



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

January 9, 2023

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

RE: Tower Share Application-T-Mobile: CT11251A
Crown Site ID#806366
73 North Main Street, Marlborough, CT 06447
Latitude: 41° 37' 47.30" / Longitude: -72° 27' 59.40"

Dear Ms. Bachman:

T-Mobile proposes to remove all Sprint equipment at the 130' mount level of the 156' monopole tower and replace it with nine (9) new antennas and ancillary antenna equipment at the 130' mount level. The monopole tower is located at 73 North Main Street, Marlborough, CT. The property and tower are owned by Crown Castle. 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) RFS – APXVAALL24_43-U-NA20 Antenna
- (3) Comscope_W-65A-R1 Antenna
- (3) Ericsson-Radio 4460 B25+ B66 RRU
- (3) Ericsson- Radio 4480 B71 + B85
- (3) Hybrid Cable (6x24)
- (1) Antenna Platform Mount

Remove:

- (3) RFS – APXVAALL24_43-U-NA20 Antenna
- (3) Generic Twin Style 1A PCS TMA
- (3) Ericsson Twin Style 1BX KRY 112 144/2 TMAs
- (3) Ericsson 4449 B71+B85
- (1) Hybrid Cable (6x24)
- (3) Antenna Mount Arms4415 RRH's

Ground:

Remove:

- (2) Equipment Cabinets

The Foundation for a Wireless World.
CrownCastle.com

(3) Ericsson – 4415 RRHs

Install New:

- (1) B160 Battery Cabinet
- (2) PSU 4813 Voltage Booster
- (1.) 6160 Cabinet
- (1.) CSR IXRe Router
- (2) RP 6651

The facility was approved by the Connecticut Siting Council in Docket No. 169 on October 25, 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 Amy J. Traversa, Interim Town Manager and Peter Hughes, Director of Planning & Development, Town of Marlborough. Crown Castle is the tower and property 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
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Melanie A. Bachman

Page 3

Attachments

cc:

Amy J. Traversa, Interim Town Manager
Town of Marlborough
26 North Main Street
Marlborough, CT 06447
860-295-6200

Peter Hughes, Director of Planning & Development
Town of Marlborough
26 North Main Street
Marlborough, CT 06447
860-295-6200

Crown Castle – Tower & Property Owner



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DOCKET NO. 169 - An application of Bell Atlantic NYNEX Mobile, for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications tower and associated equipment located within a 56+/- acre parcel at 56 East Hampton Road, in Marlborough, Connecticut. The proposed alternatives are located within a 21.7+/- acre parcel at North Main Street and within a 2.5+/- acre parcel at 9-11 South Main Street, in Marlborough, Connecticut.

Connecticut Siting Council

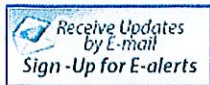
October 25, 1995

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 first alternate site in Marlborough, 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. (BANM) for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed first alternate site, located within a 21.7+/- acre parcel at North Main Street, Marlborough, Connecticut. We find the effects on scenic resources and adjacent land uses of the prime site and second alternate site to be significant, and therefore deny certification of these sites.

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, sufficient to accommodate the antennas of Springwich Cellular Limited Partnership and the Town of Marlborough, and not to exceed a total height of 160 feet above ground level (AGL).
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 placement of utilities underground, relocation of the tower within the leased parcel to provide the maximum practicable buffer of the tower from adjacent land owners; plans for the tower foundation; specifications for the placement of all antennas to be attached to this tower; plans for the equipment building and security fence; plans for the access road and utility line installation from North Main Street; 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 Sediment Control, as amended.
3. Upon the establishment of any new State or federal radio frequency 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.



Melanie Bachman,
Executive Director

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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.

-

INTERVENOR

Springwich Cellular Limited Partnership

PARTY

Town of Marlborough

PARTY

Neighbors Endorsing an Appropriate Tower
(NEAT)

ITS REPRESENTATIVE

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

Regulatory Services

Bell Atlantic NYNEX Mobile, Inc.

20 Alexander Drive

Wallingford, CT 06492

ITS REPRESENTATIVE

Peter J. Tyrrell, Esq.

Springwich Cellular Limited Partnership

227 Church Street

New Haven, CT 06510

ITS REPRESENTATIVE

William S. Fish, Jr.

Tyler, Cooper & Alcorn

CityPlace, 35th Floor

Hartford, CT 06103-3488

ITS REPRESENTATIVE

Barry S. Zitser

Perakos, Kindl & Zitser

207 Main Street

Hartford, CT 06106

Content Last Modified on 8/9/2002 11:28:31 AM

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

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CURRENT OWNER
 ADVANTAGE PROPERTIES LLC
 C/O CROWN ATLANTIC CO
 PMB 353
 4017 WASHINGTON RD
 MCMURRAY PA 15317

TOPO
 2 Above Street
UTILITIES
 1 Paved
SUPPLEMENTAL DATA
 Alt Prcl ID 2014T
 Census Dev. Lot Dev. Map
 Lake Area Photo Reta CB Letter
 GIS ID 6/26/65T
 Assoc Pid#

LOCATION
 Description
 Comm Land
 Comm Bldg
 Comm OB
SALE PRICE
 Year Code Assessed Year Code Assessed
 2020 2-1 126,300 2019 2-1 85,330
 2020 2-2 76,000 2019 2-2 56,420
 2020 2-5 663,000 2019 2-5 464,100

RECORD OF OWNERSHIP
BK-VOL/PAGE
 0252 0911
 0127 0009
SALE DATE
 05-06-2019
 02-03-1999
Q/U
 U I
V/I
 U I
VC
 0 29
 0 29

EXEMPTIONS
 Description Amount
 Total 0.00
OTHER ASSESSMENTS
 Description Number Amount
 Comm Int

ASSESSING NEIGHBORHOOD
 Nbhnd Name B Tracing Batch
 0001 B

CURRENT ASSESSMENT
 Code Appraised Assessed
 2-1 126,300 88,410
 2-2 76,000 53,200
 2-5 663,000 464,100
PREVIOUS ASSESSMENTS (HISTORY)
 Code Assessed Year Code Assessed Year Code Assessed
 2-1 85,330 2019 2-1 85,330 2019 2-1 85,330
 2-2 56,420 2019 2-2 56,420 2019 2-2 56,420
 2-5 464,100 2019 2-5 464,100 2019 2-5 464,100
Total 865,300 605,710

APPRaised VALUE SUMMARY
 Appraised Bldg. Value (Card) 76,000
 Appraised Xf (B) Value (Bldg) 0
 Appraised Ob (B) Value (Bldg) 663,000
 Appraised Land Value (Bldg) 126,300
 Special Land Value 0
 Total Appraised Parcel Value 865,300
 Valuation Method C

BUILDING PERMIT RECORD
 Permit Id Issue Date Type Description Amount Insp Date % Comp Date Comp Comments
 18-318 10-16-2018 BP 20,000 09-01-2020 100 REMOVE AND REPLACE 6A
 17-035 03-09-2017 BP 7,500 07-27-2015 100 REPLACE 3 RRUS TO EXISTI
 15-101 05-12-2015 CM Commercial 100 ANTENNA UPGRADE
 1128 12-27-2012 CM Commercial 100 GROUND MOUNTED COMM
 300 12-13-2011 CM Commercial 100 CHANGE SEVEN (7) ANTEN

LAND LINE VALUATION SECTION
 B Use Code Description Zone Land Type Land Units Unit Price I. Factor Site Index Cond. Nbhnd. Nhbnd Adj Notes Location Adjustment Adj Unit Pric Land Value
 1 200 Commercial R 1.840 AC 80,000 0.61141 C 1.00 D 1.100 0
 1 200 Commercial R 3.900 AC 7,000 1.00000 0 1.000 0
Total Card Land Units 5.740 AC **Parcel Total Land Area:** 5.7400 **Total Land Value** 126,300

VISIT / CHANGE HISTORY
 Date Id Type Is Cd Purpost/Result
 09-01-2020 JB 01 Measured
 03-13-2020 WG 12 Field Review
 07-27-2015 LM 99 Vacant Land

NOTES
 2017 UPDATE-TERMINATION/EXPIRATION OF ONE CARRIER/SPRINT/NEXTEL

CELL TOWER LOCATED BEHIND MARLBORO BARN
 CELLULAR TOWER: GATED
 500 FT LF FALL DOWN ZONE = 5.74 AC
 1.84 COMMERCIAL SITE
 3.9 COMMERCIAL EXCESS

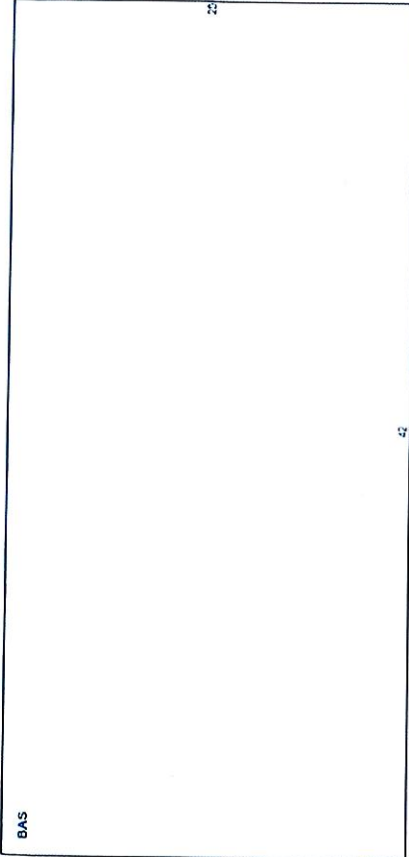
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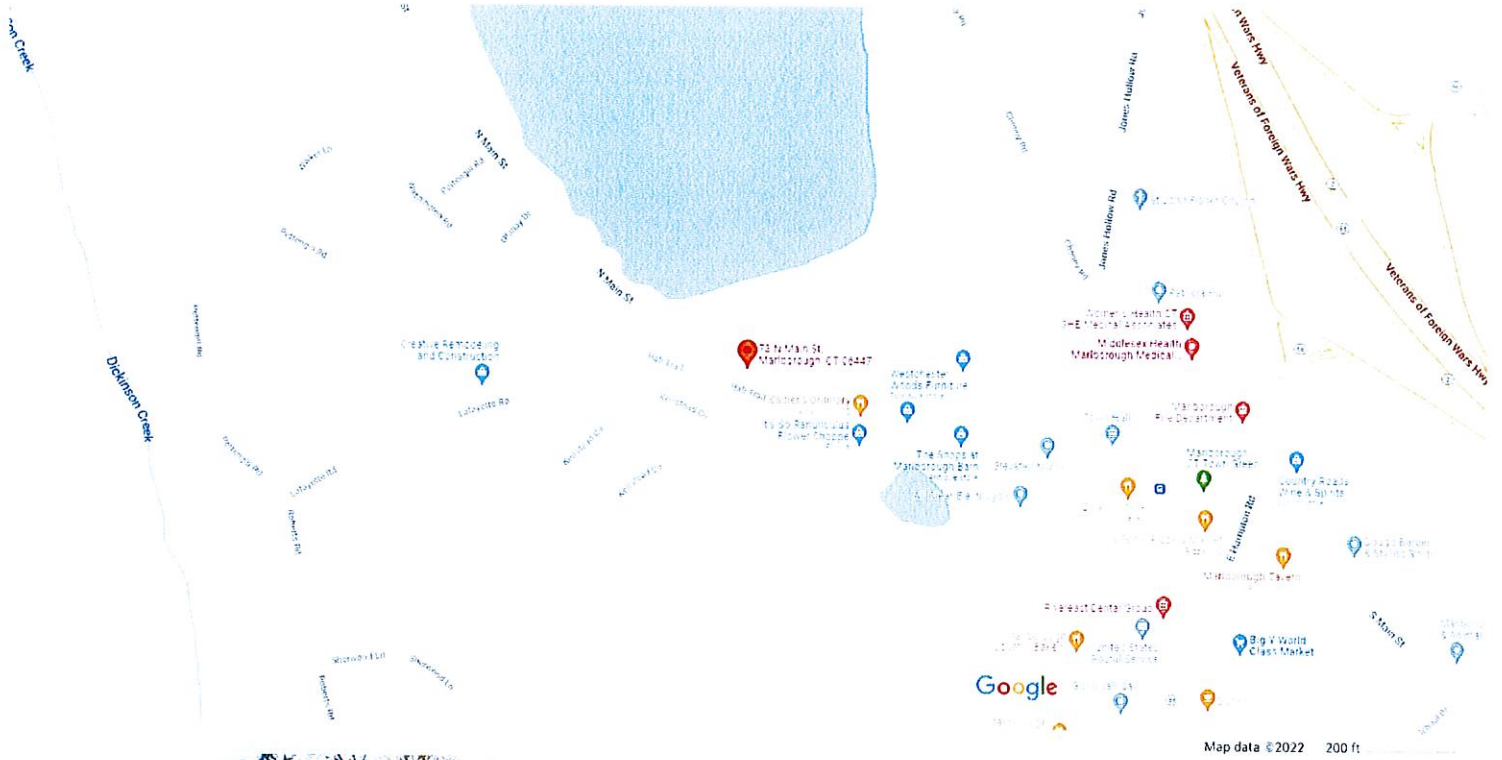
CONSTRUCTION DETAIL		CONSTRUCTION DETAIL (CONTINUED)	
Element	Cd	Description	Element
Style:		Support Shed	
Model	91	Commercial	
Grade	94	Average	
Stories:	03	1 Story	
Occupancy	1		
Exterior Wall A	1.00	Reinforc Concr	
Exterior Wall B	24		
Roof Structure	01	Flat	
Roof Cover	04	T&G/Rubber	
Interior Wall A	01	Minimum	
Interior Wall B	03	Concrete	
Interior Floor A	01	Coal or Wood	
Interior Floor B	01	None	
Heating Fuel	01	Central	
Heating Type	03	Commercial	
AC Type	200	HEAT/AC SPLIT	
Bldg Use	02	Reinforced Cnc	
Heat/AC	04	None	
Frame Type	00	None	
Baths/Plumbing	00	Light	
Ceiling/Walls	00		
Rooms/Prtns	01		
Wall Height	8.00		
% Conn Wall			
1st Floor Use:			

OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)										
Code	Description	L/B	Units	Unit Price	Yr Bilt	Cond. Cd	% Good	Grade	Grade Adj	Appr. Value
SHD1	Shed	L	360	20.00	1999	5	60	0.00	0.00	4,300
FN4	Fence 8'	L	322	20.00	2000	5	60	0.00	0.00	3,900
PAT1	Patio	L	192	3.50	2000	00	60	0.00	0.00	400
CELL	Cell Tower	L	4	163600.00	2011		100	0.00	0.00	654,400
BUILDING SUB-AREA SUMMARY SECTION										
Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprc Value				
BAS	First Floor	840	840	840	110.32	92,669				
		Ttl Gross Liv / Lease Area	840	840	840	92,669				



BAS

Google Maps 73 N Main St



73 N Main St

- Directions
- Save
- Nearby
- Send to phone
- Share

73 N Main St, Marlborough, CT 06447

JGMM+78 Marlborough, Connecticut

Photos

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Tuesday, January 10, 2023 10:55 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 770982494277: Your package has been delivered

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Hi. Your package was
delivered Tue, 01/10/2023 at
10:11am.



Delivered to 26 N MAIN ST, MARLBOROUGH, CT 06447
Received by G.GRIFFIN

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [770982494277](#)

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Marlborough Amy Traversa, Interim Town Manager 26 North Main Street MARLBOROUGH, CT, US, 06447
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Mon 1/09/2023 08:35 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	MARLBOROUGH, CT, US, 06447
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Tuesday, January 10, 2023 10:55 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 770982527754: Your package has been delivered

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10:11am.



Delivered to 26 N MAIN ST, MARLBOROUGH, CT 06447
Received by G.GRIFFIN

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [770982527754](#)

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Marlborough Peter Hughes, Director of Planning 26 North Main Street MARLBOROUGH, CT, US, 06447
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Mon 1/09/2023 08:35 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	MARLBOROUGH, CT, US, 06447
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **November 16, 2022**



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

Subject: **Mount Replacement Analysis Report**

Carrier Designation: **T-Mobile Equipment Change-Out**
Carrier Site Number: CT11251A
Carrier Site Name: East Hampton-2_1

Crown Castle Designation: **BU Number:** 806366
Site Name: HRT 107(C) 943204
JDE Job Number: 735228
Order Number: 637965 Rev. 0

Engineering Firm Designation: **Trylon Report Designation:** 218777

Site Data: **73 North Main Street, Marlborough, Hartford County, CT, 06447**
Latitude 41°37'47.30" Longitude -72°27'59.40"

Structure Information: **Tower Height & Type:** **155.5 ft Monopole**
Mount Elevation: **130.0 ft**
Mount Width & Type: **10.5 ft Platform**

Trylon is pleased to submit this “**Mount Replacement 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:

Platform **Sufficient***
***Sufficient upon completion of the changes listed in the ‘Recommendations’ section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Dan Deaconu

Respectfully Submitted by:
Cliff Abernathy, P.E.

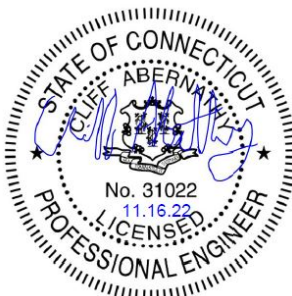


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Supplemental Drawings

1) INTRODUCTION

This is a proposed 3 sector 10.5 ft Platform, designed by Commscope.

2) ANALYSIS CRITERIA

Building Code:	2018 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.00 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.177
Seismic S₁:	0.062
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
130.0	130.0	3	CommScope	VV-65A-R1_TMO	10.5 ft Platform [Commscope, MC-PK10-C with MTC3924 Ringmount extension kit]
		3	Ericsson	AIR 6419 B41_TMO_CCIV2	
		3	RFS/Celwave	APXVAALL24_43-UNA20_TMO	
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO	
		3	Ericsson	Radio 4480_TMOV2	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	637965, Rev. 0	CCI Sites
Mount Manufacturer Drawings	Commscope	MC-PK10-C	Trylon
Structural Analysis Report	Tower Engineering Professionals	10388577	CCI Sites

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. Tylon 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)	MP1	130.0	49.4	Pass
	Horizontal(s)	H3		29.6	Pass
	Standoff(s)	M25A		40.9	Pass
	Bracing(s)	M18		55.4	Pass
	Handrail(s)	M22		12.0	Pass
	Mount Connection(s)	-		32.9	Pass

Structure Rating (max from all components) =	55.4%
---	--------------

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 15.501s

4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

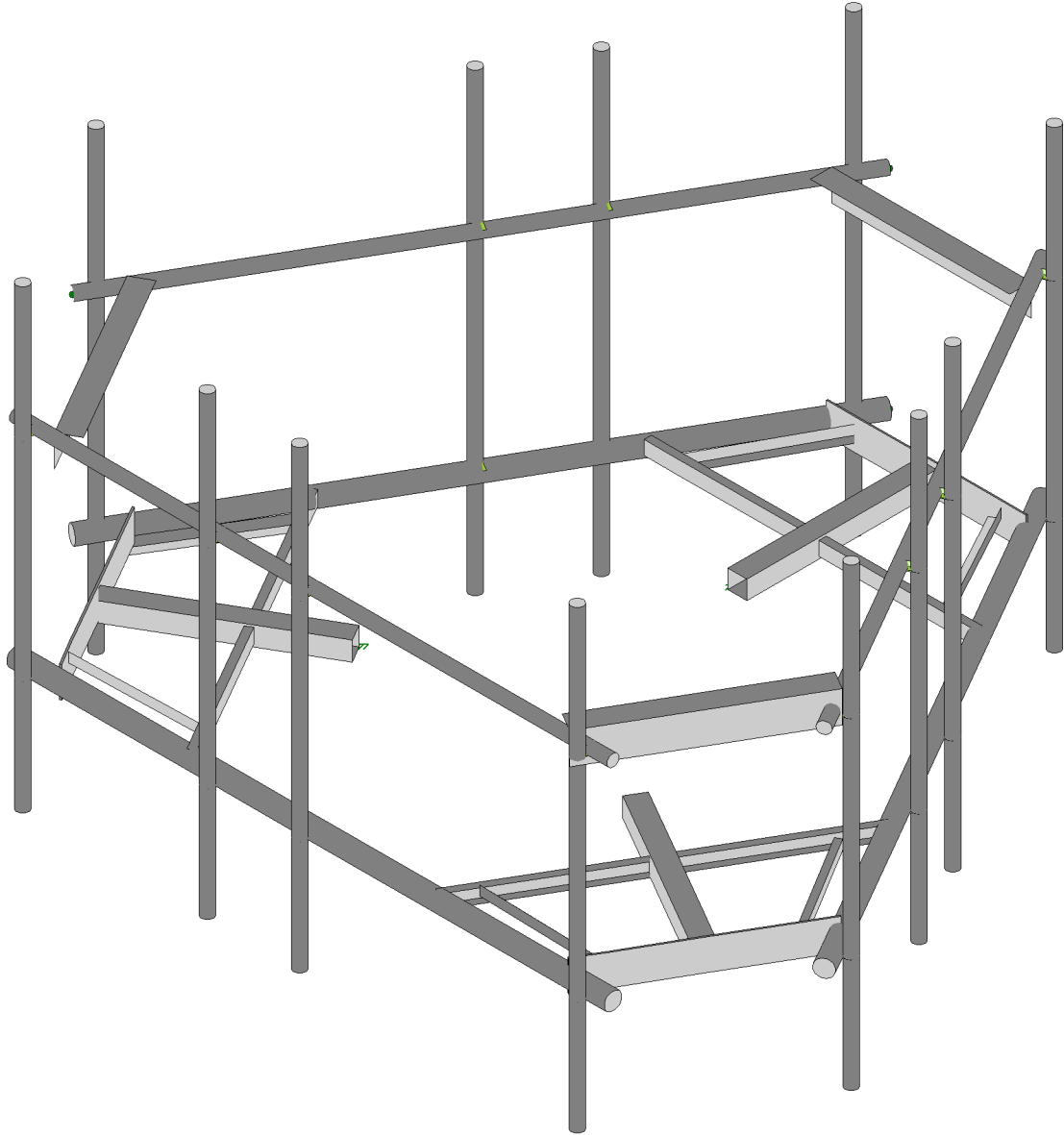
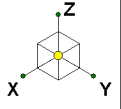
1. Commscope, MC-PK10-C platform;
2. Commscope, MTC3924 ringmount extension;
3. The handrail was considered installing approx. 44" above the bottom face horizontal.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS

