



10 INDUSTRIAL AVE,  
SUITE 3  
MAHWAH NJ 07430

PHONE: 201.684.0055  
FAX: 201.684.0066

December 12, 2018

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

Notice of Exempt Modification  
1969 Old Saybrook Road, Middletown, CT 06457  
Latitude- 41.51071600000  
Longitude- -72.5928500000

Dear Ms. Bachman,

T-Mobile currently maintains (4) existing antennas 110' level of the existing 150' monopole at 1969 Old Saybrook Road in Middletown, Connecticut. The tower is owned by Crown Castle. The property is owned by Regowset Ridge LLC. T-Mobile now intends to remove the (4) existing antennas and add (3) new 600/700/1900/2100 MHz antennas. These antennas would be installed at the same 110' level of the tower. T-Mobile also intends to add (4) coax and add (4) tower mounted amplifiers.

T-Mobile, as Omnipoint Communications, was approved for tower sharing at this facility by the Connecticut Siting Council on September 24, 1999.

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 Daniel Drew, Mayor of the City of Middletown, Joseph Samolis, Director of Planning, Conservation, and Development for the City of Middletown, as well as the tower owner 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](mailto:krichers@transcendwireless.com)

cc: Daniel Drew- as elected official  
Joseph Samolis- as zoning official  
Crown Castle- as tower owner  
Regowset Ridge LLC- as property owner

## Kyle Richers

---

**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Wednesday, December 12, 2018 9:13 AM  
**To:** krichers@transcendwireless.com  
**Subject:** UPS Ship Notification, Reference Number 1: CT11234C CSC EO



### You have a package coming.

**Scheduled Delivery Date:** Thursday, 12/13/2018

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

## Shipment Details

---

<b>From:</b>	TRANSCEND WIRELESS
<b>Tracking Number:</b>	<a href="#"><u>1ZV257424294825273</u></a>
<b>Ship To:</b>	Mayor Daniel Drew City of Middletown 245 deKoven Drive MIDDLETOWN, CT 064573460 US
<b>UPS Service:</b>	UPS GROUND
<b>Number of Packages:</b>	1
<b>Scheduled Delivery:</b>	12/13/2018
<b>Signature Required:</b>	A signature is required for package delivery
<b>Weight:</b>	1.0 LBS
<b>Reference Number 1:</b>	CT11234C CSC EO

## Kyle Richers

---

**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Wednesday, December 12, 2018 9:18 AM  
**To:** krichers@transcendwireless.com  
**Subject:** UPS Ship Notification, Reference Number 1: CT11234C CSC ZO



### You have a package coming.

**Scheduled Delivery Date:** Thursday, 12/13/2018

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

## Shipment Details

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<b>From:</b>	TRANSCEND WIRELESS
<b>Tracking Number:</b>	<a href="#">1ZV257424294939285</a>
<b>Ship To:</b>	Joseph Samolis City of Middletown 245 deKoven Drive Suite 202 MIDDLETOWN, CT 064573460 US
<b>UPS Service:</b>	UPS GROUND
<b>Number of Packages:</b>	1
<b>Scheduled Delivery:</b>	12/13/2018
<b>Signature Required:</b>	A signature is required for package delivery
<b>Weight:</b>	1.0 LBS
<b>Reference Number 1:</b>	CT11234C CSC ZO



## Kyle Richers

---

**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Wednesday, December 12, 2018 9:21 AM  
**To:** krichers@transcendwireless.com  
**Subject:** UPS Ship Notification, Reference Number 1: CT11234C CSC PO



**A signature is required for package delivery**

**You have a package coming.**

**Scheduled Delivery Date:** Thursday, 12/13/2018

[Sign Now](#)



[Change Delivery](#)

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[View Delivery Planner](#)

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

## Shipment Details

---

**From:** TRANSCEND WIRELESS  
**Tracking Number:** [1ZV257424290657293](#)  
**Ship To:** Regowset Ridge LLC  
88 High Street  
PORTLAND, CT 064801638  
US

## Kyle Richers

---

**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Wednesday, December 12, 2018 9:23 AM  
**To:** krichers@transcendwireless.com  
**Subject:** UPS Ship Notification, Reference Number 1: CT11234C CSC TO



### You have a package coming.

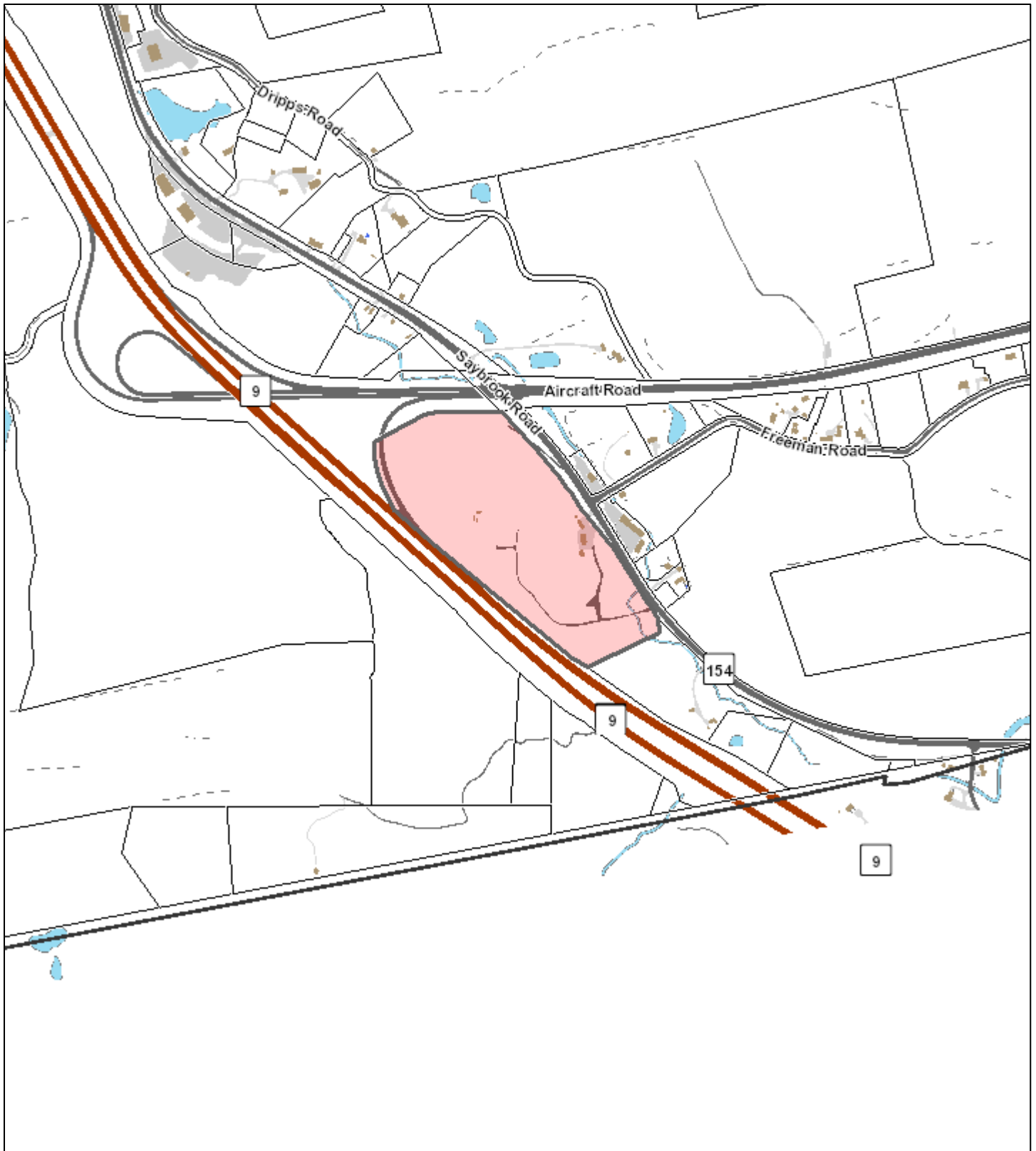
**Scheduled Delivery Date:** Thursday, 12/13/2018

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

## Shipment Details

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<b>From:</b>	TRANSCEND WIRELESS
<b>Tracking Number:</b>	<a href="#">1ZV257424293579309</a>
<b>Ship To:</b>	Crown Castle 3 Corporate Park Drive Suite 101 Clifton Park, NY 12065 US
<b>UPS Service:</b>	UPS GROUND
<b>Number of Packages:</b>	1
<b>Scheduled Delivery:</b>	12/13/2018
<b>Signature Required:</b>	A signature is required for package delivery
<b>Weight:</b>	1.0 LBS
<b>Reference Number 1:</b>	CT11234C CSC TO



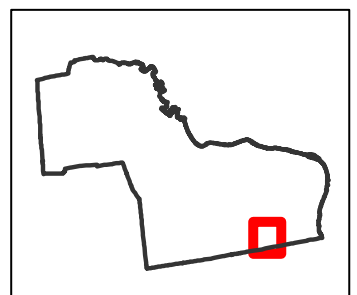
## City of Middletown, Connecticut

Map generated 5/10/2017

Map Legend: <http://gis.cityofmiddletown.com/middletownct/legend.pdf>

Property Card: <http://gis.vgsi.com/MiddletownCT/Parcel.aspx?pid=8044>

0 245 490 980 1,470 1,960 Feet 1 in = 750 ft



### MAP FOR REFERENCE ONLY - NOT A LEGAL DOCUMENT

Because of different update schedules, current property assessments may not reflect recent changes to property boundaries. Check with the Board of Assessors to confirm boundaries uses at the time of assessment.

# 1987 SAYBROOK RD

**Location** 1987 SAYBROOK RD

**Mblu** 49 / / 0015 / /

**Acct#** R07180

**Owner** REGOWSET RIDGE LLC

**Assessment** \$486,390

**Appraisal** \$694,850

**PID** 8044

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2013	\$162,310	\$532,540	\$694,850

Assessment			
Valuation Year	Improvements	Land	Total
2013	\$113,610	\$372,780	\$486,390

## Owner of Record

**Owner** REGOWSET RIDGE LLC  
**Co-Owner**  
**Address** 88 HIGH ST  
PORTLAND, CT 06480

**Sale Price** \$0  
**Certificate**  
**Book & Page** 1753/ 973  
**Sale Date** 04/17/2012  
**Instrument** 29

## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
REGOWSET RIDGE LLC	\$0		1753/ 973	29	04/17/2012
MARINO SEBASTIAN G (EST) (ETALS)	\$0		1753/ 970	29	04/17/2012
MARINO SEBASTIAN G (EST) (ETALS)	\$0		1753/ 967	29	04/17/2012
MARINO SEBASTIAN G (EST) (2/4 INT)	\$0		1753/ 964	29	04/17/2012
MARINO SEBASTIAN G (EST) (3/4 INT) &	\$0		1753/ 961	29	04/17/2012

## Building Information

### Building 1 : Section 1

**Year Built:** 1965  
**Living Area:** 2,800  
**Replacement Cost:** \$228,971

**Building Percent Good:** 65

**Replacement Cost**

**Less Depreciation:** \$148,830

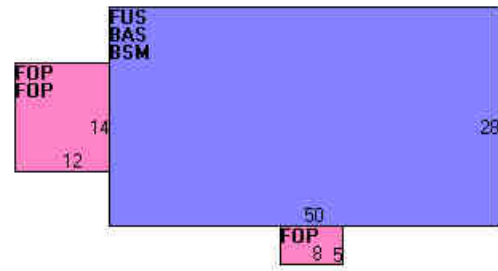
Building Attributes	
Field	Description
Style	Two Family
Model	Multi-Family
Grade	C
Stories	2 Stories
Occupancy	2
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Plastered
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	
Heat Fuel	Oil
Heat Type	Hot Water
Bedrooms	6
Full Baths	2
Half Baths	0
Extra Fixtures	0
Total Rooms	10
Bath Remodel	Not Updated
Kitchen Remodel	Not Updated
Extra Kitchens	2
Fireplaces	1
Extra Openings	1
Gas Fireplace	0
Int vs Ext	Same
A/C Type	None
A/C %	0
Fin Bsmt Area	0
Bsmt Garage	0

**Building Photo**



(<http://images.vgsi.com/photos/MiddletownCTPhotos//\00\03\1>)

**Building Layout**



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,400	1,400
FUS	Finished Upper Story	1,400	1,400
BSM	Basement	1,400	0
FOP	Framed Open Porch	376	0
		4,576	2,800

**Extra Features**

Extra Features	Legend
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No Data for Extra Features

## Land

### Land Use

**Use Code** 102  
**Description** 2 Family  
**Zone** R-60  
**Neighborhood** 12  
**Alt Land Appr Category** No

### Land Line Valuation

**Size (Acres)** 55.3  
**Frontage** 0  
**Depth** 0  
**Assessed Value** \$372,780  
**Appraised Value** \$532,540

## Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR1	Garage			520 UNITS	\$6,760	1
FGR2	Garage W/ Loft			480 UNITS	\$6,720	1

## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$162,310	\$532,540	\$694,850
2014	\$162,310	\$532,540	\$694,850
2013	\$162,310	\$532,540	\$694,850

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$113,610	\$372,780	\$486,390
2014	\$113,610	\$372,780	\$486,390
2013	\$113,610	\$372,780	\$486,390

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

T-Mobile Existing Facility

Site ID: CT11234C

Middletown/Rt9  
1969 Old Saybrook Road  
Middletown, CT 06457

**November 20, 2018**

**EBI Project Number: 6218007208**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>10.79 %</b>



November 20, 2018

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

## Emissions Analysis for Site: **CT11234C – Middletown/Rt9**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1969 Old Saybrook Road, Middletown, 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 population 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 population 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 1900 MHz (PCS) and 2100 MHz (AWS frequency 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 **1969 Old Saybrook Road, Middletown, 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 for directional panel antennas, 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) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.
- 2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 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.
- 4) Cable losses were factored in the calculations for this site. Since all the proposed radios are ground mounted the following cable loss values were used. For each ground mounted 1900 MHz (PCS) radio there was 1.65 dB of cable loss calculated into the system gains / losses for this site. For each ground mounted 2100 MHz (AWS) radio there was 1.70 dB of cable loss calculated into the system gains / losses for this site. These calculations are based upon the specified 160 feet of 1-5/8" coax per RF path.



- 5) 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.
- 6) 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 for directional panel antennas, 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.
- 7) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.
- 8) The antenna mounting height centerline of the proposed antennas is **111 feet** above ground level (AGL).
- 9) 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.
- 10) All calculations were done with respect to uncontrolled / general population threshold limits.



### T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV- 16DWVS-E-A20	Make / Model:	RFS APX16DWV- 16DWVS-E-A20	Make / Model:	RFS APX16DWV- 16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	111 feet	Height (AGL):	111 feet	Height (AGL):	111 feet
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	5	Channel Count	5	Channel Count	5
Total TX Power(W):	215	Total TX Power(W):	215	Total TX Power(W):	215
ERP (W):	6,232.39	ERP (W):	6,232.39	ERP (W):	6,232.39
Antenna A1 MPE%	<b>2.03</b>	Antenna B1 MPE%	<b>2.03</b>	Antenna C1 MPE%	<b>2.03</b>

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	<b>2.03 %</b>
AT&T	<b>4.69 %</b>
MetroPCS	<b>0.51 %</b>
Verizon Wireless	<b>2.50 %</b>
Sprint	<b>1.06 %</b>
<b>Site Total MPE %:</b>	<b>10.79 %</b>

T-Mobile Sector A Total:	2.03 %
T-Mobile Sector B Total:	2.03 %
T-Mobile Sector C Total:	2.03 %
<b>Site Total:</b>	
	10.79 %

### T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (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 PCS - 1900 MHz GSM	1	437.61	111	1.43	PCS - 1900 MHz	1000.00	0.14%
T-Mobile PCS - 1900 MHz LTE	2	1,166.97	111	7.61	PCS - 1900 MHz	1000.00	0.76%
T-Mobile AWS - 2100 MHz LTE	2	1,730.42	111	11.29	AWS - 2100 MHz	1000.00	1.13%
						<b>Total:</b>	<b>2.03%</b>

## Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.03 %
Sector B:	2.03 %
Sector C:	2.03 %
T-Mobile Maximum MPE % (Per Sector):	2.03 %
Site Total:	10.79 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **10.79%** of the allowable FCC established general population 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: **December 11, 2018**

Denice Nicholson  
Crown Castle  
3 Corporate Park Drive Suite 101  
Clifton Park, NY 12065

FDH Infrastructure Services, LLC  
6521 Meridien Drive Suite 107  
Raleigh, NC 27616  
919.755.1012

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

**Carrier Designation:** **T-Mobile Co-Locate**  
**Carrier Site Number:** CT11234C  
**Carrier Site Name:** Middletown/Rt9

**Crown Castle Designation:** **Crown Castle BU Number:** 876341  
**Crown Castle Site Name:** MIDDLETOWN 2 - MARINO PROPERTY  
**Crown Castle JDE Job Number:** 526830  
**Crown Castle Work Order Number:** 1650083  
**Crown Castle Order Number:** 456553 Rev. 0

**Engineering Firm Designation:** **FDH-IS Project Number:** 18TAJG1400(R2)

**Site Data:** **1969 Old Saybrook Road, Middletown, Middlesex County, CT**  
**Latitude 41° 30' 38.3", Longitude -72° 35' 36.1"**  
**150 Foot - Monopole Tower**

Dear Denice Nicholson,

FDH Infrastructure Services, LLC is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above mentioned tower.

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: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2016 Connecticut Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully Submitted by: Reviewed by:

Aditya Chingale, EI  
Project Engineer I

Dennis D. Abel, PE  
Director, Engineering  
CT PE License No. 23247



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**1) INTRODUCTION**

This tower is a 150 ft Monopole tower designed by Paul J. Ford and Company.

The tower has been modified multiple times to accommodate additional loading.

**2) ANALYSIS CRITERIA**

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	130 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
111.0	111.0	1	site pro 1	HRK12 Handrail Kit	12	1-5/8
		1	site pro 1	RMPQ-396 Platform Mount		
		3	ems wireless	RR65-18-02DP		
		3	ericsson	KRY 112 144/2		
		3	ericsson	KRY 112 489/1		
		3	rfs celwave	APX16DWV-16DWV-S-E-A20		

**Table 2 – Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	152.5	1	site pro 1	HRK14-HD Handrail Kit	3 1	1-1/4 7/8
	150.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8x20-25		
		3	commscope	NNVV-65B-R4		
		1	crown mounts	Platform Mount [LP 1201-1]		
		3	rfs celwave	APXVTM14-ALU-I20		
141.0	145.0	1	lucent	KS24019-L112A	1 13	1/2 1-5/8
	142.0	3	alcatel lucent	RRH2X60-AWS BAND 4		
		3	alcatel lucent	RRH2X60-PCS		
		6	andrew	HBXX-6517DS-A2M		
		3	antel	BXA-70063-6CF-EDIN-0		
		6	rfs celwave	APL868013-42T0		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
	6	rfs celwave	FD9R6004/2C-3L			
141.0	1	crown mounts	Platform Mount [LP 1201-1]			
132.0	134.0	1	raycap	DC6-48-60-18-8F	1	3/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	133.0	3	cci antennas	OPA-65R-LCUU-H6	2 12 1	3/4 1-5/8 Conduit
		3	ericsson	RRUS 11		
		6	powerwave tech	7770.00		
		3	powerwave tech	LGP21401		
	132.0	1	crown mounts	Miscellaneous [NA 510-1]		
		1	crown mounts	Platform Mount [LP 1201-1]		
		3	ericsson	RRUS 12 B2		
	129.0	3	powerwave tech	LGP21401		
128.0	3	ericsson	RRUS A2 B2			
104.0	104.0	1	crown mounts	Side Arm Mount [SO 701-1]	1	1/2
		1	lucent	KS24019-L112A		
88.0	95.0	2	sinclair	SC479-HF1LDF	1 2	1/2 7/8
	88.0	1	bird tech group	428E-83I-01-T		
		2	crown mounts	Side Arm Mount [SO 306-1]		
82.0	92.0	1	rfi antennas	BA80-41-DIN	1	7/8
	82.0	1	crown mounts	Side Arm Mount [SO 306-1]		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbour & Associates LLP	1532967	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J. Ford and Company	1613596	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Paul J. Ford and Company	1614554	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	IETS Engineering Services	1595639	CCISITES
4-POST-MODIFICATION INSPECTION	IETS Engineering Services	2504220	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	FDH Engineering, Inc.	5069317	CCISITES
4-POST-MODIFICATION INSPECTION	Sinnott Gering and Schmitt Towers, Inc.	5311239	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	5570674	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solutions, PLLC	5810606	CCISITES



### 3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

### 3.2) Assumptions

- 1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Infrastructure Services, LLC should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP23x22x0.25	Pole	5.7%	Pass
145 - 140	Pole	TP24x23x0.25	Pole	12.0%	Pass
140 - 135	Pole	TP25x24x0.25	Pole	20.2%	Pass
135 - 130	Pole	TP26x25x0.25	Pole	29.4%	Pass
130 - 125	Pole	TP27.001x26x0.25	Pole	39.1%	Pass
125 - 120	Pole	TP28.001x27.001x0.25	Pole	47.9%	Pass
120 - 115	Pole	TP29.001x28.001x0.25	Pole	56.2%	Pass
115 - 111.75	Pole	TP30.401x29.001x0.25	Pole	61.2%	Pass
111.75 - 106.75	Pole	TP30.151x29.151x0.3125	Pole	52.6%	Pass
106.75 - 101.75	Pole	TP31.151x30.151x0.3125	Pole	58.2%	Pass
101.75 - 96.75	Pole	TP32.152x31.151x0.3125	Pole	63.5%	Pass
96.75 - 91.75	Pole	TP33.152x32.152x0.3125	Pole	68.4%	Pass
91.75 - 89.5	Pole	TP33.602x33.152x0.3125	Pole	70.5%	Pass
89.5 - 89.25	Pole + Reinf.	TP33.652x33.602x0.5	Reinf. 3 Tension Rupture	59.2%	Pass
89.25 - 84.25	Pole + Reinf.	TP34.652x33.652x0.4938	Reinf. 3 Tension Rupture	63.1%	Pass
84.25 - 79.25	Pole + Reinf.	TP35.653x34.652x0.4875	Reinf. 3 Tension Rupture	67.0%	Pass
79.25 - 74.5	Pole + Reinf.	TP37.553x35.653x0.4813	Reinf. 3 Tension Rupture	70.3%	Pass
74.5 - 68.75	Pole	TP37.128x35.978x0.375	Pole	66.6%	Pass
68.75 - 67.42	Pole	TP37.394x37.128x0.375	Pole	67.4%	Pass
67.42 - 67.17	Pole	TP37.444x37.394x0.375	Pole	67.5%	Pass
67.17 - 62.17	Pole	TP38.444x37.444x0.375	Pole	70.2%	Pass
62.17 - 57.58	Pole	TP39.362x38.444x0.375	Pole	72.6%	Pass
57.58 - 57.33	Pole + Reinf.	TP39.412x39.362x0.7	Reinf. 2 Tension Rupture	55.9%	Pass
57.33 - 56.42	Pole + Reinf.	TP39.594x39.412x0.7	Reinf. 2 Tension Rupture	56.2%	Pass
56.42 - 56.17	Pole + Reinf.	TP39.644x39.594x0.5875	Reinf. 2 Tension Rupture	67.3%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
56.17 - 51.17	Pole + Reinf.	TP40.644x39.644x0.575	Reinf. 2 Tension Rupture	69.5%	Pass
51.17 - 46.17	Pole + Reinf.	TP41.645x40.644x0.575	Reinf. 2 Tension Rupture	71.6%	Pass
46.17 - 41.17	Pole + Reinf.	TP42.645x41.645x0.5625	Reinf. 2 Tension Rupture	73.5%	Pass
41.17 - 38	Pole + Reinf.	TP44.379x42.645x0.5625	Reinf. 2 Tension Rupture	74.7%	Pass
38 - 31.5	Pole	TP43.829x42.529x0.4375	Pole	70.3%	Pass
31.5 - 26.5	Pole	TP44.829x43.829x0.4375	Pole	71.9%	Pass
26.5 - 26.25	Pole + Reinf.	TP44.879x44.829x0.6875	Reinf. 1 Tension Rupture	65.0%	Pass
26.25 - 21.25	Pole + Reinf.	TP45.879x44.879x0.6875	Reinf. 1 Tension Rupture	66.4%	Pass
21.25 - 16.25	Pole + Reinf.	TP46.88x45.879x0.675	Reinf. 1 Tension Rupture	67.6%	Pass
16.25 - 11.25	Pole + Reinf.	TP47.88x46.88x0.675	Reinf. 1 Tension Rupture	68.8%	Pass
11.25 - 6.25	Pole + Reinf.	TP48.88x47.88x0.6625	Reinf. 1 Tension Rupture	69.9%	Pass
6.25 - 1.25	Pole + Reinf.	TP49.88x48.88x0.6625	Reinf. 1 Tension Rupture	71.0%	Pass
1.25 - 0	Pole + Reinf.	TP50.13x49.88x0.6625	Reinf. 1 Tension Rupture	71.3%	Pass
				Summary	
			Pole	72.6%	Pass
			Reinforcement	74.7%	Pass
			<b>Overall</b>	<b>74.7%</b>	<b>Pass</b>

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	63.6	Pass
1	Base Plate	0	60.4	Pass
1	Base Transfer Stiffener	0	98.0	Pass
1	Base Foundation	0	51.0	Pass
1	Base Foundation Soil Interaction	0	45.8	Pass

<b>Structure Rating (max from all components) =</b>	<b>98.0%</b>
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Notes:

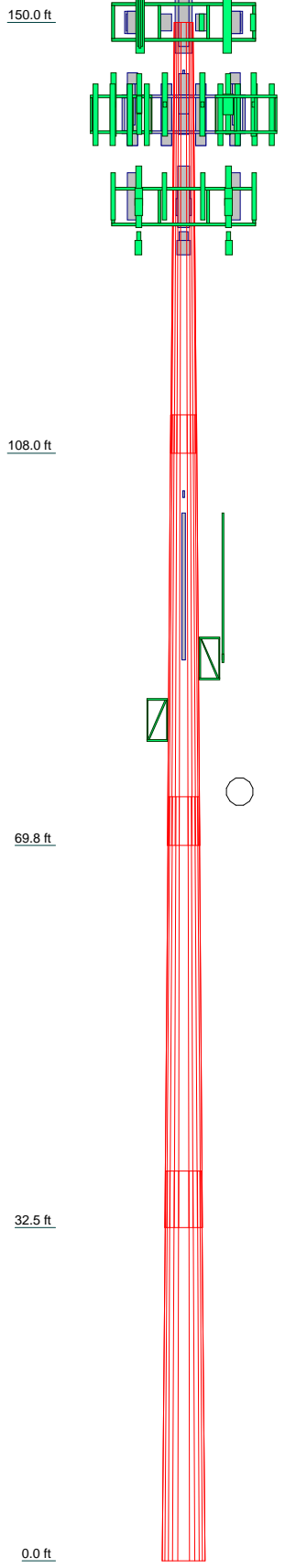
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Ratings per TIA-222-H Section 15.5

#### 4.1) Recommendations

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

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

Section	1	2	3	4
Length (ft)	42.00	42.00	42.00	38.00
Number of Sides	12	12	12	12
Thickness (in)	0.2500	0.3125	0.3750	0.4375
Socket Length (ft)	3.75	4.75	5.50	5.50
Top Dia (in)	22.0000	29.1509	35.9778	42.5288
Bot Dia (in)	30.4010	37.5530	44.3790	50.1300
Grade		A607-60	A607-65	
Weight (K)	3.0	4.8	6.9	8.4



**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

**TOWER DESIGN NOTES**

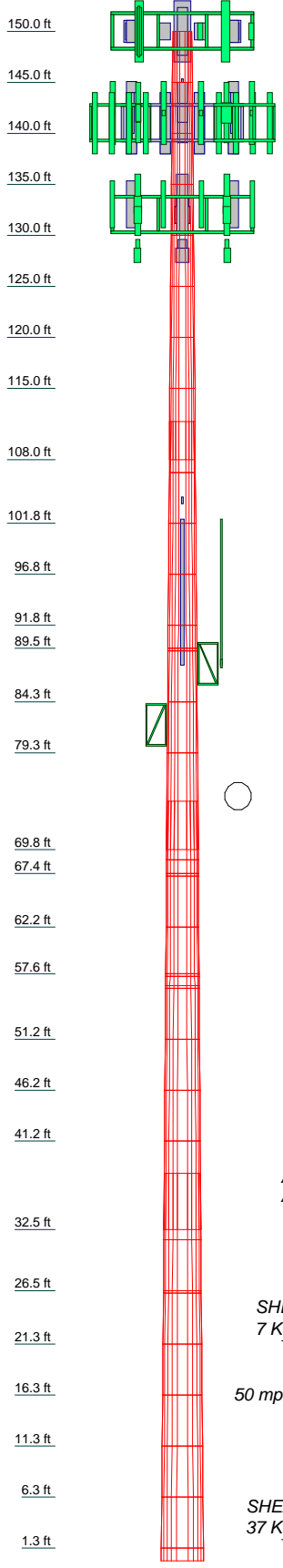
1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.27 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S



**FDH Infrastructure Services**  
 6521 Meridien Drive  
 Raleigh, NC 27616  
 Phone: 919.755.1012  
 FAX: 919.755.1031

Job: <b>876341 Middletown 2-Marino Property</b>		
Project: <b>18TAJG1400 (R2)</b>		
Client: <b>Crown Castle</b>	Drawn by: <b>Aditya Chingale</b>	App'd:
Code: <b>TIA-222-H</b>	Date: <b>12/11/18</b>	Scale: <b>NTS</b>
Path:		Dwg No. <b>E-1</b>

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
2	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
3	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
4	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
5	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
6	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
7	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
8	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
9	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
10	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
11	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
12	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
13	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
14	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
15	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
16	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
17	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
18	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
19	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
20	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
21	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
22	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
23	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
24	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
25	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
26	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
27	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
28	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
29	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
30	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
31	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
32	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
33	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
34	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
35	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
36	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
37	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
38	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
39	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
40	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
41	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
42	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
43	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
44	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
45	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
46	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
47	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
48	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
49	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3
50	5.00	12	0.2500	3.75	23.0000	23.0000	A607-60	0.3

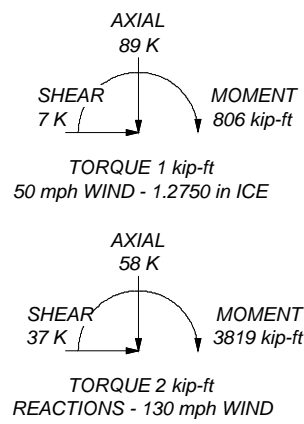


GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

**TOWER DESIGN NOTES**

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.27 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S

ALL REACTIONS ARE FACTORED



<p><b>FDH</b> INFRASTRUCTURE SERVICES ENGINEERING INNOVATION</p> <p>Tower Analysis</p>	<p><b>FDH Infrastructure Services</b> Job: <b>876341 Middletown 2-Marino Property</b></p>	
	<p>6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031</p>	
	<p>Project: <b>18TAJG1400 (R2)</b></p>	<p>Client: Crown Castle</p>
	<p>Code: TIA-222-H</p>	<p>Drawn by: Aditya Chingale</p>
	<p>Path:</p>	<p>Date: 12/11/18</p>
	<p>App'd:</p>	<p>Scale: NTS</p>
		<p>Dwg No. E-1</p>

<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b> 876341 Middletown 2-Marino Property	<b>Page</b> 1 of 47
	<b>Project</b> 18TAJG1400 (R2)	<b>Date</b> 14:38:10 12/11/18
	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

- Tower is located in Middlesex County, Connecticut.
- Tower base elevation above sea level: 369.73 ft.
- Basic wind speed of 130 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 1.2750 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- TIA-222-H Annex S.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|---|

