



10 INDUSTRIAL AVE,
SUITE 3
MAHWAH NJ 07430
PHONE: 201.684.0055

April 21, 2017

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

Notice of Exempt Modification
528 Wheelers Farms Road, Milford, CT 06461
Latitude- 41.24846194
Longitude- -73.07905830

Dear Ms. Bachman,

T-Mobile currently maintains (9) existing antennas at the 107' level of the existing 120' monopole at 528 Wheelers Farms Road in Milford, Connecticut. The tower and property is owned by Crown Castle. T-Mobile now intends to replace (3) of its existing antennas with (3) new 1900/2100 MHz antennas. These antennas would be installed at the same 107' level of the tower. T-Mobile also intends to install (1) new hybrid cable.

This facility was approved by the Council in Petition No. 656 on February 3, 2004. This approval did not include conditions that could feasibly be violated by this modification. This modification complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 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 The Honorable Benjamin G. Blake, Mayor of the City of Milford, as well as the tower and property owner.

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

1. The proposed modification will not result in an increase in the height of the existing structure
2. The proposed modifications 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 emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Kyle Richers

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
908-447-4716
krichers@transcendwireless.com

cc: Benjamin G. Blake- as elected official
Crown Castle- as tower and property owner
Stephen H. Harris- as zoning official

528 WHEELERS FARMS RD

Location 528 WHEELERS FARMS RD

Mblu 104/ 915/ 13/A /

Acct# 023047

Owner VILLAGE FOUNDATION INC
THE

Assessment \$385,000

Appraisal \$550,000

PID 100284

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$550,000	\$0	\$550,000

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$385,000	\$0	\$385,000

Owner of Record

Owner VILLAGE FOUNDATION INC THE
Other C/O GLOBAL SIGNAL ACQUISITIONS II LLC
Address PMB 331
4017 WASHINGTON RD
MCMURRAY, PA 15317

Sale Price \$0
Certificate
Book & Page 00259/5630
Sale Date 05/15/1942

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
VILLAGE FOUNDATION INC THE	\$0		00259/5630	05/15/1942

Building Information

Building 1 : Section 1

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

Building Attributes

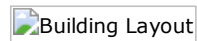
Field	Description
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Description:	
Kitchen Descrip:	
Int Condition:	
Solar Panels	
House Generator	

Building Photo



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

Building Layout



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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use		Land Line Valuation	
Use Code	434V	Size (Acres)	0
Description	CELL TOWER MDL-00	Frontage	
Zone		Depth	
Neighborhood	GG	Assessed Value	\$0
Alt Land Appr Category	No	Appraised Value	\$0

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CEL1	CEL TWR SITE			1 UNITS	\$550,000	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2013	\$450,000	\$0	\$450,000
2012	\$450,000	\$0	\$450,000
2011	\$450,000	\$0	\$450,000

Assessment			
Valuation Year	Improvements	Land	Total
2013	\$315,000	\$0	\$315,000
2012	\$315,000	\$0	\$315,000
2011	\$315,000	\$0	\$315,000

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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11082E

Stratford/ MP X53/ Main
528 Wheelers Farms Road
Milford, CT 06460

April 17, 2017

EBI Project Number: 6217001580

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	15.35 %

April 17, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11082E – Stratford/ MP X53/ Main**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **528 Wheelers Farms Road, Milford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu\text{W}/\text{cm}^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **528 Wheelers Farms Road, Milford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

- 7) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF path an additional 1.48 dB of loss was factored into the calculations used for this analysis. This is based on manufacturers Specifications for 140 feet of 1-5/8" coax cable on each path.
- 8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 9) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antennas used in this modeling are the **Ericsson AIR32 B2A/B66Aa** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B2A/B66Aa** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 11) The antenna mounting height centerline of the proposed antennas is **107 feet** above ground level (AGL).
- 12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 13) All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	3.29	Antenna B1 MPE%	3.29	Antenna C1 MPE%	3.29
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,328.71	ERP (W):	6,328.71	ERP (W):	6,328.71
Antenna A2 MPE%	2.23	Antenna B2 MPE%	2.23	Antenna C2 MPE%	2.23
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.65	Antenna B3 MPE%	0.65	Antenna C3 MPE%	0.65

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	6.17 %
AT&T	2.29 %
XM Satellite Radio	0.20 %
Clearwire	0.15 %
Sprint	0.68 %
Metricom	0.67 %
Verizon Wireless	5.19 %
Site Total MPE %:	15.35 %

T-Mobile Sector A Total:	6.17 %
T-Mobile Sector B Total:	6.17 %
T-Mobile Sector C Total:	6.17 %
Site Total:	15.35 %

T-Mobile _Max Values per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	107	16.45	AWS - 2100 MHz	1000	1.65%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	107	16.45	PCS - 1900 MHz	1000	1.65%
T-Mobile AWS - 2100 MHz UMTS	2	830.08	107	5.85	AWS - 2100 MHz	1000	0.59%
T-Mobile PCS - 1900 MHz UMTS	2	1,167.14	107	8.23	PCS - 1900 MHz	1000	0.82%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	107	8.23	PCS - 1900 MHz	1000	0.82%
T-Mobile 700 MHz LTE	1	865.21	107	3.05	700 MHz	467	0.65%
						Total*:	6.17%

NOTE: Totals may vary by 0.01% due to summing of remainders

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	6.17 %
Sector B:	6.17 %
Sector C:	6.17 %
T-Mobile Per Sector Maximum:	6.17 %
Site Total:	15.35 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **15.35%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Date: **April 7, 2017**

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



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation: **T-Mobile Co-Locate**
Carrier Site Number: CT11082E
Carrier Site Name: Stratford/ MP X 53/ Main

Crown Castle Designation: **Crown Castle BU Number:** 876320
Crown Castle Site Name: 528 Wheelers Farm Rd
Crown Castle JDE Job Number: 432979
Crown Castle Work Order Number: 1386337
Crown Castle Application Number: 386169 Rev. 1

Engineering Firm Designation: **TEP Project Number:** 25570.114864

Site Data: **528 Wheelers Farm Road, Milford, New Haven County, CT 06460**
Latitude 41° 14' 54.35", Longitude -73° 4' 44.67"
120 Foot - Monopole Tower

Dear Charles Trask,

Tower Engineering Professionals 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 1021266, in accordance with application 386169, revision 1.

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

LC7: Existing + Reserved + Proposed Equipment

Sufficient Capacity

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code (2012 International Building Code) based upon an ultimate 3-second wind gust speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3.1 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 appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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: Joshua Rozina, P.E. / TML

Respectfully submitted by:

William H. Martin, P.E., S.E.

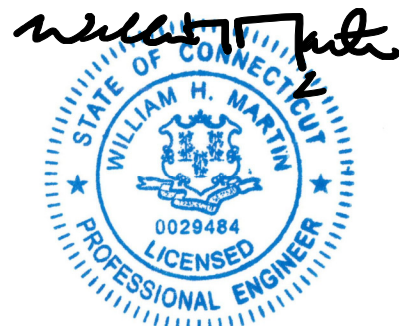


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1) INTRODUCTION

This tower is a 120-ft monopole tower designed by Paul J. Ford and Co. in February of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F-1996 for the appurtenances listed in Table 3. The tower has been modified multiple times in the past to accommodate additional loading. TEP visited the site in April of 2013 to perform a post modification inspection. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the ANSI/TIA-222-G-2-2009 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 using a nominal 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75 inch ice thickness, and 60 mph under service loads with the following design criteria:

Type of Analysis: **Rigorous Structural Analysis**

Classification of Structure: **Class II**

Exposure Category: **Exposure C**

Topographic Category: **Category 1**

Earthquake Category: **Not Considered**

Earthquake effects may be ignored per this standard for site locations where S_s does not exceed 1.0. (New Haven County Max $S_s = 0.32$).

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
105.0	107.0	1	Ericsson	AIR 32 B2a/B66Aa w/ Mount Pipe	1	1-5/8	1
		2	Ericsson	AIR -32 B2A/B66AA w/ Mount Pipe			

Notes:

- 1) See "Appendix B - Base Level Drawing" for assumed feed line configuration.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
122.0	122.0	1	Tower Mounts	Platform Mount [LP 713-1]	3	1-1/4	1
	121.0	3	RFS Celwave	APXVSP18-C-A20 w/ Mount Pipe			
		2	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
		1	Alcatel Lucent	800MHZ RRH			
		3	Alcatel Lucent	TD-RRH8x20-25			
	3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe	1	1-1/4	2	
	120.0	9	RFS Celwave	ACU-A20-N	-	-	1
		2	Alcatel Lucent	800MHZ RRH			
		3	Alcatel Lucent	800 External Notch Filter			
		1	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	116.0	1	Trimble	ACUTIME 2000	-	-	1
	114.0	2	Commscope	SBNHH-1D65B w/ Mount Pipe	1	1-5/8	2
		4	Commscope	SBNHH-1D45B w/ Mount Pipe			
		3	Alcatel Lucent	RRH2x60-700			
		3	Alcatel Lucent	RRH2X60-1900			
		3	Alcatel Lucent	AWS-3 RRH4X45			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		2	Andrew	DB846F65ZAXY w/ Mount Pipe	7	1-5/8	1
		4	Antel	LPA-80063/4CF w/ Mount Pipe			
		3	Antel	BXA-171063/8CF w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
	113.0	2	RFS Celwave	FD9R6004/2C-3L			
		4	RFS Celwave	FD9R6004/2C-3L			
	105.0	107.0	3	Ericsson	AIR 21 B4A B2P w/ Mount Pipe	-	-
3			Ericsson	AIR 21 B2A B4P w/ Mount Pipe	7	1-5/8	1
1			Ericsson	KRY 112 144/1			
3			Commscope	LNx-6515DS-VTM w/ Mount Pipe			
3			Ericsson	RRUS 11 B12			
105.0		2	Ericsson	KRY 112 144/1			
		1	Tower Mounts	Platform Mount [LP 1201-1]			
97.0	97.0	3	Ericsson	TME-RRUS-32 B30	-	-	2
		3	Ericsson	WCS RRUS-32-B30	2 1	3/4 3/8	1
		3	Ericsson	RRUS 11			
		2	Raycap	DC6-48-60-18-8F			
		1	Tower Mounts	Side Arm Mount [SO 102-3]			
96.0	97.0	3	Quintel Technology	QS66512-2 w/ Mount Pipe	-	-	2
		1	Commscope	WCS-IMFQ-AMT	12 2 1	1-1/4 3/4 3/8	1
		3	Powerwave Tech	7770.00 w/ Mount Pipe			
		3	CCI Antennas	OPA-65R-LCUU-H6 w/ Mount Pipe			
	96.0	6	Powerwave Tech	LGP2140X			
		1	Tower Mounts	Platform Mount [LP 601-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
82.0	82.0	-	-	-	12	7/8	4
75.0	75.0	-	-	-	1	1/2	1

Notes:

- 1) Existing equipment
- 2) Reserved equipment
- 3) Existing equipment to be removed; not considered in this analysis
- 4) Abandoned equipment; considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
120.0	120.0	12	Decibel	DB980 H90	-	-
100.0	100.0	12	Decibel	DB980 H90	-	-
90.0	90.0	12	Decibel	DB980 H90	-	-
80.0	80.0	1	Generic	GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Supplemental Geotechnical Report	FDH, Inc.	1613534	CCISites
Tower Foundation Drawings	Paul J. Ford and Co.	1614583	CCISites
Tower Manufacturer Drawings	Paul J. Ford and Co.	1614557	CCISites
Tower Reinforcement Drawings	Semaan Engineering Solutions	1613579	CCISites
Post Modification Inspection	Semaan Engineering Solutions	3350209	CCISites
Tower Reinforcement Drawings	B&T Engineering	2460630	CCISites
Post Modification Inspection	B&T Engineering	2460628	CCISites
Tower Reinforcement Drawings	B&T Engineering	3349207	CCISites
Post Modification Inspection	B&T Engineering	3349204	CCISites
Tower Reinforcement Drawings	Paul J. Ford and Co.	3338935	CCISites
Post Modification Inspection	Tower Engineering Professionals	3753892	CCISites
Tower Reinforcement Drawings	Paul J. Ford and Co.	4961357	CCISites
Post Modification Inspection	SGS, Inc.	5760332	CCISites
Tower Reinforcement Drawings	Paul J. Ford and Co.	5873963	CCISites
Post Modification Inspection	FDH Velocitel	6112300	CCISites

3.1) Analysis Method

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

For analysis of monopole shaft reinforcements, the plates are modeled as linear appurtenances along the exterior of the pole. The loads calculated from tnxTower are then exported to a proprietary calculation sheet created by Tower Engineering Professionals, Inc. that analyzes each reinforcing element along each critical axis and presents percent capacities for each element and the pole shaft along each critical axis. The actual percent capacity of the tower structure including the reinforcing elements is reported in Table 5 - Section Capacity (Summary).

3.2) Assumptions

- 1) The tower and foundation were built in accordance with the manufacturer's specifications.
- 2) The tower and foundation 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 "Appendix B – Base Level Drawing".
- 4) All tower components are in sufficient condition to carry their full design capacity.
- 5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
- 6) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not analyze antennas supporting mounts as part of this structural analysis report.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	ΦP_{allow} (K)	% Capacity	Pass / Fail
L1	120.00-78.00	Pole	TP30.49x22.00x0.2500	1	Note 1	Note 1	53.2	Pass
L2	81.75-39.75	Pole	TP37.71x29.23x0.3125	2	Note 1	Note 1	58.9	Pass
L3	44.50-0.00	Pole	TP45.12x36.13x0.3750	3	Note 1	Note 1	66.6	Pass
M1	8.00-0.00	Mod (Ex)	(TS) 1.25x8.00 (65ksi)	1	Note 1	Note 1	63.7	Pass
M2	56.00-2.00	Mod (Ex)	Face-In C6x10.5	2	Note 1	Note 1	95.1	Pass
M3	56.00-8.67	Mod (Ex)	Face-In C6x10.5	3	Note 1	Note 1	89.7	Pass
M4	25.50-0.50	Mod (Ex)	(Aero) MP304	4	Note 1	Note 1	71.5	Pass
M5	37.00-2.50	Mod (Ex)	PL 1" x 5"	5	Note 1	Note 1	79.0	Pass
M6	72.08-32.08	Mod (Ex)	PL 1" x 5"	6	Note 1	Note 1	71.5	Pass
M7	15.50-0.50	Mod (Ex)	(Aero) MP303	7	Note 1	Note 1	78.0	Pass
M8	45.50-25.50	Mod (Ex)	(Aero) MP303	8	Note 1	Note 1	72.7	Pass
M9	72.00-52.00	Mod (Ex)	CCI-SFP-045100	9	Note 1	Note 1	71.4	Pass
M10	74.79-50.54	Mod (Ex)	CCI-SFP-045100	10	Note 1	Note 1	66.2	Pass
M11	72.00-52.00	Mod (Ex)	CCI-AFP-045100	11	Note 1	Note 1	71.4	Pass
M12	92.00-67.00	Mod (Ex)	CCI-AFP-060100	12	Note 1	Note 1	52.2	Pass
M13	92.08-72.08	Mod (Ex)	CCI-AFP-045100	13	Note 1	Note 1	51.7	Pass
M14	57.50-42.50	Mod (Ex)	CCI-SFP-045100	14	Note 1	Note 1	70.0	Pass
M15	57.25-42.25	Mod (Ex)	CCI-SFP-045100	15	Note 1	Note 1	70.0	Pass
M16	100.75-73.00	Mod (Ex)	PL 1.25" x 4"	16	Note 1	Note 1	60.6	Pass
M17b	100.75-74.00	Mod (Ex)	PL 1.25" x 4"	17	Note 1	Note 1	55.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	ΦP_{allow} (K)	% Capacity	Pass / Fail	
M18b	80.00-68.25	Mod (Ex)	PL 1.25" x 4"	18	Note 1	Note 1	59.1	Pass	
M19	78.25-68.25	Mod (Ex)	PL 1.25" x 4"	19	Note 1	Note 1	54.8	Pass	
							Summary		
							Pole (L3)	66.6	Pass
							Mod (M2)	95.1	Pass
							RATING =	95.1	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Original Anchor Rods	-	61.0	Pass
1	Reinforcing Anchor Rods	-	39.1	Pass
1	Base Plate	-	79.3	Pass
1	Base Foundation Soil Interaction	-	58.8	Pass
1	Base Foundation Structural	-	94.4	Pass

Structure Rating (max from all components) =	95.1%
-----------------------------------------------------	--------------

Notes:

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

4.1) Recommendations

- 1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
- 2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	20.750	12	0.2500					
2	0.250	12	0.2779					
3	8.920	12	0.3169					
4	0.560	12	0.4658					
5	11.500	12	0.6158					
6	5.090	12	0.7206					
7	12.121	12	0.8520					
8	12.121	12	0.9773					
9	12.121	12	1.1026					
10	12.121	12	1.2279					
11	12.121	12	1.3532					
12	12.121	12	1.4785					
13	12.121	12	1.6038					
14	13.500	12	1.7291					
15	5.090	12	1.8544					
16	12.121	12	1.9797					
17	12.121	12	2.1050					
18	12.121	12	2.2303					
19	12.121	12	2.3556					
20	12.290	12	2.4809					
21	9.750	12	2.6062					
22	0.417	12	2.7315					
23	10.333	12	2.8568					
24	9.750	12	2.9821					
25	4.080	12	3.1074					
26	5.420	12	3.2327					
27	2.002	12	3.3580					
28	0.697	12	3.4833					

120.0 ft

99.3 ft

90.1 ft

78.0 ft

76.8 ft

75.5 ft

73.3 ft

70.5 ft

56.0 ft

54.5 ft

52.0 ft

39.8 ft

34.8 ft

24.0 ft

14.3 ft

10.2 ft

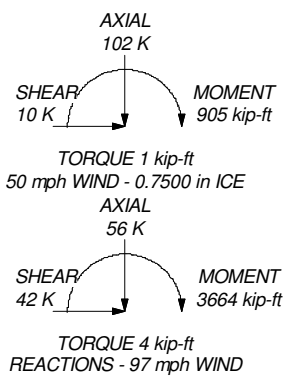
4.8 ft

2.0 ft

0.0 ft



ALL REACTIONS ARE FACTORED



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSP18-C-A20 w/ Mount Pipe	122	Platform Mount [LP 305-1]	113
APXVSP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSP18-C-A20 w/ Mount Pipe	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
800 EXTERNAL NOTCH FILTER	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
800 EXTERNAL NOTCH FILTER	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
800 EXTERNAL NOTCH FILTER	122	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
(3) ACU-A20-N	122	KRY 112 144/1	105
(3) ACU-A20-N	122	KRY 112 144/1	105
(3) ACU-A20-N	122	KRY 112 144/1	105
PCS 1900MHz 4x45W-65MHz	122	LNx-6515DS-VTM w/ Mount Pipe	105
PCS 1900MHz 4x45W-65MHz	122	LNx-6515DS-VTM w/ Mount Pipe	105
PCS 1900MHz 4x45W-65MHz	122	LNx-6515DS-VTM w/ Mount Pipe	105
800MHZ RRH	122	RRUS 11 B12	105
800MHZ RRH	122	RRUS 11 B12	105
800MHZ RRH	122	RRUS 11 B12	105
TD-RRH8x20-25	122	AIR 32 B2A/B66Aa w/ Mount Pipe	105
TD-RRH8x20-25	122	AIR -32 B2A/B66AA w/ Mount Pipe	105
TD-RRH8x20-25	122	AIR -32 B2A/B66AA w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	122	Platform Mount [LP 1201-1]	105
APXVTM14-C-120 w/ Mount Pipe	122	RRUS 11	97
APXVTM14-C-120 w/ Mount Pipe	122	RRUS 11	97
Platform Mount [LP 713-1]	122	RRUS 11	97
(2) 2.4" Dia. x 5-ft Pipe	122	DC6-48-60-18-8F	97
(2) 2.4" Dia. x 5-ft Pipe	122	DC6-48-60-18-8F	97
(2) 2.4" Dia. x 5-ft Pipe	122	WCS RRUS-32-B30	97
Pipe 6" x 10'	120	(2) WCS RRUS-32-B30	97
(2) DB846F65ZAXY w/ Mount Pipe	113	TME-RRUS-32 B30	97
(2) LPA-80063/4CF w/ Mount Pipe	113	TME-RRUS-32 B30	97
(2) LPA-80063/4CF w/ Mount Pipe	113	TME-RRUS-32 B30	97
ACUTIME 2000	113	Side Arm Mount [SO 102-3]	97
BXA-171063/8CF w/ Mount Pipe	113	(2) 2.4" Dia. x 5-ft Pipe	97
BXA-171063/8CF w/ Mount Pipe	113	(2) 2.4" Dia. x 5-ft Pipe	97
BXA-171063/8CF w/ Mount Pipe	113	(2) 2.4" Dia. x 5-ft Pipe	97
(2) FD9R6004/2C-3L	113	7770.00 w/ Mount Pipe	96
(4) FD9R6004/2C-3L	113	7770.00 w/ Mount Pipe	96
DB-T1-6Z-8AB-0Z	113	7770.00 w/ Mount Pipe	96
(2) SBNHH-1D65B w/ Mount Pipe	113	7770.00 w/ Mount Pipe	96
(2) SBNHH-1D45B w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
(2) SBNHH-1D45B w/ Mount Pipe	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
RRH2x60-700	113	OPA-65R-LCUU-H6 w/ Mount Pipe	96
RRH2x60-700	113	(2) LGP2140X	96
RRH2x60-700	113	(2) LGP2140X	96
RRH2x60-1900	113	(2) LGP2140X	96
RRH2x60-1900	113	QS66512-2 w/ Mount Pipe	96
RRH2x60-1900	113	QS66512-2 w/ Mount Pipe	96
RRH2x60-1900	113	QS66512-2 w/ Mount Pipe	96
AWS-3 RRH4X45	113	WCS-IMFQ-AMT	96
AWS-3 RRH4X45	113	Platform Mount [LP 601-1]	96
AWS-3 RRH4X45	113	2.4" Dia x 6-ft Pipe	96
DB-T1-6Z-8AB-0Z	113	2.4" Dia x 6-ft Pipe	96
2.4" Dia x 6-ft Pipe	113	2.4" Dia x 6-ft Pipe	96
2.4" Dia x 6-ft Pipe	113	2.4" Dia x 6-ft Pipe	96
2.4" Dia x 6-ft Pipe	113		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
MPRF-Fy=60ks	60 ksi	75 ksi	MPRF-Fy=60ks	60 ksi	75 ksi
Density=100%			Density=50%		

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft



Tower Engineering Professionals

Tower Engineering Professionals

326 Tryon Rd.
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: **528 Wheelers Farm Rd (BU 876320)**

Project: **TEP No. 25570.114864**

Client: Crown Castle	Drawn by: JDR	App'd:
Code: TIA-222-G	Date: 04/06/17	Scale: NTS
Path: C:\Users\jrozina\Desktop\Tnx\876320_LC7.ar		Dwg No. E-1

tnxTower Tower Engineering Professionals 326 Tryon Rd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job 528 Wheelers Farm Rd (BU 876320)	Page 1 of 33
	Project TEP No. 25570.114864	Date 14:33:41 04/06/17
	Client Crown Castle	Designed by JDR

Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Basic wind speed of 97 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.000 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 <li style="background-color: #e0e0e0;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	120.000-99.250	20.750	0.00	12	22.0000	26.1925	0.2500	1.0000	MPRF-Fy=60ksi, Density=100% (60 ksi)

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	Client Crown Castle	Designed by JDR

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
L2	99.250-99.000	0.250	0.00	12	26.1925	26.2430	0.2779	1.1117	MPRF-Fy=60ksi, Density=100% (60 ksi)
L3	99.000-90.080	8.920	0.00	12	26.2430	28.0453	0.3169	1.2674	MPRF-Fy=60ksi, Density=100% (60 ksi)
L4	90.080-89.500	0.580	0.00	12	28.0453	28.1625	0.4858	1.9432	MPRF-Fy=60ksi, Density=100% (60 ksi)
L5	89.500-78.000	11.500	3.75	12	28.1625	30.4860	0.6158	2.4631	MPRF-Fy=60ksi, Density=50% (60 ksi)
L6	78.000-76.750	5.000	0.00	12	29.2280	30.2382	0.8500	3.4002	MPRF-Fy=60ksi, Density=50% (60 ksi)
L7	76.750-75.500	1.250	0.00	12	30.2382	30.4908	0.9200	3.6798	MPRF-Fy=60ksi, Density=50% (60 ksi)
L8	75.500-74.500	1.000	0.00	12	30.4908	30.6928	0.8072	3.2287	MPRF-Fy=60ksi, Density=50% (60 ksi)
L9	74.500-73.290	1.210	0.00	12	30.6928	30.9373	0.7332	2.9326	MPRF-Fy=60ksi, Density=50% (60 ksi)
L10	73.290-70.500	2.790	0.00	12	30.9373	31.5010	0.7490	2.9962	MPRF-Fy=60ksi, Density=50% (60 ksi)
L11	70.500-70.000	0.500	0.00	12	31.5010	31.6021	0.7880	3.1522	MPRF-Fy=60ksi, Density=50% (60 ksi)
L12	70.000-69.750	0.250	0.00	12	31.6021	31.6526	0.7391	2.9563	MPRF-Fy=60ksi, Density=50% (60 ksi)
L13	69.750-69.500	0.250	0.00	12	31.6526	31.7031	0.8375	3.3500	MPRF-Fy=60ksi, Density=50% (60 ksi)
L14	69.500-56.000	13.500	0.00	12	31.7031	34.4307	0.6773	2.7091	MPRF-Fy=60ksi, Density=50% (60 ksi)
L15	56.000-55.750	0.250	0.00	12	34.4307	34.4812	0.7398	2.9592	MPRF-Fy=60ksi, Density=50% (60 ksi)
L16	55.750-54.500	1.250	0.00	12	34.4812	34.7338	0.8164	3.2654	MPRF-Fy=60ksi, Density=50% (60 ksi)
L17	54.500-54.000	0.500	0.00	12	34.7338	34.8348	0.9500	3.8000	MPRF-Fy=60ksi, Density=50% (60 ksi)
L18	54.000-53.500	0.500	0.00	12	34.8348	34.9358	0.8077	3.2307	MPRF-Fy=60ksi, Density=50% (60 ksi)
L19	53.500-52.040	1.460	0.00	12	34.9358	35.2308	0.7150	2.8599	MPRF-Fy=60ksi, Density=50% (60 ksi)
L20	52.040-39.750	12.290	4.75	12	35.2308	37.7140	0.6462	2.5849	MPRF-Fy=60ksi, Density=50% (60 ksi)
L21	39.750-34.750	9.750	0.00	12	36.1290	38.0989	0.7440	2.9760	MPRF-Fy=60ksi

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	Client Crown Castle	Designed by JDR

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
L22	34.750-34.333	0.417	0.00	12	38.0989	38.1831	0.8520	3.4078	i, Density=100% (60 ksi) MPRF-Fy=60ks
L23	34.333-24.000	10.333	0.00	12	38.1831	40.2709	0.7206	2.8823	i, Density=50% (60 ksi) MPRF-Fy=60ks
L24	24.000-14.250	9.750	0.00	12	40.2709	42.2409	0.7587	3.0347	i, Density=100% (60 ksi) MPRF-Fy=60ks
L25	14.250-10.170	4.080	0.00	12	42.2409	43.0652	0.8110	3.2438	i, Density=50% (60 ksi) MPRF-Fy=60ks
L26	10.170-4.750	5.420	0.00	12	43.0652	44.1603	0.7957	3.1829	i, Density=50% (60 ksi) MPRF-Fy=60ks
L27	4.750-2.000	2.750	0.00	12	44.1603	44.7159	0.7684	3.0737	i, Density=50% (60 ksi) MPRF-Fy=60ks
L28	2.000-0.000	2.000		12	44.7159	45.1200	0.6978	2.7911	i, Density=100% (60 ksi) MPRF-Fy=60ks

Tapered Pole Properties

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
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
L2	27.1165	20.8837	1793.9763	9.2874	13.5677	132.2240	3635.0824	10.2783	6.3496	25.398
	27.1688	23.2369	1999.6016	9.2955	13.5939	147.0958	4051.7350	11.4365	6.2883	22.626
L3	27.1688	26.4520	2269.4506	9.2816	13.5939	166.9466	4598.5222	13.0189	6.1839	19.516
	29.0346	28.2909	2776.3985	9.9268	14.5274	191.1140	5625.7360	13.9239	6.6670	21.041
L4	29.0346	43.1107	4179.3875	9.8663	14.5274	287.6890	8468.5721	21.2178	6.2142	12.792
	29.1559	43.2940	4232.9289	9.9082	14.5882	290.1621	8577.0616	21.3080	6.2456	12.856
L5	29.1559	54.6184	5290.0960	9.8617	14.5882	362.6297	10719.1687	26.8815	5.8973	9.577
	31.5614	59.2254	6744.8349	10.6935	15.7917	427.1114	13666.8641	29.1489	6.5200	10.588
L6	31.0435	77.6748	7984.1444	10.1593	15.1401	527.3507	16178.0411	38.2292	5.5550	6.535
	31.3049	80.4400	8867.5522	10.5210	15.6634	566.1318	17968.0649	39.5901	5.8257	6.853
L7	31.3049	86.8481	9528.4763	10.4959	15.6634	608.3272	19307.2764	42.7440	5.6384	6.129
	31.5664	87.5963	9776.8501	10.5864	15.7942	619.0139	19810.5490	43.1122	5.7061	6.203
L8	31.5664	77.1509	8676.8267	10.6267	15.7942	549.3668	17581.6033	37.9713	6.0083	7.444
	31.7756	77.6761	8855.2172	10.6991	15.8989	556.9706	17943.0709	38.2298	6.0624	7.511
L9	31.7756	70.7283	8103.1447	10.7256	15.8989	509.6672	16419.1680	34.8103	6.2608	8.539
	32.0287	71.3055	8303.1382	10.8131	16.0255	518.1193	16824.4090	35.0944	6.3263	8.629
L10	32.0287	72.8116	8469.6105	10.8074	16.0255	528.5072	17161.7270	35.8357	6.2388	8.389
	32.6123	74.1713	8952.9905	11.0092	16.3175	548.6729	18141.1860	36.5048	6.4348	8.591
L11	32.6123	77.9343	9383.3674	10.9953	16.3175	575.0480	19013.2462	38.3569	6.3303	8.033
	32.7169	78.1906	9476.2660	11.0314	16.3699	578.8847	19201.4841	38.4830	6.3574	8.067
L12	32.7169	73.4491	8929.9354	11.0489	16.3699	545.5106	18094.4702	36.1494	6.4886	8.779
	32.7692	73.5694	8973.8528	11.0670	16.3960	547.3186	18183.4586	36.2086	6.5021	8.798
L13	32.7692	83.1002	10071.9671	11.0318	16.3960	614.2930	20408.5359	40.8994	6.2384	7.449

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Tower Engineering Professionals</p> <p style="text-align: center;">326 Tryon Rd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p>Job</p> <p style="text-align: center;">528 Wheelers Farm Rd (BU 876320)</p>	<p>Page</p> <p style="text-align: center;">4 of 33</p>
	<p>Project</p> <p style="text-align: center;">TEP No. 25570.114864</p>	<p>Date</p> <p style="text-align: center;">14:33:41 04/06/17</p>
	<p>Client</p> <p style="text-align: center;">Crown Castle</p>	<p>Designed by</p> <p style="text-align: center;">JDR</p>

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
L14	32.8214	83.2364	10121.5780	11.0499	16.4222	616.3352	20509.0612	40.9664	6.2519	7.465
	32.8214	67.6613	8313.2821	11.1072	16.4222	506.2223	16844.9634	33.3008	6.6813	9.865
	35.6453	73.6097	10704.2868	12.0837	17.8351	600.1804	21689.7871	36.2285	7.4124	10.944
L15	35.6453	80.2557	11627.5493	12.0614	17.8351	651.9469	23560.5673	39.4994	7.2448	9.793
	35.6976	80.3760	11679.9264	12.0794	17.8613	653.9243	23666.6974	39.5586	7.2583	9.811
L16	35.6976	88.4934	12801.2191	12.0520	17.8613	716.7022	25938.7405	43.5538	7.0531	8.64
	35.9591	88.1573	13091.4965	12.1424	17.9921	727.6244	26526.9213	43.8805	7.1208	8.723
L17	35.9591	103.3443	15055.3043	12.0946	17.9921	836.7727	30506.1283	50.8629	6.7627	7.119
	36.0637	103.6533	15190.7684	12.1308	18.0444	841.8533	30780.6151	51.0150	6.7897	7.147
L18	36.0637	88.4955	13078.5026	12.1817	18.0444	724.7941	26500.5921	43.5548	7.1711	8.879
	36.1682	88.7582	13195.3359	12.2179	18.0968	729.1543	26737.3279	43.6841	7.1982	8.912
L19	36.1682	78.7840	11776.2260	12.2511	18.0968	650.7364	23861.8267	38.7751	7.4467	10.415
	36.4736	79.4631	12083.3978	12.3567	18.2496	662.1195	24484.2399	39.1093	7.5257	10.526
L20	36.4736	71.9652	10986.8780	12.3813	18.2496	602.0348	22262.3935	35.4191	7.7100	11.931
	39.0444	77.1323	13527.4276	13.2703	19.5359	692.4411	27410.2358	37.9622	8.3755	12.961
L21	38.3971	84.7700	13547.7320	12.6678	18.7148	723.9039	27451.3780	41.7212	7.6887	10.334
	39.4429	89.4892	15938.7054	13.3731	19.7352	807.6262	32296.1384	44.0439	8.2166	11.044
L22	39.4429	102.1802	18094.0094	13.3344	19.7352	916.8371	36663.3686	50.2900	7.9273	9.305
	39.5301	102.4112	18216.9758	13.3646	19.7789	921.0327	36912.5318	50.4037	7.9498	9.331
L23	39.5301	86.9239	15571.1091	13.4116	19.7789	787.2603	31551.2885	42.7813	8.3019	11.521
	41.6915	91.7682	18322.2354	14.1590	20.8603	878.3288	37125.8164	45.1655	8.8614	12.298
L24	41.6915	96.5273	19235.3048	14.1454	20.8603	922.0994	38975.9425	47.5078	8.7593	11.545
	43.7310	101.3398	22258.1358	14.8506	21.8808	1017.2467	45101.0175	49.8763	9.2873	12.241
L25	43.7310	108.1847	23701.7161	14.8319	21.8808	1083.2215	48026.1028	53.2452	9.1472	11.28
	44.5844	110.3373	25144.8542	15.1270	22.3078	1127.1789	50950.2918	54.3047	9.3681	11.552
L26	44.5844	108.3043	24699.3356	15.1325	22.3078	1107.2075	50047.5502	53.3041	9.4089	11.824
	45.7181	111.1101	26669.1698	15.5245	22.8750	1165.8639	54038.9685	54.6850	9.7024	12.193
L27	45.7181	107.3652	25802.7476	15.5343	22.8750	1127.9876	52283.3620	52.8419	9.7756	12.722
	46.2933	108.7399	26806.6898	15.7332	23.1628	1157.3144	54317.6213	53.5185	9.9245	12.915
L28	46.2933	98.9031	24460.1314	15.7585	23.1628	1056.0074	49562.8578	48.6771	10.1138	14.494
	46.7117	99.8110	25139.9723	15.9032	23.3722	1075.6375	50940.3997	49.1239	10.2221	14.649

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	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				1	1	1			
120.000-99.250									
L2				1	1	0.900479			
99.250-99.000									
L3				1	1	0.790898			
99.000-90.080									
L4				1	1	0.518998			
90.080-89.500									
L5				1	1	0.822203			
89.500-78.000									
L6				1	1	0.748701			
78.000-76.750									
L7				1	1	0.693338			
76.750-75.500									
L8				1	1	0.787121			
75.500-74.500									
L9				1	1	0.864344			
74.500-73.290									
L10				1	1	0.846243			
73.290-70.500									
L11				1	1	0.805343			
70.500-70.000									
L12				1	1	0.857312			

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	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
70.000-69.750									
L13				1	1	0.758966			
69.750-69.500									
L14				1	1	0.932797			
69.500-56.000									
L15				1	1	0.855536			
56.000-55.750									
L16				1	1	0.776973			
55.750-54.500									
L17				1	1	0.670274			
54.500-54.000									
L18				1	1	0.785048			
54.000-53.500									
L19				1	1	0.884349			
53.500-52.040									
L20				1	1	0.976094			
52.040-39.750									
L21				1	1	0.509018			
39.750-34.750									
L22				1	1	0.891569			
34.750-34.333									
L23				1	1	0.524957			
34.333-24.000									
L24				1	1	0.997694			
24.000-14.250									
L25				1	1	0.934379			
14.250-10.170									
L26				1	1	0.951682			
10.170-4.750									
L27				1	1	0.984765			
4.750-2.000									
L28				1	1	0.541319			
2.000-0.000									

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	plf
LDF7-50A(1-5/8)	A	Surface Ar (CaAa)	113.000 - 0.000	8	7	0.500 0.500	1.9800		0.82
*									
LDF7-50A(1-5/8)	B	Surface Ar (CaAa)	105.000 - 0.000	7	7	0.250 0.250	1.9800		0.82
*									
Safety Line 3/8	A	Surface Ar (CaAa)	120.000 - 0.000	1	1	-0.250 -0.250	0.3750		0.22
Step Pegs (5/8" SR) 7-in. w/30" step	A	Surface Ar (CaAa)	120.000 - 0.000	1	1	-0.250 -0.250	0.3500		0.49
*									
C6x10.5	A	Surface Ar (CaAa)	56.000 - 0.000	1	1	0.500 0.500	2.0300		10.50
C6x10.5	A	Surface Ar (CaAa)	56.000 - 0.000	1	1	-0.250 -0.250	2.0300		10.50
C6x10.5	B	Surface Ar	56.000 - 0.000	1	1	0.250	2.0300		10.50

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Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
		(CaAa)				0.250			
C6x10.5	C	Surface Ar	56.000 - 0.000	1	1	0.000	2.0300		10.50
		(CaAa)				0.000			
PL 1x4.5	A	Surface Ar	72.000 - 56.000	1	1	0.500	1.0000		15.34
		(CaAa)				0.500			
PL 1x4.5	B	Surface Ar	74.790 - 56.000	1	1	0.250	1.0000		15.34
		(CaAa)				0.250			
PL 1x4.5	C	Surface Ar	72.000 - 56.000	1	1	0.000	1.0000		15.34
		(CaAa)				0.000			
PL 1x4.5	A	Surface Ar	72.000 - 56.000	1	1	-0.250	1.0000		15.34
		(CaAa)				-0.250			
PL 1x6	A	Surface Ar	92.000 - 72.000	1	1	0.500	1.0000		20.45
		(CaAa)				0.500			
PL 1x6	C	Surface Ar	92.000 - 72.000	1	1	0.000	1.0000		20.45
		(CaAa)				0.000			
*									
PL 1x4.5	A	Surface Ar	92.080 - 72.080	1	1	-0.250	1.0000		15.34
		(CaAa)				-0.250			
PL 1x4.5	B	Surface Ar	92.080 - 72.080	1	1	0.250	1.0000		15.34
		(CaAa)				0.250			
PL 1.25x4	A	Surface Ar	100.750 - 98.080	1	1	-0.250	1.2500		17.04
		(CaAa)				-0.250			
PL 1.25x4	B	Surface Ar	100.750 - 98.080	1	1	0.250	1.2500		17.04
		(CaAa)				0.250			
PL 1.25x4	C	Surface Ar	100.750 - 98.000	1	1	0.000	1.2500		17.04
		(CaAa)				0.000			
*									

