



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

August 16, 2022

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

RE: **Notice of Exempt Modification for T-Mobile: CT11233A**  
**Crown Site#806367**  
**65 Maple Avenue West, Haddam, CT 06441**  
**Latitude: 41° 29' 4.54" / Longitude: -72° 34' 20.81"**

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 98-foot mount level on the existing 115'-6" monopole tower located at 65 Maple Avenue West, Haddam, CT. The property and tower are owned by Crown Atlantic Co LLC (Crown Castle). T-Mobile now intends to replace three (3) antennas and ancillary equipment at the 98 ft level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

**Panned Modification:**

**Tower:**

Installed New:

- (3) Ericsson – AIR6419 B41 Antennas
- (3) Ericsson- 4460 B25+B66 RRH
- (2) Hybrid Cable 6x24

Remove:

- (3) EMS - RR90-17 - XXDP Antennas
- (3) Ericsson KRY 112 144/2 TMAs
- (3) Generic Twin Style - 1B-AWS TMAs
- All existing T-Mobile Coaxial Cables

**Ground:**

Install New:

- (1) 6160 Cabinet
- (1.) B160 Battery Cabinet
- (1) RP 6651
- (1) PSU 4813 vR2A
- (1) CRS IXRc V2
- (1) RP6651

The Foundation for a Wireless World.

[CrownCastle.com](http://CrownCastle.com)

Remove:

- (3^) Ericsson 4415 B66A RRUS
- (6) RUSO1 DUW30

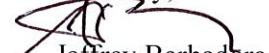
The facility was approved by the Connecticut Siting Council Docket No. 170 on November 15, 1995.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Robert McGarry, First Selectman, Town of Haddam and Bill Warner – Town Planner, Town of Haddam. Crown Castle is the property and tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,



Jeffrey Barbadora  
Site Acquisition Specialist  
1800 W. Park Drive, STE 250  
Westborough, MA 01581  
(781) 970-0053  
Jeff.Barbadora@crowncastle.com

Melanie A. Bachman

Page 3

Attachments

cc:

Robert McGarry, First Selectman  
Town of Haddam – First Selectman's Office  
30 Field Park Drive  
Haddam, CT 06438  
(860) 345-8531

Bill Warner – Town Planner  
Town of Haddam – Land Use Dept  
30 Field Park Drive  
Haddam, CT 06438  
(860) 345-8531, Ext 219

Crown Castle, Property and Tower Owner



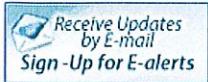
# CONNECTICUT SITING COUNCIL

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Melanie Bachman,  
Executive Director

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**DOCKET NO. 170** - An application of Metro Mobile CTS of Hartford, Inc. for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility located at 109 Maple Avenue West in the Higganum section of the Town of Haddam, Connecticut.

## Connecticut Siting Council

November 15, 1995

## DECISION AND ORDER

Pursuant to the foregoing Findings of Fact, and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed prime site in the Higganum section of Haddam, Connecticut, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Bell Atlantic NYNEX Mobile, Inc. for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed prime site, located within an 88.85 acre parcel at 109 Maple Avenue West, Haddam, Connecticut. We find the effects on scenic resources and the environment from the alternate site to be more significant than the effects from the prime site, and therefore deny certification of the alternate site without prejudice.

The facility shall be constructed, operated, and maintained as a monopole substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed communications service and sufficient to accommodate tower sharing, and not to exceed a total height of 120 feet above ground level.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include plans for the tower and tower foundation; specifications for the placement of all antennas to be attached to this tower; plans for the equipment building, security fence, emergency generator and fuel tank; plans for the access road and utility line installation from 109 Maple Avenue West; plans for site clearing and tree trimming; and plans for water drainage and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sedimentation Control, as amended.
3. Upon the establishment of any new State or federal radio frequency power density standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
4. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. If the facility does not initially provide, or permanently ceases to provide, cellular services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.
7. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.
8. The Certificate Holder shall notify the Council upon completion of construction and provide the final cost to construct the facility.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The

Hartford Courant and the Middletown Press.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

**APPLICANT**

Bell Atlantic NYNEX Mobile, Inc.

**ITS REPRESENTATIVES**

Brian C.S. Freeman, Esq.

Kenneth C. Baldwin, Esq.

Robinson & Cole

One Commercial Plaza

Hartford, CT 06103-3597

David S. Malko

General Manager - Engineering

Sandy M. Ranciato

Manager - Regulatory Services

Bell Atlantic NYNEX Mobile, Inc.

20 Alexander Drive

Wallingford, CT 06492

**INTERVENOR**

Town of Haddam

**ITS REPRESENTATIVE**

The Honorable Marjorie W. DeBold

First Selectman

Town of Haddam

30 Field Park Drive

Haddam, CT 06438

**INTERVENOR**

Springwich Cellular Limited Partnership

Peter J. Tyrrell, Esq.

General Counsel - Wireless

Springwich Cellular Limited Partnership

500 Enterprise Dr., 4th floor

Rocky Hill, CT 06067

Content Last Modified on 8/9/2002 11:34:46 AM

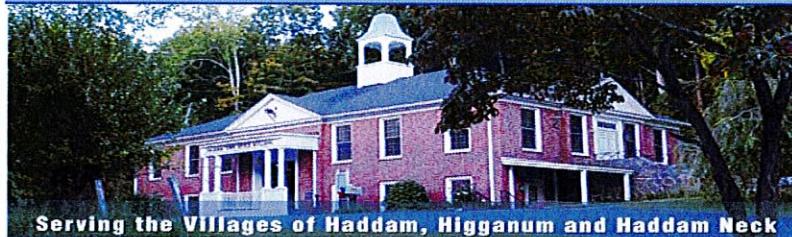
Ten Franklin Square New Britain, CT 06051 / 860-827-2935

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The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2020.



Information on the Property Records for the Municipality of Haddam was last updated on 8/15/2022.



## Parcel Information

Location:	65 MAPLE AVE WEST C	Property Use:	Vacant Land	Primary Use:	Cell Tower
Unique ID:	MT380800	Map Block	23 001 1 C	Acres:	0.2500
		Lot:			
490 Acres:	0.00	Zone:	R-2	Volume / Page:	0336/0559
Developers		Census:	5901		
Map / Lot:					

## Value Information

	Appraised Value	Assessed Value
Land	415,000	290,500
Buildings	0	0
Detached Outbuildings	29,290	20,500

	Appraised Value	Assessed Value
Total	444,290	311,000

## Owner's Information

### Owner's Data

DAMICO LOUIS W JR + DAMICO ENZO  
 C/O CROWN ATLANTIC CO LLC PMB 3  
 4017 WASHINGTON RD  
 MCMURRAY, PA 15317

## Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
8 Ft Chain Fence	2007	0.00	0.00	2,240
Building Utility	2007	0.00	0.00	580

## Owner History - Sales

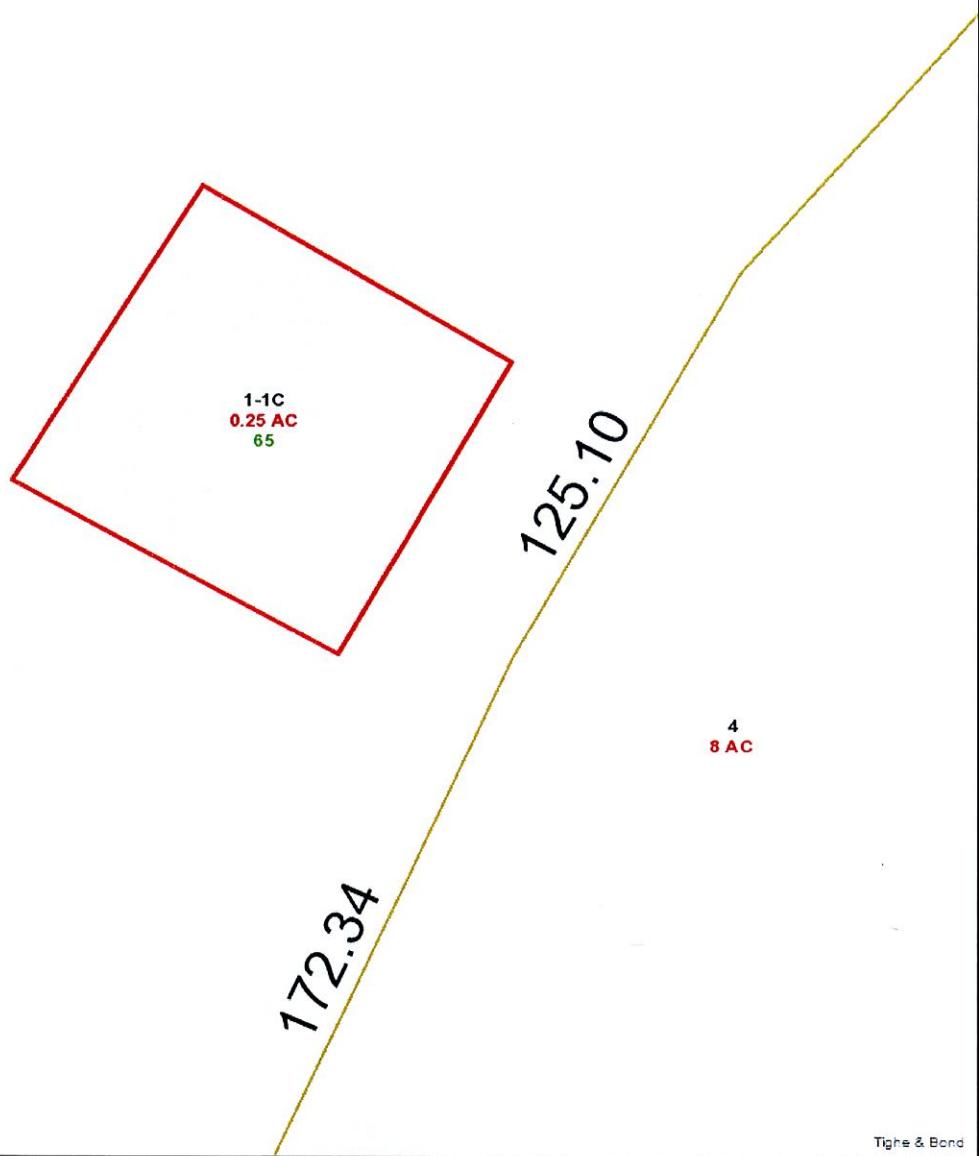
Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
DAMICO LOUIS W JR + DAMICO ENZO	0336	0559	04/05/2010		\$0
DAMICO LOUIS W SR + LOUIS W JR	0305	0805	10/10/2006		\$0
DAMICO LOUIS W & MARJORY C DAMICO FAMILY	0256	0789	01/27/2003		\$0
DAMICO LOUIS W	0233	1040	12/21/2000		\$0

## Building Permits

Permit Number	Permit Type	Date Opened	Reason
B-21-224	Building	11/09/2021	Install antennas ancillary towers and ground equipment No structural changes
E-21-111	Electrical	07/21/2021	Install 25 KW Backup diesel generator for t-mobile facility

Permit Number	Permit Type	Date Opened	Reason
B-20-224	Building	10/21/2020	Modify existing antennas configuration on the cell tower by replacing 3 RRU's (non antennas) already
E-19-072	Electrical	06/25/2019	Install 25 KW generator AC diesel generator; gas tank for existing telecommunications facility for T
8980	Unknown	12/05/2007	MOUNT 2 ANTENNAS ON EXIST TOWE

Information Published With Permission From The Assessor



Tighe & Bond

## 65 MAPLE AVE WEST

8/16/2022 7:45:40

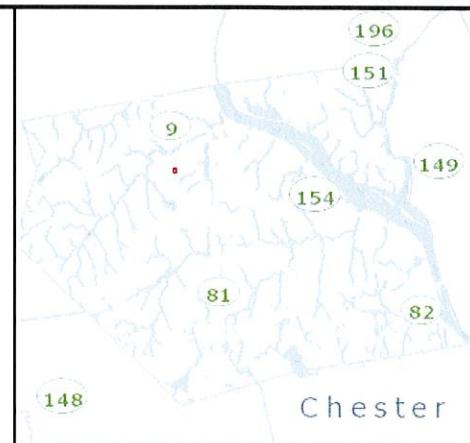
1"=50'

### Property Information

Parcel\_ID 23 001 1 C  
 Street Address 65 MAPLE AVE WEST  
 Sale Price 0



The information depicted on this map is for planning purposes only.  
 It is not adequate for legal boundary definition, regulatory  
 interpretation, or parcel-level analyses.



**Barbadora, Jeff**

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**Sent:** Thursday, August 18, 2022 10:57 AM  
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Delivered to 30 FIELD PARK DR, HADDAM, CT 06438

**OBTAI<sup>N</sup> PROOF OF DELIVERY**

TRACKING NUMBER

[777669462215](#)

FROM Jeff Barbadora  
1800 W. Park Drive  
WESTBOROUGH, MA, US, 01581

TO Town of Haddam, First Selectman Off  
Robert McGarry, First Selectman  
30 Field Park Drive  
HADDAM, CT, US, 06438

REFERENCE 799001.7680

SHIPPER REFERENCE 799001.7680

SHIP DATE Wed 8/17/2022 05:40 PM

DELIVERED TO Residence

PACKAGING TYPE FedEx Envelope

ORIGIN WESTBOROUGH, MA, US, 01581

DESTINATION HADDAM, CT, US, 06438

SPECIAL HANDLING Deliver Weekday

NUMBER OF PIECES 1

TOTAL SHIPMENT WEIGHT 0.50 LB

SERVICE TYPE FedEx Priority Overnight

**Barbadora, Jeff**

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10:56am.



Delivered to 30 FIELD PARK DR, HADDAM, CT 06438

[OBTAIN PROOF OF DELIVERY](#)

TRACKING NUMBER

[777669473418](#)

**FROM** Jeff Barbadora  
1800 W. Park Drive  
WESTBOROUGH, MA, US, 01581

**TO** Town of Haddam, Land Use Dept  
Bill Warner, Town Planner  
30 Field Park Drive  
HADDAM, CT, US, 06438

**REFERENCE** 799001.7680

**SHIPPER REFERENCE** 799001.7680

**SHIP DATE** Wed 8/17/2022 05:40 PM

**DELIVERED TO** Residence

**PACKAGING TYPE** FedEx Envelope

**ORIGIN** WESTBOROUGH, MA, US, 01581

**DESTINATION** HADDAM, CT, US, 06438

**SPECIAL HANDLING** Deliver Weekday

**NUMBER OF PIECES** 1

**TOTAL SHIPMENT WEIGHT** 1.00 LB

**SERVICE TYPE** FedEx Priority Overnight

Date: June 22, 2022



Tower Engineering Professionals  
326 Tryon Road  
Raleigh, NC 27603  
(919) 661-6351

**Subject: Structural Analysis Report**

<b>Carrier Designation:</b>	<b>T-Mobile Co-Locate</b>
	<b>Site Number:</b> CT11233A
	<b>Site Name:</b>   Higginum_1
<b>Crown Castle Designation:</b>	<b>BU Number:</b> 806367
	<b>Site Name:</b> HRT 046 943209
	<b>JDE Job Number:</b> 721538
	<b>Work Order Number:</b> 2129482
	<b>Order Number:</b> 621594 Rev. 0
<b>Engineering Firm Designation:</b>	<b>TEP Project Number:</b> 217454.713700
<b>Site Data:</b>	<b>65 Maple Ave West, Haddam, Middlesex County, CT 06441</b> <b>Latitude 41° 29' 4.54", Longitude -72° 34' 20.81"</b> <b>115.5 Foot - Monopole Tower</b>

*Tower Engineering Professionals* 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 – 56.0%**

This analysis utilizes an ultimate 3-second gust wind speed of 121 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Gautam Sopal, E.I. / RAL

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

06/22/2022

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## 1) INTRODUCTION

This tower is a 115.5-ft monopole tower designed by Paul J. Ford & Company.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	121 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1.0
<b>Ice Thickness:</b>	1.0 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
97.0	98.0	3	Ericsson	AIR 6419 B41_TMO	3	1-5/8
		3	RFS Celwave	APXVAALL24_43-U-NA20		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	RADIO 4449 B71/B85A		
	97.0	1	Tower Mounts	Platform Mount [LP 301-1]		

**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)
117.0	120.0	2	Antel	LPA-80080/6CF w/ Mount Pipe	12	1-5/8
		4	Antel	LPA-80063/6CF w/ Mount Pipe		
		6	Commscope	JAHH-65B-R3B w/ Mount Pipe		
		3	VZW	Sub6 Antenna - VZS01 w/ Mount Pipe		
		3	Commscope	CBC78T-DS-43-2X		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
		1	Raycap	RVZDC-6627-PF-48		
	117.0	1	Tower Mounts	Platform Mount [LP 1001-1]		
104.0	109.0	2	Decibel	DB411-A	3	7/8
	107.0	1	Maxrad	MFB4505		
	104.0	1	Tower Mounts	Side Arm Mount [SO 702-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
87.0	89.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	2 2 4 12	3/8 7/16 3/4 7/8
		4	CCI Antennas	HPA65R-BU6A w/ Mount Pipe		
		2	CCI Antennas	HPA65R-BU8A w/ Mount Pipe		
		2	Kathrein	80010965 w/ Mount Pipe		
		1	Kathrein	80010966 w/ Mount Pipe		
		6	Powerwave Technologies	LGP21401		
		3	Ericsson	RRUS 4415 B25		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		2	Raycap	DC6-48-60-18-8C-EV		
		1	Raycap	DC6-48-60-18-8F		
	87.0	1	Tower Mounts	Platform Mount [LP 304-1]		
75.0	77.0	3	Kathrein	742 213	6	1-5/8
	75.0	1	Tower Mounts	Pipe Mount [PM 601-3]		
69.0	69.0	3	JMA Wireless	MX08FRO665-20 w/ Mount Pipe	1	1-3/8
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Commscope MC-PK8-DSH		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	2225355	CCISites
Tower Foundation Drawings	2200141	CCISites
Tower Manufacturer Drawings	997499	CCISites

#### 3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. 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.

### 3.2) Assumptions

- 1) The tower and structures were maintained in accordance with the TIA-222 Standard.
- 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. Tower Engineering Professionals 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	P (k)	$\phi P_{allow}$ (k)	% Capacity	Pass / Fail	
L1	115.5 - 83.92	Pole	TP40.829x32.25x0.25	1	-12.99	1790.03	19.1	Pass	
L2	83.92 - 41.25	Pole	TP51.92x38.8811x0.3125	2	-29.94	2808.03	38.6	Pass	
L3	41.25 - 0	Pole	TP62.5x49.4614x0.375	3	-46.78	4073.37	45.9	Pass	
							Summary		
							Pole (L3)	45.9	Pass
							<b>RATING =</b>	<b>45.9</b>	<b>Pass</b>

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	49.3	Pass
1,2	Base Plate	-	47.6	Pass
1,2	Base Foundation Structural	-	22.8	Pass
1,2	Base Foundation Soil Interaction	-	56.0	Pass

<b>Structure Rating (max from all components) =</b>	<b>56.0%</b>
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Notes:

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

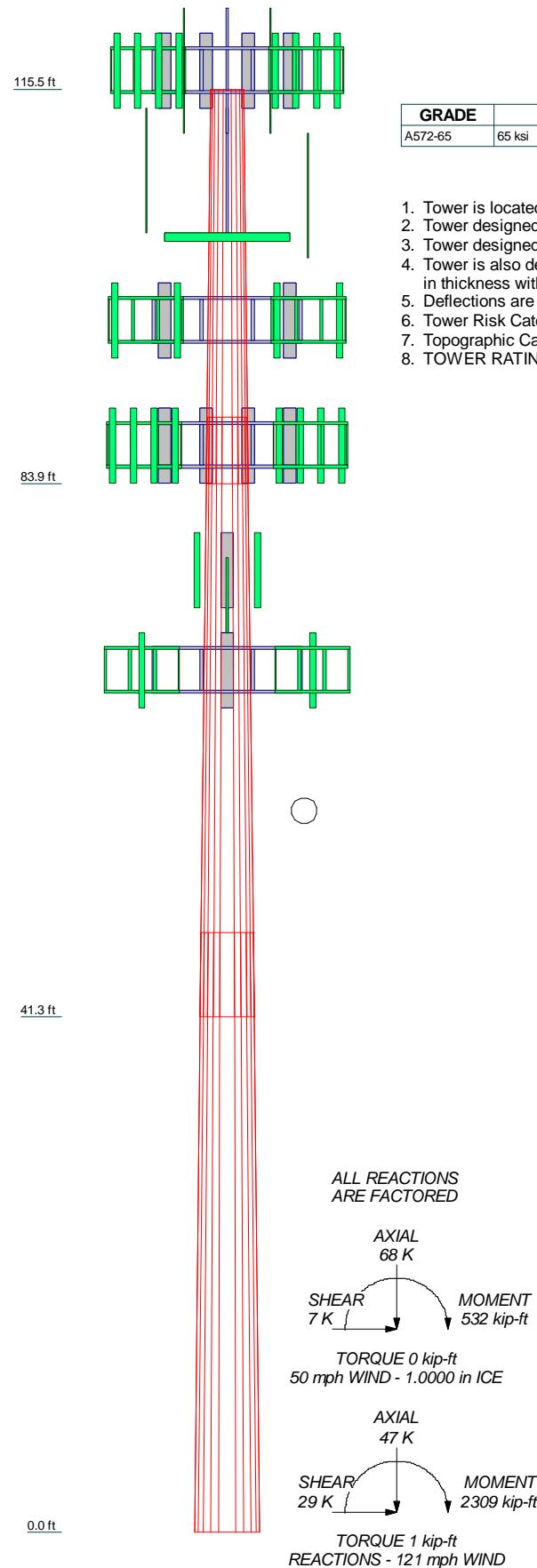
### 4.1) Recommendations

- 1) 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	3	2	2	1
Length (ft)	48.00	48.00	31.58	
Number of Sides	12	12	12	
Thickness (in)	0.3750	0.3125	0.2500	
Socket Length (ft)		6.75	5.33	
Top Dia (in)	49.4614	38.8811	32.2500	
Bot Dia (in)	62.5000	51.5200	40.8290	
Grade		A572-65		
Weight (K)	21.5	11.0	7.4	3.1



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

## TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 121 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 45.9%

## ALL REACTIONS ARE FACTORED

AXIAL 68 K

SHEAR 7 K

MOMENT 532 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 1.0000 in ICE

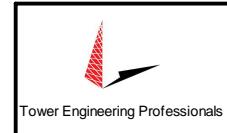
*TORQUE 0 kip-ft  
50 mph WIND - 1.0000 in ICE*

AXIAL  
47 K

SHEAR  
29 K

MOMENT  
2309 kip-ft

*TORQUE 1 kip-ft  
REACTIONS - 121 mph WIND*



**Tower Engineering Professionals**

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

Job: **HRT 046 943209 (BU 806367)**

Project: **TEP No. 217454.713700**

Client: Crown Castle Drawn by: Davis | Clemonns App'd:

Code: TIA-222-H Date: 06/20/23

Code: IA-222-H Date: 06/20/22

Path: Dwg No. E-1  
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<b>tnxTower</b>  <b>Tower Engineering Professionals</b> 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> HRT 046 943209 (BU 806367)	<b>Page</b> 1 of 17
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	<b>Client</b> Crown Castle	<b>Designed by</b> Davis L. Clemons

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in Middlesex County, Connecticut.

