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

August 17, 2022

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

RE: **Notice of Exempt Modification for T-Mobile: CT11252A**
Crown Site#808382
74 Goodrich Lane, Portland, CT 06480
Latitude: 41° 36′ 29.90″ / Longitude: -72° 35′ 29.56″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 150' level of the 160' monopole located 74 Goodrich Lane, Portland, CT. T-Mobile to remove all equipment at the 136' level of the tower. T-Mobile to replace six (6) antennas, add three (3) new antennas and ancillary equipment at the 150' level of the monopole tower. The property and tower are owned by Crown Castle. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Installed New:
(3) Ericsson – AIR6419 B41 Antennas
(3) RFS APXVAALL24_43-U-NA20 Antennas
(3) Commscope W-65A-R1 Antennas
(3) Ericsson-Radio 4480_B71+B85 RRU
(3) Ericsson- 4460 B25+B66 RRH
(3) Hybrid Cable 6x24
Mount Modification

Remove: @136'-0"
(3) Comscope-SBNH-1D65C Antenna
(3) Ericsson AIR21 KRC118023-1_B2P_B4A Antennas
(1) Antenna Mount
(3) Ericsson RRUS-11 B2 RRUs
(3) Ericsson RRUS-11 B12 RRUs
(3) Generic Twin Style - 1B-AWS TMAs
(4) Hybrid Cables
(6) 1-5/8" Coaxial Cables
(1) 9x18 HCR Hybrid Trunk

Remove: @ 150'-0"

(3) Commscope – DT465B2XR Antenna
(3) RFS – APXVSPP18-C-A20 Antenna
(3) Alcatel Lucent -TD-RRH8x50- RRH
(3) Alcatel Lucent -TD-RRH8x20-25 RRH
(3) Alcatel Lucent -1900 MHZ RRH
(3) Alcatel Lucent -800MHZ RRH

Ground:

Install New:

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

Remove:

(1) RBS 6131 Cabinet
(3.) DUW30
(6.) RU22
(1) BB5216
(1) 66EC Cabinet

The original approval of the facility was granted by the Connecticut Siting Council Docket No. 58 on July 11, 1986.

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 Ryan Curly, First Selectman, Town of Portland and Dan Bourret, Development Planner, Town of Portland. Crown Castle is the property and tower owner.

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

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

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

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

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

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

Sincerely,

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

Attachments
cc:

Ryan Curly, First Selectman
Town of Portland
33 East Main Street, 2nd Floor
Portland, CT 06480
(860) 342-6715

Dan Bourret – Development Planner
Town of Portland
33 East Main Street
Portland, CT 06480
(860) 342-6715

Crown Castle, Property and Tower Owner

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR COPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN HARTFORD, TOLLAND AND MIDDLESEX COUNTIES.	CONNECTICUT SITING COUNCIL
	July 11, 1986.

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Connecticut Siting Council (Council) hereby directs that a Certificate of Environmental Compatibility and Public Need as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to the Hartford Cellular Company for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Vernon, Windsor, and Willington subject to the conditions below.

1) The proposed Bloomfield and Middlefield sites are rejected without prejudice.

2) The antennas on the Glastonbury tower shall be mounted no higher than the 180' level of this existing tower.

3) The Portland and Rocky Hill towers shall be monopoles.

4) The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of

a) 193' at the Haddam site;

b) 173' at the Portland site;

c) 153' at the Rocky Hill site;

d) 173' at the Somers site;

e) 173' at the Vernon site;

f) 153' at the Willington site;

g) 173' at the Windsor site.

5) The Hartford site receive antennas shall be mounted below the top of the high point of the building to preclude visibility.

6) Any future actions requiring the removal of the existing Glastonbury tower to be shared by the certificate holder shall also apply to the equipment mounted on that tower by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

7) The certificate holder shall submit a development and management (D&M) plan for the Haddam, Portland, Rocky Hill, Somers, Vernon and Windsor sites pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. In addition to the requirements of Section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Haddam, Somers, Vernon, and Windsor sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The D&M plan must be approved prior to facility construction. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.

8) All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the

site plan required by order number 7.

9) The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facilities granted in this decison shall continue to be in compliance with such standards.

10) The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11) A fence not lower than 8' shall surround each tower and associated equipment.

12) Unless necessary to comply with order 13, no lights shall be installed on any of these towers.

13) The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14) Construction activities shall take place during daylight working hours.

15) This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16) This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Middletown Press, Manchester Journal Inquirer, and the Willimantic Chronicle.

The parties to the proceeding are:

Metro Mobile (applicant)
5 Eversley Avenue
Norwalk, Connecticut 06855
ATTN: Armand Mascioli
General Manager

Howard L. Slater, Esq. (its attorneys)
Scott A. Gursky, Esq.
Byrne, Slater,Sandler,
Shulman & Rouse, P.C.
111 Pearl Street
Hartford, Connecticut 06103

Richard Rubin, Esq.
Fleischman and Walsh, P.C.
1725 N Street, N.W.
Washington, D. C. 20036

qPublic.net™ Town of Portland, CT

Summary

Parcel Number	084-0009
Alternate ID/Map Block Lot	00354100
Location Address	74 GOODRICH LANE
Legal Description	(Note: Not to be used on legal documents.)
Zoning	R25
Land Use	(431) Communication Towers
Acres	0.083
Property Class	400
Neighborhood	600
Tax District	0
Vol/Page	284/47

Map Not Available

Owner

Owner
HALE JOAN J &
CROWN ATLANTIC LLC
PMB 353
4017 WASHINGTON RD
MCMURRAY PA 15317

Valuation

Effective Date of Current Values: 10/01/2021

	Appraised Values	Assessed Values
Current Land	$81,000	$56,700
Current Building	$171,000	$119,700
Current Total	$252,000	$176,400

2020 Values

	Appraised Values	Assessed Values
Land	$74,900	$52,430
Building	$139,200	$97,440
Total	$214,100	$149,870

Valuation History

Tax Year	Appraised Land Value	Appraised Improvements Value	Appraised Total Value	Assessed Land Value	Assessed Improvements Value	Assessed Total Value
2021	$81,000	$171,000	$252,000	$56,700	$119,700	$176,400
2020	$74,900	$139,200	$214,100	$52,430	$97,440	$149,870
2019	$74,900	$139,200	$214,100	$52,430	$97,440	$149,870
2018	$74,900	$139,200	$214,100	$52,430	$97,440	$149,870
2017	$74,900	$139,200	$214,100	$52,430	$97,440	$149,870
2016	$74,900	$139,200	$214,100	$52,430	$97,440	$149,870

Recent Sales In Area

Sale date range:

From:

08/17/2019

To:

08/17/2022

Sales by Neighborhood

Land

Line	Descr	Acres	Base Size	Base Rate	Land Val
1	PRIMARY	0.0830	0.75	187.900	$80,960

Total Acres:
0.0830
Total Land-Value:
$80,960

Accessory Information

Card 1

Descr	Full Description	Type	Quantity	Year	Size	Area	Grade	Mods	Cond	F	MD%	Value
FENCE CHAI	FENCE CHAIN	FN1	1	1996	8 x 260	2,080	C -AVERAGE		3	3	0	$2,700
TOWER CELL	TOWER CELLULAR	TT4	1	1978	1 x 160	160	C -AVERAGE		4	4	0	$146,160
MACH SHED	FRAME MACHINERY SHED	SH1	1	1978	1 x 200	200	A -VERY GOOD +		4	4	0	$12,600
MACH SHED	FRAME MACHINERY SHED	SH1	1	2000	1 x 96	96	B -GOOD		4	4	0	$3,930
PAVING CON	PAVING CONCRETE MAT/SLAB	PC3	1	1996	1 x 2640	2,640	B -GOOD		3	3	0	$5,610