APPENDIX B
SOFTWARE INPUT CALCULATIONS



Envelope Only Solution

Trylon

DD

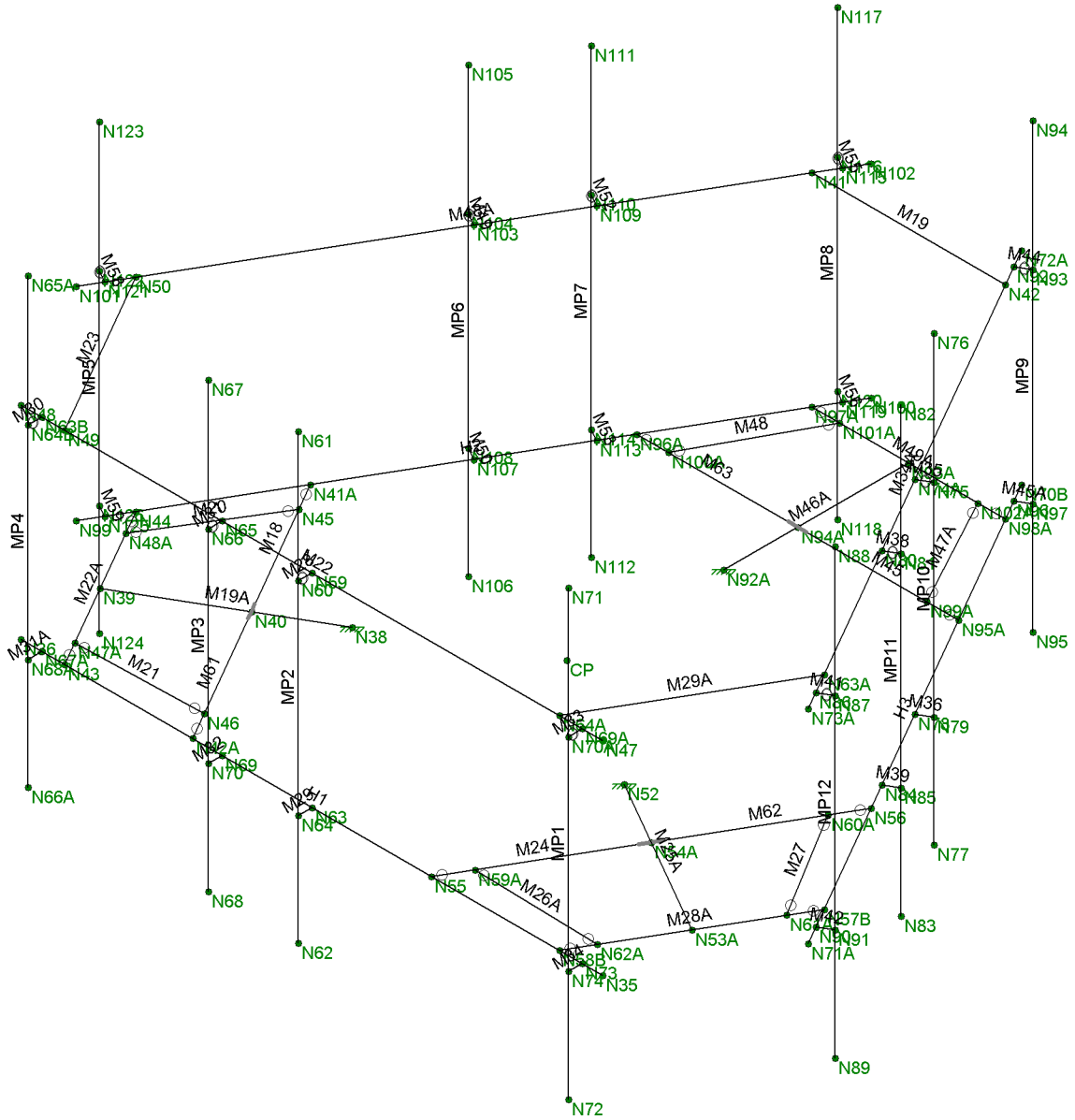
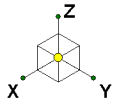
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Envelope Only Solution

Trylon

DD

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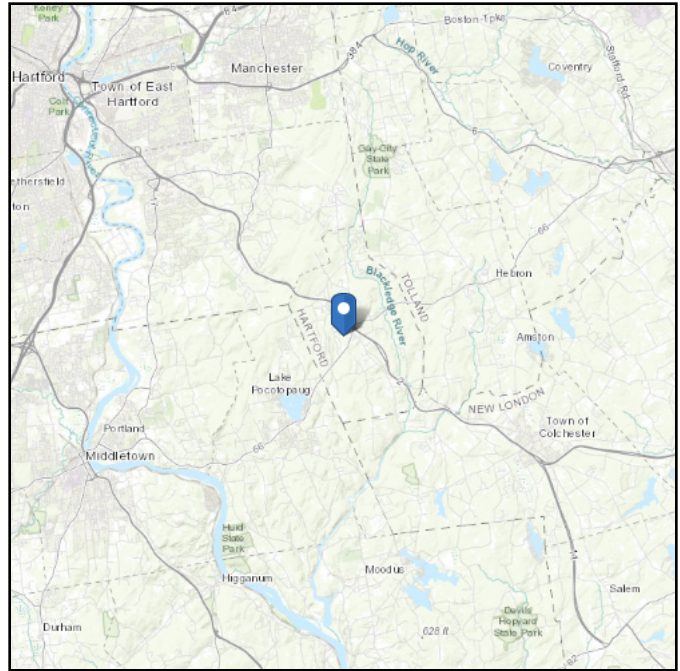
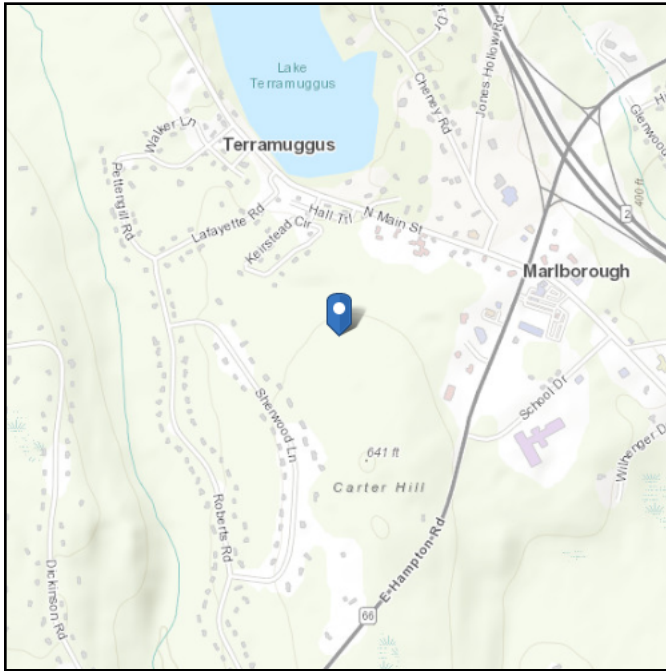
APPENDIX B
SOFTWARE INPUT CALCULATIONS

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: 577.55 ft (NAVD 88)
Latitude: 41.629806
Longitude: -72.4665



Ice

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 Nov 15 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.

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

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.



Trylon

1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	218777
Carrier Site ID:	CT11251A
Carrier Site Name:	East Hampton-2_1

CODES AND STANDARDS	
Building Code:	2018 IBC
Local Building Code:	2022 CSBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	130.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	155.5	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	577.55	ft.

TOPOGRAPHIC DATA		
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	--

WIND PARAMETERS		
Design Wind Speed:	130	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.07	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (G _h):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	42.87	psf
Ground Elevation Factor (K_e):	0.98	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	6.83	psf
Mount Ice Thickness (t_{iz}):	1.15	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	77.17	psf
Round Member Pressure:	46.30	psf
Ice Wind Pressure:	7.38	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel. (S_s):	0.177	g
1 Second Accel. (S_1):	0.062	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (C_s):	0.09	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
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 [CONT.]

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft ²)	EPA_T (ft ²)	Weight (lbs)
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

<i>Appurtenance Name</i>	<i>Qty.</i>	<i>Elevation [ft]</i>	<i>K_{zt}</i>	<i>K_z</i>	<i>K_d</i>	<i>t_d</i>	<i>q_z [psf]</i>	<i>q_{zi} [psf]</i>
XVAALL24_43-U-NA20_TI	3	130	1.00	1.07	0.95	1.15	42.87	6.34
AIR 6419 B41_TMO_CCIV/	3	130	1.00	1.07	0.95	1.15	42.87	6.34
VV-65A-R1_TMO	3	130	1.00	1.07	0.95	1.15	42.87	6.34
Radio 4480_TMOV2	3	130	1.00	1.07	0.95	1.15	42.87	6.34
RADIO 4460 B2/B25 B66_TM	3	130	1.00	1.07	0.95	1.15	42.87	6.34

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

<i>Appurtenance Name</i>	<i>Qty.</i>	<i>--</i>	<i>0° 180°</i>	<i>30° 210°</i>	<i>60° 240°</i>	<i>90° 270°</i>	<i>120° 300°</i>	<i>150° 330°</i>
APXVAALL24_43-U-NA20_TMO	3	No Ice	566.05	295.47	475.86	205.28	475.86	295.47
--	--	w/ Ice	92.57	51.75	78.96	38.14	78.96	51.75
AIR 6419 B41_TMO_CCIV2	3	No Ice	240.77	127.91	203.15	90.29	203.15	127.91
--	--	w/ Ice	41.50	23.86	35.62	17.98	35.62	23.86
VV-65A-R1_TMO	3	No Ice	172.86	93.57	146.43	67.14	146.43	93.57
--	--	w/ Ice	30.96	18.78	26.90	14.72	26.90	18.78
Radio 4480_TMOV2	3	No Ice	111.06	68.20	96.77	53.91	96.77	68.20
--	--	w/ Ice	18.32	11.71	16.11	9.50	16.11	11.71
RADIO 4460 B2/B25 B66_TMO	3	No Ice	82.54	69.42	78.17	65.05	78.17	69.42
--	--	w/ Ice	13.83	11.78	13.15	11.10	13.15	11.78
--	--	No Ice						
--	--	w/ Ice						
--	--	No Ice						
--	--	w/ Ice						
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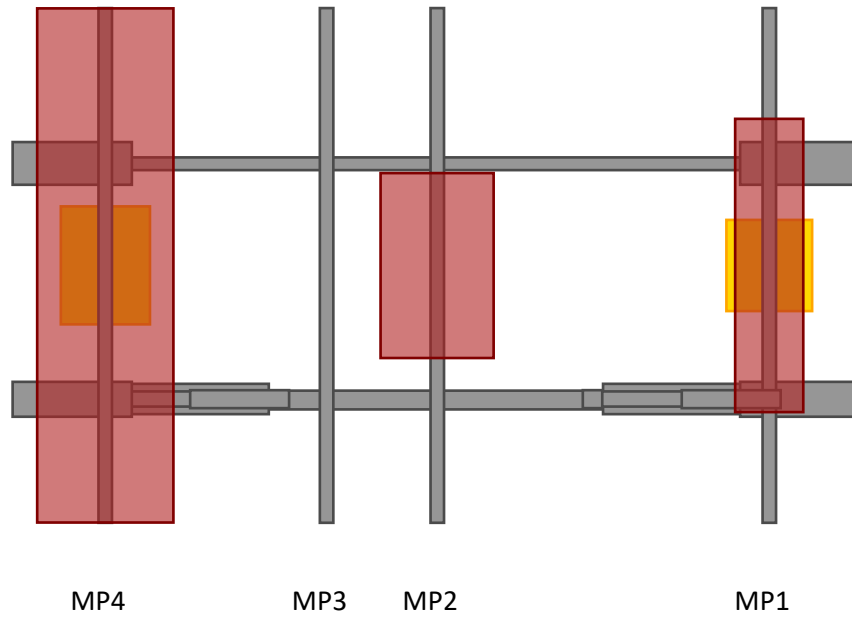
EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

<i>Appurtenance Name</i>	<i>Qty.</i>	<i>--</i>	<i>0° 180°</i>	<i>30° 210°</i>	<i>60° 240°</i>	<i>90° 270°</i>	<i>120° 300°</i>	<i>150° 330°</i>
		No Ice						
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		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
APXVAALL24_43-U-NA20_TMO	3	130	149.9	16.98
AIR 6419 B41_TMO_CCIV2	3	130	81.84	9.27
VV-65A-R1_TMO	3	130	33.3	3.77
Radio 4480_TMOV2	3	130	81	9.18
RADIO 4460 B2/B25 B66_TMO	3	130	109	12.35

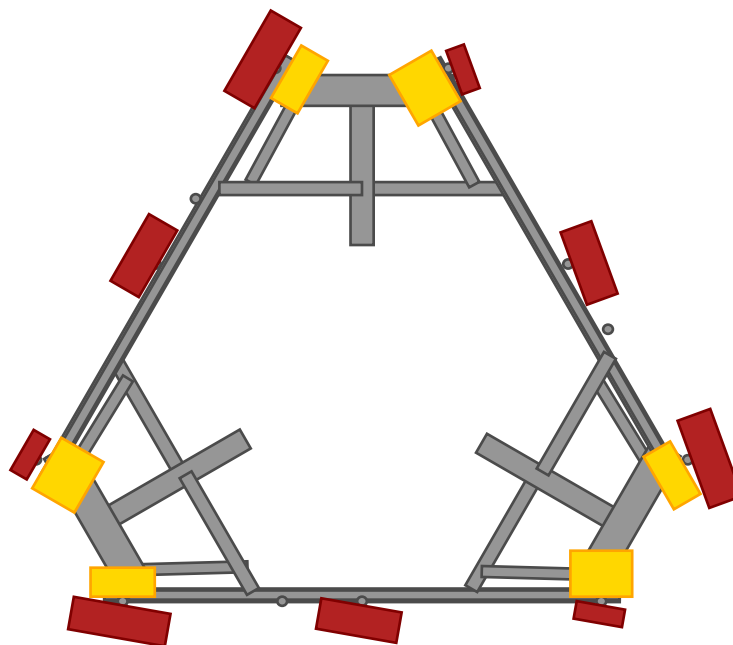
ELEVATION VIEW



*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



Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
APXVAALL24_43-U-NA20_TMO	3	130	MP4/MP8/MP12	10/120/250
AIR 6419 B41_TMO_CCIV2	3	130	MP2/MP6/MP10	10/120/250
VV-65A-R1_TMO	3	130	MP1/MP5/MP9	10/120/250
Radio 4480_TMOV2	3	130	MP4/MP8/MP12	0/120/240
RADIO 4460 B2/B25 B66_TMO	3	130	MP1/MP5/MP9	0/120/240

APPENDIX C
SOFTWARE ANALYSIS OUTPUT

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APPENDIX D
ADDITIONAL CALCULATIONS

BOLT TOOL 1.5.2

Project Data	
Job Code:	218777
Carrier Site ID:	CT11251A
Carrier Site Name:	East Hampton-2_1

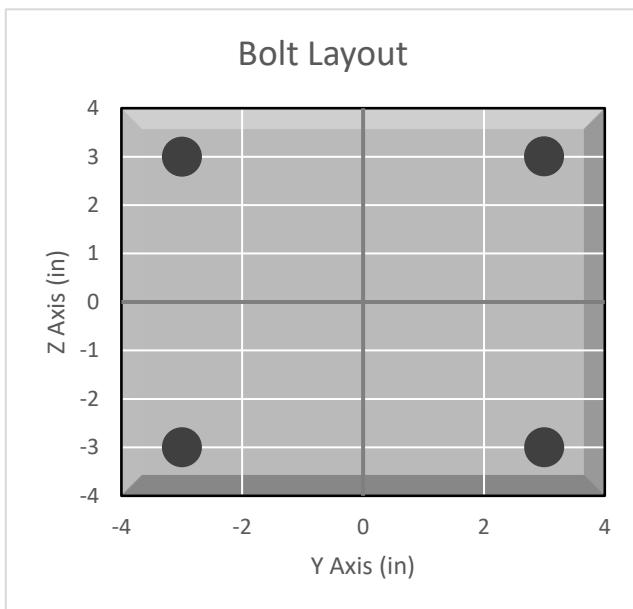
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

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 Monopole Collar

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	7020.0	lbs
Shear Force (V_u):	1554.7	lbs
Tension Usage:	32.9%	--
Shear Usage:	10.7%	--
Interaction:	32.9%	Pass
Controlling Member:	M25A	--
Controlling LC:	15	--

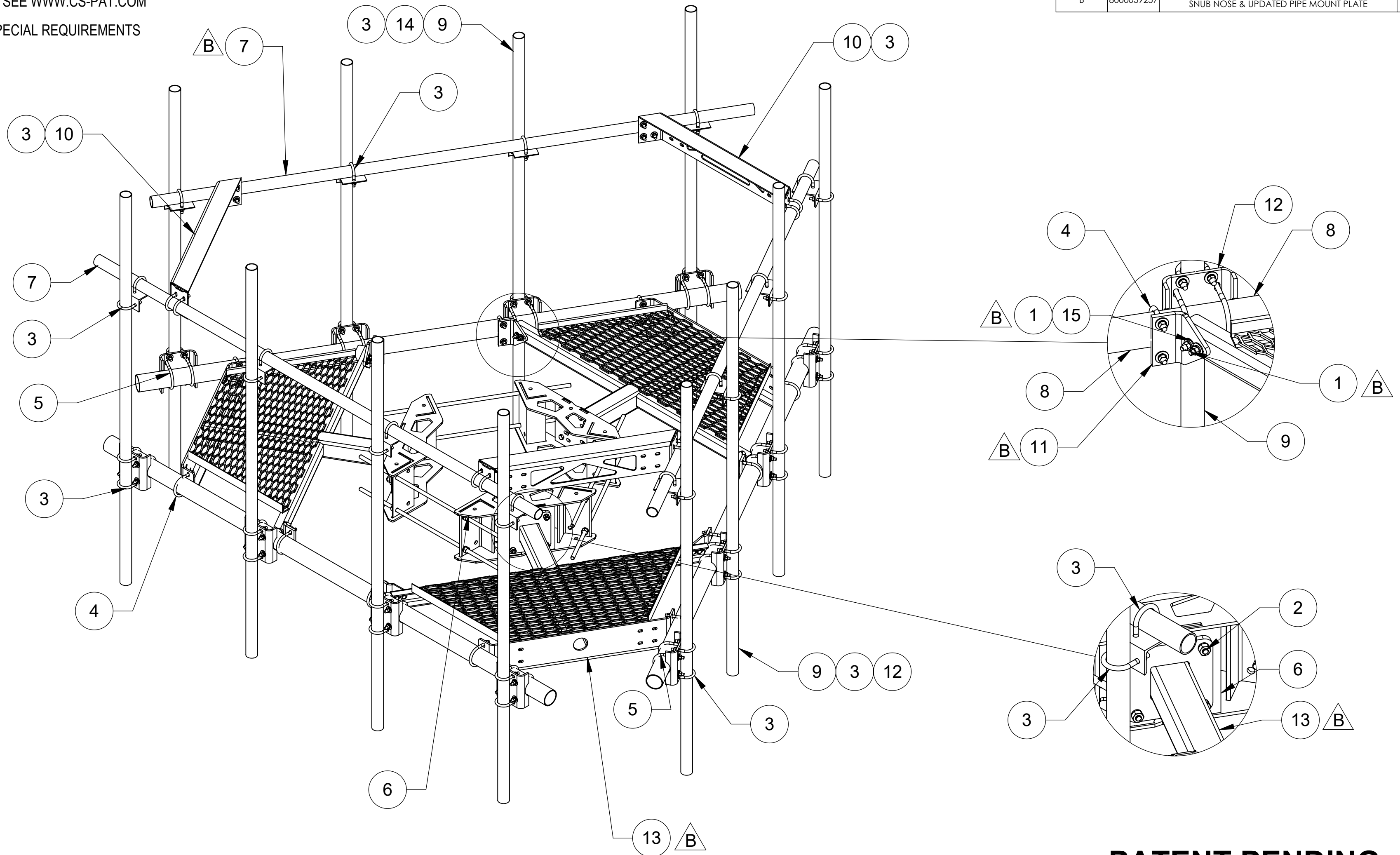
*Rating per TIA-222-H Section 15.5



APPENDIX E
SUPPLEMENTAL DRAWINGS

NOTES:
 1.0 GENERAL
 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS
 1.2 FOR PATENTS, SEE WWW.CS-PAT.COM
 2.0 DESIGN NOTES
 3.0 MANUFACTURING/SPECIAL REQUIREMENTS
 4.0 TEST
 5.0 PACKAGING

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A	8000026787	INITIAL RELEASE	MRC	04/05/18
B	8000039257	UPDATED HR PIPE TO SCH 40 AND UPDATED WELDMENT SNUB NOSE & UPDATED PIPE MOUNT PLATE	MRC	02/14/20



PATENT PENDING

COMMScope, INC. OF NORTH CAROLINA

TOLERANCES		SAP MATERIAL MASTER	
0 PLACE $x \pm .25$	2 PLACE $.xx \pm 0.06$	MC-PK10-C	
1 PLACE $.x \pm 0.12$	ANGLES $\pm 2^\circ$		
FINISH GALV A123		MATERIAL A500, A1011/A1018	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y 14.5M-1994	NAME	DATE	TITLE
	CE MRC	02/14/20	10'6" FACE SNUB NOSE PLATFORM 12 PIPES
	RW MC1107	02/27/2020	
	RV	02/27/2020	
AD BCAMPBELLCON	02/27/2020		
RE FA1024	02/27/2020	SCALE	DOCUMENT NO.
ECN 008000039257	1:16	MC-PK10-C	
SIZE	WORK AREA 24	MODEL	
C		VERSION	DRAWING
		01	STATUS
		RE	REVISION
		B	VERSION
		01	STATUS
		RE	REVISION
		B	SHEET
			1 OF 2

ITEM	PART NO.	DESCRIPTION	QTY.	NOTE NO.
1	GB-04205	1/2" X 2" GALV BOLT KIT	12	B
2	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12	
3	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	60	
4	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12	
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	24	
6	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	
7	MT651126154	2-38" O.D. X 126" PIPE, SHD 40	3	B
8	MT-547-126	Ø 3.5" O.D. X 126 PIPE	3	
9	MT-651-96	Ø 2.375" OD X 96" PIPE	12	
10	MT195801	Corner Weldment Snub Nose Handrail	3	
11	MTC300618	MT196 Pipe Mount Plate	6	B
12	MT21701	PIPE MOUNT PLATE	12	
13	MTC300602	LOW PROFILE CO-LOCATION PLTFM SNUB NOSE	3	B
14	XA2020.01	ANTENNA MOUNT ANGLE	12	
15	GWF-04	1/2" GALV FLAT WASHER	24	

DENSITY	0.15	lbs/in³
MASS	1582.84	lbs
VOLUME	10271.93	in³
SURFACE AREA		in²
HEIGHT		
LENGTH		
WIDTH		