Tower base elevation above sea level: 515.00 ft.

Basic wind speed of 121 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .

Maximum demand-capacity ratio is: 1.05.

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	Retention 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

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## Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	115.50-83.92	31.58	5.3300	12	32.2500	40.8290	0.2500	1.0000	A572-65 (65 ksi)
L2	83.92-41.25	48.00	6.7500	12	38.8811	51.9200	0.3125	1.2500	A572-65 (65 ksi)
L3	41.25-0.00	48.00		12	49.4614	62.5000	0.3750	1.5000	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	33.2995	25.7600	3366.9120	11.4560	16.7055	201.5451	6822.2765	12.6783	7.9730	31.892
	42.1811	32.6661	6865.7163	14.5273	21.1494	324.6290	13911.8025	16.0773	10.2722	41.089
L2	41.6413	38.8096	7368.7188	13.8075	20.1404	365.8678	14931.0220	19.1009	9.5826	30.664
	53.6413	51.9300	17653.4791	18.4755	26.8946	656.3959	35770.7347	25.5584	13.0771	41.847
L3	52.9722	59.2718	18228.7383	17.5729	25.6210	711.4763	36936.3658	29.1718	12.2507	32.668
	64.5725	75.0159	36954.9224	22.2407	32.3750	1141.4648	74880.6918	36.9206	15.7450	41.987

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
	ft	ft <sup>2</sup>	in				in	in	in
L1				1	1	1			
115.50-83.92									
L2 83.92-41.25				1	1	1			
L3 41.25-0.00				1	1	1			

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

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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
CU12PSM9P8XXX(1-3/8)	B	No	Surface Ar (CaAa)	69.00 - 0.00	1	1	0.000 0.000	1.4110		1.66
****										

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAA	Weight
							ft <sup>2</sup> /ft	plf
**117**								
LDF7-50A(1-5/8)	B	No	No	Inside Pole	115.50 - 0.00	10	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
HB158-21U6S12-X XXM-01(1-5/8)	B	No	No	Inside Pole	115.50 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
**104**								
LCF78-50J(7/8)	B	No	No	Inside Pole	104.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
**97**								
HCS 6X12 4AWG(1-5/8)	C	No	No	Inside Pole	97.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
HB158-21U6S24-xx M_TMO(1-5/8)	C	No	No	Inside Pole	97.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	87.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
WR-VG122ST-BRD A(7/16)	A	No	No	Inside Pole	87.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
**75**								
AVA7-50(1-5/8)	A	No	No	Inside Pole	75.00 - 0.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
****								

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	115.50-83.92	A	0.000	0.000	3.731	0.000	0.02
		B	0.000	0.000	5.602	0.000	0.42
		C	0.000	0.000	0.000	0.000	0.10
L2	83.92-41.25	A	0.000	0.000	51.689	0.000	0.44
		B	0.000	0.000	14.903	0.000	0.64
		C	0.000	0.000	0.000	0.000	0.32

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Tower Section	Tower Elevation	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>	Weight K
L3	41.25-0.00	A	0.000	0.000	49.969	0.000	0.46
		B	0.000	0.000	16.442	0.000	0.64
		C	0.000	0.000	0.000	0.000	0.31

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

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>	Weight K
L1	115.50-83.92	A	0.949	0.000	0.000	7.110	0.000	0.07
		B	0.000	0.000	0.000	17.464	0.000	0.53
		C	0.000	0.000	0.000	0.000	0.000	0.10
L2	83.92-41.25	A	0.906	0.000	0.000	98.501	0.000	1.18
		B	0.000	0.000	0.000	40.738	0.000	0.92
		C	0.000	0.000	0.000	0.000	0.000	0.32
L3	41.25-0.00	A	0.808	0.000	0.000	93.615	0.000	1.13
		B	0.000	0.000	0.000	42.993	0.000	0.93
		C	0.000	0.000	0.000	0.000	0.000	0.31

### Feed Line Center of Pressure

Section	Elevation	$CP_X$ ft	$CP_Z$ in	$CP_X$ Ice in	$CP_Z$ Ice in
L1	115.50-83.92	0.2774	-0.7966	1.1148	-1.1003
L2	83.92-41.25	-3.3309	-3.4181	-2.9396	-3.9008
L3	41.25-0.00	-3.2877	-3.6727	-2.9311	-4.3405

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
L1	2	Safety Line 3/8	83.92 - 115.50	1.0000	1.0000
L1	9	LCF78-50J(7/8)	83.92 - 104.00	1.0000	1.0000
L1	16	LDF5-50A(7/8)	83.92 - 87.00	1.0000	1.0000
L1	17	FB-L98B-002-75000(3/8)	83.92 - 87.00	1.0000	1.0000
L1	20	WR-VG86ST-BRD(3/4)	83.92 - 87.00	1.0000	1.0000
L1	21	2" Flexible Conduit	83.92 - 87.00	1.0000	1.0000
L2	2	Safety Line 3/8	41.25 - 83.92	1.0000	1.0000
L2	9	LCF78-50J(7/8)	41.25 - 83.92	1.0000	1.0000
L2	16	LDF5-50A(7/8)	41.25 - 83.92	1.0000	1.0000
L2	17	FB-L98B-002-75000(3/8)	41.25 - 83.92	1.0000	1.0000
L2	20	WR-VG86ST-BRD(3/4)	41.25 - 83.92	1.0000	1.0000
L2	21	2" Flexible Conduit	41.25 - 83.92	1.0000	1.0000
L2	25	CU12PSM9P8XXX(1-3/8)	41.25 - 69.00	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L3	2	Safety Line 3/8	0.00 - 41.25	1.0000	1.0000
L3	9	LCF78-50J(7/8)	0.00 - 41.25	1.0000	1.0000
L3	16	LDF5-50A(7/8)	0.00 - 41.25	1.0000	1.0000
L3	17	FB-L98B-002-75000(3/8)	0.00 - 41.25	1.0000	1.0000
L3	20	WR-VG86ST-BRD(3/4)	0.00 - 41.25	1.0000	1.0000
L3	21	2" Flexible Conduit	0.00 - 41.25	1.0000	1.0000
L3	25	CU12PSM9P8XXX(1-3/8)	0.00 - 41.25	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
						ft	ft		
**117**									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	3.02 3.57 4.14	7.80 8.42 9.06	0.06 0.12 0.19
		g	3.00						
(2) LPA-80063/6CF w/ Mount Pipe	B	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	10.06 10.75 11.40	10.45 11.74 12.87	0.06 0.15 0.25
		g	3.00						
(2) LPA-80063/6CF w/ Mount Pipe	C	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	10.06 10.75 11.40	10.45 11.74 12.87	0.06 0.15 0.25
		g	3.00						
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	5.50 5.97 6.45	4.38 4.84 5.30	0.10 0.17 0.25
		g	3.00						
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	5.50 5.97 6.45	4.38 4.84 5.30	0.10 0.17 0.25
		g	3.00						
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	5.50 5.97 6.45	4.38 4.84 5.30	0.10 0.17 0.25
		g	3.00						
Sub6 Antenna - VZS01 w/ Mount Pipe	A	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.92 5.26 5.62	2.69 3.15 3.63	0.10 0.14 0.19
		g	3.00						
Sub6 Antenna - VZS01 w/ Mount Pipe	B	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.92 5.26 5.62	2.69 3.15 3.63	0.10 0.14 0.19
		g	3.00						
Sub6 Antenna - VZS01 w/ Mount Pipe	C	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.92 5.26 5.62	2.69 3.15 3.63	0.10 0.14 0.19
		g	3.00						
CBC78T-DS-43-2X	A	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.53	0.51 0.60 0.70	0.02 0.03 0.04
		g	3.00						
CBC78T-DS-43-2X	B	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.53	0.51 0.60 0.70	0.02 0.03 0.04
		g	3.00						
CBC78T-DS-43-2X	C	From Centroid-Le	4.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.53	0.51 0.60 0.70	0.02 0.03 0.04
		g	3.00						
RFV01U-D1A	A	From	4.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.88 0.45 0.53	1.25 0.60 0.70	0.08 0.03 0.04
		g	3.00						

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Description	Face or Leg	Offset Type	Offsets: Horz ft	Offsets: Lateral ft	Azimuth Adjustment °	Placement ft	CAA Front ft <sup>2</sup>	CAA Side ft <sup>2</sup>	Weight K
		Centroid-Le	0.00			1/2" Ice	2.05	1.39	0.10
RFV01U-D1A	B	g	3.00			1" Ice	2.22	1.54	0.12
		From	4.00	0.0000	117.00	No Ice	1.88	1.25	0.08
RFV01U-D1A	C	Centroid-Le	0.00			1/2" Ice	2.05	1.39	0.10
		g	3.00			1" Ice	2.22	1.54	0.12
RFV01U-D2A	A	From	4.00	0.0000	117.00	No Ice	1.88	1.25	0.08
		Centroid-Le	0.00			1/2" Ice	2.05	1.39	0.10
RFV01U-D2A	B	g	3.00			1" Ice	2.22	1.54	0.12
		From	4.00	0.0000	117.00	No Ice	1.88	1.25	0.08
RFV01U-D2A	C	Centroid-Le	0.00			1/2" Ice	2.05	1.14	0.09
		g	3.00			1" Ice	2.22	1.28	0.11
RFV01U-D2A	B	From	4.00	0.0000	117.00	No Ice	1.88	1.01	0.07
		Centroid-Le	0.00			1/2" Ice	2.05	1.14	0.09
RFV01U-D2A	C	g	3.00			1" Ice	2.22	1.28	0.11
		From	4.00	0.0000	117.00	No Ice	1.88	1.01	0.07
RVZDC-6627-PF-48	B	Centroid-Le	0.00			1/2" Ice	2.05	1.14	0.09
		g	3.00			1" Ice	2.22	1.28	0.11
(3) 2.4" Dia x 6-ft Pipe	A	From	4.00	0.0000	117.00	No Ice	1.43	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.93	1.93	0.03
(3) 2.4" Dia x 6-ft Pipe	B	g	0.00			1" Ice	2.30	2.30	0.05
		From	4.00	0.0000	117.00	No Ice	1.43	1.43	0.02
(3) 2.4" Dia x 6-ft Pipe	C	Centroid-Le	0.00			1/2" Ice	1.93	1.93	0.03
		g	0.00			1" Ice	2.30	2.30	0.05
8' Ladder	C	From	4.00	0.0000	117.00	No Ice	1.43	1.43	0.02
		Centroid-Fa	0.00			1/2" Ice	1.93	1.93	0.03
Platform Mount [LP 1001-1]	C	g	0.00			1" Ice	2.30	2.30	0.05
		From	2.00	-4.0000	117.00	No Ice	1.53	5.33	0.10
		Centroid-Fa	0.00			1/2" Ice	4.36	8.08	0.11
		ce	0.00			1" Ice	7.19	10.83	0.13
						1/2" Ice	50.34	50.34	3.95
						1" Ice	56.62	56.62	5.04
**104**									
DB411-A	A	From Leg	6.00	0.0000	104.00	No Ice	1.50	1.50	0.03
		0.00				1/2" Ice	2.70	2.70	0.03
MFB4505	B	From Leg	5.00			1" Ice	3.90	3.90	0.04
		6.00	0.0000		104.00	No Ice	0.84	0.84	0.00
DB411-A	C	0.00				1/2" Ice	1.50	1.50	0.01
		3.00				1" Ice	2.13	2.13	0.02
Side Arm Mount [SO 702-3]	C	From Leg	6.00	0.0000	104.00	No Ice	1.50	1.50	0.03
		0.00				1/2" Ice	2.70	2.70	0.03
		5.00				1" Ice	3.90	3.90	0.04
						1/2" Ice	3.37	3.37	0.13
						1" Ice	4.12	4.12	0.19
**97**									
AIR 6419 B41_TMO	A	From Leg	4.00	0.0000	97.00	No Ice	7.00	2.83	0.10
		0.00				1/2" Ice	7.53	3.24	0.14
AIR 6419 B41_TMO	B	g	1.00			1" Ice	8.07	3.67	0.19
		From	4.00	0.0000	97.00	No Ice	7.00	2.83	0.10
AIR 6419 B41_TMO	C	Centroid-Le	0.00			1/2" Ice	7.53	3.24	0.14
		g	1.00			1" Ice	8.07	3.67	0.19
AIR 6419 B41_TMO	C	From	4.00	0.0000	97.00	No Ice	7.00	2.83	0.10
		Centroid-Le	0.00			1/2" Ice	7.53	3.24	0.14

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Description	Face or Leg	Offset Type	Offsets: Horz ft	Offsets: Lateral Vert ft	Azimuth Adjustment °	Placement ft	CAA <sub>Front</sub>	CAA <sub>Side</sub>	Weight K
APXVAALL24_43-U-NA20	A	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	8.07 14.67 15.43	3.67 5.32 5.99
APXVAALL24_43-U-NA20	B	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	16.21 14.67 15.43	6.68 5.32 5.99
APXVAALL24_43-U-NA20	C	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	16.21 14.67 15.43	6.68 5.32 5.99
RADIO 4460 B2/B25 B66_TMO	A	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	16.21 2.14 2.32	0.38 0.11 0.13
RADIO 4460 B2/B25 B66_TMO	B	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	2.51 2.14 2.32	0.16 0.11 0.13
RADIO 4460 B2/B25 B66_TMO	C	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	2.51 2.14 2.32	0.38 0.11 0.13
RADIO 4449 B71/B85A	A	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	2.51 1.64 1.80	0.16 0.07 0.09
RADIO 4449 B71/B85A	B	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	2.51 1.64 1.80	0.11 0.07 0.09
RADIO 4449 B71/B85A	C	g From Centroid-Le	1.00 4.00 0.00	1.00 4.00 0.00	0.0000	97.00	1" Ice No Ice 1/2" Ice	2.51 1.64 1.80	0.11 0.07 0.09
Platform Mount [LP 301-1]	C	None			0.0000	97.00	1" Ice No Ice 1/2" Ice	2.51 23.81 30.24	0.11 1.61 30.24
							1" Ice	36.33	2.73
*87*									
7770.00 w/ Mount Pipe	A	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 5.75 6.18	0.16 0.06 0.10
7770.00 w/ Mount Pipe	B	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 5.75 6.18	0.16 0.06 0.10
7770.00 w/ Mount Pipe	C	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 5.75 6.18	0.16 0.06 0.10
(2) HPA65R-BU6A w/ Mount Pipe	A	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 5.83 6.40	0.16 0.08 0.14
(2) HPA65R-BU6A w/ Mount Pipe	B	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 5.83 6.40	0.16 0.08 0.14
(2) HPA65R-BU8A w/ Mount Pipe	C	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 5.83 6.40	0.16 0.08 0.14
80010965 w/ Mount Pipe	A	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 12.26 13.03	0.22 0.14 0.23
80010965 w/ Mount Pipe	B	g From Centroid-Le	2.00 4.00 0.00	2.00 4.00 0.00	0.0000	87.00	1" Ice No Ice 1/2" Ice	6.61 12.26 13.03	0.22 0.14 0.23
80010966 w/ Mount Pipe	C	g From	2.00 4.00	2.00 4.00	0.0000	87.00	1" Ice No Ice	6.61 14.61	0.22 0.16

<b>tnxTower</b>  <b>Tower Engineering Professionals</b> 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job HRT 046 943209 (BU 806367)							Page 8 of 17
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	Client Crown Castle							Designed by Davis L. Clemons

Description	Face or Leg	Offset Type	Offsets: Horz ft	Lateral ft	Azimuth Adjustment °	Placement ft	CAA <sub>A</sub> Front ft <sup>2</sup>	CAA <sub>A</sub> Side ft <sup>2</sup>	Weight K	
		Centroid-Le	0.00				1/2" Ice	15.47	7.63	0.27
(2) LGP21401	A	g	2.00				1" Ice	16.35	8.42	0.39
		From	4.00	0.0000		87.00	No Ice	1.10	0.21	0.01
(2) LGP21401	B	Centroid-Le	0.00				1/2" Ice	1.24	0.27	0.02
		g	2.00				1" Ice	1.38	0.35	0.03
(2) LGP21401	C	From	4.00	0.0000		87.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00				1/2" Ice	1.24	0.27	0.02
RRUS 4415 B25	A	g	2.00				1" Ice	1.38	0.35	0.03
		From	4.00	0.0000		87.00	No Ice	1.64	0.68	0.04
RRUS 4415 B25	B	Centroid-Le	0.00				1/2" Ice	1.80	0.79	0.06
		g	2.00				1" Ice	1.97	0.91	0.07
RRUS 4415 B25	C	From	4.00	0.0000		87.00	No Ice	1.64	0.68	0.04
		Centroid-Le	0.00				1/2" Ice	1.80	0.79	0.06
RRUS 4449 B5/B12	A	g	2.00				1" Ice	1.97	0.91	0.07
		From	4.00	0.0000		87.00	No Ice	1.97	1.41	0.07
RRUS 4449 B5/B12	B	Centroid-Le	0.00				1/2" Ice	2.14	1.56	0.09
		g	2.00				1" Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	C	From	4.00	0.0000		87.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00				1/2" Ice	2.14	1.56	0.09
RRUS 8843 B2/B66A	A	g	2.00				1" Ice	2.33	1.73	0.11
		From	4.00	0.0000		87.00	No Ice	1.64	1.35	0.07
RRUS 8843 B2/B66A	B	Centroid-Le	0.00				1/2" Ice	1.80	1.50	0.09
		g	2.00				1" Ice	1.97	1.65	0.11
RRUS 8843 B2/B66A	C	From	4.00	0.0000		87.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00				1/2" Ice	1.80	1.50	0.09
DC6-48-60-18-8C-EV	A	g	2.00				1" Ice	1.97	1.65	0.11
		From	4.00	0.0000		87.00	No Ice	1.14	1.14	0.03
DC6-48-60-18-8C-EV	B	Centroid-Le	0.00				1/2" Ice	1.79	1.79	0.05
		g	2.00				1" Ice	2.00	2.00	0.07
DC6-48-60-18-8F	C	From	4.00	0.0000		87.00	No Ice	1.21	1.21	0.03
		Centroid-Le	0.00				1/2" Ice	1.89	1.89	0.05
Platform Mount [LP 304-1]	C	g	2.00				1" Ice	2.11	2.11	0.08
		From	4.00	0.0000		87.00	No Ice	17.49	17.49	1.35
		Centroid-Le	0.00				1/2" Ice	21.37	21.37	1.71
742 213	A	None					1" Ice	25.28	25.28	2.13
		From Leg	1.00	0.0000		75.00	No Ice	3.57	1.60	0.02
			0.00				1/2" Ice	4.21	2.21	0.05
742 213	B		2.00				1" Ice	4.86	2.83	0.08
		From Leg	1.00	0.0000		75.00	No Ice	3.57	1.60	0.02
			0.00				1/2" Ice	4.21	2.21	0.05
			2.00				1" Ice	4.86	2.83	0.08

\*75\*

<b>tnxTower</b>  <b>Tower Engineering Professionals</b> 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	HRT 046 943209 (BU 806367)	Page
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Description	Face or Leg	Offset Type	Offsets: Horz ft	Offsets: Lateral ft	Azimuth Adjustment °	Placement ft	CAA Front ft <sup>2</sup>	CAA Side ft <sup>2</sup>	Weight K
742 213	C	From Leg	1.00 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	3.57 4.21 4.86	1.60 2.21 2.83	0.02 0.05 0.08
Pipe Mount [PM 601-3]	C	None		0.0000	75.00	No Ice 1/2" Ice 1" Ice	3.17 3.79 4.42	3.17 3.79 4.42	0.20 0.23 0.28
*69*									
MX08FRO665-20 w/ Mount Pipe	A	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.10 0.18 0.28
MX08FRO665-20 w/ Mount Pipe	B	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.10 0.18 0.28
MX08FRO665-20 w/ Mount Pipe	C	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.10 0.18 0.28
TA08025-B604	A	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604	B	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604	C	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B605	A	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605	B	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605	C	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
RDIDC-9181-PF-48	A	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	2.01 2.19 2.37	1.17 1.31 1.46	0.02 0.04 0.06
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Le	4.00 0.00 g 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
Commscope MC-PK8-DSH	C	None		0.0000	69.00	No Ice 1/2" Ice 1" Ice	34.24 62.95 91.66	34.24 62.95 91.66	1.75 2.10 2.45

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	<b>Client</b>	Crown Castle	<b>Designed by</b> Davis L. Clemons

## Load Combinations

<i>Comb. No.</i>	<i>Description</i>
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
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

## Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
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	<b>Client</b>	Crown Castle	<b>Designed by</b> Davis L. Clemons

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	115.5 - 83.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.72	-0.29	-0.77
			Max. Mx	20	-12.99	261.60	0.20
			Max. My	14	-13.01	-0.33	-246.58
			Max. Vy	20	-12.34	261.60	0.20
			Max. Vx	2	-11.83	0.41	246.20
			Max. Torque	8			-1.41
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.77	1.26	0.40
			Max. Mx	20	-29.94	1068.46	0.08
L2	83.92 - 41.25	Pole	Max. My	2	-29.96	0.36	1031.09
			Max. Vy	20	-23.17	1068.46	0.08
			Max. Vx	2	-22.65	0.36	1031.09
			Max. Torque	8			-1.62
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.58	2.65	2.39
			Max. Mx	20	-46.78	2309.09	0.12
			Max. My	2	-46.78	0.21	2247.28
			Max. Vy	20	-28.52	2309.09	0.12
			Max. Vx	2	-28.01	0.21	2247.28
L3	41.25 - 0	Pole	Max. Torque	8			-1.50
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.58	2.65	2.39
			Max. Mx	20	-46.78	2309.09	0.12
			Max. My	2	-46.78	0.21	2247.28
			Max. Vy	20	-28.52	2309.09	0.12
			Max. Vx	2	-28.01	0.21	2247.28
			Max. Torque	8			-1.50

## Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	67.58	0.00	0.00
	Max. H <sub>x</sub>	20	46.79	28.50	-0.01
	Max. H <sub>z</sub>	2	46.79	-0.01	28.00
	Max. M <sub>x</sub>	2	2247.28	-0.01	28.00
	Max. M <sub>z</sub>	8	2307.15	-28.50	0.01
	Max. Torsion	20	1.49	28.50	-0.01
	Min. Vert	15	35.09	0.01	-28.00
	Min. H <sub>x</sub>	8	46.79	-28.50	0.01
	Min. H <sub>z</sub>	14	46.79	0.01	-28.00
	Min. M <sub>x</sub>	14	-2245.52	0.01	-28.00
	Min. M <sub>z</sub>	20	-2309.09	28.50	-0.01
	Min. Torsion	8	-1.50	-28.50	0.01

## Tower Mast Reaction Summary

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overshielding Moment, M <sub>x</sub>	Overshielding Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	38.99	0.00	0.00	-0.73	0.79	0.00
1.2 Dead+1.0 Wind 0 deg - No	46.79	0.01	-28.00	-2247.28	0.21	-0.26
Ice						
0.9 Dead+1.0 Wind 0 deg - No	35.09	0.01	-28.00	-2237.75	-0.03	-0.26
Ice						
1.2 Dead+1.0 Wind 30 deg - No	46.79	14.36	-24.42	-1957.17	-1159.80	0.54
Ice						
0.9 Dead+1.0 Wind 30 deg - No	35.09	14.36	-24.42	-1948.86	-1155.22	0.54

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<i>Load Combination</i>	<i>Vertical</i>	<i>Shear<sub>x</sub></i>	<i>Shear<sub>z</sub></i>	<i>Overturning Moment, M<sub>x</sub></i> kip-ft	<i>Overturning Moment, M<sub>z</sub></i> kip-ft	<i>Torque</i> kip-ft
	<i>K</i>	<i>K</i>	<i>K</i>			
Ice						
1.2 Dead+1.0 Wind 60 deg - No Ice	46.79	24.69	-14.01	-1124.73	-1998.30	1.18
0.9 Dead+1.0 Wind 60 deg - No Ice	35.09	24.69	-14.01	-1119.86	-1990.23	1.18
1.2 Dead+1.0 Wind 90 deg - No Ice	46.79	28.50	-0.01	-1.64	-2307.15	1.50
0.9 Dead+1.0 Wind 90 deg - No Ice	35.09	28.50	-0.01	-1.42	-2297.79	1.49
1.2 Dead+1.0 Wind 120 deg - No Ice	46.79	24.68	13.99	1121.65	-1997.54	1.41
0.9 Dead+1.0 Wind 120 deg - No Ice	35.09	24.68	13.99	1117.23	-1989.47	1.41
1.2 Dead+1.0 Wind 150 deg - No Ice	46.79	14.24	24.24	1944.17	-1152.44	0.95
0.9 Dead+1.0 Wind 150 deg - No Ice	35.09	14.24	24.24	1936.34	-1147.88	0.95
1.2 Dead+1.0 Wind 180 deg - No Ice	46.79	-0.01	28.00	2245.52	1.73	0.25
0.9 Dead+1.0 Wind 180 deg - No Ice	35.09	-0.01	28.00	2236.44	1.48	0.25
1.2 Dead+1.0 Wind 210 deg - No Ice	46.79	-14.36	24.42	1955.41	1161.74	-0.52
0.9 Dead+1.0 Wind 210 deg - No Ice	35.09	-14.36	24.42	1947.54	1156.67	-0.51
1.2 Dead+1.0 Wind 240 deg - No Ice	46.79	-24.69	14.01	1122.97	2000.24	-1.15
0.9 Dead+1.0 Wind 240 deg - No Ice	35.09	-24.69	14.01	1118.54	1991.68	-1.15
1.2 Dead+1.0 Wind 270 deg - No Ice	46.79	-28.50	0.01	-0.12	2309.09	-1.49
0.9 Dead+1.0 Wind 270 deg - No Ice	35.09	-28.50	0.01	0.10	2299.23	-1.49
1.2 Dead+1.0 Wind 300 deg - No Ice	46.79	-24.68	-13.99	-1123.42	1999.48	-1.43
0.9 Dead+1.0 Wind 300 deg - No Ice	35.09	-24.68	-13.99	-1118.54	1990.92	-1.43
1.2 Dead+1.0 Wind 330 deg - No Ice	46.79	-14.24	-24.24	-1945.93	1154.38	-0.98
0.9 Dead+1.0 Wind 330 deg - No Ice	35.09	-14.24	-24.24	-1937.66	1149.33	-0.98
1.2 Dead+1.0 Ice+1.0 Temp	67.58	0.00	0.00	-2.39	2.65	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	67.58	0.00	-6.45	-522.29	2.62	-0.08
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	67.58	3.26	-5.59	-452.69	-261.84	0.12
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	67.58	5.65	-3.23	-262.44	-455.42	0.29
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	67.58	6.53	-0.00	-2.51	-526.23	0.38
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	67.58	5.65	3.22	257.44	-455.32	0.37
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	67.58	3.26	5.59	447.76	-261.68	0.26
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	67.58	-0.00	6.45	517.46	2.81	0.08
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	67.58	-3.26	5.59	447.86	267.28	-0.12
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	67.58	-5.65	3.23	257.60	460.85	-0.28
1.2 Dead+1.0 Wind 270	67.58	-6.53	0.00	-2.32	531.67	-0.38

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Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	67.58	-5.65	-3.22	-262.27	460.76	-0.37
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	67.58	-3.26	-5.59	-452.60	267.11	-0.26
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	38.99	0.00	-6.49	-520.03	0.63	-0.06
Dead+Wind 30 deg - Service	38.99	3.33	-5.66	-452.97	-267.52	0.12
Dead+Wind 60 deg - Service	38.99	5.72	-3.25	-260.54	-461.35	0.27
Dead+Wind 90 deg - Service	38.99	6.61	-0.00	-0.91	-532.75	0.35
Dead+Wind 120 deg - Service	38.99	5.72	3.24	258.77	-461.18	0.33
Dead+Wind 150 deg - Service	38.99	3.30	5.62	448.91	-265.82	0.22
Dead+Wind 180 deg - Service	38.99	-0.00	6.49	518.57	0.98	0.06
Dead+Wind 210 deg - Service	38.99	-3.33	5.66	451.51	269.13	-0.12
Dead+Wind 240 deg - Service	38.99	-5.72	3.25	259.07	462.97	-0.27
Dead+Wind 270 deg - Service	38.99	-6.61	0.00	-0.56	534.36	-0.34
Dead+Wind 300 deg - Service	38.99	-5.72	-3.24	-260.23	462.79	-0.33
Dead+Wind 330 deg - Service	38.99	-3.30	-5.62	-450.37	267.43	-0.22

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-38.99	0.00	0.00	38.99	0.00	0.000%
2	0.01	-46.79	-28.00	-0.01	46.79	28.00	0.000%
3	0.01	-35.09	-28.00	-0.01	35.09	28.00	0.000%
4	14.36	-46.79	-24.42	-14.36	46.79	24.42	0.000%
5	14.36	-35.09	-24.42	-14.36	35.09	24.42	0.000%
6	24.69	-46.79	-14.01	-24.69	46.79	14.01	0.000%
7	24.69	-35.09	-14.01	-24.69	35.09	14.01	0.000%
8	28.50	-46.79	-0.01	-28.50	46.79	0.01	0.000%
9	28.50	-35.09	-0.01	-28.50	35.09	0.01	0.000%
10	24.68	-46.79	13.99	-24.68	46.79	-13.99	0.000%
11	24.68	-35.09	13.99	-24.68	35.09	-13.99	0.000%
12	14.24	-46.79	24.24	-14.24	46.79	-24.24	0.000%
13	14.24	-35.09	24.24	-14.24	35.09	-24.24	0.000%
14	-0.01	-46.79	28.00	0.01	46.79	-28.00	0.000%
15	-0.01	-35.09	28.00	0.01	35.09	-28.00	0.000%
16	-14.36	-46.79	24.42	14.36	46.79	-24.42	0.000%
17	-14.36	-35.09	24.42	14.36	35.09	-24.42	0.000%
18	-24.69	-46.79	14.01	24.69	46.79	-14.01	0.000%
19	-24.69	-35.09	14.01	24.69	35.09	-14.01	0.000%
20	-28.50	-46.79	0.01	28.50	46.79	-0.01	0.000%
21	-28.50	-35.09	0.01	28.50	35.09	-0.01	0.000%
22	-24.68	-46.79	-13.99	24.68	46.79	13.99	0.000%
23	-24.68	-35.09	-13.99	24.68	35.09	13.99	0.000%
24	-14.24	-46.79	-24.24	14.24	46.79	-24.24	0.000%
25	-14.24	-35.09	-24.24	14.24	35.09	24.24	0.000%
26	0.00	-67.58	0.00	0.00	67.58	0.00	0.000%
27	0.00	-67.58	-6.45	-0.00	67.58	6.45	0.000%
28	3.26	-67.58	-5.59	-3.26	67.58	5.59	0.000%
29	5.65	-67.58	-3.23	-5.65	67.58	3.23	0.000%
30	6.53	-67.58	-0.00	-6.53	67.58	0.00	0.000%
31	5.65	-67.58	3.22	-5.65	67.58	-3.22	0.000%
32	3.26	-67.58	5.59	-3.26	67.58	-5.59	0.000%
33	-0.00	-67.58	6.45	0.00	67.58	-6.45	0.000%
34	-3.26	-67.58	5.59	3.26	67.58	-5.59	0.000%
35	-5.65	-67.58	3.23	5.65	67.58	-3.23	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
36	-6.53	-67.58	0.00	6.53	67.58	-0.00	0.000%
37	-5.65	-67.58	-3.22	5.65	67.58	3.22	0.000%
38	-3.26	-67.58	-5.59	3.26	67.58	5.59	0.000%
39	0.00	-38.99	-6.49	-0.00	38.99	6.49	0.000%
40	3.33	-38.99	-5.66	-3.33	38.99	5.66	0.000%
41	5.72	-38.99	-3.25	-5.72	38.99	3.25	0.000%
42	6.61	-38.99	-0.00	-6.61	38.99	0.00	0.000%
43	5.72	-38.99	3.24	-5.72	38.99	-3.24	0.000%
44	3.30	-38.99	5.62	-3.30	38.99	-5.62	0.000%
45	-0.00	-38.99	6.49	0.00	38.99	-6.49	0.000%
46	-3.33	-38.99	5.66	3.33	38.99	-5.66	0.000%
47	-5.72	-38.99	3.25	5.72	38.99	-3.25	0.000%
48	-6.61	-38.99	0.00	6.61	38.99	-0.00	0.000%
49	-5.72	-38.99	-3.24	5.72	38.99	3.24	0.000%
50	-3.30	-38.99	-5.62	3.30	38.99	5.62	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00002165
3	Yes	4	0.00000001	0.00001150
4	Yes	4	0.00000001	0.00039709
5	Yes	4	0.00000001	0.00025977
6	Yes	4	0.00000001	0.00035026
7	Yes	4	0.00000001	0.00022792
8	Yes	4	0.00000001	0.00009029
9	Yes	4	0.00000001	0.00005958
10	Yes	4	0.00000001	0.00042694
11	Yes	4	0.00000001	0.00027988
12	Yes	4	0.00000001	0.00035595
13	Yes	4	0.00000001	0.00023224
14	Yes	4	0.00000001	0.00002167
15	Yes	4	0.00000001	0.00001152
16	Yes	4	0.00000001	0.00036365
17	Yes	4	0.00000001	0.00023704
18	Yes	4	0.00000001	0.00042352
19	Yes	4	0.00000001	0.00027735
20	Yes	4	0.00000001	0.00009040
21	Yes	4	0.00000001	0.00005964
22	Yes	4	0.00000001	0.00034847
23	Yes	4	0.00000001	0.00022662
24	Yes	4	0.00000001	0.00040109
25	Yes	4	0.00000001	0.00026272
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00025130
28	Yes	4	0.00000001	0.00025903
29	Yes	4	0.00000001	0.00026109
30	Yes	4	0.00000001	0.00025535
31	Yes	4	0.00000001	0.00026102
32	Yes	4	0.00000001	0.00025824
33	Yes	4	0.00000001	0.00025052
34	Yes	4	0.00000001	0.00025976
35	Yes	4	0.00000001	0.00026328
36	Yes	4	0.00000001	0.00025790

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37	Yes	4	0.00000001	0.00026342
38	Yes	4	0.00000001	0.00026064
39	Yes	4	0.00000001	0.00000400
40	Yes	4	0.00000001	0.00000874
41	Yes	4	0.00000001	0.00000776
42	Yes	4	0.00000001	0.00000632
43	Yes	4	0.00000001	0.00001015
44	Yes	4	0.00000001	0.00000758
45	Yes	4	0.00000001	0.00000399
46	Yes	4	0.00000001	0.00000769
47	Yes	4	0.00000001	0.00000998
48	Yes	4	0.00000001	0.00000635
49	Yes	4	0.00000001	0.00000784
50	Yes	4	0.00000001	0.00000902

### Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	115.5 - 83.92	5.198	48	0.3690	0.0013
L2	89.25 - 41.25	3.263	48	0.3248	0.0007
L3	48 - 0	0.983	48	0.1832	0.0002

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

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
117.00	(2) LPA-80080/6CF w/ Mount Pipe	48	5.198	0.3690	0.0013	126516
104.00	DB411-A	48	4.330	0.3529	0.0010	55007
97.00	AIR 6419 B41_TMO	48	3.814	0.3411	0.0008	34193
87.00	7770.00 w/ Mount Pipe	48	3.108	0.3193	0.0006	22748
75.00	742 213	48	2.332	0.2838	0.0004	17393
69.00	MX08FRO665-20 w/ Mount Pipe	48	1.979	0.2632	0.0004	15569

### Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	115.5 - 83.92	22.476	20	1.5965	0.0058
L2	89.25 - 41.25	14.108	20	1.4047	0.0029
L3	48 - 0	4.251	20	0.7920	0.0009

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

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<i>Elevation</i> ft	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i> in	<i>Tilt</i> °	<i>Twist</i> °	<i>Radius of Curvature</i> ft
117.00	(2) LPA-80080/6CF w/ Mount Pipe	20	22.476	1.5965	0.0058	29248
104.00	DB411-A	20	18.722	1.5264	0.0044	12716
97.00	AIR 6419 B41_TMO	20	16.491	1.4753	0.0036	7904
87.00	7770.00 w/ Mount Pipe	20	13.439	1.3807	0.0027	5259
75.00	742 213	20	10.081	1.2273	0.0019	4022
69.00	MX08FRO665-20 w/ Mount Pipe	20	8.557	1.1381	0.0016	3601

## Compression Checks

### Pole Design Data

<i>Section No.</i>	<i>Elevation</i> ft	<i>Size</i>	<i>L</i> ft	<i>L<sub>u</sub></i> ft	<i>Kl/r</i>	<i>A</i> in <sup>2</sup>	<i>P<sub>u</sub></i> K	$\phi P_n$ K	<i>Ratio</i> $\frac{P_u}{\phi P_n}$
L1	115.5 - 83.92 (1)	TP40.829x32.25x0.25	31.58	0.00	0.0	31.5005	-12.99	1704.79	0.008
L2	83.92 - 41.25 (2)	TP51.92x38.8811x0.3125	48.00	0.00	0.0	50.0850	-29.94	2674.31	0.011
L3	41.25 - 0 (3)	TP62.5x49.4614x0.375	48.00	0.00	0.0	75.0159	-46.78	3879.40	0.012

### Pole Bending Design Data

<i>Section No.</i>	<i>Elevation</i> ft	<i>Size</i>	<i>M<sub>ux</sub></i> kip-ft	$\phi M_{nx}$ kip-ft	<i>Ratio</i> $\frac{M_{ux}}{\phi M_{nx}}$	<i>M<sub>uy</sub></i> kip-ft	$\phi M_{ny}$ kip-ft	<i>Ratio</i> $\frac{M_{uy}}{\phi M_{ny}}$
L1	115.5 - 83.92 (1)	TP40.829x32.25x0.25	261.60	1361.13	0.192	0.00	1361.13	0.000
L2	83.92 - 41.25 (2)	TP51.92x38.8811x0.3125	1068.46	2716.25	0.393	0.00	2716.25	0.000
L3	41.25 - 0 (3)	TP62.5x49.4614x0.375	2309.09	4919.18	0.469	0.00	4919.18	0.000

### Pole Shear Design Data

<i>Section No.</i>	<i>Elevation</i> ft	<i>Size</i>	<i>Actual V<sub>u</sub></i> K	$\phi V_n$ K	<i>Ratio</i> $\frac{V_u}{\phi V_n}$	<i>Actual T<sub>u</sub></i> kip-ft	$\phi T_n$ kip-ft	<i>Ratio</i> $\frac{T_u}{\phi T_n}$
L1	115.5 - 83.92 (1)	TP40.829x32.25x0.25	12.34	552.83	0.022	1.33	1902.90	0.001
L2	83.92 - 41.25 (2)	TP51.92x38.8811x0.3125	23.17	878.99	0.026	1.49	3848.45	0.000
L3	41.25 - 0 (3)	TP62.5x49.4614x0.375	28.52	1316.53	0.022	1.49	7194.44	0.000

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### Pole Interaction Design Data

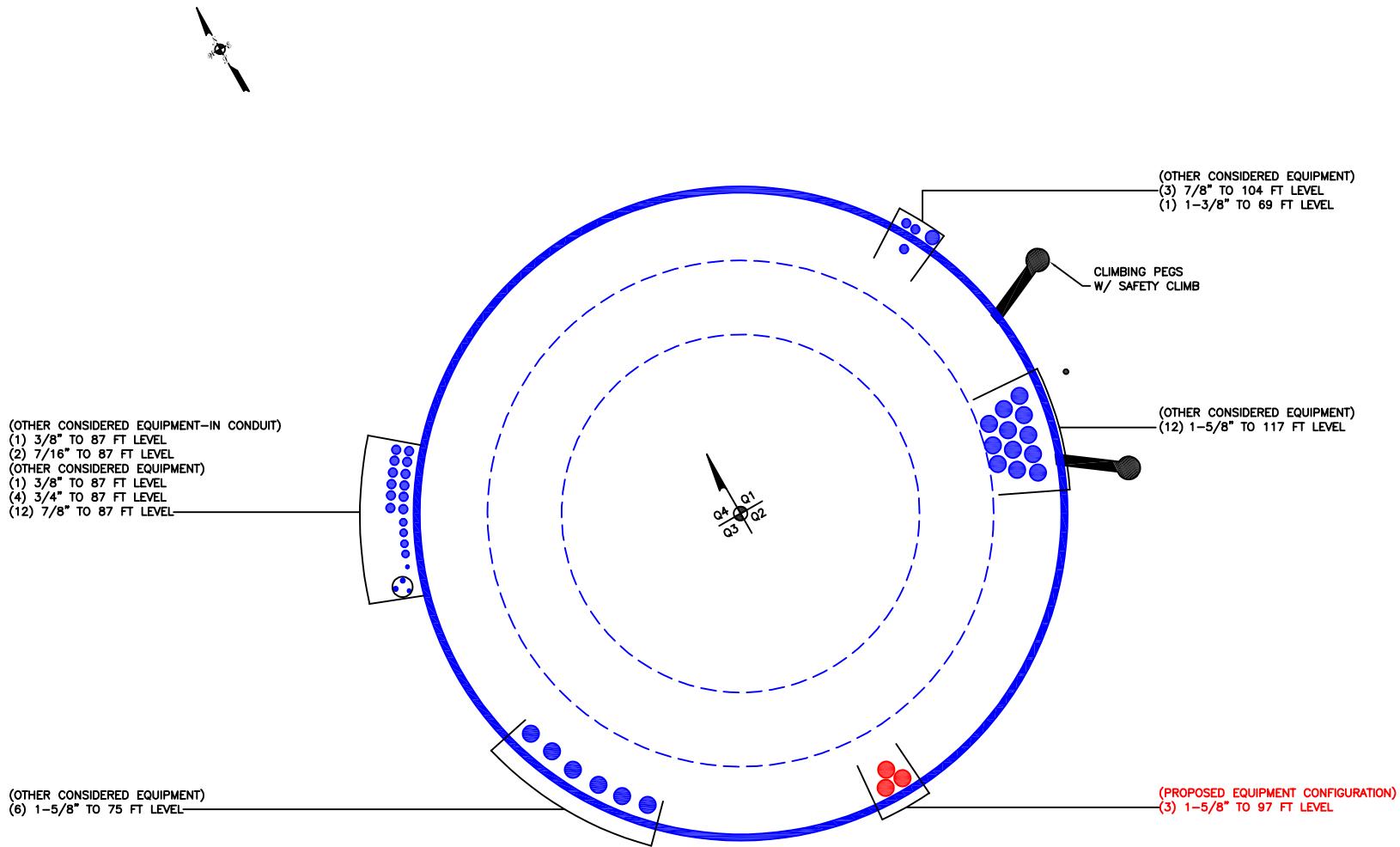
Section No.	Elevation	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft	$\phi P_n$	$\phi M_{nx}$	$\phi M_{ny}$	$\phi V_n$	$\phi T_n$			
L1	115.5 - 83.92 (1)	0.008	0.192	0.000	0.022	0.001	0.200	1.050	4.8.2
L2	83.92 - 41.25 (2)	0.011	0.393	0.000	0.026	0.000	0.405	1.050	4.8.2
L3	41.25 - 0 (3)	0.012	0.469	0.000	0.022	0.000	0.482	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	115.5 - 83.92	Pole	TP40.829x32.25x0.25	1	-12.99	1790.03	19.1	Pass
L2	83.92 - 41.25	Pole	TP51.92x38.8811x0.3125	2	-29.94	2808.03	38.6	Pass
L3	41.25 - 0	Pole	TP62.5x49.4614x0.375	3	-46.78	4073.37	45.9	Pass
			Summary			Pole (L3)	45.9	Pass
			RATING =			<b>45.9</b>	<b>45.9</b>	Pass

