

March 16, 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
426 River Road, Willington, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 83-foot level on an existing 110-foot tower at 426 River Road in Willington, Connecticut (the “Property”). The tower is owned by Crown Castle (“Crown”). The Council approved Cellco’s use of this tower in 2016 (PE1133-VER-20150327). Cellco now intends to replace two (2) remote radio heads (“RRHs”) with two (2) newer model RRHs on the tower. Included in Attachment 1 are specifications for Cellco’s replacement 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 Christina B. Mailhos, First Selectman of the Town of Willington; Susan Yorgensen, Willington Planning-Zoning/Wetlands Agent; the Willington Fire Department, the Property owner; and Crown, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure. Cellco’s replacement RRHs will be installed on its existing platform at the 83-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 operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A 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 Willington 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:

Christina B. Mailhos, First Selectman
Susan Yorgensen, Planning-Zoning/Wetlands Agent
Willington Fire Department
Crown
Tim Parks

ATTACHMENT 1

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.

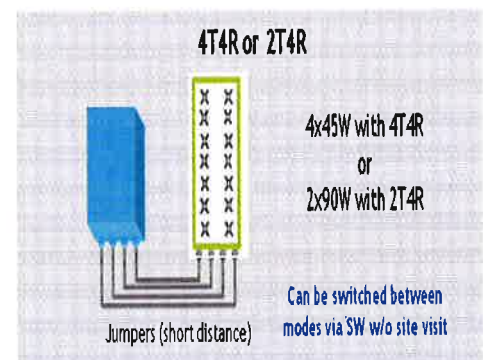
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the 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	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield)
Volume in Liters	35.5 (with solar shield) 29.7 (without solar shield)
Weight in kg (lb) (w/o mounting HW)	25.8kg (56.8lb) (with solar shield)
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) UL50E Type 4 Enclosure
Wind load (@150km/h or 93mph)	250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

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ATTACHMENT 2

ATTACHMENT 3

Date: October 19, 2016

Timothy Howell
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS®

Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
(770) 701-2500

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-Locate
Carrier Site Number: 282810
Carrier Site Name: Willington West, CT

Crown Castle Designation: Crown Castle BU Number: 841301
Crown Castle Site Name: WILLINGTON-RIVER RD
Crown Castle JDE Job Number: 394955
Crown Castle Work Order Number: 1314690
Crown Castle Application Number: 360342 Rev. 0

Engineering Firm Designation: Jacobs Engineering Group Inc. Project Number: 1314690

Site Data: 426 RIVER ROAD, WILLINGTON, Tolland County, CT
Latitude 41° 53' 26.72", Longitude -72° 17' 21.77"
110 Foot - Monopole Tower

Dear Timothy Howell,

Jacobs Engineering Group Inc. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 959210, in accordance with application 360342, 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:

LC5: Existing + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C 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 Jacobs Engineering Group Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by:



Miguel E. Maayo III
Structural Engineer



Reviewed by:

Matthew E. Watkins, P.E., LEED^{AP}
Project Engineer

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1) INTRODUCTION

This tower is a 110 ft Monopole tower mapped by ADP Structural & Welding in May of 2011. The original design code and wind speed are unknown.

The tower has been modified per reinforcement drawings prepared by GPD, in June of 2012. Modifications consist of shaft reinforcement and base plate stiffeners.

This tower has been modified per reinforcement drawings prepared by AeroSolutions, in January of 2015. Modifications consist of additional anchor rods and shaft reinforcement.

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 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads and exposure category C.

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
83.0	83.0	2	alcatel lucent	B66A RRH4X45	-	-	-

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	113.0	2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	1 2 12	3/8 3/4 7/8	1
		6	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe			
		1	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		6	powerwave technologies	TT19-08BP111-001			
	111.0	6	ericsson	RRUS 11			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 712-1]			
100.0	102.0	2	dapa	48212S w/ Mount Pipe	4	1-5/8	1
	100.0	1	tower mounts	Platform Mount [LP 712-1]			
83.0	83.0	2	alcatel lucent	RRH2X60-AWS	2	1-5/8	1
		2	alcatel lucent	B13 RRH4X30-4R			
		2	alcatel lucent	RRH2X60-PCS			
		4	andrew	SBNHH-1D65A w/ Mount Pipe			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		2	tower mounts	Pipe Mount [PM 702-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
69.0	74.0	1	decibel	DB810M-XC	3	1/2	1
	72.0	1	dapa	48212S w/ Mount Pipe			
	71.0	1	decibel	DB201-F			
	69.0	1	tower mounts	Side Arm Mount [SO 201-1]			

Notes:

- 1) Existing Equipment
- 2) 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)
Unknown						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	WEI	4710168	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	WEI	4710170	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ADP Structural & Welding	5113552	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD	4945191	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	AeroSolutions	5537030	CCISITES
4-POST MODIFICATION INSPECTION	FDH Velocitel Engineering Innovation	5822398	CCISITES
4-POST MODIFICATION INSPECTION	FDH Velocitel Engineering Innovation	5864402	CCISITES
4-STRUCTURAL ANALYSIS REPORT	AeroSolutions	5729966	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.7.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) The following material grades were assumed based on previous experience with similar towers: Pole Shaft A572-65, Base Plate A572-60, Anchor Rods A615-75, Concrete f_c 3 ksi, and Rebar Yield Strength 60 ksi.
- 5) The existing reinforcement was installed per the referenced documents.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	21.8%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	34.6%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	51.3%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	50.9%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	58.9%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	67.3%	Pass
80 - 78.75	Pole	TP18.112x17.89x0.25	Pole	69.4%	Pass
78.75 - 78.5	Pole + Reinf.	TP18.156x18.112x0.55	Reinf. 6 Tension Rupture	59.3%	Pass
78.5 - 73.5	Pole + Reinf.	TP19.044x18.156x0.5375	Reinf. 6 Tension Rupture	67.3%	Pass
73.5 - 68.5	Pole + Reinf.	TP19.932x19.044x0.5125	Reinf. 6 Tension Rupture	74.7%	Pass
68.5 - 64.25	Pole + Reinf.	TP20.686x19.932x0.5	Reinf. 6 Tension Rupture	80.9%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	62.3%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	67.8%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	70.4%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	55.3%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	59.3%	Pass
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	60.6%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 5 Tension Rupture	63.2%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 5 Tension Rupture	66.0%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 5 Tension Rupture	67.1%	Pass
37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 2 Tension Rupture	65.7%	Pass
37 - 34.25	Pole + Reinf.	TP25.562x25.065x0.6875	Reinf. 2 Tension Rupture	67.0%	Pass
34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.5125	Pole	77.7%	Pass

34 - 33.75	Pole + Reinf.	TP25.652x25.607x0.5125	Pole	77.8%	Pass
33.75 - 33.5	Pole + Reinf.	TP25.697x25.652x0.725	Reinf. 4 Tension Rupture	62.3%	Pass
33.5 - 28.5	Pole + Reinf.	TP26.601x25.697x0.7	Reinf. 4 Tension Rupture	64.4%	Pass
28.5 - 23.5	Pole + Reinf.	TP27.504x26.601x0.6875	Reinf. 4 Tension Rupture	66.4%	Pass
23.5 - 18.5	Pole + Reinf.	TP28.408x27.504x0.675	Reinf. 4 Tension Rupture	68.1%	Pass
18.5 - 13.5	Pole + Reinf.	TP29.311x28.408x0.6625	Reinf. 4 Tension Rupture	69.7%	Pass
13.5 - 8.5	Pole + Reinf.	TP30.215x29.311x0.6375	Reinf. 4 Tension Rupture	71.2%	Pass
8.5 - 3.5	Pole + Reinf.	TP31.119x30.215x0.6375	Reinf. 4 Tension Rupture	72.5%	Pass
3.5 - 0	Pole + Reinf.	TP31.751x31.119x0.625	Reinf. 4 Tension Rupture	73.3%	Pass
				Summary	
			Pole	77.8%	Pass
			Reinforcement	80.9%	Pass
			Overall	80.9%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	47.7	Pass
1	Anchor Rod Sleeve Pipe	0	50.1	Pass
1	Base Plate	0	54.6	Pass
1	Base Foundation Soil Interaction	0	42.5	Pass

Structure Rating (max from all components) =	80.9%
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Notes:

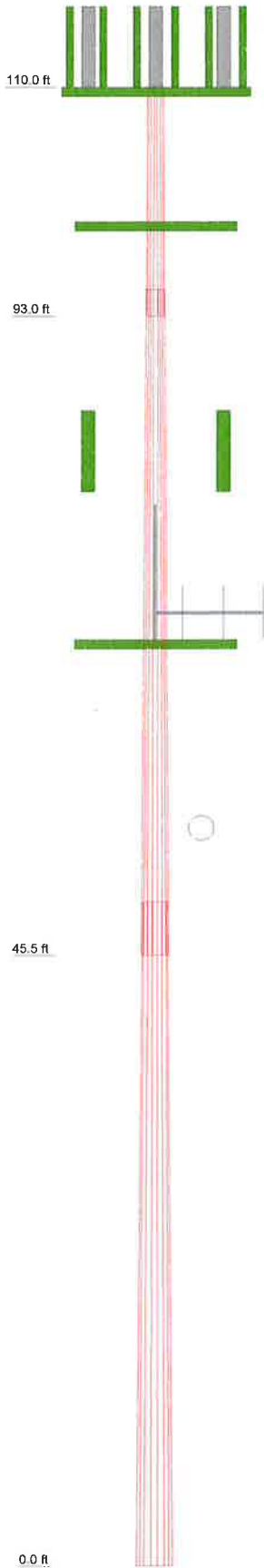
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	17,000	49,500	49,500
Number of Sides	18	18	18
Thickness (in)	0.188	0.250	0.313
Socket Length (ft)	2,000	4,000	4,000
Top Dia (in)	13,051	15,226	22,806
Bot Dia (in)	15,941	24,016	31,751
Grade		A572-65	
Weight (K)	0.5	2.6	4.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) P65-15-XLH-RR w/ Mount Pipe	110	(2) 6' x 2" Mount Pipe	100
(2) P65-15-XLH-RR w/ Mount Pipe	110	6' x 2" Mount Pipe	100
(2) P65-15-XLH-RR w/ Mount Pipe	110	Transition Ladder	100
P65-16-XLH-RR w/ Mount Pipe	110	(2) SBNHH-1D65A w/ Mount Pipe	83
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	(2) SBNHH-1D65A w/ Mount Pipe	83
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	DB-T1-6Z-8AB-0Z	83
DC6-48-60-18-8F	110	DB-T1-6Z-8AB-0Z	83
(2) RRUS 11	110	B13 RRH4X30-4R	83
(2) RRUS 11	110	B13 RRH4X30-4R	83
(2) RRUS 11	110	RRH2X60-PCS	83
(2) TT19-08BP111-001	110	RRH2X60-PCS	83
(2) TT19-08BP111-001	110	B66A RRH4X45	83
(2) TT19-08BP111-001	110	B66A RRH4X45	83
Platform Mount [LP 712-1]	110	T-Arm Mount [TA 702-1]	83
6' x 2" Mount Pipe	110	T-Arm Mount [TA 702-1]	83
6' x 2" Mount Pipe	110	DB201-F	69
6' x 2" Mount Pipe	110	DB810M-XC	69
Transition Ladder	110	48212S w/ Mount Pipe	69
48212S w/ Mount Pipe	100	Side Arm Mount [SO 201-1]	69
48212S w/ Mount Pipe	100	12' Horizontal x 4" HSS	69
Platform Mount [LP 712-1]	100	7x2" Antenna Mount Pipe	69
6' x 2" Mount Pipe	100	7x2" Antenna Mount Pipe	69
		7x2" Antenna Mount Pipe	69

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	85 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97,000 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50,000 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60,000 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft

Jacobs Engineering Group, Inc.

5449 Bells Ferry Rd
Acworth, GA 30102
Phone: (770) 701-2500
FAX: (770) 701-2501

Job: **WILLINGTON-RIVER RD**

Project: **BU#841301 WO#1314690**

Client: **Crown Castle**

Drawn by: **Miguel Maayo III**

App'd:

Code: **TIA-222-G**

Date: **10/19/16**

Scale: **N**

Path:

Dwg No.:

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) P65-15-XLH-RR w/ Mount Pipe	110	(2) 6' x 2" Mount Pipe	100
(2) P65-15-XLH-RR w/ Mount Pipe	110	6' x 2" Mount Pipe	100
(2) P65-15-XLH-RR w/ Mount Pipe	110	Transition Ladder	100
P65-16-XLH-RR w/ Mount Pipe	110	(2) SBNHH-1D65A w/ Mount Pipe	83
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	(2) SBNHH-1D65A w/ Mount Pipe	83
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	DB-T1-6Z-8AB-0Z	83
DC6-48-60-18-8F	110	DB-T1-6Z-8AB-0Z	83
(2) RRUS 11	110	B13 RRH4X30-4R	83
(2) RRUS 11	110	B13 RRH4X30-4R	83
(2) RRUS 11	110	RRH2X60-PCS	83
(2) RRUS 11	110	RRH2X60-PCS	83
(2) TT19-08BP111-001	110	B66A RRH4X45	83
(2) TT19-08BP111-001	110	B66A RRH4X45	83
(2) TT19-08BP111-001	110	T-Arm Mount [TA 702-1]	83
Platform Mount [LP 712-1]	110	T-Arm Mount [TA 702-1]	83
6' x 2" Mount Pipe	110	DB201-F	69
6' x 2" Mount Pipe	110	DB810M-XC	69
6' x 2" Mount Pipe	110	48212S w/ Mount Pipe	69
6' x 2" Mount Pipe	110	Side Arm Mount [SO 201-1]	69
Transition Ladder	110	12" Horizontal x 4" HSS	69
48212S w/ Mount Pipe	100	7x2" Antenna Mount Pipe	69
48212S w/ Mount Pipe	100	7x2" Antenna Mount Pipe	69
Platform Mount [LP 712-1]	100	7x2" Antenna Mount Pipe	69
6' x 2" Mount Pipe	100	7x2" Antenna Mount Pipe	69

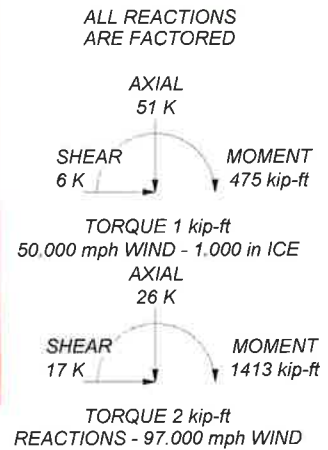
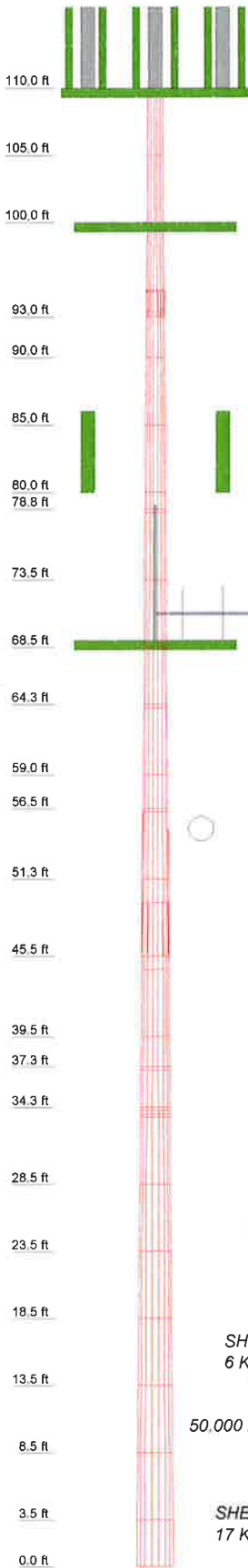
MATERIAL STRENGTH

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 C to the TIA-222-G Standard.
3. Tower designed for a 97.000 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.000 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.000 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.000	18	0.188	2.000	13.051	13.901	0.1	0.1
2	5.000	18	0.188	2.000	14.751	15.941	0.1	0.1
3	7.000	18	0.188	2.000	15.226	16.114	0.2	0.2
4	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
5	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
6	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
7	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
8	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
9	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
10	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
11	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
12	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
13	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
14	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
15	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
16	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
17	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
18	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
19	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
20	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
21	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
22	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
23	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
24	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
25	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
26	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
27	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
28	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
29	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
30	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
31	5.000	18	0.250	2.000	16.114	17.002	0.2	0.2
32	3.500	18	0.625	4.000	31.119	31.751	0.8	1.1



<p>Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: (770) 701-2500 FAX: (770) 701-2501</p>	<p>Job: WILLINGTON-RIVER RD</p>		
	<p>Project: BU#841301 WO#1314690</p>		
	<p>Client: Crown Castle</p>	<p>Drawn by: Miguel Maayo III</p>	<p>App'd:</p>
	<p>Code: TIA-222-G</p>	<p>Date: 10/19/16</p>	<p>Scale: N</p>
	<p>Path:</p>		<p>Dwg No.</p>