## Tapered Pole Section Geometry

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031</p>	<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	2 of 47
	<b>Project</b>	18TAJG1400 (R2)	<b>Date</b>	14:38:10 12/11/18
	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-145.00	5.00	0.00	12	22.0000	23.0001	0.2500	1.0000	A607-60 (60 ksi)
L2	145.00-140.00	5.00	0.00	12	23.0001	24.0002	0.2500	1.0000	A607-60 (60 ksi)
L3	140.00-135.00	5.00	0.00	12	24.0002	25.0004	0.2500	1.0000	A607-60 (60 ksi)
L4	135.00-130.00	5.00	0.00	12	25.0004	26.0005	0.2500	1.0000	A607-60 (60 ksi)
L5	130.00-125.00	5.00	0.00	12	26.0005	27.0006	0.2500	1.0000	A607-60 (60 ksi)
L6	125.00-120.00	5.00	0.00	12	27.0006	28.0007	0.2500	1.0000	A607-60 (60 ksi)
L7	120.00-115.00	5.00	0.00	12	28.0007	29.0008	0.2500	1.0000	A607-60 (60 ksi)
L8	115.00-108.00	7.00	3.75	12	29.0008	30.4010	0.2500	1.0000	A607-60 (60 ksi)
L9	108.00-106.75	5.00	0.00	12	29.1509	30.1512	0.3125	1.2500	A607-60 (60 ksi)
L10	106.75-101.75	5.00	0.00	12	30.1512	31.1514	0.3125	1.2500	A607-60 (60 ksi)
L11	101.75-96.75	5.00	0.00	12	31.1514	32.1517	0.3125	1.2500	A607-60 (60 ksi)
L12	96.75-91.75	5.00	0.00	12	32.1517	33.1519	0.3125	1.2500	A607-60 (60 ksi)
L13	91.75-89.50	2.25	0.00	12	33.1519	33.6020	0.3125	1.2500	A607-60 (60 ksi)
L14	89.50-89.25	0.25	0.00	12	33.6020	33.6520	0.5000	2.0000	A607-60 (60 ksi)
L15	89.25-84.25	5.00	0.00	12	33.6520	34.6523	0.4938	1.9750	A607-60 (60 ksi)
L16	84.25-79.25	5.00	0.00	12	34.6523	35.6525	0.4875	1.9500	A607-60 (60 ksi)
L17	79.25-69.75	9.50	4.75	12	35.6525	37.5530	0.4813	1.9250	A607-60 (60 ksi)
L18	69.75-68.75	5.75	0.00	12	35.9778	37.1279	0.3750	1.5000	A607-65 (65 ksi)
L19	68.75-67.42	1.33	0.00	12	37.1279	37.3940	0.3750	1.5000	A607-65 (65 ksi)
L20	67.42-67.17	0.25	0.00	12	37.3940	37.4440	0.3750	1.5000	A607-65 (65 ksi)
L21	67.17-62.17	5.00	0.00	12	37.4440	38.4441	0.3750	1.5000	A607-65 (65 ksi)
L22	62.17-57.58	4.59	0.00	12	38.4441	39.3623	0.3750	1.5000	A607-65 (65 ksi)
L23	57.58-57.33	0.25	0.00	12	39.3623	39.4123	0.7000	2.8000	A607-65 (65 ksi)
L24	57.33-56.42	0.91	0.00	12	39.4123	39.5943	0.7000	2.8000	A607-65 (65 ksi)
L25	56.42-56.17	0.25	0.00	12	39.5943	39.6443	0.5875	2.3500	A607-65 (65 ksi)
L26	56.17-51.17	5.00	0.00	12	39.6443	40.6444	0.5750	2.3000	A607-65 (65 ksi)
L27	51.17-46.17	5.00	0.00	12	40.6444	41.6446	0.5750	2.3000	A607-65 (65 ksi)
L28	46.17-41.17	5.00	0.00	12	41.6446	42.6447	0.5625	2.2500	A607-65 (65 ksi)
L29	41.17-32.50	8.67	5.50	12	42.6447	44.3790	0.5625	2.2500	A607-65 (65 ksi)
L30	32.50-31.50	6.50	0.00	12	42.5288	43.8290	0.4375	1.7500	A607-65 (65 ksi)
L31	31.50-26.50	5.00	0.00	12	43.8290	44.8292	0.4375	1.7500	A607-65

<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	3 of 47
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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
L32	26.50-26.25	0.25	0.00	12	44.8292	44.8792	0.6875	2.7500	(65 ksi) A607-65
L33	26.25-21.25	5.00	0.00	12	44.8792	45.8794	0.6875	2.7500	(65 ksi) A607-65
L34	21.25-16.25	5.00	0.00	12	45.8794	46.8795	0.6750	2.7000	(65 ksi) A607-65
L35	16.25-11.25	5.00	0.00	12	46.8795	47.8797	0.6750	2.7000	(65 ksi) A607-65
L36	11.25-6.25	5.00	0.00	12	47.8797	48.8798	0.6625	2.6500	(65 ksi) A607-65
L37	6.25-1.25	5.00	0.00	12	48.8798	49.8800	0.6625	2.6500	(65 ksi) A607-65
L38	1.25-0.00	1.25		12	49.8800	50.1300	0.6625	2.6500	(65 ksi) A607-65

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	22.6879	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	23.7233	18.3138	1209.8537	8.1445	11.9141	101.5484	2451.4916	9.0135	5.4940	21.976
L2	23.7233	18.3138	1209.8537	8.1445	11.9141	101.5484	2451.4916	9.0135	5.4940	21.976
	24.7587	19.1189	1376.5302	8.5026	12.4321	110.7237	2789.2233	9.4098	5.7621	23.048
L3	24.7587	19.1189	1376.5302	8.5026	12.4321	110.7237	2789.2233	9.4098	5.7621	23.048
	25.7941	19.9240	1557.8521	8.8606	12.9502	120.2957	3156.6308	9.8060	6.0301	24.12
L4	25.7941	19.9240	1557.8521	8.8606	12.9502	120.2957	3156.6308	9.8060	6.0301	24.12
	26.8295	20.7291	1754.4363	9.2187	13.4682	130.2646	3554.9637	10.2022	6.2981	25.193
L5	26.8295	20.7291	1754.4363	9.2187	13.4682	130.2646	3554.9637	10.2022	6.2981	25.193
	27.8649	21.5342	1966.8995	9.5767	13.9863	140.6304	3985.4716	10.5985	6.5662	26.265
L6	27.8649	21.5342	1966.8995	9.5767	13.9863	140.6304	3985.4716	10.5985	6.5662	26.265
	28.9003	22.3393	2195.8583	9.9348	14.5044	151.3929	4449.4043	10.9947	6.8342	27.337
L7	28.9003	22.3393	2195.8583	9.9348	14.5044	151.3929	4449.4043	10.9947	6.8342	27.337
	29.9357	23.1444	2441.9295	10.2928	15.0224	162.5522	4948.0113	11.3910	7.1022	28.409
L8	29.9357	23.1444	2441.9295	10.2928	15.0224	162.5522	4948.0113	11.3910	7.1022	28.409
	31.3852	24.2716	2816.3524	10.7941	15.7477	178.8419	5706.6935	11.9457	7.4775	29.91
L9	30.8457	29.0187	3080.3908	10.3242	15.1002	203.9971	6241.7070	14.2821	6.9749	22.32
	31.1045	30.0252	3412.1628	10.6822	15.6183	218.4721	6913.9670	14.7775	7.2430	23.178
L10	31.1045	30.0252	3412.1628	10.6822	15.6183	218.4721	6913.9670	14.7775	7.2430	23.178
	32.1401	31.0317	3766.9410	11.0403	16.1364	233.4433	7632.8437	15.2728	7.5111	24.035
L11	32.1401	31.0317	3766.9410	11.0403	16.1364	233.4433	7632.8437	15.2728	7.5111	24.035
	33.1756	32.0382	4145.4962	11.3984	16.6546	248.9106	8399.8993	15.7682	7.7791	24.893
L12	33.1756	32.0382	4145.4962	11.3984	16.6546	248.9106	8399.8993	15.7682	7.7791	24.893
	34.2111	33.0447	4548.5997	11.7565	17.1727	264.8741	9216.6963	16.2636	8.0472	25.751
L13	34.2111	33.0447	4548.5997	11.7565	17.1727	264.8741	9216.6963	16.2636	8.0472	25.751
	34.6771	33.4976	4738.2107	11.9176	17.4058	272.2195	9600.8994	16.4865	8.1678	26.137
L14	34.6110	53.2942	7453.7571	11.8505	17.4058	428.2330	15103.3328	26.2298	7.6653	15.331
	34.6628	53.3748	7487.5926	11.8684	17.4318	429.5376	15171.8926	26.2694	7.6787	15.357
L15	34.6650	52.7175	7398.1804	11.8707	17.4318	424.4083	14990.7191	25.9460	7.6955	15.586
	35.7005	54.3078	8088.0981	12.2288	17.9499	450.5934	16388.6796	26.7286	7.9636	16.129
L16	35.7027	53.6302	7990.1014	12.2310	17.9499	445.1340	16190.1116	26.3951	7.9803	16.37
	36.7382	55.2003	8712.6307	12.5891	18.4680	471.7688	17654.1520	27.1679	8.2484	16.92
L17	36.7404	54.5023	8605.5172	12.5913	18.4680	465.9689	17437.1109	26.8244	8.2651	17.174
	38.7080	57.4473	10077.2452	13.2717	19.4525	518.0449	20419.2309	28.2738	8.7745	18.233
L18	38.0983	42.9903	6955.4340	12.7458	18.6365	373.2160	14093.5951	21.1585	8.6370	23.032
	38.3054	44.3792	7651.5443	13.1576	19.2323	397.8493	15504.1032	21.8421	8.9453	23.854



<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b> 876341 Middletown 2-Marino Property	<b>Page</b> 4 of 47
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	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L19	38.3054	44.3792	7651.5443	13.1576	19.2323	397.8493	15504.1032	21.8421	8.9453	23.854
	38.5808	44.7004	7818.9089	13.2528	19.3701	403.6591	15843.2292	22.0002	9.0166	24.044
L20	38.5808	44.7004	7818.9089	13.2528	19.3701	403.6591	15843.2292	22.0002	9.0166	24.044
	38.6326	44.7608	7850.6382	13.2707	19.3960	404.7559	15907.5214	22.0299	9.0300	24.08
L21	38.6326	44.7608	7850.6382	13.2707	19.3960	404.7559	15907.5214	22.0299	9.0300	24.08
	39.6680	45.9685	8503.3850	13.6287	19.9141	427.0041	17230.1634	22.6243	9.2980	24.795
L22	39.6680	45.9685	8503.3850	13.6287	19.9141	427.0041	17230.1634	22.6243	9.2980	24.795
	40.6185	47.0771	9133.5855	13.9574	20.3897	447.9520	18507.1205	23.1699	9.5441	25.451
L23	40.5039	87.1447	16626.5308	13.8411	20.3897	815.4397	33689.8590	42.8900	8.6731	12.39
	40.5557	87.2575	16691.1301	13.8590	20.4156	817.5692	33820.7548	42.9455	8.6865	12.409
L24	40.5557	87.2575	16691.1301	13.8590	20.4156	817.5692	33820.7548	42.9455	8.6865	12.409
	40.7441	87.6677	16927.6865	13.9242	20.5098	825.3444	34300.0821	43.1474	8.7353	12.479
L25	40.7838	73.7911	14330.8031	13.9644	20.5098	698.7280	29038.0924	36.3177	9.0368	15.382
	40.8356	73.8857	14385.9904	13.9823	20.5357	700.5340	29149.9168	36.3643	9.0502	15.405
L26	40.8400	72.3368	14093.4285	13.9868	20.5357	686.2875	28557.1071	35.6020	9.0837	15.798
	41.8754	74.1886	15203.7182	14.3449	21.0538	722.1357	30806.8549	36.5134	9.3517	16.264
L27	41.8754	74.1886	15203.7182	14.3449	21.0538	722.1357	30806.8549	36.5134	9.3517	16.264
	42.9108	76.0404	16370.8422	14.7029	21.5719	758.8966	33171.7646	37.4248	9.6198	16.73
L28	42.9152	74.4099	16029.5818	14.7074	21.5719	743.0769	32480.2785	36.6223	9.6533	17.161
	43.9507	76.2215	17229.0388	15.0654	22.0900	779.9482	34910.7037	37.5139	9.9213	17.638
L29	43.9507	76.2215	17229.0388	15.0654	22.0900	779.9482	34910.7037	37.5139	9.9213	17.638
	45.7461	79.3626	19448.1099	15.6863	22.9883	845.9995	39407.1433	39.0599	10.3861	18.464
L30	45.0137	59.2962	13409.0519	15.0687	22.0299	608.6741	27170.3746	29.1838	10.2252	23.372
	45.2208	61.1278	14690.4460	15.5342	22.7034	647.0581	29766.8263	30.0853	10.5737	24.168
L31	45.2208	61.1278	14690.4460	15.5342	22.7034	647.0581	29766.8263	30.0853	10.5737	24.168
	46.2563	62.5368	15729.8621	15.8922	23.2215	677.3830	31872.9653	30.7787	10.8417	24.781
L32	46.1681	97.7187	24303.0843	15.8027	23.2215	1046.5759	49244.6377	48.0942	10.1717	14.795
	46.2198	97.8294	24385.7750	15.8206	23.2474	1048.9668	49412.1914	48.1486	10.1851	14.815
L33	46.2198	97.8294	24385.7750	15.8206	23.2474	1048.9668	49412.1914	48.1486	10.1851	14.815
	47.2553	100.0435	26079.2372	16.1787	23.7655	1097.3568	52843.6051	49.2383	10.4532	15.205
L34	47.2597	98.2517	25626.3221	16.1832	23.7655	1078.2992	51925.8763	48.3565	10.4867	15.536
	48.2951	100.4255	27365.1923	16.5412	24.2836	1126.9010	55449.2986	49.4264	10.7547	15.933
L35	48.2951	100.4255	27365.1923	16.5412	24.2836	1126.9010	55449.2986	49.4264	10.7547	15.933
	49.3306	102.5993	29180.9957	16.8993	24.8017	1176.5742	59128.6086	50.4963	11.0227	16.33
L36	49.3350	100.7260	28663.3654	16.9037	24.8017	1155.7034	58079.7492	49.5743	11.0562	16.689
	50.3704	102.8596	30523.6603	17.2618	25.3197	1205.5281	61849.2110	50.6244	11.3243	17.093
L37	50.3704	102.8596	30523.6603	17.2618	25.3197	1205.5281	61849.2110	50.6244	11.3243	17.093
	51.4058	104.9932	32462.7531	17.6199	25.8378	1256.4045	65778.3388	51.6744	11.5923	17.498
L38	51.4058	104.9932	32462.7531	17.6199	25.8378	1256.4045	65778.3388	51.6744	11.5923	17.498
	51.6647	105.5265	32960.0295	17.7094	25.9673	1269.2879	66785.9557	51.9370	11.6593	17.599

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1				1	1	1			
150.00-145.00									
L2				1	1	1			
145.00-140.00									
L3				1	1	1			
140.00-135.00									
L4				1	1	1			
135.00-130.00									
L5				1	1	1			
130.00-125.00									
L6				1	1	1			
125.00-120.00									
L7				1	1	1			
120.00-115.00									
L8				1	1	1			

<p style="text-align: center;"><b>tnxTower</b></p> <p><b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031</p>	<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	5 of 47
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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 in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
115.00-108.00									
L9				1	1	1			
108.00-106.75									
L10				1	1	1			
106.75-101.75									
L11				1	1	1			
101.75-96.75									
L12				1	1	1			
96.75-91.75									
L13				1	1	1			
91.75-89.50									
L14				1	1	0.966256			
89.50-89.25									
L15				1	1	0.968189			
89.25-84.25									
L16				1	1	0.970768			
84.25-79.25									
L17				1	1	0.974419			
79.25-69.75									
L18				1	1	1			
69.75-68.75									
L19				1	1	1			
68.75-67.42									
L20				1	1	1			
67.42-67.17									
L21				1	1	1			
67.17-62.17									
L22				1	1	1			
62.17-57.58									
L23				1	1	1.02224			
57.58-57.33									
L24				1	1	1.01996			
57.33-56.42									
L25				1	1	0.967062			
56.42-56.17									
L26				1	1	0.979393			
56.17-51.17									
L27				1	1	0.971424			
51.17-46.17									
L28				1	1	0.98496			
46.17-41.17									
L29				1	1	0.980236			
41.17-32.50									
L30				1	1	1			
32.50-31.50									
L31				1	1	1			
31.50-26.50									
L32				1	1	0.972651			
26.50-26.25									
L33				1	1	0.965209			
26.25-21.25									
L34				1	1	0.975567			
21.25-16.25									
L35				1	1	0.96863			
16.25-11.25									
L36 11.25-6.25				1	1	0.979877			
L37 6.25-1.25				1	1	0.973384			
L38 1.25-0.00				1	1	0.971802			

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**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
** Safety Line 3/8	C	No	Surface Ar (CaAa)	149.00 - 0.00	1	1	0.000 0.000	0.3750		0.22
** AVA5-50( 7/8")	C	No	Surface Ar (CaAa)	88.00 - 0.00	2	2	-0.500 -0.480	1.1020		0.30
LDF4-50A(1/2")	C	No	Surface Ar (CaAa)	88.00 - 0.00	1	1	-0.480 -0.470	0.6300		0.15
AVA5-50( 7/8")	C	No	Surface Ar (CaAa)	82.00 - 0.00	1	1	-0.470 -0.470	1.1020		0.30
** *Flat Plate*										
** 6.5" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	30.00 - 0.00	1	1	-0.250 -0.250	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	30.00 - 0.00	1	1	0.000 0.000	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	30.00 - 0.00	1	1	0.250 0.250	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	30.00 - 0.00	1	1	-0.500 -0.500	6.5000	15.5000	0.00
** 6" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	38.00 - 30.08	1	1	-0.250 -0.250	6.0000	14.0000	20.42
6" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	38.00 - 30.08	1	1	0.000 0.000	6.0000	14.0000	20.42
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	38.00 - 30.08	1	1	0.250 0.250	6.0000	14.0000	20.42
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	38.00 - 30.08	1	1	-0.500 -0.500	6.0000	14.0000	20.42
** 6" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	60.08 - 38.00	1	1	-0.250 -0.250	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	60.08 - 38.00	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	60.08 - 38.00	1	1	0.250 0.250	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	60.08 - 38.00	1	1	-0.500 -0.500	6.0000	14.0000	0.00
** 6.5" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	32.83 - 26.25	1	1	-0.250 -0.250	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	32.83 - 26.25	1	1	0.000 0.000	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	32.83 - 26.25	1	1	0.250 0.250	6.5000	15.5000	0.00
6.5" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	32.83 - 26.25	1	1	-0.500 -0.500	6.5000	15.5000	0.00
** 6" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	92.00 - 72.00	1	1	-0.500 -0.500	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	92.00 - 72.00	1	1	-0.500 -0.500	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	92.00 - 72.00	1	1	-0.500 -0.500	6.0000	14.0000	0.00

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	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
**			(CaAa)	72.00			-0.500			
6" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	57.58 - 54.42	1	1	-0.500 -0.500	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	57.58 - 54.42	1	1	-0.500 -0.500	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	57.58 - 54.42	1	1	-0.250 -0.250	6.0000	14.0000	0.00
6" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	69.42 - 57.58	1	1	-0.500 -0.500	6.0000	14.0000	20.42
6" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	69.42 - 57.58	1	1	-0.500 -0.500	6.0000	14.0000	20.42
6" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	69.42 - 57.58	1	1	-0.250 -0.250	6.0000	14.0000	20.42
**										

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAAA ft <sup>2</sup> /ft	Weight plf
**								
HB114-08U3M12-X XXF(7/8)	B	No	No	Inside Pole	150.00 - 0.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.68 0.68 0.68 0.68
HB114-1-0813U4-M 5F(1-1/4)	B	No	No	Inside Pole	150.00 - 0.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	1.20 1.20 1.20 1.20
HB114-1-08U4-M5 F(1-1/4)	B	No	No	Inside Pole	150.00 - 0.00	2	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	1.30 1.30 1.30 1.30
**								
HB158-1-08U8-S8J 18(1-5/8)	A	No	No	Inside Pole	141.00 - 0.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	1.30 1.30 1.30 1.30
LDF4-50A(1/2)	A	No	No	Inside Pole	141.00 - 0.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.15 0.15 0.15 0.15
LDF7-50A(1-5/8)	A	No	No	Inside Pole	141.00 - 0.00	12	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.82 0.82 0.82 0.82
**								
FB-L98B-002-50000 (3/8)	C	No	No	Inside Pole	132.00 - 0.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.06 0.06 0.06 0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	132.00 - 0.00	2	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.58 0.58 0.58 0.58

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
FXL 1873 PE(1-5/8)	C	No	No	Inside Pole	132.00 - 0.00	12	No Ice	0.00	0.67
							1/2" Ice	0.00	0.67
							1" Ice	0.00	0.67
							2" Ice	0.00	0.67
2" Conduit	C	No	No	Inside Pole	132.00 - 0.00	1	No Ice	0.00	1.15
							1/2" Ice	0.00	1.15
							1" Ice	0.00	1.15
							2" Ice	0.00	1.15
**									
LDF7-50A(1-5/8)	A	No	No	Inside Pole	111.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
**									
LDF4-50A(1/2)	B	No	No	Inside Pole	104.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
**									
*Flat Plate*									
**									

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	150.00-145.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.150	0.000	0.00
L2	145.00-140.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.00
L3	140.00-135.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.00
L4	135.00-130.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.02
L5	130.00-125.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.05
L6	125.00-120.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.05
L7	120.00-115.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.05
L8	115.00-108.00	A	0.000	0.000	0.000	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.263	0.000	0.07
L9	108.00-106.75	A	0.000	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.047	0.000	0.01

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L10	106.75-101.75	A	0.000	0.000	0.000	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.05
L11	101.75-96.75	A	0.000	0.000	0.000	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.05
L12	96.75-91.75	A	0.000	0.000	0.250	0.000	0.11
		B	0.000	0.000	0.250	0.000	0.02
		C	0.000	0.000	0.438	0.000	0.05
L13	91.75-89.50	A	0.000	0.000	2.250	0.000	0.05
		B	0.000	0.000	2.250	0.000	0.01
		C	0.000	0.000	2.334	0.000	0.02
L14	89.50-89.25	A	0.000	0.000	0.250	0.000	0.01
		B	0.000	0.000	0.250	0.000	0.00
		C	0.000	0.000	0.259	0.000	0.00
L15	89.25-84.25	A	0.000	0.000	5.000	0.000	0.11
		B	0.000	0.000	5.000	0.000	0.02
		C	0.000	0.000	6.250	0.000	0.06
L16	84.25-79.25	A	0.000	0.000	5.000	0.000	0.11
		B	0.000	0.000	5.000	0.000	0.02
		C	0.000	0.000	6.908	0.000	0.06
L17	79.25-69.75	A	0.000	0.000	7.250	0.000	0.20
		B	0.000	0.000	7.250	0.000	0.04
		C	0.000	0.000	11.345	0.000	0.11
L18	69.75-68.75	A	0.000	0.000	0.652	0.000	0.03
		B	0.000	0.000	0.652	0.000	0.02
		C	0.000	0.000	1.083	0.000	0.03
L19	68.75-67.42	A	0.000	0.000	1.294	0.000	0.06
		B	0.000	0.000	1.294	0.000	0.03
		C	0.000	0.000	1.867	0.000	0.04
L20	67.42-67.17	A	0.000	0.000	0.243	0.000	0.01
		B	0.000	0.000	0.243	0.000	0.01
		C	0.000	0.000	0.351	0.000	0.01
L21	67.17-62.17	A	0.000	0.000	4.863	0.000	0.21
		B	0.000	0.000	4.863	0.000	0.13
		C	0.000	0.000	7.019	0.000	0.16
L22	62.17-57.58	A	0.000	0.000	9.464	0.000	0.19
		B	0.000	0.000	6.964	0.000	0.11
		C	0.000	0.000	8.943	0.000	0.15
L23	57.58-57.33	A	0.000	0.000	0.671	0.000	0.01
		B	0.000	0.000	0.421	0.000	0.00
		C	0.000	0.000	0.529	0.000	0.00
L24	57.33-56.42	A	0.000	0.000	2.442	0.000	0.02
		B	0.000	0.000	1.532	0.000	0.00
		C	0.000	0.000	1.924	0.000	0.01
L25	56.42-56.17	A	0.000	0.000	0.671	0.000	0.01
		B	0.000	0.000	0.421	0.000	0.00
		C	0.000	0.000	0.529	0.000	0.00
L26	56.17-51.17	A	0.000	0.000	11.195	0.000	0.11
		B	0.000	0.000	6.195	0.000	0.02
		C	0.000	0.000	8.351	0.000	0.06
L27	51.17-46.17	A	0.000	0.000	10.000	0.000	0.11
		B	0.000	0.000	5.000	0.000	0.02
		C	0.000	0.000	7.156	0.000	0.06
L28	46.17-41.17	A	0.000	0.000	10.000	0.000	0.11
		B	0.000	0.000	5.000	0.000	0.02
		C	0.000	0.000	7.156	0.000	0.06
L29	41.17-32.50	A	0.000	0.000	16.180	0.000	0.41
		B	0.000	0.000	8.090	0.000	0.15
		C	0.000	0.000	11.828	0.000	0.21
L30	32.50-31.50	A	0.000	0.000	3.382	0.000	0.06

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Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L31	31.50-26.50	B	0.000	0.000	1.691	0.000	0.03
		C	0.000	0.000	2.122	0.000	0.03
		A	0.000	0.000	18.453	0.000	0.16
L32	26.50-26.25	B	0.000	0.000	9.226	0.000	0.05
		C	0.000	0.000	11.382	0.000	0.09
		A	0.000	0.000	0.965	0.000	0.01
L33	26.25-21.25	B	0.000	0.000	0.483	0.000	0.00
		C	0.000	0.000	0.590	0.000	0.00
		A	0.000	0.000	10.833	0.000	0.11
L34	21.25-16.25	B	0.000	0.000	5.417	0.000	0.02
		C	0.000	0.000	7.572	0.000	0.06
		A	0.000	0.000	10.833	0.000	0.11
L35	16.25-11.25	B	0.000	0.000	5.417	0.000	0.02
		C	0.000	0.000	7.572	0.000	0.06
		A	0.000	0.000	10.833	0.000	0.11
L36	11.25-6.25	B	0.000	0.000	5.417	0.000	0.02
		C	0.000	0.000	7.572	0.000	0.06
		A	0.000	0.000	10.833	0.000	0.11
L37	6.25-1.25	B	0.000	0.000	5.417	0.000	0.02
		C	0.000	0.000	7.572	0.000	0.06
		A	0.000	0.000	10.833	0.000	0.11
L38	1.25-0.00	B	0.000	0.000	5.417	0.000	0.02
		C	0.000	0.000	7.572	0.000	0.06
		A	0.000	0.000	2.708	0.000	0.03
		B	0.000	0.000	1.354	0.000	0.01
		C	0.000	0.000	1.893	0.000	0.01

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	150.00-145.00	A	1.481	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.335	0.000	0.01
L2	145.00-140.00	A	1.476	0.000	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.663	0.000	0.02
L3	140.00-135.00	A	1.471	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.658	0.000	0.02
L4	135.00-130.00	A	1.465	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.653	0.000	0.04
L5	130.00-125.00	A	1.460	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.647	0.000	0.07
L6	125.00-120.00	A	1.454	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.641	0.000	0.07
L7	120.00-115.00	A	1.448	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.635	0.000	0.07
L8	115.00-108.00	A	1.440	0.000	0.000	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	2.279	0.000	0.10
L9	108.00-106.75	A	1.435	0.000	0.000	0.000	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.01

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031</p>	<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	11 of 47
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L10	106.75-101.75	C		0.000	0.000	0.407	0.000	0.02
		A	1.430	0.000	0.000	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.618	0.000	0.07
L11	101.75-96.75	A	1.423	0.000	0.000	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.611	0.000	0.07
L12	96.75-91.75	A	1.416	0.000	0.000	0.321	0.000	0.11
		B		0.000	0.000	0.321	0.000	0.03
		C		0.000	0.000	1.924	0.000	0.07
L13	91.75-89.50	A	1.411	0.000	0.000	2.885	0.000	0.07
		B		0.000	0.000	2.885	0.000	0.03
		C		0.000	0.000	3.604	0.000	0.05
L14	89.50-89.25	A	1.409	0.000	0.000	0.320	0.000	0.01
		B		0.000	0.000	0.320	0.000	0.00
		C		0.000	0.000	0.400	0.000	0.01
L15	89.25-84.25	A	1.404	0.000	0.000	6.404	0.000	0.16
		B		0.000	0.000	6.404	0.000	0.08
		C		0.000	0.000	11.635	0.000	0.16
L16	84.25-79.25	A	1.396	0.000	0.000	6.396	0.000	0.16
		B		0.000	0.000	6.396	0.000	0.08
		C		0.000	0.000	13.884	0.000	0.18
L17	79.25-69.75	A	1.383	0.000	0.000	9.255	0.000	0.28
		B		0.000	0.000	9.255	0.000	0.12
		C		0.000	0.000	25.043	0.000	0.34
L18	69.75-68.75	A	1.373	0.000	0.000	0.750	0.000	0.04
		B		0.000	0.000	0.750	0.000	0.03
		C		0.000	0.000	2.412	0.000	0.05
L19	68.75-67.42	A	1.371	0.000	0.000	1.486	0.000	0.07
		B		0.000	0.000	1.486	0.000	0.05
		C		0.000	0.000	3.682	0.000	0.08
L20	67.42-67.17	A	1.369	0.000	0.000	0.279	0.000	0.01
		B		0.000	0.000	0.279	0.000	0.01
		C		0.000	0.000	0.692	0.000	0.01
L21	67.17-62.17	A	1.364	0.000	0.000	5.582	0.000	0.26
		B		0.000	0.000	5.582	0.000	0.18
		C		0.000	0.000	13.809	0.000	0.29
L22	62.17-57.58	A	1.353	0.000	0.000	11.472	0.000	0.29
		B		0.000	0.000	8.296	0.000	0.19
		C		0.000	0.000	15.807	0.000	0.29
L23	57.58-57.33	A	1.348	0.000	0.000	0.841	0.000	0.01
		B		0.000	0.000	0.523	0.000	0.01
		C		0.000	0.000	0.931	0.000	0.01
L24	57.33-56.42	A	1.346	0.000	0.000	3.060	0.000	0.05
		B		0.000	0.000	1.905	0.000	0.02
		C		0.000	0.000	3.389	0.000	0.04
L25	56.42-56.17	A	1.345	0.000	0.000	0.840	0.000	0.01
		B		0.000	0.000	0.523	0.000	0.01
		C		0.000	0.000	0.931	0.000	0.01
L26	56.17-51.17	A	1.339	0.000	0.000	14.118	0.000	0.22
		B		0.000	0.000	7.779	0.000	0.09
		C		0.000	0.000	15.899	0.000	0.20
L27	51.17-46.17	A	1.325	0.000	0.000	12.651	0.000	0.20
		B		0.000	0.000	6.325	0.000	0.07
		C		0.000	0.000	14.390	0.000	0.18
L28	46.17-41.17	A	1.311	0.000	0.000	12.622	0.000	0.20
		B		0.000	0.000	6.311	0.000	0.07
		C		0.000	0.000	14.315	0.000	0.18
L29	41.17-32.50	A	1.289	0.000	0.000	19.431	0.000	0.58
		B		0.000	0.000	9.716	0.000	0.24
		C		0.000	0.000	23.430	0.000	0.42



<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	12 of 47
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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L30	32.50-31.50	A	1.271	0.000	0.000	3.942	0.000	0.10
		B		0.000	0.000	1.971	0.000	0.04
		C		0.000	0.000	3.553	0.000	0.07
L31	31.50-26.50	A	1.259	0.000	0.000	21.968	0.000	0.36
		B		0.000	0.000	10.984	0.000	0.15
		C		0.000	0.000	18.764	0.000	0.25
L32	26.50-26.25	A	1.247	0.000	0.000	1.158	0.000	0.02
		B		0.000	0.000	0.579	0.000	0.01
		C		0.000	0.000	0.965	0.000	0.01
L33	26.25-21.25	A	1.234	0.000	0.000	13.301	0.000	0.20
		B		0.000	0.000	6.650	0.000	0.07
		C		0.000	0.000	14.325	0.000	0.17
L34	21.25-16.25	A	1.205	0.000	0.000	13.243	0.000	0.20
		B		0.000	0.000	6.622	0.000	0.07
		C		0.000	0.000	14.173	0.000	0.17
L35	16.25-11.25	A	1.168	0.000	0.000	13.169	0.000	0.20
		B		0.000	0.000	6.585	0.000	0.07
		C		0.000	0.000	13.980	0.000	0.17
L36	11.25-6.25	A	1.116	0.000	0.000	13.066	0.000	0.19
		B		0.000	0.000	6.533	0.000	0.07
		C		0.000	0.000	13.709	0.000	0.16
L37	6.25-1.25	A	1.026	0.000	0.000	12.884	0.000	0.18
		B		0.000	0.000	6.442	0.000	0.06
		C		0.000	0.000	13.232	0.000	0.15
L38	1.25-0.00	A	0.857	0.000	0.000	3.137	0.000	0.04
		B		0.000	0.000	1.569	0.000	0.01
		C		0.000	0.000	3.087	0.000	0.03