Permits

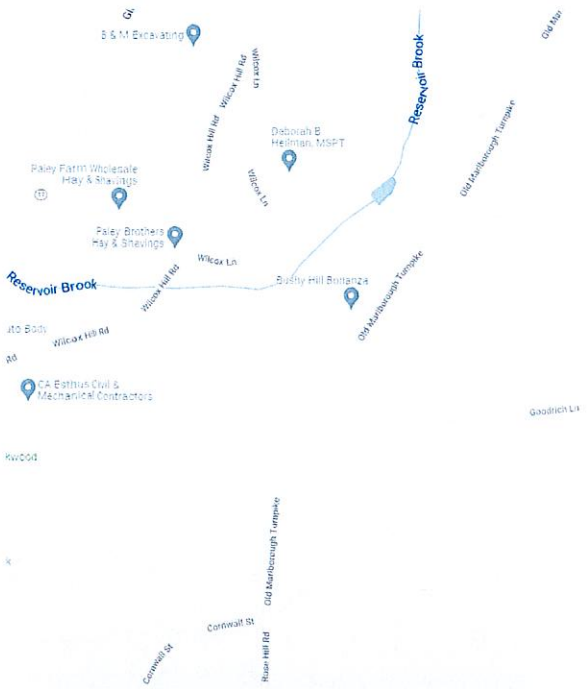
Date	Number	Amount	Purpose
01/22/2022	22-32	$20,000	74 CRER
01/12/2022	22-8	$5,600	81 CELE
12/22/2021	21-767	$50,000	73 CREP
09/22/2021	21-582	$35,000	OTHER
03/04/2021	21-91	$20,000	OTHER
05/01/2019	19-149	$10,000	OTHER
03/07/2019	19-68	$20,000	73 CREP
12/12/2018	18-594	$20,000	OTHER
08/02/2017	17-350	$15,000	OTHER
02/14/2017	17-56	$20,000	OTHER
01/31/2017	17-41	$8,000	51 BLDG
08/26/2016	16-363	$8,000	51 BLDG
11/12/2015	15-615	$15,000	BLDG
11/19/2014	14-499	$15,000	BLDG
10/15/2013	13-575	$8,000	BLDG
12/21/2012	12-703	$3,800	BLDG
07/05/2012	12-339	$25,000	BLDG
04/04/2011	10051	$10,000	BLDG
06/11/2010	9855	$7,000	BLDG
01/14/2010	9715	$15,000	BLDG
06/10/2008	9241	$15,000	BLDG
11/09/1999	6148	$38,600	BLDG

Photos

No data available for the following modules: Sales, Residential, Other Dwelling Features, Commercial, Interior/Exterior, Other Features, Tax History, Additions, Sketches.

Last Data Upload: 8/17/2022, 1:52:39 AM

Google Maps 74 Goodrich Ln



Google

Map data ©2022 200 ft

74 Goodrich Ln

Building

Directions Save Nearby Send to phone Share

74 Goodrich Ln, Portland, CT 06480

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, August 18, 2022 9:36 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 777689009487: Your package has been delivered

Hi. Your package was delivered Thu, 08/18/2022 at 9:34am.

Delivered to 33 E MAIN ST, PORTLAND, CT 06480
Received by T.DEAN

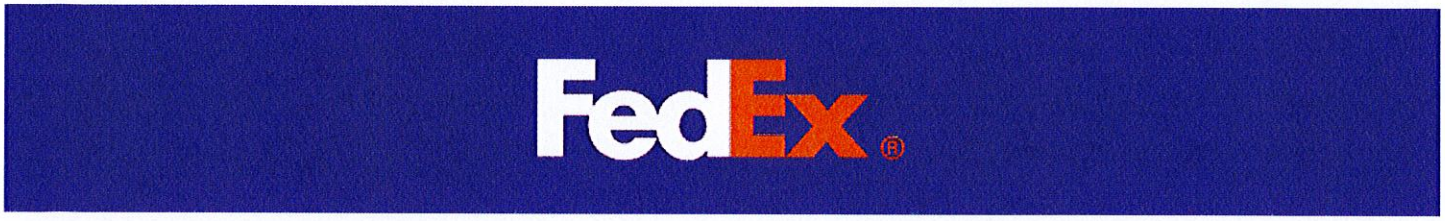
OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777689009487

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Portland Ryan Curly, First Selectman 33 East Main Street 2nd Floor PORTLAND, CT, US, 06480
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 8/17/2022 05:40 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	PORTLAND, CT, US, 06480
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, August 18, 2022 9:36 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 777689030964: Your package has been delivered



Hi. Your package was delivered Thu, 08/18/2022 at 9:34am.

Delivered to 33 E MAIN ST, PORTLAND, CT 06480
Received by T.DEAN

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777689030964

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Portland Dan Bourret, Development Planner 33 East Main Street PORTLAND, CT, US, 06480
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 8/17/2022 05:40 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	PORTLAND, CT, US, 06480
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **June 30, 2022**

B+T Group
1717 S Boulder Ave, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	**Site Number:**	CT11252A
	Site Name:	CT03XC166
Crown Castle Designation:	**BU Number:**	806382
	Site Name:	HRT 082 943274
	JDE Job Number:	721478
	Work Order Number:	2130917
	Order Number:	621455 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	81363.026.01
Site Data:	**74 GOODRICH LANE, PORTLAND, Middlesex County, CT** **Latitude *41° 36' 29.9"*, Longitude *-72° 35' 29.56"*** **160 Foot - Monopole**	

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

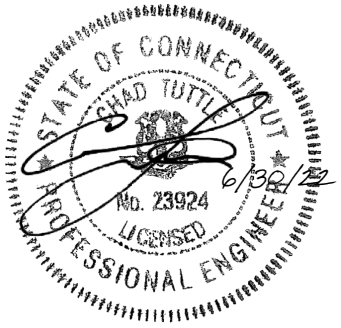
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity- 71.4%**

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: Andrew Fisher

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564; Expires: 2/01/2023



Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

TABLE OF CONTENTS

1) INTRODUCTION

This is a 160 ft. Monopole designed by Valmont. The tower has been modified by B+T group in May of 2013 and these modifications are considered to be ineffective.

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 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)
150.0	152.0	3	Commscope	VV-65B-R1_TMO	3	1-5/8
		3	Ericsson	AIR 6419 B41_TMO		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	Radio 4480_TMOV2		
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO		
	150.0	3	--	2.375" O.D, sch.40, 96" long pipe		
		1	--	Platform Mount [LP 713-1]		
61.0	61.0	1	Lucent	KS24019-L112A	1	1/2
		2	--	Side Arm Mount [SO 701-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
158.0	160.0	6	Andrew	SBNHH-1D65B	8	1-5/8
		2	Decibel	DB846F65ZAXY		
		2	Decibel	DB846H80E-SX		
		2	Raycap	RRFDC-3315-PF-48		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
		3	VZW	Sub6 Antenna - VZS01		
		3	Commscope	BSAMNT-SBS-1-2		
	158.0	1	--	Platform Mount [LP 713-1]		
142.0	144.0	2		Radiowaves HP3-11	2	1/2 Conduit
	142.0	1	--	Side Arm Mount [SO 101-3]	2	
136.0	137.0	3	Commscope	SBNH-1D65C-SR	7	1-5/8
		3	Commscope	TMAT1921B78-21A		
		3	Ericsson	ERICSSON AIR 21 B4A B2P		
		3	Ericsson	RRUS 11 B12		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	Ericsson	RRUS 11 B2		
	136.0	1	--	T-Arm Mount [TA 602-3]		
118.0	120.0	3	CCI Antennas	DMP65R-BU6D	6 3 2	1-1/4 3/4 3/8
		3	CCI Antennas	OPA65R-BU6D		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 4478 B14_CCIV2		
		3	Ericsson	RRUS 8843 B2/B66A_CCIV2		
		3	Powerwave Tech.	1001940		
		3	Powerwave Tech.	7770.00		
		6	Powerwave Tech.	LGP13519		
		2	Raycap	DC6-48-60-18-8F		
	118.0	1	--	Platform Mount [LP 304-1_HR-1]		
108.0	108.0	3	Fujitsu	TA08025-B604	1	1-1/2
		3	Fujitsu	TA08025-B605		
		3	JMA Wireless	MX08FRO665-20		
		1	Raycap	RDIDC-9181-PF-48		
		1	--	Commscope MC-PK8-DSH		
50.0	50.0	2	--	Side Arm Mount [SO 701-1]	--	--