4

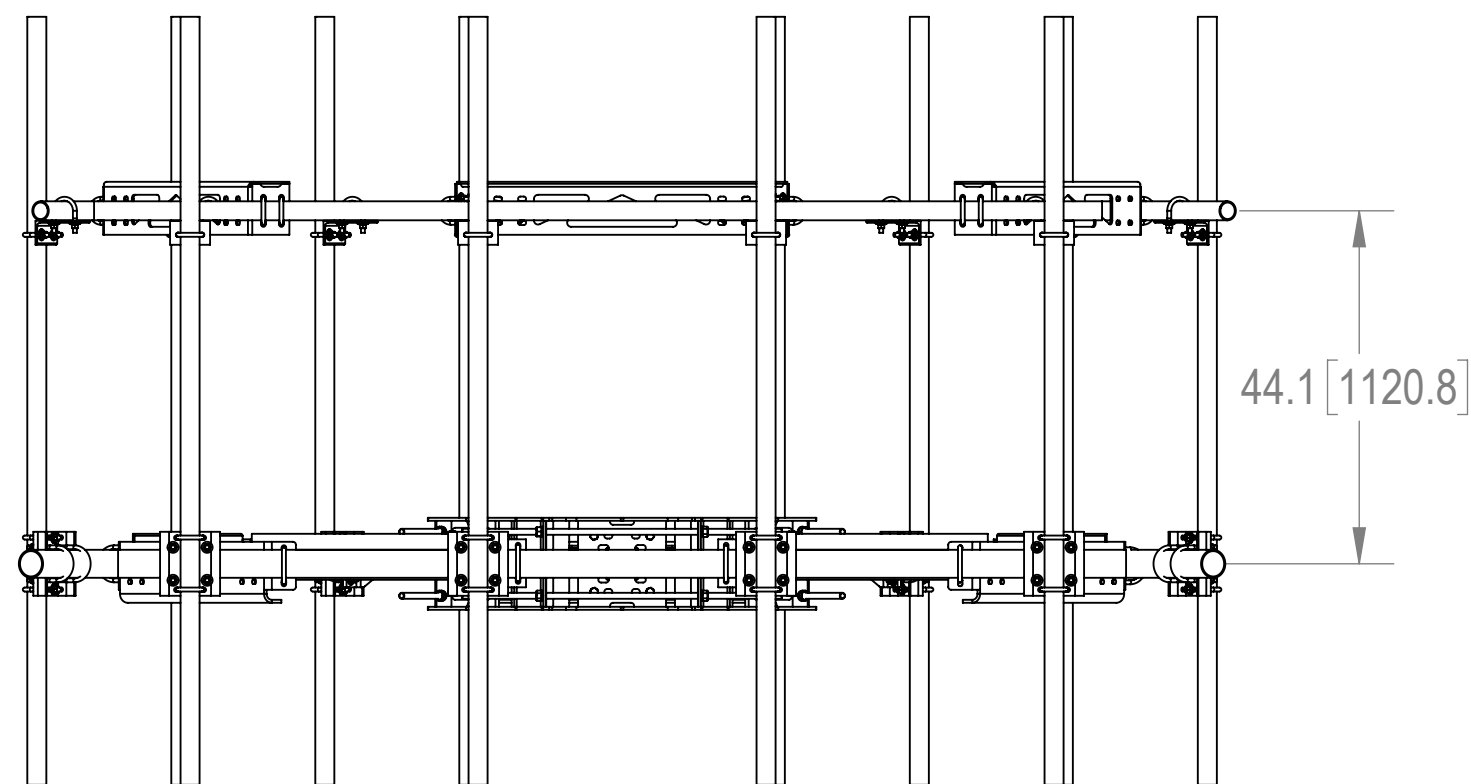
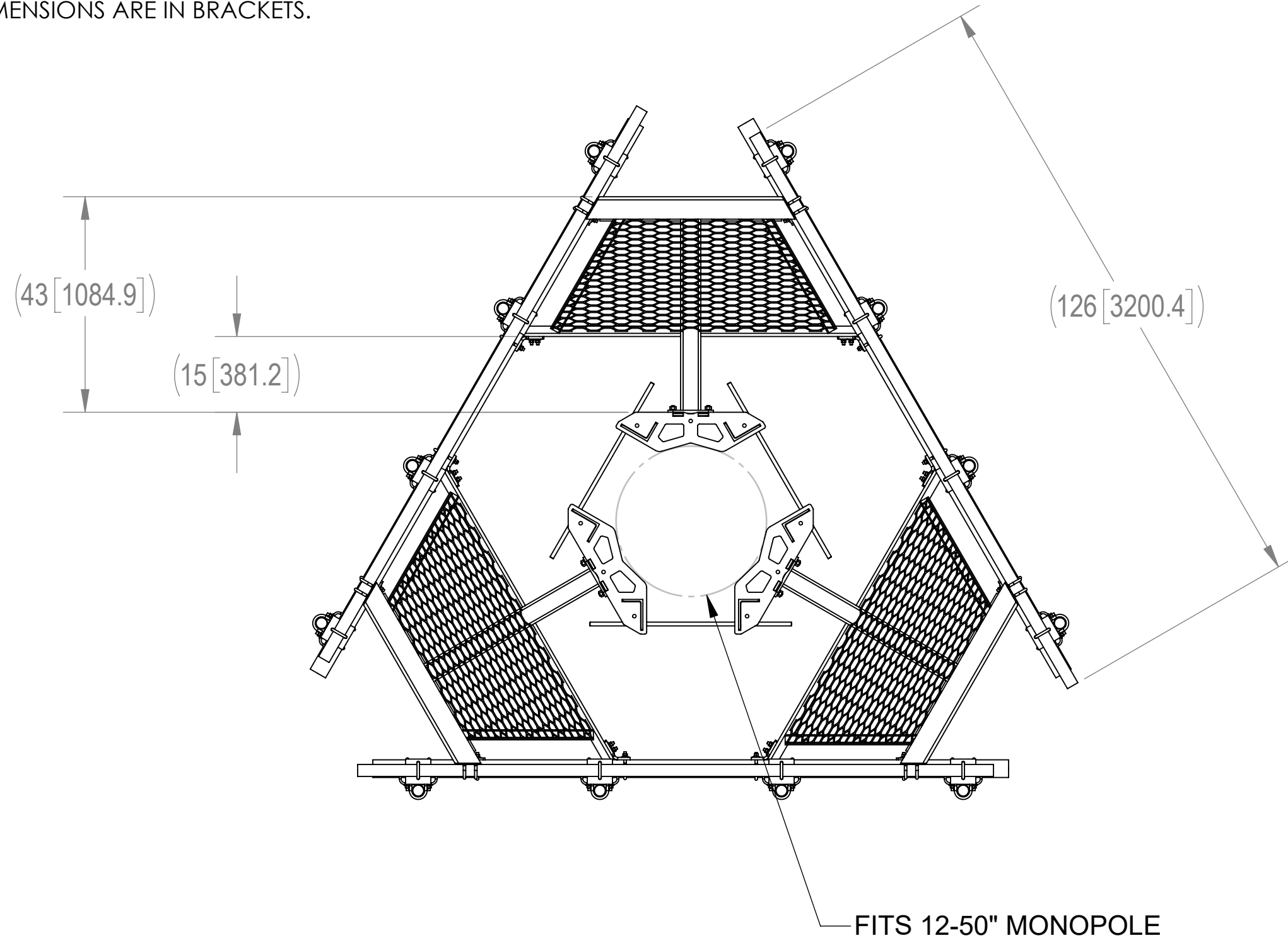
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NOTES:

1.0 ALL METRIC DIMENSIONS ARE IN BRACKETS.



COMMSCOPE, INC. OF NORTH CAROLINA				
TITLE 10'6 FACE SNUB NOSE PLATFORM 12 PIPES				
SIZE C	SCALE 1:24	DOCUMENT NO. MC-PK10-C		
		DRAWING		SHEET
		VERSION	STATUS	REVISION
		02	RE	B
				2 OF 2

4

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2

1

Date: **December 14, 2022**



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

Subject: Structural Analysis Report

Carrier Designation:

Site Number: CT11251A
Site Name: CT03XC210

Crown Castle Designation:

BU Number: 806366
Site Name: HRT 107(C) 943204
JDE Job Number: 735228
Work Order Number: 2189065
Order Number: 637965 Rev. 1

Engineering Firm Designation:

TEP Project Number: 217470.796276

Site Data:

73 North Main Street, Marlborough, Hartford County, CT 06447
Latitude 41° 37' 47.30", Longitude -72° 27' 59.40"
155.5 Foot - Monopole Tower

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 - 56.2%

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2022 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

12/14/2022

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1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 - Tower Component Stresses vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 155.5-ft monopole tower designed by FWT Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	130.0	3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	3	1-5/8
		3	Commscope	VV-65A-R1_TMO w/ Mount Pipe		
		3	Ericsson	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	Radio 4480_TMOV2		
		1	Commscope	MC-PK10-C Platform Mount		

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)
156.0	159.0	1	Commscope	LNx-8513DS-VTM w/ Mount Pipe	14	1-5/8
		3	Commscope	NHHSS-65B-R2B w/ Mount Pipe		
		3	Commscope	NHH-65B-R2B w/ Mount Pipe		
		3	Samsung Telecom.	MT6407-77A w/ Mount Pipe		
		2	Commscope	LNx-6514DS-A1M w/ Mount Pipe		
		2	Raycap	RRFDC-3315-PF-48		
		3	Samsung Telecom.	CBRS RT4401-48A		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
		156.0	1	Tower Mounts	Platform Mount [16' LP 603-1]	
156.0	156.0	3	Decibel	DB809K-Y	3	1-5/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
144.0	144.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	12 6 2	1-1/4 3/8 3/4
		3	CCI Antennas	HPA65R-BU6A w/ Mount Pipe		
		3	CCI Antennas	OPA65R-BU6D w/ Mount Pipe		
		3	Kathrein	80010965 w/ Mount Pipe		
		6	Powerwave Technologies	LGP 17201		
		3	Powerwave Technologies	1001940		
		3	Raycap	DC6-48-60-18-8F		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 32 B30		
		1	Tower Mounts	Platform Mount [16' LP 603-1]		
135.0	135.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-1/4
116.0	116.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-1/2
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Commscope MC-PK8-DSH		
100.0	102.0	3	Ericsson	AIR 6419 B41_TMO w/ Mount Pipe	3	1-5/8
		3	Commscope	VV-65A-R1_TMO w/ Mount Pipe		
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
	100.0	3	Ericsson	RADIO 4449 B71/B85A		
		1	Site Pro 1	RMQP-396 Platform Mount w/ HRK12		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	2208816	CCISites
Tower Foundation Drawings	823125	CCISites
Tower Manufacturer Drawings	823126	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)	ΦP_{allow} (k)	% Capacity	Pass / Fail
L1	155.5 - 110	Pole	TP64.606x58.6x0.375	1	-26.90	4083.22	13.5	Pass
L2	110 - 72.5	Pole	TP68.805x62.8x0.4375	2	-52.17	5456.99	27.7	Pass
L3	72.5 - 36	Pole	TP72.748x66.8082x0.5	3	-74.18	6956.40	37.2	Pass
L4	36 - 0	Pole	TP76.5x70.56x0.5	4	-103.45	7106.06	56.2	Pass
							Summary	
						Pole (L4)	56.2	Pass
						RATING =	56.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	53.8	Pass
1,2	Base Plate	-	25.0	Pass
1,2	Base Foundation Structural	-	31.9	Pass
1,2	Base Foundation Soil Interaction	-	36.3	Pass

Structure Rating (max from all components) =	56.2%
---	--------------

Notes:

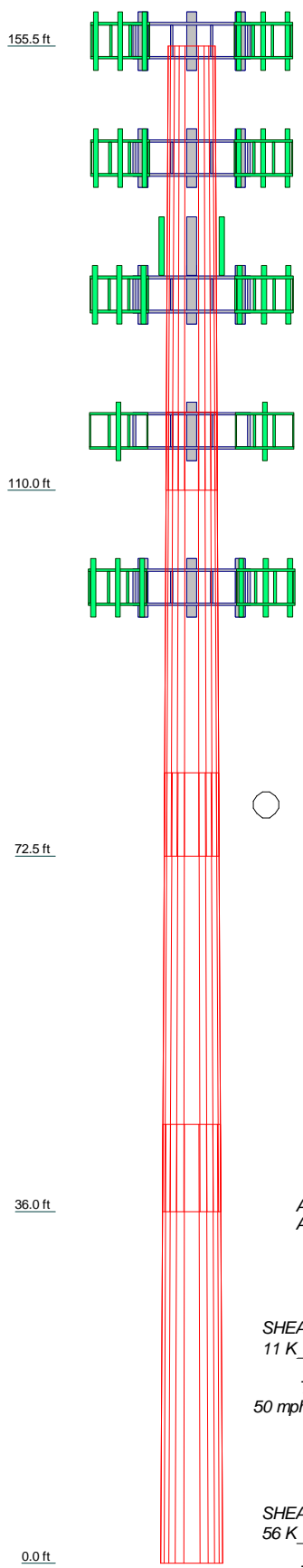
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5

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	1	2	3	4	
Length (ft)	45.50	45.50	45.00	45.00	
Number of Sides	12	12	12	12	
Thickness (in)	0.3750	0.4375	0.5000	0.5000	
Socket Length (ft)	8.00	8.50	9.00	70.5600	
Top Dia (in)	58.6000	62.8000	66.8082	76.5000	
Bot Dia (in)	64.0060	68.8050	72.7480		
Grade		A572-65			
Weight (K)	11.4	14.3	17.1	18.0	60.8

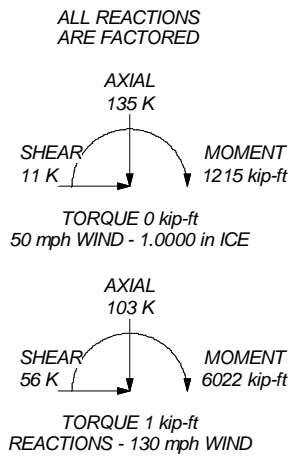


MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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: 56.2%



 Tower Engineering Professionals	Tower Engineering Professionals		Job: HRT 107 (C) 943204 (BU 806366)
	326 Tryon Rd		Project: TEP No. 217470.796276
	Raleigh, NC 27603		Client: Crown Castle
	Phone: (919) 661-6351		Drawn by: aibrahim
	FAX: (919) 661-6350		Date: 12/14/22
			App'd:
			Scale: NTS
			Dwg No. E-1

tnxTower Tower Engineering Professionals 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job HRT 107 (C) 943204 (BU 806366)	Page 1 of 15
	Project TEP No. 217470.796276	Date 11:37:32 12/14/22
	Client Crown Castle	Designed by aibrahim

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 Hartford County, Connecticut.

Tower base elevation above sea level: 578.00 ft.

Basic wind speed of 130 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.0000 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

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs 	<ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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tnxTower Tower Engineering Professionals 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job HRT 107 (C) 943204 (BU 806366)	Page 2 of 15
	Project TEP No. 217470.796276	Date 11:37:32 12/14/22
	Client Crown Castle	Designed by aibrahim

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	155.50-110.00	45.50	8.00	12	58.6000	64.6060	0.3750	1.5000	A572-65 (65 ksi)
L2	110.00-72.50	45.50	8.50	12	62.8000	68.8050	0.4375	1.7500	A572-65 (65 ksi)
L3	72.50-36.00	45.00	9.00	12	66.8082	72.7480	0.5000	2.0000	A572-65 (65 ksi)
L4	36.00-0.00	45.00		12	70.5600	76.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I ² /Q in ²	w in	w/t
L1	60.5349	70.3067	30422.9680	20.8446	30.3548	1002.2457	61645.1813	34.6028	14.6998	39.199
	66.7528	77.5589	40842.0131	22.9947	33.4659	1220.4065	82756.9913	38.1721	16.3094	43.492
L2	65.9541	87.8532	43610.4361	22.3258	32.5304	1340.6056	88366.5670	43.2387	15.6579	35.789
	71.0778	96.3127	57460.4440	24.4756	35.6410	1612.2011	116430.4378	47.4022	17.2672	39.468
L3	70.1501	106.7562	59911.9268	23.7383	34.6066	1731.2263	121397.8066	52.5421	16.5646	33.129
	75.1379	116.3193	77497.7893	25.8648	37.6835	2056.5463	157031.5318	57.2488	18.1565	36.313
L4	74.1026	112.7967	70668.0184	25.0815	36.5501	1933.4563	143192.5643	55.5151	17.5701	35.14
	79.0222	122.3600	90209.5680	27.2080	39.6270	2276.4673	182789.0418	60.2219	19.1620	38.324

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 155.50-110.00				1	1	1			
L2 110.00-72.50				1	1	1			
L3 72.50-36.00				1	1	1			
L4 36.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	No	Surface Ar (CaAa)	155.50 - 8.00	1	1	0.500 0.500	0.3750		0.22

*
*

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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
128 HB158-21U6S24-xxM_T MO(1-5/8)	C	No	Surface Ar (CaAa)	130.00 - 0.00	3	3	0.500 0.500	1.9960		2.50
116 CU12PSM9P6XXX(1-1/2)	C	No	Surface Ar (CaAa)	116.00 - 0.00	1	1	0.250 0.250	1.6000		2.35
*** *****										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
156 HB158-1-08U8-S8J 18(1-5/8)	C	No	No	Inside Pole	155.50 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.30 1.30 1.30
561(1-5/8)	C	No	No	Inside Pole	155.50 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.35 1.35 1.35
** LDF7-50A(1-5/8)	A	No	No	Inside Pole	155.50 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
144 LDF6-50A(1-1/4)	B	No	No	Inside Pole	144.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.60 0.60 0.60
FB-L98B-002-75000 (3/8)	B	No	No	Inside Pole	144.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	144.00 - 0.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.58 0.58 0.58
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	144.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.58 0.58 0.58
2" Flexible Conduit	B	No	No	Inside Pole	144.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.34 0.34 0.34
FB-L98B-034-XXX(3/8)	B	No	No	Inside Pole	144.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
135 AVA6-50(1-1/4)	C	No	No	Inside Pole	135.00 - 0.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.46 0.46 0.46
* *									
100 HB158-21U6S24-xx M_TMO(1-5/8)	A	No	No	Inside Pole	100.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.50 2.50 2.50
HCS 6X12 4AWG(1-5/8)	A	No	No	Inside Pole	100.00 - 0.00	1	No Ice 1/2" Ice	0.00 0.00	2.40 2.40

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA} ft ² /ft	Weight plf
***						1" Ice	0.00	2.40

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	155.50-110.00	A	0.000	0.000	1.706	0.000	0.12
		B	0.000	0.000	0.000	0.000	0.38
		C	0.000	0.000	12.936	0.000	1.09
L2	110.00-72.50	A	0.000	0.000	1.406	0.000	0.30
		B	0.000	0.000	0.000	0.000	0.42
		C	0.000	0.000	28.455	0.000	1.18
L3	72.50-36.00	A	0.000	0.000	1.369	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.41
		C	0.000	0.000	27.696	0.000	1.15
L4	36.00-0.00	A	0.000	0.000	1.050	0.000	0.36
		B	0.000	0.000	0.000	0.000	0.40
		C	0.000	0.000	27.317	0.000	1.13

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	155.50-110.00	A	0.977	0.000	0.000	10.596	0.000	0.20
		B		0.000	0.000	0.000	0.000	0.38
		C		0.000	0.000	21.987	0.000	1.25
L2	110.00-72.50	A	0.941	0.000	0.000	8.733	0.000	0.36
		B		0.000	0.000	0.000	0.000	0.42
		C		0.000	0.000	50.554	0.000	1.56
L3	72.50-36.00	A	0.894	0.000	0.000	8.238	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.41
		C		0.000	0.000	48.617	0.000	1.51
L4	36.00-0.00	A	0.799	0.000	0.000	6.055	0.000	0.40
		B		0.000	0.000	0.000	0.000	0.40
		C		0.000	0.000	47.184	0.000	1.47

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	155.50-110.00	-1.4528	0.6968	-1.7491	0.1656
L2	110.00-72.50	-3.2849	2.1998	-3.8846	2.1552

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Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L3	72.50-36.00	-3.3041	2.2126	-3.9087	2.1777
L4	36.00-0.00	-3.3239	2.2722	-3.9362	2.3938

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	1	Safety Line 3/8	110.00 - 155.50	1.0000	1.0000
L1	21	HB158-21U6S24-xxM_TMO (1-5/8)	110.00 - 130.00	1.0000	1.0000
L1	23	CU12PSM9P6XXX(1-1/2)	110.00 - 116.00	1.0000	1.0000
L2	1	Safety Line 3/8	72.50 - 110.00	1.0000	1.0000
L2	21	HB158-21U6S24-xxM_TMO (1-5/8)	72.50 - 110.00	1.0000	1.0000
L2	23	CU12PSM9P6XXX(1-1/2)	72.50 - 110.00	1.0000	1.0000
L3	1	Safety Line 3/8	36.00 - 72.50	1.0000	1.0000
L3	21	HB158-21U6S24-xxM_TMO (1-5/8)	36.00 - 72.50	1.0000	1.0000
L3	23	CU12PSM9P6XXX(1-1/2)	36.00 - 72.50	1.0000	1.0000
L4	1	Safety Line 3/8	8.00 - 36.00	1.0000	1.0000
L4	21	HB158-21U6S24-xxM_TMO (1-5/8)	0.00 - 36.00	1.0000	1.0000
L4	23	CU12PSM9P6XXX(1-1/2)	0.00 - 36.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	
156									
LNX-8513DS-VTM w/ Mount Pipe	A	From Centroid-Le	4.00 0.00 3.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice	4.09 4.49 4.89	3.30 3.68 4.06	0.07 0.13 0.20
NHHSS-65B-R2B w/ Mount Pipe	A	From Centroid-Le	4.00 0.00 3.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice	3.89 4.27 4.65	3.14 3.50 3.87	0.09 0.15 0.23
NHHSS-65B-R2B w/ Mount Pipe	B	From Centroid-Le	4.00 0.00 3.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice	3.89 4.27 4.65	3.14 3.50 3.87	0.09 0.15 0.23

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
NHHSS-65B-R2B w/ Mount Pipe	C	From	4.00		0.0000	156.00	No Ice	3.89	3.14	0.09
		Centroid-Le	0.00				1/2" Ice	4.27	3.50	0.15
		g	3.00				1" Ice	4.65	3.87	0.23
NHH-65B-R2B w/ Mount Pipe	A	From	4.00		0.0000	156.00	No Ice	4.09	3.29	0.07
		Centroid-Le	0.00				1/2" Ice	4.48	3.67	0.13
		g	3.00				1" Ice	4.88	4.06	0.21
NHH-65B-R2B w/ Mount Pipe	B	From	4.00		0.0000	156.00	No Ice	4.09	3.29	0.07
		Centroid-Le	0.00				1/2" Ice	4.48	3.67	0.13
		g	3.00				1" Ice	4.88	4.06	0.21
NHH-65B-R2B w/ Mount Pipe	C	From	4.00		0.0000	156.00	No Ice	4.09	3.29	0.07
		Centroid-Le	0.00				1/2" Ice	4.48	3.67	0.13
		g	3.00				1" Ice	4.88	4.06	0.21
MT6407-77A w/ Mount Pipe	A	From	4.00		0.0000	156.00	No Ice	4.91	2.68	0.10
		Centroid-Le	0.00				1/2" Ice	5.26	3.14	0.14
		g	3.00				1" Ice	5.61	3.62	0.18
MT6407-77A w/ Mount Pipe	B	From	4.00		0.0000	156.00	No Ice	4.91	2.68	0.10
		Centroid-Le	0.00				1/2" Ice	5.26	3.14	0.14
		g	3.00				1" Ice	5.61	3.62	0.18
MT6407-77A w/ Mount Pipe	C	From	4.00		0.0000	156.00	No Ice	4.91	2.68	0.10
		Centroid-Le	0.00				1/2" Ice	5.26	3.14	0.14
		g	3.00				1" Ice	5.61	3.62	0.18
LNX-6514DS-A1M w/ Mount Pipe	B	From	4.00		0.0000	156.00	No Ice	4.09	3.30	0.06
		Centroid-Le	0.00				1/2" Ice	4.49	3.68	0.13
		g	3.00				1" Ice	4.89	4.06	0.20
LNX-6514DS-A1M w/ Mount Pipe	C	From	4.00		0.0000	156.00	No Ice	4.09	3.30	0.06
		Centroid-Le	0.00				1/2" Ice	4.49	3.68	0.13
		g	3.00				1" Ice	4.89	4.06	0.20
DB809K-Y	A	From	4.00		0.0000	156.00	No Ice	2.85	2.85	0.03
		Centroid-Le	0.00				1/2" Ice	4.03	4.03	0.05
		g	3.00				1" Ice	5.21	5.21	0.08
DB809K-Y	B	From	4.00		0.0000	156.00	No Ice	2.85	2.85	0.03
		Centroid-Le	0.00				1/2" Ice	4.03	4.03	0.05
		g	3.00				1" Ice	5.21	5.21	0.08
DB809K-Y	C	From	4.00		0.0000	156.00	No Ice	2.85	2.85	0.03
		Centroid-Le	0.00				1/2" Ice	4.03	4.03	0.05
		g	3.00				1" Ice	5.21	5.21	0.08
(2) RRFDC-3315-PF-48	A	From	4.00		0.0000	156.00	No Ice	3.36	2.19	0.02
		Centroid-Le	0.00				1/2" Ice	3.60	2.39	0.05
		g	3.00				1" Ice	3.84	2.61	0.08
CBRS RT4401-48A	A	From	4.00		0.0000	156.00	No Ice	0.99	0.50	0.02
		Centroid-Le	0.00				1/2" Ice	1.12	0.60	0.03
		g	3.00				1" Ice	1.26	0.70	0.04
(2) CBRS RT4401-48A	C	From	4.00		0.0000	156.00	No Ice	0.99	0.50	0.02
		Centroid-Le	0.00				1/2" Ice	1.12	0.60	0.03
		g	3.00				1" Ice	1.26	0.70	0.04
RFV01U-D1A	A	From	4.00		0.0000	156.00	No Ice	1.88	1.25	0.08
		Centroid-Le	0.00				1/2" Ice	2.05	1.39	0.10
		g	3.00				1" Ice	2.22	1.54	0.12
(2) RFV01U-D1A	B	From	4.00		0.0000	156.00	No Ice	1.88	1.25	0.08
		Centroid-Le	0.00				1/2" Ice	2.05	1.39	0.10
		g	3.00				1" Ice	2.22	1.54	0.12
(2) RFV01U-D2A	B	From	4.00		0.0000	156.00	No Ice	1.88	1.01	0.07
		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	C	From	4.00		0.0000	156.00	No Ice	1.88	1.01	0.07
		Centroid-Le	0.00				1/2" Ice	2.05	1.14	0.09
		g	3.00				1" Ice	2.22	1.28	0.11