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>X</sub> in	CP <sub>Z</sub> in	CP <sub>X</sub> Ice in	CP <sub>Z</sub> Ice in
L1	150.00-145.00	0.0000	0.1846	0.0000	1.0634
L2	145.00-140.00	0.0000	0.2288	0.0000	1.3012
L3	140.00-135.00	0.0000	0.2288	0.0000	1.3080
L4	135.00-130.00	0.0000	0.2288	0.0000	1.3139
L5	130.00-125.00	0.0000	0.2288	0.0000	1.3189
L6	125.00-120.00	0.0000	0.2288	0.0000	1.3233
L7	120.00-115.00	0.0000	0.2288	0.0000	1.3269
L8	115.00-108.00	0.0000	0.2288	0.0000	1.3303
L9	108.00-106.75	0.0000	0.2290	0.0000	1.3333
L10	106.75-101.75	0.0000	0.2289	0.0000	1.3308
L11	101.75-96.75	0.0000	0.2289	0.0000	1.3322
L12	96.75-91.75	0.0000	0.2169	0.0000	1.2713
L13	91.75-89.50	0.0000	0.0953	0.0000	0.6834
L14	89.50-89.25	0.0000	0.0957	0.0000	0.6861
L15	89.25-84.25	0.4612	0.3772	1.2022	1.3534
L16	84.25-79.25	0.7387	0.5539	1.8586	1.7470
L17	79.25-69.75	0.9579	0.7082	2.3467	2.1228
L18	69.75-68.75	-0.2514	-1.0968	1.5049	0.8662
L19	68.75-67.42	-0.8096	-1.7553	0.8719	0.1316
L20	67.42-67.17	-0.8115	-1.7591	0.8726	0.1304
L21	67.17-62.17	-0.8176	-1.7716	0.8746	0.1264
L22	62.17-57.58	0.9442	-0.8067	2.1610	0.4881
L23	57.58-57.33	2.3114	0.0339	3.3187	1.0938
L24	57.33-56.42	2.3158	0.0340	3.3248	1.0953

<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b> 876341 Middletown 2-Marino Property	<b>Page</b> 13 of 47
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Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L25	56.42-56.17	2.3194	0.0340	3.3299	1.0964
L26	56.17-51.17	3.3006	0.8702	4.3435	2.0072
L27	51.17-46.17	4.0006	1.4492	5.0544	2.6246
L28	46.17-41.17	4.0524	1.4679	5.1220	2.6544
L29	41.17-32.50	4.0129	1.4748	5.1006	2.7253
L30	32.50-31.50	4.7486	1.5605	5.6595	2.5632
L31	31.50-26.50	4.9192	1.5944	5.8119	2.5377
L32	26.50-26.25	5.0230	1.6170	5.9108	2.5378
L33	26.25-21.25	4.3243	1.5405	5.3771	2.7042
L34	21.25-16.25	4.3746	1.5583	5.4299	2.7189
L35	16.25-11.25	4.4241	1.5757	5.4752	2.7262
L36	11.25-6.25	4.4724	1.5928	5.5073	2.7200
L37	6.25-1.25	4.5199	1.6097	5.5075	2.6795
L38	1.25-0.00	4.5491	1.6200	5.4182	2.5563

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

## Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	2	Safety Line 3/8	145.00 - 149.00	1.0000	1.0000
L2	2	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L3	2	Safety Line 3/8	135.00 - 140.00	1.0000	1.0000
L4	2	Safety Line 3/8	130.00 - 135.00	1.0000	1.0000
L5	2	Safety Line 3/8	125.00 - 130.00	1.0000	1.0000
L6	2	Safety Line 3/8	120.00 - 125.00	1.0000	1.0000
L7	2	Safety Line 3/8	115.00 - 120.00	1.0000	1.0000
L8	2	Safety Line 3/8	108.00 - 115.00	1.0000	1.0000
L10	2	Safety Line 3/8	101.75 - 106.75	1.0000	1.0000
L11	2	Safety Line 3/8	96.75 - 101.75	1.0000	1.0000
L12	2	Safety Line 3/8	91.75 - 96.75	1.0000	1.0000
L12	48	6" x 1" Flat Plate (G)	91.75 - 92.00	1.0000	1.0000
L12	49	6" x 1" Flat Plate (G)	91.75 - 92.00	1.0000	1.0000
L12	50	6" x 1" Flat Plate (G)	91.75 - 92.00	1.0000	1.0000
L13	2	Safety Line 3/8	89.50 - 91.75	1.0000	1.0000
L13	48	6" x 1" Flat Plate (G)	89.50 - 91.75	1.0000	1.0000
L13	49	6" x 1" Flat Plate (G)	89.50 - 91.75	1.0000	1.0000
L13	50	6" x 1" Flat Plate (G)	89.50 - 91.75	1.0000	1.0000
L14	2	Safety Line 3/8	89.25 - 89.50	1.0000	1.0000
L14	48	6" x 1" Flat Plate (G)	89.25 - 89.50	1.0000	1.0000
L14	49	6" x 1" Flat Plate (G)	89.25 - 89.50	1.0000	1.0000
L14	50	6" x 1" Flat Plate (G)	89.25 - 89.50	1.0000	1.0000
L15	2	Safety Line 3/8	84.25 - 89.25	1.0000	1.0000
L15	22	AVA5-50( 7/8")	84.25 - 88.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L15	23	LDF4-50A(1/2")	84.25 - 88.00	1.0000	1.0000
L15	48	6" x 1" Flat Plate (G)	84.25 - 89.25	1.0000	1.0000
L15	49	6" x 1" Flat Plate (G)	84.25 - 89.25	1.0000	1.0000
L15	50	6" x 1" Flat Plate (G)	84.25 - 89.25	1.0000	1.0000
L16	2	Safety Line 3/8	79.25 - 84.25	1.0000	1.0000
L16	22	AVA5-50( 7/8")	79.25 - 84.25	1.0000	1.0000
L16	23	LDF4-50A(1/2")	79.25 - 84.25	1.0000	1.0000
L16	24	AVA5-50( 7/8")	79.25 - 82.00	1.0000	1.0000
L16	48	6" x 1" Flat Plate (G)	79.25 - 84.25	1.0000	1.0000
L16	49	6" x 1" Flat Plate (G)	79.25 - 84.25	1.0000	1.0000
L16	50	6" x 1" Flat Plate (G)	79.25 - 84.25	1.0000	1.0000
L17	2	Safety Line 3/8	69.75 - 79.25	1.0000	1.0000
L17	22	AVA5-50( 7/8")	69.75 - 79.25	1.0000	1.0000
L17	23	LDF4-50A(1/2")	69.75 - 79.25	1.0000	1.0000
L17	24	AVA5-50( 7/8")	69.75 - 79.25	1.0000	1.0000
L17	48	6" x 1" Flat Plate (G)	72.00 - 79.25	1.0000	1.0000
L17	49	6" x 1" Flat Plate (G)	72.00 - 79.25	1.0000	1.0000
L17	50	6" x 1" Flat Plate (G)	72.00 - 79.25	1.0000	1.0000
L17	55	6" x 1" Flat Plate (G)	69.75 - 69.42	1.0000	1.0000
L17	56	6" x 1" Flat Plate (G)	69.75 - 69.42	1.0000	1.0000
L17	57	6" x 1" Flat Plate (G)	69.75 - 69.42	1.0000	1.0000
L19	2	Safety Line 3/8	67.42 - 68.75	1.0000	1.0000
L19	22	AVA5-50( 7/8")	67.42 - 68.75	1.0000	1.0000
L19	23	LDF4-50A(1/2")	67.42 - 68.75	1.0000	1.0000
L19	24	AVA5-50( 7/8")	67.42 - 68.75	1.0000	1.0000
L19	55	6" x 1" Flat Plate (G)	67.42 - 68.75	1.0000	1.0000
L19	56	6" x 1" Flat Plate (G)	67.42 - 68.75	1.0000	1.0000
L19	57	6" x 1" Flat Plate (G)	67.42 - 68.75	1.0000	1.0000
L20	2	Safety Line 3/8	67.17 - 67.42	1.0000	1.0000
L20	22	AVA5-50( 7/8")	67.17 - 67.42	1.0000	1.0000
L20	23	LDF4-50A(1/2")	67.17 - 67.42	1.0000	1.0000
L20	24	AVA5-50( 7/8")	67.17 - 67.42	1.0000	1.0000
L20	55	6" x 1" Flat Plate (G)	67.17 - 67.42	1.0000	1.0000
L20	56	6" x 1" Flat Plate (G)	67.17 - 67.42	1.0000	1.0000
L20	57	6" x 1" Flat Plate (G)	67.17 - 67.42	1.0000	1.0000
L21	2	Safety Line 3/8	62.17 - 67.17	1.0000	1.0000
L21	22	AVA5-50( 7/8")	62.17 - 67.17	1.0000	1.0000
L21	23	LDF4-50A(1/2")	62.17 - 67.17	1.0000	1.0000
L21	24	AVA5-50( 7/8")	62.17 - 67.17	1.0000	1.0000
L21	55	6" x 1" Flat Plate (G)	62.17 - 67.17	1.0000	1.0000
L21	56	6" x 1" Flat Plate (G)	62.17 - 67.17	1.0000	1.0000
L21	57	6" x 1" Flat Plate (G)	62.17 - 67.17	1.0000	1.0000
L22	2	Safety Line 3/8	57.58 - 62.17	1.0000	1.0000
L22	22	AVA5-50( 7/8")	57.58 - 62.17	1.0000	1.0000
L22	23	LDF4-50A(1/2")	57.58 - 62.17	1.0000	1.0000
L22	24	AVA5-50( 7/8")	57.58 - 62.17	1.0000	1.0000
L22	38	6" x 1" Flat Plate (G)	57.58 - 60.08	1.0000	1.0000
L22	39	6" x 1" Flat Plate (G)	57.58 - 60.08	1.0000	1.0000
L22	40	6" x 1" Flat Plate (G)	57.58 - 60.08	1.0000	1.0000
L22	41	6" x 1" Flat Plate (G)	57.58 - 60.08	1.0000	1.0000
L22	55	6" x 1" Flat Plate (G)	57.58 - 62.17	1.0000	1.0000
L22	56	6" x 1" Flat Plate (G)	57.58 - 62.17	1.0000	1.0000
L22	57	6" x 1" Flat Plate (G)	57.58 - 62.17	1.0000	1.0000
L23	2	Safety Line 3/8	57.33 - 57.58	1.0000	1.0000
L23	22	AVA5-50( 7/8")	57.33 - 57.58	1.0000	1.0000
L23	23	LDF4-50A(1/2")	57.33 - 57.58	1.0000	1.0000
L23	24	AVA5-50( 7/8")	57.33 - 57.58	1.0000	1.0000
L23	38	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000
L23	39	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000
L23	40	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000
L23	41	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000
L23	52	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000

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<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L23	53	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000
L23	54	6" x 1" Flat Plate (G)	57.33 - 57.58	1.0000	1.0000
L24	2	Safety Line 3/8	56.42 - 57.33	1.0000	1.0000
L24	22	AVA5-50( 7/8")	56.42 - 57.33	1.0000	1.0000
L24	23	LDF4-50A(1/2")	56.42 - 57.33	1.0000	1.0000
L24	24	AVA5-50( 7/8")	56.42 - 57.33	1.0000	1.0000
L24	38	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L24	39	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L24	40	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L24	41	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L24	52	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L24	53	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L24	54	6" x 1" Flat Plate (G)	56.42 - 57.33	1.0000	1.0000
L25	2	Safety Line 3/8	56.17 - 56.42	1.0000	1.0000
L25	22	AVA5-50( 7/8")	56.17 - 56.42	1.0000	1.0000
L25	23	LDF4-50A(1/2")	56.17 - 56.42	1.0000	1.0000
L25	24	AVA5-50( 7/8")	56.17 - 56.42	1.0000	1.0000
L25	38	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L25	39	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L25	40	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L25	41	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L25	52	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L25	53	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L25	54	6" x 1" Flat Plate (G)	56.17 - 56.42	1.0000	1.0000
L26	2	Safety Line 3/8	51.17 - 56.17	1.0000	1.0000
L26	22	AVA5-50( 7/8")	51.17 - 56.17	1.0000	1.0000
L26	23	LDF4-50A(1/2")	51.17 - 56.17	1.0000	1.0000
L26	24	AVA5-50( 7/8")	51.17 - 56.17	1.0000	1.0000
L26	38	6" x 1" Flat Plate (G)	51.17 - 56.17	1.0000	1.0000
L26	39	6" x 1" Flat Plate (G)	51.17 - 56.17	1.0000	1.0000
L26	40	6" x 1" Flat Plate (G)	51.17 - 56.17	1.0000	1.0000
L26	41	6" x 1" Flat Plate (G)	51.17 - 56.17	1.0000	1.0000
L26	52	6" x 1" Flat Plate (G)	54.42 - 56.17	1.0000	1.0000
L26	53	6" x 1" Flat Plate (G)	54.42 - 56.17	1.0000	1.0000
L26	54	6" x 1" Flat Plate (G)	54.42 - 56.17	1.0000	1.0000
L27	2	Safety Line 3/8	46.17 - 51.17	1.0000	1.0000
L27	22	AVA5-50( 7/8")	46.17 - 51.17	1.0000	1.0000
L27	23	LDF4-50A(1/2")	46.17 - 51.17	1.0000	1.0000
L27	24	AVA5-50( 7/8")	46.17 - 51.17	1.0000	1.0000
L27	38	6" x 1" Flat Plate (G)	46.17 - 51.17	1.0000	1.0000
L27	39	6" x 1" Flat Plate (G)	46.17 - 51.17	1.0000	1.0000
L27	40	6" x 1" Flat Plate (G)	46.17 - 51.17	1.0000	1.0000
L27	41	6" x 1" Flat Plate (G)	46.17 - 51.17	1.0000	1.0000
L28	2	Safety Line 3/8	41.17 - 46.17	1.0000	1.0000
L28	22	AVA5-50( 7/8")	41.17 - 46.17	1.0000	1.0000
L28	23	LDF4-50A(1/2")	41.17 - 46.17	1.0000	1.0000
L28	24	AVA5-50( 7/8")	41.17 - 46.17	1.0000	1.0000
L28	38	6" x 1" Flat Plate (G)	41.17 - 46.17	1.0000	1.0000
L28	39	6" x 1" Flat Plate (G)	41.17 - 46.17	1.0000	1.0000
L28	40	6" x 1" Flat Plate (G)	41.17 - 46.17	1.0000	1.0000
L28	41	6" x 1" Flat Plate (G)	41.17 - 46.17	1.0000	1.0000
L29	2	Safety Line 3/8	32.50 - 41.17	1.0000	1.0000
L29	22	AVA5-50( 7/8")	32.50 - 41.17	1.0000	1.0000
L29	23	LDF4-50A(1/2")	32.50 - 41.17	1.0000	1.0000
L29	24	AVA5-50( 7/8")	32.50 - 41.17	1.0000	1.0000
L29	33	6" x 1" Flat Plate (G)	32.50 - 38.00	1.0000	1.0000
L29	34	6" x 1" Flat Plate (G)	32.50 - 38.00	1.0000	1.0000
L29	35	6" x 1" Flat Plate (G)	32.50 - 38.00	1.0000	1.0000
L29	36	6" x 1" Flat Plate (G)	32.50 - 38.00	1.0000	1.0000
L29	38	6" x 1" Flat Plate (G)	38.00 - 41.17	1.0000	1.0000
L29	39	6" x 1" Flat Plate (G)	38.00 - 41.17	1.0000	1.0000
L29	40	6" x 1" Flat Plate (G)	38.00 - 41.17	1.0000	1.0000

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<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L29	41	6" x 1" Flat Plate (G)	38.00 - 41.17	1.0000	1.0000
L29	43	6.5" x 1.25" Flat Plate (G)	32.50 - 32.83	1.0000	1.0000
L29	44	6.5" x 1.25" Flat Plate (G)	32.50 - 32.83	1.0000	1.0000
L29	45	6.5" x 1.25" Flat Plate (G)	32.50 - 32.83	1.0000	1.0000
L29	46	6.5" x 1.25" Flat Plate (G)	32.50 - 32.83	1.0000	1.0000
L31	2	Safety Line 3/8	26.50 - 31.50	1.0000	1.0000
L31	22	AVA5-50( 7/8")	26.50 - 31.50	1.0000	1.0000
L31	23	LDF4-50A(1/2")	26.50 - 31.50	1.0000	1.0000
L31	24	AVA5-50( 7/8")	26.50 - 31.50	1.0000	1.0000
L31	28	6.5" x 1.25" Flat Plate (G)	26.50 - 30.00	1.0000	1.0000
L31	29	6.5" x 1.25" Flat Plate (G)	26.50 - 30.00	1.0000	1.0000
L31	30	6.5" x 1.25" Flat Plate (G)	26.50 - 30.00	1.0000	1.0000
L31	31	6.5" x 1.25" Flat Plate (G)	26.50 - 30.00	1.0000	1.0000
L31	33	6" x 1" Flat Plate (G)	30.08 - 31.50	1.0000	1.0000
L31	34	6" x 1" Flat Plate (G)	30.08 - 31.50	1.0000	1.0000
L31	35	6" x 1" Flat Plate (G)	30.08 - 31.50	1.0000	1.0000
L31	36	6" x 1" Flat Plate (G)	30.08 - 31.50	1.0000	1.0000
L31	43	6.5" x 1.25" Flat Plate (G)	26.50 - 31.50	1.0000	1.0000
L31	44	6.5" x 1.25" Flat Plate (G)	26.50 - 31.50	1.0000	1.0000
L31	45	6.5" x 1.25" Flat Plate (G)	26.50 - 31.50	1.0000	1.0000
L31	46	6.5" x 1.25" Flat Plate (G)	26.50 - 31.50	1.0000	1.0000
L32	2	Safety Line 3/8	26.25 - 26.50	1.0000	1.0000
L32	22	AVA5-50( 7/8")	26.25 - 26.50	1.0000	1.0000
L32	23	LDF4-50A(1/2")	26.25 - 26.50	1.0000	1.0000
L32	24	AVA5-50( 7/8")	26.25 - 26.50	1.0000	1.0000
L32	28	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	29	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	30	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	31	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	43	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	44	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	45	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L32	46	6.5" x 1.25" Flat Plate (G)	26.25 - 26.50	1.0000	1.0000
L33	2	Safety Line 3/8	21.25 - 26.25	1.0000	1.0000
L33	22	AVA5-50( 7/8")	21.25 - 26.25	1.0000	1.0000
L33	23	LDF4-50A(1/2")	21.25 - 26.25	1.0000	1.0000
L33	24	AVA5-50( 7/8")	21.25 - 26.25	1.0000	1.0000
L33	28	6.5" x 1.25" Flat Plate (G)	21.25 - 26.25	1.0000	1.0000
L33	29	6.5" x 1.25" Flat Plate (G)	21.25 - 26.25	1.0000	1.0000
L33	30	6.5" x 1.25" Flat Plate (G)	21.25 - 26.25	1.0000	1.0000
L33	31	6.5" x 1.25" Flat Plate (G)	21.25 - 26.25	1.0000	1.0000
L34	2	Safety Line 3/8	16.25 - 21.25	1.0000	1.0000
L34	22	AVA5-50( 7/8")	16.25 - 21.25	1.0000	1.0000
L34	23	LDF4-50A(1/2")	16.25 - 21.25	1.0000	1.0000
L34	24	AVA5-50( 7/8")	16.25 - 21.25	1.0000	1.0000
L34	28	6.5" x 1.25" Flat Plate (G)	16.25 - 21.25	1.0000	1.0000
L34	29	6.5" x 1.25" Flat Plate (G)	16.25 - 21.25	1.0000	1.0000
L34	30	6.5" x 1.25" Flat Plate (G)	16.25 - 21.25	1.0000	1.0000
L34	31	6.5" x 1.25" Flat Plate (G)	16.25 - 21.25	1.0000	1.0000
L35	2	Safety Line 3/8	11.25 - 16.25	1.0000	1.0000
L35	22	AVA5-50( 7/8")	11.25 - 16.25	1.0000	1.0000
L35	23	LDF4-50A(1/2")	11.25 - 16.25	1.0000	1.0000
L35	24	AVA5-50( 7/8")	11.25 - 16.25	1.0000	1.0000
L35	28	6.5" x 1.25" Flat Plate (G)	11.25 - 16.25	1.0000	1.0000
L35	29	6.5" x 1.25" Flat Plate (G)	11.25 - 16.25	1.0000	1.0000
L35	30	6.5" x 1.25" Flat Plate (G)	11.25 - 16.25	1.0000	1.0000
L35	31	6.5" x 1.25" Flat Plate (G)	11.25 - 16.25	1.0000	1.0000
L36	2	Safety Line 3/8	6.25 - 11.25	1.0000	1.0000
L36	22	AVA5-50( 7/8")	6.25 - 11.25	1.0000	1.0000
L36	23	LDF4-50A(1/2")	6.25 - 11.25	1.0000	1.0000
L36	24	AVA5-50( 7/8")	6.25 - 11.25	1.0000	1.0000
L36	28	6.5" x 1.25" Flat Plate (G)	6.25 - 11.25	1.0000	1.0000

<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b> 876341 Middletown 2-Marino Property	<b>Page</b> 17 of 47
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	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L36	29	6.5" x 1.25" Flat Plate (G)	6.25 - 11.25	1.0000	1.0000
L36	30	6.5" x 1.25" Flat Plate (G)	6.25 - 11.25	1.0000	1.0000
L36	31	6.5" x 1.25" Flat Plate (G)	6.25 - 11.25	1.0000	1.0000
L37	2	Safety Line 3/8	1.25 - 6.25	1.0000	1.0000
L37	22	AVA5-50( 7/8")	1.25 - 6.25	1.0000	1.0000
L37	23	LDF4-50A(1/2")	1.25 - 6.25	1.0000	1.0000
L37	24	AVA5-50( 7/8")	1.25 - 6.25	1.0000	1.0000
L37	28	6.5" x 1.25" Flat Plate (G)	1.25 - 6.25	1.0000	1.0000
L37	29	6.5" x 1.25" Flat Plate (G)	1.25 - 6.25	1.0000	1.0000
L37	30	6.5" x 1.25" Flat Plate (G)	1.25 - 6.25	1.0000	1.0000
L37	31	6.5" x 1.25" Flat Plate (G)	1.25 - 6.25	1.0000	1.0000
L38	2	Safety Line 3/8	0.00 - 1.25	1.0000	1.0000
L38	22	AVA5-50( 7/8")	0.00 - 1.25	1.0000	1.0000
L38	23	LDF4-50A(1/2")	0.00 - 1.25	1.0000	1.0000
L38	24	AVA5-50( 7/8")	0.00 - 1.25	1.0000	1.0000
L38	28	6.5" x 1.25" Flat Plate (G)	0.00 - 1.25	1.0000	1.0000
L38	29	6.5" x 1.25" Flat Plate (G)	0.00 - 1.25	1.0000	1.0000
L38	30	6.5" x 1.25" Flat Plate (G)	0.00 - 1.25	1.0000	1.0000
L38	31	6.5" x 1.25" Flat Plate (G)	0.00 - 1.25	1.0000	1.0000

## Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	$C_{AA}$ Front	$C_{AA}$ Side	Weight	
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
**									
Top Hat 18" Diameter x 2' 6" Tall	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.86 3.11 3.64	0.10 0.14 0.18 0.27	
*152.5*									
Site Pro 1 HRK14-HD Handrail Kit	C	None		0.0000	152.50	No Ice 1/2" Ice 1" Ice 2" Ice	6.00 8.50 11.00 16.00	0.26 0.34 0.42 0.59	
*150*									
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.56 13.14 13.70 14.85	7.76 8.80 9.69 11.52	0.12 0.21 0.32 0.55
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.56 13.14 13.70 14.85	7.76 8.80 9.69 11.52	0.12 0.21 0.32 0.55
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.56 13.14 13.70 14.85	7.76 8.80 9.69 11.52	0.12 0.21 0.32 0.55
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	2" Ice	8.38	7.94	0.34
			0.00	0.0000		No Ice	6.58	4.96	0.08
			0.00	0.0000		1/2" Ice	7.03	5.75	0.13
			0.00	0.0000		1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	2" Ice	8.38	7.94	0.34
			0.00	0.0000		No Ice	6.58	4.96	0.08
			0.00	0.0000		1/2" Ice	7.03	5.75	0.13
			0.00	0.0000		1" Ice	7.47	6.47	0.19
(2) TD-RRH8x20-25	A	From Leg	4.00	0.0000	150.00	2" Ice	8.38	7.94	0.34
			0.00	0.0000		No Ice	3.70	1.29	0.07
			0.00	0.0000		1/2" Ice	3.95	1.46	0.09
			0.00	0.0000		1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	B	From Leg	4.00	0.0000	150.00	2" Ice	4.72	2.02	0.18
			0.00	0.0000		No Ice	3.70	1.29	0.07
			0.00	0.0000		1/2" Ice	3.95	1.46	0.09
			0.00	0.0000		1" Ice	4.20	1.64	0.12
(4) RRH2X50-800	A	From Leg	4.00	0.0000	150.00	2" Ice	4.72	2.02	0.18
			0.00	0.0000		No Ice	2.13	1.79	0.05
			0.00	0.0000		1/2" Ice	2.32	1.96	0.07
			0.00	0.0000		1" Ice	2.51	2.14	0.10
(2) RRH2X50-800	B	From Leg	4.00	0.0000	150.00	2" Ice	2.92	2.53	0.15
			0.00	0.0000		No Ice	2.13	1.79	0.05
			0.00	0.0000		1/2" Ice	2.32	1.96	0.07
			0.00	0.0000		1" Ice	2.51	2.14	0.10
(2) PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00	0.0000	150.00	2" Ice	2.92	2.53	0.15
			0.00	0.0000		No Ice	2.32	2.24	0.06
			0.00	0.0000		1/2" Ice	2.53	2.44	0.08
			0.00	0.0000		1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00	0.0000	150.00	2" Ice	3.19	3.09	0.17
			0.00	0.0000		No Ice	2.32	2.24	0.06
			0.00	0.0000		1/2" Ice	2.53	2.44	0.08
			0.00	0.0000		1" Ice	2.74	2.65	0.11
(3) Pipe Mount	A	From Leg	4.00	0.0000	150.00	2" Ice	3.19	3.09	0.17
			0.00	0.0000		No Ice	1.20	1.20	0.02
			0.00	0.0000		1/2" Ice	1.50	1.50	0.03
			0.00	0.0000		1" Ice	1.81	1.81	0.04
(3) Pipe Mount	B	From Leg	4.00	0.0000	150.00	2" Ice	2.47	2.47	0.08
			0.00	0.0000		No Ice	1.20	1.20	0.02
			0.00	0.0000		1/2" Ice	1.50	1.50	0.03
			0.00	0.0000		1" Ice	1.81	1.81	0.04
(3) Pipe Mount	C	From Leg	4.00	0.0000	150.00	2" Ice	2.47	2.47	0.08
			0.00	0.0000		No Ice	1.20	1.20	0.02
			0.00	0.0000		1/2" Ice	1.50	1.50	0.03
			0.00	0.0000		1" Ice	1.81	1.81	0.04
Platform Mount [LP 1201-1]	C	None		0.0000	150.00	2" Ice	2.47	2.47	0.08
				0.0000		No Ice	23.10	23.10	2.10
				0.0000		1/2" Ice	26.80	26.80	2.50
				0.0000		1" Ice	30.50	30.50	2.90
*141*				0.0000		2" Ice	37.90	37.90	3.70
				0.0000		No Ice	3.10	4.80	0.02
				0.0000		1/2" Ice	3.48	5.42	0.06
				0.0000		1" Ice	3.85	6.04	0.11
(2) APL868013-42T0 w/ Mount Pipe	A	From Leg	4.00	0.0000	141.00	2" Ice	4.60	7.34	0.22
			0.00	0.0000		No Ice	3.10	4.80	0.02
			1.00	0.0000		1/2" Ice	3.48	5.42	0.06
			1.00	0.0000		1" Ice	3.85	6.04	0.11
(2) APL868013-42T0 w/ Mount Pipe	B	From Leg	4.00	0.0000	141.00	2" Ice	4.60	7.34	0.22
			0.00	0.0000		No Ice	3.10	4.80	0.02
			0.00	0.0000		1/2" Ice	3.48	5.42	0.06
			1.00	0.0000		1" Ice	3.85	6.04	0.11

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	<b>Client</b>		Crown Castle		<b>Designed by</b>		Aditya Chingale	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
(2) APL868013-42T0 w/ Mount Pipe	C	From Leg	4.00	0.0000	141.00	2" Ice	4.60	7.34	0.22
			0.00	No Ice		3.10	4.80	0.02	
			1.00	1/2" Ice		3.48	5.42	0.06	
				1" Ice		3.85	6.04	0.11	
KS24019-L112A	A	From Leg	4.00	0.0000	141.00	2" Ice	4.60	7.34	0.22
			0.00	No Ice		0.14	0.14	0.01	
			4.00	1/2" Ice		0.20	0.20	0.01	
				1" Ice		0.26	0.26	0.01	
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.00	0.0000	141.00	2" Ice	0.41	0.41	0.02
			0.00	No Ice		8.77	6.96	0.07	
			1.00	1/2" Ice		9.34	8.18	0.14	
				1" Ice		9.89	9.14	0.21	
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.00	0.0000	141.00	2" Ice	10.99	11.02	0.40
			0.00	No Ice		8.77	6.96	0.07	
			1.00	1/2" Ice		9.34	8.18	0.14	
				1" Ice		9.89	9.14	0.21	
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.00	0.0000	141.00	2" Ice	10.99	11.02	0.40
			0.00	No Ice		8.77	6.96	0.07	
			1.00	1/2" Ice		9.34	8.18	0.14	
				1" Ice		9.89	9.14	0.21	
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00	0.0000	141.00	2" Ice	10.99	11.02	0.40
			0.00	No Ice		7.81	5.80	0.04	
			1.00	1/2" Ice		8.36	6.95	0.10	
				1" Ice		8.87	7.82	0.17	
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00	0.0000	141.00	2" Ice	9.93	9.60	0.34
			0.00	No Ice		7.81	5.80	0.04	
			1.00	1/2" Ice		8.36	6.95	0.10	
				1" Ice		8.87	7.82	0.17	
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00	0.0000	141.00	2" Ice	9.93	9.60	0.34
			0.00	No Ice		7.81	5.80	0.04	
			1.00	1/2" Ice		8.36	6.95	0.10	
				1" Ice		8.87	7.82	0.17	
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	141.00	2" Ice	9.93	9.60	0.34
			0.00	No Ice		0.31	0.08	0.00	
			1.00	1/2" Ice		0.39	0.12	0.01	
				1" Ice		0.47	0.17	0.01	
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	141.00	2" Ice	0.65	0.29	0.02
			0.00	No Ice		0.31	0.08	0.00	
			1.00	1/2" Ice		0.39	0.12	0.01	
				1" Ice		0.47	0.17	0.01	
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	141.00	2" Ice	0.65	0.29	0.02
			0.00	No Ice		0.31	0.08	0.00	
			1.00	1/2" Ice		0.39	0.12	0.01	
				1" Ice		0.47	0.17	0.01	
RRH2X60-PCS	A	From Leg	4.00	0.0000	141.00	2" Ice	0.65	0.29	0.02
			0.00	No Ice		2.20	1.65	0.05	
			1.00	1/2" Ice		2.39	1.83	0.07	
				1" Ice		2.59	2.01	0.09	
RRH2X60-PCS	B	From Leg	4.00	0.0000	141.00	2" Ice	3.01	2.40	0.14
			0.00	No Ice		2.20	1.65	0.05	
			1.00	1/2" Ice		2.39	1.83	0.07	
				1" Ice		2.59	2.01	0.09	
RRH2X60-PCS	C	From Leg	4.00	0.0000	141.00	2" Ice	3.01	2.40	0.14
			0.00	No Ice		2.20	1.65	0.05	
			1.00	1/2" Ice		2.39	1.83	0.07	
				1" Ice		2.59	2.01	0.09	
					2" Ice	3.01	2.40	0.14	