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 1) Tower is located in Tolland County, Connecticut.
- 2) Basic wind speed of 97.000 mph.
- 3) Structure Class II.
- 4) Exposure Category C.
- 5) Topographic Category 1.
- 6) Crest Height 0.000 ft.
- 7) Nominal ice thickness of 1.000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56.000 pcf.
- 10) A wind speed of 50.000 mph is used in combination with ice.
- 11) Temperature drop of 50.000 °F.
- 12) Deflections calculated using a wind speed of 60.000 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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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	110.000-105.000	5.000	0.000	18	13.051	13.901	0.188	0.750	A572-65 (65 ksi)
L2	105.000-100.000	5.000	0.000	18	13.901	14.751	0.188	0.750	A572-65 (65 ksi)
L3	100.000-93.000	7.000	2.000	18	14.751	15.941	0.188	0.750	A572-65 (65 ksi)
L4	93.000-90.000	5.000	0.000	18	15.226	16.114	0.250	1.000	A572-65 (65 ksi)
L5	90.000-85.000	5.000	0.000	18	16.114	17.002	0.250	1.000	A572-65 (65 ksi)
L6	85.000-80.000	5.000	0.000	18	17.002	17.890	0.250	1.000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L7	80.000-78.750	1.250	0.000	18	17.890	18.112	0.250	1.000	A572-65 (65 ksi)
L8	78.750-78.500	0.250	0.000	18	18.112	18.156	0.550	2.200	A572-65 (65 ksi)
L9	78.500-73.500	5.000	0.000	18	18.156	19.044	0.537	2.150	A572-65 (65 ksi)
L10	73.500-68.500	5.000	0.000	18	19.044	19.932	0.512	2.050	A572-65 (65 ksi)
L11	68.500-64.250	4.250	0.000	18	19.932	20.686	0.500	2.000	A572-65 (65 ksi)
L12	64.250-64.000	0.250	0.000	18	20.686	20.731	0.775	3.100	A572-65 (65 ksi)
L13	64.000-59.000	5.000	0.000	18	20.731	21.619	0.750	3.000	A572-65 (65 ksi)
L14	59.000-56.500	2.500	0.000	18	21.619	22.063	0.725	2.900	A572-65 (65 ksi)
L15	56.500-56.250	0.250	0.000	18	22.063	22.107	0.975	3.900	A572-65 (65 ksi)
L16	56.250-51.250	5.000	0.000	18	22.107	22.995	0.925	3.700	A572-65 (65 ksi)
L17	51.250-45.500	5.750	4.000	18	22.995	24.016	0.912	3.650	A572-65 (65 ksi)
L18	45.500-44.500	5.000	0.000	18	22.806	23.709	0.725	2.900	A572-65 (65 ksi)
L19	44.500-39.500	5.000	0.000	18	23.709	24.613	0.713	2.850	A572-65 (65 ksi)
L20	39.500-37.250	2.250	0.000	18	24.613	25.019	0.700	2.800	A572-65 (65 ksi)
L21	37.250-37.000	0.250	0.000	18	25.019	25.065	0.700	2.800	A572-65 (65 ksi)
L22	37.000-34.250	2.750	0.000	18	25.065	25.562	0.688	2.750	A572-65 (65 ksi)
L23	34.250-34.000	0.250	0.000	18	25.562	25.607	0.512	2.050	A572-65 (65 ksi)
L24	34.000-33.750	0.250	0.000	18	25.607	25.652	0.512	2.050	A572-65 (65 ksi)
L25	33.750-33.500	0.250	0.000	18	25.652	25.697	0.725	2.900	A572-65 (65 ksi)
L26	33.500-28.500	5.000	0.000	18	25.697	26.601	0.700	2.800	A572-65 (65 ksi)
L27	28.500-23.500	5.000	0.000	18	26.601	27.504	0.688	2.750	A572-65 (65 ksi)
L28	23.500-18.500	5.000	0.000	18	27.504	28.408	0.675	2.700	A572-65 (65 ksi)
L29	18.500-13.500	5.000	0.000	18	28.408	29.311	0.662	2.650	A572-65 (65 ksi)
L30	13.500-8.500	5.000	0.000	18	29.311	30.215	0.637	2.550	A572-65 (65 ksi)
L31	8.500-3.500	5.000	0.000	18	30.215	31.119	0.637	2.550	A572-65 (65 ksi)
L32	3.500-0.000	3.500		18	31.119	31.751	0.625	2.500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	13.252	7.655	160.038	4.567	6.630	24.139	320.287	3.828	1.967	10.491
	14.115	8.161	193.906	4.868	7.062	27.459	388.067	4.081	2.117	11.288
L2	14.115	8.161	193.906	4.868	7.062	27.459	388.067	4.081	2.117	11.288
	14.979	8.667	232.243	5.170	7.494	30.993	464.792	4.334	2.266	12.086
L3	14.979	8.667	232.243	5.170	7.494	30.993	464.792	4.334	2.266	12.086
	16.187	9.375	293.952	5.592	8.098	36.299	588.291	4.689	2.476	13.203
L4	15.822	11.883	336.722	5.316	7.735	43.533	673.888	5.943	2.240	8.959
	16.362	12.588	400.233	5.632	8.186	48.893	800.992	6.295	2.396	9.584

110 Ft Monopole Tower Structural Analysis
 Project Number 1314690, Application 360342, Revision 0

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L5	16.362	12.588	400.233	5.632	8.186	48.893	800.992	6.295	2.396	9.584
	17.264	13.293	471.265	5.947	8.637	54.564	943.151	6.648	2.552	10.209
L6	17.264	13.293	471.265	5.947	8.637	54.564	943.151	6.648	2.552	10.209
	18.166	13.997	550.241	6.262	9.088	60.546	1101.207	7.000	2.709	10.834
L7	18.166	13.997	550.241	6.262	9.088	60.546	1101.207	7.000	2.709	10.834
	18.391	14.173	571.276	6.341	9.201	62.091	1143.303	7.088	2.748	10.991
L8	18.391	30.657	1194.537	6.234	9.201	129.831	2390.647	15.332	2.220	4.036
	18.436	30.735	1203.619	6.250	9.223	130.498	2408.822	15.370	2.227	4.05
L9	18.436	30.058	1178.772	6.255	9.223	127.804	2359.094	15.032	2.249	4.185
	19.338	31.572	1366.115	6.570	9.674	141.211	2734.027	15.789	2.406	4.476
L10	19.338	30.145	1307.861	6.579	9.674	135.189	2617.442	15.075	2.450	4.78
	20.239	31.589	1504.999	6.894	10.125	148.637	3011.978	15.797	2.606	5.085
L11	20.239	30.838	1471.129	6.898	10.125	145.292	2944.193	15.422	2.628	5.256
	21.006	32.036	1649.280	7.166	10.509	156.944	3300.731	16.021	2.761	5.522
L12	21.006	48.979	2453.325	7.069	10.509	233.456	4909.878	24.494	2.277	2.938
	21.051	49.088	2469.771	7.084	10.531	234.518	4942.792	24.549	2.285	2.948
L13	21.051	47.564	2399.095	7.093	10.531	227.807	4801.346	23.787	2.329	3.105
	21.952	49.678	2733.339	7.408	10.982	248.886	5470.275	24.844	2.485	3.313
L14	21.952	48.080	2651.735	7.417	10.982	241.455	5306.960	24.044	2.529	3.488
	22.403	49.101	2824.380	7.575	11.208	252.001	5652.477	24.555	2.607	3.596
L15	22.403	65.259	3666.355	7.486	11.208	327.124	7337.535	32.636	2.167	2.223
	22.448	65.396	3689.560	7.502	11.230	328.534	7383.974	32.704	2.175	2.231
L16	22.448	62.189	3525.257	7.520	11.230	313.903	7055.152	31.101	2.263	2.446
	23.350	64.796	3987.397	7.835	11.681	341.345	7980.042	32.404	2.419	2.615
L17	23.350	63.957	3940.201	7.839	11.681	337.305	7885.587	31.984	2.441	2.675
	24.386	66.914	4512.431	8.202	12.200	369.868	9030.800	33.463	2.621	2.872
L18	23.892	50.811	3129.830	7.839	11.585	270.155	6263.778	25.410	2.738	3.776
	24.075	52.890	3529.995	8.159	12.044	293.084	7064.635	26.450	2.897	3.996
L19	24.075	52.007	3474.796	8.164	12.044	288.501	6954.165	26.008	2.919	4.097
	24.993	54.050	3900.685	8.485	12.503	311.972	7806.502	27.030	3.078	4.32
L20	24.993	53.130	3838.268	8.489	12.503	306.980	7681.586	26.570	3.100	4.428
	25.405	54.033	4037.409	8.633	12.710	317.659	8080.131	27.022	3.171	4.531
L21	25.405	54.033	4037.409	8.633	12.710	317.659	8080.131	27.022	3.171	4.531
	25.451	54.133	4059.952	8.649	12.733	318.857	8125.246	27.072	3.179	4.542
L22	25.451	53.194	3993.593	8.654	12.733	313.646	7992.441	26.602	3.201	4.657
	25.956	54.278	4242.851	8.830	12.985	326.743	8491.285	27.144	3.289	4.784
L23	25.956	40.747	3230.080	8.892	12.985	248.749	6464.409	20.377	3.597	7.018
	26.002	40.820	3247.588	8.908	13.008	249.656	6499.450	20.414	3.605	7.034
L24	26.002	40.820	3247.588	8.908	13.008	249.656	6499.450	20.414	3.605	7.034
	26.048	40.894	3265.160	8.924	13.031	250.565	6534.617	20.451	3.613	7.049
L25	26.048	57.361	4502.863	8.849	13.031	345.545	9011.651	28.686	3.239	4.467
	26.094	57.465	4527.391	8.865	13.054	346.817	9060.739	28.738	3.247	4.478
L26	26.094	55.539	4384.416	8.874	13.054	335.864	8774.600	27.775	3.291	4.701
	27.011	57.546	4877.257	9.195	13.513	360.927	9760.931	28.779	3.450	4.928
L27	27.011	56.546	4797.102	9.199	13.513	354.995	9600.515	28.278	3.472	5.05
	27.929	58.517	5316.613	9.520	13.972	380.515	10640.221	29.264	3.631	5.281
L28	27.929	57.480	5227.250	9.524	13.972	374.119	10461.378	28.746	3.653	5.411
	28.846	59.416	5773.373	9.845	14.431	400.063	11554.342	29.714	3.812	5.647
L29	28.846	58.342	5674.124	9.850	14.431	393.185	11355.714	29.177	3.834	5.787
	29.764	60.242	6246.731	10.170	14.890	419.520	12501.682	30.127	3.993	6.027
L30	29.764	58.019	6026.756	10.179	14.890	404.747	12061.441	29.015	4.037	6.332
	30.681	59.848	6614.640	10.500	15.349	430.944	13237.984	29.930	4.196	6.582
L31	30.681	59.848	6614.640	10.500	15.349	430.944	13237.984	29.930	4.196	6.582
	31.599	61.676	7239.563	10.821	15.808	457.963	14488.652	30.844	4.355	6.831
L32	31.599	60.491	7106.346	10.825	15.808	449.535	14222.044	30.251	4.377	7.003
	32.241	61.746	7557.781	11.050	16.130	468.569	15125.508	30.879	4.488	7.181

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 110.000-105.000				1	1	1			
L2 105.000-100.000				1	1	1			
L3 100.000-93.000				1	1	1			
L4 93.000-				1	1	1			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	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
ft	ft ²	in							
90.000									
L5 90.000-85.000				1	1	1			
L6 85.000-80.000				1	1	1			
L7 80.000-78.750				1	1	1			
L8 78.750-78.500				1	1	0.901548			
L9 78.500-73.500				1	1	0.899947			
L10 73.500-68.500				1	1	0.921781			
L11 68.500-64.250				1	1	0.92761			
L12 64.250-64.000				1	1	0.873476			
L13 64.000-59.000				1	1	0.877291			
L14 59.000-56.500				1	1	0.894771			
L15 56.500-56.250				1	1	0.838655			
L16 56.250-51.250				1	1	0.857295			
L17 51.250-45.500				1	1	0.860295			
L18 45.500-44.500				1	1	0.899647			
L19 44.500-39.500				1	1	0.896925			
L20 39.500-37.250				1	1	0.904672			
L21 37.250-37.000				1	1	1.05392			
L22 37.000-34.250				1	1	1.06019			
L23 34.250-34.000				1	1	1.21177			
L24 34.000-33.750				1	1	1.21069			
L25 33.750-33.500				1	1	1.00374			
L26 33.500-28.500				1	1	1.01789			
L27 28.500-23.500				1	1	1.01631			
L28 23.500-18.500				1	1	1.01602			
L29 18.500-13.500				1	1	1.01697			
L30 13.500-8.500				1	1	1.03865			
L31 8.500-3.500				1	1	1.02239			
L32 3.500-0.000				1	1	1.03139			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf

PL1.25x3.5-12	A	Surface Af (CaAa)	65.500 - 45.500	1	1	0.383 0.383	3.500	9.500	0.000
PL1.25x3.5-12	B	Surface Af (CaAa)	65.500 - 45.500	1	1	0.383 0.383	3.500	9.500	0.000
PL1.25x3.5-12	C	Surface Af (CaAa)	65.500 - 45.500	1	1	0.383 0.383	3.500	9.500	0.000

CCI-SFP-06512535	A	Surface Af (CaAa)	36.500 - 1.500	1	1	-0.280 -0.280	6.500	15.500	0.000
CCI-SFP-06512535	B	Surface Af (CaAa)	36.500 - 1.500	1	1	0.217 0.217	6.500	15.500	0.000
CCI-SFP-06512535	B	Surface Af (CaAa)	36.500 - 1.500	1	1	-0.280 0.280	6.500	15.500	0.000
CCI-SFP-06512535	C	Surface Af (CaAa)	36.500 - 1.500	1	1	0.050 0.050	6.500	15.500	0.000
CCI-SFP-06512535	A	Surface Af (CaAa)	56.500 - 36.500	1	1	-0.280 -0.280	6.500	15.500	0.000
CCI-SFP-06512535	B	Surface Af (CaAa)	56.500 - 36.500	1	1	-0.280 -0.280	6.500	15.500	0.000
CCI-SFP-06512535	C	Surface Af (CaAa)	56.500 - 36.500	1	1	-0.280 -0.280	6.500	15.500	0.000
CCI-SFP-04510025	A	Surface Af (CaAa)	81.500 - 56.500	1	1	-0.280 -0.280	4.500	11.000	0.000
CCI-SFP-04510025	B	Surface Af (CaAa)	81.500 - 56.500	1	1	-0.280 -0.280	4.500	11.000	0.000
CCI-SFP-04510025	C	Surface Af (CaAa)	81.500 - 56.500	1	1	-0.280 -0.280	4.500	11.000	0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	CAAA ft ² /ft	Weight plf
LDF5-50A(7/8")	A	No	Inside Pole	110.000 - 6.000	12	No Ice 1/2" Ice 1" Ice	0.000 0.330 0.330 0.330
FB-L98-002-XXX(3/8)	A	No	Inside Pole	110.000 - 6.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.065 0.065 0.065
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	110.000 - 6.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.584 0.584
2" Flex Conduit	A	No	Inside Pole	110.000 - 6.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.340 0.340 0.340

LDF7-50A(1-5/8")	C	No	Inside Pole	100.000 - 6.000	4	No Ice 1/2" Ice 1" Ice	0.000 0.820 0.820

HB158-1-08U8-S8J18(1-5/8)	B	No	Inside Pole	83.000 - 6.000	2	No Ice 1/2" Ice 1" Ice	0.000 1.300 1.300

LDF4-50A(1/2")	A	No	Inside Pole	69.000 - 6.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.150 0.150 0.150

Feed Line/Linear Appurtenances Section Areas

110 Ft Monopole Tower Structural Analysis
 Project Number 1314690, Application 360342, Revision 0

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	110.000-105.000	A	0.000	0.000	0.000	0.000	0.028
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	105.000-100.000	A	0.000	0.000	0.000	0.000	0.028
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L3	100.000-93.000	A	0.000	0.000	0.000	0.000	0.039
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.023
L4	93.000-90.000	A	0.000	0.000	0.000	0.000	0.017
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.010
L5	90.000-85.000	A	0.000	0.000	0.000	0.000	0.028
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.016
L6	85.000-80.000	A	0.000	0.000	1.125	0.000	0.028
		B	0.000	0.000	1.125	0.000	0.008
		C	0.000	0.000	1.125	0.000	0.016
L7	80.000-78.750	A	0.000	0.000	0.938	0.000	0.007
		B	0.000	0.000	0.938	0.000	0.003
		C	0.000	0.000	0.938	0.000	0.004
L8	78.750-78.500	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.188	0.000	0.001
		C	0.000	0.000	0.188	0.000	0.001
L9	78.500-73.500	A	0.000	0.000	3.750	0.000	0.028
		B	0.000	0.000	3.750	0.000	0.013
		C	0.000	0.000	3.750	0.000	0.016
L10	73.500-68.500	A	0.000	0.000	3.750	0.000	0.028
		B	0.000	0.000	3.750	0.000	0.013
		C	0.000	0.000	3.750	0.000	0.016
L11	68.500-64.250	A	0.000	0.000	3.917	0.000	0.025
		B	0.000	0.000	3.917	0.000	0.011
		C	0.000	0.000	3.917	0.000	0.014
L12	64.250-64.000	A	0.000	0.000	0.333	0.000	0.001
		B	0.000	0.000	0.333	0.000	0.001
		C	0.000	0.000	0.333	0.000	0.001
L13	64.000-59.000	A	0.000	0.000	6.667	0.000	0.030
		B	0.000	0.000	6.667	0.000	0.013
		C	0.000	0.000	6.667	0.000	0.016
L14	59.000-56.500	A	0.000	0.000	3.333	0.000	0.015
		B	0.000	0.000	3.333	0.000	0.006
		C	0.000	0.000	3.333	0.000	0.008
L15	56.500-56.250	A	0.000	0.000	0.417	0.000	0.001
		B	0.000	0.000	0.417	0.000	0.001
		C	0.000	0.000	0.417	0.000	0.001
L16	56.250-51.250	A	0.000	0.000	8.333	0.000	0.030
		B	0.000	0.000	8.333	0.000	0.013
		C	0.000	0.000	8.333	0.000	0.016
L17	51.250-45.500	A	0.000	0.000	9.583	0.000	0.034
		B	0.000	0.000	9.583	0.000	0.015
		C	0.000	0.000	9.583	0.000	0.019
L18	45.500-44.500	A	0.000	0.000	1.083	0.000	0.006
		B	0.000	0.000	1.083	0.000	0.003
		C	0.000	0.000	1.083	0.000	0.003
L19	44.500-39.500	A	0.000	0.000	5.417	0.000	0.030
		B	0.000	0.000	5.417	0.000	0.013
		C	0.000	0.000	5.417	0.000	0.016
L20	39.500-37.250	A	0.000	0.000	2.438	0.000	0.013
		B	0.000	0.000	2.438	0.000	0.006
		C	0.000	0.000	2.438	0.000	0.007
L21	37.250-37.000	A	0.000	0.000	0.271	0.000	0.001
		B	0.000	0.000	0.271	0.000	0.001
		C	0.000	0.000	0.271	0.000	0.001
L22	37.000-34.250	A	0.000	0.000	2.979	0.000	0.016
		B	0.000	0.000	5.417	0.000	0.007
		C	0.000	0.000	2.979	0.000	0.009
L23	34.250-34.000	A	0.000	0.000	0.271	0.000	0.001
		B	0.000	0.000	0.542	0.000	0.001