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	255193	CCI Sites
Tower Modification Drawing	3865159	CCI Sites
Post modification Inspection	3996803	CCI Sites
Foundation Drawing	301226	CCI Sites
Geotech Report	1041653	CCI Sites
Crown CAD package	Date: 06/23/2022	CCI Sites

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) The tower and structures were maintained in accordance with the - TIA-222 standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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	160 - 123.667	Pole	TP29.05x18.87x0.188	1	-12.060	990.374	59.7	Pass
L2	123.667 - 76.25	Pole	TP41.95x27.461x0.313	2	-27.844	2474.062	63.3	Pass
L3	76.25 - 37	Pole	TP52.32x39.715x0.344	3	-39.784	3314.493	71.4	Pass
L4	37 - 0	Pole	TP62x49.672x0.406	4	-57.431	4687.798	65.3	Pass
							Summary	
						Pole (L3)	71.4	Pass
						Rating =	71.4	Pass

Table 5 - Tower Component Stresses vs. Capacity- LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	61.1	Pass
1,2	Base Plate	Base	33.3	Pass
1,2	Base Foundation (Structure)	Base	55.4	Pass
1,2	Base Foundation (Soil Interaction)	Base	54.2	Pass

Structure Rating (max from all components) =	**71.4%**

Notes:
1) See additional documentation in “Appendix C - Additional Calculations” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5.

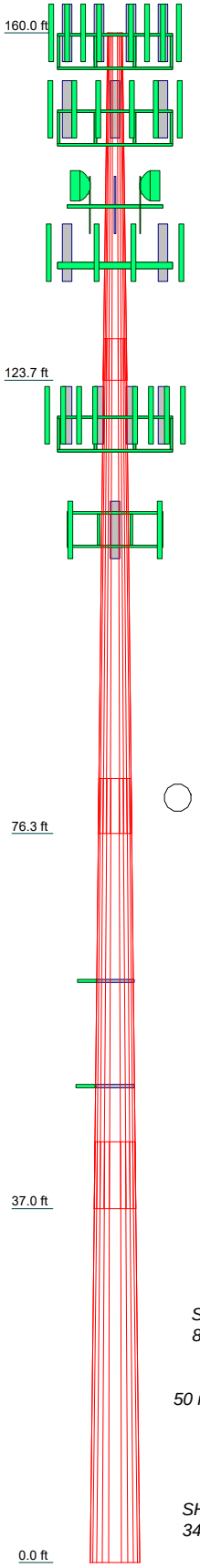
4.1) Recommendations

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

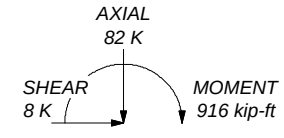
APPENDIX A

TNXTOWER OUTPUT

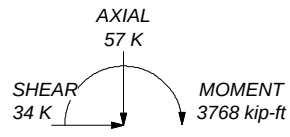
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	36.333	12	0.188	4.333	18.870	29.050		1.8
2	51.750	12	0.313	5.750	27.461	41.950		6.1
3	45.000	12	0.344	7.000	39.715	52.320		7.7
4	44.000	12	0.406		49.672	62.000		10.9
							A572-65	26.5



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 1.000 in ICE



TORQUE 2 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 Middlesex 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 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 71.4%

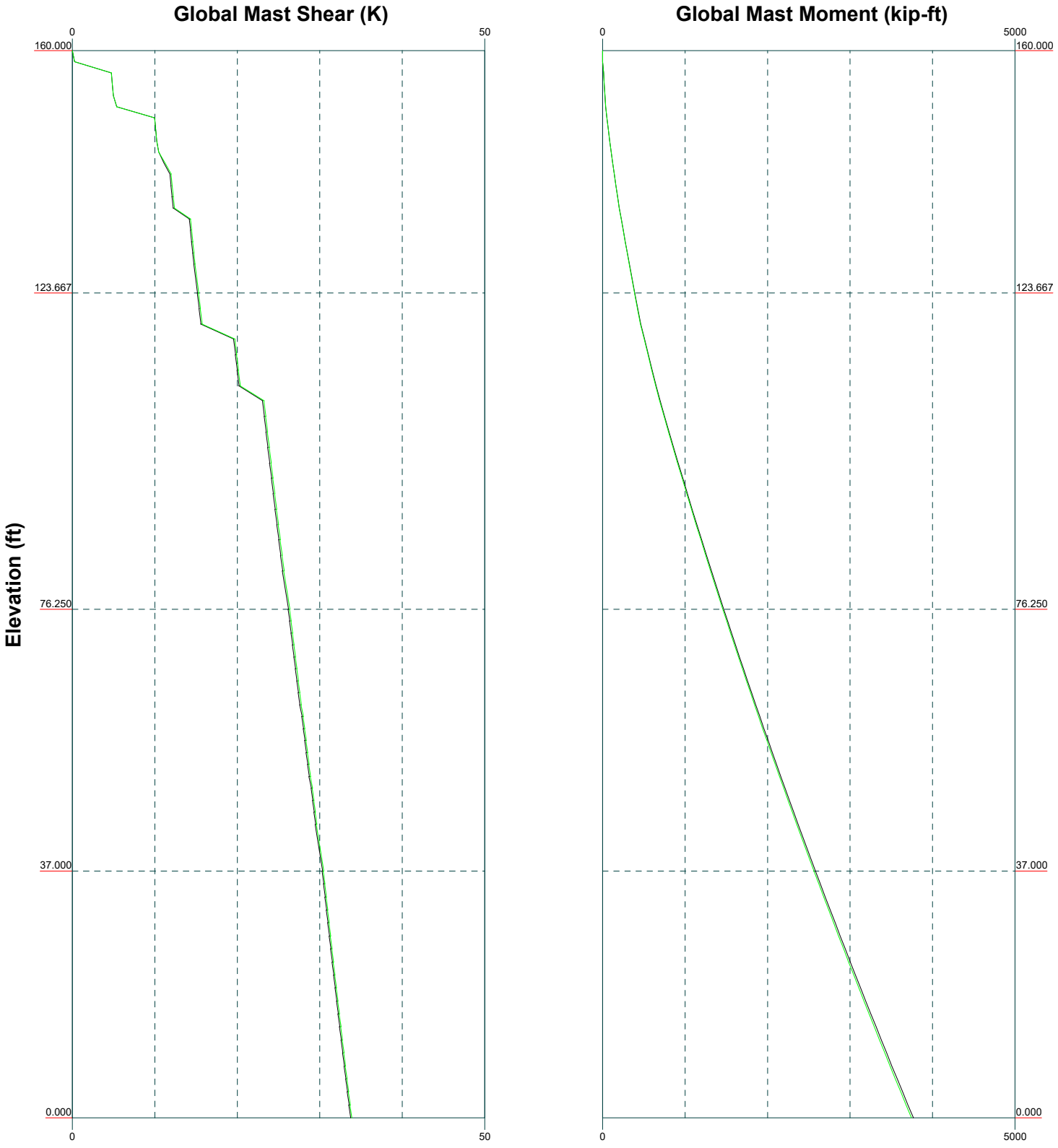
B+T Group
1717 S Boulder Ave, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 587-4630

Job: 81363.026.01 - HRT 082 943274, PA (BU# 806382			
Project:			
Client: Crown Castle	Drawn by: GURUPRASAD	App'd:	
Code: TIA-222-H	Date: 06/30/22	Scale: NTS	
Path:		Dwg No. E-1	