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
(2) 2.4" Dia x 6-ft Pipe	A	From	4.00	0.0000	156.00	No Ice	1.43	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.93	1.93	0.03
		g	3.00			1" Ice	2.30	2.30	0.05
(2) 2.4" Dia x 6-ft Pipe	B	From	4.00	0.0000	156.00	No Ice	1.43	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.93	1.93	0.03
		g	3.00			1" Ice	2.30	2.30	0.05
(2) 2.4" Dia x 6-ft Pipe	C	From	4.00	0.0000	156.00	No Ice	1.43	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.93	1.93	0.03
		g	3.00			1" Ice	2.30	2.30	0.05
BSAMNT-SBS-1-2	A	From	4.00	0.0000	156.00	No Ice	0.00	0.00	0.03
		Centroid-Le	0.00			1/2" Ice	0.00	0.00	0.03
		g	3.00			1" Ice	0.00	0.00	0.04
BSAMNT-SBS-1-2	B	From	4.00	0.0000	156.00	No Ice	0.00	0.00	0.03
		Centroid-Le	0.00			1/2" Ice	0.00	0.00	0.03
		g	3.00			1" Ice	0.00	0.00	0.04
BSAMNT-SBS-1-2	C	From	4.00	0.0000	156.00	No Ice	0.00	0.00	0.03
		Centroid-Le	0.00			1/2" Ice	0.00	0.00	0.03
		g	3.00			1" Ice	0.00	0.00	0.04
Platform Mount [LP 603-1] (16-ft)	C	None		0.0000	156.00	No Ice	46.42	46.42	2.35
						1/2" Ice	54.03	54.03	3.19
						1" Ice	62.40	62.40	4.17
Mount Reinforcement Specifications	C	None		0.0000	156.00	No Ice	28.63	28.63	0.28
						1/2" Ice	37.31	37.31	0.67
						1" Ice	45.80	45.80	0.94
144									
7770.00 w/ Mount Pipe	A	From	4.00	0.0000	144.00	No Ice	3.39	2.32	0.06
		Centroid-Le	0.00			1/2" Ice	3.75	2.66	0.10
		g	0.00			1" Ice	4.12	3.02	0.15
7770.00 w/ Mount Pipe	B	From	4.00	0.0000	144.00	No Ice	3.39	2.32	0.06
		Centroid-Le	0.00			1/2" Ice	3.75	2.66	0.10
		g	0.00			1" Ice	4.12	3.02	0.15
7770.00 w/ Mount Pipe	C	From	4.00	0.0000	144.00	No Ice	3.39	2.32	0.06
		Centroid-Le	0.00			1/2" Ice	3.75	2.66	0.10
		g	0.00			1" Ice	4.12	3.02	0.15
HPA65R-BU6A w/ Mount Pipe	A	From	4.00	0.0000	144.00	No Ice	5.83	5.00	0.08
		Centroid-Le	0.00			1/2" Ice	6.40	5.56	0.14
		g	0.00			1" Ice	6.99	6.13	0.22
HPA65R-BU6A w/ Mount Pipe	B	From	4.00	0.0000	144.00	No Ice	5.83	5.00	0.08
		Centroid-Le	0.00			1/2" Ice	6.40	5.56	0.14
		g	0.00			1" Ice	6.99	6.13	0.22
HPA65R-BU6A w/ Mount Pipe	C	From	4.00	0.0000	144.00	No Ice	5.83	5.00	0.08
		Centroid-Le	0.00			1/2" Ice	6.40	5.56	0.14
		g	0.00			1" Ice	6.99	6.13	0.22
OPA65R-BU6D w/ Mount Pipe	A	From	4.00	0.0000	144.00	No Ice	12.25	6.05	0.09
		Centroid-Le	0.00			1/2" Ice	13.00	6.71	0.18
		g	0.00			1" Ice	13.76	7.39	0.27
OPA65R-BU6D w/ Mount Pipe	B	From	4.00	0.0000	144.00	No Ice	12.25	6.05	0.09
		Centroid-Le	0.00			1/2" Ice	13.00	6.71	0.18
		g	0.00			1" Ice	13.76	7.39	0.27
OPA65R-BU6D w/ Mount Pipe	C	From	4.00	0.0000	144.00	No Ice	12.25	6.05	0.09
		Centroid-Le	0.00			1/2" Ice	13.00	6.71	0.18
		g	0.00			1" Ice	13.76	7.39	0.27
80010965 w/ Mount Pipe	A	From	4.00	0.0000	144.00	No Ice	12.26	5.79	0.14
		Centroid-Le	0.00			1/2" Ice	13.03	6.47	0.23
		g	0.00			1" Ice	13.80	7.17	0.33
80010965 w/ Mount Pipe	B	From	4.00	0.0000	144.00	No Ice	12.26	5.79	0.14
		Centroid-Le	0.00			1/2" Ice	13.03	6.47	0.23
		g	0.00			1" Ice	13.80	7.17	0.33

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	Client	Crown Castle	Designed by	aibrahim

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
80010965 w/ Mount Pipe	C	g	0.00			1" Ice	13.80	7.17	0.33
		From	4.00	0.0000	144.00	No Ice	12.26	5.79	0.14
		Centroid-Le	0.00			1/2" Ice	13.03	6.47	0.23
(2) LGP 17201	A	g	0.00			1" Ice	13.80	7.17	0.33
		From	4.00	0.0000	144.00	No Ice	1.67	0.47	0.03
		Centroid-Le	0.00			1/2" Ice	1.83	0.57	0.04
(2) LGP 17201	B	g	0.00			1" Ice	2.00	0.68	0.06
		From	4.00	0.0000	144.00	No Ice	1.67	0.47	0.03
		Centroid-Le	0.00			1/2" Ice	1.83	0.57	0.04
(2) LGP 17201	C	g	0.00			1" Ice	2.00	0.68	0.06
		From	4.00	0.0000	144.00	No Ice	1.67	0.47	0.03
		Centroid-Le	0.00			1/2" Ice	1.83	0.57	0.04
1001940	A	g	0.00			1" Ice	2.00	0.68	0.06
		From	4.00	0.0000	144.00	No Ice	0.18	0.08	0.00
		Centroid-Le	0.00			1/2" Ice	0.23	0.13	0.00
1001940	B	g	0.00			1" Ice	0.30	0.18	0.01
		From	4.00	0.0000	144.00	No Ice	0.18	0.08	0.00
		Centroid-Le	0.00			1/2" Ice	0.23	0.13	0.00
1001940	C	g	0.00			1" Ice	0.30	0.18	0.01
		From	4.00	0.0000	144.00	No Ice	0.18	0.08	0.00
		Centroid-Le	0.00			1/2" Ice	0.23	0.13	0.00
DC6-48-60-18-8F	A	g	0.00			1" Ice	0.30	0.18	0.01
		From	4.00	0.0000	144.00	No Ice	1.21	1.21	0.03
		Centroid-Le	0.00			1/2" Ice	1.89	1.89	0.05
DC6-48-60-18-8F	B	g	0.00			1" Ice	2.11	2.11	0.08
		From	4.00	0.0000	144.00	No Ice	1.21	1.21	0.03
		Centroid-Le	0.00			1/2" Ice	1.89	1.89	0.05
DC6-48-60-18-8F	C	g	0.00			1" Ice	2.11	2.11	0.08
		From	4.00	0.0000	144.00	No Ice	1.21	1.21	0.03
		Centroid-Le	0.00			1/2" Ice	1.89	1.89	0.05
RRUS 4478 B14	A	g	0.00			1" Ice	2.11	2.11	0.08
		From	4.00	0.0000	144.00	No Ice	1.84	1.06	0.06
		Centroid-Le	0.00			1/2" Ice	2.01	1.20	0.08
RRUS 4478 B14	B	g	0.00			1" Ice	2.19	1.34	0.09
		From	4.00	0.0000	144.00	No Ice	1.84	1.06	0.06
		Centroid-Le	0.00			1/2" Ice	2.01	1.20	0.08
RRUS 4478 B14	C	g	0.00			1" Ice	2.19	1.34	0.09
		From	4.00	0.0000	144.00	No Ice	1.84	1.06	0.06
		Centroid-Le	0.00			1/2" Ice	2.01	1.20	0.08
RRUS 8843 B2/B66A	A	g	0.00			1" Ice	2.19	1.34	0.09
		From	4.00	0.0000	144.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
RRUS 8843 B2/B66A	B	g	0.00			1" Ice	1.97	1.65	0.11
		From	4.00	0.0000	144.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
RRUS 8843 B2/B66A	C	g	0.00			1" Ice	1.97	1.65	0.11
		From	4.00	0.0000	144.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
RRUS 4449 B5/B12	A	g	0.00			1" Ice	1.97	1.65	0.11
		From	4.00	0.0000	144.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09
RRUS 4449 B5/B12	B	g	0.00			1" Ice	2.33	1.73	0.11
		From	4.00	0.0000	144.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09
RRUS 4449 B5/B12	C	g	0.00			1" Ice	2.33	1.73	0.11
		From	4.00	0.0000	144.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09

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	Client	Crown Castle	Designed by	aibrahim

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Lateral						Vert
RRUS 32 B30	A	g	0.00		0.0000	144.00	1" Ice	2.33	1.73	0.11
		From	4.00				No Ice	2.73	1.67	0.05
		Centroid-Le	0.00				1/2" Ice	2.95	1.86	0.07
RRUS 32 B30	B	g	0.00		0.0000	144.00	1" Ice	3.18	2.05	0.10
		From	4.00				No Ice	2.73	1.67	0.05
		Centroid-Le	0.00				1/2" Ice	2.95	1.86	0.07
RRUS 32 B30	C	g	0.00		0.0000	144.00	1" Ice	3.18	2.05	0.10
		From	4.00				No Ice	2.73	1.67	0.05
		Centroid-Le	0.00				1/2" Ice	2.95	1.86	0.07
2.4" Dia x 6-ft Pipe	A	g	0.00		0.0000	144.00	1" Ice	3.18	2.05	0.10
		From	4.00				No Ice	1.43	1.43	0.02
		Centroid-Le	0.00				1/2" Ice	1.93	1.93	0.03
2.4" Dia x 6-ft Pipe	B	g	0.00		0.0000	144.00	1" Ice	2.30	2.30	0.05
		From	4.00				No Ice	1.43	1.43	0.02
		Centroid-Le	0.00				1/2" Ice	1.93	1.93	0.03
2.4" Dia x 6-ft Pipe	C	g	0.00		0.0000	144.00	1" Ice	2.30	2.30	0.05
		From	4.00				No Ice	1.43	1.43	0.02
		Centroid-Le	0.00				1/2" Ice	1.93	1.93	0.03
Platform Mount [LP 603-1] (16-ft)	C	g	0.00		0.0000	144.00	1" Ice	2.30	2.30	0.05
		None					No Ice	46.42	46.42	2.35
							1/2" Ice	54.03	54.03	3.19
135							1" Ice	62.40	62.40	4.17
742 213 w/ Mount Pipe	A	From Leg	1.00		0.0000	135.00	No Ice	3.54	2.98	0.05
			0.00				1/2" Ice	4.13	3.57	0.09
			0.00				1" Ice	4.74	4.17	0.14
742 213 w/ Mount Pipe	B	From Leg	1.00		0.0000	135.00	No Ice	3.54	2.98	0.05
			0.00				1/2" Ice	4.13	3.57	0.09
			0.00				1" Ice	4.74	4.17	0.14
742 213 w/ Mount Pipe	C	From Leg	1.00		0.0000	135.00	No Ice	3.54	2.98	0.05
			0.00				1/2" Ice	4.13	3.57	0.09
			0.00				1" Ice	4.74	4.17	0.14
130										
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00		0.0000	130.00	No Ice	14.69	6.87	0.18
			0.00				1/2" Ice	15.46	7.55	0.31
			0.00				1" Ice	16.23	8.25	0.45
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00		0.0000	130.00	No Ice	14.69	6.87	0.18
			0.00				1/2" Ice	15.46	7.55	0.31
			0.00				1" Ice	16.23	8.25	0.45
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00		0.0000	130.00	No Ice	14.69	6.87	0.18
			0.00				1/2" Ice	15.46	7.55	0.31
			0.00				1" Ice	16.23	8.25	0.45
VV-65A-R1_TMO w/ Mount Pipe	A	From Leg	4.00		0.0000	130.00	No Ice	4.46	2.69	0.05
			0.00				1/2" Ice	4.91	3.10	0.10
			0.00				1" Ice	5.36	3.52	0.15
VV-65A-R1_TMO w/ Mount Pipe	B	From Leg	4.00		0.0000	130.00	No Ice	4.46	2.69	0.05
			0.00				1/2" Ice	4.91	3.10	0.10
			0.00				1" Ice	5.36	3.52	0.15
VV-65A-R1_TMO w/ Mount Pipe	C	From Leg	4.00		0.0000	130.00	No Ice	4.46	2.69	0.05
			0.00				1/2" Ice	4.91	3.10	0.10
			0.00				1" Ice	5.36	3.52	0.15
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	A	From Leg	4.00		0.0000	130.00	No Ice	5.79	2.97	0.10
			0.00				1/2" Ice	6.24	3.34	0.14
			0.00				1" Ice	6.71	3.73	0.19
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	B	From Leg	4.00		0.0000	130.00	No Ice	5.79	2.97	0.10
			0.00				1/2" Ice	6.24	3.34	0.14
			0.00				1" Ice	6.71	3.73	0.19

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	Project	TEP No. 217470.796276	Date	11:37:32 12/14/22
	Client	Crown Castle	Designed by	aibrahim

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	C	From Leg	4.00	0.0000	130.00	No Ice	5.79	2.97	0.10
			0.00			1/2" Ice	6.24	3.34	0.14
			0.00			1" Ice	6.71	3.73	0.19
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.0000	130.00	No Ice	2.14	1.69	0.11
			0.00			1/2" Ice	2.32	1.85	0.13
			0.00			1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00	0.0000	130.00	No Ice	2.14	1.69	0.11
			0.00			1/2" Ice	2.32	1.85	0.13
			0.00			1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.0000	130.00	No Ice	2.14	1.69	0.11
			0.00			1/2" Ice	2.32	1.85	0.13
			0.00			1" Ice	2.51	2.02	0.16
Radio 4480_TMOV2	A	From Leg	4.00	0.0000	130.00	No Ice	2.88	1.40	0.08
			0.00			1/2" Ice	3.09	1.56	0.10
			0.00			1" Ice	3.31	1.73	0.13
Radio 4480_TMOV2	B	From Leg	4.00	0.0000	130.00	No Ice	2.88	1.40	0.08
			0.00			1/2" Ice	3.09	1.56	0.10
			0.00			1" Ice	3.31	1.73	0.13
Radio 4480_TMOV2	C	From Leg	4.00	0.0000	130.00	No Ice	2.88	1.40	0.08
			0.00			1/2" Ice	3.09	1.56	0.10
			0.00			1" Ice	3.31	1.73	0.13
2.4" Dia x 8-ft Mount Pipe	A	From Leg	4.00	0.0000	130.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
2.4" Dia x 8-ft Mount Pipe	B	From Leg	4.00	0.0000	130.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
2.4" Dia x 8-ft Mount Pipe	C	From Leg	4.00	0.0000	130.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
Commscope MC-PK10-C Mount	C	None		0.0000	130.00	No Ice	17.09	17.09	1.50
						1/2" Ice	21.47	21.47	1.88
						1" Ice	25.72	25.72	2.35
116									
MX08FRO665-21 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.0000	116.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	116.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.0000	116.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
TA08025-B604	A	From Centroid-Le g	4.00	0.0000	116.00	No Ice	1.96	0.98	0.06
			0.00			1/2" Ice	2.14	1.11	0.08
			0.00			1" Ice	2.32	1.25	0.10
TA08025-B604	B	From Centroid-Le g	4.00	0.0000	116.00	No Ice	1.96	0.98	0.06
			0.00			1/2" Ice	2.14	1.11	0.08
			0.00			1" Ice	2.32	1.25	0.10
TA08025-B604	C	From Centroid-Le g	4.00	0.0000	116.00	No Ice	1.96	0.98	0.06
			0.00			1/2" Ice	2.14	1.11	0.08
			0.00			1" Ice	2.32	1.25	0.10
TA08025-B605	A	From Centroid-Le g	4.00	0.0000	116.00	No Ice	1.96	1.13	0.08
			0.00			1/2" Ice	2.14	1.27	0.09
			0.00			1" Ice	2.32	1.41	0.11
TA08025-B605	B	From Centroid-Le g	4.00	0.0000	116.00	No Ice	1.96	1.13	0.08
			0.00			1/2" Ice	2.14	1.27	0.09

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	Project TEP No. 217470.796276	Date 11:37:32 12/14/22
	Client Crown Castle	Designed by aibrahim

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
TA08025-B605	C	g	0.00		0.0000	116.00	1" Ice	2.32	1.41	0.11
		From	4.00				No Ice	1.96	1.13	0.08
		Centroid-Le	0.00				1/2" Ice	2.14	1.27	0.09
RDIDC-9181-PF-48	A	g	0.00		0.0000	116.00	1" Ice	2.32	1.41	0.11
		From	4.00				No Ice	2.01	1.17	0.02
		Centroid-Le	0.00				1/2" Ice	2.19	1.31	0.04
(2) 2.4" Dia x 8-ft Mount Pipe	A	g	0.00		0.0000	116.00	1" Ice	2.37	1.46	0.06
		From	4.00				No Ice	1.90	1.90	0.03
		Centroid-Le	0.00				1/2" Ice	2.73	2.73	0.04
(2) 2.4" Dia x 8-ft Mount Pipe	B	g	0.00		0.0000	116.00	1" Ice	3.40	3.40	0.06
		From	4.00				No Ice	1.90	1.90	0.03
		Centroid-Le	0.00				1/2" Ice	2.73	2.73	0.04
(2) 2.4" Dia x 8-ft Mount Pipe	C	g	0.00		0.0000	116.00	1" Ice	3.40	3.40	0.06
		From	4.00				No Ice	1.90	1.90	0.03
		Centroid-Le	0.00				1/2" Ice	2.73	2.73	0.04
Commscope MC-PK8-DSH	C	g	0.00		0.0000	116.00	1" Ice	3.40	3.40	0.06
		None					No Ice	34.24	34.24	1.75
							1/2" Ice	62.95	62.95	2.10
100							1" Ice	91.66	91.66	2.45
AIR 6419 B41_TMO w/ Mount Pipe	A	From	4.00		0.0000	100.00	No Ice	6.58	3.50	0.11
		Centroid-Le	0.00				1/2" Ice	7.06	3.90	0.16
		g	2.00				1" Ice	7.57	4.32	0.22
AIR 6419 B41_TMO w/ Mount Pipe	B	From	4.00		0.0000	100.00	No Ice	6.58	3.50	0.11
		Centroid-Le	0.00				1/2" Ice	7.06	3.90	0.16
		g	2.00				1" Ice	7.57	4.32	0.22
AIR 6419 B41_TMO w/ Mount Pipe	C	From	4.00		0.0000	100.00	No Ice	6.58	3.50	0.11
		Centroid-Le	0.00				1/2" Ice	7.06	3.90	0.16
		g	2.00				1" Ice	7.57	4.32	0.22
VV-65A-R1_TMO w/ Mount Pipe	A	From	4.00		0.0000	100.00	No Ice	4.46	2.69	0.05
		Centroid-Le	0.00				1/2" Ice	4.91	3.10	0.10
		g	2.00				1" Ice	5.36	3.52	0.15
VV-65A-R1_TMO w/ Mount Pipe	B	From	4.00		0.0000	100.00	No Ice	4.46	2.69	0.05
		Centroid-Le	0.00				1/2" Ice	4.91	3.10	0.10
		g	2.00				1" Ice	5.36	3.52	0.15
VV-65A-R1_TMO w/ Mount Pipe	C	From	4.00		0.0000	100.00	No Ice	4.46	2.69	0.05
		Centroid-Le	0.00				1/2" Ice	4.91	3.10	0.10
		g	2.00				1" Ice	5.36	3.52	0.15
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From	4.00		0.0000	100.00	No Ice	14.69	6.87	0.19
		Centroid-Le	0.00				1/2" Ice	15.46	7.55	0.31
		g	2.00				1" Ice	16.23	8.25	0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From	4.00		0.0000	100.00	No Ice	14.69	6.87	0.19
		Centroid-Le	0.00				1/2" Ice	15.46	7.55	0.31
		g	2.00				1" Ice	16.23	8.25	0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From	4.00		0.0000	100.00	No Ice	14.69	6.87	0.19
		Centroid-Le	0.00				1/2" Ice	15.46	7.55	0.31
		g	2.00				1" Ice	16.23	8.25	0.46
RADIO 4449 B71/B85A	A	From	4.00		0.0000	100.00	No Ice	1.64	1.31	0.07
		Centroid-Le	0.00				1/2" Ice	1.80	1.46	0.09
		g	0.00				1" Ice	1.97	1.61	0.11
RADIO 4449 B71/B85A	B	From	4.00		0.0000	100.00	No Ice	1.64	1.31	0.07
		Centroid-Le	0.00				1/2" Ice	1.80	1.46	0.09
		g	0.00				1" Ice	1.97	1.61	0.11
RADIO 4449 B71/B85A	C	From	4.00		0.0000	100.00	No Ice	1.64	1.31	0.07
		Centroid-Le	0.00				1/2" Ice	1.80	1.46	0.09
		g	0.00				1" Ice	1.97	1.61	0.11
RADIO 4460 B2/B25	A	From	4.00		0.0000	100.00	No Ice	2.14	1.69	0.11

tnxTower Tower Engineering Professionals 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	HRT 107 (C) 943204 (BU 806366)	Page	12 of 15
	Project	TEP No. 217470.796276	Date	11:37:32 12/14/22
	Client	Crown Castle	Designed by	aibrahim

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
B66_TMO		Centroid-Le	0.00		1/2" Ice	2.32	1.85	0.13
		g	2.00		1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25	B	From	4.00	0.0000	100.00	No Ice	2.14	1.69
B66_TMO		Centroid-Le	0.00		1/2" Ice	2.32	1.85	0.13
		g	2.00		1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25	C	From	4.00	0.0000	100.00	No Ice	2.14	1.69
B66_TMO		Centroid-Le	0.00		1/2" Ice	2.32	1.85	0.13
		g	2.00		1" Ice	2.51	2.02	0.16
2.4" Dia x 8-ft Mount Pipe	A	From	4.00	0.0000	100.00	No Ice	1.90	1.90
		Centroid-Le	0.00		1/2" Ice	2.73	2.73	0.04
		g	0.00		1" Ice	3.40	3.40	0.06
2.4" Dia x 8-ft Mount Pipe	B	From	4.00	0.0000	100.00	No Ice	1.90	1.90
		Centroid-Le	0.00		1/2" Ice	2.73	2.73	0.04
		g	0.00		1" Ice	3.40	3.40	0.06
2.4" Dia x 8-ft Mount Pipe	C	From	4.00	0.0000	100.00	No Ice	1.90	1.90
		Centroid-Le	0.00		1/2" Ice	2.73	2.73	0.04
		g	0.00		1" Ice	3.40	3.40	0.06
Site Pro 1 RMQP-xxx + HK12	C	None		0.0000	100.00	No Ice	31.60	29.33
						1/2" Ice	38.57	36.09
						1" Ice	45.53	42.97

Load Combinations

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

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Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155.5 - 110	6.229	44	0.2839	0.0002
L2	118 - 72.5	4.039	44	0.2675	0.0001
L3	81 - 36	2.124	45	0.2165	0.0001
L4	45 - 0	0.739	45	0.1391	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.00	LNx-8513DS-VTM w/ Mount Pipe	44	6.229	0.2839	0.0002	478308
144.00	7770.00 w/ Mount Pipe	44	5.545	0.2811	0.0001	207959
135.00	742 213 w/ Mount Pipe	44	5.015	0.2780	0.0001	116660
130.00	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	44	4.724	0.2756	0.0001	93785
116.00	MX08FRO665-21 w/ Mount Pipe	44	3.927	0.2657	0.0001	61619
100.00	AIR 6419 B41_TMO w/ Mount Pipe	45	3.064	0.2469	0.0001	48007