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L24	34.000-33.750	C	0.000	0.000	0.271	0.000	0.001
		A	0.000	0.000	0.271	0.000	0.001
		B	0.000	0.000	0.542	0.000	0.001
L25	33.750-33.500	C	0.000	0.000	0.271	0.000	0.001
		A	0.000	0.000	0.271	0.000	0.001
		B	0.000	0.000	0.542	0.000	0.001
L26	33.500-28.500	C	0.000	0.000	0.271	0.000	0.001
		A	0.000	0.000	5.417	0.000	0.030
		B	0.000	0.000	10.833	0.000	0.013
L27	28.500-23.500	C	0.000	0.000	5.417	0.000	0.016
		A	0.000	0.000	5.417	0.000	0.030
		B	0.000	0.000	10.833	0.000	0.013
L28	23.500-18.500	C	0.000	0.000	5.417	0.000	0.016
		A	0.000	0.000	5.417	0.000	0.030
		B	0.000	0.000	10.833	0.000	0.013
L29	18.500-13.500	C	0.000	0.000	5.417	0.000	0.016
		A	0.000	0.000	5.417	0.000	0.030
		B	0.000	0.000	10.833	0.000	0.013
L30	13.500-8.500	C	0.000	0.000	5.417	0.000	0.016
		A	0.000	0.000	5.417	0.000	0.030
		B	0.000	0.000	10.833	0.000	0.013
L31	8.500-3.500	C	0.000	0.000	5.417	0.000	0.016
		A	0.000	0.000	5.417	0.000	0.015
		B	0.000	0.000	10.833	0.000	0.006
L32	3.500-0.000	C	0.000	0.000	5.417	0.000	0.008
		A	0.000	0.000	2.167	0.000	0.000
		B	0.000	0.000	4.333	0.000	0.000
		C	0.000	0.000	2.167	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	110.000-105.000	A	2.251	0.000	0.000	0.000	0.000	0.028
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	105.000-100.000	A	2.240	0.000	0.000	0.000	0.000	0.028
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L3	100.000-93.000	A	2.226	0.000	0.000	0.000	0.000	0.039
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.023
L4	93.000-90.000	A	2.215	0.000	0.000	0.000	0.000	0.017
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.010
L5	90.000-85.000	A	2.205	0.000	0.000	0.000	0.000	0.028
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.016
L6	85.000-80.000	A	2.192	0.000	0.000	1.783	0.000	0.052
		B		0.000	0.000	1.783	0.000	0.032
		C		0.000	0.000	1.783	0.000	0.041
L7	80.000-78.750	A	2.183	0.000	0.000	1.483	0.000	0.027
		B		0.000	0.000	1.483	0.000	0.024
		C		0.000	0.000	1.483	0.000	0.025
L8	78.750-78.500	A	2.181	0.000	0.000	0.297	0.000	0.005
		B		0.000	0.000	0.297	0.000	0.005
		C		0.000	0.000	0.297	0.000	0.005
L9	78.500-73.500	A	2.174	0.000	0.000	5.924	0.000	0.109
		B		0.000	0.000	5.924	0.000	0.094
		C		0.000	0.000	5.924	0.000	0.098
L10	73.500-68.500	A	2.159	0.000	0.000	5.909	0.000	0.108
		B		0.000	0.000	5.909	0.000	0.093
		C		0.000	0.000	5.909	0.000	0.097
L11	68.500-64.250	A	2.145	0.000	0.000	6.276	0.000	0.112
		B		0.000	0.000	6.276	0.000	0.097

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L12	64.250-64.000	C	2.137	0.000	0.000	6.276	0.000	0.100
		A		0.000	0.000	0.547	0.000	0.009
		B		0.000	0.000	0.547	0.000	0.008
L13	64.000-59.000	C	2.128	0.000	0.000	0.547	0.000	0.008
		A		0.000	0.000	10.923	0.000	0.181
		B		0.000	0.000	10.923	0.000	0.165
L14	59.000-56.500	C	2.115	0.000	0.000	10.923	0.000	0.168
		A		0.000	0.000	5.448	0.000	0.090
		B		0.000	0.000	5.448	0.000	0.082
L15	56.500-56.250	C	2.110	0.000	0.000	5.448	0.000	0.083
		A		0.000	0.000	0.623	0.000	0.010
		B		0.000	0.000	0.623	0.000	0.009
L16	56.250-51.250	C	2.100	0.000	0.000	0.623	0.000	0.009
		A		0.000	0.000	12.449	0.000	0.197
		B		0.000	0.000	12.449	0.000	0.180
L17	51.250-45.500	C	2.078	0.000	0.000	12.449	0.000	0.183
		A		0.000	0.000	14.270	0.000	0.224
		B		0.000	0.000	14.270	0.000	0.204
L18	45.500-44.500	C	2.063	0.000	0.000	14.270	0.000	0.208
		A		0.000	0.000	1.483	0.000	0.025
		B		0.000	0.000	1.483	0.000	0.021
L19	44.500-39.500	C	2.049	0.000	0.000	1.483	0.000	0.022
		A		0.000	0.000	7.391	0.000	0.123
		B		0.000	0.000	7.391	0.000	0.106
L20	39.500-37.250	C	2.030	0.000	0.000	7.391	0.000	0.109
		A		0.000	0.000	3.319	0.000	0.055
		B		0.000	0.000	3.319	0.000	0.047
L21	37.250-37.000	C	2.024	0.000	0.000	3.319	0.000	0.049
		A		0.000	0.000	0.369	0.000	0.006
		B		0.000	0.000	0.369	0.000	0.005
L22	37.000-34.250	C	2.015	0.000	0.000	0.369	0.000	0.005
		A		0.000	0.000	4.081	0.000	0.066
		B		0.000	0.000	7.425	0.000	0.098
L23	34.250-34.000	C	2.007	0.000	0.000	4.081	0.000	0.059
		A		0.000	0.000	0.371	0.000	0.006
		B		0.000	0.000	0.742	0.000	0.010
L24	34.000-33.750	C	2.005	0.000	0.000	0.742	0.000	0.005
		A		0.000	0.000	0.371	0.000	0.006
		B		0.000	0.000	0.742	0.000	0.010
L25	33.750-33.500	C	2.004	0.000	0.000	0.742	0.000	0.005
		A		0.000	0.000	0.371	0.000	0.006
		B		0.000	0.000	0.742	0.000	0.010
L26	33.500-28.500	C	1.987	0.000	0.000	0.742	0.000	0.005
		A		0.000	0.000	7.404	0.000	0.119
		B		0.000	0.000	14.808	0.000	0.191
L27	28.500-23.500	C	1.953	0.000	0.000	7.404	0.000	0.105
		A		0.000	0.000	7.369	0.000	0.117
		B		0.000	0.000	14.739	0.000	0.187
L28	23.500-18.500	C	1.911	0.000	0.000	7.369	0.000	0.103
		A		0.000	0.000	7.328	0.000	0.114
		B		0.000	0.000	14.656	0.000	0.182
L29	18.500-13.500	C	1.860	0.000	0.000	7.328	0.000	0.101
		A		0.000	0.000	7.277	0.000	0.111
		B		0.000	0.000	14.554	0.000	0.176
L30	13.500-8.500	C	1.792	0.000	0.000	7.277	0.000	0.098
		A		0.000	0.000	7.208	0.000	0.108
		B		0.000	0.000	14.417	0.000	0.168
L31	8.500-3.500	C	1.686	0.000	0.000	7.208	0.000	0.094
		A		0.000	0.000	7.103	0.000	0.087
		B		0.000	0.000	14.206	0.000	0.150
L32	3.500-0.000	C	1.491	0.000	0.000	7.103	0.000	0.080
		A		0.000	0.000	2.763	0.000	0.025
		B		0.000	0.000	5.526	0.000	0.049
		C		0.000	0.000	2.763	0.000	0.025

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	110.000-105.000	0.000	0.000	0.000	0.000
L2	105.000-100.000	0.000	0.000	0.000	0.000
L3	100.000-93.000	0.000	0.000	0.000	0.000
L4	93.000-90.000	0.000	0.000	0.000	0.000
L5	90.000-85.000	0.000	0.000	0.000	0.000
L6	85.000-80.000	0.000	0.000	0.000	0.000
L7	80.000-78.750	0.000	0.000	0.000	0.000
L8	78.750-78.500	0.000	0.000	0.000	0.000
L9	78.500-73.500	0.000	0.000	0.000	0.000
L10	73.500-68.500	0.000	0.000	0.000	0.000
L11	68.500-64.250	0.000	0.000	0.000	0.000
L12	64.250-64.000	0.000	0.000	0.000	0.000
L13	64.000-59.000	0.000	0.000	0.000	0.000
L14	59.000-56.500	0.000	0.000	0.000	0.000
L15	56.500-56.250	0.000	0.000	0.000	0.000
L16	56.250-51.250	0.000	0.000	0.000	0.000
L17	51.250-45.500	0.000	0.000	0.000	0.000
L18	45.500-44.500	0.000	0.000	0.000	0.000
L19	44.500-39.500	0.000	0.000	0.000	0.000
L20	39.500-37.250	0.000	0.000	0.000	0.000
L21	37.250-37.000	0.000	0.000	0.000	0.000
L22	37.000-34.250	0.342	0.668	0.362	0.707
L23	34.250-34.000	0.407	0.796	0.430	0.840
L24	34.000-33.750	0.408	0.797	0.430	0.841
L25	33.750-33.500	0.408	0.798	0.431	0.842
L26	33.500-28.500	0.413	0.808	0.436	0.853
L27	28.500-23.500	0.421	0.825	0.446	0.874
L28	23.500-18.500	0.430	0.843	0.456	0.894
L29	18.500-13.500	0.438	0.860	0.465	0.913
L30	13.500-8.500	0.446	0.877	0.474	0.931
L31	8.500-3.500	0.454	0.893	0.482	0.948
L32	3.500-0.000	0.357	0.702	0.386	0.758

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L6	25	CCI-SFP-04510025	80.00 - 81.50	1.0000	1.0000
L6	26	CCI-SFP-04510025	80.00 - 81.50	1.0000	1.0000
L6	27	CCI-SFP-04510025	80.00 - 81.50	1.0000	1.0000
L7	25	CCI-SFP-04510025	78.75 - 80.00	1.0000	1.0000
L7	26	CCI-SFP-04510025	78.75 - 80.00	1.0000	1.0000
L7	27	CCI-SFP-04510025	78.75 - 80.00	1.0000	1.0000
L8	25	CCI-SFP-04510025	78.50 - 78.75	1.0000	1.0000
L8	26	CCI-SFP-04510025	78.50 - 78.75	1.0000	1.0000
L8	27	CCI-SFP-04510025	78.50 - 78.75	1.0000	1.0000
L9	25	CCI-SFP-04510025	73.50 - 78.50	1.0000	1.0000
L9	26	CCI-SFP-04510025	73.50 - 78.50	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L9	27	CCI-SFP-04510025	73.50 - 78.50	1.0000	1.0000
L10	25	CCI-SFP-04510025	68.50 - 73.50	1.0000	1.0000
L10	26	CCI-SFP-04510025	68.50 - 73.50	1.0000	1.0000
L10	27	CCI-SFP-04510025	68.50 - 73.50	1.0000	1.0000
L11	14	PL1.25x3.5-12	64.25 - 65.50	1.0000	1.0000
L11	15	PL1.25x3.5-12	64.25 - 65.50	1.0000	1.0000
L11	16	PL1.25x3.5-12	64.25 - 65.50	1.0000	1.0000
L11	25	CCI-SFP-04510025	64.25 - 68.50	1.0000	1.0000
L11	26	CCI-SFP-04510025	64.25 - 68.50	1.0000	1.0000
L11	27	CCI-SFP-04510025	64.25 - 68.50	1.0000	1.0000
L12	14	PL1.25x3.5-12	64.00 - 64.25	1.0000	1.0000
L12	15	PL1.25x3.5-12	64.00 - 64.25	1.0000	1.0000
L12	16	PL1.25x3.5-12	64.00 - 64.25	1.0000	1.0000
L12	25	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L12	26	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L12	27	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L13	14	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	15	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	16	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	25	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L13	26	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L13	27	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L14	14	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	15	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	16	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	25	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L14	26	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L14	27	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L15	14	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	15	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	16	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	22	CCI-SFP-06512535	56.25 - 56.50	1.0000	1.0000
L15	23	CCI-SFP-06512535	56.25 - 56.50	1.0000	1.0000
L15	24	CCI-SFP-06512535	56.25 - 56.50	1.0000	1.0000
L16	14	PL1.25x3.5-12	51.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L16	15	PL1.25x3.5-12	56.25 51.25 - 56.25	1.0000	1.0000
L16	16	PL1.25x3.5-12	56.25 51.25 - 56.25	1.0000	1.0000
L16	22	CCI-SFP-06512535	56.25 51.25 - 56.25	1.0000	1.0000
L16	23	CCI-SFP-06512535	56.25 51.25 - 56.25	1.0000	1.0000
L16	24	CCI-SFP-06512535	56.25 51.25 - 56.25	1.0000	1.0000
L17	14	PL1.25x3.5-12	51.25 45.50 - 51.25	1.0000	1.0000
L17	15	PL1.25x3.5-12	51.25 45.50 - 51.25	1.0000	1.0000
L17	16	PL1.25x3.5-12	51.25 45.50 - 51.25	1.0000	1.0000
L17	22	CCI-SFP-06512535	51.25 45.50 - 51.25	1.0000	1.0000
L17	23	CCI-SFP-06512535	51.25 45.50 - 51.25	1.0000	1.0000
L17	24	CCI-SFP-06512535	51.25 45.50 - 51.25	1.0000	1.0000
L19	22	CCI-SFP-06512535	44.50 39.50 - 44.50	1.0000	1.0000
L19	23	CCI-SFP-06512535	44.50 39.50 - 44.50	1.0000	1.0000
L19	24	CCI-SFP-06512535	44.50 39.50 - 44.50	1.0000	1.0000
L20	22	CCI-SFP-06512535	39.50 37.25 - 39.50	1.0000	1.0000
L20	23	CCI-SFP-06512535	39.50 37.25 - 39.50	1.0000	1.0000
L20	24	CCI-SFP-06512535	39.50 37.25 - 39.50	1.0000	1.0000
L21	22	CCI-SFP-06512535	37.25 37.00 - 37.25	1.0000	1.0000
L21	23	CCI-SFP-06512535	37.25 37.00 - 37.25	1.0000	1.0000
L21	24	CCI-SFP-06512535	37.25 37.00 - 37.25	1.0000	1.0000
L22	18	CCI-SFP-06512535	36.50 34.25 - 36.50	1.0000	1.0000
L22	19	CCI-SFP-06512535	36.50 34.25 - 36.50	1.0000	1.0000
L22	20	CCI-SFP-06512535	36.50 34.25 - 36.50	1.0000	1.0000
L22	21	CCI-SFP-06512535	36.50 34.25 - 36.50	1.0000	1.0000
L22	22	CCI-SFP-06512535	37.00 36.50 - 37.00	1.0000	1.0000
L22	23	CCI-SFP-06512535	37.00 36.50 - 37.00	1.0000	1.0000
L22	24	CCI-SFP-06512535	37.00 36.50 - 37.00	1.0000	1.0000
L23	18	CCI-SFP-06512535	34.25 34.00 - 34.25	1.0000	1.0000
L23	19	CCI-SFP-06512535	34.25 34.00 - 34.25	1.0000	1.0000
L23	20	CCI-SFP-06512535	34.25 34.00 - 34.25	1.0000	1.0000
L23	21	CCI-SFP-06512535	34.25 34.00 - 34.25	1.0000	1.0000
L24	18	CCI-SFP-06512535	34.00 33.75 - 34.00	1.0000	1.0000
L24	19	CCI-SFP-06512535	34.00 33.75 - 34.00	1.0000	1.0000
L24	20	CCI-SFP-06512535	34.00 33.75 - 34.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L24	21	CCI-SFP-06512535	33.75 - 34.00	1.0000	1.0000
L25	18	CCI-SFP-06512535	33.50 - 33.75	1.0000	1.0000
L25	19	CCI-SFP-06512535	33.50 - 33.75	1.0000	1.0000
L25	20	CCI-SFP-06512535	33.50 - 33.75	1.0000	1.0000
L25	21	CCI-SFP-06512535	33.50 - 33.75	1.0000	1.0000
L26	18	CCI-SFP-06512535	28.50 - 33.50	1.0000	1.0000
L26	19	CCI-SFP-06512535	28.50 - 33.50	1.0000	1.0000
L26	20	CCI-SFP-06512535	28.50 - 33.50	1.0000	1.0000
L26	21	CCI-SFP-06512535	28.50 - 33.50	1.0000	1.0000
L27	18	CCI-SFP-06512535	23.50 - 28.50	1.0000	1.0000
L27	19	CCI-SFP-06512535	23.50 - 28.50	1.0000	1.0000
L27	20	CCI-SFP-06512535	23.50 - 28.50	1.0000	1.0000
L27	21	CCI-SFP-06512535	23.50 - 28.50	1.0000	1.0000
L28	18	CCI-SFP-06512535	18.50 - 23.50	1.0000	1.0000
L28	19	CCI-SFP-06512535	18.50 - 23.50	1.0000	1.0000
L28	20	CCI-SFP-06512535	18.50 - 23.50	1.0000	1.0000
L28	21	CCI-SFP-06512535	18.50 - 23.50	1.0000	1.0000
L29	18	CCI-SFP-06512535	13.50 - 18.50	1.0000	1.0000
L29	19	CCI-SFP-06512535	13.50 - 18.50	1.0000	1.0000
L29	20	CCI-SFP-06512535	13.50 - 18.50	1.0000	1.0000
L29	21	CCI-SFP-06512535	13.50 - 18.50	1.0000	1.0000
L30	18	CCI-SFP-06512535	8.50 - 13.50	1.0000	1.0000
L30	19	CCI-SFP-06512535	8.50 - 13.50	1.0000	1.0000
L30	20	CCI-SFP-06512535	8.50 - 13.50	1.0000	1.0000
L30	21	CCI-SFP-06512535	8.50 - 13.50	1.0000	1.0000
L31	18	CCI-SFP-06512535	3.50 - 8.50	1.0000	1.0000
L31	19	CCI-SFP-06512535	3.50 - 8.50	1.0000	1.0000
L31	20	CCI-SFP-06512535	3.50 - 8.50	1.0000	1.0000
L31	21	CCI-SFP-06512535	3.50 - 8.50	1.0000	1.0000
L32	18	CCI-SFP-06512535	1.50 - 3.50	1.0000	1.0000
L32	19	CCI-SFP-06512535	1.50 - 3.50	1.0000	1.0000
L32	20	CCI-SFP-06512535	1.50 - 3.50	1.0000	1.0000
L32	21	CCI-SFP-06512535	1.50 - 3.50	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	ft	ft ²	ft ²	K	
(2) P65-15-XLH-RR w/ Mount Pipe	A	From Leg	4.000	0.000	110.000	No Ice	5.304	3.665	0.048
			0.000			1/2"	5.692	4.278	0.092
			3.000			Ice	6.087	4.902	0.142
(2) P65-15-XLH-RR w/ Mount Pipe	B	From Leg	4.000	0.000	110.000	No Ice	5.304	3.665	0.048
			0.000			1/2"	5.692	4.278	0.092
			3.000			Ice	6.087	4.902	0.142
(2) P65-15-XLH-RR w/ Mount Pipe	C	From Leg	4.000	0.000	110.000	No Ice	5.304	3.665	0.048
			0.000			1/2"	5.692	4.278	0.092
			3.000			Ice	6.087	4.902	0.142
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.000	0.000	110.000	No Ice	8.371	6.362	0.079
			0.000			1/2"	8.931	7.538	0.144
			3.000			Ice	9.457	8.427	0.218
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	110.000	No Ice	8.262	6.304	0.074
			0.000			1/2"	8.822	7.479	0.139
			3.000			Ice	9.346	8.368	0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000	0.000	110.000	No Ice	8.262	6.304	0.074
			0.000			1/2"	8.822	7.479	0.139
			3.000			Ice	9.346	8.368	0.212
DC6-48-60-18-8F	B	From Leg	4.000	0.000	110.000	No Ice	0.917	0.917	0.033
			0.000			1/2"	1.458	1.458	0.051
			1.000			Ice	1.643	1.643	0.071
(2) RRUS 11	A	From Leg	4.000	0.000	110.000	No Ice	2.784	1.187	0.051
			0.000			1/2"	2.992	1.334	0.072
			1.000			Ice	3.207	1.490	0.095
(2) RRUS 11	B	From Leg	4.000	0.000	110.000	No Ice	2.784	1.187	0.051
			0.000			1/2"	2.992	1.334	0.072
			1.000			Ice	3.207	1.490	0.095
(2) RRUS 11	C	From Leg	4.000	0.000	110.000	No Ice	2.784	1.187	0.051
			0.000			1/2"	2.992	1.334	0.072
			1.000			Ice	3.207	1.490	0.095
(2) TT19-08BP111-001	A	From Leg	4.000	0.000	110.000	No Ice	0.545	0.442	0.016
			0.000			1/2"	0.641	0.530	0.022
			3.000			Ice	0.743	0.626	0.029
(2) TT19-08BP111-001	B	From Leg	4.000	0.000	110.000	No Ice	0.545	0.442	0.016
			0.000			1/2"	0.641	0.530	0.022
			3.000			Ice	0.743	0.626	0.029
(2) TT19-08BP111-001	C	From Leg	4.000	0.000	110.000	No Ice	0.545	0.442	0.016
			0.000			1/2"	0.641	0.530	0.022
			3.000			Ice	0.743	0.626	0.029
Platform Mount [LP 712-1]	C	None			110.000	No Ice	24.530	24.530	1.335
						1/2"	29.940	29.940	1.646
						Ice	35.350	35.350	1.956
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	110.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	110.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	110.000	No Ice	1.425	1.425	0.022
						1/2"			
						Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			0.000			1/2"	1.925	0.033
			0.000			Ice	2.294	0.048
						1" Ice		
Transition Ladder	C	From Leg	2.000	0.000	110.000	No Ice	6.000	0.160
			0.000			1/2"	8.000	0.240
			-3.000			Ice	10.000	0.320
						1" Ice		
***** level 100 *****								
48212S w/ Mount Pipe	A	From Leg	4.000	0.000	100.000	No Ice	4.621	0.038
			0.000			1/2"	5.030	0.075
			2.000			Ice	5.437	0.118
						1" Ice		
48212S w/ Mount Pipe	C	From Leg	4.000	0.000	100.000	No Ice	4.621	0.038
			0.000			1/2"	5.030	0.075
			2.000			Ice	5.437	0.118
						1" Ice		
Platform Mount [LP 712-1]	C	None		0.000	100.000	No Ice	24.530	1.335
						1/2"	29.940	1.646
						Ice	35.350	1.956
						1" Ice		
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	100.000	No Ice	1.425	0.022
			6.000			1/2"	1.925	0.033
			0.000			Ice	2.294	0.048
						1" Ice		
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	100.000	No Ice	1.425	0.022
			6.000			1/2"	1.925	0.033
			0.000			Ice	2.294	0.048
						1" Ice		
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	100.000	No Ice	1.425	0.022
			6.000			1/2"	1.925	0.033
			0.000			Ice	2.294	0.048
						1" Ice		
Transition Ladder	C	From Leg	2.000	0.000	100.000	No Ice	6.000	0.160
			0.000			1/2"	8.000	0.240
			-3.000			Ice	10.000	0.320
						1" Ice		
***** level 92 *****								
***** level 83 *****								
(2) SBNHH-1D65A w/ Mount Pipe	C	From Face	3.000	0.000	83.000	No Ice	5.973	0.070
			0.000			1/2"	6.361	0.124
			0.000			Ice	6.757	0.186
						1" Ice		
(2) SBNHH-1D65A w/ Mount Pipe	A	From Leg	3.000	0.000	83.000	No Ice	5.973	0.070
			0.000			1/2"	6.361	0.124
			0.000			Ice	6.757	0.186
						1" Ice		
DB-T1-6Z-8AB-0Z	C	From Face	3.000	0.000	83.000	No Ice	4.800	0.044
			0.000			1/2"	5.070	0.080
			0.000			Ice	5.348	0.120
						1" Ice		
DB-T1-6Z-8AB-0Z	A	From Leg	3.000	0.000	83.000	No Ice	4.800	0.044
			0.000			1/2"	5.070	0.080
			0.000			Ice	5.348	0.120
						1" Ice		
B13 RRH4X30-4R	C	From Face	3.000	0.000	83.000	No Ice	2.160	0.057
			0.000			1/2"	2.350	0.077
			0.000			Ice	2.548	0.099
						1" Ice		
B13 RRH4X30-4R	A	From Leg	3.000	0.000	83.000	No Ice	2.160	0.057
			0.000			1/2"	2.350	0.077
			0.000			Ice	2.548	0.099
						1" Ice		
RRH2X60-PCS	C	From Face	3.000	0.000	83.000	No Ice	2.200	0.055
			0.000			1/2"	2.393	0.075
			0.000			Ice	2.593	0.099

