***									
FLC 12-50J(1/2)	A	Surface Ar (CaAa)	152.000 - 0.000	1	1	-0.080 -0.075	0.640		0.000
FLC 158-50J(1-5/8)	A	Surface Ar (CaAa)	152.000 - 0.000	2	2	-0.100 -0.040	2.015		0.001
*** 124 ***									
HB158-1-08U8-S8J18(1-5/8)	A	Surface Ar (CaAa)	124.000 - 0.000	2	2	-0.210 -0.190	1.980		0.001
*****									
***									

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
*** 150 ***								
HB114-1-0813U4-M5J(1-1/4)	A	No	Inside Pole	150.000 - 0.000	4	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*** 133 ***								
AVA7-50(1-5/8)	C	No	Inside Pole	133.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF7-50A(1-5/8)	C	No	Inside Pole	133.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF7-50A(1-5/8)	A	No	Inside Pole	124.000 - 0.000	18	No Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
*** 116 ***								
HCC 78-50J(1-1/4")	A	No	Inside Pole	116.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
FB-L98B-002-75000(3/8)	A	No	Inside Pole	116.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	116.000 - 0.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
2" Rigid Conduit	A	No	Inside Pole	116.000 - 0.000	2	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
*** 107 ***								
AVA7-50(1-5/8)	B	No	Inside Pole	107.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
*** 74 ***								
LDF4-50A(1/2)	A	No	Inside Pole	74.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
*****								
***								

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	152.000-137.420	A	0.000	0.000	6.809	0.000	0.090
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	137.420-91.090	A	0.000	0.000	34.668	0.000	1.246
		B	0.000	0.000	0.000	0.000	0.067
		C	0.000	0.000	0.000	0.000	0.382
L3	91.090-44.790	A	0.000	0.000	39.957	0.000	1.791
		B	0.000	0.000	0.000	0.000	0.194
		C	0.000	0.000	0.000	0.000	0.422
L4	44.790-0.000	A	0.000	0.000	38.654	0.000	1.735
		B	0.000	0.000	0.000	0.000	0.188
		C	0.000	0.000	0.000	0.000	0.408

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	152.000-137.420	A	2.318	0.000	0.000	23.489	0.000	0.449
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	137.420-91.090	A	2.263	0.000	0.000	110.003	0.000	2.916
		B		0.000	0.000	0.000	0.000	0.067
		C		0.000	0.000	0.000	0.000	0.382
L3	91.090-44.790	A	2.149	0.000	0.000	122.541	0.000	3.609
		B		0.000	0.000	0.000	0.000	0.194
		C		0.000	0.000	0.000	0.000	0.422
L4	44.790-0.000	A	1.919	0.000	0.000	114.967	0.000	3.367
		B		0.000	0.000	0.000	0.000	0.188
		C		0.000	0.000	0.000	0.000	0.408

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	152.000-137.420	-0.584	-0.230	-1.187	-0.463
L2	137.420-91.090	-0.930	-0.258	-1.646	-0.479
L3	91.090-44.790	-1.071	-0.274	-1.948	-0.528
L4	44.790-0.000	-1.095	-0.280	-2.095	-0.567

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	FLC 12-50J(1/2)	137.42 - 152.00	1.0000	1.0000
L1	3	FLC 158-50J(1-5/8)	137.42 - 152.00	1.0000	1.0000
L1	10	HB158-1-08U8-S8J18(1-5/8)	137.42 - 124.00	1.0000	1.0000
L2	2	FLC 12-50J(1/2)	91.09 - 137.42	1.0000	1.0000
L2	3	FLC 158-50J(1-5/8)	91.09 - 137.42	1.0000	1.0000
L2	10	HB158-1-08U8-S8J18(1-5/8)	91.09 - 124.00	1.0000	1.0000
L3	2	FLC 12-50J(1/2)	44.79 - 91.09	1.0000	1.0000
L3	3	FLC 158-50J(1-5/8)	44.79 - 91.09	1.0000	1.0000
L3	10	HB158-1-08U8-S8J18(1-5/8)	44.79 - 91.09	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
***									
*** 152 ***									
DS9A09F36D-N	A	From Leg	1.000 0.000 10.000	0.000	152.000	No Ice 1/2" Ice 1" Ice	5.760 7.713 9.683	5.760 7.713 9.683	0.047 0.088 0.142
430-94C-09168-M-110/48	A	From Leg	1.000 0.000 0.000	0.000	152.000	No Ice 1/2" Ice 1" Ice	1.031 1.174 1.323	1.031 1.174 1.323	0.020 0.030 0.042
Pipe Mount [PM 601-1]	A	From Leg	0.500 0.000 0.000	0.000	152.000	No Ice 1/2" Ice 1" Ice	3.000 3.740 4.480	0.900 1.120 1.340	0.065 0.079 0.093
*** 150***									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ETCR-654L12H6 w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	150.000	No Ice	13.271	6.537	0.105
			0.000				1/2" Ice	13.877	7.714	0.195
			2.000				1" Ice	14.448	8.605	0.293
ETCR-654L12H6 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	150.000	No Ice	13.271	6.537	0.105
			0.000				1/2" Ice	13.877	7.714	0.195
			2.000				1" Ice	14.448	8.605	0.293
ETCR-654L12H6 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	150.000	No Ice	13.271	6.537	0.105
			0.000				1/2" Ice	13.877	7.714	0.195
			2.000				1" Ice	14.448	8.605	0.293
(2) RRH2X50-800	A	From Leg	4.000	0.000	0.000	150.000	No Ice	1.701	1.282	0.053
			0.000				1/2" Ice	1.864	1.428	0.070
			2.000				1" Ice	2.035	1.580	0.090
(2) RRH2X50-800	B	From Leg	4.000	0.000	0.000	150.000	No Ice	1.701	1.282	0.053
			0.000				1/2" Ice	1.864	1.428	0.070
			2.000				1" Ice	2.035	1.580	0.090
(2) RRH2X50-800	C	From Leg	4.000	0.000	0.000	150.000	No Ice	1.701	1.282	0.053
			0.000				1/2" Ice	1.864	1.428	0.070
			2.000				1" Ice	2.035	1.580	0.090
TD-RRH8x20-25	A	From Leg	4.000	0.000	0.000	150.000	No Ice	4.045	1.535	0.070
			0.000				1/2" Ice	4.298	1.714	0.097
			2.000				1" Ice	4.557	1.901	0.128
TD-RRH8x20-25	B	From Leg	4.000	0.000	0.000	150.000	No Ice	4.045	1.535	0.070
			0.000				1/2" Ice	4.298	1.714	0.097
			2.000				1" Ice	4.557	1.901	0.128
TD-RRH8x20-25	C	From Leg	4.000	0.000	0.000	150.000	No Ice	4.045	1.535	0.070
			0.000				1/2" Ice	4.298	1.714	0.097
			2.000				1" Ice	4.557	1.901	0.128
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.000	0.000	0.000	150.000	No Ice	2.322	2.238	0.060
			0.000				1/2" Ice	2.527	2.441	0.083
			2.000				1" Ice	2.739	2.651	0.110
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.000	0.000	0.000	150.000	No Ice	2.322	2.238	0.060
			0.000				1/2" Ice	2.527	2.441	0.083
			2.000				1" Ice	2.739	2.651	0.110
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.000	0.000	0.000	150.000	No Ice	2.322	2.238	0.060
			0.000				1/2" Ice	2.527	2.441	0.083
			2.000				1" Ice	2.739	2.651	0.110
8' x 2" Pipe Mount	A	From Leg	4.000	0.000	0.000	150.000	No Ice	1.900	1.900	0.029
			0.000				1/2" Ice	2.728	2.728	0.044
			0.000				1" Ice	3.401	3.401	0.063
8' x 2" Pipe Mount	B	From Leg	4.000	0.000	0.000	150.000	No Ice	1.900	1.900	0.029
			0.000				1/2" Ice	2.728	2.728	0.044
			0.000				1" Ice	3.401	3.401	0.063
8' x 2" Pipe Mount	C	From Leg	4.000	0.000	0.000	150.000	No Ice	1.900	1.900	0.029
			0.000				1/2" Ice	2.728	2.728	0.044
			0.000				1" Ice	3.401	3.401	0.063
Miscellaneous [NA 507-1]	C	None			0.000	150.000	No Ice	4.800	4.800	0.245
							1/2" Ice	6.700	6.700	0.294
							1" Ice	8.600	8.600	0.343
Miscellaneous [NA 509-3]	C	None			0.000	150.000	No Ice	11.840	11.840	0.275