Maximum Tower Deflections - Design Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155.5 - 110	31.053	12	1.4151	0.0008
L2	118 - 72.5	20.139	12	1.3336	0.0005
L3	81 - 36	10.589	12	1.0797	0.0003
L4	45 - 0	3.684	12	0.6936	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
156.00	LNx-8513DS-VTM w/ Mount Pipe	12	31.053	1.4151	0.0008	96394
144.00	7770.00 w/ Mount Pipe	12	27.645	1.4012	0.0007	41910
135.00	742 213 w/ Mount Pipe	12	25.003	1.3858	0.0006	23510
130.00	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	12	23.552	1.3743	0.0006	18900
116.00	MX08FRO665-21 w/ Mount Pipe	12	19.583	1.3247	0.0005	12412
100.00	AIR 6419 B41_TMO w/ Mount Pipe	12	15.279	1.2312	0.0004	9651

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	45.50	0.00	0.0	76.2838	-26.90	3888.78	0.007
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	45.50	0.00	0.0	94.7324	-52.17	5197.13	0.010
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	45.00	0.00	0.0	114.407	-74.18	6625.14	0.011
L4	36 - 0 (4)	TP76.5x70.56x0.5	45.00	0.00	0.0	122.360	-103.45	6767.68	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	674.91	5014.91	0.135	0.00	5014.91	0.000
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	1997.98	7129.95	0.280	0.00	7129.95	0.000
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	3640.12	9599.50	0.379	0.00	9599.50	0.000
L4	36 - 0 (4)	TP76.5x70.56x0.5	6021.86	10492.50	0.574	0.00	10492.50	0.000

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Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	155.5 - 110 (1)	TP64.606x58.6x0.375	26.54	1338.78	0.020	0.64	7439.68	0.000
L2	110 - 72.5 (2)	TP68.805x62.8x0.4375	41.79	1662.55	0.025	0.72	9834.25	0.000
L3	72.5 - 36 (3)	TP72.748x66.8082x0.5	49.11	2007.84	0.024	0.72	12550.25	0.000
L4	36 - 0 (4)	TP76.5x70.56x0.5	56.40	2147.42	0.026	0.72	14355.92	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{ux}	ϕM_{uy}	ϕV_n	ϕT_n			
L1	155.5 - 110 (1)	0.007	0.135	0.000	0.020	0.000	0.142	1.050	4.8.2
L2	110 - 72.5 (2)	0.010	0.280	0.000	0.025	0.000	0.291	1.050	4.8.2
L3	72.5 - 36 (3)	0.011	0.379	0.000	0.024	0.000	0.391	1.050	4.8.2
L4	36 - 0 (4)	0.015	0.574	0.000	0.026	0.000	0.590	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	155.5 - 110	Pole	TP64.606x58.6x0.375	1	-26.90	4083.22	13.5	Pass
L2	110 - 72.5	Pole	TP68.805x62.8x0.4375	2	-52.17	5456.99	27.7	Pass
L3	72.5 - 36	Pole	TP72.748x66.8082x0.5	3	-74.18	6956.40	37.2	Pass
L4	36 - 0	Pole	TP76.5x70.56x0.5	4	-103.45	7106.06	56.2	Pass
Summary								
Pole (L4)							56.2	Pass
RATING =							56.2	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(3) 1-5/8" TO 100 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(6) 1-1/4" TO 135 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(3) 1-5/8" TO 156 FT LEVEL

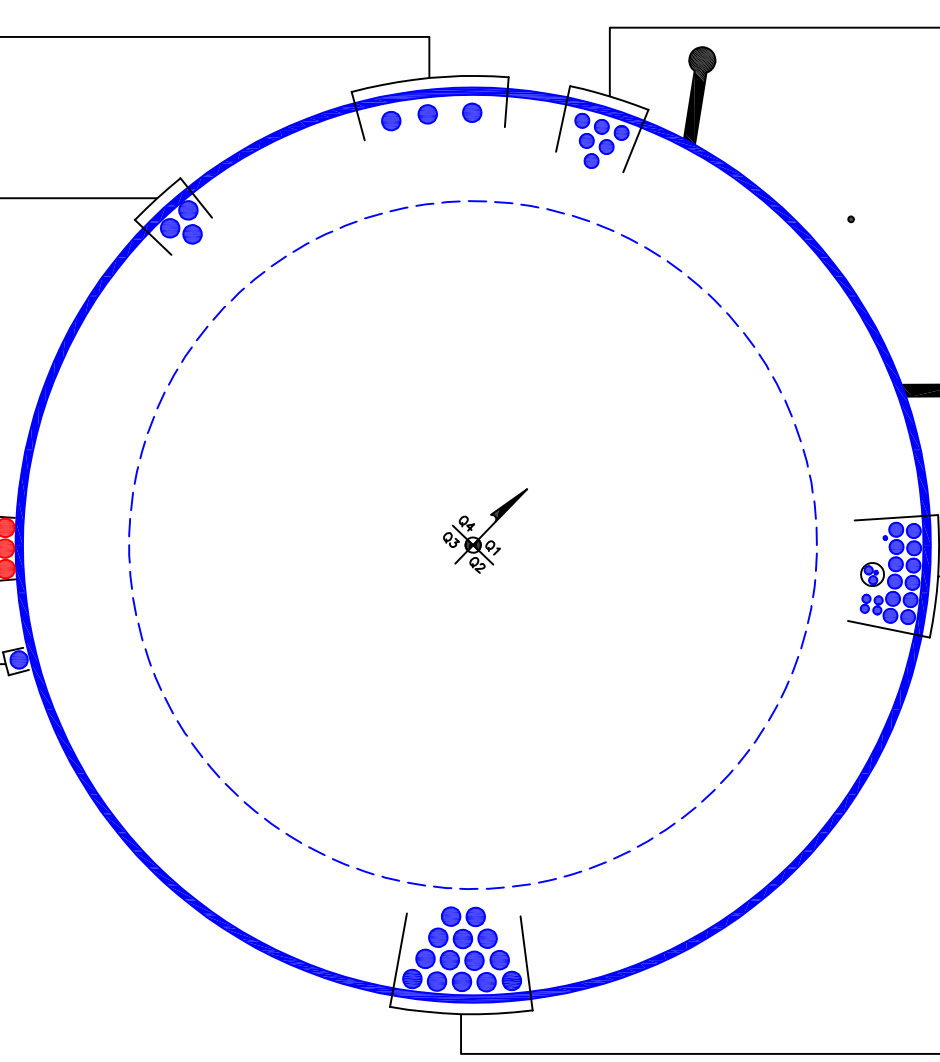
CLIMBING PEGS
W/ SAFETY CLIMB

(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-5/8" TO 130 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)
(1) 3/8" TO 144 FT LEVEL
(2) 3/4" TO 144 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 144 FT LEVEL
(4) 3/4" TO 144 FT LEVEL
(12) 1-1/4" TO 144 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 116 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(14) 1-5/8" TO 156 FT LEVEL



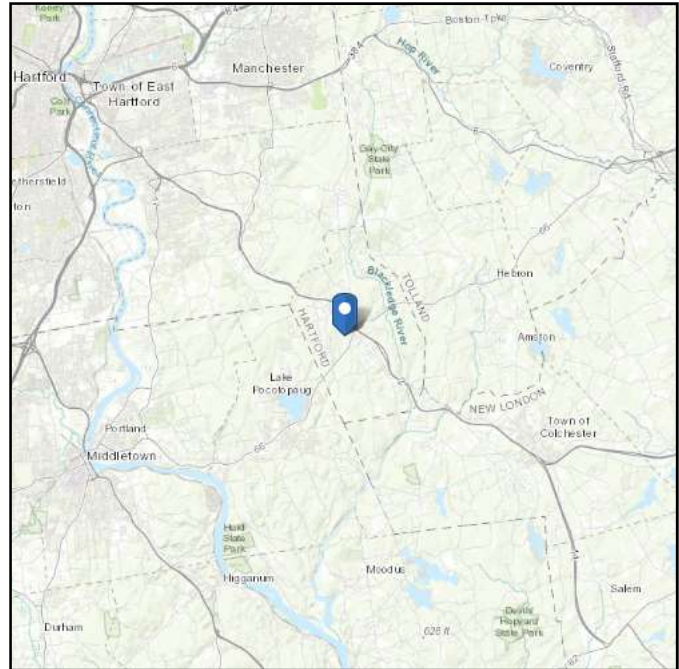
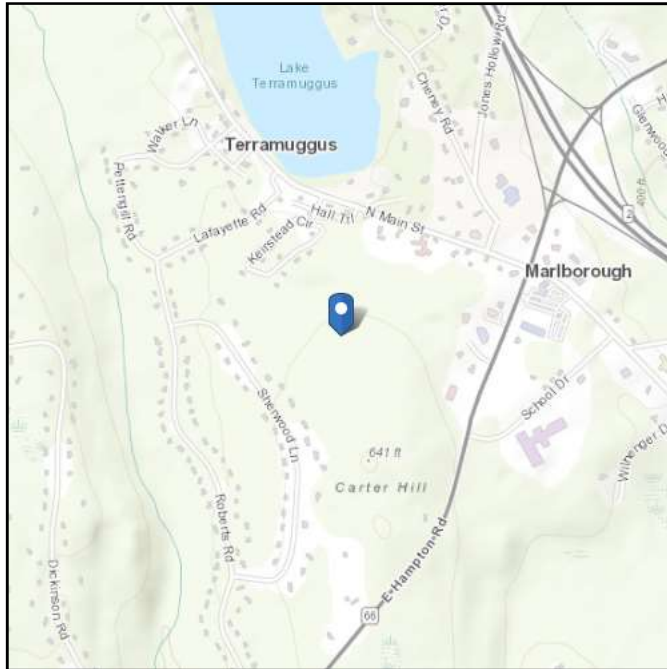
APPENDIX C
ADDITIONAL CALCULATIONS

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)

Latitude: 41.629806
Longitude: -72.4665
Elevation: 577.55 ft (NAVD 88)



Wind

Results:

Wind Speed	120 Vmph	130 Vmph per Jurisdiction
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 Nov 29 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).

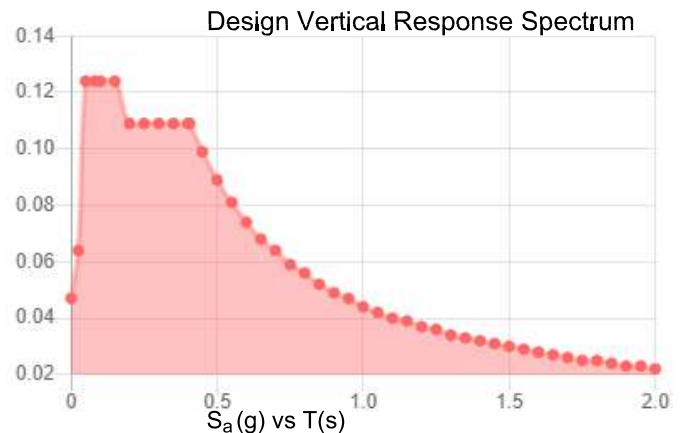
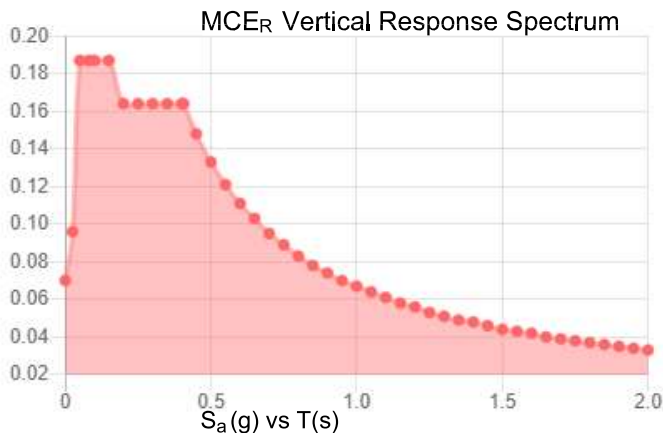
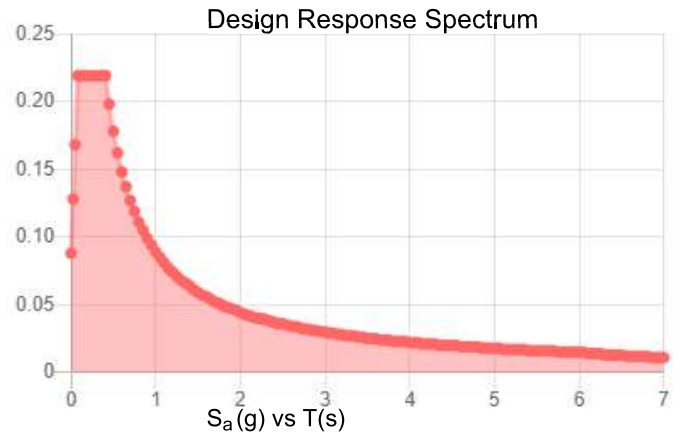
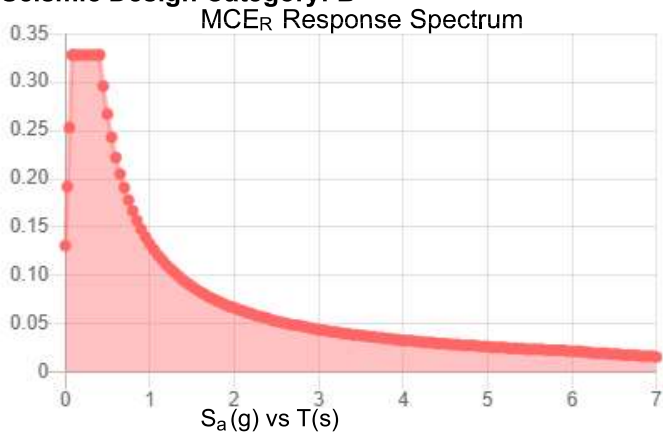
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class:

Results:

S_s :	0.205	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.113
F_v :	2.4	PGA _M :	0.178
S_{MS} :	0.328	F_{PGA} :	1.573
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.219	C_v :	0.71

Seismic Design Category: B



Data Accessed:

Tue Nov 29 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.

Ice

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 Nov 29 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.

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

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Monopole Base Plate Connection

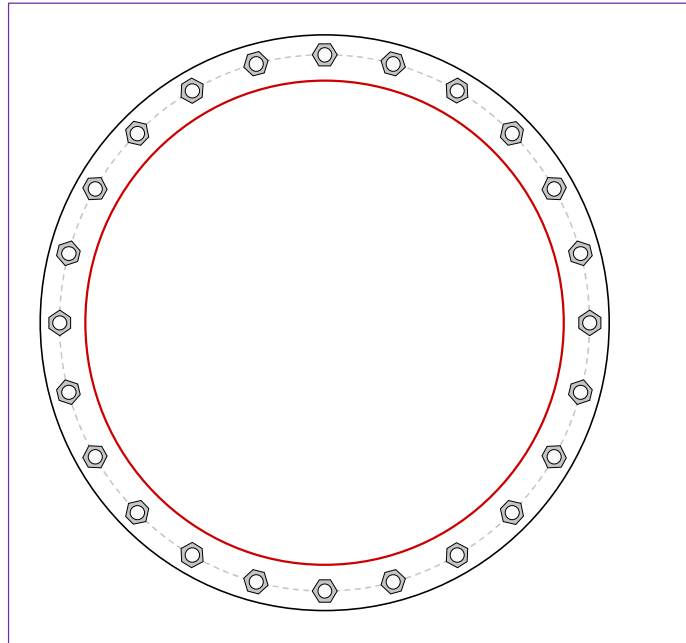


Site Info	
BU #	806366
Site Name	HRT 107(C) 943204
Order #	637965 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.25

Applied Loads	
Moment (kip-ft)	6022.00
Axial Force (kips)	103.00
Shear Force (kips)	56.00

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data
(24) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 84.75" BC
Base Plate Data
91" OD x 3.25" Plate (A633 Gr. E; $F_y=60$ ksi, $F_u=80$ ksi)
Stiffener Data
N/A
Pole Data
76.5" x 0.5" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		(units of kips, kip-in)	
$Pu_t = 137.78$	$\phi Pn_t = 243.75$		Stress Rating
$Vu = 2.33$	$\phi Vn = 149.1$		53.8%
$Mu = n/a$	$\phi Mn = n/a$		Pass
Base Plate Summary			
Max Stress (ksi):	14.15		(Flexural)
Allowable Stress (ksi):	54		
Stress Rating:	25.0%		Pass

Pier and Pad Foundation



BU #: 806366
 Site Name: HRT 107(C) 94320
 App. Number: 637965 Rev. 1

TIA-222 Revision: H
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:
 Block Foundation?:
 Rectangular Pad?:

Superstructure Analysis Reactions		
Compression, P_{comp} :	103	kips
Base Shear, V_{u_comp} :	56	kips
Moment, M_u :	6022	ft-kips
Tower Height, H :	155.5	ft
BP Dist. Above Fdn, bp_{dist} :	3.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	612.40	56.00	8.7%	Pass
<i>Bearing Pressure (ksf)</i>	15.75	2.12	12.8%	Pass
<i>Overturing (kip*ft)</i>	17867.25	6486.33	36.3%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	18547.29	6218.00	31.9%	Pass
<i>Pier Compression (kip)</i>	51554.88	154.03	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	8427.96	2215.27	25.0%	Pass
<i>Pad Shear - 1-way (kips)</i>	1850.42	242.91	12.5%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.023	11.4%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	11161.59	3730.80	31.8%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	9	ft
Ext. Above Grade, E :	0.5	ft
Pier Rebar Size, Sc :	11	
Pier Rebar Quantity, mc :	59	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Quantity, mt :	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Structural Rating*:	31.9%
Soil Rating*:	36.3%

Pad Properties		
Depth, D :	7.5	ft
Pad Width, W_1 :	33.25	ft
Pad Thickness, T :	4.5	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	11	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	25	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	130	pcf
Ultimate Gross Bearing, Q_{ult} :	21.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	40	degrees
SPT Blow Count, N_{blows} :	60	
Base Friction, μ :	0.4	
Neglected Depth, N :	4.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	14.5	ft

<--Toggle between Gross and Net



FOX HILL TELECOM

Radio Frequency Emissions Analysis Report

T Mobile™

Site ID: CT11251A

East Hampton-2_1
73 North Main Street
Marlborough, CT 06447

December 19, 2022

Fox Hill Telecom Project Number: 222019

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	17.71 %



December 19, 2022

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CT11251A – East Hampton-2_1**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **73 North Main Street, Marlborough, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

General population 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 & 700 MHz 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 2500 MHz (BRS) 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.



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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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **73 North Main Street, Marlborough, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4 \text{ ERP}}{R^2}$$

S = Power Density (in $\mu\text{w}/\text{cm}^2$)

ERP = Effective Radiated Power from antenna (watts)

R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.



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For each T-Mobile sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20
LTE	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	4	40
LTE / 5G NR	2500 MHz (BRS)	8	20

Table 1: Channel Data Table



The following T-Mobile antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAARR24_43-U-NA20	130
A	2	Commscope VV-65A-R1	130
A	3	Ericsson AIR6419 B41	130
B	1	RFS APXVAARR24_43-U-NA20	130
B	2	Commscope VV-65A-R1	130
B	3	Ericsson AIR6419 B41	130
C	1	RFS APXVAARR24_43-U-NA20	130
C	2	Commscope VV-65A-R1	130
C	3	Ericsson AIR6419 B41	130

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.



RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	2.95 / 13.35	4	120	2,443.03	1.01
Antenna A2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	9	335	12,724.61	0.78
Antenna A3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	0.75
Sector A Composite MPE%							2.54
Antenna B1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	2.95 / 13.35	4	120	2,443.03	1.01
Antenna B2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	9	335	12,724.61	0.78
Antenna B3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	0.75
Sector B Composite MPE%							2.54
Antenna C1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	2.95 / 13.35	4	120	2,443.03	1.01
Antenna C2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	9	335	12,724.61	0.78
Antenna C3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	0.75
Sector C Composite MPE%							2.54

Table 3: T-MOBILE Emissions Levels



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The Following table (*table 4*) shows all additional identified carriers on site and their emissions contribution estimates, along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three T-Mobile sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite estimated MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
T-MOBILE – Max Per Sector Value	2.54 %
AT&T	3.85 %
MetroPCS	0.41 %
Verizon Wireless	2.07 %
Town	6.03 %
Dish	2.81 %
Site Total MPE %:	17.71 %

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	2.54 %
T-MOBILE Sector B Total:	2.54 %
T-MOBILE Sector C Total:	2.54 %
Site Total:	
	17.71 %

Table 5: Site MPE Summary



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Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three T-Mobile sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	788.97	130	3.24	600 MHz	400	0.81%
T-Mobile 700 MHz LTE	2	432.54	130	0.93	700 MHz	467	0.20%
T-Mobile 1900 MHz (PCS) LTE	4	1,435.69	130	3.70	1900 MHz (PCS)	1000	0.37%
T-Mobile 1900 MHz (PCS) GSM	1	538.38	130	0.40	1900 MHz (PCS)	1000	0.04%
T-Mobile 2100 MHz (AWS) LTE	4	1,610.87	130	3.70	2100 MHz (AWS)	1000	0.37%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	2,825.08	130	7.50	2500 MHz (BRS)	1000	0.75%
						Total:	2.54 %

Table 6: T-MOBILE Maximum Sector MPE Power Values



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 estimates value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-MOBILE Sector	Power Density Value (%)
Sector A:	2.54 %
Sector B:	2.54 %
Sector C:	2.54 %
T-MOBILE Maximum Total (per sector):	2.54 %
Site Total:	17.71 %
Site Compliance Status:	COMPLIANT

The estimated composite MPE value for this site assuming all carriers present is **17.71 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

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 estimated values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01609
(978)660-3998

T-Mobile

SPRINT PCS SITE NUMBER: CT11251A
SPRINT PCS SITE NAME: CT03XC210
SPRINT PCS PROJECT: T-MOBILE ANCHOR - DRS

BUSINESS UNIT #: 806366
SITE ADDRESS: 73 NORTH MAIN STREET
MARLBOROUGH, CT 06447
COUNTY: HARTFORD
SITE TYPE: MONOPOLE
TOWER HEIGHT: 155.5

T-Mobile

12920 SE 38TH STREET
 BELLEVUE, WA 98006

CROWN CASTLE

8020 KATY FREEWAY
 HOUSTON, TX 77024

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 Suite 150 | Fort Washington, PA 19034
 www.infinigy.com

BU #: 806366
 HRT 107(C) 943204

73 NORTH MAIN STREET
 MARLBOROUGH, CT 06447

EXISTING 155.5 MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/08/2022	CB	PRELIMINARY	CB
0	06/28/2022	CB	100% FINALS	CB
1	11/21/2022	CB	100% FINALS	CB
2	01/03/2022	DGD	100% FINALS	CB

