App No: 2020121340

Revisions received 1.5.21 - JE

Application General Infomation

Applicant Name	T-Mobile c/o Crown Castle USA	Updated	12/23/2020
Application Type	Minor Modification	Ann. Plan?	Yes
Carrier	T-Mobile	Will site be used to support government telecommunications facilities or other equipment for government use?	No
Solution Type	Macro		
Existing	Existing	Gvt. Use Desc.	

Application Description

T-MOBILE PROPOSES TO ADD (3) NEW Ericsson AIR6449 B41 ANTENNAS, (6) NEW 4424 B25, (6) New RRUS32 B66A RRUS, (1) 6160 CABINET, (1) B160 BATTERY CABINET, AND (1) SQUARE PLATFORM MOUNT

Site Infomation

Site Id	402	Zoning	CR-0.75
Structure Type	Monopole	Latitude	39.05785
Address	12355 Prosperity Dr, Silver Spring	Longitude	-76.965497
County Site Name	Public Storage Prosperity	Ground Elevation	384
Carrier Site Name	Public Storage-Prosperity	City	Silver Spring
Site Owner	Public Storage LP	Lease Status	Leased
Structure Owner	Crown Castle	Does the structure require an antenna structure registration under FCC Title 47	Yes
Existing Structure Height	140	Distance to Residential Property (New, Replacement, Colocation Only)	
Provide the proposed height of the replacement structure without any antenna (New, Replacement Apps Only)		Distance to Commercial Property (New, Replacement, Colocation Only)	

Justification of why this site was selected:

The proposed Installation is intended to provide greater service to T-Mobile's customer base in the area. This site is needed to provide coverage within the surrounding
area. T-Mobile selected this site due to their existing installation. By selecting th

NearbySites (New, Replacement Apps Only):

Wednesday, December 23, 2020

1:18:46 PM

App No: 2020121340

Screening considerations(New, Colocations, Replacement Apps Only):

Wednesday, December 23, 2020

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App No: 2020121340

6409 Questions

Does this qualify as a 6409 application? (Minor Mod, Colocations Only): Yes

For towers outside the public ROW will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 20 feet, whichever is greater? No

Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet? No

For towers outside the public ROW will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 20 feet? No

More than four Equipment Cabinets? YN: No

Will the proposed installation require excavation or expansion outside the current boundaries of the site? No

Does the structure or current installation have concealment elements/measures? No

Will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 10 feet, whichever is greater? No

If yes, describe how the proposed installation does not defeat the existing concealment.

Small Wireless Facility Informatio

Small Wireless Facility Questions

Small Wireless Facility? No

Is the structure 10% taller than adjacent structures?

Cumulative volume of the proposed wireless equipment(s) exclusive of antennas in cubic feet: 17.5

Please list adjacent structure heights

Tribal Lands? No

Cumulative volume of the proposed antenna antenna(s) exclusive of equipment

ROW Information

PROW? No

Pole Number

ROW owner

ROW width

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Antenna Infomatio

Antenna Compliance	No
Compliance Desc	
Antenna Location	No
Antenna Loc. Desc.	
Env. Assessment	
Cat. Excluded?	
Routine Env. Evaluation	checked

Antenna Model	Ericsson AIR 6449 B41						
Frequency	2593-2690 2496-2592						
RAD Center	139	Max ERP	34144	Antenna Dimensions	33.1 x 20.6 x 8.6	Quantity	3

Wednesday, December 23, 2020

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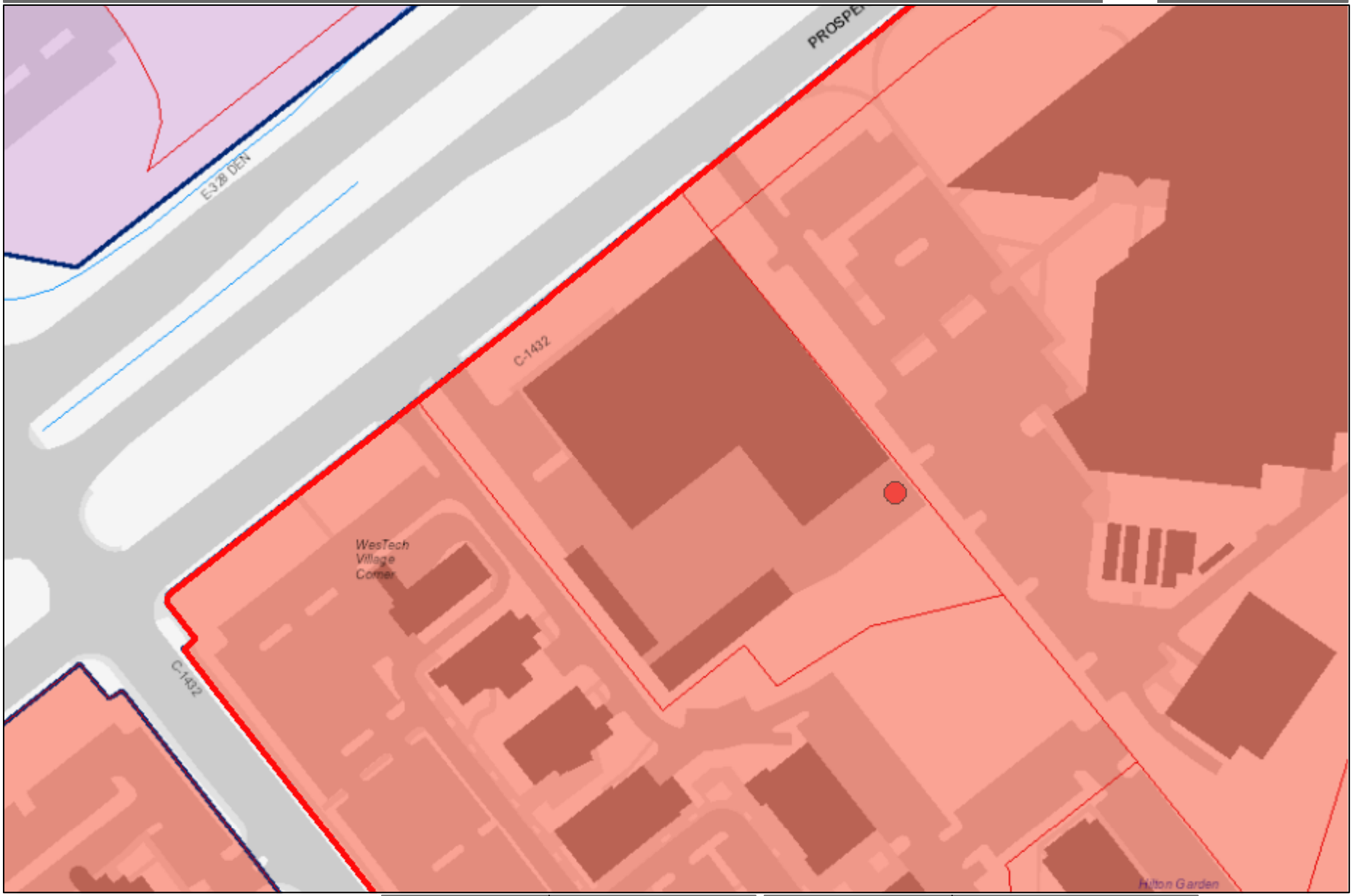
Montgomery County Zoning

Date: 12/18/2020

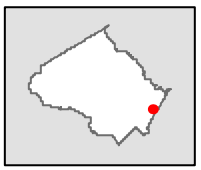
Montgomery County
Planning Department
ITI Division



Account #	03278897
Address	12355 PROSPERITY DR
Zone	CR-0.75 C-0.75 R-0.25 H-75
Overlay Zone	N/A
TDR Overlay Zone	N/A
Landuse	Industrial
Parcel, Lot, Block	N701 , 37 , N/A
WSSC Grid	216NE03
Map Amendments	N/A

Parking District	N/A
CBD	N/A
Special Protection Area	N/A
Urban District	N/A
Enterprise Zone	N/A
Arts & Ent. District	N/A
Special Tax District	N/A
Legal Description	MONTGOMERY IND PARK

Bike/Ped Priority Area	White Oak Science Gateway
Urban Renewal Area	N/A
Metro Station Policy Area	N/A
Priority Funding Area	Yes
Septic Tier	Tier 1: Sewer existing
Municipality	N/A
Master Plan	WHITE OAK SCIENCE GATEWAY
Historic Site/District	N/A
Water/Sewer Categories	W-1 / S-1



1 inch = 172 feet

New Product Introduction

Massive MIMO Mid-Band
AIR6449 B41
New Product Introduction Notification

ERICSSON

(Refresh: Update on AIR6449 usage for NY Boroughs)

PURPOSE

Ericsson's next generation AIR6449 B41 massive MIMO (M-MIMO) single band product provides additional RF power and has full band IBW sufficient to transmit 180 MHz of 4G/5G carrier bandwidth (vs. AIR6488 60 + 60 MHz carrier bandwidth). The AIR6449 also offers enhanced RF performance via a 192 antenna element array (vs. AIR6488 with 128).

BACKGROUND

The AIR6449 has a combined antenna/radio with 64 TRX. It has advantages over the previous AIR6488 model such as:

- Full 194 MHz IBW with NR+LTE mixed mode vs. 100 MHz on AIR6488
- Smaller dimensions (in height) and lighter in weight
- 25 Gbps eCPRI support

AIR 6488 vs. AIR 6449 comparison is available at this link.

USAGE GUIDELINES

- AIR6449 is planned to replace AIR6488 on a go forward basis once available
- Full Anchor Design (2.5GHz + PCS) or 2.5GHz Only (AKA "Skinny")
- All markets except New York Boroughs
    - Use existing AIR6488 if entitlement is complete or expected to complete before July 1st, 2020 (see AIR6488 NPI)
    - Use existing AIR6488 if site is expected to be on-air before July 1st, 2020 (see AIR6488 NPI)
    - Use AIR6449 if entitlement complete is forecasted after July 1st, 2020
- **New York Boroughs**
    - **NY is no longer required to use the AIR6488M product as of 6/12/2020 since T-Mobile now has access to the spectrum blocks previously used by public safety. NY should start entitling for AIR6449 starting with July'20 SC POR. August'20 HC POR should be built using AIR6449.**

TIMELINES

- Lab Entry: April 2020
- GA: July 03 2020
- New RFDS Templates for Anchor PORs reflecting AIR6449 have been created.
- This next generation hardware is expected to be available in commercial quantities in July 2020.

AFFECTED CONFIGURATIONS

Sites must be on an Anchor POR to use the AIR6449.

Site configurations that are designed with AIR6449 B41 will have a "**5A**" (5 for 2.5GHz + A for AIR6449) after the low-band indicator and/or before L19 indicator in the naming convention e.g., 67D92DB => 67D**5A**992DB, 92DB => **5A**992DB, etc.

PRODUCT DESCRIPTION

Frequency Range	LTE TDD B41: 2496 – 2690 MHz
Instantaneous BW	DL 194 MHz
Antenna Ports	64T64R
Technology	NR, LTE and NR+LTE MSMM
Antenna Elements	192
Output RF Power	320 W (=64 TRX x 5W)
Data Ports	4 x 25Gb/s CPRI
5G NR Support	YES
DC Feed	-48V DC power connector
Cooling	Passive cooling (vs. active cooling on AIR32 DB)
Dimensions (H x W x D)	33.1" x 20.6" x 8.6" inches (=841 x 524 x 217 mm)
Weight	104 lbs (=47 kg)
Electrical downtilt	-3 to 11 degrees
Horizontal beamwidth	+/- 65 degrees
HW/SW Availability	July 2020
Material SAP #	34105 – AIR 6449 B41

WARRANTY: 1 Year

SPARES: 2% of install base. Additional units can be requested as per need.

Baseband Requirements

For a typical 3-sector site,

- LTE: one dedicated BB6630 per site
- NR: one dedicated BB6648 (see its NPI) per site

Supplementary/Ancillary Materials

SKU	Description	Qty
34106	AIR6449 mandatory install kit	1 per AIR6449
34110	AIR6449 25G SFP	8 per AIR6449

The AIR6449 requires a voltage booster (i.e., PSU 4813) in almost all cases when using the current HCS 6x12. Please refer to Voltage Booster design doc for its usage guidance (depending on the HCS length and gauge). Note the installation kit is different for each cabinet type.

SKU	Description	Qty
34132	PSU 4813 main unit	1
34133	PSU installation kit for RBS61xx	Choose 1 per cabinet type
34134	PSU installation kit for PBC6200	
34135	PSU installation kit for E6x60/P6230	

LINKS

- Ericsson New T-Mobile Anchor Network Playbook
- AIR 6488 vs. AIR 6449 Comparison

CONTACTS

Kyuho Son	Principal Engineer, RAN Architecture
Weston Berry	Engineer, RAN Architecture

Revision received 1.5.21 - JE

Radio Frequency Emissions Analysis Report

T-Mobile Wireless Monopole Facility

December 21, 2020

Analysis Format: Theoretical Calculations

Sign Count	
	1
	0
	1
	0

Statement of Compliance

T-Mobile will be compliant with FCC Regulations once the mitigation measures recommended in this report are implemented.

7WAN124I
Public Storage-Prosperity
12355 Prosperity Drive, Silver Spring, MD 20904

Contents

Overview

Centerline Communications, LLC ("Centerline") has been contracted to provide a Radio Frequency (RF) Analysis for the following T-Mobile wireless monopole facility to determine whether the facility is in compliance with federal standards and regulations regarding RF emissions. This analysis includes theoretical emissions calculations for all existing equipment for T-Mobile .

The facility is located on a 140' monopole in Silver Spring, Maryland. Access to the facility is restricted to authorized personnel and facility management.

Analysis Site Data

Site ID:	7WAN124I
Site Name:	Public Storage-Prosperity
Site Address:	12355 Prosperity Drive, Silver Spring, MD 20904
Site Latitude:	39.057840
Site Longitude:	-76.96554
Facility Type:	Monopole

Compliance Summary

Status:	T-Mobile will be compliant with FCC Regulations Upon Installation of Signage
Site Modeled Composite MPE% (General Public Limit):	7.20 %
T-Mobile Max Modeled MPE% (General Public Limit):	7.20 %
Lock or Control Measures if Present:	Unlocked Gate

In addition to the T-Mobile antennas and radio equipment there are antennas and radio equipment for AT&T, Verizon which have been included in this analysis as part of the overall site compliance determination.

*To be conservative, all sites are considered uncontrolled for modeling purposes unless confirmed otherwise by a site visit.

FCC Guidelines

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 600, 700, and 800 MHz Bands is approximately 400 $\mu W/cm^2$, 467 $\mu W/cm^2$, and 567 $\mu W/cm^2$ respectively, and the general population exposure limit for the 1900 MHz PCS, 2100 MHz AWS, 2500 MHz, 3500 MHz CBRS, 5000 MHz LAA, 28GHz, and 39GHz bands is 1000 $\mu W/cm^2$. 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. Reference the Site Antenna Data Table for list of frequencies in operation at this site.

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, have been properly trained in RF safety 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, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

Additional details can be found in FCC OET 65.

Calculation Methodology & Data

Centerline has performed theoretical calculations on all transmission equipment located on this facility. All calculations have been performed using the RoofMaster® software from Waterford Consultants LLC. This software performs calculations using a cylindrical model for very conservative power density predictions within the near-field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations the power decreases inversely with the square of the distance. This modeling technique is accurate with low antenna centerlines, such as rooftops, where persons can get close to the antennas and pass through fields in close proximity.

The below calculation in Figure 1 shows the theoretical distribution of power over an imaginary cylinder with equal power distribution in all directions.

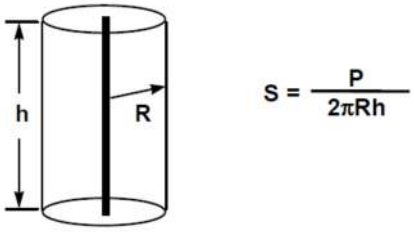


Figure 1: Distribution of power over an imaginary cylinder in all directions

This model can be modified for directional antennas to show directionality of power distribution. This formula will tend to be conservative as it assumes that all power is focused between the 3 dB power roll off points as shown in Figure 2.

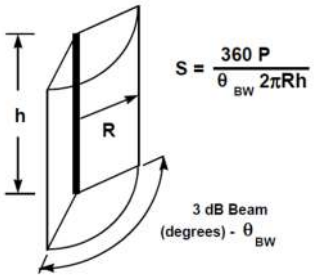


Figure 2: Distribution of power over an imaginary cylinder in all directions inside the half power roll off points (HBW)

The **proposed antenna configuration** for T-Mobile and any other known wireless carriers at this facility are shown below in **Table 1 – Site Antenna Data Table**.

All calculations for this facility were performed assuming that all radios were running at full power and were uncombined in their RF paths with the configuration shown in table 1. FCC OET Bulletin 65 – Edition 97-01 recommends that modeling of this nature should be done as described prior to yield a worst-case scenario. Due to the dynamic nature of many deployed systems the "real world" values will most likely be less than those shown in this report due to worst-case values being shown in all instances.

For all "Other" systems on this facility, exact equipment was used if available. In instances where "Other" system equipment was not available, standard radio configurations for these systems were utilized based upon prior experience with these systems on facilities in this area.

Site Antenna Data Table

Sector	Operator	Frequency Band	TX Power Per Channel	Tx #	ERP	Antenna Make	Antenna Model	Gain (dBd)	Az (°)	Antenna Centerline Height (ft)	Z Value (ft)**
A1	T-Mobile	L1900	40	4	8037.48	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	333/27	139	98.99
A1	T-Mobile	L1900	40	4	8168.08	COMMSCOPE	2HH-38A-R4-V2 p27	17.08	333/27	139	98.99
A1	T-Mobile	G1900	15	1	753.51	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	333/27	139	98.99
A2	T-Mobile	L700	40	4	3389.38	RFS	APXVAARR24 43-U-NA20	13.26	0	139	97.00
A2	T-Mobile	L600	40	2	1588.88	RFS	APXVAARR24 43-U-NA20	12.98	0	139	97.00
A2	T-Mobile	N600	30	2	1191.66	RFS	APXVAARR24 43-U-NA20	12.98	0	139	97.00
A2	T-Mobile	U2100	40	1	2244.19	RFS	APXVAARR24 43-U-NA20	17.49	0	139	97.00
A3	T-Mobile	L2100	40	2	4842.73	COMMSCOPE	2HH-38A-R4-V2 m27	17.82	333/27	139	98.99
A3	T-Mobile	L2100	40	2	4932.76	COMMSCOPE	2HH-38A-R4-V2 p27	17.9	333/27	139	98.99
A4	T-Mobile	L/N2500	60	1	3222.19	ERICSSON	AIR 6449 LTE MACRO	17.3	0	139	99.62
A4	T-Mobile	L2500	90	1	15461.18	ERICSSON	AIR 6449 LTE TB	22.35	0	139	99.62
A4	T-Mobile	N2500	90	1	15461.18	ERICSSON	AIR 6449 NR TB	22.35	0	139	99.62
B5	T-Mobile	L700	40	4	3389.38	RFS	APXVAARR24 43-U-NA20	13.26	90	139	97.00
B5	T-Mobile	L600	40	2	1588.88	RFS	APXVAARR24 43-U-NA20	12.98	90	139	85.00
B5	T-Mobile	N600	30	2	1191.66	RFS	APXVAARR24 43-U-NA20	12.98	90	139	85.00
B5	T-Mobile	U2100	40	1	2244.19	RFS	APXVAARR24 43-U-NA20	17.49	90	139	85.00
B6	T-Mobile	L1900	40	4	8037.48	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	63/117	139	86.99
B6	T-Mobile	L1900	40	4	8205.78	COMMSCOPE	2HH-38A-R4-V2 p27	17.1	63/117	139	86.99
B6	T-Mobile	G1900	15	1	753.51	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	63/117	139	86.99
B7	T-Mobile	L2100	40	2	4842.73	COMMSCOPE	2HH-38A-R4-V2 m27	17.82	63/117	139	86.99
B7	T-Mobile	L2100	40	2	4944.13	COMMSCOPE	2HH-38A-R4-V2 p27	17.91	63/117	139	86.99
B8	T-Mobile	L/N2500	60	1	3222.19	ERICSSON	AIR 6449 LTE MACRO	17.3	90	139	87.62
B8	T-Mobile	L2500	90	1	15461.18	ERICSSON	AIR 6449 LTE TB	22.35	90	139	87.62
B8	T-Mobile	N2500	90	1	15461.18	ERICSSON	AIR 6449 NR TB	22.35	90	139	87.62
C9	T-Mobile	L700	40	4	3389.38	RFS	APXVAARR24 43-U-NA20	13.26	285	139	97.00
C9	T-Mobile	L600	40	2	1588.88	RFS	APXVAARR24 43-U-NA20	12.98	285	139	97.00
C9	T-Mobile	N600	30	2	1191.66	RFS	APXVAARR24 43-U-NA20	12.98	285	139	97.00
C9	T-Mobile	U2100	40	1	2244.19	RFS	APXVAARR24 43-U-NA20	17.49	285	139	97.00
C10	T-Mobile	L1900	40	4	8037.48	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	312/213	139	98.99
C10	T-Mobile	L1900	40	4	8168.08	COMMSCOPE	2HH-38A-R4-V2 p27	17.08	312/213	139	98.99
C10	T-Mobile	G1900	15	1	753.51	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	312/213	139	98.99
C11	T-Mobile	L2100	40	2	4842.73	COMMSCOPE	2HH-38A-R4-V2 m27	17.82	312/213	139	98.99
C11	T-Mobile	L2100	40	2	4932.76	COMMSCOPE	2HH-38A-R4-V2 p27	17.9	312/213	139	98.99
C12	T-Mobile	L/N2500	60	1	3222.19	ERICSSON	AIR 6449 LTE MACRO	17.3	285	139	99.62
C12	T-Mobile	L2500	90	1	15461.18	ERICSSON	AIR 6449 LTE TB	22.35	285	139	99.62

Sector	Operator	Frequency Band	TX Power Per Channel	Tx #	ERP	Antenna Make	Antenna Model	Gain (dBd)	Az (°)	Antenna Centerline Height (ft)	Z Value (ft)**
C12	T-Mobile	N2500	90	1	15461.18	ERICSSON	AIR 6449 NR TB	22.35	285	139	99.62
13	AT&T	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	0	116	75.00
14	AT&T	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	0	116	75.00
15	AT&T	1900	30	4	4604.49	GENERIC	PANEL 6FT	15.84	0	116	75.00
15	AT&T	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	0	116	75.00
16	AT&T	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	90	116	75.00
17	AT&T	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	90	116	75.00
18	AT&T	1900	30	4	4604.49	GENERIC	PANEL 6FT	15.84	90	116	75.00
18	AT&T	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	90	116	75.00
19	AT&T	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	285	116	75.00
20	AT&T	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	285	116	75.00
21	AT&T	1900	30	4	4604.49	GENERIC	PANEL 6FT	15.84	285	116	75.00
21	AT&T	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	285	116	75.00
22	Verizon	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	0	70	29.00
23	Verizon	1900	40	4	6139.32	GENERIC	PANEL 6FT	15.84	0	70	29.00
24	Verizon	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	0	70	29.00
25	Verizon	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	0	70	29.00
26	Verizon	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	90	70	29.00
27	Verizon	1900	40	4	6139.32	GENERIC	PANEL 6FT	15.84	90	70	29.00
28	Verizon	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	90	70	29.00
29	Verizon	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	90	70	29.00
30	Verizon	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	285	70	29.00
31	Verizon	1900	40	4	6139.32	GENERIC	PANEL 6FT	15.84	285	70	29.00
32	Verizon	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	285	70	29.00
33	Verizon	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	285	70	29.00

*Table 1: Total Site Antenna data table **(Z Value is distance from bottom of antenna to walking surface)*

Results

All calculations performed based upon the data listed for this facility have produced results that are within allowable limits for General Population for exposure to RF emissions as specified by federal standards.

T-Mobile's RF Exposure: Responsibilities, Procedures & Guidelines document states that microwave dishes are compliant if they are mounted 20 feet or greater above any accessible walking or working surface.

Maximum Predicted MPE Level on Site:	% of MPE Limit:	Location:
Accessible **General Population** MPE Limits:	**7.20%**	**Sector B**
Accessible **Occupational** MPE Limits:	**1.44%**	

Ground Level Assessment:	% of MPE Limit:
Ground Level **General Population** MPE Limits:	**3.62%**
Ground Level **Occupational** MPE Limits:	**0.72%**

Sector A: Transmitting over Building1	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**6.65%**	**N/A**
Accessible **Occupational** MPE Limits:	**1.33%**	**N/A**

Sector B: Transmitting over Building2	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**7.20%**	**N/A**
Accessible **Occupational** MPE Limits:	**1.44%**	**N/A**

Sector C: Transmitting over Building1	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**5.87%**	**N/A**
Accessible **Occupational** MPE Limits:	**1.17%**	**N/A**

**Distance from Antenna is the distance that the MPE limits are exceeded from the front face of the antenna, outward across an accessible area.*

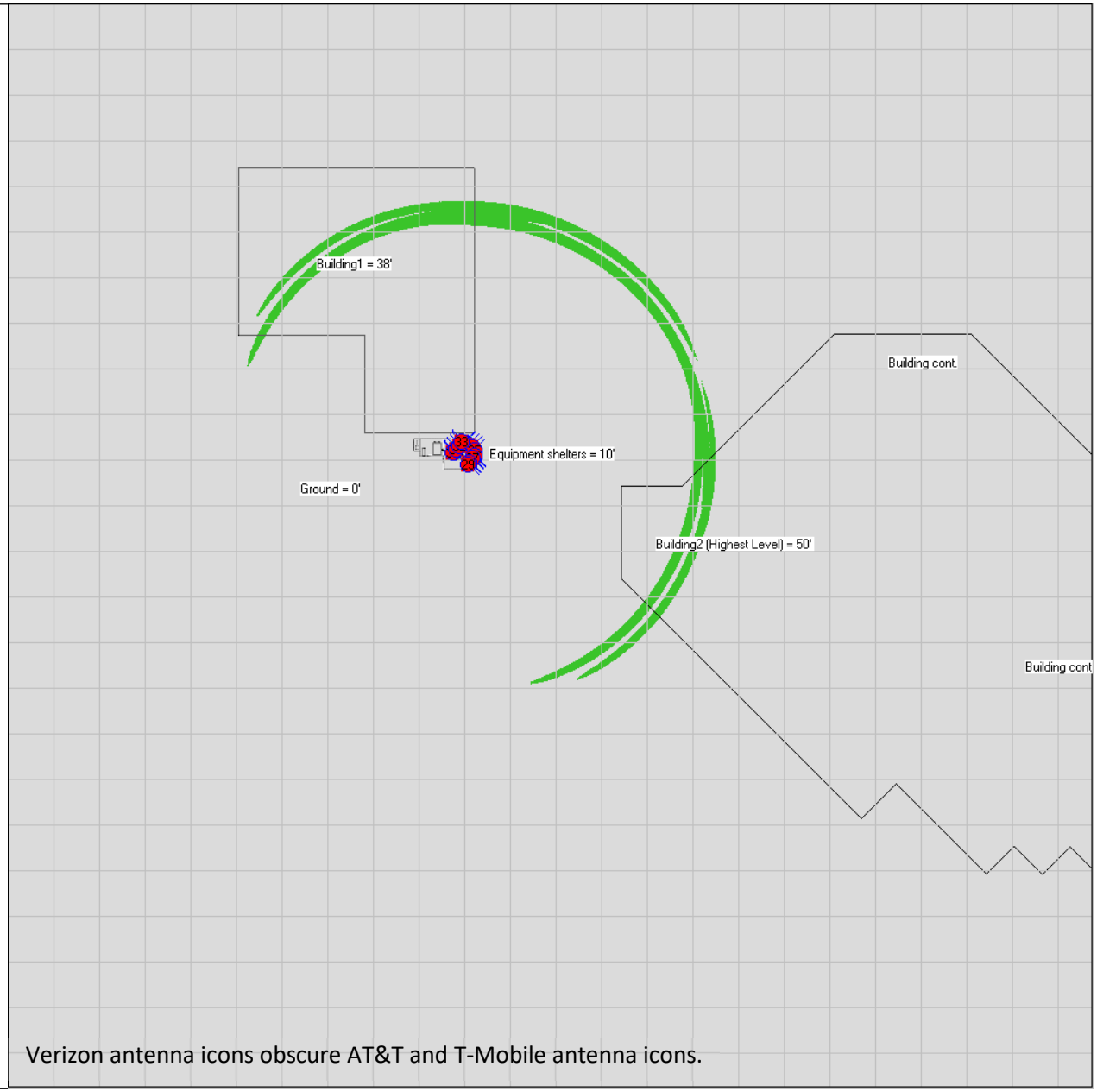
APPENDIX A: Emissions Thresholds for Walking Surfaces and Signage

Building1 (38ft.)

Emissions Thresholds for Walking Surfaces for:

7WAN124I / Public Storage-Prosperity

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.

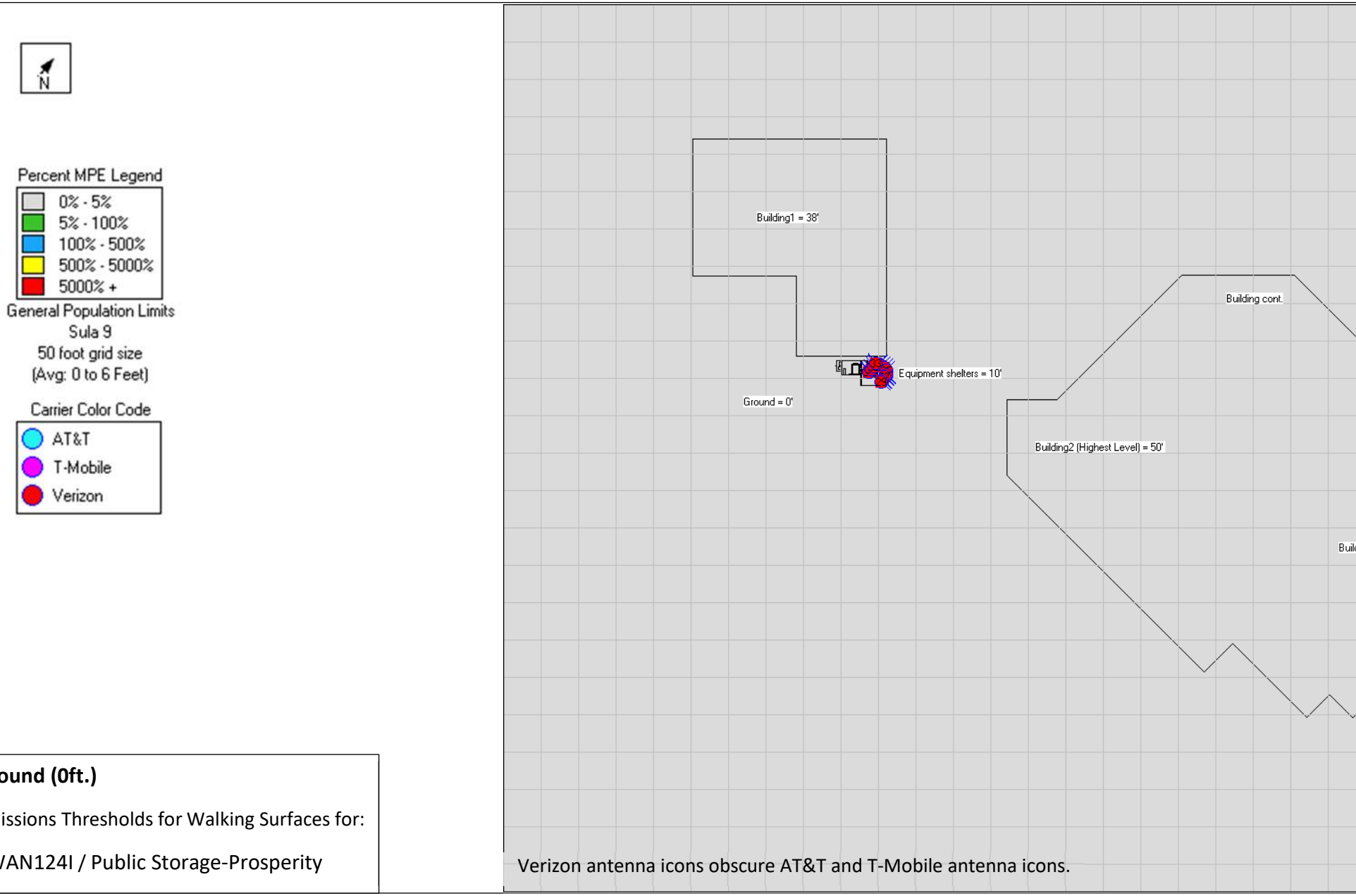


Building2 (50ft.)

Emissions Thresholds for Walking Surfaces for:

7WAN124I / Public Storage-Prosperity

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.

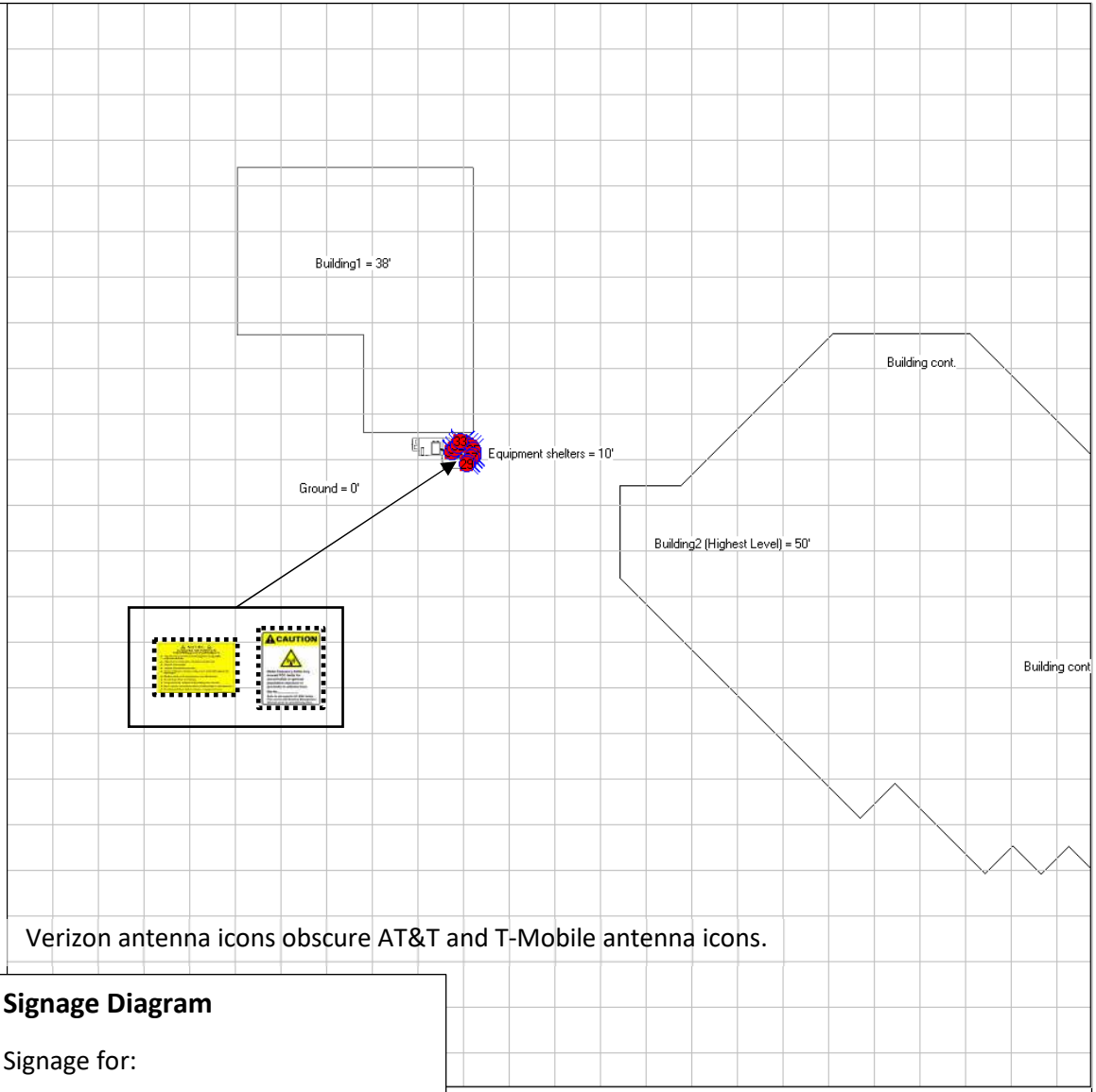


Ground (0ft.)

Emissions Thresholds for Walking Surfaces for:

7WAN124I / Public Storage-Prosperity

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.



Existing Item

Proposed Item

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.

Signage Count							
	1		0		1		0

Signage Diagram

Signage for:

7WAN124I/ Public Storage-Prosperity

Compliance Actions:

Monopole Base	• Install (1) Guideline sign on the base of the monopole. • Install (1) Caution sign on the base of the monopole.
Alpha Sector	• No Action Needed.
Beta Sector	• No Action Needed.
Gamma sector	• No Action Needed.
Notes:	• If there is a fixed climbing point located on this site, the Guideline and Caution sign should be installed at that location.

APPENDIX B: RF Signage Description Table

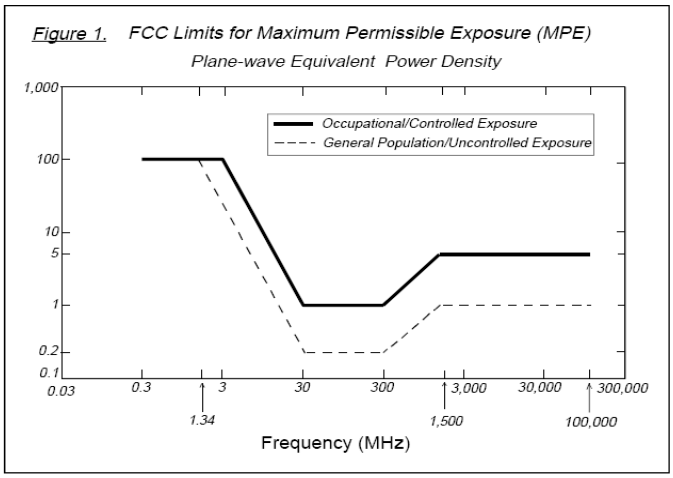
Sign	Description
	**RF Guideline Sign** Gives guidelines on how to proceed in areas that may exceed either the FCC's General Population or Occupational emissions limits.
	**Blue Notice Sign** Used to inform individuals that they are entering an area that may exceed the FCC's General Population limits. Must be placed anywhere the public can get within 30 feet vertically or horizontally of an antenna.
	**Yellow Caution Sign** Used to inform individuals that they are entering an area that may exceed the either the FCC's General Population or Occupational Emissions limits. It must be placed so it is visible from all approachable sides. It must also be just outside of the area predicted to exceed the MPE limits so it can be read without standing within the affected area.
	**Red Warning Sign** Used to inform individuals that they are entering an area that may exceed 5x the FCC's Occupational emissions limit. It must be placed so it is visible from all approachable sides. It must also be just outside of the area predicted to exceed the MPE limits so it can be read without standing within the affected area.

APPENDIX C: FCC Emissions Threshold Limits

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-I,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-I,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

* Plane-wave equivalent power density



APPENDIX D: Certifications

I, Erin Kavanaugh, preparer of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in T-Mobile's FCC Regulatory Compliance Manual.

Erin Kavanaugh

12/21/2020

I, Brandon Green, reviewer and approver of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in T-Mobile's FCC Regulatory Compliance Manual.

Brandon Green

12/21/2020

Date: **December 01, 2020**

Cheryl Schultz
Crown Castle
6325 Ardrey Kell Rd Suite 600
Charlotte, NC 28277

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	7WAN124I
	Carrier Site Name:	Public Storage-Prosperity
Crown Castle Designation:	**Crown Castle BU Number:**	826849
	Crown Castle Site Name:	Public Storage-Prosperity
	Crown Castle JDE Job Number:	608016
	Crown Castle Work Order Number:	1902871
	Crown Castle Order Number:	519470 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1902871
Site Data:	**12355 Prosperity Drive, District 5, Montgomery County, MD** **Latitude *39° 3' 28.26"*, Longitude *-76° 57' 55.79"*** **140 Foot - Monopole Tower**	

Dear Cheryl Schultz,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

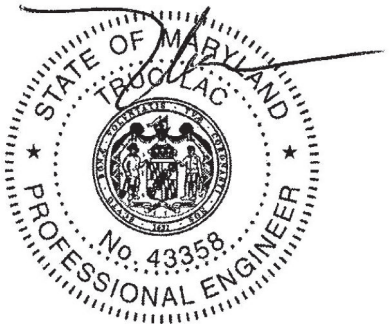
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2018 International Building Code based upon an ultimate 3-second gust wind speed of 113 mph. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Patrick Himes 12/1/2020

Respectfully submitted by:



Truc Lac, P.E., S.E.
Senior Project Engineer

Professional Certification:
I hereby certify that these documents were prepared or approved by me, and that I am duly licensed professional engineer under the laws of the State of Maryland.
License No. 43358. Expiration Date: 02/26/2021

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by Valmont PennSummit. The tower has been modified in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	113 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	40 mph
Service Wind Speed:	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)
138.0	139.0	6	commscope	2HH-38A-R4 w/ Mount Pipe	6 1	1-3/8 1-5/8
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		6	ericsson	RADIO 4424		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 01		
		6	ericsson	RRUS 32 B66A		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	138.0	1	tower mounts	Platform Mount [LP 701-1]		

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)
115.0	117.0	3	nokia	AIRSCALE RRH 4T4R B5 160W	6 4 2	1-5/8 7/8 3/8
	116.0	3	alcatel lucent	RRH4X25-WCS		
		6	commscope	NNHH-65C-R4		
		3	commscope	SBJAH4-1D65C-DL		
		2	commscope	WCS-IMFQ-AMT-43		
		3	nokia	AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA		
		2	nokia	AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB		
		2	raycap	DC6-48-60-18-8F		
	115.0	1	nokia	AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB		
		1	tower mounts	Platform Mount [LP 1301-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
70.0	70.0	3	alcatel lucent	B13 RRH2X60-4R	2	1-1/4
		3	alcatel lucent	B66A RRH4X45-4R		
		4	jma wireless	MX06FRO840-02 w/ Mount Pipe		
		2	jma wireless	MX06FRO860-02 w/ Mount Pipe		
		2	raycap	RHSDC-3315-PF-48		
		1	tower mounts	Platform Mount [LP 402-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Hillis-Carnes Engineering Associates, Inc	3480612	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	3753526	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	3480613	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Crown Castle	7876925	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solutions, PLLC	8201886	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.7.5), 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. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

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. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	140 - 135	Pole	TP20.77x20x0.1875	Pole	8.0%	Pass
L2	135 - 130	Pole	TP21.54x20.77x0.1875	Pole	17.6%	Pass
L3	130 - 125	Pole	TP22.311x21.54x0.1875	Pole	26.4%	Pass
L4	125 - 120	Pole	TP23.081x22.311x0.1875	Pole	34.5%	Pass
L5	120 - 115	Pole	TP23.851x23.081x0.1875	Pole	42.1%	Pass
L6	115 - 110	Pole	TP24.621x23.851x0.1875	Pole	55.9%	Pass
L7	110 - 105	Pole	TP25.391x24.621x0.1875	Pole	67.5%	Pass
L8	105 - 100	Pole	TP26.162x25.391x0.1875	Pole	78.3%	Pass
L9	100 - 95	Pole	TP26.932x26.162x0.1875	Pole	88.3%	Pass
L10	95 - 92.75	Pole	TP27.856x26.932x0.1875	Pole	92.5%	Pass
L11	92.75 - 87.75	Pole	TP27.673x26.903x0.25	Pole	70.8%	Pass
L12	87.75 - 82.75	Pole	TP28.444x27.673x0.25	Pole	76.4%	Pass
L13	82.75 - 77.75	Pole	TP29.214x28.444x0.25	Pole	81.5%	Pass
L14	77.75 - 72.75	Pole	TP29.984x29.214x0.25	Pole	86.3%	Pass
L15	72.75 - 67.75	Pole	TP30.754x29.984x0.25	Pole	91.8%	Pass
L16	67.75 - 62.75	Pole	TP31.524x30.754x0.25	Pole	97.4%	Pass
L17	62.75 - 61.5	Pole	TP31.717x31.524x0.25	Pole	98.8%	Pass
L18	61.5 - 61.25	Pole + Reinf.	TP31.755x31.717x0.5125	Reinf. 2 Tension Rupture	71.0%	Pass
L19	61.25 - 56.25	Pole + Reinf.	TP32.525x31.755x0.5125	Reinf. 2 Tension Rupture	75.1%	Pass
L20	56.25 - 51.25	Pole + Reinf.	TP33.295x32.525x0.5	Reinf. 2 Tension Rupture	79.0%	Pass
L21	51.25 - 51	Pole + Reinf.	TP34.027x33.295x0.5	Reinf. 2 Tension Rupture	79.2%	Pass
L22	51 - 45.5	Pole	TP33.681x32.834x0.3125	Pole	88.1%	Pass
L23	45.5 - 40.5	Pole	TP34.451x33.681x0.3125	Pole	91.3%	Pass
L24	40.5 - 35.5	Pole	TP35.222x34.451x0.3125	Pole	94.3%	Pass
L25	35.5 - 30.5	Pole	TP35.992x35.222x0.3125	Pole	97.0%	Pass
L26	30.5 - 28	Pole	TP36.377x35.992x0.3125	Pole	98.4%	Pass
L27	28 - 27.75	Pole + Reinf.	TP36.415x36.377x0.625	Reinf. 1 Tension Rupture	73.2%	Pass
L28	27.75 - 22.75	Pole + Reinf.	TP37.186x36.415x0.625	Reinf. 1 Tension Rupture	75.4%	Pass
L29	22.75 - 17.75	Pole + Reinf.	TP37.956x37.186x0.6125	Reinf. 1 Tension Rupture	77.5%	Pass
L30	17.75 - 12.75	Pole + Reinf.	TP38.726x37.956x0.6	Reinf. 1 Tension Rupture	79.6%	Pass
L31	12.75 - 7.75	Pole + Reinf.	TP39.496x38.726x0.6	Reinf. 1 Tension Rupture	81.5%	Pass
L32	7.75 - 2.75	Pole + Reinf.	TP40.266x39.496x0.5875	Reinf. 1 Tension Rupture	83.4%	Pass
L33	2.75 - 0	Pole + Reinf.	TP40.69x40.266x0.5875	Reinf. 1 Tension Rupture	84.4%	Pass
					Summary	
				Pole	98.8%	Pass
				Reinforcement	84.4%	Pass
				Overall	98.8%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	80.0	Pass
1	Base Plate	0	65.0	Pass
1	Base Foundation Structural	0	77.3	Pass
1	Base Foundation Soil Interaction	0	69.9	Pass

Structure Rating (max from all components) =	98.8%

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

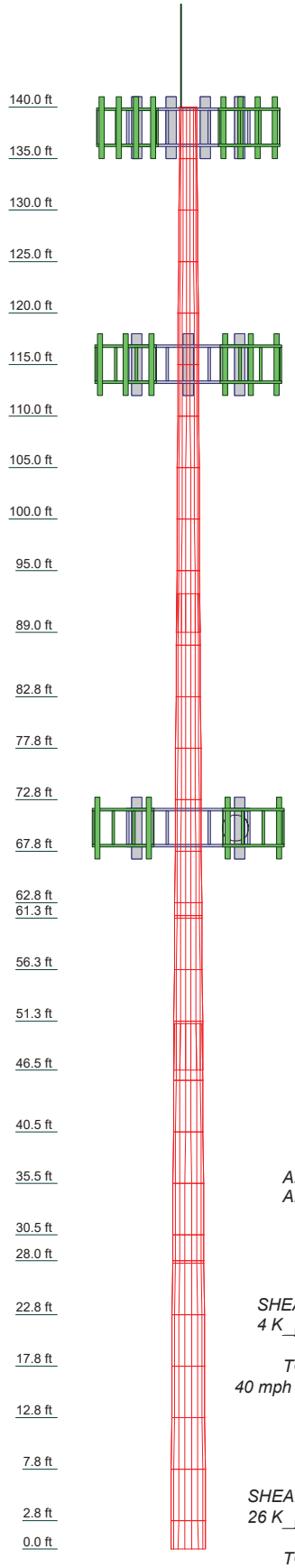
4.1) Recommendations

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

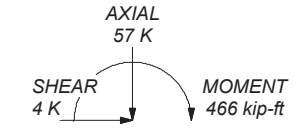
APPENDIX A

TNXTOWER OUTPUT

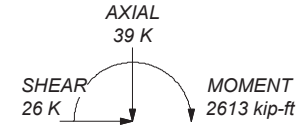
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.0000	18	0.1875		20.0000	20.7702		0.2
2	5.0000	18	0.1875		20.7702	21.5404		0.2
3	5.0000	18	0.1875		21.5404	22.3106		0.2
4	5.0000	18	0.1875		22.3106	23.0808		0.2
5	5.0000	18	0.1875		23.0808	23.8510		0.2
6	5.0000	18	0.1875		23.8510	24.6212		0.2
7	5.0000	18	0.1875		24.6212	25.3914		0.3
8	5.0000	18	0.1875		25.3914	26.1616		0.3
9	5.0000	18	0.1875		26.1616	26.9318		0.3
10	5.0000	18	0.1875	3.7500	26.9318	27.8560		0.3
11	5.0000	18	0.2500		27.8560	28.6726		0.4
12	5.0000	18	0.2500		28.6726	29.4436		0.4
13	5.0000	18	0.2500		29.4436	30.2137		0.4
14	5.0000	18	0.2500		30.2137	30.9838		0.4
15	5.0000	18	0.2500		30.9838	31.7540		0.4
16	5.0000	18	0.2500		31.7540	32.5241		0.4
17	2.5000	18	0.2500		32.5241	32.7741		0.1
18	2.5000	18	0.2500		32.7741	33.0241		0.1
19	5.0000	18	0.5125		33.0241	33.7954		0.8
20	5.0000	18	0.5000		33.7954	34.5667		0.8
21	5.0000	18	0.5000	4.5000	34.5667	35.3379		0.8
22	2.5000	18	0.3125		35.3379	35.5879		0.4
23	5.0000	18	0.3125		35.5879	36.3592		0.6
24	5.0000	18	0.3125		36.3592	37.1304		0.6
25	5.0000	18	0.3125		37.1304	37.9017		0.6
26	2.5000	18	0.3125		37.9017	38.1517		0.3
27	2.5000	18	0.3125		38.1517	38.4017		0.3
28	5.0000	18	0.6250		38.4017	39.1729		1.2
29	5.0000	18	0.6125		39.1729	39.9442		1.2
30	5.0000	18	0.6000		39.9442	40.7154		1.2
31	5.0000	18	0.6000		40.7154	41.4867		1.2
32	5.0000	18	0.5875		41.4867	42.2579		1.2
33	2.7500	18	0.5875		42.2579	42.5329		0.7
							A572-65	16.8



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
40 mph WIND - 1.0000 in ICE



TORQUE 1 kip-ft
REACTIONS - 113 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Montgomery County, Maryland.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 113 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 98.8%

CROWN CASTLE
The Pathway to Possible

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

Job: ***BU# 826849***			
Project:			
Client: Crown Castle	Drawn by: phimes		App'd:
Code: TIA-222-H	Date: 12/01/20		Scale: NTS
Path: C:\Users\phimes\Desktop\Work Area\826849\WO 1902871 - SA\Prod\826849 - Reinforced.er			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