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
							1/2" Ice	16.960	16.960	0.296
							1" Ice	22.080	22.080	0.317
Platform Mount [LP 601-1]	C	None			0.000	150.000	No Ice	28.470	28.470	1.122
							1/2" Ice	33.590	33.590	1.514
							1" Ice	38.710	38.710	1.905
*** 133***										
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	133.000	No Ice	4.593	3.319	0.034
			0.000				1/2" Ice	5.018	4.089	0.072
			3.000				1" Ice	5.436	4.784	0.115
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	133.000	No Ice	4.593	3.319	0.034
			0.000				1/2" Ice	5.018	4.089	0.072
			3.000				1" Ice	5.436	4.784	0.115
RR90-17-02DP w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	133.000	No Ice	4.593	3.319	0.034
			0.000				1/2" Ice	5.018	4.089	0.072
			3.000				1" Ice	5.436	4.784	0.115
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	133.000	No Ice	11.683	9.842	0.083
			0.000				1/2" Ice	12.404	11.366	0.173
			3.000				1" Ice	13.135	12.914	0.273
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	133.000	No Ice	11.683	9.842	0.083
			0.000				1/2" Ice	12.404	11.366	0.173
			3.000				1" Ice	13.135	12.914	0.273
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	133.000	No Ice	11.683	9.842	0.083
			0.000				1/2" Ice	12.404	11.366	0.173
			3.000				1" Ice	13.135	12.914	0.273
KRY 112 71/2	A	From Leg	4.000	0.000	0.000	133.000	No Ice	0.583	0.398	0.013
			0.000				1/2" Ice	0.688	0.488	0.018
			0.000				1" Ice	0.799	0.586	0.025
KRY 112 71/2	B	From Leg	4.000	0.000	0.000	133.000	No Ice	0.583	0.398	0.013
			0.000				1/2" Ice	0.688	0.488	0.018
			0.000				1" Ice	0.799	0.586	0.025
KRY 112 71/2	C	From Leg	4.000	0.000	0.000	133.000	No Ice	0.583	0.398	0.013
			0.000				1/2" Ice	0.688	0.488	0.018
			0.000				1" Ice	0.799	0.586	0.025
KRY 112 71/2	A	From Leg	4.000	0.000	0.000	133.000	No Ice	0.583	0.398	0.013
			0.000				1/2" Ice	0.688	0.488	0.018
			3.000				1" Ice	0.799	0.586	0.025
KRY 112 71/2	B	From Leg	4.000	0.000	0.000	133.000	No Ice	0.583	0.398	0.013
			0.000				1/2" Ice	0.688	0.488	0.018
			3.000				1" Ice	0.799	0.586	0.025
KRY 112 71/2	C	From Leg	4.000	0.000	0.000	133.000	No Ice	0.583	0.398	0.013
			0.000				1/2" Ice	0.688	0.488	0.018
			3.000				1" Ice	0.799	0.586	0.025
ATBT-BOTTOM-24V	A	From Leg	4.000	0.000	0.000	133.000	No Ice	0.104	0.065	0.003
			0.000				1/2" Ice	0.148	0.102	0.004
			3.000				1" Ice	0.199	0.147	0.006
ATBT-BOTTOM-24V	B	From Leg	4.000	0.000	0.000	133.000	No Ice	0.104	0.065	0.003
			0.000				1/2" Ice	0.148	0.102	0.004
			3.000				1" Ice	0.199	0.147	0.006
ATBT-BOTTOM-24V	C	From Leg	4.000	0.000	0.000	133.000	No Ice	0.104	0.065	0.003

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2"	0.148	0.102	0.004
			3.000			Ice	0.199	0.147	0.006
						1" Ice			
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	133.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	133.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	133.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
Platform Mount [LP 304-1]	C	None		0.000	133.000	No Ice	17.460	17.460	1.349
						1/2"	22.440	22.440	1.625
						Ice	27.420	27.420	1.900
						1" Ice			
*** 124***									
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.000	0.000	124.000	No Ice	3.956	7.095	0.037
			0.000			1/2"	4.508	8.302	0.086
			2.000			Ice	5.029	9.242	0.143
						1" Ice			
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	B	From Leg	4.000	0.000	124.000	No Ice	3.956	7.095	0.037
			0.000			1/2"	4.508	8.302	0.086
			2.000			Ice	5.029	9.242	0.143
						1" Ice			
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	C	From Leg	4.000	0.000	124.000	No Ice	3.956	7.095	0.037
			0.000			1/2"	4.508	8.302	0.086
			2.000			Ice	5.029	9.242	0.143
						1" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.000	0.000	124.000	No Ice	4.564	10.259	0.046
			0.000			1/2"	5.105	11.427	0.113
			2.000			Ice	5.612	12.312	0.187
						1" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.000	0.000	124.000	No Ice	4.564	10.259	0.046
			0.000			1/2"	5.105	11.427	0.113
			2.000			Ice	5.612	12.312	0.187
						1" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.000	0.000	124.000	No Ice	4.564	10.259	0.046
			0.000			1/2"	5.105	11.427	0.113
			2.000			Ice	5.612	12.312	0.187
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000	0.000	124.000	No Ice	8.386	7.084	0.076
			0.000			1/2"	8.950	8.275	0.146
			2.000			Ice	9.480	9.188	0.223
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000	0.000	124.000	No Ice	8.386	7.084	0.076
			0.000			1/2"	8.950	8.275	0.146
			2.000			Ice	9.480	9.188	0.223
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000	0.000	124.000	No Ice	8.386	7.084	0.076
			0.000			1/2"	8.950	8.275	0.146
			2.000			Ice	9.480	9.188	0.223
						1" Ice			
(2) DB-T1-6Z-8AB-0Z	A	From Leg	4.000	0.000	124.000	No Ice	4.800	2.000	0.044
			0.000			1/2"	5.070	2.193	0.080
			2.000			Ice	5.348	2.393	0.120
						1" Ice			
RRH2x60-700	A	From Leg	4.000	0.000	124.000	No Ice	3.500	1.816	0.060
			0.000			1/2"	3.761	2.052	0.083
			2.000			Ice	4.029	2.289	0.109
						1" Ice			
RRH2x60-700	B	From Leg	4.000	0.000	124.000	No Ice	3.500	1.816	0.060