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
*								
HB114-13U3M12-XXX F(1-1/4)	C	No	CaAa (Out Of Face)	120.000 - 0.000	1	No Ice	0.000	0.99
						1/2" Ice	0.000	2.24
						1" Ice	0.000	4.10
HB114-1-0813U4-M5J(1-1/4)	C	No	Inside Pole	120.000 - 0.000	3	No Ice	0.000	1.20
						1/2" Ice	0.000	1.20
						1" Ice	0.000	1.20
*								
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	97.000 - 0.000	1	No Ice	0.000	0.06
						1/2" Ice	0.000	0.06
						1" Ice	0.000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	97.000 - 0.000	2	No Ice	0.000	0.58
						1/2" Ice	0.000	0.58
						1" Ice	0.000	0.58
*								
LDF6-50A(1-1/4)	C	No	Inside Pole	96.000 - 0.000	12	No Ice	0.000	0.60
						1/2" Ice	0.000	0.60
						1" Ice	0.000	0.60
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	96.000 - 0.000	1	No Ice	0.000	0.06
						1/2" Ice	0.000	0.06
						1" Ice	0.000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	96.000 - 0.000	2	No Ice	0.000	0.58
						1/2" Ice	0.000	0.58
						1" Ice	0.000	0.58

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	Client		Crown Castle		Designed by		JDR	

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
2" Flexible Conduit	C	No	Inside Pole	96.000 - 0.000	2	No Ice	0.000	0.34
						1/2" Ice	0.000	0.34
						1" Ice	0.000	0.34
* LDF5-50A(7/8)	C	No	Inside Pole	82.000 - 0.000	12	No Ice	0.000	0.33
						1/2" Ice	0.000	0.33
						1" Ice	0.000	0.33
* LDF4-50A(1/2)	C	No	Inside Pole	75.000 - 0.000	1	No Ice	0.000	0.15
						1/2" Ice	0.000	0.15
						1" Ice	0.000	0.15
* Aero MP3-04	A	No	CaAa (Out Of Face)	25.500 - 0.000	1	No Ice	0.000	14.10
						1/2" Ice	0.000	15.30
						1" Ice	0.000	16.85
Aero MP3-04	B	No	CaAa (Out Of Face)	25.500 - 0.000	1	No Ice	0.000	14.10
						1/2" Ice	0.000	15.30
						1" Ice	0.000	16.85
Aero MP3-04	C	No	CaAa (Out Of Face)	25.500 - 0.000	1	No Ice	0.000	14.10
						1/2" Ice	0.000	15.30
						1" Ice	0.000	16.85
Aero MP3-04	B	No	CaAa (Out Of Face)	25.500 - 0.000	1	No Ice	0.000	14.10
						1/2" Ice	0.000	15.30
						1" Ice	0.000	16.85
* Crown 1x5	A	No	CaAa (Out Of Face)	37.000 - 2.500	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
Crown 1x5	B	No	CaAa (Out Of Face)	37.000 - 2.500	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
Crown 1x5	C	No	CaAa (Out Of Face)	37.000 - 2.500	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
Crown 1x5	C	No	CaAa (Out Of Face)	37.000 - 2.500	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
* Crown 1x5	A	No	CaAa (Out Of Face)	72.080 - 32.080	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
Crown 1x5	B	No	CaAa (Out Of Face)	72.080 - 32.080	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
Crown 1x5	C	No	CaAa (Out Of Face)	72.080 - 32.080	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
Crown 1x5	C	No	CaAa (Out Of Face)	72.080 - 32.080	1	No Ice	0.000	17.01
						1/2" Ice	0.000	35.11
						1" Ice	0.000	36.53
* Aero MP3-03	A	No	CaAa (Out Of Face)	15.500 - 0.500	1	No Ice	0.000	9.90
						1/2" Ice	0.000	11.06
						1" Ice	0.000	12.57
Aero MP3-03	A	No	CaAa (Out Of Face)	45.500 - 25.500	1	No Ice	0.000	9.90
						1/2" Ice	0.000	11.06
						1" Ice	0.000	12.57
Aero MP3-03	B	No	CaAa (Out Of Face)	15.500 - 0.500	1	No Ice	0.000	9.90
						1/2" Ice	0.000	11.06
						1" Ice	0.000	12.57
Aero MP3-03	B	No	CaAa (Out Of Face)	45.500 - 25.500	1	No Ice	0.000	9.90

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	Client		Crown Castle		Designed by		JDR	

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	CAAA ft ² /ft	Weight plf
			Face)			1/2" Ice 0.000	11.06
						1" Ice 0.000	12.57
Aero MP3-03	C	No	CaAa (Out Of Face)	15.500 - 0.500	1	No Ice 0.000	9.90
						1/2" Ice 0.000	11.06
						1" Ice 0.000	12.57
Aero MP3-03	C	No	CaAa (Out Of Face)	45.500 - 25.500	1	No Ice 0.000	9.90
						1/2" Ice 0.000	11.06
						1" Ice 0.000	12.57
Aero MP3-03	C	No	CaAa (Out Of Face)	15.500 - 0.500	1	No Ice 0.000	9.90
						1/2" Ice 0.000	11.06
						1" Ice 0.000	12.57
Aero MP3-03	C	No	CaAa (Out Of Face)	45.500 - 25.500	1	No Ice 0.000	9.90
						1/2" Ice 0.000	11.06
						1" Ice 0.000	12.57
*							
*							
PL 1x4.5	A	No	CaAa (Out Of Face)	56.000 - 52.000	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
PL 1x4.5	B	No	CaAa (Out Of Face)	56.000 - 50.540	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
PL 1x4.5	C	No	CaAa (Out Of Face)	56.000 - 52.000	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
PL 1x4.5	A	No	CaAa (Out Of Face)	56.000 - 52.000	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
*							
PL 1x6	A	No	CaAa (Out Of Face)	72.000 - 67.000	1	No Ice 0.000	20.45
						1/2" Ice 0.000	21.40
						1" Ice 0.000	22.70
PL 1x6	C	No	CaAa (Out Of Face)	72.000 - 67.000	1	No Ice 0.000	20.45
						1/2" Ice 0.000	21.40
						1" Ice 0.000	22.70
*							
PL 1x4.5	A	No	CaAa (Out Of Face)	57.250 - 42.250	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
PL 1x4.5	B	No	CaAa (Out Of Face)	57.500 - 42.500	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
PL 1x4.5	C	No	CaAa (Out Of Face)	57.500 - 42.500	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
PL 1x4.5	C	No	CaAa (Out Of Face)	57.500 - 42.500	1	No Ice 0.000	15.34
						1/2" Ice 0.000	16.19
						1" Ice 0.000	17.39
*							
*							
PL 1.25x4	C	No	CaAa (Out Of Face)	78.250 - 68.250	1	No Ice 0.000	17.04
						1/2" Ice 0.000	17.96
						1" Ice 0.000	19.22
PL 1.25x4	C	No	CaAa (Out Of Face)	80.000 - 68.250	1	No Ice 0.000	17.04
						1/2" Ice 0.000	17.96
						1" Ice 0.000	19.22
PL 1.25x4	B	No	CaAa (Out Of Face)	80.000 - 68.250	1	No Ice 0.000	17.04
						1/2" Ice 0.000	17.96
						1" Ice 0.000	19.22
PL 1.25x4	A	No	CaAa (Out Of Face)	80.000 - 68.250	1	No Ice 0.000	17.04
						1/2" Ice 0.000	17.96

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}	Weight plf
PL 1.25x4	A	No	CaAa (Out Of Face)	98.080 - 73.000	1	1" Ice	0.000
						No Ice	0.000
						1/2" Ice	0.000
PL 1.25x4	B	No	CaAa (Out Of Face)	98.080 - 74.000	1	1" Ice	0.000
						No Ice	0.000
						1/2" Ice	0.000
PL 1.25x4	C	No	CaAa (Out Of Face)	98.000 - 74.000	1	1" Ice	0.000
						No Ice	0.000
						1/2" Ice	0.000
*							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	120.000-99.250	A	0.000	0.000	20.749	0.000	0.13
		B	0.000	0.000	8.157	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.12
L2	99.250-99.000	A	0.000	0.000	0.396	0.000	0.01
		B	0.000	0.000	0.378	0.000	0.01
		C	0.000	0.000	0.031	0.000	0.01
L3	99.000-90.080	A	0.000	0.000	13.517	0.000	0.29
		B	0.000	0.000	12.678	0.000	0.23
		C	0.000	0.000	0.317	0.000	0.29
L4	90.080-89.500	A	0.000	0.000	0.962	0.000	0.03
		B	0.000	0.000	0.862	0.000	0.02
		C	0.000	0.000	0.058	0.000	0.03
L5	89.500-78.000	A	0.000	0.000	19.073	0.000	0.73
		B	0.000	0.000	17.089	0.000	0.47
		C	0.000	0.000	1.150	0.000	0.66
L6	78.000-76.750	A	0.000	0.000	2.073	0.000	0.10
		B	0.000	0.000	1.857	0.000	0.07
		C	0.000	0.000	0.125	0.000	0.11
L7	76.750-75.500	A	0.000	0.000	2.073	0.000	0.10
		B	0.000	0.000	1.857	0.000	0.07
		C	0.000	0.000	0.125	0.000	0.11
L8	75.500-74.500	A	0.000	0.000	1.659	0.000	0.08
		B	0.000	0.000	1.515	0.000	0.06
		C	0.000	0.000	0.100	0.000	0.09
L9	74.500-73.290	A	0.000	0.000	2.007	0.000	0.09
		B	0.000	0.000	1.919	0.000	0.07
		C	0.000	0.000	0.121	0.000	0.10
L10	73.290-70.500	A	0.000	0.000	4.619	0.000	0.22
		B	0.000	0.000	4.267	0.000	0.15
		C	0.000	0.000	0.279	0.000	0.28
L11	70.500-70.000	A	0.000	0.000	0.829	0.000	0.05
		B	0.000	0.000	0.743	0.000	0.03
		C	0.000	0.000	0.050	0.000	0.06
L12	70.000-69.750	A	0.000	0.000	0.415	0.000	0.02
		B	0.000	0.000	0.372	0.000	0.01
		C	0.000	0.000	0.025	0.000	0.03
L13	69.750-69.500	A	0.000	0.000	0.415	0.000	0.02
		B	0.000	0.000	0.372	0.000	0.01
		C	0.000	0.000	0.025	0.000	0.03
L14	69.500-56.000	A	0.000	0.000	22.390	0.000	0.83
		B	0.000	0.000	20.061	0.000	0.56

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L15	56.000-55.750	C	0.000	0.000	1.350	0.000	1.06
		A	0.000	0.000	0.466	0.000	0.02
		B	0.000	0.000	0.397	0.000	0.02
L16	55.750-54.500	C	0.000	0.000	0.051	0.000	0.03
		A	0.000	0.000	2.331	0.000	0.11
		B	0.000	0.000	1.986	0.000	0.08
L17	54.500-54.000	C	0.000	0.000	0.254	0.000	0.14
		A	0.000	0.000	0.932	0.000	0.05
		B	0.000	0.000	0.794	0.000	0.03
L18	54.000-53.500	C	0.000	0.000	0.102	0.000	0.05
		A	0.000	0.000	0.932	0.000	0.05
		B	0.000	0.000	0.794	0.000	0.03
L19	53.500-52.040	C	0.000	0.000	0.102	0.000	0.05
		A	0.000	0.000	2.722	0.000	0.13
		B	0.000	0.000	2.320	0.000	0.09
L20	52.040-39.750	C	0.000	0.000	0.296	0.000	0.16
		A	0.000	0.000	22.915	0.000	0.76
		B	0.000	0.000	19.529	0.000	0.63
L21	39.750-34.750	C	0.000	0.000	2.495	0.000	1.19
		A	0.000	0.000	9.322	0.000	0.31
		B	0.000	0.000	7.945	0.000	0.25
L22	34.750-34.333	C	0.000	0.000	1.015	0.000	0.49
		A	0.000	0.000	0.777	0.000	0.03
		B	0.000	0.000	0.662	0.000	0.03
L23	34.333-24.000	C	0.000	0.000	0.085	0.000	0.05
		A	0.000	0.000	19.266	0.000	0.61
		B	0.000	0.000	16.420	0.000	0.51
L24	24.000-14.250	C	0.000	0.000	2.098	0.000	0.93
		A	0.000	0.000	18.179	0.000	0.59
		B	0.000	0.000	15.493	0.000	0.61
L25	14.250-10.170	C	0.000	0.000	1.979	0.000	0.78
		A	0.000	0.000	7.607	0.000	0.28
		B	0.000	0.000	6.483	0.000	0.29
L26	10.170-4.750	C	0.000	0.000	0.828	0.000	0.40
		A	0.000	0.000	10.106	0.000	0.38
		B	0.000	0.000	8.612	0.000	0.39
L27	4.750-2.000	C	0.000	0.000	1.100	0.000	0.53
		A	0.000	0.000	5.127	0.000	0.18
		B	0.000	0.000	4.370	0.000	0.19
L28	2.000-0.000	C	0.000	0.000	0.558	0.000	0.25
		A	0.000	0.000	3.729	0.000	0.10
		B	0.000	0.000	3.178	0.000	0.10
		C	0.000	0.000	0.406	0.000	0.12

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	120.000-99.250	A	1.691	0.000	0.000	45.644	0.000	0.69
		B		0.000	0.000	12.864	0.000	0.21
		C		0.000	0.000	0.474	0.000	0.27
L2	99.250-99.000	A	1.674	0.000	0.000	0.801	0.000	0.02
		B		0.000	0.000	0.616	0.000	0.01
		C		0.000	0.000	0.079	0.000	0.01
L3	99.000-90.080	A	1.666	0.000	0.000	27.748	0.000	0.67
		B		0.000	0.000	20.323	0.000	0.51
		C		0.000	0.000	1.145	0.000	0.41

<i>tnxTower</i> <i>Tower Engineering Professionals</i> 326 Tryon Rd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	528 Wheelers Farm Rd (BU 876320)	Page	11 of 33
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	Client	Crown Castle	Designed by	JDR

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_{AA} In Face ft²</i>	<i>C_{AA} Out Face ft²</i>	<i>Weight K</i>
L4	90.080-89.500	A	1.658	0.000	0.000	2.173	0.000	0.06
		B		0.000	0.000	1.496	0.000	0.04
		C		0.000	0.000	0.250	0.000	0.04
L5	89.500-78.000	A	1.646	0.000	0.000	42.936	0.000	1.31
		B		0.000	0.000	29.593	0.000	0.88
		C		0.000	0.000	4.936	0.000	0.86
L6	78.000-76.750	A	1.633	0.000	0.000	4.667	0.000	0.16
		B		0.000	0.000	3.217	0.000	0.12
		C		0.000	0.000	0.537	0.000	0.14
L7	76.750-75.500	A	1.631	0.000	0.000	4.647	0.000	0.16
		B		0.000	0.000	3.208	0.000	0.12
		C		0.000	0.000	0.533	0.000	0.14
L8	75.500-74.500	A	1.628	0.000	0.000	3.715	0.000	0.13
		B		0.000	0.000	2.689	0.000	0.10
		C		0.000	0.000	0.426	0.000	0.12
L9	74.500-73.290	A	1.626	0.000	0.000	4.492	0.000	0.16
		B		0.000	0.000	3.617	0.000	0.12
		C		0.000	0.000	0.514	0.000	0.12
L10	73.290-70.500	A	1.621	0.000	0.000	10.310	0.000	0.40
		B		0.000	0.000	7.662	0.000	0.29
		C		0.000	0.000	1.184	0.000	0.42
L11	70.500-70.000	A	1.618	0.000	0.000	1.852	0.000	0.08
		B		0.000	0.000	1.280	0.000	0.06
		C		0.000	0.000	0.212	0.000	0.10
L12	70.000-69.750	A	1.617	0.000	0.000	0.926	0.000	0.04
		B		0.000	0.000	0.640	0.000	0.03
		C		0.000	0.000	0.106	0.000	0.05
L13	69.750-69.500	A	1.616	0.000	0.000	0.926	0.000	0.04
		B		0.000	0.000	0.640	0.000	0.03
		C		0.000	0.000	0.106	0.000	0.05
L14	69.500-56.000	A	1.599	0.000	0.000	49.738	0.000	1.74
		B		0.000	0.000	34.455	0.000	1.25
		C		0.000	0.000	5.668	0.000	1.84
L15	56.000-55.750	A	1.581	0.000	0.000	0.968	0.000	0.04
		B		0.000	0.000	0.662	0.000	0.03
		C		0.000	0.000	0.130	0.000	0.04
L16	55.750-54.500	A	1.579	0.000	0.000	4.836	0.000	0.22
		B		0.000	0.000	3.308	0.000	0.16
		C		0.000	0.000	0.648	0.000	0.22
L17	54.500-54.000	A	1.576	0.000	0.000	1.933	0.000	0.09
		B		0.000	0.000	1.322	0.000	0.06
		C		0.000	0.000	0.259	0.000	0.09
L18	54.000-53.500	A	1.575	0.000	0.000	1.932	0.000	0.09
		B		0.000	0.000	1.322	0.000	0.06
		C		0.000	0.000	0.259	0.000	0.09
L19	53.500-52.040	A	1.572	0.000	0.000	5.638	0.000	0.25
		B		0.000	0.000	3.859	0.000	0.18
		C		0.000	0.000	0.755	0.000	0.26
L20	52.040-39.750	A	1.550	0.000	0.000	47.176	0.000	1.66
		B		0.000	0.000	32.360	0.000	1.34
		C		0.000	0.000	6.305	0.000	2.01
L21	39.750-34.750	A	1.518	0.000	0.000	19.193	0.000	0.73
		B		0.000	0.000	13.165	0.000	0.58
		C		0.000	0.000	2.565	0.000	0.92
L22	34.750-34.333	A	1.507	0.000	0.000	1.581	0.000	0.07
		B		0.000	0.000	1.089	0.000	0.06
		C		0.000	0.000	0.210	0.000	0.09
L23	34.333-24.000	A	1.481	0.000	0.000	38.920	0.000	1.38
		B		0.000	0.000	26.888	0.000	1.13
		C		0.000	0.000	5.159	0.000	1.68
L24	24.000-14.250	A	1.420	0.000	0.000	36.095	0.000	1.25

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
		B		0.000	0.000	25.102	0.000	1.17
		C		0.000	0.000	4.748	0.000	1.36
L25	14.250-10.170	A	1.358	0.000	0.000	14.838	0.000	0.56
		B		0.000	0.000	10.390	0.000	0.53
		C		0.000	0.000	1.936	0.000	0.66
L26	10.170-4.750	A	1.293	0.000	0.000	19.340	0.000	0.73
		B		0.000	0.000	13.643	0.000	0.69
		C		0.000	0.000	2.501	0.000	0.87
L27	4.750-2.000	A	1.194	0.000	0.000	9.528	0.000	0.34
		B		0.000	0.000	6.800	0.000	0.32
		C		0.000	0.000	1.215	0.000	0.40
L28	2.000-0.000	A	1.057	0.000	0.000	6.642	0.000	0.17
		B		0.000	0.000	4.823	0.000	0.16
		C		0.000	0.000	0.829	0.000	0.15

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	120.000-99.250	0.3169	-0.9398	-0.0394	-0.8669
L2	99.250-99.000	0.8473	-0.8755	0.5190	-0.7137
L3	99.000-90.080	0.9026	-1.0050	0.5581	-0.8700
L4	90.080-89.500	0.8739	-0.9799	0.5061	-0.7982
L5	89.500-78.000	0.8926	-0.9986	0.5228	-0.8215
L6	78.000-76.750	0.9044	-1.0104	0.5323	-0.8357
L7	76.750-75.500	0.9081	-1.0141	0.5379	-0.8415
L8	75.500-74.500	0.9264	-1.0124	0.5792	-0.8364
L9	74.500-73.290	0.9657	-1.0036	0.6725	-0.8182
L10	73.290-70.500	0.9452	-1.0195	0.6117	-0.8443
L11	70.500-70.000	0.9252	-1.0311	0.5541	-0.8637
L12	70.000-69.750	0.9262	-1.0322	0.5552	-0.8651
L13	69.750-69.500	0.9270	-1.0329	0.5559	-0.8660
L14	69.500-56.000	0.9461	-1.0521	0.5750	-0.8915
L15	56.000-55.750	0.9046	-1.0040	0.5730	-0.8839
L16	55.750-54.500	0.9066	-1.0060	0.5750	-0.8866
L17	54.500-54.000	0.9089	-1.0083	0.5774	-0.8897
L18	54.000-53.500	0.9102	-1.0096	0.5788	-0.8914
L19	53.500-52.040	0.9127	-1.0121	0.5814	-0.8949
L20	52.040-39.750	0.9302	-1.0297	0.6005	-0.9190
L21	39.750-34.750	0.9438	-1.0434	0.6126	-0.9367
L22	34.750-34.333	0.9503	-1.0499	0.6263	-0.9486
L23	34.333-24.000	0.9630	-1.0627	0.6426	-0.9674
L24	24.000-14.250	0.9858	-1.0856	0.6757	-1.0029
L25	14.250-10.170	1.0009	-1.1008	0.7028	-1.0285
L26	10.170-4.750	1.0110	-1.1109	0.7264	-1.0478
L27	4.750-2.000	1.0194	-1.1194	0.7566	-1.0681
L28	2.000-0.000	1.0243	-1.1243	0.7933	-1.0872

Shielding Factor Ka

tnxTower**Tower Engineering
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Raleigh, NC 27603
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Project

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Date

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Client

Crown Castle

Designed by

JDR

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	10	LDF7-50A(1-5/8)	99.25 - 113.00	1.0000	1.0000
L1	14	LDF7-50A(1-5/8)	99.25 - 105.00	1.0000	1.0000
L1	29	Safety Line 3/8	99.25 - 120.00	1.0000	1.0000
L1	30	Step Pegs (5/8" SR) 7-in. w/30" step	99.25 - 120.00	1.0000	1.0000
L1	103	PL 1.25x4	99.25 - 100.75	1.0000	1.0000
L1	104	PL 1.25x4	99.25 - 100.75	1.0000	1.0000
L1	105	PL 1.25x4	99.25 - 100.75	1.0000	1.0000
L2	10	LDF7-50A(1-5/8)	99.00 - 99.25	1.0000	1.0000
L2	14	LDF7-50A(1-5/8)	99.00 - 99.25	1.0000	1.0000
L2	29	Safety Line 3/8	99.00 - 99.25	1.0000	1.0000
L2	30	Step Pegs (5/8" SR) 7-in. w/30" step	99.00 - 99.25	1.0000	1.0000
L2	103	PL 1.25x4	99.00 - 99.25	1.0000	1.0000
L2	104	PL 1.25x4	99.00 - 99.25	1.0000	1.0000
L2	105	PL 1.25x4	99.00 - 99.25	1.0000	1.0000
L3	10	LDF7-50A(1-5/8)	90.08 - 99.00	1.0000	1.0000
L3	14	LDF7-50A(1-5/8)	90.08 - 99.00	1.0000	1.0000
L3	29	Safety Line 3/8	90.08 - 99.00	1.0000	1.0000
L3	30	Step Pegs (5/8" SR) 7-in. w/30" step	90.08 - 99.00	1.0000	1.0000
L3	77	PL 1x6	90.08 - 92.00	1.0000	1.0000
L3	78	PL 1x6	90.08 - 92.00	1.0000	1.0000
L3	80	PL 1x4.5	90.08 - 92.08	1.0000	1.0000
L3	81	PL 1x4.5	90.08 - 92.08	1.0000	1.0000
L3	103	PL 1.25x4	98.08 - 99.00	1.0000	1.0000
L3	104	PL 1.25x4	98.08 - 99.00	1.0000	1.0000
L3	105	PL 1.25x4	98.00 - 99.00	1.0000	1.0000
L4	10	LDF7-50A(1-5/8)	89.50 - 90.08	1.0000	1.0000
L4	14	LDF7-50A(1-5/8)	89.50 - 90.08	1.0000	1.0000
L4	29	Safety Line 3/8	89.50 - 90.08	1.0000	1.0000
L4	30	Step Pegs (5/8" SR) 7-in. w/30" step	89.50 - 90.08	1.0000	1.0000
L4	77	PL 1x6	89.50 - 90.08	1.0000	1.0000
L4	78	PL 1x6	89.50 - 90.08	1.0000	1.0000
L4	80	PL 1x4.5	89.50 - 90.08	1.0000	1.0000
L4	81	PL 1x4.5	89.50 - 90.08	1.0000	1.0000
L5	10	LDF7-50A(1-5/8)	78.00 - 89.50	1.0000	1.0000
L5	14	LDF7-50A(1-5/8)	78.00 - 89.50	1.0000	1.0000
L5	29	Safety Line 3/8	78.00 - 89.50	1.0000	1.0000
L5	30	Step Pegs (5/8" SR) 7-in. w/30" step	78.00 - 89.50	1.0000	1.0000
L5	77	PL 1x6	78.00 - 89.50	1.0000	1.0000
L5	78	PL 1x6	78.00 - 89.50	1.0000	1.0000
L5	80	PL 1x4.5	78.00 - 89.50	1.0000	1.0000
L5	81	PL 1x4.5	78.00 - 89.50	1.0000	1.0000
L7	10	LDF7-50A(1-5/8)	75.50 - 76.75	1.0000	1.0000
L7	14	LDF7-50A(1-5/8)	75.50 - 76.75	1.0000	1.0000
L7	29	Safety Line 3/8	75.50 - 76.75	1.0000	1.0000
L7	30	Step Pegs (5/8" SR) 7-in. w/30" step	75.50 - 76.75	1.0000	1.0000
L7	77	PL 1x6	75.50 - 76.75	1.0000	1.0000
L7	78	PL 1x6	75.50 - 76.75	1.0000	1.0000
L7	80	PL 1x4.5	75.50 - 76.75	1.0000	1.0000
L7	81	PL 1x4.5	75.50 - 76.75	1.0000	1.0000
L8	10	LDF7-50A(1-5/8)	74.50 - 75.50	1.0000	1.0000
L8	14	LDF7-50A(1-5/8)	74.50 - 75.50	1.0000	1.0000
L8	29	Safety Line 3/8	74.50 - 75.50	1.0000	1.0000
L8	30	Step Pegs (5/8" SR) 7-in. w/30" step	74.50 - 75.50	1.0000	1.0000
L8	69	PL 1x4.5	74.50 - 74.79	1.0000	1.0000
L8	77	PL 1x6	74.50 - 75.50	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
L8	78	PL 1x6	74.50 - 75.50	1.0000	1.0000
L8	80	PL 1x4.5	74.50 - 75.50	1.0000	1.0000
L8	81	PL 1x4.5	74.50 - 75.50	1.0000	1.0000
L9	10	LDF7-50A(1-5/8)	73.29 - 74.50	1.0000	1.0000
L9	14	LDF7-50A(1-5/8)	73.29 - 74.50	1.0000	1.0000
L9	29	Safety Line 3/8	73.29 - 74.50	1.0000	1.0000
L9	30	Step Pegs (5/8" SR) 7-in. w/30" step	73.29 - 74.50	1.0000	1.0000
L9	69	PL 1x4.5	73.29 - 74.50	1.0000	1.0000
L9	77	PL 1x6	73.29 - 74.50	1.0000	1.0000
L9	78	PL 1x6	73.29 - 74.50	1.0000	1.0000
L9	80	PL 1x4.5	73.29 - 74.50	1.0000	1.0000
L9	81	PL 1x4.5	73.29 - 74.50	1.0000	1.0000
L10	10	LDF7-50A(1-5/8)	70.50 - 73.29	1.0000	1.0000
L10	14	LDF7-50A(1-5/8)	70.50 - 73.29	1.0000	1.0000
L10	29	Safety Line 3/8	70.50 - 73.29	1.0000	1.0000
L10	30	Step Pegs (5/8" SR) 7-in. w/30" step	70.50 - 73.29	1.0000	1.0000
L10	67	PL 1x4.5	70.50 - 72.00	1.0000	1.0000
L10	69	PL 1x4.5	70.50 - 73.29	1.0000	1.0000
L10	71	PL 1x4.5	70.50 - 72.00	1.0000	1.0000
L10	73	PL 1x4.5	70.50 - 72.00	1.0000	1.0000
L10	77	PL 1x6	72.00 - 73.29	1.0000	1.0000
L10	78	PL 1x6	72.00 - 73.29	1.0000	1.0000
L10	80	PL 1x4.5	72.08 - 73.29	1.0000	1.0000
L10	81	PL 1x4.5	72.08 - 73.29	1.0000	1.0000
L11	10	LDF7-50A(1-5/8)	70.00 - 70.50	1.0000	1.0000
L11	14	LDF7-50A(1-5/8)	70.00 - 70.50	1.0000	1.0000
L11	29	Safety Line 3/8	70.00 - 70.50	1.0000	1.0000
L11	30	Step Pegs (5/8" SR) 7-in. w/30" step	70.00 - 70.50	1.0000	1.0000
L11	67	PL 1x4.5	70.00 - 70.50	1.0000	1.0000
L11	69	PL 1x4.5	70.00 - 70.50	1.0000	1.0000
L11	71	PL 1x4.5	70.00 - 70.50	1.0000	1.0000
L11	73	PL 1x4.5	70.00 - 70.50	1.0000	1.0000
L12	10	LDF7-50A(1-5/8)	69.75 - 70.00	1.0000	1.0000
L12	14	LDF7-50A(1-5/8)	69.75 - 70.00	1.0000	1.0000
L12	29	Safety Line 3/8	69.75 - 70.00	1.0000	1.0000
L12	30	Step Pegs (5/8" SR) 7-in. w/30" step	69.75 - 70.00	1.0000	1.0000
L12	67	PL 1x4.5	69.75 - 70.00	1.0000	1.0000
L12	69	PL 1x4.5	69.75 - 70.00	1.0000	1.0000
L12	71	PL 1x4.5	69.75 - 70.00	1.0000	1.0000
L12	73	PL 1x4.5	69.75 - 70.00	1.0000	1.0000
L13	10	LDF7-50A(1-5/8)	69.50 - 69.75	1.0000	1.0000
L13	14	LDF7-50A(1-5/8)	69.50 - 69.75	1.0000	1.0000
L13	29	Safety Line 3/8	69.50 - 69.75	1.0000	1.0000
L13	30	Step Pegs (5/8" SR) 7-in. w/30" step	69.50 - 69.75	1.0000	1.0000
L13	67	PL 1x4.5	69.50 - 69.75	1.0000	1.0000
L13	69	PL 1x4.5	69.50 - 69.75	1.0000	1.0000
L13	71	PL 1x4.5	69.50 - 69.75	1.0000	1.0000
L13	73	PL 1x4.5	69.50 - 69.75	1.0000	1.0000
L14	10	LDF7-50A(1-5/8)	56.00 - 69.50	1.0000	1.0000
L14	14	LDF7-50A(1-5/8)	56.00 - 69.50	1.0000	1.0000
L14	29	Safety Line 3/8	56.00 - 69.50	1.0000	1.0000
L14	30	Step Pegs (5/8" SR) 7-in. w/30" step	56.00 - 69.50	1.0000	1.0000
L14	67	PL 1x4.5	56.00 - 69.50	1.0000	1.0000
L14	69	PL 1x4.5	56.00 - 69.50	1.0000	1.0000
L14	71	PL 1x4.5	56.00 - 69.50	1.0000	1.0000
L14	73	PL 1x4.5	56.00 - 69.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L15	10	LDF7-50A(1-5/8)	55.75 - 56.00	1.0000	1.0000
L15	14	LDF7-50A(1-5/8)	55.75 - 56.00	1.0000	1.0000
L15	29	Safety Line 3/8	55.75 - 56.00	1.0000	1.0000
L15	30	Step Pegs (5/8" SR) 7-in. w/30" step	55.75 - 56.00	1.0000	1.0000
L15	32	C6x10.5	55.75 - 56.00	1.0000	1.0000
L15	33	C6x10.5	55.75 - 56.00	1.0000	1.0000
L15	34	C6x10.5	55.75 - 56.00	1.0000	1.0000
L15	35	C6x10.5	55.75 - 56.00	1.0000	1.0000
L16	10	LDF7-50A(1-5/8)	54.50 - 55.75	1.0000	1.0000
L16	14	LDF7-50A(1-5/8)	54.50 - 55.75	1.0000	1.0000
L16	29	Safety Line 3/8	54.50 - 55.75	1.0000	1.0000
L16	30	Step Pegs (5/8" SR) 7-in. w/30" step	54.50 - 55.75	1.0000	1.0000
L16	32	C6x10.5	54.50 - 55.75	1.0000	1.0000
L16	33	C6x10.5	54.50 - 55.75	1.0000	1.0000
L16	34	C6x10.5	54.50 - 55.75	1.0000	1.0000
L16	35	C6x10.5	54.50 - 55.75	1.0000	1.0000
L17	10	LDF7-50A(1-5/8)	54.00 - 54.50	1.0000	1.0000
L17	14	LDF7-50A(1-5/8)	54.00 - 54.50	1.0000	1.0000
L17	29	Safety Line 3/8	54.00 - 54.50	1.0000	1.0000
L17	30	Step Pegs (5/8" SR) 7-in. w/30" step	54.00 - 54.50	1.0000	1.0000
L17	32	C6x10.5	54.00 - 54.50	1.0000	1.0000
L17	33	C6x10.5	54.00 - 54.50	1.0000	1.0000
L17	34	C6x10.5	54.00 - 54.50	1.0000	1.0000
L17	35	C6x10.5	54.00 - 54.50	1.0000	1.0000
L18	10	LDF7-50A(1-5/8)	53.50 - 54.00	1.0000	1.0000
L18	14	LDF7-50A(1-5/8)	53.50 - 54.00	1.0000	1.0000
L18	29	Safety Line 3/8	53.50 - 54.00	1.0000	1.0000
L18	30	Step Pegs (5/8" SR) 7-in. w/30" step	53.50 - 54.00	1.0000	1.0000
L18	32	C6x10.5	53.50 - 54.00	1.0000	1.0000
L18	33	C6x10.5	53.50 - 54.00	1.0000	1.0000
L18	34	C6x10.5	53.50 - 54.00	1.0000	1.0000
L18	35	C6x10.5	53.50 - 54.00	1.0000	1.0000
L19	10	LDF7-50A(1-5/8)	52.04 - 53.50	1.0000	1.0000
L19	14	LDF7-50A(1-5/8)	52.04 - 53.50	1.0000	1.0000
L19	29	Safety Line 3/8	52.04 - 53.50	1.0000	1.0000
L19	30	Step Pegs (5/8" SR) 7-in. w/30" step	52.04 - 53.50	1.0000	1.0000
L19	32	C6x10.5	52.04 - 53.50	1.0000	1.0000
L19	33	C6x10.5	52.04 - 53.50	1.0000	1.0000
L19	34	C6x10.5	52.04 - 53.50	1.0000	1.0000
L19	35	C6x10.5	52.04 - 53.50	1.0000	1.0000
L20	10	LDF7-50A(1-5/8)	39.75 - 52.04	1.0000	1.0000
L20	14	LDF7-50A(1-5/8)	39.75 - 52.04	1.0000	1.0000
L20	29	Safety Line 3/8	39.75 - 52.04	1.0000	1.0000
L20	30	Step Pegs (5/8" SR) 7-in. w/30" step	39.75 - 52.04	1.0000	1.0000
L20	32	C6x10.5	39.75 - 52.04	1.0000	1.0000
L20	33	C6x10.5	39.75 - 52.04	1.0000	1.0000
L20	34	C6x10.5	39.75 - 52.04	1.0000	1.0000
L20	35	C6x10.5	39.75 - 52.04	1.0000	1.0000
L22	10	LDF7-50A(1-5/8)	34.33 - 34.75	1.0000	1.0000
L22	14	LDF7-50A(1-5/8)	34.33 - 34.75	1.0000	1.0000
L22	29	Safety Line 3/8	34.33 - 34.75	1.0000	1.0000
L22	30	Step Pegs (5/8" SR) 7-in. w/30" step	34.33 - 34.75	1.0000	1.0000
L22	32	C6x10.5	34.33 - 34.75	1.0000	1.0000
L22	33	C6x10.5	34.33 - 34.75	1.0000	1.0000
L22	34	C6x10.5	34.33 - 34.75	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
L22	35	C6x10.5	34.33 - 34.75	1.0000	1.0000
L23	10	LDF7-50A(1-5/8)	24.00 - 34.33	1.0000	1.0000
L23	14	LDF7-50A(1-5/8)	24.00 - 34.33	1.0000	1.0000
L23	29	Safety Line 3/8	24.00 - 34.33	1.0000	1.0000
L23	30	Step Pegs (5/8" SR) 7-in. w/30" step	24.00 - 34.33	1.0000	1.0000
L23	32	C6x10.5	24.00 - 34.33	1.0000	1.0000
L23	33	C6x10.5	24.00 - 34.33	1.0000	1.0000
L23	34	C6x10.5	24.00 - 34.33	1.0000	1.0000
L23	35	C6x10.5	24.00 - 34.33	1.0000	1.0000
L24	10	LDF7-50A(1-5/8)	14.25 - 24.00	1.0000	1.0000
L24	14	LDF7-50A(1-5/8)	14.25 - 24.00	1.0000	1.0000
L24	29	Safety Line 3/8	14.25 - 24.00	1.0000	1.0000
L24	30	Step Pegs (5/8" SR) 7-in. w/30" step	14.25 - 24.00	1.0000	1.0000
L24	32	C6x10.5	14.25 - 24.00	1.0000	1.0000
L24	33	C6x10.5	14.25 - 24.00	1.0000	1.0000
L24	34	C6x10.5	14.25 - 24.00	1.0000	1.0000
L24	35	C6x10.5	14.25 - 24.00	1.0000	1.0000
L25	10	LDF7-50A(1-5/8)	10.17 - 14.25	1.0000	1.0000
L25	14	LDF7-50A(1-5/8)	10.17 - 14.25	1.0000	1.0000
L25	29	Safety Line 3/8	10.17 - 14.25	1.0000	1.0000
L25	30	Step Pegs (5/8" SR) 7-in. w/30" step	10.17 - 14.25	1.0000	1.0000
L25	32	C6x10.5	10.17 - 14.25	1.0000	1.0000
L25	33	C6x10.5	10.17 - 14.25	1.0000	1.0000
L25	34	C6x10.5	10.17 - 14.25	1.0000	1.0000
L25	35	C6x10.5	10.17 - 14.25	1.0000	1.0000
L26	10	LDF7-50A(1-5/8)	4.75 - 10.17	1.0000	1.0000
L26	14	LDF7-50A(1-5/8)	4.75 - 10.17	1.0000	1.0000
L26	29	Safety Line 3/8	4.75 - 10.17	1.0000	1.0000
L26	30	Step Pegs (5/8" SR) 7-in. w/30" step	4.75 - 10.17	1.0000	1.0000
L26	32	C6x10.5	4.75 - 10.17	1.0000	1.0000
L26	33	C6x10.5	4.75 - 10.17	1.0000	1.0000
L26	34	C6x10.5	4.75 - 10.17	1.0000	1.0000
L26	35	C6x10.5	4.75 - 10.17	1.0000	1.0000
L27	10	LDF7-50A(1-5/8)	2.00 - 4.75	1.0000	1.0000
L27	14	LDF7-50A(1-5/8)	2.00 - 4.75	1.0000	1.0000
L27	29	Safety Line 3/8	2.00 - 4.75	1.0000	1.0000
L27	30	Step Pegs (5/8" SR) 7-in. w/30" step	2.00 - 4.75	1.0000	1.0000
L27	32	C6x10.5	2.00 - 4.75	1.0000	1.0000
L27	33	C6x10.5	2.00 - 4.75	1.0000	1.0000
L27	34	C6x10.5	2.00 - 4.75	1.0000	1.0000
L27	35	C6x10.5	2.00 - 4.75	1.0000	1.0000
L28	10	LDF7-50A(1-5/8)	0.00 - 2.00	1.0000	1.0000
L28	14	LDF7-50A(1-5/8)	0.00 - 2.00	1.0000	1.0000
L28	29	Safety Line 3/8	0.00 - 2.00	1.0000	1.0000
L28	30	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 2.00	1.0000	1.0000
L28	32	C6x10.5	0.00 - 2.00	1.0000	1.0000
L28	33	C6x10.5	0.00 - 2.00	1.0000	1.0000
L28	34	C6x10.5	0.00 - 2.00	1.0000	1.0000
L28	35	C6x10.5	0.00 - 2.00	1.0000	1.0000