3) Tower is located in Montgomery County, Maryland.
4) Tower base elevation above sea level: 377.0000 ft.
5) Basic wind speed of 113 mph.
6) Risk Category II.
7) Exposure Category C.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.0000 ft.
11) Nominal ice thickness of 1.0000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56.00 pcf.
14) A wind speed of 40 mph is used in combination with ice.
15) Temperature drop of 50 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) TOWER RATING: 98.8%.
18) A non-linear (P-delta) analysis was used.
19) Pressures are calculated at each section.
20) Stress ratio used in pole design is 1.05.
21) Tower analysis based on target reliabilities in accordance with Annex S.
22) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
23) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	140.0000-135.0000	5.0000	0.00	18	20.0000	20.7702	0.1875	0.7500	A572-65 (65 ksi)
L2	135.0000-130.0000	5.0000	0.00	18	20.7702	21.5404	0.1875	0.7500	A572-65 (65 ksi)
L3	130.0000-125.0000	5.0000	0.00	18	21.5404	22.3106	0.1875	0.7500	A572-65 (65 ksi)
L4	125.0000-120.0000	5.0000	0.00	18	22.3106	23.0808	0.1875	0.7500	A572-65 (65 ksi)
L5	120.0000-115.0000	5.0000	0.00	18	23.0808	23.8510	0.1875	0.7500	A572-65 (65 ksi)
L6	115.0000-110.0000	5.0000	0.00	18	23.8510	24.6212	0.1875	0.7500	A572-65 (65 ksi)
L7	110.0000-105.0000	5.0000	0.00	18	24.6212	25.3914	0.1875	0.7500	A572-65 (65 ksi)
L8	105.0000-100.0000	5.0000	0.00	18	25.3914	26.1616	0.1875	0.7500	A572-65 (65 ksi)
L9	100.0000-95.0000	5.0000	0.00	18	26.1616	26.9318	0.1875	0.7500	A572-65 (65 ksi)
L10	95.0000-89.0000	6.0000	3.75	18	26.9318	27.8560	0.1875	0.7500	A572-65 (65 ksi)
L11	89.0000-87.7500	5.0000	0.00	18	26.9034	27.6735	0.2500	1.0000	A572-65 (65 ksi)
L12	87.7500-82.7500	5.0000	0.00	18	27.6735	28.4436	0.2500	1.0000	A572-65 (65 ksi)
L13	82.7500-77.7500	5.0000	0.00	18	28.4436	29.2137	0.2500	1.0000	A572-65 (65 ksi)
L14	77.7500-72.7500	5.0000	0.00	18	29.2137	29.9838	0.2500	1.0000	A572-65 (65 ksi)
L15	72.7500-67.7500	5.0000	0.00	18	29.9838	30.7540	0.2500	1.0000	A572-65 (65 ksi)
L16	67.7500-62.7500	5.0000	0.00	18	30.7540	31.5241	0.2500	1.0000	A572-65 (65 ksi)
L17	62.7500-61.5000	1.2500	0.00	18	31.5241	31.7166	0.2500	1.0000	A572-65 (65 ksi)
L18	61.5000-61.2500	0.2500	0.00	18	31.7166	31.7551	0.5125	2.0500	A572-65 (65 ksi)
L19	61.2500-56.2500	5.0000	0.00	18	31.7551	32.5253	0.5125	2.0500	A572-65 (65 ksi)
L20	56.2500-51.2500	5.0000	0.00	18	32.5253	33.2954	0.5000	2.0000	A572-65 (65 ksi)
L21	51.2500-46.5000	4.7500	4.50	18	33.2954	34.0270	0.5000	2.0000	A572-65 (65 ksi)
L22	46.5000-45.5000	5.5000	0.00	18	32.8339	33.6811	0.3125	1.2500	A572-65 (65 ksi)
L23	45.5000-40.5000	5.0000	0.00	18	33.6811	34.4513	0.3125	1.2500	A572-65 (65 ksi)
L24	40.5000-35.5000	5.0000	0.00	18	34.4513	35.2215	0.3125	1.2500	A572-65 (65 ksi)
L25	35.5000-30.5000	5.0000	0.00	18	35.2215	35.9917	0.3125	1.2500	A572-65 (65 ksi)
L26	30.5000-28.0000	2.5000	0.00	18	35.9917	36.3768	0.3125	1.2500	A572-65 (65 ksi)
L27	28.0000-27.7500	0.2500	0.00	18	36.3768	36.4154	0.6250	2.5000	A572-65 (65 ksi)
L28	27.7500-22.7500	5.0000	0.00	18	36.4154	37.1856	0.6250	2.5000	A572-65 (65 ksi)
L29	22.7500-17.7500	5.0000	0.00	18	37.1856	37.9558	0.6125	2.4500	A572-65 (65 ksi)
L30	17.7500-12.7500	5.0000	0.00	18	37.9558	38.7260	0.6000	2.4000	A572-65 (65 ksi)
L31	12.7500-7.7500	5.0000	0.00	18	38.7260	39.4962	0.6000	2.4000	A572-65 (65 ksi)
L32	7.7500-2.7500	5.0000	0.00	18	39.4962	40.2664	0.5875	2.3500	A572-65 (65 ksi)
L33	2.7500-0.0000	2.7500		18	40.2664	40.6900	0.5875	2.3500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	20.2796	11.7909	584.7409	7.0334	10.1600	57.5532	1170.2512	5.8966	3.1900	17.013
	21.0617	12.2493	655.6204	7.3069	10.5513	62.1367	1312.1034	6.1258	3.3256	17.736
L2	21.0617	12.2493	655.6204	7.3069	10.5513	62.1367	1312.1034	6.1258	3.3256	17.736
	21.8438	12.7076	732.0079	7.5803	10.9425	66.8957	1464.9790	6.3550	3.4611	18.459
L3	21.8438	12.7076	732.0079	7.5803	10.9425	66.8957	1464.9790	6.3550	3.4611	18.459
	22.6258	13.1660	814.1096	7.8537	11.3338	71.8304	1629.2905	6.5843	3.5967	19.182
L4	22.6258	13.1660	814.1096	7.8537	11.3338	71.8304	1629.2905	6.5843	3.5967	19.182
	23.4079	13.6244	902.1317	8.1271	11.7250	76.9406	1805.4505	6.8135	3.7322	19.905
L5	23.4079	13.6244	902.1317	8.1271	11.7250	76.9406	1805.4505	6.8135	3.7322	19.905
	24.1900	14.0827	996.2802	8.4005	12.1163	82.2265	1993.8714	7.0427	3.8678	20.628
L6	24.1900	14.0827	996.2802	8.4005	12.1163	82.2265	1993.8714	7.0427	3.8678	20.628
	24.9721	14.5411	1096.7613	8.6740	12.5076	87.6879	2194.9657	7.2719	4.0033	21.351
L7	24.9721	14.5411	1096.7613	8.6740	12.5076	87.6879	2194.9657	7.2719	4.0033	21.351
	25.7542	14.9995	1203.7810	8.9474	12.8988	93.3249	2409.1459	7.5012	4.1389	22.074
L8	25.7542	14.9995	1203.7810	8.9474	12.8988	93.3249	2409.1459	7.5012	4.1389	22.074
	26.5362	15.4578	1317.5454	9.2208	13.2901	99.1375	2636.8245	7.7304	4.2744	22.797
L9	26.5362	15.4578	1317.5454	9.2208	13.2901	99.1375	2636.8245	7.7304	4.2744	22.797
	27.3183	15.9162	1438.2608	9.4942	13.6813	105.1258	2878.4140	7.9596	4.4100	23.52
L10	27.3183	15.9162	1438.2608	9.4942	13.6813	105.1258	2878.4140	7.9596	4.4100	23.52
	28.2568	16.4662	1592.5845	9.8223	14.1508	112.5434	3187.2646	8.2347	4.5727	24.387
L11	27.8663	21.1494	1898.1911	9.4619	13.6669	138.8896	3798.8799	10.5767	4.2950	17.18
	28.0618	21.7605	2067.5305	9.7353	14.0581	147.0701	4137.7816	10.8823	4.4305	17.722
L12	28.0618	21.7605	2067.5305	9.7353	14.0581	147.0701	4137.7816	10.8823	4.4305	17.722
	28.8438	22.3716	2246.6531	10.0087	14.4493	155.4847	4496.2625	11.1879	4.5661	18.264
L13	28.8438	22.3716	2246.6531	10.0087	14.4493	155.4847	4496.2625	11.1879	4.5661	18.264
	29.6258	22.9827	2435.8336	10.2821	14.8406	164.1334	4874.8724	11.4935	4.7016	18.806
L14	29.6258	22.9827	2435.8336	10.2821	14.8406	164.1334	4874.8724	11.4935	4.7016	18.806
	30.4078	23.5938	2635.3468	10.5555	15.2318	173.0162	5274.1613	11.7991	4.8372	19.349
L15	30.4078	23.5938	2635.3468	10.5555	15.2318	173.0162	5274.1613	11.7991	4.8372	19.349
	31.1898	24.2049	2845.4673	10.8289	15.6230	182.1330	5694.6788	12.1048	4.9727	19.891
L16	31.1898	24.2049	2845.4673	10.8289	15.6230	182.1330	5694.6788	12.1048	4.9727	19.891
	31.9718	24.8160	3066.4700	11.1023	16.0142	191.4839	6136.9749	12.4104	5.1082	20.433
L17	31.9718	24.8160	3066.4700	11.1023	16.0142	191.4839	6136.9749	12.4104	5.1082	20.433
	32.1673	24.9688	3123.4532	11.1707	16.1120	193.8582	6251.0162	12.4868	5.1421	20.569
L18	32.1268	50.7590	6244.1653	11.0775	16.1120	387.5464	12496.5469	25.3843	4.6801	9.132
	32.1659	50.8216	6267.3100	11.0911	16.1316	388.5112	12542.8666	25.4156	4.6869	9.145
L19	32.1659	50.8216	6267.3100	11.0911	16.1316	388.5112	12542.8666	25.4156	4.6869	9.145
	32.9480	52.0744	6742.2915	11.3645	16.5228	408.0591	13493.4547	26.0421	4.8224	9.41
L20	32.9499	50.8241	6585.5537	11.3690	16.5228	398.5730	13179.7729	25.4169	4.8444	9.689
	33.7319	52.0463	7072.1663	11.6424	16.9141	418.1237	14153.6384	26.0281	4.9800	9.96
L21	33.7319	52.0463	7072.1663	11.6424	16.9141	418.1237	14153.6384	26.0281	4.9800	9.96
	34.4748	53.2073	7556.1133	11.9021	17.2857	437.1305	15122.1691	26.6087	5.1088	10.218
L22	33.9961	32.2572	4310.2417	11.5451	16.6796	258.4137	8626.1550	16.1316	5.2288	16.732
	34.1525	33.0975	4655.9572	11.8459	17.1100	272.1190	9318.0409	16.5519	5.3779	17.209
L23	34.1525	33.0975	4655.9572	11.8459	17.1100	272.1190	9318.0409	16.5519	5.3779	17.209
	34.9346	33.8614	4985.8594	12.1193	17.5013	284.8855	9978.2794	16.9339	5.5134	17.643
L24	34.9346	33.8614	4985.8594	12.1193	17.5013	284.8855	9978.2794	16.9339	5.5134	17.643
	35.7167	34.6254	5330.9885	12.3927	17.8925	297.9448	10668.9916	17.3160	5.6490	18.077
L25	35.7167	34.6254	5330.9885	12.3927	17.8925	297.9448	10668.9916	17.3160	5.6490	18.077
	36.4988	35.3893	5691.6879	12.6661	18.2838	311.2967	11390.8650	17.6980	5.7845	18.511
L26	36.4988	35.3893	5691.6879	12.6661	18.2838	311.2967	11390.8650	17.6980	5.7845	18.511
	36.8898	35.7713	5877.9838	12.8028	18.4794	318.0824	11763.7020	17.8891	5.8523	18.727
L27	36.8416	70.9227	11453.0092	12.6919	18.4794	619.7705	22921.0885	35.4681	5.3023	8.484

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	36.8807	70.9991	11490.0591	12.7056	18.4990	621.1179	22995.2372	35.5063	5.3091	8.495
L28	36.8807	70.9991	11490.0591	12.7056	18.4990	621.1179	22995.2372	35.5063	5.3091	8.495
	37.6628	72.5270	12247.9340	12.9790	18.8903	648.3729	24511.9842	36.2704	5.4447	8.711
L29	37.6647	71.1008	12015.2910	12.9834	18.8903	636.0574	24046.3919	35.5571	5.4667	8.925
	38.4468	72.5981	12790.4943	13.2569	19.2815	663.3548	25597.8186	36.3060	5.6022	9.146
L30	38.4487	71.1403	12542.0501	13.2613	19.2815	650.4697	25100.6033	35.5769	5.6242	9.374
	39.2308	72.6071	13333.9370	13.5347	19.6728	677.7856	26685.4192	36.3104	5.7598	9.6
L31	39.2308	72.6071	13333.9370	13.5347	19.6728	677.7856	26685.4192	36.3104	5.7598	9.6
	40.0129	74.0739	14158.4740	13.8081	20.0641	705.6635	28335.5781	37.0440	5.8953	9.826
L32	40.0148	72.5540	13876.8760	13.8126	20.0641	691.6285	27772.0115	36.2839	5.9173	10.072
	40.7969	73.9902	14717.3853	14.0860	20.4553	719.4892	29454.1361	37.0021	6.0529	10.303
L33	40.7969	73.9902	14717.3853	14.0860	20.4553	719.4892	29454.1361	37.0021	6.0529	10.303
	41.2271	74.7801	15193.8063	14.2364	20.6705	735.0471	30407.6050	37.3972	6.1274	10.43

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 140.0000-135.0000				1	1	1			
L2 135.0000-130.0000				1	1	1			
L3 130.0000-125.0000				1	1	1			
L4 125.0000-120.0000				1	1	1			
L5 120.0000-115.0000				1	1	1			
L6 115.0000-110.0000				1	1	1			
L7 110.0000-105.0000				1	1	1			
L8 105.0000-100.0000				1	1	1			
L9 100.0000-95.0000				1	1	1			
L10 95.0000-89.0000				1	1	1			
L11 89.0000-87.7500				1	1	1			
L12 87.7500-82.7500				1	1	1			
L13 82.7500-77.7500				1	1	1			
L14 77.7500-72.7500				1	1	1			
L15 72.7500-67.7500				1	1	1			
L16 67.7500-62.7500				1	1	1			
L17 62.7500-61.5000				1	1	1			
L18 61.5000-61.2500				1	1	0.96416			
L19 61.2500-				1	1	0.952701			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
56.2500									
L20 56.2500-51.2500				1	1	0.964956			
L21 51.2500-46.5000				1	1	0.964411			
L22 46.5000-45.5000				1	1	1			
L23 45.5000-40.5000				1	1	1			
L24 40.5000-35.5000				1	1	1			
L25 35.5000-30.5000				1	1	1			
L26 30.5000-28.0000				1	1	1			
L27 28.0000-27.7500				1	1	0.962134			
L28 27.7500-22.7500				1	1	0.952399			
L29 22.7500-17.7500				1	1	0.961989			
L30 17.7500-12.7500				1	1	0.972392			
L31 12.7500-7.7500				1	1	0.96345			
L32 7.7500-2.7500				1	1	0.974865			
L33 2.7500-0.0000				1	1	0.970186			

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
****										
CCI-65FP-065125	A	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	-0.150 -0.150	6.5000	15.5000	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	0.500 0.500	6.5000	15.5000	0.00
CCI-65FP-065125	C	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	0.350 0.350	6.5000	15.5000	0.00
*										
CCI-65FP-060100	A	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	0.000 0.000	6.0000	14.0000	0.00
CCI-65FP-060100	B	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	-0.150 -0.150	6.0000	14.0000	0.00
CCI-65FP-060100	B	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	0.500 0.500	6.0000	14.0000	0.00
CCI-65FP-060100	C	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	0.350 0.350	6.0000	14.0000	0.00
***										
70										
HB114-13U6-S12F18(1-1/4)	B	No	Surface Ar (CaAa)	70.0000 - 0.0000	2	2	-0.310 -0.270	1.5400		1.51
******										
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***									
138									
MLCH HYBRID 6X12(1-3/8)	B	No	No	Inside Pole	138.0000 - 0.0000	3	No Ice	0.0000	1.72
							1/2" Ice	0.0000	1.72
							1" Ice	0.0000	1.72
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	B	No	No	Inside Pole	138.0000 - 0.0000	1	No Ice	0.0000	1.07
							1/2" Ice	0.0000	1.07
							1" Ice	0.0000	1.07
MLCH HYBRID 6X12(1-3/8)	B	No	No	Inside Pole	138.0000 - 0.0000	3	No Ice	0.0000	1.72
							1/2" Ice	0.0000	1.72
							1" Ice	0.0000	1.72
115									
FXL-1873(1-5/8)	C	No	No	Inside Pole	115.0000 - 0.0000	6	No Ice	0.0000	0.67
							1/2" Ice	0.0000	0.67
							1" Ice	0.0000	0.67
PWRT-606-S(7/8)	C	No	No	Inside Pole	115.0000 - 0.0000	2	No Ice	0.0000	0.89
							1/2" Ice	0.0000	0.89
							1" Ice	0.0000	0.89
6-8AWG 3 PAIR(7/8)	C	No	No	Inside Pole	115.0000 - 0.0000	2	No Ice	0.0000	0.68
							1/2" Ice	0.0000	0.68
							1" Ice	0.0000	0.68
FB-L98B-034-XXXXXX(3/8)	C	No	No	Inside Pole	115.0000 - 0.0000	2	No Ice	0.0000	0.05
							1/2" Ice	0.0000	0.05
							1" Ice	0.0000	0.05
2" Rigid Conduit	C	No	No	Inside Pole	115.0000 - 0.0000	1	No Ice	0.0000	2.80
							1/2" Ice	0.0000	2.80
							1" Ice	0.0000	2.80
******									
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.0000-135.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L2	135.0000-130.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L3	130.0000-125.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L4	125.0000-120.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L5	120.0000-115.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L6	115.0000-110.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L7	110.0000-105.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L8	105.0000-100.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L9	100.0000-95.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L10	95.0000-89.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.06
L11	89.0000-87.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L12	87.7500-82.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L13	82.7500-77.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L14	77.7500-72.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L15	72.7500-67.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.693	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L16	67.7500-62.7500	A	0.000	0.000	0.750	0.000	0.00
		B	0.000	0.000	3.040	0.000	0.07
		C	0.000	0.000	0.750	0.000	0.05
L17	62.7500-61.5000	A	0.000	0.000	1.250	0.000	0.00
		B	0.000	0.000	2.885	0.000	0.02
		C	0.000	0.000	1.250	0.000	0.01
L18	61.5000-61.2500	A	0.000	0.000	0.250	0.000	0.00
		B	0.000	0.000	0.577	0.000	0.00
		C	0.000	0.000	0.250	0.000	0.00
L19	61.2500-56.2500	A	0.000	0.000	5.000	0.000	0.00
		B	0.000	0.000	11.540	0.000	0.07
		C	0.000	0.000	5.000	0.000	0.05
L20	56.2500-51.2500	A	0.000	0.000	5.000	0.000	0.00
		B	0.000	0.000	11.540	0.000	0.07
		C	0.000	0.000	5.000	0.000	0.05
L21	51.2500-46.5000	A	0.000	0.000	2.750	0.000	0.00
		B	0.000	0.000	6.963	0.000	0.07
		C	0.000	0.000	2.750	0.000	0.05
L22	46.5000-45.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.308	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L23	45.5000-40.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.540	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.05
L24	40.5000-35.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.540	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.05
L25	35.5000-30.5000	A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	2.082	0.000	0.07
		C	0.000	0.000	0.271	0.000	0.05
L26	30.5000-28.0000	A	0.000	0.000	2.708	0.000	0.00
		B	0.000	0.000	6.187	0.000	0.04
		C	0.000	0.000	2.708	0.000	0.03
L27	28.0000-27.7500	A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	0.619	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L28	27.7500-22.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L29	22.7500-17.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L30	17.7500-12.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L31	12.7500-7.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L32	7.7500-2.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L33	2.7500-0.0000	A	0.000	0.000	2.979	0.000	0.00
		B	0.000	0.000	6.805	0.000	0.04
		C	0.000	0.000	2.979	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.0000-135.0000	A	0.980	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L2	135.0000-130.0000	A	0.977	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L3	130.0000-125.0000	A	0.973	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L4	125.0000-120.0000	A	0.969	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L5	120.0000-115.0000	A	0.965	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L6	115.0000-110.0000	A	0.961	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L7	110.0000-105.0000	A	0.957	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L8	105.0000-100.0000	A	0.952	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L9	100.0000-95.0000	A	0.947	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L10	95.0000-89.0000	A	0.942	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.07
		C		0.000	0.000	0.000	0.000	0.06
L11	89.0000-87.7500	A	0.938	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L12	87.7500-82.7500	A	0.935	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L13	82.7500-77.7500	A	0.929	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L14	77.7500-72.7500	A	0.923	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L15	72.7500-67.7500	A	0.917	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.382	0.000	0.07
		C		0.000	0.000	0.000	0.000	0.05
L16	67.7500-62.7500	A	0.910	0.000	0.000	0.879	0.000	0.00
		B		0.000	0.000	4.821	0.000	0.10
		C		0.000	0.000	0.879	0.000	0.05
L17	62.7500-61.5000	A	0.906	0.000	0.000	1.465	0.000	0.01
		B		0.000	0.000	3.695	0.000	0.04
		C		0.000	0.000	1.465	0.000	0.02
L18	61.5000-61.2500	A	0.904	0.000	0.000	0.293	0.000	0.00
		B		0.000	0.000	0.739	0.000	0.01
		C		0.000	0.000	0.293	0.000	0.00
L19	61.2500-56.2500	A	0.900	0.000	0.000	5.858	0.000	0.03
		B		0.000	0.000	14.767	0.000	0.15
		C		0.000	0.000	5.858	0.000	0.08

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L20	56.2500-51.2500	A	0.892	0.000	0.000	5.854	0.000	0.03
		B		0.000	0.000	14.749	0.000	0.15
		C		0.000	0.000	5.854	0.000	0.08
L21	51.2500-46.5000	A	0.884	0.000	0.000	3.217	0.000	0.02
		B		0.000	0.000	9.313	0.000	0.12
		C		0.000	0.000	3.217	0.000	0.06
L22	46.5000-45.5000	A	0.879	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.606	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.01
L23	45.5000-40.5000	A	0.873	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	3.016	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.05
L24	40.5000-35.5000	A	0.862	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	3.003	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.05
L25	35.5000-30.5000	A	0.850	0.000	0.000	0.313	0.000	0.00
		B		0.000	0.000	3.614	0.000	0.09
		C		0.000	0.000	0.313	0.000	0.05
L26	30.5000-28.0000	A	0.840	0.000	0.000	3.128	0.000	0.02
		B		0.000	0.000	7.744	0.000	0.08
		C		0.000	0.000	3.128	0.000	0.04
L27	28.0000-27.7500	A	0.836	0.000	0.000	0.313	0.000	0.00
		B		0.000	0.000	0.774	0.000	0.01
		C		0.000	0.000	0.313	0.000	0.00
L28	27.7500-22.7500	A	0.828	0.000	0.000	6.244	0.000	0.03
		B		0.000	0.000	15.448	0.000	0.15
		C		0.000	0.000	6.244	0.000	0.08
L29	22.7500-17.7500	A	0.809	0.000	0.000	6.226	0.000	0.03
		B		0.000	0.000	15.389	0.000	0.15
		C		0.000	0.000	6.226	0.000	0.08
L30	17.7500-12.7500	A	0.787	0.000	0.000	6.203	0.000	0.03
		B		0.000	0.000	15.315	0.000	0.15
		C		0.000	0.000	6.203	0.000	0.08
L31	12.7500-7.7500	A	0.756	0.000	0.000	6.173	0.000	0.03
		B		0.000	0.000	15.216	0.000	0.14
		C		0.000	0.000	6.173	0.000	0.08
L32	7.7500-2.7500	A	0.707	0.000	0.000	6.124	0.000	0.02
		B		0.000	0.000	15.057	0.000	0.14
		C		0.000	0.000	6.124	0.000	0.08
L33	2.7500-0.0000	A	0.618	0.000	0.000	3.319	0.000	0.01
		B		0.000	0.000	8.123	0.000	0.07
		C		0.000	0.000	3.319	0.000	0.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.0000-135.0000	0.0000	0.0000	0.0000	0.0000
L2	135.0000-130.0000	0.0000	0.0000	0.0000	0.0000
L3	130.0000-125.0000	0.0000	0.0000	0.0000	0.0000
L4	125.0000-120.0000	0.0000	0.0000	0.0000	0.0000
L5	120.0000-115.0000	0.0000	0.0000	0.0000	0.0000
L6	115.0000-110.0000	0.0000	0.0000	0.0000	0.0000
L7	110.0000-105.0000	0.0000	0.0000	0.0000	0.0000
L8	105.0000-100.0000	0.0000	0.0000	0.0000	0.0000
L9	100.0000-95.0000	0.0000	0.0000	0.0000	0.0000
L10	95.0000-89.0000	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L11	89.0000-87.7500	0.0000	0.0000	0.0000	0.0000
L12	87.7500-82.7500	0.0000	0.0000	0.0000	0.0000
L13	82.7500-77.7500	0.0000	0.0000	0.0000	0.0000
L14	77.7500-72.7500	0.0000	0.0000	0.0000	0.0000
L15	72.7500-67.7500	0.4710	-1.0010	0.5068	-1.0769
L16	67.7500-62.7500	-0.2796	-1.4453	0.1617	-1.6766
L17	62.7500-61.5000	-2.3013	-0.1985	-2.0367	-0.6009
L18	61.5000-61.2500	-2.3076	-0.1989	-2.0429	-0.6021
L19	61.2500-56.2500	-2.3254	-0.2001	-2.0615	-0.6055
L20	56.2500-51.2500	-2.3588	-0.2023	-2.0966	-0.6115
L21	51.2500-46.5000	-2.0751	-0.6375	-1.3075	-1.0138
L22	46.5000-45.5000	0.9679	-2.0569	0.9851	-2.0934
L23	45.5000-40.5000	0.9690	-2.0592	0.9848	-2.0929
L24	40.5000-35.5000	0.9708	-2.0630	0.9866	-2.0967
L25	35.5000-30.5000	0.4500	-1.8316	0.6603	-1.9506
L26	30.5000-28.0000	-2.6081	-0.1665	-2.3537	-0.5739
L27	28.0000-27.7500	-2.6185	-0.1670	-2.3643	-0.5750
L28	27.7500-22.7500	-2.6357	-0.1678	-2.3825	-0.5764
L29	22.7500-17.7500	-2.6679	-0.1693	-2.4169	-0.5782
L30	17.7500-12.7500	-2.6995	-0.1708	-2.4512	-0.5785
L31	12.7500-7.7500	-2.7307	-0.1723	-2.4859	-0.5761
L32	7.7500-2.7500	-2.7613	-0.1737	-2.5220	-0.5677
L33	2.7500-0.0000	-2.7847	-0.1748	-2.5548	-0.5449

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_a No Ice	K_a Ice
L15	23	HB114-13U6-S12F18(1-1/4)	67.75 - 70.00	1.0000	1.0000
L16	7	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	8	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	9	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	10	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	23	HB114-13U6-S12F18(1-1/4)	62.75 - 67.75	1.0000	1.0000
L17	7	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	8	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	9	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	10	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	23	HB114-13U6-S12F18(1-1/4)	61.50 - 62.75	1.0000	1.0000
L18	7	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	8	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	9	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	10	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	23	HB114-13U6-S12F18(1-1/4)	61.25 - 61.50	1.0000	1.0000
L19	7	CCI-65FP-060100	56.25 - 61.25	1.0000	1.0000
L19	8	CCI-65FP-060100	56.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	9	CCI-65FP-060100	61.25 56.25 - 61.25	1.0000	1.0000
L19	10	CCI-65FP-060100	56.25 - 61.25	1.0000	1.0000
L19	23	HB114-13U6-S12F18(1-1/4)	56.25 - 61.25	1.0000	1.0000
L20	7	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	8	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	9	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	10	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	23	HB114-13U6-S12F18(1-1/4)	51.25 - 56.25	1.0000	1.0000
L21	7	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	8	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	9	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	10	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	23	HB114-13U6-S12F18(1-1/4)	46.50 - 51.25	1.0000	1.0000
L22	23	HB114-13U6-S12F18(1-1/4)	45.50 - 46.50	1.0000	1.0000
L23	23	HB114-13U6-S12F18(1-1/4)	40.50 - 45.50	1.0000	1.0000
L24	23	HB114-13U6-S12F18(1-1/4)	35.50 - 40.50	1.0000	1.0000
L25	2	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	3	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	4	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	5	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	23	HB114-13U6-S12F18(1-1/4)	30.50 - 35.50	1.0000	1.0000
L26	2	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	3	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	4	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	5	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	23	HB114-13U6-S12F18(1-1/4)	28.00 - 30.50	1.0000	1.0000
L27	2	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	3	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	4	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	5	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	23	HB114-13U6-S12F18(1-1/4)	27.75 - 28.00	1.0000	1.0000
L28	2	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000
L28	3	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000
L28	4	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L28	5	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000
L28	23	HB114-13U6-S12F18(1-1/4)	22.75 - 27.75	1.0000	1.0000
L29	2	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	3	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	4	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	5	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	23	HB114-13U6-S12F18(1-1/4)	17.75 - 22.75	1.0000	1.0000
L30	2	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	3	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	4	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	5	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	23	HB114-13U6-S12F18(1-1/4)	12.75 - 17.75	1.0000	1.0000
L31	2	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	3	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	4	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	5	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	23	HB114-13U6-S12F18(1-1/4)	7.75 - 12.75	1.0000	1.0000
L32	2	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	3	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	4	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	5	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	23	HB114-13U6-S12F18(1-1/4)	2.75 - 7.75	1.0000	1.0000
L33	2	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	3	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	4	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	5	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	23	HB114-13U6-S12F18(1-1/4)	0.00 - 2.75	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L16	7	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L16	8	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L16	9	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L16	10	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L17	7	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L17	8	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L17	9	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L17	10	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L18	7	CCI-65FP-060100	61.25 -	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L18	8	CCI-65FP-060100	61.50 61.25 - 61.50	Manual	1.0000
L18	9	CCI-65FP-060100	61.25 - 61.50	Manual	1.0000
L18	10	CCI-65FP-060100	61.25 - 61.50	Manual	1.0000
L19	7	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L19	8	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L19	9	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L19	10	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L20	7	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L20	8	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L20	9	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L20	10	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L21	7	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L21	8	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L21	9	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L21	10	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L25	2	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L25	3	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L25	4	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L25	5	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L26	2	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L26	3	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L26	4	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L26	5	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L27	2	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L27	3	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L27	4	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L27	5	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L28	2	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L28	3	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L28	4	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L28	5	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L29	2	CCI-65FP-065125	17.75 - 22.75	Manual	1.0000
L29	3	CCI-65FP-065125	17.75 - 22.75	Manual	1.0000
L29	4	CCI-65FP-065125	17.75 -	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L29	5	CCI-65FP-065125	22.75 17.75 - 22.75	Manual	1.0000
L30	2	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L30	3	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L30	4	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L30	5	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L31	2	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L31	3	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L31	4	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L31	5	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L32	2	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L32	3	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L32	4	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L32	5	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L33	2	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000
L33	3	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000
L33	4	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000
L33	5	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 3/4" x 10'	C	From Leg	0.0000 0.00 5.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice	0.7500 1.7646 2.7958	0.7500 1.7646 2.7958	0.04 0.05 0.06
** 138 ** APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
(2) 2HH-38A-R4 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	6.3600 6.7400 7.1400	3.1200 3.4300 3.7600	0.08 0.16 0.24
(2) 2HH-38A-R4 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	6.3600 6.7400 7.1400	3.1200 3.4300 3.7600	0.08 0.16 0.24
(2) 2HH-38A-R4 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	6.3600 6.7400 7.1400	3.1200 3.4300 3.7600	0.08 0.16 0.24
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.9701 2.1466 2.3306	1.5865 1.7488 1.9185	0.07 0.09 0.12
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.9701 2.1466 2.3306	1.5865 1.7488 1.9185	0.07 0.09 0.12
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.9701 2.1466 2.3306	1.5865 1.7488 1.9185	0.07 0.09 0.12
(2) RRUS 32 B66A	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.8635 3.0897 3.3233	1.7816 1.9730 2.1713	0.06 0.08 0.10
(2) RRUS 32 B66A	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.8635 3.0897 3.3233	1.7816 1.9730 2.1713	0.06 0.08 0.10
(2) RRUS 32 B66A	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.8635 3.0897 3.3233	1.7816 1.9730 2.1713	0.06 0.08 0.10
(2) RADIO 4424	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.8563 2.0266 2.2044	1.3200 1.4687 1.6248	0.09 0.11 0.13
(2) RADIO 4424	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.8563 2.0266 2.2044	1.3200 1.4687 1.6248	0.09 0.11 0.13
(2) RADIO 4424	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.8563 2.0266 2.2044	1.3200 1.4687 1.6248	0.09 0.11 0.13
RRUS 01	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.7124 2.9238 3.1427	0.9599 1.1144 1.2759	0.04 0.06 0.08
RRUS 01	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.7124 2.9238 3.1427	0.9599 1.1144 1.2759	0.04 0.06 0.08
RRUS 01	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.7124 2.9238 3.1427	0.9599 1.1144 1.2759	0.04 0.06 0.08
Platform Mount [LP 701-1]	C	None		0.00	138.0000	No Ice 1/2" Ice 1" Ice	58.6800 66.0100 73.4100	58.6800 66.0100 73.4100	2.75 3.84 5.07
*** 115 ***									
(2) NNHH-65C-R4	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice	9.7500 10.3600 10.9700	3.9600 4.5000 5.0600	0.10 0.19 0.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) NNHH-65C-R4	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	9.7500 10.3600 10.9700	3.9600 4.5000 5.0600	0.10 0.19 0.30
(2) NNHH-65C-R4	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	9.7500 10.3600 10.9700	3.9600 4.5000 5.0600	0.10 0.19 0.30
SBJAH4-1D65C-DL	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	6.4600 7.0000 7.5500	3.8600 4.3700 4.8900	0.07 0.15 0.23
SBJAH4-1D65C-DL	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	6.4600 7.0000 7.5500	3.8600 4.3700 4.8900	0.07 0.15 0.23
SBJAH4-1D65C-DL	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	6.4600 7.0000 7.5500	3.8600 4.3700 4.8900	0.07 0.15 0.23
(2) DC6-48-60-18-8F	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2117 1.8924 2.1051	1.2117 1.8924 2.1051	0.02 0.04 0.07
AIRSCALE RRH 4T4R B5 160W	A	From Leg	4.0000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2857 1.4277 1.5771	0.7204 0.8341 0.9552	0.04 0.05 0.06
AIRSCALE RRH 4T4R B5 160W	B	From Leg	4.0000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2857 1.4277 1.5771	0.7204 0.8341 0.9552	0.04 0.05 0.06
AIRSCALE RRH 4T4R B5 160W	C	From Leg	4.0000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2857 1.4277 1.5771	0.7204 0.8341 0.9552	0.04 0.05 0.06
RRH4X25-WCS	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.3367 3.5863 3.8430	3.8352 4.0945 4.3640	0.09 0.13 0.16
RRH4X25-WCS	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.3367 3.5863 3.8430	3.8352 4.0945 4.3640	0.09 0.13 0.16
RRH4X25-WCS	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.3367 3.5863 3.8430	3.8352 4.0945 4.3640	0.09 0.13 0.16
WCS-IMFQ-AMT-43	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.5535 0.6478 0.7494	0.3895 0.4704 0.5588	0.02 0.02 0.03
WCS-IMFQ-AMT-43	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.5535 0.6478 0.7494	0.3895 0.4704 0.5588	0.02 0.02 0.03
AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.6763 3.9250 4.1810	2.3086 2.5165 2.7313	0.10 0.13 0.16
AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.6763 3.9250 4.1810	2.3086 2.5165 2.7313	0.10 0.13 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.6763 3.9250 4.1810	2.3086 2.5165 2.7313	0.10 0.13 0.16
AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.9042 3.1349 3.3731	1.5298 1.7195 1.9163	0.09 0.11 0.13
AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.9042 3.1349 3.3731	1.5298 1.7195 1.9163	0.09 0.11 0.13
AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB	C	From Leg	4.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.9042 3.1349 3.3731	1.5298 1.7195 1.9163	0.09 0.11 0.13
Platform Mount [LP 1301-1]	C	None		0.00	115.0000	No Ice 1/2" Ice 1" Ice	51.7000 62.7000 73.7000	51.7000 62.7000 73.7000	2.26 2.94 3.61
*** 70 ***									
(2) MX06FRO860-02 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	8.8400 9.5100 10.2000	7.4900 8.1500 8.8200	0.11 0.22 0.34
(2) MX06FRO840-02 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	10.0100 10.6100 11.2200	6.3900 6.9500 7.5300	0.13 0.25 0.38
(2) MX06FRO840-02 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	10.0100 10.6100 11.2200	6.3900 6.9500 7.5300	0.13 0.25 0.38
B13 RRH2X60-4R	A	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.1600 2.3504 2.5481	1.6200 1.7937 1.9748	0.06 0.08 0.10
B13 RRH2X60-4R	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.1600 2.3504 2.5481	1.6200 1.7937 1.9748	0.06 0.08 0.10
B13 RRH2X60-4R	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.1600 2.3504 2.5481	1.6200 1.7937 1.9748	0.06 0.08 0.10
B66A RRH4X45-4R	A	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.5370 2.7496 2.9696	1.6101 1.7906 1.9781	0.06 0.08 0.10
B66A RRH4X45-4R	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.5370 2.7496 2.9696	1.6101 1.7906 1.9781	0.06 0.08 0.10
B66A RRH4X45-4R	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.5370 2.7496 2.9696	1.6101 1.7906 1.9781	0.06 0.08 0.10
RHSDC-3315-PF-48	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	3.3636 3.5972 3.8383	2.1921 2.3950 2.6056	0.03 0.06 0.09
RHSDC-3315-PF-48	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	3.3636 3.5972 3.8383	2.1921 2.3950 2.6056	0.03 0.06 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 402-1]	C	None		0.00	70.0000	No Ice 1/2" Ice 1" Ice	27.6500 34.7400 41.6100	27.6500 34.7400 41.6100	2.17 2.83 3.63
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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
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

Comb. No.	Description
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	140 - 135	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	26	-12.01	0.04	-0.04
			Max. Mx	20	-5.62	28.71	-0.02
			Max. My	14	-5.62	0.03	-28.69
			Max. Vy	8	8.11	-28.64	-0.02
			Max. Vx	14	8.11	0.03	-28.69
			Max. Torque	12			-0.03
L2	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.47	0.03	-0.05
			Max. Mx	20	-5.91	70.06	-0.02
			Max. My	14	-5.91	0.02	-70.04
			Max. Vy	8	8.43	-70.00	-0.03
			Max. Vx	14	8.43	0.02	-70.04
			Max. Torque	12			-0.03
L3	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.94	0.02	-0.06
			Max. Mx	20	-6.21	113.01	-0.03
			Max. My	14	-6.21	0.01	-112.99
			Max. Vy	8	8.75	-112.96	-0.04
			Max. Vx	14	8.75	0.01	-112.99
			Max. Torque	12			-0.03
L4	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.42	0.00	-0.07
			Max. Mx	20	-6.54	157.56	-0.03
			Max. My	14	-6.54	0.00	-157.53
			Max. Vy	8	9.07	-157.51	-0.04
			Max. Vx	14	9.07	0.00	-157.53
			Max. Torque	12			-0.03
L5	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.91	-0.01	-0.08
			Max. Mx	20	-6.88	203.71	-0.04
			Max. My	14	-6.88	-0.01	-203.68
			Max. Vy	8	9.40	-203.67	-0.05
			Max. Vx	14	9.39	-0.01	-203.68
			Max. Torque	12			-0.03
L6	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.00	-0.93	-0.62
			Max. Mx	8	-11.45	-283.92	-0.31
			Max. My	14	-11.46	-0.41	-283.73
			Max. Vy	8	15.53	-283.92	-0.31
			Max. Vx	14	15.52	-0.41	-283.73
			Max. Torque	16			0.59
L7	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.58	-0.95	-0.63
			Max. Mx	8	-11.94	-362.24	-0.34
			Max. My	14	-11.95	-0.45	-362.00
			Max. Vy	8	15.82	-362.24	-0.34
			Max. Vx	14	15.81	-0.45	-362.00
			Max. Torque	16			0.59
L8	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.18	-0.96	-0.65
			Max. Mx	8	-12.46	-442.00	-0.37
			Max. My	14	-12.46	-0.48	-441.71
			Max. Vy	8	16.10	-442.00	-0.37
			Max. Vx	14	16.09	-0.48	-441.71
			Max. Torque	16			0.58
L9	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.79	-0.98	-0.67

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	-13.00	-523.14	-0.40
			Max. My	14	-13.01	-0.52	-522.81
			Max. Vy	8	16.38	-523.14	-0.40
			Max. Vx	14	16.37	-0.52	-522.81
			Max. Torque	16			0.58
L10	95 - 89	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.07	-0.99	-0.67
			Max. Mx	8	-13.25	-560.10	-0.42
			Max. My	14	-13.26	-0.53	-559.74
			Max. Vy	8	16.50	-560.10	-0.42
			Max. Vx	14	16.49	-0.53	-559.74
			Max. Torque	16			0.58
L11	89 - 87.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.17	-1.00	-0.69
			Max. Mx	8	-14.11	-643.45	-0.45
			Max. My	14	-14.12	-0.57	-643.05
			Max. Vy	8	16.85	-643.45	-0.45
			Max. Vx	14	16.84	-0.57	-643.05
			Max. Torque	16			0.58
L12	87.75 - 82.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.92	-1.02	-0.70
			Max. Mx	8	-14.79	-728.36	-0.48
			Max. My	14	-14.79	-0.60	-727.91
			Max. Vy	8	17.14	-728.36	-0.48
			Max. Vx	14	17.13	-0.60	-727.91
			Max. Torque	16			0.58
L13	82.75 - 77.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.68	-1.03	-0.71
			Max. Mx	8	-15.48	-814.68	-0.51
			Max. My	14	-15.49	-0.63	-814.18
			Max. Vy	8	17.41	-814.68	-0.51
			Max. Vx	14	17.40	-0.63	-814.18
			Max. Torque	16			0.58
L14	77.75 - 72.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.46	-1.04	-0.73
			Max. Mx	8	-16.20	-902.35	-0.54
			Max. My	14	-16.21	-0.66	-901.81
			Max. Vy	8	17.68	-902.35	-0.54
			Max. Vx	14	17.67	-0.66	-901.81
			Max. Torque	16			0.58
L15	72.75 - 67.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.26	-1.07	-1.69
			Max. Mx	8	-20.67	-999.08	-0.93
			Max. My	14	-20.69	-0.70	-998.44
			Max. Vy	8	21.37	-999.08	-0.93
			Max. Vx	14	21.19	-0.70	-998.44
			Max. Torque	16			0.58
L16	67.75 - 62.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.13	-1.12	-1.67
			Max. Mx	8	-21.48	-1106.40	-0.95
			Max. My	14	-21.50	-0.75	-1104.81
			Max. Vy	8	21.59	-1106.40	-0.95
			Max. Vx	14	21.40	-0.75	-1104.81
			Max. Torque	16			0.58
L17	62.75 - 61.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.37	-1.14	-1.66
			Max. Mx	8	-21.67	-1133.43	-0.95
			Max. My	14	-21.69	-0.76	-1131.61
			Max. Vy	8	21.71	-1133.43	-0.95
			Max. Vx	14	21.52	-0.76	-1131.61
			Max. Torque	16			0.58
L18	61.5 - 61.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.44	-1.14	-1.66
			Max. Mx	8	-21.76	-1138.86	-0.96

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-21.77	-0.77	-1136.99
			Max. Vy	8	21.73	-1138.86	-0.96
			Max. Vx	14	21.53	-0.77	-1136.99
			Max. Torque	16			0.58
L19	61.25 - 56.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.92	-1.21	-1.64
			Max. Mx	8	-22.95	-1248.89	-0.97
			Max. My	14	-22.97	-0.82	-1246.04
			Max. Vy	8	22.30	-1248.89	-0.97
			Max. Vx	14	22.11	-0.82	-1246.04
			Max. Torque	16			0.58
L20	56.25 - 51.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.40	-1.28	-1.62
			Max. Mx	8	-24.18	-1361.79	-0.99
			Max. My	14	-24.20	-0.87	-1357.92
			Max. Vy	8	22.87	-1361.79	-0.99
			Max. Vx	14	22.67	-0.87	-1357.92
			Max. Torque	16			0.58
L21	51.25 - 46.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.48	-1.28	-1.62
			Max. Mx	8	-24.25	-1367.51	-0.99
			Max. My	14	-24.27	-0.87	-1363.59
			Max. Vy	8	22.89	-1367.51	-0.99
			Max. Vx	14	22.68	-0.87	-1363.59
			Max. Torque	16			0.57
L22	46.5 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.76	-1.34	-1.59
			Max. Mx	8	-26.14	-1494.51	-1.00
			Max. My	14	-26.16	-0.93	-1489.44
			Max. Vy	8	23.29	-1494.51	-1.00
			Max. Vx	14	23.08	-0.93	-1489.44
			Max. Torque	16			0.57
L23	45.5 - 40.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.80	-1.39	-1.56
			Max. Mx	8	-27.14	-1611.31	-1.02
			Max. My	14	-27.15	-0.98	-1605.19
			Max. Vy	8	23.47	-1611.31	-1.02
			Max. Vx	14	23.27	-0.98	-1605.19
			Max. Torque	16			0.57
L24	40.5 - 35.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.86	-1.44	-1.53
			Max. Mx	8	-28.16	-1728.98	-1.03
			Max. My	14	-28.17	-1.03	-1721.82
			Max. Vy	8	23.64	-1728.98	-1.03
			Max. Vx	14	23.43	-1.03	-1721.82
			Max. Torque	16			0.57
L25	35.5 - 30.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.93	-1.49	-1.50
			Max. Mx	8	-29.20	-1847.44	-1.04
			Max. My	14	-29.21	-1.08	-1839.24
			Max. Vy	8	23.78	-1847.44	-1.04
			Max. Vx	14	23.58	-1.08	-1839.24
			Max. Torque	16			0.57
L26	30.5 - 28	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.53	-1.53	-1.49
			Max. Mx	8	-29.72	-1907.09	-1.05
			Max. My	14	-29.73	-1.11	-1898.36
			Max. Vy	8	23.98	-1907.09	-1.05
			Max. Vx	14	23.78	-1.11	-1898.36
			Max. Torque	16			0.57
L27	28 - 27.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.63	-1.53	-1.49
			Max. Mx	8	-29.82	-1913.08	-1.05
			Max. My	14	-29.83	-1.11	-1904.30
			Max. Vy	8	23.98	-1913.08	-1.05
			Max. Vx	14	23.77	-1.11	-1904.30
			Max. Torque	16			0.57

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L28	27.75 - 22.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.50	-1.61	-1.46
			Max. Mx	8	-31.45	-2034.21	-1.06
			Max. My	14	-31.45	-1.16	-2024.35
			Max. Vy	8	24.48	-2034.21	-1.06
			Max. Vx	14	24.27	-1.16	-2024.35
			Max. Torque	16			0.57
L29	22.75 - 17.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.38	-1.68	-1.44
			Max. Mx	8	-33.10	-2157.71	-1.07
			Max. My	14	-33.10	-1.21	-2146.74
			Max. Vy	8	24.94	-2157.71	-1.07
			Max. Vx	14	24.72	-1.21	-2146.74
			Max. Torque	16			0.57
L30	17.75 - 12.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.28	-1.76	-1.41
			Max. Mx	8	-34.77	-2283.42	-1.08
			Max. My	14	-34.77	-1.26	-2271.31
			Max. Vy	8	25.36	-2283.42	-1.08
			Max. Vx	14	25.14	-1.26	-2271.31
			Max. Torque	16			0.57
L31	12.75 - 7.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.18	-1.83	-1.39
			Max. Mx	8	-36.46	-2411.22	-1.09
			Max. My	14	-36.46	-1.31	-2397.94
			Max. Vy	8	25.78	-2411.22	-1.09
			Max. Vx	14	25.55	-1.31	-2397.94
			Max. Torque	16			0.57
L32	7.75 - 2.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.07	-1.90	-1.36
			Max. Mx	8	-38.18	-2541.10	-1.10
			Max. My	14	-38.18	-1.37	-2526.62
			Max. Vy	8	26.19	-2541.10	-1.10
			Max. Vx	14	25.96	-1.37	-2526.62
			Max. Torque	16			0.57
L33	2.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.11	-1.94	-1.35
			Max. Mx	8	-39.12	-2613.41	-1.10
			Max. My	14	-39.12	-1.39	-2598.25
			Max. Vy	8	26.42	-2613.41	-1.10
			Max. Vx	14	26.19	-1.39	-2598.25
			Max. Torque	16			0.57

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	57.11	-4.40	-0.00
	Max. H_x	20	39.14	26.40	0.00
	Max. H_z	3	29.35	0.00	26.16
	Max. M_x	2	2597.28	0.00	26.16
	Max. M_z	8	2613.41	-26.40	-0.00
	Max. Torsion	16	0.57	12.20	-20.98
	Min. Vert	17	29.35	12.20	-20.98
	Min. H_x	8	39.14	-26.40	-0.00
	Min. H_z	15	29.35	-0.00	-26.16
	Min. M_x	14	-2598.25	-0.00	-26.16
	Min. M_z	20	-2611.84	26.40	0.00
	Min. Torsion	4	-0.56	-12.20	20.98

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	32.62	0.00	0.00	0.36	-0.60	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	39.14	-0.00	-26.16	-2597.28	-0.16	0.48
0.9 Dead+1.0 Wind 0 deg - No Ice	29.35	-0.00	-26.16	-2551.49	0.04	0.46
1.2 Dead+1.0 Wind 30 deg - No Ice	39.14	12.20	-20.98	-2201.78	-1278.47	0.56
0.9 Dead+1.0 Wind 30 deg - No Ice	29.35	12.20	-20.98	-2162.44	-1255.41	0.55
1.2 Dead+1.0 Wind 60 deg - No Ice	39.14	22.84	-13.09	-1298.38	-2262.48	0.50
0.9 Dead+1.0 Wind 60 deg - No Ice	29.35	22.84	-13.09	-1275.56	-2222.38	0.49
1.2 Dead+1.0 Wind 90 deg - No Ice	39.14	26.40	0.00	1.10	-2613.41	0.31
0.9 Dead+1.0 Wind 90 deg - No Ice	29.35	26.40	0.00	0.96	-2567.13	0.30
1.2 Dead+1.0 Wind 120 deg - No Ice	39.14	22.78	13.07	1299.40	-2261.33	0.03
0.9 Dead+1.0 Wind 120 deg - No Ice	29.35	22.78	13.07	1276.30	-2221.23	0.03
1.2 Dead+1.0 Wind 150 deg - No Ice	39.14	13.16	22.64	2249.99	-1306.46	-0.26
0.9 Dead+1.0 Wind 150 deg - No Ice	29.35	13.16	22.64	2210.08	-1283.21	-0.26
1.2 Dead+1.0 Wind 180 deg - No Ice	39.14	0.00	26.16	2598.25	-1.39	-0.48
0.9 Dead+1.0 Wind 180 deg - No Ice	29.35	0.00	26.16	2552.20	-1.17	-0.47
1.2 Dead+1.0 Wind 210 deg - No Ice	39.14	-12.20	20.98	2202.75	1276.92	-0.57
0.9 Dead+1.0 Wind 210 deg - No Ice	29.35	-12.20	20.98	2163.14	1254.27	-0.56
1.2 Dead+1.0 Wind 240 deg - No Ice	39.14	-22.84	13.09	1299.35	2260.92	-0.51
0.9 Dead+1.0 Wind 240 deg - No Ice	29.35	-22.84	13.09	1276.26	2221.24	-0.49
1.2 Dead+1.0 Wind 270 deg - No Ice	39.14	-26.40	-0.00	-0.13	2611.84	-0.30
0.9 Dead+1.0 Wind 270 deg - No Ice	29.35	-26.40	-0.00	-0.25	2565.99	-0.29
1.2 Dead+1.0 Wind 300 deg - No Ice	39.14	-22.78	-13.07	-1298.42	2259.76	-0.02
0.9 Dead+1.0 Wind 300 deg - No Ice	29.35	-22.78	-13.07	-1275.59	2220.09	-0.02
1.2 Dead+1.0 Wind 330 deg - No Ice	39.14	-13.16	-22.64	-2249.01	1304.90	0.26
0.9 Dead+1.0 Wind 330 deg - No Ice	29.35	-13.16	-22.64	-2209.38	1282.07	0.26
1.2 Dead+1.0 Ice+1.0 Temp	57.11	0.00	0.00	1.35	-1.94	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	57.11	-0.00	-4.37	-460.23	-1.93	0.11
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	57.11	2.19	-3.77	-398.00	-233.46	0.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	57.11	3.80	-2.18	-229.39	-403.44	0.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	57.11	4.40	0.00	1.53	-465.68	0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	57.11	3.80	2.18	232.29	-403.29	0.01
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	57.11	2.19	3.78	401.23	-233.78	-0.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	57.11	0.00	4.37	463.10	-2.12	-0.11
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	57.11	-2.19	3.77	400.87	229.41	-0.13

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	57.11	-3.80	2.18	232.26	399.38	-0.12
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	57.11	-4.40	-0.00	1.34	461.63	-0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	57.11	-3.80	-2.18	-229.41	399.24	-0.01
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	57.11	-2.19	-3.78	-398.36	229.72	0.06
Dead+Wind 0 deg - Service	32.62	-0.00	-6.95	-683.37	-0.49	0.13
Dead+Wind 30 deg - Service	32.62	3.24	-5.57	-579.19	-336.92	0.15
Dead+Wind 60 deg - Service	32.62	6.06	-3.48	-341.48	-595.98	0.13
Dead+Wind 90 deg - Service	32.62	7.01	0.00	0.57	-688.36	0.08
Dead+Wind 120 deg - Service	32.62	6.05	3.47	342.30	-595.68	0.01
Dead+Wind 150 deg - Service	32.62	3.50	6.01	592.51	-344.33	-0.07
Dead+Wind 180 deg - Service	32.62	0.00	6.95	684.18	-0.81	-0.13
Dead+Wind 210 deg - Service	32.62	-3.24	5.57	579.99	335.62	-0.15
Dead+Wind 240 deg - Service	32.62	-6.06	3.48	342.29	594.69	-0.13
Dead+Wind 270 deg - Service	32.62	-7.01	-0.00	0.24	687.06	-0.08
Dead+Wind 300 deg - Service	32.62	-6.05	-3.47	-341.50	594.38	-0.01
Dead+Wind 330 deg - Service	32.62	-3.50	-6.01	-591.71	343.04	0.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-32.62	0.00	0.00	32.62	0.00	0.000%
2	-0.00	-39.14	-26.16	0.00	39.14	26.16	0.000%
3	-0.00	-29.35	-26.16	0.00	29.35	26.16	0.000%
4	12.20	-39.14	-20.98	-12.20	39.14	20.98	0.000%
5	12.20	-29.35	-20.98	-12.20	29.35	20.98	0.000%
6	22.84	-39.14	-13.09	-22.84	39.14	13.09	0.000%
7	22.84	-29.35	-13.09	-22.84	29.35	13.09	0.000%
8	26.40	-39.14	0.00	-26.40	39.14	-0.00	0.000%
9	26.40	-29.35	0.00	-26.40	29.35	-0.00	0.000%
10	22.78	-39.14	13.07	-22.78	39.14	-13.07	0.000%
11	22.78	-29.35	13.07	-22.78	29.35	-13.07	0.000%
12	13.16	-39.14	22.64	-13.16	39.14	-22.64	0.000%
13	13.16	-29.35	22.64	-13.16	29.35	-22.64	0.000%
14	0.00	-39.14	26.16	-0.00	39.14	-26.16	0.000%
15	0.00	-29.35	26.16	-0.00	29.35	-26.16	0.000%
16	-12.20	-39.14	20.98	12.20	39.14	-20.98	0.000%
17	-12.20	-29.35	20.98	12.20	29.35	-20.98	0.000%
18	-22.84	-39.14	13.09	22.84	39.14	-13.09	0.000%
19	-22.84	-29.35	13.09	22.84	29.35	-13.09	0.000%
20	-26.40	-39.14	-0.00	26.40	39.14	0.00	0.000%
21	-26.40	-29.35	-0.00	26.40	29.35	0.00	0.000%
22	-22.78	-39.14	-13.07	22.78	39.14	13.07	0.000%
23	-22.78	-29.35	-13.07	22.78	29.35	13.07	0.000%
24	-13.16	-39.14	-22.64	13.16	39.14	22.64	0.000%
25	-13.16	-29.35	-22.64	13.16	29.35	22.64	0.000%
26	0.00	-57.11	0.00	-0.00	57.11	-0.00	0.000%
27	-0.00	-57.11	-4.37	0.00	57.11	4.37	0.000%
28	2.19	-57.11	-3.77	-2.19	57.11	3.77	0.000%
29	3.80	-57.11	-2.18	-3.80	57.11	2.18	0.000%
30	4.40	-57.11	0.00	-4.40	57.11	-0.00	0.000%
31	3.80	-57.11	2.18	-3.80	57.11	-2.18	0.000%
32	2.19	-57.11	3.78	-2.19	57.11	-3.78	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.00	-57.11	4.37	-0.00	57.11	-4.37	0.000%
34	-2.19	-57.11	3.77	2.19	57.11	-3.77	0.000%
35	-3.80	-57.11	2.18	3.80	57.11	-2.18	0.000%
36	-4.40	-57.11	-0.00	4.40	57.11	0.00	0.000%
37	-3.80	-57.11	-2.18	3.80	57.11	2.18	0.000%
38	-2.19	-57.11	-3.78	2.19	57.11	3.78	0.000%
39	-0.00	-32.62	-6.95	0.00	32.62	6.95	0.000%
40	3.24	-32.62	-5.57	-3.24	32.62	5.57	0.000%
41	6.06	-32.62	-3.48	-6.06	32.62	3.48	0.000%
42	7.01	-32.62	0.00	-7.01	32.62	-0.00	0.000%
43	6.05	-32.62	3.47	-6.05	32.62	-3.47	0.000%
44	3.50	-32.62	6.01	-3.50	32.62	-6.01	0.000%
45	0.00	-32.62	6.95	-0.00	32.62	-6.95	0.000%
46	-3.24	-32.62	5.57	3.24	32.62	-5.57	0.000%
47	-6.06	-32.62	3.48	6.06	32.62	-3.48	0.000%
48	-7.01	-32.62	-0.00	7.01	32.62	0.00	0.000%
49	-6.05	-32.62	-3.47	6.05	32.62	3.47	0.000%
50	-3.50	-32.62	-6.01	3.50	32.62	6.01	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00009196
3	Yes	5	0.00000001	0.00044408
4	Yes	7	0.00000001	0.00043941
5	Yes	7	0.00000001	0.00009510
6	Yes	7	0.00000001	0.00043200
7	Yes	7	0.00000001	0.00009258
8	Yes	5	0.00000001	0.00087909
9	Yes	5	0.00000001	0.00035345
10	Yes	7	0.00000001	0.00043723
11	Yes	7	0.00000001	0.00009385
12	Yes	7	0.00000001	0.00043973
13	Yes	7	0.00000001	0.00009451
14	Yes	6	0.00000001	0.00009895
15	Yes	5	0.00000001	0.00048201
16	Yes	7	0.00000001	0.00042943
17	Yes	7	0.00000001	0.00009253
18	Yes	7	0.00000001	0.00044073
19	Yes	7	0.00000001	0.00009482
20	Yes	5	0.00000001	0.00080956
21	Yes	5	0.00000001	0.00031950
22	Yes	7	0.00000001	0.00043587
23	Yes	7	0.00000001	0.00009362
24	Yes	7	0.00000001	0.00043424
25	Yes	7	0.00000001	0.00009322
26	Yes	4	0.00000001	0.00042181
27	Yes	7	0.00000001	0.00026734
28	Yes	7	0.00000001	0.00030432
29	Yes	7	0.00000001	0.00030443
30	Yes	7	0.00000001	0.00027111
31	Yes	7	0.00000001	0.00030772
32	Yes	7	0.00000001	0.00030761
33	Yes	7	0.00000001	0.00027045
34	Yes	7	0.00000001	0.00030384
35	Yes	7	0.00000001	0.00030445
36	Yes	7	0.00000001	0.00026775
37	Yes	7	0.00000001	0.00030130
38	Yes	7	0.00000001	0.00030100
39	Yes	5	0.00000001	0.00016470
40	Yes	6	0.00000001	0.00012765
41	Yes	6	0.00000001	0.00012388
42	Yes	5	0.00000001	0.00015656
43	Yes	6	0.00000001	0.00012754