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
			0.000			1/2"	3.761	2.052	0.083
			2.000			Ice	4.029	2.289	0.109
						1" Ice			
RRH2x60-700	C	From Leg	4.000	0.000	124.000	No Ice	3.500	1.816	0.060
			0.000			1/2"	3.761	2.052	0.083
			2.000			Ice	4.029	2.289	0.109
						1" Ice			
RRH4X45-AWS4 B66	A	From Leg	4.000	0.000	124.000	No Ice	2.660	1.586	0.064
			0.000			1/2"	2.878	1.769	0.084
			2.000			Ice	3.104	1.959	0.108
						1" Ice			
RRH4X45-AWS4 B66	B	From Leg	4.000	0.000	124.000	No Ice	2.660	1.586	0.064
			0.000			1/2"	2.878	1.769	0.084
			2.000			Ice	3.104	1.959	0.108
						1" Ice			
RRH4X45-AWS4 B66	C	From Leg	4.000	0.000	124.000	No Ice	2.660	1.586	0.064
			0.000			1/2"	2.878	1.769	0.084
			2.000			Ice	3.104	1.959	0.108
						1" Ice			
RRH2X60-PCS	A	From Leg	4.000	0.000	124.000	No Ice	2.200	1.723	0.055
			0.000			1/2"	2.393	1.901	0.075
			2.000			Ice	2.593	2.087	0.099
						1" Ice			
RRH2X60-PCS	B	From Leg	4.000	0.000	124.000	No Ice	2.200	1.723	0.055
			0.000			1/2"	2.393	1.901	0.075
			2.000			Ice	2.593	2.087	0.099
						1" Ice			
RRH2X60-PCS	C	From Leg	4.000	0.000	124.000	No Ice	2.200	1.723	0.055
			0.000			1/2"	2.393	1.901	0.075
			2.000			Ice	2.593	2.087	0.099
						1" Ice			
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	124.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	124.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	124.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
Platform Mount [LP 304-1]	C	None		0.000	124.000	No Ice	17.460	17.460	1.349
						1/2"	22.440	22.440	1.625
						Ice	27.420	27.420	1.900
						1" Ice			
*** 116***									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			4.000			Ice	6.607	5.711	0.157
						1" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			4.000			Ice	6.607	5.711	0.157
						1" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	116.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			4.000			Ice	6.607	5.711	0.157
						1" Ice			
(2) LGP21401	A	From Leg	4.000	0.000	116.000	No Ice	1.104	0.207	0.014
			0.000			1/2"	1.239	0.274	0.021
			0.000			Ice	1.381	0.348	0.030
						1" Ice			
(2) LGP21401	B	From Leg	4.000	0.000	116.000	No Ice	1.104	0.207	0.014

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
			0.000				1/2"	1.239	0.274	0.021
			0.000				Ice	1.381	0.348	0.030
							1" Ice			
(2) LGP21401	C	From Leg	4.000		0.000	116.000	No Ice	1.104	0.207	0.014
			0.000				1/2"	1.239	0.274	0.021
			4.000				Ice	1.381	0.348	0.030
							1" Ice			
RRUS-11	A	From Leg	4.000		0.000	116.000	No Ice	2.784	1.187	0.048
			0.000				1/2"	2.992	1.334	0.068
			4.000				Ice	3.207	1.490	0.092
							1" Ice			
RRUS-11	B	From Leg	4.000		0.000	116.000	No Ice	2.784	1.187	0.048
			0.000				1/2"	2.992	1.334	0.068
			4.000				Ice	3.207	1.490	0.092
							1" Ice			
RRUS-11	C	From Leg	4.000		0.000	116.000	No Ice	2.784	1.187	0.048
			0.000				1/2"	2.992	1.334	0.068
			4.000				Ice	3.207	1.490	0.092
							1" Ice			
DC6-48-60-18-8F	A	From Leg	2.000		0.000	116.000	No Ice	0.791	0.791	0.020
			0.000				1/2"	1.274	1.274	0.035
			4.000				Ice	1.450	1.450	0.053
							1" Ice			
80010965 w/ Mount Pipe	A	From Leg	4.000		0.000	116.000	No Ice	14.051	7.628	0.125
			0.000				1/2"	14.688	8.903	0.222
			4.000				Ice	15.303	9.963	0.327
							1" Ice			
80010965 w/ Mount Pipe	B	From Leg	4.000		0.000	116.000	No Ice	14.051	7.628	0.125
			0.000				1/2"	14.688	8.903	0.222
			4.000				Ice	15.303	9.963	0.327
							1" Ice			
80010966 w/ Mount Pipe	C	From Leg	4.000		0.000	116.000	No Ice	17.600	9.637	0.147
			0.000				1/2"	18.331	11.155	0.263
			4.000				Ice	19.071	12.696	0.390
							1" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.000		0.000	116.000	No Ice	9.895	8.113	0.077
			0.000				1/2"	10.470	9.304	0.158
			4.000				Ice	11.010	10.209	0.248
							1" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.000		0.000	116.000	No Ice	9.895	8.113	0.077
			0.000				1/2"	10.470	9.304	0.158
			4.000				Ice	11.010	10.209	0.248
							1" Ice			
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.000		0.000	116.000	No Ice	13.213	9.582	0.100
			0.000				1/2"	13.899	11.052	0.196
			4.000				Ice	14.587	12.496	0.303
							1" Ice			
(2) 7020.00	A	From Leg	4.000		0.000	116.000	No Ice	0.102	0.175	0.002
			0.000				1/2"	0.147	0.239	0.005
			4.000				Ice	0.199	0.311	0.009
							1" Ice			
(2) 7020.00	B	From Leg	4.000		0.000	116.000	No Ice	0.102	0.175	0.002
			0.000				1/2"	0.147	0.239	0.005
			4.000				Ice	0.199	0.311	0.009
							1" Ice			
(2) 7020.00	C	From Leg	4.000		0.000	116.000	No Ice	0.102	0.175	0.002
			0.000				1/2"	0.147	0.239	0.005
			4.000				Ice	0.199	0.311	0.009
							1" Ice			
RRUS 4478 B14	A	From Leg	4.000		0.000	116.000	No Ice	1.843	1.059	0.060
			0.000				1/2"	2.012	1.197	0.076
			4.000				Ice	2.190	1.342	0.094
							1" Ice			
RRUS 4478 B14	B	From Leg	4.000		0.000	116.000	No Ice	1.843	1.059	0.060
			0.000				1/2"	2.012	1.197	0.076