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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K

Pipe 6" x 10'	C	From Leg	0.000	0.00	120.000	No Ice	3.376	3.376	0.19
			0.00			1/2" Ice	6.050	6.050	0.23
			5.00			1" Ice	6.665	6.665	0.28

APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Le g	4.000 -4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Le g	4.000 -4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Le g	4.000 -4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.08 0.15 0.23
800 EXTERNAL NOTCH FILTER	A	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	B	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	C	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.01 0.02 0.02
(3) ACU-A20-N	A	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	0.067 0.104 0.148	0.117 0.162 0.215	0.00 0.00 0.00
(3) ACU-A20-N	B	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	0.067 0.104 0.148	0.117 0.162 0.215	0.00 0.00 0.00
(3) ACU-A20-N	C	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	0.067 0.104 0.148	0.117 0.162 0.215	0.00 0.00 0.00
PCS 1900MHz 4x45W-65MHz	A	From Centroid-Le g	4.000 -4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Centroid-Le g	4.000 -4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.06 0.08 0.11
800MHZ RRH	A	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.05 0.07 0.10
800MHZ RRH	B	From Centroid-Le g	4.000 -4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.05 0.07 0.10
800MHZ RRH	C	From Centroid-Le g	4.000 -4.00 -2.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.05 0.07 0.10
TD-RRH8x20-25	A	From Centroid-Le g	4.000 4.00 -1.00	30.00	122.000	No Ice 1/2" Ice 1" Ice	4.045 4.298 4.557	1.535 1.714 1.901	0.07 0.10 0.13
TD-RRH8x20-25	B	From	4.000	30.00	122.000	No Ice	4.045	1.535	0.07

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	Project	TEP No. 25570.114864	Date	14:33:41 04/06/17
	Client	Crown Castle	Designed by	JDR

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C_{AA} Front</i> <i>ft²</i>	<i>C_{AA} Side</i> <i>ft²</i>	<i>Weight</i> <i>K</i>	
		Centroid-Le	4.00			1/2" Ice	4.298	1.714	0.10
		g	-1.00			1" Ice	4.557	1.901	0.13
TD-RRH8x20-25	C	From	4.000	30.00	122.000	No Ice	4.045	1.535	0.07
		Centroid-Le	4.00			1/2" Ice	4.298	1.714	0.10
		g	-1.00			1" Ice	4.557	1.901	0.13
APXVTM14-C-120 w/ Mount Pipe	A	From	4.000	30.00	122.000	No Ice	6.342	3.607	0.06
		Centroid-Le	4.00			1/2" Ice	6.716	3.967	0.10
		g	-1.00			1" Ice	7.097	4.333	0.14
APXVTM14-C-120 w/ Mount Pipe	B	From	4.000	30.00	122.000	No Ice	6.342	3.607	0.06
		Centroid-Le	4.00			1/2" Ice	6.716	3.967	0.10
		g	-1.00			1" Ice	7.097	4.333	0.14
APXVTM14-C-120 w/ Mount Pipe	C	From	4.000	30.00	122.000	No Ice	6.342	3.607	0.06
		Centroid-Le	4.00			1/2" Ice	6.716	3.967	0.10
		g	-1.00			1" Ice	7.097	4.333	0.14
Platform Mount [LP 713-1]	C	None		0.00	122.000	No Ice	31.270	31.270	1.51
						1/2" Ice	39.680	39.680	1.93
						1" Ice	48.090	48.090	2.35
(2) 2.4" Dia. x 5-ft Pipe	A	From	4.000	0.00	122.000	No Ice	1.200	1.200	0.02
		Centroid-Le	0.00			1/2" Ice	1.502	1.502	0.03
		g	0.00			1" Ice	1.814	1.814	0.04
(2) 2.4" Dia. x 5-ft Pipe	B	From	4.000	0.00	122.000	No Ice	1.200	1.200	0.02
		Centroid-Le	0.00			1/2" Ice	1.502	1.502	0.03
		g	0.00			1" Ice	1.814	1.814	0.04
(2) 2.4" Dia. x 5-ft Pipe	C	From	4.000	0.00	122.000	No Ice	1.200	1.200	0.02
		Centroid-Le	0.00			1/2" Ice	1.502	1.502	0.03
		g	0.00			1" Ice	1.814	1.814	0.04
**									
(2) DB846F65ZAXY w/ Mount Pipe	A	From	4.000	30.00	113.000	No Ice	7.271	7.821	0.05
		Centroid-Le	0.00			1/2" Ice	7.832	9.010	0.11
		g	1.00			1" Ice	8.348	9.912	0.19
(2) LPA-80063/4CF w/ Mount Pipe	B	From	4.000	10.00	113.000	No Ice	6.396	6.614	0.04
		Centroid-Le	0.00			1/2" Ice	6.799	7.250	0.10
		g	1.00			1" Ice	7.210	7.898	0.18
(2) LPA-80063/4CF w/ Mount Pipe	C	From	4.000	30.00	113.000	No Ice	6.396	6.614	0.04
		Centroid-Le	1.50			1/2" Ice	6.799	7.250	0.10
		g	1.00			1" Ice	7.210	7.898	0.18
ACUTIME 2000	A	From	4.000	0.00	113.000	No Ice	0.255	0.255	0.00
		Centroid-Le	3.00			1/2" Ice	0.320	0.320	0.00
		g	3.00			1" Ice	0.393	0.393	0.01
BXA-171063/8CF w/ Mount Pipe	A	From	4.000	30.00	113.000	No Ice	3.140	3.510	0.03
		Centroid-Le	-3.00			1/2" Ice	3.515	4.130	0.06
		g	1.00			1" Ice	3.892	4.757	0.10
BXA-171063/8CF w/ Mount Pipe	B	From	4.000	10.00	113.000	No Ice	3.140	3.510	0.03
		Centroid-Le	-3.00			1/2" Ice	3.515	4.130	0.06
		g	1.00			1" Ice	3.892	4.757	0.10
BXA-171063/8CF w/ Mount Pipe	C	From	4.000	30.00	113.000	No Ice	3.140	3.510	0.03
		Centroid-Le	0.00			1/2" Ice	3.515	4.130	0.06
		g	1.00			1" Ice	3.892	4.757	0.10
(2) FD9R6004/2C-3L	B	From	4.000	10.00	113.000	No Ice	0.314	0.076	0.00
		Centroid-Le	0.00			1/2" Ice	0.386	0.119	0.01
		g	1.00			1" Ice	0.466	0.169	0.01
(4) FD9R6004/2C-3L	C	From	4.000	30.00	113.000	No Ice	0.314	0.076	0.00
		Centroid-Le	1.50			1/2" Ice	0.386	0.119	0.01
		g	0.00			1" Ice	0.466	0.169	0.01
DB-T1-6Z-8AB-0Z	B	From	4.000	-40.00	113.000	No Ice	4.800	2.000	0.04
		Centroid-Le	3.00			1/2" Ice	5.070	2.193	0.08
		g	1.00			1" Ice	5.348	2.393	0.12

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	Project	TEP No. 25570.114864	Date	14:33:41 04/06/17
	Client	Crown Castle	Designed by	JDR

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight	
			Horz	Vert			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	K	
(2) SBNHH-1D65B w/ Mount Pipe	A	From	4.000		0.00	113.000	No Ice	8.289	7.004	0.08
		Centroid-Le	1.50				1/2" Ice	8.849	8.185	0.14
		g	1.00				1" Ice	9.374	9.081	0.22
(2) SBNHH-1D45B w/ Mount Pipe	B	From	4.000		-40.00	113.000	No Ice	11.637	6.946	0.09
		Centroid-Le	1.50				1/2" Ice	12.228	8.127	0.17
		g	1.00				1" Ice	12.784	9.021	0.26
(2) SBNHH-1D45B w/ Mount Pipe	C	From	4.000		30.00	113.000	No Ice	11.637	6.946	0.09
		Centroid-Le	-1.50				1/2" Ice	12.228	8.127	0.17
		g	1.00				1" Ice	12.784	9.021	0.26
RRH2x60-700	A	From	4.000		30.00	113.000	No Ice	3.500	1.816	0.06
		Centroid-Le	-3.00				1/2" Ice	3.761	2.052	0.08
		g	1.00				1" Ice	4.029	2.289	0.11
RRH2x60-700	B	From	4.000		10.00	113.000	No Ice	3.500	1.816	0.06
		Centroid-Le	-3.00				1/2" Ice	3.761	2.052	0.08
		g	1.00				1" Ice	4.029	2.289	0.11
RRH2x60-700	C	From	4.000		30.00	113.000	No Ice	3.500	1.816	0.06
		Centroid-Le	0.00				1/2" Ice	3.761	2.052	0.08
		g	1.00				1" Ice	4.029	2.289	0.11
RRH2X60-1900	A	From	4.000		0.00	113.000	No Ice	1.874	1.218	0.04
		Centroid-Le	0.00				1/2" Ice	2.052	1.367	0.06
		g	1.00				1" Ice	2.237	1.523	0.08
RRH2X60-1900	B	From	4.000		-40.00	113.000	No Ice	1.874	1.218	0.04
		Centroid-Le	0.00				1/2" Ice	2.052	1.367	0.06
		g	1.00				1" Ice	2.237	1.523	0.08
RRH2X60-1900	C	From	4.000		30.00	113.000	No Ice	1.874	1.218	0.04
		Centroid-Le	-6.00				1/2" Ice	2.052	1.367	0.06
		g	1.00				1" Ice	2.237	1.523	0.08
AWS-3 RRH4X45	A	From	4.000		0.00	113.000	No Ice	3.112	3.624	0.08
		Centroid-Le	3.00				1/2" Ice	3.345	3.878	0.11
		g	1.00				1" Ice	3.595	4.139	0.15
AWS-3 RRH4X45	B	From	4.000		-40.00	113.000	No Ice	3.112	3.624	0.08
		Centroid-Le	3.00				1/2" Ice	3.345	3.878	0.11
		g	1.00				1" Ice	3.595	4.139	0.15
AWS-3 RRH4X45	C	From	4.000		30.00	113.000	No Ice	3.112	3.624	0.08
		Centroid-Le	3.00				1/2" Ice	3.345	3.878	0.11
		g	1.00				1" Ice	3.595	4.139	0.15
DB-T1-6Z-8AB-0Z	B	From	4.000		10.00	113.000	No Ice	4.800	2.000	0.04
		Centroid-Le	-3.00				1/2" Ice	5.070	2.193	0.08
		g	1.00				1" Ice	5.348	2.393	0.12
2.4" Dia x 6-ft Pipe	A	From	4.000		0.00	113.000	No Ice	1.428	1.428	0.02
		Centroid-Le	-3.00				1/2" Ice	1.927	1.927	0.03
		g	1.00				1" Ice	2.296	2.296	0.05
2.4" Dia x 6-ft Pipe	B	From	4.000		0.00	113.000	No Ice	1.428	1.428	0.02
		Centroid-Le	-3.00				1/2" Ice	1.927	1.927	0.03
		g	1.00				1" Ice	2.296	2.296	0.05
2.4" Dia x 6-ft Pipe	C	From	4.000		0.00	113.000	No Ice	1.428	1.428	0.02
		Centroid-Le	-3.00				1/2" Ice	1.927	1.927	0.03
		g	1.00				1" Ice	2.296	2.296	0.05
Platform Mount [LP 305-1]	C	None			0.00	113.000	No Ice	18.010	18.010	1.12
							1/2" Ice	23.330	23.330	1.35
							1" Ice	28.650	28.650	1.58
**										
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From	4.000		30.00	105.000	No Ice	6.329	5.642	0.11
		Centroid-Le	0.00				1/2" Ice	6.775	6.426	0.17
		g	2.00				1" Ice	7.214	7.131	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From	4.000		30.00	105.000	No Ice	6.329	5.642	0.11
		Centroid-Le	0.00				1/2" Ice	6.775	6.426	0.17

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	Project	TEP No. 25570.114864	Date	14:33:41 04/06/17
	Client	Crown Castle	Designed by	JDR

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	g	2.00			1" Ice	7.214	7.131	0.23
		From	4.000		30.00	No Ice	6.329	5.642	0.11
		Centroid-Le	0.00			1/2" Ice	6.775	6.426	0.17
KRY 112 144/1	A	g	2.00			1" Ice	7.214	7.131	0.23
		From	4.000		30.00	No Ice	0.352	0.162	0.01
		Centroid-Le	0.00			1/2" Ice	0.428	0.219	0.01
KRY 112 144/1	B	g	2.00			1" Ice	0.512	0.285	0.02
		From	4.000		30.00	No Ice	0.352	0.162	0.01
		Centroid-Le	0.00			1/2" Ice	0.428	0.219	0.01
KRY 112 144/1	C	g	2.00			1" Ice	0.512	0.285	0.02
		From	4.000		30.00	No Ice	0.352	0.162	0.01
		Centroid-Le	0.00			1/2" Ice	0.428	0.219	0.01
LNX-6515DS-VTM w/ Mount Pipe	A	g	0.00			1" Ice	0.512	0.285	0.02
		From	4.000		30.00	No Ice	11.683	9.842	0.08
		Centroid-Le	6.00			1/2" Ice	12.404	11.366	0.17
LNX-6515DS-VTM w/ Mount Pipe	B	g	2.00			1" Ice	13.135	12.914	0.27
		From	4.000		30.00	No Ice	11.683	9.842	0.08
		Centroid-Le	6.00			1/2" Ice	12.404	11.366	0.17
LNX-6515DS-VTM w/ Mount Pipe	C	g	2.00			1" Ice	13.135	12.914	0.27
		From	4.000		30.00	No Ice	11.683	9.842	0.08
		Centroid-Le	6.00			1/2" Ice	12.404	11.366	0.17
RRUS 11 B12	A	g	2.00			1" Ice	13.135	12.914	0.27
		From	4.000		30.00	No Ice	2.791	1.192	0.05
		Centroid-Le	6.00			1/2" Ice	2.998	1.340	0.07
RRUS 11 B12	A	g	2.00			1" Ice	3.213	1.496	0.10
		From	4.000		30.00	No Ice	2.791	1.192	0.05
		Centroid-Le	6.00			1/2" Ice	2.998	1.340	0.07
RRUS 11 B12	B	g	2.00			1" Ice	3.213	1.496	0.10
		From	4.000		30.00	No Ice	2.791	1.192	0.05
		Centroid-Le	6.00			1/2" Ice	2.998	1.340	0.07
AIR 32 B2a/B66Aa w/ Mount Pipe	A	g	2.00			1" Ice	3.213	1.496	0.10
		From	4.000		30.00	No Ice	6.747	6.070	0.15
		Centroid-Le	-6.00			1/2" Ice	7.202	6.867	0.21
AIR -32 B2A/B66AA w/ Mount Pipe	B	g	2.00			1" Ice	7.648	7.583	0.28
		From	4.000		30.00	No Ice	6.747	6.070	0.15
		Centroid-Le	-6.00			1/2" Ice	7.202	6.867	0.21
AIR -32 B2A/B66AA w/ Mount Pipe	C	g	2.00			1" Ice	7.648	7.583	0.28
		From	4.000		30.00	No Ice	6.747	6.070	0.15
		Centroid-Le	-6.00			1/2" Ice	7.202	6.867	0.21
Platform Mount [LP 1201-1]	C	g	2.00			1" Ice	7.648	7.583	0.28
		None			0.00	No Ice	23.100	23.100	2.10
						1/2" Ice	26.800	26.800	2.50
**						1" Ice	30.500	30.500	2.90
RRUS 11	A	From Leg	2.000		30.00	No Ice	2.791	1.192	0.05
			-2.00			1/2" Ice	2.998	1.340	0.07
			0.00			1" Ice	3.213	1.496	0.10
RRUS 11	B	From Leg	2.000		30.00	No Ice	2.791	1.192	0.05
			-2.00			1/2" Ice	2.998	1.340	0.07
			0.00			1" Ice	3.213	1.496	0.10
RRUS 11	C	From Leg	2.000		30.00	No Ice	2.791	1.192	0.05
			-2.00			1/2" Ice	2.998	1.340	0.07
			0.00			1" Ice	3.213	1.496	0.10
DC6-48-60-18-8F	A	From Leg	2.000		30.00	No Ice	0.917	0.917	0.02
			2.00			1/2" Ice	1.458	1.458	0.04
			0.00			1" Ice	1.643	1.643	0.06
DC6-48-60-18-8F	B	From Leg	2.000		30.00	No Ice	0.917	0.917	0.02

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	Project	TEP No. 25570.114864	Date	14:33:41 04/06/17
	Client	Crown Castle	Designed by	JDR

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			2.00			1/2" Ice	1.458	1.458	0.04
			0.00			1" Ice	1.643	1.643	0.06
WCS RRUS-32-B30	A	From Leg	2.000		30.00	No Ice	3.314	2.424	0.08
			2.00			1/2" Ice	3.558	2.638	0.10
			0.00			1" Ice	3.809	2.860	0.14
(2) WCS RRUS-32-B30	C	From Leg	2.000		30.00	No Ice	3.314	2.424	0.08
			2.00			1/2" Ice	3.558	2.638	0.10
			0.00			1" Ice	3.809	2.860	0.14
TME-RRUS-32 B30	A	From Leg	2.000		30.00	No Ice	3.866	2.762	0.08
			2.00			1/2" Ice	4.151	3.021	0.10
			0.00			1" Ice	4.444	3.290	0.14
TME-RRUS-32 B30	B	From Leg	2.000		30.00	No Ice	3.866	2.762	0.08
			2.00			1/2" Ice	4.151	3.021	0.10
			0.00			1" Ice	4.444	3.290	0.14
TME-RRUS-32 B30	C	From Leg	2.000		30.00	No Ice	3.866	2.762	0.08
			2.00			1/2" Ice	4.151	3.021	0.10
			0.00			1" Ice	4.444	3.290	0.14
Side Arm Mount [SO 102-3]	C	None			0.00	No Ice	3.000	3.000	0.08
						1/2" Ice	3.480	3.480	0.11
						1" Ice	3.960	3.960	0.14
(2) 2.4" Dia. x 5-ft Pipe	A	From Leg	2.000		0.00	No Ice	1.200	1.200	0.02
			0.00			1/2" Ice	1.502	1.502	0.03
			0.00			1" Ice	1.814	1.814	0.04
(2) 2.4" Dia. x 5-ft Pipe	B	From Leg	2.000		0.00	No Ice	1.200	1.200	0.02
			0.00			1/2" Ice	1.502	1.502	0.03
			0.00			1" Ice	1.814	1.814	0.04
(2) 2.4" Dia. x 5-ft Pipe	C	From Leg	2.000		0.00	No Ice	1.200	1.200	0.02
			0.00			1/2" Ice	1.502	1.502	0.03
			0.00			1" Ice	1.814	1.814	0.04
**									
7770.00 w/ Mount Pipe	A	From Centroid-Le g	4.000		23.00	No Ice	5.746	4.254	0.06
			-6.00			1/2" Ice	6.179	5.014	0.10
			1.00			1" Ice	6.607	5.711	0.16
7770.00 w/ Mount Pipe	B	From Centroid-Le g	4.000		23.00	No Ice	5.746	4.254	0.06
			-6.00			1/2" Ice	6.179	5.014	0.10
			1.00			1" Ice	6.607	5.711	0.16
7770.00 w/ Mount Pipe	C	From Centroid-Le g	4.000		23.00	No Ice	5.746	4.254	0.06
			-6.00			1/2" Ice	6.179	5.014	0.10
			1.00			1" Ice	6.607	5.711	0.16
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Centroid-Le g	4.000		30.00	No Ice	9.895	7.179	0.10
			-2.00			1/2" Ice	10.470	8.362	0.18
			1.00			1" Ice	11.010	9.259	0.26
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Centroid-Le g	4.000		30.00	No Ice	9.895	7.179	0.10
			-2.00			1/2" Ice	10.470	8.362	0.18
			1.00			1" Ice	11.010	9.259	0.26
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Centroid-Le g	4.000		30.00	No Ice	9.895	7.179	0.10
			-2.00			1/2" Ice	10.470	8.362	0.18
			1.00			1" Ice	11.010	9.259	0.26
(2) LGP2140X	A	From Centroid-Le g	4.000		23.00	No Ice	1.080	0.358	0.01
			-6.00			1/2" Ice	1.214	0.454	0.02
			0.00			1" Ice	1.355	0.556	0.03
(2) LGP2140X	B	From Centroid-Le g	4.000		23.00	No Ice	1.080	0.358	0.01
			-6.00			1/2" Ice	1.214	0.454	0.02
			0.00			1" Ice	1.355	0.556	0.03
(2) LGP2140X	C	From Centroid-Le g	4.000		23.00	No Ice	1.080	0.358	0.01
			-6.00			1/2" Ice	1.214	0.454	0.02
			0.00			1" Ice	1.355	0.556	0.03

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz Lateral	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
QS66512-2 w/ Mount Pipe	A	From Centroid-Le	4.000	6.00	30.00	96.000	No Ice 8.371	8.463	0.14
		g	1.00				1/2" Ice 8.931	9.657	0.21
							1" Ice 9.457	10.548	0.30
QS66512-2 w/ Mount Pipe	B	From Centroid-Le	4.000	6.00	30.00	96.000	No Ice 8.371	8.463	0.14
		g	1.00				1/2" Ice 8.931	9.657	0.21
							1" Ice 9.457	10.548	0.30
QS66512-2 w/ Mount Pipe	C	From Centroid-Le	4.000	6.00	30.00	96.000	No Ice 8.371	8.463	0.14
		g	1.00				1/2" Ice 8.931	9.657	0.21
							1" Ice 9.457	10.548	0.30
WCS-IMFQ-AMT	C	From Centroid-Le	4.000	-2.00	30.00	96.000	No Ice 0.989	0.644	0.03
		g	1.00				1/2" Ice 1.114	0.748	0.04
							1" Ice 1.246	0.860	0.05
Platform Mount [LP 601-1]	C	None			0.00	96.000	No Ice 28.470	28.470	1.12
							1/2" Ice 33.590	33.590	1.51
							1" Ice 38.710	38.710	1.91
2.4" Dia x 6-ft Pipe	A	From Centroid-Le	4.000	2.00	0.00	96.000	No Ice 1.428	1.428	0.02
		g	0.00				1/2" Ice 1.927	1.927	0.03
							1" Ice 2.296	2.296	0.05
2.4" Dia x 6-ft Pipe	B	From Centroid-Le	4.000	2.00	0.00	96.000	No Ice 1.428	1.428	0.02
		g	0.00				1/2" Ice 1.927	1.927	0.03
							1" Ice 2.296	2.296	0.05
2.4" Dia x 6-ft Pipe	C	From Centroid-Le	4.000	2.00	0.00	96.000	No Ice 1.428	1.428	0.02
		g	0.00				1/2" Ice 1.927	1.927	0.03
							1" Ice 2.296	2.296	0.05

*

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz Lateral	Vert						
				ft	ft	°	°	ft	ft	ft ²	K
**											

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

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Comb. No.	Description
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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 99.25	Pole	Max Tension	26	0.00	0.00	0.00
			Max. Compression	26	-28.90	-3.13	-2.02
			Max. Mx	8	-11.30	-290.71	-0.10
			Max. My	14	-11.40	-0.65	-277.20
			Max. Vy	8	19.98	-290.71	-0.10
			Max. Vx	14	19.12	-0.65	-277.20
			Max. Torque	19			4.35
L2	99.25 - 99	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.98	-3.13	-2.02
			Max. Mx	8	-11.35	-295.71	-0.09
			Max. My	14	-11.45	-0.64	-281.99
			Max. Vy	8	20.02	-295.71	-0.09

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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	99 - 90.08	Pole	Max. Vx	14	19.15	-0.64	-281.99
			Max. Torque	19			4.35
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.12	-2.38	-1.29
			Max. Mx	8	-16.47	-520.66	0.54
			Max. My	14	-16.59	0.20	-498.36
			Max. Vy	8	27.52	-520.66	0.54
L4	90.08 - 89.5	Pole	Max. Vx	14	26.45	0.20	-498.36
			Max. Torque	19			4.35
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.37	-2.40	-1.27
			Max. Mx	8	-16.64	-536.65	0.57
			Max. My	14	-16.76	0.23	-513.71
			Max. Vy	20	-27.62	535.42	-1.00
L5	89.5 - 78	Pole	Max. Vx	14	26.54	0.23	-513.71
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.90	-2.56	-0.94
			Max. Mx	8	-18.92	-755.33	1.03
			Max. My	14	-19.04	0.57	-723.69
			Max. Vy	20	-28.81	754.00	-1.35
L6	78 - 76.75	Pole	Max. Vx	14	27.69	0.57	-723.69
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.03	-2.63	-0.74
			Max. Mx	8	-20.96	-901.46	1.30
			Max. My	14	-21.08	0.82	-864.10
			Max. Vy	20	-29.65	900.13	-1.59
L7	76.75 - 75.5	Pole	Max. Vx	14	28.49	0.82	-864.10
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.75	-2.62	-0.70
			Max. Mx	8	-21.45	-938.62	1.36
			Max. My	14	-21.57	0.90	-899.83
			Max. Vy	20	-29.85	937.32	-1.66
L8	75.5 - 74.5	Pole	Max. Vx	14	28.69	0.90	-899.83
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.33	-2.63	-0.68
			Max. Mx	8	-21.86	-968.53	1.41
			Max. My	14	-21.98	0.96	-928.59
			Max. Vy	20	-30.01	967.25	-1.72
L9	74.5 - 73.29	Pole	Max. Vx	14	28.84	0.96	-928.59
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.02	-2.66	-0.62
			Max. Mx	8	-22.33	-1004.95	1.48
			Max. My	14	-22.45	1.01	-963.58
			Max. Vy	20	-30.20	1003.66	-1.77
L10	73.29 - 70.5	Pole	Max. Vx	14	29.03	1.01	-963.58
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.79	-2.56	-0.54
			Max. Mx	8	-23.50	-1089.72	1.62
			Max. My	14	-23.62	1.24	-1045.17
			Max. Vy	20	-30.65	1088.61	-1.92
L11	70.5 - 70	Pole	Max. Vx	14	29.47	1.24	-1045.17
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.15	-2.52	-0.53
			Max. Mx	8	-23.74	-1105.03	1.65

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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
L12	70 - 69.75	Pole	Max. My	14	-23.86	1.30	-1059.92
			Max. Vy	20	-30.72	1103.98	-1.95
			Max. Vx	14	29.54	1.30	-1059.92
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.33	-2.50	-0.53
			Max. Mx	8	-23.86	-1112.69	1.66
			Max. My	14	-23.97	1.33	-1067.31
			Max. Vy	20	-30.76	1111.68	-1.96
			Max. Vx	14	29.58	1.33	-1067.31
L13	69.75 - 69.5	Pole	Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.51	-2.47	-0.52
			Max. Mx	8	-23.98	-1120.37	1.67
			Max. My	14	-24.09	1.36	-1074.71
			Max. Vy	20	-30.80	1119.39	-1.97
			Max. Vx	14	29.62	1.36	-1074.71
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.59	-1.95	-0.29
L14	69.5 - 56	Pole	Max. Mx	8	-28.93	-1549.80	2.31
			Max. My	14	-29.04	2.42	-1487.51
			Max. Vy	20	-32.90	1549.55	-2.74
			Max. Vx	14	31.56	2.42	-1487.51
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.78	-1.94	-0.28
			Max. Mx	8	-29.06	-1558.01	2.32
			Max. My	14	-29.16	2.44	-1495.40
			Max. Vy	20	-32.94	1557.79	-2.75
L15	56 - 55.75	Pole	Max. Vx	14	31.59	2.44	-1495.40
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.71	-1.87	-0.23
			Max. Mx	8	-29.64	-1599.29	2.40
			Max. My	14	-29.74	2.56	-1534.99
			Max. Vy	20	-33.20	1599.17	-2.81
			Max. Vx	14	31.80	2.56	-1534.99
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
L16	55.75 - 54.5	Pole	Max. Compression	26	-62.08	-1.84	-0.22
			Max. Mx	8	-29.88	-1615.90	2.43
			Max. My	14	-29.98	2.60	-1550.90
			Max. Vy	20	-33.30	1615.81	-2.83
			Max. Vx	14	31.87	2.60	-1550.90
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.45	-1.81	-0.20
			Max. Mx	8	-30.12	-1632.55	2.46
			Max. My	14	-30.22	2.65	-1566.85
L17	54.5 - 54	Pole	Max. Vy	20	-33.40	1632.51	-2.85
			Max. Vx	14	31.95	2.65	-1566.85
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.53	-1.73	-0.15
			Max. Mx	20	-30.80	1681.55	-2.91
			Max. My	14	-30.90	2.78	-1613.64
			Max. Vy	20	-33.71	1681.55	-2.91
			Max. Vx	14	32.19	2.78	-1613.64
			Max. Torque	19			3.95
L18	54 - 53.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.53	-1.73	-0.15
L19	53.5 - 52.04	Pole	Max. Mx	20	-30.80	1681.55	-2.91
			Max. My	14	-30.90	2.78	-1613.64
			Max. Vy	20	-33.71	1681.55	-2.91
			Max. Vx	14	32.19	2.78	-1613.64
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.53	-1.73	-0.15
			Max. Mx	20	-30.80	1681.55	-2.91
			Max. My	14	-30.90	2.78	-1613.64
			Max. Vy	20	-33.71	1681.55	-2.91
L20	52.04 - 39.75	Pole	Max. Vx	14	32.19	2.78	-1613.64
			Max. Torque	19			3.95
L20	52.04 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00

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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
L21	39.75 - 34.75	Pole	Max. Compression	26	-68.58	-1.28	-0.17
			Max. Mx	20	-33.96	1941.35	-3.46
			Max. My	14	-34.06	3.49	-1860.63
			Max. Vy	20	-35.16	1941.35	-3.46
			Max. Vx	14	33.32	3.49	-1860.63
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.73	-0.60	-0.23
			Max. Mx	20	-39.06	2294.26	-4.18
			Max. My	14	-39.15	4.43	-2193.30
L22	34.75 - 34.3333	Pole	Max. Vy	20	-37.11	2294.26	-4.18
			Max. Vx	14	34.85	4.43	-2193.30
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.08	-0.56	-0.24
			Max. Mx	20	-39.28	2309.76	-4.21
			Max. My	14	-39.37	4.48	-2207.84
			Max. Vy	20	-37.18	2309.76	-4.21
			Max. Vx	14	34.91	4.48	-2207.84
			Max. Torque	19			3.95
L23	34.3333 - 24	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.44	0.06	-0.28
			Max. Mx	20	-43.97	2701.58	-4.93
			Max. My	14	-44.03	5.40	-2576.04
			Max. Vy	20	-38.61	2701.58	-4.93
			Max. Vx	14	36.35	5.40	-2576.04
			Max. Torque	19			3.95
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.32	0.11	-0.31
			Max. Mx	20	-48.56	3083.89	-5.62
L24	24 - 14.25	Pole	Max. My	14	-48.60	5.88	-2936.41
			Max. Vy	20	-39.85	3083.89	-5.62
			Max. Vx	14	37.57	5.88	-2936.41
			Max. Torque	19			3.94
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94.43	0.22	-0.38
			Max. Mx	20	-50.68	3247.50	-5.94
			Max. My	14	-50.71	6.15	-3090.75
			Max. Vy	20	-40.35	3247.50	-5.94
			Max. Vx	14	38.06	6.15	-3090.75
L25	14.25 - 10.17	Pole	Max. Torque	19			3.94
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-98.53	0.37	-0.48
			Max. Mx	20	-53.52	3468.02	-6.38
			Max. My	14	-53.53	6.50	-3298.83
			Max. Vy	20	-41.02	3468.02	-6.38
			Max. Vx	14	38.70	6.50	-3298.83
			Max. Torque	19			3.94
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-100.49	0.42	-0.52
L26	10.17 - 4.75	Pole	Max. Mx	20	-54.93	3581.27	-6.59
			Max. My	14	-54.94	6.66	-3405.72
			Max. Vy	20	-41.37	3581.27	-6.59
			Max. Vx	14	39.03	6.66	-3405.72
			Max. Torque	19			3.94
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.59	0.33	-0.49
			Max. Mx	20	-55.82	3664.15	-6.71
			Max. My	14	-55.82	6.72	-3483.97
			Max. Vy	20	-41.60	3664.15	-6.71
L27	4.75 - 2	Pole	Max. Vy	20	-41.60	3664.15	-6.71
			Max. Vx	14	39.03	6.66	-3405.72
			Max. Torque	19			3.94
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-100.49	0.42	-0.52
L28	2 - 0	Pole	Max. Mx	20	-54.93	3581.27	-6.59
			Max. My	14	-54.94	6.66	-3405.72
			Max. Vy	20	-41.37	3581.27	-6.59
			Max. Vx	14	39.03	6.66	-3405.72
			Max. Torque	19			3.94

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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
			Max. Vx	14	39.25	6.72	-3483.97
			Max. Torque	19			3.94

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	101.59	-0.00	-0.00
	Max. H _x	20	55.83	41.58	-0.05
	Max. H _z	2	55.83	-0.05	39.23
	Max. M _x	2	3481.31	-0.05	39.23
	Max. M _z	8	3661.51	-41.58	0.05
	Max. Torsion	19	3.94	32.95	-18.63
	Min. Vert	25	41.88	18.96	32.17
	Min. H _x	8	55.83	-41.58	0.05
	Min. H _z	14	55.83	0.05	-39.23
	Min. M _x	14	-3483.97	0.05	-39.23
	Min. M _z	20	-3664.15	41.58	-0.05
	Min. Torsion	7	-3.94	-32.95	18.63

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	46.53	0.00	0.00	1.09	1.08	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	55.83	0.05	-39.23	-3481.31	-4.07	1.72
0.9 Dead+1.6 Wind 0 deg - No Ice	41.88	0.05	-39.23	-3457.34	-4.36	1.73
1.2 Dead+1.6 Wind 30 deg - No Ice	55.83	19.05	-32.22	-2934.42	-1745.90	3.26
0.9 Dead+1.6 Wind 30 deg - No Ice	41.88	19.05	-32.22	-2914.06	-1733.88	3.27
1.2 Dead+1.6 Wind 60 deg - No Ice	55.83	32.95	-18.63	-1696.71	-3019.49	3.94
0.9 Dead+1.6 Wind 60 deg - No Ice	41.88	32.95	-18.63	-1685.07	-2998.48	3.94
1.2 Dead+1.6 Wind 90 deg - No Ice	55.83	41.58	-0.05	-4.08	-3661.51	2.95
0.9 Dead+1.6 Wind 90 deg - No Ice	41.88	41.58	-0.05	-4.37	-3636.39	2.95
1.2 Dead+1.6 Wind 120 deg - No Ice	55.83	32.90	18.54	1690.01	-3014.12	2.22
0.9 Dead+1.6 Wind 120 deg - No Ice	41.88	32.90	18.54	1677.77	-2993.14	2.21
1.2 Dead+1.6 Wind 150 deg - No Ice	55.83	18.96	32.17	2931.69	-1736.57	0.29
0.9 Dead+1.6 Wind 150 deg - No Ice	41.88	18.96	32.17	2910.69	-1724.62	0.28
1.2 Dead+1.6 Wind 180 deg - No Ice	55.83	-0.05	39.23	3483.97	6.72	-1.72

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Tower Engineering Professionals 326 Tryon Rd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">528 Wheelers Farm Rd (BU 876320)</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">28 of 33</p>
	<p style="text-align: center;">Project</p> <p style="text-align: center;">TEP No. 25570.114864</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">14:33:41 04/06/17</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Crown Castle</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">JDR</p>

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
0.9 Dead+1.6 Wind 180 deg - No Ice	41.88	-0.05	39.23	3459.32	6.35	-1.73
1.2 Dead+1.6 Wind 210 deg - No Ice	55.83	-19.05	32.22	2937.06	1748.55	-3.27
0.9 Dead+1.6 Wind 210 deg - No Ice	41.88	-19.05	32.22	2916.03	1735.87	-3.28
1.2 Dead+1.6 Wind 240 deg - No Ice	55.83	-32.95	18.63	1699.34	3022.14	-3.94
0.9 Dead+1.6 Wind 240 deg - No Ice	41.88	-32.95	18.63	1687.04	3000.46	-3.94
1.2 Dead+1.6 Wind 270 deg - No Ice	55.83	-41.58	0.05	6.71	3664.15	-2.94
0.9 Dead+1.6 Wind 270 deg - No Ice	41.88	-41.58	0.05	6.34	3638.36	-2.94
1.2 Dead+1.6 Wind 300 deg - No Ice	55.83	-32.90	-18.54	-1687.37	3016.75	-2.21
0.9 Dead+1.6 Wind 300 deg - No Ice	41.88	-32.90	-18.54	-1675.80	2995.11	-2.21
1.2 Dead+1.6 Wind 330 deg - No Ice	55.83	-18.96	-32.17	-2929.03	1739.21	-0.28
0.9 Dead+1.6 Wind 330 deg - No Ice	41.88	-18.96	-32.17	-2908.71	1726.59	-0.28
1.2 Dead+1.0 Ice+1.0 Temp	101.59	0.00	0.00	0.49	0.33	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.59	0.00	-9.87	-899.99	0.21	0.34
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.59	4.42	-7.54	-725.22	-426.11	0.55
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.59	7.65	-4.36	-418.51	-738.18	0.62
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.59	9.82	-0.00	0.47	-904.43	0.41
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.59	7.65	4.35	419.47	-738.14	0.28
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.59	4.41	7.54	726.21	-426.03	-0.03
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.59	-0.00	9.87	901.03	0.30	-0.34
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	101.59	-4.42	7.54	726.25	426.62	-0.55
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	101.59	-7.65	4.36	419.55	738.69	-0.62
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	101.59	-9.82	0.00	0.57	904.94	-0.41
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	101.59	-7.65	-4.35	-418.43	738.65	-0.28
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	101.59	-4.41	-7.54	-725.17	426.54	0.03
Dead+ Wind 0 deg - Service	46.53	0.01	-8.39	-741.06	-0.05	0.37
Dead+ Wind 30 deg - Service	46.53	4.08	-6.89	-624.48	-371.23	0.70
Dead+ Wind 60 deg - Service	46.53	7.05	-3.99	-360.74	-642.63	0.85
Dead+ Wind 90 deg - Service	46.53	8.90	-0.01	-0.04	-779.53	0.76
Dead+ Wind 120 deg - Service	46.53	7.04	3.97	360.96	-641.49	0.48
Dead+ Wind 150 deg - Service	46.53	4.06	6.88	625.55	-369.24	0.06
Dead+ Wind 180 deg - Service	46.53	-0.01	8.39	743.27	2.24	-0.37
Dead+ Wind 210 deg - Service	46.53	-4.08	6.89	626.70	373.42	-0.70
Dead+ Wind 240 deg - Service	46.53	-7.05	3.99	362.95	644.82	-0.85
Dead+ Wind 270 deg - Service	46.53	-8.90	0.01	2.26	781.72	-0.76
Dead+ Wind 300 deg - Service	46.53	-7.04	-3.97	-358.75	643.67	-0.48
Dead+ Wind 330 deg - Service	46.53	-4.06	-6.88	-623.33	371.43	-0.06