44	Yes	6	0.00000001	0.00012885
45	Yes	5	0.00000001	0.00016598
46	Yes	6	0.00000001	0.00012124
47	Yes	6	0.00000001	0.00012955
48	Yes	5	0.00000001	0.00015552
49	Yes	6	0.00000001	0.00012592
50	Yes	6	0.00000001	0.00012461

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	36.97	42	2.44	0.00
L2	135 - 130	34.42	42	2.44	0.00
L3	130 - 125	31.88	42	2.41	0.00
L4	125 - 120	29.38	42	2.37	0.00
L5	120 - 115	26.93	42	2.31	0.00
L6	115 - 110	24.55	42	2.24	0.00
L7	110 - 105	22.25	42	2.15	0.00
L8	105 - 100	20.06	42	2.04	0.00
L9	100 - 95	17.98	42	1.92	0.00
L10	95 - 89	16.03	42	1.79	0.00
L11	92.75 - 87.75	15.20	42	1.73	0.00
L12	87.75 - 82.75	13.42	42	1.66	0.00
L13	82.75 - 77.75	11.75	42	1.54	0.00
L14	77.75 - 72.75	10.21	42	1.41	0.00
L15	72.75 - 67.75	8.79	42	1.29	0.00
L16	67.75 - 62.75	7.51	42	1.16	0.00
L17	62.75 - 61.5	6.37	42	1.03	0.00
L18	61.5 - 61.25	6.11	42	0.99	0.00
L19	61.25 - 56.25	6.05	42	0.99	0.00
L20	56.25 - 51.25	5.05	42	0.92	0.00
L21	51.25 - 46.5	4.13	42	0.85	0.00
L22	51 - 45.5	4.08	42	0.84	0.00
L23	45.5 - 40.5	3.14	42	0.78	0.00
L24	40.5 - 35.5	2.39	42	0.66	0.00
L25	35.5 - 30.5	1.76	42	0.54	0.00
L26	30.5 - 28	1.26	42	0.42	0.00
L27	28 - 27.75	1.05	42	0.36	0.00
L28	27.75 - 22.75	1.04	42	0.35	0.00
L29	22.75 - 17.75	0.70	42	0.29	0.00
L30	17.75 - 12.75	0.43	42	0.23	0.00
L31	12.75 - 7.75	0.22	42	0.16	0.00
L32	7.75 - 2.75	0.08	42	0.10	0.00
L33	2.75 - 0	0.01	42	0.04	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.0000	Lighting Rod 3/4" x 10'	42	36.97	2.44	0.00	17830
138.0000	APXVAARR24_43-U-NA20 w/ Mount Pipe	42	35.95	2.44	0.00	17830
115.0000	(2) NNHH-65C-R4	42	24.55	2.24	0.00	3656
70.0000	(2) MX06FRO860-02 w/ Mount Pipe	42	8.07	1.22	0.00	2213

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	140.40	8	9.30	0.01
L2	135 - 130	130.71	8	9.27	0.01
L3	130 - 125	121.08	8	9.17	0.01
L4	125 - 120	111.60	8	9.01	0.01
L5	120 - 115	102.32	8	8.78	0.01
L6	115 - 110	93.29	8	8.51	0.01
L7	110 - 105	84.58	8	8.18	0.01
L8	105 - 100	76.24	8	7.78	0.01
L9	100 - 95	68.35	8	7.33	0.01
L10	95 - 89	60.95	8	6.83	0.00
L11	92.75 - 87.75	57.80	8	6.59	0.00
L12	87.75 - 82.75	51.04	8	6.30	0.00
L13	82.75 - 77.75	44.68	8	5.85	0.00
L14	77.75 - 72.75	38.81	8	5.38	0.00
L15	72.75 - 67.75	33.43	8	4.90	0.00
L16	67.75 - 62.75	28.56	8	4.41	0.00
L17	62.75 - 61.5	24.21	8	3.90	0.00
L18	61.5 - 61.25	23.21	8	3.77	0.00
L19	61.25 - 56.25	23.01	8	3.76	0.00
L20	56.25 - 51.25	19.21	8	3.50	0.00
L21	51.25 - 46.5	15.69	8	3.23	0.00
L22	51 - 45.5	15.52	8	3.21	0.00
L23	45.5 - 40.5	11.94	8	2.97	0.00
L24	40.5 - 35.5	9.07	8	2.51	0.00
L25	35.5 - 30.5	6.68	8	2.05	0.00
L26	30.5 - 28	4.78	8	1.59	0.00
L27	28 - 27.75	4.01	8	1.36	0.00
L28	27.75 - 22.75	3.94	8	1.35	0.00
L29	22.75 - 17.75	2.65	8	1.11	0.00
L30	17.75 - 12.75	1.62	8	0.87	0.00
L31	12.75 - 7.75	0.84	8	0.62	0.00
L32	7.75 - 2.75	0.31	8	0.38	0.00
L33	2.75 - 0	0.04	8	0.13	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.0000	Lighting Rod 3/4" x 10'	8	140.40	9.30	0.01	4923
138.0000	APXVAARR24_43-U-NA20 w/ Mount Pipe	8	136.52	9.29	0.01	4923
115.0000	(2) NNHH-65C-R4	8	93.29	8.51	0.01	1000
70.0000	(2) MX06FRO860-02 w/ Mount Pipe	8	30.69	4.63	0.00	588

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	140 - 135 (1)	TP20.7702x20x0.1875	5.0000	0.0000	0.0	12.2493	-5.62	716.58	0.008
L2	135 - 130 (2)	TP21.5404x20.7702x0.1875	5.0000	0.0000	0.0	12.7076	-5.91	743.40	0.008
L3	130 - 125 (3)	TP22.3106x21.5404x0.18	5.0000	0.0000	0.0	13.166	-6.21	770.21	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L4	125 - 120 (4)	TP23.0808x22.3106x0.1875	5.0000	0.0000	0.0	13.6240	-6.54	797.02	0.008
L5	120 - 115 (5)	TP23.851x23.0808x0.1875	5.0000	0.0000	0.0	14.0827	-6.88	823.84	0.008
L6	115 - 110 (6)	TP24.6212x23.851x0.1875	5.0000	0.0000	0.0	14.5411	-11.45	850.65	0.013
L7	110 - 105 (7)	TP25.3914x24.6212x0.1875	5.0000	0.0000	0.0	14.9995	-11.94	877.47	0.014
L8	105 - 100 (8)	TP26.1616x25.3914x0.1875	5.0000	0.0000	0.0	15.4578	-12.46	904.28	0.014
L9	100 - 95 (9)	TP26.9318x26.1616x0.1875	5.0000	0.0000	0.0	15.9162	-13.00	931.10	0.014
L10	95 - 89 (10)	TP27.856x26.9318x0.1875	6.0000	0.0000	0.0	16.1224	-13.26	943.16	0.014
L11	89 - 87.75 (11)	TP27.6735x26.9034x0.25	5.0000	0.0000	0.0	21.7605	-14.11	1272.99	0.011
L12	87.75 - 82.75 (12)	TP28.4436x27.6735x0.25	5.0000	0.0000	0.0	22.3716	-14.79	1308.74	0.011
L13	82.75 - 77.75 (13)	TP29.2137x28.4436x0.25	5.0000	0.0000	0.0	22.9827	-15.49	1344.49	0.012
L14	77.75 - 72.75 (14)	TP29.9838x29.2137x0.25	5.0000	0.0000	0.0	23.5938	-16.20	1380.24	0.012
L15	72.75 - 67.75 (15)	TP30.754x29.9838x0.25	5.0000	0.0000	0.0	24.2049	-20.67	1415.99	0.015
L16	67.75 - 62.75 (16)	TP31.5241x30.754x0.25	5.0000	0.0000	0.0	24.8160	-21.48	1451.74	0.015
L17	62.75 - 61.5 (17)	TP31.7166x31.5241x0.25	1.2500	0.0000	0.0	24.9688	-21.67	1460.67	0.015
L18	61.5 - 61.25 (18)	TP31.7551x31.7166x0.5125	0.2500	0.0000	0.0	50.8216	-21.76	2973.06	0.007
L19	61.25 - 56.25 (19)	TP32.5253x31.7551x0.5125	5.0000	0.0000	0.0	52.0744	-22.95	3046.35	0.008
L20	56.25 - 51.25 (20)	TP33.2954x32.5253x0.5	5.0000	0.0000	0.0	52.0463	-24.18	3044.71	0.008
L21	51.25 - 46.5 (21)	TP34.027x33.2954x0.5	4.7500	0.0000	0.0	52.1074	-24.25	3048.28	0.008
L22	46.5 - 45.5 (22)	TP33.6811x32.8339x0.3125	5.5000	0.0000	0.0	33.0975	-26.14	1936.20	0.014
L23	45.5 - 40.5 (23)	TP34.4513x33.6811x0.3125	5.0000	0.0000	0.0	33.8614	-27.14	1980.89	0.014
L24	40.5 - 35.5 (24)	TP35.2215x34.4513x0.3125	5.0000	0.0000	0.0	34.6254	-28.16	2025.59	0.014
L25	35.5 - 30.5 (25)	TP35.9917x35.2215x0.3125	5.0000	0.0000	0.0	35.3893	-29.20	2070.28	0.014
L26	30.5 - 28 (26)	TP36.3768x35.9917x0.3125	2.5000	0.0000	0.0	35.7713	-29.72	2092.62	0.014
L27	28 - 27.75 (27)	TP36.4154x36.3768x0.625	0.2500	0.0000	0.0	70.9991	-29.82	4153.45	0.007
L28	27.75 - 22.75 (28)	TP37.1856x36.4154x0.625	5.0000	0.0000	0.0	72.5270	-31.45	4242.83	0.007
L29	22.75 - 17.75 (29)	TP37.9558x37.1856x0.6125	5.0000	0.0000	0.0	72.5981	-33.10	4246.99	0.008
L30	17.75 - 12.75 (30)	TP38.726x37.9558x0.6	5.0000	0.0000	0.0	72.6071	-34.77	4247.52	0.008
L31	12.75 - 7.75 (31)	TP39.4962x38.726x0.6	5.0000	0.0000	0.0	74.0739	-36.46	4333.32	0.008
L32	7.75 - 2.75 (32)	TP40.2664x39.4962x0.5875	5.0000	0.0000	0.0	73.9902	-38.18	4328.43	0.009
L33	2.75 - 0 (33)	TP40.69x40.2664x0.5875	2.7500	0.0000	0.0	74.7801	-39.12	4374.64	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	140 - 135 (1)	TP20.7702x20x0.1875	28.71	370.51	0.077	0.00	370.51	0.000
L2	135 - 130 (2)	TP21.5404x20.7702x0.1875	70.07	394.62	0.178	0.00	394.62	0.000
L3	130 - 125 (3)	TP22.3106x21.5404x0.1875	113.01	419.15	0.270	0.00	419.15	0.000
L4	125 - 120 (4)	TP23.0808x22.3106x0.1875	157.56	444.06	0.355	0.00	444.06	0.000
L5	120 - 115 (5)	TP23.851x23.0808x0.1875	203.71	469.33	0.434	0.00	469.33	0.000
L6	115 - 110 (6)	TP24.6212x23.851x0.1875	284.03	494.91	0.574	0.00	494.91	0.000
L7	110 - 105 (7)	TP25.3914x24.6212x0.1875	362.37	520.77	0.696	0.00	520.77	0.000
L8	105 - 100 (8)	TP26.1616x25.3914x0.1875	442.13	546.88	0.808	0.00	546.88	0.000
L9	100 - 95 (9)	TP26.9318x26.1616x0.1875	523.29	573.21	0.913	0.00	573.21	0.000
L10	95 - 89 (10)	TP27.856x26.9318x0.1875	560.24	585.12	0.957	0.00	585.12	0.000
L11	89 - 87.75 (11)	TP27.6735x26.9034x0.25	643.61	877.14	0.734	0.00	877.14	0.000
L12	87.75 - 82.75 (12)	TP28.4436x27.6735x0.25	728.53	919.89	0.792	0.00	919.89	0.000
L13	82.75 - 77.75 (13)	TP29.2137x28.4436x0.25	814.86	963.21	0.846	0.00	963.21	0.000
L14	77.75 - 72.75 (14)	TP29.9838x29.2137x0.25	902.54	1007.06	0.896	0.00	1007.06	0.000
L15	72.75 - 67.75 (15)	TP30.754x29.9838x0.25	999.36	1051.42	0.950	0.00	1051.42	0.000
L16	67.75 - 62.75 (16)	TP31.5241x30.754x0.25	1106.46	1096.24	1.009	0.00	1096.24	0.000
L17	62.75 - 61.5 (17)	TP31.7166x31.5241x0.25	1133.43	1107.52	1.023	0.00	1107.52	0.000
L18	61.5 - 61.25 (18)	TP31.7551x31.7166x0.5125	1138.86	2405.37	0.473	0.00	2405.37	0.000
L19	61.25 - 56.25 (19)	TP32.5253x31.7551x0.5125	1248.89	2526.40	0.494	0.00	2526.40	0.000
L20	56.25 - 51.25 (20)	TP33.2954x32.5253x0.5	1361.79	2588.71	0.526	0.00	2588.71	0.000
L21	51.25 - 46.5 (21)	TP34.027x33.2954x0.5	1367.52	2594.83	0.527	0.00	2594.83	0.000
L22	46.5 - 45.5 (22)	TP33.6811x32.8339x0.3125	1494.52	1635.25	0.914	0.00	1635.25	0.000
L23	45.5 - 40.5 (23)	TP34.4513x33.6811x0.3125	1611.32	1701.08	0.947	0.00	1701.08	0.000
L24	40.5 - 35.5 (24)	TP35.2215x34.4513x0.3125	1728.98	1767.65	0.978	0.00	1767.65	0.000
L25	35.5 - 30.5 (25)	TP35.9917x35.2215x0.3125	1847.44	1834.95	1.007	0.00	1834.95	0.000
L26	30.5 - 28 (26)	TP36.3768x35.9917x0.3125	1907.09	1868.87	1.020	0.00	1868.87	0.000
L27	28 - 27.75 (27)	TP36.4154x36.3768x0.625	1913.08	3845.50	0.497	0.00	3845.50	0.000
L28	27.75 - 22.75 (28)	TP37.1856x36.4154x0.625	2034.21	4014.24	0.507	0.00	4014.24	0.000
L29	22.75 - 17.75 (29)	TP37.9558x37.1856x0.6125	2157.72	4106.99	0.525	0.00	4106.99	0.000
L30	17.75 - 12.75 (30)	TP38.726x37.9558x0.6	2283.42	4196.34	0.544	0.00	4196.34	0.000
L31	12.75 - 7.75 (31)	TP39.4962x38.726x0.6	2411.22	4368.94	0.552	0.00	4368.94	0.000
L32	7.75 - 2.75 (32)	TP40.2664x39.4962x0.5875	2541.10	4454.54	0.570	0.00	4454.54	0.000
L33	2.75 - 0 (33)	TP40.69x40.2664x0.5875	2613.41	4550.86	0.574	0.00	4550.86	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	140 - 135 (1)	TP20.7702x20x0.1875	8.11	214.97	0.038	0.00	387.50	0.000
L2	135 - 130 (2)	TP21.5404x20.7702x0.1875	8.43	223.02	0.038	0.00	417.04	0.000
L3	130 - 125 (3)	TP22.3106x21.5404x0.1875	8.75	231.06	0.038	0.00	447.67	0.000
L4	125 - 120 (4)	TP23.0808x22.3106x0.1875	9.07	239.11	0.038	0.02	479.38	0.000
L5	120 - 115 (5)	TP23.851x23.0808x0.1875	9.40	247.15	0.038	0.02	512.18	0.000
L6	115 - 110 (6)	TP24.6212x23.851x0.1875	15.53	255.20	0.061	0.03	546.06	0.000
L7	110 - 105 (7)	TP25.3914x24.6212x0.1875	15.82	263.24	0.060	0.03	581.03	0.000
L8	105 - 100 (8)	TP26.1616x25.3914x0.1875	16.11	271.29	0.059	0.03	617.09	0.000
L9	100 - 95 (9)	TP26.9318x26.1616x0.1875	16.38	279.33	0.059	0.03	654.22	0.000
L10	95 - 89 (10)	TP27.856x26.9318x0.1875	16.50	282.95	0.058	0.03	671.29	0.000
L11	89 - 87.75 (11)	TP27.6735x26.9034x0.25	16.86	381.90	0.044	0.03	917.17	0.000
L12	87.75 - 82.75 (12)	TP28.4436x27.6735x0.25	17.14	392.62	0.044	0.03	969.41	0.000
L13	82.75 - 77.75 (13)	TP29.2137x28.4436x0.25	17.42	403.35	0.043	0.03	1023.09	0.000
L14	77.75 - 72.75 (14)	TP29.9838x29.2137x0.25	17.68	414.07	0.043	0.03	1078.22	0.000
L15	72.75 - 67.75 (15)	TP30.754x29.9838x0.25	21.33	424.80	0.050	0.03	1134.79	0.000
L16	67.75 - 62.75 (16)	TP31.5241x30.754x0.25	21.54	435.52	0.049	0.03	1192.82	0.000
L17	62.75 - 61.5 (17)	TP31.7166x31.5241x0.25	21.71	438.20	0.050	0.31	1207.55	0.000
L18	61.5 - 61.25 (18)	TP31.7551x31.7166x0.5125	21.73	891.92	0.024	0.31	2440.36	0.000
L19	61.25 - 56.25 (19)	TP32.5253x31.7551x0.5125	22.30	913.90	0.024	0.31	2562.15	0.000
L20	56.25 - 51.25 (20)	TP33.2954x32.5253x0.5	22.87	913.41	0.025	0.31	2623.37	0.000
L21	51.25 - 46.5 (21)	TP34.027x33.2954x0.5	22.89	914.49	0.025	0.31	2629.53	0.000
L22	46.5 - 45.5 (22)	TP33.6811x32.8339x0.3125	23.29	580.86	0.040	0.31	1697.43	0.000
L23	45.5 - 40.5 (23)	TP34.4513x33.6811x0.3125	23.47	594.27	0.039	0.31	1776.69	0.000
L24	40.5 - 35.5 (24)	TP35.2215x34.4513x0.3125	23.64	607.68	0.039	0.31	1857.76	0.000
L25	35.5 - 30.5 (25)	TP35.9917x35.2215x0.3125	23.78	621.08	0.038	0.31	1940.64	0.000
L26	30.5 - 28 (26)	TP36.3768x35.9917x0.3125	23.98	627.79	0.038	0.31	1982.76	0.000
L27	28 - 27.75 (27)	TP36.4154x36.3768x0.625	23.98	1246.03	0.019	0.31	3905.49	0.000
L28	27.75 - 22.75 (28)	TP37.1856x36.4154x0.625	24.48	1272.85	0.019	0.31	4075.39	0.000
L29	22.75 - 17.75 (29)	TP37.9558x37.1856x0.6125	24.94	1274.10	0.020	0.31	4166.73	0.000
L30	17.75 - 12.75 (30)	TP38.726x37.9558x0.6	25.36	1274.25	0.020	0.31	4254.58	0.000
L31	12.75 - 7.75 (31)	TP39.4962x38.726x0.6	25.78	1300.00	0.020	0.31	4428.22	0.000
L32	7.75 - 2.75 (32)	TP40.2664x39.4962x0.5875	26.19	1298.53	0.020	0.31	4512.23	0.000
L33	2.75 - 0 (33)	TP40.69x40.2664x0.5875	26.42	1312.39	0.020	0.31	4609.08	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 135 (1)	0.008	0.077	0.000	0.038	0.000	0.087	1.050	4.8.2
L2	135 - 130 (2)	0.008	0.178	0.000	0.038	0.000	0.187	1.050	4.8.2
L3	130 - 125 (3)	0.008	0.270	0.000	0.038	0.000	0.279	1.050	4.8.2
L4	125 - 120 (4)	0.008	0.355	0.000	0.038	0.000	0.364	1.050	4.8.2
L5	120 - 115 (5)	0.008	0.434	0.000	0.038	0.000	0.444	1.050	4.8.2
L6	115 - 110 (6)	0.013	0.574	0.000	0.061	0.000	0.591	1.050	4.8.2
L7	110 - 105 (7)	0.014	0.696	0.000	0.060	0.000	0.713	1.050	4.8.2
L8	105 - 100 (8)	0.014	0.808	0.000	0.059	0.000	0.826	1.050	4.8.2
L9	100 - 95 (9)	0.014	0.913	0.000	0.059	0.000	0.930	1.050	4.8.2
L10	95 - 89 (10)	0.014	0.957	0.000	0.058	0.000	0.975	1.050	4.8.2
L11	89 - 87.75 (11)	0.011	0.734	0.000	0.044	0.000	0.747	1.050	4.8.2
L12	87.75 - 82.75 (12)	0.011	0.792	0.000	0.044	0.000	0.805	1.050	4.8.2
L13	82.75 - 77.75 (13)	0.012	0.846	0.000	0.043	0.000	0.859	1.050	4.8.2
L14	77.75 - 72.75 (14)	0.012	0.896	0.000	0.043	0.000	0.910	1.050	4.8.2
L15	72.75 - 67.75 (15)	0.015	0.950	0.000	0.050	0.000	0.968	1.050	4.8.2
L16	67.75 - 62.75 (16)	0.015	1.009	0.000	0.049	0.000	1.027	1.050	4.8.2
L17	62.75 - 61.5 (17)	0.015	1.023	0.000	0.050	0.000	1.041	1.050	4.8.2
L18	61.5 - 61.25 (18)	0.007	0.473	0.000	0.024	0.000	0.481	1.050	4.8.2
L19	61.25 - 56.25 (19)	0.008	0.494	0.000	0.024	0.000	0.502	1.050	4.8.2
L20	56.25 - 51.25 (20)	0.008	0.526	0.000	0.025	0.000	0.535	1.050	4.8.2
L21	51.25 - 46.5 (21)	0.008	0.527	0.000	0.025	0.000	0.536	1.050	4.8.2
L22	46.5 - 45.5 (22)	0.014	0.914	0.000	0.040	0.000	0.929	1.050	4.8.2
L23	45.5 - 40.5 (23)	0.014	0.947	0.000	0.039	0.000	0.963	1.050	4.8.2
L24	40.5 - 35.5 (24)	0.014	0.978	0.000	0.039	0.000	0.994	1.050	4.8.2
L25	35.5 - 30.5 (25)	0.014	1.007	0.000	0.038	0.000	1.022	1.050	4.8.2
L26	30.5 - 28 (26)	0.014	1.020	0.000	0.038	0.000	1.036	1.050	4.8.2
L27	28 - 27.75 (27)	0.007	0.497	0.000	0.019	0.000	0.505	1.050	4.8.2
L28	27.75 - 22.75 (28)	0.007	0.507	0.000	0.019	0.000	0.515	1.050	4.8.2
L29	22.75 - 17.75 (29)	0.008	0.525	0.000	0.020	0.000	0.534	1.050	4.8.2
L30	17.75 - 12.75 (30)	0.008	0.544	0.000	0.020	0.000	0.553	1.050	4.8.2
L31	12.75 - 7.75 (31)	0.008	0.552	0.000	0.020	0.000	0.561	1.050	4.8.2
L32	7.75 - 2.75 (32)	0.009	0.570	0.000	0.020	0.000	0.580	1.050	4.8.2
L33	2.75 - 0 (33)	0.009	0.574	0.000	0.020	0.000	0.584	1.050	4.8.2

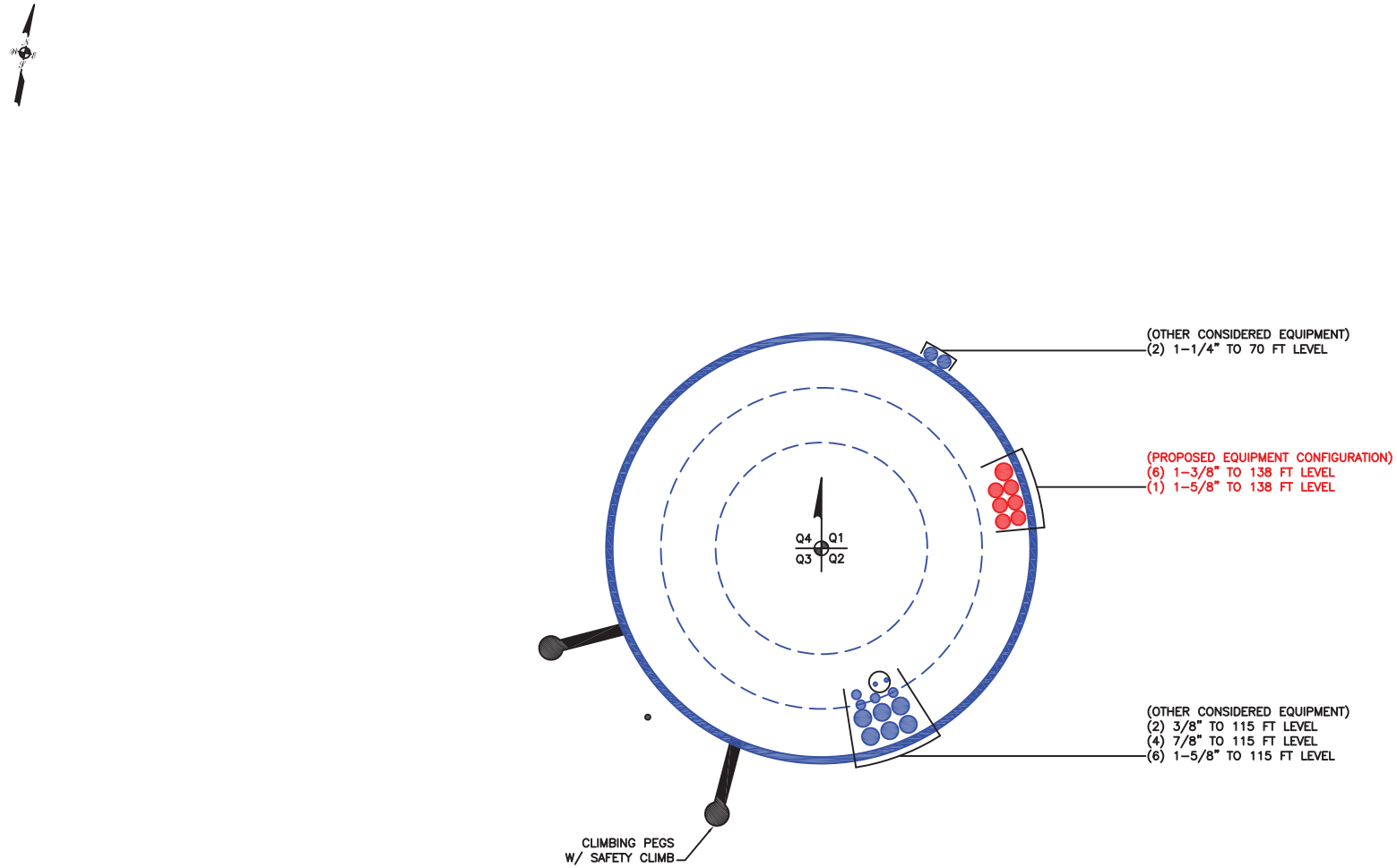
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	140 - 135	Pole	TP20.7702x20x0.1875	1	-5.62	752.41	8.3	Pass
L2	135 - 130	Pole	TP21.5404x20.7702x0.1875	2	-5.91	780.57	17.8	Pass
L3	130 - 125	Pole	TP22.3106x21.5404x0.1875	3	-6.21	808.72	26.6	Pass
L4	125 - 120	Pole	TP23.0808x22.3106x0.1875	4	-6.54	836.88	34.7	Pass
L5	120 - 115	Pole	TP23.851x23.0808x0.1875	5	-6.88	865.03	42.3	Pass
L6	115 - 110	Pole	TP24.6212x23.851x0.1875	6	-11.45	893.19	56.3	Pass
L7	110 - 105	Pole	TP25.3914x24.6212x0.1875	7	-11.94	921.34	67.9	Pass
L8	105 - 100	Pole	TP26.1616x25.3914x0.1875	8	-12.46	949.50	78.6	Pass
L9	100 - 95	Pole	TP26.9318x26.1616x0.1875	9	-13.00	977.65	88.6	Pass
L10	95 - 89	Pole	TP27.856x26.9318x0.1875	10	-13.26	990.32	92.9	Pass
L11	89 - 87.75	Pole	TP27.6735x26.9034x0.25	11	-14.11	1336.64	71.1	Pass
L12	87.75 - 82.75	Pole	TP28.4436x27.6735x0.25	12	-14.79	1374.18	76.7	Pass
L13	82.75 - 77.75	Pole	TP29.2137x28.4436x0.25	13	-15.49	1411.71	81.8	Pass
L14	77.75 - 72.75	Pole	TP29.9838x29.2137x0.25	14	-16.20	1449.25	86.6	Pass
L15	72.75 - 67.75	Pole	TP30.754x29.9838x0.25	15	-20.67	1486.79	92.2	Pass
L16	67.75 - 62.75	Pole	TP31.5241x30.754x0.25	16	-21.48	1524.33	97.8	Pass
L17	62.75 - 61.5	Pole	TP31.7166x31.5241x0.25	17	-21.67	1533.70	99.1	Pass
L18	61.5 - 61.25	Pole	TP31.7551x31.7166x0.5125	18	-21.76	3121.71	45.8	Pass
L19	61.25 - 56.25	Pole	TP32.5253x31.7551x0.5125	19	-22.95	3198.67	47.9	Pass
L20	56.25 - 51.25	Pole	TP33.2954x32.5253x0.5	20	-24.18	3196.95	50.9	Pass
L21	51.25 - 46.5	Pole	TP34.027x33.2954x0.5	21	-24.25	3200.69	51.0	Pass
L22	46.5 - 45.5	Pole	TP33.6811x32.8339x0.3125	22	-26.14	2033.01	88.5	Pass
L23	45.5 - 40.5	Pole	TP34.4513x33.6811x0.3125	23	-27.14	2079.93	91.7	Pass
L24	40.5 - 35.5	Pole	TP35.2215x34.4513x0.3125	24	-28.16	2126.87	94.6	Pass
L25	35.5 - 30.5	Pole	TP35.9917x35.2215x0.3125	25	-29.20	2173.79	97.4	Pass
L26	30.5 - 28	Pole	TP36.3768x35.9917x0.3125	26	-29.72	2197.25	98.7	Pass
L27	28 - 27.75	Pole	TP36.4154x36.3768x0.625	27	-29.82	4361.12	48.1	Pass
L28	27.75 - 22.75	Pole	TP37.1856x36.4154x0.625	28	-31.45	4454.97	49.0	Pass
L29	22.75 - 17.75	Pole	TP37.9558x37.1856x0.6125	29	-33.10	4459.34	50.8	Pass
L30	17.75 - 12.75	Pole	TP38.726x37.9558x0.6	30	-34.77	4459.90	52.6	Pass
L31	12.75 - 7.75	Pole	TP39.4962x38.726x0.6	31	-36.46	4549.99	53.4	Pass
L32	7.75 - 2.75	Pole	TP40.2664x39.4962x0.5875	32	-38.18	4544.85	55.2	Pass
L33	2.75 - 0	Pole	TP40.69x40.2664x0.5875	33	-39.12	4593.37	55.6	Pass
							Summary	
						Pole (L17)	99.1	Pass
						***RATING =**	**99.1**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(2) 1-1/4" TO 70 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(6) 1-3/8" TO 138 FT LEVEL
(1) 1-5/8" TO 138 FT LEVEL
Q4
Q1
Q3
Q2
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 115 FT LEVEL
(4) 7/8" TO 115 FT LEVEL
(6) 1-5/8" TO 115 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 826849

Work Order: 1902871

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	140	51	3.75	18	20	27.856	0.1875	Auto	A572-65
2	92.75	46.25	4.5	18	26.90	34.027	0.25	Auto	A572-65
3	51	51	0	18	32.83	40.69	0.3125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	28	plate	CCI-SFP-065125	4				x				x					x				x	
2	50.2	61.5	plate	CCI-SFP-060100	4				x				x					x				x	
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
2	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.000	4.750	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5 Export to TNX

	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	140 - 135	5		18	20.000	20.770	0.1875	A572-65	1.000
2	135 - 130	5		18	20.770	21.540	0.1875	A572-65	1.000
3	130 - 125	5		18	21.540	22.311	0.1875	A572-65	1.000
4	125 - 120	5		18	22.311	23.081	0.1875	A572-65	1.000
5	120 - 115	5		18	23.081	23.851	0.1875	A572-65	1.000
6	115 - 110	5		18	23.851	24.621	0.1875	A572-65	1.000
7	110 - 105	5		18	24.621	25.391	0.1875	A572-65	1.000
8	105 - 100	5		18	25.391	26.162	0.1875	A572-65	1.000
9	100 - 95	5		18	26.162	26.932	0.1875	A572-65	1.000
10	95 - 92.75	6	3.75	18	26.932	27.856	0.1875	A572-65	1.000
11	92.75 - 87.75	5		18	26.903	27.673	0.25	A572-65	1.000
12	87.75 - 82.75	5		18	27.673	28.444	0.25	A572-65	1.000
13	82.75 - 77.75	5		18	28.444	29.214	0.25	A572-65	1.000
14	77.75 - 72.75	5		18	29.214	29.984	0.25	A572-65	1.000
15	72.75 - 67.75	5		18	29.984	30.754	0.25	A572-65	1.000
16	67.75 - 62.75	5		18	30.754	31.524	0.25	A572-65	1.000
17	62.75 - 61.5	1.25		18	31.524	31.717	0.25	A572-65	1.000
18	61.5 - 61.25	0.25		18	31.717	31.755	0.5125	A572-65	0.964
19	61.25 - 56.25	5		18	31.755	32.525	0.5125	A572-65	0.953
20	56.25 - 51.25	5		18	32.525	33.295	0.5	A572-65	0.965
21	51.25 - 51	4.75	4.5	18	33.295	34.027	0.5	A572-65	0.964
22	51 - 45.5	5.5		18	32.834	33.681	0.3125	A572-65	1.000
23	45.5 - 40.5	5		18	33.681	34.451	0.3125	A572-65	1.000
24	40.5 - 35.5	5		18	34.451	35.222	0.3125	A572-65	1.000
25	35.5 - 30.5	5		18	35.222	35.992	0.3125	A572-65	1.000
26	30.5 - 28	2.5		18	35.992	36.377	0.3125	A572-65	1.000
27	28 - 27.75	0.25		18	36.377	36.415	0.625	A572-65	0.962
28	27.75 - 22.75	5		18	36.415	37.186	0.625	A572-65	0.952
29	22.75 - 17.75	5		18	37.186	37.956	0.6125	A572-65	0.962
30	17.75 - 12.75	5		18	37.956	38.726	0.6	A572-65	0.972
31	12.75 - 7.75	5		18	38.726	39.496	0.6	A572-65	0.963
32	7.75 - 2.75	5		18	39.496	40.266	0.5875	A572-65	0.975
33	2.75 - 0	2.75		18	40.266	40.690	0.5875	A572-65	0.970

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	140 - 135	5.62	28.71	8.11
2	135 - 130	5.91	70.07	8.43
3	130 - 125	6.21	113.01	8.75
4	125 - 120	6.54	157.56	9.07
5	120 - 115	6.88	203.71	9.40
6	115 - 110	11.45	284.03	15.53
7	110 - 105	11.94	362.36	15.82
8	105 - 100	12.46	442.13	16.11
9	100 - 95	13.00	523.29	16.38
10	95 - 92.75	13.26	560.24	16.50
11	92.75 - 87.75	14.11	643.61	16.86
12	87.75 - 82.75	14.79	728.53	17.14
13	82.75 - 77.75	15.49	814.86	17.42
14	77.75 - 72.75	16.20	902.54	17.68
15	72.75 - 67.75	20.67	999.36	21.33
16	67.75 - 62.75	21.48	1106.46	21.54
17	62.75 - 61.5	21.68	1133.44	21.66
18	61.5 - 61.25	21.76	1138.86	21.73
19	61.25 - 56.25	22.95	1248.89	22.30
20	56.25 - 51.25	24.18	1361.79	22.87
21	51.25 - 51	24.25	1367.51	22.89
22	51 - 45.5	26.14	1494.51	23.29
23	45.5 - 40.5	27.14	1611.31	23.47
24	40.5 - 35.5	28.16	1728.99	23.64
25	35.5 - 30.5	29.20	1847.44	23.78
26	30.5 - 28	29.72	1907.09	23.98
27	28 - 27.75	29.82	1913.08	23.98
28	27.75 - 22.75	31.45	2034.21	24.48
29	22.75 - 17.75	33.10	2157.71	24.94
30	17.75 - 12.75	34.77	2283.42	25.36
31	12.75 - 7.75	36.46	2411.22	25.78
32	7.75 - 2.75	38.18	2541.10	26.19
33	2.75 - 0	39.12	2613.41	26.42

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP20.77x20x0.1875	Pole	8.0%	Pass
135 - 130	Pole	TP21.54x20.77x0.1875	Pole	17.6%	Pass
130 - 125	Pole	TP22.311x21.54x0.1875	Pole	26.4%	Pass
125 - 120	Pole	TP23.081x22.311x0.1875	Pole	34.5%	Pass
120 - 115	Pole	TP23.851x23.081x0.1875	Pole	42.1%	Pass
115 - 110	Pole	TP24.621x23.851x0.1875	Pole	55.9%	Pass
110 - 105	Pole	TP25.391x24.621x0.1875	Pole	67.5%	Pass
105 - 100	Pole	TP26.162x25.391x0.1875	Pole	78.3%	Pass
100 - 95	Pole	TP26.932x26.162x0.1875	Pole	88.3%	Pass
95 - 92.75	Pole	TP27.856x26.932x0.1875	Pole	92.5%	Pass
92.75 - 87.75	Pole	TP27.673x26.903x0.25	Pole	70.8%	Pass
87.75 - 82.75	Pole	TP28.444x27.673x0.25	Pole	76.4%	Pass
82.75 - 77.75	Pole	TP29.214x28.444x0.25	Pole	81.5%	Pass
77.75 - 72.75	Pole	TP29.984x29.214x0.25	Pole	86.3%	Pass
72.75 - 67.75	Pole	TP30.754x29.984x0.25	Pole	91.8%	Pass
67.75 - 62.75	Pole	TP31.524x30.754x0.25	Pole	97.4%	Pass
62.75 - 61.5	Pole	TP31.717x31.524x0.25	Pole	98.8%	Pass
61.5 - 61.25	Pole + Reinf.	TP31.755x31.717x0.5125	Reinf. 2 Tension Rupture	71.0%	Pass
61.25 - 56.25	Pole + Reinf.	TP32.525x31.755x0.5125	Reinf. 2 Tension Rupture	75.1%	Pass
56.25 - 51.25	Pole + Reinf.	TP33.295x32.525x0.5	Reinf. 2 Tension Rupture	79.0%	Pass
51.25 - 51	Pole + Reinf.	TP34.027x33.295x0.5	Reinf. 2 Tension Rupture	79.2%	Pass
51 - 45.5	Pole	TP33.681x32.834x0.3125	Pole	88.1%	Pass
45.5 - 40.5	Pole	TP34.451x33.681x0.3125	Pole	91.3%	Pass
40.5 - 35.5	Pole	TP35.222x34.451x0.3125	Pole	94.3%	Pass
35.5 - 30.5	Pole	TP35.992x35.222x0.3125	Pole	97.0%	Pass
30.5 - 28	Pole	TP36.377x35.992x0.3125	Pole	98.4%	Pass
28 - 27.75	Pole + Reinf.	TP36.415x36.377x0.625	Reinf. 1 Tension Rupture	73.2%	Pass
27.75 - 22.75	Pole + Reinf.	TP37.186x36.415x0.625	Reinf. 1 Tension Rupture	75.4%	Pass
22.75 - 17.75	Pole + Reinf.	TP37.956x37.186x0.6125	Reinf. 1 Tension Rupture	77.5%	Pass
17.75 - 12.75	Pole + Reinf.	TP38.726x37.956x0.6	Reinf. 1 Tension Rupture	79.6%	Pass
12.75 - 7.75	Pole + Reinf.	TP39.496x38.726x0.6	Reinf. 1 Tension Rupture	81.5%	Pass
7.75 - 2.75	Pole + Reinf.	TP40.266x39.496x0.5875	Reinf. 1 Tension Rupture	83.4%	Pass
2.75 - 0	Pole + Reinf.	TP40.69x40.266x0.5875	Reinf. 1 Tension Rupture	84.4%	Pass
				Summary	
			Pole	98.8%	Pass
			Reinforcement	84.4%	Pass
			Overall	98.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*		
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
140 - 135	655	n/a	655	12.25	n/a	12.25	8.0%		
135 - 130	732	n/a	732	12.71	n/a	12.71	17.6%		
130 - 125	814	n/a	814	13.17	n/a	13.17	26.4%		
125 - 120	902	n/a	902	13.62	n/a	13.62	34.5%		
120 - 115	996	n/a	996	14.08	n/a	14.08	42.1%		
115 - 110	1096	n/a	1096	14.54	n/a	14.54	55.9%		
110 - 105	1203	n/a	1203	15.00	n/a	15.00	67.5%		
105 - 100	1317	n/a	1317	15.46	n/a	15.46	78.3%		
100 - 95	1438	n/a	1438	15.92	n/a	15.92	88.3%		
95 - 92.75	1494	n/a	1494	16.12	n/a	16.12	92.5%		
92.75 - 87.75	2067	n/a	2067	21.76	n/a	21.76	70.8%		
87.75 - 82.75	2246	n/a	2246	22.37	n/a	22.37	76.4%		
82.75 - 77.75	2435	n/a	2435	22.98	n/a	22.98	81.5%		
77.75 - 72.75	2634	n/a	2634	23.59	n/a	23.59	86.3%		
72.75 - 67.75	2844	n/a	2844	24.20	n/a	24.20	91.8%		
67.75 - 62.75	3065	n/a	3065	24.82	n/a	24.82	97.4%		
62.75 - 61.5	3122	n/a	3122	24.97	n/a	24.97	98.8%		
61.5 - 61.25	3134	3160	6294	25.00	24.00	49.00	49.4%		71.0%
61.25 - 56.25	3369	3308	6677	25.61	24.00	49.61	52.7%		75.1%
56.25 - 51.25	3616	3460	7076	26.22	24.00	50.22	56.0%		79.0%
51.25 - 51	3629	3468	7097	26.25	24.00	50.25	56.2%		79.2%
51 - 45.5	4654	n/a	4654	33.10	n/a	33.10	88.1%		
45.5 - 40.5	4984	n/a	4984	33.86	n/a	33.86	91.3%		
40.5 - 35.5	5329	n/a	5329	34.62	n/a	34.62	94.3%		
35.5 - 30.5	5690	n/a	5690	35.39	n/a	35.39	97.0%		
30.5 - 28	5876	n/a	5876	35.77	n/a	35.77	98.4%		
28 - 27.75	5895	5651	11545	35.81	32.50	68.31	50.4%	73.2%	
27.75 - 22.75	6280	5882	12162	36.57	32.50	69.07	52.3%	75.4%	
22.75 - 17.75	6682	6117	12799	37.34	32.50	69.84	54.2%	77.5%	
17.75 - 12.75	7101	6357	13458	38.10	32.50	70.60	56.0%	79.6%	
12.75 - 7.75	7536	6602	14139	38.86	32.50	71.36	57.8%	81.5%	
7.75 - 2.75	7989	6852	14841	39.63	32.50	72.13	59.5%	83.4%	
2.75 - 0	8246	6991	15238	40.05	32.50	72.55	60.5%	84.4%	

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

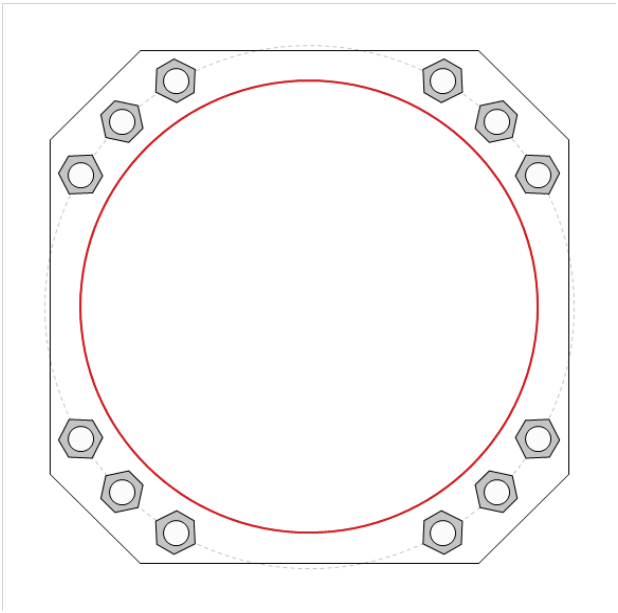
Monopole Base Plate Connection

Site Info	
BU #	826849
Site Name	ublic Storage-Prosperit
Order #	519470, Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.875

Applied Loads	
Moment (kip-ft)	2613.41
Axial Force (kips)	39.12
Shear Force (kips)	26.42

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 47" BC

Anchor Spacing: 6 in

Base Plate Data

46" W x 2.5" Plate (A615-75; Fy=75 ksi, Fu=100 ksi); Clip: 8 in

Stiffener Data

N/A

Pole Data

40.69" x 0.5875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 225.47	ϕPn_c = 268.39	**Stress Rating**
Vu = 2.2	ϕVn = 120.77	**80.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	46.08	(Flexural)
Allowable Stress (ksi):	67.5	
Stress Rating:	**65.0%**	**Pass**

Drilled Pier Foundation

BU # :	826849
Site Name:	Public Storage-Prospe
Order Number:	

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2613.41	
Axial Force (kips)	39.14	
Shear Force (kips)	26.4	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	22.5	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 22.5' below grade		
Pier Diameter	6	ft
Rebar Quantity	16	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing		in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.91	-
Soil Safety Factor	1.81	-
Max Moment (kip-ft)	2838.18	-
Rating*	*69.9%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	195.70	-
End Bearing (kips)	318.09	-
Weight of Concrete (kips)	117.06	-
Total Capacity (kips)	513.79	-
Axial (kips)	156.20	-
Rating*	*29.0%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.80	-
Critical Moment (kip-ft)	2838.05	-
Critical Moment Capacity	3498.48	-
Rating*	*77.3%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	17.04	-
Critical Shear (kip)	380.92	-
Critical Shear Capacity	469.29	-
Rating*	*77.3%*	-

Soil Interaction Rating*	**69.9%**
Structural Foundation Rating*	**77.3%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	None	# of Layers	3

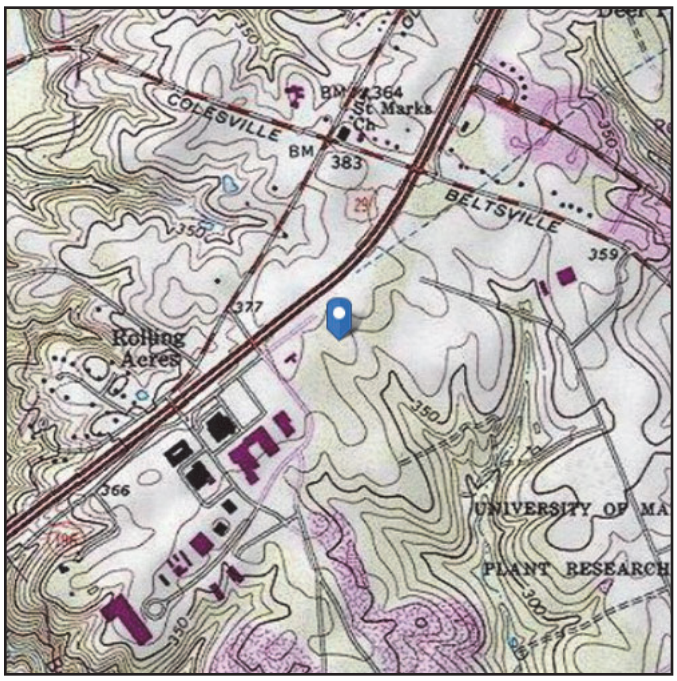
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	12	7	110	150	0	30	0.552	0.552				8	Cohesionless
3	12	22.5	10.5	110	150	0	30	0.951	0.951			15	8	Cohesionless

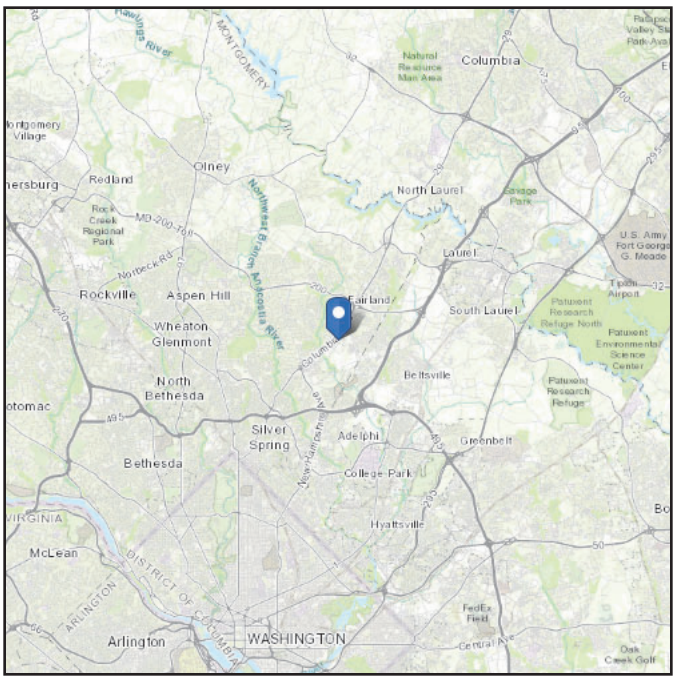
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 377.18 ft (NAVD 88)
Latitude: 39.05785
Longitude: -76.965497





Wind

Results:

Wind Speed:	113 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Thu Oct 08 2020

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

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

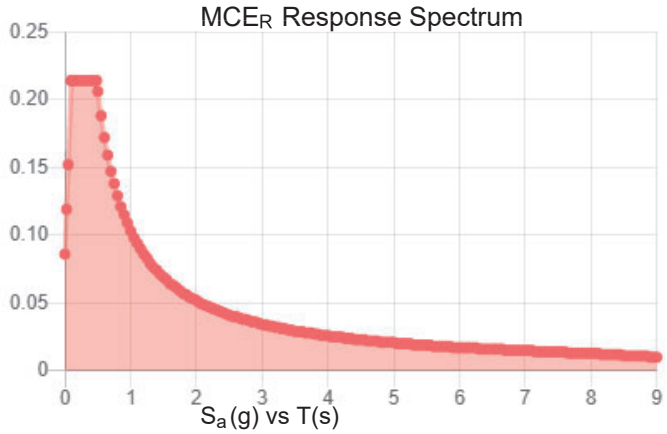
Seismic

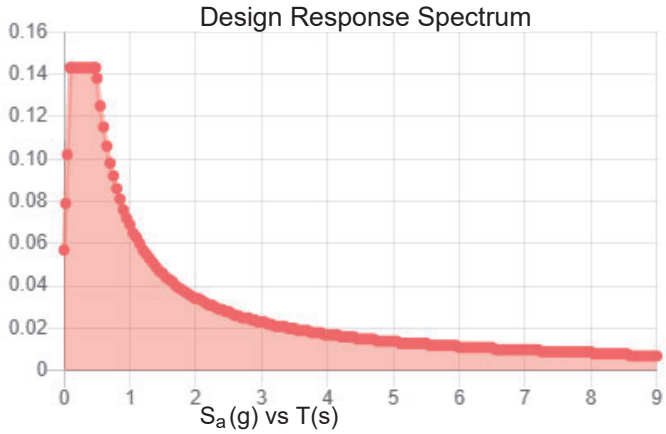
Site Soil Class: D - Default (see Section 11.4.3)

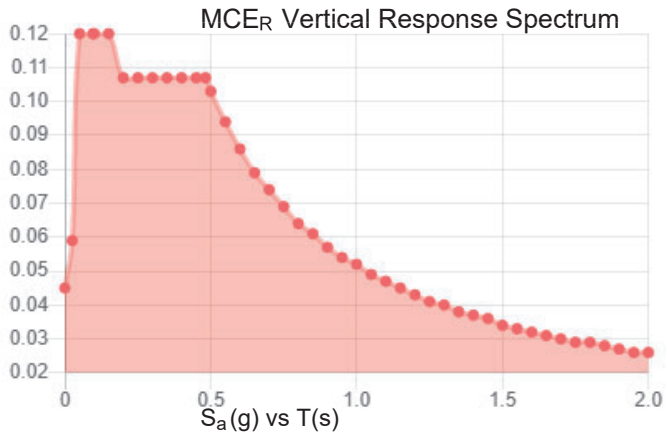
Results:

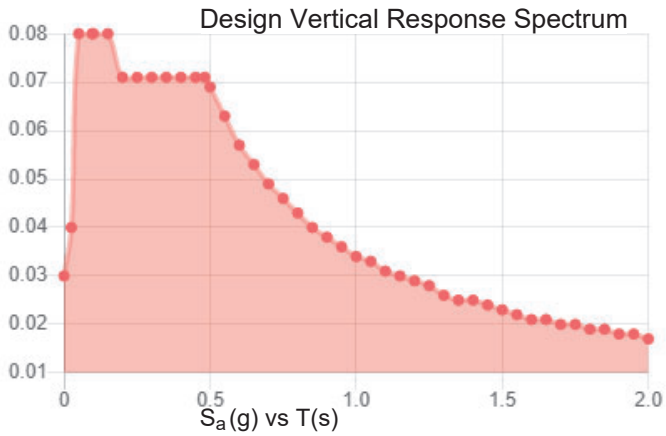
S_S :	0.134	S_{D1} :	0.069
S_1 :	0.043	T_L :	8
F_a :	1.6	PGA :	0.069
F_v :	2.4	PGA_M :	0.111
S_{MS} :	0.214	F_{PGA} :	1.6
S_{M1} :	0.103	I_e :	1
S_{DS} :	0.143	C_v :	0.7

Seismic Design Category B









Data Accessed: Thu Oct 08 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

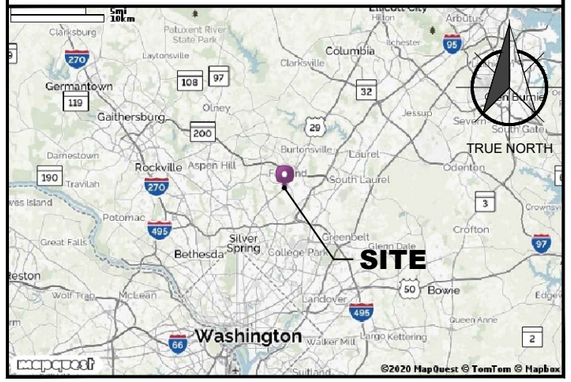
Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Oct 08 2020

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

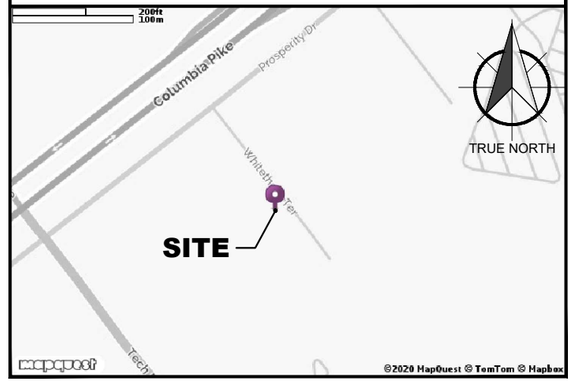
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from 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.