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
			4.000				Ice	2.190	1.342	0.094
							1" Ice			
RRUS 4478 B14	C	From Leg	4.000	0.000		116.000	No Ice	1.843	1.059	0.060
			0.000				1/2"	2.012	1.197	0.076
			4.000				Ice	2.190	1.342	0.094
							1" Ice			
RRUS 32	A	From Leg	4.000	0.000		116.000	No Ice	2.857	1.777	0.055
			0.000				1/2"	3.083	1.968	0.077
			4.000				Ice	3.316	2.166	0.103
							1" Ice			
RRUS 32	B	From Leg	4.000	0.000		116.000	No Ice	2.857	1.777	0.055
			0.000				1/2"	3.083	1.968	0.077
			4.000				Ice	3.316	2.166	0.103
							1" Ice			
RRUS 32	C	From Leg	4.000	0.000		116.000	No Ice	2.857	1.777	0.055
			0.000				1/2"	3.083	1.968	0.077
			4.000				Ice	3.316	2.166	0.103
							1" Ice			
RRUS 32 B2	A	From Leg	4.000	0.000		116.000	No Ice	2.731	1.668	0.053
			0.000				1/2"	2.953	1.855	0.074
			4.000				Ice	3.182	2.049	0.098
							1" Ice			
RRUS 32 B2	B	From Leg	4.000	0.000		116.000	No Ice	2.731	1.668	0.053
			0.000				1/2"	2.953	1.855	0.074
			4.000				Ice	3.182	2.049	0.098
							1" Ice			
RRUS 32 B2	C	From Leg	4.000	0.000		116.000	No Ice	2.731	1.668	0.053
			0.000				1/2"	2.953	1.855	0.074
			4.000				Ice	3.182	2.049	0.098
							1" Ice			
DC6-48-60-18-8F	A	From Leg	4.000	0.000		116.000	No Ice	0.791	0.791	0.020
			0.000				1/2"	1.274	1.274	0.035
			4.000				Ice	1.450	1.450	0.053
							1" Ice			
4' x 2" Pipe Mount	A	From Leg	4.000	0.000		116.000	No Ice	0.785	0.785	0.029
			0.000				1/2"	1.028	1.028	0.035
			0.000				Ice	1.281	1.281	0.044
							1" Ice			
4' x 2" Pipe Mount	B	From Leg	4.000	0.000		116.000	No Ice	0.785	0.785	0.029
			0.000				1/2"	1.028	1.028	0.035
			0.000				Ice	1.281	1.281	0.044
							1" Ice			
4' x 2" Pipe Mount	C	From Leg	4.000	0.000		116.000	No Ice	0.785	0.785	0.029
			0.000				1/2"	1.028	1.028	0.035
			0.000				Ice	1.281	1.281	0.044
							1" Ice			
Side Arm Mount [SO 701-3]	C	None			0.000	116.000	No Ice	2.830	2.830	0.195
							1/2"	3.920	3.920	0.237
							Ice	5.010	5.010	0.279
							1" Ice			
Platform Mount [LP 1201-1]	C	None			0.000	116.000	No Ice	23.100	23.100	2.100
							1/2"	26.800	26.800	2.500
							Ice	30.500	30.500	2.900
							1" Ice			
*** 107***										
742 213	A	From Leg	1.000	0.000		107.000	No Ice	5.135	2.869	0.022
			0.000				1/2"	5.609	3.483	0.047
			0.000				Ice	6.090	3.946	0.078
							1" Ice			
742 213	B	From Leg	1.000	0.000		107.000	No Ice	5.135	2.869	0.022
			0.000				1/2"	5.609	3.483	0.047
			0.000				Ice	6.090	3.946	0.078
							1" Ice			
742 213	C	From Leg	1.000	0.000		107.000	No Ice	5.135	2.869	0.022
			0.000				1/2"	5.609	3.483	0.047

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
			0.000			Ice	6.090	3.946	0.078
						1" Ice			
Pipe Mount [PM 601-3]	C	None		0.000	107.000	No Ice	4.390	4.390	0.195
						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
*** 74***									
KS24019-L112A	C	From Leg	3.000 0.000 1.000	0.000	74.000	No Ice 1/2" Ice 1" Ice	0.100 0.180 0.260	0.100 0.180 0.260	0.005 0.006 0.008
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0.000 0.000	0.000	74.000	No Ice 1/2" Ice 1" Ice	0.850 1.140 1.430	1.670 2.340 3.010	0.065 0.079 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
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

Comb. No.	Description
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	152 - 137.42	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-12.120	0.376	1.527
			Max. Mx	20	-4.653	51.564	0.327
			Max. My	2	-4.648	0.033	52.853
			Max. Vy	20	-6.163	51.564	0.327
			Max. Vx	2	-6.266	0.033	52.853
			Max. Torque	20			-0.889
L2	137.42 - 91.09	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-63.958	4.939	5.962
			Max. Mx	20	-26.512	821.116	-0.215
			Max. My	2	-26.500	-0.658	831.603
			Max. Vy	20	-25.756	821.116	-0.215
			Max. Vx	2	-26.009	-0.658	831.603
			Max. Torque	18			-1.740
L3	91.09 - 44.79	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-91.464	10.025	6.965
			Max. Mx	20	-44.646	2091.135	-2.372
			Max. My	2	-44.639	-1.955	2112.397
			Max. Vy	20	-30.981	2091.135	-2.372
			Max. Vx	2	-31.249	-1.955	2112.397
			Max. Torque	18			-1.740
L4	44.79 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-132.872	16.167	8.599
			Max. Mx	20	-74.281	3895.101	-4.314
			Max. My	2	-74.281	-3.264	3929.900
			Max. Vy	20	-36.721	3895.101	-4.314
			Max. Vx	2	-36.984	-3.264	3929.900
			Max. Torque	18			-1.739