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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
RRH2X60-AWS BAND 4	A	From Leg	4.00	0.0000	141.00	No Ice	1.88	1.28	0.04
			0.00			1/2" Ice	2.05	1.43	0.06
			1.00			1" Ice	2.24	1.60	0.08
						2" Ice	2.63	1.95	0.13
RRH2X60-AWS BAND 4	B	From Leg	4.00	0.0000	141.00	No Ice	1.88	1.28	0.04
			0.00			1/2" Ice	2.05	1.43	0.06
			1.00			1" Ice	2.24	1.60	0.08
						2" Ice	2.63	1.95	0.13
RRH2X60-AWS BAND 4	C	From Leg	4.00	0.0000	141.00	No Ice	1.88	1.28	0.04
			0.00			1/2" Ice	2.05	1.43	0.06
			1.00			1" Ice	2.24	1.60	0.08
						2" Ice	2.63	1.95	0.13
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0.0000	141.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			1.00			1" Ice	5.35	2.39	0.12
						2" Ice	5.93	2.81	0.21
Platform Mount [LP 1201-1]	C	None		0.0000	141.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70
*132*									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	132.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.0000	132.00	No Ice	9.90	7.18	0.10
			0.00			1/2" Ice	10.47	8.36	0.18
			1.00			1" Ice	11.01	9.26	0.26
						2" Ice	12.11	11.09	0.46
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	9.90	7.18	0.10
			0.00			1/2" Ice	10.47	8.36	0.18
			1.00			1" Ice	11.01	9.26	0.26
						2" Ice	12.11	11.09	0.46
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	9.90	7.18	0.10
			0.00			1/2" Ice	10.47	8.36	0.18
			1.00			1" Ice	11.01	9.26	0.26
						2" Ice	12.11	11.09	0.46
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	132.00	No Ice	1.21	1.21	0.03
			0.00			1/2" Ice	1.89	1.89	0.05
			2.00			1" Ice	2.11	2.11	0.08
						2" Ice	2.57	2.57	0.14
LGP21401	A	From Leg	4.00	0.0000	132.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			1.00			1" Ice	1.38	0.54	0.03
LGP21401	B	From Leg	4.00	0.0000	132.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			1.00			1" Ice	1.38	0.54	0.03
					2" Ice	1.69	0.77	0.05	

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
LGP21401	C	From Leg	4.00	0.0000	132.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			1.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
LGP21401	A	From Leg	4.00	0.0000	132.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			-3.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
LGP21401	B	From Leg	4.00	0.0000	132.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			-3.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
LGP21401	C	From Leg	4.00	0.0000	132.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			-3.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
RRUS 11	A	From Leg	4.00	0.0000	132.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.10
						2" Ice	3.66	1.83	0.15
RRUS 11	B	From Leg	4.00	0.0000	132.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.10
						2" Ice	3.66	1.83	0.15
RRUS 11	C	From Leg	4.00	0.0000	132.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.10
						2" Ice	3.66	1.83	0.15
RRUS 12 B2	A	From Leg	4.00	0.0000	132.00	No Ice	3.14	1.28	0.05
			0.00			1/2" Ice	3.36	1.43	0.07
			0.00			1" Ice	3.59	1.60	0.10
						2" Ice	4.07	1.95	0.16
RRUS 12 B2	B	From Leg	4.00	0.0000	132.00	No Ice	3.14	1.28	0.05
			0.00			1/2" Ice	3.36	1.43	0.07
			0.00			1" Ice	3.59	1.60	0.10
						2" Ice	4.07	1.95	0.16
RRUS 12 B2	C	From Leg	4.00	0.0000	132.00	No Ice	3.14	1.28	0.05
			0.00			1/2" Ice	3.36	1.43	0.07
			0.00			1" Ice	3.59	1.60	0.10
						2" Ice	4.07	1.95	0.16
RRUS A2 B2	A	From Leg	4.00	0.0000	132.00	No Ice	2.20	0.54	0.02
			0.00			1/2" Ice	2.38	0.65	0.04
			-4.00			1" Ice	2.57	0.77	0.05
						2" Ice	2.98	1.04	0.09
RRUS A2 B2	B	From Leg	4.00	0.0000	132.00	No Ice	2.20	0.54	0.02
			0.00			1/2" Ice	2.38	0.65	0.04
			-4.00			1" Ice	2.57	0.77	0.05
						2" Ice	2.98	1.04	0.09
RRUS A2 B2	C	From Leg	4.00	0.0000	132.00	No Ice	2.20	0.54	0.02
			0.00			1/2" Ice	2.38	0.65	0.04
			-4.00			1" Ice	2.57	0.77	0.05
						2" Ice	2.98	1.04	0.09
Miscellaneous [NA 510-1]	C	None		0.0000	132.00	No Ice	6.00	6.00	0.26
						1/2" Ice	8.50	8.50	0.34
						1" Ice	11.00	11.00	0.42
						2" Ice	16.00	16.00	0.59
Platform Mount [LP 1201-1]	C	None		0.0000	132.00	No Ice	23.10	23.10	2.10

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
							1/2" Ice	26.80	26.80	2.50
							1" Ice	30.50	30.50	2.90
							2" Ice	37.90	37.90	3.70
*111*										
***										
RR65-18-02DP w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	111.00	No Ice	4.59	3.32	0.03
			0.00				1/2" Ice	5.02	4.09	0.07
			0.00				1" Ice	5.44	4.78	0.12
							2" Ice	6.30	6.23	0.22
RR65-18-02DP w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	111.00	No Ice	4.59	3.32	0.03
			0.00				1/2" Ice	5.02	4.09	0.07
			0.00				1" Ice	5.44	4.78	0.12
							2" Ice	6.30	6.23	0.22
RR65-18-02DP w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	111.00	No Ice	4.59	3.32	0.03
			0.00				1/2" Ice	5.02	4.09	0.07
			0.00				1" Ice	5.44	4.78	0.12
							2" Ice	6.30	6.23	0.22
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	111.00	No Ice	6.82	3.49	0.06
			0.00				1/2" Ice	7.28	4.26	0.11
			0.00				1" Ice	7.72	4.96	0.16
							2" Ice	8.63	6.40	0.30
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	111.00	No Ice	6.82	3.49	0.06
			0.00				1/2" Ice	7.28	4.26	0.11
			0.00				1" Ice	7.72	4.96	0.16
							2" Ice	8.63	6.40	0.30
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	111.00	No Ice	6.82	3.49	0.06
			0.00				1/2" Ice	7.28	4.26	0.11
			0.00				1" Ice	7.72	4.96	0.16
							2" Ice	8.63	6.40	0.30
(2) KRY 112 144/2	A	From Leg	4.00	0.00	0.0000	111.00	No Ice	0.48	0.23	0.01
			0.00				1/2" Ice	0.57	0.30	0.01
			0.00				1" Ice	0.66	0.38	0.02
							2" Ice	0.88	0.55	0.04
KRY 112 144/2	B	From Leg	4.00	0.00	0.0000	111.00	No Ice	0.48	0.23	0.01
			0.00				1/2" Ice	0.57	0.30	0.01
			0.00				1" Ice	0.66	0.38	0.02
							2" Ice	0.88	0.55	0.04
KRY 112 489/1	B	From Leg	4.00	0.00	0.0000	111.00	No Ice	0.56	0.37	0.02
			0.00				1/2" Ice	0.66	0.45	0.02
			0.00				1" Ice	0.77	0.54	0.03
							2" Ice	1.00	0.75	0.05
(2) KRY 112 489/1	C	From Leg	4.00	0.00	0.0000	111.00	No Ice	0.56	0.37	0.02
			0.00				1/2" Ice	0.66	0.45	0.02
			0.00				1" Ice	0.77	0.54	0.03
							2" Ice	1.00	0.75	0.05
Site Pro 1 RMPQ-396 Platform Mount	C	None			0.0000	111.00	No Ice	14.66	14.66	1.59
							1/2" Ice	18.87	18.87	1.88
							1" Ice	23.08	23.08	2.18
							2" Ice	31.50	31.50	2.76
Site Pro 1 HRK12 Handrail Kit	C	None			0.0000	111.00	No Ice	4.80	4.80	0.25
							1/2" Ice	6.70	6.70	0.29
							1" Ice	8.60	8.60	0.34
							2" Ice	12.40	12.40	0.44
Pipe Mount	A	From Leg	4.00	0.00	0.0000	111.00	No Ice	1.20	1.20	0.02
			0.00				1/2" Ice	1.50	1.50	0.03
			0.00				1" Ice	1.81	1.81	0.04
							2" Ice	2.47	2.47	0.08

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	111.00	No Ice 1.20 1/2" Ice 1.50 1" Ice 1.81 2" Ice 2.47	1.20 1.50 1.81 2.47	0.02 0.03 0.04 0.08
Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	111.00	No Ice 1.20 1/2" Ice 1.50 1" Ice 1.81 2" Ice 2.47	1.20 1.50 1.81 2.47	0.02 0.03 0.04 0.08
**** *104*								
KS24019-L112A	A	From Leg	4.00 0.00 0.00	0.0000	104.00	No Ice 0.14 1/2" Ice 0.20 1" Ice 0.26 2" Ice 0.41	0.14 0.20 0.26 0.41	0.01 0.01 0.01 0.02
Side Arm Mount [SO 701-1]	A	None		0.0000	104.00	No Ice 0.85 1/2" Ice 1.14 1" Ice 1.43 2" Ice 2.01	0.85 1.14 1.43 2.01	0.07 0.08 0.09 0.12
*88*								
SC479-HF1LDF	A	From Leg	3.00 0.00 7.00	0.0000	88.00	No Ice 5.03 1/2" Ice 6.51 1" Ice 8.00 2" Ice 10.73	5.03 6.51 8.00 10.73	0.03 0.07 0.11 0.23
SC479-HF1LDF	B	From Leg	3.00 0.00 7.00	0.0000	88.00	No Ice 5.03 1/2" Ice 6.51 1" Ice 8.00 2" Ice 10.73	5.03 6.51 8.00 10.73	0.03 0.07 0.11 0.23
428E-83I-01-T	B	From Leg	3.00 0.00 0.00	0.0000	88.00	No Ice 0.40 1/2" Ice 0.48 1" Ice 0.57 2" Ice 0.77	0.40 0.48 0.57 0.77	0.01 0.01 0.02 0.04
Side Arm Mount [SO 306-1]	A	From Leg	1.50 0.00 0.00	0.0000	88.00	No Ice 0.98 1/2" Ice 1.70 1" Ice 2.42 2" Ice 3.86	0.98 1.70 2.42 3.86	0.04 0.06 0.08 0.12
Side Arm Mount [SO 306-1]	B	From Leg	1.50 0.00 0.00	0.0000	88.00	No Ice 0.98 1/2" Ice 1.70 1" Ice 2.42 2" Ice 3.86	0.98 1.70 2.42 3.86	0.04 0.06 0.08 0.12
*82*								
BA80-41-DIN	C	From Leg	3.00 0.00 10.00	0.0000	82.00	No Ice 8.16 1/2" Ice 11.00 1" Ice 13.13 2" Ice 17.43	8.16 11.00 13.13 17.43	0.07 0.13 0.20 0.39
Side Arm Mount [SO 306-1]	C	From Leg	1.50 0.00 0.00	0.0000	82.00	No Ice 0.98 1/2" Ice 1.70 1" Ice 2.42 2" Ice 3.86	0.98 1.70 2.42 3.86	0.04 0.06 0.08 0.12
***								

**Tower Pressures - No Ice**

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	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

$$G_H = 1.100$$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 150.00-145.00	147.48	1.104	43	9.669	A	0.000	9.669	9.669	100.00	0.000	0.000
					B	0.000	9.669		100.00	0.000	0.000
					C	0.000	9.669		100.00	0.150	0.000
L2 145.00-140.00	142.48	1.093	42	10.100	A	0.000	10.100	10.100	100.00	0.000	0.000
					B	0.000	10.100		100.00	0.000	0.000
					C	0.000	10.100		100.00	0.188	0.000
L3 140.00-135.00	137.48	1.082	42	10.532	A	0.000	10.532	10.532	100.00	0.000	0.000
					B	0.000	10.532		100.00	0.000	0.000
					C	0.000	10.532		100.00	0.188	0.000
L4 135.00-130.00	132.48	1.071	41	10.963	A	0.000	10.963	10.963	100.00	0.000	0.000
					B	0.000	10.963		100.00	0.000	0.000
					C	0.000	10.963		100.00	0.188	0.000
L5 130.00-125.00	127.48	1.059	41	11.395	A	0.000	11.395	11.395	100.00	0.000	0.000
					B	0.000	11.395		100.00	0.000	0.000
					C	0.000	11.395		100.00	0.188	0.000
L6 125.00-120.00	122.48	1.047	40	11.826	A	0.000	11.826	11.826	100.00	0.000	0.000
					B	0.000	11.826		100.00	0.000	0.000
					C	0.000	11.826		100.00	0.188	0.000
L7 120.00-115.00	117.49	1.035	40	12.257	A	0.000	12.257	12.257	100.00	0.000	0.000
					B	0.000	12.257		100.00	0.000	0.000
					C	0.000	12.257		100.00	0.188	0.000
L8 115.00-108.00	111.47	1.019	39	17.885	A	0.000	17.885	17.885	100.00	0.000	0.000
					B	0.000	17.885		100.00	0.000	0.000
					C	0.000	17.885		100.00	0.263	0.000
L9 108.00-106.75	107.37	1.009	39	3.227	A	0.000	3.227	3.227	100.00	0.000	0.000
					B	0.000	3.227		100.00	0.000	0.000
					C	0.000	3.227		100.00	0.047	0.000
L10 106.75-101.75	104.24	1	39	13.176	A	0.000	13.176	13.176	100.00	0.000	0.000
					B	0.000	13.176		100.00	0.000	0.000
					C	0.000	13.176		100.00	0.188	0.000
L11 101.75-96.75	99.24	0.986	38	13.607	A	0.000	13.607	13.607	100.00	0.000	0.000
					B	0.000	13.607		100.00	0.000	0.000
					C	0.000	13.607		100.00	0.188	0.000
L12 96.75-91.75	94.24	0.972	37	14.039	A	0.000	14.039	14.039	100.00	0.250	0.000
					B	0.000	14.039		100.00	0.250	0.000
					C	0.000	14.039		100.00	0.438	0.000
L13 91.75-89.50	90.62	0.961	37	6.458	A	0.000	6.458	6.458	100.00	2.250	0.000
					B	0.000	6.458		100.00	2.250	0.000
					C	0.000	6.458		100.00	2.334	0.000
L14 89.50-89.25	89.37	0.957	37	0.722	A	0.000	0.722	0.722	100.00	0.250	0.000
					B	0.000	0.722		100.00	0.250	0.000
					C	0.000	0.722		100.00	0.259	0.000
L15 89.25-84.25	86.74	0.949	37	14.659	A	0.000	14.659	14.659	100.00	5.000	0.000
					B	0.000	14.659		100.00	5.000	0.000
					C	0.000	14.659		100.00	6.250	0.000
L16 84.25-79.25	81.74	0.933	36	15.092	A	0.000	15.092	15.092	100.00	5.000	0.000
					B	0.000	15.092		100.00	5.000	0.000
					C	0.000	15.092		100.00	6.908	0.000
L17 79.25-69.75	74.46	0.908	35	29.865	A	0.000	29.865	29.865	100.00	7.250	0.000
					B	0.000	29.865		100.00	7.250	0.000
					C	0.000	29.865		100.00	11.345	0.000
L18 69.75-68.75	69.25	0.89	34	3.183	A	0.000	3.183	3.183	100.00	0.652	0.000
					B	0.000	3.183		100.00	0.652	0.000
					C	0.000	3.183		100.00	1.083	0.000
L19 68.75-67.42	68.08	0.885	34	4.261	A	0.000	4.261	4.261	100.00	1.294	0.000
					B	0.000	4.261		100.00	1.294	0.000

<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	25 of 47
<b>Project</b>	18TAJG1400 (R2)	<b>Date</b>	14:38:10 12/11/18
<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L20 67.42-67.17	67.29	0.882	34	0.804	C	0.000	4.261	0.804	100.00	1.867	0.000
					A	0.000	0.804		100.00	0.243	0.000
					B	0.000	0.804		100.00	0.243	0.000
L21 67.17-62.17	64.66	0.872	34	16.313	C	0.000	0.804	16.313	100.00	0.351	0.000
					A	0.000	16.313		100.00	4.863	0.000
					B	0.000	16.313		100.00	4.863	0.000
L22 62.17-57.58	59.87	0.853	33	15.355	C	0.000	16.313	15.355	100.00	7.019	0.000
					A	0.000	15.355		100.00	9.464	0.000
					B	0.000	15.355		100.00	6.964	0.000
L23 57.58-57.33	57.45	0.844	32	0.844	C	0.000	0.844	0.844	100.00	8.943	0.000
					A	0.000	0.844		100.00	0.671	0.000
					B	0.000	0.844		100.00	0.421	0.000
L24 57.33-56.42	56.87	0.841	32	3.083	C	0.000	0.844	3.083	100.00	0.529	0.000
					A	0.000	3.083		100.00	2.442	0.000
					B	0.000	3.083		100.00	1.532	0.000
L25 56.42-56.17	56.29	0.839	32	0.850	C	0.000	0.850	0.850	100.00	1.924	0.000
					A	0.000	0.850		100.00	0.671	0.000
					B	0.000	0.850		100.00	0.421	0.000
L26 56.17-51.17	53.66	0.827	32	17.232	C	0.000	0.850	17.232	100.00	0.529	0.000
					A	0.000	17.232		100.00	11.195	0.000
					B	0.000	17.232		100.00	6.195	0.000
L27 51.17-46.17	48.66	0.804	31	17.664	C	0.000	17.232	17.664	100.00	8.351	0.000
					A	0.000	17.664		100.00	10.000	0.000
					B	0.000	17.664		100.00	5.000	0.000
L28 46.17-41.17	43.66	0.78	30	18.097	C	0.000	17.664	18.097	100.00	7.156	0.000
					A	0.000	18.097		100.00	10.000	0.000
					B	0.000	18.097		100.00	5.000	0.000
L29 41.17-32.50	36.81	0.743	29	32.403	C	0.000	18.097	32.403	100.00	7.156	0.000
					A	0.000	32.403		100.00	16.180	0.000
					B	0.000	32.403		100.00	8.090	0.000
L30 32.50-31.50	32.00	0.714	27	3.760	C	0.000	32.403	3.760	100.00	11.828	0.000
					A	0.000	3.760		100.00	3.382	0.000
					B	0.000	3.760		100.00	1.691	0.000
L31 31.50-26.50	28.99	0.7	27	19.058	C	0.000	3.760	19.058	100.00	2.122	0.000
					A	0.000	19.058		100.00	18.453	0.000
					B	0.000	19.058		100.00	9.226	0.000
L32 26.50-26.25	26.37	0.7	27	0.962	C	0.000	19.058	0.962	100.00	11.382	0.000
					A	0.000	0.962		100.00	0.965	0.000
					B	0.000	0.962		100.00	0.483	0.000
L33 26.25-21.25	23.74	0.7	27	19.474	C	0.000	0.962	19.474	100.00	0.590	0.000
					A	0.000	19.474		100.00	10.833	0.000
					B	0.000	19.474		100.00	5.417	0.000
L34 21.25-16.25	18.74	0.7	27	19.907	C	0.000	19.474	19.907	100.00	7.572	0.000
					A	0.000	19.907		100.00	10.833	0.000
					B	0.000	19.907		100.00	5.417	0.000
L35 16.25-11.25	13.74	0.7	27	20.339	C	0.000	19.907	20.339	100.00	7.572	0.000
					A	0.000	20.339		100.00	10.833	0.000
					B	0.000	20.339		100.00	5.417	0.000
L36 11.25-6.25	8.74	0.7	27	20.772	C	0.000	20.339	20.772	100.00	7.572	0.000
					A	0.000	20.772		100.00	10.833	0.000
					B	0.000	20.772		100.00	5.417	0.000
L37 6.25-1.25	3.74	0.7	27	21.203	C	0.000	20.772	21.203	100.00	7.572	0.000
					A	0.000	21.203		100.00	10.833	0.000
					B	0.000	21.203		100.00	5.417	0.000
L38 1.25-0.00	0.62	0.7	27	5.368	C	0.000	21.203	5.368	100.00	7.572	0.000
					A	0.000	5.368		100.00	2.708	0.000
					B	0.000	5.368		100.00	1.354	0.000
					C	0.000	5.368		100.00	1.893	0.000

<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b> 876341 Middletown 2-Marino Property	<b>Page</b> 26 of 47
	<b>Project</b> 18TAJG1400 (R2)	<b>Date</b> 14:38:10 12/11/18
	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

**Tower Pressure - With Ice**

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>Ieg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		psf	in	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 150.00-145.00	147.48	1.104	6	1.4809	10.903	A	0.000	10.903	10.903	100.00	0.000	0.000
						B	0.000	10.903		100.00	0.000	0.000
						C	0.000	10.903		100.00	1.335	0.000
L2 145.00-140.00	142.48	1.093	6	1.4758	11.330	A	0.000	11.330	11.330	100.00	0.000	0.000
						B	0.000	11.330		100.00	0.000	0.000
						C	0.000	11.330		100.00	1.663	0.000
L3 140.00-135.00	137.48	1.082	6	1.4706	11.757	A	0.000	11.757	11.757	100.00	0.000	0.000
						B	0.000	11.757		100.00	0.000	0.000
						C	0.000	11.757		100.00	1.658	0.000
L4 135.00-130.00	132.48	1.071	6	1.4651	12.184	A	0.000	12.184	12.184	100.00	0.000	0.000
						B	0.000	12.184		100.00	0.000	0.000
						C	0.000	12.184		100.00	1.653	0.000
L5 130.00-125.00	127.48	1.059	6	1.4595	12.611	A	0.000	12.611	12.611	100.00	0.000	0.000
						B	0.000	12.611		100.00	0.000	0.000
						C	0.000	12.611		100.00	1.647	0.000
L6 125.00-120.00	122.48	1.047	6	1.4537	13.037	A	0.000	13.037	13.037	100.00	0.000	0.000
						B	0.000	13.037		100.00	0.000	0.000
						C	0.000	13.037		100.00	1.641	0.000
L7 120.00-115.00	117.49	1.035	6	1.4476	13.464	A	0.000	13.464	13.464	100.00	0.000	0.000
						B	0.000	13.464		100.00	0.000	0.000
						C	0.000	13.464		100.00	1.635	0.000
L8 115.00-108.00	111.47	1.019	6	1.4400	19.565	A	0.000	19.565	19.565	100.00	0.000	0.000
						B	0.000	19.565		100.00	0.000	0.000
						C	0.000	19.565		100.00	2.279	0.000
L9 108.00-106.75	107.37	1.009	6	1.4347	3.527	A	0.000	3.527	3.527	100.00	0.000	0.000
						B	0.000	3.527		100.00	0.000	0.000
						C	0.000	3.527		100.00	0.407	0.000
L10 106.75-101.75	104.24	1	6	1.4304	14.368	A	0.000	14.368	14.368	100.00	0.000	0.000
						B	0.000	14.368		100.00	0.000	0.000
						C	0.000	14.368		100.00	1.618	0.000
L11 101.75-96.75	99.24	0.986	6	1.4234	14.794	A	0.000	14.794	14.794	100.00	0.000	0.000
						B	0.000	14.794		100.00	0.000	0.000
						C	0.000	14.794		100.00	1.611	0.000
L12 96.75-91.75	94.24	0.972	6	1.4161	15.219	A	0.000	15.219	15.219	100.00	0.321	0.000
						B	0.000	15.219		100.00	0.321	0.000
						C	0.000	15.219		100.00	1.924	0.000
L13 91.75-89.50	90.62	0.961	5	1.4105	6.987	A	0.000	6.987	6.987	100.00	2.885	0.000
						B	0.000	6.987		100.00	2.885	0.000
						C	0.000	6.987		100.00	3.604	0.000
L14 89.50-89.25	89.37	0.957	5	1.4086	0.780	A	0.000	0.780	0.780	100.00	0.320	0.000
						B	0.000	0.780		100.00	0.320	0.000
						C	0.000	0.780		100.00	0.400	0.000
L15 89.25-84.25	86.74	0.949	5	1.4044	15.830	A	0.000	15.830	15.830	100.00	6.404	0.000
						B	0.000	15.830		100.00	6.404	0.000
						C	0.000	15.830		100.00	11.635	0.000
L16 84.25-79.25	81.74	0.933	5	1.3961	16.255	A	0.000	16.255	16.255	100.00	6.396	0.000
						B	0.000	16.255		100.00	6.396	0.000
						C	0.000	16.255		100.00	13.884	0.000
L17 79.25-69.75	74.46	0.908	5	1.3831	32.055	A	0.000	32.055	32.055	100.00	9.255	0.000
						B	0.000	32.055		100.00	9.255	0.000
						C	0.000	32.055		100.00	25.043	0.000
L18 69.75-68.75	69.25	0.89	5	1.3731	3.414	A	0.000	3.414	3.414	100.00	0.750	0.000
						B	0.000	3.414		100.00	0.750	0.000

<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	27 of 47
<b>Project</b>	18TAJG1400 (R2)	<b>Date</b>	14:38:10 12/11/18
<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L19 68.75-67.42	68.08	0.885	5	1.3708	4.565	C	0.000	3.414		100.00	2.412	0.000
						A	0.000	4.565	4.565	100.00	1.486	0.000
						B	0.000	4.565		100.00	1.486	0.000
						C	0.000	4.565		100.00	3.682	0.000
L20 67.42-67.17	67.29	0.882	5	1.3692	0.861	A	0.000	0.861	0.861	100.00	0.279	0.000
						B	0.000	0.861		100.00	0.279	0.000
						C	0.000	0.861		100.00	0.692	0.000
L21 67.17-62.17	64.66	0.872	5	1.3637	17.449	A	0.000	17.449	17.449	100.00	5.582	0.000
						B	0.000	17.449		100.00	5.582	0.000
						C	0.000	17.449		100.00	13.809	0.000
L22 62.17-57.58	59.87	0.853	5	1.3532	16.390	A	0.000	16.390	16.390	100.00	11.472	0.000
						B	0.000	16.390		100.00	8.296	0.000
						C	0.000	16.390		100.00	15.807	0.000
L23 57.58-57.33	57.45	0.844	5	1.3477	0.901	A	0.000	0.901	0.901	100.00	0.841	0.000
						B	0.000	0.901		100.00	0.523	0.000
						C	0.000	0.901		100.00	0.931	0.000
L24 57.33-56.42	56.87	0.841	5	1.3463	3.287	A	0.000	3.287	3.287	100.00	3.060	0.000
						B	0.000	3.287		100.00	1.905	0.000
						C	0.000	3.287		100.00	3.389	0.000
L25 56.42-56.17	56.29	0.839	5	1.3449	0.906	A	0.000	0.906	0.906	100.00	0.840	0.000
						B	0.000	0.906		100.00	0.523	0.000
						C	0.000	0.906		100.00	0.931	0.000
L26 56.17-51.17	53.66	0.827	5	1.3385	18.348	A	0.000	18.348	18.348	100.00	14.118	0.000
						B	0.000	18.348		100.00	7.779	0.000
						C	0.000	18.348		100.00	15.899	0.000
L27 51.17-46.17	48.66	0.804	5	1.3255	18.768	A	0.000	18.768	18.768	100.00	12.651	0.000
						B	0.000	18.768		100.00	6.325	0.000
						C	0.000	18.768		100.00	14.390	0.000
L28 46.17-41.17	43.66	0.78	4	1.3112	19.190	A	0.000	19.190	19.190	100.00	12.622	0.000
						B	0.000	19.190		100.00	6.311	0.000
						C	0.000	19.190		100.00	14.315	0.000
L29 41.17-32.50	36.81	0.743	4	1.2890	34.266	A	0.000	34.266	34.266	100.00	19.431	0.000
						B	0.000	34.266		100.00	9.716	0.000
						C	0.000	34.266		100.00	23.430	0.000
L30 32.50-31.50	32.00	0.714	4	1.2711	3.975	A	0.000	3.975	3.975	100.00	3.942	0.000
						B	0.000	3.975		100.00	1.971	0.000
						C	0.000	3.975		100.00	3.553	0.000
L31 31.50-26.50	28.99	0.7	4	1.2586	20.107	A	0.000	20.107	20.107	100.00	21.968	0.000
						B	0.000	20.107		100.00	10.984	0.000
						C	0.000	20.107		100.00	18.764	0.000
L32 26.50-26.25	26.37	0.7	4	1.2467	1.014	A	0.000	1.014	1.014	100.00	1.158	0.000
						B	0.000	1.014		100.00	0.579	0.000
						C	0.000	1.014		100.00	0.965	0.000
L33 26.25-21.25	23.74	0.7	4	1.2337	20.502	A	0.000	20.502	20.502	100.00	13.301	0.000
						B	0.000	20.502		100.00	6.650	0.000
						C	0.000	20.502		100.00	14.325	0.000
L34 21.25-16.25	18.74	0.7	4	1.2049	20.911	A	0.000	20.911	20.911	100.00	13.243	0.000
						B	0.000	20.911		100.00	6.622	0.000
						C	0.000	20.911		100.00	14.173	0.000
L35 16.25-11.25	13.74	0.7	4	1.1680	21.312	A	0.000	21.312	21.312	100.00	13.169	0.000
						B	0.000	21.312		100.00	6.585	0.000
						C	0.000	21.312		100.00	13.980	0.000
L36 11.25-6.25	8.74	0.7	4	1.1164	21.702	A	0.000	21.702	21.702	100.00	13.066	0.000
						B	0.000	21.702		100.00	6.533	0.000
						C	0.000	21.702		100.00	13.709	0.000
L37 6.25-1.25	3.74	0.7	4	1.0256	22.058	A	0.000	22.058	22.058	100.00	12.884	0.000
						B	0.000	22.058		100.00	6.442	0.000
						C	0.000	22.058		100.00	13.232	0.000
L38 1.25-0.00	0.62	0.7	4	0.8575	5.547	A	0.000	5.547	5.547	100.00	3.137	0.000
						B	0.000	5.547		100.00	1.569	0.000



<b>tnxTower</b>  <b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031	<b>Job</b> 876341 Middletown 2-Marino Property	<b>Page</b> 28 of 47
	<b>Project</b> 18TAJG1400 (R2)	<b>Date</b> 14:38:10 12/11/18
	<b>Client</b> Crown Castle	<b>Designed by</b> Aditya Chingale

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	in	ft <sup>2</sup>	c	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
						C	0.000	5.547		100.00	3.087	0.000