SITE INFORMATION

CROWN CASTLE USA INC.
 SITE NAME: HRT 107(C) 943204
 BU NUMBER: 806366

TOWER OWNER: CROWN CASTLE
 2000 CORPORATE DRIVE
 CANONSBURG, PA 15317

CARRIER/APPLICANT: SPRINT PCS
 STREET ADDRESS
 CITY, STATE ZIP

SITE ADDRESS: 73 NORTH MAIN STREET
 MARLBOROUGH, CT 06447
COUNTY: HARTFORD

LATTITUDE: 41.62980555555556°
LONGITUDE: -72.4665°
LAT/LONG TYPE: NAD83
GROUND ELEVATION: 581

AREA OF CONSTRUCTION: EXISTING
CURRENT ZONING: NOT FOUND
MAP/PARCEL #: 000008-000026-000056CD

OCCUPANCY CLASSIFICATION: U
TYPE OF CONSTRUCTION: IIB
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION

PROPERTY OWNER: GLOBAL SIGNAL ACQUISITION
 PO BOX 277455
 ATLANTA, GA 30384-7455
 (XXX) XXX-XXXX

JURISDICTION: CT - CONNECTICUT SITING COUNCIL
 TEN FRANKLIN SQUARE
 NEW BRITAIN, CT 06051

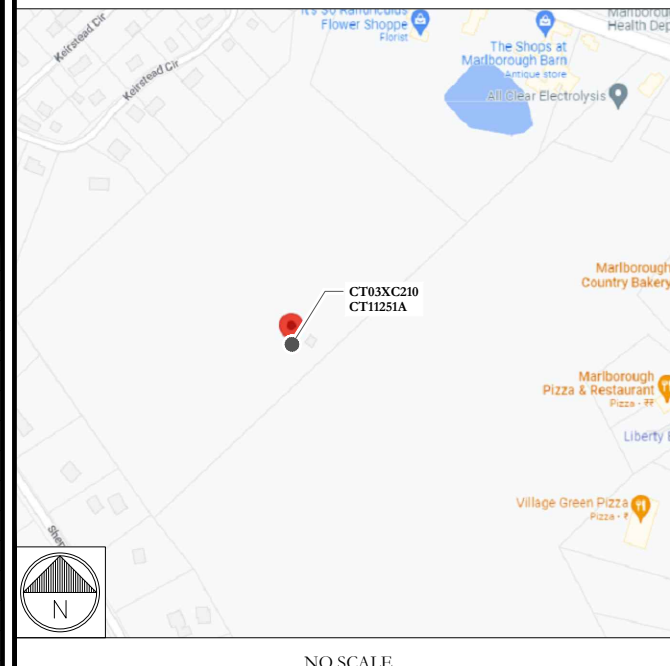
ELECTRIC PROVIDER: CONNECTICUT LIGHT & POWER CO
 8609472000

TELCO PROVIDER: FIBER APP
 NOT FOUND

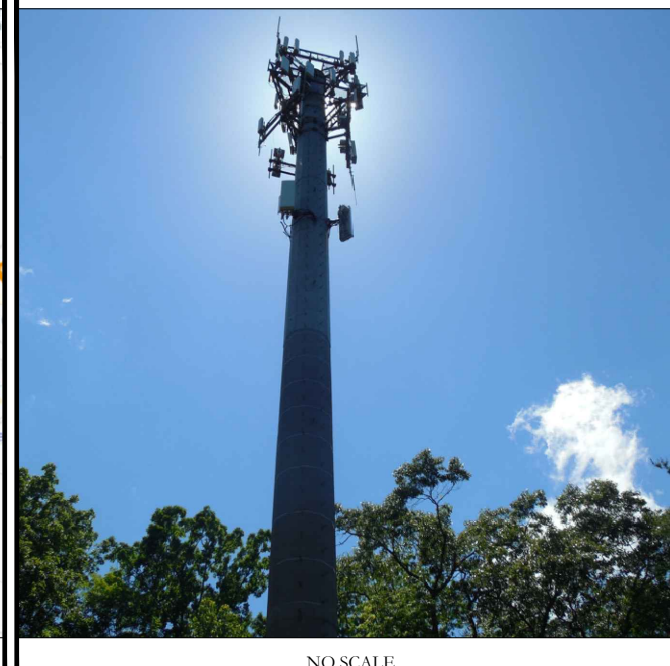
DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	COMPOUND PLAN
C-1.2	EQUIPMENT PLANS
C-2	TOWER ELEVATIONS
C-3	ANTENNA PLANS
C-4	ANTENNA & CABLE SCHEDULE
C-5	ANTENNA EQUIPMENT SPECS
C-6	RAN EQUIPMENT SPECS & DETAILS
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

LOCATION MAP



PHOTO



PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

- TOWER SCOPE OF WORK:**
- REMOVE ALL SPRINT EQUIPMENT
 - REMOVE ALL T-MOBILE EQUIPMENT
 - INSTALL (3) RFS - APXVAALL24_43-U-NA20 ANTENNAS
 - INSTALL (3) COMMSCOPE - VV-65A-R1 ANTENNAS
 - INSTALL (3) ERICSSON - 6419 B41 ANTENNAS
 - INSTALL (3) ERICSSON - 4480 B71+B85 RRHS
 - INSTALL (3) ERICSSON - 4460 B25+B66 RRHS
 - INSTALL (3) 6X24 4AWG 60M HYBRID TRUNKS
 - INSTALL (1) ANTENNA MOUNT

- GROUND SCOPE OF WORK:**
- REMOVE (2) EQUIPMENT CABINETS
 - REMOVE (3) ERICSSON - 4415 RRHS
 - INSTALL (1) 6160 & (1) B160 BATTERY CABINET
 - INSTALL (1) CSR iXRe V2 ROUTER IN (P) CABINET
 - INSTALL (2) RP 6651 IN (P) CABINET
 - RELOCATE (1) DUG20 TO (P) CABINET

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 22X34. 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.

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	2022 CONNECTICUT BUILDING CODE/2021 IBC
MECHANICAL	2022 CONNECTICUT BUILDING CODE/2021 IMC
ELECTRICAL	2022 CONNECTICUT BUILDING CODE/2020 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	TOWER ENGINEERING PROFESSIONALS
DATED:	12/14/22
MOUNT ANALYSIS:	TRYLON
DATED:	11/16/2022
RFDS REVISION:	3
DATED:	10/07/2022
ORDER ID:	637965
REVISION:	0

PROJECT TEAM

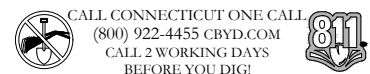
A&E FIRM: INFINIGY
 500 WEST OFFICE CENTER DRIVE / SUITE 150
 FORT WASHINGTON, PA 19034

CROWN CASTLE USA INC. DISTRICT CONTACTS:
 8020 KATY FREEWAY
 HOUSTON, TX 77024

TRICIA PELON - PROJECT MANAGER
 7244166279

JASON D'AMICO - CONSTRUCTION MANAGER
 +18602090104

JENNIFER MERSING - AES
 JENNIFER.MERSING@CROWNCastle.COM

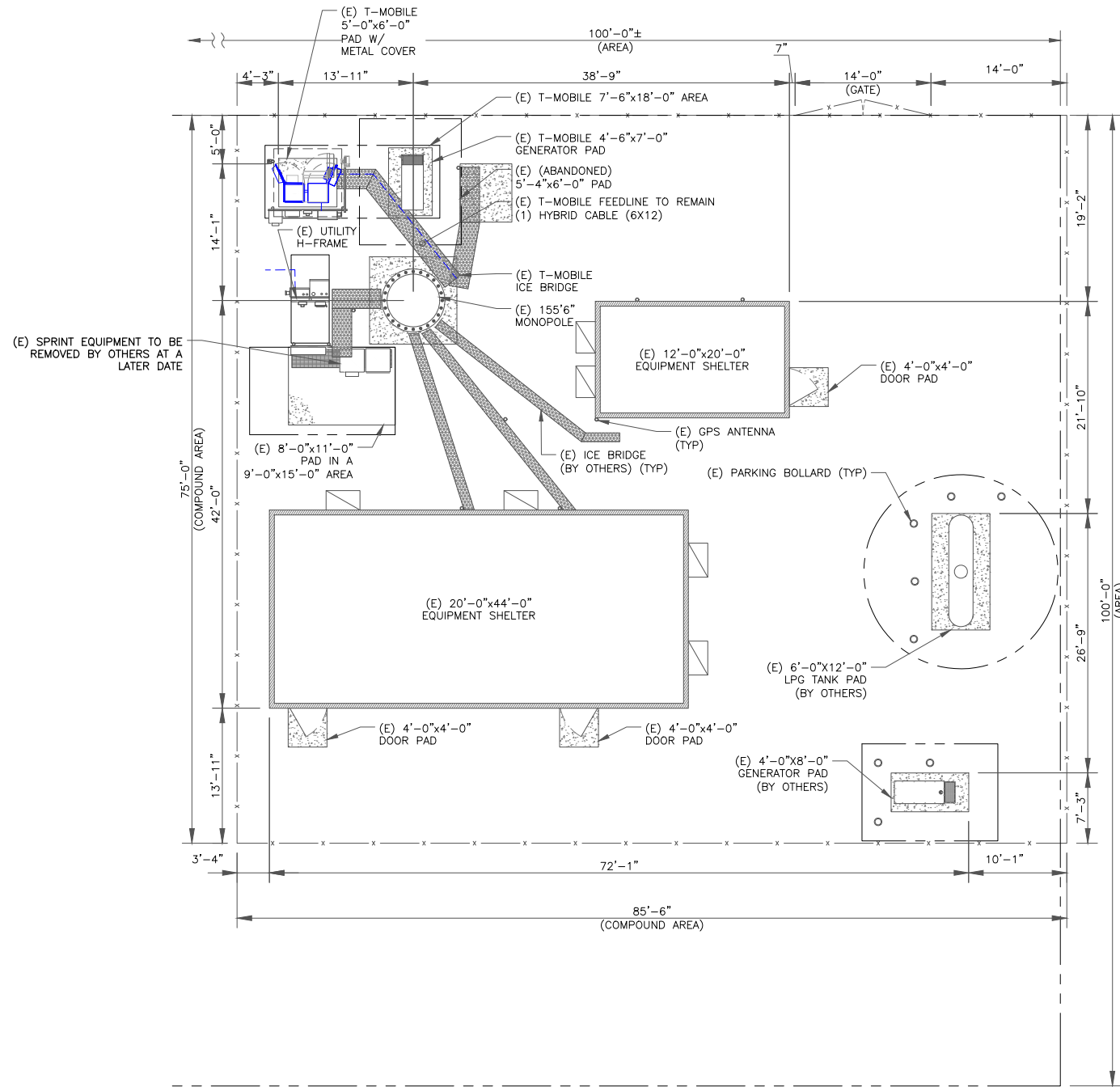


PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

SHEET NUMBER: T-1

REVISION: 2

INSTALLER NOTE:
EXPLODE BLOCK AND START NOTE HERE,
OR CHOOSE FROM THE LIST OF
STANDARD NOTES...



1 SITE PLAN
SCALE: 1/8"=1'-0" (FULL SIZE)
1/16"=1'-0" (11x17)



T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

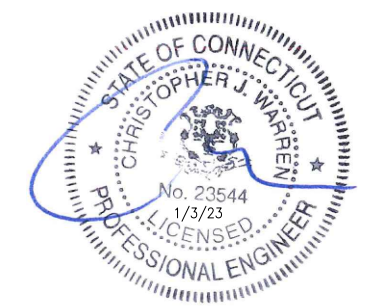
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HRT 107(C) 943204
73 NORTH MAIN STREET
MARLBOROUGH, CT 06447
EXISTING 155.5 MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/08/2022	CB	PRELIMINARY	CB
0	06/28/2022	CB	100% FINALS	CB
1	11/21/2022	CB	100% FINALS	CB
2	01/03/2022	DGD	100% FINALS	CB

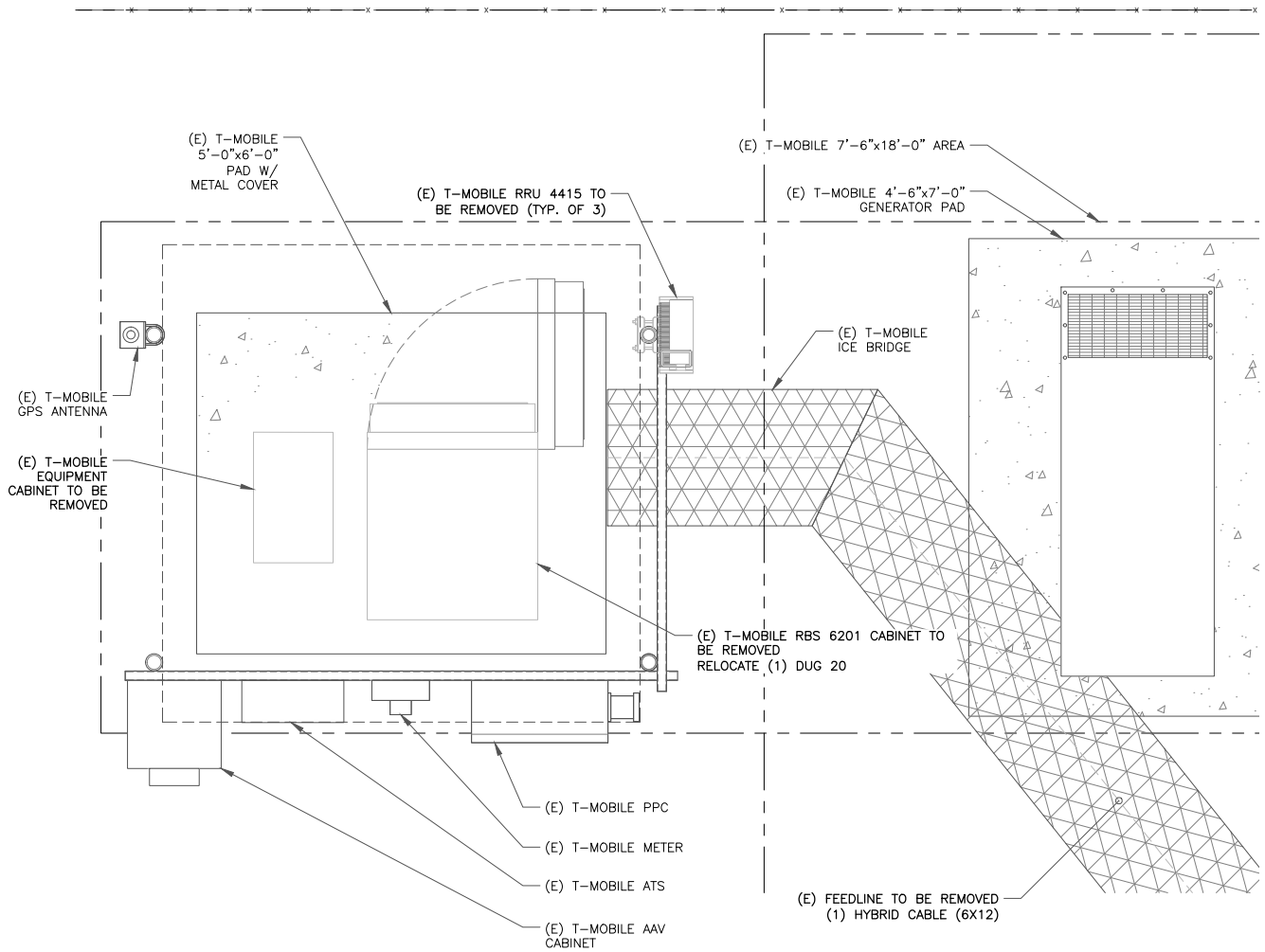


IT IS A VIOLATION OF LAW FOR ANY PERSON,
UNLESS THEY ARE ACTING UNDER THE DIRECTION
OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

SHEET NUMBER: **C-1.1** REVISION: **2**

TEMPLATE NAME: BASE TEMPLATE

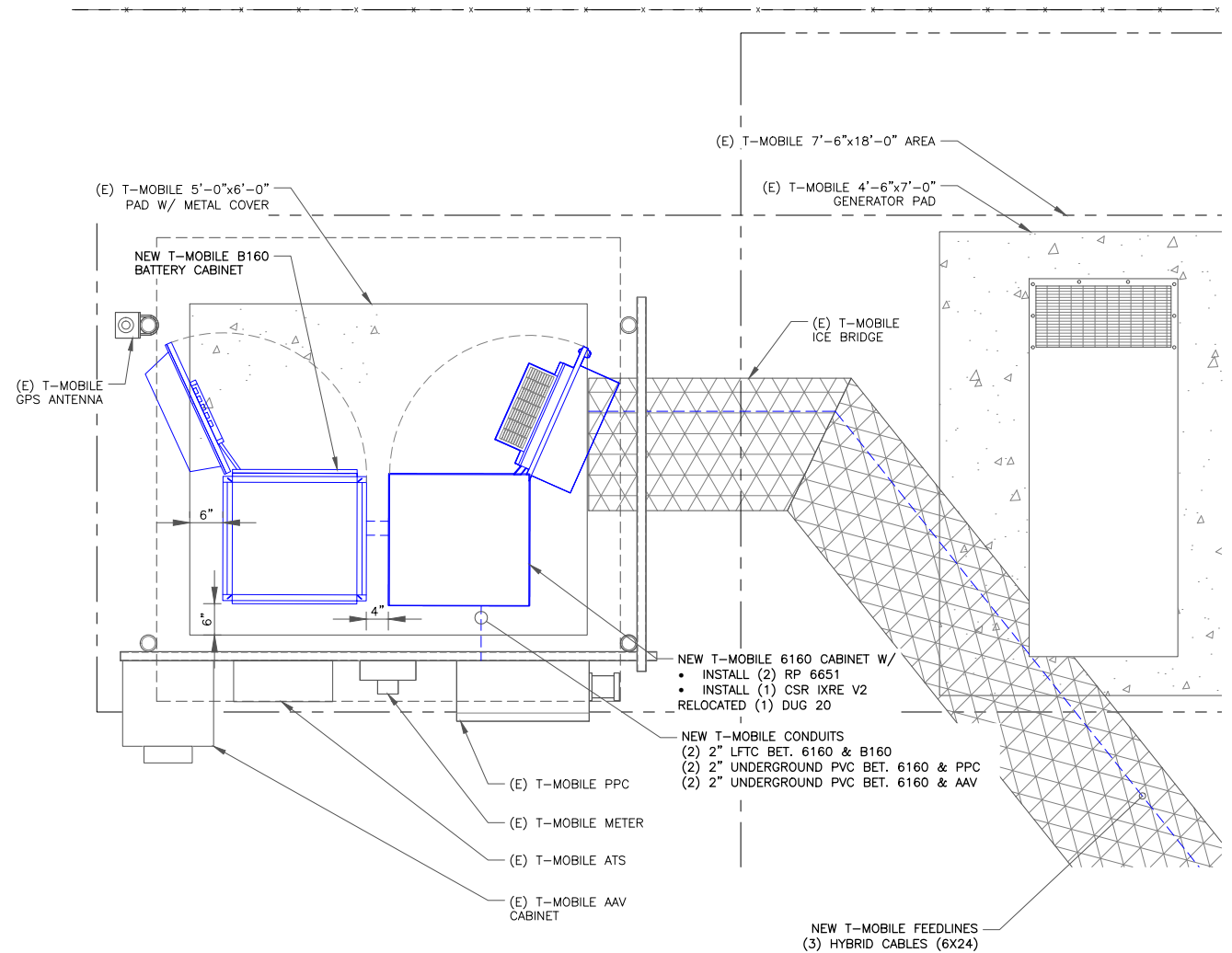
INSTALLER NOTE:
EXPLODE BLOCK AND START NOTE HERE, OR CHOOSE FROM THE LIST OF STANDARD NOTES...



1 EXISTING EQUIPMENT PLAN
SCALE: 1/8"=1'-0" (FULL SIZE)
3/8"=1'-0" (11x17)



INSTALLER NOTE:
EXPLODE BLOCK AND START NOTE HERE, OR CHOOSE FROM THE LIST OF STANDARD NOTES...



2 FINAL EQUIPMENT PLAN
SCALE: 1/8"=1'-0" (FULL SIZE)
3/8"=1'-0" (11x17)



GROUND SCOPE OF WORK:

- REMOVE (2) CABINETS
- REMOVE (3) RRUS
- RELOCATE (1) DUG20
- INSTALL 6160 CABINET
- INSTALL (2) RP 6651
- INSTALL (1) CSR IXRE V2

NOTE:
THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. SPRINT PCS IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

T-Mobile

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CROWN CASTLE

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HRT 107(C) 943204

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MARLBOROUGH, CT 06447

EXISTING 155.5 MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/08/2022	CB	PRELIMINARY	CB
0	06/28/2022	CB	100% FINALS	CB
1	11/21/2022	CB	100% FINALS	CB
2	01/03/2022	DGD	100% FINALS	CB

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/3/23
LICENSED PROFESSIONAL ENGINEER

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: **C-1.2** REVISION: **2**

TEMPLATE NAME: BASE TEMPLATE

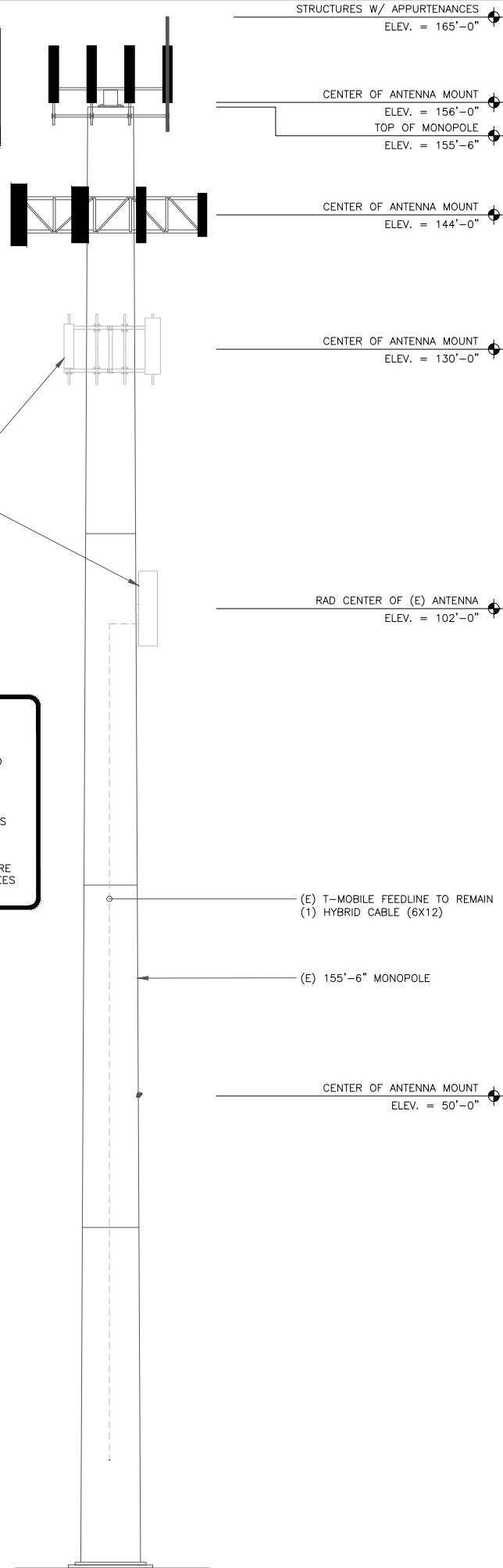
TEMPLATE NAME: BASE TEMPLATE

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.

T-MOBILE EQUIPMENT
 ANTENNA CL: 130'-0"
 MOUNT CL: 130'-0"

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

PROJECT SPECIFIC NOTES:
 1. SPRINT EQUIPMENT WILL BE DECOMMISSIONED.
 2. ALL SPRINT TOWER EQUIPMENT TO BE REMOVED AND TO RELINQUISH THEIR RAD CENTER.
 3. EXISTING T-MOBILE TOWER EQUIPMENT TO BE REMOVED.
 4. NEW T-MOBILE EQUIPMENT TO BE INSTALLED IN SPRINT'S PREVIOUS RAD CENTER.
 5. VERTICAL TOWER SPACE MAY NOT EXCEED 8 FEET. ALL EQUIPMENT INCLUDING MOUNTS AND MOUNTING HARDWARE MUST FIT WITHIN VERTICAL ENVELOPE OR ADDITIONAL FEES MAY APPLY.



