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

May 31, 2022

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

RE: **Notice of Exempt Modification for T-Mobile: CT11248A**
Crown Site ID# 806368
374 Three Mile Road, Glastonbury, CT 06033
Latitude: 41° 41′ 36.93″ / Longitude: -72° 32′ 50.11″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 116-foot mount on the existing 145-foot monopole tower located at 374 Three Mile Road, Glastonbury, CT. The property is owned by John R. Flanagan and the tower is owned by Crown Castle. T-Mobile now intends to replace three (3) antennas and ancillary equipment at the 116ft level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Installed New:
(3) Ericsson – AIR6419 B41 Antennas
(3) Ericsson-Radio 4460 B25 + B66 RRU
(1) HB158-21U6S24-XXM_TMO Hybrid
(3) Handrail support kits

Remove:
(3) Ericsson Air KCR118023-1_B2A-B4P Antennas
(3) Twin Style 1B AWS TMAs
(6) Coaxial Cables (1-5/8")

Ground:

Install New:
(1) 6160 AC V1 Enclosure
(1) B160 Battery Cabinet
(1) RP 6651
(1.) PSU 4813 VR2A
(1^) CSR IXRE V2

Remove:

(6) RUS01 B4

The facility was approved by the Connecticut Siting Council on October 21, 1996. The Council's Decision and Order include Conditions which this exempt modification complies with.

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 Richard Johnson – Town Manager, Town of Glastonbury, Rebecca Augur – Director of Planning and Land Use, Town of Glastonbury. John R. Flanagan, property owner and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

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

Attachments
cc:

Richard Johnson – Town Manager
Town of Glastonbury
2155 Main Street, 2nd Floor
Glastonbury, CT 06033
860-652-7500

Rebecca Augur – Director of Planning and Land Use
Town of Glastonbury
2155 Main Street, 2nd Floor
Glastonbury, CT 06033
860-652-7510

John R. Flanagan – Property Owner
366 Three Mile Road
Glastonbury, CT 06033

Crown Castle - Tower Owner

DOCKET NO. 174 - An application of Cellco Partnership d/b/a Bell Atlantic NYNEX Mobile for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility and associated equipment located within an approximately 30-acre parcel at 366 Three Mile Road, in the East Glastonbury section of the Town of Glastonbury, Connecticut. The proposed alternate one site is located within the same approximately 30-acre parcel at 366 Three Mile Road. The proposed alternate two site is located within an approximately 50-acre parcel at 1952 New London Turnpike, in the East Glastonbury section of the Town of Glastonbury, Connecticut.

Connecticut Siting Council

October 21, 1996

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed prime site in Glastonbury, 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 (BANM) for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed prime site, located within a 30-acre parcel at Three Mile Road, Glastonbury, Connecticut. We find the effects on scenic resources and adjacent land uses of the first alternate site and second alternate site to be significant, and therefore deny certification of these sites.

The facility shall be constructed, operated, and maintained 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 Glastonbury, and not to exceed a height of 150 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 relocation of the tower within the leased parcel to prevent the fall zone of the tower from crossing the nearby Connecticut Light and Power Company transmission lines; 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 Three Mile Road; plans for site clearing and tree trimming; plans for water drainage and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and plans for the

construction of an architecturally treated gate at the entrance to the access road from Three Mile Road; and plans for the installation of a propane tank to fuel the emergency generator.

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.

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 Glastonbury Citizen.

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

ITS REPRESENTATIVE
Kenneth C. Baldwin, Esq.
Brian C. S. Freeman, Esq.
Robinson & Cole
One Commercial Plaza
Hartford, CT 06103-3597

Mr. David S. Malko, P.E.
Sandy M. Ranciato, Manager - Real Estate/Zoning
Bell Atlantic NYNEX Mobile

	20 Alexander Drive Wallingford, CT 06492
PARTY Town of Glastonbury	**ITS REPRESENTATIVE** William S. Fish, Jr., Esq. Kevin S. Murphy, Esq. Tyler, Cooper & Alcorn CityPlace - 35th Floor Hartford, CT 06103-3488
INTERVENOR Springwich Cellular Limited Partnership	**ITS REPRESENTATIVE** Peter J. Tyrrell, Esq. Springwich Cellular Limited Partnership 500 Enterprise Drive Rocky Hill, CT 06067-3900

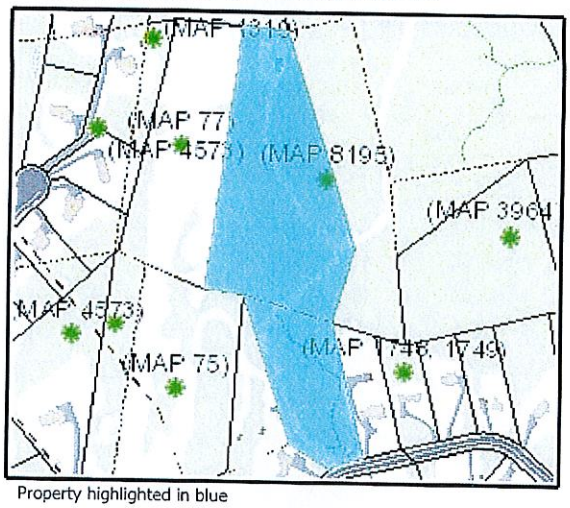
Town of Glastonbury GIS Parcel Report

Report Generated 3/17/2022 10:43:14 AM

Owner of Record

GIS ID: 70600374
Owner: FLANAGAN JOHN R
Co-Owner:
Address: 366 THREE MILE RD
City, State ZIP: GLASTONBURY, CT 06033-3837

Account Number: 70600374
Property Address: 374 THREE MILE RD



Property highlighted in blue

Parcel Information

Map/Street/Lot I8 / 7060 / S0035 **Property ID:** 13664
Developer Lot ID: 72 **Water:** Well
Parcel Acreage: 9.08 **Sewer:** Septic
Zoning Code: RR **Census:** 5204

Valuation Summary

Item	Appraised Value	Assessed Value
Buildings	0	0
Land	1044200	684200
Appurtenances	173300	121300
Total	**1217500**	**805500**

Building Picture Not Applicable

Owner of Record	Deed / Page	Sale Date	Sale Price
FLANAGAN JOHN R	3772/0193	2022-02-07	0
FLANAGAN JOSEPHINE I+JOHN R	2725/0212	2009-12-31	0
FLANAGAN JOSEPHINE I TRUSTEE	2725/0205	2009-12-31	0
FLANAGAN JOSEPHINE I TRUSTEE	2725/0210	2009-12-31	0
FLANAGAN JOSEPHINE I TRUSTEE	1884/0085	2003-07-30	0
FLANAGAN JOSEPHINE I TR+JOSEPHINE I	1828/0149	2003-06-02	0
FLANAGAN JOSEPHINE I TR+JAMES F	1828/0145	2003-06-02	0
FLANAGAN JOSEPHINE+JAMES F	0251/1107	1980-12-31	0

Building Information

Building ID 0

Year Constructed :
Building Type :
Style :
Occupany :
Stories :
Building Zone :
Roof Type :
Roof Material :
Est. Gross S.F. :
Est. Living S.F. :

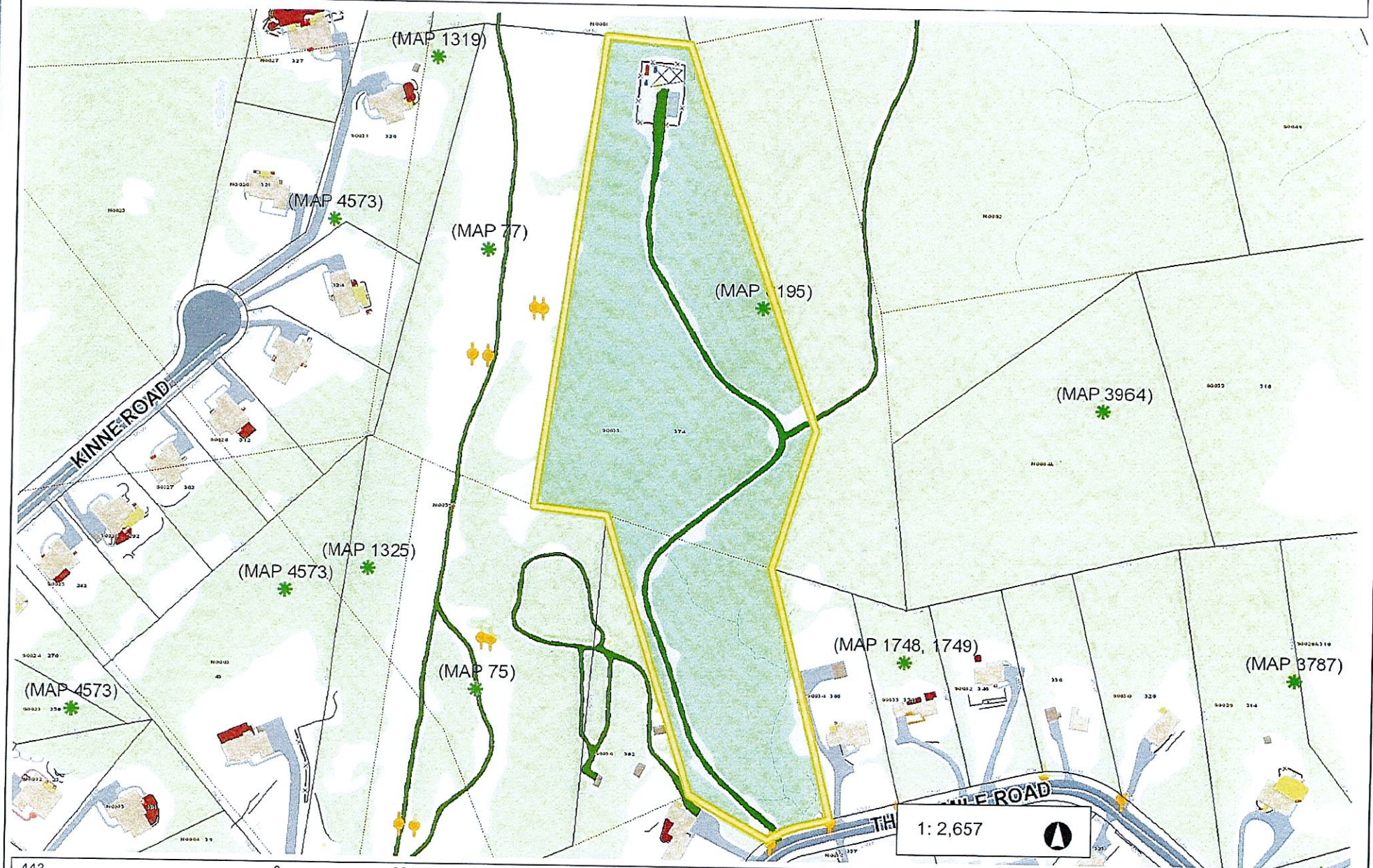
Number of Rooms :
Number of Bedrooms :
Number of Bathrooms :
Number of Half-Baths :
Exterior Wall :
Interior Wall :
Interior Floor :
Interior Floor #2 :
Air Conditioning Type :
Heat Type :
Fuel Type :

Building Sketch Not Applicable

Subarea Type	Est. Gross S.F.	Est. Living S.F.

Outbuilding Type	Est. Gross S.F.	Comments
Cell Shed	924.00	

Town of Glastonbury GIS



NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, June 1, 2022 9:49 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 776996850917: Your package has been delivered

Hi. Your package was delivered Wed, 06/01/2022 at 9:45am.

Delivered to 2155 MAIN ST, GLASTONBURY, CT 06033
Received by D.LUKE

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 776996850917

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Glastonbury Richard Johnson Town Manager 2155 Main Street 2nd Floor GLASTONBURY, CT, US, 06033
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Tue 5/31/2022 05:13 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	GLASTONBURY, CT, US, 06033
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: Wednesday, June 1, 2022 9:49 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 776996872841: Your package has been delivered

Hi. Your package was delivered Wed, 06/01/2022 at 9:45am.

Delivered to 2155 MAIN ST, GLASTONBURY, CT 06033
Received by D.LUKE

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 776996872841

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Glastonbury Rebecca Augur 2155 Main Street 3rd Floor GLASTONBURY, CT, US, 06033
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Tue 5/31/2022 05:13 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	GLASTONBURY, CT, US, 06033
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: Wednesday, June 1, 2022 11:56 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 776996922530: Your package has been delivered

Hi. Your package was delivered Wed, 06/01/2022 at 11:55am.

Delivered to 366 THREE MILE RD, GLASTONBURY, CT 06033

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 776996922530

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Property Owner John R. Flanagan 366 Mile Road GLASTONBURY, CT, US, 06033
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Tue 5/31/2022 05:13 PM
DELIVERED TO	Residence
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	GLASTONBURY, CT, US, 06033
SPECIAL HANDLING	Residential Delivery
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **May 03, 2022**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Site Number:	CT11248A
Crown Castle Designation:	**BU Number:**	806368
	Site Name:	HRT 049B 943215
	JDE Job Number:	714913
	Work Order Number:	2107202
	Order Number:	614467 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	2107202
Site Data:	**374 Three Mile Rd., GLASTONBURY, HARTFORD County, CT** **Latitude *41° 41' 36.93"*, Longitude *-72° 32' 50.11"*** **145 Foot - Monopole Tower**	

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity- 53.1%**

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Jared Koski, EI

Respectfully submitted by:

Digitally signed by Maham Barimani
Date: 2022.05.03 15:24:13 -04'00'

STATE OF CONNECTICUT
MAHAM BARIMANI
30501
LICENSED
PROFESSIONAL ENGINEER

Maham Barimani, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 145 ft Monopole tower designed by Engineered Endeavors, Inc. The tower has been modified in the past to accommodate additional loading, however, the modification, which consists of base plate stiffeners, was not included in this analysis since the anchor rods and base plate are passing without the modification at a lower rate.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 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)
114.0	116.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	4	1-5/8
		3	ericsson	AIR 6419 B41_TMO w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71/B85A		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	114.0	1	tower mounts	Platform Mount [LP 602-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
147.0	148.0	6	andrew	SBNHH-1D65B w/ Mount Pipe	7	1-5/8
		2	antel	LPA-80063/6CF w/ Mount Pipe		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
		4	swedcom	SC-E 6014 REV2 w/ Mount Pipe		
	147.0	1	tower mounts	Platform Mount [LP 1001-1]		
137.0	142.0	3	ericsson	AIR 6419 B77G_CCIV2	2	3/8
	140.0	1	cci antennas	DMP65R-BU6D w/ Mount Pipe	2	13/16
		2	cci antennas	DMP65R-BU8D w/ Mount Pipe	4	7/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		1	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		2	cci antennas	OPA65R-BU8D w/ Mount Pipe		
		3	ericsson	RRUS 32 B2_CCIV2		
		3	ericsson	RRUS 4426 B66		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		2	raycap	DC9-48-60-24-8C-EV_CCIV2		
	138.0	3	ericsson	AIR 6449 B77D		
	137.0	1	tower mounts	Platform Mount [LP 1002-1]		
129.0	132.0	2	gps	GPS_A	-	-
	130.0	12	decibel	DB844G65ZAXY w/ Mount Pipe		
	129.0	1	tower mounts	Platform Mount [LP 601-1]		
		1	tower mounts	Side Arm Mount [SO 701-3]		
127.0	127.0	1	sigfox	CAVITY FILTER	1	1/2
		1	sigfox	CXL 900-3LW		
		1	sigfox	LNA		
		1	tower mounts	Side Arm Mount [SO 306-1]		
95.0	97.0	1	commscope	HT65A-F-2X2 w/ Mount Pipe	1 2	1-1/8 1-1/4
		1	nokia	FWHR		
	96.0	1	repeater technologies	DA1900-39		
	95.0	2	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	262197	CCISITES
4-TOWER MANUFACTURER DRAWINGS	262188	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	974245	CCISITES
4-POST-MODIFICATION INSPECTION	1090825	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	1037241	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) 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. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	145 - 92.5208	Pole	TP35.675x20.5x0.344	1	-25.217	2304.687	45.4	Pass
L2	92.5208 - 44.7083	Pole	TP48.658x33.554x0.438	2	-38.849	4009.582	47.9	Pass
L3	44.7083 - 0	Pole	TP60.5x45.899x0.469	3	-59.676	5565.703	51.7	Pass
							Summary	
						Pole (L3)	51.7	Pass
						Rating =	51.7	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	47.7	Pass
1	Base Plate	0	53.1	Pass
1,2	Base Foundation (Compared w/ Design Loads)	0	51.2	Pass

Structure Rating (max from all components) =	53.1%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Foundation capacity determined by comparing analysis reactions to original design reactions.

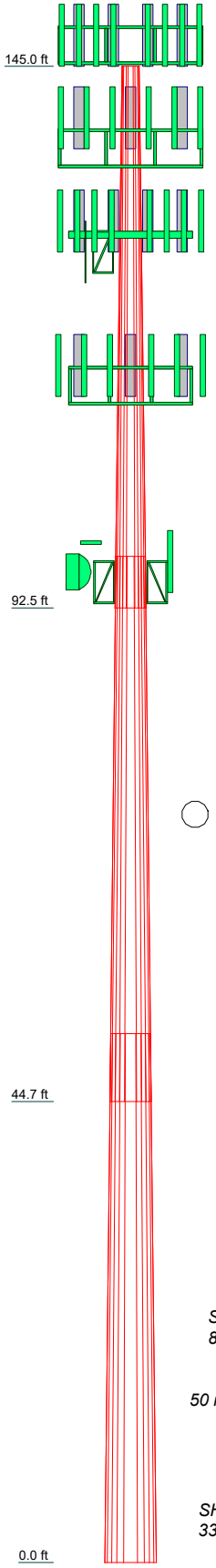
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	52.479	12	0.344	4.958	20.500	35.675		5.5
2	52.771	12	0.438	6.583	33.554	48.658	A572-65	10.3
3	51.292	12	0.469		45.899	60.500		13.9
								29.7



ALL REACTIONS ARE FACTORED

AXIAL 98 K

SHEAR 8 K

MOMENT 909 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 60 K

SHEAR 33 K

MOMENT 3628 kip-ft

TORQUE 4 kip-ft
REACTIONS - 119 mph WIND

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 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 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 0.000 ft
8. TOWER RATING: 51.7%

CROWN CASTLE
The Pathway to Possible

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

Job: ***BU# 806368***			
Project:			
Client: Crown Castle	Drawn by: JKoski		App'd:
Code: TIA-222-H	Date: 05/03/22		Scale: NTS
Path: C:\Users\jkoski\Desktop\Work Area\806368\WO 2107202 - SA\Prod\806368.eri			Dwg No. E-1

Tower Input Data

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

- Tower is located in Hartford County, Connecticut.
- Tower base elevation above sea level: 467.000 ft.
- Basic wind speed of 119 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	145.000-92.521	52.479	4.958	12	20.500	35.675	0.344	1.375	A572-65 (65 ksi)
L2	92.521-44.708	52.771	6.583	12	33.554	48.658	0.438	1.750	A572-65 (65 ksi)
L3	44.708-0.000	51.292		12	45.899	60.500	0.469	1.875	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.102	22.310	1156.948	7.216	10.619	108.951	2344.290	10.981	4.573	13.303
	36.812	39.107	6231.054	12.649	18.480	337.185	12625.805	19.247	8.640	25.134
L2	36.052	46.652	6530.446	11.856	17.381	375.727	13232.453	22.961	7.820	17.874
	50.220	67.931	20161.136	17.263	25.205	799.891	40851.928	33.433	11.868	27.127
L3	49.293	68.571	18063.825	16.264	23.776	759.766	36602.206	33.748	11.045	23.562
	62.469	90.610	41678.805	21.491	31.339	1329.934	84452.559	44.595	14.958	31.91

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 145.000-92.521				1	1	1			
L2 92.521-44.708				1	1	1			
L3 44.708-0.000				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
HB158-1-08U8-S8J18(1-5/8)	C	No	Surface Ar (CaAa)	144.813 - 0.000	1	1	0.100 0.150	1.980		1.300
HCS 6X12 4AWG(1-5/8)	A	No	Surface Ar (CaAa)	114.000 - 0.000	3	3	0.150 0.250	1.660		2.400
*										
LDF6-50A(1-1/4)	B	No	Surface Ar (CaAa)	95.000 - 0.000	3	3	0.150 0.250	1.550		0.600
*										
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HJ7-50A(1-5/8)	C	No	No	Inside Pole	144.813 - 0.000	6	No Ice	0.000	1.040
							1/2" Ice	0.000	1.040
							1" Ice	0.000	1.040
							2" Ice	0.000	1.040
*									