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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	0.00	-46.53	0.00	0.00	46.53	0.00	0.000%
2	0.05	-55.83	-39.23	-0.05	55.83	39.23	0.000%
3	0.05	-41.88	-39.23	-0.05	41.88	39.23	0.000%
4	19.05	-55.83	-32.22	-19.05	55.83	32.22	0.000%
5	19.05	-41.88	-32.22	-19.05	41.88	32.22	0.000%
6	32.95	-55.83	-18.63	-32.95	55.83	18.63	0.000%
7	32.95	-41.88	-18.63	-32.95	41.88	18.63	0.000%
8	41.58	-55.83	-0.05	-41.58	55.83	0.05	0.000%
9	41.58	-41.88	-0.05	-41.58	41.88	0.05	0.000%
10	32.90	-55.83	18.54	-32.90	55.83	-18.54	0.000%
11	32.90	-41.88	18.54	-32.90	41.88	-18.54	0.000%
12	18.96	-55.83	32.17	-18.96	55.83	-32.17	0.000%
13	18.96	-41.88	32.17	-18.96	41.88	-32.17	0.000%
14	-0.05	-55.83	39.23	0.05	55.83	-39.23	0.000%
15	-0.05	-41.88	39.23	0.05	41.88	-39.23	0.000%
16	-19.05	-55.83	32.22	19.05	55.83	-32.22	0.000%
17	-19.05	-41.88	32.22	19.05	41.88	-32.22	0.000%
18	-32.95	-55.83	18.63	32.95	55.83	-18.63	0.000%
19	-32.95	-41.88	18.63	32.95	41.88	-18.63	0.000%
20	-41.58	-55.83	0.05	41.58	55.83	-0.05	0.000%
21	-41.58	-41.88	0.05	41.58	41.88	-0.05	0.000%
22	-32.90	-55.83	-18.54	32.90	55.83	18.54	0.000%
23	-32.90	-41.88	-18.54	32.90	41.88	18.54	0.000%
24	-18.96	-55.83	-32.17	18.96	55.83	32.17	0.000%
25	-18.96	-41.88	-32.17	18.96	41.88	32.17	0.000%
26	0.00	-101.59	0.00	-0.00	101.59	-0.00	0.000%
27	0.00	-101.59	-9.87	-0.00	101.59	9.87	0.000%
28	4.42	-101.59	-7.54	-4.42	101.59	7.54	0.000%
29	7.65	-101.59	-4.36	-7.65	101.59	4.36	0.000%
30	9.82	-101.59	-0.00	-9.82	101.59	0.00	0.000%
31	7.65	-101.59	4.35	-7.65	101.59	-4.35	0.000%
32	4.41	-101.59	7.54	-4.41	101.59	-7.54	0.000%
33	-0.00	-101.59	9.87	0.00	101.59	-9.87	0.000%
34	-4.42	-101.59	7.54	4.42	101.59	-7.54	0.000%
35	-7.65	-101.59	4.36	7.65	101.59	-4.36	0.000%
36	-9.82	-101.59	0.00	9.82	101.59	-0.00	0.000%
37	-7.65	-101.59	-4.35	7.65	101.59	4.35	0.000%
38	-4.41	-101.59	-7.54	4.41	101.59	7.54	0.000%
39	0.01	-46.53	-8.39	-0.01	46.53	8.39	0.000%
40	4.08	-46.53	-6.89	-4.08	46.53	6.89	0.000%
41	7.05	-46.53	-3.99	-7.05	46.53	3.99	0.000%
42	8.90	-46.53	-0.01	-8.90	46.53	0.01	0.000%
43	7.04	-46.53	3.97	-7.04	46.53	-3.97	0.000%
44	4.06	-46.53	6.88	-4.06	46.53	-6.88	0.000%
45	-0.01	-46.53	8.39	0.01	46.53	-8.39	0.000%
46	-4.08	-46.53	6.89	4.08	46.53	-6.89	0.000%
47	-7.05	-46.53	3.99	7.05	46.53	-3.99	0.000%
48	-8.90	-46.53	0.01	8.90	46.53	-0.01	0.000%
49	-7.04	-46.53	-3.97	7.04	46.53	3.97	0.000%
50	-4.06	-46.53	-6.88	4.06	46.53	6.88	0.000%

Non-Linear Convergence Results

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<i>Load Combination</i>	<i>Converged?</i>	<i>Number of Cycles</i>	<i>Displacement Tolerance</i>	<i>Force Tolerance</i>
1	Yes	4	0.0000001	0.0000001
2	Yes	5	0.0000001	0.00011426
3	Yes	5	0.0000001	0.00005314
4	Yes	6	0.0000001	0.00005672
5	Yes	5	0.0000001	0.00081889
6	Yes	6	0.0000001	0.00004957
7	Yes	5	0.0000001	0.00071338
8	Yes	5	0.0000001	0.00019794
9	Yes	5	0.0000001	0.00009081
10	Yes	6	0.0000001	0.00005573
11	Yes	5	0.0000001	0.00080292
12	Yes	6	0.0000001	0.00005244
13	Yes	5	0.0000001	0.00075651
14	Yes	5	0.0000001	0.00010184
15	Yes	5	0.0000001	0.00004737
16	Yes	6	0.0000001	0.00005027
17	Yes	5	0.0000001	0.00072434
18	Yes	6	0.0000001	0.00005840
19	Yes	5	0.0000001	0.00084158
20	Yes	5	0.0000001	0.00021144
21	Yes	5	0.0000001	0.00009694
22	Yes	6	0.0000001	0.00005076
23	Yes	5	0.0000001	0.00073081
24	Yes	6	0.0000001	0.00005304
25	Yes	5	0.0000001	0.00076490
26	Yes	4	0.0000001	0.00004161
27	Yes	6	0.0000001	0.00010474
28	Yes	6	0.0000001	0.00011368
29	Yes	6	0.0000001	0.00011409
30	Yes	6	0.0000001	0.00010647
31	Yes	6	0.0000001	0.00011480
32	Yes	6	0.0000001	0.00011375
33	Yes	6	0.0000001	0.00010514
34	Yes	6	0.0000001	0.00011285
35	Yes	6	0.0000001	0.00011421
36	Yes	6	0.0000001	0.00010563
37	Yes	6	0.0000001	0.00011335
38	Yes	6	0.0000001	0.00011263
39	Yes	4	0.0000001	0.00024821
40	Yes	4	0.0000001	0.00095330
41	Yes	4	0.0000001	0.00071138
42	Yes	4	0.0000001	0.00042403
43	Yes	4	0.0000001	0.00090074
44	Yes	4	0.0000001	0.00075673
45	Yes	4	0.0000001	0.00024554
46	Yes	4	0.0000001	0.00071913
47	Yes	5	0.0000001	0.00002937
48	Yes	4	0.0000001	0.00042878
49	Yes	4	0.0000001	0.00070714
50	Yes	4	0.0000001	0.00077805

Compression Checks

Pole Design Data

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	120 - 99.25 (1)	TP26.1925x22x0.25	20.750	0.000	0.0	20.8837	-11.30	1355.01	0.008
L2	99.25 - 99 (2)	TP26.243x26.1925x0.2779	0.250	0.000	0.0	23.2369	-11.35	1563.79	0.007
L3	99 - 90.08 (3)	TP28.0453x26.243x0.3169	8.920	0.000	0.0	28.2909	-16.47	1924.91	0.009
L4	90.08 - 89.5 (4)	TP28.1625x28.0453x0.4858	0.580	0.000	0.0	43.2940	-16.64	2945.73	0.006
L5	89.5 - 78 (5)	TP30.486x28.1625x0.6158	11.500	0.000	0.0	57.7231	-18.92	3927.48	0.005
L6	78 - 76.75 (6)	TP30.2382x29.228x0.85	5.000	0.000	0.0	80.4400	-20.96	5473.14	0.004
L7	76.75 - 75.5 (7)	TP30.4908x30.2382x0.92	1.250	0.000	0.0	87.5963	-21.45	5960.05	0.004
L8	75.5 - 74.5 (8)	TP30.6928x30.4908x0.8072	1.000	0.000	0.0	77.6761	-21.86	5285.08	0.004
L9	74.5 - 73.29 (9)	TP30.9373x30.6928x0.7332	1.210	0.000	0.0	71.3055	-22.33	4851.62	0.005
L10	73.29 - 70.5 (10)	TP31.501x30.9373x0.749	2.790	0.000	0.0	74.1713	-23.50	5046.61	0.005
L11	70.5 - 70 (11)	TP31.6021x31.501x0.788	0.500	0.000	0.0	78.1906	-23.74	5320.09	0.004
L12	70 - 69.75 (12)	TP31.6526x31.6021x0.7391	0.250	0.000	0.0	73.5694	-23.86	5005.66	0.005
L13	69.75 - 69.5 (13)	TP31.7031x31.6526x0.8375	0.250	0.000	0.0	83.2364	-23.98	5663.40	0.004
L14	69.5 - 56 (14)	TP34.4307x31.7031x0.6773	13.500	0.000	0.0	73.6097	-28.93	5008.41	0.006
L15	56 - 55.75 (15)	TP34.4812x34.4307x0.7398	0.250	0.000	0.0	80.3761	-29.06	5468.79	0.005
L16	55.75 - 54.5 (16)	TP34.7338x34.4812x0.8164	1.250	0.000	0.0	89.1573	-29.64	6066.27	0.005
L17	54.5 - 54 (17)	TP34.8348x34.7338x0.95	0.500	0.000	0.0	103.6530	-29.88	7052.57	0.004
L18	54 - 53.5 (18)	TP34.9358x34.8348x0.8077	0.500	0.000	0.0	88.7582	-30.12	6039.11	0.005
L19	53.5 - 52.04 (19)	TP35.2308x34.9358x0.715	1.460	0.000	0.0	79.4631	-30.80	5406.67	0.006
L20	52.04 - 39.75 (20)	TP37.714x35.2308x0.6462	12.290	0.000	0.0	75.1353	-33.96	5112.20	0.007
L21	39.75 - 34.75 (21)	TP38.0989x36.129x0.744	9.750	0.000	0.0	89.4892	-39.06	6088.85	0.006
L22	34.75 - 34.3333 (22)	TP38.1831x38.0989x0.852	0.417	0.000	0.0	102.4110	-39.28	6968.06	0.006
L23	34.3333 - 24 (23)	TP40.2709x38.1831x0.7206	10.333	0.000	0.0	91.7682	-43.97	6243.91	0.007
L24	24 - 14.25 (24)	TP42.2409x40.2709x0.7587	9.750	0.000	0.0	101.3400	-48.56	6895.16	0.007
L25	14.25 - 10.17 (25)	TP43.0652x42.2409x0.811	4.080	0.000	0.0	110.3370	-50.68	7507.35	0.007
L26	10.17 - 4.75 (26)	TP44.1603x43.0652x0.7957	5.420	0.000	0.0	111.1100	-53.52	7559.93	0.007
L27	4.75 - 2 (27)	TP44.7159x44.1603x0.7684	2.750	0.000	0.0	108.7400	-54.93	7398.67	0.007
L28	2 - 0 (28)	TP45.12x44.7159x0.6978	2.000	0.000	0.0	99.8110	-55.82	6791.14	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	120 - 99.25 (1)	TP26.1925x22x0.25	290.71	714.93	0.407	0.00	714.93	0.000
L2	99.25 - 99 (2)	TP26.243x26.1925x0.2779	295.71	824.93	0.358	0.00	824.93	0.000
L3	99 - 90.08 (3)	TP28.0453x26.243x0.3169	520.66	1083.62	0.480	0.00	1083.62	0.000
L4	90.08 - 89.5 (4)	TP28.1625x28.0453x0.4858	536.65	1645.22	0.326	0.00	1645.22	0.000
L5	89.5 - 78 (5)	TP30.486x28.1625x0.6158	755.33	2299.22	0.329	0.00	2299.22	0.000
L6	78 - 76.75 (6)	TP30.2382x29.228x0.85	901.46	3209.97	0.281	0.00	3209.97	0.000
L7	76.75 - 75.5 (7)	TP30.4908x30.2382x0.92	938.62	3509.81	0.267	0.00	3509.81	0.000
L8	75.5 - 74.5 (8)	TP30.6928x30.4908x0.8072	968.52	3158.03	0.307	0.00	3158.03	0.000

tnxTower Tower Engineering Professionals 326 Tryon Rd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job 528 Wheelers Farm Rd (BU 876320)	Page 32 of 33
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	Client Crown Castle	Designed by JDR

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L9	74.5 - 73.29 (9)	TP30.9373x30.6928x0.7332	1004.96	2937.73	0.342	0.00	2937.73	0.000
L10	73.29 - 70.5 (10)	TP31.501x30.9373x0.749	1089.72	3110.97	0.350	0.00	3110.97	0.000
L11	70.5 - 70 (11)	TP31.6021x31.501x0.788	1105.03	3282.28	0.337	0.00	3282.28	0.000
L12	70 - 69.75 (12)	TP31.6526x31.6021x0.7391	1112.69	3103.30	0.359	0.00	3103.30	0.000
L13	69.75 - 69.5 (13)	TP31.7031x31.6526x0.8375	1120.38	3494.62	0.321	0.00	3494.62	0.000
L14	69.5 - 56 (14)	TP34.4307x31.7031x0.6773	1549.80	3403.03	0.455	0.00	3403.03	0.000
L15	56 - 55.75 (15)	TP34.4812x34.4307x0.7398	1558.02	3707.75	0.420	0.00	3707.75	0.000
L16	55.75 - 54.5 (16)	TP34.7338x34.4812x0.8164	1599.30	4125.63	0.388	0.00	4125.63	0.000
L17	54.5 - 54 (17)	TP34.8348x34.7338x0.95	1615.90	4773.31	0.339	0.00	4773.31	0.000
L18	54 - 53.5 (18)	TP34.9358x34.8348x0.8077	1632.55	4134.31	0.395	0.00	4134.31	0.000
L19	53.5 - 52.04 (19)	TP35.2308x34.9358x0.715	1681.55	3754.22	0.448	0.00	3754.22	0.000
L20	52.04 - 39.75 (20)	TP37.714x35.2308x0.6462	1941.36	3723.78	0.521	0.00	3723.78	0.000
L21	39.75 - 34.75 (21)	TP38.0989x36.129x0.744	2294.27	4579.24	0.501	0.00	4579.24	0.000
L22	34.75 - 34.3333 (22)	TP38.1831x38.0989x0.852	2309.76	5222.26	0.442	0.00	5222.26	0.000
L23	34.3333 - 24 (23)	TP40.2709x38.1831x0.7206	2701.58	4980.13	0.542	0.00	4980.13	0.000
L24	24 - 14.25 (24)	TP42.2409x40.2709x0.7587	3083.90	5767.79	0.535	0.00	5767.79	0.000
L25	14.25 - 10.17 (25)	TP43.0652x42.2409x0.811	3247.51	6391.11	0.508	0.00	6391.11	0.000
L26	10.17 - 4.75 (26)	TP44.1603x43.0652x0.7957	3468.03	6610.45	0.525	0.00	6610.45	0.000
L27	4.75 - 2 (27)	TP44.7159x44.1603x0.7684	3581.28	6561.97	0.546	0.00	6561.97	0.000
L28	2 - 0 (28)	TP45.12x44.7159x0.6978	3664.16	6098.87	0.601	0.00	6098.87	0.000

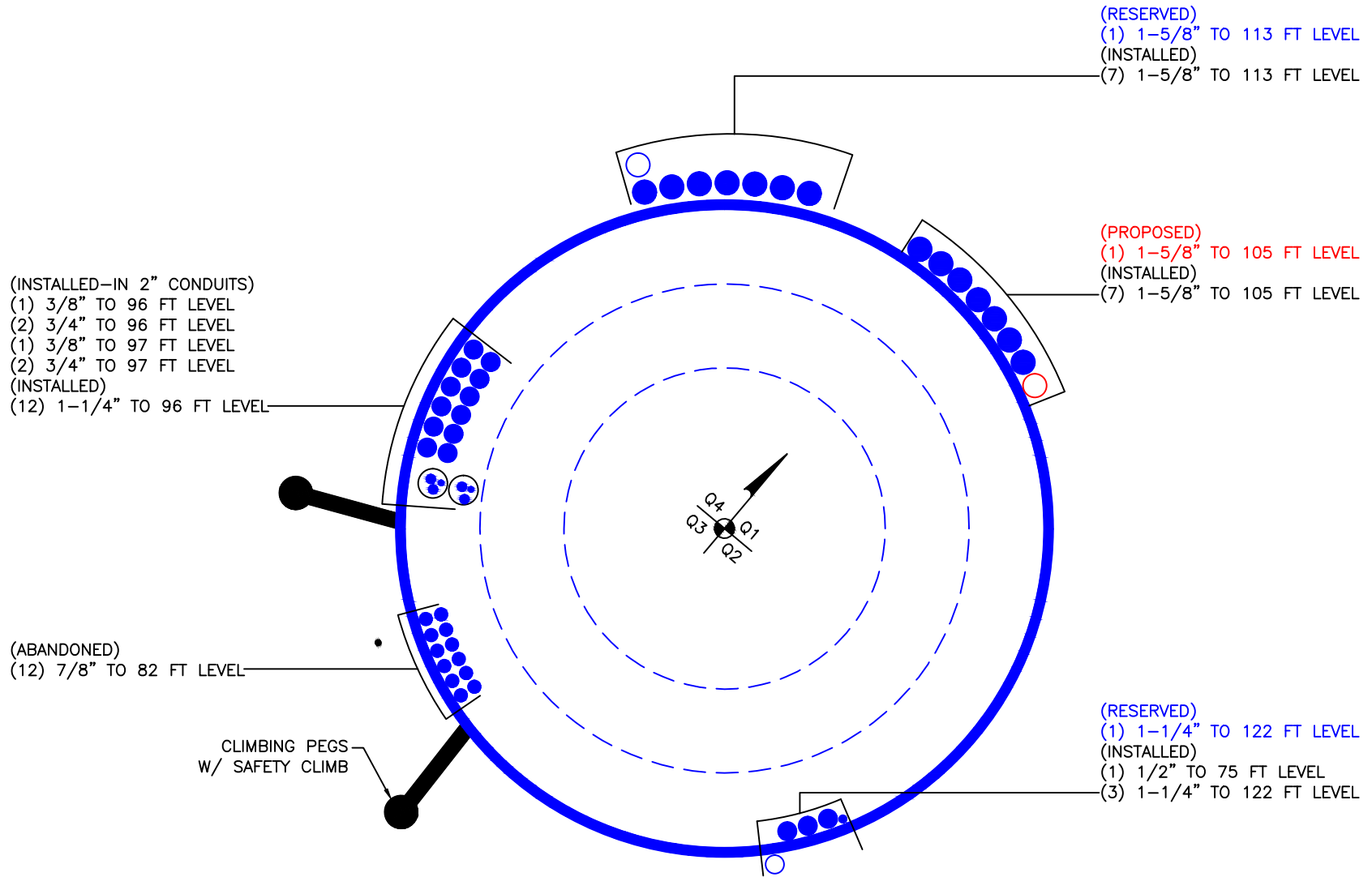
Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 99.25 (1)	TP26.1925x22x0.25	19.98	677.51	0.029	3.76	1449.66	0.003
L2	99.25 - 99 (2)	TP26.243x26.1925x0.2779	20.02	781.89	0.026	3.76	1672.71	0.002
L3	99 - 90.08 (3)	TP28.0453x26.243x0.3169	27.52	962.46	0.029	3.57	2197.23	0.002
L4	90.08 - 89.5 (4)	TP28.1625x28.0453x0.4858	27.62	1472.86	0.019	3.56	3335.99	0.001
L5	89.5 - 78 (5)	TP30.486x28.1625x0.6158	28.81	1963.74	0.015	3.55	4662.09	0.001
L6	78 - 76.75 (6)	TP30.2382x29.228x0.85	29.65	2736.57	0.011	3.55	6508.81	0.001
L7	76.75 - 75.5 (7)	TP30.4908x30.2382x0.92	29.85	2980.02	0.010	3.55	7116.80	0.000
L8	75.5 - 74.5 (8)	TP30.6928x30.4908x0.8072	30.01	2642.54	0.011	3.55	6403.48	0.001
L9	74.5 - 73.29 (9)	TP30.9373x30.6928x0.7332	30.20	2425.81	0.012	3.55	5956.82	0.001
L10	73.29 - 70.5 (10)	TP31.501x30.9373x0.749	30.65	2523.31	0.012	3.55	6308.08	0.001
L11	70.5 - 70 (11)	TP31.6021x31.501x0.788	30.72	2660.05	0.012	3.55	6655.43	0.001
L12	70 - 69.75 (12)	TP31.6526x31.6021x0.7391	30.76	2502.83	0.012	3.55	6292.52	0.001
L13	69.75 - 69.5 (13)	TP31.7031x31.6526x0.8375	30.80	2831.70	0.011	3.55	7086.00	0.001
L14	69.5 - 56 (14)	TP34.4307x31.7031x0.6773	32.90	2504.20	0.013	3.55	6900.27	0.001
L15	56 - 55.75 (15)	TP34.4812x34.4307x0.7398	32.94	2734.39	0.012	3.55	7518.16	0.000
L16	55.75 - 54.5 (16)	TP34.7338x34.4812x0.8164	33.20	3033.13	0.011	3.54	8365.50	0.000
L17	54.5 - 54 (17)	TP34.8348x34.7338x0.95	33.30	3526.29	0.009	3.51	9678.75	0.000

tnxTower Tower Engineering Professionals 326 Tryon Rd. Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	528 Wheelers Farm Rd (BU 876320)	Page	33 of 33
	Project	TEP No. 25570.114864	Date	14:33:41 04/06/17
	Client	Crown Castle	Designed by	JDR

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L18	54 - 53.5 (18)	TP34.9358x34.8348x0.8077	33.40	3019.56	0.011	3.49	8383.08	0.000
L19	53.5 - 52.04 (19)	TP35.2308x34.9358x0.715	33.71	2703.34	0.012	3.47	7612.38	0.000
L20	52.04 - 39.75 (20)	TP37.714x35.2308x0.6462	35.16	2556.10	0.014	3.26	7550.65	0.000
L21	39.75 - 34.75 (21)	TP38.0989x36.129x0.744	37.11	3044.42	0.012	2.98	9285.25	0.000
L22	34.75 - 34.3333 (22)	TP38.1831x38.0989x0.852	37.18	3484.03	0.011	2.95	10589.08	0.000
L23	34.3333 - 24 (23)	TP40.2709x38.1831x0.7206	38.61	3121.95	0.012	2.94	10098.17	0.000
L24	24 - 14.25 (24)	TP42.2409x40.2709x0.7587	39.85	3447.58	0.012	2.94	11695.25	0.000
L25	14.25 - 10.17 (25)	TP43.0652x42.2409x0.811	40.35	3753.68	0.011	2.94	12959.17	0.000
L26	10.17 - 4.75 (26)	TP44.1603x43.0652x0.7957	41.02	3779.97	0.011	2.94	13403.92	0.000
L27	4.75 - 2 (27)	TP44.7159x44.1603x0.7684	41.37	3699.33	0.011	2.94	13305.67	0.000
L28	2 - 0 (28)	TP45.12x44.7159x0.6978	41.60	3395.57	0.012	2.94	12366.58	0.000

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS



528 Wheelers Farm Rd (BU 876320)

Pole (L3)	66.6%	Pass
Mod (M2)	95.1%	Pass

TEP #: 25570.114864
 Analysis: JDR 4/7/2017
 Check: TML 4/7/2017

Monopole Reinforcement_v1.8.11 - TIA-222-G

Mod #	Modification Type	Termination Length (ft)	Bot. Elevation (ft)	Top Elevation (ft)	Termination Length (ft)	Modification Location (° or Flat/Point #)	Location (F/P)	Lateral Offset (in)
1	(TS) 1.25x8.00 (65ksi)	0.00	0.00	8.00	3.25	3 5 9 11	Flats	0.00
2	Face-In C6x10.5	-2.00	2.00	56.00		4 10	Flats	0.00
3	Face-In C6x10.5		8.67	56.00		1 7	Flats	0.00
4	(Aero) MP304		0.50	25.50		3 5 9 11	Flats	0.00
5	PL 1" x 5"		2.50	37.00		2 6 8 12	Flats	-2.50
6	PL 1" x 5"		32.08	72.08	2.33	2 6 8 12	Flats	2.50
7	(Aero) MP303	-0.50	0.50	15.50		2 6 8 12	Flats	2.50
8	(Aero) MP303	-1.50	25.50	45.50		3 5 9 11	Flats	0.00
9	CCI-SFP-045100		52.00	72.00		11	Flats	-2.00
10	CCI-SFP-045100		50.54	74.79		3	Flats	0.00
11	CCI-AFP-045100		52.00	72.00		5 9	Flats	0.00
12	CCI-AFP-060100		67.00	92.00		1 10	Flats	0.00
13	CCI-AFP-045100	-2.08	72.08	92.08		5 9	Flats	0.00
14	CCI-SFP-045100		42.50	57.50		2 6 8	Flats	-3.00
15	CCI-SFP-045100		42.25	57.25		12	Flats	-3.00
16	PL 1.25" x 4"		73.00	100.75		2	Flats	0.00
17a	PL 1.25" x 4"		74.00	100.75		6	Flats	2.00
17b	PL 1.25" x 4"		74.00	100.75	1.75	12	Flats	-2.00
18a	PL 1.25" x 4"		68.25	80.00		4 7	Flats	0.00
18b	PL 1.25" x 4"	1.75	68.25	80.00		11	Flats	2.00
19	PL 1.25" x 4"		68.25	78.25		8	Flats	-3.00

MODIFICATION PROPERTIES

#	Modification	Default Termination (ft)	Stitch (in)	k	Drill Hole (in)	Bolt/Weld Capacity (k)	A _G (in ²)	F _y (ksi)	F _U (ksi)
1	(TS) 1.25x8.00 (65ksi)	4.00	0.75	0.80	Weld	Weld	9.06	65.0	80.0
2	Face-In C6x10.5	1.50	24.00	0.80	1.5000	33.4	3.08	65.0	80.0
4	(Aero) MP304	1.50	18.00	0.80	1.2188	36.0	4.13	65.0	80.0
5	PL 1" x 5"	2.25	18.00	0.80	1.2500	36.0	5.00	65.0	80.0
7	(Aero) MP303	1.25	18.00	0.80	1.2188	36.0	2.92	65.0	80.0
9	CCI-SFP-045100	1.50	20.00	0.80	1.1875	36.0	4.50	65.0	80.0
11	CCI-AFP-045100	2.00	20.00	0.80	1.1875	36.0	4.50	65.0	80.0
12	CCI-AFP-060100	2.50	16.00	0.80	1.1875	36.0	6.00	65.0	80.0
16	PL 1.25" x 4"	1.50	27.00	0.80	1.3125	36.0	5.00	65.0	80.0



528 Wheelers Farm Rd (BU 876320)

Pole (L3)	66.6%	Pass
Mod (M2)	95.1%	Pass

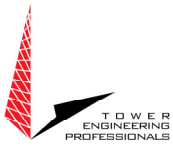
TEP #: 25570.114864
 Analysis: JDR 4/7/2017
 Check: TML 4/7/2017

Monopole Reinforcement_v1.8.11 - TIA-222-G - Capacities

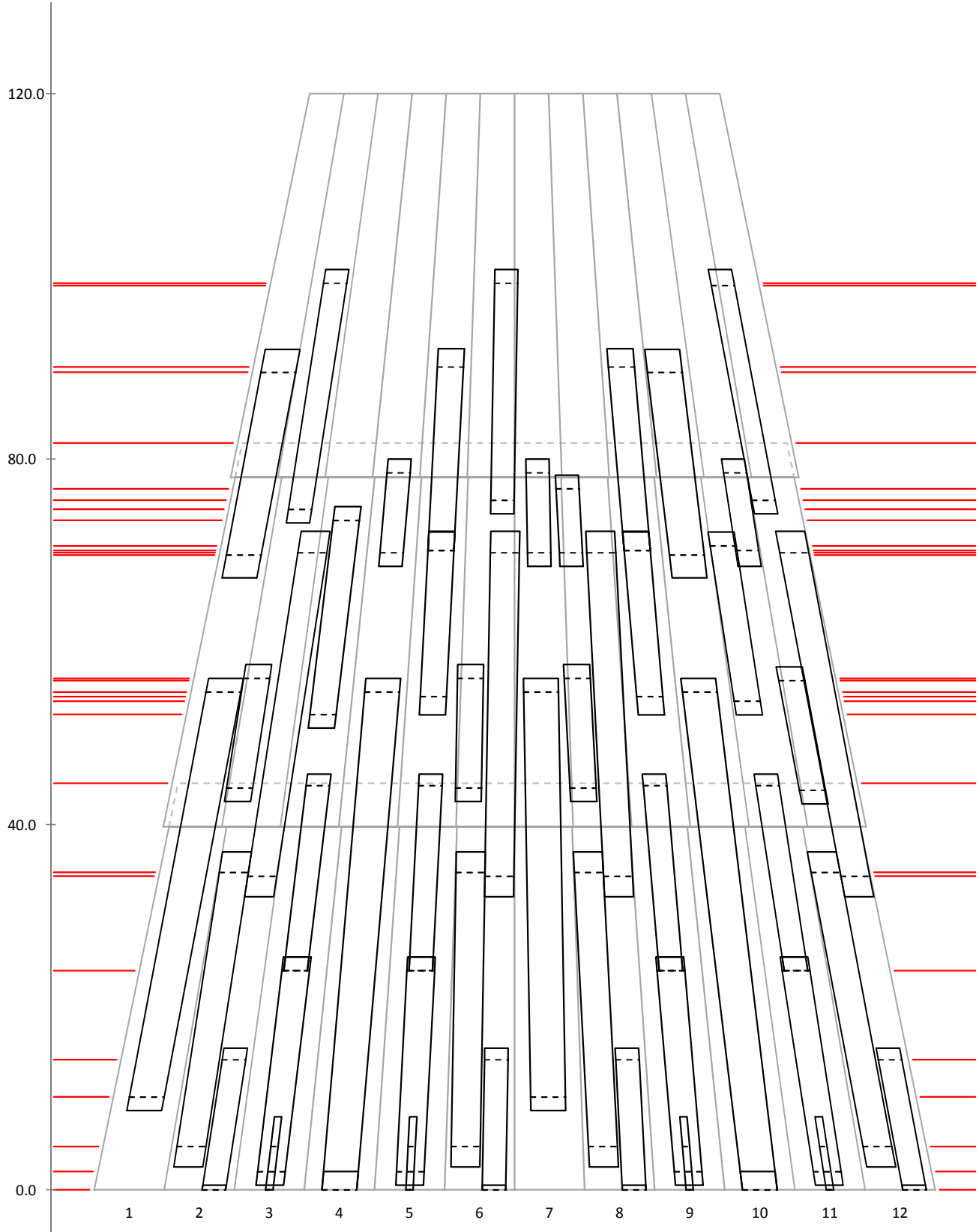
Section No.	Elevation (ft)	Type	Size	Critical Element	Pu (k)	φPn (k)	% Capacity	Pass/Fail
L1	120.00-78.00	Pole	TP30.49×22.00×0.2500	1	Note 1	Note 1	53.2	Pass
L2	81.75-39.75	Pole	TP37.71×29.23×0.3125	2	Note 1	Note 1	58.9	Pass
L3	44.50-0.00	Pole	TP45.12×36.13×0.3750	3	Note 1	Note 1	66.6	Pass
M1	8.00-0.00	Mod (Ex)	(TS) 1.25×8.00 (65ksi)	1	Note 1	Note 1	63.7	Pass
M2	56.00-2.00	Mod (Ex)	Face-In C6x10.5	2	Note 1	Note 1	95.1	Pass
M3	56.00-8.67	Mod (Ex)	Face-In C6x10.5	3	Note 1	Note 1	89.7	Pass
M4	25.50-0.50	Mod (Ex)	(Aero) MP304	4	Note 1	Note 1	71.5	Pass
M5	37.00-2.50	Mod (Ex)	PL 1" x 5"	5	Note 1	Note 1	79.0	Pass
M6	72.08-32.08	Mod (Ex)	PL 1" x 5"	6	Note 1	Note 1	71.5	Pass
M7	15.50-0.50	Mod (Ex)	(Aero) MP303	7	Note 1	Note 1	78.0	Pass
M8	45.50-25.50	Mod (Ex)	(Aero) MP303	8	Note 1	Note 1	72.7	Pass
M9	72.00-52.00	Mod (Ex)	CCI-SFP-045100	9	Note 1	Note 1	71.4	Pass
M10	74.79-50.54	Mod (Ex)	CCI-SFP-045100	10	Note 1	Note 1	66.2	Pass
M11	72.00-52.00	Mod (Ex)	CCI-AFP-045100	11	Note 1	Note 1	71.4	Pass
M12	92.00-67.00	Mod (Ex)	CCI-AFP-060100	12	Note 1	Note 1	52.2	Pass
M13	92.08-72.08	Mod (Ex)	CCI-AFP-045100	13	Note 1	Note 1	51.7	Pass
M14	57.50-42.50	Mod (Ex)	CCI-SFP-045100	14	Note 1	Note 1	70.0	Pass
M15	57.25-42.25	Mod (Ex)	CCI-SFP-045100	15	Note 1	Note 1	70.0	Pass
M16	100.75-73.00	Mod (Ex)	PL 1.25" x 4"	16	Note 1	Note 1	60.6	Pass
M17b	100.75-74.00	Mod (Ex)	PL 1.25" x 4"	17	Note 1	Note 1	55.2	Pass
M18b	80.00-68.25	Mod (Ex)	PL 1.25" x 4"	18	Note 1	Note 1	59.1	Pass
M19	78.25-68.25	Mod (Ex)	PL 1.25" x 4"	19	Note 1	Note 1	54.8	Pass

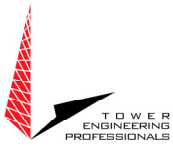
Summary

Pole (L3)	66.6	Pass
Mod (M2)	95.1	Pass
RATING =	95.1	Pass



Reinforcement Layout

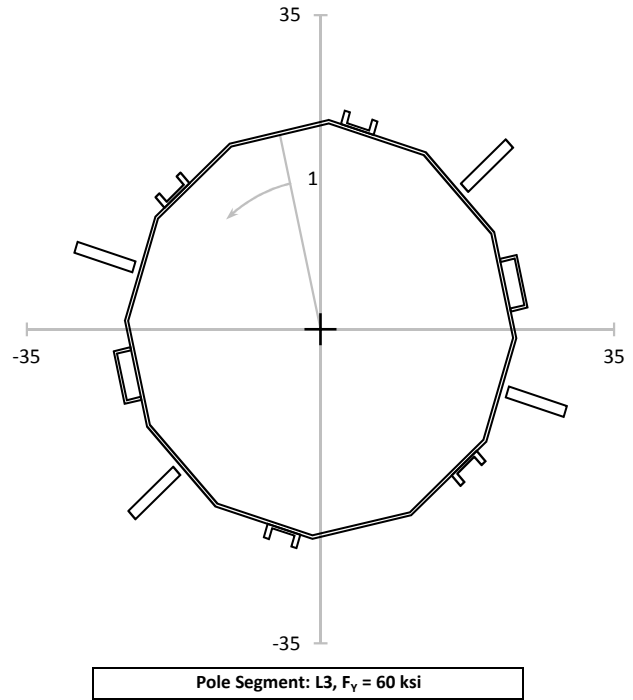




Elevation: 0.00-ft

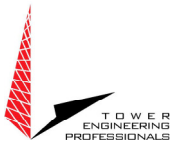
Loads	
Axial:	55.8 k
Moment:	3,664.2 k-ft
Shear:	41.6 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	27.9 k
Moment:	1,998.2 k-ft
Shear:	20.8 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	2
q:	0.077 k/in
Bolt/Weld Cap:	33.4 k/bolt
Max Spacing:	436.09 in
Stitch:	24.00 in
Capacity:	5.5%

Pole Info	
OD:	45.12 in
t:	0.3750 in
Pole A_G :	54.03 in ²
Pole I_G :	13,807.2 in ⁴
Controlling	
Angle:	347.40°
I_{CONT} :	25,644.6 in ⁴
A_G :	108.12 in ²
Minimum	
Angle:	178.55°
I_{MIN} :	25,140.0 in ⁴
t_{EFF} :	0.6978 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
171.95	23.20	25318.5	0.516	40.292	0.385	0.029	61.256	61.256	30.628	61.256	66.6%

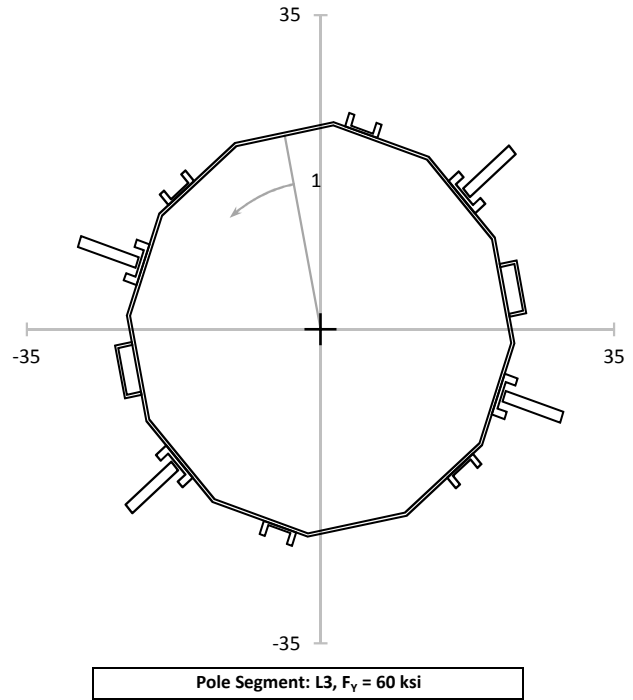
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
1	1	36.65	24.73	30264.4	0.516	35.928	0.385	58.485	58.485	29.250	62.3%
1	2	143.20	24.76	29650.2	0.516	36.713	0.385	58.485	58.485	29.250	63.7%
1	3	216.65	24.73	30264.4	0.516	35.928	0.385	58.485	58.485	29.250	62.3%
1	4	323.20	24.76	29650.2	0.516	36.713	0.385	58.485	58.485	29.250	63.7%
2	1	93.30	23.02	38514.3	0.516	26.283	0.385	51.601	37.832	29.250	68.1%
2	2	273.30	23.02	38514.3	0.516	26.283	0.385	51.601	37.832	29.250	68.1%
7	1	18.35	22.17	26683.4	0.516	36.530	0.385	53.615	49.540	29.250	72.7%
7	2	167.40	22.84	25644.6	0.516	39.158	0.385	53.615	49.540	29.250	78.0%
7	3	198.35	22.17	26683.4	0.516	36.530	0.385	53.615	49.540	29.250	72.7%
7	4	347.40	22.84	25644.6	0.516	39.158	0.385	53.615	49.540	29.250	78.0%



Elevation: 2.00-ft

Loads	
Axial:	54.9 k
Moment:	3,581.3 k-ft
Shear:	41.4 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	23.7 k
Moment:	1,781.8 k-ft
Shear:	17.8 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	4
q:	0.110 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	326.62 in
Stitch:	18.00 in
Capacity:	5.5%

Pole Info	
OD:	44.72 in
t:	0.3750 in
Pole A_G :	53.54 in ²
Pole I_G :	13,436.5 in ⁴
Controlling	
Angle:	348.80°
I_G :	27,348.8 in ⁴
A_G :	124.15 in ²
Minimum	
Angle:	358.90°
I_{MIN} :	26,806.7 in ⁴
t_{EFF} :	0.7684 in