TIA-222-H - 119 mph/50 mph 1.000 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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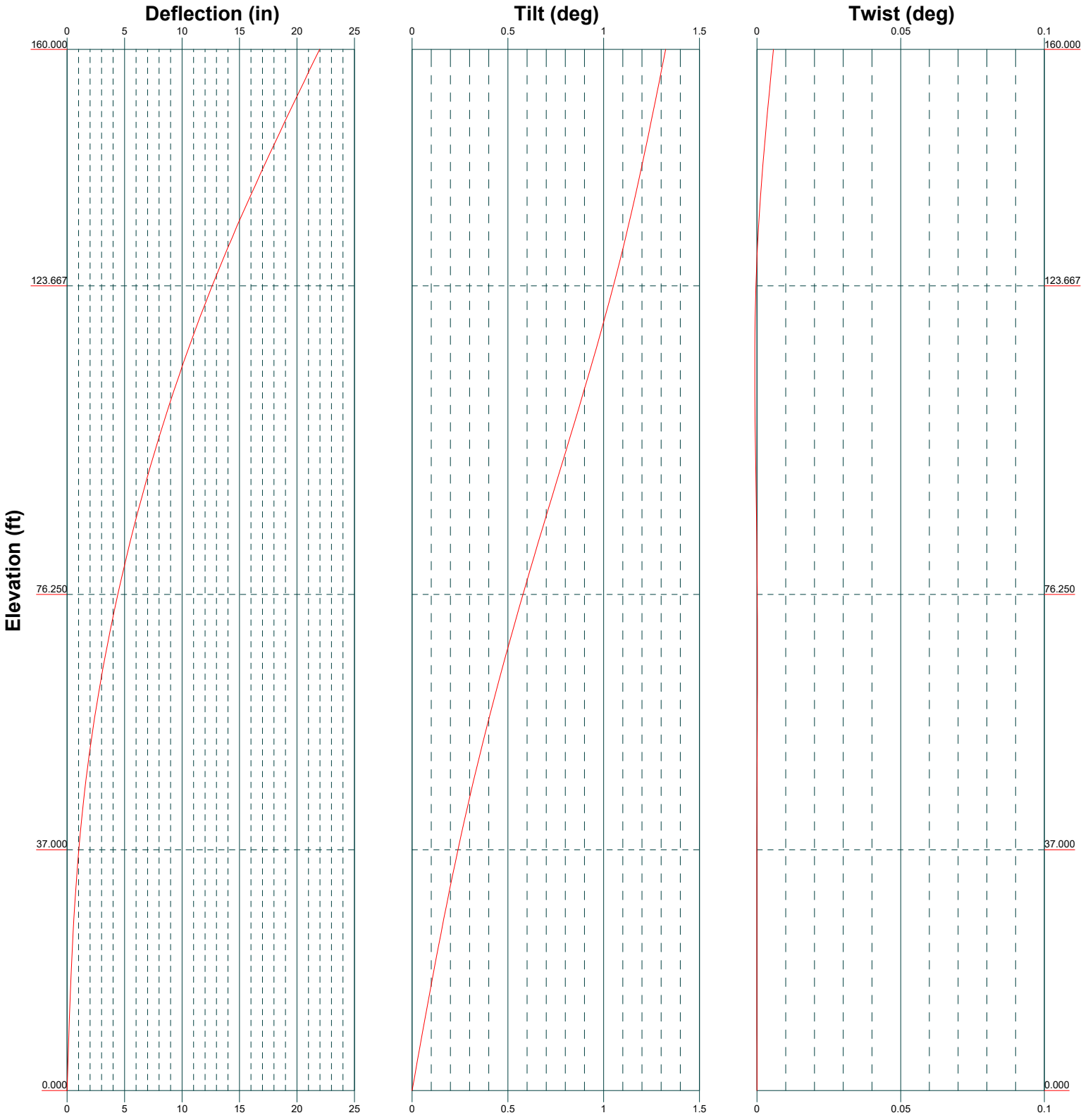
Job: 81363.026.01 - HRT 082 943274, PA (BU# 806382			
Project:			
Client: Crown Castle	Drawn by: GURUPRASAD	App'd:	
Code: TIA-222-H	Date: 06/30/22	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-H - Service - 60 mph

Maximum Values



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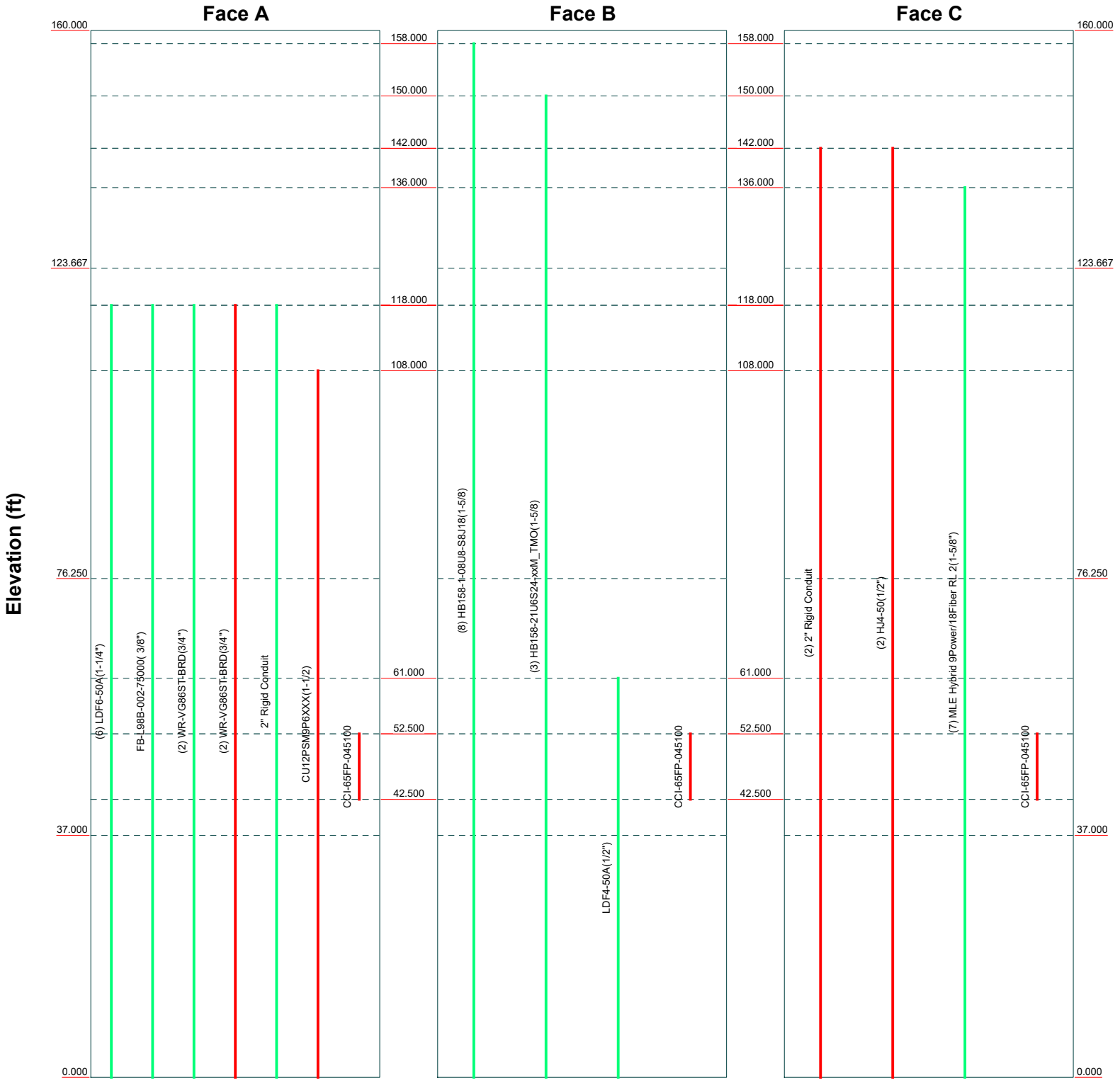
Phone: (918) 587-4630
FAX: (918) 587-4630

Job: ***81363.026.01 - HRT 082 943274, PA (BU# 806382***			
Project:			
Client: Crown Castle	Drawn by: GURUPRASAD	App'd:	
Code: TIA-222-H	Date: 06/30/22	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 160'

Round | Flat | App In Face | App Out Face | Truss Leg



B+T GRP

B+T Group
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Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 587-4630

Job: ***81363.026.01 - HRT 082 943274, PA (BU# 806382***			
Project:			
Client: Crown Castle	Drawn by: GURUPRASAD	App'd:	
Code: TIA-222-H	Date: 06/30/22	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