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
FB-L98B-235-XXX(3/8)	C	No	No	Inside Pole	137.000 - 0.000	2	No Ice	0.000	0.060
							1/2" Ice	0.000	0.060
							1" Ice	0.000	0.060
							2" Ice	0.000	0.060
LDF6-50A(1-1/4)	C	No	No	Inside Pole	137.000 - 0.000	6	No Ice	0.000	0.600
							1/2" Ice	0.000	0.600
							1" Ice	0.000	0.600
							2" Ice	0.000	0.600
PWRT-608-S(13/16)	C	No	No	Inside Pole	137.000 - 0.000	2	No Ice	0.000	0.620
							1/2" Ice	0.000	0.620
							1" Ice	0.000	0.620
							2" Ice	0.000	0.620
PWRT-606-S(7/8)	C	No	No	Inside Pole	137.000 - 0.000	4	No Ice	0.000	0.890
							1/2" Ice	0.000	0.890
							1" Ice	0.000	0.890
							2" Ice	0.000	0.890
*									
EC4-50(1/2)	A	No	No	Inside Pole	127.000 - 0.000	1	No Ice	0.000	0.160
							1/2" Ice	0.000	0.160
							1" Ice	0.000	0.160
							2" Ice	0.000	0.160
*									
HB158-21U6S24-xxM_TMO(1-5/8)	A	No	No	Inside Pole	114.000 - 0.000	1	No Ice	0.000	2.500
							1/2" Ice	0.000	2.500
							1" Ice	0.000	2.500
							2" Ice	0.000	2.500
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	145.000-92.521	A	0.000	0.000	10.697	0.000	0.214
		B	0.000	0.000	1.153	0.000	0.004
		C	0.000	0.000	10.354	0.000	0.773
L2	92.521-44.708	A	0.000	0.000	23.811	0.000	0.471
		B	0.000	0.000	22.233	0.000	0.086
		C	0.000	0.000	9.467	0.000	0.768
L3	44.708-0.000	A	0.000	0.000	22.265	0.000	0.441
		B	0.000	0.000	20.789	0.000	0.080
		C	0.000	0.000	8.852	0.000	0.718

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	145.000-92.521	A	1.447	0.000	0.000	21.140	0.000	0.422
		B		0.000	0.000	2.338	0.000	0.027
		C		0.000	0.000	25.485	0.000	1.090
L2	92.521-44.708	A	1.370	0.000	0.000	47.057	0.000	0.935
		B		0.000	0.000	45.084	0.000	0.525
		C		0.000	0.000	23.302	0.000	1.057
L3	44.708-0.000	A	1.222	0.000	0.000	43.148	0.000	0.846
		B		0.000	0.000	41.304	0.000	0.465
		C		0.000	0.000	21.106	0.000	0.969

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	145.000-92.521	-0.890	0.001	-1.171	0.319
L2	92.521-44.708	0.556	-1.229	0.615	-1.124
L3	44.708-0.000	0.586	-1.294	0.682	-1.258

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	HB158-1-08U8-S8J18(1-5/8)	92.52 - 144.81	1.0000	1.0000
L1	21	HCS 6X12 4AWG(1-5/8)	92.52 - 114.00	1.0000	1.0000
L1	24	LDF6-50A(1-1/4)	92.52 - 95.00	1.0000	1.0000
L2	2	HB158-1-08U8-S8J18(1-5/8)	44.71 - 92.52	1.0000	1.0000
L2	21	HCS 6X12 4AWG(1-5/8)	44.71 - 92.52	1.0000	1.0000
L2	24	LDF6-50A(1-1/4)	44.71 - 92.52	1.0000	1.0000
L3	2	HB158-1-08U8-S8J18(1-5/8)	0.00 - 44.71	1.0000	1.0000
L3	21	HCS 6X12 4AWG(1-5/8)	0.00 - 44.71	1.0000	1.0000
L3	24	LDF6-50A(1-1/4)	0.00 - 44.71	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft
(2) SC-E 6014 REV2 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	147.000
(2) SC-E 6014 REV2 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	147.000
(2) LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	147.000
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	147.000
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	147.000
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	147.000
MT6407-77A w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	147.000
MT6407-77A w/ Mount Pipe	B	From Leg	4.000	0.000	147.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.000 1.000		
MT6407-77A w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	147.000
			1.000		
DB-T1-6Z-8AB-0Z	A	From Leg	4.000 0.000	0.000	147.000
			1.000		
RFV01U-D1A	A	From Leg	4.000 0.000	0.000	147.000
			1.000		
RFV01U-D1A	B	From Leg	4.000 0.000	0.000	147.000
			1.000		
RFV01U-D1A	C	From Leg	4.000 0.000	0.000	147.000
			1.000		
RFV01U-D2A	A	From Leg	4.000 0.000	0.000	147.000
			1.000		
RFV01U-D2A	B	From Leg	4.000 0.000	0.000	147.000
			1.000		
RFV01U-D2A	C	From Leg	4.000 0.000	0.000	147.000
			1.000		
Platform Mount [LP 1001-1]	C	None		0.000	147.000
Side Arm Mount [SO 102-3]	C	None		0.000	147.000
15.5' x Pipe 2.5 STD horizontal mount pipe	A	From Leg	4.000 0.000	0.000	147.000
			0.000		
15.5' x Pipe 2.5 STD horizontal mount pipe	B	From Leg	4.000 0.000	0.000	147.000
			0.000		
15.5' x Pipe 2.5 STD horizontal mount pipe	C	From Leg	4.000 0.000	0.000	147.000
			0.000		
(2) L 2.5x2.5x3/16x6'	A	From Leg	2.000 0.000	0.000	147.000
			0.000		
(2) L 2.5x2.5x3/16x6'	B	From Leg	2.000 0.000	0.000	147.000
			0.000		
(2) L 2.5x2.5x3/16x6'	C	From Leg	2.000 0.000	0.000	147.000
			0.000		
(2) 4' x 2" Pipe Mount	A	From Leg	4.000 0.000	0.000	147.000
			0.000		
4' x 2" Pipe Mount	C	From Leg	4.000 0.000	0.000	147.000
			0.000		
*					
RRUS 32 B2_CCIV2	A	From Leg	4.000 0.000	0.000	137.000
			3.000		
RRUS 32 B2_CCIV2	B	From Leg	4.000 0.000	0.000	137.000
			3.000		
RRUS 32 B2_CCIV2	C	From Leg	4.000 0.000	0.000	137.000
			3.000		
AIR 6419 B77G_CCIV2	A	From Leg	4.000 0.000	0.000	137.000
			5.000		

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
AIR 6419 B77G_CCIV2	B	From Leg	4.000 0.000 5.000	0.000	137.000
AIR 6419 B77G_CCIV2	C	From Leg	4.000 0.000 5.000	0.000	137.000
AIR 6449 B77D	A	From Leg	4.000 0.000 1.000	0.000	137.000
AIR 6449 B77D	B	From Leg	4.000 0.000 1.000	0.000	137.000
AIR 6449 B77D	C	From Leg	4.000 0.000 1.000	0.000	137.000
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	137.000
OPA65R-BU8D w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	137.000
OPA65R-BU8D w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	137.000
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	137.000
DMP65R-BU8D w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	137.000
DMP65R-BU8D w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4478 B14_CCIV2	A	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4478 B14_CCIV2	B	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4478 B14_CCIV2	C	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4426 B66	A	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4426 B66	B	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4426 B66	C	From Leg	4.000 0.000 3.000	0.000	137.000
DC9-48-60-24-8C-EV_CCIV2	A	From Leg	4.000 0.000 3.000	0.000	137.000
DC9-48-60-24-8C-EV_CCIV2	B	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4449 B5/B12	B	From Leg	4.000 0.000 3.000	0.000	137.000
RRUS 4449 B5/B12	C	From Leg	4.000 0.000	0.000	137.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
Platform Mount [LP 1002-1]	C	None	3.000	0.000	137.000
(3) 3' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	137.000
(2) 3' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	137.000
(2) 3' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	137.000
8' x 2.375'' Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	137.000
8' x 2.375'' Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	137.000
8' x 2.375'' Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	137.000
*					
(4) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	129.000
(4) DB844G65ZAXY w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	129.000
(4) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	129.000
GPS_A	A	From Leg	4.000 0.000 3.000	0.000	129.000
GPS_A	B	From Leg	4.000 0.000 3.000	0.000	129.000
Side Arm Mount [SO 701-3]	C	None		0.000	129.000
Platform Mount [LP 601-1]	C	None		0.000	129.000
*					
CXL 900-3LW	C	From Leg	4.000 0.000 0.000	0.000	127.000
LNA	C	From Leg	4.000 0.000 0.000	0.000	127.000
CAVITY FILTER	C	From Leg	4.000 0.000 0.000	0.000	127.000
Side Arm Mount [SO 306-1]	C	From Leg	2.000 0.000 0.000	0.000	127.000
*					
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	114.000
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	114.000
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	114.000
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	114.000
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000	0.000	114.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	0.000 2.000 4.000 0.000	0.000	114.000
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	2.000 4.000 0.000	0.000	114.000
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	2.000 4.000 0.000	0.000	114.000
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	2.000 4.000 0.000	0.000	114.000
RADIO 4460 B2/B25 B66_TMO	A	From Leg	2.000 4.000 0.000	0.000	114.000
RADIO 4460 B2/B25 B66_TMO	B	From Leg	2.000 4.000 0.000	0.000	114.000
RADIO 4460 B2/B25 B66_TMO	C	From Leg	2.000 4.000 0.000	0.000	114.000
RADIO 4449 B71/B85A	A	From Leg	2.000 4.000 0.000	0.000	114.000
RADIO 4449 B71/B85A	B	From Leg	2.000 4.000 0.000	0.000	114.000
RADIO 4449 B71/B85A	C	From Leg	2.000 4.000 0.000	0.000	114.000
Platform Mount [LP 602-1]	C	None	2.000	0.000	114.000
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	114.000
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	114.000
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	114.000
Transition Ladder	C	From Face	2.000 0.000 -4.000	0.000	114.000
HT65A-F-2X2 w/ Mount Pipe	B	From Leg	3.000 0.000 2.000	0.000	95.000
FWHR	B	From Leg	3.000 0.000 2.000	0.000	95.000
2' Ice Shield	C	From Leg	3.000 0.000 4.000	0.000	95.000
Side Arm Mount [SO 701-1]	B	From Leg	1.500 0.000 0.000	0.000	95.000
Side Arm Mount [SO 701-1]	C	From Leg	1.500 0.000 0.000	0.000	95.000

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft
repeater technologies DA1900-39 *	C	Paraboloid w/Shroud (HP)	From Leg	3.000 0.000 1.000	30.000		95.000	3.542

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 92.5208	Pole	Max Tension	26	0.000	-0.000	0.000
			Max. Compression	26	-53.645	2.559	-2.395
			Max. Mx	20	-25.217	832.722	-0.095
			Max. My	14	-25.222	0.307	-832.168
			Max. Vy	8	23.429	-831.476	-0.805
			Max. Vx	14	23.410	0.307	-832.168
			Max. Torque	13			-2.591
L2	92.5208 - 44.7083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-72.007	3.395	-3.511
			Max. Mx	8	-38.849	-2043.238	-2.370
			Max. My	14	-38.857	1.257	-2034.857
			Max. Vy	8	28.495	-2043.238	-2.370
			Max. Vx	14	28.277	1.257	-2034.857
			Max. Torque	11			-3.839
L3	44.7083 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-98.212	4.096	-2.697
			Max. Mx	8	-59.676	-3627.890	-3.296
			Max. My	14	-59.676	2.502	-3608.621
			Max. Vy	8	33.301	-3627.890	-3.296
			Max. Vx	14	33.087	2.502	-3608.621
			Max. Torque	11			-3.833

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	98.212	7.921	0.019
	Max. H_x	20	59.693	33.186	0.026
	Max. H_z	2	59.693	0.063	33.057
	Max. M_x	2	3607.916	0.063	33.057
	Max. M_z	8	3627.890	-33.270	-0.026
	Max. Torsion	25	3.742	16.685	28.606
	Min. Vert	17	44.770	16.640	-28.580
	Min. H_x	8	59.693	-33.270	-0.026
	Min. H_z	14	59.693	0.011	-33.057
	Min. M_x	14	-3608.621	0.011	-33.057
	Min. M_z	20	-3623.182	33.186	0.026
	Min. Torsion	11	-3.831	-28.866	-16.524

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	49.744	0.000	0.000	0.258	1.426	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	59.693	-0.063	-33.057	-3607.916	8.420	-2.732
0.9 Dead+1.0 Wind 0 deg - No Ice	44.770	-0.063	-33.057	-3572.159	7.907	-2.725
1.2 Dead+1.0 Wind 30 deg - No Ice	59.693	16.720	-28.556	-3117.163	-1821.106	-0.227
0.9 Dead+1.0 Wind 30 deg - No Ice	44.770	16.720	-28.556	-3086.258	-1803.493	-0.213
1.2 Dead+1.0 Wind 60 deg - No Ice	59.693	28.840	-16.479	-1798.593	-3144.127	1.585

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 60 deg - No Ice	44.770	28.840	-16.479	-1780.798	-3113.369	1.602
1.2 Dead+1.0 Wind 90 deg - No Ice	59.693	33.270	0.026	3.296	-3627.890	3.017
0.9 Dead+1.0 Wind 90 deg - No Ice	44.770	33.270	0.026	3.177	-3592.332	3.033
1.2 Dead+1.0 Wind 120 deg - No Ice	59.693	28.866	16.524	1804.395	-3147.096	3.821
0.9 Dead+1.0 Wind 120 deg - No Ice	44.770	28.866	16.524	1786.368	-3116.308	3.831
1.2 Dead+1.0 Wind 150 deg - No Ice	59.693	16.765	28.582	3120.813	-1826.246	3.724
0.9 Dead+1.0 Wind 150 deg - No Ice	44.770	16.765	28.582	3089.690	-1808.584	3.726
1.2 Dead+1.0 Wind 180 deg - No Ice	59.693	-0.011	33.057	3608.621	2.501	2.574
0.9 Dead+1.0 Wind 180 deg - No Ice	44.770	-0.011	33.057	3572.669	2.039	2.567
1.2 Dead+1.0 Wind 210 deg - No Ice	59.693	-16.640	28.580	3120.243	1816.780	0.603
0.9 Dead+1.0 Wind 210 deg - No Ice	44.770	-16.640	28.580	3089.124	1798.303	0.589
1.2 Dead+1.0 Wind 240 deg - No Ice	59.693	-28.754	16.459	1797.314	3139.162	-1.365
0.9 Dead+1.0 Wind 240 deg - No Ice	44.770	-28.754	16.459	1779.343	3107.541	-1.382
1.2 Dead+1.0 Wind 270 deg - No Ice	59.693	-33.186	-0.026	-2.623	3623.182	-2.838
0.9 Dead+1.0 Wind 270 deg - No Ice	44.770	-33.186	-0.026	-2.691	3586.761	-2.853
1.2 Dead+1.0 Wind 300 deg - No Ice	59.693	-28.780	-16.504	-1801.757	3142.103	-3.665
0.9 Dead+1.0 Wind 300 deg - No Ice	44.770	-28.780	-16.504	-1783.929	3110.459	-3.675
1.2 Dead+1.0 Wind 330 deg - No Ice	59.693	-16.685	-28.606	-3122.502	1821.889	-3.740
0.9 Dead+1.0 Wind 330 deg - No Ice	44.770	-16.685	-28.606	-3091.549	1803.371	-3.742
1.2 Dead+1.0 Ice+1.0 Temp	98.212	-0.000	0.000	2.697	4.096	0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	98.212	-0.027	-7.919	-901.508	7.684	-0.704
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	98.212	3.973	-6.837	-777.813	-448.358	-0.094
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	98.212	6.872	-3.938	-446.489	-779.401	0.388
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	98.212	7.937	0.019	5.504	-901.220	0.773
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	98.212	6.892	3.971	456.788	-782.055	0.988
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	98.212	4.007	6.856	786.172	-452.953	0.963
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	98.212	0.012	7.919	907.217	2.380	0.672
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	98.212	-3.957	6.841	784.010	455.281	0.175
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	98.212	-6.855	3.934	451.790	786.190	-0.338
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	98.212	-7.921	-0.019	0.200	908.062	-0.735
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	98.212	-6.874	-3.967	-450.677	788.840	-0.959
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	98.212	-3.991	-6.861	-780.954	459.872	-0.971
Dead+Wind 0 deg - Service	49.744	-0.015	-7.915	-858.487	3.065	-0.657
Dead+Wind 30 deg - Service	49.744	4.003	-6.837	-741.682	-432.375	-0.050
Dead+Wind 60 deg - Service	49.744	6.905	-3.946	-427.860	-747.261	0.387
Dead+Wind 90 deg - Service	49.744	7.966	0.006	0.995	-862.402	0.729
Dead+Wind 120 deg - Service	49.744	6.911	3.956	429.662	-747.966	0.919

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 150 deg - Service	49.744	4.014	6.843	742.968	-433.597	0.893
Dead+Wind 180 deg - Service	49.744	-0.003	7.915	859.069	1.656	0.618
Dead+Wind 210 deg - Service	49.744	-3.984	6.843	742.829	433.458	0.146
Dead+Wind 240 deg - Service	49.744	-6.885	3.941	427.971	748.187	-0.328
Dead+Wind 270 deg - Service	49.744	-7.946	-0.006	-0.415	863.391	-0.685
Dead+Wind 300 deg - Service	49.744	-6.891	-3.952	-428.611	748.891	-0.886
Dead+Wind 330 deg - Service	49.744	-3.995	-6.849	-742.952	434.678	-0.904

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-49.744	0.000	0.000	49.744	0.000	0.000%
2	-0.063	-59.693	-33.057	0.063	59.693	33.057	0.000%
3	-0.063	-44.770	-33.057	0.063	44.770	33.057	0.000%
4	16.720	-59.693	-28.556	-16.720	59.693	28.556	0.000%
5	16.720	-44.770	-28.556	-16.720	44.770	28.556	0.000%
6	28.840	-59.693	-16.479	-28.840	59.693	16.479	0.000%
7	28.840	-44.770	-16.479	-28.840	44.770	16.479	0.000%
8	33.270	-59.693	0.026	-33.270	59.693	-0.026	0.000%
9	33.270	-44.770	0.026	-33.270	44.770	-0.026	0.000%
10	28.866	-59.693	16.524	-28.866	59.693	-16.524	0.000%
11	28.866	-44.770	16.524	-28.866	44.770	-16.524	0.000%
12	16.765	-59.693	28.582	-16.765	59.693	-28.582	0.000%
13	16.765	-44.770	28.582	-16.765	44.770	-28.582	0.000%
14	-0.011	-59.693	33.057	0.011	59.693	-33.057	0.000%
15	-0.011	-44.770	33.057	0.011	44.770	-33.057	0.000%
16	-16.640	-59.693	28.580	16.640	59.693	-28.580	0.000%
17	-16.640	-44.770	28.580	16.640	44.770	-28.580	0.000%
18	-28.754	-59.693	16.459	28.754	59.693	-16.459	0.000%
19	-28.754	-44.770	16.459	28.754	44.770	-16.459	0.000%
20	-33.186	-59.693	-0.026	33.186	59.693	0.026	0.000%
21	-33.186	-44.770	-0.026	33.186	44.770	0.026	0.000%
22	-28.780	-59.693	-16.504	28.780	59.693	16.504	0.000%
23	-28.780	-44.770	-16.504	28.780	44.770	16.504	0.000%
24	-16.685	-59.693	-28.606	16.685	59.693	28.606	0.000%
25	-16.685	-44.770	-28.606	16.685	44.770	28.606	0.000%
26	0.000	-98.212	0.000	0.000	98.212	-0.000	0.000%
27	-0.027	-98.212	-7.919	0.027	98.212	7.919	0.000%
28	3.973	-98.212	-6.837	-3.973	98.212	6.837	0.000%
29	6.872	-98.212	-3.938	-6.872	98.212	3.938	0.000%
30	7.937	-98.212	0.019	-7.937	98.212	-0.019	0.000%
31	6.892	-98.212	3.971	-6.892	98.212	-3.971	0.000%
32	4.007	-98.212	6.856	-4.007	98.212	-6.856	0.000%
33	0.012	-98.212	7.919	-0.012	98.212	-7.919	0.000%
34	-3.957	-98.212	6.841	3.957	98.212	-6.841	0.000%
35	-6.855	-98.212	3.934	6.855	98.212	-3.934	0.000%
36	-7.921	-98.212	-0.019	7.921	98.212	0.019	0.000%
37	-6.874	-98.212	-3.967	6.874	98.212	3.967	0.000%
38	-3.991	-98.212	-6.861	3.991	98.212	6.861	0.000%
39	-0.015	-49.744	-7.915	0.015	49.744	7.915	0.000%
40	4.003	-49.744	-6.837	-4.003	49.744	6.837	0.000%
41	6.905	-49.744	-3.946	-6.905	49.744	3.946	0.000%
42	7.966	-49.744	0.006	-7.966	49.744	-0.006	0.000%
43	6.911	-49.744	3.956	-6.911	49.744	-3.956	0.000%
44	4.014	-49.744	6.843	-4.014	49.744	-6.843	0.000%
45	-0.003	-49.744	7.915	0.003	49.744	-7.915	0.000%
46	-3.984	-49.744	6.843	3.984	49.744	-6.843	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
47	-6.885	-49.744	3.941	6.885	49.744	-3.941	0.000%
48	-7.946	-49.744	-0.006	7.946	49.744	0.006	0.000%
49	-6.891	-49.744	-3.952	6.891	49.744	3.952	0.000%
50	-3.995	-49.744	-6.849	3.995	49.744	6.849	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00057307
3	Yes	4	0.00000001	0.00036851
4	Yes	5	0.00000001	0.00026135
5	Yes	5	0.00000001	0.00012365
6	Yes	5	0.00000001	0.00025709
7	Yes	5	0.00000001	0.00012138
8	Yes	4	0.00000001	0.00055973
9	Yes	4	0.00000001	0.00036230
10	Yes	5	0.00000001	0.00028445
11	Yes	5	0.00000001	0.00013519
12	Yes	5	0.00000001	0.00024941
13	Yes	5	0.00000001	0.00011750
14	Yes	4	0.00000001	0.00053534
15	Yes	4	0.00000001	0.00034234
16	Yes	5	0.00000001	0.00026845
17	Yes	5	0.00000001	0.00012703
18	Yes	5	0.00000001	0.00026900
19	Yes	5	0.00000001	0.00012740
20	Yes	4	0.00000001	0.00051824
21	Yes	4	0.00000001	0.00033355
22	Yes	5	0.00000001	0.00024827
23	Yes	5	0.00000001	0.00011691
24	Yes	5	0.00000001	0.00028475
25	Yes	5	0.00000001	0.00013536
26	Yes	4	0.00000001	0.00001492
27	Yes	5	0.00000001	0.00016203
28	Yes	5	0.00000001	0.00017689
29	Yes	5	0.00000001	0.00017673
30	Yes	5	0.00000001	0.00016184
31	Yes	5	0.00000001	0.00018158
32	Yes	5	0.00000001	0.00018045
33	Yes	5	0.00000001	0.00016456
34	Yes	5	0.00000001	0.00018215
35	Yes	5	0.00000001	0.00018198
36	Yes	5	0.00000001	0.00016439
37	Yes	5	0.00000001	0.00018031
38	Yes	5	0.00000001	0.00018175
39	Yes	4	0.00000001	0.00003768
40	Yes	4	0.00000001	0.00008410
41	Yes	4	0.00000001	0.00008108
42	Yes	4	0.00000001	0.00003758
43	Yes	4	0.00000001	0.00011111
44	Yes	4	0.00000001	0.00007876
45	Yes	4	0.00000001	0.00003644
46	Yes	4	0.00000001	0.00009179
47	Yes	4	0.00000001	0.00009317
48	Yes	4	0.00000001	0.00003616
49	Yes	4	0.00000001	0.00007822
50	Yes	4	0.00000001	0.00011133