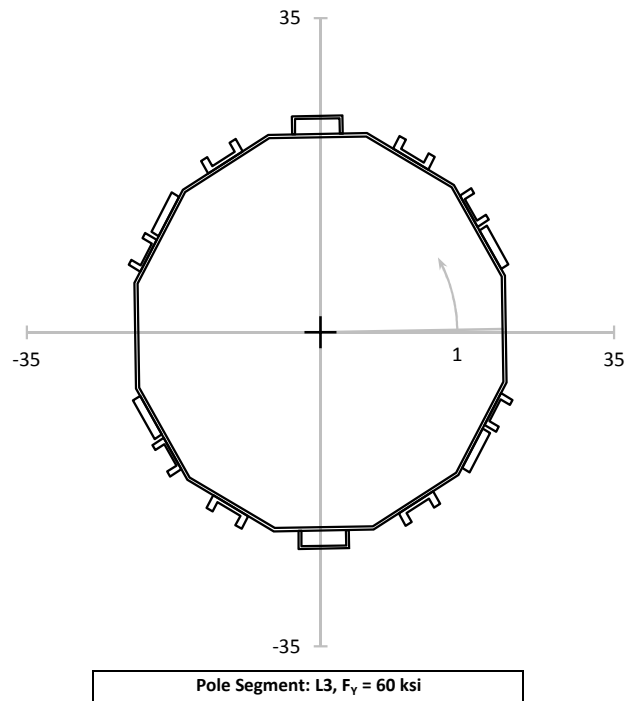
POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ΦF_A (ksi)	ΦF_B (ksi)	ΦF_V (ksi)	ΦF_T (ksi)	Capacity
172.80	22.95	27006.0	0.442	36.519	0.333	0.030	61.507	61.507	30.754	61.507	60.1%

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ΦF_A (ksi)	ΦF_B (ksi)	ΦF_V (ksi)	Capacity
1	1	33.15	23.85	32378.4	0.442	31.657	0.333	58.485	58.485	29.250	54.9%
1	2	146.55	23.91	31847.9	0.442	32.269	0.333	58.485	58.485	29.250	55.9%
1	3	213.15	23.85	32378.4	0.442	31.657	0.333	58.485	58.485	29.250	54.9%
1	4	326.55	23.91	31847.9	0.442	32.269	0.333	58.485	58.485	29.250	55.9%
2	1	94.10	22.80	44260.9	0.442	22.137	0.333	51.601	37.832	29.250	57.4%
2	2	274.10	22.80	44260.9	0.442	22.137	0.333	51.601	37.832	29.250	57.4%
4	1	33.15	20.49	32378.4	0.442	27.199	0.333	53.494	49.881	29.250	53.7%
4	2	146.55	20.55	31847.9	0.442	27.724	0.333	53.494	49.881	29.250	54.7%
4	3	213.15	20.49	32378.4	0.442	27.199	0.333	53.494	49.881	29.250	53.7%
4	4	326.55	20.55	31847.9	0.442	27.724	0.333	53.494	49.881	29.250	54.7%
7	1	16.55	21.74	28422.9	0.442	32.866	0.333	53.615	49.540	29.250	65.5%
7	2	168.80	22.53	27348.8	0.442	35.402	0.333	53.615	49.540	29.250	70.6%
7	3	196.55	21.74	28422.9	0.442	32.866	0.333	53.615	49.540	29.250	65.5%
7	4	348.80	22.53	27348.8	0.442	35.402	0.333	53.615	49.540	29.250	70.6%

Elevation: 4.75-ft

Loads	
Axial:	53.5 k
Moment:	3,468.0 k-ft
Shear:	41.0 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	26.4 k
Moment:	1,682.1 k-ft
Shear:	20.2 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	5
q:	0.172 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	208.96 in
Stitch:	18.00 in
Capacity:	8.6%

Pole Info	
OD:	44.16 in
t:	0.3750 in
Pole A_G :	52.87 in ²
Pole I_G :	12,937.7 in ⁴
Controlling	
Angle:	89.05°
I_G :	26,745.1 in ⁴
A_G :	107.23 in ²
Minimum	
Angle:	250.30°
I_{MIN} :	26,669.2 in ⁴
t_{EFF} :	0.7957 in



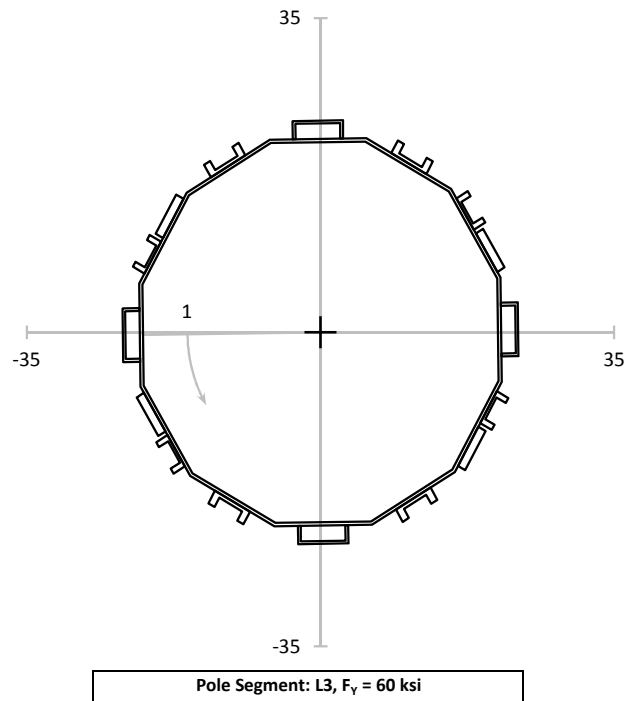
POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
74.75	22.87	26673.6	0.499	35.689	0.383	0.031	61.853	61.853	30.926	61.853	58.5%

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	89.05	22.58	26745.1	0.499	35.131	0.383	51.601	37.832	29.250	91.6%
2	2	269.05	22.58	26745.1	0.499	35.131	0.383	51.601	37.832	29.250	91.6%
4	1	60.55	22.69	26690.4	0.499	35.377	0.383	53.494	49.881	29.250	69.9%
4	2	118.45	22.68	27077.5	0.499	34.860	0.383	53.494	49.881	29.250	68.9%
4	3	240.55	22.69	26690.4	0.499	35.377	0.383	53.494	49.881	29.250	69.9%
4	4	298.45	22.68	27077.5	0.499	34.860	0.383	53.494	49.881	29.250	68.9%
5	1	25.25	22.71	27038.2	0.499	34.954	0.383	46.178	44.250	29.250	77.9%
5	2	142.80	22.72	27338.8	0.499	34.578	0.383	46.178	44.250	29.250	77.0%
5	3	205.25	22.71	27038.2	0.499	34.954	0.383	46.178	44.250	29.250	77.9%
5	4	322.80	22.72	27338.8	0.499	34.578	0.383	46.178	44.250	29.250	77.0%
7	1	37.70	22.80	26883.1	0.499	35.297	0.383	53.615	49.540	29.250	70.3%
7	2	156.05	22.81	27401.4	0.499	34.639	0.383	53.615	49.540	29.250	68.9%
7	3	217.70	22.80	26883.1	0.499	35.297	0.383	53.615	49.540	29.250	70.3%
7	4	336.05	22.81	27401.4	0.499	34.639	0.383	53.615	49.540	29.250	68.9%

Elevation: 10.17-ft

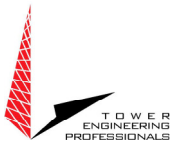
Loads	
Axial:	50.7 k
Moment:	3,247.5 k-ft
Shear:	40.4 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	23.3 k
Moment:	1,543.5 k-ft
Shear:	18.6 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	5
q:	0.163 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	220.97 in
Stitch:	18.00 in
Capacity:	8.1%

Pole Info	
OD:	43.07 in
t:	0.3750 in
Pole A_G :	51.55 in ²
Pole I_G :	11,991.1 in ⁴
Controlling	
Angle:	269.20°
I_G :	25,153.7 in ⁴
A_G :	112.07 in ²
Minimum	
Angle:	86.35°
I_{MIN} :	25,144.9 in ⁴
t_{EFF} :	0.8110 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
257.50	22.29	25229.6	0.452	34.424	0.360	0.032	62.534	62.534	31.267	62.534	55.8%

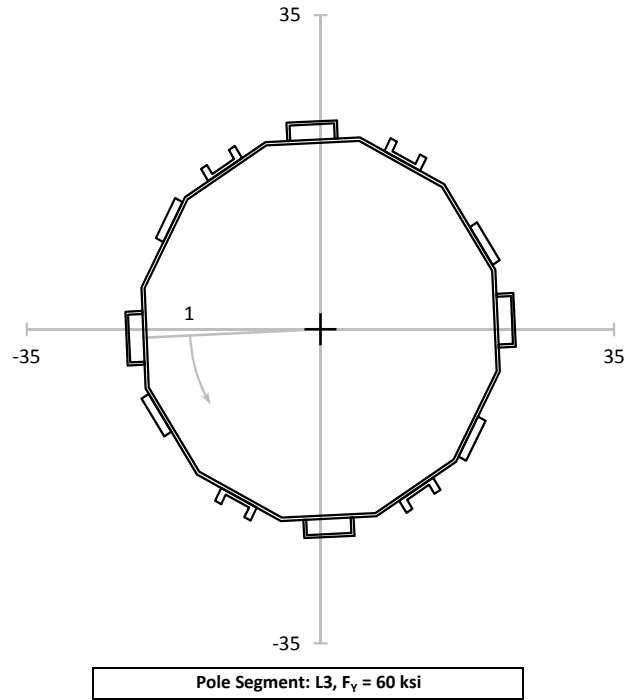
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	89.20	22.03	25153.7	0.452	34.131	0.360	51.601	37.832	29.250	89.0%
2	2	269.20	22.03	25153.7	0.452	34.131	0.360	51.601	37.832	29.250	89.0%
3	1	1.20	22.03	28702.1	0.452	29.908	0.360	51.601	37.832	29.250	77.9%
3	2	181.20	22.03	28702.1	0.452	29.908	0.360	51.601	37.832	29.250	77.9%
4	1	65.35	22.05	25604.9	0.452	33.554	0.360	53.494	49.881	29.250	66.4%
4	2	113.60	22.00	25896.2	0.452	33.114	0.360	53.494	49.881	29.250	65.5%
4	3	245.35	22.05	25604.9	0.452	33.554	0.360	53.494	49.881	29.250	66.4%
4	4	293.60	22.00	25896.2	0.452	33.114	0.360	53.494	49.881	29.250	65.5%
5	1	30.40	22.01	27604.3	0.452	31.079	0.360	46.178	44.250	29.250	69.2%
5	2	136.15	21.99	27235.2	0.452	31.466	0.360	46.178	44.250	29.250	70.1%
5	3	210.40	22.01	27604.3	0.452	31.079	0.360	46.178	44.250	29.250	69.2%
5	4	316.15	21.99	27235.2	0.452	31.466	0.360	46.178	44.250	29.250	70.1%
7	1	44.05	22.07	26767.5	0.452	32.128	0.360	53.615	49.540	29.250	64.0%
7	2	150.75	22.15	28058.9	0.452	30.768	0.360	53.615	49.540	29.250	61.2%
7	3	224.05	22.07	26767.5	0.452	32.128	0.360	53.615	49.540	29.250	64.0%
7	4	330.75	22.15	28058.9	0.452	30.768	0.360	53.615	49.540	29.250	61.2%



Elevation: 14.25-ft

Loads	
Axial:	48.6 k
Moment:	3,083.9 k-ft
Shear:	39.9 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	24.7 k
Moment:	1,563.1 k-ft
Shear:	20.3 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	5
q:	0.191 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	188.61 in
Stitch:	18.00 in
Capacity:	9.5%

Pole Info	
OD:	42.24 in
t:	0.3750 in
Pole A_g :	50.55 in ²
Pole I_g :	11,309.8 in ⁴
Controlling	
Angle:	267.40°
I_g :	22,501.5 in ⁴
A_g :	99.39 in ²
Minimum	
Angle:	241.70°
I_{MIN} :	22,258.1 in ⁴
t_{EFF} :	0.7587 in



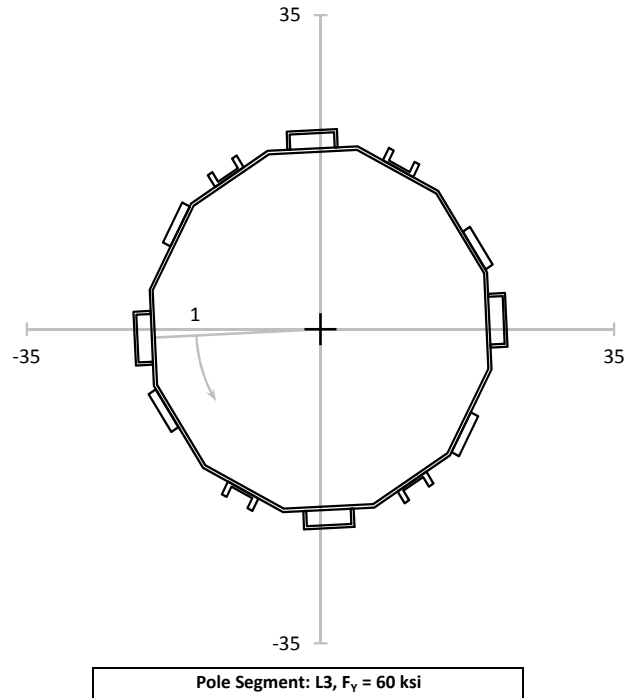
POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
73.65	21.87	22313.6	0.489	36.279	0.401	0.034	63.047	63.047	31.524	63.047	58.3%

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	87.40	21.60	22501.5	0.489	35.521	0.401	51.601	37.832	29.250	92.6%
2	2	267.40	21.60	22501.5	0.489	35.521	0.401	51.601	37.832	29.250	92.6%
3	1	2.85	21.59	23207.0	0.489	34.434	0.401	51.601	37.832	29.250	89.7%
3	2	182.85	21.59	23207.0	0.489	34.434	0.401	51.601	37.832	29.250	89.7%
4	1	60.20	21.73	22259.0	0.489	36.128	0.401	53.494	49.881	29.250	71.5%
4	2	117.00	21.70	23133.4	0.489	34.715	0.401	53.494	49.881	29.250	68.6%
4	3	240.20	21.73	22259.0	0.489	36.128	0.401	53.494	49.881	29.250	71.5%
4	4	297.00	21.70	23133.4	0.489	34.715	0.401	53.494	49.881	29.250	68.6%
5	1	26.50	21.73	22688.7	0.489	35.448	0.401	46.178	44.250	29.250	79.0%
5	2	142.40	21.76	23519.4	0.489	34.240	0.401	46.178	44.250	29.250	76.3%
5	3	206.50	21.73	22688.7	0.489	35.448	0.401	46.178	44.250	29.250	79.0%
5	4	322.40	21.76	23519.4	0.489	34.240	0.401	46.178	44.250	29.250	76.3%

Elevation: 24.00-ft

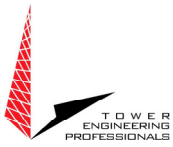
Loads	
Axial:	44.0 k
Moment:	2,701.6 k-ft
Shear:	38.6 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	23.0 k
Moment:	1,443.1 k-ft
Shear:	20.2 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	5
q:	0.207 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	174.20 in
Stitch:	18.00 in
Capacity:	10.3%

Pole Info	
OD:	40.27 in
t:	0.3750 in
Pole A_g :	48.17 in ²
Pole I_g :	9,787.2 in ⁴
Controlling	
Angle:	267.30°
I_g :	18,423.3 in ⁴
A_g :	92.17 in ²
Minimum	
Angle:	74.20°
I_{MIN} :	18,322.2 in ⁴
t_{EFF} :	0.7206 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
74.85	20.86	18322.5	0.477	36.909	0.419	0.037	64.273	64.273	32.136	64.273	58.2%

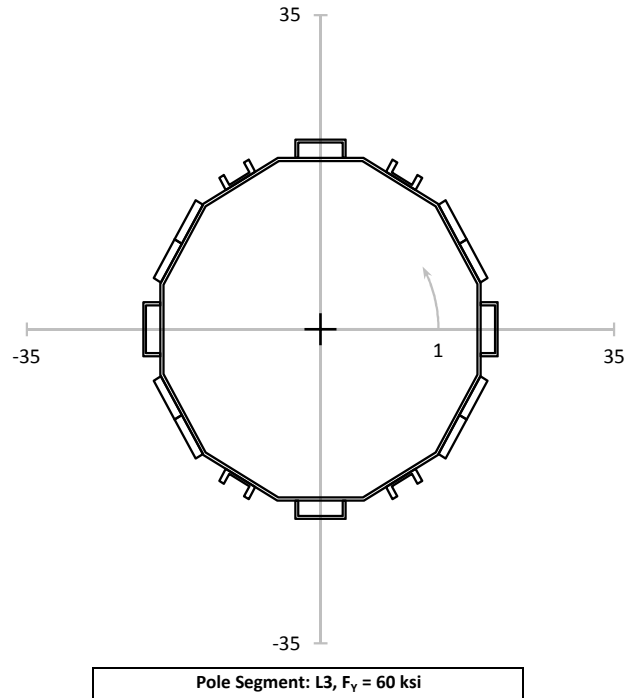
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	87.30	20.61	18423.3	0.477	36.271	0.419	51.601	37.832	29.250	94.6%
2	2	267.30	20.61	18423.3	0.477	36.271	0.419	51.601	37.832	29.250	94.6%
3	1	3.50	20.60	20078.0	0.477	33.257	0.419	51.601	37.832	29.250	86.7%
3	2	183.50	20.60	20078.0	0.477	33.257	0.419	51.601	37.832	29.250	86.7%
5	1	28.90	20.68	19318.4	0.477	34.703	0.419	46.178	44.250	29.250	77.4%
5	2	138.70	20.73	19927.3	0.477	33.717	0.419	46.178	44.250	29.250	75.1%
5	3	208.90	20.68	19318.4	0.477	34.703	0.419	46.178	44.250	29.250	77.4%
5	4	318.70	20.73	19927.3	0.477	33.717	0.419	46.178	44.250	29.250	75.1%
8	1	62.45	20.71	18404.2	0.477	36.475	0.419	53.615	49.540	29.250	72.7%
8	2	114.20	20.62	19136.0	0.477	34.932	0.419	53.615	49.540	29.250	69.6%
8	3	242.45	20.71	18404.2	0.477	36.475	0.419	53.615	49.540	29.250	72.7%
8	4	294.20	20.62	19136.0	0.477	34.932	0.419	53.615	49.540	29.250	69.6%



Elevation: 34.33-ft

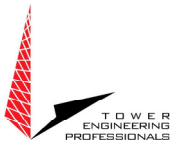
Loads	
Axial:	39.3 k
Moment:	2,309.6 k-ft
Shear:	37.2 k
Torsion:	2.9 k-ft
Equivalent Loads to Pole	
Axial:	16.4 k
Moment:	1,047.7 k-ft
Shear:	15.5 k
Torsion:	2.9 k-ft
Shear Flow	
Controlling Mod:	2
q:	0.123 k/in
Bolt/Weld Cap:	33.4 k/bolt
Max Spacing:	271.23 in
Stitch:	24.00 in
Capacity:	8.8%

Pole Info	
OD:	38.18 in
t:	0.3750 in
Pole A_G :	45.65 in ²
Pole I_G :	8,329.7 in ⁴
Controlling	
Angle:	90.00°
I_G :	18,217.0 in ⁴
A_G :	109.65 in ²
Minimum	
Angle:	90.00°
I_{MIN} :	18,217.0 in ⁴
t_{EFF} :	0.8520 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
279.60	19.69	18363.3	0.358	29.720	0.339	0.041	65.572	65.572	32.786	65.572	45.9%

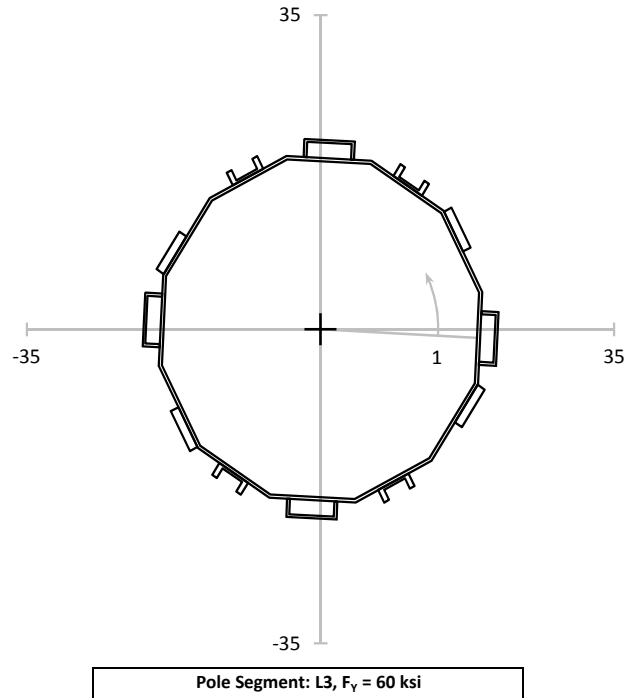
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	90.00	19.59	18217.0	0.358	29.807	0.339	51.601	37.832	29.250	77.9%
2	2	270.00	19.59	18217.0	0.358	29.807	0.339	51.601	37.832	29.250	77.9%
3	1	360.00	19.59	23478.2	0.358	23.128	0.339	51.601	37.832	29.250	60.2%
3	2	180.00	19.59	23478.2	0.358	23.128	0.339	51.601	37.832	29.250	60.2%
5	1	35.65	19.25	21691.0	0.358	24.597	0.339	46.178	44.250	29.250	54.8%
5	2	128.50	19.14	20255.8	0.358	26.195	0.339	46.178	44.250	29.250	58.4%
5	3	215.65	19.25	21691.0	0.358	24.597	0.339	46.178	44.250	29.250	54.8%
5	4	308.50	19.14	20255.8	0.358	26.195	0.339	46.178	44.250	29.250	58.4%
6	1	51.50	19.14	20255.8	0.358	26.195	0.339	46.178	44.250	29.250	58.4%
6	2	144.35	19.25	21691.0	0.358	24.597	0.339	46.178	44.250	29.250	54.8%
6	3	231.50	19.14	20255.8	0.358	26.195	0.339	46.178	44.250	29.250	58.4%
6	4	324.35	19.25	21691.0	0.358	24.597	0.339	46.178	44.250	29.250	54.8%
8	1	70.15	19.37	18823.6	0.358	28.525	0.339	53.615	49.540	29.250	56.9%
8	2	109.85	19.37	18823.6	0.358	28.525	0.339	53.615	49.540	29.250	56.9%
8	3	250.15	19.37	18823.6	0.358	28.525	0.339	53.615	49.540	29.250	56.9%
8	4	289.85	19.37	18823.6	0.358	28.525	0.339	53.615	49.540	29.250	56.9%



Elevation: 34.75-ft

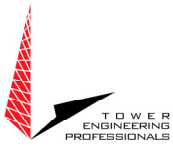
Loads	
Axial:	39.1 k
Moment:	2,294.3 k-ft
Shear:	37.1 k
Torsion:	3.0 k-ft
Equivalent Loads to Pole	
Axial:	19.9 k
Moment:	1,190.9 k-ft
Shear:	18.9 k
Torsion:	3.0 k-ft
Shear Flow	
Controlling Mod:	6
q:	0.216 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	166.55 in
Stitch:	18.00 in
Capacity:	10.8%

Pole Info	
OD:	38.10 in
t:	0.3750 in
Pole A_G :	45.55 in ²
Pole I_G :	8,274.2 in ⁴
Controlling	
Angle:	92.95°
I_G :	16,037.7 in ⁴
A_G :	89.55 in ²
Minimum	
Angle:	106.55°
I_{MIN} :	15,938.7 in ⁴
t_{EFF} :	0.7440 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
105.30	19.73	15939.6	0.436	34.087	0.414	0.042	65.624	65.624	32.812	65.624	52.6%

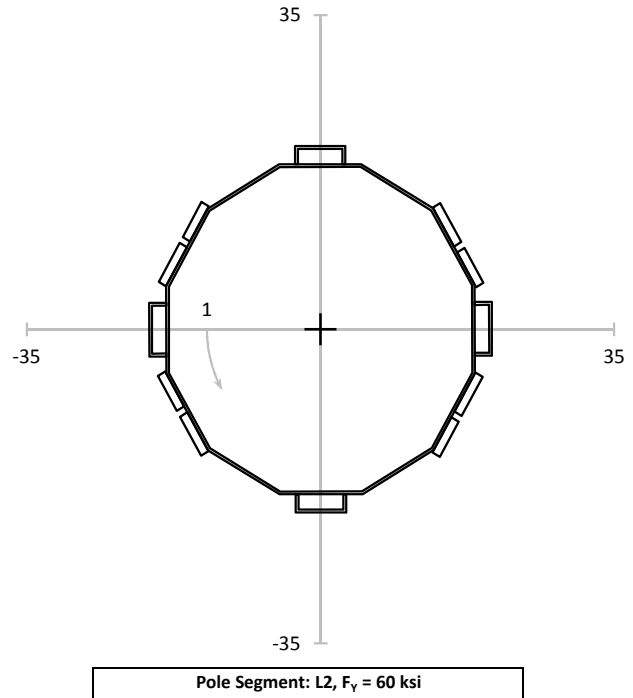
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	92.95	19.52	16037.7	0.436	33.515	0.414	51.601	37.832	29.250	87.5%
2	2	272.95	19.52	16037.7	0.436	33.515	0.414	51.601	37.832	29.250	87.5%
3	1	356.20	19.51	17511.4	0.436	30.668	0.414	51.601	37.832	29.250	79.9%
3	2	176.20	19.51	17511.4	0.436	30.668	0.414	51.601	37.832	29.250	79.9%
6	1	41.85	19.65	17401.3	0.436	31.083	0.414	46.178	44.250	29.250	69.3%
6	2	151.20	19.60	16822.1	0.436	32.073	0.414	46.178	44.250	29.250	71.5%
6	3	221.85	19.65	17401.3	0.436	31.083	0.414	46.178	44.250	29.250	69.3%
6	4	331.20	19.60	16822.1	0.436	32.073	0.414	46.178	44.250	29.250	71.5%
8	1	66.05	19.53	16693.6	0.436	32.209	0.414	53.615	49.540	29.250	64.2%
8	2	117.60	19.62	16004.3	0.436	33.755	0.414	53.615	49.540	29.250	67.3%
8	3	246.05	19.53	16693.6	0.436	32.209	0.414	53.615	49.540	29.250	64.2%
8	4	297.60	19.62	16004.3	0.436	33.755	0.414	53.615	49.540	29.250	67.3%



Elevation: 44.50-ft

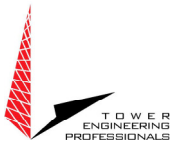
Loads	
Axial:	34.0 k
Moment:	1,941.4 k-ft
Shear:	35.2 k
Torsion:	3.2 k-ft
Equivalent Loads to Pole	
Axial:	14.3 k
Moment:	989.2 k-ft
Shear:	14.8 k
Torsion:	3.2 k-ft
Shear Flow	
Controlling Mod:	2
q:	0.169 k/in
Bolt/Weld Cap:	33.4 k/bolt
Max Spacing:	197.69 in
Stitch:	24.00 in
Capacity:	12.1%

Pole Info	
OD:	36.75 in
t:	0.3125 in
Pole A_G :	36.67 in ²
Pole I_G :	6,215.7 in ⁴
Controlling	
Angle:	269.85°
I_G :	12,097.9 in ⁴
A_G :	86.99 in ²
Minimum	
Angle:	89.65°
I_{MIN} :	12,097.9 in ⁴
t_{EFF} :	0.6241 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
82.55	18.87	12199.2	0.390	36.042	0.404	0.059	61.887	61.887	30.944	61.887	58.9%

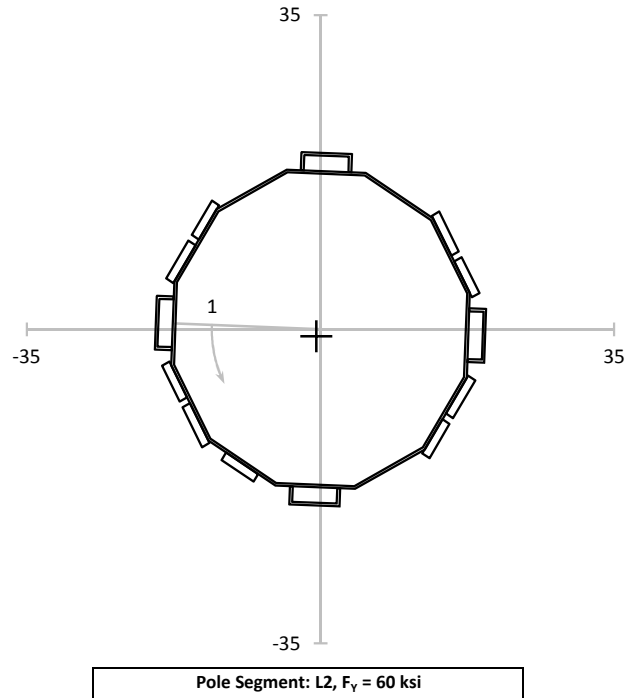
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	89.85	18.88	12097.9	0.390	36.351	0.404	51.601	37.832	29.250	95.1%
2	2	269.85	18.88	12097.9	0.390	36.351	0.404	51.601	37.832	29.250	95.1%
3	1	0.80	18.88	18688.4	0.390	23.529	0.404	51.601	37.832	29.250	61.2%
3	2	180.80	18.88	18688.4	0.390	23.529	0.404	51.601	37.832	29.250	61.2%
6	1	60.00	17.60	13713.5	0.390	29.895	0.404	46.178	44.250	29.250	66.7%
6	2	134.30	17.50	15351.6	0.390	26.551	0.404	46.178	44.250	29.250	59.1%
6	3	240.00	17.60	13713.5	0.390	29.895	0.404	46.178	44.250	29.250	66.7%
6	4	314.30	17.50	15351.6	0.390	26.551	0.404	46.178	44.250	29.250	59.1%
14	1	44.05	17.58	15466.0	0.390	26.487	0.404	43.686	43.333	29.250	61.5%
14	2	118.70	17.69	13650.2	0.390	30.188	0.404	43.686	43.333	29.250	70.0%
14	3	224.05	17.58	15466.0	0.390	26.487	0.404	43.686	43.333	29.250	61.5%
15	1	298.70	17.69	13650.2	0.390	30.188	0.404	43.686	43.333	29.250	70.0%



Elevation: 52.04-ft

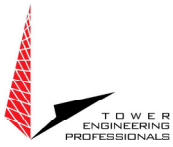
Loads	
Axial:	30.8 k
Moment:	1,681.5 k-ft
Shear:	33.7 k
Torsion:	3.4 k-ft
Equivalent Loads to Pole	
Axial:	12.0 k
Moment:	772.0 k-ft
Shear:	13.2 k
Torsion:	3.4 k-ft
Shear Flow	
Controlling Mod:	2
q:	0.164 k/in
Bolt/Weld Cap:	33.4 k/bolt
Max Spacing:	203.36 in
Stitch:	24.00 in
Capacity:	11.8%

Pole Info	
OD:	35.23 in
t:	0.3125 in
Pole A_g :	35.14 in ²
Pole I_g :	5,468.3 in ⁴
Controlling	
Angle:	272.15°
I_g :	11,928.7 in ⁴
A_g :	89.96 in ²
Minimum	
Angle:	96.00°
I_{MIN} :	11,904.2 in ⁴
t_{EFF} :	0.7037 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
279.70	18.87	11927.2	0.342	31.922	0.375	0.068	63.025	63.025	31.512	63.025	51.2%

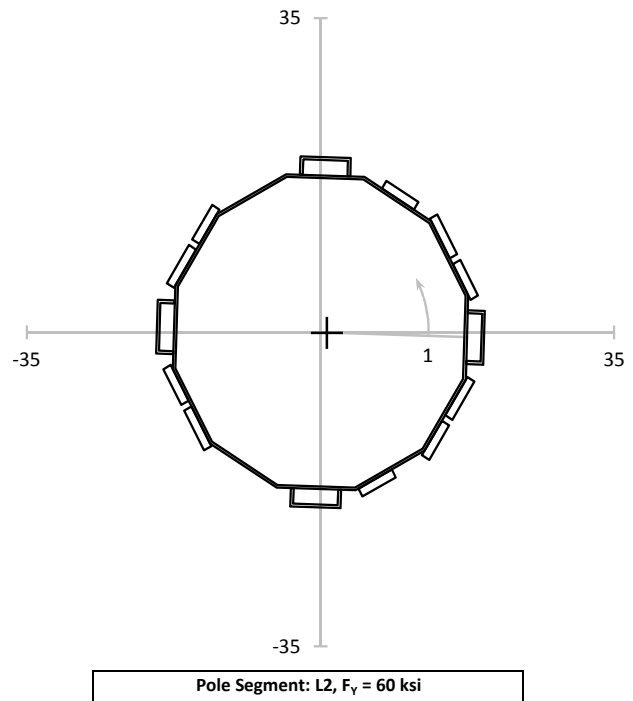
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	93.65	17.32	11913.3	0.342	29.344	0.375	51.601	37.832	29.250	76.7%
2	2	272.15	18.87	11928.7	0.342	31.920	0.375	51.601	37.832	29.250	83.5%
3	1	345.15	17.27	16689.7	0.342	20.884	0.375	51.601	37.832	29.250	54.3%
3	2	176.55	18.49	17235.5	0.342	21.645	0.375	51.601	37.832	29.250	56.3%
6	1	57.55	16.31	14021.2	0.342	23.476	0.375	46.178	44.250	29.250	52.3%
6	2	140.05	17.25	14554.1	0.342	23.922	0.375	46.178	44.250	29.250	53.3%
6	3	239.60	17.89	13832.1	0.342	26.102	0.375	46.178	44.250	29.250	58.2%
6	4	314.20	17.00	14000.8	0.342	24.497	0.375	46.178	44.250	29.250	54.6%
10	1	75.80	16.56	12556.5	0.342	26.611	0.375	43.686	43.333	29.250	61.7%
14	1	34.75	16.99	16114.1	0.342	21.269	0.375	43.686	43.333	29.250	49.5%
14	2	124.25	17.23	13132.8	0.342	26.468	0.375	43.686	43.333	29.250	61.4%
14	3	220.45	18.12	15628.2	0.342	23.402	0.375	43.686	43.333	29.250	54.4%
15	1	300.15	17.66	12822.3	0.342	27.786	0.375	43.686	43.333	29.250	64.4%



Elevation: 53.50-ft

Loads	
Axial:	30.1 k
Moment:	1,632.6 k-ft
Shear:	33.4 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	11.2 k
Moment:	664.6 k-ft
Shear:	12.4 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	9
q:	0.200 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	180.31 in
Stitch:	20.00 in
Capacity:	11.1%

Pole Info	
OD:	34.94 in
t:	0.3125 in
Pole A_G :	34.84 in ²
Pole I_G :	5,330.9 in ⁴
Controlling	
Angle:	91.80°
I_G :	13,017.1 in ⁴
A_G :	94.16 in ²
Minimum	
Angle:	90.75°
I_{MIN} :	13,015.8 in ⁴
t_{EFF} :	0.7959 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ΦF_A (ksi)	ΦF_B (ksi)	ΦF_V (ksi)	ΦF_T (ksi)	Capacity
100.95	18.25	13146.5	0.320	27.190	0.355	0.070	63.245	63.245	31.622	63.245	43.5%

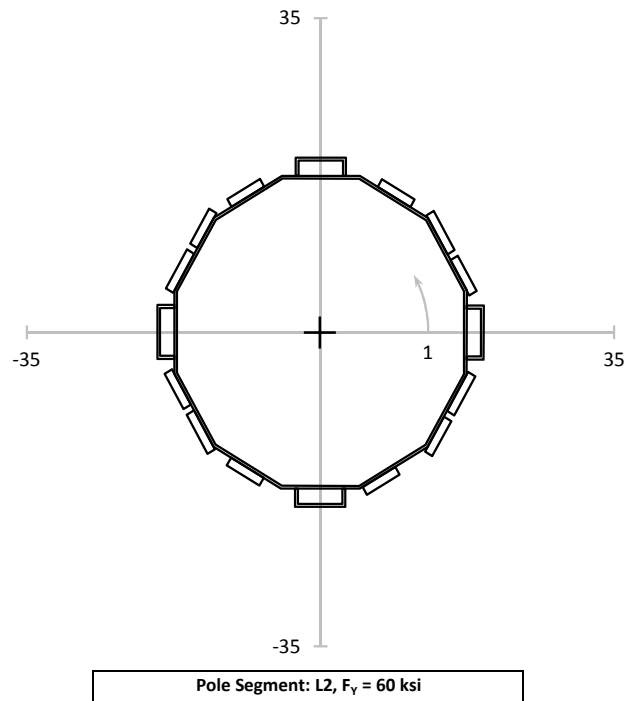
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ΦF_A (ksi)	ΦF_B (ksi)	ΦF_V (ksi)	Capacity
2	1	91.80	18.03	13017.1	0.320	27.137	0.355	51.601	37.832	29.250	70.9%
2	2	268.80	17.93	13020.7	0.320	26.981	0.355	51.601	37.832	29.250	70.5%
3	1	359.60	17.19	17198.5	0.320	19.582	0.355	51.601	37.832	29.250	50.9%
3	2	179.00	18.74	17196.3	0.320	21.351	0.355	51.601	37.832	29.250	55.6%
6	1	54.95	16.94	14449.0	0.320	22.967	0.355	46.178	44.250	29.250	51.2%
6	2	144.40	18.30	15728.8	0.320	22.789	0.355	46.178	44.250	29.250	50.8%
6	3	231.95	18.04	14660.2	0.320	24.108	0.355	46.178	44.250	29.250	53.8%
6	4	322.50	16.84	15595.1	0.320	21.159	0.355	46.178	44.250	29.250	47.1%
9	1	283.60	17.57	13222.1	0.320	26.037	0.355	43.686	43.333	29.250	60.3%
10	1	72.70	17.34	13418.4	0.320	25.321	0.355	43.686	43.333	29.250	58.7%
14	1	35.45	17.00	15845.5	0.320	21.015	0.355	43.686	43.333	29.250	48.9%
14	2	126.55	18.18	14446.3	0.320	24.652	0.355	43.686	43.333	29.250	57.2%
14	3	212.75	18.43	16026.5	0.320	22.529	0.355	43.686	43.333	29.250	52.3%
15	1	304.00	16.99	14272.4	0.320	23.322	0.355	43.686	43.333	29.250	54.1%



Elevation: 54.00-ft

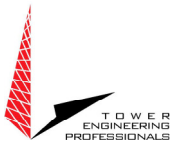
Loads	
Axial:	29.9 k
Moment:	1,615.9 k-ft
Shear:	33.3 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	10.1 k
Moment:	562.4 k-ft
Shear:	11.2 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	9
q:	0.175 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	205.59 in
Stitch:	20.00 in
Capacity:	9.7%

Pole Info	
OD:	34.83 in
t:	0.3125 in
Pole A_G :	34.74 in ²
Pole I_G :	5,284.4 in ⁴
Controlling	
Angle:	90.10°
I_G :	15,100.2 in ⁴
A_G :	103.06 in ²
Minimum	
Angle:	271.10°
I_{MIN} :	15,099.4 in ⁴
t_{EFF} :	0.9438 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ΦF_A (ksi)	ΦF_B (ksi)	ΦF_V (ksi)	ΦF_T (ksi)	Capacity
101.15	18.03	15184.3	0.290	23.027	0.323	0.071	63.320	63.320	31.660	63.320	36.8%