**APPENDIX B**

**BASE LEVEL DRAWING**



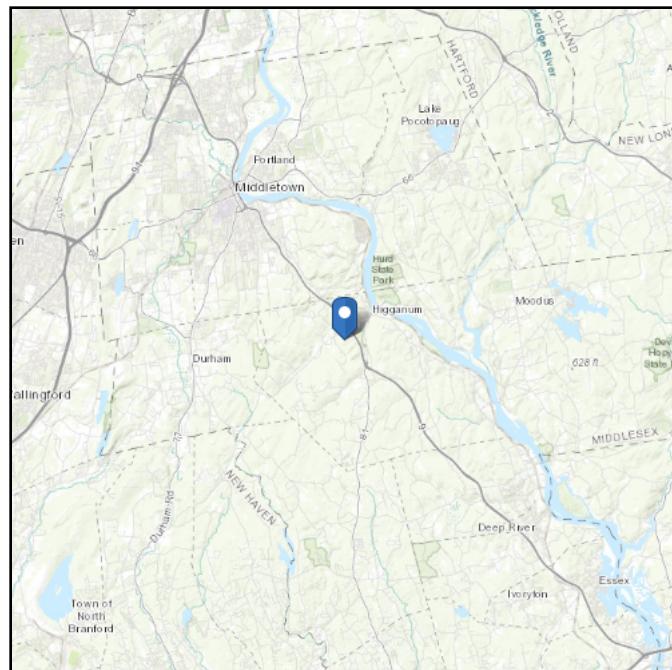
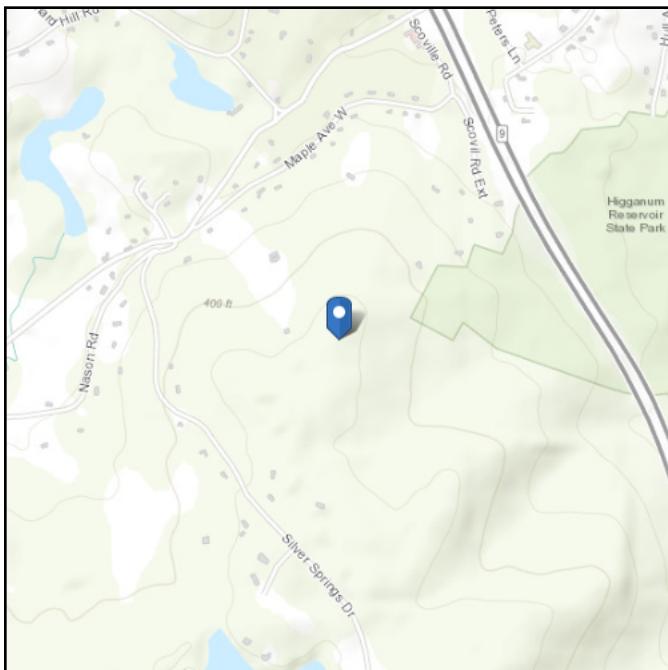
**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

# 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:** 514.59 ft (NAVD 88)  
**Latitude:** 41.484594  
**Longitude:** -72.572447



## Wind

### Results:

Wind Speed	121 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

**Data Source:** ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

**Date Accessed:** Mon Jun 20 2022

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 in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

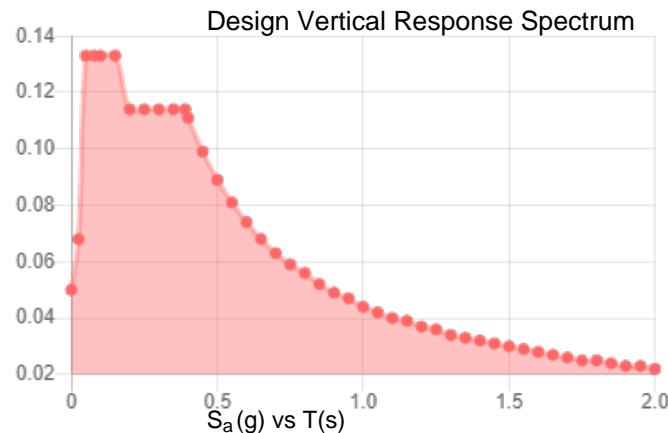
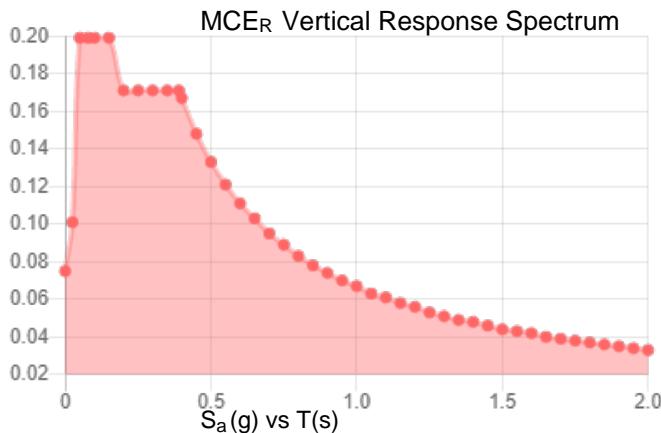
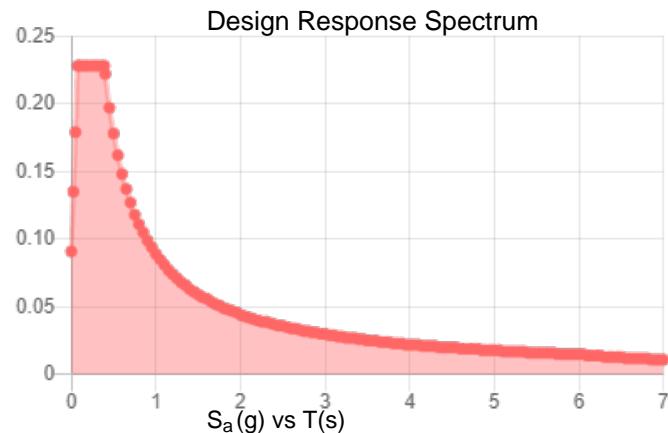
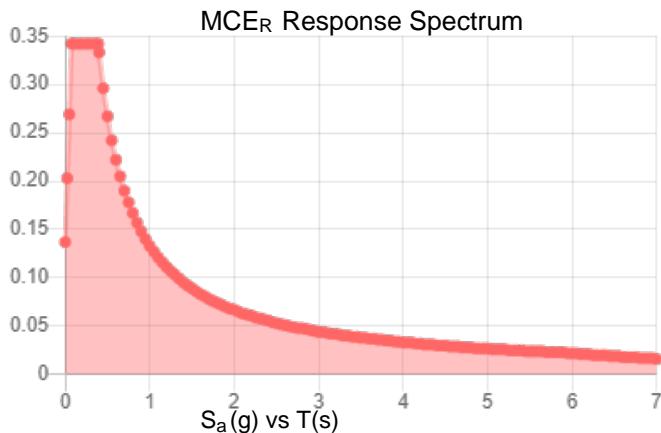
## Seismic

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

### Results:

$S_s$ :	0.214	$S_{D1}$ :	0.089
$S_1$ :	0.056	$T_L$ :	6
$F_a$ :	1.6	$PGA$ :	0.12
$F_v$ :	2.4	$PGA_M$ :	0.187
$S_{MS}$ :	0.342	$F_{PGA}$ :	1.56
$S_{M1}$ :	0.133	$I_e$ :	1
$S_{DS}$ :	0.228	$C_v$ :	0.728

**Seismic Design Category** B



**Data Accessed:** Mon Jun 20 2022

**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.

**Results:**

Ice Thickness: 1.00 in.

Concurrent Temperature: 15 F

Gust Speed 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Mon Jun 20 2022

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.

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# Monopole Base Plate Connection

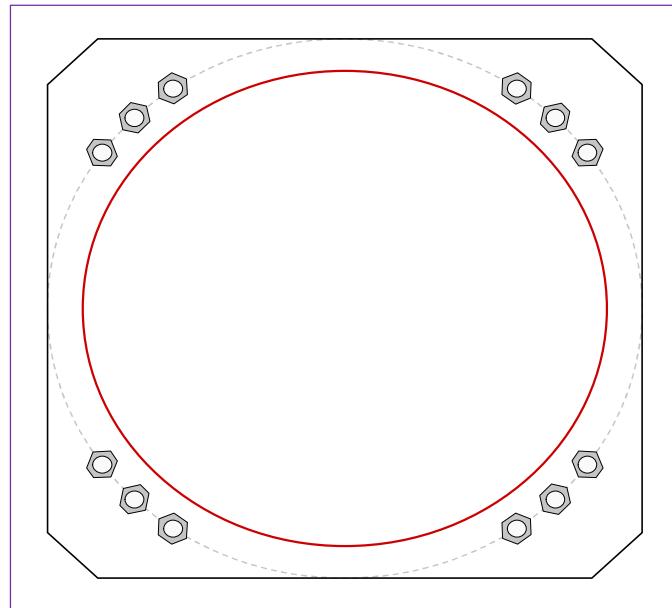


Site Info	
BU #	806367
Site Name	HRT 046 943209
Order #	621594 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	1.75

Applied Loads	
Moment (kip-ft)	2309.00
Axial Force (kips)	47.00
Shear Force (kips)	29.00

\*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 71" BC

Anchor Spacing: 6 in

### Base Plate Data

71" W x 2.5" Plate (A633 Gr. E; Fy=60 ksi, Fu=70 ksi); Clip: 6 in

### Stiffener Data

N/A

### Pole Data

62.5" x 0.375" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

## Analysis Results

### Anchor Rod Summary

(units of kips, kip-in)

$P_{u\_t} = 126.11$	$\phi P_{n\_t} = 243.75$	Stress Rating
$V_u = 2.42$	$\phi V_n = 149.1$	49.3%
$M_u = n/a$	$\phi M_n = n/a$	Pass

### Base Plate Summary

Max Stress (ksi):	26.98	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	47.6%	Pass

## Pier and Pad Foundation



BU # :	806367
Site Name:	HRT 046 943209
App. Number:	621594 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	<input type="checkbox"/>
Block Foundation?:	<input checked="" type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	47	kips
Base Shear, $V_u$ _comp:	29	kips
Moment, $M_u$ :	2309	ft-kips
Tower Height, $H$ :	115.5	ft
BP Dist. Above Fdn, $bp_{dist}$ :	4	in
Bolt Circle / Bearing Plate Width, $BC$ :	71	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	116.86	29.00	23.6%	Pass
<i>Bearing Pressure (ksf)</i>	9.00	1.52	16.9%	Pass
<i>Overturning (kip*ft)</i>	4351.04	2434.67	56.0%	Pass
<i>Pad Flexure (kip*ft)</i>	3946.25	944.13	22.8%	Pass
<i>Pad Shear - 1-way (kips)</i>	1072.17	125.77	11.2%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.002	1.4%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3730.81	0.00	0.0%	Pass

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	22.8%
Soil Rating*:	56.0%

Pad Properties		
Depth, $D$ :	3.5	ft
Pad Width, $W_1$ :	25	ft
Pad Thickness, $T$ :	4	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	8	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	26	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	3	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	120	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	12.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\varphi$ :	36	degrees
SPT Blow Count, $N_{blows}$ :	33	
Base Friction, $\mu$ :	0.4	
Neglected Depth, $N$ :	3.33	ft
Foundation Bearing on Rock?:	No	
Groundwater Depth, $gw$ :	8	ft

<-- Toggle between Gross and Net

Date: June 14, 2022



Trylon  
1825 W. Walnut Hill Lane,  
Suite 302  
Irving, TX 75038  
214-930-1730

<b>Subject:</b>	<b>Mount Analysis Report</b>	
<b>Carrier Designation:</b>	T-Mobile Equipment Change Out	
	<b>Carrier Site Number:</b>	CT11233A
	<b>Carrier Site Name:</b>	Higganum_1
<b>Crown Castle Designation:</b>	<b>BU Number:</b>	806367
	<b>Site Name:</b>	HRT 046 943209
	<b>JDE Job Number:</b>	721538
	<b>Order Number:</b>	621594 Rev. 0
<b>Engineering Firm Designation:</b>	<b>Trylon Report Designation:</b>	211661
<b>Site Data:</b>	<b>65 Maple Ave West, Haddam, Middlesex County, CT, 06441</b> <b>Latitude 41°29'4.54" Longitude -72°34'20.81"</b>	
<b>Structure Information:</b>	<b>Tower Height &amp; Type:</b>	115.5 ft Monopole
	<b>Mount Elevation:</b>	97.0 ft
	<b>Mount Width &amp; Type:</b>	12.5 ft Platform

Trylon is pleased to submit this **“Mount Analysis Report”** to determine the structural integrity of T-Mobile’s antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

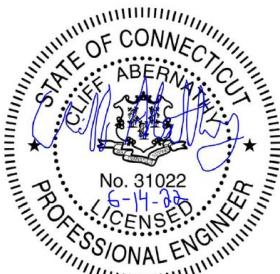
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

<b>Platform</b>	<b>Sufficient</b>
-----------------	-------------------

This analysis utilizes an ultimate 3-second gust wind speed of 121 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Steve Mustaro, P.E.

Respectfully Submitted by:  
Cliff Abernathy, P.E.



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### **2) ANALYSIS CRITERIA**

Table 1 - Proposed Equipment Configuration

### **3) ANALYSIS PROCEDURE**

Table 2 - Documents Provided

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3.2) Assumptions

### **4) ANALYSIS RESULTS**

Table 3 - Mount Component Stresses vs. Capacity

4.1) Recommendations

### **5) APPENDIX A**

Wire Frame and Rendered Models

### **6) APPENDIX B**

Software Input Calculations

### **7) APPENDIX C**

Software Analysis Output

### **8) APPENDIX D**

Additional Calculations

## 1) INTRODUCTION

This is an existing three sector 12.5 ft Platform, designed by Site Pro 1.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2015 IBC / 2018 CSBC
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	121 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor at Base:</b>	1.0
<b>Topographic Factor at Mount:</b>	1.0
<b>Ice Thickness:</b>	1.0 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic S<sub>s</sub>:</b>	0.214
<b>Seismic S<sub>1</sub>:</b>	0.056
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb
<b>Man Live Load at Mount Pipes:</b>	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
97.0	98.0	3	RFS/CELWAVE	APXVAALL24_43-U-NA20	12.5 ft Platform
		3	ERICSSON	AIR 6419 B41_TMO	
		3	ERICSSON	RADIO 4449 B71/B85A	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	

## 3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	621594 Rev. 0	CCI Sites
Mount Manufacturer Drawings	Site Pro 1	RMQP-SPT	Trylon

### 3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision E).

### 3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
- 5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Trylon should be notified to determine the effect on the structural integrity of the antenna mounting system.

## 4) ANALYSIS RESULTS

**Table 3 - Mount Component Stresses vs. Capacity (Platform, All Sectors)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2, 3, 4	Mount Pipe(s)	MP8	97.0	45.5	Pass
	Horizontal(s)	H1		14.1	Pass
	Standoff(s)	M3		29.0	Pass
	Bracing(s)	M73A		15.8	Pass
	Handrail(s)	M81		29.5	Pass
	Mount Connection(s)	-		23.6	Pass

Structure Rating (max from all components) =	45.5%
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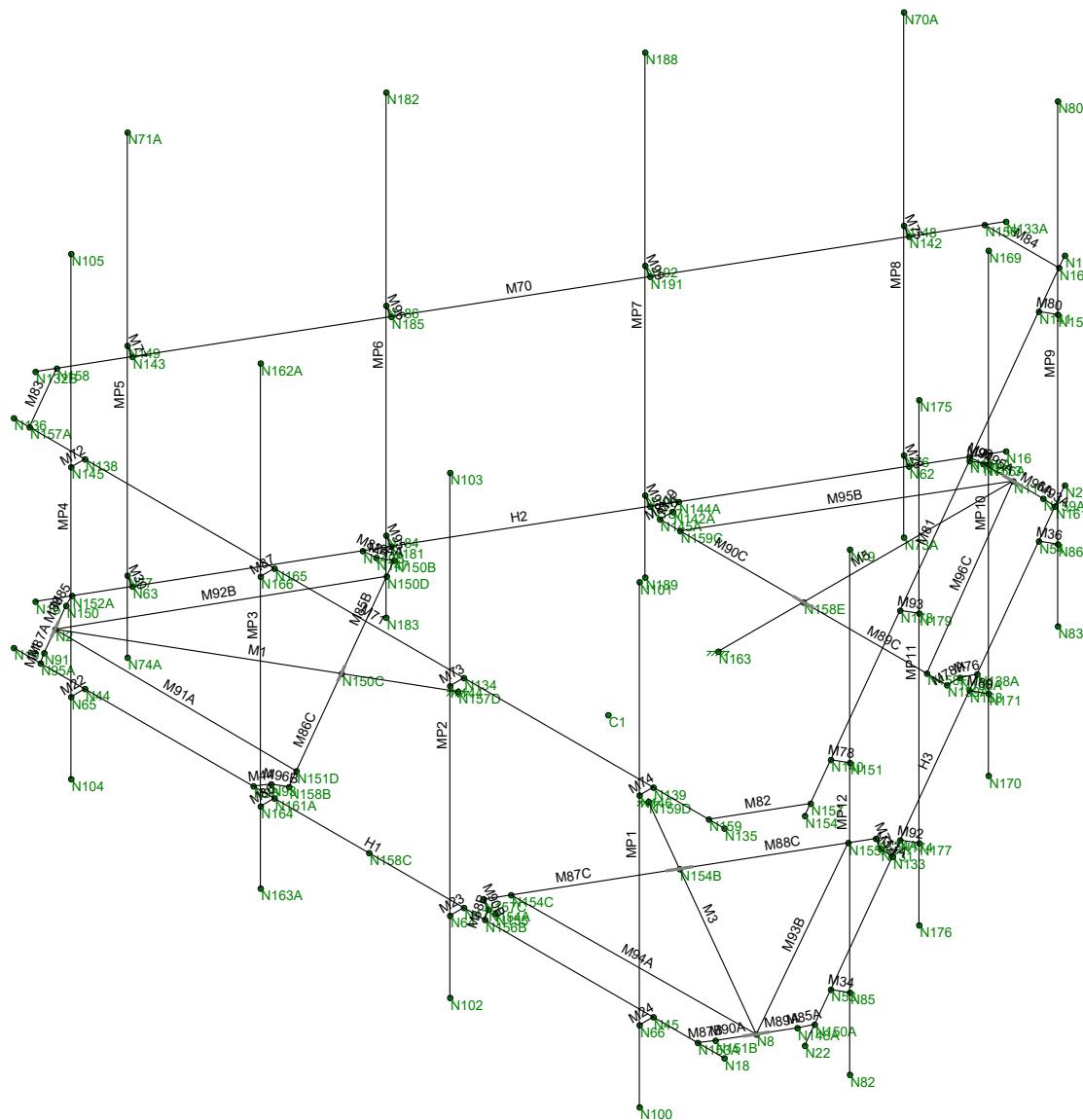
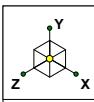
Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D – Additional Calculations" for detailed mount connection calculations.
- 3) All sectors are typical
- 4) Rating per TIA-222-H, Section 15.5