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	132.872	0.000	0.000
	Max. H_x	20	74.291	36.700	-0.040
	Max. H_z	2	74.291	-0.040	36.963
	Max. M_x	2	3929.900	-0.040	36.963
	Max. M_z	8	3890.406	-36.700	0.040
	Max. Torsion	6	1.738	-31.803	18.516
	Min. Vert	11	55.718	-31.764	-18.447
	Min. H_x	8	74.291	-36.700	0.040
	Min. H_z	14	74.291	0.040	-36.963

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M_x	14	-3927.303	0.040	-36.963
	Min. M_z	20	-3895.101	36.700	-0.040
	Min. Torsion	18	-1.739	31.803	-18.516

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	61.909	0.000	0.000	-1.052	1.919	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	74.291	0.040	-36.963	-3929.900	-3.264	-0.870
0.9 Dead+1.6 Wind 0 deg - No Ice	55.718	0.040	-36.963	-3912.313	-3.833	-0.870
1.2 Dead+1.6 Wind 30 deg - No Ice	74.291	18.384	-32.031	-3406.374	-1948.885	-1.506
0.9 Dead+1.6 Wind 30 deg - No Ice	55.718	18.384	-32.031	-3391.085	-1940.916	-1.504
1.2 Dead+1.6 Wind 60 deg - No Ice	74.291	31.803	-18.516	-1970.461	-3371.679	-1.738
0.9 Dead+1.6 Wind 60 deg - No Ice	55.718	31.803	-18.516	-1961.479	-3357.467	-1.734
1.2 Dead+1.6 Wind 90 deg - No Ice	74.291	36.700	-0.040	-6.909	-3890.406	-1.505
0.9 Dead+1.6 Wind 90 deg - No Ice	55.718	36.700	-0.040	-6.551	-3873.919	-1.501
1.2 Dead+1.6 Wind 120 deg - No Ice	74.291	31.764	18.447	1958.149	-3366.069	-0.869
0.9 Dead+1.6 Wind 120 deg - No Ice	55.718	31.764	18.447	1949.875	-3351.884	-0.866
1.2 Dead+1.6 Wind 150 deg - No Ice	74.291	18.316	31.991	3398.169	-1939.166	-0.001
0.9 Dead+1.6 Wind 150 deg - No Ice	55.718	18.316	31.991	3383.570	-1931.243	0.001
1.2 Dead+1.6 Wind 180 deg - No Ice	74.291	-0.040	36.963	3927.303	7.959	0.868
0.9 Dead+1.6 Wind 180 deg - No Ice	55.718	-0.040	36.963	3910.379	7.336	0.867
1.2 Dead+1.6 Wind 210 deg - No Ice	74.291	-18.384	32.031	3403.778	1953.578	1.505
0.9 Dead+1.6 Wind 210 deg - No Ice	55.718	-18.384	32.031	3389.152	1944.418	1.503
1.2 Dead+1.6 Wind 240 deg - No Ice	74.291	-31.803	18.516	1967.866	3376.372	1.739
0.9 Dead+1.6 Wind 240 deg - No Ice	55.718	-31.803	18.516	1959.547	3360.969	1.736
1.2 Dead+1.6 Wind 270 deg - No Ice	74.291	-36.700	0.040	4.314	3895.101	1.507
0.9 Dead+1.6 Wind 270 deg - No Ice	55.718	-36.700	0.040	4.619	3877.422	1.503
1.2 Dead+1.6 Wind 300 deg - No Ice	74.291	-31.764	-18.447	-1960.744	3370.764	0.870
0.9 Dead+1.6 Wind 300 deg - No Ice	55.718	-31.764	-18.447	-1951.808	3355.388	0.867
1.2 Dead+1.6 Wind 330 deg - No Ice	74.291	-18.316	-31.991	-3400.765	1943.861	-0.000
0.9 Dead+1.6 Wind 330 deg - No Ice	55.718	-18.316	-31.991	-3385.503	1934.747	-0.002
1.2 Dead+1.0 Ice+1.0 Temp	132.872	-0.000	-0.000	-8.599	16.167	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	132.872	-0.002	-10.434	-1124.382	16.386	-0.272
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	132.872	5.179	-9.035	-974.960	-536.433	-0.475
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	132.872	8.973	-5.215	-566.649	-941.103	-0.551

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	132.872	10.363	0.002	-8.857	-1089.194	-0.480
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	132.872	8.975	5.219	548.956	-941.023	-0.279
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	132.872	5.183	9.037	957.325	-536.295	-0.004
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	132.872	0.002	10.434	1106.827	16.546	0.272
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	132.872	-5.179	9.035	957.405	569.364	0.476
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	132.872	-8.973	5.215	549.094	974.034	0.552
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	132.872	-10.363	-0.002	-8.697	1122.125	0.480
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	132.872	-8.975	-5.219	-566.511	973.954	0.280
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	132.872	-5.183	-9.037	-974.880	569.226	0.005
Dead+Wind 0 deg - Service	61.909	0.008	-7.295	-774.205	0.846	-0.172
Dead+Wind 30 deg - Service	61.909	3.628	-6.321	-671.178	-382.042	-0.297
Dead+Wind 60 deg - Service	61.909	6.276	-3.654	-388.597	-662.040	-0.343
Dead+Wind 90 deg - Service	61.909	7.243	-0.008	-2.181	-764.122	-0.297
Dead+Wind 120 deg - Service	61.909	6.269	3.641	384.530	-660.936	-0.171
Dead+Wind 150 deg - Service	61.909	3.615	6.313	667.919	-380.130	0.000
Dead+Wind 180 deg - Service	61.909	-0.008	7.295	772.050	3.054	0.172
Dead+Wind 210 deg - Service	61.909	-3.628	6.321	669.023	385.943	0.297
Dead+Wind 240 deg - Service	61.909	-6.276	3.654	386.442	665.941	0.343
Dead+Wind 270 deg - Service	61.909	-7.243	0.008	0.027	768.023	0.297
Dead+Wind 300 deg - Service	61.909	-6.269	-3.641	-386.685	664.837	0.171
Dead+Wind 330 deg - Service	61.909	-3.615	-6.313	-670.074	384.031	-0.000