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral	Vert					
RRH2X60-PCS	A	From Leg	3.000	0.000	0.000	83.000	1" Ice	2.200	1.723	0.055
			0.000	0.000	0.000		No Ice	2.393	1.901	0.075
			0.000	0.000	0.000		1/2" Ice	2.593	2.087	0.099
B66A RRH4X45	A	From Leg	3.000	0.000	0.000	83.000	1" Ice	2.580	1.630	0.067
			0.000	0.000	0.000		No Ice	2.794	1.811	0.087
			0.000	0.000	0.000		1/2" Ice	3.015	1.999	0.111
B66A RRH4X45	C	From Leg	3.000	0.000	0.000	83.000	1" Ice	2.580	1.630	0.067
			0.000	0.000	0.000		No Ice	2.794	1.811	0.087
			0.000	0.000	0.000		1/2" Ice	3.015	1.999	0.111
T-Arm Mount [TA 702-1]	C	From Leg	1.500	0.000	0.000	83.000	1" Ice	2.780	2.230	0.113
			0.000	0.000	0.000		No Ice	3.390	2.430	0.143
			0.000	0.000	0.000		1/2" Ice	4.000	2.630	0.173
T-Arm Mount [TA 702-1]	A	From Leg	1.500	0.000	0.000	83.000	1" Ice	2.780	2.230	0.113
			0.000	0.000	0.000		No Ice	3.390	2.430	0.143
			0.000	0.000	0.000		1/2" Ice	4.000	2.630	0.173
***** level 69 ***** DB201-F	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	0.400	0.400	0.010
			0.000	0.000	0.000		No Ice	0.720	0.720	0.013
			2.000	0.000	0.000		1/2" Ice	1.040	1.040	0.016
DB810M-XC	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	2.115	2.115	0.030
			0.000	0.000	0.000		No Ice	3.141	3.141	0.046
			5.000	0.000	0.000		1/2" Ice	4.184	4.184	0.069
48212S w/ Mount Pipe	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	4.621	3.116	0.038
			0.000	0.000	0.000		No Ice	5.030	3.826	0.075
			3.000	0.000	0.000		1/2" Ice	5.437	4.493	0.118
Side Arm Mount [SO 201-1]	A	From Leg	1.000	0.000	0.000	69.000	1" Ice	2.960	2.110	0.096
			0.000	0.000	0.000		No Ice	4.100	2.930	0.117
			0.000	0.000	0.000		1/2" Ice	5.240	3.750	0.138
12' Horizontal x 4" HSS	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	5.600	0.156	0.144
			0.000	0.000	0.000		No Ice	6.564	0.212	0.187
			0.000	0.000	0.000		1/2" Ice	7.536	0.277	0.240
7'x2" Antenna Mount Pipe	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	1.663	1.663	0.026
			0.000	0.000	0.000		No Ice	2.391	2.391	0.039
			-2.000	0.000	0.000		1/2" Ice	2.825	2.825	0.056
7'x2" Antenna Mount Pipe	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	1.663	1.663	0.026
			0.000	0.000	0.000		No Ice	2.391	2.391	0.039
			-2.000	0.000	0.000		1/2" Ice	2.825	2.825	0.056
7'x2" Antenna Mount Pipe	A	From Leg	2.000	0.000	0.000	69.000	1" Ice	1.663	1.663	0.026
			0.000	0.000	0.000		No Ice	2.391	2.391	0.039
			-2.000	0.000	0.000		1/2" Ice	2.825	2.825	0.056

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	110 - 105	Pole	Max Tension	1	0.000	-0.000	0.000
			Max. Compression	26	-9.212	0.691	-1.074
			Max. Mx	20	-2.544	36.200	-0.300
			Max. My	14	-2.526	0.224	-36.333
			Max. Vy	20	-5.722	36.200	-0.300
			Max. Vx	14	5.729	0.224	-36.333
			Max. Torque	22			0.738
L2	105 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-9.646	0.761	-1.094
			Max. Mx	20	-2.757	65.326	-0.312
			Max. My	14	-2.739	0.258	-65.493

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	100 - 93	Pole	Max. Vy	20	-5.932	65.326	-0.312
			Max. Vx	14	5.939	0.258	-65.493
			Max. Torque	22			0.737
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-14.649	3.070	-2.040
			Max. Mx	20	-4.762	108.059	-0.837
			Max. My	14	-4.732	0.978	-108.315
			Max. Vy	20	-8.563	108.059	-0.837
			Max. Vx	14	8.614	0.978	-108.315
L4	93 - 90	Pole	Max. Torque	24			2.159
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-15.371	3.151	-2.049
			Max. Mx	20	-5.180	151.425	-1.015
			Max. My	14	-5.149	1.184	-151.943
			Max. Vy	20	-8.782	151.425	-1.015
			Max. Vx	14	8.835	1.184	-151.943
			Max. Torque	24			2.157
			Max Tension	1	0.000	0.000	0.000
L5	90 - 85	Pole	Max. Compression	26	-15.943	3.220	-2.048
			Max. Mx	20	-5.561	195.813	-1.187
			Max. My	14	-5.530	1.383	-196.600
			Max. Vy	20	-8.984	195.813	-1.187
			Max. Vx	2	-9.038	0.221	195.203
			Max. Torque	24			2.156
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.298	4.435	-1.373
			Max. Mx	20	-6.977	247.385	-1.167
L6	85 - 80	Pole	Max. My	14	-6.899	2.149	-249.156
			Max. Vy	20	-11.070	247.385	-1.167
			Max. Vx	2	-11.636	0.463	248.362
			Max. Torque	24			2.433
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.517	4.450	-1.369
			Max. Mx	20	-7.088	261.242	-1.246
			Max. My	14	-7.012	2.235	-263.720
			Max. Vy	20	-11.119	261.242	-1.246
L7	80 - 78.75	Pole	Max. Vx	2	-11.686	0.387	262.928
			Max. Torque	24			2.431
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.574	4.454	-1.368
			Max. Mx	20	-7.136	264.021	-1.262
			Max. My	14	-7.061	2.253	-266.641
			Max. Vy	20	-11.124	264.021	-1.262
			Max. Vx	2	-11.690	0.372	265.848
			Max. Torque	24			2.431
L8	78.75 - 78.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.731	4.506	-1.350
			Max. Mx	20	-7.811	320.246	-1.578
			Max. My	14	-7.739	2.595	-325.700
			Max. Vy	20	-11.374	320.246	-1.578
			Max. Vx	2	-11.943	0.070	324.913
			Max. Torque	24			2.431
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.360	4.554	-2.562
L9	78.5 - 73.5	Pole	Max. Mx	20	-8.950	378.430	-0.761
			Max. My	2	-8.855	-0.235	387.543
			Max. Vy	20	-12.231	378.430	-0.761
			Max. Vx	2	-13.163	-0.235	387.543
			Max. Torque	24			2.430
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.437	4.591	-2.582
			Max. Mx	20	-9.569	430.820	-1.030
			Max. My	2	-9.481	-0.497	443.895
L10	73.5 - 68.5	Pole	Max. Vy	20	-12.436	430.820	-1.030
			Max. Vx	2	-13.369	-0.497	443.895
			Max. Torque	16			-2.314
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.522	4.596	-2.584
			Max. Mx	20	-9.626	433.929	-1.045
			Max. My	2			
			Max. Vy	20			
			Max. Vx	2			
L11	68.5 - 64.25	Pole	Max. Vy	20			
			Max. Vx	2			
			Max. Torque	16			
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.522	4.596	-2.584
			Max. Mx	20	-9.626	433.929	-1.045
			Max. My	2			
			Max. Vy	20			
			Max. Vx	2			
L12	64.25 - 64	Pole	Max. Vy	20			
			Max. Vx	2			
			Max. Torque	16			
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.522	4.596	-2.584
			Max. Mx	20	-9.626	433.929	-1.045
			Max. My	2			
			Max. Vy	20			
			Max. Vx	2			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
L13	64 - 59	Pole	Max. My	2	-9.538	-0.512	447.237			
			Max. Vy	20	-12.446	433.929	-1.045			
			Max. Vx	2	-13.377	-0.512	447.237			
			Max. Torque	16			-2.312			
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-27.225	4.632	2.604			
			Max. Mx	20	-10.604	496.824	-1.364			
			Max. My	2	-10.521	-0.821	514.800			
			Max. Vy	20	-12.721	496.824	-1.364			
			Max. Vx	2	-13.655	-0.821	514.800			
L14	59 - 56.5	Pole	Max. Torque	16			-2.312			
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-28.086	4.650	2.614			
			Max. Mx	20	-11.104	528.783	-1.523			
			Max. My	2	-11.024	-0.976	549.094			
			Max. Vy	20	-12.858	528.783	-1.523			
			Max. Vx	2	-13.792	-0.976	549.094			
			Max. Torque	16			-2.311			
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-28.187	4.656	2.615			
L15	56.5 - 56.25	Pole	Max. Mx	20	-11.172	531.997	-1.537			
			Max. My	2	-11.092	-0.991	552.542			
			Max. Vy	20	-12.869	531.997	-1.537			
			Max. Vx	2	-13.802	-0.991	552.542			
			Max. Torque	16			-2.311			
			Max Tension	1	0.000	0.000	0.000			
			L16	56.25 - 51.25	Pole	Max. Compression	26	-30.190	4.687	2.633
						Max. Mx	20	-12.384	597.046	-1.857
						Max. My	2	-12.310	-1.303	622.268
						Max. Vy	20	-13.159	597.046	-1.857
Max. Vx	2	-14.095				-1.303	622.268			
Max. Torque	16						-2.311			
L17	51.25 - 45.5	Pole				Max Tension	1	0.000	0.000	0.000
						Max. Compression	26	-30.898	4.698	2.639
						Max. Mx	20	-12.814	620.154	-1.969
						Max. My	2	-12.740	-1.412	647.014
			Max. Vy	20	-13.263	620.154	-1.969			
			Max. Vx	2	-14.199	-1.412	647.014			
			Max. Torque	16			-2.310			
			L18	45.5 - 44.5	Pole	Max Tension	1	0.000	0.000	0.000
						Max. Compression	26	-33.889	4.731	2.657
						Max. Mx	20	-14.787	687.290	-2.288
Max. My	2	-14.717				-1.724	718.841			
Max. Vy	20	-13.592				687.290	-2.288			
Max. Vx	2	-14.531				-1.724	718.841			
Max. Torque	16						-2.309			
L19	44.5 - 39.5	Pole				Max Tension	1	0.000	0.000	0.000
						Max. Compression	26	-35.540	4.762	2.672
						Max. Mx	20	-15.884	755.831	-2.609
			Max. My	2	-15.822	-2.039	792.077			
			Max. Vy	20	-13.840	755.831	-2.609			
			Max. Vx	2	-14.779	-2.039	792.077			
			Max. Torque	16			-2.309			
			L20	39.5 - 37.25	Pole	Max Tension	1	0.000	0.000	0.000
						Max. Compression	26	-36.292	4.774	2.679
						Max. Mx	20	-16.386	787.078	-2.753
Max. My	2	-16.327				-2.181	825.433			
Max. Vy	20	-13.951				787.078	-2.753			
Max. Vx	2	-14.889				-2.181	825.433			
Max. Torque	16						-2.308			
L21	37.25 - 37	Pole				Max Tension	1	0.000	0.000	0.000
						Max. Compression	26	-36.385	4.778	2.680
						Max. Mx	20	-16.457	790.565	-2.768
			Max. My	2	-16.398	-2.196	829.155			
			Max. Vy	20	-13.960	790.565	-2.768			
			Max. Vx	2	-14.894	-2.196	829.155			
			Max. Torque	16			-2.308			
			L22	37 - 34.25	Pole	Max. Torque	16			-2.308
						Max Tension	1	0.000	0.000	0.000