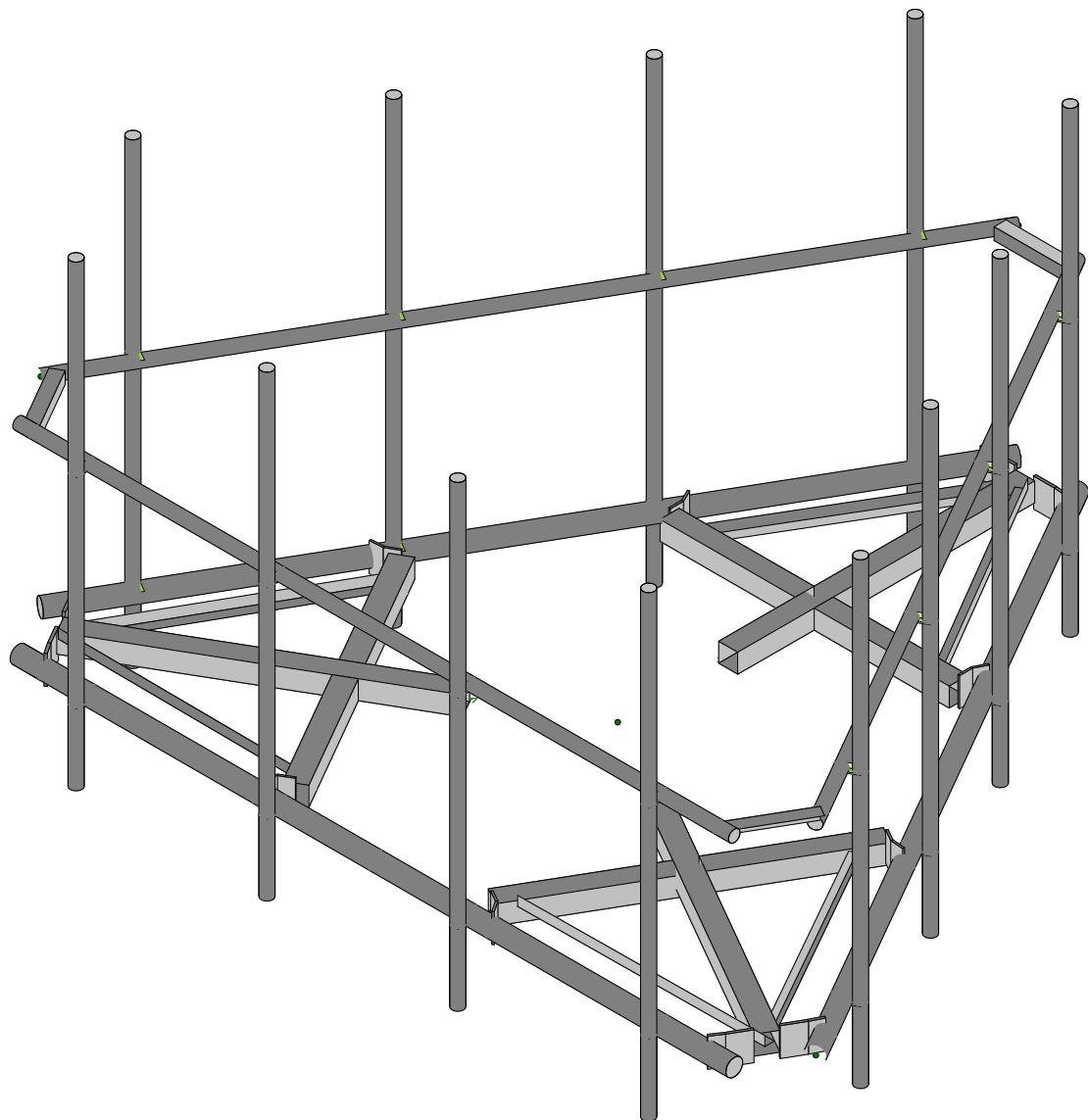
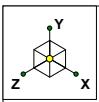
### 4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



Trylon	806367	Wireframe
SMM		June 14, 2022 at 3:31 PM
211661		806367_loaded.r3d



Trylon	806367	Render
SMM		June 14, 2022 at 3:32 PM
211661		806367_loaded.r3d

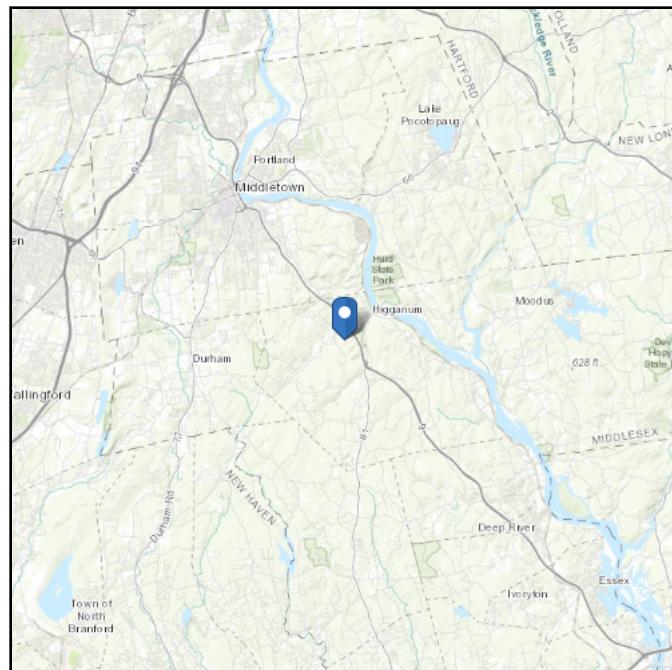
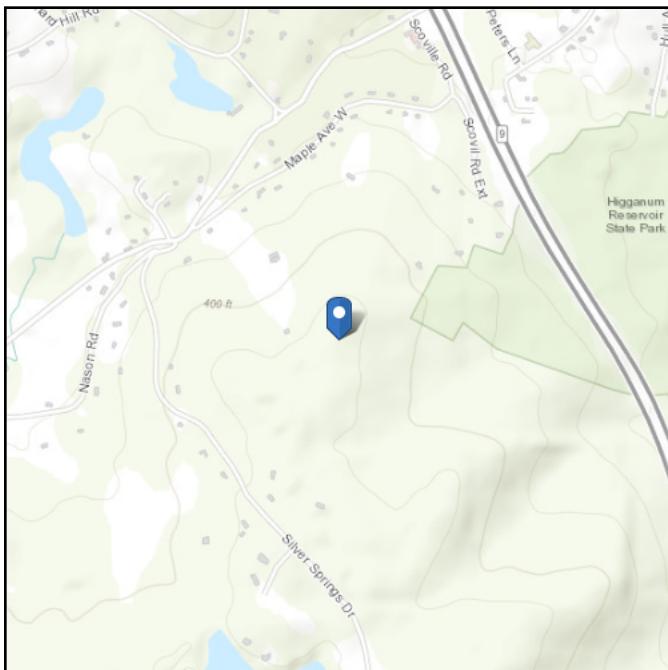
**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

# 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:** 514.59 ft (NAVD 88)  
**Latitude:** 41.484594  
**Longitude:** -72.572447



## Wind

### Results:

Wind Speed	121 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

**Data Source:** ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

**Date Accessed:** Tue Jun 14 2022

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 in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

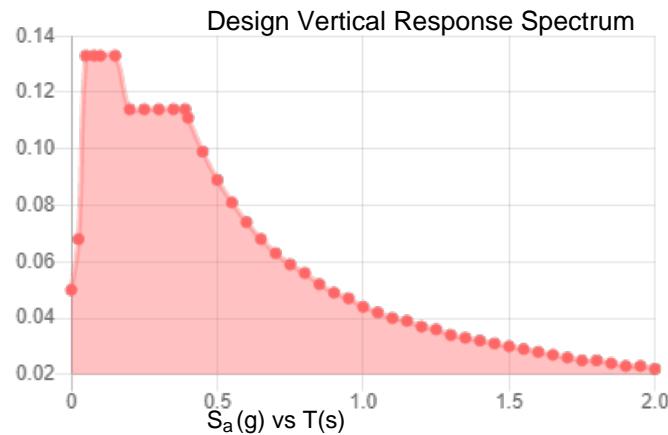
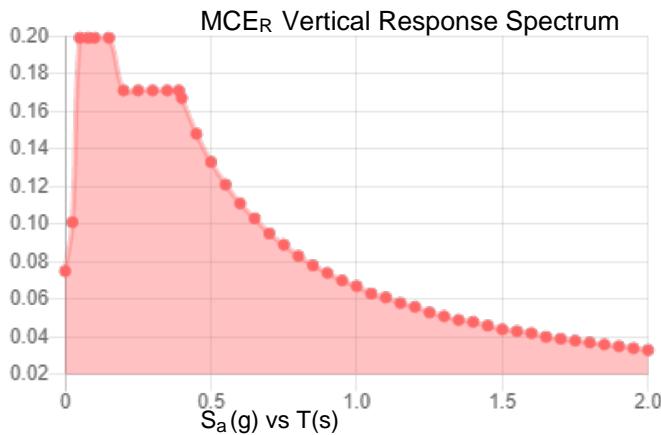
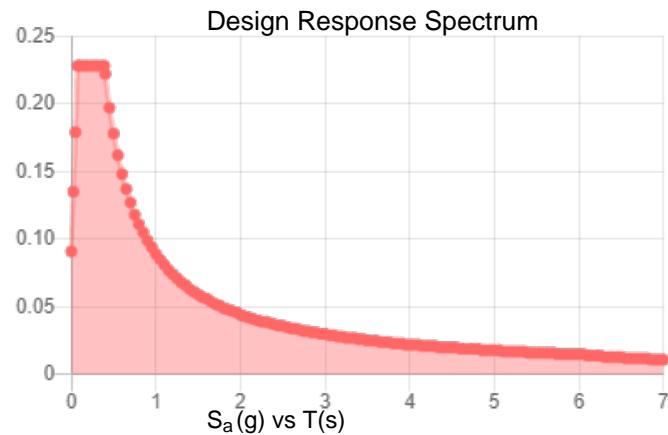
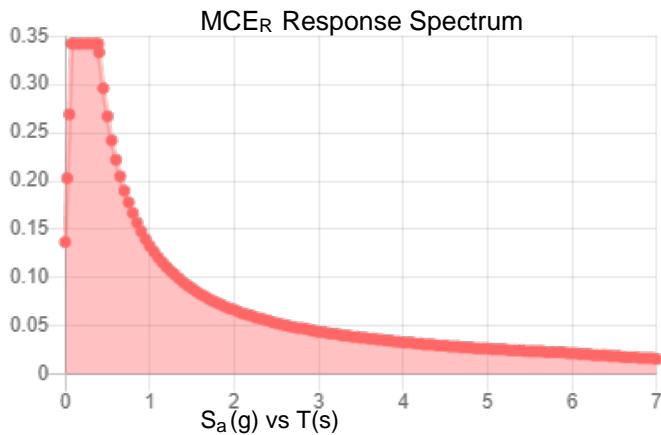
## Seismic

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

### Results:

$S_s$ :	0.214	$S_{D1}$ :	0.089
$S_1$ :	0.056	$T_L$ :	6
$F_a$ :	1.6	$PGA$ :	0.12
$F_v$ :	2.4	$PGA_M$ :	0.187
$S_{MS}$ :	0.342	$F_{PGA}$ :	1.56
$S_{M1}$ :	0.133	$I_e$ :	1
$S_{DS}$ :	0.228	$C_v$ :	0.728

**Seismic Design Category** B



**Data Accessed:** Tue Jun 14 2022

**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.

**Results:**

Ice Thickness: 1.00 in.

Concurrent Temperature: 15 F

Gust Speed 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Tue Jun 14 2022

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.

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## TIA LOAD CALCULATOR 2.2

PROJECT DATA			WIND PARAMETERS		
Job Code:	211661		Design Wind Speed:	121	mph
Carrier Site ID:	BU 806367		Wind Escalation Factor ( $K_s$ ):	1.00	--
Carrier Site Name:	HRT 046 943209		Velocity Coefficient ( $K_z$ ):	0.98	--
CODES AND STANDARDS			Directionality Factor ( $K_d$ ):	0.95	--
Building Code:	2015 IBC		Gust Effect Factor ( $G_h$ ):	1.00	--
Local Building Code:	2018 CSBC		Shielding Factor ( $K_a$ ):	0.90	--
Design Standard:	TIA-222-H		Velocity Pressure ( $q_z$ ):	34.24	psf
STRUCTURE DETAILS			Ground Elevation Factor ( $K_e$ ):	0.98	--
Mount Type:	Platform	--			
Mount Elevation:	97.0	ft.			
Number of Sectors:	3	--			
Structure Type:	Monopole	--			
Structure Height:	115.5	ft.			
ANALYSIS CRITERIA			ICE PARAMETERS		
Structure Risk Category:	II	--	Design Ice Wind Speed:	50	mph
Exposure Category:	B	--	Design Ice Thickness ( $t_i$ ):	1.00	in
Site Class:	D - Default	--	Importance Factor ( $I_i$ ):	1.00	--
Ground Elevation:	514.59	ft.	Ice Velocity Pressure ( $q_{zi}$ ):	6.65	psf
TOPOGRAPHIC DATA			Mount Ice Thickness ( $t_{iz}$ ):	1.11	in
Topographic Category:	1.00	--			
Topographic Feature:	N/A	--			
Crest Point Elevation:	0.00	ft.			
Base Point Elevation:	0.00	ft.			
Crest to Mid-Height (L/2):	0.00	ft.			
Distance from Crest (x):	0.00	ft.			
Base Topo Factor ( $K_{zt}$ ):	1.00	--			
Mount Topo Factor ( $K_{zt}$ ):	1.00	--			
SEISMIC PARAMETERS					
Importance Factor ( $I_e$ ):	1.00	--			
Short Period Accel .( $S_s$ ):	0.21	g			
1 Second Accel ( $S_1$ ):	0.06	g			
Short Period Des. ( $S_{DS}$ ):	0.23	g			
1 Second Des. ( $S_{D1}$ ):	0.09	g			
Short Period Coeff. ( $F_a$ ):	1.60	--			
1 Second Coeff. ( $F_v$ ):	2.40	--			
Response Coefficient ( $C_s$ ):	0.11	--			
Amplification Factor ( $A_s$ ):	1.20	--			

## LOAD COMBINATIONS [LRFD]

#	<i>Description</i>	#	<i>Description</i>
1	1.4DL	42	1.2DL + 1DLi + 1WLi 180 AZI
2	1.2DL + 1WL 0 AZI	43	1.2DL + 1DLi + 1WLi 210 AZI
3	1.2DL + 1WL 30 AZI	44	1.2DL + 1DLi + 1WLi 225 AZI
4	1.2DL + 1WL 45 AZI	45	1.2DL + 1DLi + 1WLi 240 AZI
5	1.2DL + 1WL 60 AZI	46	1.2DL + 1DLi + 1WLi 270 AZI
6	1.2DL + 1WL 90 AZI	47	1.2DL + 1DLi + 1WLi 300 AZI
7	1.2DL + 1WL 120 AZI	48	1.2DL + 1DLi + 1WLi 315 AZI
8	1.2DL + 1WL 135 AZI	49	1.2DL + 1DLi + 1WLi 330 AZI
9	1.2DL + 1WL 150 AZI	50	(1.2+0.2Sds) + 1.0E 0 AZI
10	1.2DL + 1WL 180 AZI	51	(1.2+0.2Sds) + 1.0E 30 AZI
11	1.2DL + 1WL 210 AZI	52	(1.2+0.2Sds) + 1.0E 45 AZI
12	1.2DL + 1WL 225 AZI	53	(1.2+0.2Sds) + 1.0E 60 AZI
13	1.2DL + 1WL 240 AZI	54	(1.2+0.2Sds) + 1.0E 90 AZI
14	1.2DL + 1WL 270 AZI	55	(1.2+0.2Sds) + 1.0E 120 AZI
15	1.2DL + 1WL 300 AZI	56	(1.2+0.2Sds) + 1.0E 135 AZI
16	1.2DL + 1WL 315 AZI	57	(1.2+0.2Sds) + 1.0E 150 AZI
17	1.2DL + 1WL 330 AZI	58	(1.2+0.2Sds) + 1.0E 180 AZI
18	0.9DL + 1WL 0 AZI	59	(1.2+0.2Sds) + 1.0E 210 AZI
19	0.9DL + 1WL 30 AZI	60	(1.2+0.2Sds) + 1.0E 225 AZI
20	0.9DL + 1WL 45 AZI	61	(1.2+0.2Sds) + 1.0E 240 AZI
21	0.9DL + 1WL 60 AZI	62	(1.2+0.2Sds) + 1.0E 270 AZI
22	0.9DL + 1WL 90 AZI	63	(1.2+0.2Sds) + 1.0E 300 AZI
23	0.9DL + 1WL 120 AZI	64	(1.2+0.2Sds) + 1.0E 315 AZI
24	0.9DL + 1WL 135 AZI	65	(1.2+0.2Sds) + 1.0E 330 AZI
25	0.9DL + 1WL 150 AZI	66	(0.9-0.2Sds) + 1.0E 0 AZI
26	0.9DL + 1WL 180 AZI	67	(0.9-0.2Sds) + 1.0E 30 AZI
27	0.9DL + 1WL 210 AZI	68	(0.9-0.2Sds) + 1.0E 45 AZI
28	0.9DL + 1WL 225 AZI	69	(0.9-0.2Sds) + 1.0E 60 AZI
29	0.9DL + 1WL 240 AZI	70	(0.9-0.2Sds) + 1.0E 90 AZI
30	0.9DL + 1WL 270 AZI	71	(0.9-0.2Sds) + 1.0E 120 AZI
31	0.9DL + 1WL 300 AZI	72	(0.9-0.2Sds) + 1.0E 135 AZI
32	0.9DL + 1WL 315 AZI	73	(0.9-0.2Sds) + 1.0E 150 AZI
33	0.9DL + 1WL 330 AZI	74	(0.9-0.2Sds) + 1.0E 180 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI	75	(0.9-0.2Sds) + 1.0E 210 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI	76	(0.9-0.2Sds) + 1.0E 225 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI	77	(0.9-0.2Sds) + 1.0E 240 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI	78	(0.9-0.2Sds) + 1.0E 270 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI	79	(0.9-0.2Sds) + 1.0E 300 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI	80	(0.9-0.2Sds) + 1.0E 315 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI	81	(0.9-0.2Sds) + 1.0E 330 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI	82-88	1.2D + 1.5 Lv1

#	Description	#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1	121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1	122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1	123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1	124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1	125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1	126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1	127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1	128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1	129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1	130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1	131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1	132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1	133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1	134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1	135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1	136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2	137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2	138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2	139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2	140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2	141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2	142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2	143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2	144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2	145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2	146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2	147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2	148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2	149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2	150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2	151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2	152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

\*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

## EQUIPMENT LOADING

## **EQUIPMENT LOADING [CONT.]**

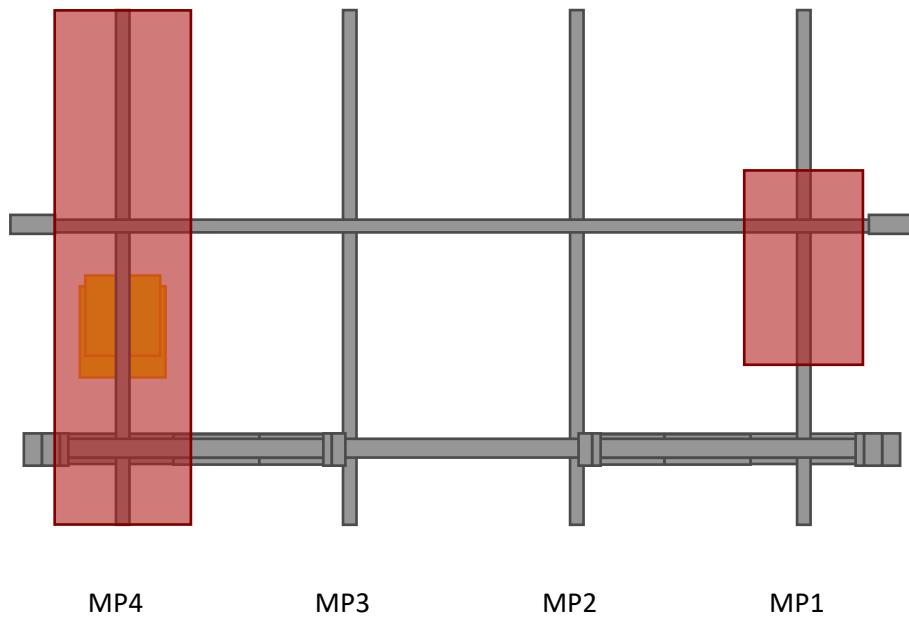
## **EQUIPMENT WIND CALCULATIONS**

## EQUIPMENT LATERAL WIND FORCE CALCULATIONS

## **EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]**

## **EQUIPMENT SEISMIC FORCE CALCULATIONS**

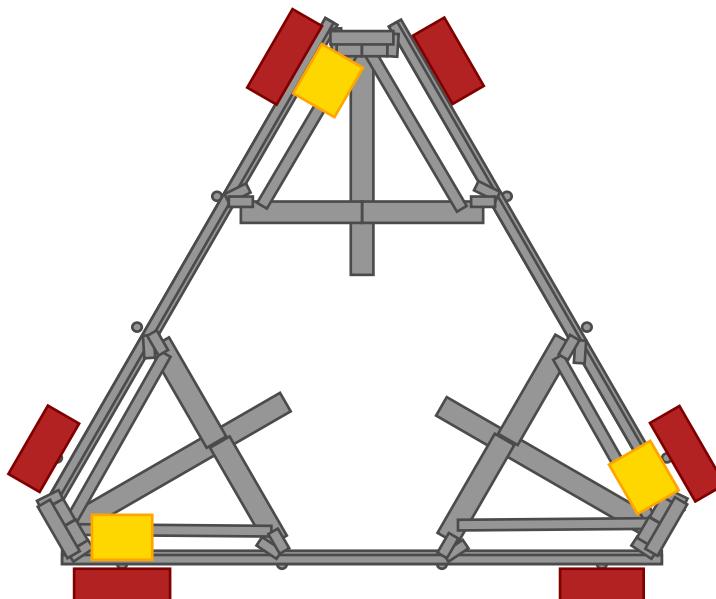
### ELEVATION VIEW



\*these drawings are intended to show approximate locations of equipment on the mount and should not be used to determine exact placement of equipment or additional hardware

\*\*Elevation View Shows Only One Sector

### PLAN VIEW





**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

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Í	ØFÍ I	GEEEE	FFFÍ I	Þ	ÞÍ	ÞJ	Í EEEE	FÈ	Í EEE
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9bj YcdY5=G7 % H fl \* \$!%\$L @F: 8 GYY7cXY7\ YWg'f7cbhjbi YXZ

9bj YcdY5=G=G%\$!% . @: 8 7c `X: cfa YX'GhYY 7cXY7| YWg

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## APPENDIX D

### ADDITIONAL CALCULATIONS

**BOLT TOOL 1.5.2**

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Carrier Site Name:	HRT 046 943209

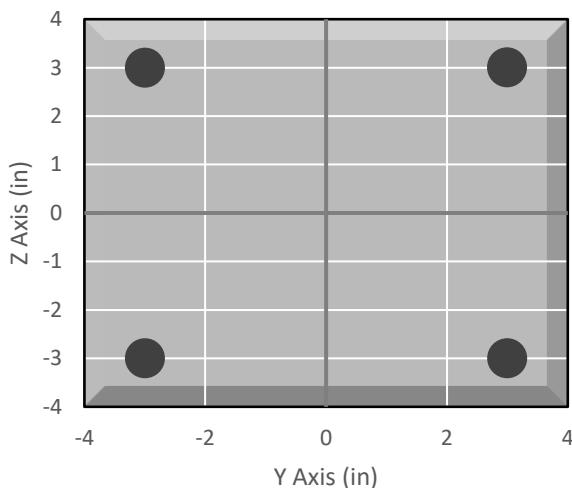
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description	
Standoff to Collar	

Bolt Check*		
Tensile Capacity ( $\phi T_n$ ):	20340.1	lbs
Shear Capacity ( $\phi V_n$ ):	13805.8	lbs
Tension Force ( $T_u$ ):	5047.7	lbs
Shear Force ( $V_u$ ):	510.2	lbs
Tension Usage:	23.6%	--
Shear Usage:	3.5%	--
Interaction:	23.6%	Pass
Controlling Member:	M3	--
Controlling LC:	13	--

\*Rating per TIA-222-H Section 15.5

**Bolt Layout**




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

T-Mobile Existing Facility

Site ID: CT11233A

Higganum\_I  
65 Maple Avenue West  
Haddam, Connecticut 06441

**August 12, 2022**

**EBI Project Number: 6222004967**

<b>Site Compliance Summary</b>	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>72.34%</b>



August 12, 2022

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

## Emissions Analysis for Site: CT11233A - Higganum\_I

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **65 Maple Avenue West in Haddam, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400  $\mu\text{W}/\text{cm}^2$  and 467  $\mu\text{W}/\text{cm}^2$ , respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000  $\mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 65 Maple Avenue West in Haddam, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts per Channel.
- 4) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 10 Watts per Channel.
- 5) 1 LTE channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.
- 6) 1 LTE channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.