Tower is located in Middlesex County, Connecticut.
Tower base elevation above sea level: 317.000 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 1.000 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.
TIA-222-H Annex S.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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	160.000-123.667	36.333	4.333	12	18.870	29.050	0.188	0.750	A572-65 (65 ksi)
L2	123.667-76.250	51.750	5.750	12	27.461	41.950	0.313	1.250	A572-65 (65 ksi)
L3	76.250-37.000	45.000	7.000	12	39.715	52.320	0.344	1.375	A572-65 (65 ksi)
L4	37.000-0.000	44.000		12	49.672	62.000	0.406	1.625	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	19.470	11.280	502.514	6.688	9.775	51.410	1018.229	5.551	4.555	24.292
	30.009	17.426	1852.870	10.333	15.048	123.131	3754.417	8.576	7.283	38.842
L2	29.575	27.318	2569.965	9.719	14.225	180.668	5207.445	13.445	6.522	20.871
	43.320	41.898	9271.410	14.906	21.730	426.662	18786.390	20.621	10.405	33.296
L3	42.662	43.579	8622.350	14.095	20.572	419.122	17471.219	21.448	9.722	28.283
	54.044	57.531	19838.067	18.607	27.102	731.984	40197.302	28.315	13.101	38.111
L4	53.311	64.445	19964.737	17.637	25.730	775.933	40453.969	31.718	12.223	30.088
	64.044	80.572	39016.215	22.051	32.116	1214.853	79057.429	39.655	15.527	38.221

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 160.000-123.667				1	1	1			
L2 123.667-76.250				1	1	1			
L3 76.250-37.000				1	1	1			
L4 37.000-0.000				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 klf
* *										
2" Rigid Conduit	C	No	Surface Ar (CaAa)	142.000 - 0.000	2	2	0.100 0.200	2.000		0.003
HJ4-50(1/2")	C	No	Surface Ar	142.000 -	2	2	0.200	0.580		0.000

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 klf
			(CaAa)	0.000			0.250			
*										
WR-VG86ST-BRD(3/4")	A	No	Surface Ar (CaAa)	118.000 - 0.000	2	1	-0.470 -0.450	0.795		0.001
*										
CU12PSM9P6XXX(1-1/2)	A	No	Surface Ar (CaAa)	108.000 - 0.000	1	1	0.200 0.230	1.600		0.002
*										
*										
*										
CCI-65FP-045100	A	No	Surface Af (CaAa)	52.500 - 42.500	1	1	0.450 0.500	4.500	11.000	0.015
CCI-65FP-045100	B	No	Surface Af (CaAa)	52.500 - 42.500	1	1	0.450 0.500	4.500	11.000	0.015
CCI-65FP-045100	C	No	Surface Af (CaAa)	52.500 - 42.500	1	1	0.450 0.500	4.500	11.000	0.015
*										

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 klf
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	158.000 - 0.000	8	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	No	Inside Pole	150.000 - 0.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.003 0.003 0.003
*									
MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	C	No	No	Inside Pole	136.000 - 0.000	7	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF6-50A(1-1/4")	A	No	No	Inside Pole	118.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
FB-L98B-002-75000(3/8")	A	No	No	Inside Pole	118.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
WR-VG86ST-BRD(3/4")	A	No	No	Inside Pole	118.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*									
2" Rigid Conduit	A	No	No	Inside Pole	118.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.003 0.003 0.003
*									
LDF4-50A(1/2")	B	No	No	Inside Pole	61.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
*									

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	160.000-123.667	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.555
		C	0.000	0.000	9.460	0.000	0.204
L2	123.667-76.250	A	0.000	0.000	8.399	0.000	0.457
		B	0.000	0.000	0.000	0.000	0.849
		C	0.000	0.000	24.467	0.000	0.644
L3	76.250-37.000	A	0.000	0.000	16.900	0.000	0.605
		B	0.000	0.000	7.500	0.000	0.859
		C	0.000	0.000	27.753	0.000	0.687
L4	37.000-0.000	A	0.000	0.000	8.861	0.000	0.426
		B	0.000	0.000	0.000	0.000	0.668
		C	0.000	0.000	19.092	0.000	0.503

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	160.000-123.667	A	0.983	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.555
		C		0.000	0.000	20.832	0.000	0.347
L2	123.667-76.250	A	0.949	0.000	0.000	22.844	0.000	0.733
		B		0.000	0.000	0.000	0.000	0.849
		C		0.000	0.000	53.881	0.000	1.014
L3	76.250-37.000	A	0.897	0.000	0.000	32.965	0.000	0.933
		B		0.000	0.000	8.672	0.000	0.913
		C		0.000	0.000	52.604	0.000	1.033
L4	37.000-0.000	A	0.800	0.000	0.000	22.133	0.000	0.664
		B		0.000	0.000	0.000	0.000	0.668
		C		0.000	0.000	40.454	0.000	0.760

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.000-123.667	-0.562	1.550	-0.784	2.045
L2	123.667-76.250	-1.571	2.174	-2.274	2.803
L3	76.250-37.000	-1.587	1.814	-2.475	2.552
L4	37.000-0.000	-1.828	2.088	-2.803	2.911

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	6	2" Rigid Conduit	123.67 - 142.00	1.0000	1.0000
L1	7	HJ4-50(1/2")	123.67 - 142.00	1.0000	1.0000
L2	6	2" Rigid Conduit	76.25 - 123.67	1.0000	1.0000
L2	7	HJ4-50(1/2")	76.25 - 123.67	1.0000	1.0000
L2	15	WR-VG86ST-BRD(3/4")	76.25 - 118.00	1.0000	1.0000
L2	21	CU12PSM9P6XXX(1-1/2)	76.25 - 108.00	1.0000	1.0000
L3	6	2" Rigid Conduit	37.00 - 76.25	1.0000	1.0000
L3	7	HJ4-50(1/2")	37.00 - 76.25	1.0000	1.0000
L3	15	WR-VG86ST-BRD(3/4")	37.00 - 76.25	1.0000	1.0000
L3	21	CU12PSM9P6XXX(1-1/2)	37.00 - 76.25	1.0000	1.0000
L3	31	CCI-65FP-045100	42.50 - 52.50	1.0000	1.0000
L3	32	CCI-65FP-045100	42.50 - 52.50	1.0000	1.0000
L3	33	CCI-65FP-045100	42.50 - 52.50	1.0000	1.0000
L4	6	2" Rigid Conduit	0.00 - 37.00	1.0000	1.0000
L4	7	HJ4-50(1/2")	0.00 - 37.00	1.0000	1.0000
L4	15	WR-VG86ST-BRD(3/4")	0.00 - 37.00	1.0000	1.0000
L4	21	CU12PSM9P6XXX(1-1/2)	0.00 - 37.00	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L3	31	CCI-65FP-045100	42.50 - 52.50	Auto	0.0000
L3	32	CCI-65FP-045100	42.50 - 52.50	Auto	0.0000
L3	33	CCI-65FP-045100	42.50 - 52.50	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.090 4.490 4.890	3.300 3.680 4.070	0.066 0.130 0.204
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.090 4.490 4.890	3.300 3.680 4.070	0.066 0.130 0.204

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.090 4.490 4.890	3.300 3.680 4.070	0.066 0.130 0.204
DB846H80E-SX w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.120 4.760 5.420	6.380 7.050 7.740	0.052 0.104 0.166
DB846H80E-SX w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.120 4.760 5.420	6.380 7.050 7.740	0.052 0.104 0.166
(2) DB846F65ZAXY w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	6.100 6.800 7.510	6.810 7.520 8.240	0.058 0.119 0.191
(2) RFV01U-D1A	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.250 1.393 1.543	0.084 0.103 0.124
RFV01U-D1A	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.250 1.393 1.543	0.084 0.103 0.124
RFV01U-D2A	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.013 1.145 1.284	0.070 0.087 0.106
(2) RFV01U-D2A	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223	1.013 1.145 1.284	0.070 0.087 0.106
RRFDC-3315-PF-48	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	3.364 3.597 3.838	2.192 2.395 2.606	0.032 0.061 0.093
RRFDC-3315-PF-48	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	3.364 3.597 3.838	2.192 2.395 2.606	0.032 0.061 0.093
Sub6 Antenna - VZS01 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.915 5.264 5.623	2.687 3.151 3.631	0.101 0.141 0.186
Sub6 Antenna - VZS01 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.915 5.264 5.623	2.687 3.151 3.631	0.101 0.141 0.186
Sub6 Antenna - VZS01 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	4.915 5.264 5.623	2.687 3.151 3.631	0.101 0.141 0.186
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	158.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
Side Arm Mount [SO 102-3]	C	None		0.000	160.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	3.600 4.180 4.750	0.075 0.105 0.135
Platform Mount [LP 713-1]	C	None		0.000	158.000	No Ice 1/2" Ice 1" Ice	32.890 35.760 38.760	32.890 35.760 38.760	1.510 2.228 3.026
*									
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	6.580 7.060 7.570	3.500 3.900 4.320	0.111 0.162 0.220
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	6.580 7.060	3.500 3.900	0.111 0.162