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L23	34.25 - 34	Pole	Max. Compression	26	-37.441	4.757	2.622
			Max. Mx	20	-17.160	829.124	-2.944
			Max. My	2	-17.104	-2.370	870.307
			Max. Vy	20	-14.100	829.124	-2.944
			Max. Vx	2	-15.049	-2.370	870.307
			Max. Torque	16			-2.308
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.530	4.756	2.616
			Max. Mx	20	-17.225	832.648	-2.960
			Max. My	2	-17.171	-2.386	874.068
L24	34 - 33.75	Pole	Max. Vy	20	-14.105	832.648	-2.960
			Max. Vx	2	-15.053	-2.386	874.068
			Max. Torque	16			-2.307
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.619	4.754	2.609
			Max. Mx	20	-17.283	836.174	-2.976
			Max. My	2	-17.229	-2.402	877.832
			Max. Vy	20	-14.116	836.174	-2.976
			Max. Vx	2	-15.065	-2.402	877.832
			Max. Torque	16			-2.307
L25	33.75 - 33.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.717	4.752	2.603
			Max. Mx	20	-17.349	839.703	-2.992
			Max. My	2	-17.296	-2.418	881.599
			Max. Vy	20	-14.127	839.703	-2.992
			Max. Vx	2	-15.078	-2.418	881.599
			Max. Torque	16			-2.307
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.664	4.697	2.468
			Max. Mx	20	-18.649	910.904	-3.312
L26	33.5 - 28.5	Pole	Max. My	2	-18.601	-2.734	957.647
			Max. Vy	20	-14.368	910.904	-3.312
			Max. Vx	2	-15.353	-2.734	957.647
			Max. Torque	16			-2.307
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.626	4.633	2.328
			Max. Mx	20	-19.974	983.261	-3.630
			Max. My	2	-19.933	-3.050	1034.994
			Max. Vy	20	-14.594	983.261	-3.630
			Max. Vx	2	-15.605	-3.050	1034.994
L27	28.5 - 23.5	Pole	Max. Torque	16			-2.307
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.600	4.557	2.181
			Max. Mx	20	-21.319	1056.711	-3.948
			Max. My	2	-21.287	-3.366	1113.554
			Max. Vy	20	-14.806	1056.711	-3.948
			Max. Vx	2	-15.839	-3.366	1113.554
			Max. Torque	16			-2.306
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45.581	4.482	2.034
L28	23.5 - 18.5	Pole	Max. Mx	20	-22.685	1131.173	-4.264
			Max. My	2	-22.661	-3.682	1193.223
			Max. Vy	20	-14.999	1131.173	-4.264
			Max. Vx	2	-16.050	-3.682	1193.223
			Max. Torque	16			-2.305
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.562	4.408	1.891
			Max. Mx	20	-24.073	1206.583	-4.579
			Max. My	2	-24.057	-3.998	1273.915
			Max. Vy	20	-15.186	1206.583	-4.579
L29	18.5 - 13.5	Pole	Max. Vx	2	-16.249	-3.998	1273.915
			Max. Torque	16			-2.305
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.489	4.337	1.754
			Max. Mx	20	-25.443	1282.921	-4.892
			Max. My	2	-25.436	-4.312	1355.592
			Max. Vy	8	15.371	-1280.047	6.619
			Max. Vx	2	-16.445	-4.312	1355.592
			Max. Torque	16			-2.305
			L30	13.5 - 8.5	Pole	Max. Compression	26
Max. Mx	20	-25.443				1282.921	-4.892
Max. My	2	-25.436				-4.312	1355.592
Max. Vy	8	15.371				-1280.047	6.619
Max. Vx	2	-16.445				-4.312	1355.592
Max. Torque	16						-2.305
Max Tension	1	0.000				0.000	0.000
Max. Compression	26	-49.489				4.337	1.754
Max. Mx	20	-25.443				1282.921	-4.892
Max. My	2	-25.436				-4.312	1355.592
L31	8.5 - 3.5	Pole	Max. Vy	8	15.371	-1280.047	6.619
			Max. Vx	2	-16.445	-4.312	1355.592
			Max. Torque	16			-2.305
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.489	4.337	1.754
			Max. Mx	20	-25.443	1282.921	-4.892
			Max. My	2	-25.436	-4.312	1355.592
			Max. Vy	8	15.371	-1280.047	6.619
			Max. Vx	2	-16.445	-4.312	1355.592
			Max. Torque	16			-2.305

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L32	3.5 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.700	4.312	1.707
			Max. Mx	20	-26.391	1336.905	-5.110
			Max. My	2	-26.390	-4.532	1413.324
			Max. Vy	8	15.502	-1334.032	6.837
			Max. Vx	2	-16.571	-4.532	1413.324
			Max. Torque	16			-2.305

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	50.700	-0.000	-0.000
	Max. H _x	21	19.799	15.488	-0.062
	Max. H _z	2	26.399	-0.062	16.557
	Max. M _x	2	1413.324	-0.062	16.557
	Max. M _z	8	1334.032	-15.488	0.062
	Max. Torsion	2	2.279	-0.062	16.557
	Min. Vert	21	19.799	15.488	-0.062
	Min. H _x	9	19.799	-15.489	0.062
	Min. H _z	14	26.399	0.062	-16.557
	Min. M _x	14	-1411.604	0.062	-16.557
	Min. M _z	20	-1336.905	15.488	-0.062
	Min. Torsion	16	-2.305	7.798	-14.230

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	21.999	0.001	-0.000	-0.700	1.115	-0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	26.399	0.062	-16.557	-1413.324	-4.532	-2.279
0.9 Dead+1.6 Wind 0 deg - No Ice	19.799	0.062	-16.556	-1398.648	-4.853	-2.244
1.2 Dead+1.6 Wind 30 deg - No Ice	26.399	7.798	-14.230	-1223.975	-671.415	-2.278
0.9 Dead+1.6 Wind 30 deg - No Ice	19.799	7.798	-14.230	-1211.219	-664.841	-2.260
1.2 Dead+1.6 Wind 60 deg - No Ice	26.399	13.445	-8.252	-710.518	-1158.077	-1.677
0.9 Dead+1.6 Wind 60 deg - No Ice	19.799	13.445	-8.252	-703.024	-1146.469	-1.680
1.2 Dead+1.6 Wind 90 deg - No Ice	26.399	15.488	-0.062	-6.837	-1334.032	-0.633
0.9 Dead+1.6 Wind 90 deg - No Ice	19.799	15.489	-0.062	-6.555	-1320.613	-0.656
1.2 Dead+1.6 Wind 120 deg - No Ice	26.399	13.383	8.144	698.464	-1152.133	0.584
0.9 Dead+1.6 Wind 120 deg - No Ice	19.799	13.383	8.144	691.515	-1140.583	0.546
1.2 Dead+1.6 Wind 150 deg - No Ice	26.399	7.691	14.168	1216.309	-661.088	1.653
0.9 Dead+1.6 Wind 150 deg - No Ice	19.799	7.691	14.168	1204.053	-654.616	1.611
1.2 Dead+1.6 Wind 180 deg - No Ice	26.399	-0.062	16.557	1411.604	7.414	2.286
0.9 Dead+1.6 Wind 180 deg - No Ice	19.799	-0.062	16.556	1397.369	6.972	2.251
1.2 Dead+1.6 Wind 210 deg	26.399	-7.798	14.230	1222.265	674.306	2.305

110 Ft Monopole Tower Structural Analysis
 Project Number 1314690, Application 360342, Revision 0

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
- No Ice						
0.9 Dead+1.6 Wind 210 deg - No Ice	19.799	-7.798	14.230	1209.947	666.966	2.286
1.2 Dead+1.6 Wind 240 deg - No Ice	26.399	-13.445	8.252	708.805	1160.983	1.696
0.9 Dead+1.6 Wind 240 deg - No Ice	19.799	-13.445	8.252	701.750	1148.605	1.699
1.2 Dead+1.6 Wind 270 deg - No Ice	26.399	-15.488	0.062	5.110	1336.905	0.625
0.9 Dead+1.6 Wind 270 deg - No Ice	19.799	-15.488	0.062	5.271	1322.727	0.649
1.2 Dead+1.6 Wind 300 deg - No Ice	26.399	-13.383	-8.144	-700.200	1155.034	-0.611
0.9 Dead+1.6 Wind 300 deg - No Ice	19.799	-13.383	-8.144	-692.806	1142.716	-0.572
1.2 Dead+1.6 Wind 330 deg - No Ice	26.399	-7.691	-14.168	-1218.041	663.974	-1.672
0.9 Dead+1.6 Wind 330 deg - No Ice	19.799	-7.691	-14.168	-1205.341	656.739	-1.630
1.2 Dead+1.0 Ice+1.0 Temp	50.700	0.000	0.000	-1.707	4.312	-0.002
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	50.700	0.013	-5.521	-475.308	3.223	-0.928
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	50.700	2.556	-4.551	-406.346	-223.505	-0.868
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	50.700	4.447	-2.653	-236.958	-390.836	-0.577
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	50.700	5.091	-0.013	-2.878	-449.394	-0.132
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	50.700	4.434	2.632	231.510	-389.690	0.348
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	50.700	2.549	4.564	402.565	-221.993	0.734
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	50.700	-0.013	5.521	471.852	5.520	0.923
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	50.700	-2.556	4.551	402.893	232.252	0.864
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	50.700	-4.447	2.653	233.504	399.590	0.573
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	50.700	-5.091	0.013	-0.582	458.148	0.127
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	50.700	-4.434	-2.632	-234.974	398.440	-0.353
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	50.700	-2.549	-4.564	-406.026	230.737	-0.739
Dead+Wind 0 deg - Service	21.999	0.013	-3.542	-301.310	-0.066	-0.491
Dead+Wind 30 deg - Service	21.999	1.668	-3.044	-261.006	-141.981	-0.493
Dead+Wind 60 deg - Service	21.999	2.876	-1.765	-151.729	-245.530	-0.364
Dead+Wind 90 deg - Service	21.999	3.313	-0.013	-1.987	-282.938	-0.137
Dead+Wind 120 deg - Service	21.999	2.863	1.742	148.095	-244.259	0.126
Dead+Wind 150 deg - Service	21.999	1.645	3.031	258.303	-139.780	0.356
Dead+Wind 180 deg - Service	21.999	-0.013	3.542	299.878	2.476	0.491
Dead+Wind 210 deg - Service	21.999	-1.668	3.045	259.587	144.399	0.494
Dead+Wind 240 deg - Service	21.999	-2.876	1.765	150.297	247.941	0.364
Dead+Wind 270 deg - Service	21.999	-3.313	0.013	0.555	285.349	0.137
Dead+Wind 300 deg - Service	21.999	-2.863	-1.742	-149.528	246.670	-0.127
Dead+Wind 330 deg - Service	21.999	-1.645	-3.031	-259.749	142.197	-0.357

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	-21.999	0.000	-0.001	21.999	0.000	0.003%
2	0.062	-26.399	-16.557	-0.062	26.399	16.557	0.000%
3	0.062	-19.799	-16.557	-0.062	19.799	16.556	0.000%
4	7.798	-26.399	-14.230	-7.798	26.399	14.230	0.000%
5	7.798	-19.799	-14.230	-7.798	19.799	14.230	0.000%
6	13.445	-26.399	-8.252	-13.445	26.399	8.252	0.000%
7	13.445	-19.799	-8.252	-13.445	19.799	8.252	0.000%
8	15.489	-26.399	-0.062	-15.488	26.399	0.062	0.001%
9	15.489	-19.799	-0.062	-15.489	19.799	0.062	0.001%
10	13.383	-26.399	8.144	-13.383	26.399	-8.144	0.000%
11	13.383	-19.799	8.144	-13.383	19.799	-8.144	0.000%
12	7.691	-26.399	14.168	-7.691	26.399	-14.168	0.000%
13	7.691	-19.799	14.168	-7.691	19.799	-14.168	0.000%
14	-0.062	-26.399	16.557	0.062	26.399	-16.557	0.000%
15	-0.062	-19.799	16.557	0.062	19.799	-16.556	0.000%
16	-7.798	-26.399	14.230	7.798	26.399	-14.230	0.000%
17	-7.798	-19.799	14.230	7.798	19.799	-14.230	0.000%
18	-13.445	-26.399	8.252	13.445	26.399	-8.252	0.000%
19	-13.445	-19.799	8.252	13.445	19.799	-8.252	0.000%
20	-15.489	-26.399	0.062	15.488	26.399	-0.062	0.003%
21	-15.489	-19.799	0.062	15.488	19.799	-0.062	0.002%
22	-13.383	-26.399	-8.144	13.383	26.399	8.144	0.000%
23	-13.383	-19.799	-8.144	13.383	19.799	8.144	0.000%
24	-7.691	-26.399	-14.168	7.691	26.399	14.168	0.000%
25	-7.691	-19.799	-14.168	7.691	19.799	14.168	0.000%
26	0.000	-50.700	0.000	-0.000	50.700	-0.000	0.000%
27	0.013	-50.700	-5.521	-0.013	50.700	5.521	0.000%
28	2.556	-50.700	-4.551	-2.556	50.700	4.551	0.000%
29	4.447	-50.700	-2.653	-4.447	50.700	2.653	0.000%
30	5.091	-50.700	-0.013	-5.091	50.700	0.013	0.000%
31	4.434	-50.700	2.632	-4.434	50.700	-2.632	0.000%
32	2.549	-50.700	4.564	-2.549	50.700	-4.564	0.000%
33	-0.013	-50.700	5.521	0.013	50.700	-5.521	0.000%
34	-2.556	-50.700	4.551	2.556	50.700	-4.551	0.000%
35	-4.447	-50.700	2.653	4.447	50.700	-2.653	0.000%
36	-5.091	-50.700	0.013	5.091	50.700	-0.013	0.000%
37	-4.434	-50.700	-2.632	4.434	50.700	2.632	0.000%
38	-2.549	-50.700	-4.564	2.549	50.700	4.564	0.000%
39	0.013	-21.999	-3.542	-0.013	21.999	3.542	0.001%
40	1.668	-21.999	-3.045	-1.668	21.999	3.044	0.001%
41	2.877	-21.999	-1.766	-2.876	21.999	1.765	0.001%
42	3.314	-21.999	-0.013	-3.313	21.999	0.013	0.003%
43	2.863	-21.999	1.743	-2.863	21.999	-1.742	0.001%
44	1.646	-21.999	3.031	-1.645	21.999	-3.031	0.001%
45	-0.013	-21.999	3.542	0.013	21.999	-3.542	0.001%
46	-1.668	-21.999	3.045	1.668	21.999	-3.045	0.001%
47	-2.877	-21.999	1.766	2.876	21.999	-1.765	0.001%
48	-3.314	-21.999	0.013	3.313	21.999	-0.013	0.003%
49	-2.863	-21.999	-1.743	2.863	21.999	1.742	0.001%
50	-1.646	-21.999	-3.031	1.645	21.999	3.031	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00001095
2	Yes	20	0.00000001	0.00007490
3	Yes	19	0.00000001	0.00011878
4	Yes	22	0.00000001	0.00010250
5	Yes	22	0.00000001	0.00007355
6	Yes	22	0.00000001	0.00011605
7	Yes	22	0.00000001	0.00008392
8	Yes	18	0.00000001	0.00010548
9	Yes	18	0.00000001	0.00008442

10	Yes	22	0.00000001	0.00010994
11	Yes	22	0.00000001	0.00007946
12	Yes	22	0.00000001	0.00010125
13	Yes	22	0.00000001	0.00007287
14	Yes	20	0.00000001	0.00008576
15	Yes	19	0.00000001	0.00013598
16	Yes	22	0.00000001	0.00012101
17	Yes	22	0.00000001	0.00008708
18	Yes	22	0.00000001	0.00010545
19	Yes	22	0.00000001	0.00007586
20	Yes	17	0.00000001	0.00013626
21	Yes	17	0.00000001	0.00011187
22	Yes	22	0.00000001	0.00010594
23	Yes	22	0.00000001	0.00007639
24	Yes	22	0.00000001	0.00011659
25	Yes	22	0.00000001	0.00008381
26	Yes	14	0.00000001	0.00014690
27	Yes	21	0.00000001	0.00008773
28	Yes	21	0.00000001	0.00010599
29	Yes	21	0.00000001	0.00010849
30	Yes	21	0.00000001	0.00008175
31	Yes	21	0.00000001	0.00010640
32	Yes	21	0.00000001	0.00010482
33	Yes	21	0.00000001	0.00008755
34	Yes	21	0.00000001	0.00011457
35	Yes	21	0.00000001	0.00011011
36	Yes	21	0.00000001	0.00008578
37	Yes	21	0.00000001	0.00011054
38	Yes	21	0.00000001	0.00011439
39	Yes	16	0.00000001	0.00008445
40	Yes	16	0.00000001	0.00010292
41	Yes	16	0.00000001	0.00014704
42	Yes	15	0.00000001	0.00005777
43	Yes	16	0.00000001	0.00012398
44	Yes	16	0.00000001	0.00009739
45	Yes	16	0.00000001	0.00008650
46	Yes	17	0.00000001	0.00008686
47	Yes	16	0.00000001	0.00010582
48	Yes	15	0.00000001	0.00005636
49	Yes	16	0.00000001	0.00010783
50	Yes	17	0.00000001	0.00007930