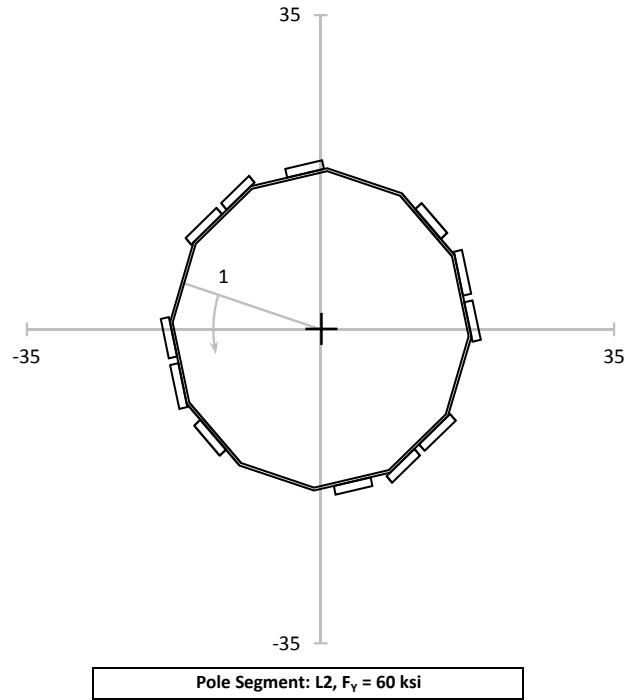
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ΦF_A (ksi)	ΦF_B (ksi)	ΦF_V (ksi)	Capacity
2	1	90.10	17.96	15100.2	0.290	23.064	0.323	51.601	37.832	29.250	60.2%
2	2	270.45	17.87	15099.7	0.290	22.953	0.323	51.601	37.832	29.250	59.9%
3	1	359.70	17.99	17875.9	0.290	19.517	0.323	51.601	37.832	29.250	50.8%
3	2	179.30	17.84	17874.8	0.290	19.354	0.323	51.601	37.832	29.250	50.4%
6	1	47.50	17.92	16419.5	0.290	21.167	0.323	46.178	44.250	29.250	47.2%
6	2	149.50	17.85	17115.7	0.290	20.225	0.323	46.178	44.250	29.250	45.1%
6	3	227.55	17.75	16417.1	0.290	20.970	0.323	46.178	44.250	29.250	46.7%
6	4	330.00	17.96	17137.2	0.290	20.323	0.323	46.178	44.250	29.250	45.3%
9	1	288.10	17.93	15337.5	0.290	22.664	0.323	43.686	43.333	29.250	52.6%
10	1	67.35	17.84	15549.2	0.290	22.247	0.323	43.686	43.333	29.250	51.6%
11	1	112.70	17.78	15476.6	0.290	22.281	0.323	43.686	43.333	29.250	51.7%
11	2	247.60	17.69	15540.3	0.290	22.074	0.323	43.686	43.333	29.250	51.2%
14	1	27.90	18.10	17311.9	0.290	20.276	0.323	43.686	43.333	29.250	47.1%
14	2	130.70	17.89	16229.2	0.290	21.370	0.323	43.686	43.333	29.250	49.6%
14	3	207.80	17.93	17315.8	0.290	20.081	0.323	43.686	43.333	29.250	46.6%
15	1	311.20	17.95	16253.1	0.290	21.410	0.323	43.686	43.333	29.250	49.7%



Elevation: 54.50-ft

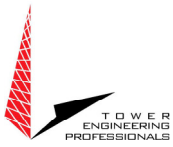
Loads	
Axial:	29.6 k
Moment:	1,599.3 k-ft
Shear:	33.2 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	11.3 k
Moment:	640.6 k-ft
Shear:	12.7 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	9
q:	0.202 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	178.42 in
Stitch:	20.00 in
Capacity:	11.2%

Pole Info	
OD:	34.73 in
t:	0.3125 in
Pole A_G :	34.64 in ²
Pole I_G :	5,238.1 in ⁴
Controlling	
Angle:	287.50°
I_G :	13,222.2 in ⁴
A_G :	90.64 in ²
Minimum	
Angle:	271.10°
I_{MIN} :	13,001.6 in ⁴
t_{EFF} :	0.8103 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
280.70	17.97	13078.7	0.327	26.375	0.366	0.071	63.396	63.396	31.698	63.396	42.1%

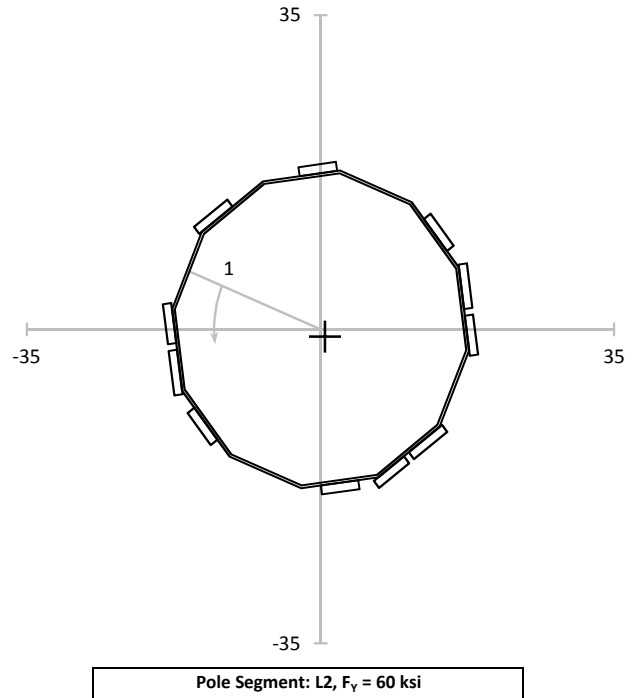
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
6	1	48.85	17.81	14248.8	0.327	23.989	0.366	46.178	44.250	29.250	53.5%
6	2	148.15	17.73	14946.5	0.327	22.766	0.366	46.178	44.250	29.250	50.7%
6	3	228.90	17.62	14246.4	0.327	23.735	0.366	46.178	44.250	29.250	52.9%
6	4	328.75	17.86	14972.8	0.327	22.887	0.366	46.178	44.250	29.250	51.0%
9	1	287.50	17.85	13222.2	0.327	25.916	0.366	43.686	43.333	29.250	60.1%
10	1	68.20	17.76	13419.0	0.327	25.403	0.366	43.686	43.333	29.250	58.9%
11	1	111.85	17.70	13348.8	0.327	25.448	0.366	43.686	43.333	29.250	59.0%
11	2	248.45	17.60	13410.4	0.327	25.180	0.366	43.686	43.333	29.250	58.4%
14	1	29.10	18.01	15153.2	0.327	22.811	0.366	43.686	43.333	29.250	53.0%
14	2	129.35	17.76	14060.7	0.327	24.242	0.366	43.686	43.333	29.250	56.3%
14	3	209.00	17.82	15157.2	0.327	22.560	0.366	43.686	43.333	29.250	52.4%
15	1	309.90	17.83	14086.5	0.327	24.287	0.366	43.686	43.333	29.250	56.4%



Elevation: 55.75-ft

Loads	
Axial:	29.1 k
Moment:	1,558.0 k-ft
Shear:	32.9 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	11.6 k
Moment:	672.8 k-ft
Shear:	13.2 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	9
q:	0.232 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	155.42 in
Stitch:	20.00 in
Capacity:	12.9%

Pole Info	
OD:	34.48 in
t:	0.3125 in
Pole A_G :	34.38 in ²
Pole I_G :	5,123.6 in ⁴
Controlling	
Angle:	292.45°
I_G :	11,945.9 in ⁴
A_G :	85.88 in ²
Minimum	
Angle:	106.80°
I_{MIN} :	11,917.9 in ⁴
t_{EFF} :	0.7559 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
106.95	18.61	11917.9	0.338	29.200	0.384	0.073	63.584	63.584	31.792	63.584	46.5%

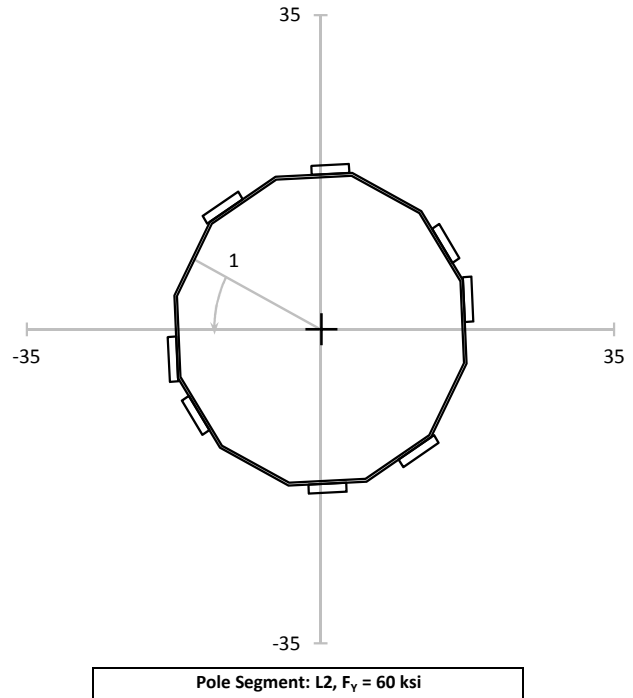
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
6	1	44.65	17.99	14185.8	0.338	23.713	0.384	46.178	44.250	29.250	52.8%
6	2	146.45	16.57	13098.4	0.338	23.648	0.384	46.178	44.250	29.250	52.7%
6	3	232.25	17.30	13843.2	0.338	23.364	0.384	46.178	44.250	29.250	52.1%
6	4	325.20	18.45	13036.5	0.338	26.465	0.384	46.178	44.250	29.250	59.1%
9	1	292.45	18.67	11945.9	0.338	29.218	0.384	43.686	43.333	29.250	67.7%
10	1	69.00	17.30	13008.0	0.338	24.869	0.384	43.686	43.333	29.250	57.7%
11	1	114.75	16.83	11973.2	0.338	26.274	0.384	43.686	43.333	29.250	60.9%
11	2	254.75	17.47	12735.2	0.338	25.648	0.384	43.686	43.333	29.250	59.5%
14	1	18.65	18.58	14815.4	0.338	23.451	0.384	43.686	43.333	29.250	54.5%
14	2	130.35	16.77	12380.5	0.338	25.324	0.384	43.686	43.333	29.250	58.8%
14	3	206.90	17.40	14729.4	0.338	22.081	0.384	43.686	43.333	29.250	51.3%



Elevation: 56.00-ft

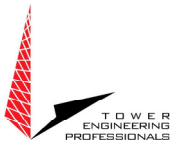
Loads	
Axial:	28.9 k
Moment:	1,549.8 k-ft
Shear:	32.9 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	13.7 k
Moment:	742.9 k-ft
Shear:	15.6 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	6
q:	0.274 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	131.29 in
Stitch:	18.00 in
Capacity:	13.7%

Pole Info	
OD:	34.43 in
t:	0.3125 in
Pole A_G :	34.33 in ²
Pole I_G :	5,101.0 in ⁴
Controlling	
Angle:	297.30°
I_G :	10,746.8 in ⁴
A_G :	72.33 in ²
Minimum	
Angle:	135.60°
I_{MIN} :	10,642.3 in ⁴
t_{EFF} :	0.6731 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
135.40	17.87	10642.3	0.400	31.224	0.455	0.073	63.622	63.622	31.811	63.622	49.7%

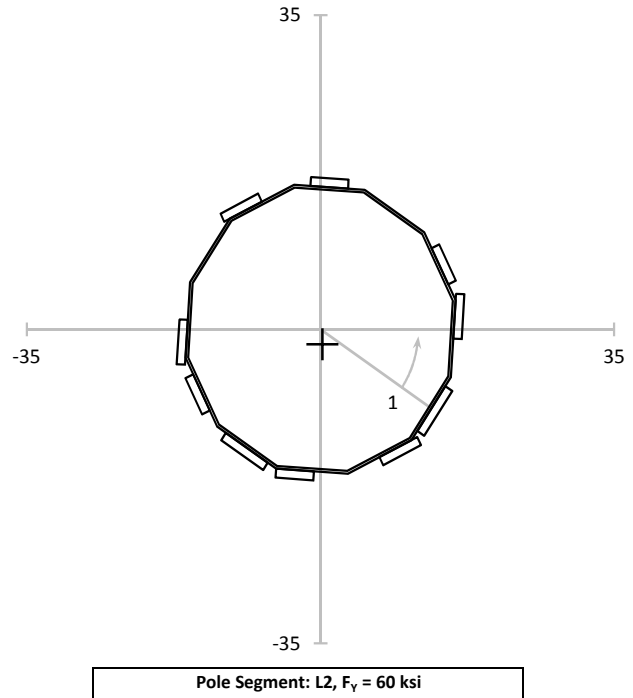
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
6	1	36.30	18.01	11674.7	0.400	28.684	0.455	46.178	44.250	29.250	63.9%
6	2	154.30	17.78	10751.4	0.400	30.761	0.455	46.178	44.250	29.250	68.6%
6	3	216.45	17.76	11675.6	0.400	28.290	0.455	46.178	44.250	29.250	63.1%
6	4	334.85	17.93	10757.6	0.400	31.005	0.455	46.178	44.250	29.250	69.2%
9	1	297.30	17.78	10746.8	0.400	30.776	0.455	43.686	43.333	29.250	71.4%
10	1	62.75	17.80	11610.1	0.400	28.512	0.455	43.686	43.333	29.250	66.2%
11	1	122.15	17.70	10699.6	0.400	30.762	0.455	43.686	43.333	29.250	71.4%
11	2	243.20	17.58	11605.4	0.400	28.178	0.455	43.686	43.333	29.250	65.4%



Elevation: 69.50-ft

Loads	
Axial:	24.0 k
Moment:	1,120.4 k-ft
Shear:	30.8 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	9.3 k
Moment:	446.5 k-ft
Shear:	11.9 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	11
q:	0.246 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	146.15 in
Stitch:	20.00 in
Capacity:	13.7%

Pole Info	
OD:	31.70 in
t:	0.3125 in
Pole A_g :	31.59 in ²
Pole I_g :	3,972.7 in ⁴
Controlling	
Angle:	123.75°
I_g :	10,115.7 in ⁴
A_g :	81.59 in ²
Minimum	
Angle:	135.40°
I_{MIN} :	10,066.3 in ⁴
t_{EFF} :	0.8325 in



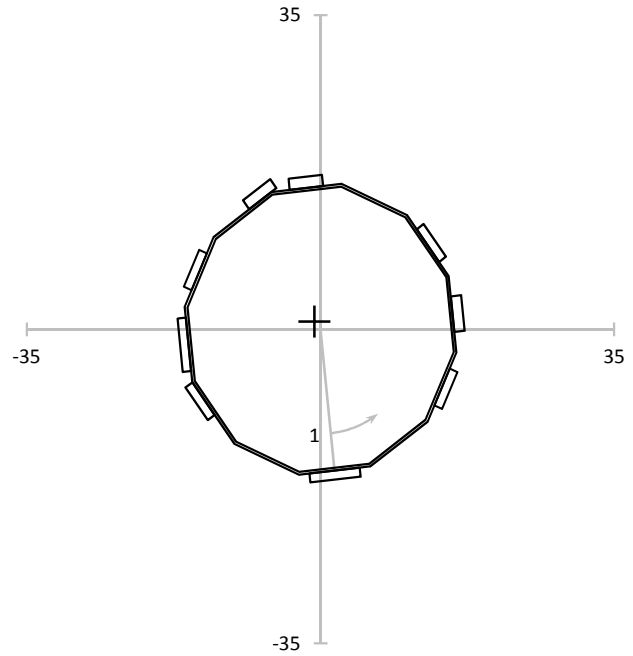
POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
134.80	18.09	10066.5	0.294	24.166	0.378	0.087	65.658	65.658	32.829	65.658	37.3%

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
6	1	44.25	16.55	11273.5	0.294	19.735	0.378	46.178	44.250	29.250	44.0%
6	2	152.45	18.01	10170.0	0.294	23.804	0.378	46.178	44.250	29.250	53.1%
6	3	209.70	16.68	11185.4	0.294	20.045	0.378	46.178	44.250	29.250	44.7%
6	4	337.00	15.02	10229.8	0.294	19.745	0.378	46.178	44.250	29.250	44.0%
9	1	295.35	14.85	10208.5	0.294	19.556	0.378	43.686	43.333	29.250	45.5%
10	1	70.10	16.90	11063.3	0.294	20.542	0.378	43.686	43.333	29.250	47.7%
11	1	123.75	17.98	10115.7	0.294	23.893	0.378	43.686	43.333	29.250	55.4%
11	2	236.60	15.88	11228.5	0.294	19.016	0.378	43.686	43.333	29.250	44.2%
12	1	358.25	15.20	10624.6	0.294	19.233	0.378	48.528	47.500	29.250	40.3%
12	2	272.25	15.04	10631.5	0.294	19.018	0.378	48.528	47.500	29.250	39.8%

Elevation: 69.75-ft

Loads	
Axial:	23.9 k
Moment:	1,112.7 k-ft
Shear:	30.8 k
Torsion:	3.5 k-ft
Equivalent Loads to Pole	
Axial:	9.8 k
Moment:	487.4 k-ft
Shear:	12.7 k
Torsion:	3.5 k-ft
Shear Flow	
Controlling Mod:	19
q:	0.261 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	137.91 in
Stitch:	27.00 in
Capacity:	19.6%

Pole Info	
OD:	31.65 in
t:	0.3125 in
Pole A_G :	31.54 in ²
Pole I_G :	3,953.6 in ⁴
Controlling	
Angle:	173.90°
I_G :	9,134.4 in ⁴
A_G :	76.54 in ²
Minimum	
Angle:	164.50°
I_{MIN} :	9,084.9 in ⁴
t_{EFF} :	0.7489 in



Pole Segment: L2, $F_y = 60$ ksi

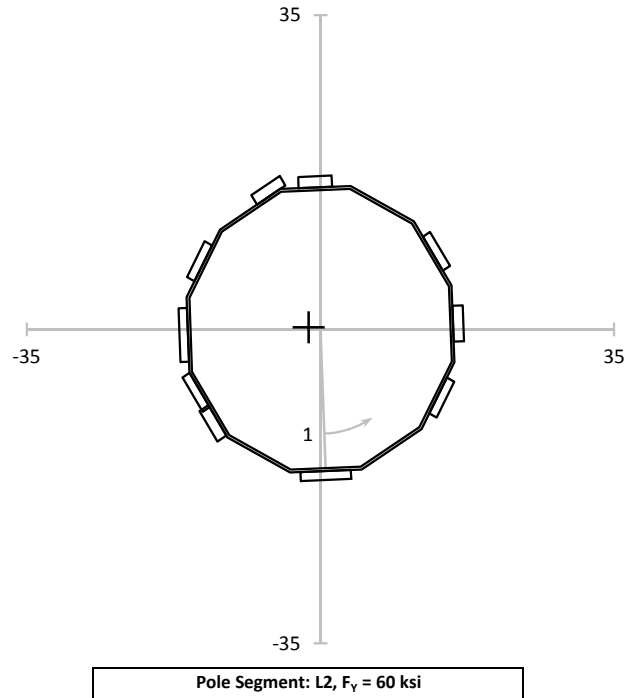
POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
166.85	17.14	9088.0	0.312	25.190	0.402	0.087	65.696	65.696	32.848	65.696	38.8%

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
9	1	307.25	16.00	9762.8	0.312	21.884	0.402	43.686	43.333	29.250	50.8%
10	1	51.20	17.21	10646.7	0.312	21.579	0.402	43.686	43.333	29.250	50.1%
11	1	126.50	16.18	9786.3	0.312	22.074	0.402	43.686	43.333	29.250	51.3%
11	2	235.85	15.24	10747.0	0.312	18.936	0.402	43.686	43.333	29.250	44.1%
12	1	357.15	17.20	9173.8	0.312	25.033	0.402	48.528	47.500	29.250	52.2%
12	2	281.45	15.57	10555.6	0.312	19.690	0.402	48.528	47.500	29.250	41.2%
18a	1	92.75	17.02	10754.4	0.312	21.130	0.402	41.614	39.375	29.250	52.9%
18a	2	173.90	15.51	9134.4	0.312	22.665	0.402	41.614	39.375	29.250	56.8%
19	1	189.95	15.46	9427.0	0.312	21.900	0.402	41.614	39.375	29.250	54.8%

Elevation: 70.00-ft

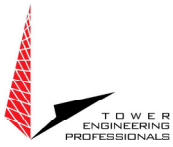
Loads	
Axial:	23.7 k
Moment:	1,105.0 k-ft
Shear:	30.7 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	9.2 k
Moment:	444.6 k-ft
Shear:	11.9 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	19
q:	0.255 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	141.07 in
Stitch:	27.00 in
Capacity:	19.1%

Pole Info	
OD:	31.60 in
t:	0.3125 in
Pole A_g :	31.49 in ²
Pole I_g :	3,934.5 in ⁴
Controlling	
Angle:	177.75°
I_g :	9,757.6 in ⁴
A_g :	81.49 in ²
Minimum	
Angle:	5.25°
I_{MIN} :	9,726.8 in ⁴
t_{EFF} :	0.8107 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
15.60	16.99	9784.6	0.291	23.032	0.377	0.087	65.734	65.734	32.867	65.734	35.5%

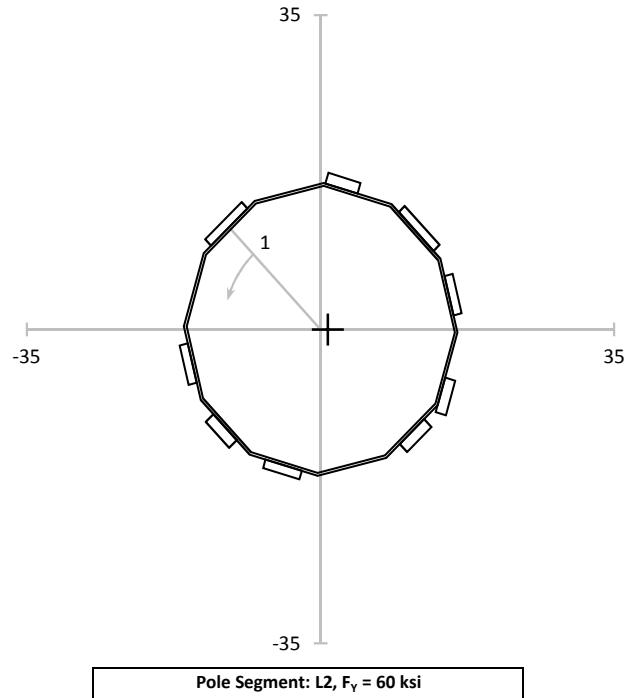
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
9	1	303.65	15.12	11119.1	0.291	18.026	0.377	43.686	43.333	29.250	41.9%
10	1	52.00	17.41	10680.4	0.291	21.612	0.377	43.686	43.333	29.250	50.2%
12	1	4.95	16.62	9726.8	0.291	22.655	0.377	48.528	47.500	29.250	47.3%
12	2	269.05	14.89	11504.3	0.291	17.164	0.377	48.528	47.500	29.250	36.0%
13	1	124.90	17.25	11085.8	0.291	20.628	0.377	43.686	43.333	29.250	47.9%
13	2	228.55	14.75	10572.1	0.291	18.505	0.377	43.686	43.333	29.250	43.0%
18a	1	86.45	17.81	11483.1	0.291	20.568	0.377	41.614	39.375	29.250	51.5%
18a	2	177.75	16.21	9757.6	0.291	22.030	0.377	41.614	39.375	29.250	55.2%
18b	1	320.40	15.40	10622.0	0.291	19.221	0.377	41.614	39.375	29.250	48.1%
19	1	192.55	16.01	9755.7	0.291	21.765	0.377	41.614	39.375	29.250	54.6%



Elevation: 70.50-ft

Loads	
Axial:	23.5 k
Moment:	1,089.7 k-ft
Shear:	30.6 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	9.6 k
Moment:	453.7 k-ft
Shear:	12.5 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	20
q:	0.258 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	139.63 in
Stitch:	27.00 in
Capacity:	19.3%

Pole Info	
OD:	31.50 in
t:	0.3125 in
Pole A_G :	31.38 in ²
Pole I_G :	3,896.5 in ⁴
Controlling	
Angle:	316.25°
I_G :	9,703.4 in ⁴
A_G :	76.88 in ²
Minimum	
Angle:	166.90°
I_{MIN} :	9,390.9 in ⁴
t_{EFF} :	0.7887 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
167.40	16.80	9391.0	0.306	23.399	0.398	0.088	65.809	65.809	32.905	65.809	36.0%

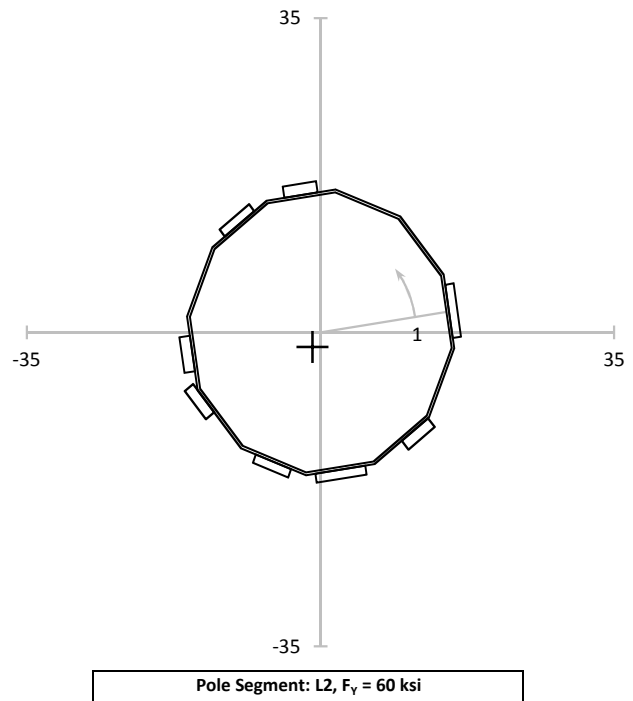
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
10	1	54.45	17.04	10419.3	0.306	21.385	0.398	43.686	43.333	29.250	49.7%
12	1	359.05	16.89	9444.4	0.306	23.379	0.398	48.528	47.500	29.250	48.8%
12	2	276.55	15.62	10458.2	0.306	19.533	0.398	48.528	47.500	29.250	40.9%
13	1	123.90	16.35	9950.4	0.306	21.487	0.398	43.686	43.333	29.250	49.9%
13	2	236.70	15.37	10451.3	0.306	19.227	0.398	43.686	43.333	29.250	44.7%
18a	1	90.90	16.96	10523.9	0.306	21.078	0.398	41.614	39.375	29.250	52.8%
18a	2	175.60	15.73	9418.6	0.306	21.837	0.398	41.614	39.375	29.250	54.7%
18b	1	316.25	16.33	9703.4	0.306	22.011	0.398	41.614	39.375	29.250	55.1%
19	1	192.75	15.76	9620.1	0.306	21.430	0.398	41.614	39.375	29.250	53.7%



Elevation: 73.29-ft

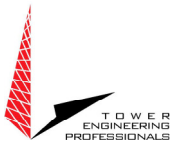
Loads	
Axial:	22.4 k
Moment:	1,005.0 k-ft
Shear:	30.2 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	9.6 k
Moment:	438.6 k-ft
Shear:	13.0 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	19
q:	0.295 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	122.07 in
Stitch:	27.00 in
Capacity:	22.1%

Pole Info	
OD:	30.94 in
t:	0.3125 in
Pole A_G :	30.82 in ²
Pole I_G :	3,689.0 in ⁴
Controlling	
Angle:	81.30°
I_G :	8,987.6 in ⁴
A_G :	71.82 in ²
Minimum	
Angle:	29.85°
I_{MIN} :	8,507.7 in ⁴
t_{EFF} :	0.7527 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
223.35	17.90	8550.5	0.311	25.250	0.420	0.091	66.230	66.230	33.115	66.230	38.6%

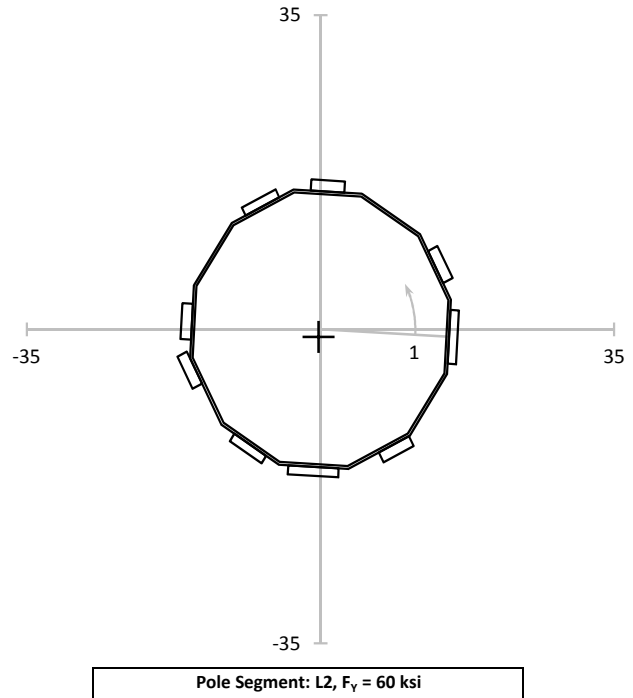
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
12	1	8.50	17.18	8611.7	0.311	24.061	0.420	48.528	47.500	29.250	50.2%
12	2	270.45	14.48	9103.2	0.311	19.187	0.420	48.528	47.500	29.250	40.2%
13	1	112.75	16.76	9280.3	0.311	21.782	0.420	43.686	43.333	29.250	50.6%
13	2	236.95	14.05	8670.5	0.311	19.541	0.420	43.686	43.333	29.250	45.5%
18a	1	81.30	17.56	8987.6	0.311	23.567	0.420	41.614	39.375	29.250	59.1%
18a	2	178.85	14.94	8715.8	0.311	20.671	0.420	41.614	39.375	29.250	51.7%
18b	1	316.40	15.83	9228.6	0.311	20.684	0.420	41.614	39.375	29.250	51.8%
19	1	197.65	14.78	8542.8	0.311	20.871	0.420	41.614	39.375	29.250	52.2%



Elevation: 74.50-ft

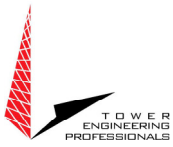
Loads	
Axial:	21.9 k
Moment:	968.5 k-ft
Shear:	30.0 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	8.7 k
Moment:	379.5 k-ft
Shear:	12.0 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	19
q:	0.270 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	133.10 in
Stitch:	27.00 in
Capacity:	20.3%

Pole Info	
OD:	30.69 in
t:	0.3125 in
Pole A_G :	30.57 in ²
Pole I_G :	3,601.4 in ⁴
Controlling	
Angle:	93.15°
I_G :	9,315.8 in ⁴
A_G :	76.57 in ²
Minimum	
Angle:	304.70°
I_{MIN} :	9,125.1 in ⁴
t_{EFF} :	0.8340 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
106.20	16.67	9195.1	0.286	21.075	0.392	0.093	66.413	66.413	33.206	66.413	32.2%

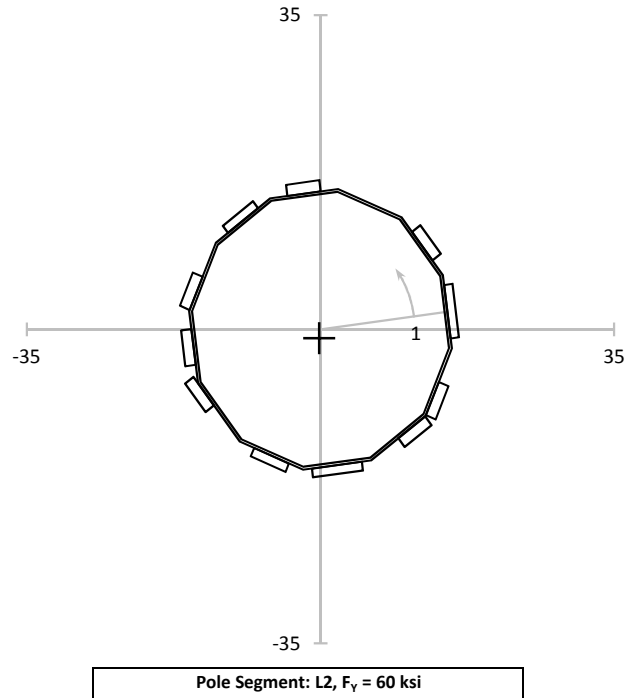
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
12	1	359.15	16.03	9586.7	0.286	19.431	0.392	48.528	47.500	29.250	40.6%
12	2	274.50	14.95	9301.3	0.286	18.679	0.392	48.528	47.500	29.250	39.1%
13	1	118.80	16.51	9132.4	0.286	21.009	0.392	43.686	43.333	29.250	48.8%
13	2	242.40	14.97	9671.4	0.286	17.994	0.392	43.686	43.333	29.250	41.9%
16	1	31.85	16.59	9820.5	0.286	19.630	0.392	41.614	39.375	29.250	49.1%
18a	1	93.15	16.80	9315.8	0.286	20.963	0.392	41.614	39.375	29.250	52.5%
18a	2	172.70	15.76	9510.3	0.286	19.257	0.392	41.614	39.375	29.250	48.2%
18b	1	309.00	15.54	9129.0	0.286	19.781	0.392	41.614	39.375	29.250	49.5%
19	1	193.90	15.78	9734.4	0.286	18.839	0.392	41.614	39.375	29.250	47.1%



Elevation: 75.50-ft

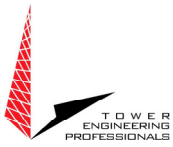
Loads	
Axial:	21.5 k
Moment:	938.6 k-ft
Shear:	29.8 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	7.5 k
Moment:	347.1 k-ft
Shear:	10.5 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	19
q:	0.258 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	139.68 in
Stitch:	27.00 in
Capacity:	19.3%

Pole Info	
OD:	30.49 in
t:	0.3125 in
Pole A_G :	30.37 in ²
Pole I_G :	3,530.0 in ⁴
Controlling	
Angle:	82.60°
I_G :	9,683.3 in ⁴
A_G :	86.37 in ²
Minimum	
Angle:	247.35°
I_{MIN} :	9,535.3 in ⁴
t_{EFF} :	0.8950 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
252.55	16.78	9553.0	0.249	19.790	0.345	0.094	66.563	66.563	33.282	66.563	30.1%

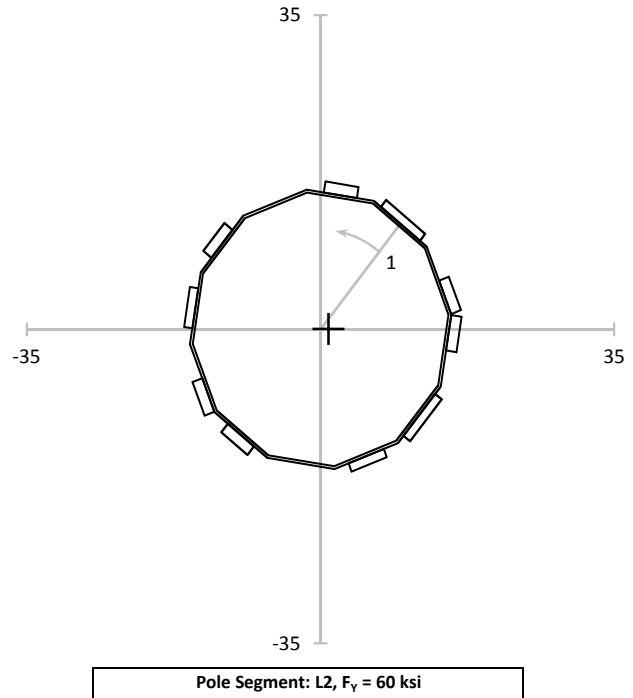
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
12	1	14.05	15.79	10905.8	0.249	16.306	0.345	48.528	47.500	29.250	34.1%
12	2	264.15	14.68	9713.9	0.249	17.017	0.345	48.528	47.500	29.250	35.6%
13	1	106.10	16.13	10371.7	0.249	17.516	0.345	43.686	43.333	29.250	40.7%
13	2	241.65	14.75	9556.2	0.249	17.390	0.345	43.686	43.333	29.250	40.4%
16	1	41.85	16.39	9930.1	0.249	18.590	0.345	41.614	39.375	29.250	46.6%
17a	1	151.50	16.12	11646.3	0.249	15.593	0.345	41.614	39.375	29.250	39.0%
17b	1	320.35	15.59	11486.4	0.249	15.286	0.345	41.614	39.375	29.250	38.2%
18a	1	82.60	16.73	9683.3	0.249	19.460	0.345	41.614	39.375	29.250	48.8%
18a	2	185.45	15.42	11194.4	0.249	15.515	0.345	41.614	39.375	29.250	38.8%
18b	1	299.40	15.15	10862.3	0.249	15.711	0.345	41.614	39.375	29.250	39.3%
19	1	207.70	15.28	10403.1	0.249	16.538	0.345	41.614	39.375	29.250	41.4%



Elevation: 76.75-ft

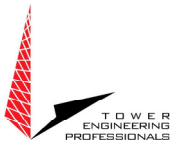
Loads	
Axial:	21.0 k
Moment:	901.5 k-ft
Shear:	29.6 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	7.8 k
Moment:	359.5 k-ft
Shear:	11.0 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	16
q:	0.263 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	137.11 in
Stitch:	27.00 in
Capacity:	19.7%

Pole Info	
OD:	30.24 in
t:	0.3125 in
Pole A_G :	30.11 in ²
Pole I_G :	3,442.1 in ⁴
Controlling	
Angle:	38.95°
I_G :	8,746.6 in ⁴
A_G :	81.11 in ²
Minimum	
Angle:	50.40°
I_{MIN} :	8,659.8 in ⁴
t_{EFF} :	0.8283 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
49.05	15.74	8661.0	0.259	19.654	0.365	0.096	66.752	66.752	33.376	66.752	29.8%

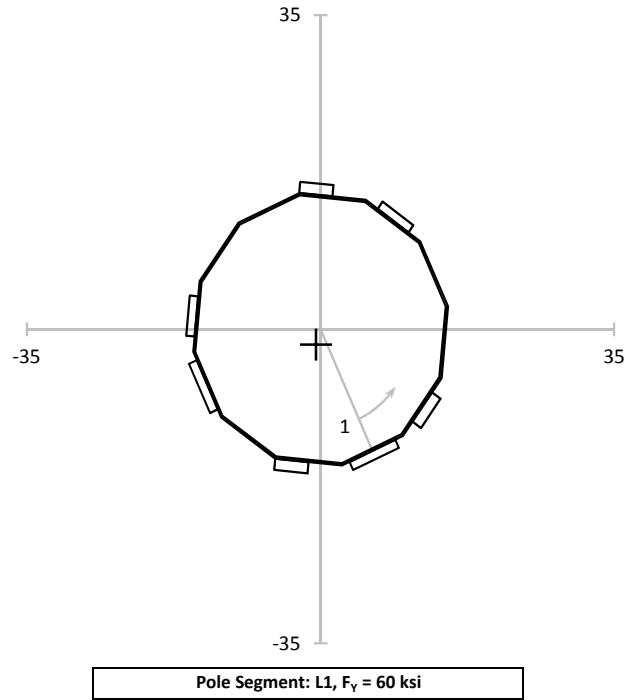
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
12	1	15.15	14.65	9395.1	0.259	16.870	0.365	48.528	47.500	29.250	35.3%
12	2	256.65	14.67	9092.9	0.259	17.451	0.365	48.528	47.500	29.250	36.5%
13	1	110.10	16.25	10308.1	0.259	17.055	0.365	43.686	43.333	29.250	39.6%
13	2	234.55	15.35	8671.5	0.259	19.147	0.365	43.686	43.333	29.250	44.4%
16	1	38.95	15.50	8746.6	0.259	19.169	0.365	41.614	39.375	29.250	48.0%
17a	1	164.95	16.51	10487.7	0.259	17.032	0.365	41.614	39.375	29.250	42.6%
17b	1	325.50	14.94	10852.3	0.259	14.896	0.365	41.614	39.375	29.250	37.2%
18a	1	80.45	16.10	9214.8	0.259	18.905	0.365	41.614	39.375	29.250	47.4%
18a	2	190.40	15.98	9572.1	0.259	18.057	0.365	41.614	39.375	29.250	45.2%
18b	1	298.80	14.79	10571.0	0.259	15.135	0.365	41.614	39.375	29.250	37.8%