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-61.909	0.000	0.000	61.909	0.000	0.000%
2	0.040	-74.291	-36.963	-0.040	74.291	36.963	0.000%
3	0.040	-55.718	-36.963	-0.040	55.718	36.963	0.000%
4	18.384	-74.291	-32.031	-18.384	74.291	32.031	0.000%
5	18.384	-55.718	-32.031	-18.384	55.718	32.031	0.000%
6	31.803	-74.291	-18.516	-31.803	74.291	18.516	0.000%
7	31.803	-55.718	-18.516	-31.803	55.718	18.516	0.000%
8	36.700	-74.291	-0.040	-36.700	74.291	0.040	0.000%
9	36.700	-55.718	-0.040	-36.700	55.718	0.040	0.000%
10	31.764	-74.291	18.447	-31.764	74.291	-18.447	0.000%
11	31.764	-55.718	18.447	-31.764	55.718	-18.447	0.000%
12	18.316	-74.291	31.991	-18.316	74.291	-31.991	0.000%
13	18.316	-55.718	31.991	-18.316	55.718	-31.991	0.000%
14	-0.040	-74.291	36.963	0.040	74.291	-36.963	0.000%
15	-0.040	-55.718	36.963	0.040	55.718	-36.963	0.000%
16	-18.384	-74.291	32.031	18.384	74.291	-32.031	0.000%
17	-18.384	-55.718	32.031	18.384	55.718	-32.031	0.000%
18	-31.803	-74.291	18.516	31.803	74.291	-18.516	0.000%
19	-31.803	-55.718	18.516	31.803	55.718	-18.516	0.000%
20	-36.700	-74.291	0.040	36.700	74.291	-0.040	0.000%
21	-36.700	-55.718	0.040	36.700	55.718	-0.040	0.000%
22	-31.764	-74.291	-18.447	31.764	74.291	18.447	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
23	-31.764	-55.718	-18.447	31.764	55.718	18.447	0.000%
24	-18.316	-74.291	-31.991	18.316	74.291	31.991	0.000%
25	-18.316	-55.718	-31.991	18.316	55.718	31.991	0.000%
26	0.000	-132.872	0.000	0.000	132.872	0.000	0.000%
27	-0.002	-132.872	-10.434	0.002	132.872	10.434	0.000%
28	5.179	-132.872	-9.035	-5.179	132.872	9.035	0.000%
29	8.973	-132.872	-5.215	-8.973	132.872	5.215	0.000%
30	10.363	-132.872	0.002	-10.363	132.872	-0.002	0.000%
31	8.975	-132.872	5.219	-8.975	132.872	-5.219	0.000%
32	5.183	-132.872	9.037	-5.183	132.872	-9.037	0.000%
33	0.002	-132.872	10.434	-0.002	132.872	-10.434	0.000%
34	-5.179	-132.872	9.035	5.179	132.872	-9.035	0.000%
35	-8.973	-132.872	5.215	8.973	132.872	-5.215	0.000%
36	-10.363	-132.872	-0.002	10.363	132.872	0.002	0.000%
37	-8.975	-132.872	-5.219	8.975	132.872	5.219	0.000%
38	-5.183	-132.872	-9.037	5.183	132.872	9.037	0.000%
39	0.008	-61.909	-7.295	-0.008	61.909	7.295	0.000%
40	3.628	-61.909	-6.321	-3.628	61.909	6.321	0.000%
41	6.276	-61.909	-3.654	-6.276	61.909	3.654	0.000%
42	7.243	-61.909	-0.008	-7.243	61.909	0.008	0.000%
43	6.269	-61.909	3.641	-6.269	61.909	-3.641	0.000%
44	3.615	-61.909	6.313	-3.615	61.909	-6.313	0.000%
45	-0.008	-61.909	7.295	0.008	61.909	-7.295	0.000%
46	-3.628	-61.909	6.321	3.628	61.909	-6.321	0.000%
47	-6.276	-61.909	3.654	6.276	61.909	-3.654	0.000%
48	-7.243	-61.909	0.008	7.243	61.909	-0.008	0.000%
49	-6.269	-61.909	-3.641	6.269	61.909	3.641	0.000%
50	-3.615	-61.909	-6.313	3.615	61.909	6.313	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	0.00003332
3	Yes	4	0.00000001	0.00002002
4	Yes	4	0.00000001	0.00049168
5	Yes	4	0.00000001	0.00032483
6	Yes	4	0.00000001	0.00056098
7	Yes	4	0.00000001	0.00037234
8	Yes	4	0.00000001	0.00008438
9	Yes	4	0.00000001	0.00005599
10	Yes	4	0.00000001	0.00048689
11	Yes	4	0.00000001	0.00032229
12	Yes	4	0.00000001	0.00052240
13	Yes	4	0.00000001	0.00034625
14	Yes	4	0.00000001	0.00003601
15	Yes	4	0.00000001	0.00002202
16	Yes	4	0.00000001	0.00055278
17	Yes	4	0.00000001	0.00036651
18	Yes	4	0.00000001	0.00048332
19	Yes	4	0.00000001	0.00031942
20	Yes	4	0.00000001	0.00008110
21	Yes	4	0.00000001	0.00005373
22	Yes	4	0.00000001	0.00054368
23	Yes	4	0.00000001	0.00036041
24	Yes	4	0.00000001	0.00050830
25	Yes	4	0.00000001	0.00033602
26	Yes	4	0.00000001	0.00001242
27	Yes	4	0.00000001	0.00058298
28	Yes	4	0.00000001	0.00060148
29	Yes	4	0.00000001	0.00059539
30	Yes	4	0.00000001	0.00056033
31	Yes	4	0.00000001	0.00058334
32	Yes	4	0.00000001	0.00058720

33	Yes	4	0.00000001	0.00056786
34	Yes	4	0.00000001	0.00060102
35	Yes	4	0.00000001	0.00060193
36	Yes	4	0.00000001	0.00057982
37	Yes	4	0.00000001	0.00061301
38	Yes	4	0.00000001	0.00061424
39	Yes	4	0.00000001	0.00000393
40	Yes	4	0.00000001	0.00000631
41	Yes	4	0.00000001	0.00000808
42	Yes	4	0.00000001	0.00000485
43	Yes	4	0.00000001	0.00000623
44	Yes	4	0.00000001	0.00000676
45	Yes	4	0.00000001	0.00000391
46	Yes	4	0.00000001	0.00000768
47	Yes	4	0.00000001	0.00000641
48	Yes	4	0.00000001	0.00006009
49	Yes	4	0.00000001	0.00000754
50	Yes	4	0.00000001	0.00000647

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	152 - 137.42	6.242	39	0.334	0.001
L2	142.59 - 91.09	5.585	39	0.332	0.001
L3	97.92 - 44.79	2.719	39	0.261	0.000
L4	53.21 - 0	0.806	39	0.137	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.000	DS9A09F36D-N	39	6.242	0.334	0.001	215096
150.000	ETCR-654L12H6 w/ Mount Pipe	39	6.102	0.334	0.001	215096
133.000	RR90-17-02DP w/ Mount Pipe	39	4.925	0.324	0.001	62691
124.000	LPA-171080-12CF-EDIN-2 w/ Mount Pipe	39	4.321	0.313	0.000	44034
116.000	7770.00 w/ Mount Pipe	39	3.803	0.300	0.000	34823
107.000	742 213	39	3.246	0.282	0.000	28189
74.000	KS24019-L112A	39	1.541	0.196	0.000	19133