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	15.956	39	1.538	0.016
L2	105 - 100	14.385	39	1.498	0.014
L3	100 - 93	12.871	39	1.424	0.013
L4	95 - 90	11.444	39	1.316	0.010
L5	90 - 85	10.110	39	1.225	0.008
L6	85 - 80	8.890	39	1.105	0.006
L7	80 - 78.75	7.799	39	0.976	0.005
L8	78.75 - 78.5	7.548	39	0.942	0.004
L9	78.5 - 73.5	7.499	39	0.939	0.004
L10	73.5 - 68.5	6.552	39	0.869	0.004
L11	68.5 - 64.25	5.682	39	0.792	0.003
L12	64.25 - 64	5.007	39	0.724	0.003
L13	64 - 59	4.970	39	0.721	0.003
L14	59 - 56.5	4.245	39	0.664	0.002
L15	56.5 - 56.25	3.905	39	0.634	0.002
L16	56.25 - 51.25	3.872	39	0.632	0.002
L17	51.25 - 45.5	3.235	39	0.584	0.002
L18	49.5 - 44.5	3.024	39	0.568	0.002
L19	44.5 - 39.5	2.444	39	0.534	0.002
L20	39.5 - 37.25	1.918	39	0.472	0.001
L21	37.25 - 37	1.702	39	0.443	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L22	37 - 34.25	1.679	39	0.440	0.001
L23	34.25 - 34	1.435	39	0.406	0.001
L24	34 - 33.75	1.414	39	0.402	0.001
L25	33.75 - 33.5	1.393	39	0.398	0.001
L26	33.5 - 28.5	1.372	39	0.395	0.001
L27	28.5 - 23.5	0.990	39	0.335	0.001
L28	23.5 - 18.5	0.671	39	0.275	0.001
L29	18.5 - 13.5	0.415	39	0.216	0.001
L30	13.5 - 8.5	0.220	39	0.157	0.000
L31	8.5 - 3.5	0.087	39	0.098	0.000
L32	3.5 - 0	0.015	39	0.040	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.000	(2) P65-15-XLH-RR w/ Mount Pipe	39	15.956	1.538	0.016	4961
100.000	48212S w/ Mount Pipe	39	12.871	1.424	0.013	3176
83.000	(2) SBNHH-1D65A w/ Mount Pipe	39	8.437	1.057	0.006	2175
69.000	DB201-F	39	5.766	0.801	0.003	3659

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	74.913	2	7.174	0.077
L2	105 - 100	67.516	2	6.999	0.070
L3	100 - 93	60.386	2	6.661	0.063
L4	95 - 90	53.676	2	6.175	0.047
L5	90 - 85	47.409	2	5.758	0.038
L6	85 - 80	41.680	2	5.193	0.030
L7	80 - 78.75	36.564	2	4.579	0.022
L8	78.75 - 78.5	35.388	2	4.420	0.021
L9	78.5 - 73.5	35.157	2	4.404	0.020
L10	73.5 - 68.5	30.720	2	4.074	0.017
L11	68.5 - 64.25	26.643	2	3.715	0.014
L12	64.25 - 64	23.482	2	3.392	0.012
L13	64 - 59	23.305	2	3.380	0.012
L14	59 - 56.5	19.907	2	3.113	0.010
L15	56.5 - 56.25	18.314	2	2.975	0.010
L16	56.25 - 51.25	18.158	2	2.964	0.009
L17	51.25 - 45.5	15.172	2	2.741	0.008
L18	49.5 - 44.5	14.182	2	2.663	0.008
L19	44.5 - 39.5	11.463	2	2.504	0.007
L20	39.5 - 37.25	8.995	2	2.212	0.006
L21	37.25 - 37	7.984	2	2.081	0.006
L22	37 - 34.25	7.876	2	2.066	0.006
L23	34.25 - 34	6.732	2	1.905	0.005
L24	34 - 33.75	6.633	2	1.886	0.005
L25	33.75 - 33.5	6.535	2	1.866	0.005
L26	33.5 - 28.5	6.438	2	1.853	0.005
L27	28.5 - 23.5	4.646	2	1.570	0.004
L28	23.5 - 18.5	3.150	2	1.289	0.003
L29	18.5 - 13.5	1.946	2	1.011	0.002
L30	13.5 - 8.5	1.031	2	0.736	0.002
L31	8.5 - 3.5	0.407	2	0.458	0.001
L32	3.5 - 0	0.069	2	0.188	0.000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.000	(2) P65-15-XLH-RR w/ Mount Pipe	2	74.913	7.174	0.077	1127
100.000	48212S w/ Mount Pipe	2	60.386	6.661	0.063	717
83.000	(2) SBNHH-1D65A w/ Mount Pipe	2	39.557	4.965	0.027	477
69.000	DB201-F	2	27.034	3.754	0.015	786

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	110 - 105 (1)	TP13.901x13.051x0.188	5.000	0.000	0.0	8.161	-2.528	606.340	0.004
L2	105 - 100 (2)	TP14.751x13.901x0.188	5.000	0.000	0.0	8.667	-2.741	643.922	0.004
L3	100 - 93 (3)	TP15.941x14.751x0.188	7.000	0.000	0.0	9.173	-4.733	681.505	0.007
L4	93 - 90 (4)	TP16.114x15.226x0.25	5.000	0.000	0.0	12.588	-5.150	935.225	0.006
L5	90 - 85 (5)	TP17.002x16.114x0.25	5.000	0.000	0.0	13.292	-5.532	987.568	0.006
L6	85 - 80 (6)	TP17.89x17.002x0.25	5.000	0.000	0.0	13.997	-6.911	1039.910	0.007
L7	80 - 78.75 (7)	TP18.112x17.89x0.25	1.250	0.000	0.0	14.173	-7.024	1053.000	0.007
L8	78.75 - 78.5 (8)	TP18.156x18.112x0.55	0.250	0.000	0.0	30.735	-7.072	2283.440	0.003
L9	78.5 - 73.5 (9)	TP19.044x18.156x0.538	5.000	0.000	0.0	31.572	-7.750	2345.670	0.003
L10	73.5 - 68.5 (10)	TP19.932x19.044x0.513	5.000	0.000	0.0	31.589	-8.855	2346.890	0.004
L11	68.5 - 64.25 (11)	TP20.686x19.932x0.5	4.250	0.000	0.0	32.036	-9.481	2380.110	0.004
L12	64.25 - 64 (12)	TP20.731x20.686x0.775	0.250	0.000	0.0	49.088	-9.538	3647.020	0.003
L13	64 - 59 (13)	TP21.619x20.731x0.75	5.000	0.000	0.0	49.678	-10.521	3690.830	0.003
L14	59 - 56.5 (14)	TP22.063x21.619x0.725	2.500	0.000	0.0	49.101	-11.024	3647.970	0.003
L15	56.5 - 56.25 (15)	TP22.107x22.063x0.975	0.250	0.000	0.0	65.396	-11.092	4858.620	0.002
L16	56.25 - 51.25 (16)	TP22.995x22.107x0.925	5.000	0.000	0.0	64.796	-12.310	4814.040	0.003
L17	51.25 - 45.5 (17)	TP24.016x22.995x0.913	5.750	0.000	0.0	64.857	-12.740	4818.540	0.003
L18	45.5 - 44.5 (18)	TP23.709x22.806x0.725	5.000	0.000	0.0	52.890	-14.717	3929.480	0.004
L19	44.5 - 39.5 (19)	TP24.613x23.709x0.713	5.000	0.000	0.0	54.050	-15.822	4015.640	0.004
L20	39.5 - 37.25 (20)	TP25.019x24.613x0.7	2.250	0.000	0.0	54.033	-16.327	4014.380	0.004
L21	37.25 - 37 (21)	TP25.065x25.019x0.7	0.250	0.000	0.0	54.133	-16.398	4021.830	0.004
L22	37 - 34.25 (22)	TP25.562x25.065x0.688	2.750	0.000	0.0	54.278	-17.104	4032.610	0.004
L23	34.25 - 34 (23)	TP25.607x25.562x0.513	0.250	0.000	0.0	40.820	-17.171	3032.740	0.006
L24	34 - 33.75 (24)	TP25.652x25.607x0.513	0.250	0.000	0.0	40.894	-17.230	3038.200	0.006

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L25	33.75 - 33.5 (25)	TP25.697x25.652x0.725	0.250	0.000	0.0	57.465	-17.296	4269.330	0.004
L26	33.5 - 28.5 (26)	TP26.601x25.697x0.7	5.000	0.000	0.0	57.546	-18.601	4275.390	0.004
L27	28.5 - 23.5 (27)	TP27.504x26.601x0.688	5.000	0.000	0.0	58.518	-19.933	4347.560	0.005
L28	23.5 - 18.5 (28)	TP28.408x27.504x0.675	5.000	0.000	0.0	59.416	-21.287	4414.320	0.005
L29	18.5 - 13.5 (29)	TP29.311x28.408x0.663	5.000	0.000	0.0	60.242	-22.661	4475.690	0.005
L30	13.5 - 8.5 (30)	TP30.215x29.311x0.638	5.000	0.000	0.0	59.848	-24.057	4446.390	0.005
L31	8.5 - 3.5 (31)	TP31.119x30.215x0.638	5.000	0.000	0.0	61.676	-25.436	4582.220	0.006
L32	3.5 - 0 (32)	TP31.751x31.119x0.625	3.500	0.000	0.0	61.746	-26.390	4587.430	0.006

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{rx} kip-ft	Ratio M _{ux} / φM _{rx}	M _{uy} kip-ft	φM _{ry} kip-ft	Ratio M _{uy} / φM _{ry}
L1	110 - 105 (1)	TP13.901x13.051x0.188	36.399	170.004	0.214	0.000	170.004	0.000
L2	105 - 100 (2)	TP14.751x13.901x0.188	65.552	191.882	0.342	0.000	191.882	0.000
L3	100 - 93 (3)	TP15.941x14.751x0.188	108.745	215.086	0.506	0.000	215.086	0.000
L4	93 - 90 (4)	TP16.114x15.226x0.25	152.458	302.710	0.504	0.000	302.710	0.000
L5	90 - 85 (5)	TP17.002x16.114x0.25	197.197	337.821	0.584	0.000	337.821	0.000
L6	85 - 80 (6)	TP17.89x17.002x0.25	249.828	374.858	0.666	0.000	374.858	0.000
L7	80 - 78.75 (7)	TP18.112x17.89x0.25	264.286	384.418	0.687	0.000	384.418	0.000
L8	78.75 - 78.5 (8)	TP18.156x18.112x0.55	267.186	807.948	0.331	0.000	807.948	0.000
L9	78.5 - 73.5 (9)	TP19.044x18.156x0.538	325.818	874.275	0.373	0.000	874.275	0.000
L10	73.5 - 68.5 (10)	TP19.932x19.044x0.513	387.543	920.250	0.421	0.000	920.250	0.000
L11	68.5 - 64.25 (11)	TP20.686x19.932x0.5	443.895	971.683	0.457	0.000	971.683	0.000
L12	64.25 - 64 (12)	TP20.731x20.686x0.775	447.238	1451.958	0.308	0.000	1451.958	0.000
L13	64 - 59 (13)	TP21.619x20.731x0.75	514.800	1540.917	0.334	0.000	1540.917	0.000
L14	59 - 56.5 (14)	TP22.063x21.619x0.725	549.095	1560.200	0.352	0.000	1560.200	0.000
L15	56.5 - 56.25 (15)	TP22.107x22.063x0.975	552.543	2034.033	0.272	0.000	2034.033	0.000
L16	56.25 - 51.25 (16)	TP22.995x22.107x0.925	622.269	2113.350	0.294	0.000	2113.350	0.000
L17	51.25 - 45.5 (17)	TP24.016x22.995x0.913	647.016	2148.708	0.301	0.000	2148.708	0.000
L18	45.5 - 44.5 (18)	TP23.709x22.806x0.725	718.843	1814.558	0.396	0.000	1814.558	0.000
L19	44.5 - 39.5 (19)	TP24.613x23.709x0.713	792.079	1931.500	0.410	0.000	1931.500	0.000
L20	39.5 - 37.25 (20)	TP25.019x24.613x0.7	825.436	1966.708	0.420	0.000	1966.708	0.000
L21	37.25 - 37 (21)	TP25.065x25.019x0.7	829.158	1974.125	0.420	0.000	1974.125	0.000
L22	37 - 34.25 (22)	TP25.562x25.065x0.688	870.308	2022.950	0.430	0.000	2022.950	0.000
L23	34.25 - 34 (23)	TP25.607x25.562x0.513	874.075	1545.683	0.565	0.000	1545.683	0.000
L24	34 - 33.75 (24)	TP25.652x25.607x0.513	877.833	1551.308	0.566	0.000	1551.308	0.000
L25	33.75 - 33.5 (25)	TP25.697x25.652x0.725	881.600	2147.225	0.411	0.000	2147.225	0.000
L26	33.5 - 28.5 (26)	TP26.601x25.697x0.7	957.650	2234.592	0.429	0.000	2234.592	0.000
L27	28.5 - 23.5 (27)	TP27.504x26.601x0.688	1035.000	2355.867	0.439	0.000	2355.867	0.000
L28	23.5 - 18.5 (28)	TP28.408x27.504x0.675	1113.558	2476.892	0.450	0.000	2476.892	0.000

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L29	18.5 - 13.5 (29)	TP29.311x28.408x0.663	1193.225	2597.358	0.459	0.000	2597.358	0.000
L30	13.5 - 8.5 (30)	TP30.215x29.311x0.638	1273.925	2668.083	0.477	0.000	2668.083	0.000
L31	8.5 - 3.5 (31)	TP31.119x30.215x0.638	1355.600	2835.358	0.478	0.000	2835.358	0.000
L32	3.5 - 0 (32)	TP31.751x31.119x0.625	1413.333	2901.025	0.487	0.000	2901.025	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	ϕV_n	Ratio	Actual	ϕT_n	Ratio
			V_u K	K	$\frac{V_u}{\phi V_n}$	T_u kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	110 - 105 (1)	TP13.901x13.051x0.188	5.728	303.170	0.019	0.176	340.424	0.001
L2	105 - 100 (2)	TP14.751x13.901x0.188	5.938	321.961	0.018	0.175	384.235	0.000
L3	100 - 93 (3)	TP15.941x14.751x0.188	8.632	340.753	0.025	1.007	430.697	0.002
L4	93 - 90 (4)	TP16.114x15.226x0.25	8.852	467.612	0.019	1.006	606.161	0.002
L5	90 - 85 (5)	TP17.002x16.114x0.25	9.055	493.784	0.018	1.004	676.467	0.001
L6	85 - 80 (6)	TP17.89x17.002x0.25	11.552	519.955	0.022	1.562	750.633	0.002
L7	80 - 78.75 (7)	TP18.112x17.89x0.25	11.601	526.498	0.022	1.562	769.776	0.002
L8	78.75 - 78.5 (8)	TP18.156x18.112x0.55	11.614	1141.720	0.010	1.562	1617.875	0.001
L9	78.5 - 73.5 (9)	TP19.044x18.156x0.538	11.858	1172.830	0.010	1.561	1750.683	0.001
L10	73.5 - 68.5 (10)	TP19.932x19.044x0.513	13.163	1162.720	0.011	2.289	1842.750	0.001
L11	68.5 - 64.25 (11)	TP20.686x19.932x0.5	13.369	1190.050	0.011	2.287	1945.733	0.001
L12	64.25 - 64 (12)	TP20.731x20.686x0.775	13.377	1823.510	0.007	2.287	2907.467	0.001
L13	64 - 59 (13)	TP21.619x20.731x0.75	13.655	1845.410	0.007	2.286	3085.592	0.001
L14	59 - 56.5 (14)	TP22.063x21.619x0.725	13.792	1823.990	0.008	2.285	3124.217	0.001
L15	56.5 - 56.25 (15)	TP22.107x22.063x0.975	13.802	2429.310	0.006	2.285	4073.042	0.001
L16	56.25 - 51.25 (16)	TP22.995x22.107x0.925	14.096	2407.020	0.006	2.285	4231.875	0.001
L17	51.25 - 45.5 (17)	TP24.016x22.995x0.913	14.200	2409.270	0.006	2.284	4302.675	0.001
L18	45.5 - 44.5 (18)	TP23.709x22.806x0.725	14.531	1964.740	0.007	2.284	3633.550	0.001
L19	44.5 - 39.5 (19)	TP24.613x23.709x0.713	14.779	2007.820	0.007	2.283	3867.717	0.001
L20	39.5 - 37.25 (20)	TP25.019x24.613x0.7	14.889	2007.190	0.007	2.282	3938.225	0.001
L21	37.25 - 37 (21)	TP25.065x25.019x0.7	14.895	2010.920	0.007	2.282	3953.075	0.001
L22	37 - 34.25 (22)	TP25.562x25.065x0.688	15.050	2016.300	0.007	2.282	4050.842	0.001
L23	34.25 - 34 (23)	TP25.607x25.562x0.513	15.053	1516.370	0.010	2.282	3095.150	0.001
L24	34 - 33.75 (24)	TP25.652x25.607x0.513	15.065	1519.100	0.010	2.282	3106.417	0.001
L25	33.75 - 33.5 (25)	TP25.697x25.652x0.725	15.078	2134.670	0.007	2.282	4299.708	0.001
L26	33.5 - 28.5 (26)	TP26.601x25.697x0.7	15.353	2137.690	0.007	2.281	4474.642	0.001
L27	28.5 - 23.5 (27)	TP27.504x26.601x0.688	15.605	2173.780	0.007	2.280	4717.492	0.000
L28	23.5 - 18.5 (28)	TP28.408x27.504x0.675	15.839	2207.160	0.007	2.280	4959.833	0.000
L29	18.5 - 13.5 (29)	TP29.311x28.408x0.663	16.050	2237.840	0.007	2.279	5201.067	0.000
L30	13.5 - 8.5 (30)	TP30.215x29.311x0.638	16.250	2223.190	0.007	2.279	5342.692	0.000
L31	8.5 - 3.5 (31)	TP31.119x30.215x0.638	16.445	2291.110	0.007	2.279	5677.658	0.000
L32	3.5 - 0 (32)	TP31.751x31.119x0.625	16.571	2293.720	0.007	2.279	5809.150	0.000