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 92.5208	15.553	48	1.018	0.006
L2	97.4792 - 44.7083	6.685	48	0.688	0.002
L3	51.2917 - 0	1.759	48	0.321	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.000	(2) SC-E 6014 REV2 w/ Mount Pipe	48	15.553	1.018	0.006	53426
137.000	RRUS 32 B2_CCIV2	48	13.928	0.965	0.005	33391
129.000	(4) DB844G65ZAXY w/ Mount Pipe	48	12.327	0.912	0.004	16695
127.000	CXL 900-3LW	48	11.933	0.899	0.004	14840
114.000	AIR -32 B2A/B66AA w/ Mount Pipe	48	9.467	0.809	0.003	8616
96.000	repeater technologies DA1900-39	48	6.461	0.676	0.002	5698
95.000	HT65A-F-2X2 w/ Mount Pipe	48	6.313	0.669	0.002	5695

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 92.5208	65.367	8	4.278	0.023
L2	97.4792 - 44.7083	28.113	8	2.894	0.008
L3	51.2917 - 0	7.394	8	1.349	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.000	(2) SC-E 6014 REV2 w/ Mount Pipe	8	65.367	4.278	0.023	12814
137.000	RRUS 32 B2_CCIV2	8	58.544	4.058	0.020	8008
129.000	(4) DB844G65ZAXY w/ Mount Pipe	8	51.818	3.834	0.017	4003
127.000	CXL 900-3LW	8	50.163	3.778	0.017	3558
114.000	AIR -32 B2A/B66AA w/ Mount Pipe	8	39.802	3.404	0.012	2064
96.000	repeater technologies DA1900-39	8	27.173	2.846	0.008	1362
95.000	HT65A-F-2X2 w/ Mount Pipe	8	26.549	2.814	0.007	1361

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	145 - 92.5208 (1)	TP35.675x20.5x0.344	52.479	0.000	0.0	37.520	-25.217	2194.940	0.011
L2	92.5208 - 44.7083 (2)	TP48.658x33.554x0.438	52.771	0.000	0.0	65.276	-38.849	3818.650	0.010
L3	44.7083 - 0 (3)	TP60.5x45.899x0.469	51.292	0.000	0.0	90.610	-59.676	5300.670	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	145 - 92.5208 (1)	TP35.675x20.5x0.344	832.722	1793.083	0.464	0.000	1793.083	0.000
L2	92.5208 - 44.7083 (2)	TP48.658x33.554x0.438	2043.617	4149.033	0.493	0.000	4149.033	0.000
L3	44.7083 - 0 (3)	TP60.5x45.899x0.469	3627.892	6827.617	0.531	0.000	6827.617	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	145 - 92.5208 (1)	TP35.675x20.5x0.344	23.429	658.481	0.036	1.701	1963.408	0.001
L2	92.5208 - 44.7083 (2)	TP48.658x33.554x0.438	28.486	1145.600	0.025	3.823	4669.300	0.001
L3	44.7083 - 0 (3)	TP60.5x45.899x0.469	33.301	1590.200	0.021	3.017	8397.083	0.000

Pole Interaction Design Data

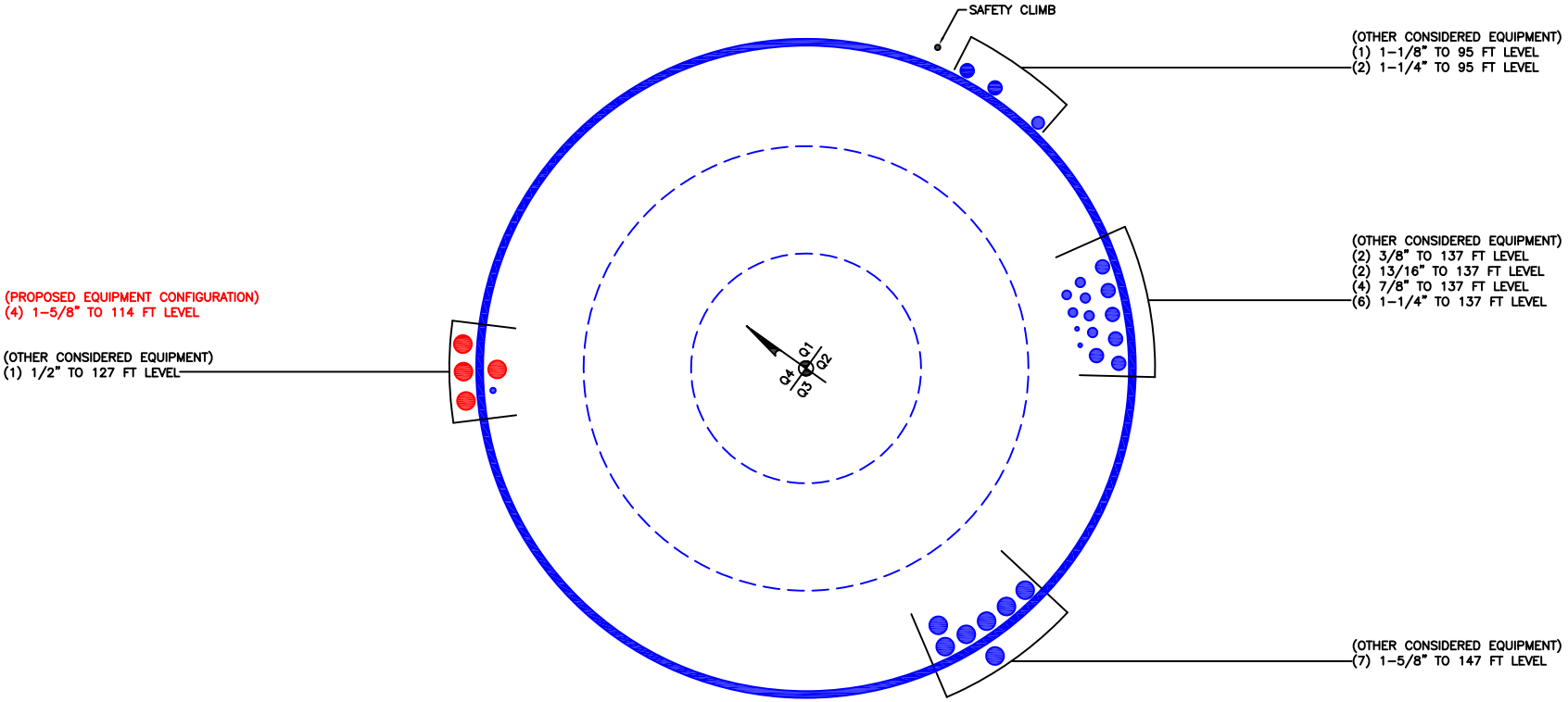
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	145 - 92.5208 (1)	0.011	0.464	0.000	0.036	0.001	0.477	1.050	4.8.2
L2	92.5208 - 44.7083 (2)	0.010	0.493	0.000	0.025	0.001	0.503	1.050	4.8.2
L3	44.7083 - 0 (3)	0.011	0.531	0.000	0.021	0.000	0.543	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	145 - 92.5208	Pole	TP35.675x20.5x0.344	1	-25.217	2304.687	45.4	Pass
L2	92.5208 - 44.7083	Pole	TP48.658x33.554x0.438	2	-38.849	4009.582	47.9	Pass
L3	44.7083 - 0	Pole	TP60.5x45.899x0.469	3	-59.676	5565.703	51.7	Pass
							Summary	
						Pole (L3)	51.7	Pass
						RATING =	**51.7**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


SAFETY CLIMB
(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/8" TO 95 FT LEVEL
(2) 1-1/4" TO 95 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 137 FT LEVEL
(2) 13/16" TO 137 FT LEVEL
(4) 7/8" TO 137 FT LEVEL
(6) 1-1/4" TO 137 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(4) 1-5/8" TO 114 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 127 FT LEVEL
Q1
Q2
Q3
Q4
(OTHER CONSIDERED EQUIPMENT)
(7) 1-5/8" TO 147 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

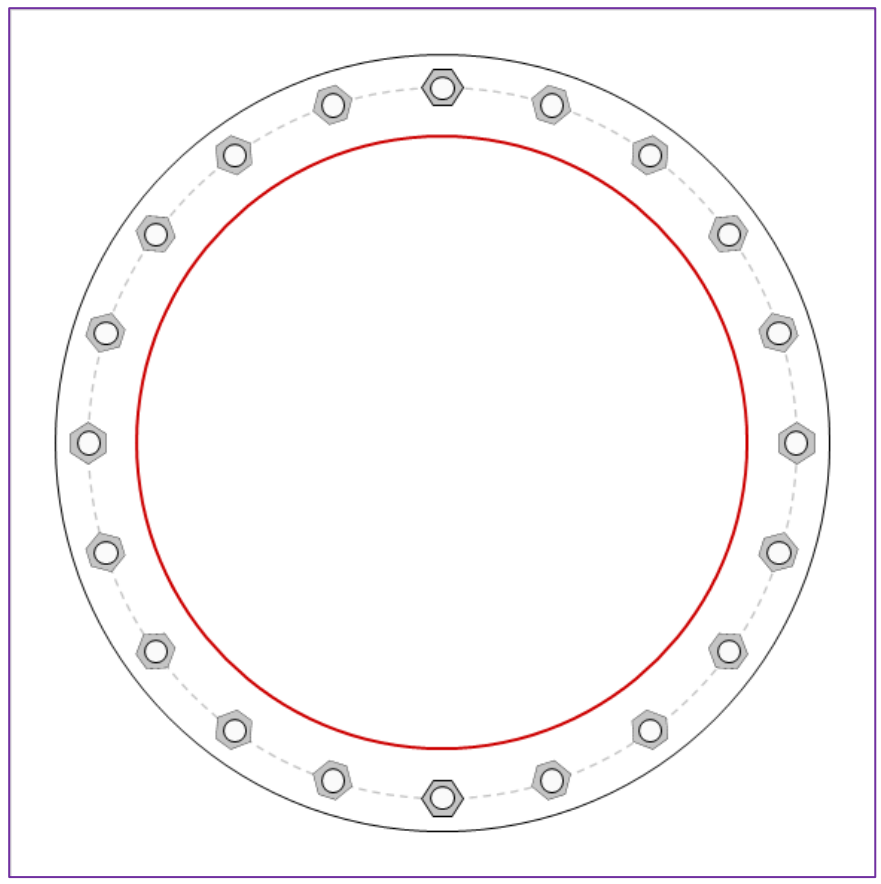
Monopole Base Plate Connection

Site Info	
BU #	806368
Site Name	HRT 049B 943215
Order #	614467 Rev 0

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

Applied Loads	
Moment (kip-ft)	3627.89
Axial Force (kips)	59.68
Shear Force (kips)	33.30

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 70" BC

Base Plate Data

76.5" OD x 2.25" Plate (A817 Gr. 60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

60.5" x 0.46875" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 121.35	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.67	ϕVn = 149.1	**47.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	30.09	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**53.1%**	**Pass**

Monopole Base Reaction Comparison Test

BU # :	806368
Site Name:	HRT 049B 943215
Order Number:	614467 Rev 0
Design TIA:	TIA-222-F
Current TIA:	TIA-222-H
Component:	Monopole Base
Reference Doc ID:	974245

TIA-222-F Compared To TIA-222-H

MONOPOLE BASE FOUNDATION REACTION COMPARISON

REACTIONS	DESIGN REACTIONS	*MODIFIED DESIGN REACTIONS	CURRENT REACTIONS	% CAPACITY
MOMENT (kip-ft)	5001.4	6751.9	3627.9	51.2%
SHEAR (kips)	44.6	60.2	33.3	52.7%

Deisgn loads from: CCIsites Doc #974245

Although the shear capacity is at 52.7%, the moment reaction is the governing criteria for a monopole drilled pier foundation. Therefore, the overall capacity for this foundation is 51.2%.

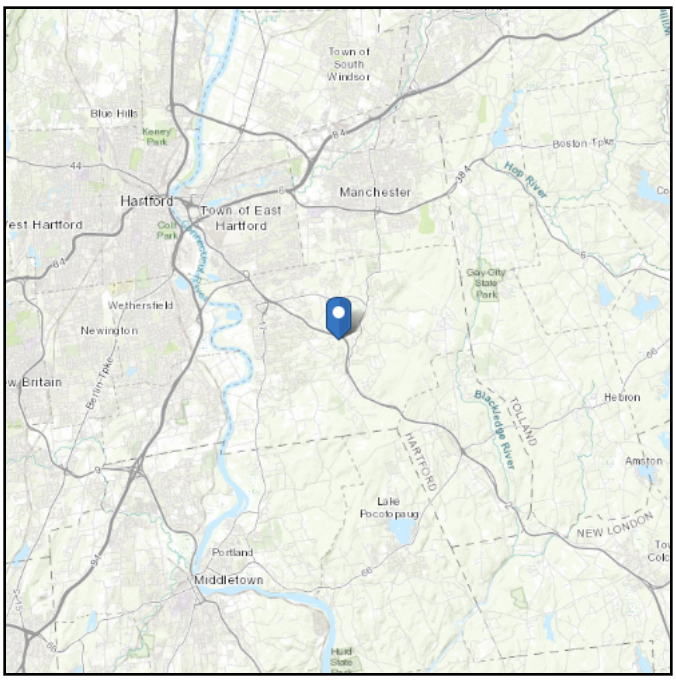
*Design loads were multiplied by 1.35 for comparison as allowed by TIA-222-H, Section 15.6.

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: 467.15 ft (NAVD 88)
Latitude: 41.693592
Longitude: -72.547253



Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 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 May 03 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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

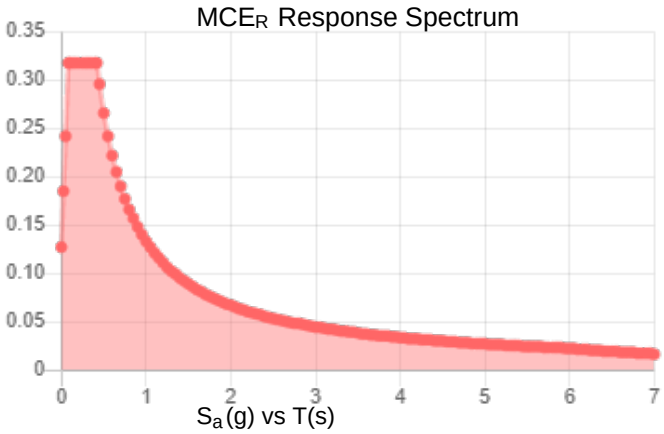
Seismic

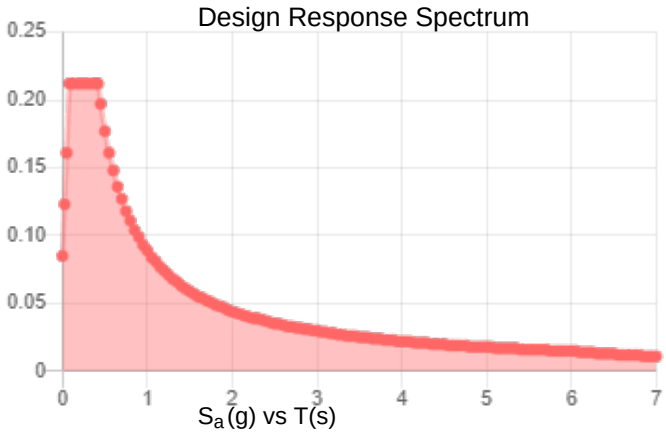
Site Soil Class: D - Default (see Section 11.4.3)

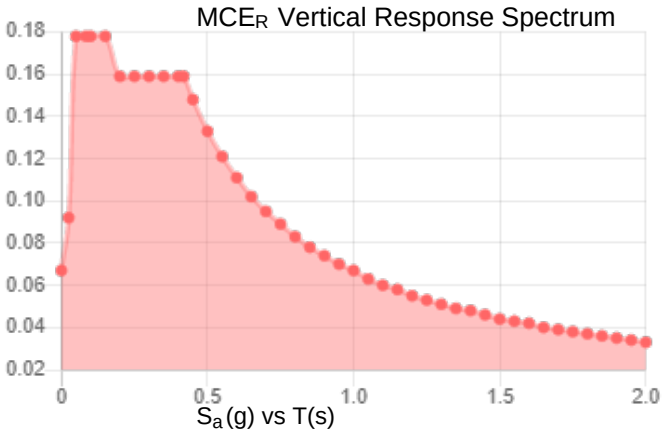
Results:

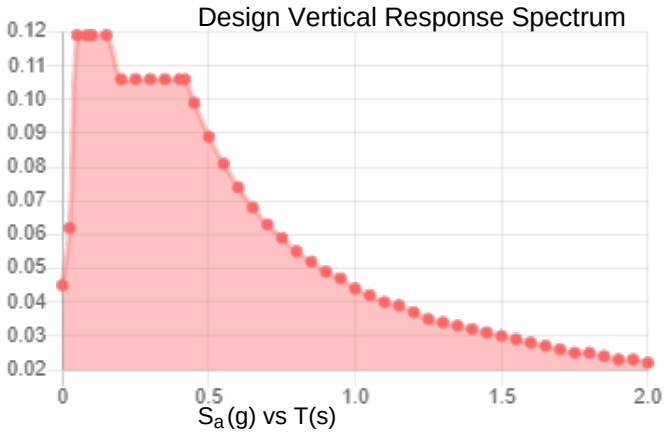
S_S :	0.199	S_{D1} :	0.089
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.109
F_v :	2.4	PGA_M :	0.172
S_{MS} :	0.318	F_{PGA} :	1.582
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.212	C_v :	0.7

Seismic Design Category B









Data Accessed: **Tue May 03 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:	1.50 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 May 03 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.

Date: **April 28, 2022**

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

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11248A
	Carrier Site Name:	Glastonbury
Crown Castle Designation:	**BU Number:**	806368
	Site Name:	HRT 049B 943215
	JDE Job Number:	714913
	Order Number:	614467 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	207926
Site Data:	**374 Three Mile Rd., Glastonbury, Hartford County, CT, 06033**	
	Latitude 41°41'36.93" Longitude -72°32'50.11"	
Structure Information:	**Tower Height & Type:**	**145.0 ft Monopole**
	Mount Elevation:	**114.0 ft**
	Mount Width & Type:	**11.7 ft Platform**

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

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

Platform **Sufficient**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 119 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Adrian Marin

Respectfully Submitted by:
Jinshan Wang, P.E.