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	152 - 137.42	31.668	2	1.694	0.004
L2	142.59 - 91.09	28.338	2	1.681	0.003
L3	97.92 - 44.79	13.806	2	1.323	0.002
L4	53.21 - 0	4.092	2	0.695	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
152.000	DS9A09F36D-N	2	31.668	1.694	0.004	43345
150.000	ETCR-654L12H6 w/ Mount Pipe	2	30.958	1.692	0.004	43345
133.000	RR90-17-02DP w/ Mount Pipe	2	24.991	1.645	0.003	12501
124.000	LPA-171080-12CF-EDIN-2 w/ Mount Pipe	2	21.929	1.588	0.002	8747
116.000	7770.00 w/ Mount Pipe	2	19.301	1.521	0.002	6904
107.000	742 213	2	16.477	1.429	0.002	5581
74.000	KS24019-L112A	2	7.825	0.996	0.001	3774

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	152 - 137.42 (1)	TP37.31x33.03x0.313	14.580	0.000	0.0	35.192	-4.648	2526.220	0.002
L2	137.42 - 91.09 (2)	TP50.15x35.167x0.375	51.500	0.000	0.0	56.880	-26.500	3935.810	0.007
L3	91.09 - 44.79 (3)	TP62.86x47.413x0.438	53.130	0.000	0.0	83.282	-44.639	5613.010	0.008
L4	44.79 - 0 (4)	TP75x59.537x0.5	53.210	0.000	0.0	118.231	-74.281	7706.060	0.010

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	152 - 137.42 (1)	TP37.31x33.03x0.313	52.853	1841.350	0.029	0.000	1841.350	0.000
L2	137.42 - 91.09 (2)	TP50.15x35.167x0.375	831.602	3867.683	0.215	0.000	3867.683	0.000
L3	91.09 - 44.79 (3)	TP62.86x47.413x0.438	2112.400	6926.250	0.305	0.000	6926.250	0.000
L4	44.79 - 0 (4)	TP75x59.537x0.5	3929.900	11818.916	0.333	0.000	11818.916	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	152 - 137.42 (1)	TP37.31x33.03x0.313	6.266	1255.380	0.005	0.000	3687.208	0.000
L2	137.42 - 91.09 (2)	TP50.15x35.167x0.375	26.009	1967.910	0.013	0.635	7744.825	0.000
L3	91.09 - 44.79 (3)	TP62.86x47.413x0.438	31.249	2806.510	0.011	0.870	13869.416	0.000
L4	44.79 - 0 (4)	TP75x59.537x0.5	36.984	3853.030	0.010	0.870	23666.667	0.000

Pole Interaction Design Data

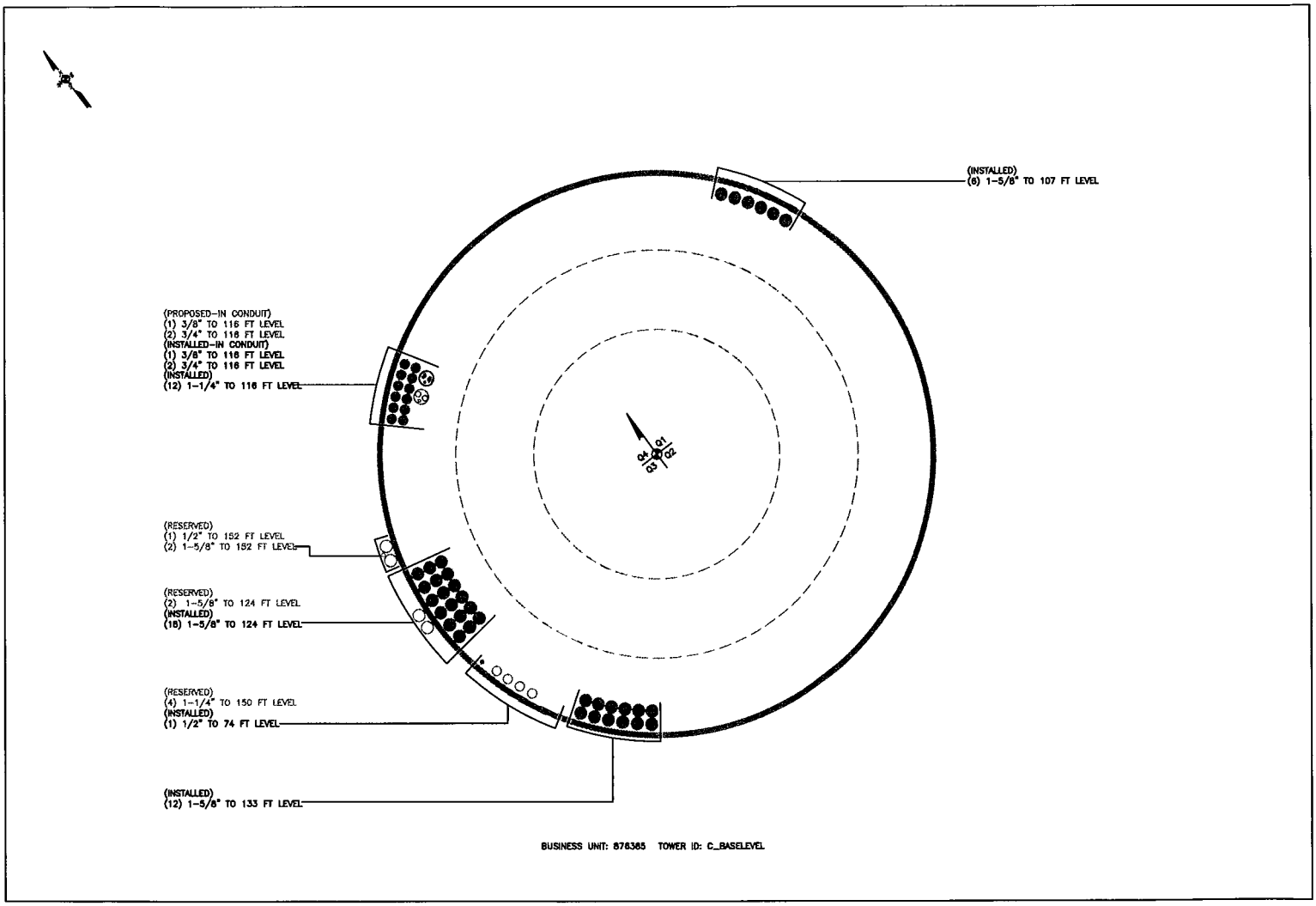
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	152 - 137.42 (1)	0.002	0.029	0.000	0.005	0.000	0.031	1.000	4.8.2
L2	137.42 - 91.09 (2)	0.007	0.215	0.000	0.013	0.000	0.222	1.000	4.8.2
L3	91.09 - 44.79 (3)	0.008	0.305	0.000	0.011	0.000	0.313	1.000	4.8.2
L4	44.79 - 0 (4)	0.010	0.333	0.000	0.010	0.000	0.342	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	152 - 137.42	Pole	TP37.31x33.03x0.313	1	-4.648	2526.220	3.1	Pass
L2	137.42 - 91.09	Pole	TP50.15x35.167x0.375	2	-26.500	3935.810	22.2	Pass
L3	91.09 - 44.79	Pole	TP62.86x47.413x0.438	3	-44.639	5613.010	31.3	Pass
L4	44.79 - 0	Pole	TP75x59.537x0.5	4	-74.281	7706.060	34.2	Pass
							Summary	
						Pole (L4)	34.2	Pass
						RATING =	**34.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876365 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *876385*
Site Name: *N. COVENTRY / WALLBEOFF*
App #: *418267 Rev. 1*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	28	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	85	in