Revisions received 1.5.21 - JE

VICINITY MAP



LOCAL MAP



T-MOBILE ANCHOR OVERLAY

CONSTRUCTION DRAWINGS

T-MOBILE SITE CONFIGURATION: 6SEC-67D5A993D-2MB OUTDOOR (6131)

T-MOBILE SITE ID:

7WAN124I

T-MOBILE SITE NAME:

PUBLIC STORAGE-PROSPERITY

CROWN BU:

826849

PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:

12355 PROSPERITY DRIVE
DISTRICT 5, MD 20904
(MONTGOMERY COUNTY)

PROJECT DESCRIPTION / SOW

ANCHOR UPGRADE. T-MOBILE PROPOSES TO ADD (3) NEW ANTENNAS AT 139', REMOVE (6) RRHs, ADD (12) NEW RRHs AT 140' AND ADD (1) NEW SQUARE PLATFORM MOUNT ON EXISTING 140' MONOPOLE. T-MOBILE PROPOSES ADDING (1) 6160 CABINET, AND (1) B160 BATTERY CABINET TO GROUND PAD EQUIPMENT

REFERENCE NOTES

7WAN124I_Anchor_5_2020-07-09

GC SHALL REVIEW AND COMPLY WITH TOWER STRUCTURAL ANALYSIS COMPLETED BY: CROWN CASTLE
DATED: 10/16/2020PROJECT #: 1868671

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GN-2	GENERAL NOTES	1	01/04/2021
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C-2	TOWER ELEVATION & ANTENNA LAYOUT	1	01/04/2021
C-3	RF SCHEDULE	1	01/04/2021
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G-3	GROUNDING DETAILS	1	01/04/2021
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GENERAL NOTES

811 Know what's below. Call before you dig.

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION, THEREFORE HANDICAP ACCESS IS NOT REQUIRED. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS NEW. PARKING REQUIREMENTS ARE UNCHANGED. TRAFFIC IS UNAFFECTED. SIGNAGE IS NOT NEW. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING:

CODE TYPE	CODE
BUILDING	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

SITE SUMMARY

TOWER HEIGHT/TYPE:	140' MONOPOLE
SCOPE TYPE:	T-MOBILE ANCHOR UPGRADE
OCCUPANCY TYPE:	TELECOMMUNICATIONS
LATITUDE:	39° 3' 28.26"N (39.057850)
LONGITUDE:	76° 57' 55.79"W (-76.965497)
JURISDICTION:	MONTGOMERY COUNTY
PARCEL #:	N/A
ZONING CLASSIFICATION:	N/A

PROJECT DIRECTORY

APPLICANT:	T-MOBILE 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705
STRUCTURE OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CROWN PROJECT MANAGER:	CONTACT: SHANNON HOUGH CAMPBELL 100 REGENCY DRIVE, SUITE 300 CARY, NC 27518 PHONE: (704) 405-6593
SITE DESIGN:	MASTEC NETWORK SOLUTIONS 507 AIRPORT BLVD, SUITE 111 MORRISVILLE, NC 27560 CONTACT: RAPHAEL MOHAMED PHONE: (919) 674-5895

STATE OF MARYLAND · RAPHAEL MOHAMED · 32372 · PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32372, EXPIRATION DATE: 11/10/2021

RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372 01/04/2021

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
01/04/2021	CONSTRUCTION	0	RM
01/04/2021	CONSTRUCTION	1	RM

DRAWN BY: KJC
CHECKED BY: CS
APPV'D BY: RM
MNS PROJECT NO: 84228-AEC

PREPARED FOR:

T-Mobile
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PREPARED FOR:

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

PREPARED BY:

MasTec Network Solutions
507 AIRPORT BLVD, SUITE 111
MORRISVILLE, NC 27560

T-MOBILE SITE ID:
7WAN124I

CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED- NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"Ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE
   GROUND:
   SLAB AND WALLS.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.

5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N. TYPE 1. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR- _____
   SUBCONTRACTOR- GENERAL CONTRACTOR (CONSTRUCTION)
   CARRIER- T-MOBILE
   TOWER OWNER- CROWN CASTLE USA INC.
   OEM- ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR AND CROWN CASTLE USA INC.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE USA INC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION WITH OUTER JACKET LISTED OR LABELED FOR THE LOCATION USED UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E. RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL; SHALL MEET OR EXCEED UL 50 AND RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.
24. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
25. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "T-MOBILE".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

STATE OF MARYLAND
RAPHAEL MOHAMED
32372
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BYME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32372, EXPIRATION DATE: 11/10/2021

RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372 01/04/2021

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
01/04/2021	CONSTRUCTION	0	RM
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DRAWN BY:	KJC
CHECKED BY:	CS
APPV'D BY:	RM
MNS PROJECT NO:	84228-AEC

PREPARED FOR:
T-Mobile
12050 BALTIMORE AVENUE
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3530 TORINGDON WAY, SUITE 300
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507 AIRPORT BLVD, SUITE 111
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T-MOBILE SITE ID:
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CROWN BU:
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PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 AWG SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS, WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL	ABOVE GRADE LEVEL
BTS	BASE TRANSCEIVER STATION
(E)	EXISTING
MIN.	MINIMUM
REF	REFERENCE
RF	RADIO FREQUENCY
T.B.D.	TO BE DETERMINED
T.B.R.	TO BE RESOLVED
TYP	TYPICAL
REQ	REQUIRED
EGR	EQUIPMENT GROUND RING
AWG	AMERICAN WIRE GAUGE
MGB	MASTER GROUND BAR
EG	EQUIPMENT GROUND
BCW	BARE COPPER WIRE
SIAD	SMART INTEGRATED ACCESS DEVICE
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
RBS	RADIO BASE STATION

SYMBOLS:

SOLID GROUND BUS BAR

SOLID NEUTRAL BUS BAR

SUPPLEMENTAL GROUND CONDUCTOR


2-POLE THERMAL-MAGNETIC CIRCUIT BREAKER


SINGLE-POLE THERMAL-MAGNETIC CIRCUIT BREAKER


CHEMICAL GROUND ROD

TEST WELL


DISCONNECT SWITCH

METER


EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)


MECHANICAL CONNECTION

GROUNDING WIRE

NEC INSULATOR COLOR CODE		
DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED-POLARITY MARK AT TERMINATION
VDC NEG	-	*BLACK-POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE OR PURPLE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

STATE OF MARYLAND
RAPHAEL MOHAMED
32372
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RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372 01/04/2021

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
01/04/2021	CONSTRUCTION	0	RM
01/04/2021	CONSTRUCTION	1	RM

DRAWN BY: KJC
CHECKED BY: CS
APPV'D BY: RM
MNS PROJECT NO: 84228-AEC

PREPARED FOR:
T-Mobile
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PREPARED FOR:
CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

PREPARED BY:
MasTec Network Solutions
507 AIRPORT BLVD, SUITE 111
MORRISVILLE, NC 27560

T-MOBILE SITE ID:
7WAN124I

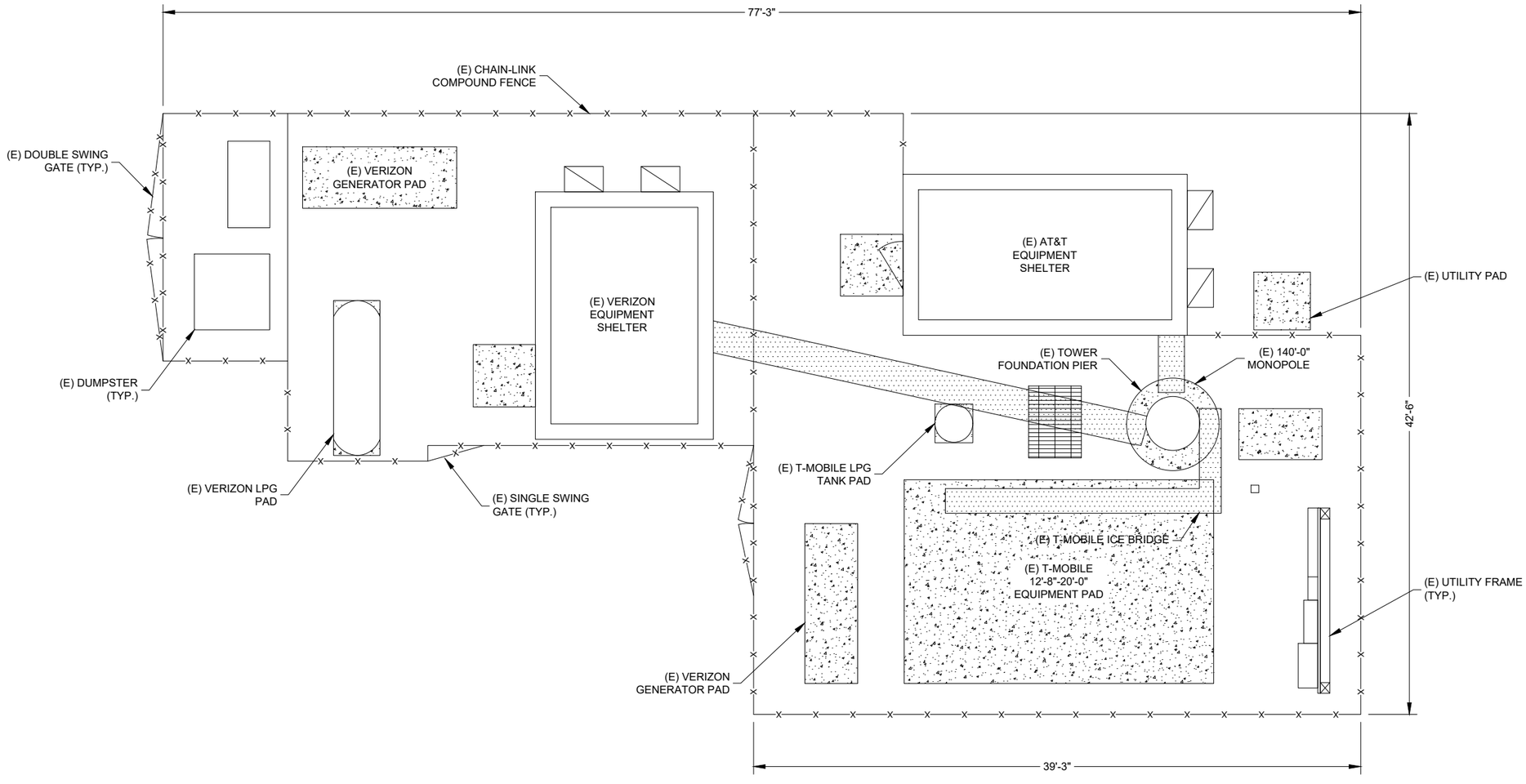
CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2



0 8' 16'

1"=8'-0"

SITE PLAN

11"x17" SCALE: 1"=8'-0"

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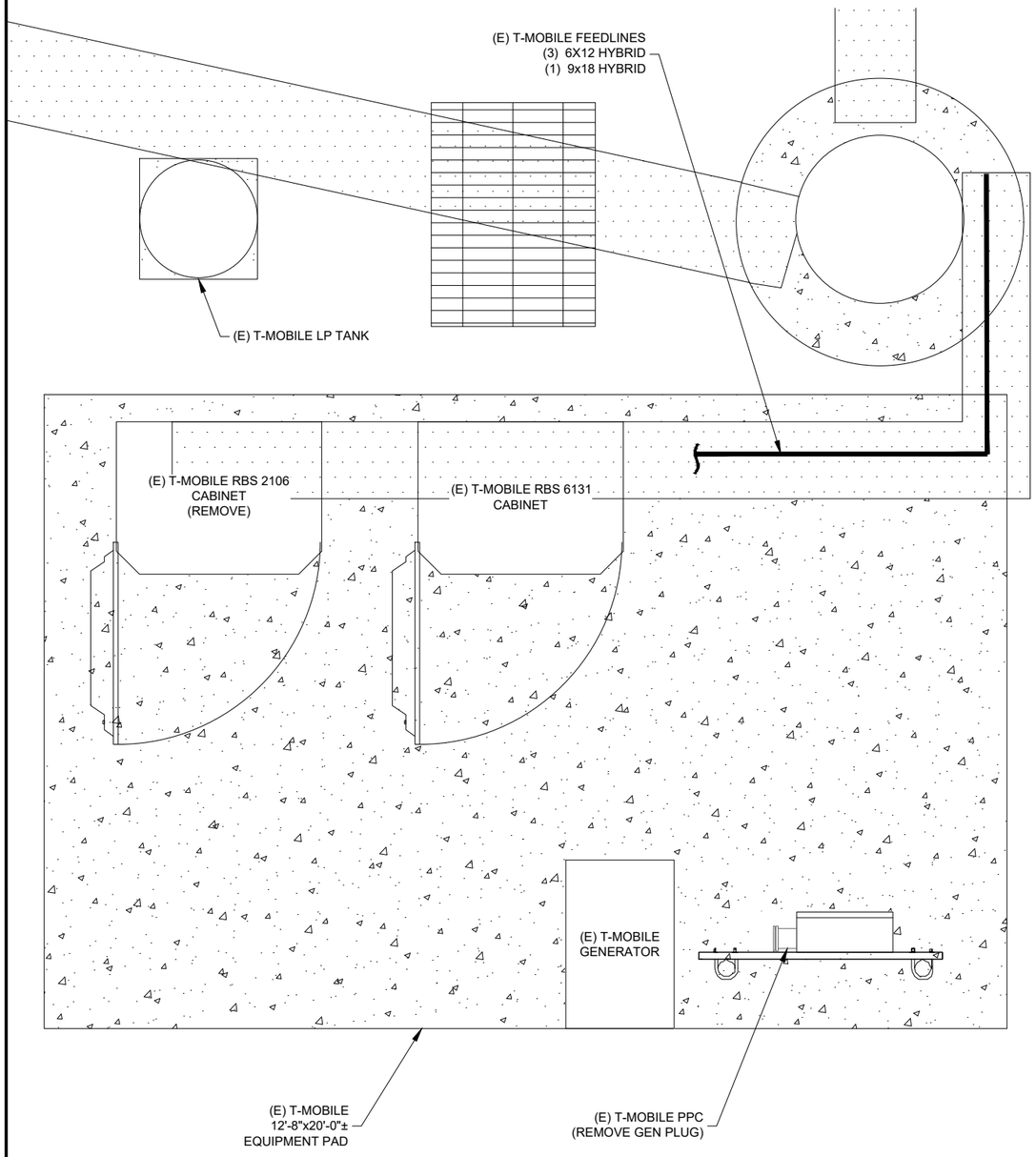
SHEET TITLE

SITE PLAN

SHEET NUMBER
C-1



0 3' 6'

1" = 3'

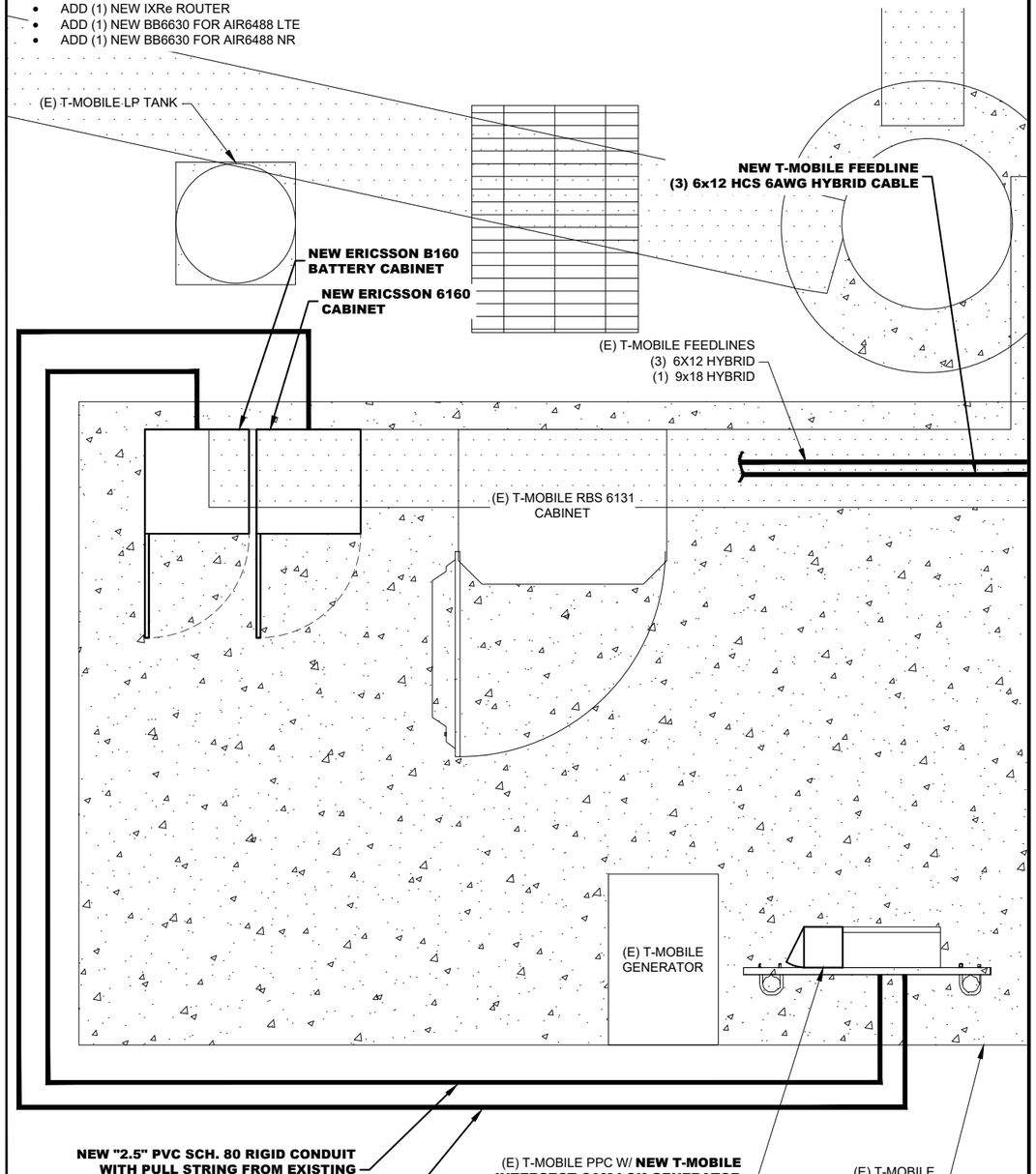
EXISTING EQUIPMENT LAYOUT

11"x17" SCALE: 1" = 3'

TRUE NORTH

SCOPE:

- ADDITIONAL SSCFOR ADDITIONAL POWER NEXT TO EXISTING CABINET+BATTERY CABINET
- UPGRADE AC SERVICES AND REPLACE PPC
- ADD (1) NEW IXRe ROUTER
- ADD (1) NEW BB6630 FOR AIR6488 LTE
- ADD (1) NEW BB6630 FOR AIR6488 NR



0 3' 6'

1" = 3'

FINAL EQUIPMENT LAYOUT

11"x17" SCALE: 1" = 3'

TRUE NORTH

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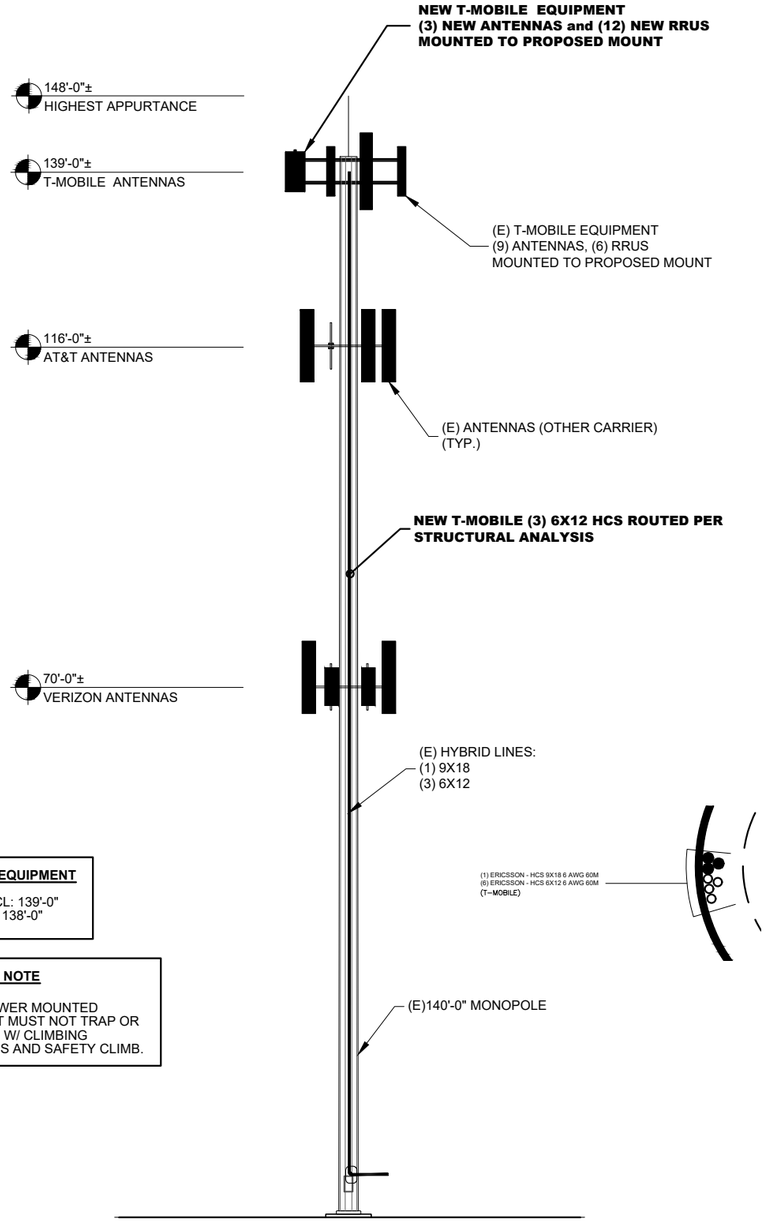
140' MONOPOLE

SHEET TITLE

EQUIPMENT LAYOUT

SHEET NUMBER
C-1.1



T-MOBILE EQUIPMENT

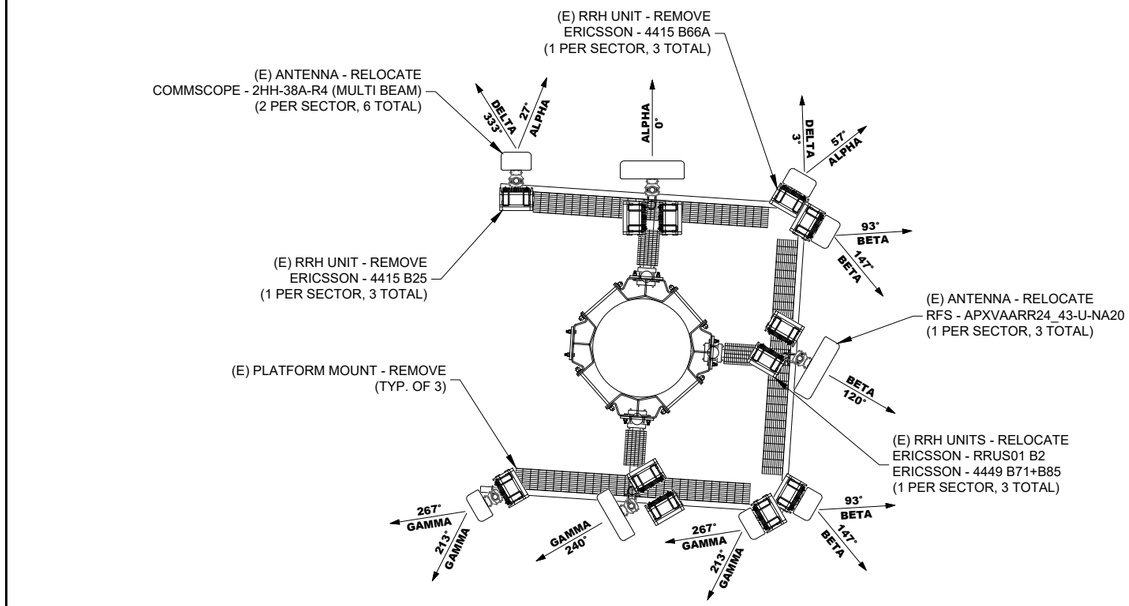
ANTENNA CL: 139'-0"
MOUNT CL: 138'-0"

INSTALLER NOTE

DIRECT TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ CLIMBING PEGS/STEPS AND SAFETY CLIMB.

0 20' 40'
1"=20'-0"

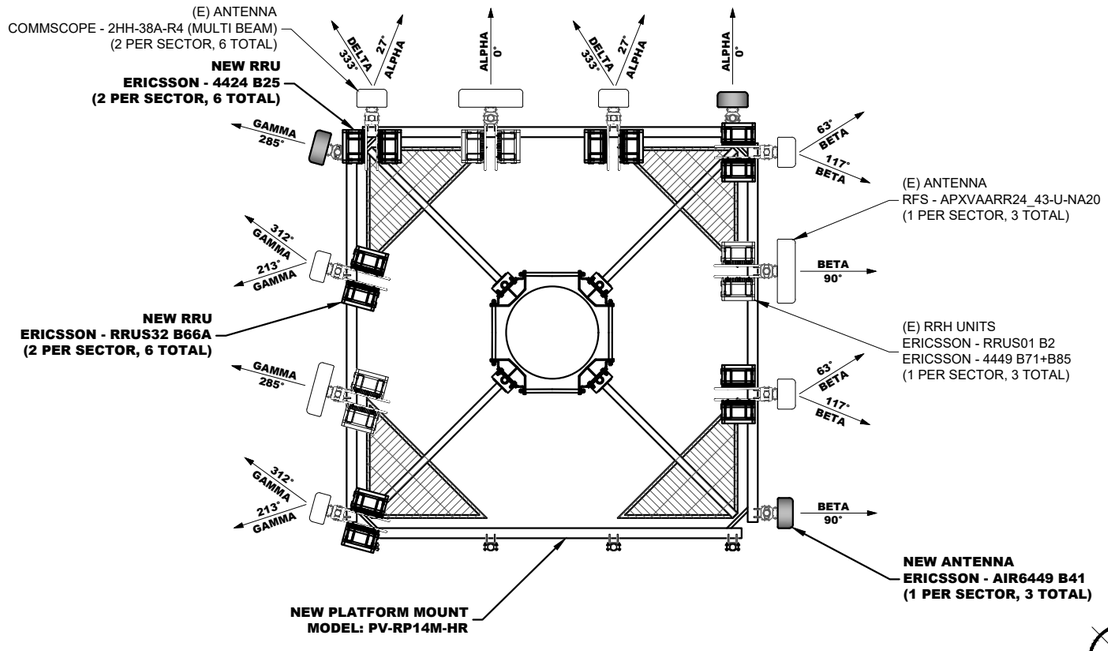
FINAL TOWER ELEVATION
11"x17" SCALE: 1"=20'-0"



0 5' 10'
1"=5'-0"

EXISTING ANTENNA LAYOUT
11"x17" SCALE: 1"=5'-0"

TRUE NORTH



0 5' 10'
1"=5'-0"

FINAL ANTENNA LAYOUT
11"x17" SCALE: 1"=5'-0"

TRUE NORTH

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CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE

TOWER ELEVATION & ANTENNA LAYOUT

SHEET NUMBER

C-2

FINAL RF EQUIPMENT SCHEDULE

SECTOR - POSITION	ANTENNA MAKE/MODEL	RAD CENTER	AZIMUTH	TME ℄	(QTY.) RADIO	(QTY.) CABLES	CABLE LENGTH
A1	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	333°/27°	-	**(2) ERICSSON - 4424 B25 (N)**	(1) ERICSSON - HCS 9X18 (3) ERICSSON - HCS 6X12 **(3) ERICSSON - HCS 6X12 (N)**	200'-0"
A2	RFS - APXVAARR24_43-U-NA20	139'-0"	0°	-	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - RRUS01 B2		
A3	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	333°/27°	-	**(2) ERICSSON -RRUS32 B66A (N)**		
A4	**ERICSSON - AIR6449 B41 (N)**	139'-0"	0°	-	-		
B1	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	63°/117°	-	**(2) ERICSSON - 4424 B25 (N)**		
B2	RFS - APXVAARR24_43-U-NA20	139'-0"	90°	-	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - RRUS01 B2		
B3	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	63°/117°	-	**(2) ERICSSON -RRUS32 B66A (N)**		
B4	**ERICSSON - AIR6449 B41 (N)**	139'-0"	90°	-	-		
C1	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	312°/213°	-	**(2) ERICSSON - 4424 B25 (N)**		
C2	RFS - APXVAARR24_43-U-NA20	139'-0"	285°	-	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - RRUS01 B2		
C3	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	312°/213°	-	**(2) ERICSSON -RRUS32 B66A (N)**		
C4	**ERICSSON - AIR6449 B41 (N)**	139'-0"	285°	-	-		
TOTALS	**(12) ANTENNAS**	**-**			**(18) RRU'S**	**(7) CABLES**	**-**

(N) = NEW

RF EQUIPMENT SCHEDULE

11"x17" SCALE: NTS

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SITE ADDRESS:
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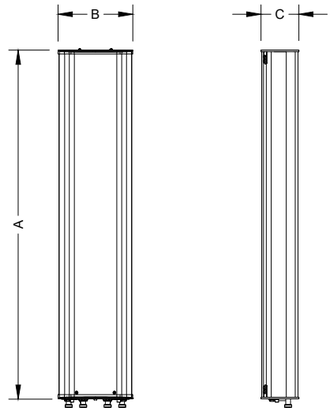
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
RF SCHEDULE

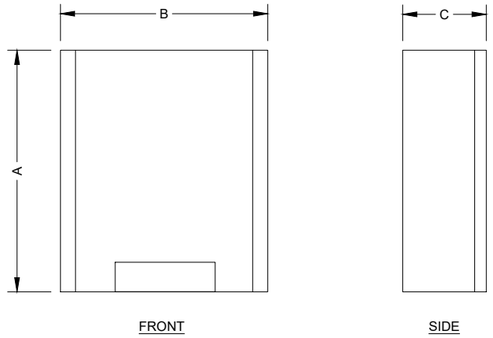
SHEET NUMBER
C-3



NEW ANTENNA SPECIFICATIONS				
ANTENNA MODEL	**LENGTH (A)**	**WIDTH (B)**	**DEPTH (C)**	**WEIGHT**
ERICSSON - AIR6449 B41	33.11"	20.51"	8.54"	114.63LBS

NEW ANTENNA SPECIFICATIONS

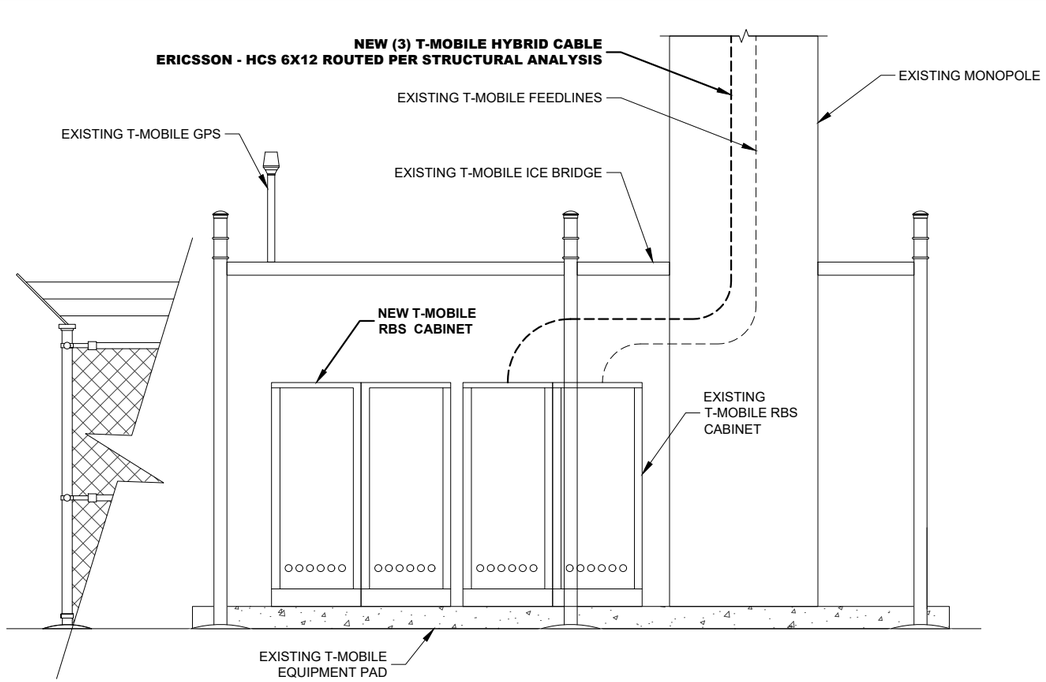
SCALE: N.T.S.



NEW RADIO SPECIFICATIONS				
RADIO MODEL	**LENGTH (A)**	**WIDTH (B)**	**DEPTH (C)**	**WEIGHT**
4449 B71+B85	17.91"	13.2"	10.63"	73.21LBS
RRUA32 B66A	27.6"	12.45"	7.41"	55.12LBS

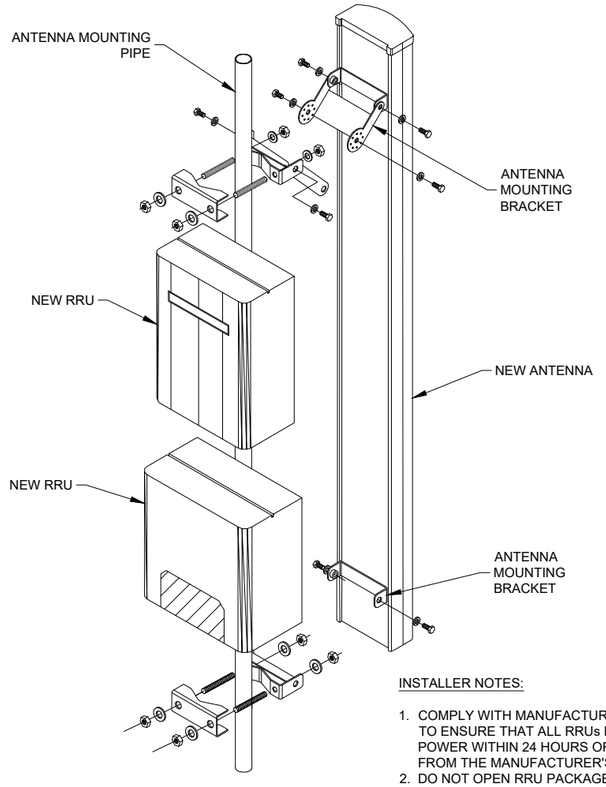
NEW RADIO SPECIFICATIONS

SCALE: N.T.S.



EQUIPMENT ELEVATION DETAIL

11"x17" SCALE: N.T.S.

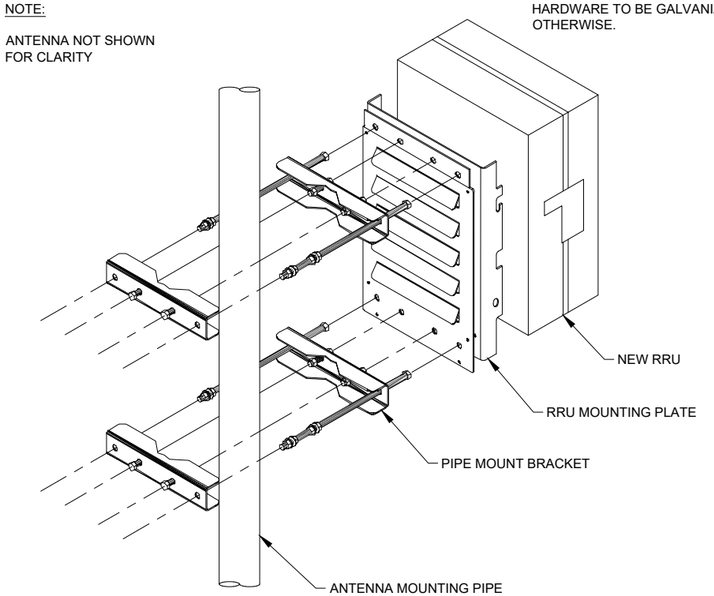


INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRUs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRU PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.

NOTE:

ANTENNA NOT SHOWN FOR CLARITY



MOUNTING DETAIL

11"x17" SCALE: N.T.S.

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EXISTING
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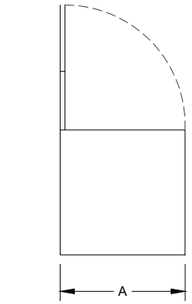
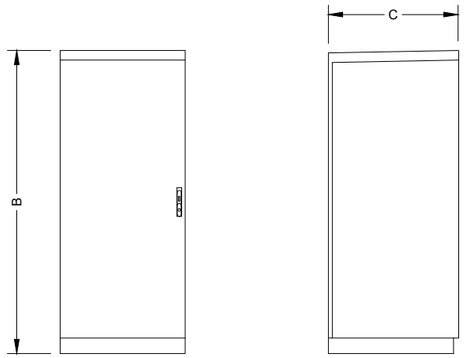
SHEET TITLE

EQUIPMENT DETAILS & SPECIFICATIONS

SHEET NUMBER
C-4



PLAN VIEW

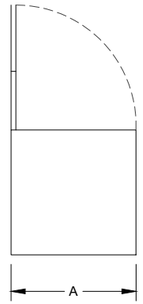


FRONT VIEW RIGHT SIDE VIEW

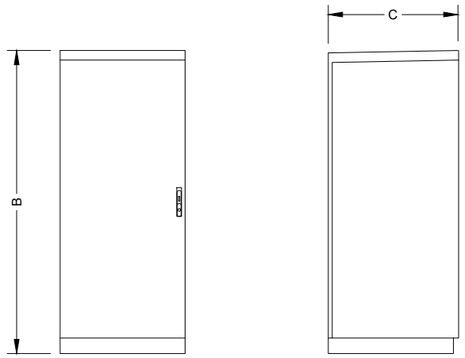
NEW CABINET SPECIFICATIONS				
CABINET MODEL	**WIDTH (A)**	**LENGTH (B)**	**DEPTH (C)**	**WEIGHT**
ERICSSON B160	25.59"	62.99"	25.59"	295.0 LBS

ERICSSON B160 CABINET SPECIFICATIONS

SCALE: N.T.S.



PLAN VIEW



FRONT VIEW RIGHT SIDE VIEW

NEW CABINET SPECIFICATIONS				
CABINET MODEL	**WIDTH (A)**	**LENGTH (B)**	**DEPTH (C)**	**WEIGHT**
ERICSSON 6160	25.59"	62.99"	25.59"	388.0 LBS

ERICSSON 6160 CABINET SPECIFICATIONS

SCALE: N.T.S.

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RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372 01/04/2021

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DATE	DESCRIPTION	REV	ISSUED BY
01/04/2021	CONSTRUCTION	0	RM
01/04/2021	CONSTRUCTION	1	RM

DRAWN BY: KJC
CHECKED BY: CS
APPV'D BY: RM
MNS PROJECT NO: 84228-AEC

PREPARED FOR:

T-Mobile

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

PREPARED BY:

MasTec Network Solutions

507 AIRPORT BLVD, SUITE 111
MORRISVILLE, NC 27560

T-MOBILE SITE ID:
7WAN124I

CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

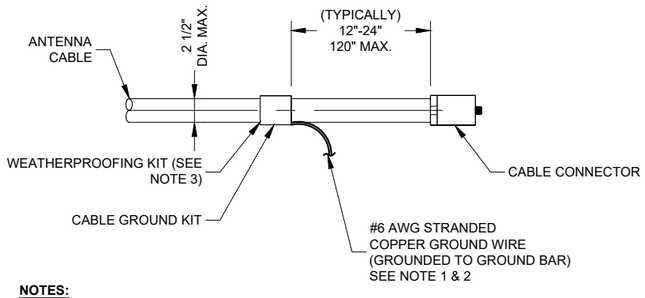
SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE

EQUIPMENT DETAILS & SPECIFICATIONS

SHEET NUMBER
C-4.1

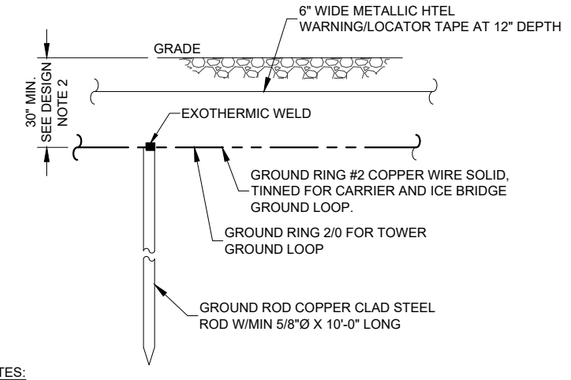


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

CABLE GROUND KIT CONNECTIONS

11"x17" SCALE: N.T.S.

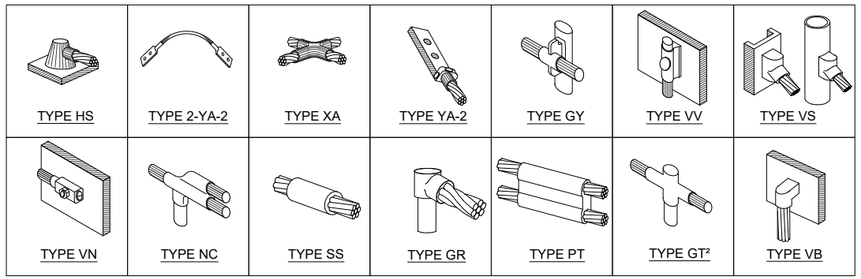


NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICAL, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE.
3. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

GROUND ROD DETAIL

11"x17" SCALE: N.T.S.

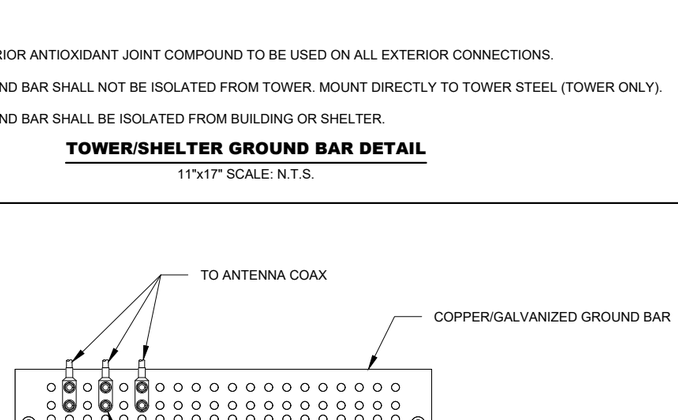


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

CADWELD GROUNDING CONNECTIONS

11"x17" SCALE: N.T.S.

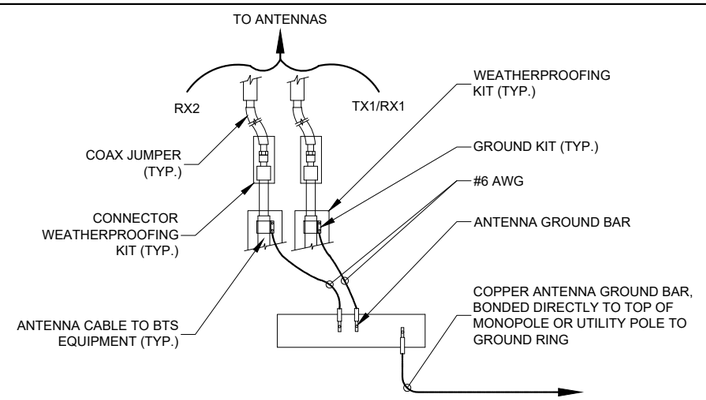


NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

TOWER/SHELTER GROUND BAR DETAIL

11"x17" SCALE: N.T.S.

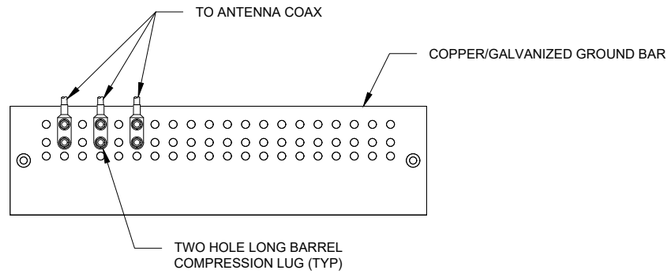


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

GROUNDING CABLE CONNECTIONS

11"x17" SCALE: N.T.S.



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

GROUND BAR

11"x17" SCALE: N.T.S.

STATE OF MARYLAND
RAPHAEL MOHAMED
32372
PROFESSIONAL ENGINEER

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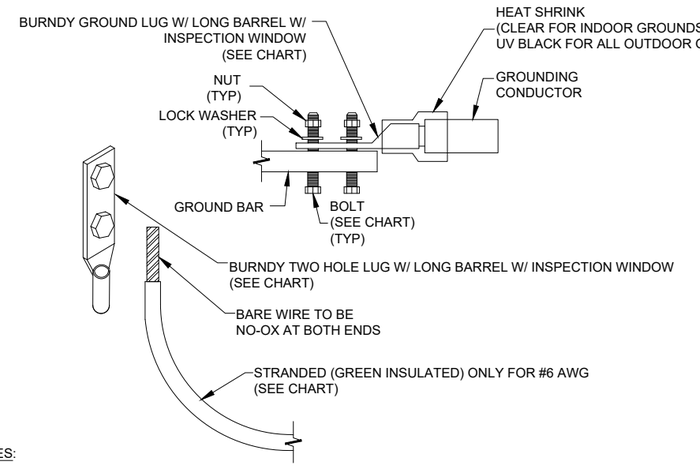
EXISTING
140' MONOPOLE

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-1

WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT

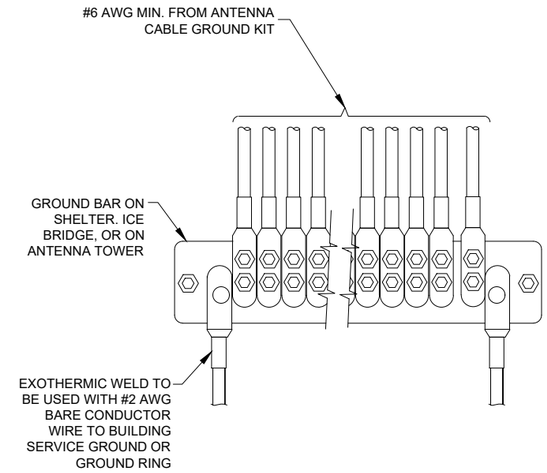


NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

MECHANICAL LUG CONNECTION

11"x17" SCALE: N.T.S.

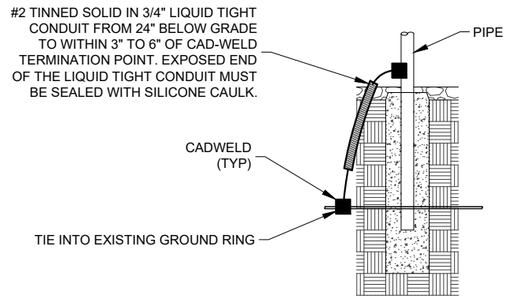


NOTE:

GROUND BARS AT BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

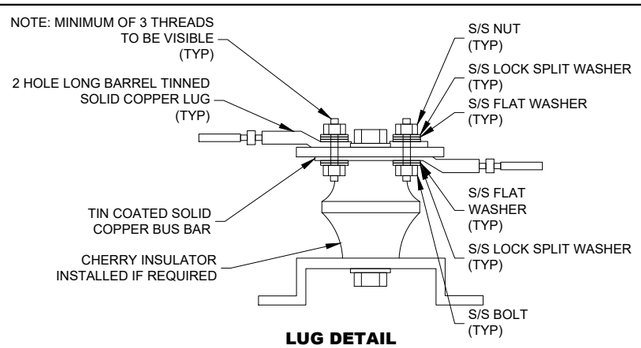
GROUNDWIRE INSTALLATION

11"x17" SCALE: N.T.S.



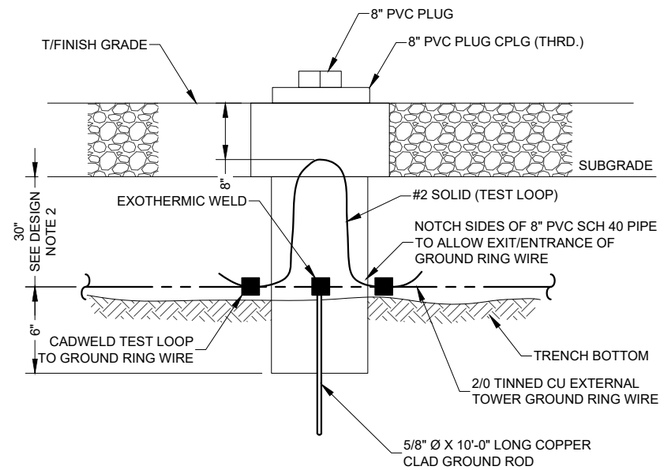
TRANSITIONING GROUND DETAIL

11"x17" SCALE: N.T.S.



LUG DETAIL

11"x17" SCALE: N.T.S.



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICHEVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

INSPECTION WELL DETAIL

11"x17" SCALE: N.T.S.

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MARYLAND NO. 32372 01/04/2021

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BELTSVILLE, MD 20705

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T-MOBILE SITE ID:
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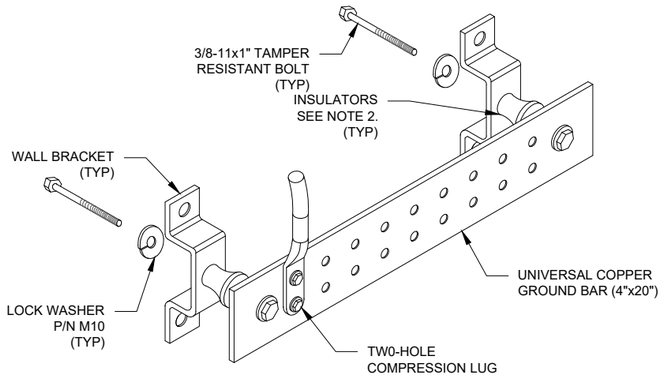
CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2



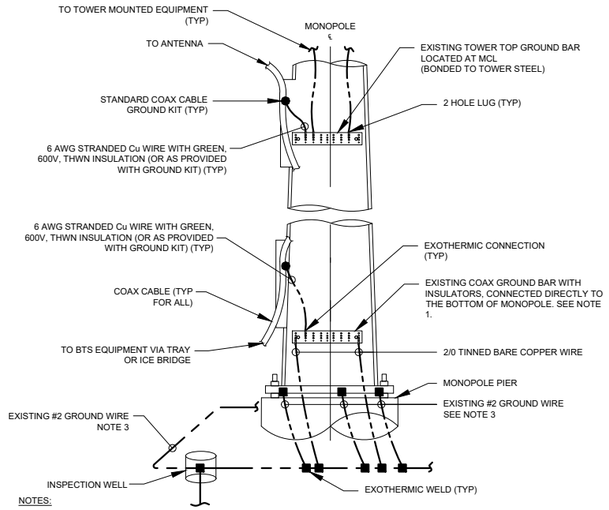
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.

2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

GROUND BAR DETAIL

11"x17" SCALE: N.T.S.

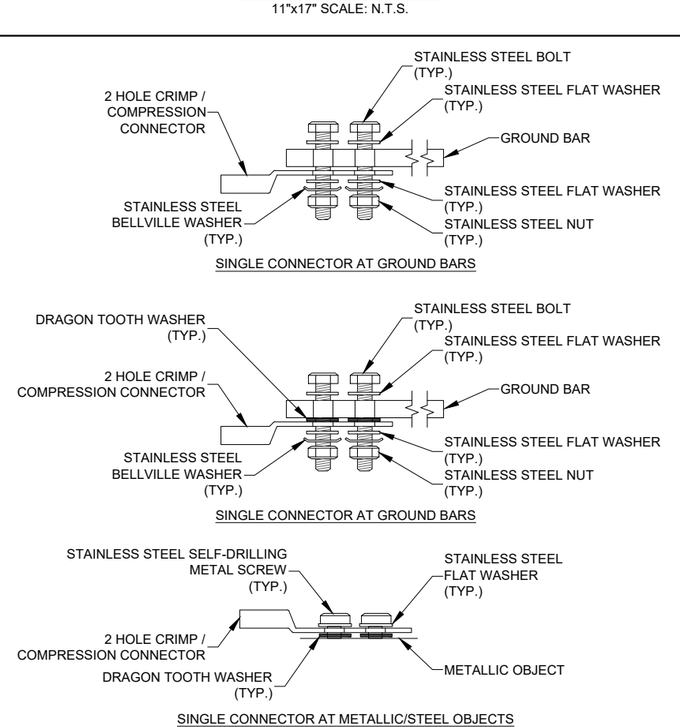


NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

TYPICAL ANTENNA CABLE GROUNDING

11"x17" SCALE: N.T.S.

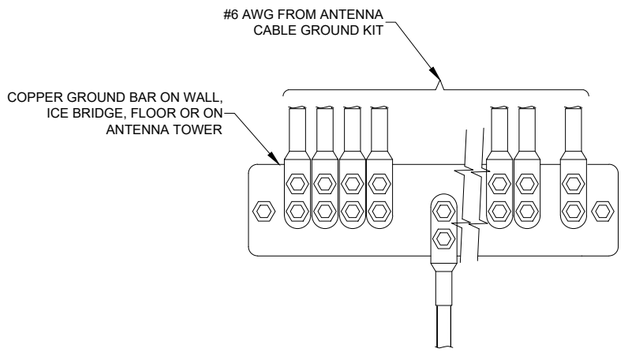


HARDWARE DETAIL FOR EXTERIOR CONNECTIONS

11"x17" SCALE: N.T.S.