1 EXISTING ELEVATION
 SCALE: 1/8"=1'-0" (FULL SIZE)
 1/16"=1'-0" (11x17)

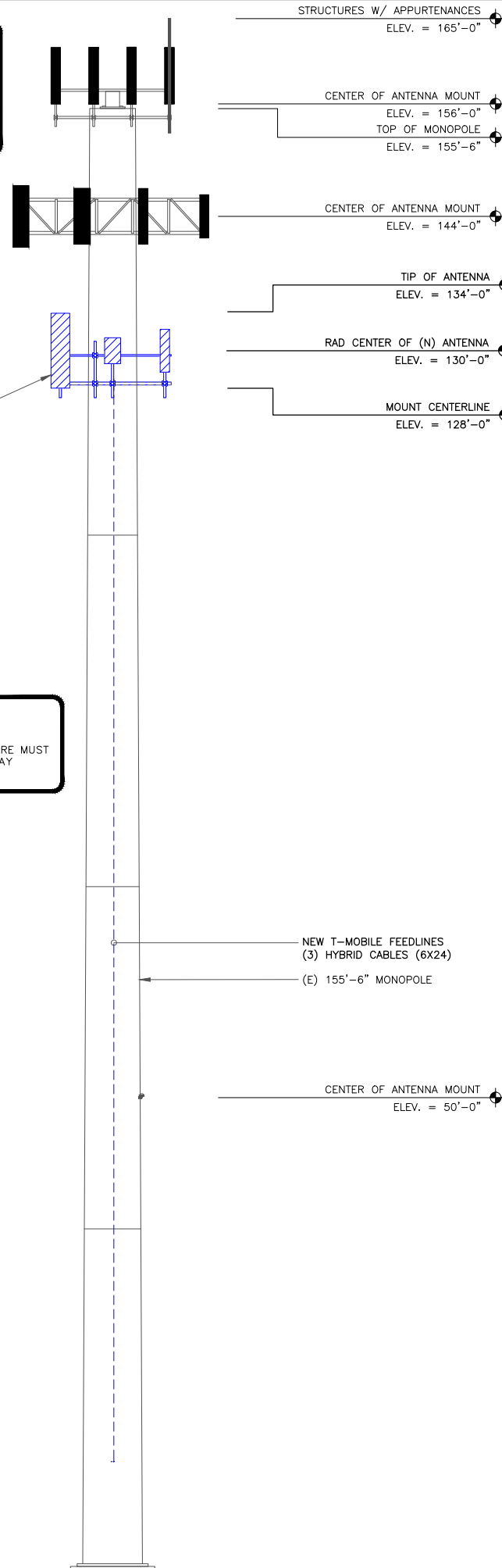
NOTES:
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T-MOBILE EQUIPMENT
 ANTENNA CL: 130'-0"
 MOUNT CL: 130'-0"

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

PROJECT SPECIFIC NOTE:
 VERTICAL TOWER SPACE MAY NOT EXCEED 8 FEET. ALL EQUIPMENT INCLUDING MOUNTS AND MOUNTING HARDWARE MUST FIT WITHIN VERTICAL ENVELOPE OR ADDITIONAL FEES MAY APPLY.

NEW T-MOBILE EQUIPMENT
 (6) ANTENNAS
 (3) RRHS
 (1) SITE PRO 1 RMQP-396
 (3) SITE PRO 1 HRK12 HANDRAIL KIT



2 FINAL ELEVATION
 SCALE: 1/8"=1'-0" (FULL SIZE)
 1/16"=1'-0" (11x17)

T-Mobile
 12920 SE 38TH STREET
 BELLEVUE, WA 98006

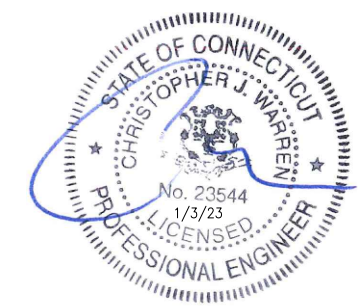
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 HRT 107(C) 943204
 73 NORTH MAIN STREET
 MARLBOROUGH, CT 06447
 EXISTING 155.5 MONOPOLE

ISSUED FOR:

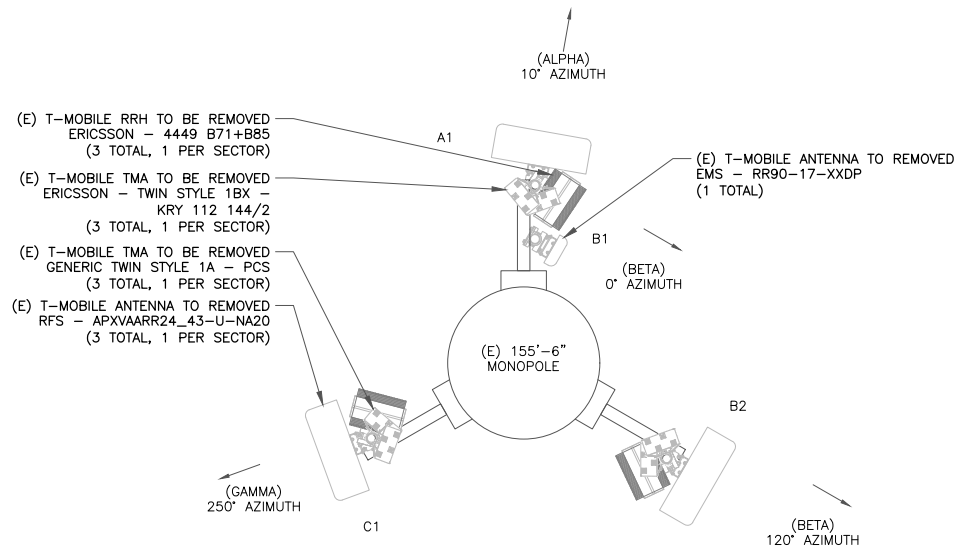
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/08/2022	CB	PRELIMINARY	CB
0	06/28/2022	CB	100% FINALS	CB
1	11/21/2022	CB	100% FINALS	CB
2	01/03/2022	DGD	100% FINALS	CB



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SHEET NUMBER: **C-2**
 REVISION: **2**

TEMPLATE NAME: BASE TEMPLATE

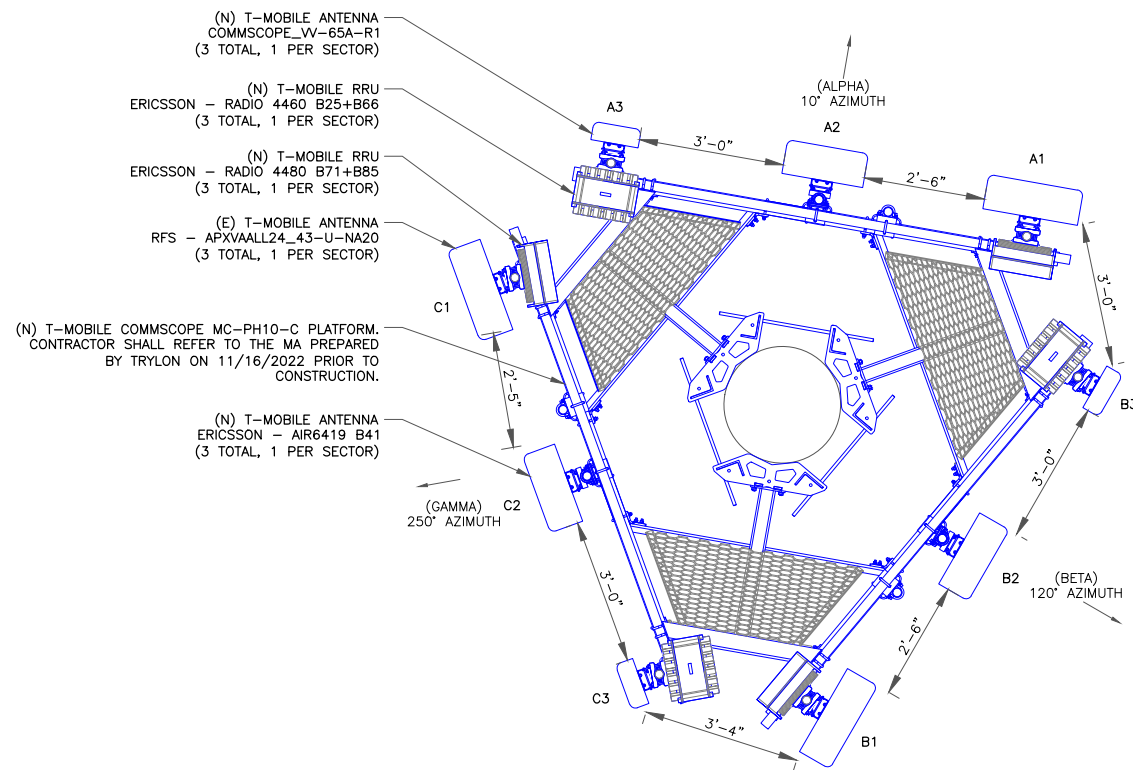


1 EXISTING ANTENNA PLAN
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)



MOUNT ANALYSIS NOTES:

1. THE DESIGN DEPICTED IN THESE DRAWINGS IS VALID WHEN ACCOMPANIED BY A CORRESPONDING PASSING MOUNT ANALYSIS.
2. CONSTRUCTION MANAGER / GENERAL CONTRACTOR SHALL REVIEW THE MOUNT ANALYSIS FOR ANY CONDITIONS PRIOR TO INSTALLATION.
3. ANY REQUIRED MOUNT MODIFICATION DESIGN OR MOUNT REPLACEMENT SHALL BE APPROVED BY EOR.



2 FINAL ANTENNA PLAN
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)



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EXISTING 155.5 MONOPOLE

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2	01/03/2022	DGD	100% FINALS	CB



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SHEET NUMBER:

C-3

REVISION:

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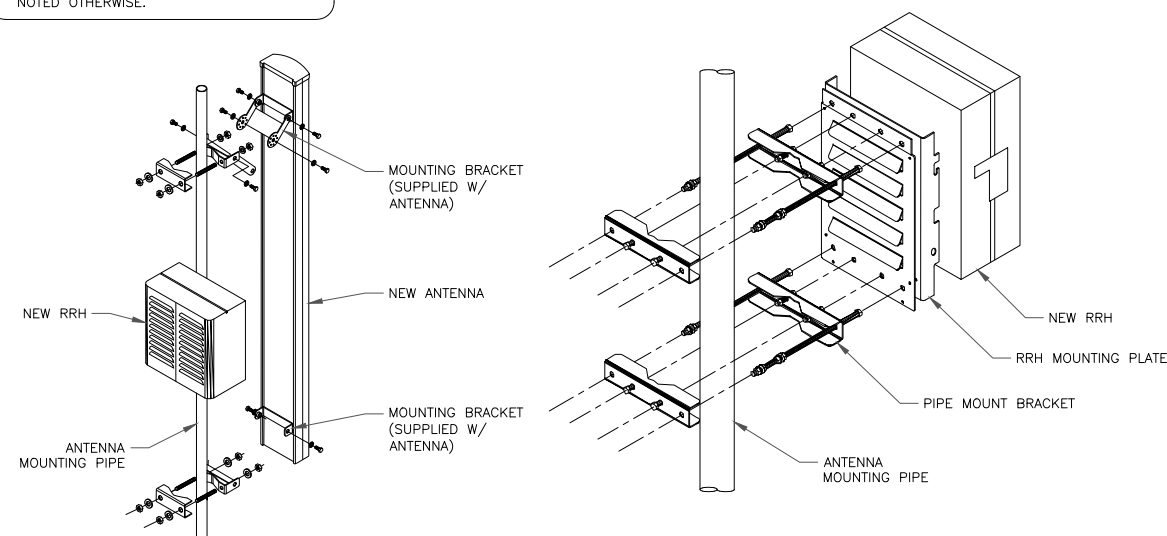
EXISTING 155.5 MONOPOLE

ANTENNA SCHEDULE										
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A3	L2100, L1900, G1900	130'-0"	10°	COMMSCOPE	WV-65A-R1	0	2/2	(1) ERICSSON - RRUS 4460 B25+B66	-
ALPHA	A2	L2500, N2500	130'-0"	10°	ERICSSON	AIR6419 B41	0	2/2	-	-
ALPHA	A1	L700, L600, N600	130'-0"	10°	RFS	APXVAALL24_43-U-NA20	0	2/2	(1) ERICSSON - RRUS 4480 B71+B85	(1) 6X24 HYBRID 60M IN LENGTH
BETA	B3	L2100, L1900, G1900	130'-0"	120°	COMMSCOPE	WV-65A-R1	0	2/2	(1) ERICSSON - RRUS 4460 B25+B66	-
BETA	B2	L2500, N2500	130'-0"	120°	ERICSSON	AIR6419 B41	0	2/2	-	-
BETA	B1	L700, L600, N600	130'-0"	120°	RFS	APXVAALL24_43-U-NA20	0	2/2	(1) ERICSSON - RRUS 4480 B71+B85	(1) 6X24 HYBRID 60M IN LENGTH
GAMMA	C3	L2100, L1900, G1900	130'-0"	250°	COMMSCOPE	WV-65A-R1	0	2/2	(1) ERICSSON - RRUS 4460 B25+B66	-
GAMMA	C2	L2500, N2500	130'-0"	250°	ERICSSON	AIR6419 B41	0	2/2	-	-
GAMMA	C1	L700, L600, N600	130'-0"	250°	RFS	APXVAALL24_43-U-NA20	0	2/2	(1) ERICSSON - RRUS 4480 B71+B85	(1) 6X24 HYBRID 60M IN LENGTH

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.



NOTE:

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

2 ANTENNA WITH RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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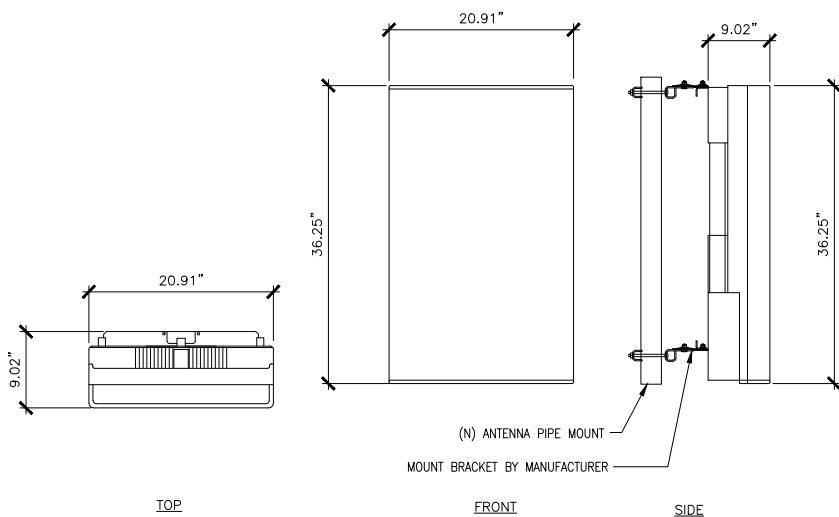
SHEET NUMBER:

C-4

REVISION:

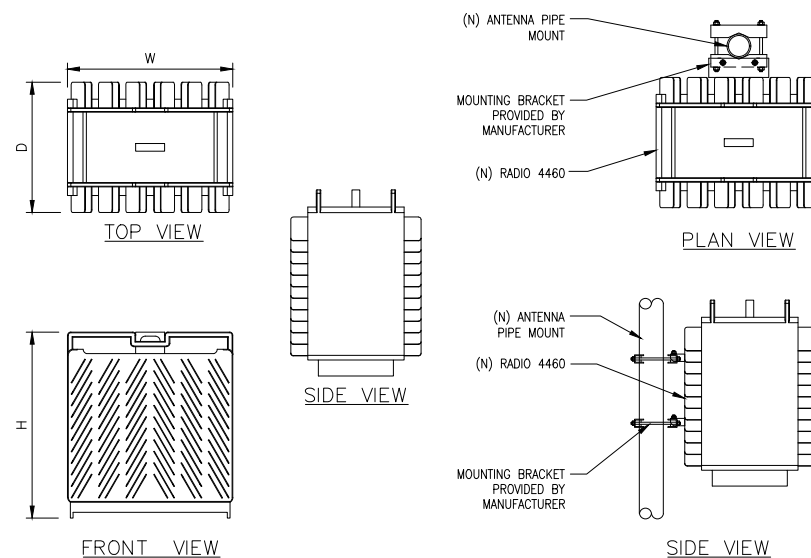
2

MANUFACTURER: ERICSSON
 MODEL: AIR6419 B41
 WEIGHT: 104 LBS (W/ MOUNT BRACKET 113)
 DIMENSIONS: 36.25"H. X 20.91"W. X 9.02"D.
 FREQUENCY: REFER TO RF DATA SHEET

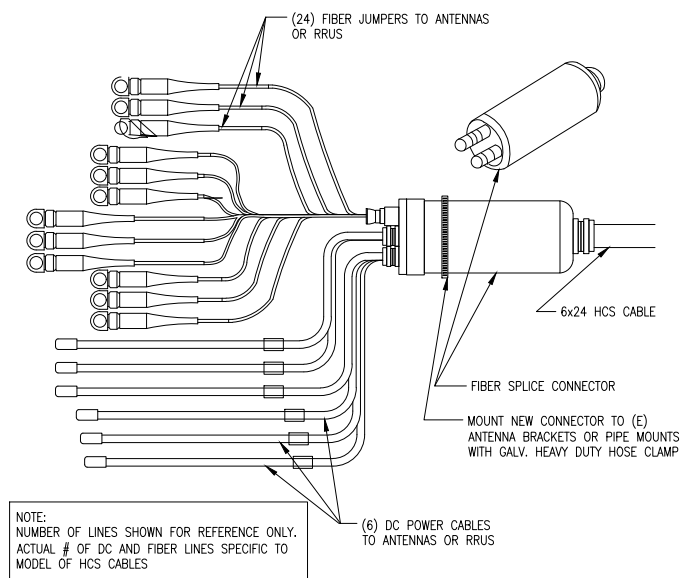


1 (N) AIR6419 B41 ANTENNA SPEC
 SCALE: NOT TO SCALE

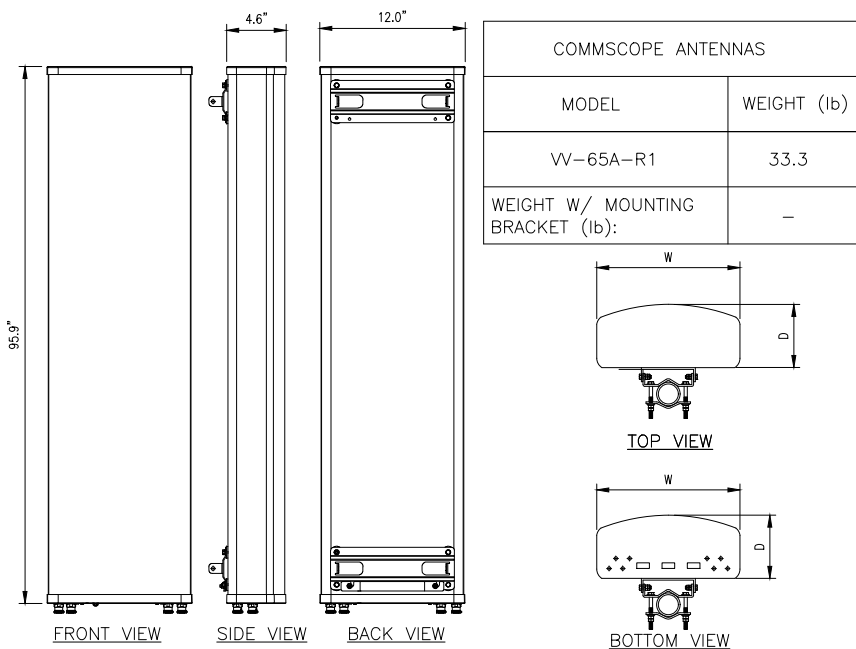
ERICSSON RADIO-4460 B25 B66
 DIMENSIONS, WxDxH: 17.0"x15.1"x11.9"
 MAX OUTPUT POWER: 4x80W (2x(2x80W))
 TOTAL WEIGHT: 109 lbs
 TEMPERATURE: -40° TO 55° C



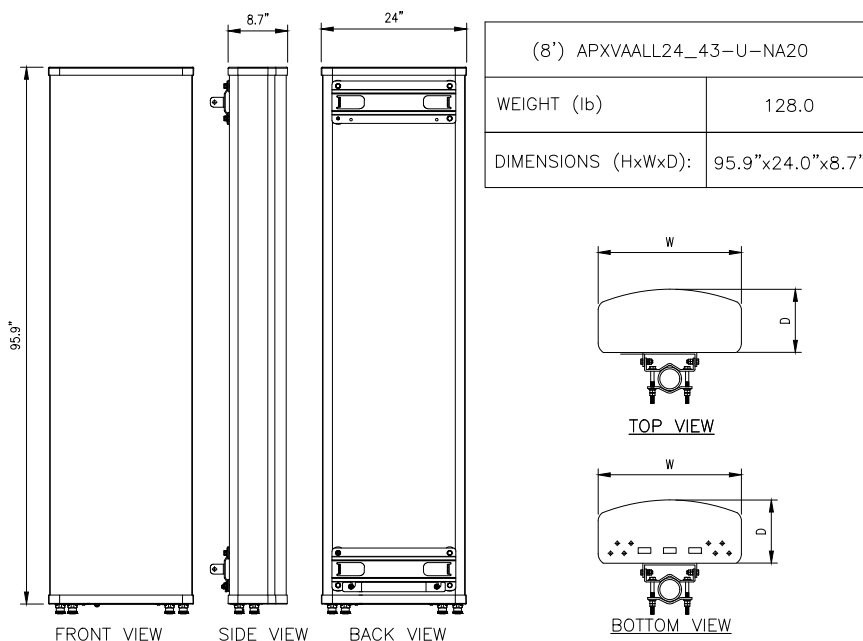
2 (N) RADIO 4460 SPEC
 SCALE: NOT TO SCALE



3 (N) 6X24 HCS CABLE DETAIL
 SCALE: NOT TO SCALE

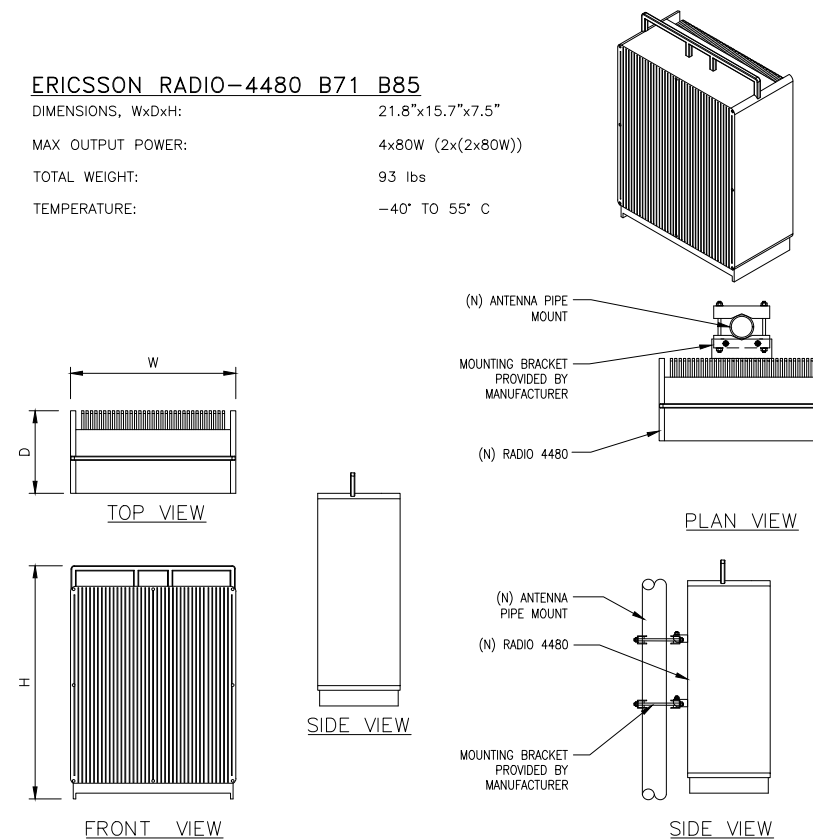


4 (N) COMMSCOPE - W-65A-R1 ANTENNA SPEC
 SCALE: NOT TO SCALE



5 (N) APXVAALL24_43-U-NA20 ANTENNA SPEC
 SCALE: NOT TO SCALE

ERICSSON RADIO-4480 B71 B85
 DIMENSIONS, WxDxH: 21.8"x15.7"x7.5"
 MAX OUTPUT POWER: 4x80W (2x(2x80W))
 TOTAL WEIGHT: 93 lbs
 TEMPERATURE: -40° TO 55° C