Plate Data		
Diam:	91	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.50	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:	75	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	3930	ft-kips
Axial, Pu:	74	kips
Shear, Vu:	37	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ń):	84.6 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	32.5% Pass	

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	23.2 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	43.0% Pass	Y.L. Length: 40.00

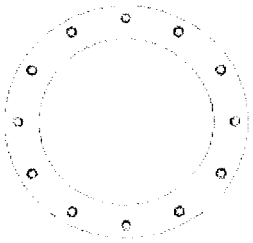
n/a

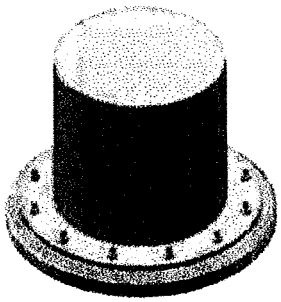
Stiffener Results

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

Pier and Pad Foundation

BU # :	876385
Site Name:	N. COVENTRY / W
App. Number:	418267 Rev. 1

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	74	kips
Base Shear, Vu_comp:	37	kips
Moment, M_u:	3930	ft-kips
Tower Height, **H**:	152	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	9.0	ft
Ext. Above Grade, **E**:	1.00	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	62	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	20	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	8.0	ft
Pad Width, **W**:	29.0	ft
Pad Thickness, **T**:	3.0	ft
Pad Rebar Size, **Sp**:	9	
Pad Rebar Quantity, **mp**:	25	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	130	pcf
Ultimate Gross Bearing, Qult:	16.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	40	degrees
SPT Blow Count, N_{blows}:	98	
Base Friction, μ:	0.55	
Neglected Depth, **N**:	4.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	637.01	37.00	**5.8%**	**Pass**
Bearing Pressure (ksf)	12.00	2.13	**17.7%**	**Pass**
*Overturning (kip*ft)*	14037.39	4272.25	**30.4%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	10504.59	4152.00	**39.5%**	**Pass**
Pier Compression (kip)	51554.88	161.48	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	3450.84	1343.13	**38.9%**	**Pass**
Pad Shear - 1-way (kips)	1033.61	192.91	**18.7%**	**Pass**
Pad Shear - 2-way (ksi)	0.19	0.03	**17.2%**	**Pass**

Soil Rating:	**30.4%**
Structural Rating:	**39.5%**

Version 2.5.4

CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU:	876385
Work Order:	1497620
Application:	418267 Rev. 1

CROWN CASTLE

	Degrees	Minutes	Seconds		
Site Latitude =	41	47	56.20	41.7989	degrees
Site Longitude =	-72	19	55.88	-72.3322	degrees
Ground Supported Structure =	Yes				
Structure Class =	II			*(Table 2-1)*	
Site Class =	D - Stiff Soil			*(Table 2-11)*	

Spectral response acceleration short periods, S_S =	0.176	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.063	

Importance Factor, I =	1.0	*(Table 2-3)*
Acceleration-based site coefficient, F_a =	1.6	*(Table 2-12)*
Velocity-based site coefficient, F_v =	2.4	*(Table 2-13)*

Design spectral response acceleration short period, S_{DS} =	0.188	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.101	*(2.7.6)*

Seismic Design Category - Short Period Response =	B	*ASCE 7-05 Table 11.6-1*
Seismic Design Category - 1s Period Response =	B	*ASCE 7-05 Table 11.6-2*

Worst Case Seismic Design Category =	B	*ASCE 7-05 Tables 11.6-1 and 6-2*

CROWN CASTLE

3530 Toringdon Way Suite 300
Charlotte, NC 28277

Phone: (704) 405-6552
Fax: (724) 416-6297
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL

Re: Application for Zoning/Building Permit
Crown Castle telecommunications site at: REILLY MTN. RD., COVENTRY, CT 6238

GLOBAL SIGNAL ACQUISITIONS II LLC ("Crown Castle") hereby authorizes THE CONNECTICUT LIGHT AND POWER COMPANY d/b/a EVERSOURCE ENERGY, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below. EVERSOURCE ENERGY shall have the right to use AT&T's structural analysis dated 12/13/17 for all filings with the CT - CONNECTICUT SITING COUNCIL.

Crown Site ID/Name: 876385/N. COVENTRY / WALLBEOFF
Customer Site ID: /Coventry
Site Address: Reilly Mtn. Rd., COVENTRY, CT 6238
APN:

Crown Castle

By: _____ Date: 6/25/18

Zachary Plummer
Real Estate Specialist

From:	Florio, Steven J
To:	Bellion, Susan J
Subject:	FW: AT&T Site ID: CT1106 - Coventry - Riley Mountain
Date:	Tuesday, June 26, 2018 10:43:53 AM
Attachments:	876385 - Crown LOA 386809.pdf ATT Structural - CT-1106 - Coventry CT.pdf

Sue, Below is the approval email from AT&T.

From: BRADY, SARA [mailto:SB368E@att.com]
Sent: Tuesday, June 26, 2018 9:25 AM
To: Gelinas, Christopher <christopher.gelinas@eversource.com>; Florio, Steven J <steven.florio@eversource.com>
Cc: RINCON, JESSICA <JR7293@att.com>
Subject: FW: AT&T Site ID: CT1106 - Coventry - Riley Mountain

Good Morning Chris:

RE: 400 Riley Mountain Rd in Coventry, CT (AT&T Site CT1106)

The Connecticut Light and Power Company dba Eversource Energy is approved to use the AT&T structural dated 12-13-17 for 400 Riley Mountain Rd, Coventry, CT for their filings with the Connecticut Siting Council.

Thank you,

Lynn Brady

Sr. Manager, Real Estate & Construction
AT&T Mobility New England
550 Cochituate Rd. Suite 13 and 14
Framingham, MA 01701

508-494-6078 (cell)

mailto:sb368e@att.com