NOTE:

1. ALL BOTTOM GROUND BARS TO BE EXOTHERMICALLY WELDED TO EXISTING GROUND RING.



GROUNDWIRE INSTALLATION

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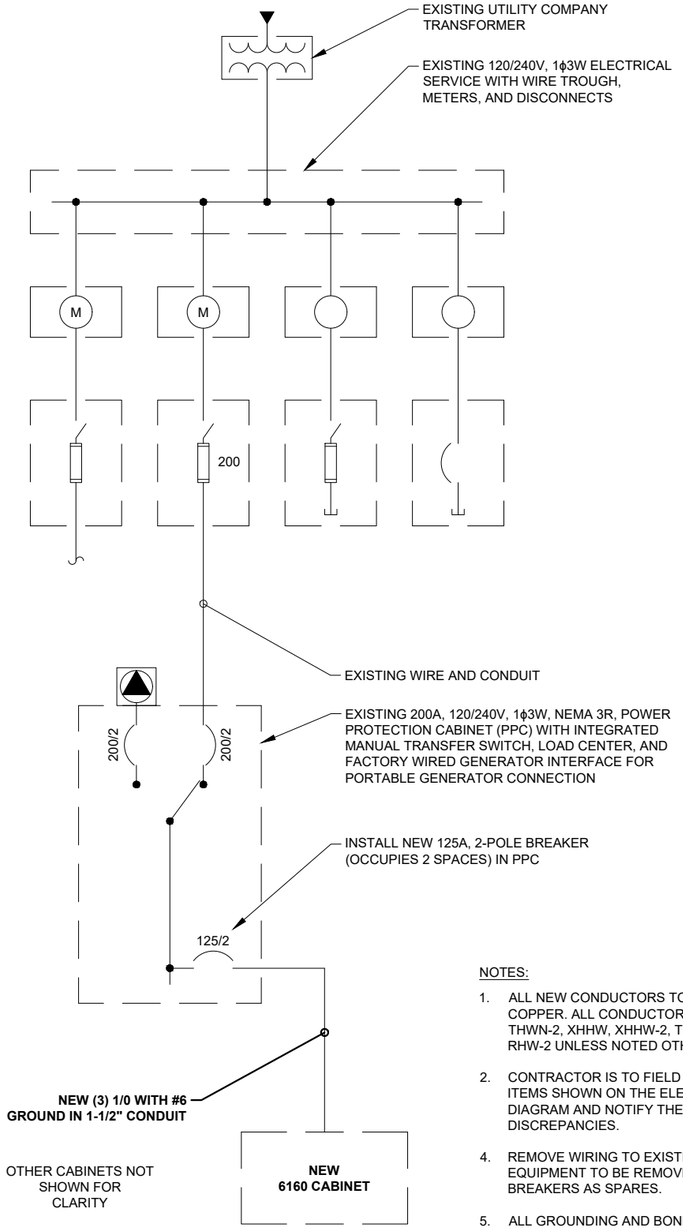
EXISTING
140' MONOPOLE

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3



NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. REMOVE WIRING TO EXISTING BREAKERS FROM EQUIPMENT TO BE REMOVED. RELABEL EMPTY BREAKERS AS SPARES.
5. ALL GROUNDING AND BONDING PER THE NEC.

ELECTRICAL ONE-LINE DIAGRAM

11"x17" SCALE: N.T.S.

T-MOBILE PPC PANEL

MAIN: 200 AMP MAIN BREAKER	**VOLTAGE/PHASE**: 120/240V, 1-PHASE, 3-WIRE	**SHORT CIRCUIT CURRENT RATING**: 22,000 AMPS
MOUNTING: OUTDOOR PPC ENCLOSURE	**ENCLOSURE**: NEMA 3R	**SURGE PROTECTION DEVICE**: YES
SERVICE FROM: N/A	**MANUFACTURER**: SCHNEIDER ELECTRIC (SQUARE D)	**MODEL NUMBER**: QO TYPE PANEL

DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	LOAD (VA) A-PHASE	LOAD (VA) B-PHASE	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
SURGE	0	NC	60	1	0		2	20	NC	0	GFI
	0	NC		3		0	4	20	NC	0	LIGHT
6160 CABINET	**6700**	**C**	***125**	5	11200		6	150	C	4500	6131 CABINET
	6700	**C**		7		11200	8		C	4500	
TELCO DISC	180	NC	30	9	1680		10	150	C	1500	FIBER TOWER
	180	NC		11		1680	12		C	1500	
BLANK				13	0		14				BLANK
BLANK				15		0	16				BLANK
BLANK				17	0		18				BLANK
BLANK				19		0	20				BLANK
BLANK				21	0		22				BLANK
BLANK				23		0	24				BLANK
BASE LOAD (VA) =					12880	12880					
25% OF CONTINUOUS LOAD (VA) =					3175	3175					
TOTAL LOAD (VA) =					16055	16055					
TOTAL LOAD (A) =					134	134					

C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD

** INDICATES NEW LOAD. ALL OTHER LOADS ARE EXISTING.
REPLACE OR INSTALL NEW BREAKER AS NECESSARY.
NEW BREAKERS TO BE SAME TYPE AND AIC RATING AS EXISTING.

** INDICATES FACTORY WIRED

C = CONTINUOUS LOAD, NC = NON-CONTINUOUS LOAD
* INSTALL NEW SQUARE D QO2150 BREAKER
** REMOVE WIRE TO EXISTING BREAKER AND MARK AS SPARE
(ALL LOADS ARE EXISTING UNLESS NOTED OTHERWISE)

PPC SCHEDULE

11"x17" SCALE: N.T.S.

STATE OF MARYLAND
RAPHAEL MOHAMED
32372
PROFESSIONAL ENGINEER

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EXISTING
140' MONOPOLE

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-1

App No: 2020121340

Application General Infomation

Applicant Name	T-Mobile c/o Crown Castle USA	Updated	12/23/2020
Application Type	Minor Modification	Ann. Plan?	Yes
Carrier	T-Mobile	Will site be used to support government telecommunications facilities or other equipment for government use?	No
Solution Type	Macro		
Existing	Existing	Gvt. Use Desc.	

Application Description

T-MOBILE PROPOSES TO ADD (3) NEW Ericsson AIR6449 B41 ANTENNAS, (6) NEW 4424 B25, (6) New RRUS32 B66A RRUS, (1) 6160 CABINET, (1) B160 BATTERY CABINET, AND (1) SQUARE PLATFORM MOUNT

Site Infomation

Site Id	402	Zoning	CR-0.75
Structure Type	Monopole	Latitude	39.05785
Address	12355 Prosperity Dr, Silver Spring	Longitude	-76.965497
County Site Name	Public Storage Prosperity	Ground Elevation	384
Carrier Site Name	Public Storage-Prosperity	City	Silver Spring
Site Owner	Public Storage LP	Lease Status	Leased
Structure Owner	Crown Castle	Does the structure require an antenna structure registration under FCC Title 47	Yes
Existing Structure Height	140		
Provide the proposed height of the replacement structure without any antenna (New, Replacement Apps Only)		Distance to Residential Property (New, Replacement, Colocation Only)	
		Distance to Commercial Property (New, Replacement, Colocation Only)	

Justification of why this site was selected:

The proposed Installation is intended to provide greater service to T-Mobile's customer base in the area. This site is needed to provide coverage within the surrounding
area. T-Mobile selected this site due to their existing installation. By selecting th

NearbySites (New, Replacement Apps Only):

Wednesday, December 23, 2020

1:18:46 PM

App No: 2020121340

Screening considerations(New, Colocations, Replacement Apps Only):

Wednesday, December 23, 2020

1:18:46 PM

App No: 2020121340

6409 Questions

Does this qualify as a 6409 application? (Minor Mod, Colocations Only): Yes

For towers outside the public ROW will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 20 feet, whichever is greater? No

Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet? No

For towers outside the public ROW will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 20 feet? No

More than four Equipment Cabinets? YN: No

Will the proposed installation require excavation or expansion outside the current boundaries of the site? No

Does the structure or current installation have concealment elements/measures? No

Will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 10 feet, whichever is greater? No

If yes, describe how the proposed installation does not defeat the existing concealment.

Small Wireless Facility Informatio

Small Wireless Facility Questions

Small Wireless Facility? No

Is the structure 10% taller than adjacent structures?

Cumulative volume of the proposed wireless equipment(s) exclusive of antennas in cubic feet: 17.5

Please list adjacent structure heights

Tribal Lands? No

Cumulative volume of the proposed antenna antenna(s) exclusive of equipment

ROW Information

PROW? No

Pole Number

ROW owner

ROW width

Wednesday, December 23, 2020

1:18:46 PM

App No: 2020121340

Antenna Infomatio

Antenna Compliance	No
Compliance Desc	
Antenna Location	No
Antenna Loc. Desc.	
Env. Assessment	
Cat. Excluded?	
Routine Env. Evaluation	checked

Antenna Model	Ericsson AIR 6449 B41						
Frequency	2593-2690 2496-2592						
RAD Center	139	Max ERP	3222	Antenna Dimensions	33.1 x 20.6 x 8.6	Quantity	3

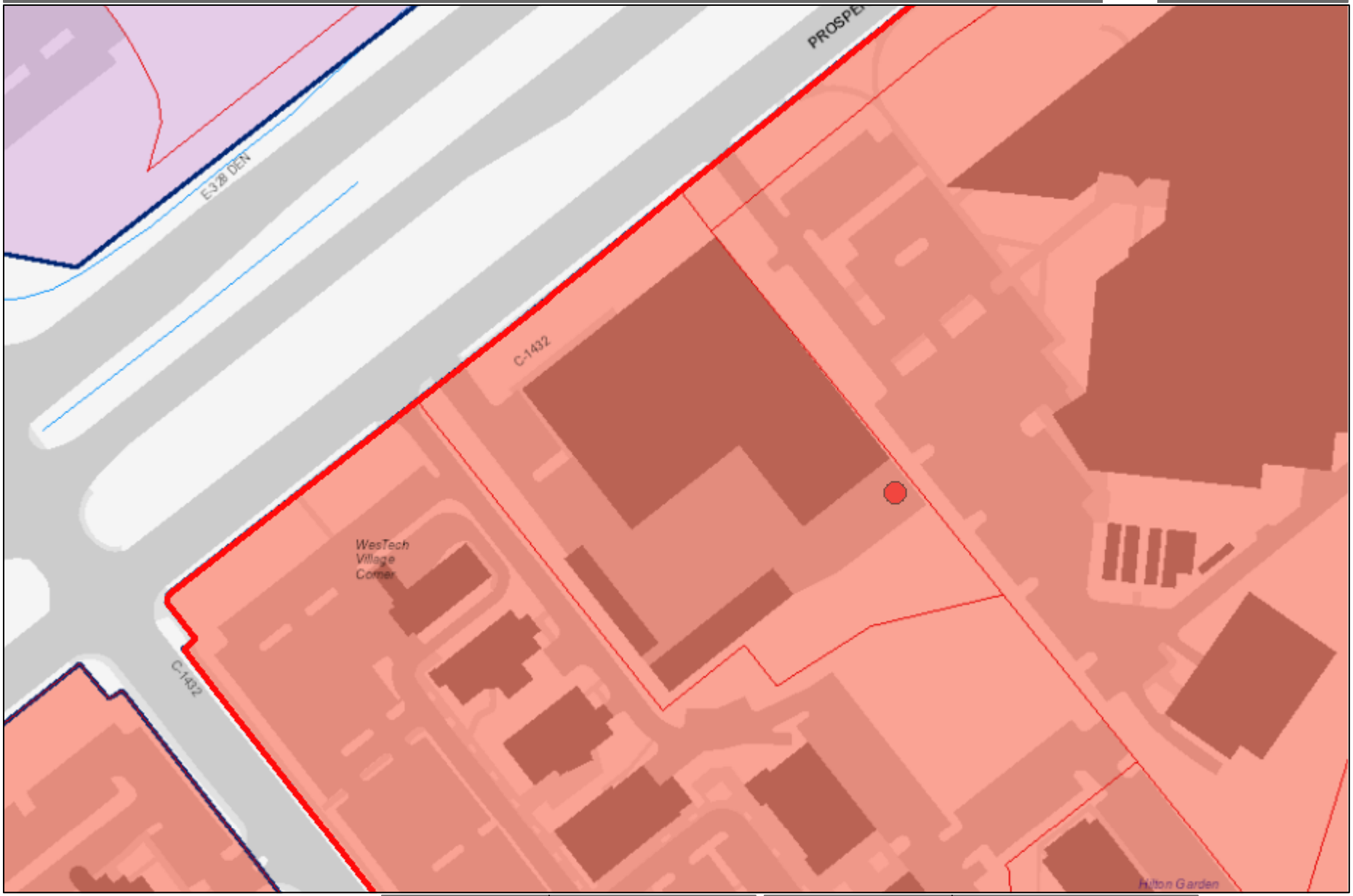
Wednesday, December 23, 2020

1:18:46 PM

Montgomery County Zoning

Date: 12/18/2020

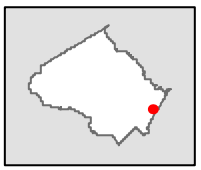
Montgomery County
Planning Department
ITI Division



Account #	03278897
Address	12355 PROSPERITY DR
Zone	CR-0.75 C-0.75 R-0.25 H-75
Overlay Zone	N/A
TDR Overlay Zone	N/A
Landuse	Industrial
Parcel, Lot, Block	N701 , 37 , N/A
WSSC Grid	216NE03
Map Amendments	N/A

Parking District	N/A
CBD	N/A
Special Protection Area	N/A
Urban District	N/A
Enterprise Zone	N/A
Arts & Ent. District	N/A
Special Tax District	N/A
Legal Description	MONTGOMERY IND PARK

Bike/Ped Priority Area	White Oak Science Gateway
Urban Renewal Area	N/A
Metro Station Policy Area	N/A
Priority Funding Area	Yes
Septic Tier	Tier 1: Sewer existing
Municipality	N/A
Master Plan	WHITE OAK SCIENCE GATEWAY
Historic Site/District	N/A
Water/Sewer Categories	W-1 / S-1



1 inch = 172 feet

New Product Introduction

Massive MIMO Mid-Band
AIR6449 B41
New Product Introduction Notification

ERICSSON

(Refresh: Update on AIR6449 usage for NY Boroughs)

PURPOSE

Ericsson's next generation AIR6449 B41 massive MIMO (M-MIMO) single band product provides additional RF power and has full band IBW sufficient to transmit 180 MHz of 4G/5G carrier bandwidth (vs. AIR6488 60 + 60 MHz carrier bandwidth). The AIR6449 also offers enhanced RF performance via a 192 antenna element array (vs. AIR6488 with 128).

BACKGROUND

The AIR6449 has a combined antenna/radio with 64 TRX. It has advantages over the previous AIR6488 model such as:

- Full 194 MHz IBW with NR+LTE mixed mode vs. 100 MHz on AIR6488
- Smaller dimensions (in height) and lighter in weight
- 25 Gbps eCPRI support

AIR 6488 vs. AIR 6449 comparison is available at this link.

USAGE GUIDELINES

- AIR6449 is planned to replace AIR6488 on a go forward basis once available
- Full Anchor Design (2.5GHz + PCS) or 2.5GHz Only (AKA "Skinny")
- All markets except New York Boroughs
    - Use existing AIR6488 if entitlement is complete or expected to complete before July 1st, 2020 (see AIR6488 NPI)
    - Use existing AIR6488 if site is expected to be on-air before July 1st, 2020 (see AIR6488 NPI)
    - Use AIR6449 if entitlement complete is forecasted after July 1st, 2020
- **New York Boroughs**
    - **NY is no longer required to use the AIR6488M product as of 6/12/2020 since T-Mobile now has access to the spectrum blocks previously used by public safety. NY should start entitling for AIR6449 starting with July'20 SC POR. August'20 HC POR should be built using AIR6449.**

TIMELINES

- Lab Entry: April 2020
- GA: July 03 2020
- New RFDS Templates for Anchor PORs reflecting AIR6449 have been created.
- This next generation hardware is expected to be available in commercial quantities in July 2020.

AFFECTED CONFIGURATIONS

Sites must be on an Anchor POR to use the AIR6449.

Site configurations that are designed with AIR6449 B41 will have a "**5A**" (5 for 2.5GHz + A for AIR6449) after the low-band indicator and/or before L19 indicator in the naming convention e.g., 67D92DB => 67D**5A**992DB, 92DB => **5A**992DB, etc.

PRODUCT DESCRIPTION

Frequency Range	LTE TDD B41: 2496 – 2690 MHz
Instantaneous BW	DL 194 MHz
Antenna Ports	64T64R
Technology	NR, LTE and NR+LTE MSMM
Antenna Elements	192
Output RF Power	320 W (=64 TRX x 5W)
Data Ports	4 x 25Gb/s CPRI
5G NR Support	YES
DC Feed	-48V DC power connector
Cooling	Passive cooling (vs. active cooling on AIR32 DB)
Dimensions (H x W x D)	33.1" x 20.6" x 8.6" inches (=841 x 524 x 217 mm)
Weight	104 lbs (=47 kg)
Electrical downtilt	-3 to 11 degrees
Horizontal beamwidth	+/- 65 degrees
HW/SW Availability	July 2020
Material SAP #	34105 – AIR 6449 B41

WARRANTY: 1 Year

SPARES: 2% of install base. Additional units can be requested as per need.

Baseband Requirements

For a typical 3-sector site,

- LTE: one dedicated BB6630 per site
- NR: one dedicated BB6648 (see its NPI) per site

Supplementary/Ancillary Materials

SKU	Description	Qty
34106	AIR6449 mandatory install kit	1 per AIR6449
34110	AIR6449 25G SFP	8 per AIR6449

The AIR6449 requires a voltage booster (i.e., PSU 4813) in almost all cases when using the current HCS 6x12. Please refer to Voltage Booster design doc for its usage guidance (depending on the HCS length and gauge). Note the installation kit is different for each cabinet type.

SKU	Description	Qty
34132	PSU 4813 main unit	1
34133	PSU installation kit for RBS61xx	Choose 1 per cabinet type
34134	PSU installation kit for PBC6200	
34135	PSU installation kit for E6x60/P6230	

LINKS

- Ericsson New T-Mobile Anchor Network Playbook
- AIR 6488 vs. AIR 6449 Comparison

CONTACTS

Kyuho Son	Principal Engineer, RAN Architecture
Weston Berry	Engineer, RAN Architecture

Radio Frequency Emissions Analysis Report

T-Mobile Wireless Monopole Facility

December 21, 2020

Analysis Format: Theoretical Calculations

Sign Count	
	1
	0
	1
	0

Statement of Compliance

T-Mobile will be compliant with FCC Regulations once the mitigation measures recommended in this report are implemented.

7WAN124I
Public Storage-Prosperity
12355 Prosperity Drive, Silver Spring, MD 20904

Contents

Overview

Centerline Communications, LLC ("Centerline") has been contracted to provide a Radio Frequency (RF) Analysis for the following T-Mobile wireless monopole facility to determine whether the facility is in compliance with federal standards and regulations regarding RF emissions. This analysis includes theoretical emissions calculations for all existing equipment for T-Mobile .

The facility is located on a 140' monopole in Silver Spring, Maryland. Access to the facility is restricted to authorized personnel and facility management.

Analysis Site Data

Site ID:	7WAN124I
Site Name:	Public Storage-Prosperity
Site Address:	12355 Prosperity Drive, Silver Spring, MD 20904
Site Latitude:	39.057840
Site Longitude:	-76.96554
Facility Type:	Monopole

Compliance Summary

Status:	T-Mobile will be compliant with FCC Regulations Upon Installation of Signage
Site Modeled Composite MPE% (General Public Limit):	7.20 %
T-Mobile Max Modeled MPE% (General Public Limit):	7.20 %
Lock or Control Measures if Present:	Unlocked Gate

In addition to the T-Mobile antennas and radio equipment there are antennas and radio equipment for AT&T, Verizon which have been included in this analysis as part of the overall site compliance determination.

*To be conservative, all sites are considered uncontrolled for modeling purposes unless confirmed otherwise by a site visit.

FCC Guidelines

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 600, 700, and 800 MHz Bands is approximately 400 $\mu W/cm^2$, 467 $\mu W/cm^2$, and 567 $\mu W/cm^2$ respectively, and the general population exposure limit for the 1900 MHz PCS, 2100 MHz AWS, 2500 MHz, 3500 MHz CBRS, 5000 MHz LAA, 28GHz, and 39GHz bands is 1000 $\mu W/cm^2$. 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. Reference the Site Antenna Data Table for list of frequencies in operation at this site.

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, have been properly trained in RF safety 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, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

Additional details can be found in FCC OET 65.

Calculation Methodology & Data

Centerline has performed theoretical calculations on all transmission equipment located on this facility. All calculations have been performed using the RoofMaster® software from Waterford Consultants LLC. This software performs calculations using a cylindrical model for very conservative power density predictions within the near-field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations the power decreases inversely with the square of the distance. This modeling technique is accurate with low antenna centerlines, such as rooftops, where persons can get close to the antennas and pass through fields in close proximity.

The below calculation in Figure 1 shows the theoretical distribution of power over an imaginary cylinder with equal power distribution in all directions.

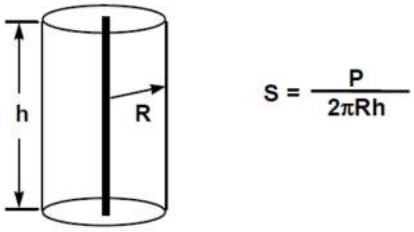


Figure 1: Distribution of power over an imaginary cylinder in all directions

This model can be modified for directional antennas to show directionality of power distribution. This formula will tend to be conservative as it assumes that all power is focused between the 3 dB power roll off points as shown in Figure 2.

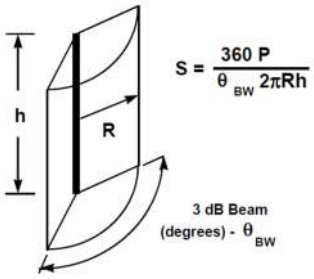


Figure 2: Distribution of power over an imaginary cylinder in all directions inside the half power roll off points (HBW)

The **proposed antenna configuration** for T-Mobile and any other known wireless carriers at this facility are shown below in **Table 1 – Site Antenna Data Table**.

All calculations for this facility were performed assuming that all radios were running at full power and were uncombined in their RF paths with the configuration shown in table 1. FCC OET Bulletin 65 – Edition 97-01 recommends that modeling of this nature should be done as described prior to yield a worst-case scenario. Due to the dynamic nature of many deployed systems the "real world" values will most likely be less than those shown in this report due to worst-case values being shown in all instances.

For all "Other" systems on this facility, exact equipment was used if available. In instances where "Other" system equipment was not available, standard radio configurations for these systems were utilized based upon prior experience with these systems on facilities in this area.

Site Antenna Data Table

Sector	Operator	Frequency Band	TX Power Per Channel	Tx #	ERP	Antenna Make	Antenna Model	Gain (dBd)	Az (°)	Antenna Centerline Height (ft)	Z Value (ft)**
A1	T-Mobile	L1900	40	4	8037.48	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	0	139	98.99
A1	T-Mobile	L1900	40	4	8168.08	COMMSCOPE	2HH-38A-R4-V2 p27	17.08	0	139	98.99
A1	T-Mobile	G1900	15	1	753.51	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	0	139	98.99
A2	T-Mobile	L700	40	4	3389.38	RFS	APXVAARR24 43-U-NA20	13.26	0	139	97.00
A2	T-Mobile	L600	40	2	1588.88	RFS	APXVAARR24 43-U-NA20	12.98	0	139	97.00
A2	T-Mobile	N600	30	2	1191.66	RFS	APXVAARR24 43-U-NA20	12.98	0	139	97.00
A2	T-Mobile	U2100	40	1	2244.19	RFS	APXVAARR24 43-U-NA20	17.49	0	139	97.00
A3	T-Mobile	L2100	40	2	4842.73	COMMSCOPE	2HH-38A-R4-V2 m27	17.82	0	139	98.99
A3	T-Mobile	L2100	40	2	4932.76	COMMSCOPE	2HH-38A-R4-V2 p27	17.9	0	139	98.99
A4	T-Mobile	L/N2500	60	1	3222.19	ERICSSON	AIR 6449 LTE MACRO	17.3	0	139	99.62
A4	T-Mobile	L2500	90	1	15461.18	ERICSSON	AIR 6449 LTE TB	22.35	0	139	99.62
A4	T-Mobile	N2500	90	1	15461.18	ERICSSON	AIR 6449 NR TB	22.35	0	139	99.62
B5	T-Mobile	L700	40	4	3389.38	RFS	APXVAARR24 43-U-NA20	13.26	90	139	97.00
B5	T-Mobile	L600	40	2	1588.88	RFS	APXVAARR24 43-U-NA20	12.98	90	139	85.00
B5	T-Mobile	N600	30	2	1191.66	RFS	APXVAARR24 43-U-NA20	12.98	90	139	85.00
B5	T-Mobile	U2100	40	1	2244.19	RFS	APXVAARR24 43-U-NA20	17.49	90	139	85.00
B6	T-Mobile	L1900	40	4	8037.48	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	90	139	86.99
B6	T-Mobile	L1900	40	4	8205.78	COMMSCOPE	2HH-38A-R4-V2 p27	17.1	90	139	86.99
B6	T-Mobile	G1900	15	1	753.51	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	90	139	86.99
B7	T-Mobile	L2100	40	2	4842.73	COMMSCOPE	2HH-38A-R4-V2 m27	17.82	90	139	86.99
B7	T-Mobile	L2100	40	2	4944.13	COMMSCOPE	2HH-38A-R4-V2 p27	17.91	90	139	86.99
B8	T-Mobile	L/N2500	60	1	3222.19	ERICSSON	AIR 6449 LTE MACRO	17.3	90	139	87.62
B8	T-Mobile	L2500	90	1	15461.18	ERICSSON	AIR 6449 LTE TB	22.35	90	139	87.62
B8	T-Mobile	N2500	90	1	15461.18	ERICSSON	AIR 6449 NR TB	22.35	90	139	87.62
C9	T-Mobile	L700	40	4	3389.38	RFS	APXVAARR24 43-U-NA20	13.26	285	139	97.00
C9	T-Mobile	L600	40	2	1588.88	RFS	APXVAARR24 43-U-NA20	12.98	285	139	97.00
C9	T-Mobile	N600	30	2	1191.66	RFS	APXVAARR24 43-U-NA20	12.98	285	139	97.00
C9	T-Mobile	U2100	40	1	2244.19	RFS	APXVAARR24 43-U-NA20	17.49	285	139	97.00
C10	T-Mobile	L1900	40	4	8037.48	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	285	139	98.99
C10	T-Mobile	L1900	40	4	8168.08	COMMSCOPE	2HH-38A-R4-V2 p27	17.08	285	139	98.99
C10	T-Mobile	G1900	15	1	753.51	COMMSCOPE	2HH-38A-R4-V2 m27	17.01	285	139	98.99
C11	T-Mobile	L2100	40	2	4842.73	COMMSCOPE	2HH-38A-R4-V2 m27	17.82	285	139	98.99
C11	T-Mobile	L2100	40	2	4932.76	COMMSCOPE	2HH-38A-R4-V2 p27	17.9	285	139	98.99
C12	T-Mobile	L/N2500	60	1	3222.19	ERICSSON	AIR 6449 LTE MACRO	17.3	285	139	99.62
C12	T-Mobile	L2500	90	1	15461.18	ERICSSON	AIR 6449 LTE TB	22.35	285	139	99.62

Sector	Operator	Frequency Band	TX Power Per Channel	Tx #	ERP	Antenna Make	Antenna Model	Gain (dBd)	Az (°)	Antenna Centerline Height (ft)	Z Value (ft)**
C12	T-Mobile	N2500	90	1	15461.18	ERICSSON	AIR 6449 NR TB	22.35	285	139	99.62
13	AT&T	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	0	116	75.00
14	AT&T	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	0	116	75.00
15	AT&T	1900	30	4	4604.49	GENERIC	PANEL 6FT	15.84	0	116	75.00
15	AT&T	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	0	116	75.00
16	AT&T	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	90	116	75.00
17	AT&T	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	90	116	75.00
18	AT&T	1900	30	4	4604.49	GENERIC	PANEL 6FT	15.84	90	116	75.00
18	AT&T	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	90	116	75.00
19	AT&T	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	285	116	75.00
20	AT&T	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	285	116	75.00
21	AT&T	1900	30	4	4604.49	GENERIC	PANEL 6FT	15.84	285	116	75.00
21	AT&T	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	285	116	75.00
22	Verizon	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	0	70	29.00
23	Verizon	1900	40	4	6139.32	GENERIC	PANEL 6FT	15.84	0	70	29.00
24	Verizon	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	0	70	29.00
25	Verizon	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	0	70	29.00
26	Verizon	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	90	70	29.00
27	Verizon	1900	40	4	6139.32	GENERIC	PANEL 6FT	15.84	90	70	29.00
28	Verizon	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	90	70	29.00
29	Verizon	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	90	70	29.00
30	Verizon	850	40	4	2924.96	GENERIC	PANEL 6FT	12.62	285	70	29.00
31	Verizon	1900	40	4	6139.32	GENERIC	PANEL 6FT	15.84	285	70	29.00
32	Verizon	2100	40	4	6968.19	GENERIC	PANEL 6FT	16.39	285	70	29.00
33	Verizon	700	40	4	2736.02	GENERIC	PANEL 6FT	12.33	285	70	29.00

*Table 1: Total Site Antenna data table **(Z Value is distance from bottom of antenna to walking surface)*

Results

All calculations performed based upon the data listed for this facility have produced results that are within allowable limits for General Population for exposure to RF emissions as specified by federal standards.

T-Mobile's RF Exposure: Responsibilities, Procedures & Guidelines document states that microwave dishes are compliant if they are mounted 20 feet or greater above any accessible walking or working surface.

Maximum Predicted MPE Level on Site:	% of MPE Limit:	Location:
Accessible **General Population** MPE Limits:	**7.20%**	**Sector B**
Accessible **Occupational** MPE Limits:	**1.44%**	

Ground Level Assessment:	% of MPE Limit:
Ground Level **General Population** MPE Limits:	**3.62%**
Ground Level **Occupational** MPE Limits:	**0.72%**

Sector A: Transmitting over Building1	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**6.65%**	**N/A**
Accessible **Occupational** MPE Limits:	**1.33%**	**N/A**

Sector B: Transmitting over Building2	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**7.20%**	**N/A**
Accessible **Occupational** MPE Limits:	**1.44%**	**N/A**

Sector C: Transmitting over Building1	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**5.87%**	**N/A**
Accessible **Occupational** MPE Limits:	**1.17%**	**N/A**

**Distance from Antenna is the distance that the MPE limits are exceeded from the front face of the antenna, outward across an accessible area.*

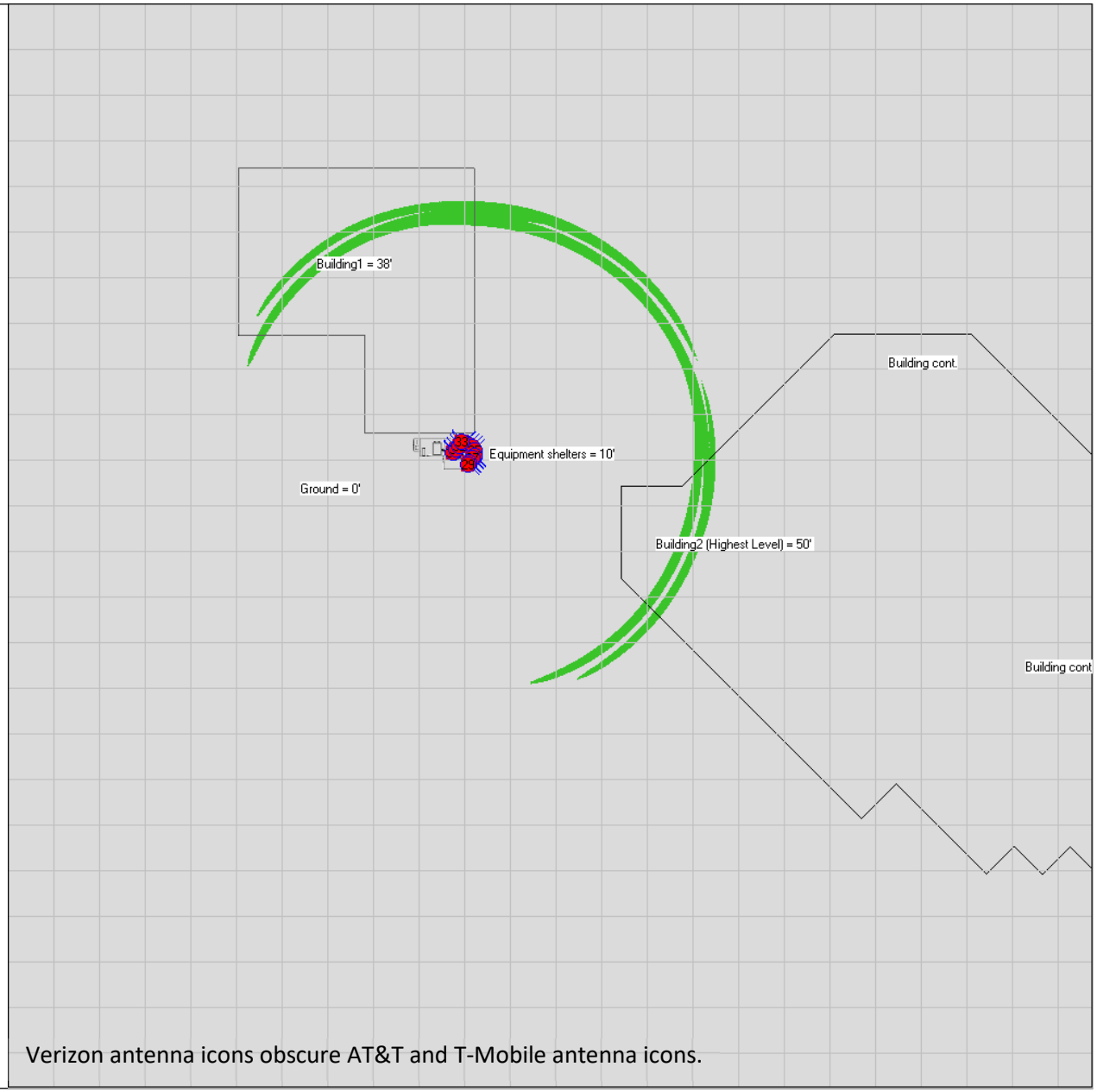
APPENDIX A: Emissions Thresholds for Walking Surfaces and Signage

Building1 (38ft.)

Emissions Thresholds for Walking Surfaces for:

7WAN124I / Public Storage-Prosperity

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.

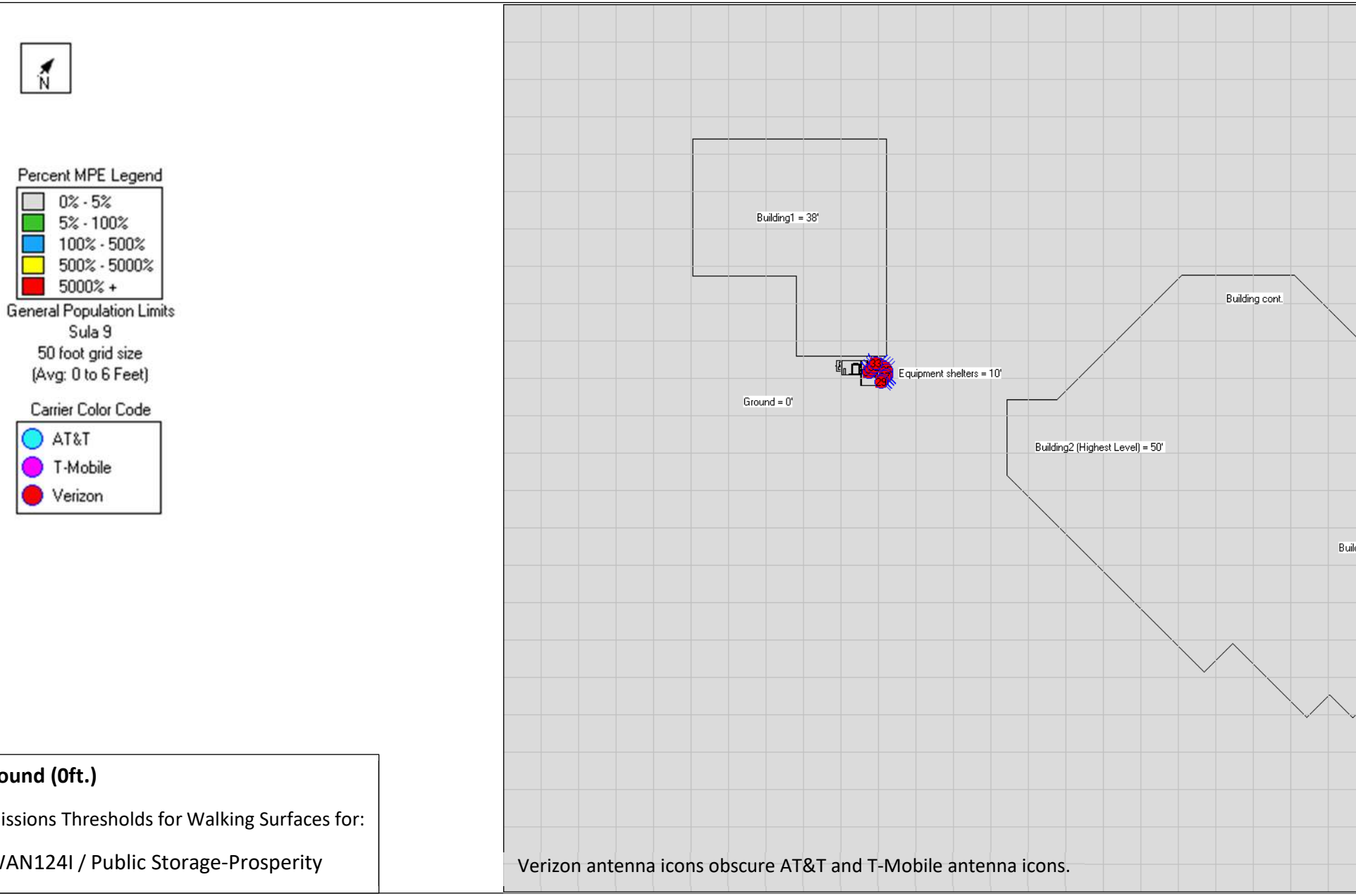


Building2 (50ft.)

Emissions Thresholds for Walking Surfaces for:

7WAN124I / Public Storage-Prosperity

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.

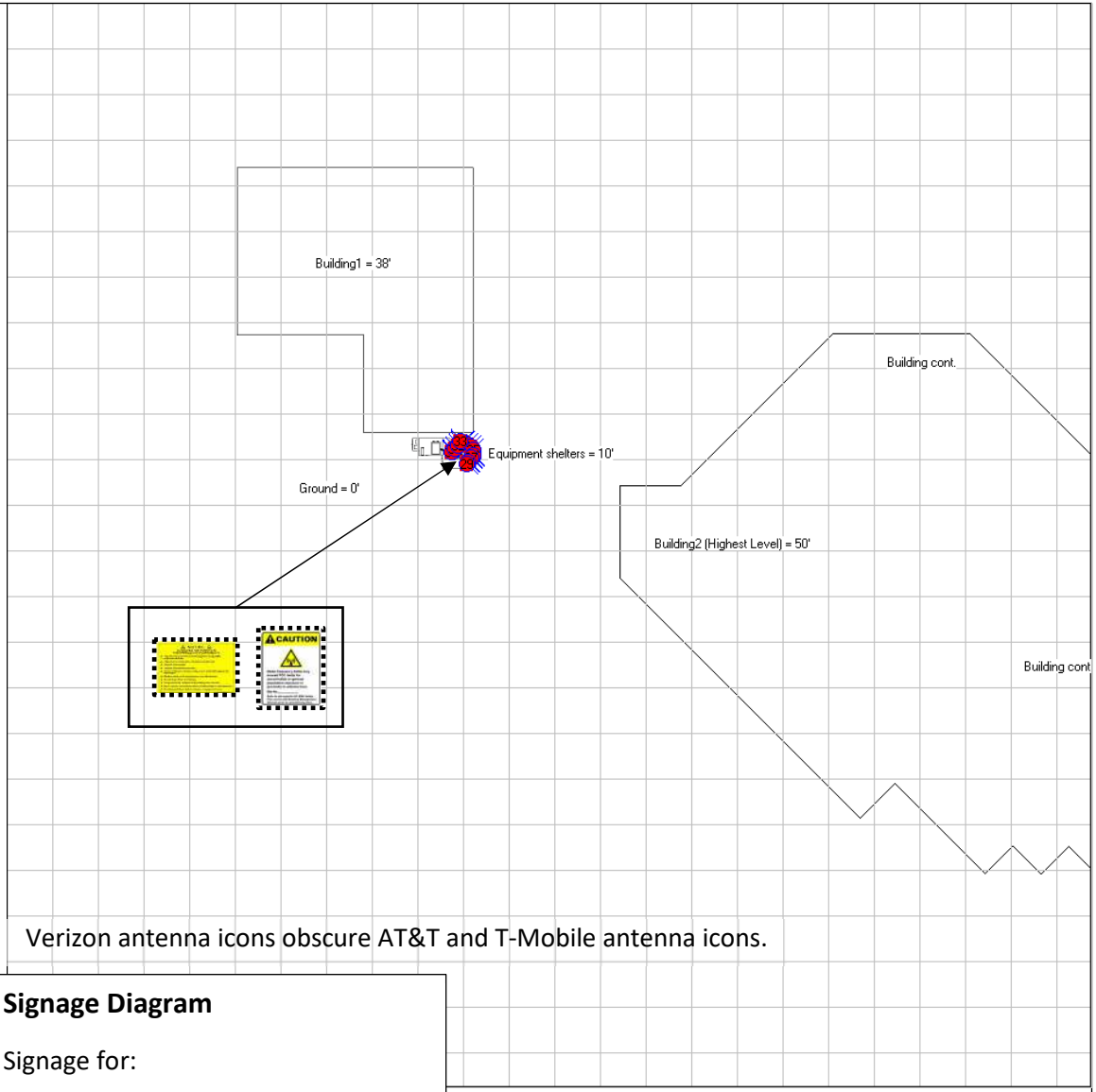


Ground (0ft.)

Emissions Thresholds for Walking Surfaces for:

7WAN124I / Public Storage-Prosperity

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.



Existing Item

Proposed Item

Verizon antenna icons obscure AT&T and T-Mobile antenna icons.

Signage Count							
	1		0		1		0

Signage Diagram

Signage for:

7WAN124I/ Public Storage-Prosperity

Compliance Actions:

Monopole Base	• Install (1) Guideline sign on the base of the monopole. • Install (1) Caution sign on the base of the monopole.
Alpha Sector	• No Action Needed.
Beta Sector	• No Action Needed.
Gamma sector	• No Action Needed.
Notes:	• If there is a fixed climbing point located on this site, the Guideline and Caution sign should be installed at that location.

APPENDIX B: RF Signage Description Table

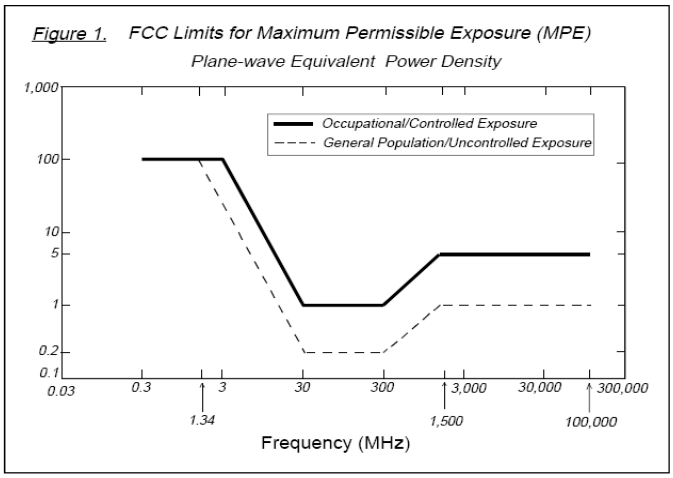
Sign	Description
	**RF Guideline Sign** Gives guidelines on how to proceed in areas that may exceed either the FCC's General Population or Occupational emissions limits.
	**Blue Notice Sign** Used to inform individuals that they are entering an area that may exceed the FCC's General Population limits. Must be placed anywhere the public can get within 30 feet vertically or horizontally of an antenna.
	**Yellow Caution Sign** Used to inform individuals that they are entering an area that may exceed the either the FCC's General Population or Occupational Emissions limits. It must be placed so it is visible from all approachable sides. It must also be just outside of the area predicted to exceed the MPE limits so it can be read without standing within the affected area.
	**Red Warning Sign** Used to inform individuals that they are entering an area that may exceed 5x the FCC's Occupational emissions limit. It must be placed so it is visible from all approachable sides. It must also be just outside of the area predicted to exceed the MPE limits so it can be read without standing within the affected area.

APPENDIX C: FCC Emissions Threshold Limits

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-I,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-I,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

* Plane-wave equivalent power density



APPENDIX D: Certifications

I, Erin Kavanaugh, preparer of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in T-Mobile's FCC Regulatory Compliance Manual.

Erin Kavanaugh

12/21/2020

I, Brandon Green, reviewer and approver of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in T-Mobile's FCC Regulatory Compliance Manual.

Brandon Green

12/21/2020

Date: **December 01, 2020**

Cheryl Schultz
Crown Castle
6325 Ardrey Kell Rd Suite 600
Charlotte, NC 28277

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	7WAN124I
	Carrier Site Name:	Public Storage-Prosperity
Crown Castle Designation:	**Crown Castle BU Number:**	826849
	Crown Castle Site Name:	Public Storage-Prosperity
	Crown Castle JDE Job Number:	608016
	Crown Castle Work Order Number:	1902871
	Crown Castle Order Number:	519470 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1902871
Site Data:	**12355 Prosperity Drive, District 5, Montgomery County, MD** **Latitude *39° 3' 28.26"*, Longitude *-76° 57' 55.79"*** **140 Foot - Monopole Tower**	

Dear Cheryl Schultz,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

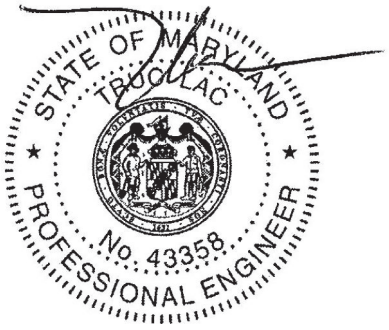
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2018 International Building Code based upon an ultimate 3-second gust wind speed of 113 mph. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Patrick Himes 12/1/2020

Respectfully submitted by:



Truc Lac, P.E., S.E.
Senior Project Engineer

Professional Certification:
I hereby certify that these documents were prepared or approved by me, and that I am duly licensed professional engineer under the laws of the State of Maryland.
License No. 43358. Expiration Date: 02/26/2021

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by Valmont PennSummit. The tower has been modified in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	113 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	40 mph
Service Wind Speed:	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)
138.0	139.0	6	commscope	2HH-38A-R4 w/ Mount Pipe	6 1	1-3/8 1-5/8
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		6	ericsson	RADIO 4424		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 01		
		6	ericsson	RRUS 32 B66A		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	138.0	1	tower mounts	Platform Mount [LP 701-1]		

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)
115.0	117.0	3	nokia	AIRSCALE RRH 4T4R B5 160W	6 4 2	1-5/8 7/8 3/8
	116.0	3	alcatel lucent	RRH4X25-WCS		
		6	commscope	NNHH-65C-R4		
		3	commscope	SBJAH4-1D65C-DL		
		2	commscope	WCS-IMFQ-AMT-43		
		3	nokia	AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA		
		2	nokia	AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB		
		2	raycap	DC6-48-60-18-8F		
	115.0	1	nokia	AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB		
		1	tower mounts	Platform Mount [LP 1301-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
70.0	70.0	3	alcatel lucent	B13 RRH2X60-4R	2	1-1/4
		3	alcatel lucent	B66A RRH4X45-4R		
		4	jma wireless	MX06FRO840-02 w/ Mount Pipe		
		2	jma wireless	MX06FRO860-02 w/ Mount Pipe		
		2	raycap	RHSDC-3315-PF-48		
		1	tower mounts	Platform Mount [LP 402-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Hillis-Carnes Engineering Associates, Inc	3480612	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	3753526	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	3480613	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Crown Castle	7876925	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solutions, PLLC	8201886	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.7.5), 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. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

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. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	140 - 135	Pole	TP20.77x20x0.1875	Pole	8.0%	Pass
L2	135 - 130	Pole	TP21.54x20.77x0.1875	Pole	17.6%	Pass
L3	130 - 125	Pole	TP22.311x21.54x0.1875	Pole	26.4%	Pass
L4	125 - 120	Pole	TP23.081x22.311x0.1875	Pole	34.5%	Pass
L5	120 - 115	Pole	TP23.851x23.081x0.1875	Pole	42.1%	Pass
L6	115 - 110	Pole	TP24.621x23.851x0.1875	Pole	55.9%	Pass
L7	110 - 105	Pole	TP25.391x24.621x0.1875	Pole	67.5%	Pass
L8	105 - 100	Pole	TP26.162x25.391x0.1875	Pole	78.3%	Pass
L9	100 - 95	Pole	TP26.932x26.162x0.1875	Pole	88.3%	Pass
L10	95 - 92.75	Pole	TP27.856x26.932x0.1875	Pole	92.5%	Pass
L11	92.75 - 87.75	Pole	TP27.673x26.903x0.25	Pole	70.8%	Pass
L12	87.75 - 82.75	Pole	TP28.444x27.673x0.25	Pole	76.4%	Pass
L13	82.75 - 77.75	Pole	TP29.214x28.444x0.25	Pole	81.5%	Pass
L14	77.75 - 72.75	Pole	TP29.984x29.214x0.25	Pole	86.3%	Pass
L15	72.75 - 67.75	Pole	TP30.754x29.984x0.25	Pole	91.8%	Pass
L16	67.75 - 62.75	Pole	TP31.524x30.754x0.25	Pole	97.4%	Pass
L17	62.75 - 61.5	Pole	TP31.717x31.524x0.25	Pole	98.8%	Pass
L18	61.5 - 61.25	Pole + Reinf.	TP31.755x31.717x0.5125	Reinf. 2 Tension Rupture	71.0%	Pass
L19	61.25 - 56.25	Pole + Reinf.	TP32.525x31.755x0.5125	Reinf. 2 Tension Rupture	75.1%	Pass
L20	56.25 - 51.25	Pole + Reinf.	TP33.295x32.525x0.5	Reinf. 2 Tension Rupture	79.0%	Pass
L21	51.25 - 51	Pole + Reinf.	TP34.027x33.295x0.5	Reinf. 2 Tension Rupture	79.2%	Pass
L22	51 - 45.5	Pole	TP33.681x32.834x0.3125	Pole	88.1%	Pass
L23	45.5 - 40.5	Pole	TP34.451x33.681x0.3125	Pole	91.3%	Pass
L24	40.5 - 35.5	Pole	TP35.222x34.451x0.3125	Pole	94.3%	Pass
L25	35.5 - 30.5	Pole	TP35.992x35.222x0.3125	Pole	97.0%	Pass
L26	30.5 - 28	Pole	TP36.377x35.992x0.3125	Pole	98.4%	Pass
L27	28 - 27.75	Pole + Reinf.	TP36.415x36.377x0.625	Reinf. 1 Tension Rupture	73.2%	Pass
L28	27.75 - 22.75	Pole + Reinf.	TP37.186x36.415x0.625	Reinf. 1 Tension Rupture	75.4%	Pass
L29	22.75 - 17.75	Pole + Reinf.	TP37.956x37.186x0.6125	Reinf. 1 Tension Rupture	77.5%	Pass
L30	17.75 - 12.75	Pole + Reinf.	TP38.726x37.956x0.6	Reinf. 1 Tension Rupture	79.6%	Pass
L31	12.75 - 7.75	Pole + Reinf.	TP39.496x38.726x0.6	Reinf. 1 Tension Rupture	81.5%	Pass
L32	7.75 - 2.75	Pole + Reinf.	TP40.266x39.496x0.5875	Reinf. 1 Tension Rupture	83.4%	Pass
L33	2.75 - 0	Pole + Reinf.	TP40.69x40.266x0.5875	Reinf. 1 Tension Rupture	84.4%	Pass
					Summary	
				Pole	98.8%	Pass
				Reinforcement	84.4%	Pass
				Overall	98.8%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	80.0	Pass
1	Base Plate	0	65.0	Pass
1	Base Foundation Structural	0	77.3	Pass
1	Base Foundation Soil Interaction	0	69.9	Pass

Structure Rating (max from all components) =	98.8%

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

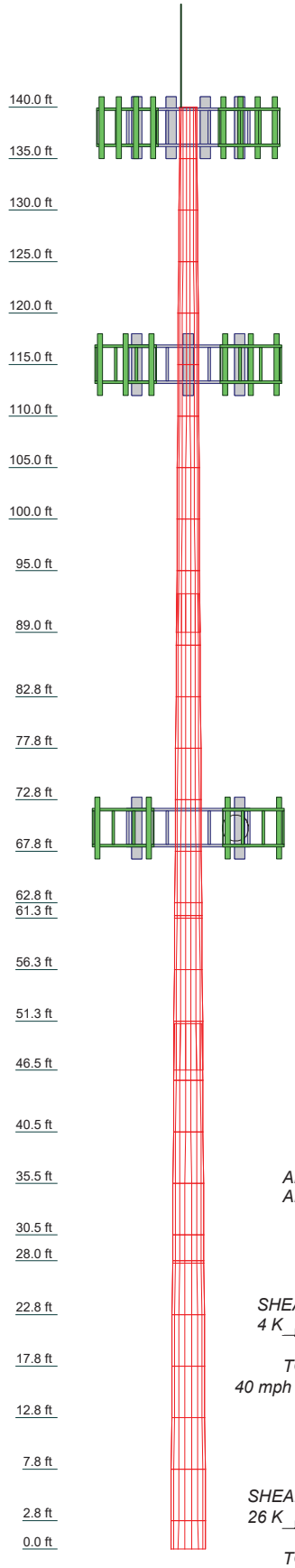
4.1) Recommendations

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

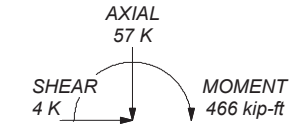
APPENDIX A

TNXTOWER OUTPUT

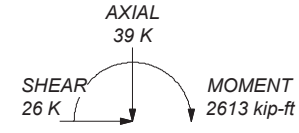
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.0000	18	0.1875		20.0000	20.7702		0.2
2	5.0000	18	0.1875		20.7702	21.5404		0.2
3	5.0000	18	0.1875		21.5404	22.3106		0.2
4	5.0000	18	0.1875		22.3106	23.0808		0.2
5	5.0000	18	0.1875		23.0808	23.8510		0.2
6	5.0000	18	0.1875		23.8510	24.6212		0.2
7	5.0000	18	0.1875		24.6212	25.3914		0.3
8	5.0000	18	0.1875		25.3914	26.1616		0.3
9	5.0000	18	0.1875		26.1616	26.9318		0.3
10	5.0000	18	0.1875	3.7500	26.9318	27.8560		0.3
11	5.0000	18	0.2500		27.8560	28.6726		0.4
12	5.0000	18	0.2500		28.6726	29.4436		0.4
13	5.0000	18	0.2500		29.4436	30.2137		0.4
14	5.0000	18	0.2500		30.2137	30.9838		0.4
15	5.0000	18	0.2500		30.9838	31.7540		0.4
16	5.0000	18	0.2500		31.7540	32.5241		0.4
17	2.5000	18	0.2500		32.5241	32.7741		0.1
18	2.5000	18	0.2500		32.7741	33.0241		0.1
19	5.0000	18	0.5125		33.0241	33.7954		0.8
20	5.0000	18	0.5000		33.7954	34.5667		0.8
21	5.0000	18	0.5000	4.5000	34.5667	35.3379		0.8
22	2.5000	18	0.3125		35.3379	35.5879		0.4
23	5.0000	18	0.3125		35.5879	36.3592		0.6
24	5.0000	18	0.3125		36.3592	37.1304		0.6
25	5.0000	18	0.3125		37.1304	37.9017		0.6
26	2.5000	18	0.3125		37.9017	38.1517		0.3
27	2.5000	18	0.3125		38.1517	38.4017		0.3
28	5.0000	18	0.6250		38.4017	39.1729		1.2
29	5.0000	18	0.6125		39.1729	39.9442		1.2
30	5.0000	18	0.6000		39.9442	40.7154		1.2
31	5.0000	18	0.6000		40.7154	41.4867		1.2
32	5.0000	18	0.5875		41.4867	42.2579		1.2
33	2.7500	18	0.5875		42.2579	42.5329		0.7
							A572-65	16.8