Pole Interaction Design Data

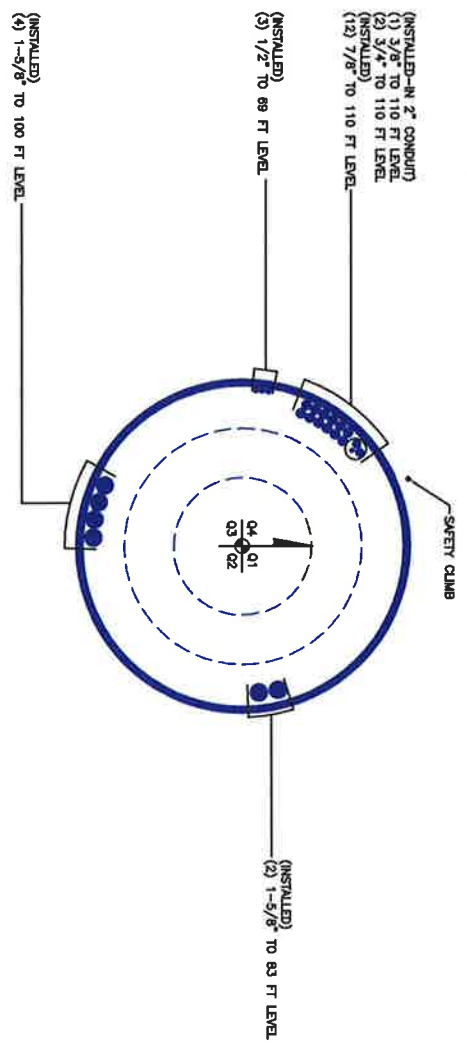
Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	110 - 105 (1)	0.004	0.214	0.000	0.019	0.001	0.219	1.000	4.8.2 ✓
L2	105 - 100 (2)	0.004	0.342	0.000	0.018	0.000	0.346	1.000	4.8.2 ✓
L3	100 - 93 (3)	0.007	0.506	0.000	0.025	0.002	0.513	1.000	4.8.2 ✓
L4	93 - 90 (4)	0.006	0.504	0.000	0.019	0.002	0.510	1.000	4.8.2 ✓
L5	90 - 85 (5)	0.006	0.584	0.000	0.018	0.001	0.590	1.000	4.8.2 ✓
L6	85 - 80 (6)	0.007	0.666	0.000	0.022	0.002	0.674	1.000	4.8.2 ✓
L7	80 - 78.75 (7)	0.007	0.687	0.000	0.022	0.002	0.695	1.000	4.8.2 ✓
L8	78.75 - 78.5 (8)	0.003	0.331	0.000	0.010	0.001	0.334	1.000	4.8.2 ✓
L9	78.5 - 73.5 (9)	0.003	0.373	0.000	0.010	0.001	0.376	1.000	4.8.2 ✓
L10	73.5 - 68.5 (10)	0.004	0.421	0.000	0.011	0.001	0.425	1.000	4.8.2 ✓
L11	68.5 - 64.25 (11)	0.004	0.457	0.000	0.011	0.001	0.461	1.000	4.8.2 ✓
L12	64.25 - 64 (12)	0.003	0.308	0.000	0.007	0.001	0.311	1.000	4.8.2 ✓
L13	64 - 59 (13)	0.003	0.334	0.000	0.007	0.001	0.337	1.000	4.8.2 ✓
L14	59 - 56.5 (14)	0.003	0.352	0.000	0.008	0.001	0.355	1.000	4.8.2 ✓
L15	56.5 - 56.25 (15)	0.002	0.272	0.000	0.006	0.001	0.274	1.000	4.8.2 ✓
L16	56.25 - 51.25 (16)	0.003	0.294	0.000	0.006	0.001	0.297	1.000	4.8.2 ✓
L17	51.25 - 45.5 (17)	0.003	0.301	0.000	0.006	0.001	0.304	1.000	4.8.2 ✓
L18	45.5 - 44.5 (18)	0.004	0.396	0.000	0.007	0.001	0.400	1.000	4.8.2 ✓
L19	44.5 - 39.5 (19)	0.004	0.410	0.000	0.007	0.001	0.414	1.000	4.8.2 ✓
L20	39.5 - 37.25 (20)	0.004	0.420	0.000	0.007	0.001	0.424	1.000	4.8.2 ✓
L21	37.25 - 37 (21)	0.004	0.420	0.000	0.007	0.001	0.424	1.000	4.8.2 ✓
L22	37 - 34.25 (22)	0.004	0.430	0.000	0.007	0.001	0.435	1.000	4.8.2 ✓
L23	34.25 - 34 (23)	0.006	0.565	0.000	0.010	0.001	0.571	1.000	4.8.2 ✓
L24	34 - 33.75 (24)	0.006	0.566	0.000	0.010	0.001	0.572	1.000	4.8.2 ✓
L25	33.75 - 33.5 (25)	0.004	0.411	0.000	0.007	0.001	0.415	1.000	4.8.2 ✓
L26	33.5 - 28.5 (26)	0.004	0.429	0.000	0.007	0.001	0.433	1.000	4.8.2 ✓
L27	28.5 - 23.5 (27)	0.005	0.439	0.000	0.007	0.000	0.444	1.000	4.8.2 ✓

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L28	23.5 - 18.5 (28)	0.005	0.450	0.000	0.007	0.000	0.454	1.000	4.8.2 ✓
L29	18.5 - 13.5 (29)	0.005	0.459	0.000	0.007	0.000	0.465	1.000	4.8.2 ✓
L30	13.5 - 8.5 (30)	0.005	0.477	0.000	0.007	0.000	0.483	1.000	4.8.2 ✓
L31	8.5 - 3.5 (31)	0.006	0.478	0.000	0.007	0.000	0.484	1.000	4.8.2 ✓
L32	3.5 - 0 (32)	0.006	0.487	0.000	0.007	0.000	0.493	1.000	4.8.2 ✓

APPENDIX B
BASE LEVEL DRAWING



CROWN REGION ADDRESS
USA



BUSINESS UNIT: 041301 TOWER ID: C_BASLEVEL

BASE LEVEL DRAWING

PLOT DATE: 03/12/18 FILE NAME: 041301_BASELEVEL.dwg

1" = 1'-0" 1

BASE LEVEL

SHEET NUMBER

SITE NUMBER:

SITE NAME:

WILLINGTON-RIVER RD

BUSINESS UNIT NUMBER

041301

SITE ADDRESS

428 RIVER ROAD

WILLINGTON, CT 06279

TOLLAND COUNTY

USA

DRAWN BY: EJB

CHECKED BY:

DRAWING DATE: 12/08/14

15/06/15

23/10/15

17/1/2018

04/02/18

01/02/18

UPDATED PER WORK ORDER # 300000

UPDATED PER WORK ORDER 058207

UPDATED PER WORK ORDER 1071804

UPDATED PER WORK ORDER 1011811

UPDATED PER WORK ORDER 1441912

15/06/15

23/10/15

17/1/2018

04/02/18

01/02/18

A1-0

APPENDIX C
ADDITIONAL CALCULATIONS

Additional Calculations



Site BU: 841301

Work Order: 1314690



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Pole Geometry

Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
110	17	2	18	13.051	15.941	0.1875	0.75	A572-65
95	49.5	4	18	15.23	24.016	0.25	1	A572-65
49.5	49.5	0	18	22.81	31.751	0.3125	1.25	A572-65

Reinforcement Configuration

Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
46.75	64.25	plate	3.5"x1.25"	3	x							x					x					
0	56.5	plate	CCI-SFP-065125	2					x													x
0	33.75	plate	CCI-SFP-065125	1																		x
0	37.25	plate	CCI-SFP-065125	1										x								
34.25	56.5	plate	CCI-SFP-065125	1											x							
56.5	78.75	plate	CCI-SFP-045100	3						x					x							x

Reinforcement Details

B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _w (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
3.5	1.25	4.375	0.625	15.000	15.000	12.000	2.813	1.1875	A572-65
6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (In)	Bottom Diameter (In)	Wall Thickness (In)	Tapered Pole Grade	Weight Multiplier
1	110 - 105	5		18	13.051	13.901	0.1875	A572-65	1.000
2	105 - 100	5		18	13.901	14.751	0.1875	A572-65	1.000
3	100 - 95	7	2	18	14.751	15.941	0.1875	A572-65	1.000
4	95 - 90	5		18	15.226	16.114	0.25	A572-65	1.000
5	90 - 85	5		18	16.114	17.002	0.25	A572-65	1.000
6	85 - 80	5		18	17.002	17.890	0.25	A572-65	1.000
7	80 - 78.75	1.25		18	17.890	18.112	0.25	A572-65	1.000
8	78.75 - 78.5	0.25		18	18.112	18.156	0.55	A572-65	0.902
9	78.5 - 73.5	5		18	18.156	19.044	0.5375	A572-65	0.900
10	73.5 - 68.5	5		18	19.044	19.932	0.5125	A572-65	0.922
11	68.5 - 64.25	4.25		18	19.932	20.686	0.5	A572-65	0.928
12	64.25 - 64	0.25		18	20.686	20.731	0.775	A572-65	0.873
13	64 - 59	5		18	20.731	21.619	0.75	A572-65	0.877
14	59 - 56.5	2.5		18	21.619	22.063	0.725	A572-65	0.895
15	56.5 - 56.25	0.25		18	22.063	22.107	0.975	A572-65	0.839
16	56.25 - 51.25	5		18	22.107	22.995	0.925	A572-65	0.857
17	51.25 - 49.5	5.75	4	18	22.995	24.016	0.9125	A572-65	0.860
18	49.5 - 44.5	5		18	22.806	23.709	0.725	A572-65	0.900
19	44.5 - 39.5	5		18	23.709	24.613	0.7125	A572-65	0.897
20	39.5 - 37.25	2.25		18	24.613	25.019	0.7	A572-65	0.905
21	37.25 - 37	0.25		18	25.019	25.065	0.7	A572-65	1.054
22	37 - 34.25	2.75		18	25.065	25.562	0.6875	A572-65	1.060
23	34.25 - 34	0.25		18	25.562	25.607	0.5125	A572-65	1.212
24	34 - 33.75	0.25		18	25.607	25.652	0.5125	A572-65	1.211
25	33.75 - 33.5	0.25		18	25.652	25.697	0.725	A572-65	1.004
26	33.5 - 28.5	5		18	25.697	26.601	0.7	A572-65	1.018
27	28.5 - 23.5	5		18	26.601	27.504	0.6875	A572-65	1.016
28	23.5 - 18.5	5		18	27.504	28.408	0.675	A572-65	1.016
29	18.5 - 13.5	5		18	28.408	29.311	0.6625	A572-65	1.017
30	13.5 - 8.5	5		18	29.311	30.215	0.6375	A572-65	1.039
31	8.5 - 3.5	5		18	30.215	31.119	0.6375	A572-65	1.022
32	3.5 - 0	3.5		18	31.119	31.751	0.625	A572-65	1.031

TNX Section Forces

Increment (ft):		5	TNX Output		
	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)	
1	110 - 105	2.5281	36.399	5.728	
2	105 - 100	2.7406	65.552	5.9379	
3	100 - 95	4.7328	108.75	8.6316	
4	95 - 90	5.1502	152.46	8.8525	
5	90 - 85	5.5325	197.2	9.0548	
6	85 - 80	6.9108	249.83	11.552	
7	80 - 78.75	7.0238	264.29	11.601	
8	78.75 - 78.5	7.0724	267.19	11.614	
9	78.5 - 73.5	7.7497	325.82	11.858	
10	73.5 - 68.5	8.8553	387.54	13.163	
11	68.5 - 64.25	9.4805	443.9	13.369	
12	64.25 - 64	9.538	447.24	13.377	
13	64 - 59	10.521	514.8	13.655	
14	59 - 56.5	11.024	549.09	13.792	
15	56.5 - 56.25	11.092	552.54	13.802	
16	56.25 - 51.25	12.31	622.27	14.096	
17	51.25 - 49.5	12.74	647.02	14.2	
18	49.5 - 44.5	14.717	718.84	14.531	
19	44.5 - 39.5	15.822	792.08	14.779	
20	39.5 - 37.25	16.327	825.44	14.889	
21	37.25 - 37	16.398	829.16	14.894	
22	37 - 34.25	17.104	870.31	15.05	
23	34.25 - 34	17.171	874.07	15.053	
24	34 - 33.75	17.229	877.84	15.065	
25	33.75 - 33.5	17.296	881.6	15.078	
26	33.5 - 28.5	18.601	957.65	15.353	
27	28.5 - 23.5	19.933	1035	15.605	
28	23.5 - 18.5	21.287	1113.6	15.839	
29	18.5 - 13.5	22.661	1193.2	16.05	
30	13.5 - 8.5	24.057	1273.9	16.25	
31	8.5 - 3.5	25.436	1355.6	16.445	
32	3.5 - 0	26.39	1413.3	16.571	

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	21.8%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	34.6%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	51.3%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	50.9%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	58.9%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	67.3%	Pass
80 - 78.75	Pole	TP18.112x17.89x0.25	Pole	69.4%	Pass
78.75 - 78.5	Pole + Reinf.	TP18.156x18.112x0.55	Reinf. 6 Tension Rupture	59.3%	Pass
78.5 - 73.5	Pole + Reinf.	TP19.044x18.156x0.5375	Reinf. 6 Tension Rupture	67.3%	Pass
73.5 - 68.5	Pole + Reinf.	TP19.932x19.044x0.5125	Reinf. 6 Tension Rupture	74.7%	Pass
68.5 - 64.25	Pole + Reinf.	TP20.686x19.932x0.5	Reinf. 6 Tension Rupture	80.9%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	62.3%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	67.8%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	70.4%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	55.3%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	59.3%	Pass
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	60.6%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 5 Tension Rupture	63.2%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 5 Tension Rupture	66.0%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 5 Tension Rupture	67.1%	Pass
37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 2 Tension Rupture	65.7%	Pass
37 - 34.25	Pole + Reinf.	TP25.562x25.065x0.6875	Reinf. 2 Tension Rupture	67.0%	Pass
34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.5125	Pole	77.7%	Pass
34 - 33.75	Pole + Reinf.	TP25.652x25.607x0.5125	Pole	77.8%	Pass
33.75 - 33.5	Pole + Reinf.	TP25.697x25.652x0.725	Reinf. 4 Tension Rupture	62.3%	Pass
33.5 - 28.5	Pole + Reinf.	TP26.601x25.697x0.7	Reinf. 4 Tension Rupture	64.4%	Pass
28.5 - 23.5	Pole + Reinf.	TP27.504x26.601x0.6875	Reinf. 4 Tension Rupture	66.4%	Pass
23.5 - 18.5	Pole + Reinf.	TP28.408x27.504x0.675	Reinf. 4 Tension Rupture	68.1%	Pass
18.5 - 13.5	Pole + Reinf.	TP29.311x28.408x0.6625	Reinf. 4 Tension Rupture	69.7%	Pass
13.5 - 8.5	Pole + Reinf.	TP30.215x29.311x0.6375	Reinf. 4 Tension Rupture	71.2%	Pass
8.5 - 3.5	Pole + Reinf.	TP31.119x30.215x0.6375	Reinf. 4 Tension Rupture	72.5%	Pass
3.5 - 0	Pole + Reinf.	TP31.751x31.119x0.625	Reinf. 4 Tension Rupture	73.3%	Pass
				Summary	
			Pole	77.8%	Pass
			Reinforcement	80.9%	Pass
			Overall	80.9%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity						
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6
110 - 105	194	n/a	194	8.16	n/a	8.16	21.8%						
105 - 100	232	n/a	232	8.67	n/a	8.67	34.6%						
100 - 95	275	n/a	275	9.17	n/a	9.17	51.3%						
95 - 90	400	n/a	400	12.59	n/a	12.59	50.9%						
90 - 85	471	n/a	471	13.29	n/a	13.29	58.9%						
85 - 80	550	n/a	550	14.00	n/a	14.00	67.3%						
80 - 78.75	571	n/a	571	14.17	n/a	14.17	69.4%						
78.75 - 78.5	575	631	1207	14.21	13.50	27.71	41.8%						59.3%
78.5 - 73.5	665	690	1355	14.91	13.50	28.41	47.5%						67.3%
73.5 - 68.5	764	751	1515	15.62	13.50	29.12	52.9%						74.7%
68.5 - 64.25	855	806	1661	16.22	13.50	29.72	57.3%						80.9%
64.25 - 64	861	1609	2470	16.25	26.63	42.88	38.9%	62.3%					54.9%
64 - 59	978	1741	2719	16.96	26.63	43.58	42.5%	67.8%					59.8%
59 - 56.5	1040	1809	2849	17.31	26.63	43.93	44.1%	70.4%					62.0%
56.5 - 56.25	1046	2609	3656	17.34	37.50	54.84	34.7%	55.3%	44.1%			44.1%	
56.25 - 51.25	1179	2807	3987	18.05	37.50	55.55	37.2%	59.3%	47.3%			47.3%	
51.25 - 49.5	1228	2879	4107	18.29	37.50	55.79	38.1%	60.6%	48.3%			48.3%	
49.5 - 44.5	1604	1943	3547	23.21	24.38	47.58	49.9%		63.2%			63.2%	
44.5 - 39.5	1798	2083	3880	24.10	24.38	48.48	52.1%		66.0%			66.0%	
39.5 - 37.25	1889	2147	4036	24.51	24.38	48.88	53.1%		67.1%			67.1%	
37.25 - 37	1900	2183	4083	24.55	32.50	57.05	53.5%		65.7%		44.6%	54.1%	
37 - 34.25	2016	2263	4280	25.04	32.50	57.54	54.7%		67.0%		45.6%	55.3%	
34.25 - 34	2061	1233	3293	25.09	24.38	49.46	77.7%		73.0%		66.1%		
34 - 33.75	2072	1237	3308	25.13	24.38	49.51	77.8%		73.2%		66.2%		
33.75 - 33.5	2051	2452	4503	25.18	32.50	57.68	53.9%		61.4%	55.4%	62.3%		
33.5 - 28.5	2278	2614	4892	26.07	32.50	58.57	55.8%		63.4%	57.3%	64.4%		
28.5 - 23.5	2521	2782	5303	26.97	32.50	59.47	57.5%		65.3%	59.1%	66.4%		
23.5 - 18.5	2780	2955	5736	27.87	32.50	60.37	59.0%		67.0%	60.8%	68.1%		
18.5 - 13.5	3057	3134	6191	28.76	32.50	61.26	60.5%		68.6%	62.3%	69.7%		
13.5 - 8.5	3352	3318	6670	29.66	32.50	62.16	61.8%		70.0%	63.6%	71.2%		
8.5 - 3.5	3665	3507	7172	30.55	32.50	63.05	63.0%		71.3%	64.9%	72.5%		
3.5 - 0	3895	3643	7538	31.18	32.50	63.68	63.7%		72.1%	65.7%	73.3%		

Note: Section capacity checked in 5 degree increments.