**Tower Pressure - Service**

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	c	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1	147.48	1.104	8	9.669	A	0.000	9.669	9.669	100.00	0.000	0.000
150.00-145.00					B	0.000	9.669		100.00	0.000	0.000
					C	0.000	9.669		100.00	0.150	0.000
L2	142.48	1.093	8	10.100	A	0.000	10.100	10.100	100.00	0.000	0.000
145.00-140.00					B	0.000	10.100		100.00	0.000	0.000
					C	0.000	10.100		100.00	0.188	0.000
L3	137.48	1.082	8	10.532	A	0.000	10.532	10.532	100.00	0.000	0.000
140.00-135.00					B	0.000	10.532		100.00	0.000	0.000
					C	0.000	10.532		100.00	0.188	0.000
L4	132.48	1.071	8	10.963	A	0.000	10.963	10.963	100.00	0.000	0.000
135.00-130.00					B	0.000	10.963		100.00	0.000	0.000
					C	0.000	10.963		100.00	0.188	0.000
L5	127.48	1.059	8	11.395	A	0.000	11.395	11.395	100.00	0.000	0.000
130.00-125.00					B	0.000	11.395		100.00	0.000	0.000
					C	0.000	11.395		100.00	0.188	0.000
L6	122.48	1.047	8	11.826	A	0.000	11.826	11.826	100.00	0.000	0.000
125.00-120.00					B	0.000	11.826		100.00	0.000	0.000
					C	0.000	11.826		100.00	0.188	0.000
L7	117.49	1.035	8	12.257	A	0.000	12.257	12.257	100.00	0.000	0.000
120.00-115.00					B	0.000	12.257		100.00	0.000	0.000
					C	0.000	12.257		100.00	0.188	0.000
L8	111.47	1.019	7	17.885	A	0.000	17.885	17.885	100.00	0.000	0.000
115.00-108.00					B	0.000	17.885		100.00	0.000	0.000
					C	0.000	17.885		100.00	0.263	0.000
L9	107.37	1.009	7	3.227	A	0.000	3.227	3.227	100.00	0.000	0.000
108.00-106.75					B	0.000	3.227		100.00	0.000	0.000
					C	0.000	3.227		100.00	0.047	0.000
L10	104.24	1	7	13.176	A	0.000	13.176	13.176	100.00	0.000	0.000
106.75-101.75					B	0.000	13.176		100.00	0.000	0.000
					C	0.000	13.176		100.00	0.188	0.000
L11	99.24	0.986	7	13.607	A	0.000	13.607	13.607	100.00	0.000	0.000
101.75-96.75					B	0.000	13.607		100.00	0.000	0.000
					C	0.000	13.607		100.00	0.188	0.000
L12	94.24	0.972	7	14.039	A	0.000	14.039	14.039	100.00	0.250	0.000
96.75-91.75					B	0.000	14.039		100.00	0.250	0.000
					C	0.000	14.039		100.00	0.438	0.000
L13	90.62	0.961	7	6.458	A	0.000	6.458	6.458	100.00	2.250	0.000
91.75-89.50					B	0.000	6.458		100.00	2.250	0.000
					C	0.000	6.458		100.00	2.334	0.000
L14	89.37	0.957	7	0.722	A	0.000	0.722	0.722	100.00	0.250	0.000
89.50-89.25					B	0.000	0.722		100.00	0.250	0.000
					C	0.000	0.722		100.00	0.259	0.000
L15	86.74	0.949	7	14.659	A	0.000	14.659	14.659	100.00	5.000	0.000
89.25-84.25					B	0.000	14.659		100.00	5.000	0.000
					C	0.000	14.659		100.00	6.250	0.000

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Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> <sub>In</sub> Face	C <sub>AA</sub> <sub>Out</sub> Face
ft	ft		psf	ft <sup>2</sup>	c	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L16 84.25-79.25	81.74	0.933	7	15.092	A	0.000	15.092	15.092	100.00	5.000	0.000
					B	0.000	15.092		100.00	5.000	0.000
					C	0.000	15.092		100.00	6.908	0.000
L17 79.25-69.75	74.46	0.908	7	29.865	A	0.000	29.865	29.865	100.00	7.250	0.000
					B	0.000	29.865		100.00	7.250	0.000
					C	0.000	29.865		100.00	11.345	0.000
L18 69.75-68.75	69.25	0.89	7	3.183	A	0.000	3.183	3.183	100.00	0.652	0.000
					B	0.000	3.183		100.00	0.652	0.000
					C	0.000	3.183		100.00	1.083	0.000
L19 68.75-67.42	68.08	0.885	7	4.261	A	0.000	4.261	4.261	100.00	1.294	0.000
					B	0.000	4.261		100.00	1.294	0.000
					C	0.000	4.261		100.00	1.867	0.000
L20 67.42-67.17	67.29	0.882	6	0.804	A	0.000	0.804	0.804	100.00	0.243	0.000
					B	0.000	0.804		100.00	0.243	0.000
					C	0.000	0.804		100.00	0.351	0.000
L21 67.17-62.17	64.66	0.872	6	16.313	A	0.000	16.313	16.313	100.00	4.863	0.000
					B	0.000	16.313		100.00	4.863	0.000
					C	0.000	16.313		100.00	7.019	0.000
L22 62.17-57.58	59.87	0.853	6	15.355	A	0.000	15.355	15.355	100.00	9.464	0.000
					B	0.000	15.355		100.00	6.964	0.000
					C	0.000	15.355		100.00	8.943	0.000
L23 57.58-57.33	57.45	0.844	6	0.844	A	0.000	0.844	0.844	100.00	0.671	0.000
					B	0.000	0.844		100.00	0.421	0.000
					C	0.000	0.844		100.00	0.529	0.000
L24 57.33-56.42	56.87	0.841	6	3.083	A	0.000	3.083	3.083	100.00	2.442	0.000
					B	0.000	3.083		100.00	1.532	0.000
					C	0.000	3.083		100.00	1.924	0.000
L25 56.42-56.17	56.29	0.839	6	0.850	A	0.000	0.850	0.850	100.00	0.671	0.000
					B	0.000	0.850		100.00	0.421	0.000
					C	0.000	0.850		100.00	0.529	0.000
L26 56.17-51.17	53.66	0.827	6	17.232	A	0.000	17.232	17.232	100.00	11.195	0.000
					B	0.000	17.232		100.00	6.195	0.000
					C	0.000	17.232		100.00	8.351	0.000
L27 51.17-46.17	48.66	0.804	6	17.664	A	0.000	17.664	17.664	100.00	10.000	0.000
					B	0.000	17.664		100.00	5.000	0.000
					C	0.000	17.664		100.00	7.156	0.000
L28 46.17-41.17	43.66	0.78	6	18.097	A	0.000	18.097	18.097	100.00	10.000	0.000
					B	0.000	18.097		100.00	5.000	0.000
					C	0.000	18.097		100.00	7.156	0.000
L29 41.17-32.50	36.81	0.743	5	32.403	A	0.000	32.403	32.403	100.00	16.180	0.000
					B	0.000	32.403		100.00	8.090	0.000
					C	0.000	32.403		100.00	11.828	0.000
L30 32.50-31.50	32.00	0.714	5	3.760	A	0.000	3.760	3.760	100.00	3.382	0.000
					B	0.000	3.760		100.00	1.691	0.000
					C	0.000	3.760		100.00	2.122	0.000
L31 31.50-26.50	28.99	0.7	5	19.058	A	0.000	19.058	19.058	100.00	18.453	0.000
					B	0.000	19.058		100.00	9.226	0.000
					C	0.000	19.058		100.00	11.382	0.000
L32 26.50-26.25	26.37	0.7	5	0.962	A	0.000	0.962	0.962	100.00	0.965	0.000
					B	0.000	0.962		100.00	0.483	0.000
					C	0.000	0.962		100.00	0.590	0.000
L33 26.25-21.25	23.74	0.7	5	19.474	A	0.000	19.474	19.474	100.00	10.833	0.000
					B	0.000	19.474		100.00	5.417	0.000
					C	0.000	19.474		100.00	7.572	0.000
L34 21.25-16.25	18.74	0.7	5	19.907	A	0.000	19.907	19.907	100.00	10.833	0.000
					B	0.000	19.907		100.00	5.417	0.000
					C	0.000	19.907		100.00	7.572	0.000
L35 16.25-11.25	13.74	0.7	5	20.339	A	0.000	20.339	20.339	100.00	10.833	0.000
					B	0.000	20.339		100.00	5.417	0.000
					C	0.000	20.339		100.00	7.572	0.000

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Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L36 11.25-6.25	8.74	0.7	5	20.772	A	0.000	20.772	20.772	100.00	10.833	0.000
					B	0.000	20.772	100.00	5.417	0.000	
					C	0.000	20.772	100.00	7.572	0.000	
L37 6.25-1.25	3.74	0.7	5	21.203	A	0.000	21.203	21.203	100.00	10.833	0.000
					B	0.000	21.203	100.00	5.417	0.000	
					C	0.000	21.203	100.00	7.572	0.000	
L38 1.25-0.00	0.62	0.7	5	5.368	A	0.000	5.368	5.368	100.00	2.708	0.000
					B	0.000	5.368	100.00	1.354	0.000	
					C	0.000	5.368	100.00	1.893	0.000	

## Load Combinations

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

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Comb. No.	Description
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	150 - 145	Pole	Max Tension	1	0.00	0.0	-0.0
			Max. Compression	26	-9.65	-2.5	4.3
			Max. Mx	8	-4.53	-30.0	1.5
			Max. My	2	-4.50	-0.7	31.9
			Max. Vy	8	5.86	-30.0	1.5
			Max. Vx	2	-6.07	-0.7	31.9
			Max. Torque	10			2.8
L2	145 - 140	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-18.64	-3.3	4.0
			Max. Mx	8	-8.10	-70.1	1.1
			Max. My	2	-8.06	-0.5	72.7
			Max. Vy	8	11.73	-70.1	1.1
			Max. Vx	2	-11.89	-0.5	72.7
			Max. Torque	10			2.8
L3	140 - 135	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-19.39	-3.3	4.0
			Max. Mx	8	-8.57	-130.0	0.6
			Max. My	2	-8.53	-0.0	133.4
			Max. Vy	8	12.22	-130.0	0.6
			Max. Vx	2	-12.39	-0.0	133.4
			Max. Torque	10			2.8
L4	135 - 130	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-28.34	-3.4	4.6
			Max. Mx	8	-12.82	-203.0	0.2
			Max. My	2	-12.78	0.5	207.4
			Max. Vy	8	17.26	-203.0	0.2
			Max. Vx	2	-17.43	0.5	207.4
			Max. Torque	10			3.0
L5	130 - 125	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-29.20	-3.4	4.7
			Max. Mx	8	-13.42	-290.5	-0.3
			Max. My	2	-13.37	1.0	295.7
			Max. Vy	8	17.75	-290.5	-0.3
			Max. Vx	2	-17.92	1.0	295.7
			Max. Torque	10			3.0
L6	125 - 120	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-30.09	-3.4	4.7
			Max. Mx	8	-14.05	-380.5	-0.9
			Max. My	2	-14.00	1.6	386.6
			Max. Vy	8	18.25	-380.5	-0.9
			Max. Vx	2	-18.42	1.6	386.6
			Max. Torque	10			3.0
L7	120 - 115	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-31.00	-3.5	4.7
			Max. Mx	8	-14.70	-472.9	-1.4
			Max. My	2	-14.66	2.1	479.9

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L8	115 - 108	Pole	Max. Vy	8	18.75	-472.9	-1.4
			Max. Vx	2	-18.92	2.1	479.9
			Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-31.62	-3.5	4.7
			Max. Mx	8	-15.16	-534.4	-1.7
			Max. My	2	-15.12	2.5	541.9
			Max. Vy	8	19.07	-534.4	-1.7
L9	108 - 106.75	Pole	Max. Vx	2	-19.25	2.5	541.9
			Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-38.08	-3.5	4.7
			Max. Mx	8	-18.87	-640.5	-2.4
			Max. My	2	-18.83	3.1	648.8
			Max. Vy	8	21.85	-640.5	-2.4
			Max. Vx	2	-22.03	3.1	648.8
L10	106.75 - 101.75	Pole	Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-39.36	-3.5	4.8
			Max. Mx	8	-19.86	-751.1	-2.9
			Max. My	2	-19.82	3.6	760.4
			Max. Vy	8	22.43	-751.1	-2.9
			Max. Vx	2	-22.61	3.6	760.4
			Max. Torque	10			3.0
L11	101.75 - 96.75	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-40.53	-3.5	4.8
			Max. Mx	8	-20.79	-864.4	-3.4
			Max. My	2	-20.76	4.2	874.6
			Max. Vy	8	22.93	-864.4	-3.4
			Max. Vx	2	-23.11	4.2	874.6
			Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
L12	96.75 - 91.75	Pole	Max. Compression	26	-41.74	-3.6	4.8
			Max. Mx	8	-21.76	-980.2	-4.0
			Max. My	2	-21.72	4.7	991.3
			Max. Vy	8	23.42	-980.2	-4.0
			Max. Vx	2	-23.60	4.7	991.3
			Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-42.36	-3.6	4.8
L13	91.75 - 89.5	Pole	Max. Mx	8	-22.20	-1033.2	-4.2
			Max. My	2	-22.16	4.9	1044.7
			Max. Vy	8	23.65	-1033.2	-4.2
			Max. Vx	2	-23.90	4.9	1044.7
			Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-42.44	-3.6	4.8
			Max. Mx	8	-22.28	-1039.1	-4.2
L14	89.5 - 89.25	Pole	Max. My	2	-22.24	5.0	1050.7
			Max. Vy	8	23.66	-1039.1	-4.2
			Max. Vx	2	-23.93	5.0	1050.7
			Max. Torque	10			3.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-44.83	-4.6	5.2
			Max. Mx	8	-23.75	-1164.2	-4.6
			Max. My	2	-23.70	5.2	1177.3
L15	89.25 - 84.25	Pole	Max. Vy	8	24.80	-1164.2	-4.6
			Max. Vx	2	-25.23	5.2	1177.3
			Max. Torque	10			4.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-44.83	-4.6	5.2
			Max. Mx	8	-23.75	-1164.2	-4.6
			Max. My	2	-23.70	5.2	1177.3
			Max. Vy	8	24.80	-1164.2	-4.6
L16	84.25 - 79.25	Pole	Max. Vx	2	-25.23	5.2	1177.3
			Max. Torque	10			4.0
			Max Tension	1	0.00	0.0	0.0

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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
L17	79.25 - 69.75	Pole	Max. Compression	26	-47.08	-3.2	4.3
			Max. Mx	8	-25.23	-1293.4	-5.3
			Max. My	2	-25.17	6.1	1309.4
			Max. Vy	8	25.74	-1293.4	-5.3
			Max. Vx	2	-26.37	6.1	1309.4
			Max. Torque	10			4.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-48.84	-3.3	4.2
			Max. Mx	8	-26.55	-1416.9	-5.8
			Max. My	2	-26.48	6.6	1436.1
L18	69.75 - 68.75	Pole	Max. Vy	8	26.26	-1416.9	-5.8
			Max. Vx	2	-27.04	6.6	1436.1
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-52.16	-3.3	4.0
			Max. Mx	8	-29.00	-1569.9	-6.4
			Max. My	2	-28.92	7.2	1594.1
			Max. Vy	8	26.96	-1569.9	-6.4
			Max. Vx	2	-27.89	7.2	1594.1
			Max. Torque	10			2.5
L19	68.75 - 67.42	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-52.71	-3.3	4.0
			Max. Mx	8	-29.42	-1605.8	-6.6
			Max. My	2	-29.35	7.3	1631.3
			Max. Vy	8	27.09	-1605.8	-6.6
			Max. Vx	2	-28.03	7.3	1631.3
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-52.82	-3.3	4.0
			Max. Mx	8	-29.51	-1612.6	-6.6
L20	67.42 - 67.17	Pole	Max. My	2	-29.45	7.3	1638.3
			Max. Vy	8	27.11	-1612.6	-6.6
			Max. Vx	2	-28.04	7.3	1638.3
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-54.90	-3.4	4.0
			Max. Mx	8	-31.14	-1749.4	-7.0
			Max. My	2	-31.07	7.8	1779.8
			Max. Vy	8	27.60	-1749.4	-7.0
			Max. Vx	2	-28.53	7.8	1779.8
L21	67.17 - 62.17	Pole	Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-56.94	-3.4	4.0
			Max. Mx	8	-32.65	-1877.4	-7.5
			Max. My	2	-32.60	8.3	1912.1
			Max. Vy	8	28.20	-1877.4	-7.5
			Max. Vx	2	-29.13	8.3	1912.1
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-57.08	-3.4	4.0
L22	62.17 - 57.58	Pole	Max. Mx	8	-32.77	-1884.4	-7.5
			Max. My	2	-32.72	8.3	1919.3
			Max. Vy	8	28.22	-1884.4	-7.5
			Max. Vx	2	-29.15	8.3	1919.3
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-57.60	-3.4	4.0
			Max. Mx	8	-33.15	-1910.2	-7.6
			Max. My	2	-33.09	8.4	1945.9
			Max. Vy	8	28.36	-1910.2	-7.6
L23	57.58 - 57.33	Pole	Max. Vx	2	-29.29	8.4	1945.9
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-57.60	-3.4	4.0
			Max. Mx	8	-33.15	-1910.2	-7.6
L24	57.33 - 56.42	Pole	Max. My	2	-33.09	8.4	1945.9
			Max. Vy	8	28.36	-1910.2	-7.6
			Max. Vx	2	-29.29	8.4	1945.9
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0

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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
L25	56.42 - 56.17	Pole	Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-57.72	-3.4	4.0
			Max. Mx	8	-33.24	-1917.2	-7.6
			Max. My	2	-33.19	8.4	1953.3
			Max. Vy	8	28.39	-1917.2	-7.6
			Max. Vx	2	-29.32	8.4	1953.3
			Max. Torque	10			2.5
L26	56.17 - 51.17	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-60.08	-3.4	3.8
			Max. Mx	8	-34.99	-2060.9	-8.2
			Max. My	2	-34.94	9.0	2101.6
			Max. Vy	8	29.10	-2060.9	-8.2
			Max. Vx	2	-30.03	9.0	2101.6
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
L27	51.17 - 46.17	Pole	Max. Compression	26	-62.42	-3.3	3.7
			Max. Mx	8	-36.78	-2208.0	-8.7
			Max. My	2	-36.74	9.5	2253.3
			Max. Vy	8	29.77	-2208.0	-8.7
			Max. Vx	2	-30.70	9.5	2253.3
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-64.78	-3.2	3.6
L28	46.17 - 41.17	Pole	Max. Mx	8	-38.60	-2358.4	-9.3
			Max. My	2	-38.56	10.0	2408.4
			Max. Vy	8	30.42	-2358.4	-9.3
			Max. Vx	2	-31.35	10.0	2408.4
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-66.50	-3.2	3.5
			Max. Mx	8	-39.97	-2455.4	-9.6
L29	41.17 - 32.5	Pole	Max. My	2	-39.94	10.4	2508.3
			Max. Vy	8	30.82	-2455.4	-9.6
			Max. Vx	2	-31.75	10.4	2508.3
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-71.81	-2.9	3.3
			Max. Mx	8	-44.10	-2658.6	-10.3
			Max. My	2	-44.07	11.2	2717.6
L30	32.5 - 31.5	Pole	Max. Vy	8	31.74	-2658.6	-10.3
			Max. Vx	2	-32.67	11.2	2717.6
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-74.25	-2.8	3.2
			Max. Mx	8	-45.85	-2818.6	-10.8
			Max. My	2	-45.83	11.8	2882.3
			Max. Vy	8	32.32	-2818.6	-10.8
L31	31.5 - 26.5	Pole	Max. Vx	2	-33.24	11.8	2882.3
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-74.40	-2.8	3.2
			Max. Mx	8	-45.98	-2826.7	-10.8
			Max. My	2	-45.95	11.8	2890.6
			Max. Vy	8	32.34	-2826.7	-10.8
			Max. Vx	2	-33.26	11.8	2890.6
L32	26.5 - 26.25	Pole	Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-77.19	-2.7	3.0
			Max. Mx	8	-48.23	-2989.9	-11.4
			Max. My	2	-48.21	12.4	3058.4
			Max. Vy	8	32.34	-2826.7	-10.8
			Max. Vx	2	-33.26	11.8	2890.6
			Max. Torque	10			2.5
L33	26.25 - 21.25	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-77.19	-2.7	3.0
			Max. Mx	8	-48.23	-2989.9	-11.4
			Max. My	2	-48.21	12.4	3058.4

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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
L34	21.25 - 16.25	Pole	Max. Vy	8	32.95	-2989.9	-11.4
			Max. Vx	2	-33.87	12.4	3058.4
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-80.01	-2.7	2.9
			Max. Mx	8	-50.52	-3156.1	-11.9
			Max. My	2	-50.50	12.9	3229.2
			Max. Vy	8	33.56	-3156.1	-11.9
L35	16.25 - 11.25	Pole	Max. Vx	2	-34.48	12.9	3229.2
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-82.84	-2.6	2.8
			Max. Mx	8	-52.84	-3325.3	-12.5
			Max. My	2	-52.83	13.4	3403.0
			Max. Vy	8	34.17	-3325.3	-12.5
			Max. Vx	2	-35.08	13.4	3403.0
L36	11.25 - 6.25	Pole	Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-85.67	-2.6	2.7
			Max. Mx	8	-55.20	-3497.6	-13.0
			Max. My	2	-55.19	13.9	3579.8
			Max. Vy	8	34.78	-3497.6	-13.0
			Max. Vx	2	-35.69	13.9	3579.8
			Max. Torque	10			2.5
L37	6.25 - 1.25	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	26	-88.49	-2.5	2.5
			Max. Mx	8	-57.59	-3673.0	-13.5
			Max. My	2	-57.58	14.4	3759.7
			Max. Vy	8	35.39	-3673.0	-13.5
			Max. Vx	2	-36.30	14.4	3759.7
			Max. Torque	10			2.5
			Max Tension	1	0.00	0.0	0.0
L38	1.25 - 0	Pole	Max. Compression	26	-89.18	-2.5	2.5
			Max. Mx	8	-58.19	-3717.3	-13.7
			Max. My	2	-58.19	14.6	3805.1
			Max. Vy	20	-35.55	3714.9	17.8
			Max. Vx	2	-36.46	14.6	3805.1
			Max. Torque	10			2.5

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	89.18	0.00	-0.00
	Max. H <sub>x</sub>	20	58.20	35.53	0.10
	Max. H <sub>z</sub>	3	43.65	0.10	36.44
	Max. M <sub>x</sub>	2	3805.1	0.10	36.44
	Max. M <sub>z</sub>	8	3717.3	-35.53	-0.10
	Max. Torsion	10	2.5	-31.75	-18.46
	Min. Vert	3	43.65	0.10	36.44
	Min. H <sub>x</sub>	9	43.65	-35.53	-0.10
	Min. H <sub>z</sub>	15	43.65	-0.10	-35.69
	Min. M <sub>x</sub>	14	-3738.3	-0.10	-35.69
	Min. M <sub>z</sub>	20	-3714.9	35.53	0.10
	Min. Torsion	22	-2.5	30.82	17.93



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## Tower Mast Reaction Summary

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturing Moment, M <sub>x</sub>	Overturing Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	48.50	-0.00	0.00	-1.6	-0.9	-0.0
1.2 Dead+1.0 Wind 0 deg - No Ice	58.20	-0.10	-36.44	-3805.1	14.6	1.3
0.9 Dead+1.0 Wind 0 deg - No Ice	43.65	-0.10	-36.44	-3761.8	14.7	1.2
1.2 Dead+1.0 Wind 30 deg - No Ice	58.20	17.68	-30.85	-3233.6	-1845.6	0.0
0.9 Dead+1.0 Wind 30 deg - No Ice	43.65	17.68	-30.85	-3196.5	-1824.5	0.0
1.2 Dead+1.0 Wind 60 deg - No Ice	58.20	29.18	-16.87	-1833.0	-3167.0	-1.2
0.9 Dead+1.0 Wind 60 deg - No Ice	43.65	29.18	-16.87	-1811.5	-3130.5	-1.2
1.2 Dead+1.0 Wind 90 deg - No Ice	58.20	35.53	0.10	13.7	-3717.3	-2.1
0.9 Dead+1.0 Wind 90 deg - No Ice	43.65	35.53	0.10	14.0	-3675.0	-2.1
1.2 Dead+1.0 Wind 120 deg - No Ice	58.20	31.75	18.46	1923.4	-3299.3	-2.5
0.9 Dead+1.0 Wind 120 deg - No Ice	43.65	31.75	18.46	1902.3	-3262.0	-2.4
1.2 Dead+1.0 Wind 150 deg - No Ice	58.20	16.97	29.42	3200.5	-1847.0	-2.2
0.9 Dead+1.0 Wind 150 deg - No Ice	43.65	16.97	29.42	3164.4	-1825.6	-2.1
1.2 Dead+1.0 Wind 180 deg - No Ice	58.20	0.10	35.69	3738.3	-16.9	-1.3
0.9 Dead+1.0 Wind 180 deg - No Ice	43.65	0.10	35.69	3696.6	-16.4	-1.2
1.2 Dead+1.0 Wind 210 deg - No Ice	58.20	-17.68	30.85	3229.4	1843.2	-0.0
0.9 Dead+1.0 Wind 210 deg - No Ice	43.65	-17.68	30.85	3193.4	1822.7	-0.0
1.2 Dead+1.0 Wind 240 deg - No Ice	58.20	-31.64	18.29	1896.2	3281.3	1.2
0.9 Dead+1.0 Wind 240 deg - No Ice	43.65	-31.64	18.29	1875.5	3244.9	1.2
1.2 Dead+1.0 Wind 270 deg - No Ice	58.20	-35.53	-0.10	-17.8	3714.9	2.1
0.9 Dead+1.0 Wind 270 deg - No Ice	43.65	-35.53	-0.10	-17.0	3673.2	2.1
1.2 Dead+1.0 Wind 300 deg - No Ice	58.20	-30.82	-17.93	-1885.9	3224.9	2.5
0.9 Dead+1.0 Wind 300 deg - No Ice	43.65	-30.82	-17.93	-1864.0	3188.7	2.4
1.2 Dead+1.0 Wind 330 deg - No Ice	58.20	-16.97	-29.42	-3204.6	1844.7	2.2
0.9 Dead+1.0 Wind 330 deg - No Ice	43.65	-16.97	-29.42	-3167.5	1823.9	2.1
1.2 Dead+1.0 Ice+1.0 Temp	89.18	-0.00	0.00	-2.5	-2.5	-0.0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	89.18	-0.04	-7.00	-806.0	0.0	0.3
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	89.18	3.48	-6.06	-697.1	-400.0	-0.0
1.2 Dead+1.0 Wind 60 deg+1.0	89.18	6.04	-3.49	-402.1	-693.5	-0.3

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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90 deg+1.0	89.18	6.98	0.02	-0.0	-801.9	-0.5
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	89.18	6.05	3.52	401.3	-696.1	-0.6
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	89.18	3.50	6.07	694.4	-404.5	-0.5
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	89.18	0.02	7.00	800.7	-5.2	-0.3
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	89.18	-3.48	6.06	691.8	394.8	0.0
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	89.18	-6.04	3.49	396.8	688.3	0.3
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	89.18	-6.98	-0.02	-5.2	796.7	0.5
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	89.18	-6.05	-3.52	-406.6	690.9	0.6
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	89.18	-3.50	-6.07	-699.7	399.3	0.5
Dead+Wind 0 deg - Service	48.50	-0.02	-6.94	-722.0	2.0	0.2
Dead+Wind 30 deg - Service	48.50	3.37	-5.88	-613.8	-350.3	0.0
Dead+Wind 60 deg - Service	48.50	5.56	-3.21	-348.5	-600.5	-0.2
Dead+Wind 90 deg - Service	48.50	6.77	0.02	1.3	-704.8	-0.4
Dead+Wind 120 deg - Service	48.50	6.05	3.52	363.0	-625.7	-0.5
Dead+Wind 150 deg - Service	48.50	3.23	5.61	604.8	-350.6	-0.4
Dead+Wind 180 deg - Service	48.50	0.02	6.80	706.7	-4.0	-0.2
Dead+Wind 210 deg - Service	48.50	-3.37	5.88	610.3	348.3	-0.0
Dead+Wind 240 deg - Service	48.50	-6.03	3.49	357.8	620.7	0.2
Dead+Wind 270 deg - Service	48.50	-6.77	-0.02	-4.7	702.8	0.4
Dead+Wind 300 deg - Service	48.50	-5.87	-3.42	-358.5	610.0	0.5
Dead+Wind 330 deg - Service	48.50	-3.23	-5.61	-608.2	348.6	0.4

## 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	-48.50	0.00	0.00	48.50	-0.00	0.002%
2	-0.10	-58.20	-36.44	0.10	58.20	36.44	0.000%
3	-0.10	-43.65	-36.44	0.10	43.65	36.44	0.000%
4	17.68	-58.20	-30.85	-17.68	58.20	30.85	0.000%
5	17.68	-43.65	-30.85	-17.68	43.65	30.85	0.000%
6	29.18	-58.20	-16.87	-29.18	58.20	16.87	0.000%
7	29.18	-43.65	-16.87	-29.18	43.65	16.87	0.000%
8	35.53	-58.20	0.10	-35.53	58.20	-0.10	0.000%
9	35.53	-43.65	0.10	-35.53	43.65	-0.10	0.000%
10	31.75	-58.20	18.46	-31.75	58.20	-18.46	0.000%
11	31.75	-43.65	18.46	-31.75	43.65	-18.46	0.000%
12	16.97	-58.20	29.42	-16.97	58.20	-29.42	0.000%
13	16.97	-43.65	29.42	-16.97	43.65	-29.42	0.000%
14	0.10	-58.20	35.69	-0.10	58.20	-35.69	0.000%
15	0.10	-43.65	35.69	-0.10	43.65	-35.69	0.000%
16	-17.68	-58.20	30.85	17.68	58.20	-30.85	0.000%
17	-17.68	-43.65	30.85	17.68	43.65	-30.85	0.000%
18	-31.64	-58.20	18.29	31.64	58.20	-18.29	0.000%
19	-31.64	-43.65	18.29	31.64	43.65	-18.29	0.000%
20	-35.53	-58.20	-0.10	35.53	58.20	0.10	0.000%
21	-35.53	-43.65	-0.10	35.53	43.65	0.10	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
22	-30.82	-58.20	-17.93	30.82	58.20	17.93	0.000%
23	-30.82	-43.65	-17.93	30.82	43.65	17.93	0.000%
24	-16.97	-58.20	-29.42	16.97	58.20	29.42	0.000%
25	-16.97	-43.65	-29.42	16.97	43.65	29.42	0.000%
26	0.00	-89.18	0.00	0.00	89.18	-0.00	0.000%
27	-0.02	-89.18	-7.00	0.04	89.18	7.00	0.024%
28	3.48	-89.18	-6.06	-3.48	89.18	6.06	0.000%
29	6.04	-89.18	-3.49	-6.04	89.18	3.49	0.000%
30	6.98	-89.18	0.02	-6.98	89.18	-0.02	0.000%
31	6.05	-89.18	3.52	-6.05	89.18	-3.52	0.000%
32	3.50	-89.18	6.07	-3.50	89.18	-6.07	0.000%
33	0.02	-89.18	7.00	-0.02	89.18	-7.00	0.000%
34	-3.48	-89.18	6.06	3.48	89.18	-6.06	0.000%
35	-6.04	-89.18	3.49	6.04	89.18	-3.49	0.000%
36	-6.98	-89.18	-0.02	6.98	89.18	0.02	0.000%
37	-6.05	-89.18	-3.52	6.05	89.18	3.52	0.000%
38	-3.50	-89.18	-6.07	3.50	89.18	6.07	0.000%
39	-0.02	-48.50	-6.94	0.02	48.50	6.94	0.000%
40	3.37	-48.50	-5.88	-3.37	48.50	5.88	0.000%
41	5.56	-48.50	-3.21	-5.56	48.50	3.21	0.000%
42	6.77	-48.50	0.02	-6.77	48.50	-0.02	0.000%
43	6.05	-48.50	3.52	-6.05	48.50	-3.52	0.000%
44	3.23	-48.50	5.61	-3.23	48.50	-5.61	0.000%
45	0.02	-48.50	6.80	-0.02	48.50	-6.80	0.000%
46	-3.37	-48.50	5.88	3.37	48.50	-5.88	0.000%
47	-6.03	-48.50	3.49	6.03	48.50	-3.49	0.000%
48	-6.77	-48.50	-0.02	6.77	48.50	0.02	0.000%
49	-5.87	-48.50	-3.42	5.87	48.50	3.42	0.000%
50	-3.23	-48.50	-5.61	3.23	48.50	5.61	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.0000001	0.00001308
2	Yes	15	0.0000001	0.00008083
3	Yes	15	0.0000001	0.00005378
4	Yes	17	0.0000001	0.00009154
5	Yes	17	0.0000001	0.00005580
6	Yes	17	0.0000001	0.00009241
7	Yes	17	0.0000001	0.00005651
8	Yes	15	0.0000001	0.00013088
9	Yes	15	0.0000001	0.00009063
10	Yes	17	0.0000001	0.00009243
11	Yes	17	0.0000001	0.00005614
12	Yes	17	0.0000001	0.00009616
13	Yes	17	0.0000001	0.00005880
14	Yes	15	0.0000001	0.00012920
15	Yes	15	0.0000001	0.00008934
16	Yes	17	0.0000001	0.00009050
17	Yes	17	0.0000001	0.00005528
18	Yes	17	0.0000001	0.00009143
19	Yes	17	0.0000001	0.00005565
20	Yes	16	0.0000001	0.00003845
21	Yes	15	0.0000001	0.00012669
22	Yes	17	0.0000001	0.00009672