6 (N) RADIO 4480 SPEC
 SCALE: NOT TO SCALE

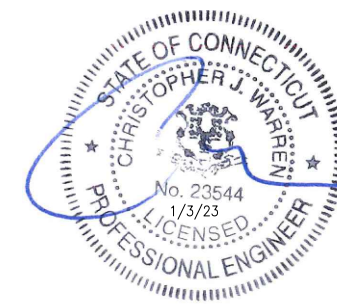
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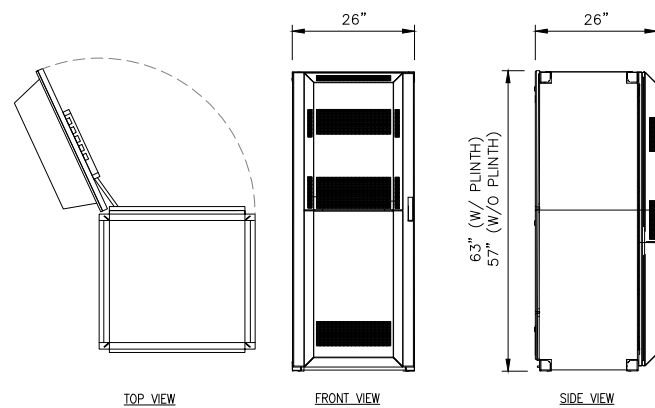
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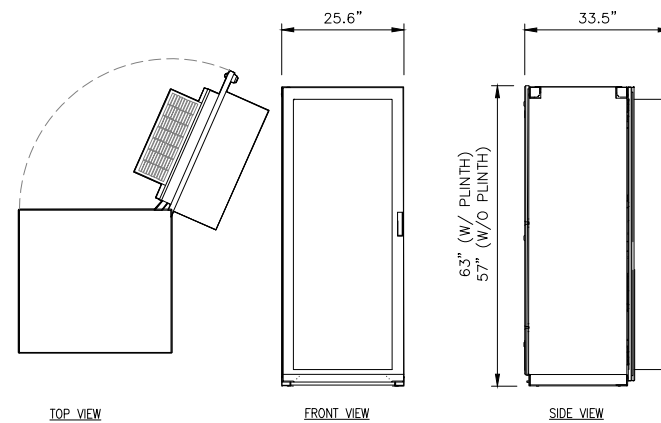
SHEET NUMBER:
C-5

REVISION:
2



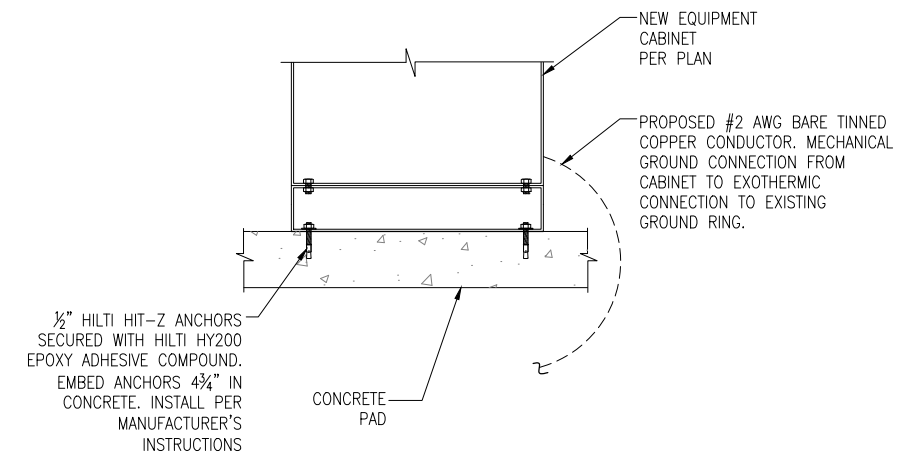
ERICSSON MODEL NO.:	B160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x26"x26" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	485 LBS
MAXIMUM WEIGHT:	2100± LBS

1 (N) B160 CABINET DETAIL
SCALE: NOT TO SCALE

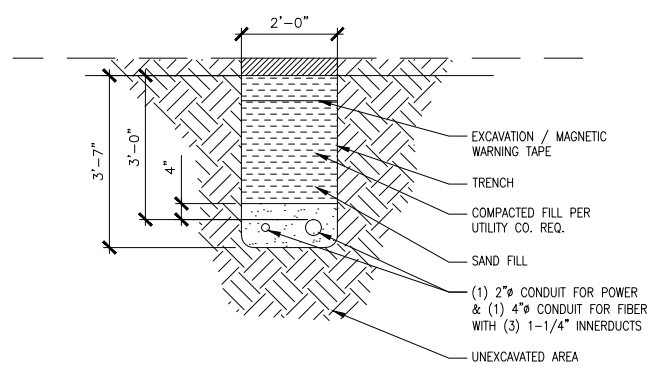


ERICSSON MODEL NO.:	6160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x25.6"x25.6" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	410 LBS
MAXIMUM WEIGHT:	770± LBS

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

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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2	01/03/2022	DGD	100% FINALS	CB

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
1/3/23
LICENSED PROFESSIONAL ENGINEER

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SHEET NUMBER: **C-6** REVISION: **2**

TEMPLATE NAME: BASE TEMPLATE

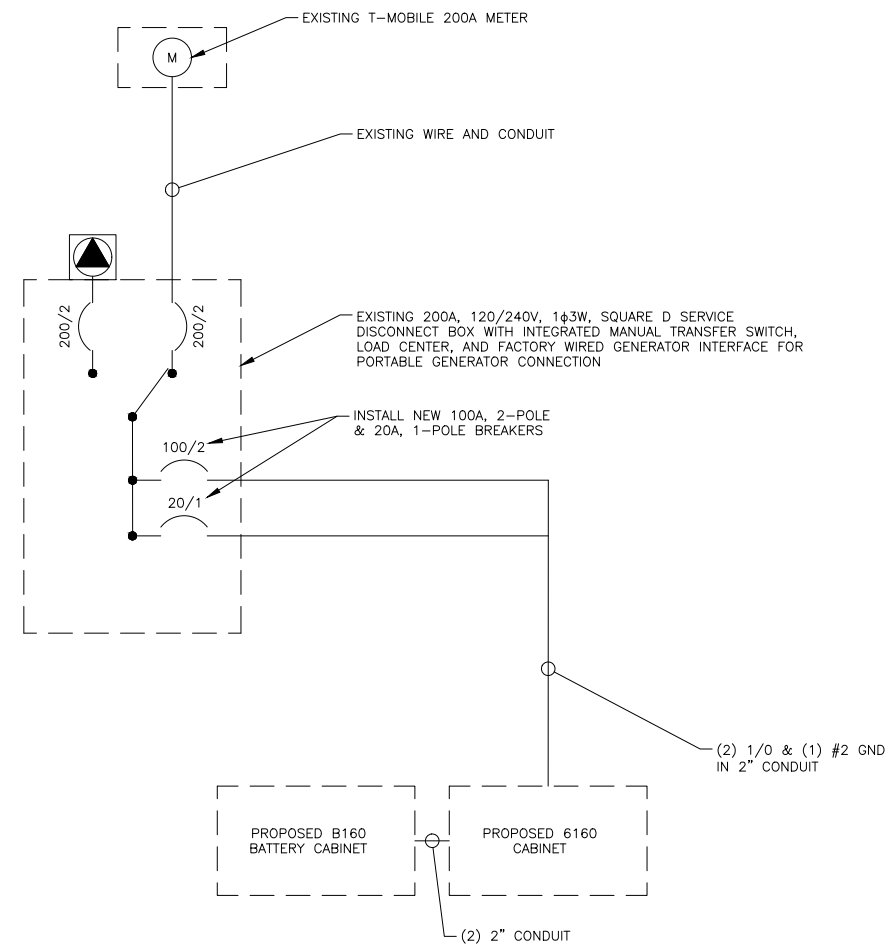
TEMPLATE NAME: BASE TEMPLATE

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
					A	B					
TVSS	0	NC	60	1	0		2	20	C	0	GFI
	0				3		3500	4	100	C	3500
SPARE			50	5	3500		6			3500	
					7		180	8	20	NC	180
EMERSON	200	C	20	9	200		10				
TELCO GFI	180	C	20	11		180	12				
				13	0		14				
				15		0	16				
				17		0	18				
				19		0	20				
				21		0	22				
				23		0	24				
BASE LOAD (VA) =					3700	3860	C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD				
25% OF CONTINUOUS LOAD (VA) =					875	875	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.				
TOTAL LOAD (VA) =					4575	4735					
TOTAL LOAD (A) =					38	39					

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE

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.



2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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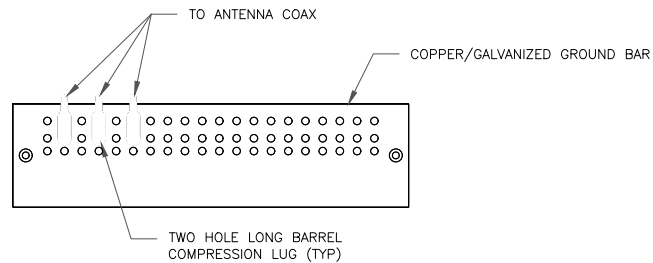
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SHEET NUMBER:

E-1

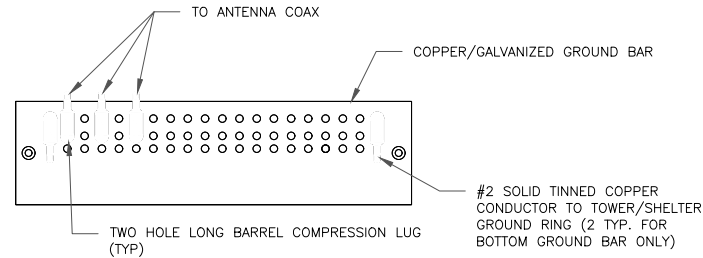
REVISION:

2



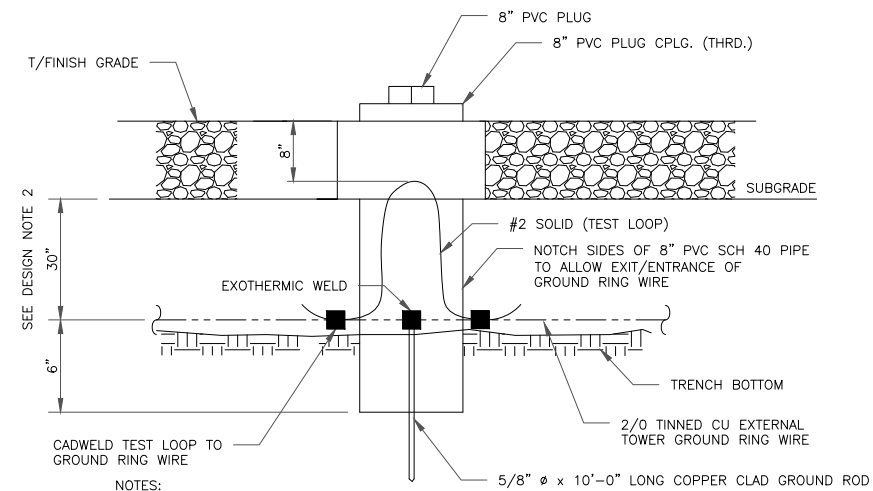
- NOTES:
1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
 2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
 3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



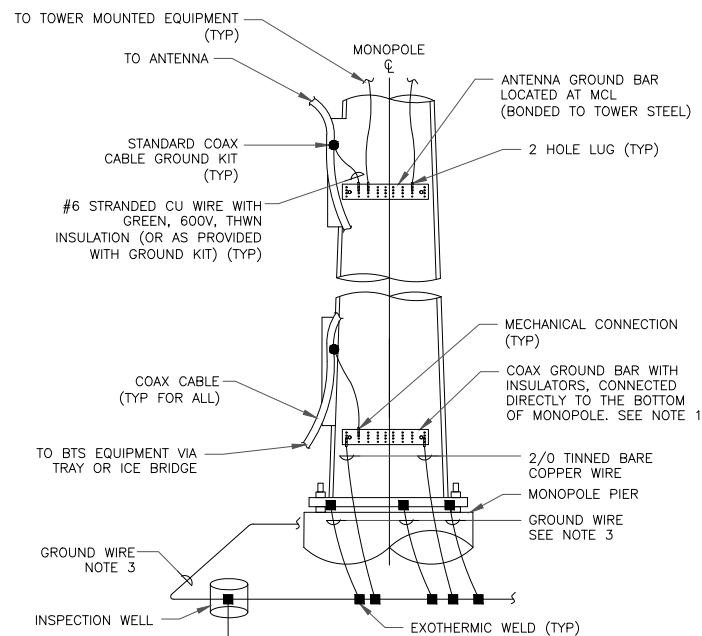
- NOTES:
1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
 2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
 3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



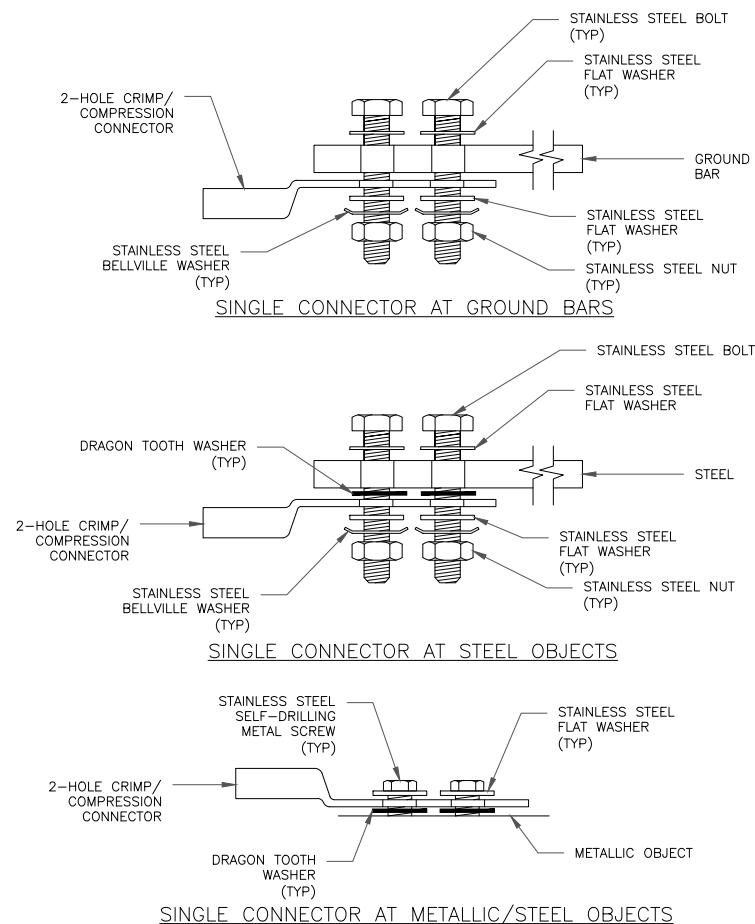
- NOTES:
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
 2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE

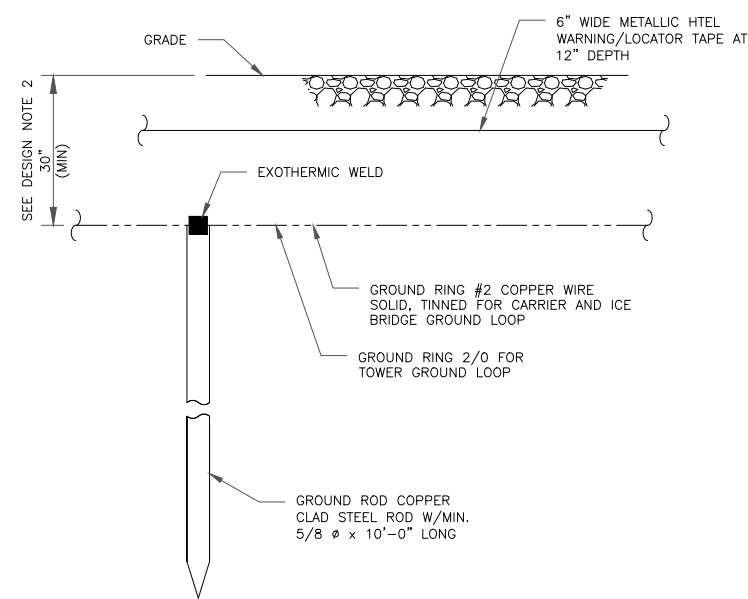


- NOTES:
1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
 2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE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

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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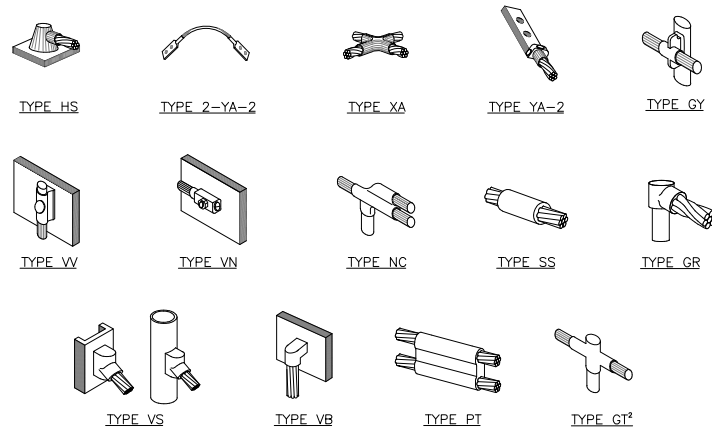
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SHEET NUMBER: **G-1** REVISION: **2**

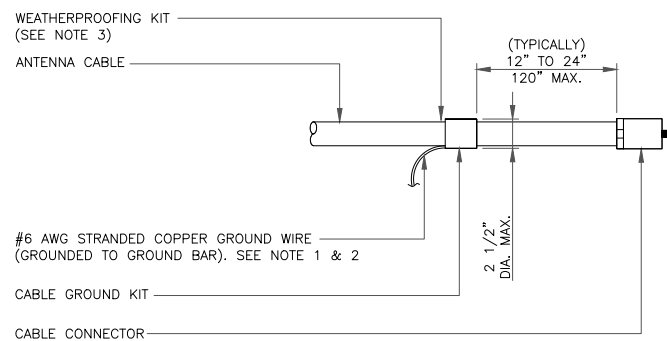
TEMPLATE NAME: BASE TEMPLATE



NOTE:

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

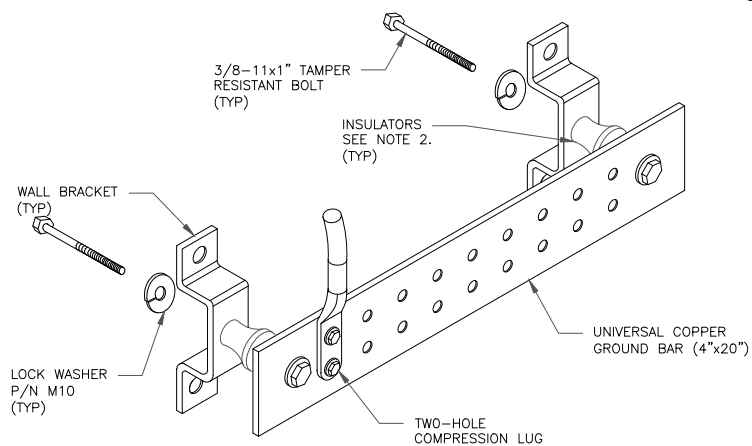
1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE



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.

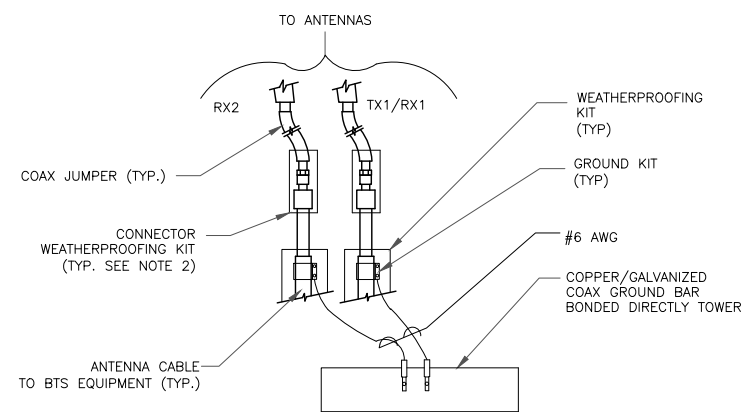
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

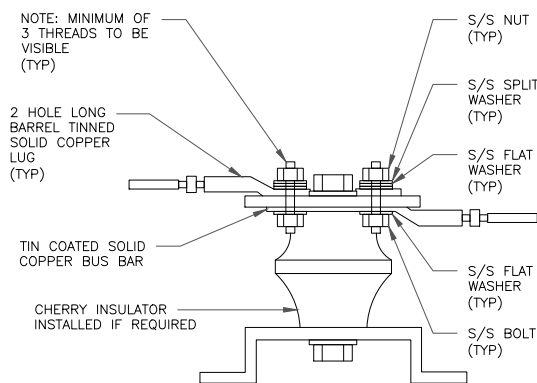
6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

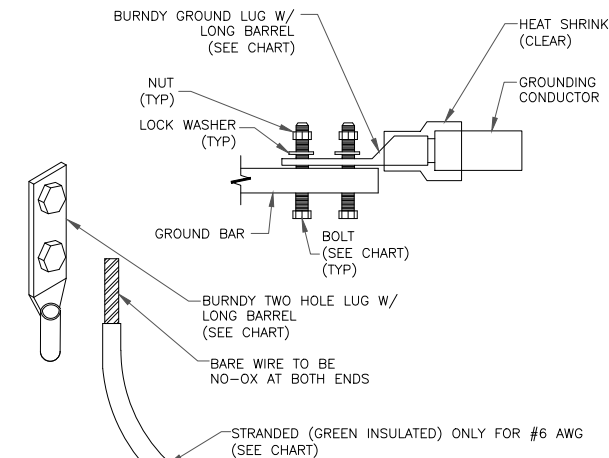
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE

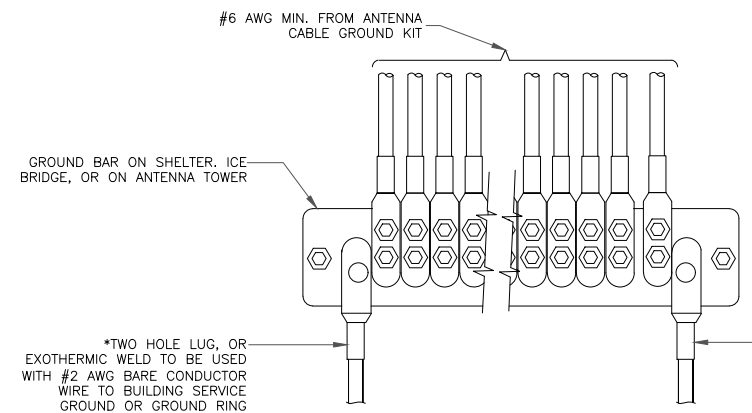
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



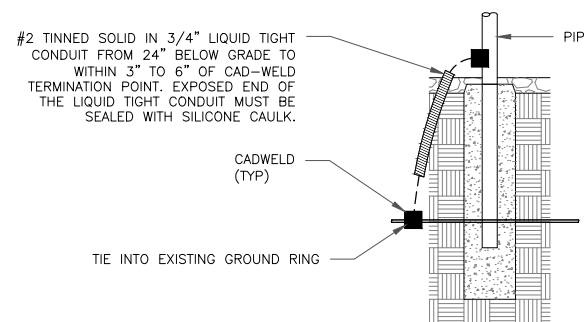
NOTES:

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

2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

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EXISTING 155.5 MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/08/2022	CB	PRELIMINARY	CB
0	06/28/2022	CB	100% FINALS	CB
1	11/21/2022	CB	100% FINALS	CB
2	01/03/2022	DGD	100% FINALS	CB



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: **G-2** REVISION: **2**