Project Name:	Wilmington-River RD	JACOBS Jacobs Engineering Group, Inc.	Created On: 6/17/2014
Project Number:	BU#841301		Checked By: SMR
Job Number:	WO#1314690		Revised On: 9/16/2016
Date:	10/19/2016		Revision No.: 2.5

Monopole Additional Anchor Rod and Bracket Checks

New Design?	No	
Code:	G	
Moment (M)	1413	kip-ft
Axial (P)	26	kips
Shear (V)	17	kips

Existing Rods		
Number of Rods	8	
Rod Circle	38.8	in
y	19.4	in
Moment of Inertia (I)	4892.68	in ⁴
Rod Grade	A615-75	
Thread Type	Non-Upset	
Diameter (d)	2.25	in
Ag	3.98	in ²
Ae	3.25	in ²
Fy	75	ksi
Fu	100	ksi
Tension per Rod	124.09	kips
Shear per Rod	2.13	kips
Allowable	260.0	kips
% Capacity	47.7%	%
	Pass	

New Rods		
Number of Rods	4	
Rod Circle	51.3	in
y	25.65	in
Moment of Inertia (I)	4,276	in ⁴
Rod Grade	A193 B7	
Thread Type	Non-Upset	
Diameter (d)	2.25	in
Ag	3.98	in ²
Ae	3.25	in ²
Fy	105	ksi
Fu	125	ksi
Tension per Rod	154.16	kips
Shear per Rod	0.00	kips
Allowable	325.0	kips
% Capacity	47.4%	%
	Pass	

Total Moment of Inertia	9169.18	in ⁴
-------------------------	---------	-----------------

Horizontal and Vertical Weld to Pole Checks		
Pole Grade		
Fy	65	ksi
Fu	80	ksi
Base Plate Grade		
Fy	60	ksi
Fu	75	ksi
Bracket Plate Grade		
Fy	65	ksi
Fu	80	ksi
Bracket plate thickness	1.25	in
Bracket Plate width	7.25	in
Height of vertical weld from base plate	96	in
Notch	0.75	in
Gap between Base Plate and Pipe	0	in
Vertical fillet weld size (bracket to pole)	6	x/16 in
Weld Material Grade	80	ksi

Pipe/HSS Checks		
Pipe/HSS	HSS	
Diameter Pipe/Width HSS	5	in
thickness of pipe	0.5	in
inner diameter of pipe	4	in
Pipe Fy	46	ksi
Length of Pipe	14	in
Pipe Area	7.88	in ²
MOI of pipe	26.00	in ⁴
r pipe	1.82	in
Allowable Bearing	489.35	k
% Capacity	31.5%	%
	Pass	
Fa	27.11	ksi
Fe	4818.2	ksi
kl/r	7.71	
4.71*v(E/Fy)	118.26	
Fcr	45.82	ksi
øPn	326.23	k
% Capacity	47.3%	%
	Pass	

Case 1: Vertical Fillet Weld Controls		
Check extreme fiber 1		
ra1	2.97	ksi
Rnweld	36.00	ksi
Cap1	8.2%	%
	Pass	
Check extreme fiber 2		
ra2	3.00	ksi
Fu	75.00	ksi
Rnplate	33.75	ksi
Cap2	8.9%	%
	Pass	

Case 2: Vertical Fillet Base Material Controls		
Check extreme fiber 1		
ra1	2.20	ksi
Rnweld	36.00	ksi
Cap3	6.1%	%
	Pass	
Check extreme fiber 2		
ra2	2.25	ksi
Fu	75.00	ksi
Rnplate	33.75	ksi
Cap4	6.7%	%
	Pass	

Vertical Weld to Pipe Checks		
length of vertical weld to pipe	14	in
Vertical fillet weld size (bracket to pipe)	8	x/16 in
Weld Material Grade	80	ksi
C1	1.03	
ex	2.5	in
a	0.18	
C	3.55	
Allowable	307.39	k
% Capacity	50.1%	%
	Pass	

Bracket Plate Check		
ΦF_v	35.1	ksi
ΦV_n	614.25	k
V_n	154.2	k
bracket plate welded to base plate?	Yes	
Elastic Section Modulus	40.8	in ³
Plastic Section Modulus	61.3	in ³
ΦM_n	3583.1	k-in
M_u	385.4	k-in
% Capacity	25.1%	%
	Pass	

New Anchor Rods Reinforce Foundation **No**

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

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

Site Data

BU#:	841301
Site Name:	WILLINGTON-RIVER RD
App #:	360342 Rev.0
Pole Manufacturer:	Other

Anchor Rod Data

Qty:	8	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	38.75	in

Plate Data

Diam:	46.75	in
Thick:	1.5	in
Grade:	60	ksi
Single-Rod B-eff:	12.60	in

Stiffener Data (Welding at both sides)

Config:	3	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	7	in
Height:	18	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi
Clear Space between	6	in

Pole Data

Diam:	31.751	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu:	753.6	ft-kips
Axial, Pu:	26	kips
Shear, Vu:	17	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):	124.1 Kips
Allowable Axial, Φ*Fu*Anet:	260.0 Kips
Anchor Rod Stress Ratio:	47.7% Pass

Stiffened
AISC LRFD
φ*Tn

Base Plate Results

Base Plate Stress:	29.5 ksi	Flexural Check
Allowable Plate Stress:	54.0 ksi	
Base Plate Stress Ratio:	54.6% Pass	

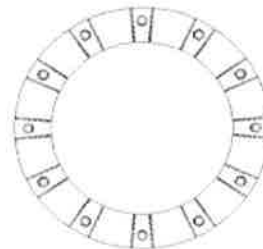
Stiffened
AISC LRFD
φ*Fy
Y.L. Length:
N/A, Roark

Stiffener Results

Horizontal Weld :	41.8% Pass
Vertical Weld:	16.9% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	15.2% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	44.5% Pass
Plate Comp. (AISC Bracket):	52.3% Pass

Pole Results

Pole Punching Shear Check:	6.7% Pass
----------------------------	------------------



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

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

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

Site Data

BU#: 841301
Site Name: <i>Willington-River RD</i>
App #: 360342 Rev. 0

Loads Already Factored

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

Pad & Pier Data

Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	12	in
Pad Bearing Depth, D:	5	ft
Pad Thickness, T:	2.5	ft
Pad Width=Length, L:	22	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	6	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	36.00	ft^2
Pier Height:	3.50	ft
Soil (above pad) Height:	2.50	ft

Soil Parameters

Unit Weight, γ :	125.0	pcf
Ultimate Bearing Capacity, q_n :	8.00	ksf
Strength Reduct. factor, ϕ :	0.75	
Angle of Friction, Φ :	36.0	degrees
Undrained Shear Strength, C_u :	0.00	ksf
Allowable Bearing: $\phi * q_n$:	6.00	ksf
Passive Pres. Coeff., K_p	3.85	

Forces/Moments due to Wind and Lateral Soil

Minimum of ($\phi * \text{Ultimate Pad Passive Force, } V_u$):	17.0	kips
Pad Force Location Above D:	1.11	ft
ϕ (Passive Pressure Moment):	18.89	ft-kips
Factored O.T. M(WL), "1.6W":	1515.0	ft-kips
Factored OT (MW-Msoil), M1	1496.11	ft-kips

Resistance due to Foundation Gravity

Soil Wedge Projection grade, a:	1.82	ft
Sum of Soil Wedges Wt:	11.64	kips
Soil Wedges ecc, K1:	9.69	ft
Ftg+Soil above Pad wt:	340.4	kips
Unfactored (Total ftg-soil Wt):	352.04	kips
1.2D. No Soil Wedges :	434.48	kips
0.9D. With Soil Wedges :	336.33	kips

Resistance due to Cohesion (Vertical)

$\phi * (1/2 * C_u) (\text{Total Vert. Planes})$	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces

TIA Revision:	G	<--Pull Down
Factored DL Axial, PDU:	26	kips
Factored WL Axial, PWu:	0	kips
Factored WL Shear, Vu:	17	kips
Factored WL Moment, Mu:	1413	ft-kips

Load Factor Shaft Factored Loads

1.00	1.2D+1.6W, Pu:	26	kips
0.90	0.9D+1.6W, Pu:	19.5	kips
1.00	Vu:	17	kips
	Mu:	1413	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(No Soil Wedges) [Reaction+Conc+Soil]	434.48	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	1496.11	ft-kips

Orthogonal Direction:

$ecc1 = M1/P1 = 3.44 \text{ ft}$
 $Orthogonal qu = 1.46 \text{ ksf}$
 $qu/\phi * q_n \text{ Ratio} = 24.33\% \text{ Pass}$

Diagonal Direction:

$ecc2 = (0.707M1)/P1 = 2.43 \text{ ft}$
 $Diagonal qu = 1.48 \text{ ksf}$
 $qu/\phi * q_n \text{ Ratio} = 24.67\% \text{ Pass}$

Run

<-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(w/ Soil Wedges) [Reaction+Conc+Soil]	336.33	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	1394.64	ft-kips

$Orthogonal ecc3 = M2/P2 = 4.15 \text{ ft}$
 $Ortho Non Bearing Length, NBL = 8.29 \text{ ft}$
 $Orthogonal qu = 1.22 \text{ ksf}$
 $Diagonal qu = 1.29 \text{ ksf}$

Max Reaction Moment (ft-kips) so that $qu = \phi * q_n = 100\%$ Capacity Rating

Actual M:	1413.00		
M Orthogonal:	3321.24	42.54%	Pass
M Diagonal:	3321.24	42.54%	Pass


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**ASCE 7-10 Windspeeds
(3-sec peak gust in mph*):**

Risk Category I: 115

Risk Category II: 125

Risk Category III-IV: 135

MRI 10-Year: 77**

MRI 25-Year: 87**

MRI 50-Year: 94**

MRI 100-Year: 101**

ASCE 7-05 Windspeed:

100 (3-sec peak gust in mph)

ASCE 7-93 Windspeed:

81 (fastest mile in mph)



*Miles per hour

**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

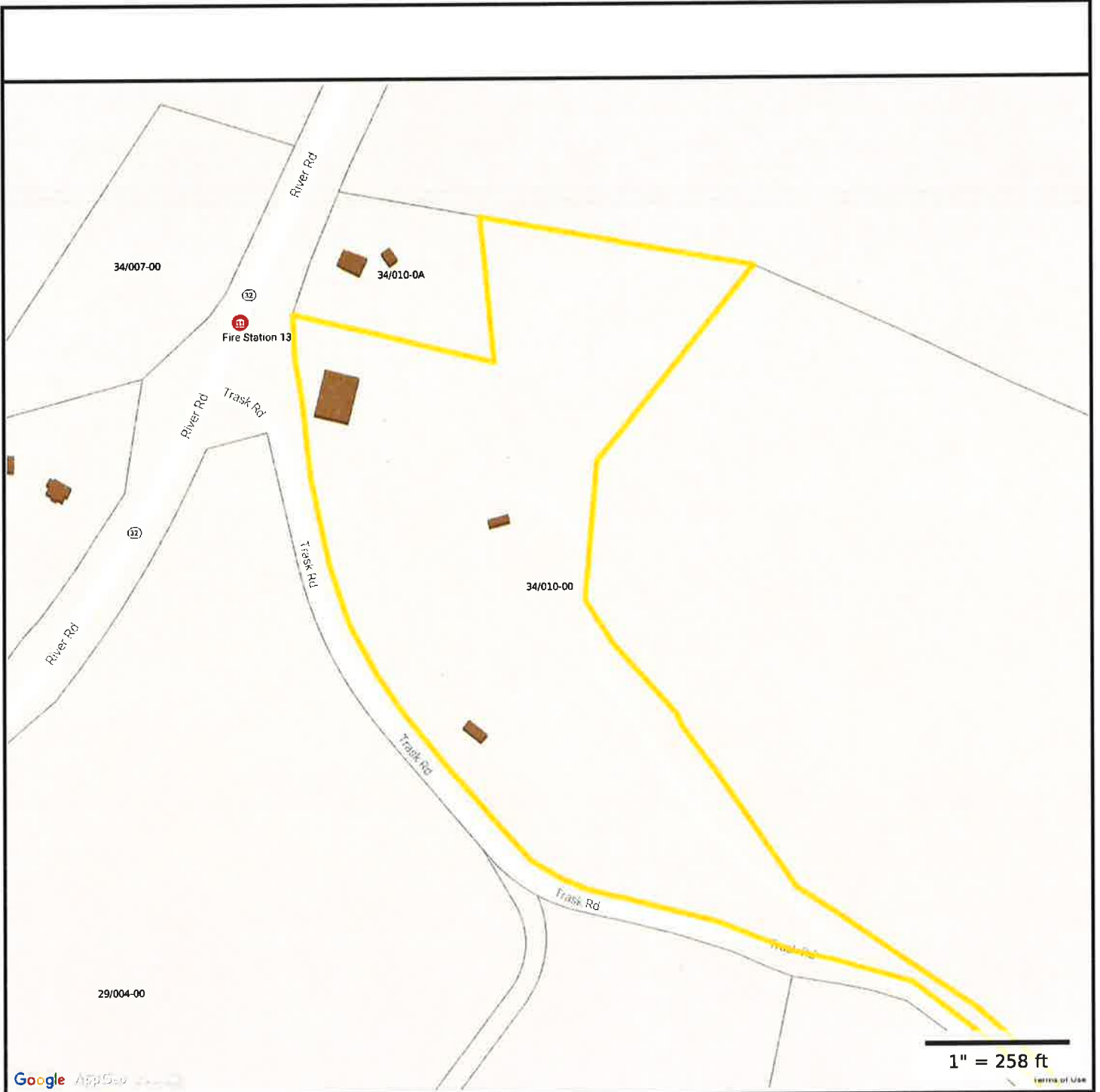


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ATTACHMENT 4



Google Apps

1" = 258 ft

Terms of Use

Property Information

Property ID 09013160-4891
Location 426 RIVER RD
Owner WILLINGTON FIRE DEPT INC



**MAP FOR REFERENCE ONLY
 NOT A LEGAL DOCUMENT**

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426 RIVER RD

Location 426 RIVER RD **Assessment** \$285,980
Mblu 34/ / 010-00/ / **Appraisal** \$408,520
Acct# 00242700 **PID** 4891
Owner WILLINGTON FIRE DEPT INC **Building Count** 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2013	\$298,840	\$109,680	\$408,520
Assessment			
Valuation Year	Improvements	Land	Total
2013	\$209,200	\$76,780	\$285,980

Owner of Record

Owner WILLINGTON FIRE DEPT INC
Co-Owner
Address P O BOX 161
 WILLINGTON, CT 06279

Sale Price \$0
Certificate 1
Book & Page 80/355
Sale Date 06/25/1980

Building Information

Building 1 : Section 1

Year Built: 1985
Living Area: 4266
Replacement Cost: \$344,471
Building Percent Good: 80
Replacement Cost Less Depreciation: \$275,580

Building Attributes	
Field	Description
STYLE	Fire Station
MODEL	Commercial
Grade	C-
Stories:	1
Occupancy	1.00
Exterior Wall 1	Typical
Exterior Wall 2	

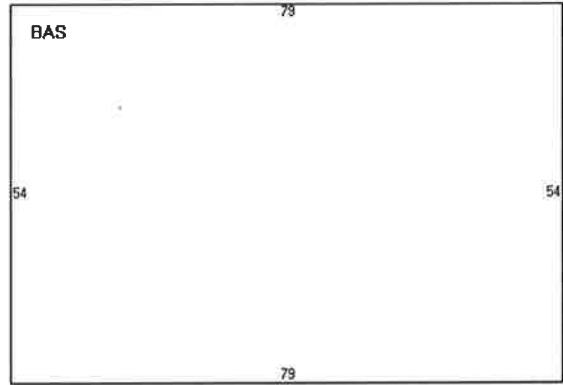
Building Photo



(<http://images.vgsi.com/photos/WilmingtonCTPhotos//\00\00\18>,

Roof Structure	Typical
Roof Cover	Typical
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Typical
Interior Floor 2	
Heating Fuel	Typical
Heating Type	Floor Furnace
AC Type	Unit/AC
Bldg Use	MUN FIRE
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	None
Frame Type	Fireprf Steel
Baths/Plumbing	Average
Ceiling/Wall	-DESCRIPTION-
Rooms/Prtns	Average
Wall Height	14.00
% Comn Wall	

Building Layout



Building Sub-Areas			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	4266	4266
		4266	4266

Extra Features

Extra Features		Legend
No Data for Extra Features		

Land

Land Use

Use Code 9032
Description MUN FIRE
Zone R80
Neighborhood 301
Alt Land Appr Category No

Land Line Valuation

Size (Acres) 13.16
Frontage
Depth
Assessed Value \$76,780
Appraised Value \$109,680

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LT1	LIGHTS-IN W/PL			1.00 UNITS	\$480	1

LT5	MERC VAP/FLU			1.00 UNITS	\$770	1
PAV1	PAVING-ASPHALT			15000.00 S.F.	\$21,000	1
SHD1	SHED FRAME			168.00 S.F.	\$1,010	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2012	\$316,590	\$139,410	\$456,000

Assessment			
Valuation Year	Improvements	Land	Total
2012	\$221,620	\$97,590	\$319,210

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