- 7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 45 Watts.
- 8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 15 Watts.
- 9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 90 Watts.
- 10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 30 Watts.
- 11) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 12) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 13) The antennas used in this modeling are the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative



estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 14) The antenna mounting height centerline of the proposed antennas is 98 feet above ground level (AGL).
- 15) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 16) All calculations were done with respect to uncontrolled / general population threshold limits.



## T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd
Height (AGL):	98 feet	Height (AGL):	98 feet	Height (AGL):	98 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	180.00 Watts	Total TX Power (W):	180.00 Watts	Total TX Power (W):	180.00 Watts
ERP (W):	23,258.96	ERP (W):	23,258.96	ERP (W):	23,258.96
Antenna A1 MPE %:	<b>9.88%</b>	Antenna B1 MPE %:	<b>9.88%</b>	Antenna C1 MPE %:	<b>9.88%</b>
Antenna #:	<b>2</b>	Antenna #:	<b>2</b>	Antenna #:	<b>2</b>
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	98 feet	Height (AGL):	98 feet	Height (AGL):	98 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts
ERP (W):	16,321.77	ERP (W):	16,321.77	ERP (W):	16,321.77
Antenna A2 MPE %:	<b>8.89%</b>	Antenna B2 MPE %:	<b>8.89%</b>	Antenna C2 MPE %:	<b>8.89%</b>



Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	18.77%
Dish	19.83%
Town	0.89%
AT&T	17.89%
Metro PCS	1.09%
Verizon	13.81%
Haddam VFD	0.06%
<b>Site Total MPE % :</b>	<b>72.34%</b>

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	18.77%
T-Mobile Sector B Total:	18.77%
T-Mobile Sector C Total:	18.77%
Site Total MPE % :	72.34%

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

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	7214.60	98.0	30.64	2500 MHz LTE 1C & 2C Traffic	1000	3.06%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	538.38	98.0	2.29	2500 MHz LTE 1C & 2C Broadcast	1000	0.23%
T-Mobile 2500 MHz NR Traffic	1	14429.21	98.0	61.29	2500 MHz NR Traffic	1000	6.13%
T-Mobile 2500 MHz NR Broadcast	1	1076.77	98.0	4.57	2500 MHz NR Broadcast	1000	0.46%
T-Mobile 600 MHz LTE	1	788.97	98.0	3.35	600 MHz LTE	400	0.84%
T-Mobile 600 MHz NR	1	1577.94	98.0	6.70	600 MHz NR	400	1.68%
T-Mobile 700 MHz LTE	1	926.96	98.0	3.94	700 MHz LTE	467	0.84%
T-Mobile 1900 MHz GSM	1	350.75	98.0	1.49	1900 MHz GSM	1000	0.15%
T-Mobile 1900 MHz LTE	1	5612.03	98.0	23.84	1900 MHz LTE	1000	2.38%
T-Mobile 2100 MHz LTE	1	7065.13	98.0	30.01	2100 MHz LTE	1000	3.00%
						<b>Total:</b>	<b>18.77%</b>

- NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.



## Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	18.77%
Sector B:	18.77%
Sector C:	18.77%
T-Mobile Maximum MPE % (Sector A):	18.77%
Site Total:	72.34%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **72.34%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



**T-MOBILE SITE NUMBER:** CT11233A  
**T-MOBILE SITE NAME:** HIGGANUM\_1  
**SITE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 115'-6"

CT11233A\_ANCHOR: 67D5998E\_1XAIR+1OP

**BUSINESS UNIT #:** 806367  
**SITE ADDRESS:** 65 MAPLE AVENUE WEST  
**COUNTY:** HADDAM, CT  
**JURISDICTION:** MIDDLESEX  
**MIDDLESEX COUNTY**

T-Mobile

12920 SE 38TH STREET  
BELLEVUE, WA 98006

**CROWN CASTLE**

3 CORPORATE PARK DRIVE, SUITE 101  
CLIFTON PARK, NY 12065

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**T-MOBILE SITE NUMBER:**  
**CT11233A**

**BU #:** 806367  
**HRT** 046 943209

65 MAPLE AVENUE WEST  
HADDAM, CT

EXISTING 115'-6" MONOPOLE

<b>SITE INFORMATION</b>	
CROWN CASTLE USA INC.	HRT 046 943209
SITE NAME:	
SITE ADDRESS:	65 MAPLE AVENUE WEST HADDAM, CT
COUNTY:	MIDDLESEX
MAP/PARCEL #:	VERIFY
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.48458500° (41°29'04.5")
LONGITUDE:	-72.57249800° (72°34'21.0")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	±339 FT
CURRENT ZONING:	TBD
JURISDICTION:	MIDDLESEX COUNTY
OCCUPANCY CLASSIFICATION:	TBD
TYPE OF CONSTRUCTION:	TBD
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TBD ---
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	TBD
TELCO PROVIDER:	TBD

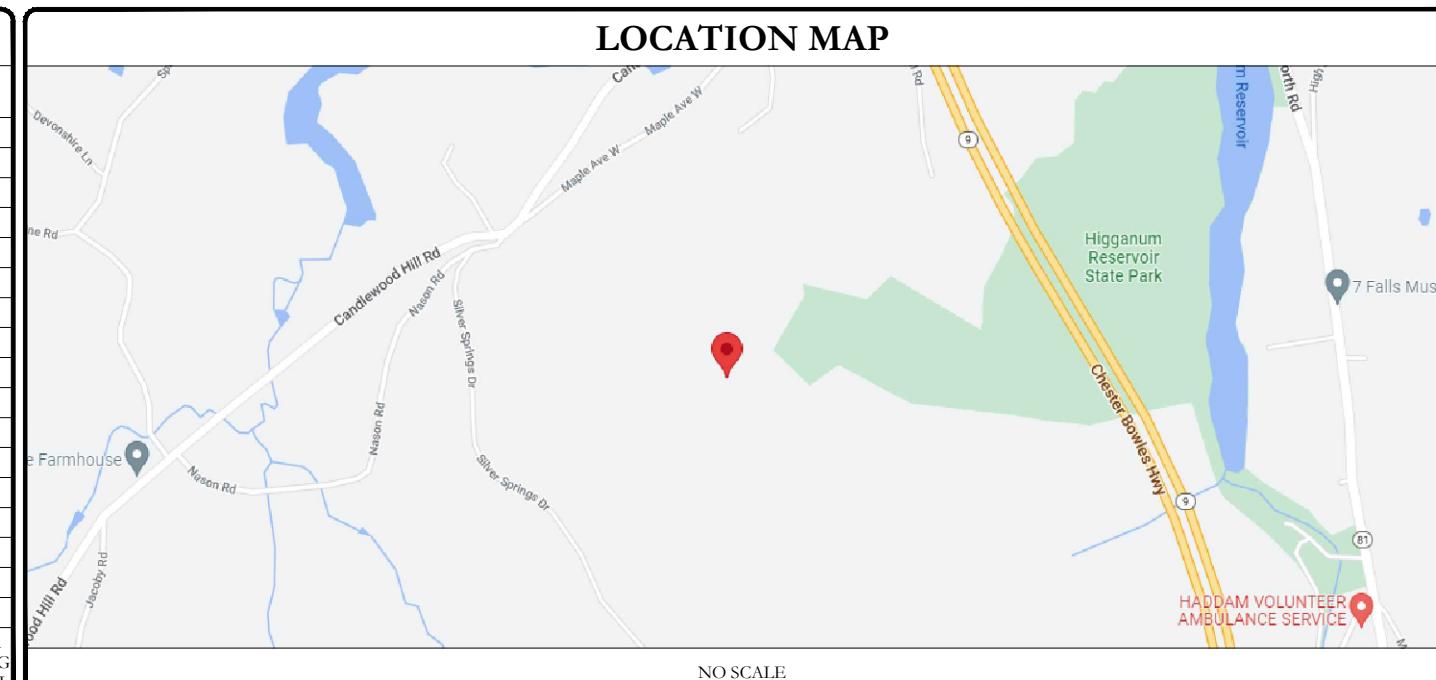
<b>PROJECT TEAM</b>	
A&E FIRM:	INFINIGY 500 WEST OFFICE CENTER DR. SUITE 150, FORT WASHINGTON, PA 19034
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TBD - PROJECT MANAGER
	TBD - CONSTRUCTION MANAGER

<b>DRAWING INDEX</b>	
SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
C-6	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

<b>PROJECT DESCRIPTION</b>	
A&E FIRM:	THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.
CROWN CASTLE USA INC. DISTRICT CONTACTS:	TOWER SCOPE OF WORK: • REMOVE (3) ANTENNAS • REMOVE (6) TMAS • REMOVE ALL COAX CABLES • INSTALL (3) ANTENNAS • INSTALL (3) RRHS • INSTALL (2) HYBRID CABLES
<p>GROUND SCOPE OF WORK:</p> <ul style="list-style-type: none"> <li>• REMOVE (3) ERICSSON - 4415 B66A RRUS</li> <li>• REMOVE (6) RUS01 B2 FROM (E) RBS 6201 CABINET</li> <li>• INSTALL (1) 6160 &amp; (1) B160 BATTERY CABINET</li> <li>• INSTALL (1) PSU4813 VOLTAGE BOOSTER IN (P) CABINET</li> <li>• INSTALL (1) CSR IXRE ROUTER IN (P) CABINET</li> <li>• INSTALL (1) RP 6651 IN (P) CABINET</li> </ul>	

NOTE: PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.



### APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS 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 THESE CODES:

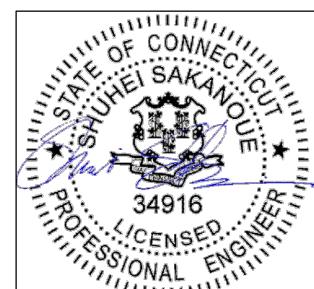
CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

#### REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	TOWER ENGINEERING PROFESSIONALS
DATED:	06/22/2022
MOUNT ANALYSIS:	TRYLON
DATED:	06/14/2022
RFDS REVISION:	6
DATED:	05/26/2022
ORDER ID:	621594
REVISION:	0

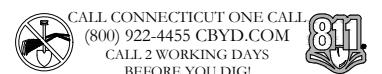
### APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

**SHEET NUMBER:** T-1    **REVISION:** 0



THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

## CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

- NOTICE TO PROCEED—NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
- "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT: THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
- 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 CED-STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
- ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED-STD-10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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 CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR 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 E) CONSTRUCTION SAFETY PROCEDURES.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- 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, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPAKTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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 CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
- CONTRACTOR 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.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- CONTRACTOR 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- 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.

## GREENFIELD GROUNDING NOTES:

- 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.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
- THE CONTRACTOR 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.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- 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.
- EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES. #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
- 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.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTI-OXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING 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 CONDUIT SHALL BE USED, WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
- BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

## GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
CARRIER: T-MOBILE  
TOWER OWNER: CROWN CASTLE USA INC.
- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
- THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
- NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRIORITY OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
- SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 CROWN CASTLE.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
- CONTRACTOR 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

## ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECT, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
- END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR 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.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RELATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- 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 NOT LESS THAN 75° C (90° C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90's AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNTOWNS (WIREMOLD SPECIMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) 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.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHELL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA 0S 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA 0S 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T-MOBILE".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

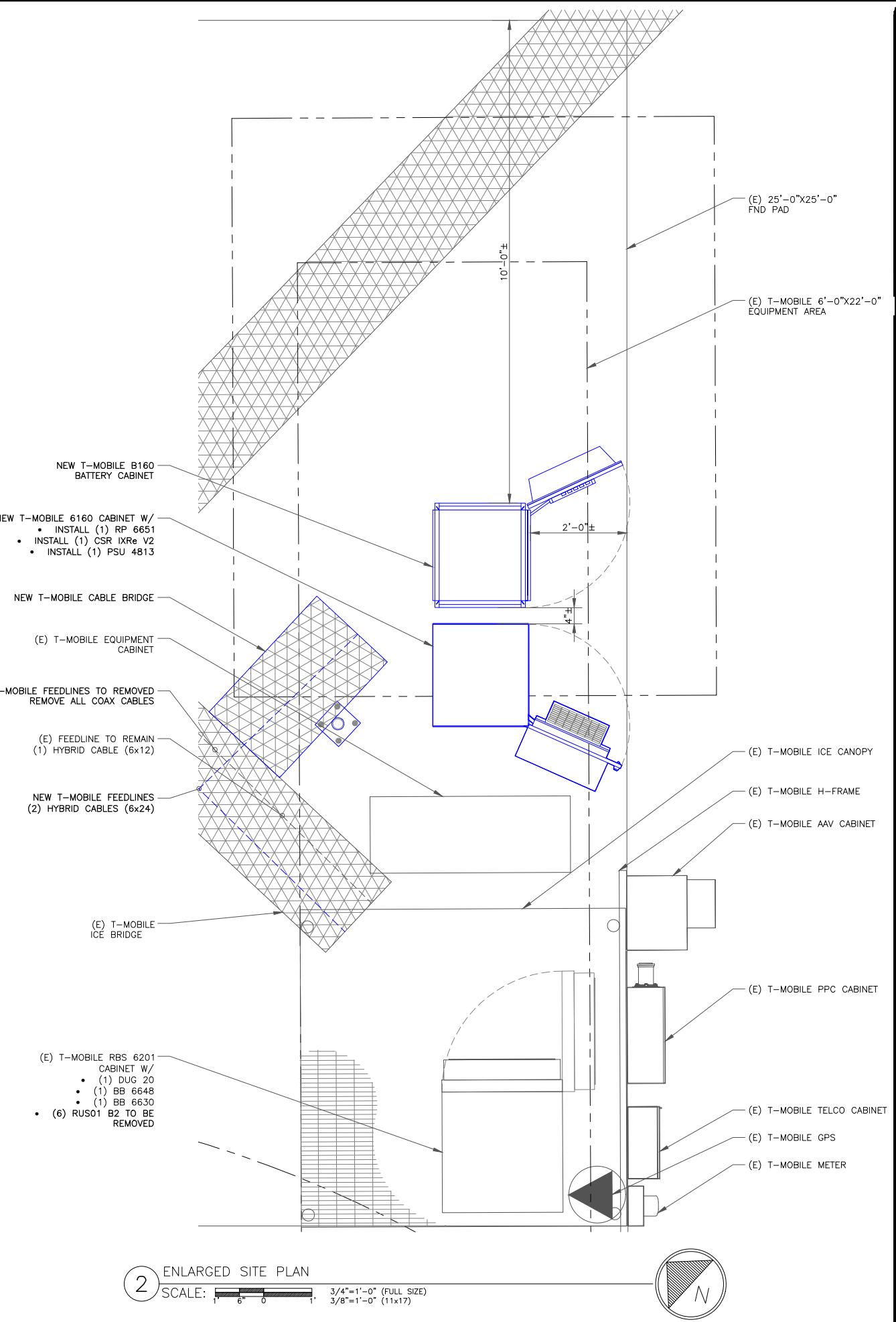
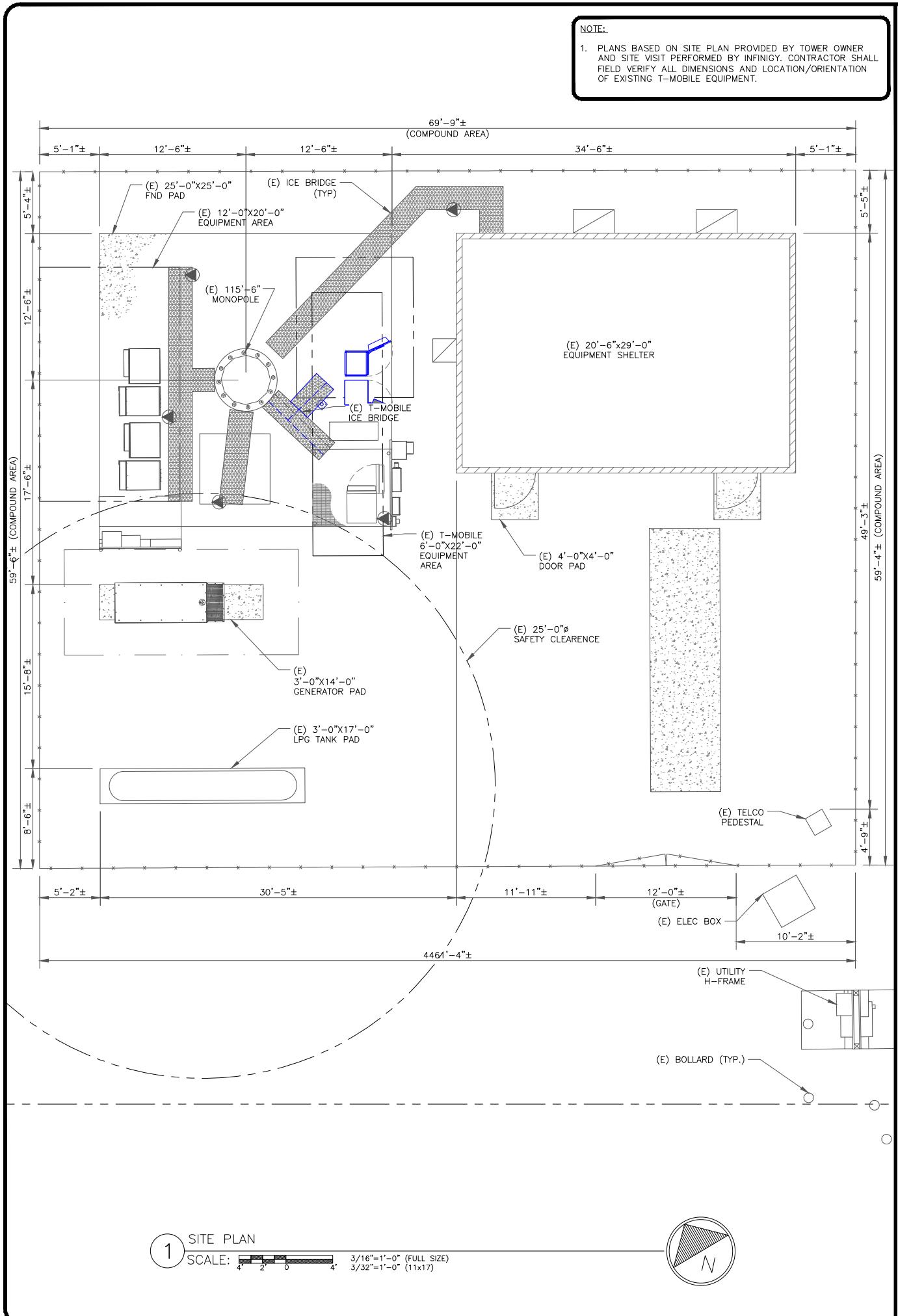
CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
	POS (+)	RED**
	NEG (-)	BLACK**

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

\*\* POLARITY MARKED AT TERMINATION

## APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE



•••Mobile•••

12920 SE 38TH STREET  
BELLEVUE, WA 98006

The logo for Crown Castle, featuring the letters 'CC' in a stylized, rounded font to the left of the words 'CROWN' and 'CASTLE' in a bold, sans-serif font.