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23	Yes	17	0.00000001	0.00005901
24	Yes	17	0.00000001	0.00009018
25	Yes	17	0.00000001	0.00005506
26	Yes	13	0.00000001	0.00010371
27	Yes	17	0.00000001	0.00008710
28	Yes	16	0.00000001	0.00014703
29	Yes	16	0.00000001	0.00014674
30	Yes	16	0.00000001	0.00013302
31	Yes	16	0.00000001	0.00014488
32	Yes	16	0.00000001	0.00014514
33	Yes	16	0.00000001	0.00013058
34	Yes	16	0.00000001	0.00014136
35	Yes	16	0.00000001	0.00014093
36	Yes	16	0.00000001	0.00013017
37	Yes	16	0.00000001	0.00014542
38	Yes	16	0.00000001	0.00014589
39	Yes	13	0.00000001	0.00011698
40	Yes	14	0.00000001	0.00010421
41	Yes	14	0.00000001	0.00010842
42	Yes	13	0.00000001	0.00013192
43	Yes	14	0.00000001	0.00009973
44	Yes	14	0.00000001	0.00011607
45	Yes	13	0.00000001	0.00011716
46	Yes	14	0.00000001	0.00009989
47	Yes	14	0.00000001	0.00009891
48	Yes	13	0.00000001	0.00013449
49	Yes	14	0.00000001	0.00011902
50	Yes	14	0.00000001	0.00009687

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	18.199	39	1.1378	0.0066
L2	145 - 140	17.010	39	1.1322	0.0058
L3	140 - 135	15.830	39	1.1206	0.0051
L4	135 - 130	14.666	39	1.1007	0.0045
L5	130 - 125	13.527	39	1.0725	0.0039
L6	125 - 120	12.423	39	1.0352	0.0034
L7	120 - 115	11.362	39	0.9903	0.0029
L8	115 - 108	10.351	39	0.9393	0.0025
L9	111.75 - 106.75	9.724	39	0.9035	0.0022
L10	106.75 - 101.75	8.793	39	0.8706	0.0020
L11	101.75 - 96.75	7.909	39	0.8174	0.0017
L12	96.75 - 91.75	7.082	39	0.7614	0.0015
L13	91.75 - 89.5	6.315	39	0.7033	0.0013
L14	89.5 - 89.25	5.990	39	0.6767	0.0012
L15	89.25 - 84.25	5.954	39	0.6748	0.0011
L16	84.25 - 79.25	5.268	39	0.6359	0.0010
L17	79.25 - 69.75	4.623	39	0.5956	0.0009
L18	74.5 - 68.75	4.050	39	0.5564	0.0008
L19	68.75 - 67.42	3.397	39	0.5224	0.0007
L20	67.42 - 67.17	3.254	39	0.5076	0.0007
L21	67.17 - 62.17	3.227	39	0.5048	0.0007
L22	62.17 - 57.58	2.728	39	0.4484	0.0006
L23	57.58 - 57.33	2.322	43	0.3965	0.0005
L24	57.33 - 56.42	2.301	43	0.3950	0.0005
L25	56.42 - 56.17	2.227	43	0.3894	0.0005
L26	56.17 - 51.17	2.206	43	0.3876	0.0005

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L27	51.17 - 46.17	1.820	43	0.3502	0.0004
L28	46.17 - 41.17	1.473	43	0.3130	0.0003
L29	41.17 - 32.5	1.165	43	0.2752	0.0003
L30	38 - 31.5	0.990	43	0.2514	0.0003
L31	31.5 - 26.5	0.668	43	0.2179	0.0002
L32	26.5 - 26.25	0.465	43	0.1682	0.0002
L33	26.25 - 21.25	0.457	43	0.1666	0.0002
L34	21.25 - 16.25	0.299	43	0.1348	0.0001
L35	16.25 - 11.25	0.174	43	0.1028	0.0001
L36	11.25 - 6.25	0.083	43	0.0711	0.0001
L37	6.25 - 1.25	0.026	43	0.0393	0.0000
L38	1.25 - 0	0.001	43	0.0078	0.0000

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.50	Site Pro 1 HRK14-HD Handrail Kit	39	18.199	1.1378	0.0067	32732
150.00	Top Hat 18" Diameter x 2' 6" Tall	39	18.199	1.1378	0.0067	32732
141.00	(2) APL868013-42T0 w/ Mount Pipe	39	16.065	1.1236	0.0053	20132
132.00	(2) 7770.00 w/ Mount Pipe	39	13.979	1.0848	0.0042	9793
111.00	RR65-18-02DP w/ Mount Pipe	39	9.582	0.8974	0.0022	7159
104.00	KS24019-L112A	39	8.300	0.8437	0.0019	5596
88.00	SC479-HF1LDF	39	5.779	0.6654	0.0011	6562
82.00	BA80-41-DIN	39	4.972	0.6183	0.0009	6966

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	95.662	2	5.9517	0.0341
L2	145 - 140	89.448	2	5.9306	0.0299
L3	140 - 135	83.274	2	5.8772	0.0263
L4	135 - 130	77.178	2	5.7779	0.0231
L5	130 - 125	71.208	2	5.6346	0.0202
L6	125 - 120	65.413	2	5.4427	0.0174
L7	120 - 115	59.840	2	5.2099	0.0150
L8	115 - 108	54.528	2	4.9443	0.0128
L9	111.75 - 106.75	51.230	10	4.7574	0.0115
L10	106.75 - 101.75	46.341	10	4.5857	0.0104
L11	101.75 - 96.75	41.696	10	4.3065	0.0090
L12	96.75 - 91.75	37.350	10	4.0126	0.0077
L13	91.75 - 89.5	33.314	10	3.7073	0.0065
L14	89.5 - 89.25	31.602	10	3.5670	0.0060
L15	89.25 - 84.25	31.416	10	3.5570	0.0060
L16	84.25 - 79.25	27.802	10	3.3523	0.0051
L17	79.25 - 69.75	24.405	10	3.1413	0.0045
L18	74.5 - 68.75	21.385	10	2.9350	0.0040
L19	68.75 - 67.42	17.942	10	2.7565	0.0036

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L20	67.42 - 67.17	17.186	10	2.6787	0.0035
L21	67.17 - 62.17	17.046	10	2.6639	0.0034
L22	62.17 - 57.58	14.413	10	2.3673	0.0029
L23	57.58 - 57.33	12.269	10	2.0944	0.0024
L24	57.33 - 56.42	12.160	10	2.0862	0.0024
L25	56.42 - 56.17	11.765	10	2.0567	0.0024
L26	56.17 - 51.17	11.658	10	2.0471	0.0024
L27	51.17 - 46.17	9.618	10	1.8503	0.0021
L28	46.17 - 41.17	7.784	10	1.6541	0.0018
L29	41.17 - 32.5	6.156	10	1.4545	0.0015
L30	38 - 31.5	5.233	10	1.3286	0.0014
L31	31.5 - 26.5	3.527	10	1.1514	0.0011
L32	26.5 - 26.25	2.459	10	0.8889	0.0008
L33	26.25 - 21.25	2.412	10	0.8805	0.0008
L34	21.25 - 16.25	1.579	10	0.7124	0.0007
L35	16.25 - 11.25	0.921	10	0.5431	0.0005
L36	11.25 - 6.25	0.440	10	0.3757	0.0003
L37	6.25 - 1.25	0.135	10	0.2073	0.0002
L38	1.25 - 0	0.005	10	0.0410	0.0000

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.50	Site Pro 1 HRK14-HD Handrail Kit	2	95.662	5.9517	0.0356	7871
150.00	Top Hat 18" Diameter x 2' 6" Tall	2	95.662	5.9517	0.0356	7871
141.00	(2) APL868013-42T0 w/ Mount Pipe	2	84.504	5.8914	0.0284	4357
132.00	(2) 7770.00 w/ Mount Pipe	2	73.578	5.6975	0.0224	1961
111.00	RR65-18-02DP w/ Mount Pipe	10	50.484	4.7257	0.0117	1388
104.00	KS24019-L112A	10	43.752	4.4445	0.0101	1079
88.00	SC479-HF1LDF	10	30.493	3.5075	0.0059	1257
82.00	BA80-41-DIN	10	26.245	3.2602	0.0049	1331

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 145 (1)	TP23.0001x22x0.25	5.00	0.00	0.0	18.3138	-4.50	1221.47	0.004
L2	145 - 140 (2)	TP24.0002x23.0001x0.25	5.00	0.00	0.0	19.1189	-8.06	1257.32	0.006
L3	140 - 135 (3)	TP25.0004x24.0002x0.25	5.00	0.00	0.0	19.9240	-8.53	1291.67	0.007
L4	135 - 130 (4)	TP26.0005x25.0004x0.25	5.00	0.00	0.0	20.7291	-12.78	1324.52	0.010
L5	130 - 125 (5)	TP27.0006x26.0005x0.25	5.00	0.00	0.0	21.5342	-13.37	1355.86	0.010
L6	125 - 120 (6)	TP28.0007x27.0006x0.25	5.00	0.00	0.0	22.3393	-14.01	1385.70	0.010
L7	120 - 115 (7)	TP29.0008x28.0007x0.25	5.00	0.00	0.0	23.1444	-14.67	1414.04	0.010
L8	115 - 108 (8)	TP30.401x29.0008x0.25	7.00	0.00	0.0	23.6677	-15.13	1431.66	0.011

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> φP <sub>n</sub>
L9	108 - 106.75 (9)	TP30.1512x29.1509x0.3125	5.00	0.00	0.0	30.0252	-18.84	1971.16	0.010
L10	106.75 - 101.75 (10)	TP31.1514x30.1512x0.3125	5.00	0.00	0.0	31.0317	-19.83	2014.07	0.010
L11	101.75 - 96.75 (11)	TP32.1517x31.1514x0.3125	5.00	0.00	0.0	32.0382	-20.77	2055.47	0.010
L12	96.75 - 91.75 (12)	TP33.1519x32.1517x0.3125	5.00	0.00	0.0	33.0447	-21.74	2095.37	0.010
L13	91.75 - 89.5 (13)	TP33.602x33.1519x0.3125	2.25	0.00	0.0	33.4976	-22.18	2112.83	0.010
L14	89.5 - 89.25 (14)	TP33.652x33.602x0.5	0.25	0.00	0.0	53.3748	-22.26	3631.62	0.006
L15	89.25 - 84.25 (15)	TP34.6523x33.652x0.4938	5.00	0.00	0.0	54.3078	-23.73	3695.10	0.006
L16	84.25 - 79.25 (16)	TP35.6525x34.6523x0.4875	5.00	0.00	0.0	55.2003	-25.17	3755.83	0.007
L17	79.25 - 69.75 (17)	TP37.553x35.6525x0.4813	9.50	0.00	0.0	55.9748	-26.48	3808.53	0.007
L18	69.75 - 68.75 (18)	TP37.1279x35.9778x0.375	5.75	0.00	0.0	44.3792	-28.92	3084.94	0.009
L19	68.75 - 67.42 (19)	TP37.394x37.1279x0.375	1.33	0.00	0.0	44.7004	-29.35	3098.92	0.009
L20	67.42 - 67.17 (20)	TP37.444x37.394x0.375	0.25	0.00	0.0	44.7608	-29.45	3101.54	0.009
L21	67.17 - 62.17 (21)	TP38.4441x37.444x0.375	5.00	0.00	0.0	45.9685	-31.07	3152.97	0.010
L22	62.17 - 57.58 (22)	TP39.3623x38.4441x0.375	4.59	0.00	0.0	47.0771	-32.60	3198.69	0.010
L23	57.58 - 57.33 (23)	TP39.4123x39.3623x0.7	0.25	0.00	0.0	87.2575	-32.72	6431.75	0.005
L24	57.33 - 56.42 (24)	TP39.5943x39.4123x0.7	0.91	0.00	0.0	87.6677	-33.09	6461.99	0.005
L25	56.42 - 56.17 (25)	TP39.6443x39.5943x0.5875	0.25	0.00	0.0	73.8857	-33.19	5446.12	0.006
L26	56.17 - 51.17 (26)	TP40.6445x39.6443x0.575	5.00	0.00	0.0	74.1886	-34.94	5468.44	0.006
L27	51.17 - 46.17 (27)	TP41.6446x40.6445x0.575	5.00	0.00	0.0	76.0404	-36.73	5604.94	0.007
L28	46.17 - 41.17 (28)	TP42.6447x41.6446x0.5625	5.00	0.00	0.0	76.2215	-38.55	5618.28	0.007
L29	41.17 - 32.5 (29)	TP44.379x42.6447x0.5625	8.67	0.00	0.0	77.3700	-39.93	5702.94	0.007
L30	32.5 - 31.5 (30)	TP43.829x42.5288x0.4375	6.50	0.00	0.0	61.1278	-44.06	4230.33	0.010
L31	31.5 - 26.5 (31)	TP44.8292x43.829x0.4375	5.00	0.00	0.0	62.5368	-45.82	4290.23	0.011
L32	26.5 - 26.25 (32)	TP44.8792x44.8292x0.6875	0.25	0.00	0.0	97.8294	-45.95	7211.00	0.006
L33	26.25 - 21.25 (33)	TP45.8794x44.8792x0.6875	5.00	0.00	0.0	100.0430	-48.20	7374.20	0.007
L34	21.25 - 16.25 (34)	TP46.8795x45.8794x0.675	5.00	0.00	0.0	100.4250	-50.50	7402.36	0.007
L35	16.25 - 11.25 (35)	TP47.8797x46.8795x0.675	5.00	0.00	0.0	102.5990	-52.83	7562.60	0.007
L36	11.25 - 6.25 (36)	TP48.8798x47.8797x0.6625	5.00	0.00	0.0	102.8600	-55.19	7581.78	0.007
L37	6.25 - 1.25 (37)	TP49.88x48.8798x0.6625	5.00	0.00	0.0	104.9930	-57.58	7739.05	0.007
L38	1.25 - 0 (38)	TP50.13x49.88x0.6625	1.25	0.00	0.0	105.5270	-58.19	7778.36	0.007

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### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$	$\phi M_{ux}$	Ratio	$M_{uy}$	$\phi M_{uy}$	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{ux}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{uy}}$
L1	150 - 145 (1)	TP23.0001x22x0.25	31.9	564.4	0.057	0.0	564.4	0.000
L2	145 - 140 (2)	TP24.0002x23.0001x0.25	72.7	606.8	0.120	0.0	606.8	0.000
L3	140 - 135 (3)	TP25.0004x24.0002x0.25	133.4	649.9	0.205	0.0	649.9	0.000
L4	135 - 130 (4)	TP26.0005x25.0004x0.25	207.4	693.6	0.299	0.0	693.6	0.000
L5	130 - 125 (5)	TP27.0006x26.0005x0.25	295.7	737.9	0.401	0.0	737.9	0.000
L6	125 - 120 (6)	TP28.0007x27.0006x0.25	386.5	782.6	0.494	0.0	782.6	0.000
L7	120 - 115 (7)	TP29.0008x28.0007x0.25	480.1	827.6	0.580	0.0	827.6	0.000
L8	115 - 108 (8)	TP30.401x29.0008x0.25	542.2	857.0	0.633	0.0	857.0	0.000
L9	108 - 106.75 (9)	TP30.1512x29.1509x0.3125	649.4	1195.2	0.543	0.0	1195.2	0.000
L10	106.75 - 101.75 (10)	TP31.1514x30.1512x0.3125	761.1	1262.6	0.603	0.0	1262.6	0.000
L11	101.75 - 96.75 (11)	TP32.1517x31.1514x0.3125	875.5	1330.8	0.658	0.0	1330.8	0.000
L12	96.75 - 91.75 (12)	TP33.1519x32.1517x0.3125	992.4	1399.6	0.709	0.0	1399.6	0.000
L13	91.75 - 89.5 (13)	TP33.602x33.1519x0.3125	1045.8	1430.8	0.731	0.0	1430.8	0.000
L14	89.5 - 89.25 (14)	TP33.652x33.602x0.5	1051.8	2435.5	0.432	0.0	2435.5	0.000
L15	89.25 - 84.25 (15)	TP34.6523x33.652x0.4938	1177.4	2554.9	0.461	0.0	2554.9	0.000
L16	84.25 - 79.25 (16)	TP35.6525x34.6523x0.4875	1309.4	2674.9	0.490	0.0	2674.9	0.000
L17	79.25 - 69.75 (17)	TP37.553x35.6525x0.4813	1436.2	2787.7	0.515	0.0	2787.7	0.000
L18	69.75 - 68.75 (18)	TP37.1279x35.9778x0.375	1594.1	2304.7	0.692	0.0	2304.7	0.000
L19	68.75 - 67.42 (19)	TP37.394x37.1279x0.375	1631.3	2332.0	0.700	0.0	2332.0	0.000
L20	67.42 - 67.17 (20)	TP37.444x37.394x0.375	1638.3	2337.2	0.701	0.0	2337.2	0.000
L21	67.17 - 62.17 (21)	TP38.4441x37.444x0.375	1779.8	2440.7	0.729	0.0	2440.7	0.000
L22	62.17 - 57.58 (22)	TP39.3623x38.4441x0.375	1912.1	2536.4	0.754	0.0	2536.4	0.000
L23	57.58 - 57.33 (23)	TP39.4123x39.3623x0.7	1919.4	5021.9	0.382	0.0	5021.9	0.000
L24	57.33 - 56.42 (24)	TP39.5943x39.4123x0.7	1945.9	5069.7	0.384	0.0	5069.7	0.000
L25	56.42 - 56.17 (25)	TP39.6443x39.5943x0.5875	1953.3	4303.0	0.454	0.0	4303.0	0.000
L26	56.17 - 51.17 (26)	TP40.6445x39.6443x0.575	2101.6	4435.7	0.474	0.0	4435.7	0.000
L27	51.17 - 46.17 (27)	TP41.6446x40.6445x0.575	2253.9	4661.5	0.484	0.0	4661.5	0.000
L28	46.17 - 41.17 (28)	TP42.6447x41.6446x0.5625	2410.4	4790.8	0.503	0.0	4790.8	0.000
L29	41.17 - 32.5 (29)	TP44.379x42.6447x0.5625	2511.3	4937.3	0.509	0.0	4937.3	0.000
L30	32.5 - 31.5 (30)	TP43.829x42.5288x0.4375	2722.3	3731.6	0.730	0.0	3731.6	0.000
L31	31.5 - 26.5 (31)	TP44.8292x43.829x0.4375	2888.4	3872.6	0.746	0.0	3872.6	0.000
L32	26.5 - 26.25 (32)	TP44.8792x44.8292x0.6875	2896.8	6443.3	0.450	0.0	6443.3	0.000
L33	26.25 - 21.25 (33)	TP45.8794x44.8792x0.6875	3066.1	6740.5	0.455	0.0	6740.5	0.000



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Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{rx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	$M_{uy}$ kip-ft	$\phi M_{ry}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L34	21.25 - 16.25 (34)	TP46.8795x45.8794x0.675	3238.3	6922.0	0.468	0.0	6922.0	0.000
L35	16.25 - 11.25 (35)	TP47.8797x46.8795x0.675	3413.6	7227.1	0.472	0.0	7227.1	0.000
L36	11.25 - 6.25 (36)	TP48.8798x47.8797x0.6625	3591.9	7405.0	0.485	0.0	7405.0	0.000
L37	6.25 - 1.25 (37)	TP49.88x48.8798x0.6625	3773.2	7717.5	0.489	0.0	7717.5	0.000
L38	1.25 - 0 (38)	TP50.13x49.88x0.6625	3819.0	7796.6	0.490	0.0	7796.6	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 145 (1)	TP23.0001x22x0.25	6.07	296.68	0.020	1.4	580.7	0.002
L2	145 - 140 (2)	TP24.0002x23.0001x0.25	11.89	309.73	0.038	1.7	633.5	0.003
L3	140 - 135 (3)	TP25.0004x24.0002x0.25	12.39	322.77	0.038	1.7	688.6	0.003
L4	135 - 130 (4)	TP26.0005x25.0004x0.25	17.43	335.81	0.052	1.7	745.9	0.002
L5	130 - 125 (5)	TP27.0006x26.0005x0.25	17.93	348.86	0.051	1.7	805.6	0.002
L6	125 - 120 (6)	TP28.0007x27.0006x0.25	18.46	361.90	0.051	2.7	867.6	0.003
L7	120 - 115 (7)	TP29.0008x28.0007x0.25	18.96	374.94	0.051	2.7	931.8	0.003
L8	115 - 108 (8)	TP30.401x29.0008x0.25	19.29	383.42	0.050	2.7	974.8	0.003
L9	108 - 106.75 (9)	TP30.1512x29.1509x0.3125	22.06	486.41	0.045	2.7	1250.1	0.002
L10	106.75 - 101.75 (10)	TP31.1514x30.1512x0.3125	22.65	502.71	0.045	2.7	1336.2	0.002
L11	101.75 - 96.75 (11)	TP32.1517x31.1514x0.3125	23.14	519.02	0.045	2.7	1425.2	0.002
L12	96.75 - 91.75 (12)	TP33.1519x32.1517x0.3125	23.64	535.32	0.044	2.7	1517.1	0.002
L13	91.75 - 89.5 (13)	TP33.602x33.1519x0.3125	23.86	542.66	0.044	2.7	1559.3	0.002
L14	89.5 - 89.25 (14)	TP33.652x33.602x0.5	23.88	864.67	0.028	2.7	2446.0	0.001
L15	89.25 - 84.25 (15)	TP34.6523x33.652x0.4938	24.98	879.79	0.028	3.9	2567.6	0.002
L16	84.25 - 79.25 (16)	TP35.6525x34.6523x0.4875	26.37	894.25	0.029	1.3	2689.9	0.000
L17	79.25 - 69.75 (17)	TP37.553x35.6525x0.4813	27.04	906.79	0.030	1.3	2804.9	0.000
L18	69.75 - 68.75 (18)	TP37.1279x35.9778x0.375	27.89	778.85	0.036	1.3	2466.8	0.001
L19	68.75 - 67.42 (19)	TP37.394x37.1279x0.375	28.03	784.49	0.036	1.3	2503.1	0.001
L20	67.42 - 67.17 (20)	TP37.444x37.394x0.375	28.04	785.55	0.036	1.3	2509.9	0.001
L21	67.17 - 62.17 (21)	TP38.4441x37.444x0.375	28.53	806.75	0.035	1.3	2648.6	0.000
L22	62.17 - 57.58 (22)	TP39.3623x38.4441x0.375	29.13	826.20	0.035	1.3	2779.2	0.000
L23	57.58 - 57.33 (23)	TP39.4123x39.3623x0.7	29.15	1531.37	0.019	1.3	5027.8	0.000
L24	57.33 - 56.42 (24)	TP39.5943x39.4123x0.7	29.29	1538.57	0.019	1.3	5076.1	0.000
L25	56.42 - 56.17 (25)	TP39.6443x39.5943x0.5875	29.32	1296.69	0.023	1.3	4321.9	0.000

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Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L26	56.17 - 51.17 (26)	TP40.6445x39.6443x0.575	30.03	1302.01	0.023	1.3	4458.3	0.000
L27	51.17 - 46.17 (27)	TP41.6446x40.6445x0.575	30.99	1334.51	0.023	2.5	4687.0	0.001
L28	46.17 - 41.17 (28)	TP42.6447x41.6446x0.5625	31.64	1337.69	0.024	2.5	4820.2	0.001
L29	41.17 - 32.5 (29)	TP44.379x42.6447x0.5625	32.04	1357.84	0.024	2.5	4968.6	0.001
L30	32.5 - 31.5 (30)	TP43.829x42.5288x0.4375	32.95	1072.79	0.031	2.5	4012.5	0.001
L31	31.5 - 26.5 (31)	TP44.8292x43.829x0.4375	33.53	1097.52	0.031	2.5	4201.6	0.001
L32	26.5 - 26.25 (32)	TP44.8792x44.8292x0.6875	33.55	1716.91	0.020	2.5	6468.0	0.000
L33	26.25 - 21.25 (33)	TP45.8794x44.8792x0.6875	34.16	1755.76	0.019	2.5	6768.8	0.000
L34	21.25 - 16.25 (34)	TP46.8795x45.8794x0.675	34.76	1762.47	0.020	2.5	6955.4	0.000
L35	16.25 - 11.25 (35)	TP47.8797x46.8795x0.675	35.37	1800.62	0.020	2.5	7264.3	0.000
L36	11.25 - 6.25 (36)	TP48.8798x47.8797x0.6625	35.98	1805.19	0.020	2.5	7447.4	0.000
L37	6.25 - 1.25 (37)	TP49.88x48.8798x0.6625	36.59	1842.63	0.020	2.5	7764.0	0.000
L38	1.25 - 0 (38)	TP50.13x49.88x0.6625	36.75	1851.99	0.020	2.5	7844.2	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 145 (1)	0.004	0.057	0.000	0.020	0.002	0.061	1.050	4.8.2
L2	145 - 140 (2)	0.006	0.120	0.000	0.038	0.003	0.128	1.050	4.8.2
L3	140 - 135 (3)	0.007	0.205	0.000	0.038	0.003	0.213	1.050	4.8.2
L4	135 - 130 (4)	0.010	0.299	0.000	0.052	0.002	0.312	1.050	4.8.2
L5	130 - 125 (5)	0.010	0.401	0.000	0.051	0.002	0.414	1.050	4.8.2
L6	125 - 120 (6)	0.010	0.494	0.000	0.051	0.003	0.507	1.050	4.8.2
L7	120 - 115 (7)	0.010	0.580	0.000	0.051	0.003	0.593	1.050	4.8.2
L8	115 - 108 (8)	0.011	0.633	0.000	0.050	0.003	0.646	1.050	4.8.2
L9	108 - 106.75 (9)	0.010	0.543	0.000	0.045	0.002	0.555	1.050	4.8.2
L10	106.75 - 101.75 (10)	0.010	0.603	0.000	0.045	0.002	0.615	1.050	4.8.2
L11	101.75 - 96.75 (11)	0.010	0.658	0.000	0.045	0.002	0.670	1.050	4.8.2
L12	96.75 - 91.75 (12)	0.010	0.709	0.000	0.044	0.002	0.722	1.050	4.8.2
L13	91.75 - 89.5 (13)	0.010	0.731	0.000	0.044	0.002	0.743	1.050	4.8.2
L14	89.5 - 89.25 (14)	0.006	0.432	0.000	0.028	0.001	0.439	1.050	4.8.2
L15	89.25 - 84.25 (15)	0.006	0.461	0.000	0.028	0.002	0.468	1.050	4.8.2
L16	84.25 - 79.25 (16)	0.007	0.490	0.000	0.029	0.000	0.497	1.050	4.8.2
L17	79.25 - 69.75 (17)	0.007	0.515	0.000	0.030	0.000	0.523	1.050	4.8.2
L18	69.75 - 68.75	0.009	0.692	0.000	0.036	0.001	0.702	1.050	4.8.2

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u$	$M_{ux}$	$M_{uy}$	$V_u$	$T_u$			
L19	(18) 68.75 - 67.42	0.009	0.700	0.000	0.036	0.001	0.710	1.050	4.8.2
L20	(19) 67.42 - 67.17	0.009	0.701	0.000	0.036	0.001	0.712	1.050	4.8.2
L21	(20) 67.17 - 62.17	0.010	0.729	0.000	0.035	0.000	0.740	1.050	4.8.2
L22	(21) 62.17 - 57.58	0.010	0.754	0.000	0.035	0.000	0.765	1.050	4.8.2
L23	(22) 57.58 - 57.33	0.005	0.382	0.000	0.019	0.000	0.388	1.050	4.8.2
L24	(23) 57.33 - 56.42	0.005	0.384	0.000	0.019	0.000	0.389	1.050	4.8.2
L25	(24) 56.42 - 56.17	0.006	0.454	0.000	0.023	0.000	0.461	1.050	4.8.2
L26	(25) 56.17 - 51.17	0.006	0.474	0.000	0.023	0.000	0.481	1.050	4.8.2
L27	(26) 51.17 - 46.17	0.007	0.484	0.000	0.023	0.001	0.491	1.050	4.8.2
L28	(27) 46.17 - 41.17	0.007	0.503	0.000	0.024	0.001	0.511	1.050	4.8.2
L29	(28) 41.17 - 32.5	0.007	0.509	0.000	0.024	0.001	0.516	1.050	4.8.2
L30	(29) 32.5 - 31.5 (30)	0.010	0.730	0.000	0.031	0.001	0.741	1.050	4.8.2
L31	31.5 - 26.5 (31)	0.011	0.746	0.000	0.031	0.001	0.758	1.050	4.8.2
L32	26.5 - 26.25 (32)	0.006	0.450	0.000	0.020	0.000	0.456	1.050	4.8.2
L33	26.25 - 21.25 (33)	0.007	0.455	0.000	0.019	0.000	0.462	1.050	4.8.2
L34	21.25 - 16.25 (34)	0.007	0.468	0.000	0.020	0.000	0.475	1.050	4.8.2
L35	16.25 - 11.25 (35)	0.007	0.472	0.000	0.020	0.000	0.480	1.050	4.8.2
L36	11.25 - 6.25 (36)	0.007	0.485	0.000	0.020	0.000	0.493	1.050	4.8.2
L37	6.25 - 1.25 (37)	0.007	0.489	0.000	0.020	0.000	0.497	1.050	4.8.2
L38	1.25 - 0 (38)	0.007	0.490	0.000	0.020	0.000	0.498	1.050	4.8.2

### Section Capacity Table

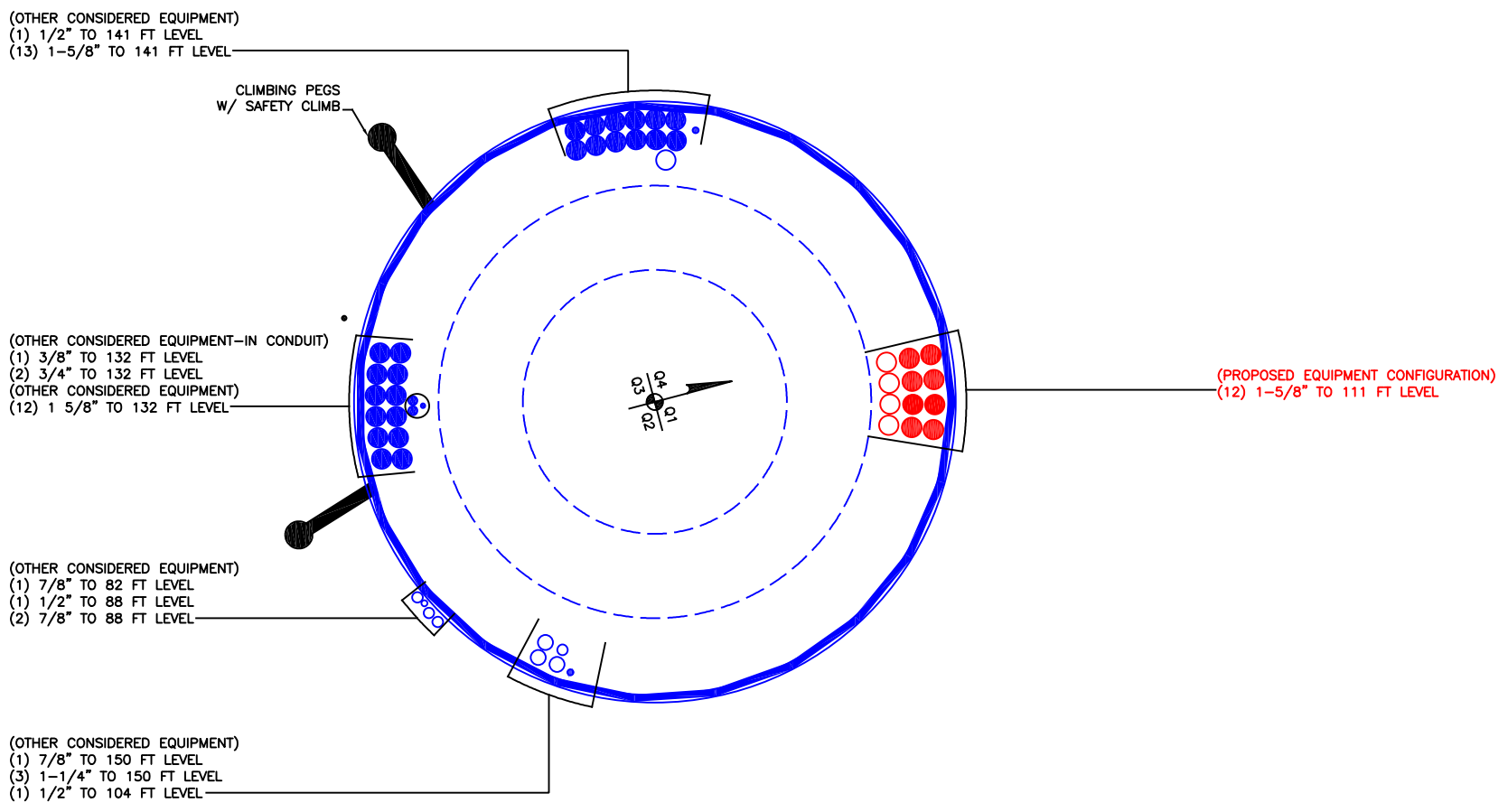
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 145	Pole	TP23.0001x22x0.25	1	-4.50	1282.54	5.8	Pass
L2	145 - 140	Pole	TP24.0002x23.0001x0.25	2	-8.06	1320.19	12.2	Pass
L3	140 - 135	Pole	TP25.0004x24.0002x0.25	3	-8.53	1356.25	20.3	Pass
L4	135 - 130	Pole	TP26.0005x25.0004x0.25	4	-12.78	1390.75	29.7	Pass
L5	130 - 125	Pole	TP27.0006x26.0005x0.25	5	-13.37	1423.65	39.4	Pass
L6	125 - 120	Pole	TP28.0007x27.0006x0.25	6	-14.01	1454.98	48.3	Pass
L7	120 - 115	Pole	TP29.0008x28.0007x0.25	7	-14.67	1484.74	56.5	Pass
L8	115 - 108	Pole	TP30.401x29.0008x0.25	8	-15.13	1503.24	61.5	Pass
L9	108 - 106.75	Pole	TP30.1512x29.1509x0.3125	9	-18.84	2069.72	52.9	Pass
L10	106.75 - 101.75	Pole	TP31.1514x30.1512x0.3125	10	-19.83	2114.77	58.6	Pass
L11	101.75 - 96.75	Pole	TP32.1517x31.1514x0.3125	11	-20.77	2158.24	63.8	Pass