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	7.570	4.320	0.220
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	6.580 7.060	3.500 3.900	0.111 0.162
			2.000			1" Ice	7.570	4.320	0.220
APXVAALL24_43-U-NA20 _TMO	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	14.670 15.430	5.320 5.990	0.150 0.262
			2.000			1" Ice	16.210	6.680	0.382
APXVAALL24_43-U-NA20 _TMO	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	14.670 15.430	5.320 5.990	0.150 0.262
			2.000			1" Ice	16.210	6.680	0.382
APXVAALL24_43-U-NA20 _TMO	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	14.670 15.430	5.320 5.990	0.150 0.262
			2.000			1" Ice	16.210	6.680	0.382
VV-65B-R1_TMO w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	8.154 8.704	5.426 6.558	0.067 0.127
			2.000			1" Ice	9.219	7.414	0.196
VV-65B-R1_TMO w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	8.154 8.704	5.426 6.558	0.067 0.127
			2.000			1" Ice	9.219	7.414	0.196
VV-65B-R1_TMO w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	8.154 8.704	5.426 6.558	0.067 0.127
			2.000			1" Ice	9.219	7.414	0.196
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.139 2.321	1.686 1.850	0.109 0.131
			2.000			1" Ice	2.511	2.022	0.156
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.139 2.321	1.686 1.850	0.109 0.131
			2.000			1" Ice	2.511	2.022	0.156
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.139 2.321	1.686 1.850	0.109 0.131
			2.000			1" Ice	2.511	2.022	0.156
Radio 4480_TMOV2	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.878 3.091	1.397 1.558	0.081 0.103
			2.000			1" Ice	3.312	1.727	0.128
Radio 4480_TMOV2	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.878 3.091	1.397 1.558	0.081 0.103
			2.000			1" Ice	3.312	1.727	0.128
Radio 4480_TMOV2	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.878 3.091	1.397 1.558	0.081 0.103
			2.000			1" Ice	3.312	1.727	0.128
L 2.5x2.5x1/4x12'	A	From Leg	4.000 0.000	0.000	153.000	No Ice 1/2" Ice	5.000 6.363	0.500 1.842	0.062 0.079
			0.000			1" Ice	7.738	3.196	0.106
L 2.5x2.5x1/4x12'	B	From Leg	4.000 0.000	0.000	153.000	No Ice 1/2" Ice	5.000 6.363	0.500 1.842	0.062 0.079
			0.000			1" Ice	7.738	3.196	0.106
L 2.5x2.5x1/4x12'	C	From Leg	4.000 0.000	0.000	153.000	No Ice 1/2" Ice	5.000 6.363	0.500 1.842	0.062 0.079
			0.000			1" Ice	7.738	3.196	0.106
(2) 8' x 2.375" Mount Pipe	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	1.900 2.728	1.900 2.728	0.029 0.044
			0.000			1" Ice	3.401	3.401	0.063
(2) 8' x 2.375" Mount Pipe	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	1.900 2.728	1.900 2.728	0.029 0.044
			0.000			1" Ice	3.401	3.401	0.063
(2) 8' x 2.375" Mount Pipe	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	1.900 2.728	1.900 2.728	0.029 0.044

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	3.401	3.401	0.063
Platform Mount [LP 713-1]	C	None		0.000	150.000	No Ice	32.890	32.890	1.510
						1/2" Ice	35.760	35.760	2.228
						1" Ice	38.760	38.760	3.026
*									
(2) 6' x 3" Mount Pipe	A	From Leg	2.000	0.000	142.000	No Ice	1.767	1.767	0.030
			0.000			1/2" Ice	2.129	2.129	0.044
			0.000			1" Ice	2.501	2.501	0.061
(2) 6' x 3" Mount Pipe	B	From Leg	2.000	0.000	142.000	No Ice	1.767	1.767	0.030
			0.000			1/2" Ice	2.129	2.129	0.044
			0.000			1" Ice	2.501	2.501	0.061
(2) 6' x 3" Mount Pipe	C	From Leg	2.000	0.000	142.000	No Ice	1.767	1.767	0.030
			0.000			1/2" Ice	2.129	2.129	0.044
			0.000			1" Ice	2.501	2.501	0.061
4' x 2" Horizontal Pipe Mount	B	From Face	0.500	0.000	145.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
4' x 2" Horizontal Pipe Mount	C	From Face	0.500	0.000	145.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
J-Box - 1' x 1' x 4"	C	From Leg	0.500	0.000	145.000	No Ice	2.133	1.200	0.020
			0.000			1/2" Ice	2.315	1.343	0.039
			0.000			1" Ice	2.504	1.493	0.061
Side Arm Mount [SO 101-3]	C	None		0.000	142.000	No Ice	5.810	5.810	0.252
						1/2" Ice	6.950	6.950	0.341
						1" Ice	8.280	8.280	0.457
*									
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000	0.000	136.000	No Ice	3.140	2.590	0.111
			0.000			1/2" Ice	3.450	2.880	0.163
			1.000			1" Ice	3.770	3.190	0.224
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000	0.000	136.000	No Ice	3.140	2.590	0.111
			0.000			1/2" Ice	3.450	2.880	0.163
			1.000			1" Ice	3.770	3.190	0.224
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000	0.000	136.000	No Ice	3.140	2.590	0.111
			0.000			1/2" Ice	3.450	2.880	0.163
			1.000			1" Ice	3.770	3.190	0.224
SBNH-1D65C-SR w/ Mount Pipe	A	From Leg	4.000	0.000	136.000	No Ice	5.560	4.470	0.083
			0.000			1/2" Ice	6.070	4.970	0.165
			1.000			1" Ice	6.590	5.480	0.260
SBNH-1D65C-SR w/ Mount Pipe	B	From Leg	4.000	0.000	136.000	No Ice	5.560	4.470	0.083
			0.000			1/2" Ice	6.070	4.970	0.165
			1.000			1" Ice	6.590	5.480	0.260
SBNH-1D65C-SR w/ Mount Pipe	C	From Leg	4.000	0.000	136.000	No Ice	5.560	4.470	0.083
			0.000			1/2" Ice	6.070	4.970	0.165
			1.000			1" Ice	6.590	5.480	0.260
RRUS 11 B2	A	From Leg	4.000	0.000	136.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			1.000			1" Ice	3.259	1.485	0.095
RRUS 11 B2	B	From Leg	4.000	0.000	136.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			1.000			1" Ice	3.259	1.485	0.095
RRUS 11 B2	C	From Leg	4.000	0.000	136.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			1.000			1" Ice	3.259	1.485	0.095
RRUS 11 B12	A	From Leg	4.000	0.000	136.000	No Ice	2.833	1.182	0.051
			0.000			1/2" Ice	3.043	1.330	0.072
			1.000			1" Ice	3.259	1.485	0.095