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
40 mph WIND - 1.0000 in ICE



TORQUE 1 kip-ft
REACTIONS - 113 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Montgomery County, Maryland.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 113 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 98.8%

CROWN CASTLE
The Pathway to Possible

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

Job: ***BU# 826849***			
Project:			
Client: Crown Castle	Drawn by: phimes		App'd:
Code: TIA-222-H	Date: 12/01/20		Scale: NTS
Path: C:\Users\phimes\Desktop\Work Area\826849\WO 1902871 - SA\Prod\826849 - Reinforced.er			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

3) Tower is located in Montgomery County, Maryland.
4) Tower base elevation above sea level: 377.0000 ft.
5) Basic wind speed of 113 mph.
6) Risk Category II.
7) Exposure Category C.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.0000 ft.
11) Nominal ice thickness of 1.0000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56.00 pcf.
14) A wind speed of 40 mph is used in combination with ice.
15) Temperature drop of 50 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) TOWER RATING: 98.8%.
18) A non-linear (P-delta) analysis was used.
19) Pressures are calculated at each section.
20) Stress ratio used in pole design is 1.05.
21) Tower analysis based on target reliabilities in accordance with Annex S.
22) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
23) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	140.0000-135.0000	5.0000	0.00	18	20.0000	20.7702	0.1875	0.7500	A572-65 (65 ksi)
L2	135.0000-130.0000	5.0000	0.00	18	20.7702	21.5404	0.1875	0.7500	A572-65 (65 ksi)
L3	130.0000-125.0000	5.0000	0.00	18	21.5404	22.3106	0.1875	0.7500	A572-65 (65 ksi)
L4	125.0000-120.0000	5.0000	0.00	18	22.3106	23.0808	0.1875	0.7500	A572-65 (65 ksi)
L5	120.0000-115.0000	5.0000	0.00	18	23.0808	23.8510	0.1875	0.7500	A572-65 (65 ksi)
L6	115.0000-110.0000	5.0000	0.00	18	23.8510	24.6212	0.1875	0.7500	A572-65 (65 ksi)
L7	110.0000-105.0000	5.0000	0.00	18	24.6212	25.3914	0.1875	0.7500	A572-65 (65 ksi)
L8	105.0000-100.0000	5.0000	0.00	18	25.3914	26.1616	0.1875	0.7500	A572-65 (65 ksi)
L9	100.0000-95.0000	5.0000	0.00	18	26.1616	26.9318	0.1875	0.7500	A572-65 (65 ksi)
L10	95.0000-89.0000	6.0000	3.75	18	26.9318	27.8560	0.1875	0.7500	A572-65 (65 ksi)
L11	89.0000-87.7500	5.0000	0.00	18	26.9034	27.6735	0.2500	1.0000	A572-65 (65 ksi)
L12	87.7500-82.7500	5.0000	0.00	18	27.6735	28.4436	0.2500	1.0000	A572-65 (65 ksi)
L13	82.7500-77.7500	5.0000	0.00	18	28.4436	29.2137	0.2500	1.0000	A572-65 (65 ksi)
L14	77.7500-72.7500	5.0000	0.00	18	29.2137	29.9838	0.2500	1.0000	A572-65 (65 ksi)
L15	72.7500-67.7500	5.0000	0.00	18	29.9838	30.7540	0.2500	1.0000	A572-65 (65 ksi)
L16	67.7500-62.7500	5.0000	0.00	18	30.7540	31.5241	0.2500	1.0000	A572-65 (65 ksi)
L17	62.7500-61.5000	1.2500	0.00	18	31.5241	31.7166	0.2500	1.0000	A572-65 (65 ksi)
L18	61.5000-61.2500	0.2500	0.00	18	31.7166	31.7551	0.5125	2.0500	A572-65 (65 ksi)
L19	61.2500-56.2500	5.0000	0.00	18	31.7551	32.5253	0.5125	2.0500	A572-65 (65 ksi)
L20	56.2500-51.2500	5.0000	0.00	18	32.5253	33.2954	0.5000	2.0000	A572-65 (65 ksi)
L21	51.2500-46.5000	4.7500	4.50	18	33.2954	34.0270	0.5000	2.0000	A572-65 (65 ksi)
L22	46.5000-45.5000	5.5000	0.00	18	32.8339	33.6811	0.3125	1.2500	A572-65 (65 ksi)
L23	45.5000-40.5000	5.0000	0.00	18	33.6811	34.4513	0.3125	1.2500	A572-65 (65 ksi)
L24	40.5000-35.5000	5.0000	0.00	18	34.4513	35.2215	0.3125	1.2500	A572-65 (65 ksi)
L25	35.5000-30.5000	5.0000	0.00	18	35.2215	35.9917	0.3125	1.2500	A572-65 (65 ksi)
L26	30.5000-28.0000	2.5000	0.00	18	35.9917	36.3768	0.3125	1.2500	A572-65 (65 ksi)
L27	28.0000-27.7500	0.2500	0.00	18	36.3768	36.4154	0.6250	2.5000	A572-65 (65 ksi)
L28	27.7500-22.7500	5.0000	0.00	18	36.4154	37.1856	0.6250	2.5000	A572-65 (65 ksi)
L29	22.7500-17.7500	5.0000	0.00	18	37.1856	37.9558	0.6125	2.4500	A572-65 (65 ksi)
L30	17.7500-12.7500	5.0000	0.00	18	37.9558	38.7260	0.6000	2.4000	A572-65 (65 ksi)
L31	12.7500-7.7500	5.0000	0.00	18	38.7260	39.4962	0.6000	2.4000	A572-65 (65 ksi)
L32	7.7500-2.7500	5.0000	0.00	18	39.4962	40.2664	0.5875	2.3500	A572-65 (65 ksi)
L33	2.7500-0.0000	2.7500		18	40.2664	40.6900	0.5875	2.3500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	20.2796	11.7909	584.7409	7.0334	10.1600	57.5532	1170.2512	5.8966	3.1900	17.013
	21.0617	12.2493	655.6204	7.3069	10.5513	62.1367	1312.1034	6.1258	3.3256	17.736
L2	21.0617	12.2493	655.6204	7.3069	10.5513	62.1367	1312.1034	6.1258	3.3256	17.736
	21.8438	12.7076	732.0079	7.5803	10.9425	66.8957	1464.9790	6.3550	3.4611	18.459
L3	21.8438	12.7076	732.0079	7.5803	10.9425	66.8957	1464.9790	6.3550	3.4611	18.459
	22.6258	13.1660	814.1096	7.8537	11.3338	71.8304	1629.2905	6.5843	3.5967	19.182
L4	22.6258	13.1660	814.1096	7.8537	11.3338	71.8304	1629.2905	6.5843	3.5967	19.182
	23.4079	13.6244	902.1317	8.1271	11.7250	76.9406	1805.4505	6.8135	3.7322	19.905
L5	23.4079	13.6244	902.1317	8.1271	11.7250	76.9406	1805.4505	6.8135	3.7322	19.905
	24.1900	14.0827	996.2802	8.4005	12.1163	82.2265	1993.8714	7.0427	3.8678	20.628
L6	24.1900	14.0827	996.2802	8.4005	12.1163	82.2265	1993.8714	7.0427	3.8678	20.628
	24.9721	14.5411	1096.7613	8.6740	12.5076	87.6879	2194.9657	7.2719	4.0033	21.351
L7	24.9721	14.5411	1096.7613	8.6740	12.5076	87.6879	2194.9657	7.2719	4.0033	21.351
	25.7542	14.9995	1203.7810	8.9474	12.8988	93.3249	2409.1459	7.5012	4.1389	22.074
L8	25.7542	14.9995	1203.7810	8.9474	12.8988	93.3249	2409.1459	7.5012	4.1389	22.074
	26.5362	15.4578	1317.5454	9.2208	13.2901	99.1375	2636.8245	7.7304	4.2744	22.797
L9	26.5362	15.4578	1317.5454	9.2208	13.2901	99.1375	2636.8245	7.7304	4.2744	22.797
	27.3183	15.9162	1438.2608	9.4942	13.6813	105.1258	2878.4140	7.9596	4.4100	23.52
L10	27.3183	15.9162	1438.2608	9.4942	13.6813	105.1258	2878.4140	7.9596	4.4100	23.52
	28.2568	16.4662	1592.5845	9.8223	14.1508	112.5434	3187.2646	8.2347	4.5727	24.387
L11	27.8663	21.1494	1898.1911	9.4619	13.6669	138.8896	3798.8799	10.5767	4.2950	17.18
	28.0618	21.7605	2067.5305	9.7353	14.0581	147.0701	4137.7816	10.8823	4.4305	17.722
L12	28.0618	21.7605	2067.5305	9.7353	14.0581	147.0701	4137.7816	10.8823	4.4305	17.722
	28.8438	22.3716	2246.6531	10.0087	14.4493	155.4847	4496.2625	11.1879	4.5661	18.264
L13	28.8438	22.3716	2246.6531	10.0087	14.4493	155.4847	4496.2625	11.1879	4.5661	18.264
	29.6258	22.9827	2435.8336	10.2821	14.8406	164.1334	4874.8724	11.4935	4.7016	18.806
L14	29.6258	22.9827	2435.8336	10.2821	14.8406	164.1334	4874.8724	11.4935	4.7016	18.806
	30.4078	23.5938	2635.3468	10.5555	15.2318	173.0162	5274.1613	11.7991	4.8372	19.349
L15	30.4078	23.5938	2635.3468	10.5555	15.2318	173.0162	5274.1613	11.7991	4.8372	19.349
	31.1898	24.2049	2845.4673	10.8289	15.6230	182.1330	5694.6788	12.1048	4.9727	19.891
L16	31.1898	24.2049	2845.4673	10.8289	15.6230	182.1330	5694.6788	12.1048	4.9727	19.891
	31.9718	24.8160	3066.4700	11.1023	16.0142	191.4839	6136.9749	12.4104	5.1082	20.433
L17	31.9718	24.8160	3066.4700	11.1023	16.0142	191.4839	6136.9749	12.4104	5.1082	20.433
	32.1673	24.9688	3123.4532	11.1707	16.1120	193.8582	6251.0162	12.4868	5.1421	20.569
L18	32.1268	50.7590	6244.1653	11.0775	16.1120	387.5464	12496.5469	25.3843	4.6801	9.132
	32.1659	50.8216	6267.3100	11.0911	16.1316	388.5112	12542.8666	25.4156	4.6869	9.145
L19	32.1659	50.8216	6267.3100	11.0911	16.1316	388.5112	12542.8666	25.4156	4.6869	9.145
	32.9480	52.0744	6742.2915	11.3645	16.5228	408.0591	13493.4547	26.0421	4.8224	9.41
L20	32.9499	50.8241	6585.5537	11.3690	16.5228	398.5730	13179.7729	25.4169	4.8444	9.689
	33.7319	52.0463	7072.1663	11.6424	16.9141	418.1237	14153.6384	26.0281	4.9800	9.96
L21	33.7319	52.0463	7072.1663	11.6424	16.9141	418.1237	14153.6384	26.0281	4.9800	9.96
	34.4748	53.2073	7556.1133	11.9021	17.2857	437.1305	15122.1691	26.6087	5.1088	10.218
L22	33.9961	32.2572	4310.2417	11.5451	16.6796	258.4137	8626.1550	16.1316	5.2288	16.732
	34.1525	33.0975	4655.9572	11.8459	17.1100	272.1190	9318.0409	16.5519	5.3779	17.209
L23	34.1525	33.0975	4655.9572	11.8459	17.1100	272.1190	9318.0409	16.5519	5.3779	17.209
	34.9346	33.8614	4985.8594	12.1193	17.5013	284.8855	9978.2794	16.9339	5.5134	17.643
L24	34.9346	33.8614	4985.8594	12.1193	17.5013	284.8855	9978.2794	16.9339	5.5134	17.643
	35.7167	34.6254	5330.9885	12.3927	17.8925	297.9448	10668.9916	17.3160	5.6490	18.077
L25	35.7167	34.6254	5330.9885	12.3927	17.8925	297.9448	10668.9916	17.3160	5.6490	18.077
	36.4988	35.3893	5691.6879	12.6661	18.2838	311.2967	11390.8650	17.6980	5.7845	18.511
L26	36.4988	35.3893	5691.6879	12.6661	18.2838	311.2967	11390.8650	17.6980	5.7845	18.511
	36.8898	35.7713	5877.9838	12.8028	18.4794	318.0824	11763.7020	17.8891	5.8523	18.727
L27	36.8416	70.9227	11453.0092	12.6919	18.4794	619.7705	22921.0885	35.4681	5.3023	8.484

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	36.8807	70.9991	11490.0591	12.7056	18.4990	621.1179	22995.2372	35.5063	5.3091	8.495
L28	36.8807	70.9991	11490.0591	12.7056	18.4990	621.1179	22995.2372	35.5063	5.3091	8.495
	37.6628	72.5270	12247.9340	12.9790	18.8903	648.3729	24511.9842	36.2704	5.4447	8.711
L29	37.6647	71.1008	12015.2910	12.9834	18.8903	636.0574	24046.3919	35.5571	5.4667	8.925
	38.4468	72.5981	12790.4943	13.2569	19.2815	663.3548	25597.8186	36.3060	5.6022	9.146
L30	38.4487	71.1403	12542.0501	13.2613	19.2815	650.4697	25100.6033	35.5769	5.6242	9.374
	39.2308	72.6071	13333.9370	13.5347	19.6728	677.7856	26685.4192	36.3104	5.7598	9.6
L31	39.2308	72.6071	13333.9370	13.5347	19.6728	677.7856	26685.4192	36.3104	5.7598	9.6
	40.0129	74.0739	14158.4740	13.8081	20.0641	705.6635	28335.5781	37.0440	5.8953	9.826
L32	40.0148	72.5540	13876.8760	13.8126	20.0641	691.6285	27772.0115	36.2839	5.9173	10.072
	40.7969	73.9902	14717.3853	14.0860	20.4553	719.4892	29454.1361	37.0021	6.0529	10.303
L33	40.7969	73.9902	14717.3853	14.0860	20.4553	719.4892	29454.1361	37.0021	6.0529	10.303
	41.2271	74.7801	15193.8063	14.2364	20.6705	735.0471	30407.6050	37.3972	6.1274	10.43

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 140.0000-135.0000				1	1	1			
L2 135.0000-130.0000				1	1	1			
L3 130.0000-125.0000				1	1	1			
L4 125.0000-120.0000				1	1	1			
L5 120.0000-115.0000				1	1	1			
L6 115.0000-110.0000				1	1	1			
L7 110.0000-105.0000				1	1	1			
L8 105.0000-100.0000				1	1	1			
L9 100.0000-95.0000				1	1	1			
L10 95.0000-89.0000				1	1	1			
L11 89.0000-87.7500				1	1	1			
L12 87.7500-82.7500				1	1	1			
L13 82.7500-77.7500				1	1	1			
L14 77.7500-72.7500				1	1	1			
L15 72.7500-67.7500				1	1	1			
L16 67.7500-62.7500				1	1	1			
L17 62.7500-61.5000				1	1	1			
L18 61.5000-61.2500				1	1	0.96416			
L19 61.2500-				1	1	0.952701			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
56.2500									
L20 56.2500-51.2500				1	1	0.964956			
L21 51.2500-46.5000				1	1	0.964411			
L22 46.5000-45.5000				1	1	1			
L23 45.5000-40.5000				1	1	1			
L24 40.5000-35.5000				1	1	1			
L25 35.5000-30.5000				1	1	1			
L26 30.5000-28.0000				1	1	1			
L27 28.0000-27.7500				1	1	0.962134			
L28 27.7500-22.7500				1	1	0.952399			
L29 22.7500-17.7500				1	1	0.961989			
L30 17.7500-12.7500				1	1	0.972392			
L31 12.7500-7.7500				1	1	0.96345			
L32 7.7500-2.7500				1	1	0.974865			
L33 2.7500-0.0000				1	1	0.970186			

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
****										
CCI-65FP-065125	A	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	-0.150 -0.150	6.5000	15.5000	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	0.500 0.500	6.5000	15.5000	0.00
CCI-65FP-065125	C	No	Surface Af (CaAa)	30.7500 - 0.0000	1	1	0.350 0.350	6.5000	15.5000	0.00
*										
CCI-65FP-060100	A	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	0.000 0.000	6.0000	14.0000	0.00
CCI-65FP-060100	B	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	-0.150 -0.150	6.0000	14.0000	0.00
CCI-65FP-060100	B	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	0.500 0.500	6.0000	14.0000	0.00
CCI-65FP-060100	C	No	Surface Af (CaAa)	63.5000 - 48.5000	1	1	0.350 0.350	6.0000	14.0000	0.00
***										
70										
HB114-13U6-S12F18(1-1/4)	B	No	Surface Ar (CaAa)	70.0000 - 0.0000	2	2	-0.310 -0.270	1.5400		1.51
******										
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***									
138									
MLCH HYBRID 6X12(1-3/8)	B	No	No	Inside Pole	138.0000 - 0.0000	3	No Ice	0.0000	1.72
							1/2" Ice	0.0000	1.72
							1" Ice	0.0000	1.72
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	B	No	No	Inside Pole	138.0000 - 0.0000	1	No Ice	0.0000	1.07
							1/2" Ice	0.0000	1.07
							1" Ice	0.0000	1.07
MLCH HYBRID 6X12(1-3/8)	B	No	No	Inside Pole	138.0000 - 0.0000	3	No Ice	0.0000	1.72
							1/2" Ice	0.0000	1.72
							1" Ice	0.0000	1.72
115									
FXL-1873(1-5/8)	C	No	No	Inside Pole	115.0000 - 0.0000	6	No Ice	0.0000	0.67
							1/2" Ice	0.0000	0.67
							1" Ice	0.0000	0.67
PWRT-606-S(7/8)	C	No	No	Inside Pole	115.0000 - 0.0000	2	No Ice	0.0000	0.89
							1/2" Ice	0.0000	0.89
							1" Ice	0.0000	0.89
6-8AWG 3 PAIR(7/8)	C	No	No	Inside Pole	115.0000 - 0.0000	2	No Ice	0.0000	0.68
							1/2" Ice	0.0000	0.68
							1" Ice	0.0000	0.68
FB-L98B-034-XXXXXX(3/8)	C	No	No	Inside Pole	115.0000 - 0.0000	2	No Ice	0.0000	0.05
							1/2" Ice	0.0000	0.05
							1" Ice	0.0000	0.05
2" Rigid Conduit	C	No	No	Inside Pole	115.0000 - 0.0000	1	No Ice	0.0000	2.80
							1/2" Ice	0.0000	2.80
							1" Ice	0.0000	2.80
******									
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.0000-135.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L2	135.0000-130.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L3	130.0000-125.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L4	125.0000-120.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L5	120.0000-115.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
L6	115.0000-110.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L7	110.0000-105.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L8	105.0000-100.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L9	100.0000-95.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L10	95.0000-89.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.06
L11	89.0000-87.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L12	87.7500-82.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L13	82.7500-77.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L14	77.7500-72.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L15	72.7500-67.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.693	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.05
L16	67.7500-62.7500	A	0.000	0.000	0.750	0.000	0.00
		B	0.000	0.000	3.040	0.000	0.07
		C	0.000	0.000	0.750	0.000	0.05
L17	62.7500-61.5000	A	0.000	0.000	1.250	0.000	0.00
		B	0.000	0.000	2.885	0.000	0.02
		C	0.000	0.000	1.250	0.000	0.01
L18	61.5000-61.2500	A	0.000	0.000	0.250	0.000	0.00
		B	0.000	0.000	0.577	0.000	0.00
		C	0.000	0.000	0.250	0.000	0.00
L19	61.2500-56.2500	A	0.000	0.000	5.000	0.000	0.00
		B	0.000	0.000	11.540	0.000	0.07
		C	0.000	0.000	5.000	0.000	0.05
L20	56.2500-51.2500	A	0.000	0.000	5.000	0.000	0.00
		B	0.000	0.000	11.540	0.000	0.07
		C	0.000	0.000	5.000	0.000	0.05
L21	51.2500-46.5000	A	0.000	0.000	2.750	0.000	0.00
		B	0.000	0.000	6.963	0.000	0.07
		C	0.000	0.000	2.750	0.000	0.05
L22	46.5000-45.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.308	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L23	45.5000-40.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.540	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.05
L24	40.5000-35.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.540	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.05
L25	35.5000-30.5000	A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	2.082	0.000	0.07
		C	0.000	0.000	0.271	0.000	0.05
L26	30.5000-28.0000	A	0.000	0.000	2.708	0.000	0.00
		B	0.000	0.000	6.187	0.000	0.04
		C	0.000	0.000	2.708	0.000	0.03
L27	28.0000-27.7500	A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	0.619	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L28	27.7500-22.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L29	22.7500-17.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L30	17.7500-12.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L31	12.7500-7.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05
L32	7.7500-2.7500	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	12.373	0.000	0.07
		C	0.000	0.000	5.417	0.000	0.05

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L33	2.7500-0.0000	A	0.000	0.000	2.979	0.000	0.00
		B	0.000	0.000	6.805	0.000	0.04
		C	0.000	0.000	2.979	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.0000-135.0000	A	0.980	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L2	135.0000-130.0000	A	0.977	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L3	130.0000-125.0000	A	0.973	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L4	125.0000-120.0000	A	0.969	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L5	120.0000-115.0000	A	0.965	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.00
L6	115.0000-110.0000	A	0.961	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L7	110.0000-105.0000	A	0.957	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L8	105.0000-100.0000	A	0.952	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L9	100.0000-95.0000	A	0.947	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L10	95.0000-89.0000	A	0.942	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.07
		C		0.000	0.000	0.000	0.000	0.06
L11	89.0000-87.7500	A	0.938	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L12	87.7500-82.7500	A	0.935	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L13	82.7500-77.7500	A	0.929	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L14	77.7500-72.7500	A	0.923	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.05
L15	72.7500-67.7500	A	0.917	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.382	0.000	0.07
		C		0.000	0.000	0.000	0.000	0.05
L16	67.7500-62.7500	A	0.910	0.000	0.000	0.879	0.000	0.00
		B		0.000	0.000	4.821	0.000	0.10
		C		0.000	0.000	0.879	0.000	0.05
L17	62.7500-61.5000	A	0.906	0.000	0.000	1.465	0.000	0.01
		B		0.000	0.000	3.695	0.000	0.04
		C		0.000	0.000	1.465	0.000	0.02
L18	61.5000-61.2500	A	0.904	0.000	0.000	0.293	0.000	0.00
		B		0.000	0.000	0.739	0.000	0.01
		C		0.000	0.000	0.293	0.000	0.00
L19	61.2500-56.2500	A	0.900	0.000	0.000	5.858	0.000	0.03
		B		0.000	0.000	14.767	0.000	0.15
		C		0.000	0.000	5.858	0.000	0.08

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L20	56.2500-51.2500	A	0.892	0.000	0.000	5.854	0.000	0.03
		B		0.000	0.000	14.749	0.000	0.15
		C		0.000	0.000	5.854	0.000	0.08
L21	51.2500-46.5000	A	0.884	0.000	0.000	3.217	0.000	0.02
		B		0.000	0.000	9.313	0.000	0.12
		C		0.000	0.000	3.217	0.000	0.06
L22	46.5000-45.5000	A	0.879	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.606	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.01
L23	45.5000-40.5000	A	0.873	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	3.016	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.05
L24	40.5000-35.5000	A	0.862	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	3.003	0.000	0.09
		C		0.000	0.000	0.000	0.000	0.05
L25	35.5000-30.5000	A	0.850	0.000	0.000	0.313	0.000	0.00
		B		0.000	0.000	3.614	0.000	0.09
		C		0.000	0.000	0.313	0.000	0.05
L26	30.5000-28.0000	A	0.840	0.000	0.000	3.128	0.000	0.02
		B		0.000	0.000	7.744	0.000	0.08
		C		0.000	0.000	3.128	0.000	0.04
L27	28.0000-27.7500	A	0.836	0.000	0.000	0.313	0.000	0.00
		B		0.000	0.000	0.774	0.000	0.01
		C		0.000	0.000	0.313	0.000	0.00
L28	27.7500-22.7500	A	0.828	0.000	0.000	6.244	0.000	0.03
		B		0.000	0.000	15.448	0.000	0.15
		C		0.000	0.000	6.244	0.000	0.08
L29	22.7500-17.7500	A	0.809	0.000	0.000	6.226	0.000	0.03
		B		0.000	0.000	15.389	0.000	0.15
		C		0.000	0.000	6.226	0.000	0.08
L30	17.7500-12.7500	A	0.787	0.000	0.000	6.203	0.000	0.03
		B		0.000	0.000	15.315	0.000	0.15
		C		0.000	0.000	6.203	0.000	0.08
L31	12.7500-7.7500	A	0.756	0.000	0.000	6.173	0.000	0.03
		B		0.000	0.000	15.216	0.000	0.14
		C		0.000	0.000	6.173	0.000	0.08
L32	7.7500-2.7500	A	0.707	0.000	0.000	6.124	0.000	0.02
		B		0.000	0.000	15.057	0.000	0.14
		C		0.000	0.000	6.124	0.000	0.08
L33	2.7500-0.0000	A	0.618	0.000	0.000	3.319	0.000	0.01
		B		0.000	0.000	8.123	0.000	0.07
		C		0.000	0.000	3.319	0.000	0.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.0000-135.0000	0.0000	0.0000	0.0000	0.0000
L2	135.0000-130.0000	0.0000	0.0000	0.0000	0.0000
L3	130.0000-125.0000	0.0000	0.0000	0.0000	0.0000
L4	125.0000-120.0000	0.0000	0.0000	0.0000	0.0000
L5	120.0000-115.0000	0.0000	0.0000	0.0000	0.0000
L6	115.0000-110.0000	0.0000	0.0000	0.0000	0.0000
L7	110.0000-105.0000	0.0000	0.0000	0.0000	0.0000
L8	105.0000-100.0000	0.0000	0.0000	0.0000	0.0000
L9	100.0000-95.0000	0.0000	0.0000	0.0000	0.0000
L10	95.0000-89.0000	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L11	89.0000-87.7500	0.0000	0.0000	0.0000	0.0000
L12	87.7500-82.7500	0.0000	0.0000	0.0000	0.0000
L13	82.7500-77.7500	0.0000	0.0000	0.0000	0.0000
L14	77.7500-72.7500	0.0000	0.0000	0.0000	0.0000
L15	72.7500-67.7500	0.4710	-1.0010	0.5068	-1.0769
L16	67.7500-62.7500	-0.2796	-1.4453	0.1617	-1.6766
L17	62.7500-61.5000	-2.3013	-0.1985	-2.0367	-0.6009
L18	61.5000-61.2500	-2.3076	-0.1989	-2.0429	-0.6021
L19	61.2500-56.2500	-2.3254	-0.2001	-2.0615	-0.6055
L20	56.2500-51.2500	-2.3588	-0.2023	-2.0966	-0.6115
L21	51.2500-46.5000	-2.0751	-0.6375	-1.3075	-1.0138
L22	46.5000-45.5000	0.9679	-2.0569	0.9851	-2.0934
L23	45.5000-40.5000	0.9690	-2.0592	0.9848	-2.0929
L24	40.5000-35.5000	0.9708	-2.0630	0.9866	-2.0967
L25	35.5000-30.5000	0.4500	-1.8316	0.6603	-1.9506
L26	30.5000-28.0000	-2.6081	-0.1665	-2.3537	-0.5739
L27	28.0000-27.7500	-2.6185	-0.1670	-2.3643	-0.5750
L28	27.7500-22.7500	-2.6357	-0.1678	-2.3825	-0.5764
L29	22.7500-17.7500	-2.6679	-0.1693	-2.4169	-0.5782
L30	17.7500-12.7500	-2.6995	-0.1708	-2.4512	-0.5785
L31	12.7500-7.7500	-2.7307	-0.1723	-2.4859	-0.5761
L32	7.7500-2.7500	-2.7613	-0.1737	-2.5220	-0.5677
L33	2.7500-0.0000	-2.7847	-0.1748	-2.5548	-0.5449

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_a No Ice	K_a Ice
L15	23	HB114-13U6-S12F18(1-1/4)	67.75 - 70.00	1.0000	1.0000
L16	7	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	8	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	9	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	10	CCI-65FP-060100	62.75 - 63.50	1.0000	1.0000
L16	23	HB114-13U6-S12F18(1-1/4)	62.75 - 67.75	1.0000	1.0000
L17	7	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	8	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	9	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	10	CCI-65FP-060100	61.50 - 62.75	1.0000	1.0000
L17	23	HB114-13U6-S12F18(1-1/4)	61.50 - 62.75	1.0000	1.0000
L18	7	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	8	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	9	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	10	CCI-65FP-060100	61.25 - 61.50	1.0000	1.0000
L18	23	HB114-13U6-S12F18(1-1/4)	61.25 - 61.50	1.0000	1.0000
L19	7	CCI-65FP-060100	56.25 - 61.25	1.0000	1.0000
L19	8	CCI-65FP-060100	56.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	9	CCI-65FP-060100	61.25 56.25 - 61.25	1.0000	1.0000
L19	10	CCI-65FP-060100	56.25 - 61.25	1.0000	1.0000
L19	23	HB114-13U6-S12F18(1-1/4)	56.25 - 61.25	1.0000	1.0000
L20	7	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	8	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	9	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	10	CCI-65FP-060100	51.25 - 56.25	1.0000	1.0000
L20	23	HB114-13U6-S12F18(1-1/4)	51.25 - 56.25	1.0000	1.0000
L21	7	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	8	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	9	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	10	CCI-65FP-060100	48.50 - 51.25	1.0000	1.0000
L21	23	HB114-13U6-S12F18(1-1/4)	46.50 - 51.25	1.0000	1.0000
L22	23	HB114-13U6-S12F18(1-1/4)	45.50 - 46.50	1.0000	1.0000
L23	23	HB114-13U6-S12F18(1-1/4)	40.50 - 45.50	1.0000	1.0000
L24	23	HB114-13U6-S12F18(1-1/4)	35.50 - 40.50	1.0000	1.0000
L25	2	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	3	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	4	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	5	CCI-65FP-065125	30.50 - 30.75	1.0000	1.0000
L25	23	HB114-13U6-S12F18(1-1/4)	30.50 - 35.50	1.0000	1.0000
L26	2	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	3	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	4	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	5	CCI-65FP-065125	28.00 - 30.50	1.0000	1.0000
L26	23	HB114-13U6-S12F18(1-1/4)	28.00 - 30.50	1.0000	1.0000
L27	2	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	3	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	4	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	5	CCI-65FP-065125	27.75 - 28.00	1.0000	1.0000
L27	23	HB114-13U6-S12F18(1-1/4)	27.75 - 28.00	1.0000	1.0000
L28	2	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000
L28	3	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000
L28	4	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L28	5	CCI-65FP-065125	22.75 - 27.75	1.0000	1.0000
L28	23	HB114-13U6-S12F18(1-1/4)	22.75 - 27.75	1.0000	1.0000
L29	2	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	3	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	4	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	5	CCI-65FP-065125	17.75 - 22.75	1.0000	1.0000
L29	23	HB114-13U6-S12F18(1-1/4)	17.75 - 22.75	1.0000	1.0000
L30	2	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	3	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	4	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	5	CCI-65FP-065125	12.75 - 17.75	1.0000	1.0000
L30	23	HB114-13U6-S12F18(1-1/4)	12.75 - 17.75	1.0000	1.0000
L31	2	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	3	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	4	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	5	CCI-65FP-065125	7.75 - 12.75	1.0000	1.0000
L31	23	HB114-13U6-S12F18(1-1/4)	7.75 - 12.75	1.0000	1.0000
L32	2	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	3	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	4	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	5	CCI-65FP-065125	2.75 - 7.75	1.0000	1.0000
L32	23	HB114-13U6-S12F18(1-1/4)	2.75 - 7.75	1.0000	1.0000
L33	2	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	3	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	4	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	5	CCI-65FP-065125	0.00 - 2.75	1.0000	1.0000
L33	23	HB114-13U6-S12F18(1-1/4)	0.00 - 2.75	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L16	7	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L16	8	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L16	9	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L16	10	CCI-65FP-060100	62.75 - 63.50	Manual	1.0000
L17	7	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L17	8	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L17	9	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L17	10	CCI-65FP-060100	61.50 - 62.75	Manual	1.0000
L18	7	CCI-65FP-060100	61.25 -	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L18	8	CCI-65FP-060100	61.50 61.25 - 61.50	Manual	1.0000
L18	9	CCI-65FP-060100	61.25 - 61.50	Manual	1.0000
L18	10	CCI-65FP-060100	61.25 - 61.50	Manual	1.0000
L19	7	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L19	8	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L19	9	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L19	10	CCI-65FP-060100	56.25 - 61.25	Manual	1.0000
L20	7	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L20	8	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L20	9	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L20	10	CCI-65FP-060100	51.25 - 56.25	Manual	1.0000
L21	7	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L21	8	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L21	9	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L21	10	CCI-65FP-060100	48.50 - 51.25	Manual	1.0000
L25	2	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L25	3	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L25	4	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L25	5	CCI-65FP-065125	30.50 - 30.75	Manual	1.0000
L26	2	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L26	3	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L26	4	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L26	5	CCI-65FP-065125	28.00 - 30.50	Manual	1.0000
L27	2	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L27	3	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L27	4	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L27	5	CCI-65FP-065125	27.75 - 28.00	Manual	1.0000
L28	2	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L28	3	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L28	4	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L28	5	CCI-65FP-065125	22.75 - 27.75	Manual	1.0000
L29	2	CCI-65FP-065125	17.75 - 22.75	Manual	1.0000
L29	3	CCI-65FP-065125	17.75 - 22.75	Manual	1.0000
L29	4	CCI-65FP-065125	17.75 -	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L29	5	CCI-65FP-065125	22.75 17.75 - 22.75	Manual	1.0000
L30	2	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L30	3	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L30	4	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L30	5	CCI-65FP-065125	12.75 - 17.75	Manual	1.0000
L31	2	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L31	3	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L31	4	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L31	5	CCI-65FP-065125	7.75 - 12.75	Manual	1.0000
L32	2	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L32	3	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L32	4	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L32	5	CCI-65FP-065125	2.75 - 7.75	Manual	1.0000
L33	2	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000
L33	3	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000
L33	4	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000
L33	5	CCI-65FP-065125	0.00 - 2.75	Manual	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 3/4" x 10'	C	From Leg	0.0000 0.00 5.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice	0.7500 1.7646 2.7958	0.7500 1.7646 2.7958	0.04 0.05 0.06
** 138 ** APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
(2) 2HH-38A-R4 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	6.3600 6.7400 7.1400	3.1200 3.4300 3.7600	0.08 0.16 0.24
(2) 2HH-38A-R4 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	6.3600 6.7400 7.1400	3.1200 3.4300 3.7600	0.08 0.16 0.24
(2) 2HH-38A-R4 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	6.3600 6.7400 7.1400	3.1200 3.4300 3.7600	0.08 0.16 0.24
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.9701 2.1466 2.3306	1.5865 1.7488 1.9185	0.07 0.09 0.12
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.9701 2.1466 2.3306	1.5865 1.7488 1.9185	0.07 0.09 0.12
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.9701 2.1466 2.3306	1.5865 1.7488 1.9185	0.07 0.09 0.12
(2) RRUS 32 B66A	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.8635 3.0897 3.3233	1.7816 1.9730 2.1713	0.06 0.08 0.10
(2) RRUS 32 B66A	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.8635 3.0897 3.3233	1.7816 1.9730 2.1713	0.06 0.08 0.10
(2) RRUS 32 B66A	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.8635 3.0897 3.3233	1.7816 1.9730 2.1713	0.06 0.08 0.10
(2) RADIO 4424	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.8563 2.0266 2.2044	1.3200 1.4687 1.6248	0.09 0.11 0.13
(2) RADIO 4424	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.8563 2.0266 2.2044	1.3200 1.4687 1.6248	0.09 0.11 0.13
(2) RADIO 4424	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	1.8563 2.0266 2.2044	1.3200 1.4687 1.6248	0.09 0.11 0.13
RRUS 01	A	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.7124 2.9238 3.1427	0.9599 1.1144 1.2759	0.04 0.06 0.08
RRUS 01	B	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.7124 2.9238 3.1427	0.9599 1.1144 1.2759	0.04 0.06 0.08
RRUS 01	C	From Leg	4.0000 0.00 1.00	0.00	138.0000	No Ice 1/2" Ice 1" Ice	2.7124 2.9238 3.1427	0.9599 1.1144 1.2759	0.04 0.06 0.08
Platform Mount [LP 701-1]	C	None		0.00	138.0000	No Ice 1/2" Ice 1" Ice	58.6800 66.0100 73.4100	58.6800 66.0100 73.4100	2.75 3.84 5.07
*** 115 ***									
(2) NNHH-65C-R4	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice	9.7500 10.3600 10.9700	3.9600 4.5000 5.0600	0.10 0.19 0.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) NNHH-65C-R4	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	9.7500 10.3600 10.9700	3.9600 4.5000 5.0600	0.10 0.19 0.30
(2) NNHH-65C-R4	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	9.7500 10.3600 10.9700	3.9600 4.5000 5.0600	0.10 0.19 0.30
SBJAH4-1D65C-DL	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	6.4600 7.0000 7.5500	3.8600 4.3700 4.8900	0.07 0.15 0.23
SBJAH4-1D65C-DL	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	6.4600 7.0000 7.5500	3.8600 4.3700 4.8900	0.07 0.15 0.23
SBJAH4-1D65C-DL	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	6.4600 7.0000 7.5500	3.8600 4.3700 4.8900	0.07 0.15 0.23
(2) DC6-48-60-18-8F	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2117 1.8924 2.1051	1.2117 1.8924 2.1051	0.02 0.04 0.07
AIRSCALE RRH 4T4R B5 160W	A	From Leg	4.0000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2857 1.4277 1.5771	0.7204 0.8341 0.9552	0.04 0.05 0.06
AIRSCALE RRH 4T4R B5 160W	B	From Leg	4.0000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2857 1.4277 1.5771	0.7204 0.8341 0.9552	0.04 0.05 0.06
AIRSCALE RRH 4T4R B5 160W	C	From Leg	4.0000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	1.2857 1.4277 1.5771	0.7204 0.8341 0.9552	0.04 0.05 0.06
RRH4X25-WCS	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.3367 3.5863 3.8430	3.8352 4.0945 4.3640	0.09 0.13 0.16
RRH4X25-WCS	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.3367 3.5863 3.8430	3.8352 4.0945 4.3640	0.09 0.13 0.16
RRH4X25-WCS	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.3367 3.5863 3.8430	3.8352 4.0945 4.3640	0.09 0.13 0.16
WCS-IMFQ-AMT-43	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.5535 0.6478 0.7494	0.3895 0.4704 0.5588	0.02 0.02 0.03
WCS-IMFQ-AMT-43	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.5535 0.6478 0.7494	0.3895 0.4704 0.5588	0.02 0.02 0.03
AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.6763 3.9250 4.1810	2.3086 2.5165 2.7313	0.10 0.13 0.16
AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.6763 3.9250 4.1810	2.3086 2.5165 2.7313	0.10 0.13 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIRSCALE DUAL RRH 4T4R B12/14 320W AHLBA	C	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	3.6763 3.9250 4.1810	2.3086 2.5165 2.7313	0.10 0.13 0.16
AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB	A	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.9042 3.1349 3.3731	1.5298 1.7195 1.9163	0.09 0.11 0.13
AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB	B	From Leg	4.0000 0.00 1.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.9042 3.1349 3.3731	1.5298 1.7195 1.9163	0.09 0.11 0.13
AIRSCALE DUAL RRH 4T4R B25/66 320W AHFIB	C	From Leg	4.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	2.9042 3.1349 3.3731	1.5298 1.7195 1.9163	0.09 0.11 0.13
Platform Mount [LP 1301-1]	C	None		0.00	115.0000	No Ice 1/2" Ice 1" Ice	51.7000 62.7000 73.7000	51.7000 62.7000 73.7000	2.26 2.94 3.61
*** 70 ***									
(2) MX06FRO860-02 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	8.8400 9.5100 10.2000	7.4900 8.1500 8.8200	0.11 0.22 0.34
(2) MX06FRO840-02 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	10.0100 10.6100 11.2200	6.3900 6.9500 7.5300	0.13 0.25 0.38
(2) MX06FRO840-02 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	10.0100 10.6100 11.2200	6.3900 6.9500 7.5300	0.13 0.25 0.38
B13 RRH2X60-4R	A	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.1600 2.3504 2.5481	1.6200 1.7937 1.9748	0.06 0.08 0.10
B13 RRH2X60-4R	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.1600 2.3504 2.5481	1.6200 1.7937 1.9748	0.06 0.08 0.10
B13 RRH2X60-4R	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.1600 2.3504 2.5481	1.6200 1.7937 1.9748	0.06 0.08 0.10
B66A RRH4X45-4R	A	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.5370 2.7496 2.9696	1.6101 1.7906 1.9781	0.06 0.08 0.10
B66A RRH4X45-4R	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.5370 2.7496 2.9696	1.6101 1.7906 1.9781	0.06 0.08 0.10
B66A RRH4X45-4R	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	2.5370 2.7496 2.9696	1.6101 1.7906 1.9781	0.06 0.08 0.10
RHSDC-3315-PF-48	B	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	3.3636 3.5972 3.8383	2.1921 2.3950 2.6056	0.03 0.06 0.09
RHSDC-3315-PF-48	C	From Leg	4.0000 0.00 0.00	0.00	70.0000	No Ice 1/2" Ice 1" Ice	3.3636 3.5972 3.8383	2.1921 2.3950 2.6056	0.03 0.06 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 402-1]	C	None		0.00	70.0000	No Ice 1/2" Ice 1" Ice	27.6500 34.7400 41.6100	27.6500 34.7400 41.6100	2.17 2.83 3.63
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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
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

Comb. No.	Description
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	140 - 135	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	26	-12.01	0.04	-0.04
			Max. Mx	20	-5.62	28.71	-0.02
			Max. My	14	-5.62	0.03	-28.69
			Max. Vy	8	8.11	-28.64	-0.02
			Max. Vx	14	8.11	0.03	-28.69
			Max. Torque	12			-0.03
L2	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.47	0.03	-0.05
			Max. Mx	20	-5.91	70.06	-0.02
			Max. My	14	-5.91	0.02	-70.04
			Max. Vy	8	8.43	-70.00	-0.03
			Max. Vx	14	8.43	0.02	-70.04
			Max. Torque	12			-0.03
L3	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.94	0.02	-0.06
			Max. Mx	20	-6.21	113.01	-0.03
			Max. My	14	-6.21	0.01	-112.99
			Max. Vy	8	8.75	-112.96	-0.04
			Max. Vx	14	8.75	0.01	-112.99
			Max. Torque	12			-0.03
L4	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.42	0.00	-0.07
			Max. Mx	20	-6.54	157.56	-0.03
			Max. My	14	-6.54	0.00	-157.53
			Max. Vy	8	9.07	-157.51	-0.04
			Max. Vx	14	9.07	0.00	-157.53
			Max. Torque	12			-0.03
L5	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.91	-0.01	-0.08
			Max. Mx	20	-6.88	203.71	-0.04
			Max. My	14	-6.88	-0.01	-203.68
			Max. Vy	8	9.40	-203.67	-0.05
			Max. Vx	14	9.39	-0.01	-203.68
			Max. Torque	12			-0.03
L6	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.00	-0.93	-0.62
			Max. Mx	8	-11.45	-283.92	-0.31
			Max. My	14	-11.46	-0.41	-283.73
			Max. Vy	8	15.53	-283.92	-0.31
			Max. Vx	14	15.52	-0.41	-283.73
			Max. Torque	16			0.59
L7	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.58	-0.95	-0.63
			Max. Mx	8	-11.94	-362.24	-0.34
			Max. My	14	-11.95	-0.45	-362.00
			Max. Vy	8	15.82	-362.24	-0.34
			Max. Vx	14	15.81	-0.45	-362.00
			Max. Torque	16			0.59
L8	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.18	-0.96	-0.65
			Max. Mx	8	-12.46	-442.00	-0.37
			Max. My	14	-12.46	-0.48	-441.71
			Max. Vy	8	16.10	-442.00	-0.37
			Max. Vx	14	16.09	-0.48	-441.71
			Max. Torque	16			0.58
L9	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.79	-0.98	-0.67

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	-13.00	-523.14	-0.40
			Max. My	14	-13.01	-0.52	-522.81
			Max. Vy	8	16.38	-523.14	-0.40
			Max. Vx	14	16.37	-0.52	-522.81
			Max. Torque	16			0.58
L10	95 - 89	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.07	-0.99	-0.67
			Max. Mx	8	-13.25	-560.10	-0.42
			Max. My	14	-13.26	-0.53	-559.74
			Max. Vy	8	16.50	-560.10	-0.42
			Max. Vx	14	16.49	-0.53	-559.74
			Max. Torque	16			0.58
L11	89 - 87.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.17	-1.00	-0.69
			Max. Mx	8	-14.11	-643.45	-0.45
			Max. My	14	-14.12	-0.57	-643.05
			Max. Vy	8	16.85	-643.45	-0.45
			Max. Vx	14	16.84	-0.57	-643.05
			Max. Torque	16			0.58
L12	87.75 - 82.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.92	-1.02	-0.70
			Max. Mx	8	-14.79	-728.36	-0.48
			Max. My	14	-14.79	-0.60	-727.91
			Max. Vy	8	17.14	-728.36	-0.48
			Max. Vx	14	17.13	-0.60	-727.91
			Max. Torque	16			0.58
L13	82.75 - 77.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.68	-1.03	-0.71
			Max. Mx	8	-15.48	-814.68	-0.51
			Max. My	14	-15.49	-0.63	-814.18
			Max. Vy	8	17.41	-814.68	-0.51
			Max. Vx	14	17.40	-0.63	-814.18
			Max. Torque	16			0.58
L14	77.75 - 72.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.46	-1.04	-0.73
			Max. Mx	8	-16.20	-902.35	-0.54
			Max. My	14	-16.21	-0.66	-901.81
			Max. Vy	8	17.68	-902.35	-0.54
			Max. Vx	14	17.67	-0.66	-901.81
			Max. Torque	16			0.58
L15	72.75 - 67.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.26	-1.07	-1.69
			Max. Mx	8	-20.67	-999.08	-0.93
			Max. My	14	-20.69	-0.70	-998.44
			Max. Vy	8	21.37	-999.08	-0.93
			Max. Vx	14	21.19	-0.70	-998.44
			Max. Torque	16			0.58
L16	67.75 - 62.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.13	-1.12	-1.67
			Max. Mx	8	-21.48	-1106.40	-0.95
			Max. My	14	-21.50	-0.75	-1104.81
			Max. Vy	8	21.59	-1106.40	-0.95
			Max. Vx	14	21.40	-0.75	-1104.81
			Max. Torque	16			0.58
L17	62.75 - 61.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.37	-1.14	-1.66
			Max. Mx	8	-21.67	-1133.43	-0.95
			Max. My	14	-21.69	-0.76	-1131.61
			Max. Vy	8	21.71	-1133.43	-0.95
			Max. Vx	14	21.52	-0.76	-1131.61
			Max. Torque	16			0.58
L18	61.5 - 61.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.44	-1.14	-1.66
			Max. Mx	8	-21.76	-1138.86	-0.96

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-21.77	-0.77	-1136.99
			Max. Vy	8	21.73	-1138.86	-0.96
			Max. Vx	14	21.53	-0.77	-1136.99
			Max. Torque	16			0.58
L19	61.25 - 56.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.92	-1.21	-1.64
			Max. Mx	8	-22.95	-1248.89	-0.97
			Max. My	14	-22.97	-0.82	-1246.04
			Max. Vy	8	22.30	-1248.89	-0.97
			Max. Vx	14	22.11	-0.82	-1246.04
			Max. Torque	16			0.58
L20	56.25 - 51.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.40	-1.28	-1.62
			Max. Mx	8	-24.18	-1361.79	-0.99
			Max. My	14	-24.20	-0.87	-1357.92
			Max. Vy	8	22.87	-1361.79	-0.99
			Max. Vx	14	22.67	-0.87	-1357.92
			Max. Torque	16			0.58
L21	51.25 - 46.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.48	-1.28	-1.62
			Max. Mx	8	-24.25	-1367.51	-0.99
			Max. My	14	-24.27	-0.87	-1363.59
			Max. Vy	8	22.89	-1367.51	-0.99
			Max. Vx	14	22.68	-0.87	-1363.59
			Max. Torque	16			0.57
L22	46.5 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.76	-1.34	-1.59
			Max. Mx	8	-26.14	-1494.51	-1.00
			Max. My	14	-26.16	-0.93	-1489.44
			Max. Vy	8	23.29	-1494.51	-1.00
			Max. Vx	14	23.08	-0.93	-1489.44
			Max. Torque	16			0.57
L23	45.5 - 40.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.80	-1.39	-1.56
			Max. Mx	8	-27.14	-1611.31	-1.02
			Max. My	14	-27.15	-0.98	-1605.19
			Max. Vy	8	23.47	-1611.31	-1.02
			Max. Vx	14	23.27	-0.98	-1605.19
			Max. Torque	16			0.57
L24	40.5 - 35.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.86	-1.44	-1.53
			Max. Mx	8	-28.16	-1728.98	-1.03
			Max. My	14	-28.17	-1.03	-1721.82
			Max. Vy	8	23.64	-1728.98	-1.03
			Max. Vx	14	23.43	-1.03	-1721.82
			Max. Torque	16			0.57
L25	35.5 - 30.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.93	-1.49	-1.50
			Max. Mx	8	-29.20	-1847.44	-1.04
			Max. My	14	-29.21	-1.08	-1839.24
			Max. Vy	8	23.78	-1847.44	-1.04
			Max. Vx	14	23.58	-1.08	-1839.24
			Max. Torque	16			0.57
L26	30.5 - 28	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.53	-1.53	-1.49
			Max. Mx	8	-29.72	-1907.09	-1.05
			Max. My	14	-29.73	-1.11	-1898.36
			Max. Vy	8	23.98	-1907.09	-1.05
			Max. Vx	14	23.78	-1.11	-1898.36
			Max. Torque	16			0.57
L27	28 - 27.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.63	-1.53	-1.49
			Max. Mx	8	-29.82	-1913.08	-1.05
			Max. My	14	-29.83	-1.11	-1904.30
			Max. Vy	8	23.98	-1913.08	-1.05
			Max. Vx	14	23.77	-1.11	-1904.30
			Max. Torque	16			0.57

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L28	27.75 - 22.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.50	-1.61	-1.46
			Max. Mx	8	-31.45	-2034.21	-1.06
			Max. My	14	-31.45	-1.16	-2024.35
			Max. Vy	8	24.48	-2034.21	-1.06
			Max. Vx	14	24.27	-1.16	-2024.35
			Max. Torque	16			0.57
L29	22.75 - 17.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.38	-1.68	-1.44
			Max. Mx	8	-33.10	-2157.71	-1.07
			Max. My	14	-33.10	-1.21	-2146.74
			Max. Vy	8	24.94	-2157.71	-1.07
			Max. Vx	14	24.72	-1.21	-2146.74
			Max. Torque	16			0.57
L30	17.75 - 12.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.28	-1.76	-1.41
			Max. Mx	8	-34.77	-2283.42	-1.08
			Max. My	14	-34.77	-1.26	-2271.31
			Max. Vy	8	25.36	-2283.42	-1.08
			Max. Vx	14	25.14	-1.26	-2271.31
			Max. Torque	16			0.57
L31	12.75 - 7.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.18	-1.83	-1.39
			Max. Mx	8	-36.46	-2411.22	-1.09
			Max. My	14	-36.46	-1.31	-2397.94
			Max. Vy	8	25.78	-2411.22	-1.09
			Max. Vx	14	25.55	-1.31	-2397.94
			Max. Torque	16			0.57
L32	7.75 - 2.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.07	-1.90	-1.36
			Max. Mx	8	-38.18	-2541.10	-1.10
			Max. My	14	-38.18	-1.37	-2526.62
			Max. Vy	8	26.19	-2541.10	-1.10
			Max. Vx	14	25.96	-1.37	-2526.62
			Max. Torque	16			0.57
L33	2.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.11	-1.94	-1.35
			Max. Mx	8	-39.12	-2613.41	-1.10
			Max. My	14	-39.12	-1.39	-2598.25
			Max. Vy	8	26.42	-2613.41	-1.10
			Max. Vx	14	26.19	-1.39	-2598.25
			Max. Torque	16			0.57

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	57.11	-4.40	-0.00
	Max. H_x	20	39.14	26.40	0.00
	Max. H_z	3	29.35	0.00	26.16
	Max. M_x	2	2597.28	0.00	26.16
	Max. M_z	8	2613.41	-26.40	-0.00
	Max. Torsion	16	0.57	12.20	-20.98
	Min. Vert	17	29.35	12.20	-20.98
	Min. H_x	8	39.14	-26.40	-0.00
	Min. H_z	15	29.35	-0.00	-26.16
	Min. M_x	14	-2598.25	-0.00	-26.16
	Min. M_z	20	-2611.84	26.40	0.00
	Min. Torsion	4	-0.56	-12.20	20.98

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	32.62	0.00	0.00	0.36	-0.60	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	39.14	-0.00	-26.16	-2597.28	-0.16	0.48
0.9 Dead+1.0 Wind 0 deg - No Ice	29.35	-0.00	-26.16	-2551.49	0.04	0.46
1.2 Dead+1.0 Wind 30 deg - No Ice	39.14	12.20	-20.98	-2201.78	-1278.47	0.56
0.9 Dead+1.0 Wind 30 deg - No Ice	29.35	12.20	-20.98	-2162.44	-1255.41	0.55
1.2 Dead+1.0 Wind 60 deg - No Ice	39.14	22.84	-13.09	-1298.38	-2262.48	0.50
0.9 Dead+1.0 Wind 60 deg - No Ice	29.35	22.84	-13.09	-1275.56	-2222.38	0.49
1.2 Dead+1.0 Wind 90 deg - No Ice	39.14	26.40	0.00	1.10	-2613.41	0.31
0.9 Dead+1.0 Wind 90 deg - No Ice	29.35	26.40	0.00	0.96	-2567.13	0.30
1.2 Dead+1.0 Wind 120 deg - No Ice	39.14	22.78	13.07	1299.40	-2261.33	0.03
0.9 Dead+1.0 Wind 120 deg - No Ice	29.35	22.78	13.07	1276.30	-2221.23	0.03
1.2 Dead+1.0 Wind 150 deg - No Ice	39.14	13.16	22.64	2249.99	-1306.46	-0.26
0.9 Dead+1.0 Wind 150 deg - No Ice	29.35	13.16	22.64	2210.08	-1283.21	-0.26
1.2 Dead+1.0 Wind 180 deg - No Ice	39.14	0.00	26.16	2598.25	-1.39	-0.48
0.9 Dead+1.0 Wind 180 deg - No Ice	29.35	0.00	26.16	2552.20	-1.17	-0.47
1.2 Dead+1.0 Wind 210 deg - No Ice	39.14	-12.20	20.98	2202.75	1276.92	-0.57
0.9 Dead+1.0 Wind 210 deg - No Ice	29.35	-12.20	20.98	2163.14	1254.27	-0.56
1.2 Dead+1.0 Wind 240 deg - No Ice	39.14	-22.84	13.09	1299.35	2260.92	-0.51
0.9 Dead+1.0 Wind 240 deg - No Ice	29.35	-22.84	13.09	1276.26	2221.24	-0.49
1.2 Dead+1.0 Wind 270 deg - No Ice	39.14	-26.40	-0.00	-0.13	2611.84	-0.30
0.9 Dead+1.0 Wind 270 deg - No Ice	29.35	-26.40	-0.00	-0.25	2565.99	-0.29
1.2 Dead+1.0 Wind 300 deg - No Ice	39.14	-22.78	-13.07	-1298.42	2259.76	-0.02
0.9 Dead+1.0 Wind 300 deg - No Ice	29.35	-22.78	-13.07	-1275.59	2220.09	-0.02
1.2 Dead+1.0 Wind 330 deg - No Ice	39.14	-13.16	-22.64	-2249.01	1304.90	0.26
0.9 Dead+1.0 Wind 330 deg - No Ice	29.35	-13.16	-22.64	-2209.38	1282.07	0.26
1.2 Dead+1.0 Ice+1.0 Temp	57.11	0.00	0.00	1.35	-1.94	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	57.11	-0.00	-4.37	-460.23	-1.93	0.11
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	57.11	2.19	-3.77	-398.00	-233.46	0.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	57.11	3.80	-2.18	-229.39	-403.44	0.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	57.11	4.40	0.00	1.53	-465.68	0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	57.11	3.80	2.18	232.29	-403.29	0.01
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	57.11	2.19	3.78	401.23	-233.78	-0.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	57.11	0.00	4.37	463.10	-2.12	-0.11
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	57.11	-2.19	3.77	400.87	229.41	-0.13