# INFINIGY®

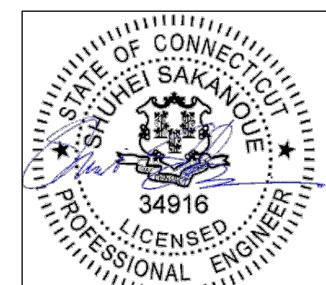
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T-MOBILE SITE NUMBER:  
**CT11233A**

BU #: 806367  
HRT 046 943209

65 MAPLE AVENUE WEST  
HADDAM, CT

## EXISTING 115'-6" MONOPOLE

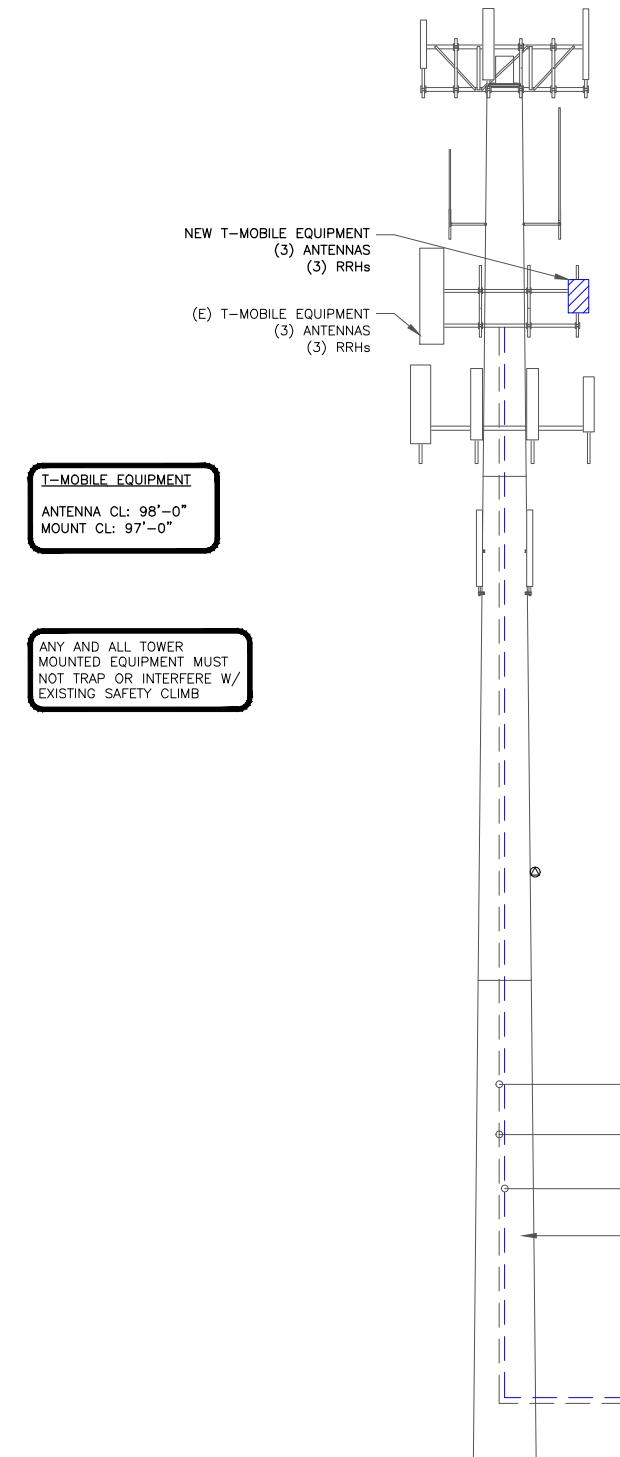


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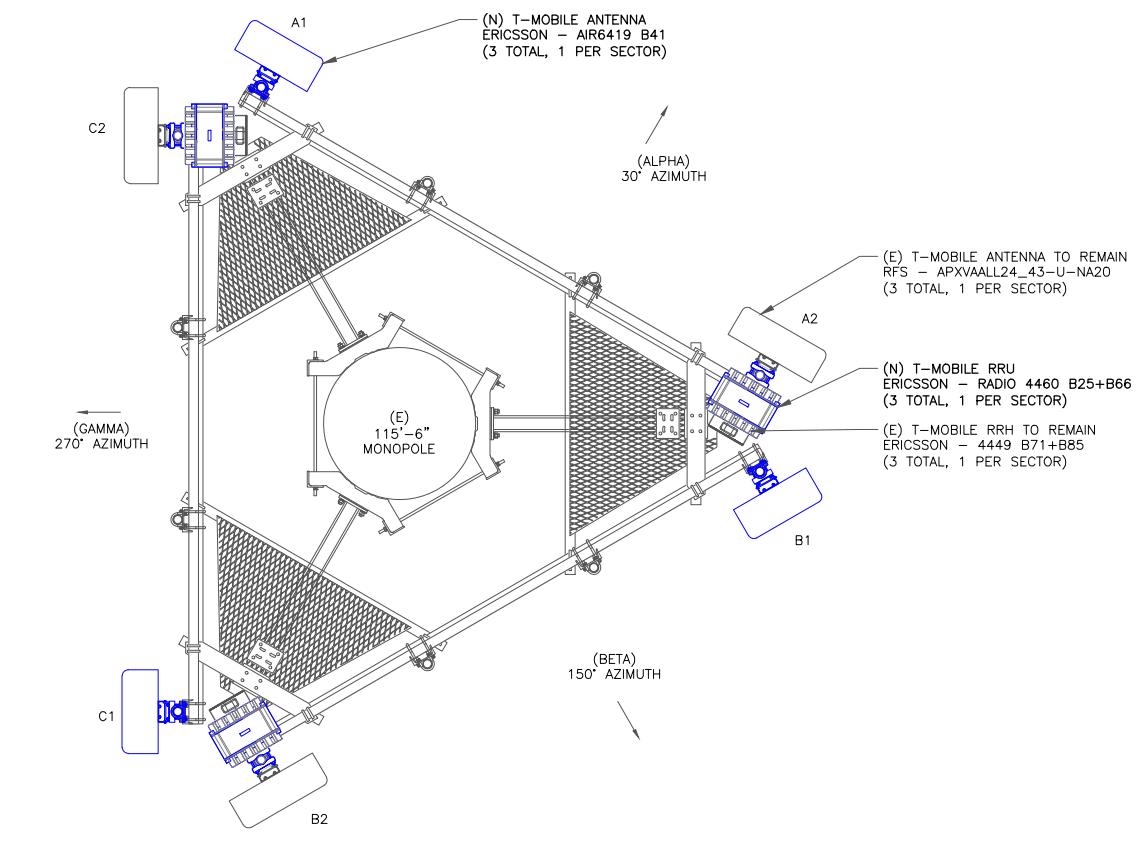
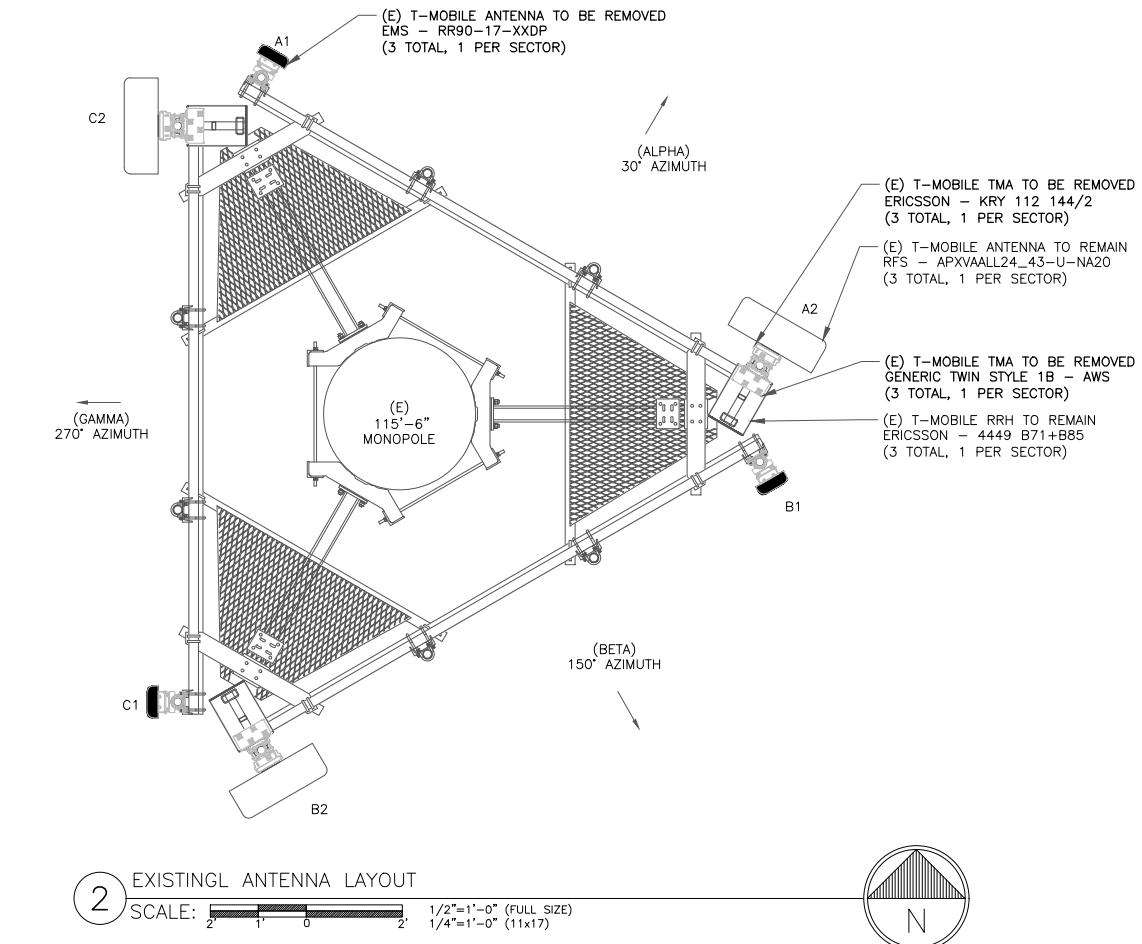
SHEET NUMBER: C-1 REVISION: 0

NOTES:

1. ELEVATION BASED ON DRAWING PROVIDED BY TOWER OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.
2. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



TOP OF STRUCTURAL/APPROAUNTANCE ELEV. = 122'-0"  
RAD CENTER OF ANTENNA MOUNT ELEV. = 117'-0"  
TOP OF MONOPOLE ELEV. = 115'-6"  
RAD CENTER OF ANTENNA MOUNT ELEV. = 104'-0"  
TOP OF ANTENNA ELEV. = 99'-6"  
RAD CENTER OF ANTENNA MOUNT ELEV. = 98'-0"  
RAD CENTER OF ANTENNA MOUNT ELEV. = 97'-0"  
RAD CENTER OF ANTENNA MOUNT ELEV. = 87'-0"  
RAD CENTER OF ANTENNA MOUNT ELEV. = 75'-0"



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**CT1123A**

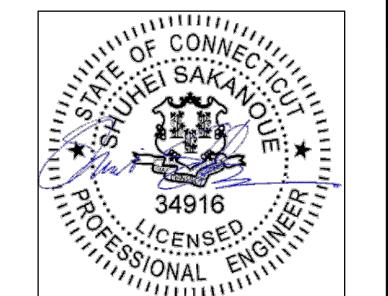
BU #: 806367  
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65 MAPLE AVENUE WEST  
HADDAM, CT

EXISTING 115'-6" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES/QA
0	08/01/2022	RCD	100% FINALS	SS



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BU #: 806367  
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65 MAPLE AVENUE WEST  
HADDAM, CT

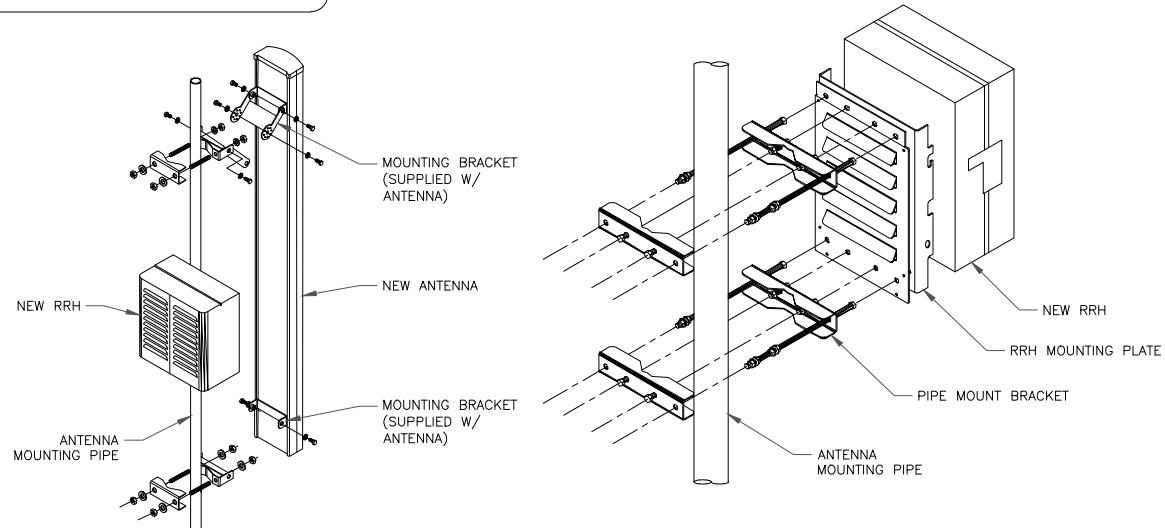
EXISTING 115'-6" MONOPOLE

**1** ANTENNA AND CABLE SCHEDULE

SCALE: NOT TO SCALE

INSTALLER NOTES:

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



**2** ANTENNA WITH RRH MOUNTING DETAIL

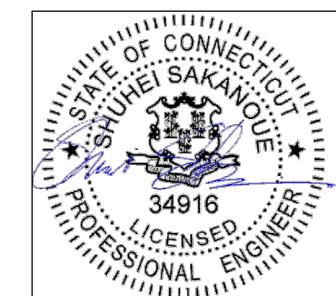
SCALE: NOT TO SCALE

NOTE:

1. CONTRACTOR SHALL INSTALL 3RD DUAL RRH MOUNT TO ACCOMMODATE ALL RRH BRACKETS HOLES IF NECESSARY.

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SHEET NUMBER: **C-3** REVISION: **0**



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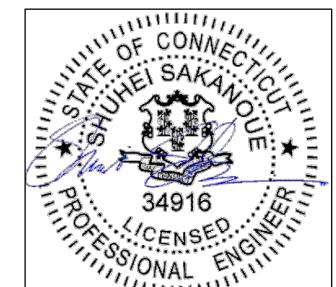
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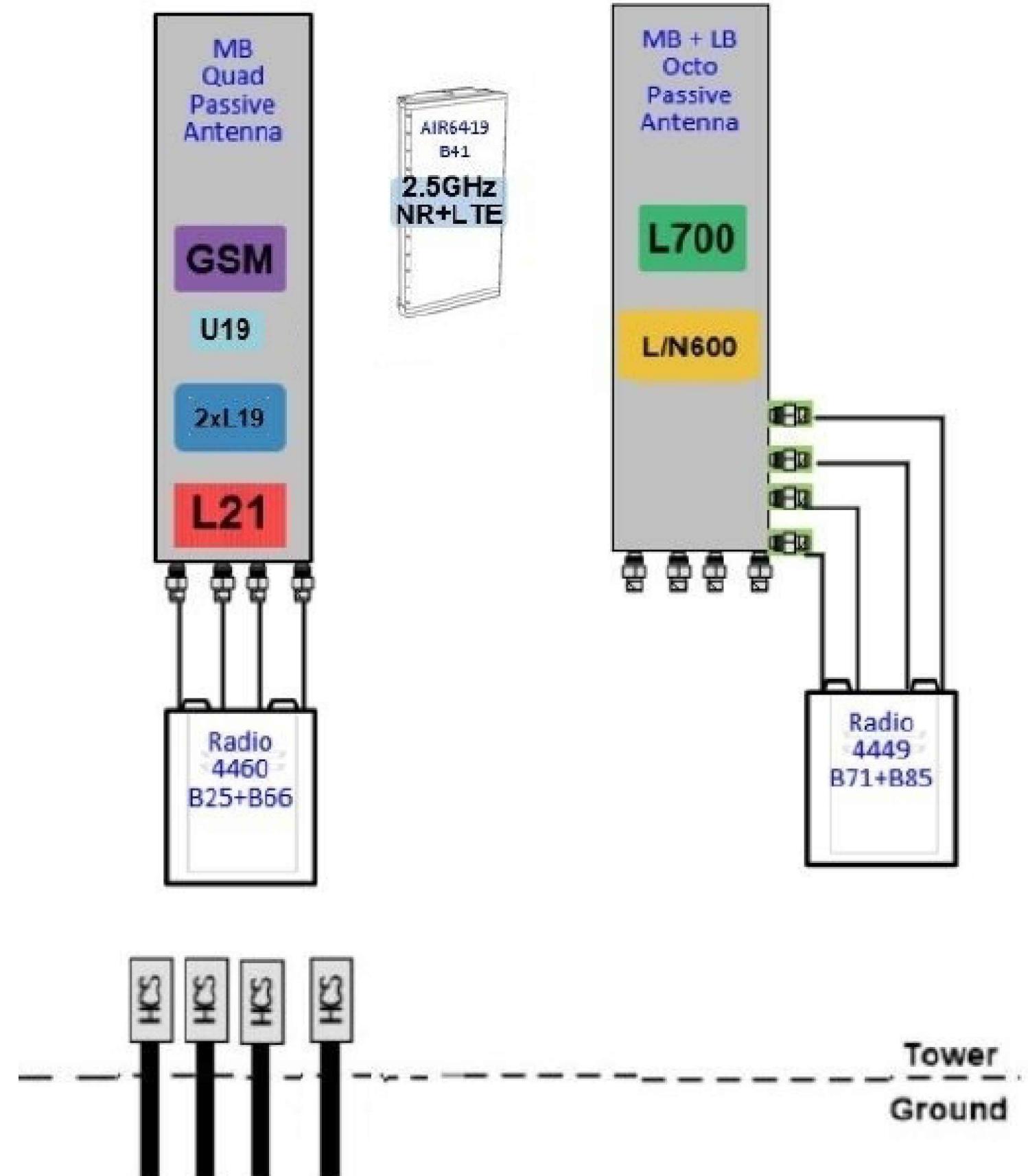
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/01/2022	RCD	100% FINALS	SS



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SHEET NUMBER: **C-4** REVISION: **0**



PLUMBING DIAGRAM  
1 SCALE: NOT TO SCALE

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**T-MOBILE SITE NUMBER:**  
**CT1123A**

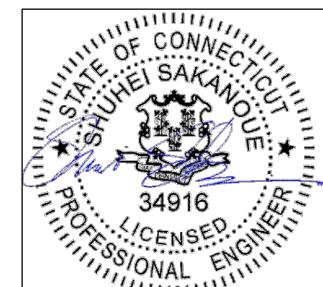
**BU #:** 806367  
**HRT** 046 943209

65 MAPLE AVENUE WEST  
HADDAM, CT

EXISTING 115'-6" MONOPOLE

**ISSUED FOR:**

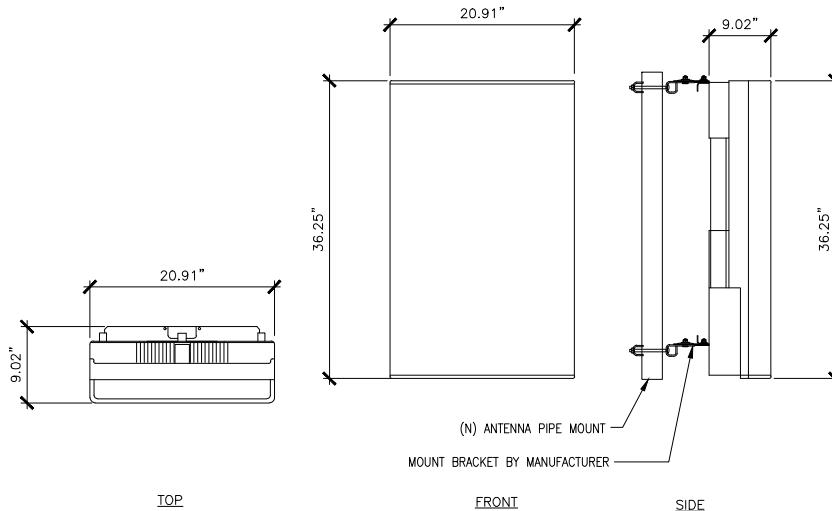
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**SHEET NUMBER:** **C-5** **REVISION:** **0**

MANUFACTURER: ERICSSON  
MODEL: AIR6419 B41  
WEIGHT: 96.5 LBS (W/ MOUNT BRACKET 113)  
DIMENSIONS: 36.25" H. X 20.91" W. X 9.02" D.  
FREQUENCY: REFER TO RF DATA SHEET