Elevation: 81.75-ft

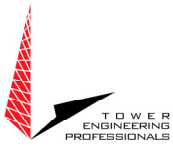
Loads	
Axial:	18.9 k
Moment:	755.3 k-ft
Shear:	28.8 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	7.5 k
Moment:	316.5 k-ft
Shear:	11.4 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	17
q:	0.337 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	106.82 in
Stitch:	27.00 in
Capacity:	25.3%

Pole Info	
OD:	29.73 in
t:	0.2500 in
Pole A_G :	23.73 in ²
Pole I_G :	2,632.0 in ⁴
Controlling	
Angle:	155.50°
I_G :	7,404.0 in ⁴
A_G :	59.73 in ²
Minimum	
Angle:	65.25°
I_{MIN} :	6,339.5 in ⁴
t_{EFF} :	0.6258 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
256.90	16.24	6382.8	0.317	23.063	0.482	0.123	61.584	61.584	30.792	61.584	38.0%

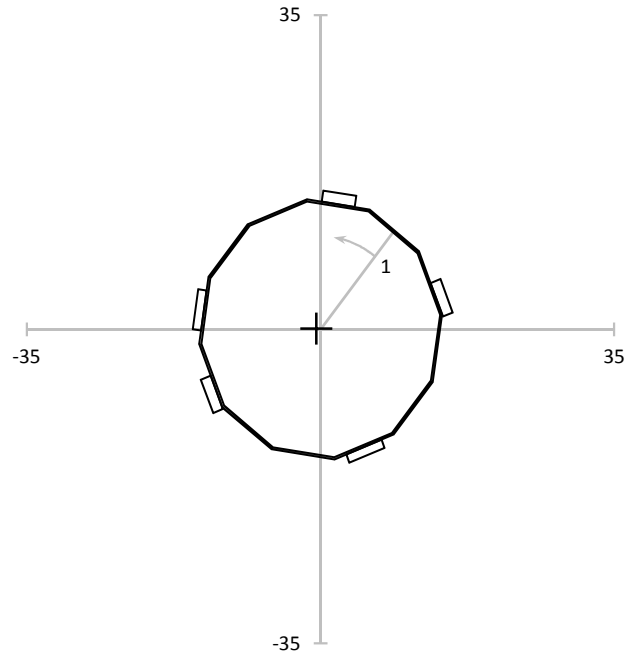
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
12	1	13.20	13.92	7001.7	0.317	18.024	0.482	48.528	47.500	29.250	37.8%
12	2	259.95	14.20	6407.9	0.317	20.080	0.482	48.528	47.500	29.250	42.1%
13	1	113.20	16.87	6926.2	0.317	22.082	0.482	43.686	43.333	29.250	51.3%
13	2	236.30	15.09	6365.4	0.317	21.488	0.482	43.686	43.333	29.250	49.9%
16	1	43.05	14.92	6491.7	0.317	20.829	0.482	41.614	39.375	29.250	52.1%
17a	1	155.50	17.32	7404.0	0.317	21.205	0.482	41.614	39.375	29.250	53.1%
17b	1	318.60	13.79	7316.5	0.317	17.082	0.482	41.614	39.375	29.250	42.6%



Elevation: 89.50-ft

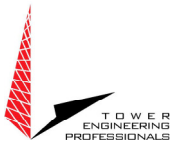
Loads	
Axial:	16.6 k
Moment:	536.6 k-ft
Shear:	27.6 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	8.1 k
Moment:	277.5 k-ft
Shear:	13.4 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	16
q:	0.446 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	80.77 in
Stitch:	27.00 in
Capacity:	33.4%

Pole Info	
OD:	28.16 in
t:	0.2500 in
Pole A_G :	22.47 in ²
Pole I_G :	2,234.5 in ⁴
Controlling	
Angle:	38.55°
I_G :	4,486.9 in ⁴
A_G :	46.47 in ²
Minimum	
Angle:	243.10°
I_{MIN} :	4,297.4 in ⁴
t_{EFF} :	0.4936 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
251.95	14.89	4323.4	0.358	22.173	0.594	0.137	63.045	63.045	31.523	63.045	35.8%

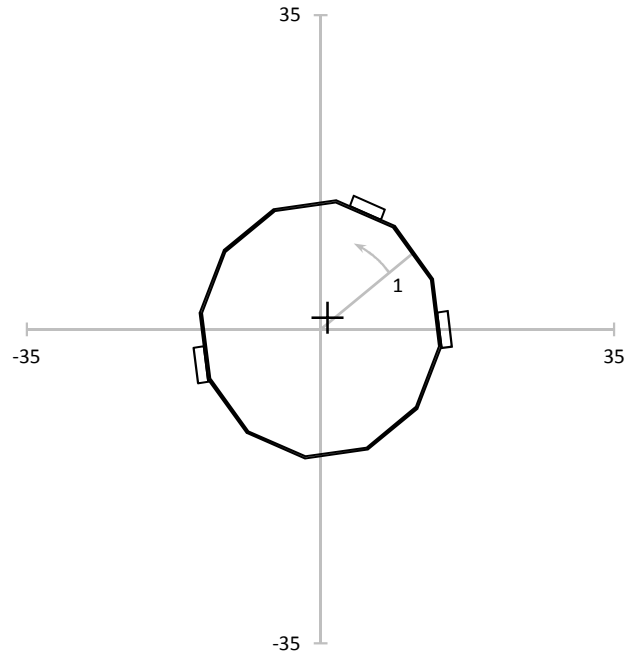
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
13	1	107.15	13.74	4828.6	0.358	18.325	0.594	43.686	43.333	29.250	42.8%
13	2	242.15	14.82	4297.7	0.358	22.208	0.594	43.686	43.333	29.250	51.7%
16	1	38.55	14.48	4486.9	0.358	20.786	0.594	41.614	39.375	29.250	51.9%
17a	1	162.80	14.41	5364.7	0.358	17.304	0.594	41.614	39.375	29.250	43.1%
17b	1	314.40	15.18	5283.1	0.358	18.505	0.594	41.614	39.375	29.250	46.1%



Elevation: 90.08-ft

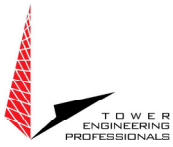
Loads	
Axial:	16.5 k
Moment:	520.7 k-ft
Shear:	27.5 k
Torsion:	3.6 k-ft
Equivalent Loads to Pole	
Axial:	9.9 k
Moment:	402.6 k-ft
Shear:	16.5 k
Torsion:	3.6 k-ft
Shear Flow	
Controlling Mod:	16
q:	0.535 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	67.32 in
Stitch:	27.00 in
Capacity:	40.1%

Pole Info	
OD:	28.05 in
t:	0.2500 in
Pole A_G :	22.38 in ²
Pole I_G :	2,206.5 in ⁴
Controlling	
Angle:	52.35°
I_G :	3,154.6 in ⁴
A_G :	37.38 in ²
Minimum	
Angle:	74.00°
I_{MIN} :	2,911.3 in ⁴
t_{EFF} :	0.3328 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
72.40	15.44	2912.8	0.441	33.112	0.736	0.139	63.155	63.155	31.577	63.155	53.2%

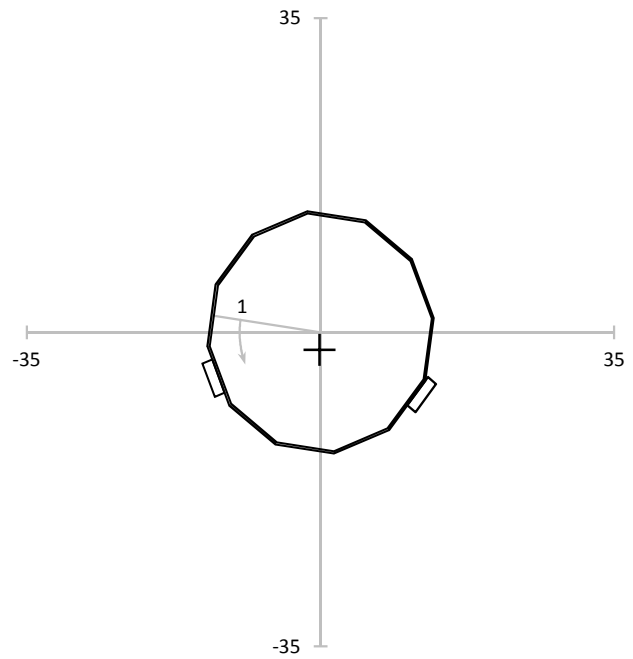
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
16	1	52.35	12.27	3154.6	0.441	24.292	0.736	41.614	39.375	29.250	60.6%
17a	1	153.75	15.80	4638.8	0.441	21.282	0.736	41.614	39.375	29.250	53.0%
17b	1	291.25	12.64	3564.4	0.441	22.153	0.736	41.614	39.375	29.250	55.2%



Elevation: 99.00-ft

Loads	
Axial:	11.3 k
Moment:	295.7 k-ft
Shear:	20.0 k
Torsion:	3.8 k-ft
Equivalent Loads to Pole	
Axial:	7.7 k
Moment:	258.1 k-ft
Shear:	13.5 k
Torsion:	3.8 k-ft
Shear Flow	
Controlling Mod:	17
q:	0.433 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	83.19 in
Stitch:	27.00 in
Capacity:	32.5%

Pole Info	
OD:	26.24 in
t:	0.2500 in
Pole A_G :	20.92 in ²
Pole I_G :	1,804.5 in ⁴
Controlling	
Angle:	278.25°
I_G :	2,068.1 in ⁴
A_G :	30.92 in ²
Minimum	
Angle:	93.85°
I_{MIN} :	2,060.6 in ⁴
t_{EFF} :	0.2867 in



POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
278.25	15.45	2068.1	0.367	26.501	0.647	0.168	64.837	64.837	32.418	64.837	41.5%

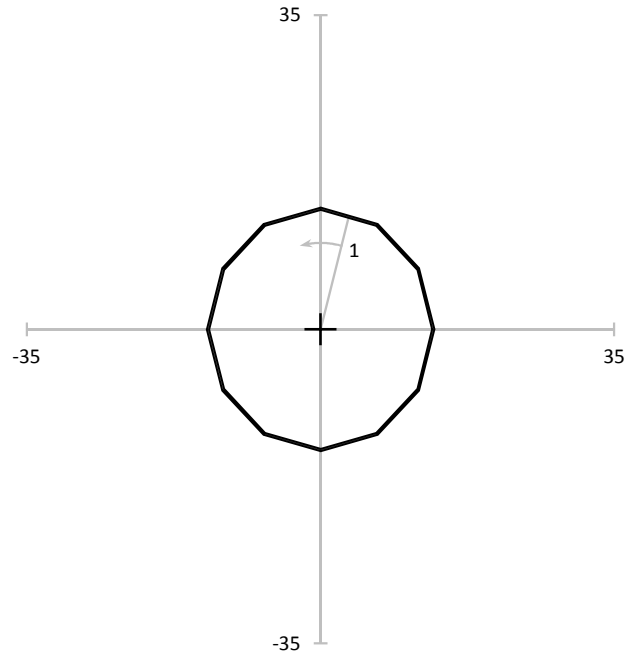
MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
16	1	47.50	11.79	2738.7	0.367	15.272	0.647	41.614	39.375	29.250	37.9%
17a	1	140.75	11.89	2750.4	0.367	15.343	0.647	41.614	39.375	29.250	38.1%



Elevation: 99.25-ft

Loads	
Axial:	11.3 k
Moment:	290.7 k-ft
Shear:	20.0 k
Torsion:	3.8 k-ft
Equivalent Loads to Pole	
Axial:	11.3 k
Moment:	290.7 k-ft
Shear:	20.0 k
Torsion:	3.8 k-ft
Shear Flow N/A	

Pole Info	
OD:	26.19 in
t:	0.2500 in
Pole A_G :	20.88 in ²
Pole I_G :	1,794.0 in ⁴
Controlling	
Angle:	15.00°
I_G :	1,794.0 in ⁴
A_G :	20.88 in ²
Minimum	
Angle:	0.00°
I_{MIN} :	1,794.0 in ⁴
t_{EFF} :	0.2500 in



Pole Segment: L1, $F_y = 60$ ksi

POLE CAPACITY											
Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
15.00	13.57	1794.0	0.541	26.383	0.957	0.169	64.884	64.884	32.442	64.884	41.6%

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	Y_{CONT} (in)	I (in ⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity



Capacity: **61.0%** **PASS**

528 Wheelers Farm Rd (BU 876320)

TEP #: 25570.114864

Analysis: JDR 4/6/2017

Check: TML 4/6/2017

Custom Anchor Rod Capacity Check_v1.0.1

Factored Tower Base Reactions

	LC1	LC2	
Moment:	3,664.0	905.0	kip-ft
Axial (Download):	56.0	102.0	kip
Shear:	42.0	10.0	kip
Axial (Uplift):			kip

Load Centroid

X: 0.00 in
Y: 0.00 in

Code Revision

- TIA-222-G
- TIA-222-F

Pole/Base Plate Geometry

Pole Shape: 12
 Pole OD: 45.120 in
 Pole Thickness: 0.375 in
 Plate Shape: Square
 Plate Width: 57.00 in
 Plate Thickness: 3.25 in
 Clip: 6.00 in

Anchor Size	A _{NET} (in ²)	F _y (ksi)	F _u (ksi)	Config.	T/C	Qty.	Bolt Circle (in)	Spacing (in)	l _{ar} (in)	Bolt One Angle (Round) or Locations (Custom) (°)
2-1/4" (A615-J) (F)	3.248	75.0	100.0	Quad	T/C	16	58.000	6.00	1.000	
R71 150ksi 1-3/8"	1.580	100.0	150.0	Custom	T/C	8	58.000		1.000	8 82 98 172 188 262 278 352

Bolt Group	A _{NET} (in ²)	Y _{CONT} (in)	T _u (k)	C _u (k)	M _u (k-ft)	V _u (k)	φ _{RNT} (k)	φ _{RNM} (k-ft)	φ _{RNV} (k)	Orientation (°)	Capacity (%)
1	3.248	-28.996	146.46	151.16	0.24	3.61	259.81	7.88	149.47	140.0	61.0%
2	1.580	-28.996	70.41	72.69	0.06	0.84	189.60	3.57	97.07	171.0	39.1%

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

- Assumptions:** 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding $(1) \times (\text{Rod Diameter})$

Site Data

BU#: 876320
 Site Name: 528 Wheelers Farm Rd
 App #: 386169 Rev. 1

Anchor Rod Data

Eta Factor, η	0.55	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data

W=Side:	57	in
Thick:	3.25	in
Grade:	50	ksi
Clip Distance:	6	in

Stiffener Data (Welding at both sides)

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

Pole Data

Diam:	45.12	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round

Base Reactions

TIA Revision:	G	
Factored Moment, Mu:	2922.43	ft-kips
Factored Axial, Pu:		kips
Factored Shear, Vu:		kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/ η): 151.2 Kips

Base Plate Results

Base Plate Stress: 35.7 ksi
 PL Design Bending Strength, $\Phi \cdot F_y$: 45.0 ksi
 Base Plate Stress Ratio: 79.3% **Pass**

Flexural Check

PL Ref. Data

Yield Line (in):	35.49
Max PL Length:	35.49

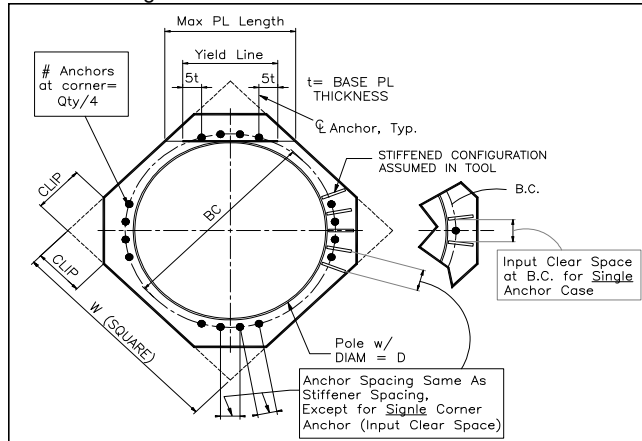
N/A - Unstiffened

Stiffener Results

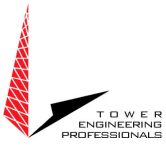
Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

Pole Punching Shear Check: N/A



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



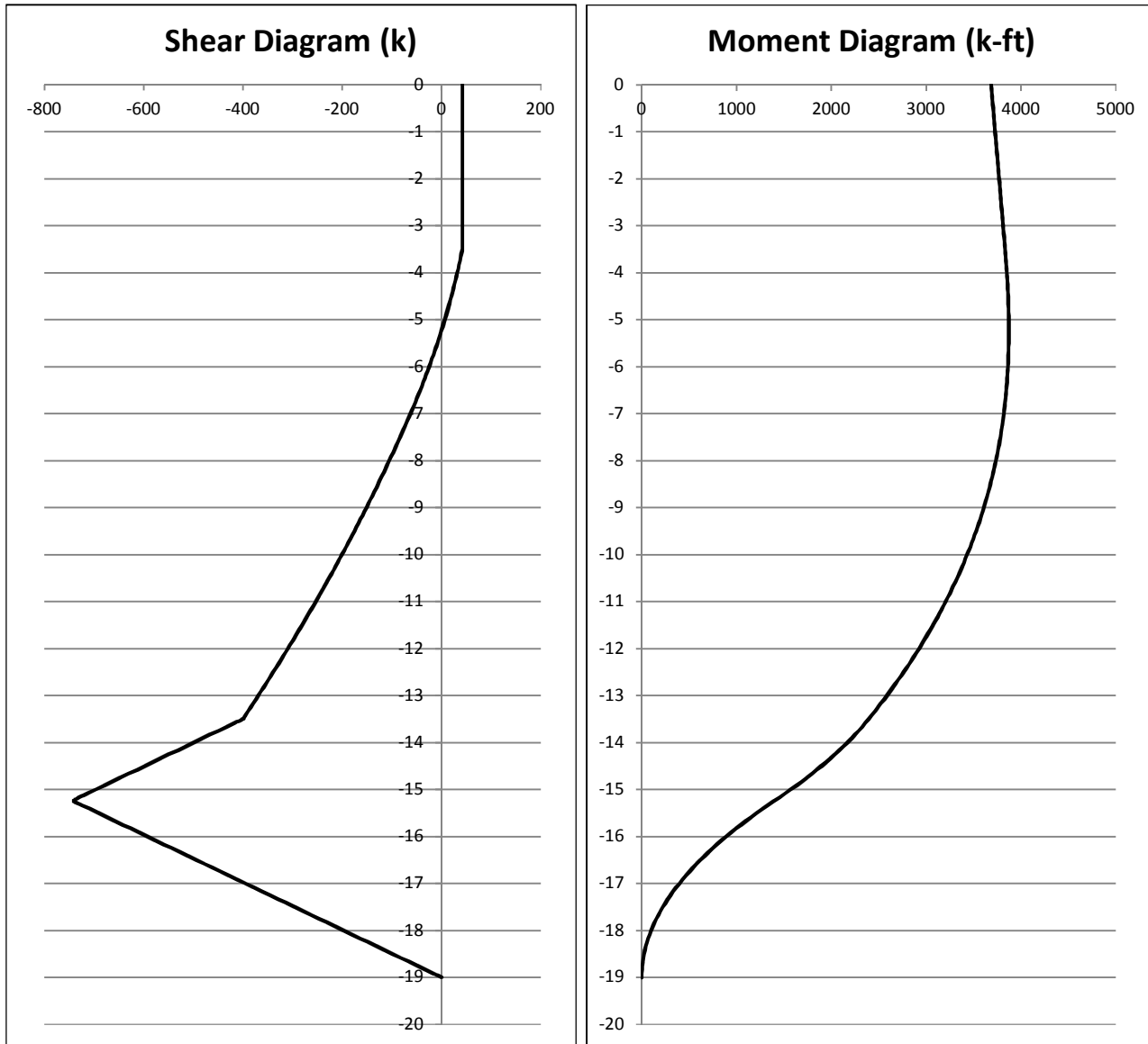
528 Wheelers Farm Rd (BU 876320)

TEP #: 25570.114864

Analysis: JDR 4/6/2017

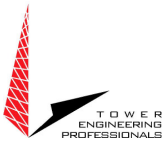
Check: TML 4/6/2017

Soil Interaction: LC1



Max Unfactored Moment: 3871.1 kip-ft
@ 5.23 ft below grade

Additional Factor of Safety: 2.27
Capacity = 58.8% PASS



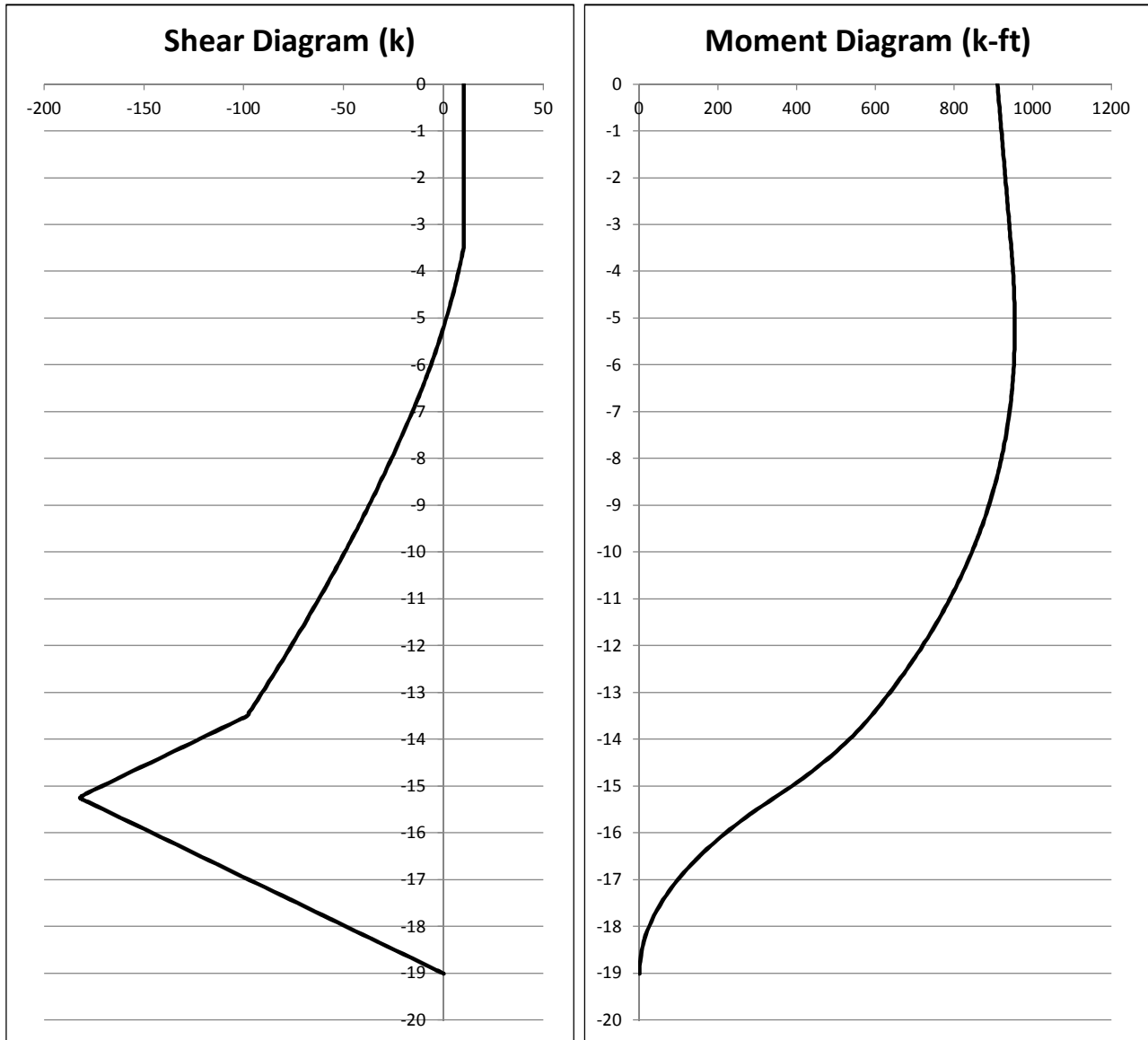
528 Wheelers Farm Rd (BU 876320)

TEP #: 25570.114864

Analysis: JDR 4/6/2017

Check: TML 4/6/2017

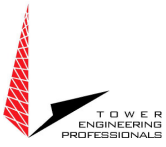
Soil Interaction: LC2



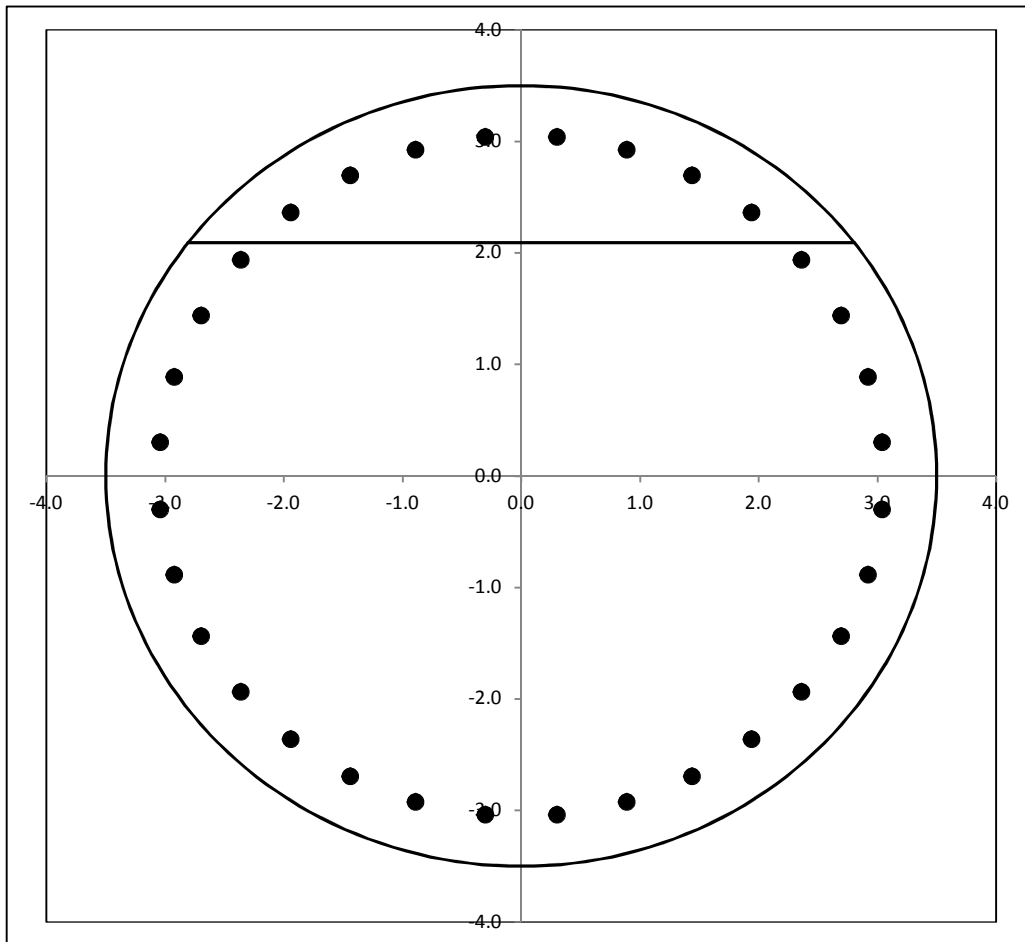
Max Unfactored Moment: 954.1 kip-ft
@ 5.19 ft below grade

Additional Factor of Safety: 9.23

Capacity = 14.5% PASS



Reinforcement Capacity

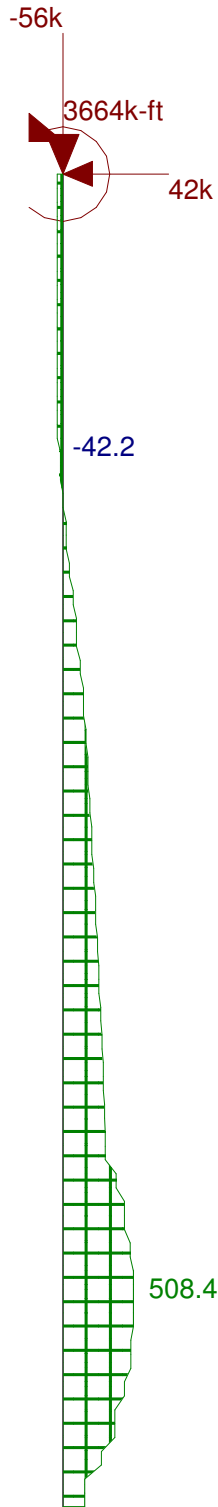
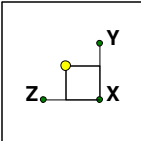


	LC1	LC2
V_u	508.4	125.1 kip
V_c	610.1	612.7 kip
V_s	108.1	108.1 kip
ϕV_n	538.7	540.6 kip
Capacity =	94.4%	23.1%
	PASS	PASS

*Taken from RISA 3D

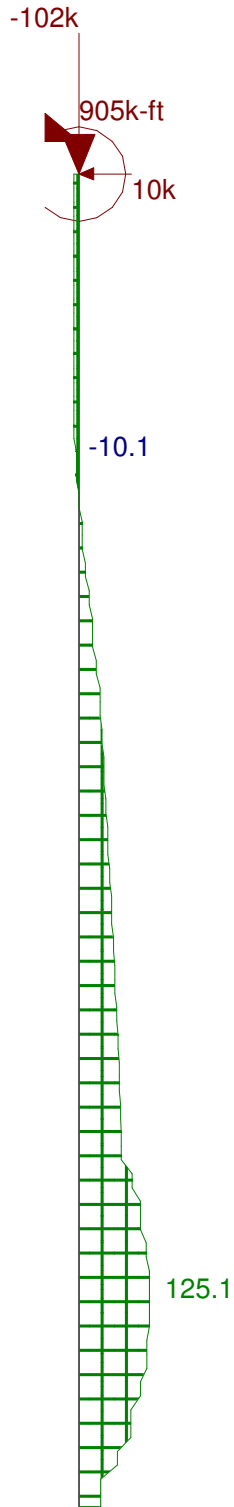
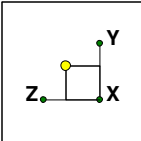
	LC1	LC2
M_u	3871.1	954.1 kip-ft
ϕM_n	7488.1	7590.7 kip-ft
Capacity =	51.7%	12.6%
	PASS	PASS

$f_{y,tie} = 40.0$



Loads: LC 1, LC1 Wind
Results for LC 1, LC1 Wind
Member z Shear Forces (k)

Tower Engineering Profess...	528 Wheelers Farm Rd. (BU 876320)	SK - 1
TML		Apr 6, 2017 at 2:37 PM
TEP No. 25570.114864		Foundation.r3d



Loads: LC 2, LC2 Ice
Results for LC 2, LC2 Ice
Member z Shear Forces (k)

Tower Engineering Profess...	528 Wheelers Farm Rd. (BU 876320)	SK - 2
TML		Apr 6, 2017 at 2:38 PM
TEP No. 25570.114864		Foundation.r3d

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

STRATFORD/ MP X53/ MAIN

SITE ID: CT11082E - L1900

CROWN BU No.: 876320

528 WHEELERS FARMS ROAD

MILFORD, CT 06461

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES," 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.

11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

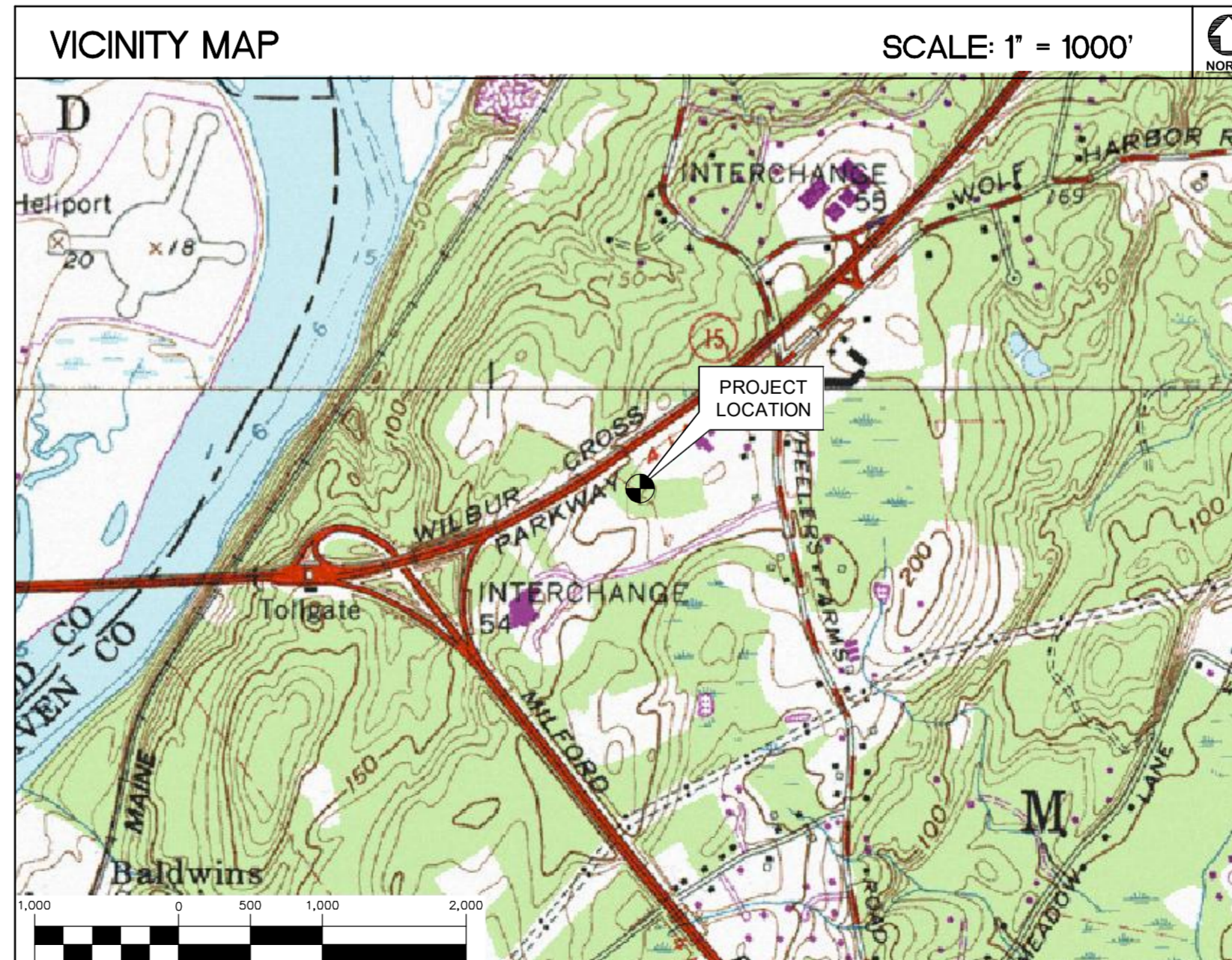
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	TO: 528 WHEELERS FARMS ROAD MILFORD, CT 06461
------------------------------------------------------------	---------------------------------------------------------

1. HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD. 0.21 MI.
2. TAKE THE 2ND RIGHT ONTO DAY HILL RD. 0.14 MI.
3. TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187 1.89 MI.
4. TURN LEFT ONTO CT-305/OLD WINDSOR RD. 2.32 MI.
5. STAY STRAIGHT TO GO ONTO BLOOMFIELD AVE/CT-305. 0.01 MI.
6. MERGE ONTO I-91 S TOWARD HARTFORD 24.76 MI.
7. MERGE ONTO CT-15 S/WILBUR CROSS PKWY W via EXIT 17 TOWARD E MAIN ST. 26.25 MI.
8. TAKE EXIT 55 TOWARD WHEELERS FARMS RD. 0.15 MI.
9. STAY STRAIGHT TO GO ONTO WELLINGTON RD. 0.08 MI.
10. TAKE THE 1ST LEFT ONTO WHEELERS FARMS RD. 0.29 MI.

528 WHEELERS FARMS RD IS LOCATED ON THE RIGHT

VICINITY MAP



T-MOBILE RF CONFIGURATION

792DB_2xAIR+1DP

PROJECT SUMMARY

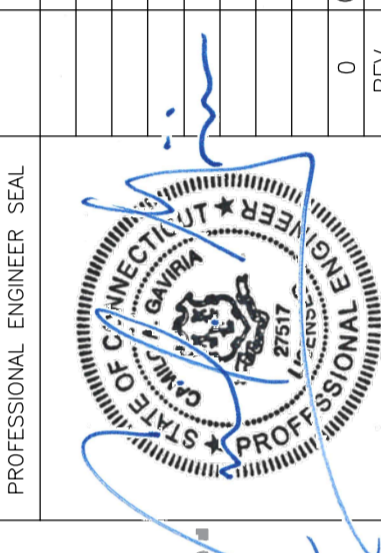
1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
 - A. REMOVE AND REPLACE EXISTING POSITION ONE (1) ANTENNA, TYPICAL OF (3)/(1) PER SECTOR, WITH (3) NEW AIR 32 ANTENNAS.
 - B. INSTALL PROPOSED HYBRID CABLE SYSTEM (P/N: ERICSSON 6x12 HCS) FROM EQUIPMENT AT GRADE UP EXTERIOR OF MONOPOLE TO EXISTING T-MOBILE LOW PROFILE ANTENNA PLATFORM.