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>FDH Infrastructure Services</b> 6521 Meridien Drive Raleigh, NC 27616 Phone: 919.755.1012 FAX: 919.755.1031</p>	<b>Job</b>	876341 Middletown 2-Marino Property	<b>Page</b>	47 of 47
	<b>Project</b>	18TAJG1400 (R2)	<b>Date</b>	14:38:10 12/11/18
	<b>Client</b>	Crown Castle	<b>Designed by</b>	Aditya Chingale

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L12	96.75 - 91.75	Pole	TP33.1519x32.1517x0.3125	12	-21.74	2200.14	68.7	Pass
L13	91.75 - 89.5	Pole	TP33.602x33.1519x0.3125	13	-22.18	2218.47	70.8	Pass
L14	89.5 - 89.25	Pole	TP33.652x33.602x0.5	14	-22.26	3813.20	41.8	Pass
L15	89.25 - 84.25	Pole	TP34.6523x33.652x0.4938	15	-23.73	3879.85	44.6	Pass
L16	84.25 - 79.25	Pole	TP35.6525x34.6523x0.4875	16	-25.17	3943.62	47.3	Pass
L17	79.25 - 69.75	Pole	TP37.553x35.6525x0.4813	17	-26.48	3998.96	49.8	Pass
L18	69.75 - 68.75	Pole	TP37.1279x35.9778x0.375	18	-28.92	3239.19	66.9	Pass
L19	68.75 - 67.42	Pole	TP37.394x37.1279x0.375	19	-29.35	3253.87	67.6	Pass
L20	67.42 - 67.17	Pole	TP37.444x37.394x0.375	20	-29.45	3256.62	67.8	Pass
L21	67.17 - 62.17	Pole	TP38.4441x37.444x0.375	21	-31.07	3310.62	70.5	Pass
L22	62.17 - 57.58	Pole	TP39.3623x38.4441x0.375	22	-32.60	3358.62	72.9	Pass
L23	57.58 - 57.33	Pole	TP39.4123x39.3623x0.7	23	-32.72	6753.34	36.9	Pass
L24	57.33 - 56.42	Pole	TP39.5943x39.4123x0.7	24	-33.09	6785.09	37.1	Pass
L25	56.42 - 56.17	Pole	TP39.6443x39.5943x0.5875	25	-33.19	5718.43	43.9	Pass
L26	56.17 - 51.17	Pole	TP40.6445x39.6443x0.575	26	-34.94	5741.86	45.8	Pass
L27	51.17 - 46.17	Pole	TP41.6446x40.6445x0.575	27	-36.73	5885.19	46.7	Pass
L28	46.17 - 41.17	Pole	TP42.6447x41.6446x0.5625	28	-38.55	5899.19	48.6	Pass
L29	41.17 - 32.5	Pole	TP44.379x42.6447x0.5625	29	-39.93	5988.09	49.2	Pass
L30	32.5 - 31.5	Pole	TP43.829x42.5288x0.4375	30	-44.06	4441.85	70.6	Pass
L31	31.5 - 26.5	Pole	TP44.8292x43.829x0.4375	31	-45.82	4504.74	72.1	Pass
L32	26.5 - 26.25	Pole	TP44.8792x44.8292x0.6875	32	-45.95	7571.55	43.5	Pass
L33	26.25 - 21.25	Pole	TP45.8794x44.8792x0.6875	33	-48.20	7742.91	44.0	Pass
L34	21.25 - 16.25	Pole	TP46.8795x45.8794x0.675	34	-50.50	7772.48	45.2	Pass
L35	16.25 - 11.25	Pole	TP47.8797x46.8795x0.675	35	-52.83	7940.73	45.7	Pass
L36	11.25 - 6.25	Pole	TP48.8798x47.8797x0.6625	36	-55.19	7960.87	46.9	Pass
L37	6.25 - 1.25	Pole	TP49.88x48.8798x0.6625	37	-57.58	8126.00	47.3	Pass
L38	1.25 - 0	Pole	TP50.13x49.88x0.6625	38	-58.19	8167.28	47.4	Pass
						Summary		
						Pole (L22)	72.9	Pass
						<b>RATING =</b>	<b>72.9</b>	<b>Pass</b>

**\*NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

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



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

Site BU: 876341  
Work Order: 1650083



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**Pole Geometry**

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	150	42	3.75	12	22	30.401	0.25	Auto	A607-60
2	111.75	42	4.75	12	29.15	37.553	0.3125	Auto	A607-60
3	74.5	42	5.5	12	35.98	44.379	0.375	Auto	A607-65
4	38	38	0	12	42.53	50.13	0.4375	Auto	A607-65

**Reinforcement Configuration**

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number												
						1	2	3	4	5	6	7	8	9	10	11	12
1	0	26.5	plate	CCI-WAFP-065125	4		x			x			x			x	
2	26.5	57.58	plate	CCI-AFP-060100	4		x			x			x			x	
3	74.5	89.5	plate	CCI-AFP-060100	3			x				x				x	
4	56.42	67.42	plate	CCI-SFP-060100	3			x				x			x		
5																	
6																	
7																	
8																	
9																	
10																	

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L <sub>v</sub> (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.25	8.125	0.625	n/a	42.000	19.000	6.563	1.1875	A572-65
2	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
3	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
4	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65



# TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	150 - 145	5		12	22.000	23.000	0.25	A607-60	1.000
2	145 - 140	5		12	23.000	24.000	0.25	A607-60	1.000
3	140 - 135	5		12	24.000	25.000	0.25	A607-60	1.000
4	135 - 130	5		12	25.000	26.000	0.25	A607-60	1.000
5	130 - 125	5		12	26.000	27.001	0.25	A607-60	1.000
6	125 - 120	5		12	27.001	28.001	0.25	A607-60	1.000
7	120 - 115	5		12	28.001	29.001	0.25	A607-60	1.000
8	115 - 111.75	7	3.75	12	29.001	30.401	0.25	A607-60	1.000
9	111.75 - 106.75	5		12	29.151	30.151	0.3125	A607-60	1.000
10	106.75 - 101.75	5		12	30.151	31.151	0.3125	A607-60	1.000
11	101.75 - 96.75	5		12	31.151	32.152	0.3125	A607-60	1.000
12	96.75 - 91.75	5		12	32.152	33.152	0.3125	A607-60	1.000
13	91.75 - 89.5	2.25		12	33.152	33.602	0.3125	A607-60	1.000
14	89.5 - 89.25	0.25		12	33.602	33.652	0.5	A607-60	0.966
15	89.25 - 84.25	5		12	33.652	34.652	0.49375	A607-60	0.968
16	84.25 - 79.25	5		12	34.652	35.653	0.4875	A607-60	0.971
17	79.25 - 74.5	9.5	4.75	12	35.653	37.553	0.48125	A607-60	0.974
18	74.5 - 68.75	5.75		12	35.978	37.128	0.375	A607-65	1.000
19	68.75 - 67.42	1.33		12	37.128	37.394	0.375	A607-65	1.000
20	67.42 - 67.17	0.25		12	37.394	37.444	0.375	A607-65	1.000
21	67.17 - 62.17	5		12	37.444	38.444	0.375	A607-65	1.000
22	62.17 - 57.58	4.59		12	38.444	39.362	0.375	A607-65	1.000
23	57.58 - 57.33	0.25		12	39.362	39.412	0.7	A607-65	1.022
24	57.33 - 56.42	0.91		12	39.412	39.594	0.7	A607-65	1.020
25	56.42 - 56.17	0.25		12	39.594	39.644	0.5875	A607-65	0.967
26	56.17 - 51.17	5		12	39.644	40.644	0.575	A607-65	0.979
27	51.17 - 46.17	5		12	40.644	41.645	0.575	A607-65	0.971
28	46.17 - 41.17	5		12	41.645	42.645	0.5625	A607-65	0.985
29	41.17 - 38	8.67	5.5	12	42.645	44.379	0.5625	A607-65	0.980
30	38 - 31.5	6.5		12	42.529	43.829	0.4375	A607-65	1.000
31	31.5 - 26.5	5		12	43.829	44.829	0.4375	A607-65	1.000
32	26.5 - 26.25	0.25		12	44.829	44.879	0.6875	A607-65	0.973
33	26.25 - 21.25	5		12	44.879	45.879	0.6875	A607-65	0.965
34	21.25 - 16.25	5		12	45.879	46.880	0.675	A607-65	0.976
35	16.25 - 11.25	5		12	46.880	47.880	0.675	A607-65	0.969
36	11.25 - 6.25	5		12	47.880	48.880	0.6625	A607-65	0.980
37	6.25 - 1.25	5		12	48.880	49.880	0.6625	A607-65	0.973
38	1.25 - 0	1.25		12	49.880	50.130	0.6625	A607-65	0.972

## TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
1	150 - 145	4.50	31.93	6.07	
2	145 - 140	8.06	72.66	11.89	
3	140 - 135	8.53	133.35	12.39	
4	135 - 130	12.78	207.37	17.43	
5	130 - 125	13.37	295.72	17.93	
6	125 - 120	14.00	386.56	18.42	
7	120 - 115	14.67	480.06	18.96	
8	115 - 111.75	15.13	542.19	19.29	
9	111.75 - 106.75	18.84	649.36	22.06	
10	106.75 - 101.75	19.83	761.09	22.65	
11	101.75 - 96.75	20.77	875.50	23.14	
12	96.75 - 91.75	21.74	992.39	23.64	
13	91.75 - 89.5	22.18	1045.80	23.86	
14	89.5 - 89.25	22.26	1051.76	23.88	
15	89.25 - 84.25	23.73	1177.41	24.98	
16	84.25 - 79.25	25.17	1309.38	26.37	
17	79.25 - 74.5	26.48	1436.16	27.04	
18	74.5 - 68.75	28.92	1594.14	27.89	
19	68.75 - 67.42	29.35	1631.32	28.03	
20	67.42 - 67.17	29.45	1638.33	28.04	
21	67.17 - 62.17	31.07	1779.77	28.53	
22	62.17 - 57.58	32.60	1912.08	29.13	
23	57.58 - 57.33	32.72	1919.36	29.15	
24	57.33 - 56.42	33.09	1945.94	29.29	
25	56.42 - 56.17	33.19	1953.27	29.32	
26	56.17 - 51.17	34.94	2101.59	30.03	
27	51.17 - 46.17	36.73	2253.93	30.99	
28	46.17 - 41.17	38.55	2410.43	31.64	
29	41.17 - 38	39.93	2511.27	32.04	
30	38 - 31.5	44.06	2722.35	32.95	
31	31.5 - 26.5	45.82	2888.43	33.53	
32	26.5 - 26.25	45.95	2896.82	33.55	
33	26.25 - 21.25	48.20	3066.05	34.16	
34	21.25 - 16.25	50.50	3238.30	34.76	
35	16.25 - 11.25	52.83	3413.57	35.37	
36	11.25 - 6.25	55.19	3591.87	35.98	
37	6.25 - 1.25	57.58	3773.21	36.59	
38	1.25 - 0	58.19	3819.02	36.75	

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP23x22x0.25	Pole	5.7%	Pass
145 - 140	Pole	TP24x23x0.25	Pole	12.0%	Pass
140 - 135	Pole	TP25x24x0.25	Pole	20.2%	Pass
135 - 130	Pole	TP26x25x0.25	Pole	29.4%	Pass
130 - 125	Pole	TP27.001x26x0.25	Pole	39.1%	Pass
125 - 120	Pole	TP28.001x27.001x0.25	Pole	47.9%	Pass
120 - 115	Pole	TP29.001x28.001x0.25	Pole	56.2%	Pass
115 - 111.75	Pole	TP30.401x29.001x0.25	Pole	61.2%	Pass
111.75 - 106.75	Pole	TP30.151x29.151x0.3125	Pole	52.6%	Pass
106.75 - 101.75	Pole	TP31.151x30.151x0.3125	Pole	58.2%	Pass
101.75 - 96.75	Pole	TP32.152x31.151x0.3125	Pole	63.5%	Pass
96.75 - 91.75	Pole	TP33.152x32.152x0.3125	Pole	68.4%	Pass
91.75 - 89.5	Pole	TP33.602x33.152x0.3125	Pole	70.5%	Pass
89.5 - 89.25	Pole + Reinf.	TP33.652x33.602x0.5	Reinf. 3 Tension Rupture	59.2%	Pass
89.25 - 84.25	Pole + Reinf.	TP34.652x33.652x0.4938	Reinf. 3 Tension Rupture	63.1%	Pass
84.25 - 79.25	Pole + Reinf.	TP35.653x34.652x0.4875	Reinf. 3 Tension Rupture	67.0%	Pass
79.25 - 74.5	Pole + Reinf.	TP37.553x35.653x0.4813	Reinf. 3 Tension Rupture	70.3%	Pass
74.5 - 68.75	Pole	TP37.128x35.978x0.375	Pole	66.6%	Pass
68.75 - 67.42	Pole	TP37.394x37.128x0.375	Pole	67.4%	Pass
67.42 - 67.17	Pole	TP37.444x37.394x0.375	Pole	67.5%	Pass
67.17 - 62.17	Pole	TP38.444x37.444x0.375	Pole	70.2%	Pass
62.17 - 57.58	Pole	TP39.362x38.444x0.375	Pole	72.6%	Pass
57.58 - 57.33	Pole + Reinf.	TP39.412x39.362x0.7	Reinf. 2 Tension Rupture	55.9%	Pass
57.33 - 56.42	Pole + Reinf.	TP39.594x39.412x0.7	Reinf. 2 Tension Rupture	56.2%	Pass
56.42 - 56.17	Pole + Reinf.	TP39.644x39.594x0.5875	Reinf. 2 Tension Rupture	67.3%	Pass
56.17 - 51.17	Pole + Reinf.	TP40.644x39.644x0.575	Reinf. 2 Tension Rupture	69.5%	Pass
51.17 - 46.17	Pole + Reinf.	TP41.645x40.644x0.575	Reinf. 2 Tension Rupture	71.6%	Pass
46.17 - 41.17	Pole + Reinf.	TP42.645x41.645x0.5625	Reinf. 2 Tension Rupture	73.5%	Pass
41.17 - 38	Pole + Reinf.	TP44.379x42.645x0.5625	Reinf. 2 Tension Rupture	74.7%	Pass
38 - 31.5	Pole	TP43.829x42.529x0.4375	Pole	70.3%	Pass
31.5 - 26.5	Pole	TP44.829x43.829x0.4375	Pole	71.9%	Pass
26.5 - 26.25	Pole + Reinf.	TP44.879x44.829x0.6875	Reinf. 1 Tension Rupture	65.0%	Pass
26.25 - 21.25	Pole + Reinf.	TP45.879x44.879x0.6875	Reinf. 1 Tension Rupture	66.4%	Pass
21.25 - 16.25	Pole + Reinf.	TP46.88x45.879x0.675	Reinf. 1 Tension Rupture	67.6%	Pass
16.25 - 11.25	Pole + Reinf.	TP47.88x46.88x0.675	Reinf. 1 Tension Rupture	68.8%	Pass
11.25 - 6.25	Pole + Reinf.	TP48.88x47.88x0.6625	Reinf. 1 Tension Rupture	69.9%	Pass
6.25 - 1.25	Pole + Reinf.	TP49.88x48.88x0.6625	Reinf. 1 Tension Rupture	71.0%	Pass
1.25 - 0	Pole + Reinf.	TP50.13x49.88x0.6625	Reinf. 1 Tension Rupture	71.3%	Pass
				Summary	
			Pole	72.6%	Pass
			Reinforcement	74.7%	Pass
			Overall	74.7%	Pass

# Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity*				
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4
150 - 145	1211	n/a	1211	18.29	n/a	18.29	5.7%				
145 - 140	1378	n/a	1378	19.09	n/a	19.09	12.0%				
140 - 135	1560	n/a	1560	19.90	n/a	19.90	20.2%				
135 - 130	1757	n/a	1757	20.70	n/a	20.70	29.4%				
130 - 125	1970	n/a	1970	21.50	n/a	21.50	39.1%				
125 - 120	2199	n/a	2199	22.31	n/a	22.31	47.9%				
120 - 115	2445	n/a	2445	23.11	n/a	23.11	56.2%				
115 - 111.75	2615	n/a	2615	23.63	n/a	23.63	61.2%				
111.75 - 106.75	3417	n/a	3417	29.98	n/a	29.98	52.6%				
106.75 - 101.75	3772	n/a	3772	30.99	n/a	30.99	58.2%				
101.75 - 96.75	4151	n/a	4151	31.99	n/a	31.99	63.5%				
96.75 - 91.75	4555	n/a	4555	33.00	n/a	33.00	68.4%				
91.75 - 89.5	4745	n/a	4745	33.45	n/a	33.45	70.5%				
89.5 - 89.25	4766	2729	7495	33.50	18.00	51.50	43.5%			59.2%	
89.25 - 84.25	5208	2888	8096	34.50	18.00	52.50	47.0%			63.1%	
84.25 - 79.25	5676	3050	8727	35.51	18.00	53.51	50.5%			67.0%	
79.25 - 74.5	6147	3209	9356	36.46	18.00	54.46	53.6%			70.3%	
74.5 - 68.75	7662	n/a	7662	44.32	n/a	44.32	66.6%				
68.75 - 67.42	7829	n/a	7829	44.64	n/a	44.64	67.4%				
67.42 - 67.17	7861	n/a	7861	44.70	n/a	44.70	67.5%				
67.17 - 62.17	8515	n/a	8515	45.90	n/a	45.90	70.2%				
62.17 - 57.58	9146	n/a	9146	47.01	n/a	47.01	72.6%				
57.58 - 57.33	9185	7695	16880	47.07	42.00	89.07	40.0%		55.9%		53.5%
57.33 - 56.42	9314	7764	17078	47.29	42.00	89.29	40.4%		56.2%		53.9%
56.42 - 56.17	9346	4993	14339	47.35	24.00	71.35	46.3%		67.3%		
56.17 - 51.17	10078	5240	15318	48.56	24.00	72.56	48.3%		69.5%		
51.17 - 46.17	10848	5493	16341	49.76	24.00	73.76	50.3%		71.6%		
46.17 - 41.17	11656	5752	17408	50.97	24.00	74.97	52.2%		73.5%		
41.17 - 38	12188	5919	18107	51.73	24.00	75.73	53.5%		74.7%		
38 - 31.5	14710	n/a	14710	61.04	n/a	61.04	70.3%				
31.5 - 26.5	15751	n/a	15751	62.45	n/a	62.45	71.9%				
26.5 - 26.25	15804	8704	24508	62.52	32.50	95.02	45.0%	65.0%			
26.25 - 21.25	16896	9083	25978	63.92	32.50	96.42	46.3%	66.4%			
21.25 - 16.25	18036	9470	27506	65.33	32.50	97.83	47.6%	67.6%			
16.25 - 11.25	19226	9865	29091	66.74	32.50	99.24	48.9%	68.8%			
11.25 - 6.25	20468	10268	30737	68.15	32.50	100.65	50.2%	69.9%			
6.25 - 1.25	21762	10680	32442	69.55	32.50	102.05	51.5%	71.0%			
1.25 - 0	22094	10784	32878	69.90	32.50	102.40	51.8%	71.3%			

Note: Section capacity checked in 5 degree increments.  
Rating per TIA-222-H Section 15.5.

## Monopole Anchor Rod Modifications

### Project & Site Details

Project No.	18TAJG1400 (R2)
Project Name	Middletown 2- Marino Property
Site ID	876341
Date	December 11, 2018
Code	ANSI/TIA-222-H
Maximum Stress Ratio	100%

### Tower Reactions

Moment	3819	k-ft
Axial	58	k
Shear	37	k

### Optional Inputs

Axis Angle to 0° (°)	90
Additional Inertia (in <sup>4</sup> )	0

### Centroid

x	0.0000	in
y	0.0000	in

### Existing Anchor Rod Input

Anchor Rods	Y	(Y/N)
Base Plate Type	Square	
Quantity	16	Rods
Grade	A615-75	
Thread Form	Non-Upset	
Diameter	2.25	in
Bolt Circle	58	in
Angle to 0° of First Rod		
Spacing	6	in
l <sub>ar</sub>	1	in

### Foundation Input

Pier Diameter	7	ft
f'c, Pier Concrete Strength	3000	psi
f <sub>y</sub> , Rebar Yield Strength	60000	psi
Vertical Rebar Size	#11	
Vertical Rebar Quantity		Bars
Horizontal Rebar Size	#5	
Side Cover	4	in
Top Cover	4	in
τ, Ultimate Bond Resistance	1.69	ksi
Vertical Bar Diameter	1.41	in
Horizontal Bar Diameter	0.625	in
Rebar Cage Circle	73.34	in

### Moment of Inertia

	I (in <sup>4</sup> )	Angle (°)
Min.	35458.0	6
Max.	35458.0	70.5
Current	<b>35458.0</b>	<b>90</b>

### Post-Installed Anchor Rods

Quantity	4	Rods
Any Symmetric Rods?	N	(Y/N)

### Individual Post-Installed Anchor Rod Input

Name	Angle	Axis Angle of Max (°)	Axial Force (kips)	Allow. Axial (kips)	Controlling	Percentage	Pass/Fail
AR1	0	90.0	See Calcs	N/A	Compression Interaction	59.5%	Pass
AR1	90	0.0	See Calcs	N/A	Compression Interaction	59.5%	Pass
AR1	180	90.0	See Calcs	N/A	Compression Interaction	59.5%	Pass
AR1	270	0.0	See Calcs	N/A	Compression Interaction	59.5%	Pass
Existing Rods		39.0	151.8	N/A	Compression Interaction	59.4%	Pass

**Overall 59.5% Pass**

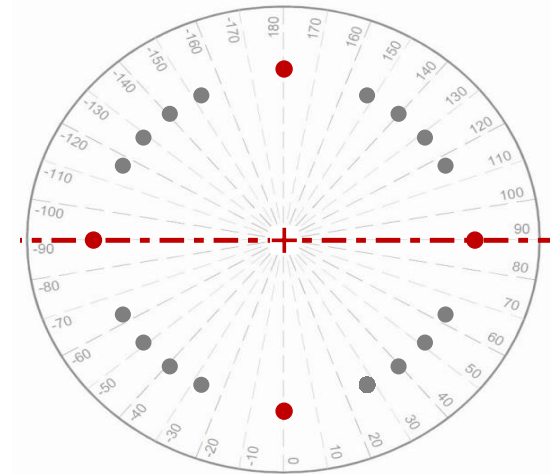
### Post-Installed Anchor Rod Summary

Post-Installed Anchor Rods						Anchor Rod Sleeve		Transfer Plate	
Assembly Name	Diameter (in)	Grade	Bolt Circle (in)	Target Tension (kips)	Required Embedment (ft)	Member	Grade	Dimensions (H" x W" x T")	Grade
AR1	2.25	A615-75	61	188	5.50	-	-	-	-

### Anchor Rod Colors

Apply New Rod Colors

AR1





# Monopole Base Plate Connection

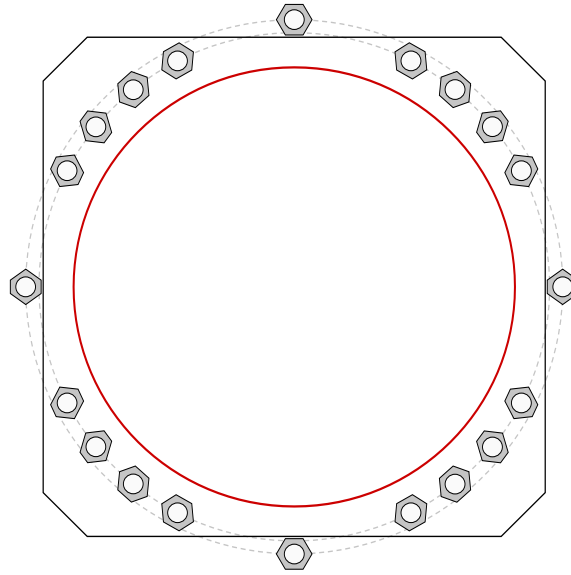


Site Info	
BU #	876341
Site Name	Metown 2 - Marino Proj
Order #	456553

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	1

Applied Loads	
Moment (kip-ft)	3819.02
Axial Force (kips)	58.19
Shear Force (kips)	36.75

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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Anchor Rod Data
GROUP 1: (16) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 58" BC
GROUP 2: (4) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 61" BC
Base Plate Data
57" OD x 3" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi)
Stiffener Data
N/A
Pole Data
50.13" x 0.4375" 12-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
<b>GROUP 1:</b>		
$P_u_c = 158.28$	$\phi P_n_c = 243.75$	<b>Stress Rating</b>
$V_u = 2.3$	$\phi V_n = 73.13$	<b>61.9%</b>
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
<b>GROUP 2:</b>		
$P_u_c = 162.66$	$\phi P_n_c = 243.75$	<b>Stress Rating</b>
$V_u = 0$	$\phi V_n = 73.13$	<b>63.6%</b>
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
<b>Base Plate Summary</b>		
Max Stress (ksi):	28.55	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	<b>60.4%</b>	<b>Pass</b>

### Base Transfer Stiffener

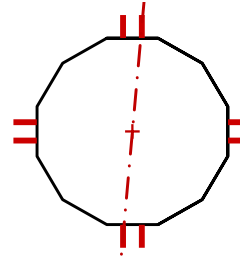
Project & Site Details	
Project No.	18TAJG1400 (R2)
Project Name	Middletown 2 - Marino Property
Site ID	876341
Date	December 11, 2018
Code	ANSI/TIA-222-G
Maximum Stress Ratio	100%

Tower Reactions		
Moment	3819	k-ft
Axial	58	kips
Shear	37	kips

Optional Inputs	
Axis Angle to 0° (°)	175
Additional Inertia (in <sup>4</sup> )	

Centroid		
x	0.0000	in
y	0.0000	in

Pole Properties		
Pole Diameter	50.13	in
Pole Thickness	0.4375	in
Pole Grade	A607-65	
Number of Sides	12	Sided



Moment of Inertia		
	I (in <sup>4</sup> )	Angle (°)
Min.	39469.9	0
Max.	39469.9	43
Current	39469.9	175

Stiffener Properties		
Stiffener Quantity	8	Stiffeners
Any Symmetric Plates?	N	(Y/N)

Individual Stiffener Input					
Stiffener Name	Angle to 0° (°)	Axis Angle of Max (°)	Controlling Case	Percentage	Pass/Fail
1. PL 10x0.5	5	N/A	0	N/A	N/A
1. PL 10x0.5	85	N/A	0	N/A	N/A
1. PL 10x0.5	95	N/A	0	N/A	N/A
1. PL 10x0.5	175	N/A	0	N/A	N/A
1. PL 10x0.5	185	N/A	0	N/A	N/A
1. PL 10x0.5	265	N/A	0	N/A	N/A
1. PL 10x0.5	275	N/A	0	N/A	N/A
1. PL 10x0.5	355	N/A	0	N/A	N/A
Pole	0		Stress	0.0%	Pass

<b>Overall</b>	<b>0.0%</b>	<b>Pass</b>
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Stiffener Input													
Stiffener Name	Width (in)	Thickness (in)	Considering Plate Capacity (Y/N)	Height (in)	Notch (in)	Offset from Pole (in)	Grade	Weld Electrode (ksi)	Vertical Weld Size (in)	Horizontal Weld Type	Groove Angle (°)	Horizontal Groove Size (in)	Horizontal Fillet Size (in)
1. PL 10x0.5	10	0.5	Y	30	0.75	0	A572-50	70	1/4	Double Sided	0	0	0.25

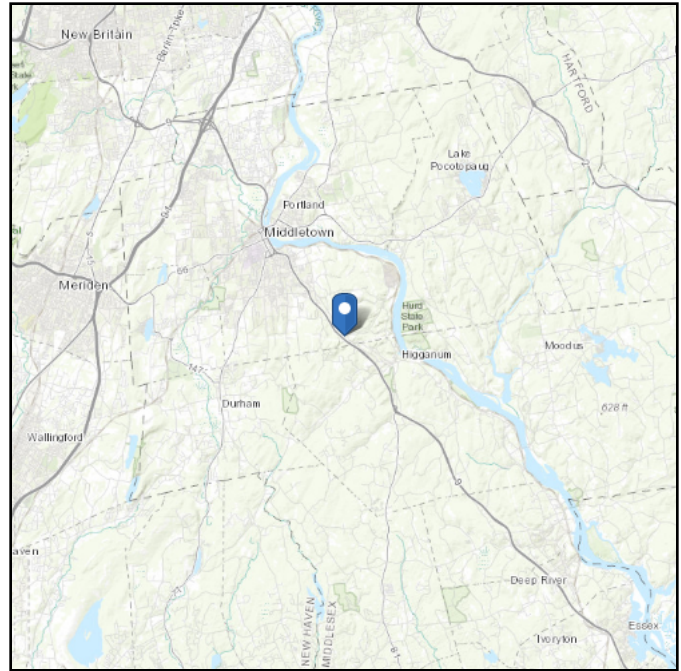


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 369.73 ft (NAVD 88)  
**Latitude:** 41.510639  
**Longitude:** -72.593361



## Wind

### Results:

Wind Speed:	126 Vmph
10-year MRI	78 Vmph
25-year MRI	87 Vmph
50-year MRI	95 Vmph
100-year MRI	103 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Tue Oct 23 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

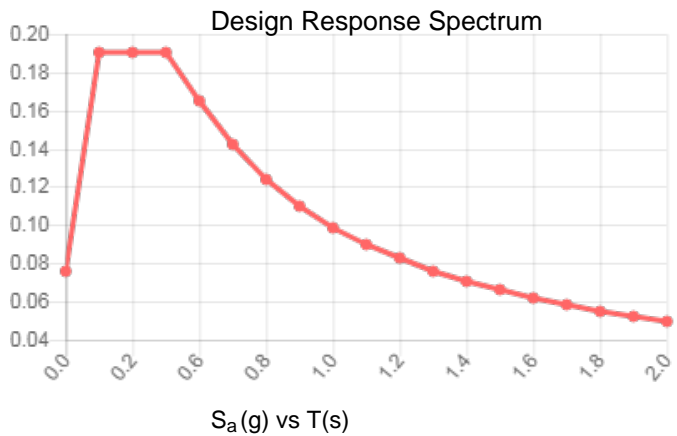
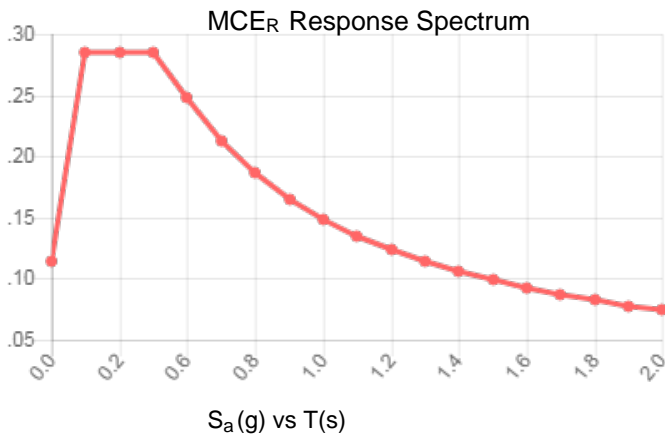
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.178	$S_{DS}$ :	0.190
$S_1$ :	0.062	$S_{D1}$ :	0.099
$F_a$ :	1.600	$T_L$ :	6.000
$F_v$ :	2.400	PGA :	0.091
$S_{MS}$ :	0.285	PGA <sub>M</sub> :	0.145
$S_{M1}$ :	0.149	$F_{PGA}$ :	1.600
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Tue Oct 23 2018