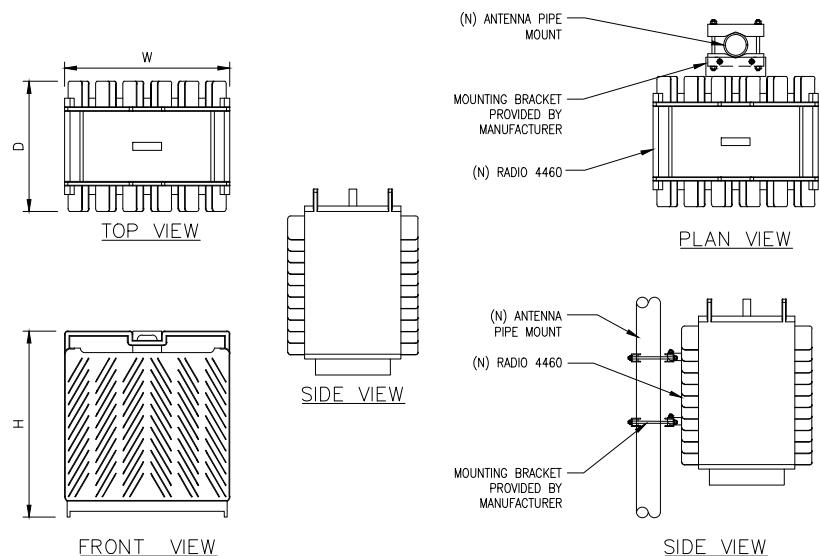


1 (N) AIR6419 B41 ANTENNA SPEC

SCALE: NOT TO SCALE

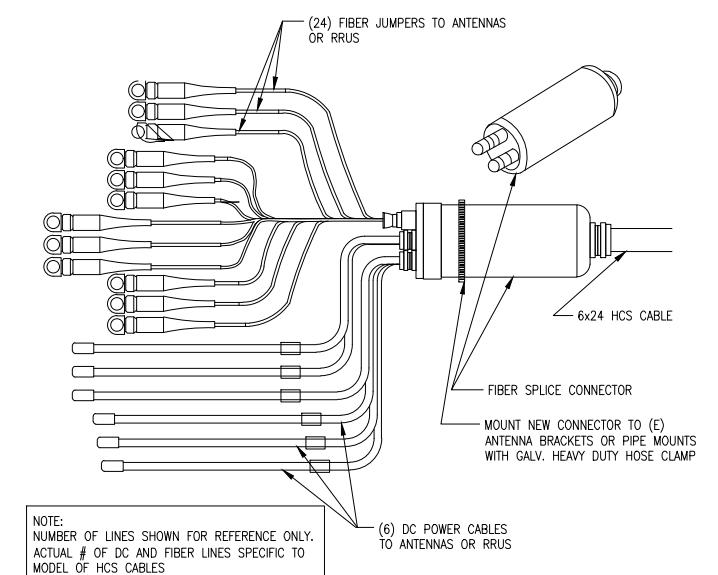
**ERICSSON RADIO-4460 B25 B66**

DIMENSIONS, WxDxH: 17.0" x 15.1" x 11.9"  
MAX OUTPUT POWER: 4x80W (2x(2x80W))  
TOTAL WEIGHT: 109 lbs  
TEMPERATURE: -40° TO 55° C



2 (N) RADIO 4460 SPEC

SCALE: NOT TO SCALE



3 (N) 6X24 HCS CABLE DETAIL

SCALE: NOT TO SCALE

4 NOT USED

SCALE: NOT TO SCALE

5 NOT USED

SCALE: NOT TO SCALE

6 NOT USED

SCALE: NOT TO SCALE

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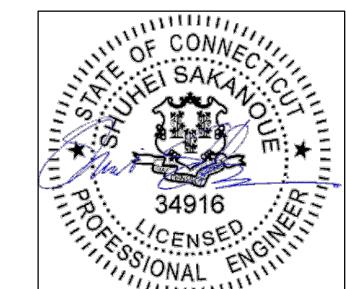
BU #: 806367  
HRT 046 943209

65 MAPLE AVENUE WEST  
HADDAM, CT

EXISTING 115'-6" MONOPOLE

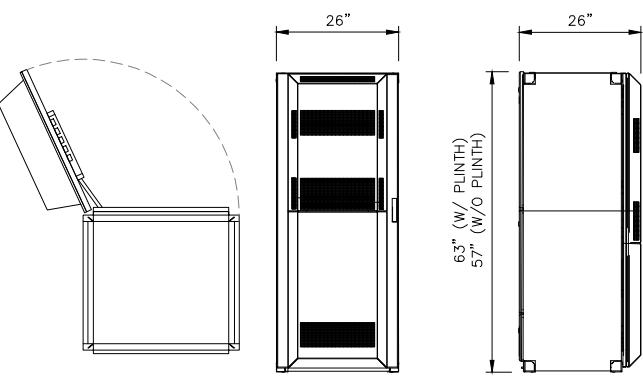
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SHEET NUMBER: **C-6** REVISION: **0**



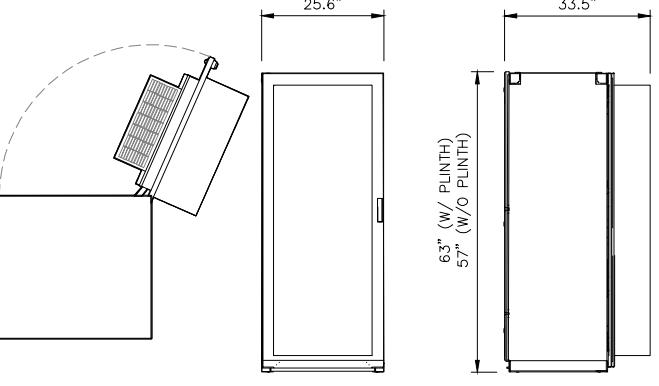
TOP VIEW

FRONT VIEW

SIDE VIEW

ERICSSON MODEL NO.: **B160**

RACK SPACE: 19U  
DIMENSIONS, HxWxD: 63" x 26" x 26" (W/ 6" PLINTH)  
CABINET WEIGHT, EMPTY: 485 LBS  
MAXIMUM WEIGHT: 2100± LBS



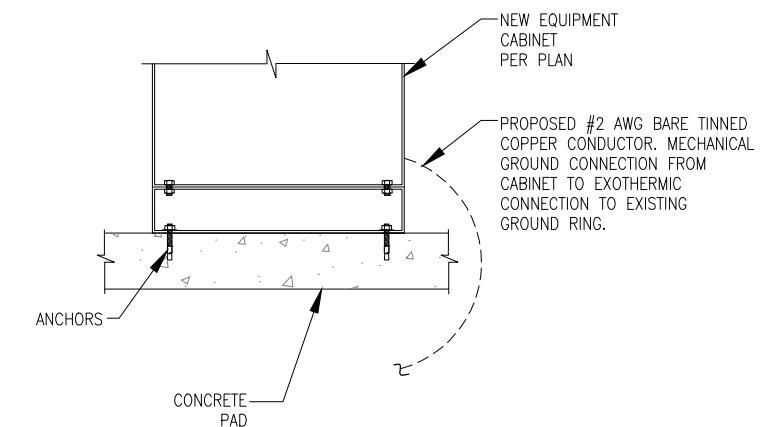
TOP VIEW

FRONT VIEW

SIDE VIEW

ERICSSON MODEL NO.: **6160**

RACK SPACE: 19U  
DIMENSIONS, HxWxD: 63" x 25.6" x 25.6" (W/ 6" PLINTH)  
CABINET WEIGHT, EMPTY: 410 LBS  
MAXIMUM WEIGHT: 770± LBS



① (N) B160 CABINET DETAIL

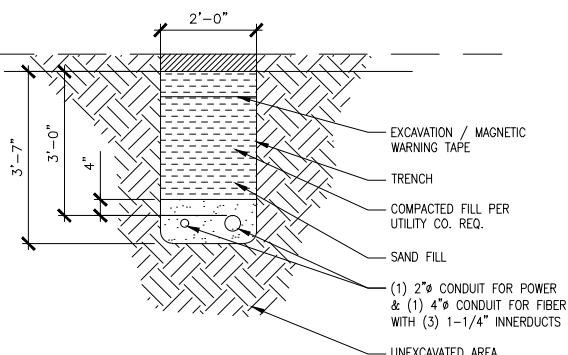
SCALE: NOT TO SCALE

② (N) 6160 CABINET DETAIL

SCALE: NOT TO SCALE

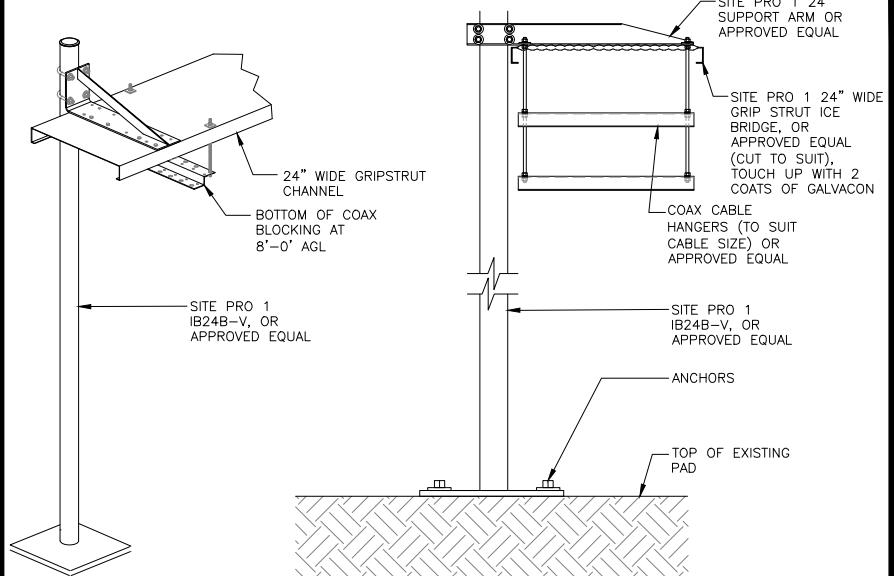
③ (N) EQUIPMENT CABINET MOUNTING DETAIL

SCALE: NOT TO SCALE



④ (N) CONDUIT TRENCH DETAIL

SCALE: NOT TO SCALE



SITE PRO 1 PART #

BASE SHOE PIPE COLUMNS  
10'-6" COLUMN IB24B-V

⑤ CABLE BRIDGE DETAIL

SCALE: NOT TO SCALE

⑥ NOT USED

SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:  
**CT11233A**

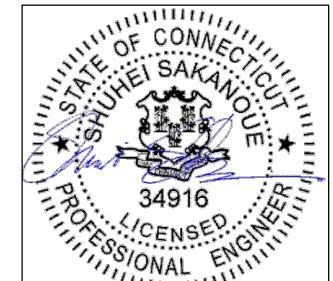
BU #: 806367  
**HRT 046 943209**

65 MAPLE AVENUE WEST  
HADDAM, CT

EXISTING 115'-6" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES/QA
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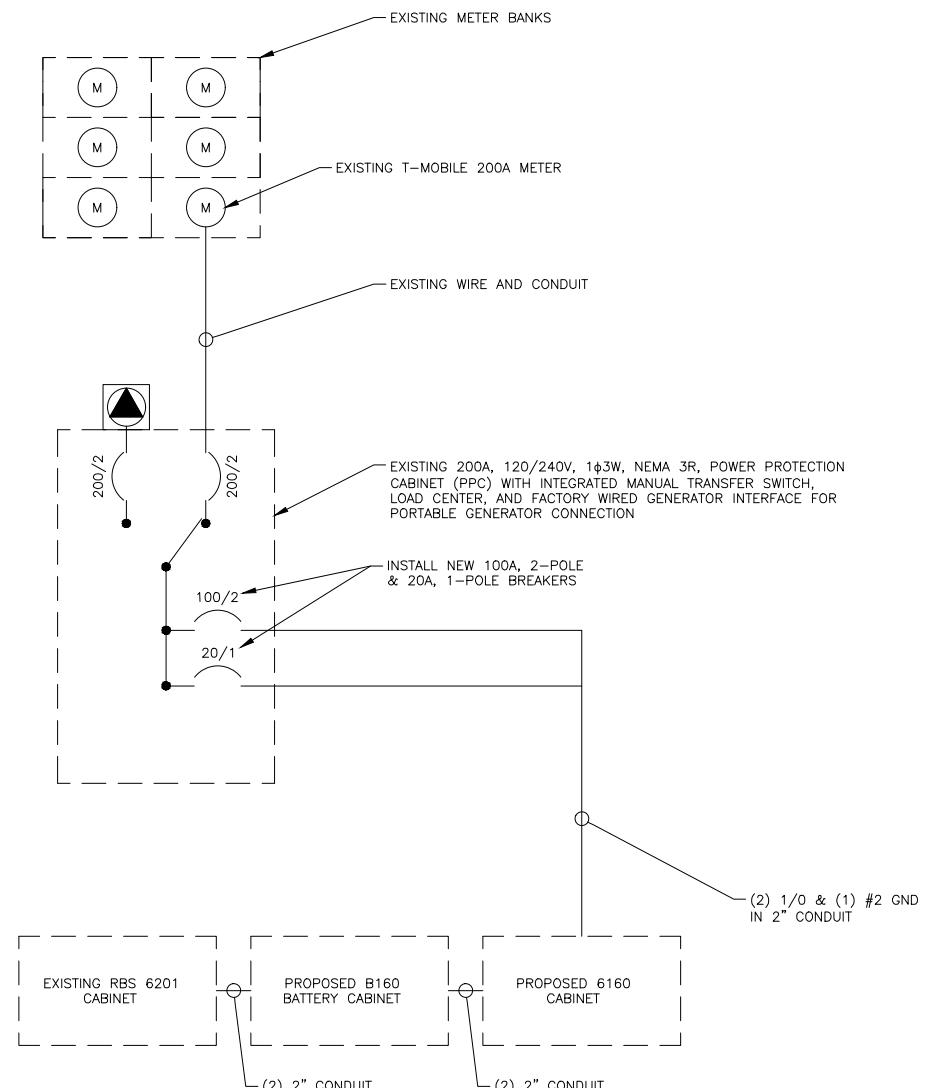


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SHEET NUMBER: **E-1** REVISION: **0**

NOTES:

- ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, OR XHHW-2 UNLESS NOTED OTHERWISE.
- CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- ALL GROUNDING AND BONDING PER THE NEC.



1 ONE LINE DIAGRAM  
SCALE: NOT TO SCALE

**T-MOBILE PANEL SCHEDULE**

MAIN: 200A MAIN BREAKER			VOTAGE/PHASE: 120/240V, 1-PHASE, 3-WIRE			SHORT CIRCUIT CURRENT RATING: --				
MOUNTING: INSIDE PPC ENCLOSURE			ENCLOSURE: NEMA 3R			SURGE PROTECTION DEVICE: YES				
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	PHASE LOADS (VA)	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
6160	8750	C	100	1	8751	7	60	NC	1	SURGE ARRESTOR
	8750	C		2	8751	8		NC	1	
6160 GFI	180	NC	20	3	180	9	20	NC	0	OFF
TELCO FAN	200	NC	10	4	200	10	20	NC	0	OFF
MMBS (TO BE OFF)	0	C	100	5	180	11	20	NC	180	EXTERNAL RECEPTACLE
	0	C		6	180	12	20	NC	180	INTERNAL RECEPTACLE
BASE LOAD (VA) =			9111	9131	C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD					
25% OF CONTINUOUS LOAD (VA) =			2188	2188						
TOTAL LOAD (VA) =			11299	11319						
TOTAL LOAD (A) =			94	94						
NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING. CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT CABINETS THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED VALUES.										

1 AC PANEL SCHEDULE  
SCALE: NOT TO SCALE

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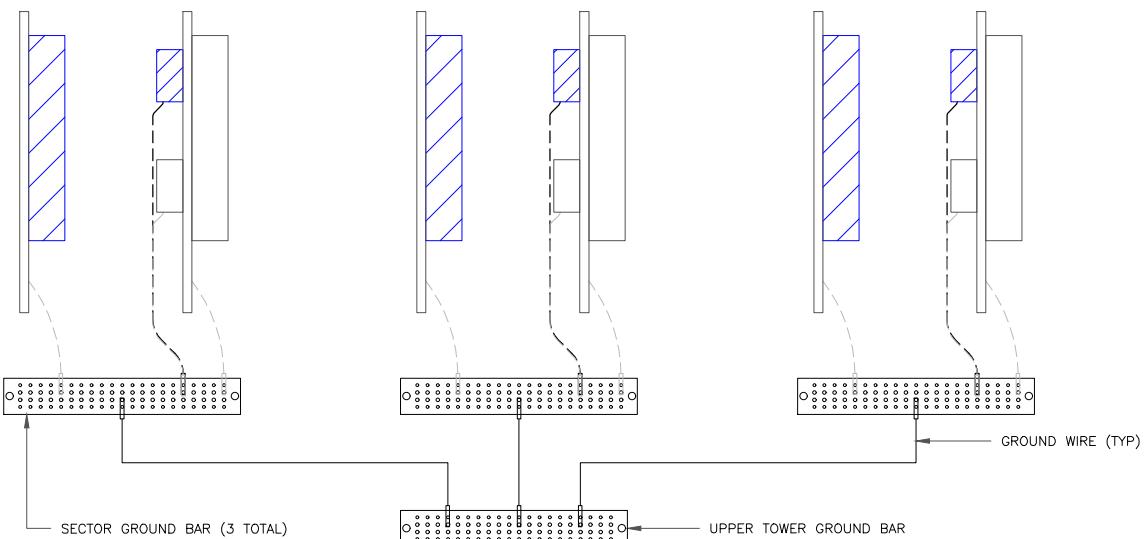
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ALPHA

BETA

GAMMA



1 ANTENNA GROUNDING DIAGRAM  
SCALE: NOT TO SCALE

NOTE:

ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.

T-MOBILE SITE NUMBER:  
**CT11233A**

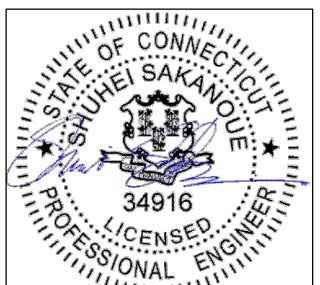
BU #: 806367  
**HRT 046 943209**

65 MAPLE AVENUE WEST  
HADDAM, CT

EXISTING 115'-6" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES/QA
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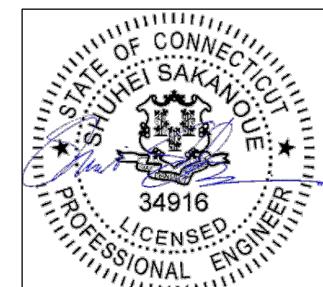
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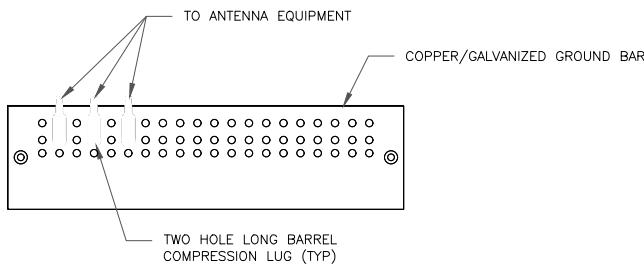
**ISSUED FOR:**

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SHEET NUMBER: **G-2** REVISION: **0**

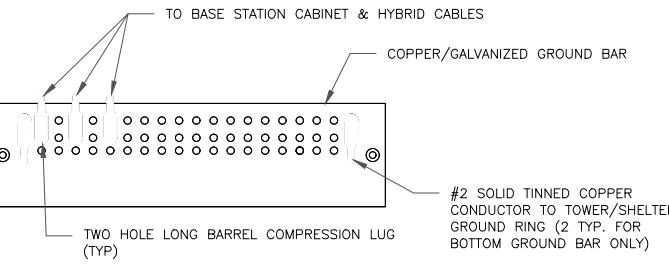


NOTES:

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 ANTENNA MOUNT STEEL.

**1** ANTENNA SECTOR GROUND BAR DETAIL

SCALE: NOT TO SCALE

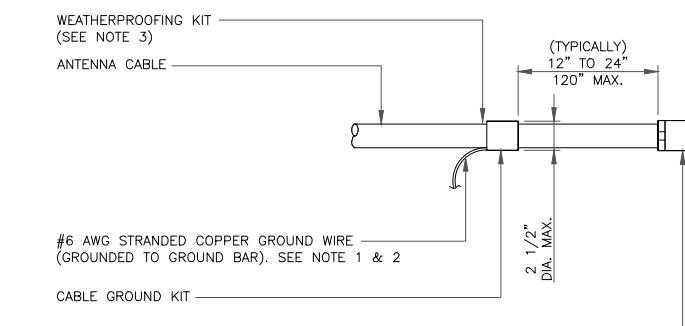


NOTES:

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.

**2** TOWER/SHELTER GROUND BAR DETAIL

SCALE: NOT TO SCALE

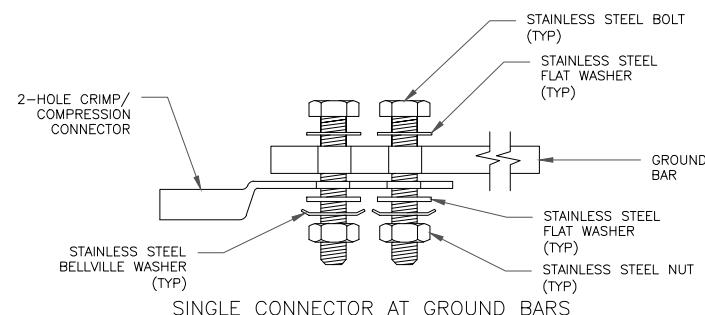


NOTES:

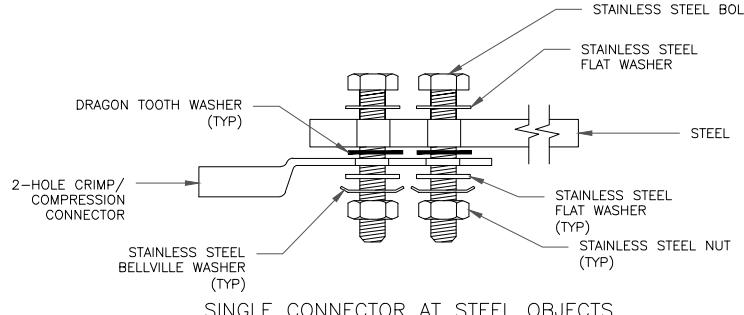
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

**3** CABLE GROUND KIT CONNECTION

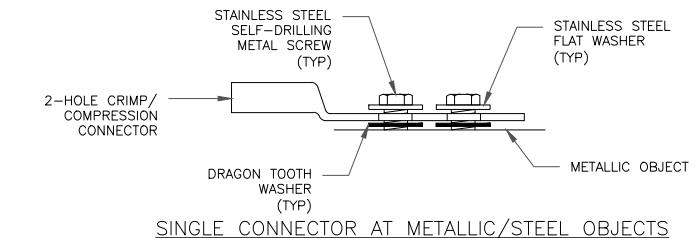
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS



SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

**4** HARDWARE DETAIL FOR EXTERIOR CONNECTIONS  
SCALE: NOT TO SCALE

**5** NOT USED  
SCALE: NOT TO SCALE

**6** NOT USED  
SCALE: NOT TO SCALE