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 11 B12	B	From Leg	4.000 0.000 1.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	2.833 3.043 3.259	1.182 1.330 1.485	0.051 0.072 0.095
RRUS 11 B12	C	From Leg	4.000 0.000 1.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	2.833 3.043 3.259	1.182 1.330 1.485	0.051 0.072 0.095
TMAT1921B78-21A	A	From Leg	4.000 0.000 1.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.652 0.755 0.864	0.300 0.376 0.459	0.018 0.023 0.030
TMAT1921B78-21A	B	From Leg	4.000 0.000 1.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.652 0.755 0.864	0.300 0.376 0.459	0.018 0.023 0.030
TMAT1921B78-21A	C	From Leg	4.000 0.000 1.000	0.000	136.000	No Ice 1/2" Ice 1" Ice	0.652 0.755 0.864	0.300 0.376 0.459	0.018 0.023 0.030
T-Arm Mount [TA 602-3]	C	None		0.000	136.000	No Ice 1/2" Ice 1" Ice	13.400 16.440 19.700	13.400 16.440 19.700	0.774 1.004 1.292
*									
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	12.250 13.000 13.760	6.050 6.710 7.390	0.089 0.176 0.275
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	12.250 13.000 13.760	6.050 6.710 7.390	0.089 0.176 0.275
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	12.250 13.000 13.760	6.050 6.710 7.390	0.089 0.176 0.275
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	11.960 12.700 13.460	5.970 6.630 7.300	0.115 0.201 0.298
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	11.960 12.700 13.460	5.970 6.630 7.300	0.115 0.201 0.298
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	11.960 12.700 13.460	5.970 6.630 7.300	0.115 0.201 0.298
1001940	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	0.176 0.232 0.295	0.083 0.126 0.178	0.002 0.004 0.006
1001940	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	0.176 0.232 0.295	0.083 0.126 0.178	0.002 0.004 0.006
1001940	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice	0.176 0.232 0.295	0.083 0.126 0.178	0.002 0.004 0.006
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.980 2.157	1.695 1.861	0.075 0.096

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	2.341	2.035	0.119
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.980 2.157	1.695 1.861	0.075 0.096
			2.000			1" Ice	2.341	2.035	0.119
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.980 2.157	1.695 1.861	0.075 0.096
			2.000			1" Ice	2.341	2.035	0.119
RRUS 4478 B14_CCIV2	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	2.021 2.200	1.246 1.396	0.059 0.077
			2.000			1" Ice	2.386	1.554	0.097
RRUS 4478 B14_CCIV2	B	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	2.021 2.200	1.246 1.396	0.059 0.077
			2.000			1" Ice	2.386	1.554	0.097
RRUS 4478 B14_CCIV2	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	2.021 2.200	1.246 1.396	0.059 0.077
			2.000			1" Ice	2.386	1.554	0.097
(2) LGP13519	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	0.290 0.362	0.181 0.241	0.005 0.008
			2.000			1" Ice	0.441	0.310	0.012
(2) LGP13519	B	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	0.290 0.362	0.181 0.241	0.005 0.008
			2.000			1" Ice	0.441	0.310	0.012
(2) LGP13519	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	0.290 0.362	0.181 0.241	0.005 0.008
			2.000			1" Ice	0.441	0.310	0.012
RRUS 4449 B5/B12	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.968 2.144	1.408 1.564	0.071 0.090
			2.000			1" Ice	2.328	1.727	0.111
RRUS 4449 B5/B12	B	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.968 2.144	1.408 1.564	0.071 0.090
			2.000			1" Ice	2.328	1.727	0.111
RRUS 4449 B5/B12	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.968 2.144	1.408 1.564	0.071 0.090
			2.000			1" Ice	2.328	1.727	0.111
DC6-48-60-18-8F	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.212 1.892	1.212 1.892	0.033 0.055
			2.000			1" Ice	2.105	2.105	0.080
DC6-48-60-18-8F	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	1.212 1.892	1.212 1.892	0.033 0.055
			2.000			1" Ice	2.105	2.105	0.080
3' x 2" Pipe Mount	A	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	0.583 0.770	0.583 0.770	0.011 0.017
			2.000			1" Ice	0.967	0.967	0.024
3' x 2" Pipe Mount	B	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	0.583 0.770	0.583 0.770	0.011 0.017
			2.000			1" Ice	0.967	0.967	0.024
(2) 3' x 2" Pipe Mount	C	From Leg	4.000 0.000	0.000	118.000	No Ice 1/2" Ice	0.583 0.770	0.583 0.770	0.011 0.017
			2.000			1" Ice	0.967	0.967	0.024
Platform Mount [LP 304-1_HR-1]	C	None		0.000	118.000	No Ice 1/2" Ice 1" Ice	21.410 26.620 31.660	21.410 26.620 31.660	1.605 2.056 2.598
*									
MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice	8.010 8.520 9.040	4.230 4.690 5.160	0.098 0.184 0.281
MX08FRO665-20 w/ Mount	B	From Leg	4.000	0.000	108.000	No Ice	8.010	4.230	0.098

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.000			1/2" Ice	8.520	4.690	0.184
			0.000			1" Ice	9.040	5.160	0.281
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.000	0.000	108.000	No Ice	8.010	4.230	0.098
			0.000			1/2" Ice	8.520	4.690	0.184
			0.000			1" Ice	9.040	5.160	0.281
TA08025-B604	A	From Leg	4.000	0.000	108.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
TA08025-B604	B	From Leg	4.000	0.000	108.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
TA08025-B604	C	From Leg	4.000	0.000	108.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
TA08025-B605	A	From Leg	4.000	0.000	108.000	No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
TA08025-B605	B	From Leg	4.000	0.000	108.000	No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
TA08025-B605	C	From Leg	4.000	0.000	108.000	No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
RDIDC-9181-PF-48	A	From Leg	4.000	0.000	108.000	No Ice	2.012	1.168	0.022
			0.000			1/2" Ice	2.189	1.311	0.040
			0.000			1" Ice	2.373	1.461	0.060
8'x2" Antenna Mount Pipe	A	From Leg	2.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
(2) 8'x2" Antenna Mount Pipe	A	From Leg	4.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
(2) 8'x2" Antenna Mount Pipe	B	From Leg	4.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
(2) 8'x2" Antenna Mount Pipe	C	From Leg	4.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.064
Commscope MC-PK8-DSH	A	None		0.000	108.000	No Ice	34.240	34.240	1.749
						1/2" Ice	62.950	62.950	2.099
						1" Ice	91.660	91.660	2.450
*									
KS24019-L112A	A	From Leg	3.000	0.000	61.000	No Ice	0.141	0.141	0.005
			0.000			1/2" Ice	0.198	0.198	0.007
			0.000			1" Ice	0.262	0.262	0.009
2' x 2" Pipe Mount	A	From Leg	3.000	0.000	61.000	No Ice	0.023	0.023	0.007
			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
2' x 2" Pipe Mount	C	From Leg	3.000	0.000	61.000	No Ice	0.023	0.023	0.007
			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	61.000	No Ice	0.850	1.670	0.065
			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	61.000	No Ice	0.850	1.670	0.065
			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*									
2' x 2" Pipe Mount	A	From Leg	3.000	0.000	50.000	No Ice	0.023	0.023	0.007
			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
2' x 2" Pipe Mount	C	From Leg	3.000	0.000	50.000	No Ice	0.023	0.023	0.007
			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	50.000	No Ice	0.850	1.670	0.065
			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	50.000	No Ice	0.850	1.670	0.065
			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Radiowaves HP3-11	B	Paraboloid w/Shroud (HP)	From Leg	2.000	70.000		142.000	3.167	No Ice	7.876	0.050
				0.000					1/2" Ice	8.296	0.093
				2.000					1" Ice	8.716	0.135
Radiowaves HP3-11	C	Paraboloid w/Shroud (HP)	From Leg	2.000	78.000		142.000	3.167	No Ice	7.876	0.050
				0.000					1/2" Ice	8.296	0.093
				2.000					1" Ice	8.716	0.135
*											

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

Comb. No.	Description
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	160 - 123.667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-23.645	1.179	-0.882
			Max. Mx	8	-12.078	-322.395	-1.119
			Max. My	14	-12.060	-0.854	-324.872
			Max. Vy	8	14.736	-322.395	-1.119
			Max. Vx	2	-14.883	0.459	324.687
			Max. Torque	11			-1.783
L2	123.667 - 76.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.698	2.320	-0.920
			Max. Mx	8	-27.860	-1308.510	-5.640
			Max. My	2	-27.844	3.224	1318.696
			Max. Vy	8	25.511	-1308.510	-5.640
			Max. Vx	2	-25.685	3.224	1318.696
			Max. Torque	11			-1.859
L3	76.25 - 37	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-61.166	3.729	-1.157