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	57.11	-3.80	2.18	232.26	399.38	-0.12
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	57.11	-4.40	-0.00	1.34	461.63	-0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	57.11	-3.80	-2.18	-229.41	399.24	-0.01
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	57.11	-2.19	-3.78	-398.36	229.72	0.06
Dead+Wind 0 deg - Service	32.62	-0.00	-6.95	-683.37	-0.49	0.13
Dead+Wind 30 deg - Service	32.62	3.24	-5.57	-579.19	-336.92	0.15
Dead+Wind 60 deg - Service	32.62	6.06	-3.48	-341.48	-595.98	0.13
Dead+Wind 90 deg - Service	32.62	7.01	0.00	0.57	-688.36	0.08
Dead+Wind 120 deg - Service	32.62	6.05	3.47	342.30	-595.68	0.01
Dead+Wind 150 deg - Service	32.62	3.50	6.01	592.51	-344.33	-0.07
Dead+Wind 180 deg - Service	32.62	0.00	6.95	684.18	-0.81	-0.13
Dead+Wind 210 deg - Service	32.62	-3.24	5.57	579.99	335.62	-0.15
Dead+Wind 240 deg - Service	32.62	-6.06	3.48	342.29	594.69	-0.13
Dead+Wind 270 deg - Service	32.62	-7.01	-0.00	0.24	687.06	-0.08
Dead+Wind 300 deg - Service	32.62	-6.05	-3.47	-341.50	594.38	-0.01
Dead+Wind 330 deg - Service	32.62	-3.50	-6.01	-591.71	343.04	0.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-32.62	0.00	0.00	32.62	0.00	0.000%
2	-0.00	-39.14	-26.16	0.00	39.14	26.16	0.000%
3	-0.00	-29.35	-26.16	0.00	29.35	26.16	0.000%
4	12.20	-39.14	-20.98	-12.20	39.14	20.98	0.000%
5	12.20	-29.35	-20.98	-12.20	29.35	20.98	0.000%
6	22.84	-39.14	-13.09	-22.84	39.14	13.09	0.000%
7	22.84	-29.35	-13.09	-22.84	29.35	13.09	0.000%
8	26.40	-39.14	0.00	-26.40	39.14	-0.00	0.000%
9	26.40	-29.35	0.00	-26.40	29.35	-0.00	0.000%
10	22.78	-39.14	13.07	-22.78	39.14	-13.07	0.000%
11	22.78	-29.35	13.07	-22.78	29.35	-13.07	0.000%
12	13.16	-39.14	22.64	-13.16	39.14	-22.64	0.000%
13	13.16	-29.35	22.64	-13.16	29.35	-22.64	0.000%
14	0.00	-39.14	26.16	-0.00	39.14	-26.16	0.000%
15	0.00	-29.35	26.16	-0.00	29.35	-26.16	0.000%
16	-12.20	-39.14	20.98	12.20	39.14	-20.98	0.000%
17	-12.20	-29.35	20.98	12.20	29.35	-20.98	0.000%
18	-22.84	-39.14	13.09	22.84	39.14	-13.09	0.000%
19	-22.84	-29.35	13.09	22.84	29.35	-13.09	0.000%
20	-26.40	-39.14	-0.00	26.40	39.14	0.00	0.000%
21	-26.40	-29.35	-0.00	26.40	29.35	0.00	0.000%
22	-22.78	-39.14	-13.07	22.78	39.14	13.07	0.000%
23	-22.78	-29.35	-13.07	22.78	29.35	13.07	0.000%
24	-13.16	-39.14	-22.64	13.16	39.14	22.64	0.000%
25	-13.16	-29.35	-22.64	13.16	29.35	22.64	0.000%
26	0.00	-57.11	0.00	-0.00	57.11	-0.00	0.000%
27	-0.00	-57.11	-4.37	0.00	57.11	4.37	0.000%
28	2.19	-57.11	-3.77	-2.19	57.11	3.77	0.000%
29	3.80	-57.11	-2.18	-3.80	57.11	2.18	0.000%
30	4.40	-57.11	0.00	-4.40	57.11	-0.00	0.000%
31	3.80	-57.11	2.18	-3.80	57.11	-2.18	0.000%
32	2.19	-57.11	3.78	-2.19	57.11	-3.78	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.00	-57.11	4.37	-0.00	57.11	-4.37	0.000%
34	-2.19	-57.11	3.77	2.19	57.11	-3.77	0.000%
35	-3.80	-57.11	2.18	3.80	57.11	-2.18	0.000%
36	-4.40	-57.11	-0.00	4.40	57.11	0.00	0.000%
37	-3.80	-57.11	-2.18	3.80	57.11	2.18	0.000%
38	-2.19	-57.11	-3.78	2.19	57.11	3.78	0.000%
39	-0.00	-32.62	-6.95	0.00	32.62	6.95	0.000%
40	3.24	-32.62	-5.57	-3.24	32.62	5.57	0.000%
41	6.06	-32.62	-3.48	-6.06	32.62	3.48	0.000%
42	7.01	-32.62	0.00	-7.01	32.62	-0.00	0.000%
43	6.05	-32.62	3.47	-6.05	32.62	-3.47	0.000%
44	3.50	-32.62	6.01	-3.50	32.62	-6.01	0.000%
45	0.00	-32.62	6.95	-0.00	32.62	-6.95	0.000%
46	-3.24	-32.62	5.57	3.24	32.62	-5.57	0.000%
47	-6.06	-32.62	3.48	6.06	32.62	-3.48	0.000%
48	-7.01	-32.62	-0.00	7.01	32.62	0.00	0.000%
49	-6.05	-32.62	-3.47	6.05	32.62	3.47	0.000%
50	-3.50	-32.62	-6.01	3.50	32.62	6.01	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00009196
3	Yes	5	0.00000001	0.00044408
4	Yes	7	0.00000001	0.00043941
5	Yes	7	0.00000001	0.00009510
6	Yes	7	0.00000001	0.00043200
7	Yes	7	0.00000001	0.00009258
8	Yes	5	0.00000001	0.00087909
9	Yes	5	0.00000001	0.00035345
10	Yes	7	0.00000001	0.00043723
11	Yes	7	0.00000001	0.00009385
12	Yes	7	0.00000001	0.00043973
13	Yes	7	0.00000001	0.00009451
14	Yes	6	0.00000001	0.00009895
15	Yes	5	0.00000001	0.00048201
16	Yes	7	0.00000001	0.00042943
17	Yes	7	0.00000001	0.00009253
18	Yes	7	0.00000001	0.00044073
19	Yes	7	0.00000001	0.00009482
20	Yes	5	0.00000001	0.00080956
21	Yes	5	0.00000001	0.00031950
22	Yes	7	0.00000001	0.00043587
23	Yes	7	0.00000001	0.00009362
24	Yes	7	0.00000001	0.00043424
25	Yes	7	0.00000001	0.00009322
26	Yes	4	0.00000001	0.00042181
27	Yes	7	0.00000001	0.00026734
28	Yes	7	0.00000001	0.00030432
29	Yes	7	0.00000001	0.00030443
30	Yes	7	0.00000001	0.00027111
31	Yes	7	0.00000001	0.00030772
32	Yes	7	0.00000001	0.00030761
33	Yes	7	0.00000001	0.00027045
34	Yes	7	0.00000001	0.00030384
35	Yes	7	0.00000001	0.00030445
36	Yes	7	0.00000001	0.00026775
37	Yes	7	0.00000001	0.00030130
38	Yes	7	0.00000001	0.00030100
39	Yes	5	0.00000001	0.00016470
40	Yes	6	0.00000001	0.00012765
41	Yes	6	0.00000001	0.00012388
42	Yes	5	0.00000001	0.00015656
43	Yes	6	0.00000001	0.00012754

44	Yes	6	0.00000001	0.00012885
45	Yes	5	0.00000001	0.00016598
46	Yes	6	0.00000001	0.00012124
47	Yes	6	0.00000001	0.00012955
48	Yes	5	0.00000001	0.00015552
49	Yes	6	0.00000001	0.00012592
50	Yes	6	0.00000001	0.00012461

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	36.97	42	2.44	0.00
L2	135 - 130	34.42	42	2.44	0.00
L3	130 - 125	31.88	42	2.41	0.00
L4	125 - 120	29.38	42	2.37	0.00
L5	120 - 115	26.93	42	2.31	0.00
L6	115 - 110	24.55	42	2.24	0.00
L7	110 - 105	22.25	42	2.15	0.00
L8	105 - 100	20.06	42	2.04	0.00
L9	100 - 95	17.98	42	1.92	0.00
L10	95 - 89	16.03	42	1.79	0.00
L11	92.75 - 87.75	15.20	42	1.73	0.00
L12	87.75 - 82.75	13.42	42	1.66	0.00
L13	82.75 - 77.75	11.75	42	1.54	0.00
L14	77.75 - 72.75	10.21	42	1.41	0.00
L15	72.75 - 67.75	8.79	42	1.29	0.00
L16	67.75 - 62.75	7.51	42	1.16	0.00
L17	62.75 - 61.5	6.37	42	1.03	0.00
L18	61.5 - 61.25	6.11	42	0.99	0.00
L19	61.25 - 56.25	6.05	42	0.99	0.00
L20	56.25 - 51.25	5.05	42	0.92	0.00
L21	51.25 - 46.5	4.13	42	0.85	0.00
L22	51 - 45.5	4.08	42	0.84	0.00
L23	45.5 - 40.5	3.14	42	0.78	0.00
L24	40.5 - 35.5	2.39	42	0.66	0.00
L25	35.5 - 30.5	1.76	42	0.54	0.00
L26	30.5 - 28	1.26	42	0.42	0.00
L27	28 - 27.75	1.05	42	0.36	0.00
L28	27.75 - 22.75	1.04	42	0.35	0.00
L29	22.75 - 17.75	0.70	42	0.29	0.00
L30	17.75 - 12.75	0.43	42	0.23	0.00
L31	12.75 - 7.75	0.22	42	0.16	0.00
L32	7.75 - 2.75	0.08	42	0.10	0.00
L33	2.75 - 0	0.01	42	0.04	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.0000	Lighting Rod 3/4" x 10'	42	36.97	2.44	0.00	17830
138.0000	APXVAARR24_43-U-NA20 w/ Mount Pipe	42	35.95	2.44	0.00	17830
115.0000	(2) NNHH-65C-R4	42	24.55	2.24	0.00	3656
70.0000	(2) MX06FRO860-02 w/ Mount Pipe	42	8.07	1.22	0.00	2213

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	140.40	8	9.30	0.01
L2	135 - 130	130.71	8	9.27	0.01
L3	130 - 125	121.08	8	9.17	0.01
L4	125 - 120	111.60	8	9.01	0.01
L5	120 - 115	102.32	8	8.78	0.01
L6	115 - 110	93.29	8	8.51	0.01
L7	110 - 105	84.58	8	8.18	0.01
L8	105 - 100	76.24	8	7.78	0.01
L9	100 - 95	68.35	8	7.33	0.01
L10	95 - 89	60.95	8	6.83	0.00
L11	92.75 - 87.75	57.80	8	6.59	0.00
L12	87.75 - 82.75	51.04	8	6.30	0.00
L13	82.75 - 77.75	44.68	8	5.85	0.00
L14	77.75 - 72.75	38.81	8	5.38	0.00
L15	72.75 - 67.75	33.43	8	4.90	0.00
L16	67.75 - 62.75	28.56	8	4.41	0.00
L17	62.75 - 61.5	24.21	8	3.90	0.00
L18	61.5 - 61.25	23.21	8	3.77	0.00
L19	61.25 - 56.25	23.01	8	3.76	0.00
L20	56.25 - 51.25	19.21	8	3.50	0.00
L21	51.25 - 46.5	15.69	8	3.23	0.00
L22	51 - 45.5	15.52	8	3.21	0.00
L23	45.5 - 40.5	11.94	8	2.97	0.00
L24	40.5 - 35.5	9.07	8	2.51	0.00
L25	35.5 - 30.5	6.68	8	2.05	0.00
L26	30.5 - 28	4.78	8	1.59	0.00
L27	28 - 27.75	4.01	8	1.36	0.00
L28	27.75 - 22.75	3.94	8	1.35	0.00
L29	22.75 - 17.75	2.65	8	1.11	0.00
L30	17.75 - 12.75	1.62	8	0.87	0.00
L31	12.75 - 7.75	0.84	8	0.62	0.00
L32	7.75 - 2.75	0.31	8	0.38	0.00
L33	2.75 - 0	0.04	8	0.13	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.0000	Lighting Rod 3/4" x 10'	8	140.40	9.30	0.01	4923
138.0000	APXVAARR24_43-U-NA20 w/ Mount Pipe	8	136.52	9.29	0.01	4923
115.0000	(2) NNHH-65C-R4	8	93.29	8.51	0.01	1000
70.0000	(2) MX06FRO860-02 w/ Mount Pipe	8	30.69	4.63	0.00	588

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	140 - 135 (1)	TP20.7702x20x0.1875	5.0000	0.0000	0.0	12.2493	-5.62	716.58	0.008
L2	135 - 130 (2)	TP21.5404x20.7702x0.1875	5.0000	0.0000	0.0	12.7076	-5.91	743.40	0.008
L3	130 - 125 (3)	TP22.3106x21.5404x0.18	5.0000	0.0000	0.0	13.166	-6.21	770.21	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L4	125 - 120 (4)	TP23.0808x22.3106x0.1875	5.0000	0.0000	0.0	13.6240	-6.54	797.02	0.008
L5	120 - 115 (5)	TP23.851x23.0808x0.1875	5.0000	0.0000	0.0	14.0827	-6.88	823.84	0.008
L6	115 - 110 (6)	TP24.6212x23.851x0.1875	5.0000	0.0000	0.0	14.5411	-11.45	850.65	0.013
L7	110 - 105 (7)	TP25.3914x24.6212x0.1875	5.0000	0.0000	0.0	14.9995	-11.94	877.47	0.014
L8	105 - 100 (8)	TP26.1616x25.3914x0.1875	5.0000	0.0000	0.0	15.4578	-12.46	904.28	0.014
L9	100 - 95 (9)	TP26.9318x26.1616x0.1875	5.0000	0.0000	0.0	15.9162	-13.00	931.10	0.014
L10	95 - 89 (10)	TP27.856x26.9318x0.1875	6.0000	0.0000	0.0	16.1224	-13.26	943.16	0.014
L11	89 - 87.75 (11)	TP27.6735x26.9034x0.25	5.0000	0.0000	0.0	21.7605	-14.11	1272.99	0.011
L12	87.75 - 82.75 (12)	TP28.4436x27.6735x0.25	5.0000	0.0000	0.0	22.3716	-14.79	1308.74	0.011
L13	82.75 - 77.75 (13)	TP29.2137x28.4436x0.25	5.0000	0.0000	0.0	22.9827	-15.49	1344.49	0.012
L14	77.75 - 72.75 (14)	TP29.9838x29.2137x0.25	5.0000	0.0000	0.0	23.5938	-16.20	1380.24	0.012
L15	72.75 - 67.75 (15)	TP30.754x29.9838x0.25	5.0000	0.0000	0.0	24.2049	-20.67	1415.99	0.015
L16	67.75 - 62.75 (16)	TP31.5241x30.754x0.25	5.0000	0.0000	0.0	24.8160	-21.48	1451.74	0.015
L17	62.75 - 61.5 (17)	TP31.7166x31.5241x0.25	1.2500	0.0000	0.0	24.9688	-21.67	1460.67	0.015
L18	61.5 - 61.25 (18)	TP31.7551x31.7166x0.5125	0.2500	0.0000	0.0	50.8216	-21.76	2973.06	0.007
L19	61.25 - 56.25 (19)	TP32.5253x31.7551x0.5125	5.0000	0.0000	0.0	52.0744	-22.95	3046.35	0.008
L20	56.25 - 51.25 (20)	TP33.2954x32.5253x0.5	5.0000	0.0000	0.0	52.0463	-24.18	3044.71	0.008
L21	51.25 - 46.5 (21)	TP34.027x33.2954x0.5	4.7500	0.0000	0.0	52.1074	-24.25	3048.28	0.008
L22	46.5 - 45.5 (22)	TP33.6811x32.8339x0.3125	5.5000	0.0000	0.0	33.0975	-26.14	1936.20	0.014
L23	45.5 - 40.5 (23)	TP34.4513x33.6811x0.3125	5.0000	0.0000	0.0	33.8614	-27.14	1980.89	0.014
L24	40.5 - 35.5 (24)	TP35.2215x34.4513x0.3125	5.0000	0.0000	0.0	34.6254	-28.16	2025.59	0.014
L25	35.5 - 30.5 (25)	TP35.9917x35.2215x0.3125	5.0000	0.0000	0.0	35.3893	-29.20	2070.28	0.014
L26	30.5 - 28 (26)	TP36.3768x35.9917x0.3125	2.5000	0.0000	0.0	35.7713	-29.72	2092.62	0.014
L27	28 - 27.75 (27)	TP36.4154x36.3768x0.625	0.2500	0.0000	0.0	70.9991	-29.82	4153.45	0.007
L28	27.75 - 22.75 (28)	TP37.1856x36.4154x0.625	5.0000	0.0000	0.0	72.5270	-31.45	4242.83	0.007
L29	22.75 - 17.75 (29)	TP37.9558x37.1856x0.6125	5.0000	0.0000	0.0	72.5981	-33.10	4246.99	0.008
L30	17.75 - 12.75 (30)	TP38.726x37.9558x0.6	5.0000	0.0000	0.0	72.6071	-34.77	4247.52	0.008
L31	12.75 - 7.75 (31)	TP39.4962x38.726x0.6	5.0000	0.0000	0.0	74.0739	-36.46	4333.32	0.008
L32	7.75 - 2.75 (32)	TP40.2664x39.4962x0.5875	5.0000	0.0000	0.0	73.9902	-38.18	4328.43	0.009
L33	2.75 - 0 (33)	TP40.69x40.2664x0.5875	2.7500	0.0000	0.0	74.7801	-39.12	4374.64	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	140 - 135 (1)	TP20.7702x20x0.1875	28.71	370.51	0.077	0.00	370.51	0.000
L2	135 - 130 (2)	TP21.5404x20.7702x0.1875	70.07	394.62	0.178	0.00	394.62	0.000
L3	130 - 125 (3)	TP22.3106x21.5404x0.1875	113.01	419.15	0.270	0.00	419.15	0.000
L4	125 - 120 (4)	TP23.0808x22.3106x0.1875	157.56	444.06	0.355	0.00	444.06	0.000
L5	120 - 115 (5)	TP23.851x23.0808x0.1875	203.71	469.33	0.434	0.00	469.33	0.000
L6	115 - 110 (6)	TP24.6212x23.851x0.1875	284.03	494.91	0.574	0.00	494.91	0.000
L7	110 - 105 (7)	TP25.3914x24.6212x0.1875	362.37	520.77	0.696	0.00	520.77	0.000
L8	105 - 100 (8)	TP26.1616x25.3914x0.1875	442.13	546.88	0.808	0.00	546.88	0.000
L9	100 - 95 (9)	TP26.9318x26.1616x0.1875	523.29	573.21	0.913	0.00	573.21	0.000
L10	95 - 89 (10)	TP27.856x26.9318x0.1875	560.24	585.12	0.957	0.00	585.12	0.000
L11	89 - 87.75 (11)	TP27.6735x26.9034x0.25	643.61	877.14	0.734	0.00	877.14	0.000
L12	87.75 - 82.75 (12)	TP28.4436x27.6735x0.25	728.53	919.89	0.792	0.00	919.89	0.000
L13	82.75 - 77.75 (13)	TP29.2137x28.4436x0.25	814.86	963.21	0.846	0.00	963.21	0.000
L14	77.75 - 72.75 (14)	TP29.9838x29.2137x0.25	902.54	1007.06	0.896	0.00	1007.06	0.000
L15	72.75 - 67.75 (15)	TP30.754x29.9838x0.25	999.36	1051.42	0.950	0.00	1051.42	0.000
L16	67.75 - 62.75 (16)	TP31.5241x30.754x0.25	1106.46	1096.24	1.009	0.00	1096.24	0.000
L17	62.75 - 61.5 (17)	TP31.7166x31.5241x0.25	1133.43	1107.52	1.023	0.00	1107.52	0.000
L18	61.5 - 61.25 (18)	TP31.7551x31.7166x0.5125	1138.86	2405.37	0.473	0.00	2405.37	0.000
L19	61.25 - 56.25 (19)	TP32.5253x31.7551x0.5125	1248.89	2526.40	0.494	0.00	2526.40	0.000
L20	56.25 - 51.25 (20)	TP33.2954x32.5253x0.5	1361.79	2588.71	0.526	0.00	2588.71	0.000
L21	51.25 - 46.5 (21)	TP34.027x33.2954x0.5	1367.52	2594.83	0.527	0.00	2594.83	0.000
L22	46.5 - 45.5 (22)	TP33.6811x32.8339x0.3125	1494.52	1635.25	0.914	0.00	1635.25	0.000
L23	45.5 - 40.5 (23)	TP34.4513x33.6811x0.3125	1611.32	1701.08	0.947	0.00	1701.08	0.000
L24	40.5 - 35.5 (24)	TP35.2215x34.4513x0.3125	1728.98	1767.65	0.978	0.00	1767.65	0.000
L25	35.5 - 30.5 (25)	TP35.9917x35.2215x0.3125	1847.44	1834.95	1.007	0.00	1834.95	0.000
L26	30.5 - 28 (26)	TP36.3768x35.9917x0.3125	1907.09	1868.87	1.020	0.00	1868.87	0.000
L27	28 - 27.75 (27)	TP36.4154x36.3768x0.625	1913.08	3845.50	0.497	0.00	3845.50	0.000
L28	27.75 - 22.75 (28)	TP37.1856x36.4154x0.625	2034.21	4014.24	0.507	0.00	4014.24	0.000
L29	22.75 - 17.75 (29)	TP37.9558x37.1856x0.6125	2157.72	4106.99	0.525	0.00	4106.99	0.000
L30	17.75 - 12.75 (30)	TP38.726x37.9558x0.6	2283.42	4196.34	0.544	0.00	4196.34	0.000
L31	12.75 - 7.75 (31)	TP39.4962x38.726x0.6	2411.22	4368.94	0.552	0.00	4368.94	0.000
L32	7.75 - 2.75 (32)	TP40.2664x39.4962x0.5875	2541.10	4454.54	0.570	0.00	4454.54	0.000
L33	2.75 - 0 (33)	TP40.69x40.2664x0.5875	2613.41	4550.86	0.574	0.00	4550.86	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	140 - 135 (1)	TP20.7702x20x0.1875	8.11	214.97	0.038	0.00	387.50	0.000
L2	135 - 130 (2)	TP21.5404x20.7702x0.1875	8.43	223.02	0.038	0.00	417.04	0.000
L3	130 - 125 (3)	TP22.3106x21.5404x0.1875	8.75	231.06	0.038	0.00	447.67	0.000
L4	125 - 120 (4)	TP23.0808x22.3106x0.1875	9.07	239.11	0.038	0.02	479.38	0.000
L5	120 - 115 (5)	TP23.851x23.0808x0.1875	9.40	247.15	0.038	0.02	512.18	0.000
L6	115 - 110 (6)	TP24.6212x23.851x0.1875	15.53	255.20	0.061	0.03	546.06	0.000
L7	110 - 105 (7)	TP25.3914x24.6212x0.1875	15.82	263.24	0.060	0.03	581.03	0.000
L8	105 - 100 (8)	TP26.1616x25.3914x0.1875	16.11	271.29	0.059	0.03	617.09	0.000
L9	100 - 95 (9)	TP26.9318x26.1616x0.1875	16.38	279.33	0.059	0.03	654.22	0.000
L10	95 - 89 (10)	TP27.856x26.9318x0.1875	16.50	282.95	0.058	0.03	671.29	0.000
L11	89 - 87.75 (11)	TP27.6735x26.9034x0.25	16.86	381.90	0.044	0.03	917.17	0.000
L12	87.75 - 82.75 (12)	TP28.4436x27.6735x0.25	17.14	392.62	0.044	0.03	969.41	0.000
L13	82.75 - 77.75 (13)	TP29.2137x28.4436x0.25	17.42	403.35	0.043	0.03	1023.09	0.000
L14	77.75 - 72.75 (14)	TP29.9838x29.2137x0.25	17.68	414.07	0.043	0.03	1078.22	0.000
L15	72.75 - 67.75 (15)	TP30.754x29.9838x0.25	21.33	424.80	0.050	0.03	1134.79	0.000
L16	67.75 - 62.75 (16)	TP31.5241x30.754x0.25	21.54	435.52	0.049	0.03	1192.82	0.000
L17	62.75 - 61.5 (17)	TP31.7166x31.5241x0.25	21.71	438.20	0.050	0.31	1207.55	0.000
L18	61.5 - 61.25 (18)	TP31.7551x31.7166x0.5125	21.73	891.92	0.024	0.31	2440.36	0.000
L19	61.25 - 56.25 (19)	TP32.5253x31.7551x0.5125	22.30	913.90	0.024	0.31	2562.15	0.000
L20	56.25 - 51.25 (20)	TP33.2954x32.5253x0.5	22.87	913.41	0.025	0.31	2623.37	0.000
L21	51.25 - 46.5 (21)	TP34.027x33.2954x0.5	22.89	914.49	0.025	0.31	2629.53	0.000
L22	46.5 - 45.5 (22)	TP33.6811x32.8339x0.3125	23.29	580.86	0.040	0.31	1697.43	0.000
L23	45.5 - 40.5 (23)	TP34.4513x33.6811x0.3125	23.47	594.27	0.039	0.31	1776.69	0.000
L24	40.5 - 35.5 (24)	TP35.2215x34.4513x0.3125	23.64	607.68	0.039	0.31	1857.76	0.000
L25	35.5 - 30.5 (25)	TP35.9917x35.2215x0.3125	23.78	621.08	0.038	0.31	1940.64	0.000
L26	30.5 - 28 (26)	TP36.3768x35.9917x0.3125	23.98	627.79	0.038	0.31	1982.76	0.000
L27	28 - 27.75 (27)	TP36.4154x36.3768x0.625	23.98	1246.03	0.019	0.31	3905.49	0.000
L28	27.75 - 22.75 (28)	TP37.1856x36.4154x0.625	24.48	1272.85	0.019	0.31	4075.39	0.000
L29	22.75 - 17.75 (29)	TP37.9558x37.1856x0.6125	24.94	1274.10	0.020	0.31	4166.73	0.000
L30	17.75 - 12.75 (30)	TP38.726x37.9558x0.6	25.36	1274.25	0.020	0.31	4254.58	0.000
L31	12.75 - 7.75 (31)	TP39.4962x38.726x0.6	25.78	1300.00	0.020	0.31	4428.22	0.000
L32	7.75 - 2.75 (32)	TP40.2664x39.4962x0.5875	26.19	1298.53	0.020	0.31	4512.23	0.000
L33	2.75 - 0 (33)	TP40.69x40.2664x0.5875	26.42	1312.39	0.020	0.31	4609.08	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 135 (1)	0.008	0.077	0.000	0.038	0.000	0.087	1.050	4.8.2
L2	135 - 130 (2)	0.008	0.178	0.000	0.038	0.000	0.187	1.050	4.8.2
L3	130 - 125 (3)	0.008	0.270	0.000	0.038	0.000	0.279	1.050	4.8.2
L4	125 - 120 (4)	0.008	0.355	0.000	0.038	0.000	0.364	1.050	4.8.2
L5	120 - 115 (5)	0.008	0.434	0.000	0.038	0.000	0.444	1.050	4.8.2
L6	115 - 110 (6)	0.013	0.574	0.000	0.061	0.000	0.591	1.050	4.8.2
L7	110 - 105 (7)	0.014	0.696	0.000	0.060	0.000	0.713	1.050	4.8.2
L8	105 - 100 (8)	0.014	0.808	0.000	0.059	0.000	0.826	1.050	4.8.2
L9	100 - 95 (9)	0.014	0.913	0.000	0.059	0.000	0.930	1.050	4.8.2
L10	95 - 89 (10)	0.014	0.957	0.000	0.058	0.000	0.975	1.050	4.8.2
L11	89 - 87.75 (11)	0.011	0.734	0.000	0.044	0.000	0.747	1.050	4.8.2
L12	87.75 - 82.75 (12)	0.011	0.792	0.000	0.044	0.000	0.805	1.050	4.8.2
L13	82.75 - 77.75 (13)	0.012	0.846	0.000	0.043	0.000	0.859	1.050	4.8.2
L14	77.75 - 72.75 (14)	0.012	0.896	0.000	0.043	0.000	0.910	1.050	4.8.2
L15	72.75 - 67.75 (15)	0.015	0.950	0.000	0.050	0.000	0.968	1.050	4.8.2
L16	67.75 - 62.75 (16)	0.015	1.009	0.000	0.049	0.000	1.027	1.050	4.8.2
L17	62.75 - 61.5 (17)	0.015	1.023	0.000	0.050	0.000	1.041	1.050	4.8.2
L18	61.5 - 61.25 (18)	0.007	0.473	0.000	0.024	0.000	0.481	1.050	4.8.2
L19	61.25 - 56.25 (19)	0.008	0.494	0.000	0.024	0.000	0.502	1.050	4.8.2
L20	56.25 - 51.25 (20)	0.008	0.526	0.000	0.025	0.000	0.535	1.050	4.8.2
L21	51.25 - 46.5 (21)	0.008	0.527	0.000	0.025	0.000	0.536	1.050	4.8.2
L22	46.5 - 45.5 (22)	0.014	0.914	0.000	0.040	0.000	0.929	1.050	4.8.2
L23	45.5 - 40.5 (23)	0.014	0.947	0.000	0.039	0.000	0.963	1.050	4.8.2
L24	40.5 - 35.5 (24)	0.014	0.978	0.000	0.039	0.000	0.994	1.050	4.8.2
L25	35.5 - 30.5 (25)	0.014	1.007	0.000	0.038	0.000	1.022	1.050	4.8.2
L26	30.5 - 28 (26)	0.014	1.020	0.000	0.038	0.000	1.036	1.050	4.8.2
L27	28 - 27.75 (27)	0.007	0.497	0.000	0.019	0.000	0.505	1.050	4.8.2
L28	27.75 - 22.75 (28)	0.007	0.507	0.000	0.019	0.000	0.515	1.050	4.8.2
L29	22.75 - 17.75 (29)	0.008	0.525	0.000	0.020	0.000	0.534	1.050	4.8.2
L30	17.75 - 12.75 (30)	0.008	0.544	0.000	0.020	0.000	0.553	1.050	4.8.2
L31	12.75 - 7.75 (31)	0.008	0.552	0.000	0.020	0.000	0.561	1.050	4.8.2
L32	7.75 - 2.75 (32)	0.009	0.570	0.000	0.020	0.000	0.580	1.050	4.8.2
L33	2.75 - 0 (33)	0.009	0.574	0.000	0.020	0.000	0.584	1.050	4.8.2

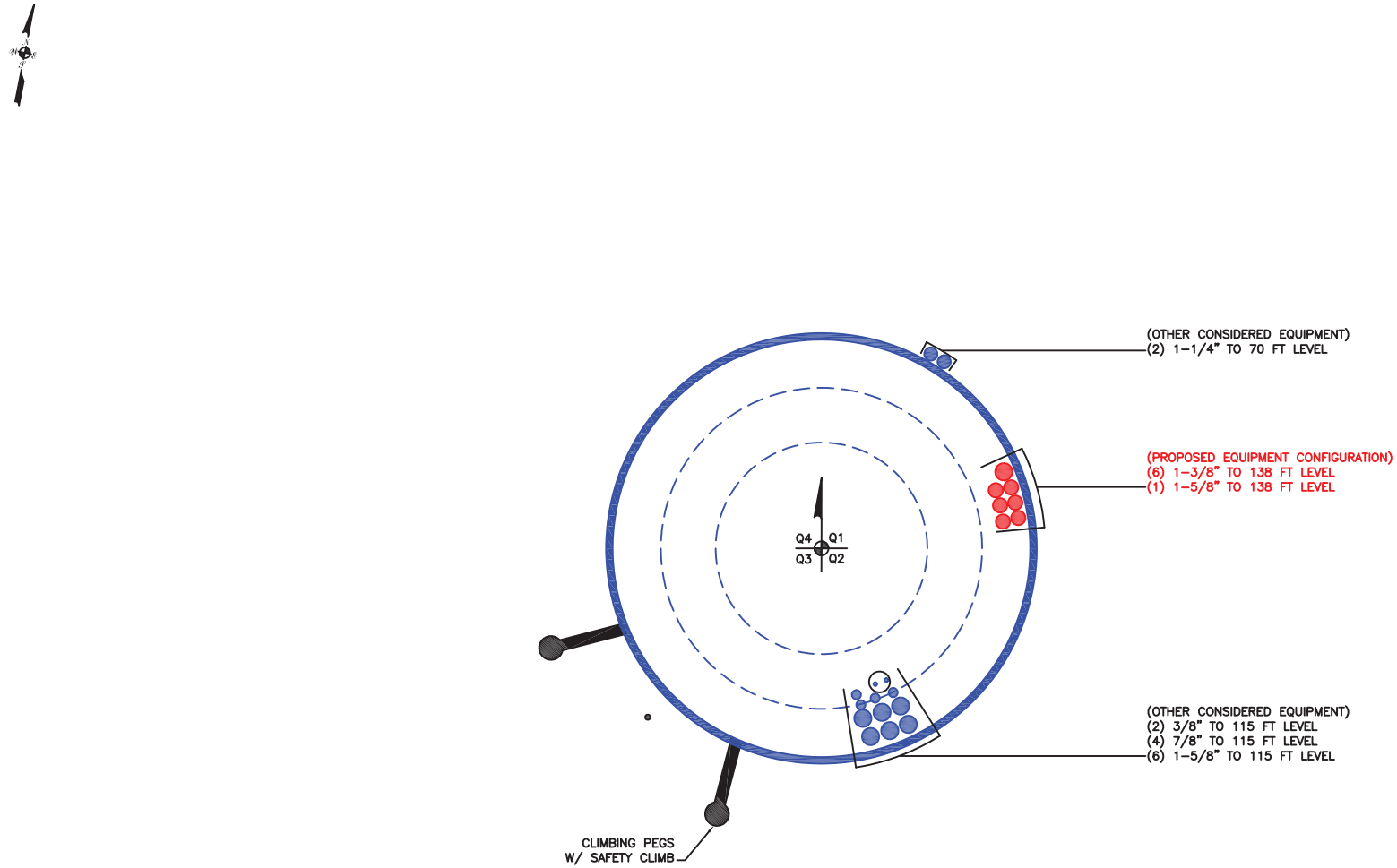
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	140 - 135	Pole	TP20.7702x20x0.1875	1	-5.62	752.41	8.3	Pass
L2	135 - 130	Pole	TP21.5404x20.7702x0.1875	2	-5.91	780.57	17.8	Pass
L3	130 - 125	Pole	TP22.3106x21.5404x0.1875	3	-6.21	808.72	26.6	Pass
L4	125 - 120	Pole	TP23.0808x22.3106x0.1875	4	-6.54	836.88	34.7	Pass
L5	120 - 115	Pole	TP23.851x23.0808x0.1875	5	-6.88	865.03	42.3	Pass
L6	115 - 110	Pole	TP24.6212x23.851x0.1875	6	-11.45	893.19	56.3	Pass
L7	110 - 105	Pole	TP25.3914x24.6212x0.1875	7	-11.94	921.34	67.9	Pass
L8	105 - 100	Pole	TP26.1616x25.3914x0.1875	8	-12.46	949.50	78.6	Pass
L9	100 - 95	Pole	TP26.9318x26.1616x0.1875	9	-13.00	977.65	88.6	Pass
L10	95 - 89	Pole	TP27.856x26.9318x0.1875	10	-13.26	990.32	92.9	Pass
L11	89 - 87.75	Pole	TP27.6735x26.9034x0.25	11	-14.11	1336.64	71.1	Pass
L12	87.75 - 82.75	Pole	TP28.4436x27.6735x0.25	12	-14.79	1374.18	76.7	Pass
L13	82.75 - 77.75	Pole	TP29.2137x28.4436x0.25	13	-15.49	1411.71	81.8	Pass
L14	77.75 - 72.75	Pole	TP29.9838x29.2137x0.25	14	-16.20	1449.25	86.6	Pass
L15	72.75 - 67.75	Pole	TP30.754x29.9838x0.25	15	-20.67	1486.79	92.2	Pass
L16	67.75 - 62.75	Pole	TP31.5241x30.754x0.25	16	-21.48	1524.33	97.8	Pass
L17	62.75 - 61.5	Pole	TP31.7166x31.5241x0.25	17	-21.67	1533.70	99.1	Pass
L18	61.5 - 61.25	Pole	TP31.7551x31.7166x0.5125	18	-21.76	3121.71	45.8	Pass
L19	61.25 - 56.25	Pole	TP32.5253x31.7551x0.5125	19	-22.95	3198.67	47.9	Pass
L20	56.25 - 51.25	Pole	TP33.2954x32.5253x0.5	20	-24.18	3196.95	50.9	Pass
L21	51.25 - 46.5	Pole	TP34.027x33.2954x0.5	21	-24.25	3200.69	51.0	Pass
L22	46.5 - 45.5	Pole	TP33.6811x32.8339x0.3125	22	-26.14	2033.01	88.5	Pass
L23	45.5 - 40.5	Pole	TP34.4513x33.6811x0.3125	23	-27.14	2079.93	91.7	Pass
L24	40.5 - 35.5	Pole	TP35.2215x34.4513x0.3125	24	-28.16	2126.87	94.6	Pass
L25	35.5 - 30.5	Pole	TP35.9917x35.2215x0.3125	25	-29.20	2173.79	97.4	Pass
L26	30.5 - 28	Pole	TP36.3768x35.9917x0.3125	26	-29.72	2197.25	98.7	Pass
L27	28 - 27.75	Pole	TP36.4154x36.3768x0.625	27	-29.82	4361.12	48.1	Pass
L28	27.75 - 22.75	Pole	TP37.1856x36.4154x0.625	28	-31.45	4454.97	49.0	Pass
L29	22.75 - 17.75	Pole	TP37.9558x37.1856x0.6125	29	-33.10	4459.34	50.8	Pass
L30	17.75 - 12.75	Pole	TP38.726x37.9558x0.6	30	-34.77	4459.90	52.6	Pass
L31	12.75 - 7.75	Pole	TP39.4962x38.726x0.6	31	-36.46	4549.99	53.4	Pass
L32	7.75 - 2.75	Pole	TP40.2664x39.4962x0.5875	32	-38.18	4544.85	55.2	Pass
L33	2.75 - 0	Pole	TP40.69x40.2664x0.5875	33	-39.12	4593.37	55.6	Pass
							Summary	
						Pole (L17)	99.1	Pass
						***RATING =**	**99.1**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(2) 1-1/4" TO 70 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(6) 1-3/8" TO 138 FT LEVEL
(1) 1-5/8" TO 138 FT LEVEL
Q4
Q1
Q3
Q2
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 115 FT LEVEL
(4) 7/8" TO 115 FT LEVEL
(6) 1-5/8" TO 115 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 826849

Work Order: 1902871

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	140	51	3.75	18	20	27.856	0.1875	Auto	A572-65
2	92.75	46.25	4.5	18	26.90	34.027	0.25	Auto	A572-65
3	51	51	0	18	32.83	40.69	0.3125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	28	plate	CCI-SFP-065125	4				x				x					x				x	
2	50.2	61.5	plate	CCI-SFP-060100	4				x				x					x				x	
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
2	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.000	4.750	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5 Export to TNX

	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	140 - 135	5		18	20.000	20.770	0.1875	A572-65	1.000
2	135 - 130	5		18	20.770	21.540	0.1875	A572-65	1.000
3	130 - 125	5		18	21.540	22.311	0.1875	A572-65	1.000
4	125 - 120	5		18	22.311	23.081	0.1875	A572-65	1.000
5	120 - 115	5		18	23.081	23.851	0.1875	A572-65	1.000
6	115 - 110	5		18	23.851	24.621	0.1875	A572-65	1.000
7	110 - 105	5		18	24.621	25.391	0.1875	A572-65	1.000
8	105 - 100	5		18	25.391	26.162	0.1875	A572-65	1.000
9	100 - 95	5		18	26.162	26.932	0.1875	A572-65	1.000
10	95 - 92.75	6	3.75	18	26.932	27.856	0.1875	A572-65	1.000
11	92.75 - 87.75	5		18	26.903	27.673	0.25	A572-65	1.000
12	87.75 - 82.75	5		18	27.673	28.444	0.25	A572-65	1.000
13	82.75 - 77.75	5		18	28.444	29.214	0.25	A572-65	1.000
14	77.75 - 72.75	5		18	29.214	29.984	0.25	A572-65	1.000
15	72.75 - 67.75	5		18	29.984	30.754	0.25	A572-65	1.000
16	67.75 - 62.75	5		18	30.754	31.524	0.25	A572-65	1.000
17	62.75 - 61.5	1.25		18	31.524	31.717	0.25	A572-65	1.000
18	61.5 - 61.25	0.25		18	31.717	31.755	0.5125	A572-65	0.964
19	61.25 - 56.25	5		18	31.755	32.525	0.5125	A572-65	0.953
20	56.25 - 51.25	5		18	32.525	33.295	0.5	A572-65	0.965
21	51.25 - 51	4.75	4.5	18	33.295	34.027	0.5	A572-65	0.964
22	51 - 45.5	5.5		18	32.834	33.681	0.3125	A572-65	1.000
23	45.5 - 40.5	5		18	33.681	34.451	0.3125	A572-65	1.000
24	40.5 - 35.5	5		18	34.451	35.222	0.3125	A572-65	1.000
25	35.5 - 30.5	5		18	35.222	35.992	0.3125	A572-65	1.000
26	30.5 - 28	2.5		18	35.992	36.377	0.3125	A572-65	1.000
27	28 - 27.75	0.25		18	36.377	36.415	0.625	A572-65	0.962
28	27.75 - 22.75	5		18	36.415	37.186	0.625	A572-65	0.952
29	22.75 - 17.75	5		18	37.186	37.956	0.6125	A572-65	0.962
30	17.75 - 12.75	5		18	37.956	38.726	0.6	A572-65	0.972
31	12.75 - 7.75	5		18	38.726	39.496	0.6	A572-65	0.963
32	7.75 - 2.75	5		18	39.496	40.266	0.5875	A572-65	0.975
33	2.75 - 0	2.75		18	40.266	40.690	0.5875	A572-65	0.970

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	140 - 135	5.62	28.71	8.11
2	135 - 130	5.91	70.07	8.43
3	130 - 125	6.21	113.01	8.75
4	125 - 120	6.54	157.56	9.07
5	120 - 115	6.88	203.71	9.40
6	115 - 110	11.45	284.03	15.53
7	110 - 105	11.94	362.36	15.82
8	105 - 100	12.46	442.13	16.11
9	100 - 95	13.00	523.29	16.38
10	95 - 92.75	13.26	560.24	16.50
11	92.75 - 87.75	14.11	643.61	16.86
12	87.75 - 82.75	14.79	728.53	17.14
13	82.75 - 77.75	15.49	814.86	17.42
14	77.75 - 72.75	16.20	902.54	17.68
15	72.75 - 67.75	20.67	999.36	21.33
16	67.75 - 62.75	21.48	1106.46	21.54
17	62.75 - 61.5	21.68	1133.44	21.66
18	61.5 - 61.25	21.76	1138.86	21.73
19	61.25 - 56.25	22.95	1248.89	22.30
20	56.25 - 51.25	24.18	1361.79	22.87
21	51.25 - 51	24.25	1367.51	22.89
22	51 - 45.5	26.14	1494.51	23.29
23	45.5 - 40.5	27.14	1611.31	23.47
24	40.5 - 35.5	28.16	1728.99	23.64
25	35.5 - 30.5	29.20	1847.44	23.78
26	30.5 - 28	29.72	1907.09	23.98
27	28 - 27.75	29.82	1913.08	23.98
28	27.75 - 22.75	31.45	2034.21	24.48
29	22.75 - 17.75	33.10	2157.71	24.94
30	17.75 - 12.75	34.77	2283.42	25.36
31	12.75 - 7.75	36.46	2411.22	25.78
32	7.75 - 2.75	38.18	2541.10	26.19
33	2.75 - 0	39.12	2613.41	26.42

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP20.77x20x0.1875	Pole	8.0%	Pass
135 - 130	Pole	TP21.54x20.77x0.1875	Pole	17.6%	Pass
130 - 125	Pole	TP22.311x21.54x0.1875	Pole	26.4%	Pass
125 - 120	Pole	TP23.081x22.311x0.1875	Pole	34.5%	Pass
120 - 115	Pole	TP23.851x23.081x0.1875	Pole	42.1%	Pass
115 - 110	Pole	TP24.621x23.851x0.1875	Pole	55.9%	Pass
110 - 105	Pole	TP25.391x24.621x0.1875	Pole	67.5%	Pass
105 - 100	Pole	TP26.162x25.391x0.1875	Pole	78.3%	Pass
100 - 95	Pole	TP26.932x26.162x0.1875	Pole	88.3%	Pass
95 - 92.75	Pole	TP27.856x26.932x0.1875	Pole	92.5%	Pass
92.75 - 87.75	Pole	TP27.673x26.903x0.25	Pole	70.8%	Pass
87.75 - 82.75	Pole	TP28.444x27.673x0.25	Pole	76.4%	Pass
82.75 - 77.75	Pole	TP29.214x28.444x0.25	Pole	81.5%	Pass
77.75 - 72.75	Pole	TP29.984x29.214x0.25	Pole	86.3%	Pass
72.75 - 67.75	Pole	TP30.754x29.984x0.25	Pole	91.8%	Pass
67.75 - 62.75	Pole	TP31.524x30.754x0.25	Pole	97.4%	Pass
62.75 - 61.5	Pole	TP31.717x31.524x0.25	Pole	98.8%	Pass
61.5 - 61.25	Pole + Reinf.	TP31.755x31.717x0.5125	Reinf. 2 Tension Rupture	71.0%	Pass
61.25 - 56.25	Pole + Reinf.	TP32.525x31.755x0.5125	Reinf. 2 Tension Rupture	75.1%	Pass
56.25 - 51.25	Pole + Reinf.	TP33.295x32.525x0.5	Reinf. 2 Tension Rupture	79.0%	Pass
51.25 - 51	Pole + Reinf.	TP34.027x33.295x0.5	Reinf. 2 Tension Rupture	79.2%	Pass
51 - 45.5	Pole	TP33.681x32.834x0.3125	Pole	88.1%	Pass
45.5 - 40.5	Pole	TP34.451x33.681x0.3125	Pole	91.3%	Pass
40.5 - 35.5	Pole	TP35.222x34.451x0.3125	Pole	94.3%	Pass
35.5 - 30.5	Pole	TP35.992x35.222x0.3125	Pole	97.0%	Pass
30.5 - 28	Pole	TP36.377x35.992x0.3125	Pole	98.4%	Pass
28 - 27.75	Pole + Reinf.	TP36.415x36.377x0.625	Reinf. 1 Tension Rupture	73.2%	Pass
27.75 - 22.75	Pole + Reinf.	TP37.186x36.415x0.625	Reinf. 1 Tension Rupture	75.4%	Pass
22.75 - 17.75	Pole + Reinf.	TP37.956x37.186x0.6125	Reinf. 1 Tension Rupture	77.5%	Pass
17.75 - 12.75	Pole + Reinf.	TP38.726x37.956x0.6	Reinf. 1 Tension Rupture	79.6%	Pass
12.75 - 7.75	Pole + Reinf.	TP39.496x38.726x0.6	Reinf. 1 Tension Rupture	81.5%	Pass
7.75 - 2.75	Pole + Reinf.	TP40.266x39.496x0.5875	Reinf. 1 Tension Rupture	83.4%	Pass
2.75 - 0	Pole + Reinf.	TP40.69x40.266x0.5875	Reinf. 1 Tension Rupture	84.4%	Pass
				Summary	
			Pole	98.8%	Pass
			Reinforcement	84.4%	Pass
			Overall	98.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*		
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
140 - 135	655	n/a	655	12.25	n/a	12.25	8.0%		
135 - 130	732	n/a	732	12.71	n/a	12.71	17.6%		
130 - 125	814	n/a	814	13.17	n/a	13.17	26.4%		
125 - 120	902	n/a	902	13.62	n/a	13.62	34.5%		
120 - 115	996	n/a	996	14.08	n/a	14.08	42.1%		
115 - 110	1096	n/a	1096	14.54	n/a	14.54	55.9%		
110 - 105	1203	n/a	1203	15.00	n/a	15.00	67.5%		
105 - 100	1317	n/a	1317	15.46	n/a	15.46	78.3%		
100 - 95	1438	n/a	1438	15.92	n/a	15.92	88.3%		
95 - 92.75	1494	n/a	1494	16.12	n/a	16.12	92.5%		
92.75 - 87.75	2067	n/a	2067	21.76	n/a	21.76	70.8%		
87.75 - 82.75	2246	n/a	2246	22.37	n/a	22.37	76.4%		
82.75 - 77.75	2435	n/a	2435	22.98	n/a	22.98	81.5%		
77.75 - 72.75	2634	n/a	2634	23.59	n/a	23.59	86.3%		
72.75 - 67.75	2844	n/a	2844	24.20	n/a	24.20	91.8%		
67.75 - 62.75	3065	n/a	3065	24.82	n/a	24.82	97.4%		
62.75 - 61.5	3122	n/a	3122	24.97	n/a	24.97	98.8%		
61.5 - 61.25	3134	3160	6294	25.00	24.00	49.00	49.4%		71.0%
61.25 - 56.25	3369	3308	6677	25.61	24.00	49.61	52.7%		75.1%
56.25 - 51.25	3616	3460	7076	26.22	24.00	50.22	56.0%		79.0%
51.25 - 51	3629	3468	7097	26.25	24.00	50.25	56.2%		79.2%
51 - 45.5	4654	n/a	4654	33.10	n/a	33.10	88.1%		
45.5 - 40.5	4984	n/a	4984	33.86	n/a	33.86	91.3%		
40.5 - 35.5	5329	n/a	5329	34.62	n/a	34.62	94.3%		
35.5 - 30.5	5690	n/a	5690	35.39	n/a	35.39	97.0%		
30.5 - 28	5876	n/a	5876	35.77	n/a	35.77	98.4%		
28 - 27.75	5895	5651	11545	35.81	32.50	68.31	50.4%	73.2%	
27.75 - 22.75	6280	5882	12162	36.57	32.50	69.07	52.3%	75.4%	
22.75 - 17.75	6682	6117	12799	37.34	32.50	69.84	54.2%	77.5%	
17.75 - 12.75	7101	6357	13458	38.10	32.50	70.60	56.0%	79.6%	
12.75 - 7.75	7536	6602	14139	38.86	32.50	71.36	57.8%	81.5%	
7.75 - 2.75	7989	6852	14841	39.63	32.50	72.13	59.5%	83.4%	
2.75 - 0	8246	6991	15238	40.05	32.50	72.55	60.5%	84.4%	

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

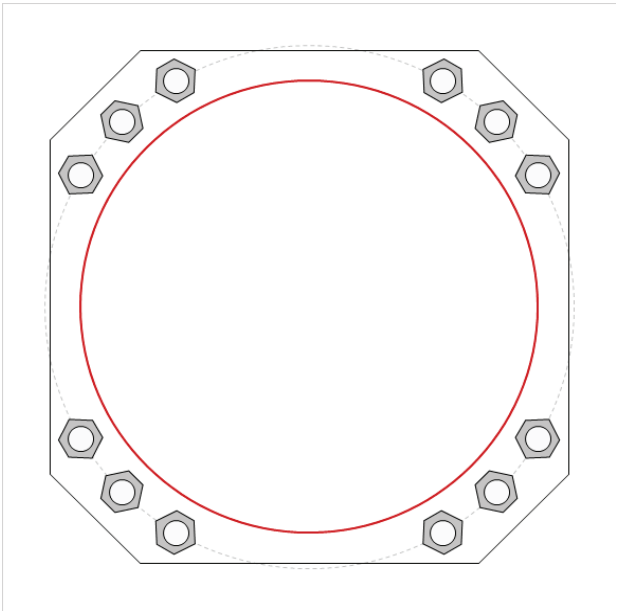
Monopole Base Plate Connection

Site Info	
BU #	826849
Site Name	ublic Storage-Prosperit
Order #	519470, Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.875

Applied Loads	
Moment (kip-ft)	2613.41
Axial Force (kips)	39.12
Shear Force (kips)	26.42

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 47" BC

Anchor Spacing: 6 in

Base Plate Data

46" W x 2.5" Plate (A615-75; Fy=75 ksi, Fu=100 ksi); Clip: 8 in

Stiffener Data

N/A

Pole Data

40.69" x 0.5875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 225.47	ϕPn_c = 268.39	**Stress Rating**
Vu = 2.2	ϕVn = 120.77	**80.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	46.08	(Flexural)
Allowable Stress (ksi):	67.5	
Stress Rating:	**65.0%**	**Pass**

Drilled Pier Foundation

BU # :	826849
Site Name:	Public Storage-Prospe
Order Number:	

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2613.41	
Axial Force (kips)	39.14	
Shear Force (kips)	26.4	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	22.5	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 22.5' below grade		
Pier Diameter	6	ft
Rebar Quantity	16	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing		in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.91	-
Soil Safety Factor	1.81	-
Max Moment (kip-ft)	2838.18	-
Rating*	*69.9%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	195.70	-
End Bearing (kips)	318.09	-
Weight of Concrete (kips)	117.06	-
Total Capacity (kips)	513.79	-
Axial (kips)	156.20	-
Rating*	*29.0%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.80	-
Critical Moment (kip-ft)	2838.05	-
Critical Moment Capacity	3498.48	-
Rating*	*77.3%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	17.04	-
Critical Shear (kip)	380.92	-
Critical Shear Capacity	469.29	-
Rating*	*77.3%*	-

Soil Interaction Rating*	**69.9%**
Structural Foundation Rating*	**77.3%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	None	# of Layers	3

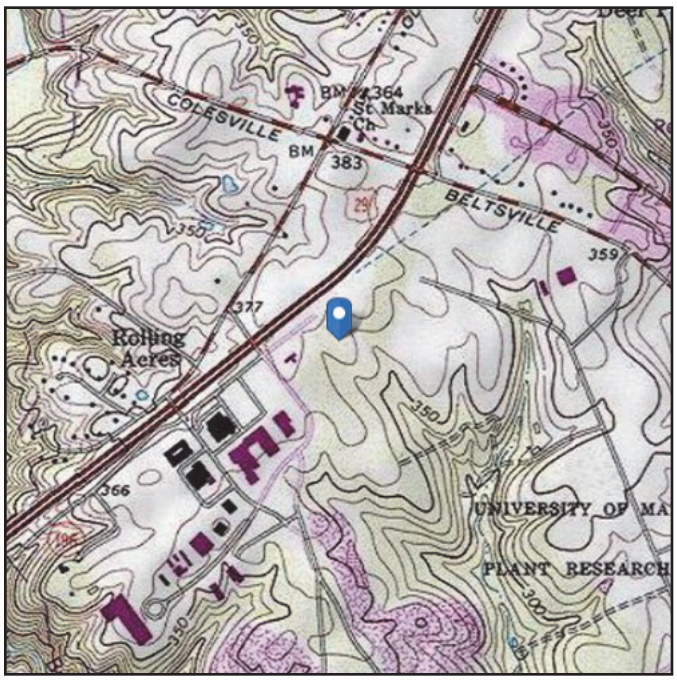
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	12	7	110	150	0	30	0.552	0.552				8	Cohesionless
3	12	22.5	10.5	110	150	0	30	0.951	0.951			15	8	Cohesionless

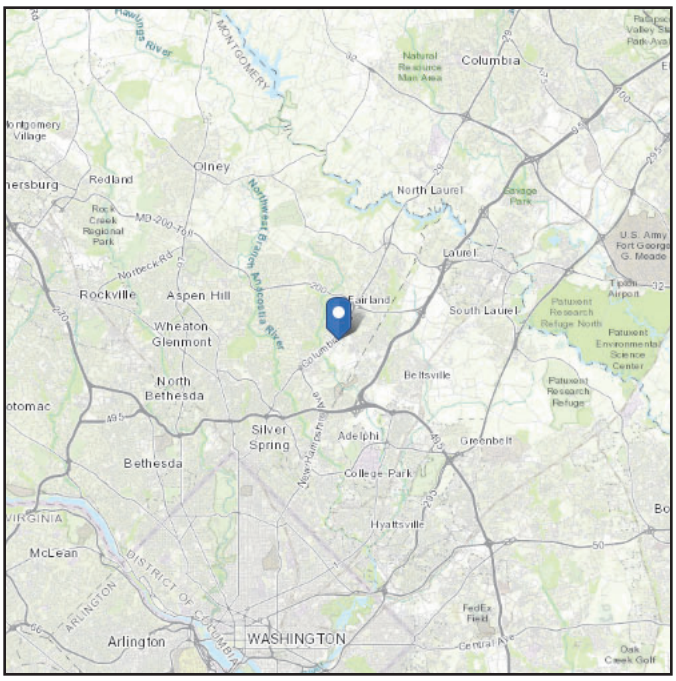
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 377.18 ft (NAVD 88)
Latitude: 39.05785
Longitude: -76.965497





Wind

Results:

Wind Speed:	113 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Thu Oct 08 2020

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

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

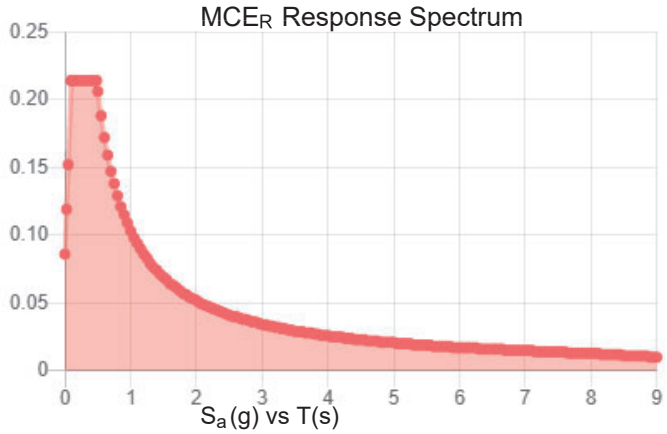
Seismic

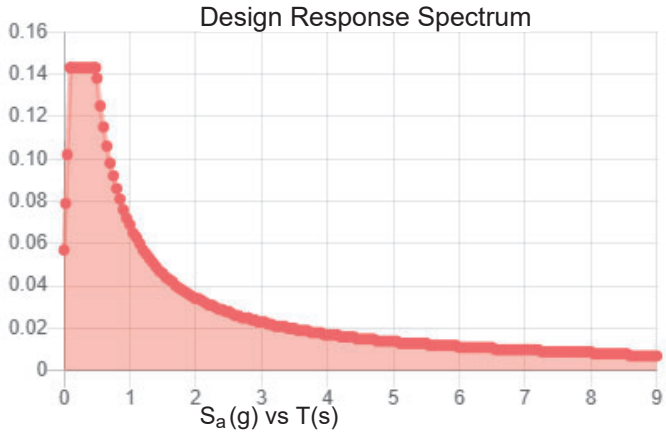
Site Soil Class: D - Default (see Section 11.4.3)

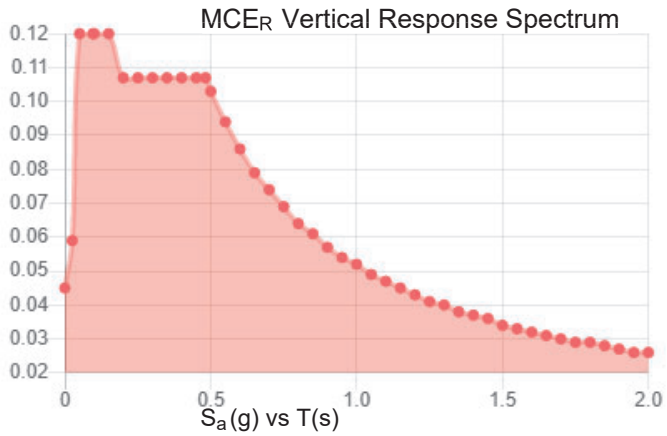
Results:

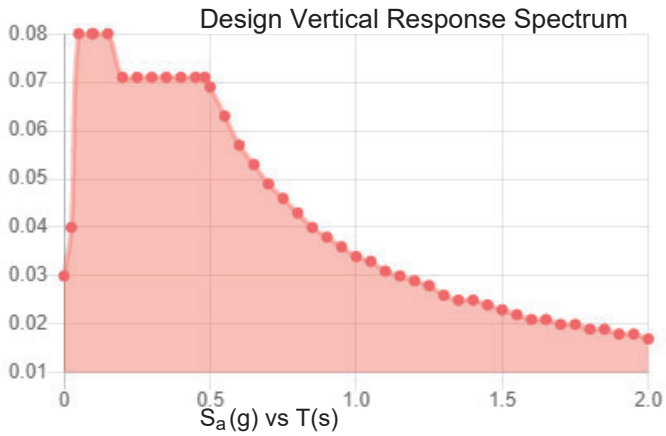
S_S :	0.134	S_{D1} :	0.069
S_1 :	0.043	T_L :	8
F_a :	1.6	PGA :	0.069
F_v :	2.4	PGA_M :	0.111
S_{MS} :	0.214	F_{PGA} :	1.6
S_{M1} :	0.103	I_e :	1
S_{DS} :	0.143	C_v :	0.7

Seismic Design Category B









Data Accessed: Thu Oct 08 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

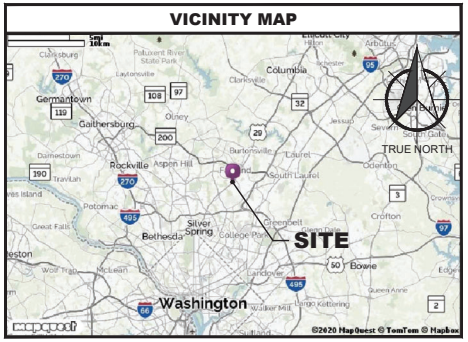
Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Oct 08 2020

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 500-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.