PROJECT INFORMATION

SITE NAME:	STRATFORD/ MP X53/ MAIN
SITE ID:	CT11082E - L1900
SITE ADDRESS:	CROWN BU No.: 876320 528 WHEELERS FARMS ROAD MILFORD, CT 06461
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	BRIAN PAUL (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (860) 550-5971
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-14'-54.46" N LONGITUDE: 73°-04'-44.60" W GROUND ELEVATION: 215'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS AND SITE NOTES	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING CONFIG.	0
E-1	TYPICAL ELECTRICAL DETAILS	0



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(203) 488-0360
(203) 488-8387 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
CT174/UNIV BRIDGEPORT_RT
SITE ID: CT1714A
126 PARK AVENUE
BRIDGEPORT, CT 06604

DATE: 04/11/17
SCALE: AS NOTED
JOB NO. 17012.20

TITLE SHEET

T-1

Sheet No. 1 of 6

REV.	DATE	BY	CHK'D BY	CAC	DESCRIPTION
0	04/13/17	LCL			CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

- 1. DESIGN CRITERIA:
 - WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 95-115 MPH (3 SECOND GUST)
 - RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
 - NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
 - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

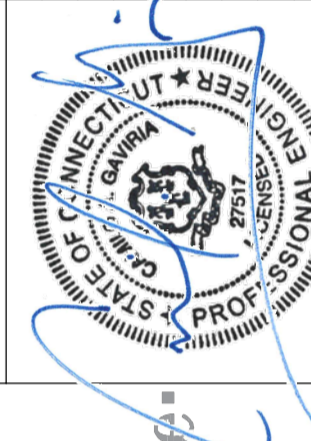



GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
- DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
- BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
- DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
- AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
- THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
- ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
- SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
- NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
- REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

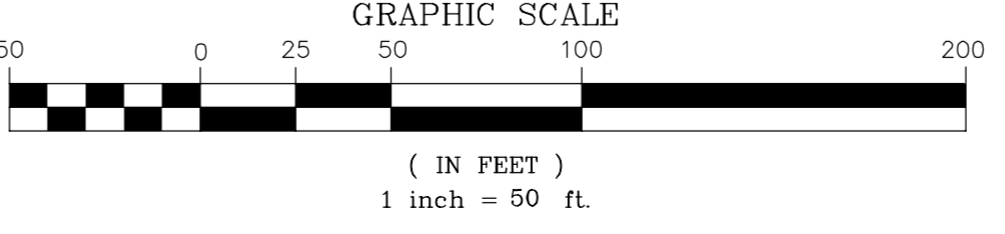
1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

- STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
 - STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
 - STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 - STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 - PIPE---ASTM A53 (FY = 35 KSI)
 - CONNECTION BOLTS---ASTM A325-N
 - U-BOLTS---ASTM A36
 - ANCHOR RODS---ASTM F 1554
 - WELDING ELECTRODE---ASTM E 70XX
- CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
 - STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
 - PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
 - FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
 - INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
 - AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
 - ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
 - ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
 - THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
 - CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
 - STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
 - LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
 - SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
 - MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
 - FABRICATE BEAMS WITH MILL CAMBER UP.
 - LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
 - COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
 - INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
 - FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

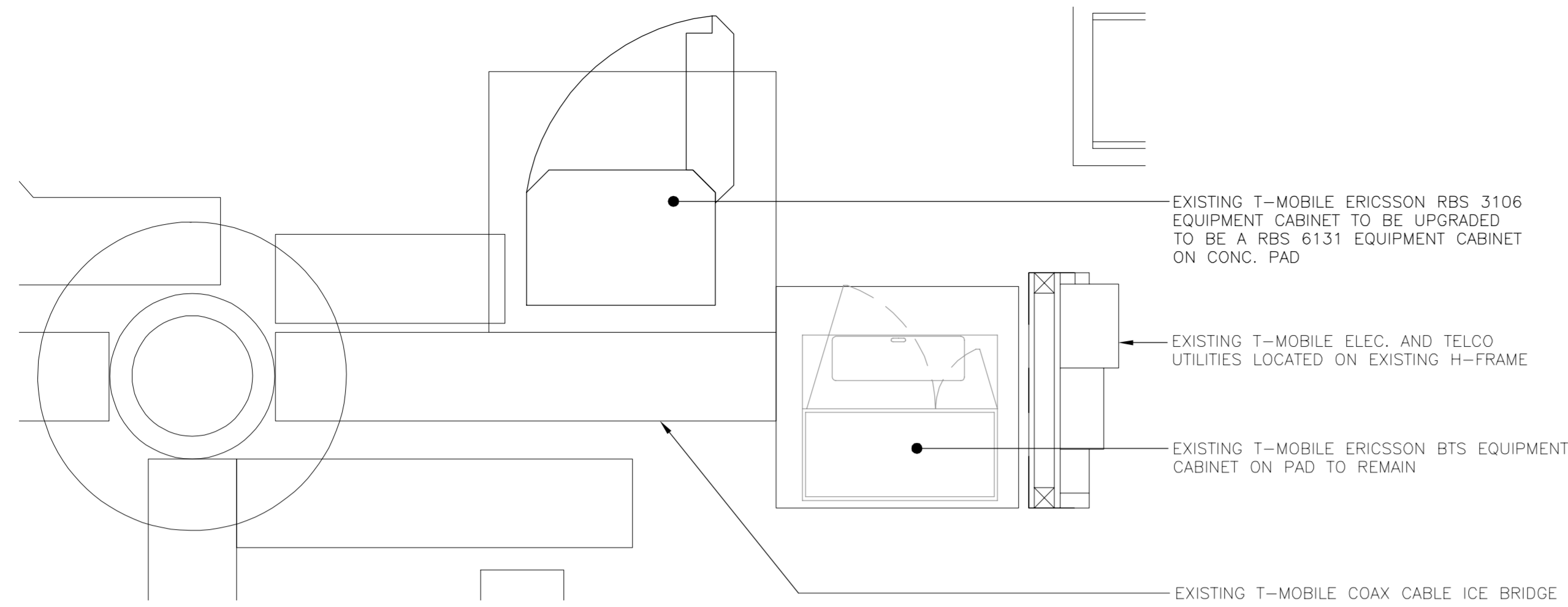
PROFESSIONAL ENGINEER SEAL		CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION	
		CAC LCL DATE: 04/13/17 REV. 0 DRAWN BY: CHK'D BY:	
			
		(203) 488-0360 (203) 488-8387 Fax 63-2 North Branford Road Branford, CT 06405 www.CentekEng.com	
T-MOBILE NORTHEAST LLC WIRELESS COMMUNICATIONS FACILITY CT714/UNIV BRIDGEPORT_RT SITE ID: CT11714A 126 PARK AVENUE BRIDGEPORT, CT 06604			
DATE: 04/11/17			
SCALE: AS NOTED			
JOB NO. 17012.20			
DESIGN BASIS AND SITE NOTES			
			
Sheet No. 2 of 6			



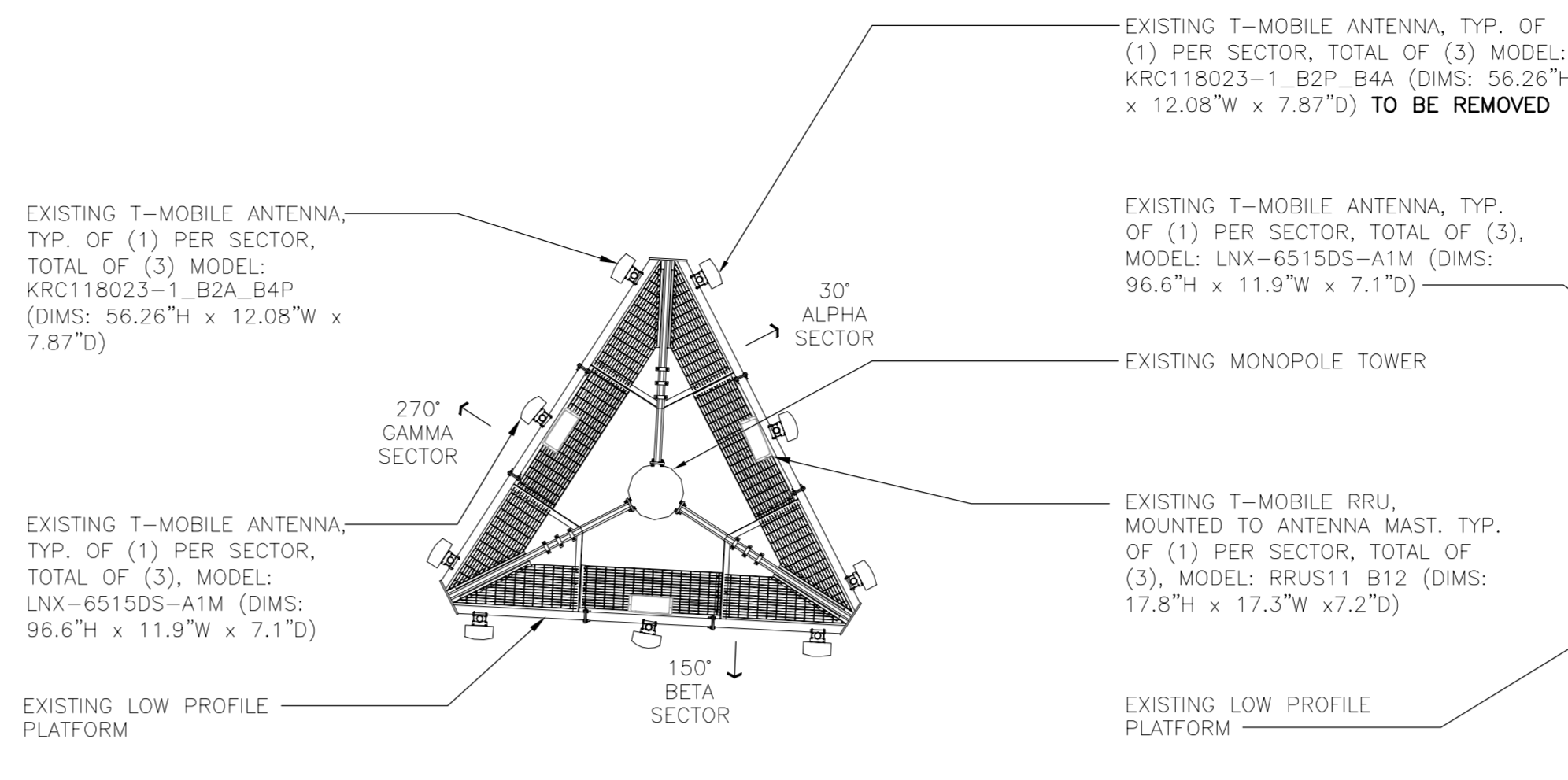
1 SITE LOCATION PLAN
C-1 SCALE: 1" = 50'



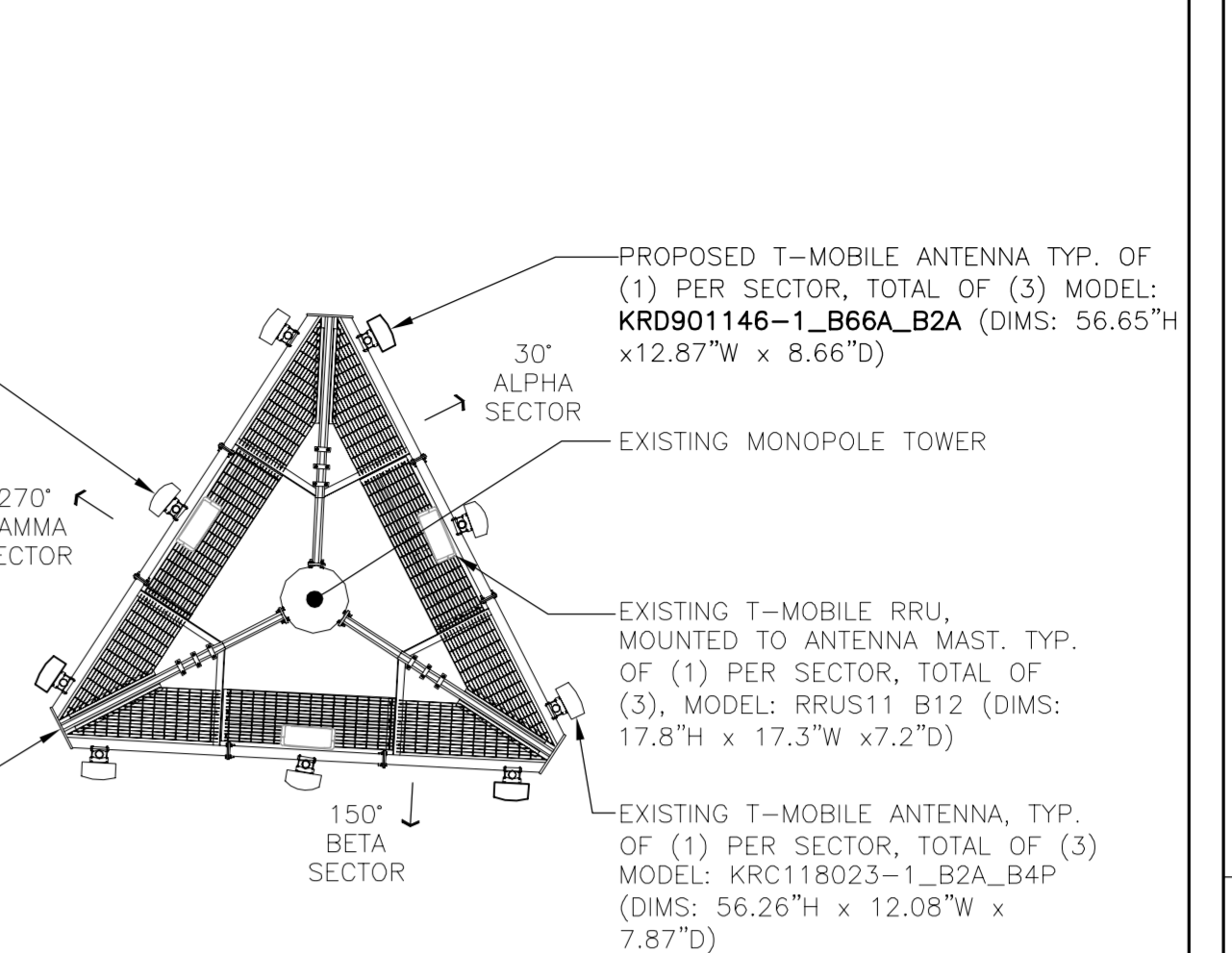
<p>T-MOBILE NORTHEAST LLC WIRELESS COMMUNICATIONS FACILITY CT714/UNIV.BRIDGEPORT_RT SITE ID: CT11714A 126 PARK AVENUE BRIDGEPORT, CT 06604</p>	<p>(203) 488-0360 (203) 488-8387 Fax 63-2 North Branford Road Branford, CT 06405 www.CentekEng.com</p>
<p>DATE: 04/11/17 SCALE: AS NOTED JOB NO. 17012.20</p>	<p>CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION DRAWN BY: CHK'D BY: CAG DATE: 04/13/17 LCL REV. 0</p>
<p>SITE LOCATION PLAN</p>	
<p>C-1</p>	
<p>Sheet No. 3 of 6</p>	



3 EQUIPMENT PLAN
 C-2 SCALE: 3/8" = 1'
 TRUE NORTH

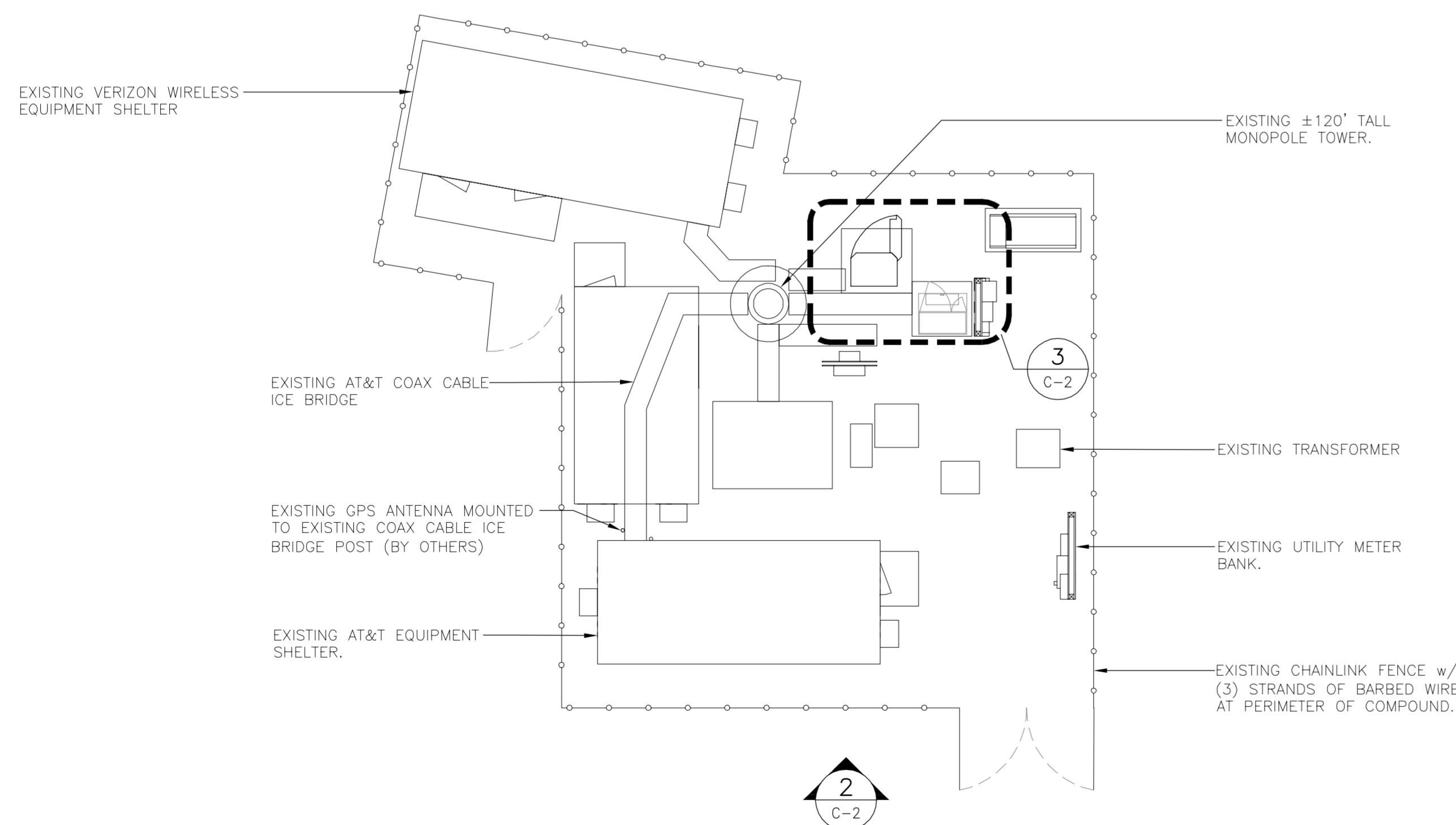


4 EXISTING ANTENNA MOUNTING CONFIGURATION
 C-2 SCALE: 3/8" = 1'
 107' ELEVATION TRUE NORTH

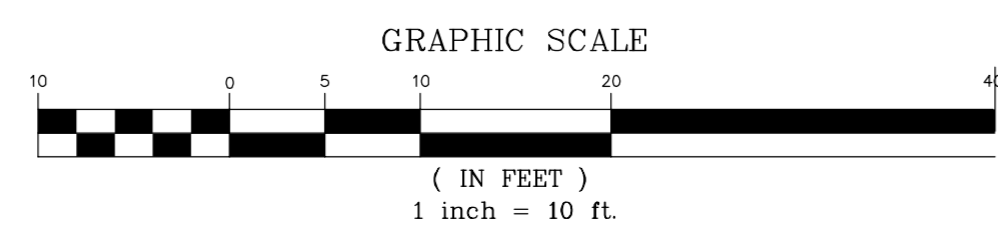


5 PROPOSED ANTENNA MOUNTING CONFIGURATION
 C-2 SCALE: 3/8" = 1'
 107' ELEVATION TRUE NORTH

T-MOBILE RAN TEMPLATE:
 792DB OUTDOOR
 T-MOBILE RF CONFIGURATION:
 792DB_2xAIR+1DP

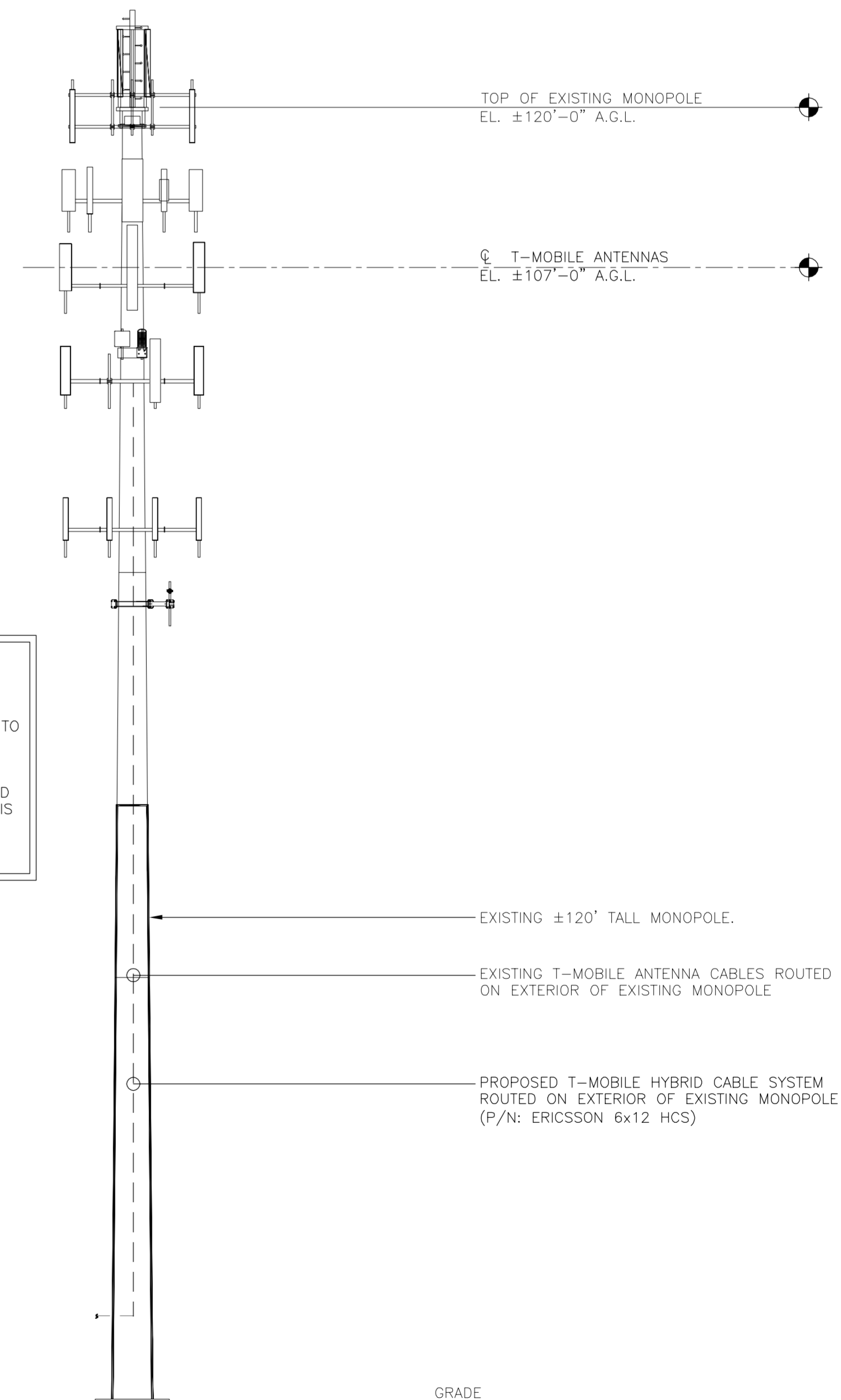


1 COMPOUND PLAN
 C-2 SCALE: 1" = 10'
 TRUE NORTH

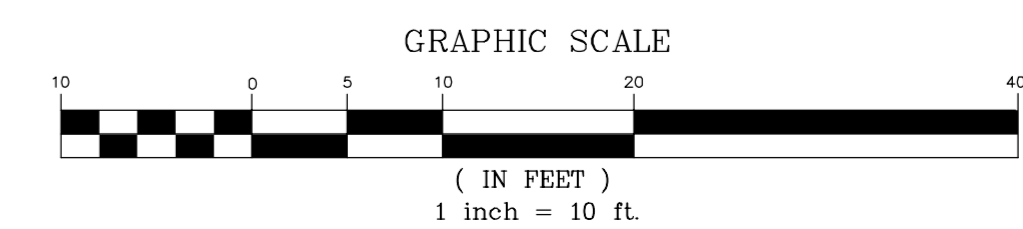


TOWER STRUCTURAL NOTES:

- TOWER STRUCTURAL ANALYSIS SIGNED AND SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT TO BE PROVIDED PRIOR TO INSTALLATION OF THE ADDITIONAL TOWER LOADING DEPICTED HEREIN.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS REPORT AND FINAL T-MOBILE RF DATA SHEET.



2 TOWER ELEVATION
 C-2 SCALE: 1" = 10'
 GRADE



REV.	0	04/13/17	LGL	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
DATE					DESCRIPTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

CENTEK engineering
 Centek on Solutions
 (203) 488-0380
 (203) 488-8387 Fax
 63-2 North Branford Road
 Branford, CT 06405
 www.CentekEng.com

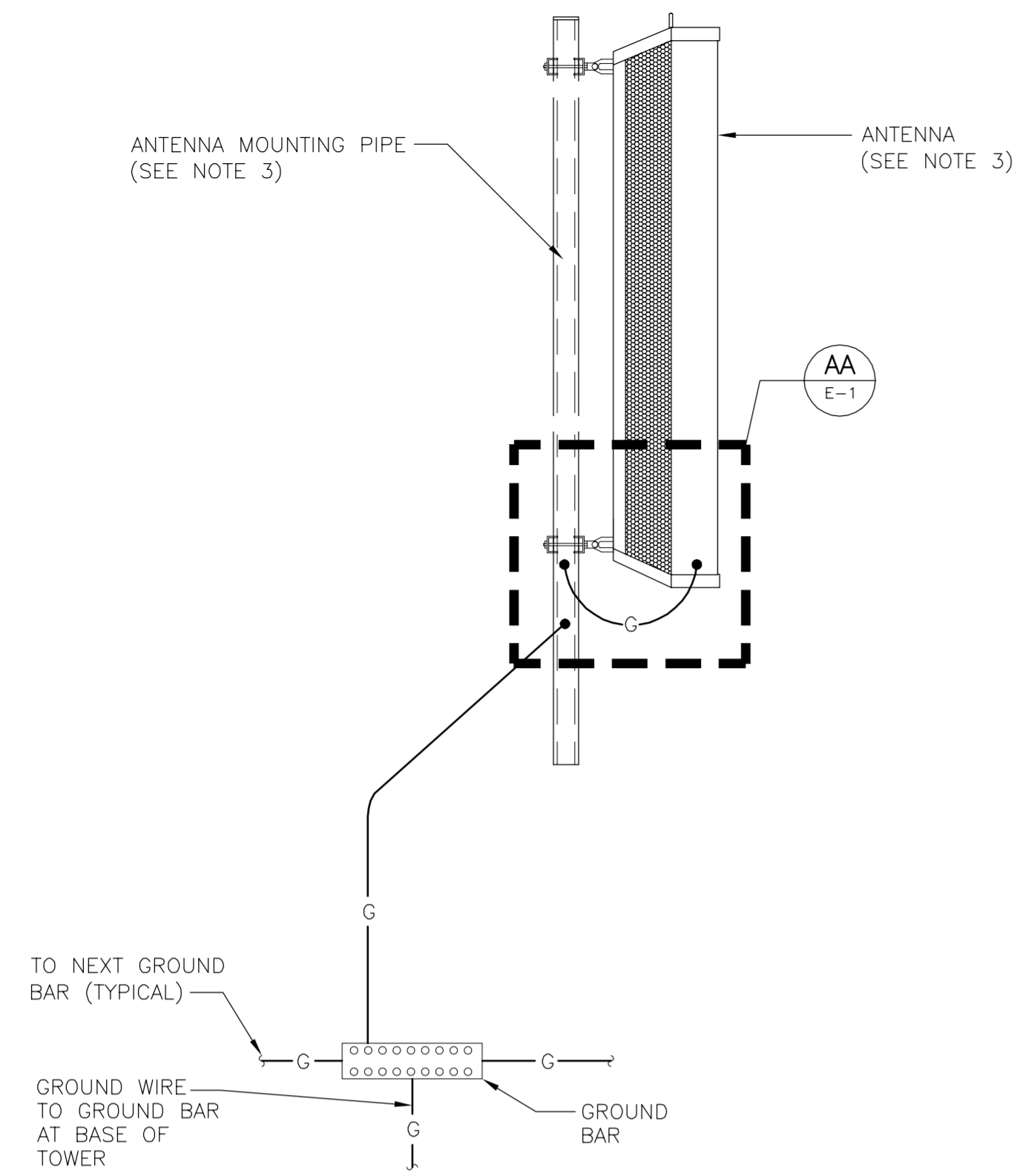
T-MOBILE NORTHEAST LLC
 WIRELESS COMMUNICATIONS FACILITY
CT174/UNIV BRIDGEPORT_RT
 SITE ID: CT1714A
 126 PARK AVENUE
 BRIDGEPORT, CT 06604

DATE: 04/11/17
 SCALE: AS NOTED
 JOB NO. 17012.20

COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING CONFIG.

C-2

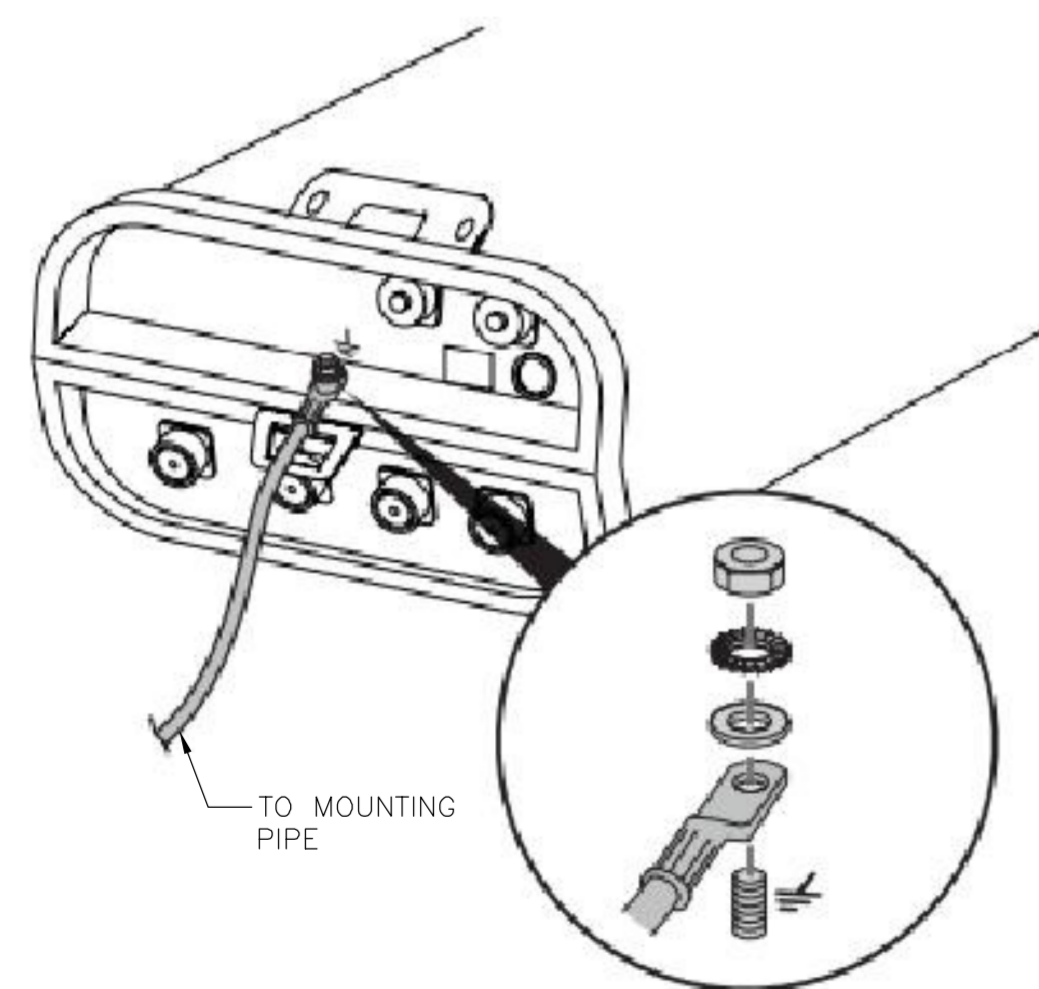
Sheet No. 4 of 6



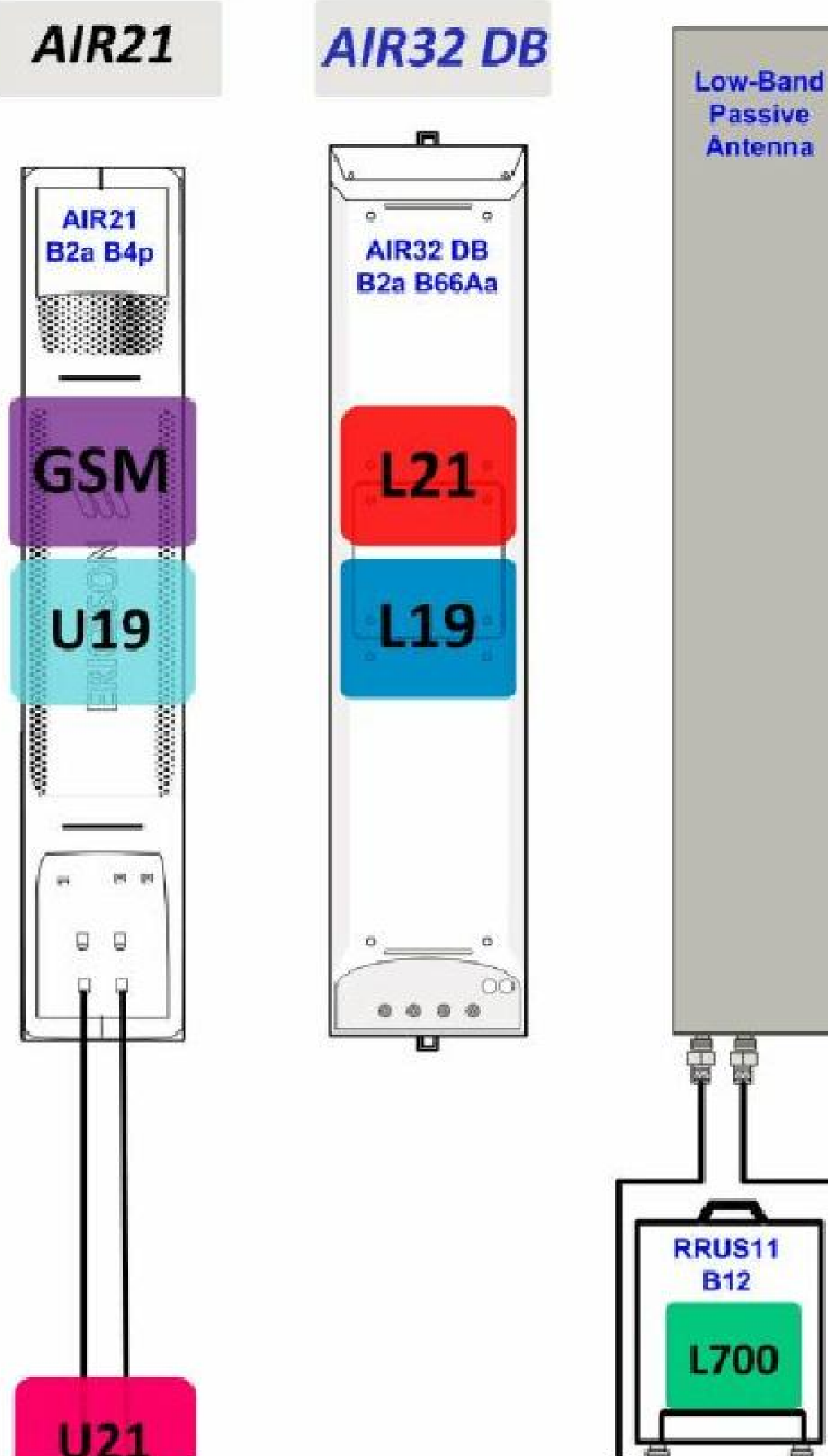
NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

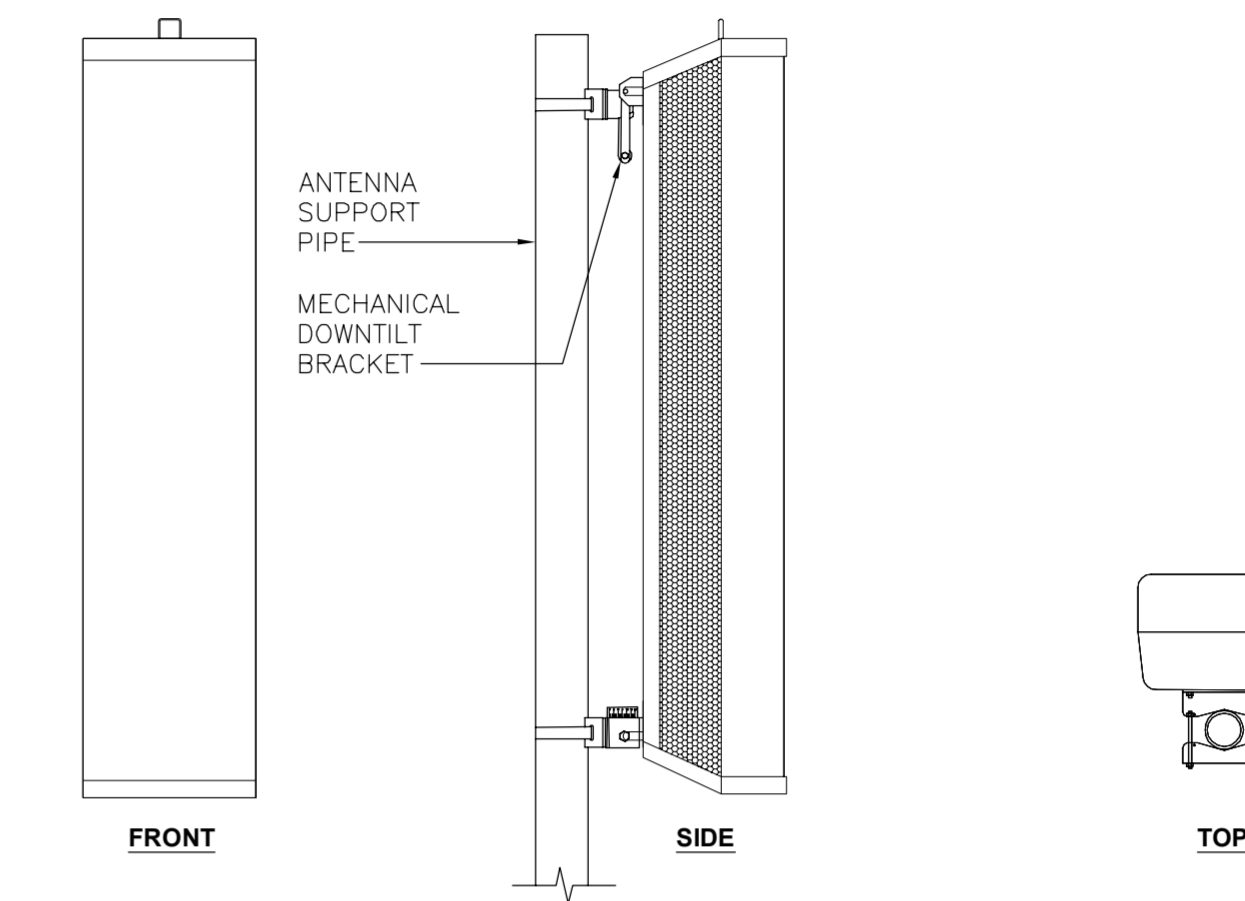
1 TYPICAL ANTENNA GROUNDING DETAIL
E-1 SCALE: NONE



AA TYPICAL ANTENNA GROUNDING DETAIL
E-1 SCALE: NONE



2 PROPOSED PLUMBING DIAGRAM
E-1 SCALE: NONE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: KRD901146-1_B66A_B2A	56.65"L x 12.87"W x 8.66"D	132.2 LBS.

3 PROPOSED ANTENNA DETAIL
E-1 SCALE: NONE

REV.	DATE	DESCRIPTION
0	04/13/17	LCL DRAWN BY CHK'D BY CAG CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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TYPICAL ELECTRICAL DETAILS

E-1

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