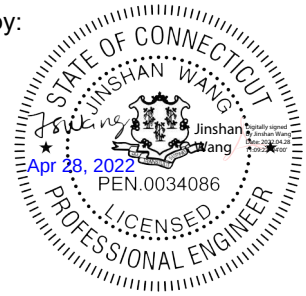


TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 11.7 ft Platform, mapped by RKS.

2) ANALYSIS CRITERIA

Building Code:	2018 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	119 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.50 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.199
Seismic S_1:	0.055
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
114.0	116.0	3	Ericsson	AIR -32 B2A/B66AA	11.7 ft Platform
		3	Ericsson	AIR 6419 B41_TMO	
		3	RFS/Celwave	APXVAARR24_43-U-NA20	
		3	Ericsson	RADIO 4449 B71/B85A	
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	614467, Rev. 0	CCI Sites
Mount Mapping Drawings	RKS	8352814	CCI Sites
Mount Analysis Report	Paul J Ford and Company	9332670	CCI Sites
Structural Analysis Report	B+T Group	10149245	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. Trylon should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3,4	Mount Pipe(s)	MP11	114.0	24.3	Pass
	Horizontal(s)	H3		36.2	Pass
	Standoff(s)	M55A		39.1	Pass
	Bracing(s)	M2		75.5	Pass
	Handrail(s)	M9		19.6	Pass
	Ladder Step(s)	M15		27.1	Pass
	Ladder Rails(s)	M11		41.4	Pass
	Plate(s)	P2081		52.5	Pass
	Mount Connection(s)	-		58.8	Pass

Structure Rating (max from all components) =	**75.5%**

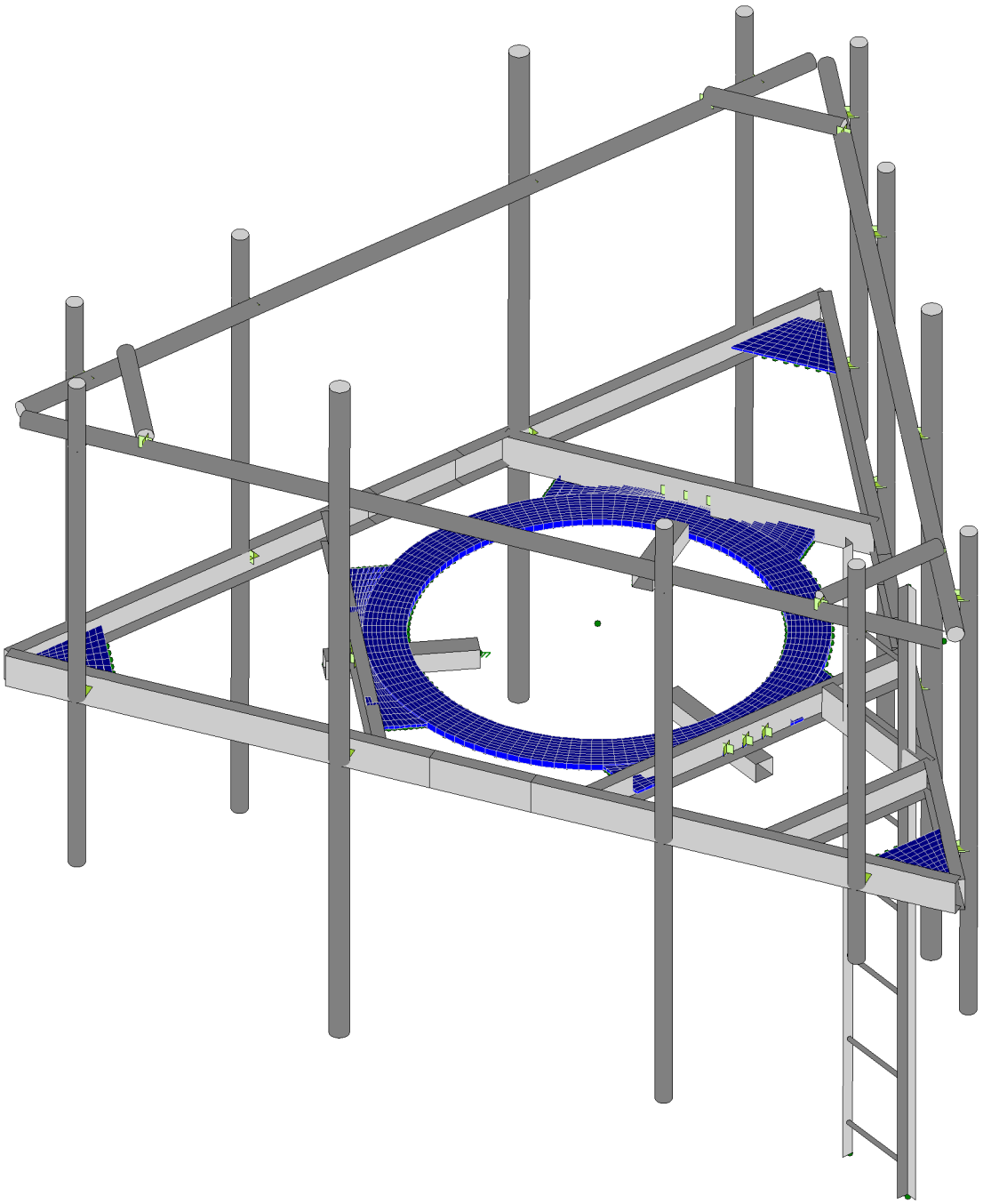
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in "Appendix D – Additional Calculations" for detailed mount connection calculations.
3) All sectors are typical
4) Rating per TIA-222-H,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

4.1) Recommendations

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

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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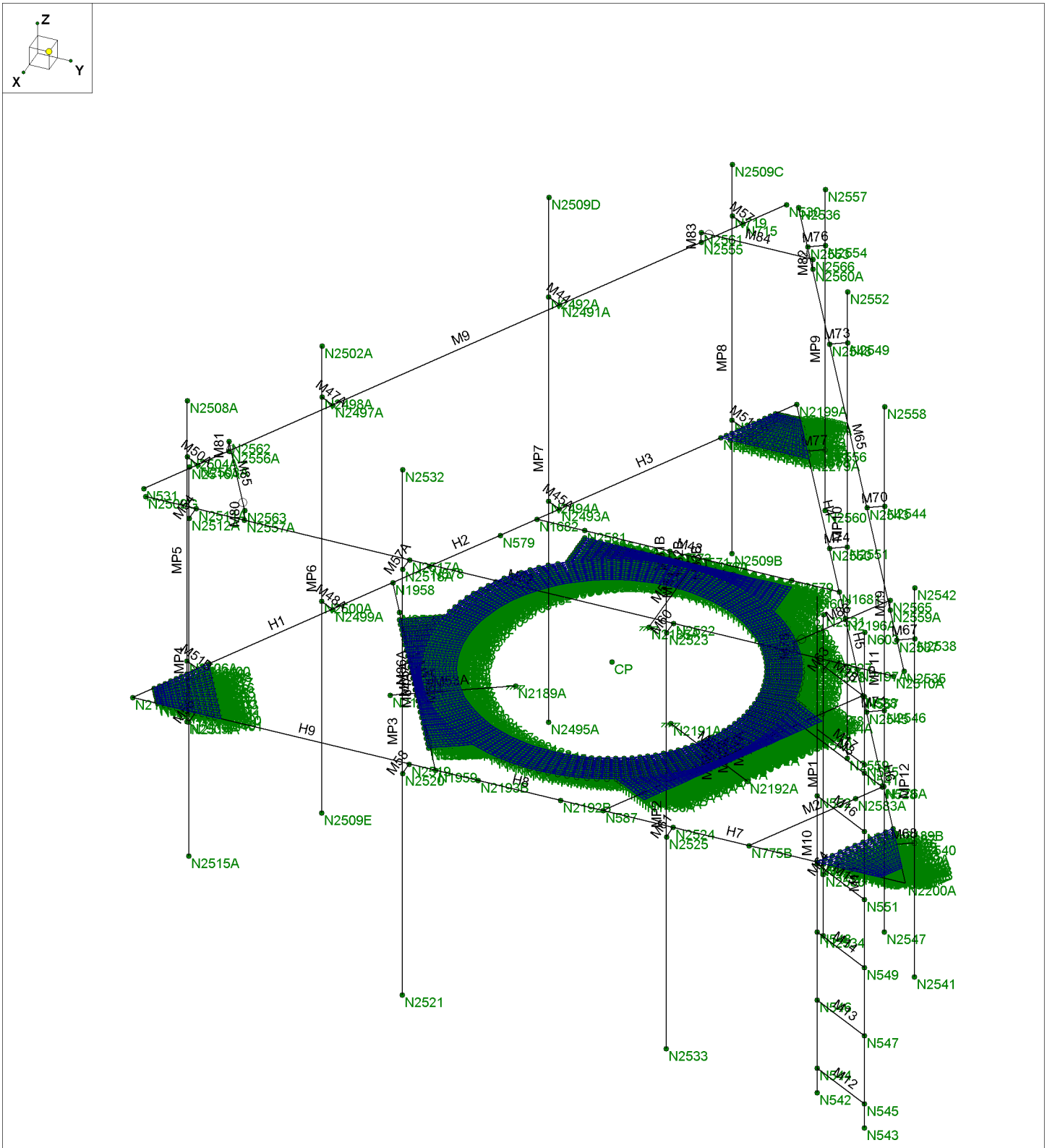

Envelope Only Solution

Trylon	806368	SK - 2
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APPENDIX B

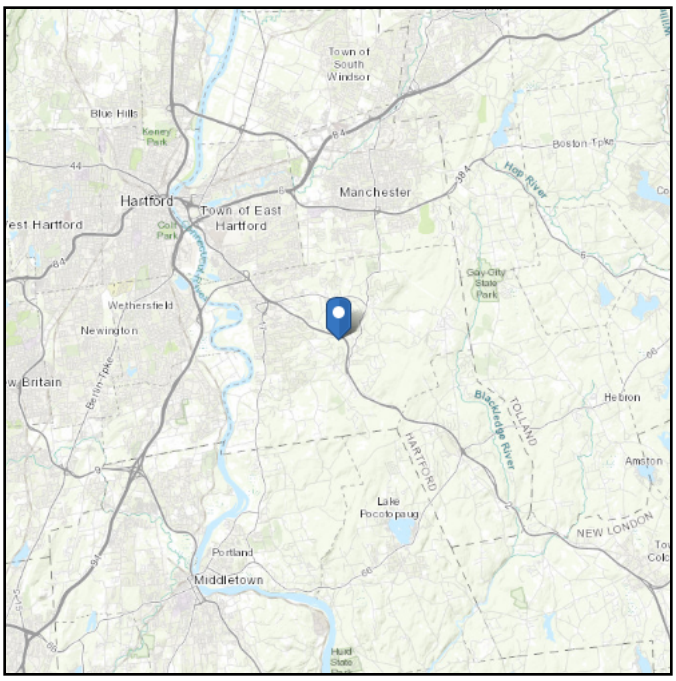
SOFTWARE INPUT CALCULATIONS

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: 467.15 ft (NAVD 88)
Latitude: 41.693592
Longitude: -72.547253



Wind

Results:

Wind Speed	119 Vmph
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25-year MRI	84 Vmph
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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: Thu Apr 28 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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

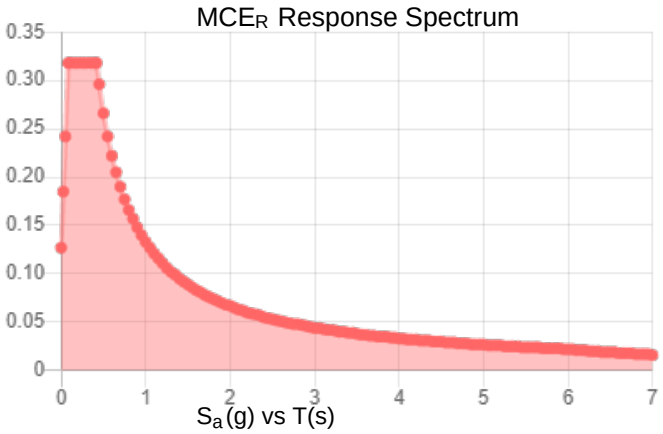
Seismic

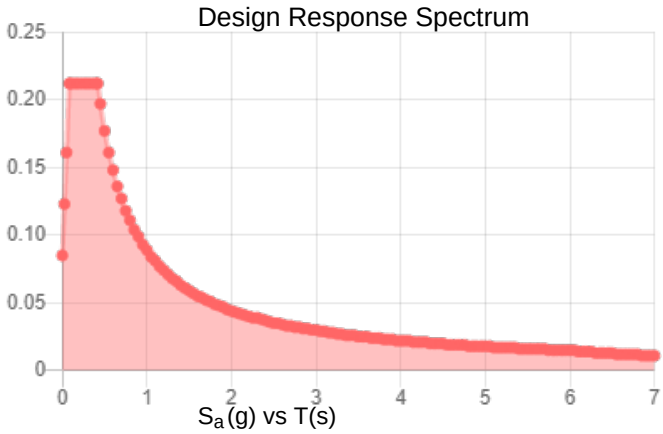
Site Soil Class: D - Default (see Section 11.4.3)

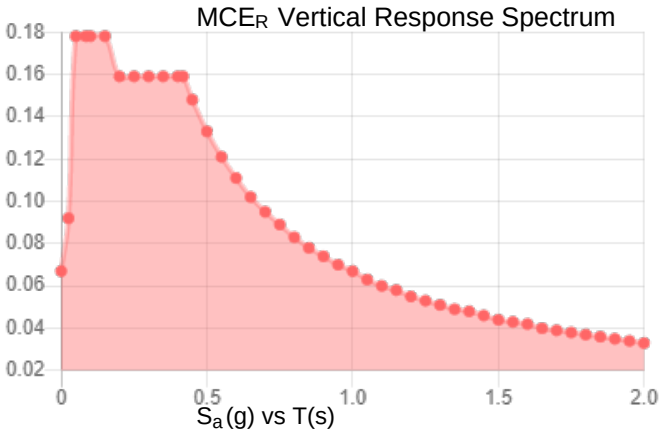
Results:

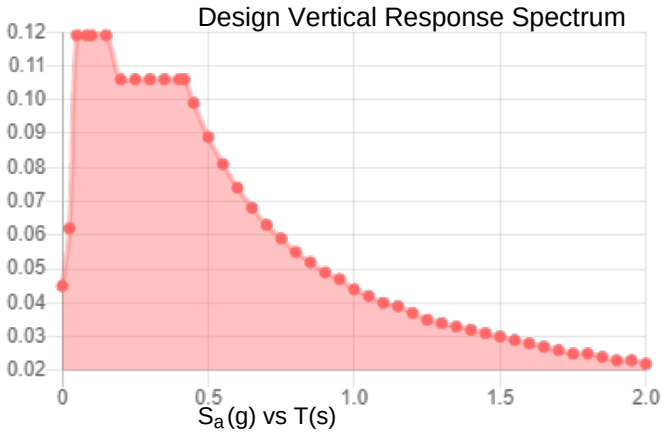
S_S :	0.199	S_{D1} :	0.089
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.109
F_v :	2.4	PGA_M :	0.172
S_{MS} :	0.318	F_{PGA} :	1.582
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.212	C_v :	0.7

Seismic Design Category B









Data Accessed: **Thu Apr 28 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:	1.50 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Apr 28 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.

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

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	207926
Carrier Site ID:	CT11248A
Carrier Site Name:	Glastonbury

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

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	114.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	145.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	467.15	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:	119	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.03	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	34.74	psf
Ground Elevation Factor (K_e):	0.98	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	6.77	psf
Mount Ice Thickness (t_{iz}):	1.70	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	62.53	psf
Round Member Pressure:	37.52	psf
Ice Wind Pressure:	7.31	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.199	g
1 Second Accel (S_1):	0.055	g
Short Period Des. (S_{DS}):	0.21	g
1 Second Des. (S_{D1}):	0.09	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.11	--
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
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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

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	Weight (lbs)
AIR -32 B2A/B66AA	3	116	No Ice	3.86	2.51	172.00
--	--	--	w/ Ice	5.03	3.62	177.76
APXVAARR24_43-U-NA20	3	116	No Ice	14.67	5.32	128.00
--	--	--	w/ Ice	17.04	7.41	418.25
AIR 6419 B41_TMO	3	116	No Ice	7	2.83	96.50
--	--	--	w/ Ice	8.69	4.17	166.50
RADIO 4460 B2/B25 B66_TMO	3	116	No Ice	2.14	1.69	109.00
--	--	--	w/ Ice	2.57	2.08	88.19
RADIO 4449 B71/B85A	3	116	No Ice	1.64	1.31	74.95
--	--	--	w/ Ice	2.03	1.66	70.15
			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			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	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			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	***Qty.***	***Elevation [ft]***	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
AIR -32 B2A/B66AA	3	116	1.00	1.03	0.95	1.70	34.91	6.16
APXVAARR24_43-U-NA2	3	116	1.00	1.03	0.95	1.70	34.91	6.16
AIR 6419 B41_TMO	3	116	1.00	1.03	0.95	1.70	34.91	6.16
ADIO 4460 B2/B25 B66_T	3	116	1.00	1.03	0.95	1.70	34.91	6.16
RADIO 4449 B71/B85A	3	116	1.00	1.03	0.95	1.70	34.91	6.16

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	*Qty.*	*--*	*0° 180°*	*30° 210°*	*60° 240°*	*90° 270°*	*120° 300°*	*150° 330°*
AIR -32 B2A/B66AA	3	No Ice	121.29	89.47	110.68	78.87	110.68	89.47
--	--	w/ Ice	27.92	22.03	25.96	20.07	25.96	22.03
APXVAARR24_43-U-NA20	3	No Ice	460.96	240.61	387.51	167.16	387.51	240.61
--	--	w/ Ice	94.51	54.44	81.15	41.08	81.15	54.44
AIR 6419 B41_TMO	3	No Ice	219.95	121.68	187.20	88.92	187.20	121.68
--	--	w/ Ice	48.18	29.39	41.92	23.13	41.92	29.39
RADIO 4460 B2/B25 B66_TMO	3	No Ice	67.22	56.53	63.66	52.97	63.66	56.53
--	--	w/ Ice	14.27	12.23	13.59	11.55	13.59	12.23
RADIO 4449 B71/B85A	3	No Ice	51.67	43.79	49.04	41.17	49.04	43.79
--	--	w/ Ice	11.26	9.74	10.75	9.23	10.75	9.74
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

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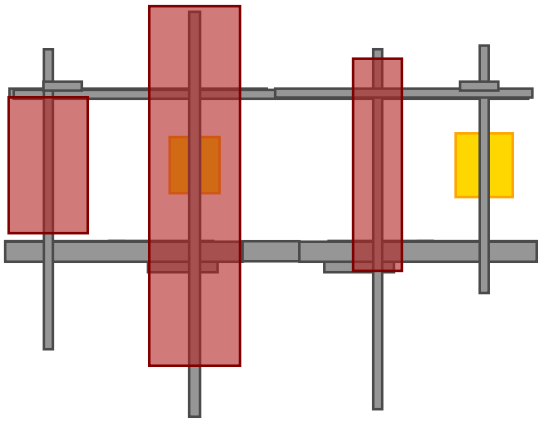
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	***Qty.***	***Elevation [ft]***	***Weight [lbs]***	F_p [lbs]
AIR -32 B2A/B66AA	3	116	172	21.91
APXVAARR24_43-U-NA20	3	116	128	16.30
AIR 6419 B41_TMO	3	116	96.5	12.29
RADIO 4460 B2/B25 B66_TMO	3	116	109	13.88
RADIO 4449 B71/B85A	3	116	74.95	9.55