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

## Ice

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### Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Tue Oct 23 2018

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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## Drilled Pier Foundation

BU #: 876341  
 Site Name: Middletown 2- Marino F  
 Order Number: 456553

TIA-222 Revision: H  
 Tower Type: Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	3819	
Axial Force (kips)	58	
Shear Force (kips)	37	

Material Properties		
Concrete Strength, f <sub>c</sub> :	3	ksi
Rebar Strength, F <sub>y</sub> :	60	ksi

Pier Design Data		
Depth	18.5	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
<i>From 0.5' above grade to 18.5' below grade</i>		
Pier Diameter	7	ft
Rebar Quantity	32	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity		
D <sub>v=0</sub> (ft from TOC)	4.88	-
Soil Safety Factor	2.77	-
Max Moment (kip-ft)	4031.23	-
Rating*	45.8%	-
Soil Vertical Capacity		
Skin Friction (kips)	493.73	-
End Bearing (kips)	758.82	-
Weight of Concrete (kips)	131.62	-
Total Capacity (kips)	1252.55	-
Axial (kips)	189.62	-
Rating*	14.4%	-
Reinforced Concrete Capacity		
Critical Depth (ft from TOC)	4.88	-
Critical Moment (kip-ft)	4031.23	-
Critical Moment Capacity	7527.31	-
Rating*	51.0%	-

Soil Interaction Rating*	45.8%
Structural Foundation Rating*	51.0%

\*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>

Soil Profile			
Groundwater Depth	n/a	ft	# of Layers
			3

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ <sub>soil</sub> (pcf)	γ <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	120	150	0	0	0.000	0.000					Cohesionless
2	3.5	4	0.5	120	150	0	32	0.557	0.557				38	Cohesionless
3	4	18.5	14.5	125	150	4	0	2.045	2.045			26.29		Cohesive







**DESIGN BASIS:**

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

- 1. DESIGN CRITERIA:
  - WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 100-120 MPH (3 SECOND GUST)
  - RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
  - NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 MPH ( $V_{asd}$ ) (EXPOSURE B)/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10 PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
  - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

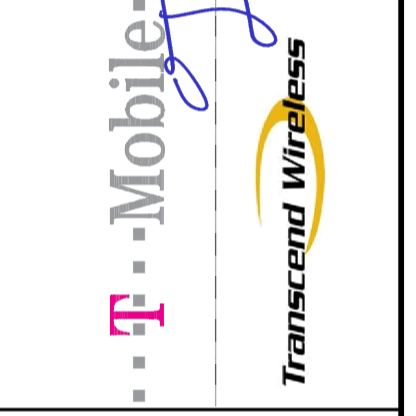
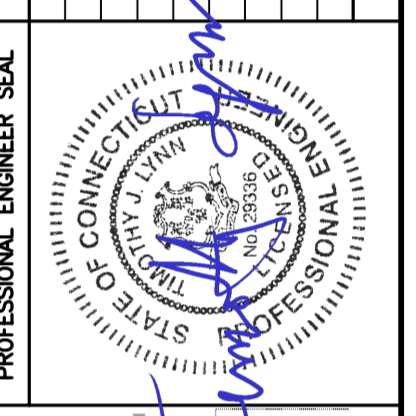
**GENERAL NOTES:**

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. 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.
3. 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.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. 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.
7. 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.
8. 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.
9. 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
10. 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.
11. 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.
12. 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.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

**STRUCTURAL STEEL**

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
  - A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
  - B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
  - C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
  - D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
  - E. PIPE---ASTM A53 (FY = 35 KSI)
  - F. CONNECTION BOLTS---ASTM A325-N
  - G. U-BOLTS---ASTM A36
  - H. ANCHOR RODS---ASTM F 1554
  - I. WELDING ELECTRODE---ASTM E 70XX
2. 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.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. 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.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. 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.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. 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.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. 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.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	TITLE	BY	CHK'D BY	CAG	ISSUED FOR CONSTRUCTION	DESCRIPTION
0	12/15/18						



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 WIRELESS COMMUNICATIONS FACILITY  
**MIDDLETOWN/RT9**  
**SITE ID: CT11234C**  
 1969 OLD SAYBROOK RD  
 MIDDLETOWN, CT 06457

DATE: 09/17/18  
 SCALE: AS NOTED  
 JOB NO. 18127.06

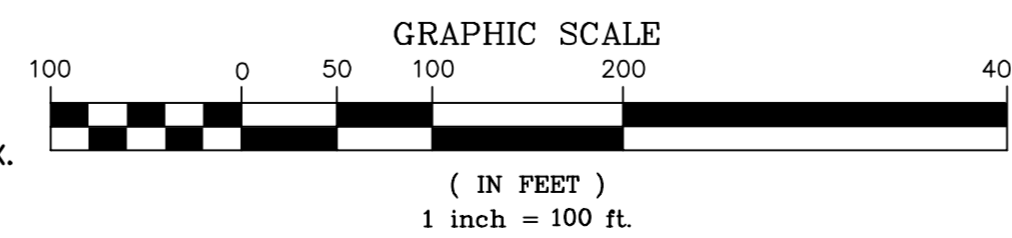
DESIGN BASIS  
 AND SITE NOTES



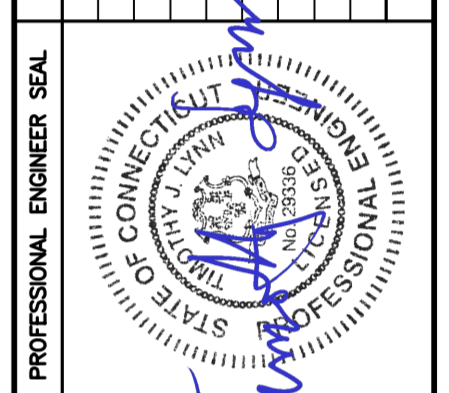


**1** SITE LOCATION PLAN  
C-1

SCALE: 1" = 100'



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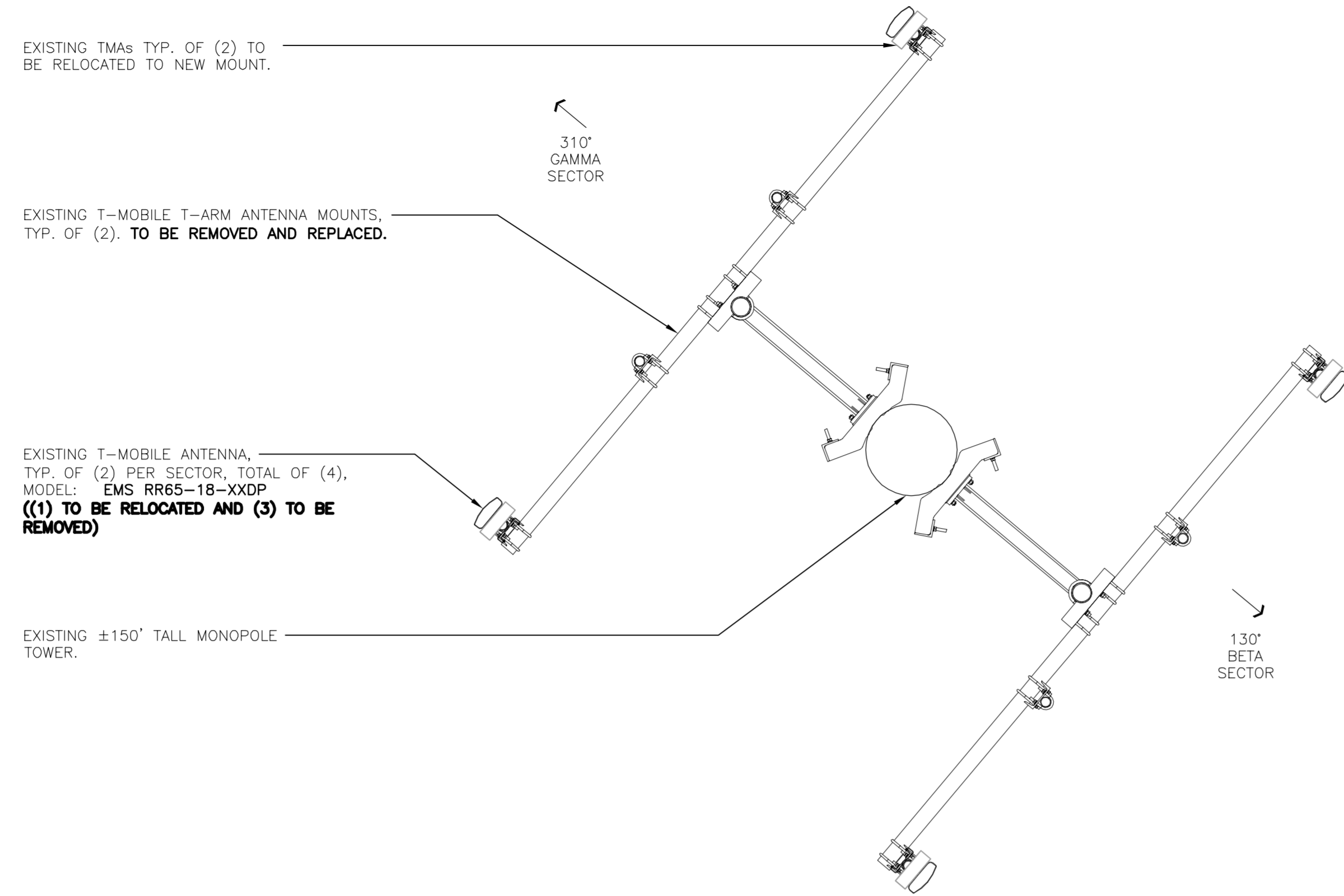
DATE: 09/17/18  
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SITE LOCATION PLAN

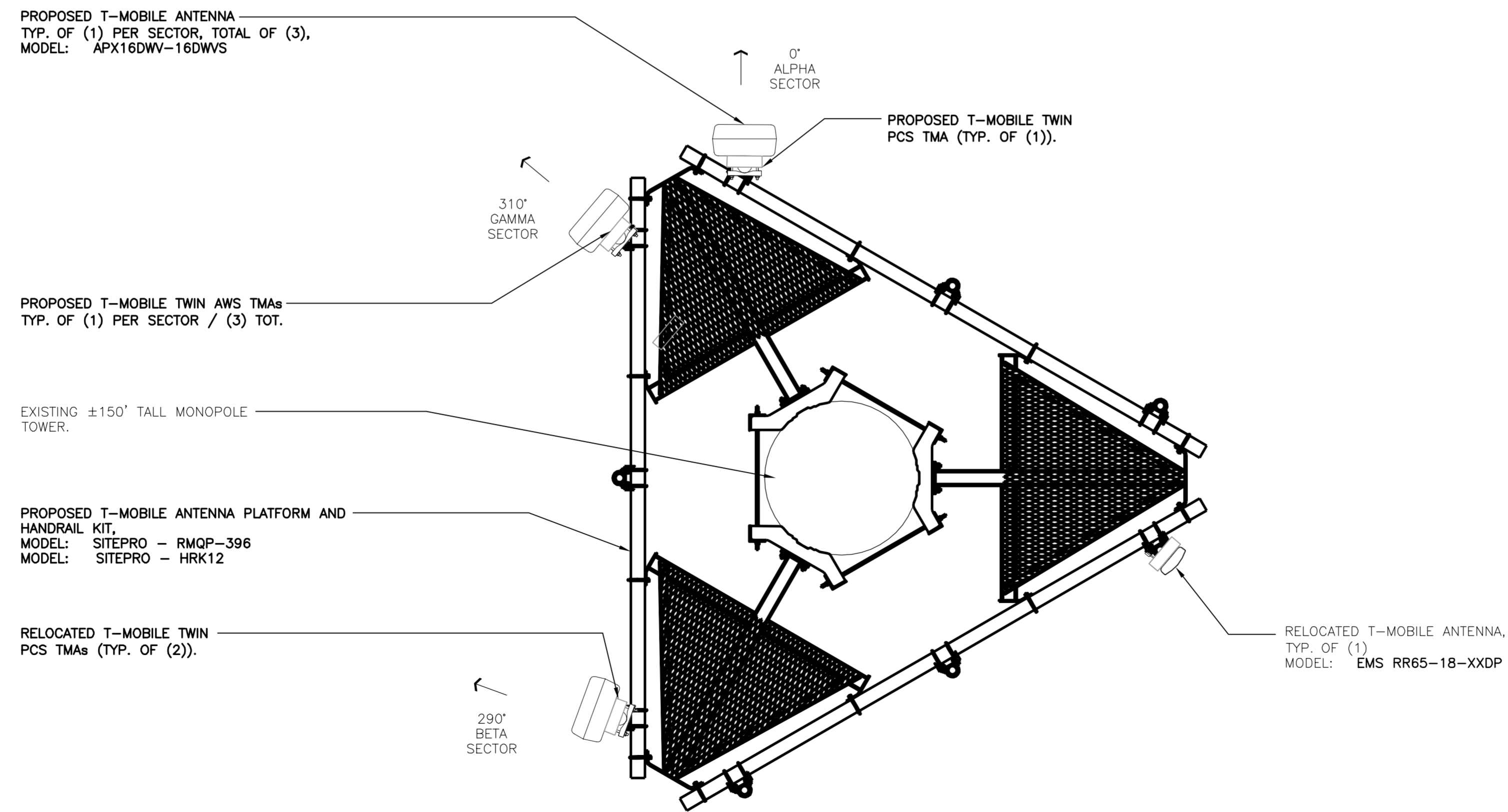
**C-1**  
Sheet No. 3 of 6







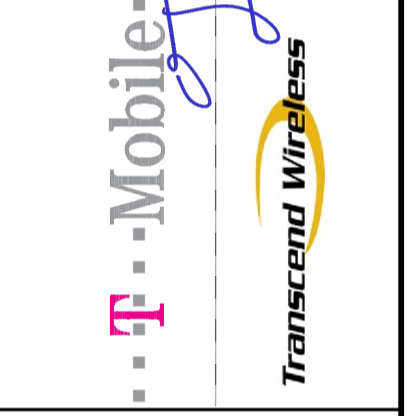
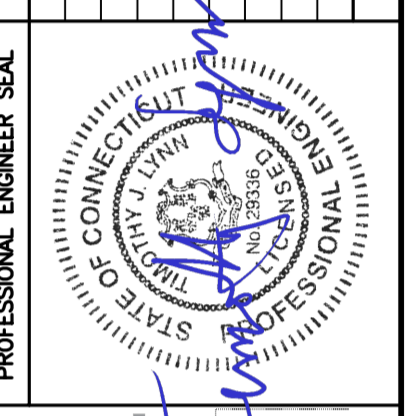
**1** EXISTING ANTENNA MOUNTING CONFIGURATION  
C-3 SCALE: 1/2" = 1'



**2** PROPOSED ANTENNA MOUNTING CONFIGURATION  
C-3 SCALE: 1/2" = 1'



REV.	DATE	BY	CHK'D BY	DESCRIPTION
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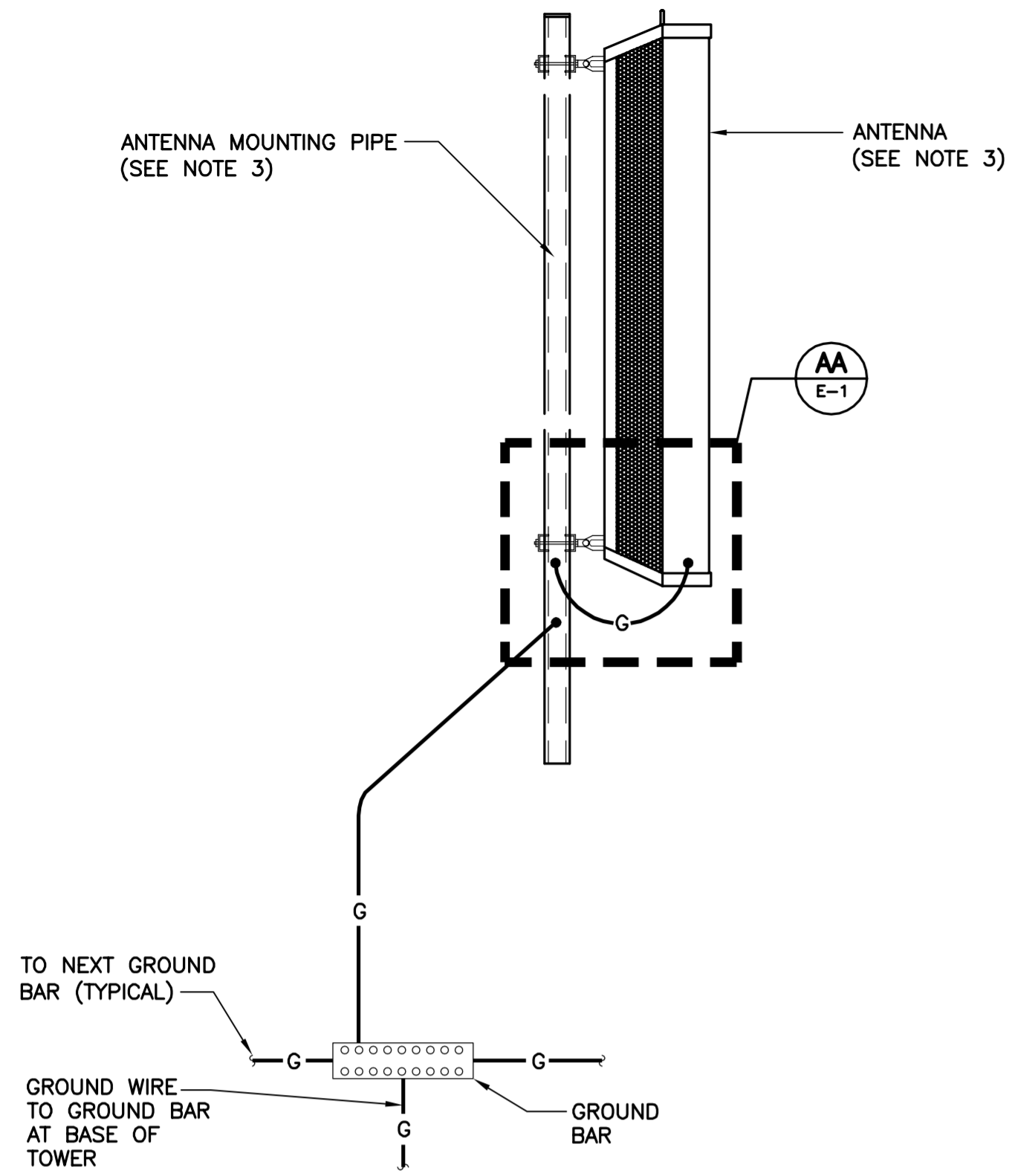


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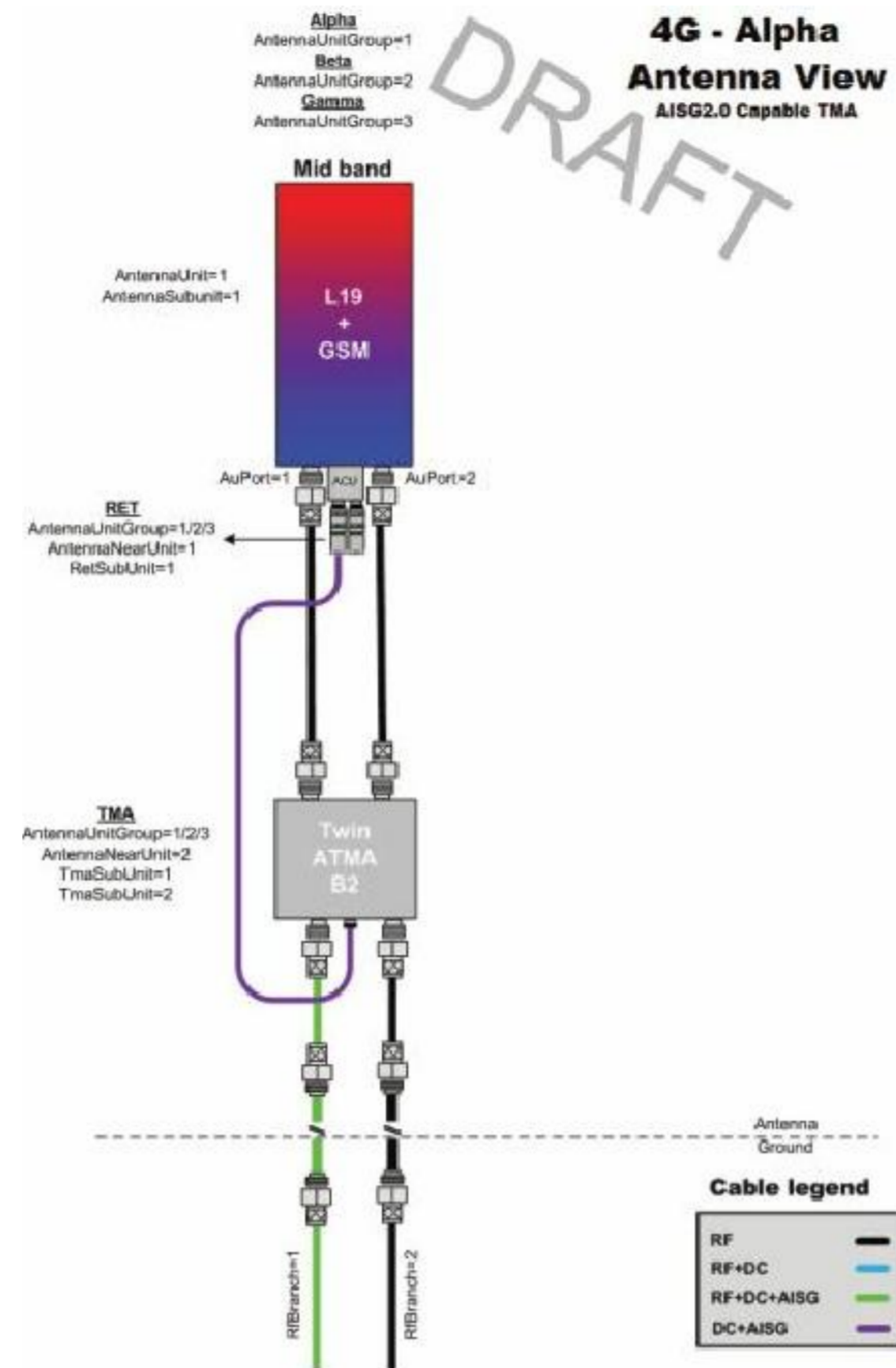
ANTENNA MOUNTING CONFIGURATION



**NOTES:**

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

**1** TYPICAL ANTENNA GROUNDING DETAIL  
E-1 SCALE: NONE



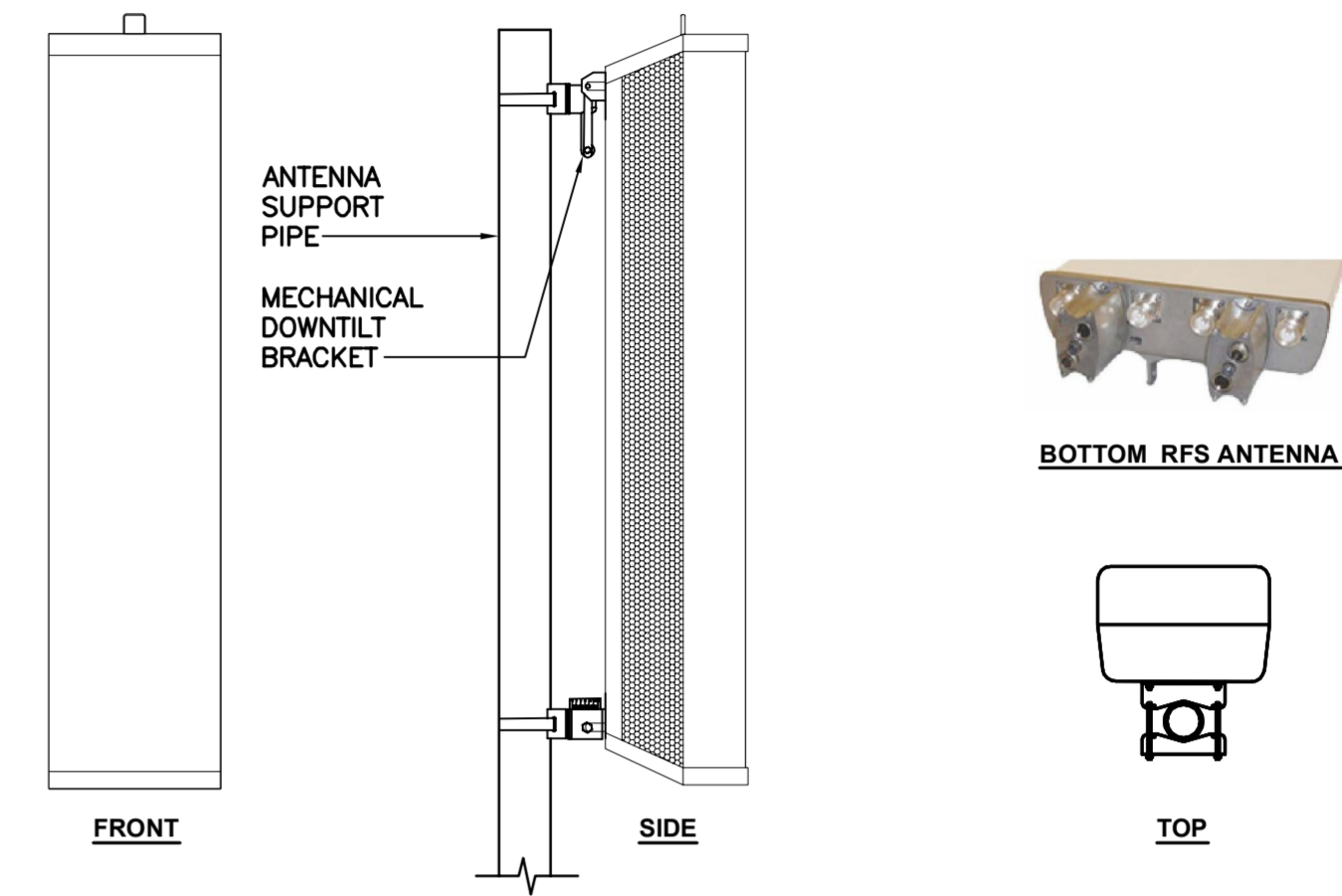
**4G - Alpha**  
**Antenna View**  
AISG2.0 Capable TMA

**DRAFT**

**Cable legend**

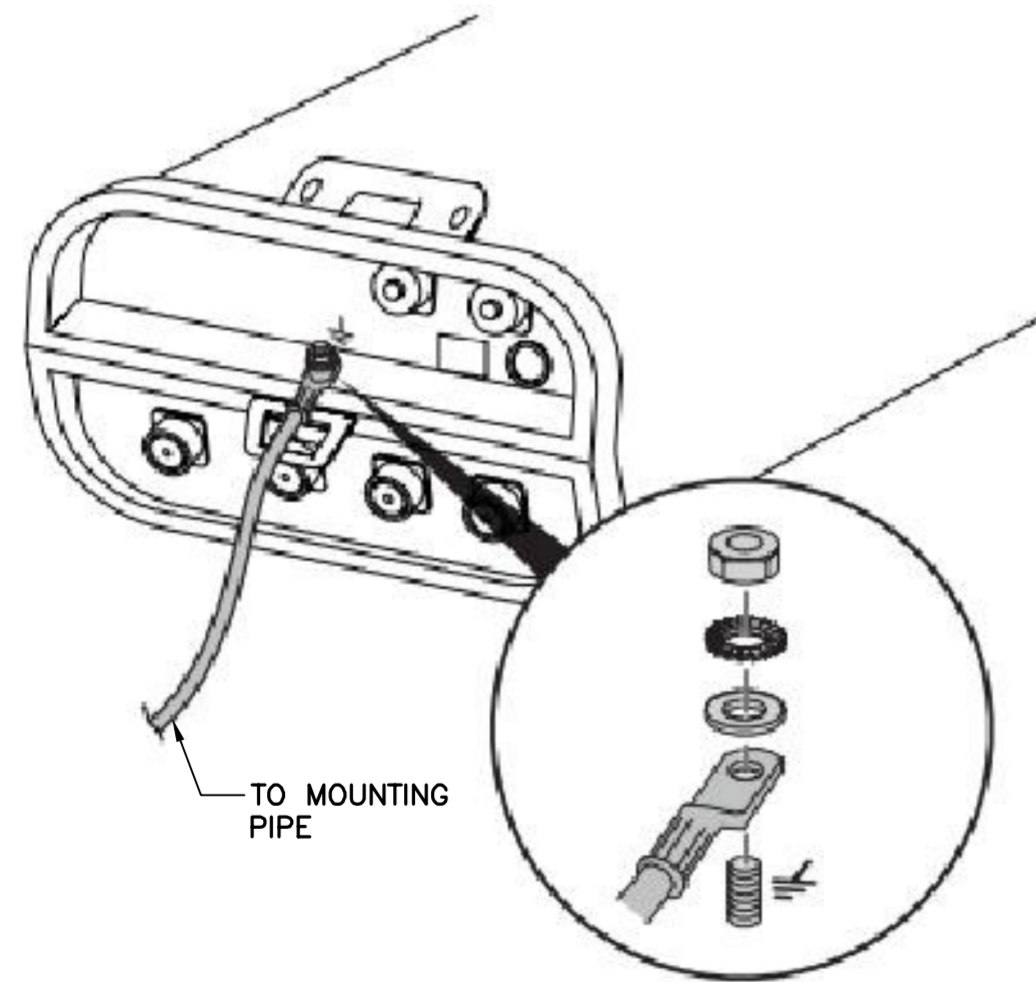
RF	—
RF+DC	—
RF+DC+AISG	—
DC+AISG	—

**2** PROPOSED PLUMBING DIAGRAM  
E-1 SCALE: NONE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APX16DWV-16DWV-S-E-A20	55.9"L x 13"W x 3.15"D	41 LBS.

**3** PROPOSED ANTENNA DETAIL  
E-1 SCALE: NONE



**AA** TYPICAL ANTENNA GROUNDING DETAIL  
E-1 SCALE: NONE



TOWER MOUNTED AMPLIFIER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: ATMA1412D-1A20	12.0"L x 10.0"W x 4.0"D	13.0 LBS.

**NOTES:**  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

**4** PROPOSED TMA DETAIL  
E-1 SCALE: NONE



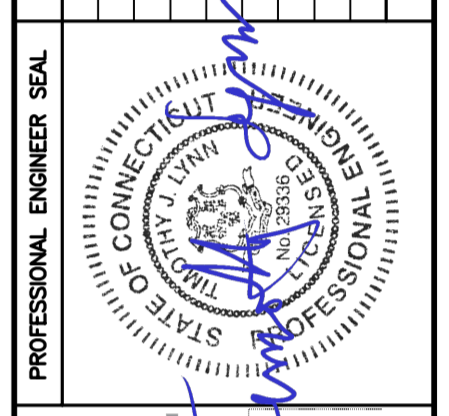
ISOMETRIC VIEW

SMALL FOOTPRINT BATTERY CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: PTS MODEL: PTS8003	32.25"H x 14.04"W x 26.31"D	60 LBS.

**NOTES:**  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

**5** SMALL FOOTPRINT BATTERY CABINET DETAIL  
E-1 SCALE: NTS

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TYPICAL ELECTRICAL DETAILS  
**E-1**  
Sheet No. 6 of 6