VICINITY MAP



T-MOBILE ANCHOR OVERLAY

CONSTRUCTION DRAWINGS

T-MOBILE SITE CONFIGURATION: 6SEC-67D5A993D-2MB OUTDOOR (6131)

LOCAL MAP

T-MOBILE SITE ID:

7WAN124I

T-MOBILE SITE NAME:

PUBLIC STORAGE-PROSPERITY

CROWN BU:

826849

PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:

12355 PROSPERITY DRIVE
DISTRICT 5, MD 20904
(MONTGOMERY COUNTY)

PROJECT DESCRIPTION / SOW

ANCHOR UPGRADE. T-MOBILE PROPOSES TO ADD (3) NEW ANTENNAS, (12) NEW RRUS, (1) 6160 CABINET, (1) B160 BATTERY CABINET, AND (1) SQUARE PLATFORM MOUNT

REFERENCE NOTES

7WAN124I_Anchor_5_2020-07-09

GC SHALL REVIEW AND COMPLY WITH TOWER STRUCTURAL ANALYSIS COMPLETED BY: CROWN CASTLE
DATED: 10/16/2020PROJECT #: 1868671

SHEET INDEX

SHEET	DESCRIPTION	REV.	REV. DATE
T-1	TITLE SHEET	0	12/17/2020
GN-1	GENERAL NOTES	0	12/17/2020
GN-2	GENERAL NOTES	0	12/17/2020
C-1	OVERALL SITE PLAN	0	12/17/2020
C-1.1	SITE PLAN	0	12/17/2020
C-1.2	EQUIPMENT LAYOUT	0	12/17/2020
C-2	TOWER ELEVATION & ANTENNA LAYOUT	0	12/17/2020
C-3	RF SCHEDULE	0	12/17/2020
C-4	EQUIPMENT DETAILS & SPECIFICATIONS	0	12/17/2020
C-4.1	EQUIPMENT DETAILS & SPECIFICATIONS	0	12/17/2020
C-5	GENERATOR DETAILS	0	12/17/2020
G-1	GROUNDING DETAILS	0	12/17/2020
G-2	GROUNDING DETAILS	0	12/17/2020
G-3	GROUNDING DETAILS	0	12/17/2020
E-1	ELECTRICAL DETAILS	0	12/17/2020

GENERAL NOTES

811 Know what's below. Call before you dig.

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION, THEREFORE HANDICAP ACCESS IS NOT REQUIRED. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS NEW. PARKING REQUIREMENTS ARE UNCHANGED. TRAFFIC IS UNAFFECTED. SIGNAGE IS NOT NEW. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING:

CODE TYPE	CODE
BUILDING	2015 IBC AND SUBTITLE 4 PRINCE GEORGE'S
MECHANICAL	COUNTY BUILDING CODE
ELECTRICAL	2015 IMC
	2014 NFPA 70 NED AND SUBTITLE 9
	PRINCE GEORGE'S COUNTY ELECTRICAL CODE

SITE SUMMARY

TOWER HEIGHT/TYPE:	140' MONOPOLE
SCOPE TYPE:	T-MOBILE ANCHOR UPGRADE
OCCUPANCY TYPE:	TELECOMMUNICATIONS
LATITUDE:	39° 3' 28.26"N (39.057850)
LONGITUDE:	76° 57' 55.79"W (-76.965497)
JURISDICTION:	MONTGOMERY COUNTY
PARCEL #:	N/A
ZONING CLASSIFICATION:	N/A

PROJECT DIRECTORY

APPLICANT:	T-MOBILE 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705
STRUCTURE OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CROWN PROJECT MANAGER:	CONTACT: SHANNON HOUGH CAMPBELL 100 REGENCY DRIVE, SUITE 300 CARY, NC 27518 PHONE: (704) 405-6593
SITE DESIGN:	MASTEC NETWORK SOLUTIONS 507 AIRPORT BLVD, SUITE 111 MORRISVILLE, NC 27560 CONTACT: RAPHAEL MOHAMED PHONE: (919) 674-5895

STATE OF MARYLAND · RAPHAEL MOHAMED · 32372 · PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32372, EXPIRATION DATE: 11/10/2021

RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372
12/17/2020

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
12/17/2020	CONSTRUCTION	0	RM

DRAWN BY:	KJC
CHECKED BY:	CS
APP'V'D BY:	RM
MNS PROJECT NO:	84228-AEC

PREPARED FOR:

T-Mobile
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PREPARED FOR:

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

PREPARED BY:

MasTec Network Solutions
507 AIRPORT BLVD, SUITE 111
MORRISVILLE, NC 27560

T-MOBILE SITE ID:
7WAN124I

CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED- NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"Ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE
   GROUND:
   SLAB AND WALLS.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N. TYPE 1. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR- _____
   SUBCONTRACTOR- GENERAL CONTRACTOR (CONSTRUCTION)
   CARRIER- T-MOBILE
   TOWER OWNER- CROWN CASTLE USA INC.
   OEM- ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR AND CROWN CASTLE USA INC.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE USA INC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION WITH OUTER JACKET LISTED OR LABELED FOR THE LOCATION USED UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E. RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL; SHALL MEET OR EXCEED UL 50 AND RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.
24. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
25. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "T-MOBILE".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32372, EXPIRATION DATE: 11/10/2021

RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372 12/17/2020

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
12/17/2020	CONSTRUCTION	0	RM

DRAWN BY:	KJC
CHECKED BY:	CS
APP'V'D BY:	RM
MNS PROJECT NO:	84228-AEC

PREPARED FOR:
T-Mobile
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CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 AWG SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS, WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

SYMBOLS:

S/G	SOLID GROUND BUS BAR
S/N	SOLID NEUTRAL BUS BAR
	SUPPLEMENTAL GROUND CONDUCTOR
	2-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
	SINGLE-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
	CHEMICAL GROUND ROD
	TEST WELL
	DISCONNECT SWITCH
M	METER
	EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)
	MECHANICAL CONNECTION
	GROUNDING WIRE

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL	ABOVE GRADE LEVEL
BTS	BASE TRANSCEIVER STATION
(E)	EXISTING
MIN.	MINIMUM
REF	REFERENCE
RF	RADIO FREQUENCY
T.B.D.	TO BE DETERMINED
T.B.R.	TO BE RESOLVED
TYP	TYPICAL
REQ	REQUIRED
EGR	EQUIPMENT GROUND RING
AWG	AMERICAN WIRE GAUGE
MGB	MASTER GROUND BAR
EG	EQUIPMENT GROUND
BCW	BARE COPPER WIRE
SIAD	SMART INTEGRATED ACCESS DEVICE
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
RBS	RADIO BASE STATION

NEC INSULATOR COLOR CODE		
DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED-POLARITY MARK AT TERMINATION
VDC NEG	-	*BLACK-POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE OR PURPLE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

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RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372

12/17/2020

SUBMITTALS

DATE	DESCRIPTION	REV	ISSUED BY
12/17/2020	CONSTRUCTION	0	RM

DRAWN BY:	KJC
CHECKED BY:	CS
APP'V'D BY:	RM
MNS PROJECT NO:	84228-AEC

PREPARED FOR:

T-Mobile

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

PREPARED BY:

MasTec Network Solutions

507 AIRPORT BLVD, SUITE 111
MORRISVILLE, NC 27560

T-MOBILE SITE ID:
7WAN124I

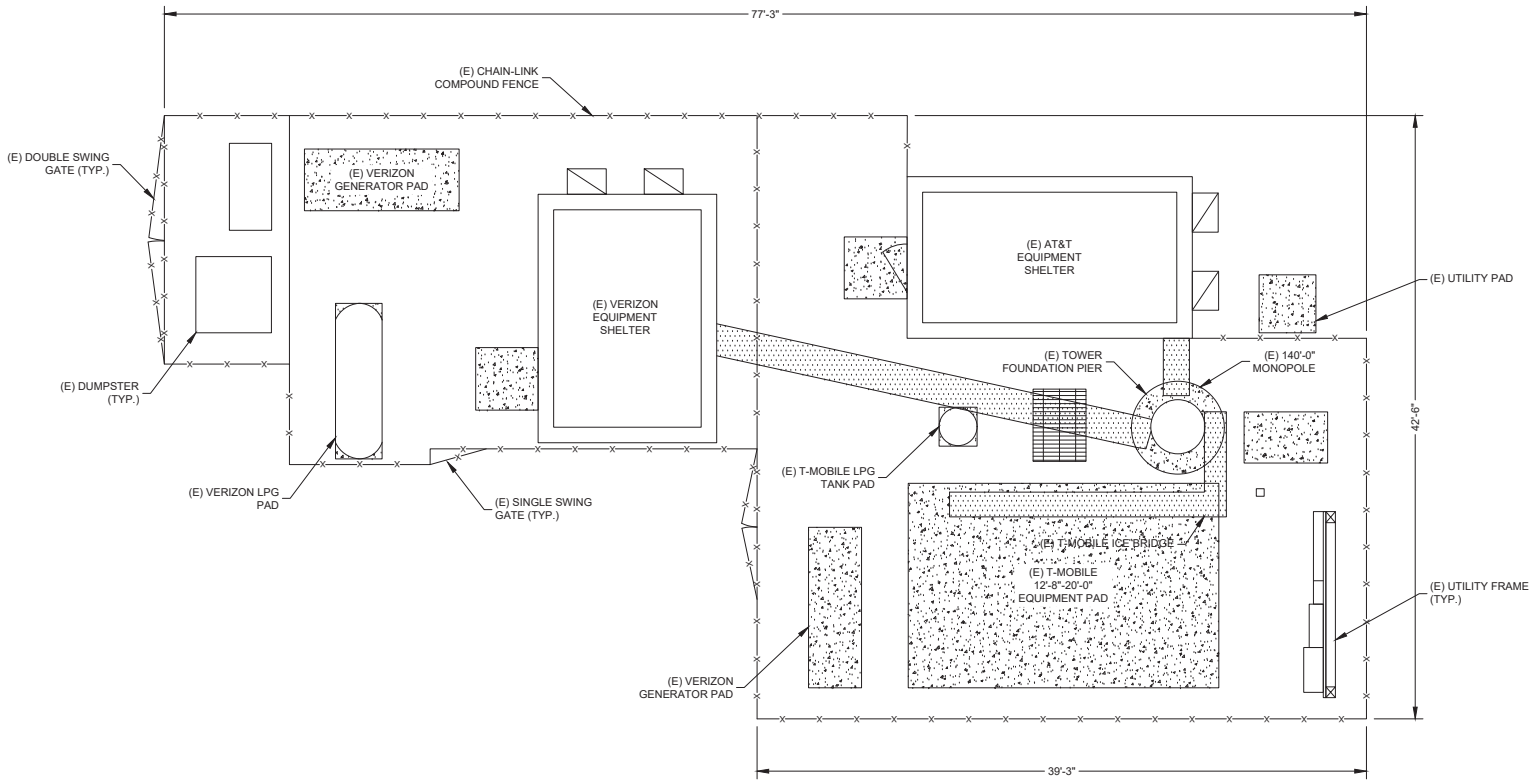
CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2



0 8' 16'

1"=8'-0"

SITE PLAN

11"x17" SCALE: 1"=8'-0"

STATE OF MARYLAND
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32372
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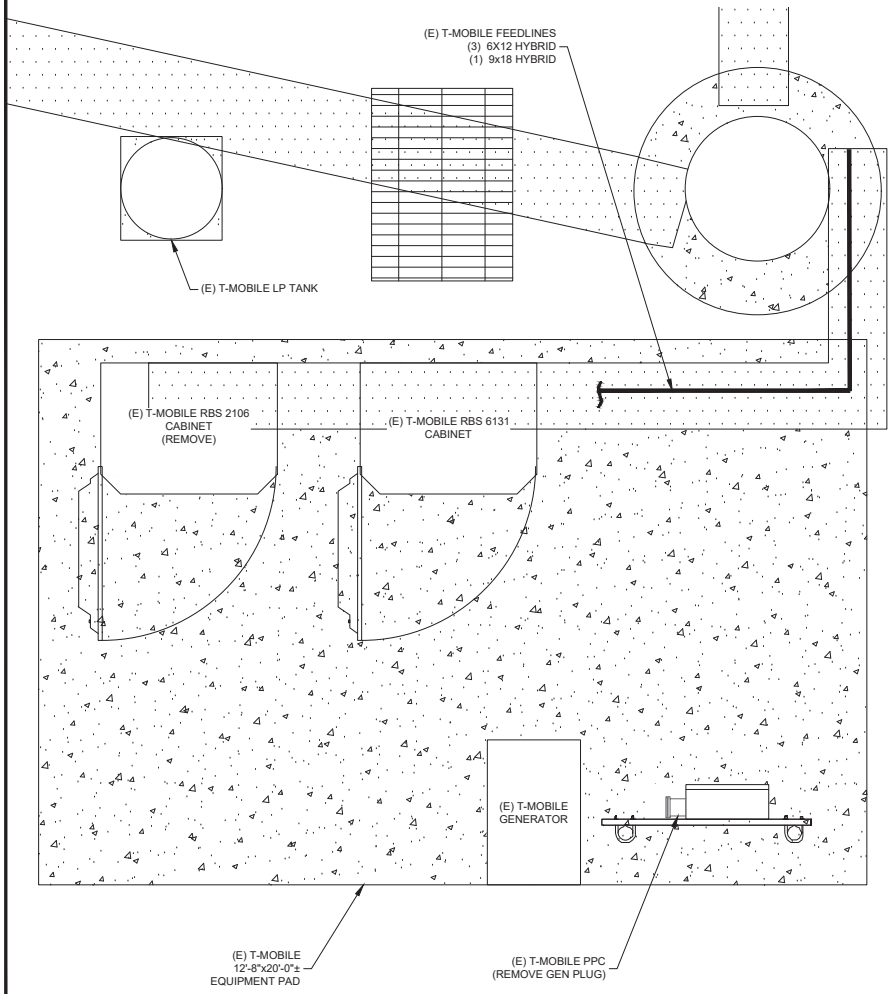
140' MONOPOLE

SHEET TITLE
SITE PLAN

SHEET NUMBER
C-1



0 3' 6'

1" = 3'

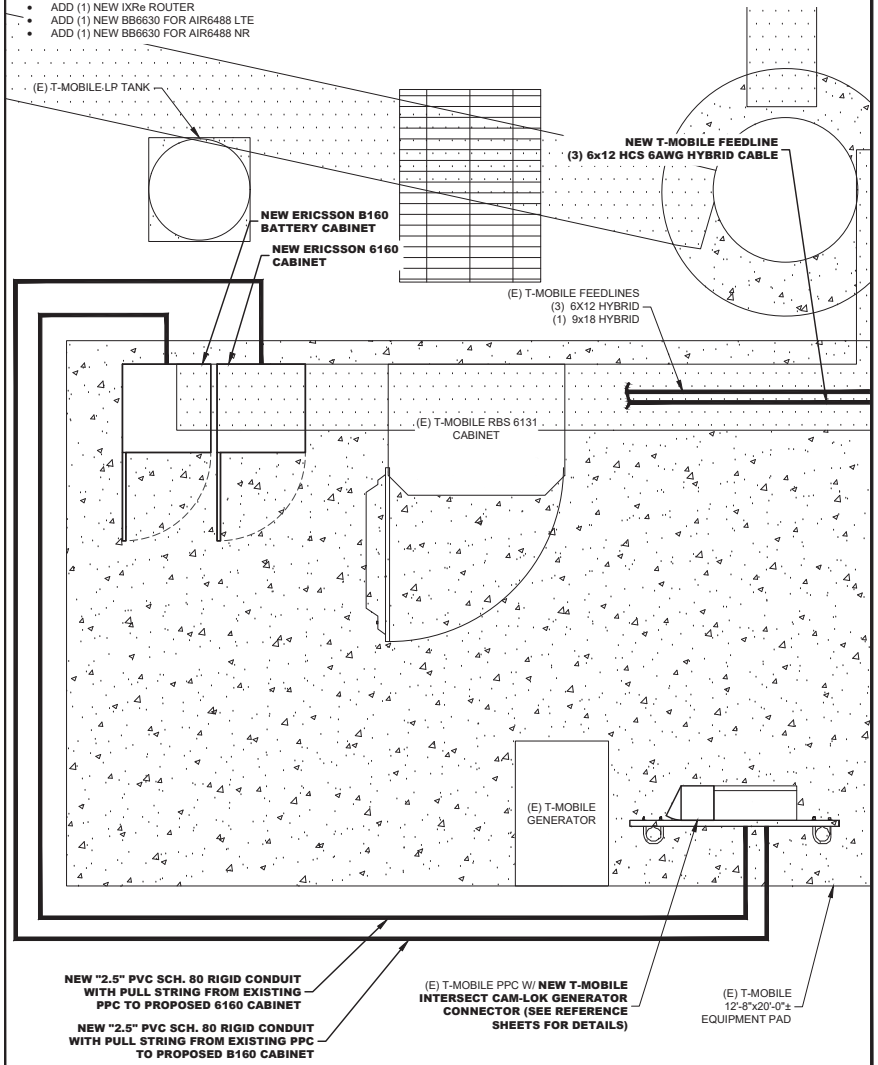
EXISTING EQUIPMENT LAYOUT

11"x17" SCALE: 1" = 3'

TRUE NORTH

SCOPE:

- ADDITIONAL SSCFOR ADDITIONAL POWER NEXT TO EXISTING CABINET+BATTERY CABINET
- UPGRADE AC SERVICES AND REPLACE PPC
- ADD (1) NEW IXRe ROUTER
- ADD (1) NEW BB6630 FOR AIR6488 LTE
- ADD (1) NEW BB6630 FOR AIR6488 NR



0 3' 6'

1" = 3'

FINAL EQUIPMENT LAYOUT

11"x17" SCALE: 1" = 3'

TRUE NORTH

STATE OF MARYLAND
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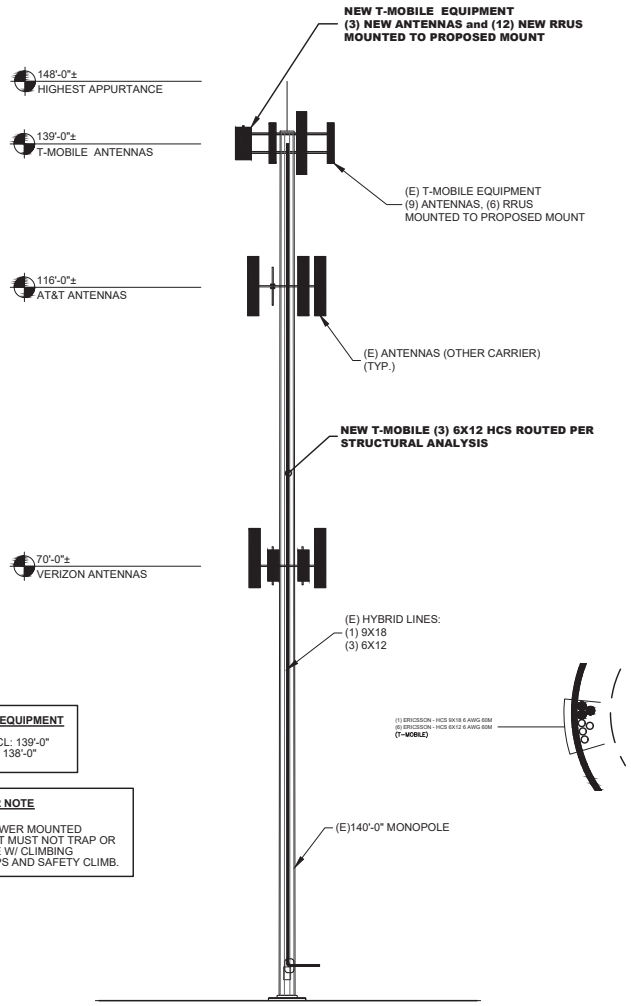
EXISTING
140' MONOPOLE

SHEET TITLE

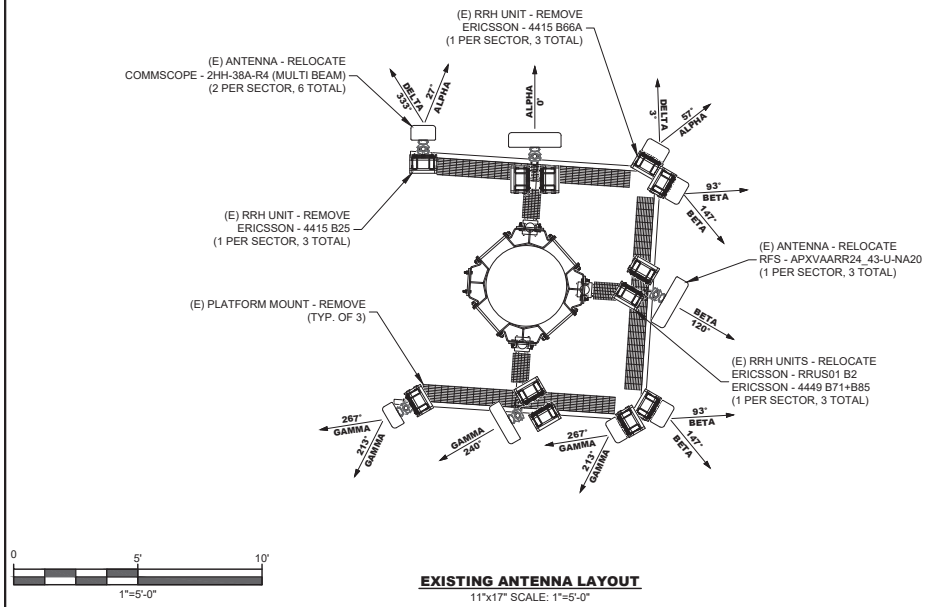
EQUIPMENT LAYOUT

SHEET NUMBER
C-1.1



FINAL TOWER ELEVATION

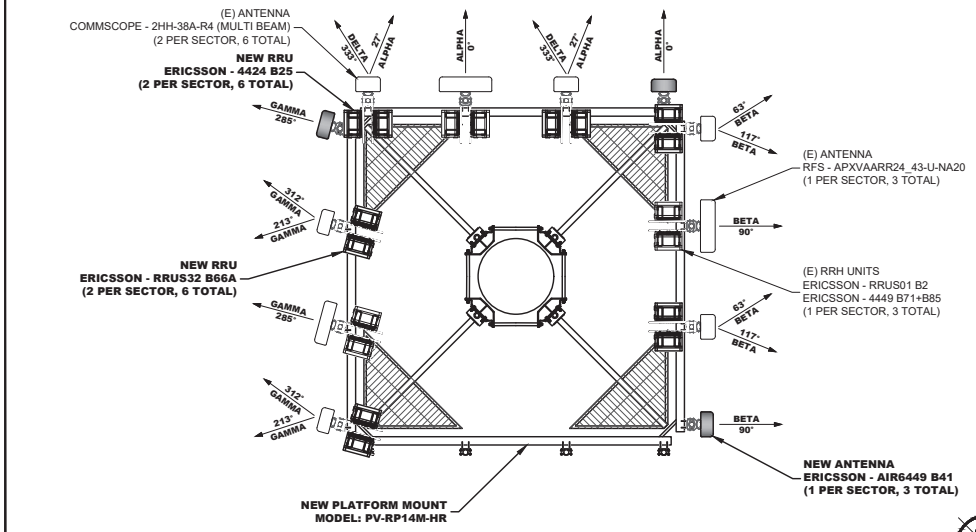
11"x17" SCALE: 1"=20'-0"



EXISTING ANTENNA LAYOUT

11"x17" SCALE: 1"=5'-0"

TRUE NORTH



FINAL ANTENNA LAYOUT

11"x17" SCALE: 1"=5'-0"

TRUE NORTH

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PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE

TOWER ELEVATION & ANTENNA LAYOUT

SHEET NUMBER

C-2

FINAL RF EQUIPMENT SCHEDULE

SECTOR - POSITION	ANTENNA MAKE/MODEL	RAD CENTER	AZIMUTH	TME ℄	(QTY.) RADIO	(QTY.) CABLES	CABLE LENGTH
A1	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	0°	-	**(2) ERICSSON - 4424 B25 (N)**	(1) ERICSSON - HCS 9X18 (3) ERICSSON - HCS 6X12 **(3) ERICSSON - HCS 6X12 (N)**	200'-0"
A2	RFS - APXVAARR24_43-U-NA20	139'-0"	0°	-	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - RRUS01 B2		
A3	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	0°	-	**(2) ERICSSON -RRUS32 B66A (N)**		
A4	**ERICSSON - AIR6449 B41 (N)**	139'-0"	0°	-	-		
B1	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	90°	-	**(2) ERICSSON - 4424 B25 (N)**		
B2	RFS - APXVAARR24_43-U-NA20	139'-0"	90°	-	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - RRUS01 B2		
B3	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	90°	-	**(2) ERICSSON -RRUS32 B66A (N)**		
B4	**ERICSSON - AIR6449 B41 (N)**	139'-0"	90°	-	-		
C1	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	285°	-	**(2) ERICSSON - 4424 B25 (N)**		
C2	RFS - APXVAARR24_43-U-NA20	139'-0"	285°	-	(1) ERICSSON - 4449 B71+B85 (1) ERICSSON - RRUS01 B2		
C3	COMMSCOPE - 2HH-38A-R4 (MULTI-BEAM)	139'-0"	285°	-	**(2) ERICSSON -RRUS32 B66A (N)**		
C4	**ERICSSON - AIR6449 B41 (N)**	139'-0"	285°	-	-		
TOTALS	**(12) ANTENNAS**	**-**			**(18) RRU'S**	**(7) CABLES**	**-**

(N) = NEW

RF EQUIPMENT SCHEDULE

11"x17" SCALE: NTS

STATE OF MARYLAND
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PUBLIC STORAGE-PROSPERITY

SITE ADDRESS:
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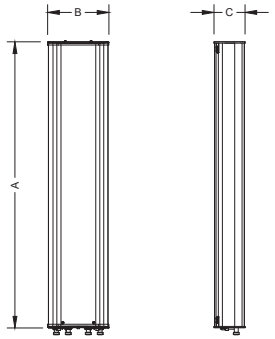
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
RF SCHEDULE

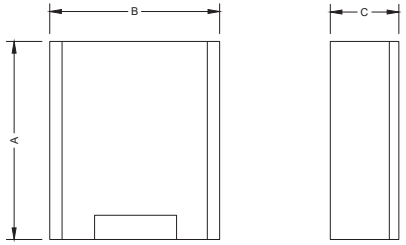
SHEET NUMBER
C-3



NEW ANTENNA SPECIFICATIONS				
ANTENNA MODEL	LENGTH (A)	WIDTH (B)	DEPTH (C)	WEIGHT
ERICSSON - AIR6449 B41	33.11"	20.51"	8.54"	114.63LBS

NEW ANTENNA SPECIFICATIONS

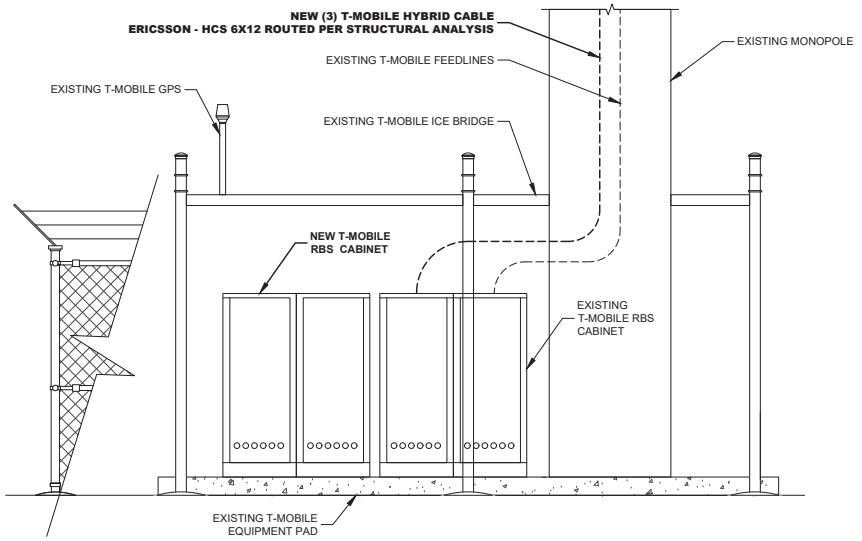
SCALE: N.T.S.



NEW RADIO SPECIFICATIONS				
RADIO MODEL	LENGTH (A)	WIDTH (B)	DEPTH (C)	WEIGHT
4449 B71+B85	17.91"	13.2"	10.63"	73.21LBS
RRUA32 B66A	27.6"	12.45"	7.41"	55.12LBS

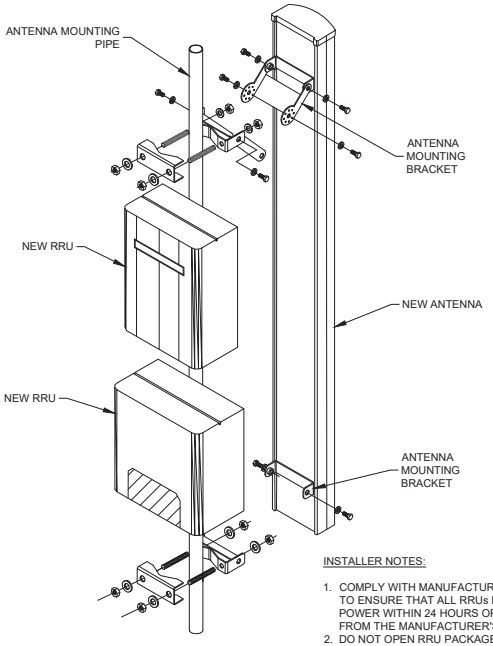
NEW RADIO SPECIFICATIONS

SCALE: N.T.S.



EQUIPMENT ELEVATION DETAIL

11"x17" SCALE: N.T.S.

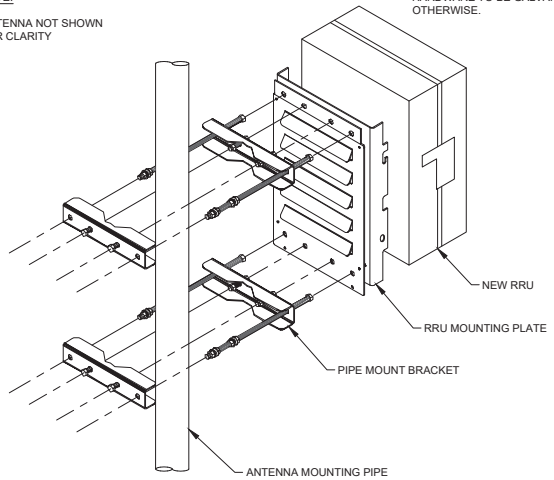


INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRUs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRU PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.

NOTE:

ANTENNA NOT SHOWN
FOR CLARITY



MOUNTING DETAIL

11"x17" SCALE: N.T.S.

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12/17/2020

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BELTSVILLE, MD 20705

PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
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T-MOBILE SITE ID:
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CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

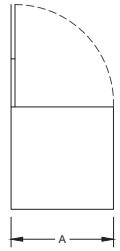
SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

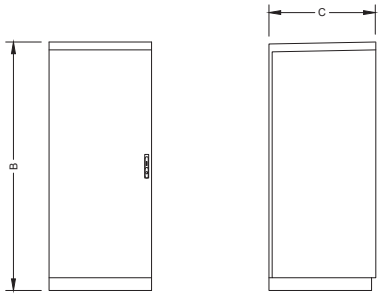
SHEET TITLE

EQUIPMENT DETAILS & SPECIFICATIONS

SHEET NUMBER
C-4



PLAN VIEW

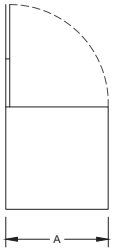


FRONT VIEW RIGHT SIDE VIEW

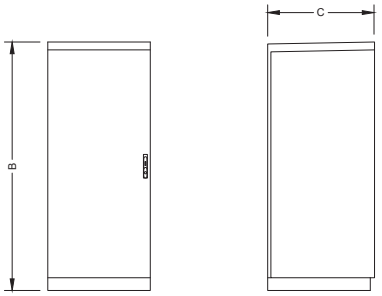
NEW CABINET SPECIFICATIONS				
CABINET MODEL	WIDTH (A)	LENGTH (B)	DEPTH (C)	WEIGHT
ERICSSON B160	25.59"	62.99"	25.59"	295.0 LBS

ERICSSON B160 CABINET SPECIFICATIONS

SCALE: N.T.S.



PLAN VIEW



FRONT VIEW RIGHT SIDE VIEW

NEW CABINET SPECIFICATIONS				
CABINET MODEL	WIDTH (A)	LENGTH (B)	DEPTH (C)	WEIGHT
ERICSSON 6160	25.59"	62.99"	25.59"	388.0 LBS

ERICSSON 6160 CABINET SPECIFICATIONS

SCALE: N.T.S.

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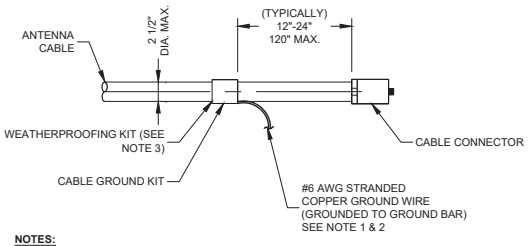
SHEET NUMBER
C-4.1

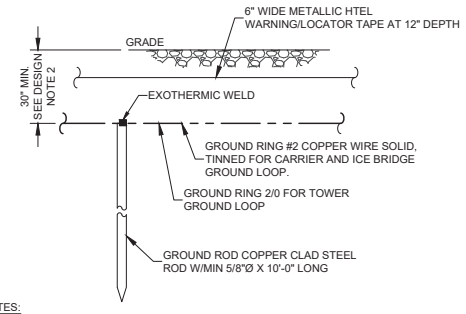


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

CABLE GROUND KIT CONNECTIONS

11"x17" SCALE: N.T.S.

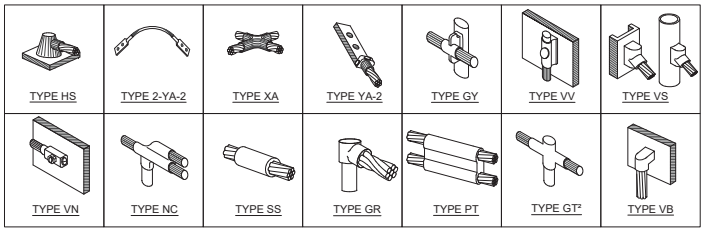


NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICAL, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE.
3. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

GROUND ROD DETAIL

11"x17" SCALE: N.T.S.

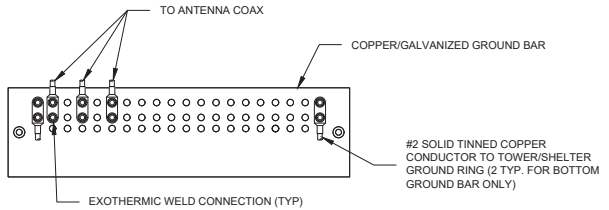


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

CADWELD GROUNDING CONNECTIONS

11"x17" SCALE: N.T.S.

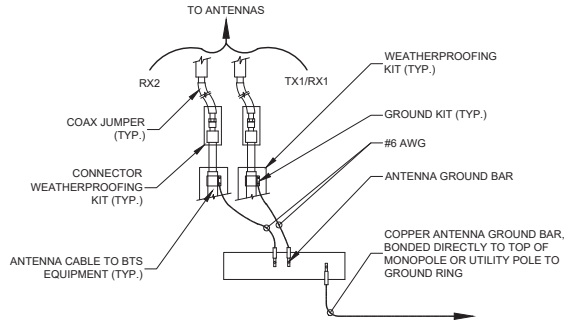


NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

TOWER/SHELTER GROUND BAR DETAIL

11"x17" SCALE: N.T.S.

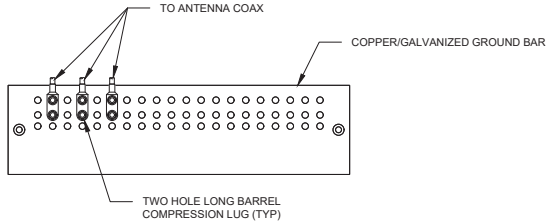


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

GROUNDING CABLE CONNECTIONS

11"x17" SCALE: N.T.S.



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

GROUND BAR

11"x17" SCALE: N.T.S.

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RAPHAEL MOHAMED, P.E.
MARYLAND NO. 32372
12/17/2020

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DATE	DESCRIPTION	REV	ISSUED BY
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CHECKED BY:	CS
APP'V'D BY:	RM
MNS PROJECT NO:	84228-AEC

PREPARED FOR:

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12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

PREPARED BY:

MasTec Network Solutions

507 AIRPORT BLVD, SUITE 111
MORRISVILLE, NC 27560

T-MOBILE SITE ID:
7WAN124I

CROWN BU:
826849
PUBLIC STORAGE-PROSPERITY

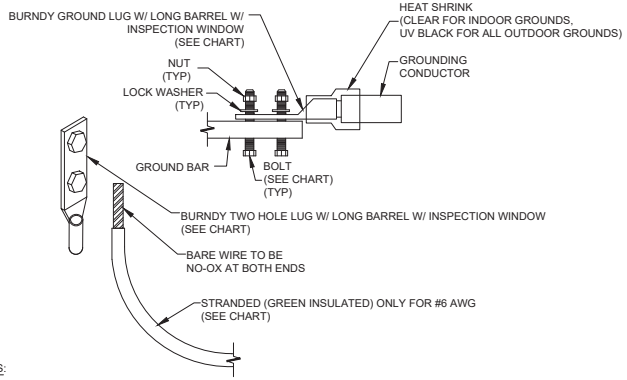
SITE ADDRESS:
12355 PROSPERITY DRIVE
DISTRICT 5, MARYLAND 20904

EXISTING
140' MONOPOLE

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-1

WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT

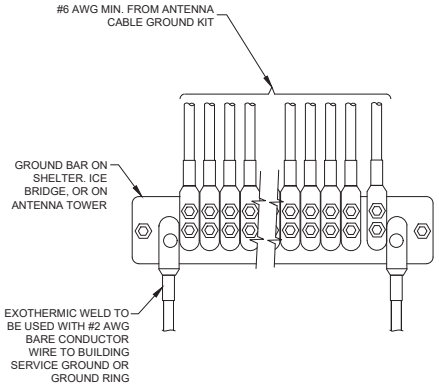


NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

MECHANICAL LUG CONNECTION

11"x17" SCALE: N.T.S.

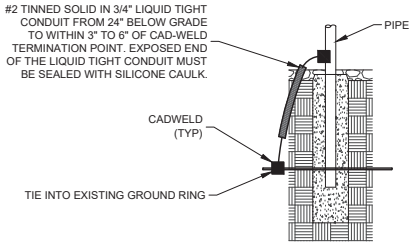


NOTE:

GROUND BARS AT BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

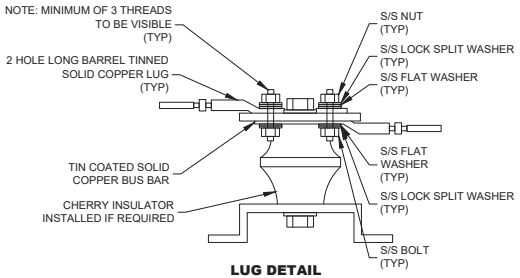
GROUNDWIRE INSTALLATION

11"x17" SCALE: N.T.S.



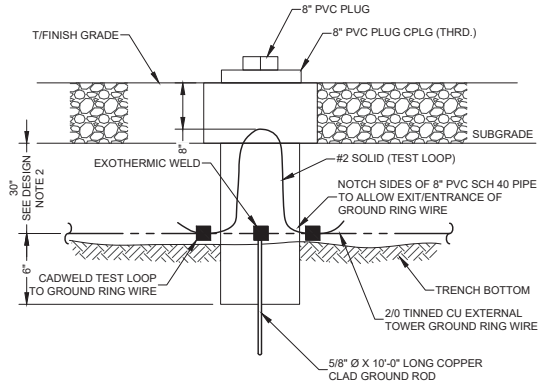
TRANSITIONING GROUND DETAIL

11"x17" SCALE: N.T.S.



LUG DETAIL

11"x17" SCALE: N.T.S.



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICHEVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

INSPECTION WELL DETAIL

11"x17" SCALE: N.T.S.

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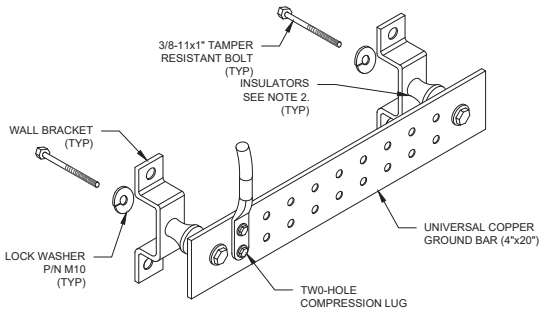
EXISTING
140' MONOPOLE

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2



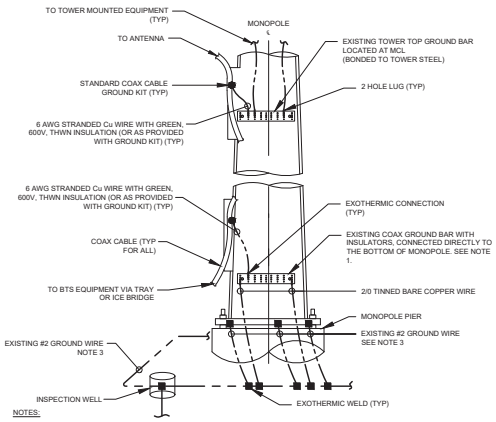
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.

2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

GROUND BAR DETAIL

11"x17" SCALE: N.T.S.

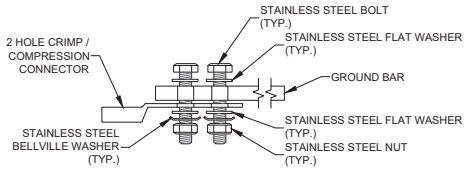


NOTES:

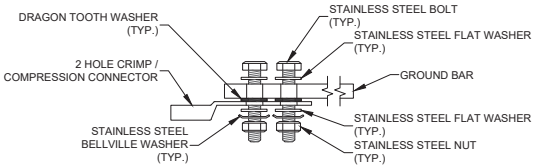
1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

TYPICAL ANTENNA CABLE GROUNDING

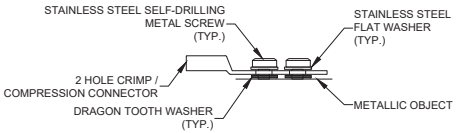
11"x17" SCALE: N.T.S.



SINGLE CONNECTOR AT GROUND BARS



SINGLE CONNECTOR AT GROUND BARS



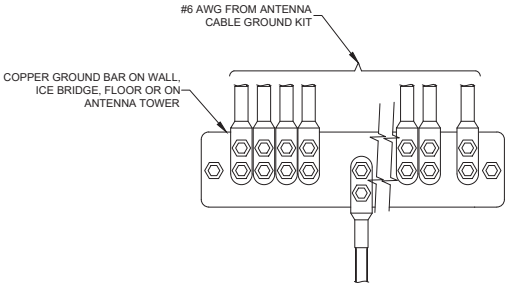
SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

HARDWARE DETAIL FOR EXTERIOR CONNECTIONS

11"x17" SCALE: N.T.S.

NOTE:

1. ALL BOTTOM GROUND BARS TO BE EXOTHERMICALLY WELDED TO EXISTING GROUND RING.



GROUNDWIRE INSTALLATION

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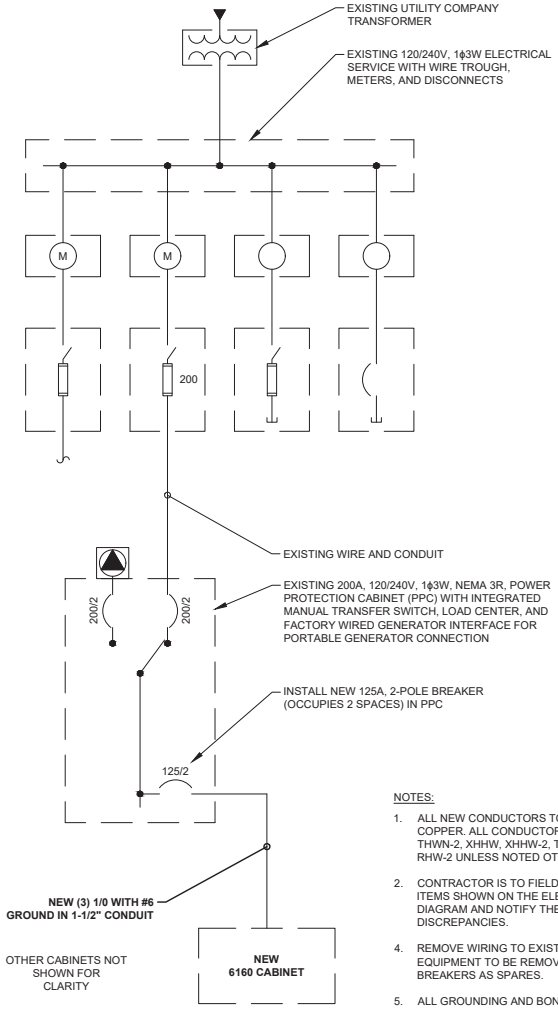
SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3



ELECTRICAL ONE-LINE DIAGRAM

11"x17" SCALE: N.T.S.

NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. REMOVE WIRING TO EXISTING BREAKERS FROM EQUIPMENT TO BE REMOVED. RELABEL EMPTY BREAKERS AS SPARES.
5. ALL GROUNDING AND BONDING PER THE NEC.

T-MOBILE PPC PANEL

MAIN: 200 AMP MAIN BREAKER	**VOLTAGE/PHASE**: 120/240V, 1-PHASE, 3-WIRE	**SHORT CIRCUIT CURRENT RATING**: 22,000 AMPS
MOUNTING: OUTDOOR PPC ENCLOSURE	**ENCLOSURE**: NEMA 3R	**SURGE PROTECTION DEVICE**: YES
SERVICE FROM: N/A	**MANUFACTURER**: SCHNEIDER ELECTRIC (SQUARE D)	**MODEL NUMBER**: QO TYPE PANEL

DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	LOAD (VA) A-PHASE	LOAD (VA) B-PHASE	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
SURGE	0	NC	60	1	0		2	20	NC	0	GFI
	0	NC		3		0	4	20	NC	0	LIGHT
6160 CABINET	**6700**	**C**	***125**	5	11200		6	150	C	4500	6131 CABINET
	6700	**C**		7		11200	8		C	4500	
TELCO DISC	180	NC	30	9	1680		10	150	C	1500	FIBER TOWER
	180	NC		11		1680	12		C	1500	
BLANK				13	0		14				BLANK
BLANK				15		0	16				BLANK
BLANK				17	0		18				BLANK
BLANK				19		0	20				BLANK
BLANK				21	0		22				BLANK
BLANK				23		0	24				BLANK
BASE LOAD (VA) =					12880	12880					
25% OF CONTINUOUS LOAD (VA) =					3175	3175					
TOTAL LOAD (VA) =					16055	16055					
TOTAL LOAD (A) =					134	134					

C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD

** INDICATES NEW LOAD. ALL OTHER LOADS ARE EXISTING. REPLACE OR INSTALL NEW BREAKER AS NECESSARY. NEW BREAKERS TO BE SAME TYPE AND AIC RATING AS EXISTING.

** INDICATES FACTORY WIRED

C = CONTINUOUS LOAD, NC = NON-CONTINUOUS LOAD
* INSTALL NEW SQUARE D QO2150 BREAKER
** REMOVE WIRE TO EXISTING BREAKER AND MARK AS SPARE
(ALL LOADS ARE EXISTING UNLESS NOTED OTHERWISE)

PPC SCHEDULE

11"x17" SCALE: N.T.S.

STATE OF MARYLAND
RAPHAEL MOHAMED
32372
PROFESSIONAL ENGINEER

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