ELEVATION VIEW

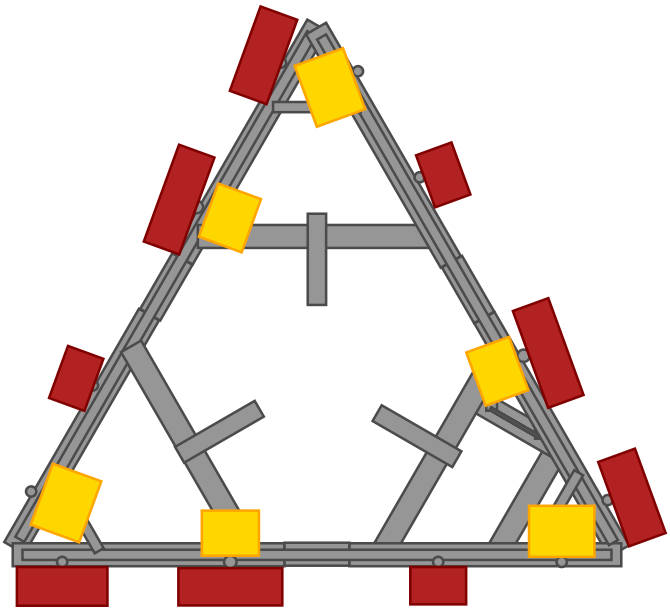


MP4 MP3 MP2 MP1

*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



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

Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
AIR -32 B2A/B66AA	3	116	MP2/MP6/MP10	0/110/250
APXVAARR24_43-U-NA20	3	116	MP3/MP7/MP11	0/110/250
AIR 6419 B41_TMO	3	116	MP4/MP8/MP12	0/110/250
RADIO 4460 B2/B25 B66_TMO	3	116	MP1/MP5/MP9	0/110/250
RADIO 4449 B71/B85A	3	116	MP3/MP7/MP11	0/110/250

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XY
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E..	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	SAE J429 Grade 2	29000	11154	.3	.65	.49	57	1.1	74	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design ...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Bracings	C5X9	Beam	Channel	A36 Gr.36	Typical	2.64	.624	8.89	.109
2	Handrails	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	PIPE_2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	Ladder Steps	SR 5/8_HRA_HRB	Beam	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
5	Ladder Rails	L1.75x1.75x1/4	Beam	Single ...	A36 Gr.36	Typical	.813	.227	.227	.015
6	Standoffs	HSS3X3X5	Beam	Tube	A500 Gr.B Rect	Typical	2.94	3.45	3.45	5.94
7	PIPE_2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design ...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
8	Handrail Corners	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
9	Horizontals	C5X9	Beam	Channel	A36 Gr.36	Typical	2.64	.624	8.89	.109

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N2191A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2185A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N2189A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL			-1		24		6	
2	Structure Wind X	WLX						86		
3	Structure Wind Y	WLY						86		
4	Wind Load 0 AZI	WLX					48			
5	Wind Load 30 AZI	None					48			
6	Wind Load 45 AZI	None					48			
7	Wind Load 60 AZI	None					48			
8	Wind Load 90 AZI	WLY					48			
9	Wind Load 120 AZI	None					48			
10	Wind Load 135 AZI	None					48			
11	Wind Load 150 AZI	None					48			
12	Ice Weight	OL1					24	86	7	
13	Ice Structure Wind X	OL2						86		
14	Ice Structure Wind Y	OL3						86		
15	Ice Wind Load 0 AZI	OL2					48			
16	Ice Wind Load 30 AZI	None					48			
17	Ice Wind Load 45 AZI	None					48			
18	Ice Wind Load 60 AZI	None					48			
19	Ice Wind Load 90 AZI	OL3					48			
20	Ice Wind Load 120 AZI	None					48			
21	Ice Wind Load 135 AZI	None					48			
22	Ice Wind Load 150 AZI	None					48			
23	Seismic Load X	ELX	-.127				24			
24	Seismic Load Y	ELY		-.127			24			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
33	Live Load 9 (Lv)	None					1			
34	Live Load 10 (Lv)	None					1			
35	Live Load 11 (Lv)	None					1			
36	Live Load 12 (Lv)	None					1			
37	Live Load 13 (Lv)	None					1			
38	Live Load 14 (Lv)	None					1			
39	Live Load 15 (Lv)	None					1			
40	Live Load 16 (Lv)	None					1			
41	Live Load 17 (Lv)	None					1			
42	Live Load 18 (Lv)	None					1			
43	Live Load 19 (Lv)	None					1			
44	Live Load 20 (Lv)	None					1			
45	Live Load 21 (Lv)	None					1			
46	Live Load 22 (Lv)	None					1			
47	Live Load 23 (Lv)	None					1			
48	Live Load 24 (Lv)	None					1			
49	Live Load 25 (Lv)	None					1			
50	Live Load 26 (Lv)	None					1			
51	Live Load 27 (Lv)	None					1			
52	Maintenance Load 1 (...	None					1			
53	Maintenance Load 2 (...	None					1			
54	Maintenance Load 3 (...	None					1			
55	Maintenance Load 4 (...	None					1			
56	Maintenance Load 5 (...	None					1			
57	Maintenance Load 6 (...	None					1			
58	Maintenance Load 7 (...	None					1			
59	Maintenance Load 8 (...	None					1			
60	Maintenance Load 9 (...	None					1			
61	Maintenance Load 10 ...	None					1			
62	Maintenance Load 11 ...	None					1			
63	Maintenance Load 12 ...	None					1			
64	BLC 1 Transient Area...	None						43		
65	BLC 12 Transient Are...	None						50		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4DL	Yes	Y		DL	1.4																		
2	1.2DL + 1...	Yes	Y		DL	1.2	2	1	3		4	1												
3	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	.5	5	1												
4	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	.707	6	1												
5	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	.866	7	1												
6	1.2DL + 1...	Yes	Y		DL	1.2	2		3	1	8	1												
7	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	.866	9	1												
8	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	.707	10	1												
9	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	.5	11	1												
10	1.2DL + 1...	Yes	Y		DL	1.2	2	-1	3		4	-1												
11	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1												
12	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1												
13	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1												
14	1.2DL + 1...	Yes	Y		DL	1.2	2		3	-1	8	-1												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
15	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1														
16	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1														
18	0.9DL + 1...	Yes	Y		DL	.9	2	1	3		4	1														
19	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	.5	5	1														
20	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	.707	6	1														
21	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	.866	7	1														
22	0.9DL + 1...	Yes	Y		DL	.9	2		3	1	8	1														
23	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1...	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1...	Yes	Y		DL	.9	2		3	-1	8	-1														
31	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2S...	Yes	Y		DL	1.242	23	1	24																	
51	(1.2+0.2S...	Yes	Y		DL	1.242	23	.866	24	.5																
52	(1.2+0.2S...	Yes	Y		DL	1.242	23	.707	24	.707																
53	(1.2+0.2S...	Yes	Y		DL	1.242	23	.5	24	.866																
54	(1.2+0.2S...	Yes	Y		DL	1.242	23		24	1																
55	(1.2+0.2S...	Yes	Y		DL	1.242	23	-.5	24	.866																
56	(1.2+0.2S...	Yes	Y		DL	1.242	23	-.707	24	.707																
57	(1.2+0.2S...	Yes	Y		DL	1.242	23	-.866	24	.5																
58	(1.2+0.2S...	Yes	Y		DL	1.242	23	-1	24																	
59	(1.2+0.2S...	Yes	Y		DL	1.242	23	-.866	24	-.5																
60	(1.2+0.2S...	Yes	Y		DL	1.242	23	-.707	24	-.707																
61	(1.2+0.2S...	Yes	Y		DL	1.242	23	-.5	24	-.866																
62	(1.2+0.2S...	Yes	Y		DL	1.242	23		24	-1																
63	(1.2+0.2S...	Yes	Y		DL	1.242	23	.5	24	-.866																
64	(1.2+0.2S...	Yes	Y		DL	1.242	23	.707	24	-.707																
65	(1.2+0.2S...	Yes	Y		DL	1.242	23	.866	24	-.5																
66	(0.9-0.2Sd...	Yes	Y		DL	.858	23	1	24																	

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
67	(0.9-0.2Sd..	Yes	Y		DL	.858	23	.866	24	.5																
68	(0.9-0.2Sd..	Yes	Y		DL	.858	23	.707	24	.707																
69	(0.9-0.2Sd..	Yes	Y		DL	.858	23	.5	24	.866																
70	(0.9-0.2Sd..	Yes	Y		DL	.858	23		24	1																
71	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-.5	24	.866																
72	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-.707	24	.707																
73	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-.866	24	.5																
74	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-1	24																	
75	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-.866	24	-.5																
76	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-.707	24	-.707																
77	(0.9-0.2Sd..	Yes	Y		DL	.858	23	-.5	24	-.866																
78	(0.9-0.2Sd..	Yes	Y		DL	.858	23		24	-1																
79	(0.9-0.2Sd..	Yes	Y		DL	.858	23	.5	24	-.866																
80	(0.9-0.2Sd..	Yes	Y		DL	.858	23	.707	24	-.707																
81	(0.9-0.2Sd..	Yes	Y		DL	.858	23	.866	24	-.5																
82	1.2DL + 1...	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1...	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1...	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1...	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1...	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1...	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1...	Yes	Y		DL	1.2	31	1.5																		
89	1.2DL + 1...	Yes	Y		DL	1.2	32	1.5																		
90	1.2DL + 1...	Yes	Y		DL	1.2	33	1.5																		
91	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5																		
92	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5																		
93	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5																		
94	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5																		
95	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5																		
96	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5																		
97	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5																		
98	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5																		
99	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5																		
100	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5																		
101	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5																		
102	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5																		
103	1.2DL + 1...	Yes	Y		DL	1.2	46	1.5																		
104	1.2DL + 1...	Yes	Y		DL	1.2	47	1.5																		
105	1.2DL + 1...	Yes	Y		DL	1.2	48	1.5																		
106	1.2DL + 1...	Yes	Y		DL	1.2	49	1.5																		
107	1.2DL + 1...	Yes	Y		DL	1.2	50	1.5																		
108	1.2DL + 1...	Yes	Y		DL	1.2	51	1.5																		
109	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.064	3		4	.064												
110	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.055	3	.032	5	.064												
111	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.045	3	.045	6	.064												
112	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.032	3	.055	7	.064												
113	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2		3	.064	8	.064												
114	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.032	3	.055	9	.064												
115	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.045	3	.045	10	.064												
116	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.055	3	.032	11	.064												
117	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.064	3		4	-.064												
118	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.055	3	-.032	5	-.064												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
119	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.045	3	-.045	6	-.064												
120	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	-.032	3	-.055	7	-.064												
121	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2		3	-.064	8	-.064												
122	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.032	3	-.055	9	-.064												
123	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.045	3	-.045	10	-.064												
124	1.2DL + 1...	Yes	Y		DL	1.2	52	1.5	2	.055	3	-.032	11	-.064												
125	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.064	3		4	.064												
126	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.055	3	.032	5	.064												
127	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.045	3	.045	6	.064												
128	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.032	3	.055	7	.064												
129	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2		3	.064	8	.064												
130	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.032	3	.055	9	.064												
131	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.045	3	.045	10	.064												
132	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.055	3	.032	11	.064												
133	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.064	3		4	-.064												
134	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.055	3	-.032	5	-.064												
135	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.045	3	-.045	6	-.064												
136	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	-.032	3	-.055	7	-.064												
137	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2		3	-.064	8	-.064												
138	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.032	3	-.055	9	-.064												
139	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.045	3	-.045	10	-.064												
140	1.2DL + 1...	Yes	Y		DL	1.2	53	1.5	2	.055	3	-.032	11	-.064												
141	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.064	3		4	.064												
142	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.055	3	.032	5	.064												
143	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.045	3	.045	6	.064												
144	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.032	3	.055	7	.064												
145	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2		3	.064	8	.064												
146	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.032	3	.055	9	.064												
147	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.045	3	.045	10	.064												
148	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.055	3	.032	11	.064												
149	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.064	3		4	-.064												
150	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.055	3	-.032	5	-.064												
151	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.045	3	-.045	6	-.064												
152	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	-.032	3	-.055	7	-.064												
153	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2		3	-.064	8	-.064												
154	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.032	3	-.055	9	-.064												
155	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.045	3	-.045	10	-.064												
156	1.2DL + 1...	Yes	Y		DL	1.2	54	1.5	2	.055	3	-.032	11	-.064												
157	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.064	3		4	.064												
158	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.055	3	.032	5	.064												
159	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.045	3	.045	6	.064												
160	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.032	3	.055	7	.064												
161	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2		3	.064	8	.064												
162	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.032	3	.055	9	.064												
163	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.045	3	.045	10	.064												
164	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.055	3	.032	11	.064												
165	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.064	3		4	-.064												
166	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.055	3	-.032	5	-.064												
167	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.045	3	-.045	6	-.064												
168	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	-.032	3	-.055	7	-.064												
169	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2		3	-.064	8	-.064												
170	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.032	3	-.055	9	-.064												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
171	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.045	3	-.045	10	-.064												
172	1.2DL + 1...	Yes	Y		DL	1.2	55	1.5	2	.055	3	-.032	11	-.064												
173	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.064	3		4	.064												
174	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.055	3	.032	5	.064												
175	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.045	3	.045	6	.064												
176	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.032	3	.055	7	.064												
177	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2		3	.064	8	.064												
178	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.032	3	.055	9	.064												
179	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.045	3	.045	10	.064												
180	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.055	3	.032	11	.064												
181	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.064	3		4	-.064												
182	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.055	3	-.032	5	-.064												
183	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.045	3	-.045	6	-.064												
184	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	-.032	3	-.055	7	-.064												
185	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2		3	-.064	8	-.064												
186	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.032	3	-.055	9	-.064												
187	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.045	3	-.045	10	-.064												
188	1.2DL + 1...	Yes	Y		DL	1.2	56	1.5	2	.055	3	-.032	11	-.064												
189	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.064	3		4	.064												
190	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.055	3	.032	5	.064												
191	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.045	3	.045	6	.064												
192	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.032	3	.055	7	.064												
193	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2		3	.064	8	.064												
194	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.032	3	.055	9	.064												
195	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.045	3	.045	10	.064												
196	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.055	3	.032	11	.064												
197	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.064	3		4	-.064												
198	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.055	3	-.032	5	-.064												
199	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.045	3	-.045	6	-.064												
200	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	-.032	3	-.055	7	-.064												
201	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2		3	-.064	8	-.064												
202	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.032	3	-.055	9	-.064												
203	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.045	3	-.045	10	-.064												
204	1.2DL + 1...	Yes	Y		DL	1.2	57	1.5	2	.055	3	-.032	11	-.064												
205	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.064	3		4	.064												
206	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.055	3	.032	5	.064												
207	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.045	3	.045	6	.064												
208	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.032	3	.055	7	.064												
209	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2		3	.064	8	.064												
210	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.032	3	.055	9	.064												
211	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.045	3	.045	10	.064												
212	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.055	3	.032	11	.064												
213	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.064	3		4	-.064												
214	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.055	3	-.032	5	-.064												
215	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.045	3	-.045	6	-.064												
216	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	-.032	3	-.055	7	-.064												
217	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2		3	-.064	8	-.064												
218	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.032	3	-.055	9	-.064												
219	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.045	3	-.045	10	-.064												
220	1.2DL + 1...	Yes	Y		DL	1.2	58	1.5	2	.055	3	-.032	11	-.064												
221	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.064	3		4	.064												
222	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.055	3	.032	5	.064												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
223	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.045	3	.045	6	.064												
224	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.032	3	.055	7	.064												
225	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2		3	.064	8	.064												
226	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.032	3	.055	9	.064												
227	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.045	3	.045	10	.064												
228	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.055	3	.032	11	.064												
229	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.064	3		4	-.064												
230	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.055	3	-.032	5	-.064												
231	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.045	3	-.045	6	-.064												
232	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	-.032	3	-.055	7	-.064												
233	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2		3	-.064	8	-.064												
234	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.032	3	-.055	9	-.064												
235	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.045	3	-.045	10	-.064												
236	1.2DL + 1...	Yes	Y		DL	1.2	59	1.5	2	.055	3	-.032	11	-.064												
237	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.064	3		4	.064												
238	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.055	3	.032	5	.064												
239	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.045	3	.045	6	.064												
240	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.032	3	.055	7	.064												
241	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2		3	.064	8	.064												
242	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.032	3	.055	9	.064												
243	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.045	3	.045	10	.064												
244	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.055	3	.032	11	.064												
245	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.064	3		4	-.064												
246	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.055	3	-.032	5	-.064												
247	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.045	3	-.045	6	-.064												
248	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	-.032	3	-.055	7	-.064												
249	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2		3	-.064	8	-.064												
250	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.032	3	-.055	9	-.064												
251	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.045	3	-.045	10	-.064												
252	1.2DL + 1...	Yes	Y		DL	1.2	60	1.5	2	.055	3	-.032	11	-.064												
253	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.064	3		4	.064												
254	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.055	3	.032	5	.064												
255	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.045	3	.045	6	.064												
256	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.032	3	.055	7	.064												
257	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2		3	.064	8	.064												
258	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.032	3	.055	9	.064												
259	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.045	3	.045	10	.064												
260	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.055	3	.032	11	.064												
261	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.064	3		4	-.064												
262	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.055	3	-.032	5	-.064												
263	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.045	3	-.045	6	-.064												
264	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	-.032	3	-.055	7	-.064												
265	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2		3	-.064	8	-.064												
266	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.032	3	-.055	9	-.064												
267	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.045	3	-.045	10	-.064												
268	1.2DL + 1...	Yes	Y		DL	1.2	61	1.5	2	.055	3	-.032	11	-.064												
269	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.064	3		4	.064												
270	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.055	3	.032	5	.064												
271	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.045	3	.045	6	.064												
272	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.032	3	.055	7	.064												
273	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2		3	.064	8	.064												
274	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.032	3	.055	9	.064												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
275	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.045	3	.045	10	.064												
276	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.055	3	.032	11	.064												
277	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.064	3		4	-.064												
278	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.055	3	-.032	5	-.064												
279	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.045	3	-.045	6	-.064												
280	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	-.032	3	-.055	7	-.064												
281	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2		3	-.064	8	-.064												
282	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.032	3	-.055	9	-.064												
283	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.045	3	-.045	10	-.064												
284	1.2DL + 1...	Yes	Y		DL	1.2	62	1.5	2	.055	3	-.032	11	-.064												
285	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.064	3		4	.064												
286	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.055	3	.032	5	.064												
287	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.045	3	.045	6	.064												
288	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.032	3	.055	7	.064												
289	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2		3	.064	8	.064												
290	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.032	3	.055	9	.064												
291	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.045	3	.045	10	.064												
292	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.055	3	.032	11	.064												
293	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.064	3		4	-.064												
294	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.055	3	-.032	5	-.064												
295	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.045	3	-.045	6	-.064												
296	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	-.032	3	-.055	7	-.064												
297	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2		3	-.064	8	-.064												
298	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.032	3	-.055	9	-.064												
299	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.045	3	-.045	10	-.064												
300	1.2DL + 1...	Yes	Y		DL	1.2	63	1.5	2	.055	3	-.032	11	-.064												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N2191A	max	3814.175	36	6479.729	37	3732.498	45	3294.449	45	407.528	20	1011.746	9
2		min	-170.387	29	130.298	29	-33.642	21	-611.55	21	-1860.326	44	-1014.57	17
3	N2185A	max	-213.867	18	956.488	22	3369.603	34	365.017	14	3336.341	34	1039.954	14
4		min	-7376.394	42	-985.638	14	-58.002	26	-346.103	22	-698.229	26	-1008.501	22
5	N2189A	max	3649.944	49	-185.004	23	3235.32	39	705.875	31	434.381	32	676.049	19
6		min	73.784	26	-6401.606	47	-162.907	31	-2738.58	39	-1609.46	40	-707.506	11
7	Totals:	max	3975.522	18	4103.682	6	9382.051	42						
8		min	-3975.526	10	-4103.675	30	2897.49	67						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc.....		Shear Check	Loc.....		...	phi*P...	phi*P...	phi*M...	phi*M.....		Eqn
1	M2	C5X9	.793	28....	44	.161	28....	z	38	78590..	85536	1909....	11853	...	H1-1b
2	M29	C5X9	.442	30....	13	.189	28....	z	5	64346..	85536	1909....	11853	...	H1-1b
3	M11	L1.75x1.75x1/4	.435	29....	33	.030	41....	y	5	19759..	26341..	511.9...	907.6...	....	H2-1
4	M10	L1.75x1.75x1/4	.429	29....	25	.027	41....	z	5	19759..	26341..	511.9...	909.1...	....	H2-1
5	M55A	HSS3X3X5	.411	0	44	.131	0	y	47	11860..	121716	10005	10005	...	H1-1b
6	M3	C5X9	.388	23	16	.194	18....	z	17	82355..	85536	1909....	11853	1	H1-1b
7	M47	C5X9	.373	24....	8	.090	26....	z	2	64346..	85536	1909....	11853	...	H1-1b
8	M43	C5X9	.364	30....	2	.093	28....	z	7	64346..	85536	1909....	11853	...	H1-1b
9	M51A	HSS3X3X5	.364	0	49	.116	0	y	47	11860..	121716	10005	10005	...	H1-1b

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc.....		Shear Check	Loc.....	...	phi*P...	phi*P...	phi*M...	phi*M.....		Eqn
10	H3	C5X9	.358	7.1...	17	.381	7.8...	z	14	35337...	85536	1909....	11853	...	H1-1b
11	H1	C5X9	.357	55....	9	.271	13....	z	10	35573...	85536	1909....	11853	...	H1-1b
12	M53A	HSS3X3X5	.350	0	39	.111	0	y	42	11860...	121716	10005	10005	...	H1-1b
13	H4	C5X9	.339	55....	4	.286	13....	z	6	35573...	85536	1909....	11853	...	H1-1b
14	H6	C5X9	.315	7.1...	11	.345	7.8...	z	8	35573...	85536	1909....	11853	...	H1-1b
15	H7	C5X9	.301	55....	15	.240	13....	z	16	35573...	85536	1909....	11853	...	H1-1b
16	H9	C5X9	.286	7.1...	7	.350	7.8...	z	3	35573...	85536	1909....	11853	...	H1-1b
17	M15	SR 5/8_HRA_HRB	.285	0	13	.044	13		5	8435....	9946.8	96.768	96.768	...	H1-1b
18	M14	SR 5/8_HRA_HRB	.281	0	13	.035	13		5	8435....	9946.8	96.768	96.768	...	H1-1b
19	MP11	PIPE_2.5	.256	61....	6	.068	61....		13	26137...	50715	3596....	3596....	1	H1-1b
20	MP3	PIPE_2.5	.246	61....	2	.064	61....		7	26137...	50715	3596....	3596....	...	H1-1b
21	MP7	PIPE_2.5	.245	61....	13	.065	61....		2	26137...	50715	3596....	3596....	...	H1-1b
22	M13	SR 5/8_HRA_HRB	.240	0	13	.020	13		5	8435....	9946.8	96.768	96.768	...	H1-1b
23	MP2	PIPE_2.0	.223	52	7	.092	52		10	14916...	32130	1871....	1871....	1	H1-1b
24	MP8	PIPE_2.0	.221	52.5	14	.053	52.5		17	18857...	32130	1871....	1871....	...	H1-1b
25	MP10	PIPE_2.0	.217	52	13	.075	52		15	14916...	32130	1871....	1871....	...	H1-1b
26	MP1	PIPE_2.0	.217	52....	7	.066	52....		10	22356...	32130	1871....	1871....	1	H1-1b
27	MP12	PIPE_2.0	.213	52.5	7	.068	52.5		14	18857...	32130	1871....	1871....	1	H1-1b
28	MP4	PIPE_2.0	.209	52.5	2	.061	52.5		6	18857...	32130	1871....	1871....	...	H1-1b
29	M9	PIPE_2.0	.206	46....	6	.150	119		2	7658....	32130	1871....	1871....	1	H1-1b
30	M16	SR 5/8_HRA_HRB	.204	0	13	.036	13		5	8435....	9946.8	96.768	96.768	...	H1-1b
31	H2	C5X9	.204	15	16	.033	0	y	...	81355...	85536	1909....	11853	...	H1-1b
32	M12	SR 5/8_HRA_HRB	.202	0	13	.009	0		14	8435....	9946.8	96.768	96.768	...	H1-1b
33	MP6	PIPE_2.0	.201	52	16	.081	52		5	14916...	32130	1871....	1871....	...	H1-1b
34	H5	C5X9	.199	0	4	.032	0	y	...	81355...	85536	1909....	11853	...	H1-1b
35	M52	PIPE_2.0	.196	46....	12	.150	119		7	7658....	32130	1871....	1871....	1	H1-1b
36	MP9	PIPE_2.0	.196	52....	13	.061	11....		3	22356...	32130	1871....	1871....	...	H1-1b
37	M65	PIPE_2.0	.192	46....	17	.151	119		13	7658....	32130	1871....	1871....	1	H1-1b
38	MP5	PIPE_2.0	.184	52....	2	.058	52....		9	22356...	32130	1871....	1871....	1	H1-1b
39	H8	C5X9	.174	15	7	.034	0	y	...	81355...	85536	1909....	11853	...	H1-1b
40	M84	PIPE_2.0	.076	11....	6	.287	20....		6	31050...	32130	1871....	1871....	...	H3-6
41	M85	PIPE_2.0	.067	12....	11	.269	0		11	31050...	32130	1871....	1871....	...	H3-6
42	M86	PIPE_2.0	.065	8.4...	16	.261	0		16	31050...	32130	1871....	1871....	...	H3-6
43	M18	SR 5/8_HRA_HRB	.052	0	5	.024	13		13	8435....	9946.8	96.768	96.768	...	H1-1b
44	M17	SR 5/8_HRA_HRB	.024	0	5	.016	13		13	8435....	9946.8	96.768	96.768	...	H1-1b

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	phi*V...	phi*V...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCULATIONS

CONNECTION CHECK

Mount to Tower Connections Check (N2185A- Results from LC34)

Weldment Connections Check

Reactions		
Tension Force (X)	6.311	[kips]
Shear Force (Y)	0.03	[kips]
Shear Force (Z)	3.369	[kips]
Torsional Moment (about x-x)	0.188	[kips-in]
Bending Moment (about y-y)	40.036	[kips-in]
Bending Moment (about z-z)	0.384	[kips-in]

Fillet Weld Check		
The standoff member is Round?	No	
Height, z-z	3	[in]
Width, y-y	3	[in]
Fillet weld Thickness	0.1875	[in] *Assumed*
Weld Material Yield (Assumed)	70	[ksi]
Length of weldment	12.00	[in]
Section modulus in a line weld, y-y	12.00	[in^2]
Section modulus in a line weld, z-z	12.00	[in^2]
Fnw	63	ksi
Weld Force, y-y	3.87	kips/inch
Weld Force, z-z	0.56	kips/inch
ϕ*Rn	6.26	kips/inch
Weld Check	61.82% PASS → 58.88%	PASS

**Rating per TIA-222-H Section 15.5*

Trylon

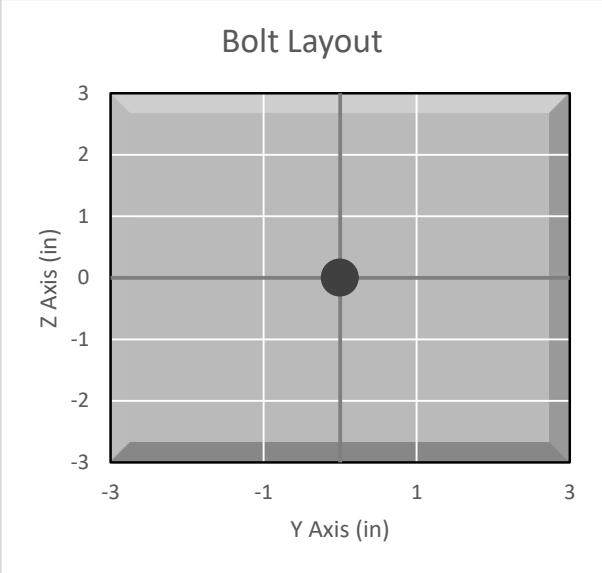
Analysis date: 28/04/2022

BOLT TOOL 1.5.2

Project Data	
Job Code:	207926
Carrier Site ID:	CT11248A
Carrier Site Name:	Glastonbury

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

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.75	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	1	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
1 Bolt

Bolt Check*		
Tensile Capacity (ϕT_n):	30101.4	lbs
Shear Capacity (ϕV_n):	19880.4	lbs
Tension Force (T_u):	220.7	lbs
Shear Force (V_u):	5838.0	lbs
Tension Usage:	0.7%	--
Shear Usage:	28.0%	--
Interaction:	28.0%	Pass
Controlling Member:	M81B	--
Controlling LC:	49	--

**Rating per TIA-222-H Section 15.5*

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

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11248A

Glastonbury
374 Three Mile Road
Glastonbury, Connecticut 06033

May 30, 2022

EBI Project Number: 6222003479

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**51.68%**

May 30, 2022

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

Emissions Analysis for Site: CT11248A - Glastonbury

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **374 Three Mile Road** in **Glastonbury, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 374 Three Mile Road in Glastonbury, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

8) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

9) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

10) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

11) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

12) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

13) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

14) The antennas used in this modeling are the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain

values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

15) The antenna mounting height centerline of the proposed antennas is 116 feet above ground level (AGL).

16) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360.00 Watts	Total TX Power (W):	360.00 Watts	Total TX Power (W):	360.00 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A1 MPE %:	**3.82%**	Antenna B1 MPE %:	**3.82%**	Antenna C1 MPE %:	**3.82%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380.00 Watts	Total TX Power (W):	380.00 Watts	Total TX Power (W):	380.00 Watts
ERP (W):	11,055.53	ERP (W):	11,055.53	ERP (W):	11,055.53
Antenna A2 MPE %:	**4.96%**	Antenna B2 MPE %:	**4.96%**	Antenna C2 MPE %:	**4.96%**
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd
Height (AGL):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts
ERP (W):	31,011.95	ERP (W):	31,011.95	ERP (W):	31,011.95
Antenna A3 MPE %:	**9.21%**	Antenna B3 MPE %:	**9.21%**	Antenna C3 MPE %:	**9.21%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	17.99%
SIGFOX	0.03%
Nextel	0.4%
Verizon	9.26%
AT&T	19.56%
Sprint	0.65%
XM Sat Radio	3.79%
Site Total MPE % :	51.68%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	17.99%
T-Mobile Sector B Total:	17.99%
T-Mobile Sector C Total:	17.99%
Site Total MPE % :	51.68%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1028.30	116.0	12.22	1900 MHz GSM	1000	1.22%
T-Mobile 1900 MHz LTE	2	2056.61	116.0	12.22	1900 MHz LTE	1000	1.22%
T-Mobile 2100 MHz LTE	2	2307.55	116.0	13.71	2100 MHz LTE	1000	1.37%
T-Mobile 600 MHz LTE	2	591.73	116.0	3.52	600 MHz LTE	400	0.88%
T-Mobile 600 MHz NR	1	1577.94	116.0	4.69	600 MHz NR	400	1.17%
T-Mobile 700 MHz LTE	2	648.82	116.0	3.86	700 MHz LTE	467	0.83%
T-Mobile 1900 MHz LTE	2	2203.69	116.0	13.10	1900 MHz LTE	1000	1.31%
T-Mobile 2100 MHz UMTS	2	1294.56	116.0	7.69	2100 MHz UMTS	1000	0.77%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	9619.47	116.0	28.58	2500 MHz LTE 1C & 2C Traffic	1000	2.86%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	717.84	116.0	2.13	2500 MHz LTE 1C & 2C Broadcast	1000	0.21%
T-Mobile 2500 MHz NR Traffic	1	19238.94	116.0	57.16	2500 MHz NR Traffic	1000	5.72%
T-Mobile 2500 MHz NR Broadcast	1	1435.69	116.0	4.27	2500 MHz NR Broadcast	1000	0.43%
						Total:	**17.99%**

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	17.99%
Sector B:	17.99%
Sector C:	17.99%
T-Mobile Maximum MPE % (Sector A):	17.99%
Site Total:	51.68%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **51.68%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

308584

CROWN CASTLE - STA PROPERTY
8000 AVALON BLVD., SUITE 700
ALPHARETTA, GA 30009

DATE 6-1-22 32-61/1110

PAY TO THE ORDER OF Connecticut Siting Council $ 625.00

Six hundred twenty five dollars DOLLARS

Security Features Included Details on Back

CHASE
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www.Chase.com

VOID AFTER 180 DAYS

FOR CT11248A-806368-714913-614467

⑈308584⑈ ⑆111000614⑆ 464638126⑈

T-Mobile

T-MOBILE SITE NUMBER: CT11248A
T-MOBILE SITE NAME: GLASTONBURY
SITE TYPE: MONOPOLE
TOWER HEIGHT: 145'-0"

BUSINESS UNIT #: 806368
SITE ADDRESS: 374 THREE MILE RD.
GLASTONBURY, CT 06033
COUNTY: HARTFORD
JURISDICTION: CONNECTICUT SITING COUNCIL

T-MOBILE ANCHOR SITE CONFIGURATION: 67D5A997DB OUTDOOR

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	HRT 049B 943215
SITE ADDRESS:	374 THREE MILE RD. GLASTONBURY, CT 06033
COUNTY:	HARTFORD
MAP/PARCEL #:	70600374
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.693605
LONGITUDE:	-72.547398
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	535'
CURRENT ZONING:	RURAL RESIDENCE
JURISDICTION:	CONNECTICUT SITING COUNCIL
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	FLANAGAN JOSEPHINE I+JOHN R 374 THREE MILE RD GLASTONBURY, CT 06033
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	CONNECTICUT LIGHT & POWER CO 1-800-286-2000
TELCO PROVIDER:	ATT 1-866-852-2721

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S. BOULDER AVE. TULSA, OK 74119 MARVIN PHILLIPS marvin.phillips@btgrp.com
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277 PAUL PEDICONE - PROJECT MANAGER PAUL.PEDICONE@CROWNCASTLE.COM JASON D'AMICO - CONSTRUCTION MANAGER JASON.DAMICO@CROWNCASTLE.COM

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR FULL SIZE. 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.

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 (3) ANTENNAS
- REMOVE (3) TMAs
- REMOVE (6) 1-5/8" COAX CABLES
- REMOVE (1) 9X18 HCS FIBER
- INSTALL (3) ANTENNAS
- INSTALL (3) RRHs
- INSTALL (1) HYBRID CABLE

GROUND SCOPE OF WORK:
- REMOVE (6) RUS01 B4
- INSTALL (1) ICE BRIDGE
- INSTALL (1) CONDUIT AND WIRING
- INSTALL (1) B160 BATTERY CABINET
- INSTALL (1) 6160 AC V1 ENCLOSURE
- INSTALL (1) RP 6651
- INSTALL (1) PSU 4813 VR2A
- INSTALL (1) CSR IXRE V2

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

LOCATION MAP

NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2018 CONNECTICUT SBC/2015 IBC
MECHANICAL	2018 CONNECTICUT SBC/2015 IMC
ELECTRICAL	2018 CONNECTICUT SBC/2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	CROWN CASTLE
DATED:	5/3/22
MOUNT ANALYSIS:	TRYLON
DATED:	4/28/22
RFDS REVISION:	8
DATED:	4/5/22
ORDER ID:	614467
REVISION:	0

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APPROVALS

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

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

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CT11248A

BU #: **806368**
HRT 049B 943215

374 THREE MILE RD.
GLASTONBURY, CT 06033

EXISTING
145'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	5/3/22	YX	PRELIMINARY REVIEW	MTJ
0	5/13/22	YX	CONSTRUCTION	MTJ

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
   THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   CARRIER: T–MOBILE
   TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
   #4 BARS AND SMALLER..... 40 ksi
   #5 BARS AND LARGER..... 60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH..... 3"
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 BARS AND LARGER..... 2"
   #5 BARS AND SMALLER..... 1–1/2"
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   SLAB AND WALLS..... 3/4"
   BEAMS AND COLUMNS..... 1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON–METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON–METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

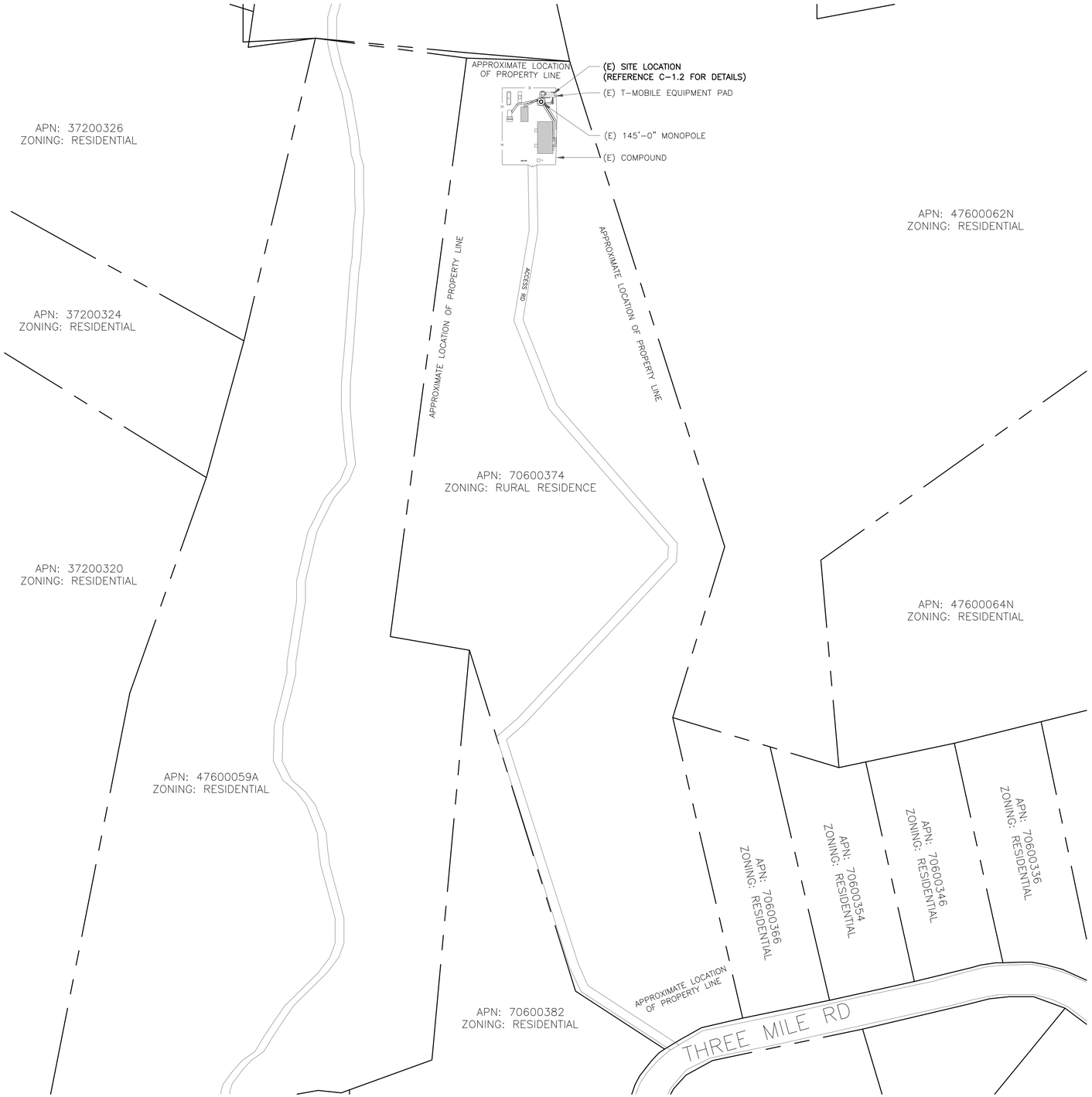
CONDUCTOR COLOR CODE

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

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEA



1 OVERALL SITE PLAN
SCALE: 80' 40' 0 80' 1" = 80'-0" (FULL SIZE) 1" = 160'-0" (11x17)

N

SITE PLAN DISCLAIMER:

PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM PREVIOUS PLAN SETS. CROWN CASTLE USA INC. HAS NOT COMPLETED A SITE SURVEY AND THEREFORE MAKES NO CLAIMS AS TO THE ACCURACY OF INFORMATION DEPICTED ON THIS SHEET.

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PARSIPPANY, NJ 07054

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T-MOBILE SITE NUMBER:
CT11248A

BU #: **806368**
HRT 049B 943215

374 THREE MILE RD.
GLASTONBURY, CT 06033

EXISTING
145'-0" MONOPOLE

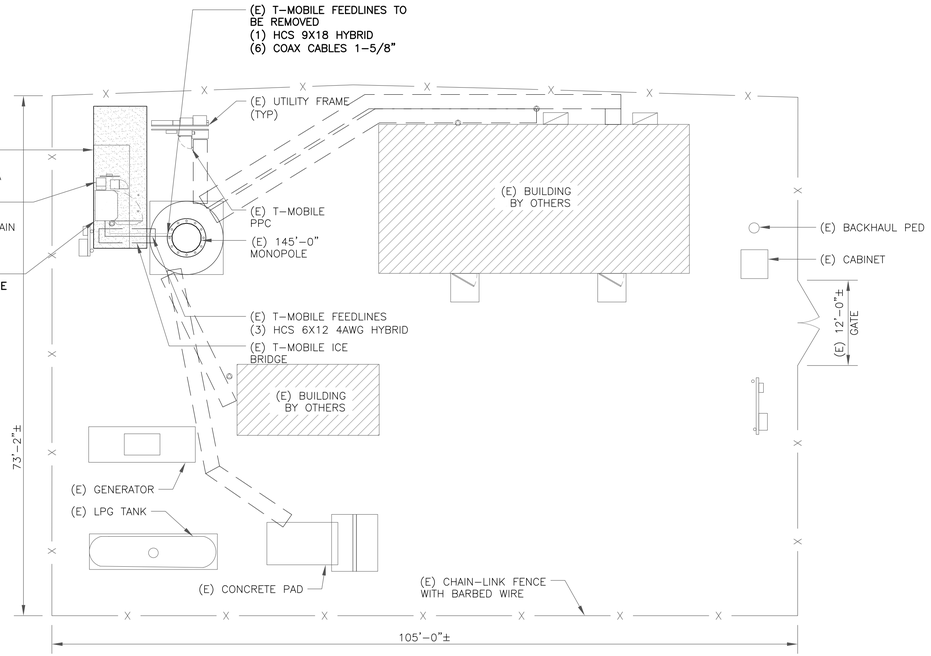
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	5/3/22	YX	PRELIMINARY REVIEW	MTJ
0	5/13/22	YX	CONSTRUCTION	MTJ

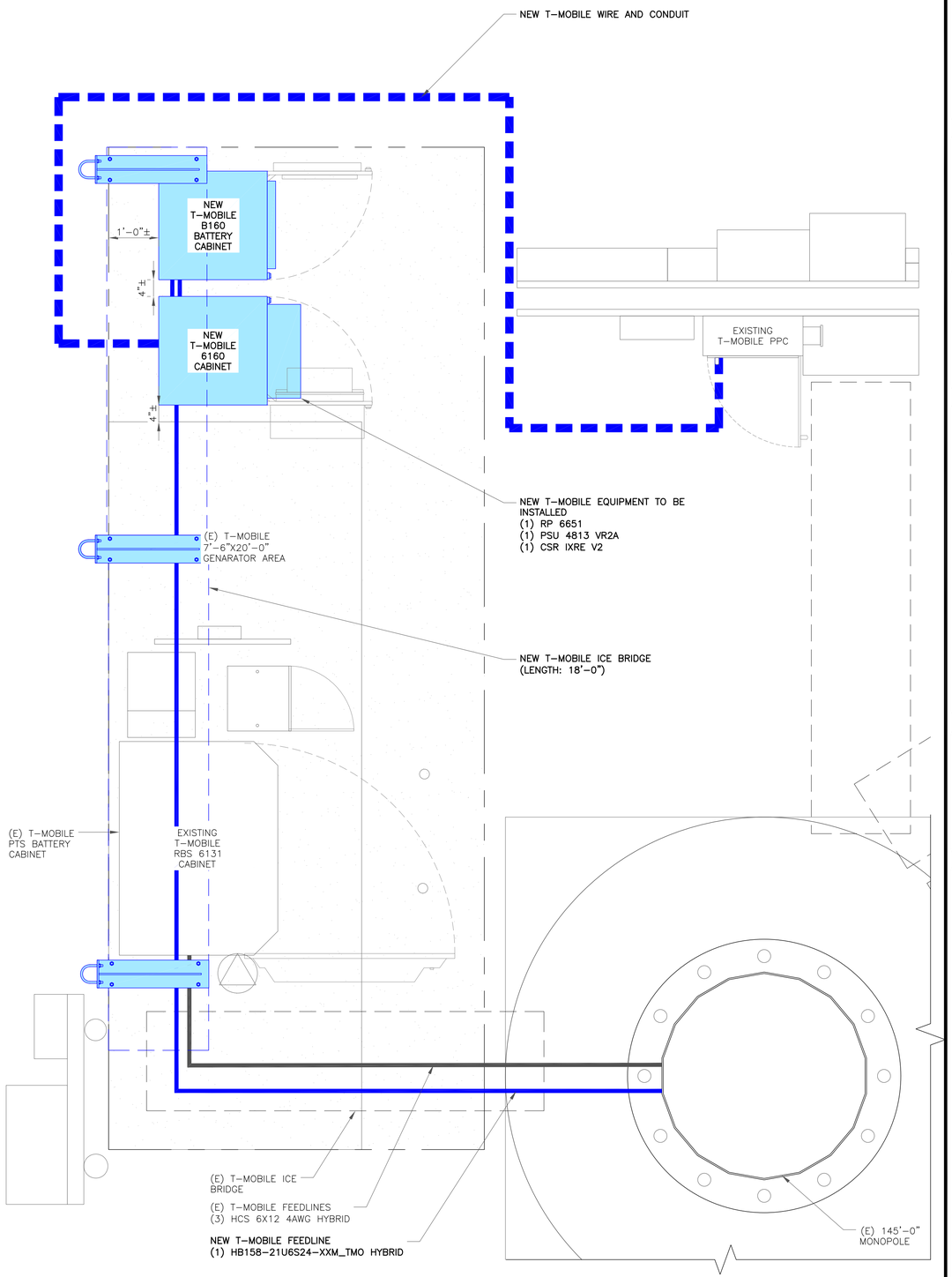
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: C-1.1

REVISION: 0



1 SITE PLAN
SCALE: 8' 4' 0 8' 3/32"=1'-0" (FULL SIZE) 3/64"=1'-0" (11x17)



2 ENLARGED SITE PLAN
SCALE: 1' 6" 0 1' 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

T-Mobile
4 SYLVAN WAY
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SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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T-MOBILE SITE NUMBER:
CT11248A

BU #: **806368**
HRT 049B 943215

374 THREE MILE RD.
GLASTONBURY, CT 06033

EXISTING
145'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	5/3/22	YX	PRELIMINARY REVIEW	MTJ
0	5/13/22	YX	CONSTRUCTION	MTJ

STATE OF CONNECTICUT
CHRISTOPHER M. TRUE
No. 23824
LICENSED PROFESSIONAL ENGINEER
5/13/22

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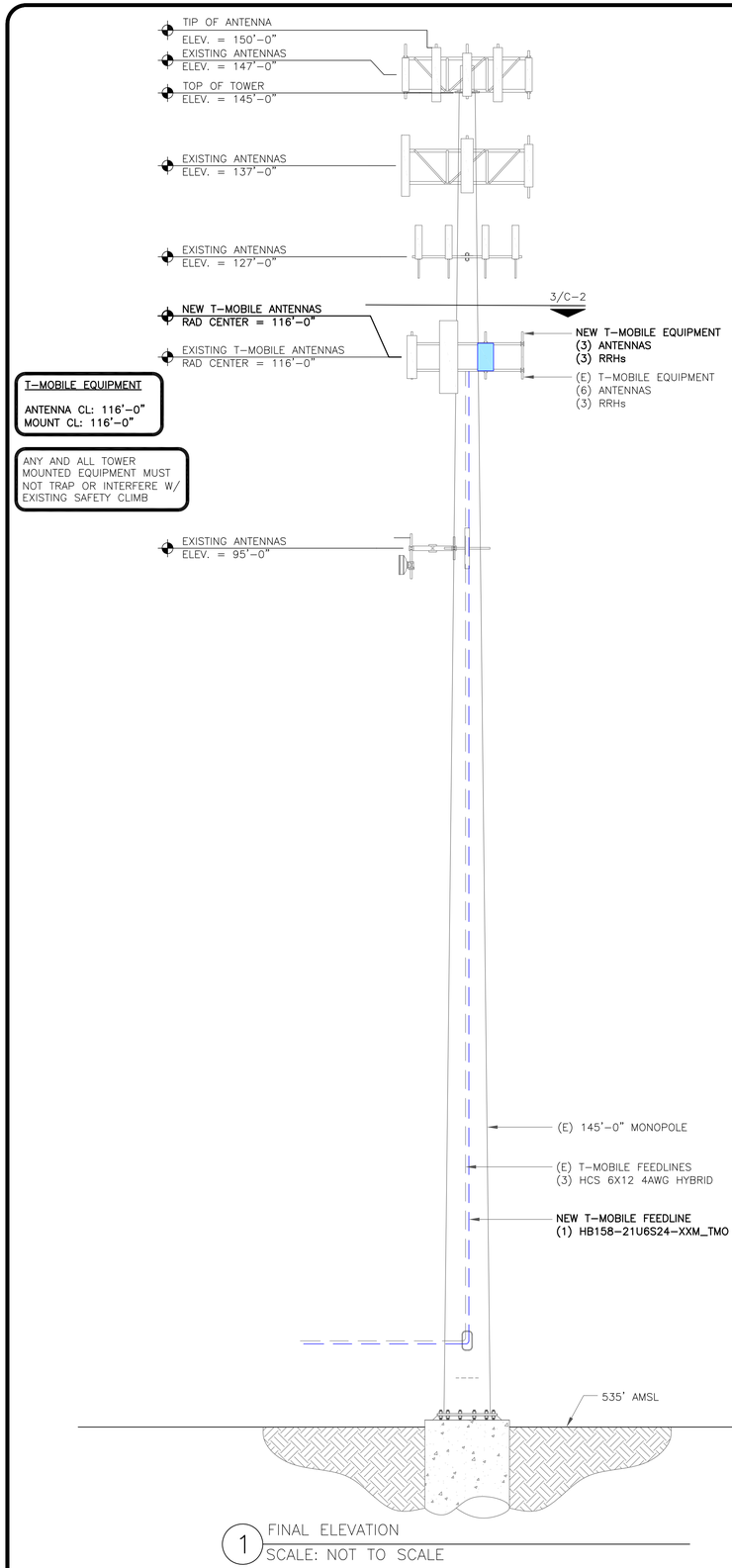
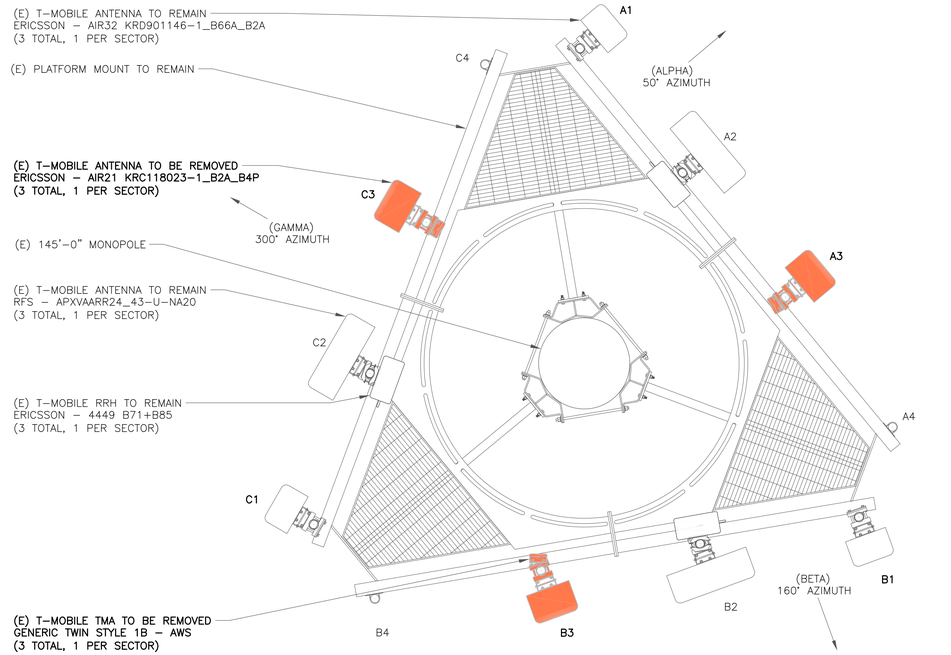
SHEET NUMBER: C-1.2
REVISION: 0

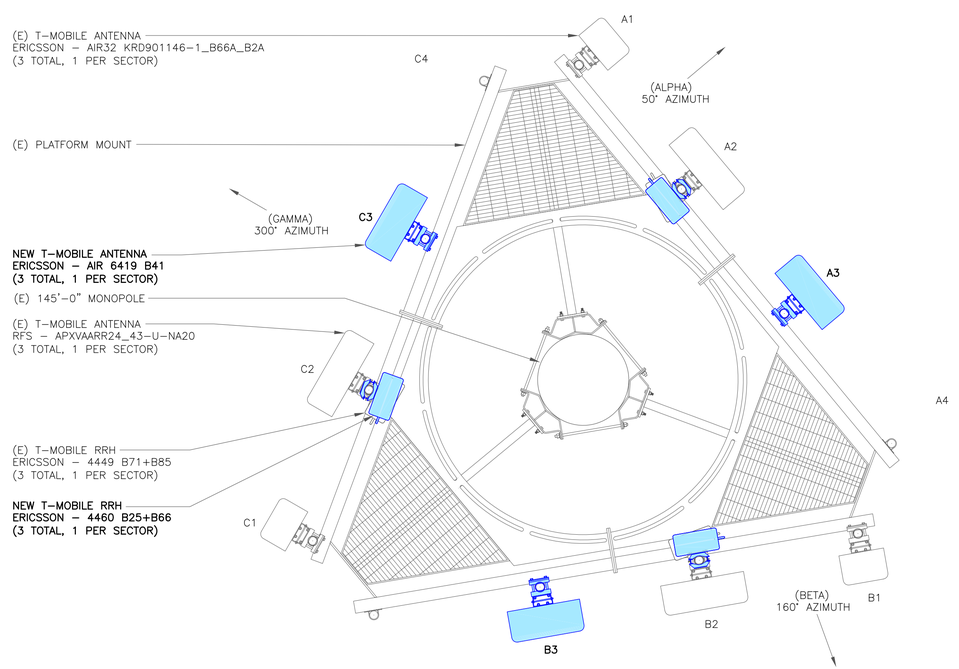


1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

N



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

N

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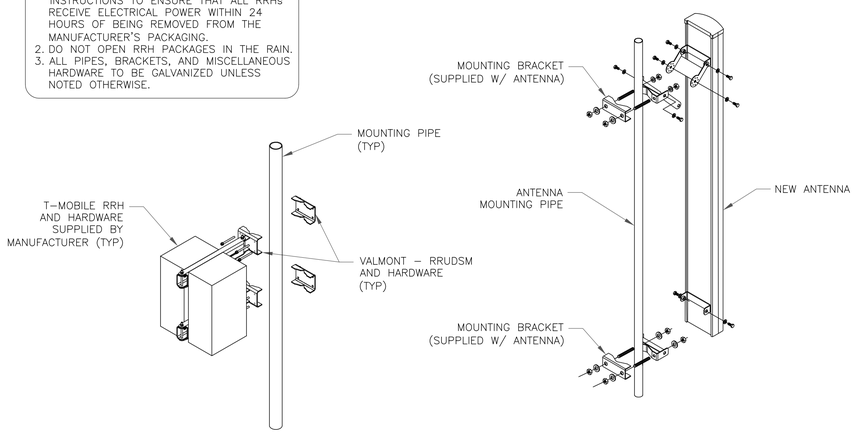
RF SYSTEM SCHEDULE

SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A1	L2100/G1900/L1900	ERICSSON	AIR32 KRD901146-1_B66A_B2A	50°	0°	2°/2°/2°/2°	**116'-0"**	–	(1) HCS 6X12 4AWG HYBRID
	A2	L2100/G1900/L1900	RFS	RFS – APXVAARR24_43-U-NA20	50°	0°	2°/2°/2°/2°	116'-0"	(1) ERICSSON – 4449 B71+B85 **(1) ERICSSON – 4460 B25+B66**	
	A3	**N2500/L2500**	**ERICSSON**	**ERICSSON – AIR 6419 B41**	**50°**	**0°**	**2°/2°**	116'-0"	**–**	
BETA	B1	L2100/G1900/L1900	ERICSSON	AIR32 KRD901146-1_B66A_B2A	160°	0°	2°/2°/2°/2°	**116'-0"**	–	(1) HCS 6X12 4AWG HYBRID
	B2	L2100/G1900/L1900	RFS	RFS – APXVAARR24_43-U-NA20	160°	0°	2°/2°/2°/2°	116'-0"	(1) ERICSSON – 4449 B71+B85 **(1) ERICSSON – 4460 B25+B66**	
	B3	**N2500/L2500**	**ERICSSON**	**ERICSSON – AIR 6419 B41**	**160°**	**0°**	**2°/2°**	116'-0"	**–**	
GAMMA	C1	L2100/G1900/L1900	ERICSSON	AIR32 KRD901146-1_B66A_B2A	300°	0°	2°/2°/2°/2°	**116'-0"**	–	(1) HCS 6X12 4AWG HYBRID **(1) HB158-21U6S24-XXM_TMO HYBRID**
	C2	L2100/G1900/L1900	RFS	RFS – APXVAARR24_43-U-NA20	300°	0°	2°/2°/2°/2°	116'-0"	(1) ERICSSON – 4449 B71+B85 **(1) ERICSSON – 4460 B25+B66**	
	C3	**N2500/L2500**	**ERICSSON**	**ERICSSON – AIR 6419 B41**	**300°**	**0°**	**2°/2°**	116'-0"	–	

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

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BU #: **806368**
HRT 049B 943215

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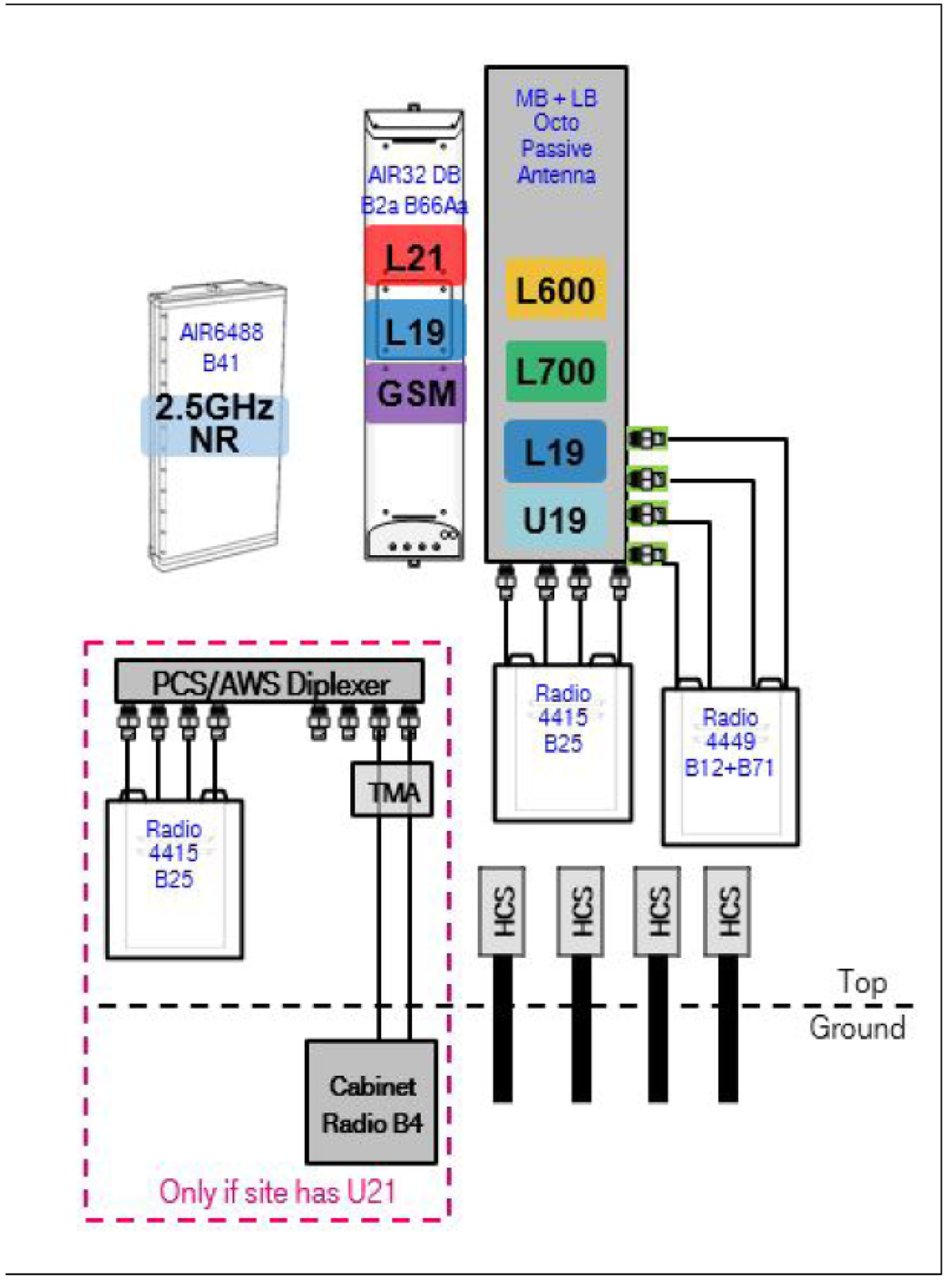
SHEET NUMBER: C-3

REVISION: 0



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
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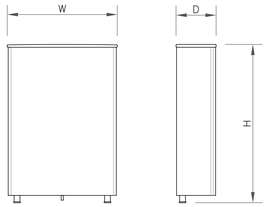
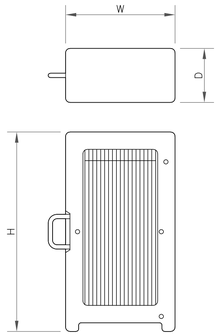
SHEET NUMBER: C-4

REVISION: 0



ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6419 B41
WIDTH	20.91"
DEPTH	9.02"
HEIGHT	36.25"
WEIGHT	96.50 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE

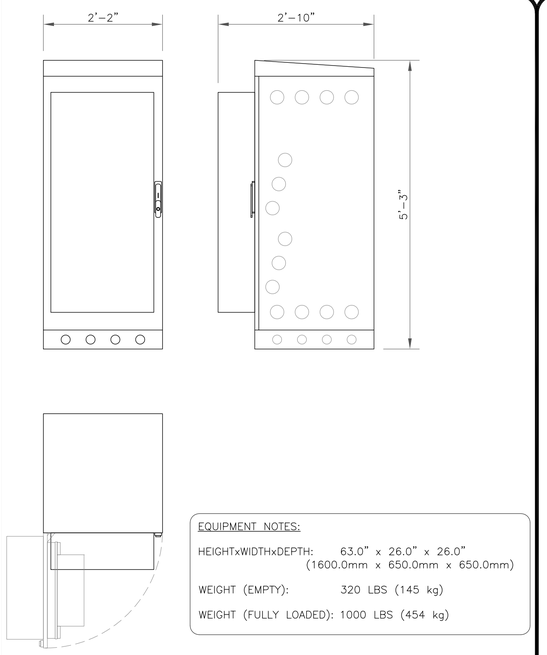


RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4460 B25+B66
WIDTH	15.10"
DEPTH	11.90"
HEIGHT	17.00"
WEIGHT	109.00 LBS

2 RRU SPECS
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE



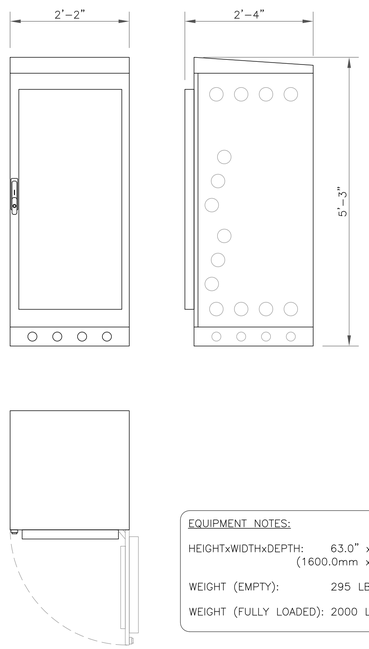
EQUIPMENT NOTES:

HEIGHTxWIDTHxDEPTH: 63.0" x 26.0" x 26.0" (1600.0mm x 650.0mm x 650.0mm)

WEIGHT (EMPTY): 320 LBS (145 kg)

WEIGHT (FULLY LOADED): 1000 LBS (454 kg)

5 ERICSSON – 6160 AC
SCALE: NOT TO SCALE



EQUIPMENT NOTES:

HEIGHTxWIDTHxDEPTH: 63.0" x 26.0" x 28.0" (1600.0mm x 660.0mm x 711.0mm)

WEIGHT (EMPTY): 295 LBS (134 kg)

WEIGHT (FULLY LOADED): 2000 LBS (908 kg)

6 ERICSSON – B160
SCALE: NOT TO SCALE

7 NOT USED
SCALE: NOT TO SCALE

8 NOT USED
SCALE: NOT TO SCALE

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374 THREE MILE RD.
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B&T ENGINEERING, INC.
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SHEET NUMBER: C-5

REVISION: 0

NOTES:

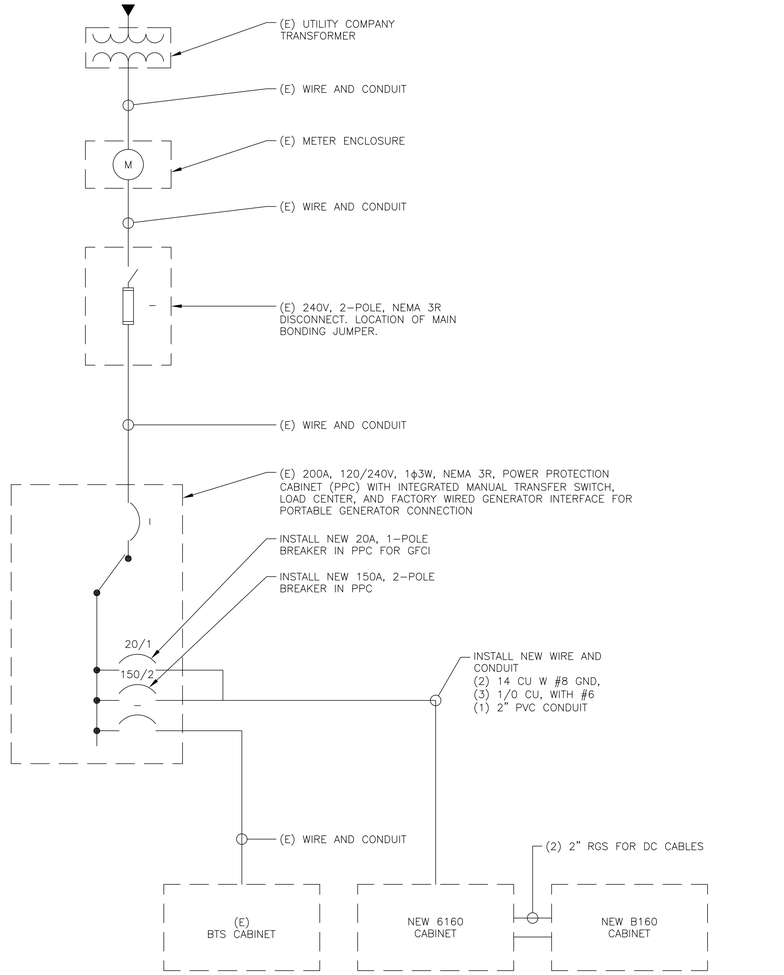
1. PANEL SCHEDULE TO BE VERIFIED BY GENERAL CONTRACTOR.

FINAL PANEL SCHEDULE								
LOAD	POLES	AMPS	BUS L1	BUS L2	BUS L3	AMPS	POLES	LOAD

RATED VOLTAGE: ☐120/240 ☐_____, 1 PHASE, 3 WIRE	BRANCH POLES: ☐12 ☐24 ☐30 ☐42	APPROVED MF'RS
RATED AMPS: ☐100 ☐225 ☐400 ☐_____,	CABINET: ☐SURFACE ☐FLUSH	NEMA ☐1 ☐3R ☐4X
☐MAIN LUGS ONLY ☐MAIN 200 AMPS ☐BREAKER ☐FUSED SWITCH	☐HINGED DOOR	☐KEYED DOOR LATCH
☐FUSED ☐CIRCUIT BREAKER BRANCH DEVICES	☐_____ TO BE GFCI BREAKERS	FULL NEUTRAL BUS GROUND BAR
ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL		

INSTALL A NEW 2P 150A BREAKER
INSTALL A NEW 1P 20A BREAKER
INSTALL NEW WIRING FOR NEW HPL3 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #6G AWG. MINIMUM CONDUIT SIZE TO BE 2".
IF MAIN DISCONNECT CIRCUIT BREAKER IS LESS THAN 150A. REPLACE WITH 2P 200A BREAKER RATED FOR 120/240V.
IF 200A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING DOCUMENTS AND PHOTOS

1 AC PANEL DETAIL
SCALE: NOT TO SCALE



NOTES:

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

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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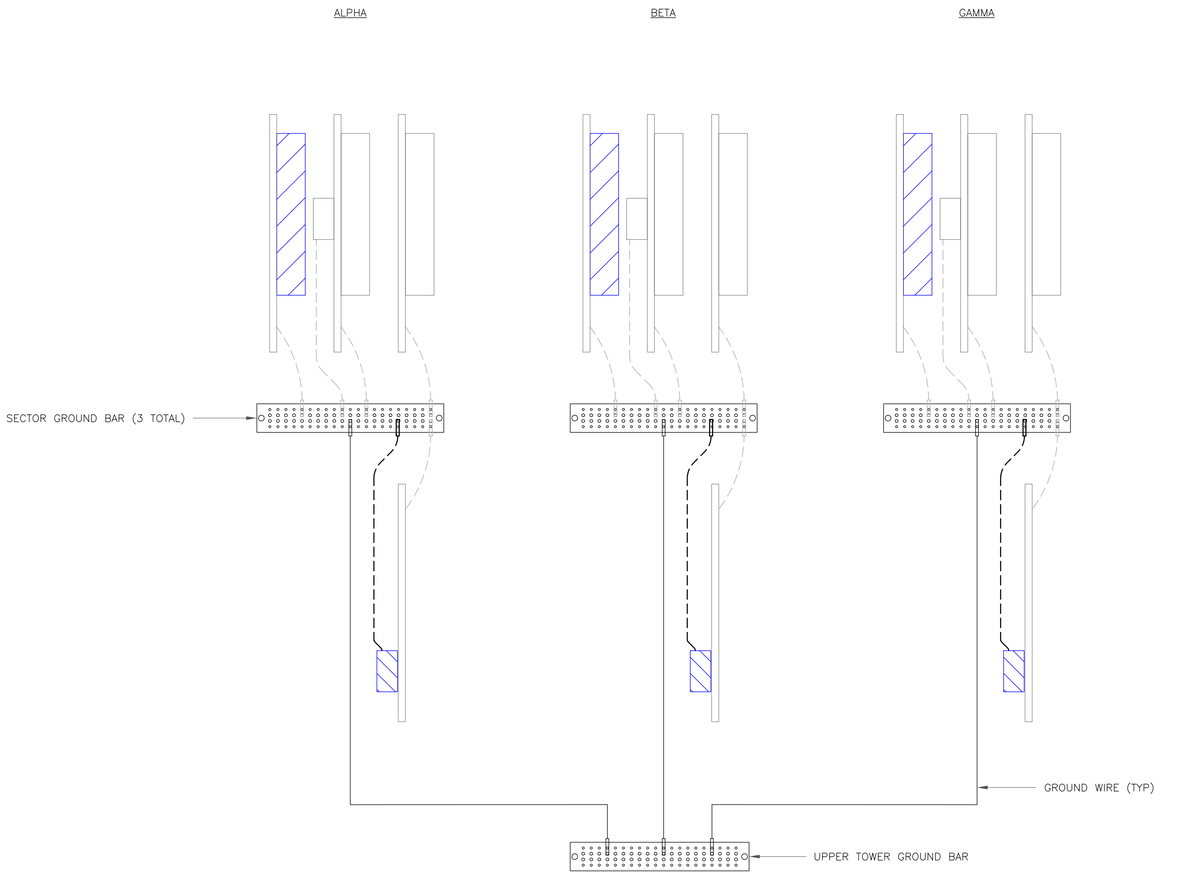

NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

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4 SYLVAN WAY
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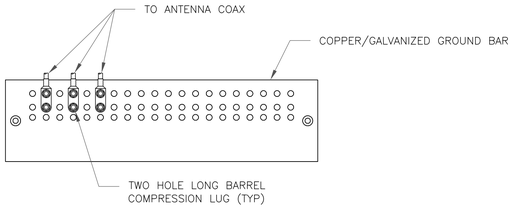
SHEET NUMBER: G-1

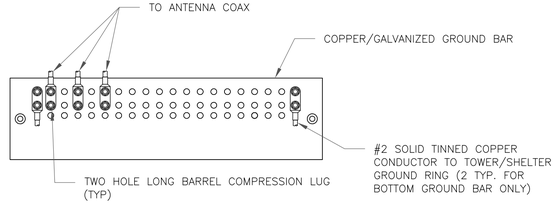
REVISION: 0



NOTES:

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

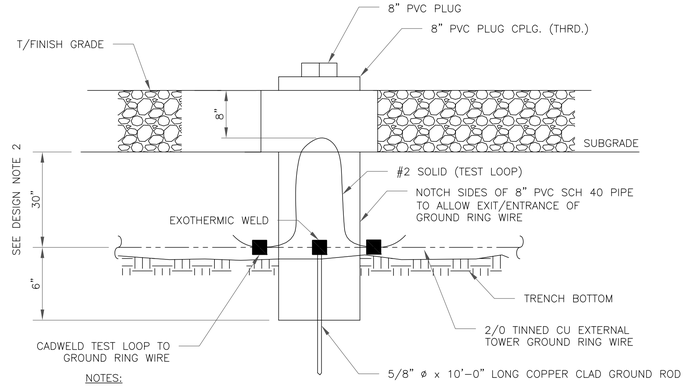
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

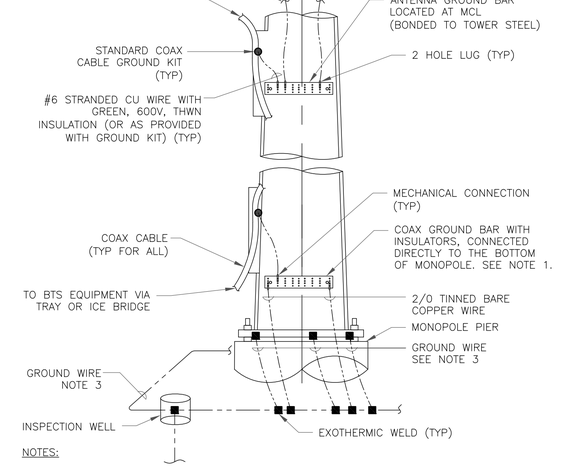
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. 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)

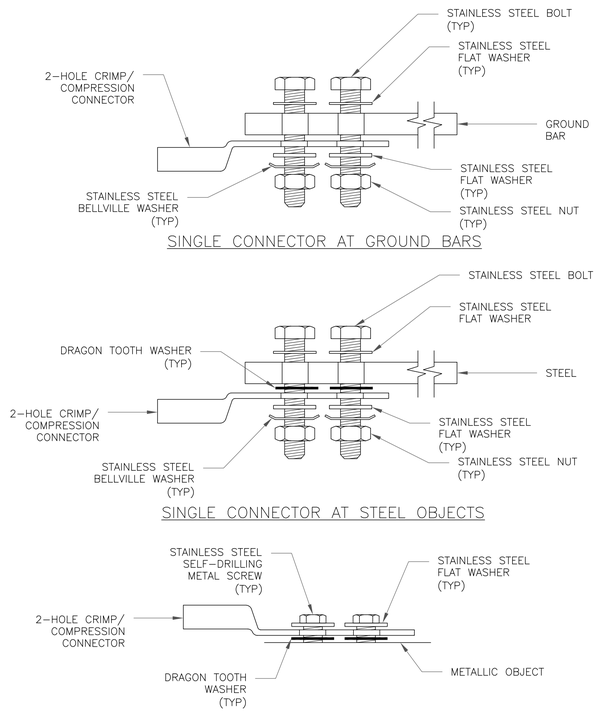
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



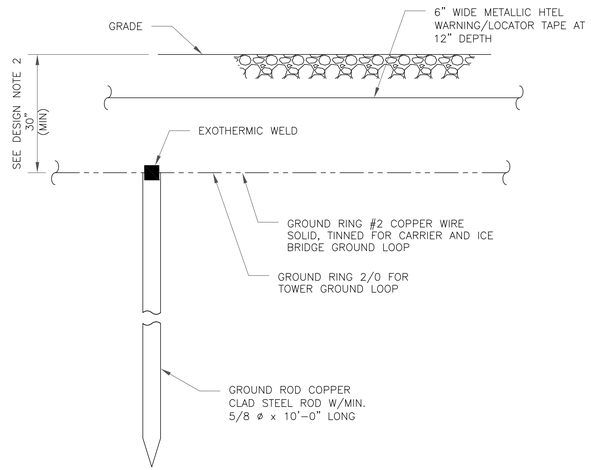
NOTES:

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



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6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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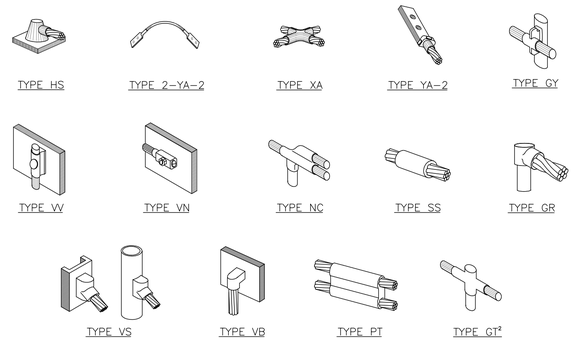
SHEET NUMBER: G-2
REVISION: 0

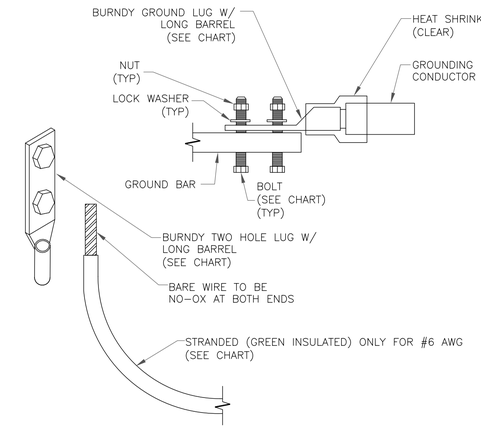


NOTE:

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

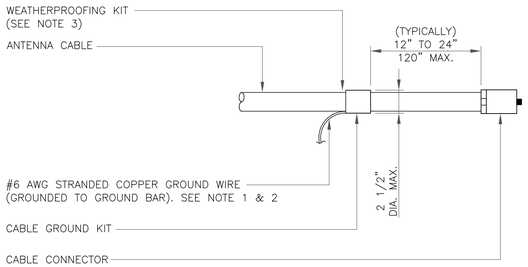
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



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.

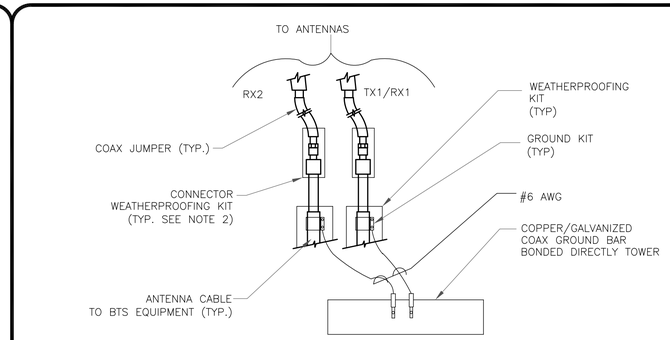
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



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.

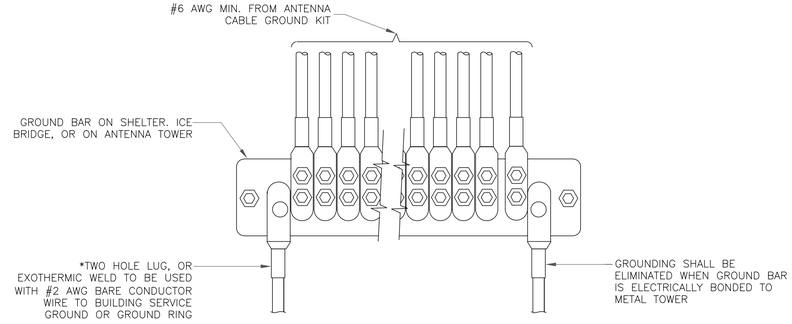
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



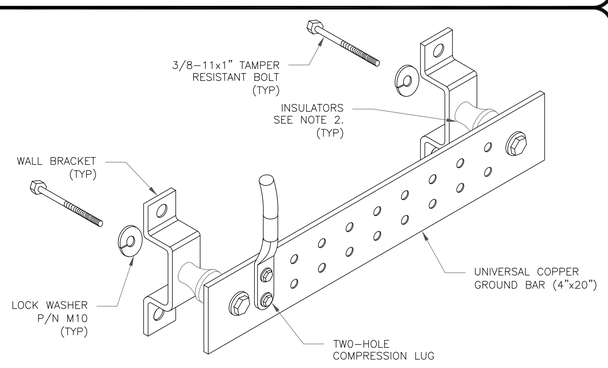
NOTES:

1. 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



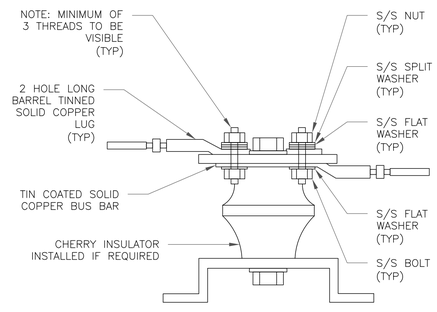
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



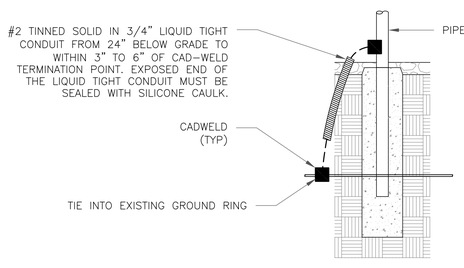
NOTES:

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



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

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1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CT11248A

BU #: **806368**
HRT 049B 943215

374 THREE MILE RD.
GLASTONBURY, CT 06033

EXISTING
145'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	5/3/22	YX	PRELIMINARY REVIEW	MTJ
0	5/13/22	YX	CONSTRUCTION	MTJ

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: G-3
REVISION: 0