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	-39.792	-2352.931	-9.552
			Max. My	2	-39.784	6.175	2370.154
			Max. Vy	8	29.504	-2352.931	-9.552
			Max. Vx	2	-29.651	6.175	2370.154
			Max. Torque	15			-1.936
L4	37 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-81.722	4.697	-2.095
			Max. Mx	8	-57.432	-3744.702	-15.075
			Max. My	2	-57.431	9.604	3768.095
			Max. Vy	8	33.752	-3744.702	-15.075
			Max. Vx	2	-33.893	9.604	3768.095
			Max. Torque	15			-1.935

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	81.722	-0.026	-8.018
	Max. H_x	20	57.447	33.687	0.040
	Max. H_z	2	57.447	0.068	33.866
	Max. M_x	2	3768.095	0.068	33.866
	Max. M_z	8	3744.702	-33.725	-0.111
	Max. Torsion	3	1.575	0.068	33.866
	Min. Vert	23	43.085	29.114	17.009
	Min. H_x	8	57.447	-33.725	-0.111
	Min. H_z	14	57.447	-0.119	-33.844
	Min. M_x	14	-3766.795	-0.119	-33.844
	Min. M_z	20	-3742.991	33.687	0.040
	Min. Torsion	15	-1.934	-0.119	-33.844

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	47.873	0.000	0.000	0.766	1.574	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	57.447	-0.068	-33.866	-3768.095	9.604	-1.571
0.9 Dead+1.0 Wind 0 deg - No Ice	43.085	-0.068	-33.866	-3727.782	9.017	-1.575
1.2 Dead+1.0 Wind 30 deg - No Ice	57.447	16.785	-29.376	-3271.674	-1861.869	-1.211
0.9 Dead+1.0 Wind 30 deg - No Ice	43.085	16.785	-29.376	-3236.670	-1842.330	-1.215
1.2 Dead+1.0 Wind 60 deg - No Ice	57.447	29.151	-16.979	-1892.888	-3235.588	0.014
0.9 Dead+1.0 Wind 60 deg - No Ice	43.085	29.151	-16.979	-1872.717	-3201.276	0.012
1.2 Dead+1.0 Wind 90 deg - No Ice	57.447	33.725	0.111	15.075	-3744.702	1.120
0.9 Dead+1.0 Wind 90 deg - No Ice	43.085	33.725	0.111	14.677	-3704.926	1.120

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 120 deg - No Ice	57.447	29.199	17.030	1897.946	-3240.280	1.517
0.9 Dead+1.0 Wind 120 deg - No Ice	43.085	29.199	17.030	1877.277	-3205.925	1.519
1.2 Dead+1.0 Wind 150 deg - No Ice	57.447	16.850	29.360	3268.515	-1867.149	1.778
0.9 Dead+1.0 Wind 150 deg - No Ice	43.085	16.850	29.360	3233.096	-1847.573	1.781
1.2 Dead+1.0 Wind 180 deg - No Ice	57.447	0.119	33.844	3766.795	-13.396	1.930
0.9 Dead+1.0 Wind 180 deg - No Ice	43.085	0.119	33.844	3726.028	-13.735	1.934
1.2 Dead+1.0 Wind 210 deg - No Ice	57.447	-16.732	29.305	3262.875	1857.845	1.365
0.9 Dead+1.0 Wind 210 deg - No Ice	43.085	-16.732	29.305	3227.505	1837.380	1.368
1.2 Dead+1.0 Wind 240 deg - No Ice	57.447	-29.153	16.909	1884.191	3239.928	0.085
0.9 Dead+1.0 Wind 240 deg - No Ice	43.085	-29.153	16.909	1863.657	3204.584	0.087
1.2 Dead+1.0 Wind 270 deg - No Ice	57.447	-33.687	-0.040	-2.476	3742.991	-0.908
0.9 Dead+1.0 Wind 270 deg - No Ice	43.085	-33.687	-0.040	-2.695	3702.257	-0.908
1.2 Dead+1.0 Wind 300 deg - No Ice	57.447	-29.114	-17.009	-1892.897	3231.401	-0.983
0.9 Dead+1.0 Wind 300 deg - No Ice	43.085	-29.114	-17.009	-1872.754	3196.177	-0.985
1.2 Dead+1.0 Wind 330 deg - No Ice	57.447	-16.799	-29.368	-3267.794	1863.490	-1.302
0.9 Dead+1.0 Wind 330 deg - No Ice	43.085	-16.799	-29.368	-3232.851	1842.986	-1.305
1.2 Dead+1.0 Ice+1.0 Temp	81.722	-0.000	0.000	2.095	4.697	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	81.722	-0.016	-8.022	-912.280	6.674	-0.371
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	81.722	3.981	-6.955	-791.377	-448.034	-0.319
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	81.722	6.914	-4.017	-456.736	-781.705	-0.075
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	81.722	7.998	0.025	5.249	-905.190	0.167
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	81.722	6.926	4.033	462.110	-782.869	0.283
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	81.722	3.999	6.955	794.928	-449.474	0.377
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	81.722	0.026	8.018	915.990	1.597	0.442
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	81.722	-3.971	6.941	793.567	456.254	0.349
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	81.722	-6.914	4.004	458.954	791.612	0.094
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	81.722	-7.990	-0.011	1.271	913.875	-0.125
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	81.722	-6.910	-4.029	-457.111	790.106	-0.177
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	81.722	-3.989	-6.956	-790.806	457.771	-0.283
Dead+Wind 0 deg - Service	47.873	-0.016	-8.112	-896.421	3.458	-0.387
Dead+Wind 30 deg - Service	47.873	4.020	-7.036	-778.241	-442.044	-0.301
Dead+Wind 60 deg - Service	47.873	6.982	-4.067	-450.019	-769.048	-0.003
Dead+Wind 90 deg - Service	47.873	8.078	0.027	4.155	-890.241	0.268

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 120 deg - Service	47.873	6.994	4.079	452.361	-770.165	0.368
Dead+Wind 150 deg - Service	47.873	4.036	7.032	778.622	-443.300	0.434
Dead+Wind 180 deg - Service	47.873	0.029	8.106	897.242	-2.014	0.474
Dead+Wind 210 deg - Service	47.873	-4.008	7.019	777.273	443.427	0.338
Dead+Wind 240 deg - Service	47.873	-6.983	4.050	449.083	772.418	0.027
Dead+Wind 270 deg - Service	47.873	-8.069	-0.010	-0.023	892.173	-0.216
Dead+Wind 300 deg - Service	47.873	-6.973	-4.074	-450.021	770.391	-0.238
Dead+Wind 330 deg - Service	47.873	-4.024	-7.034	-777.315	444.774	-0.319

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-47.873	0.000	0.000	47.873	0.000	0.000%
2	-0.068	-57.447	-33.866	0.068	57.447	33.866	0.000%
3	-0.068	-43.085	-33.866	0.068	43.085	33.866	0.000%
4	16.785	-57.447	-29.376	-16.785	57.447	29.376	0.000%
5	16.785	-43.085	-29.376	-16.785	43.085	29.376	0.000%
6	29.151	-57.447	-16.979	-29.151	57.447	16.979	0.000%
7	29.151	-43.085	-16.979	-29.151	43.085	16.979	0.000%
8	33.725	-57.447	0.111	-33.725	57.447	-0.111	0.000%
9	33.725	-43.085	0.111	-33.725	43.085	-0.111	0.000%
10	29.199	-57.447	17.030	-29.199	57.447	-17.030	0.000%
11	29.199	-43.085	17.030	-29.199	43.085	-17.030	0.000%
12	16.850	-57.447	29.360	-16.850	57.447	-29.360	0.000%
13	16.850	-43.085	29.360	-16.850	43.085	-29.360	0.000%
14	0.119	-57.447	33.844	-0.119	57.447	-33.844	0.000%
15	0.119	-43.085	33.844	-0.119	43.085	-33.844	0.000%
16	-16.732	-57.447	29.305	16.732	57.447	-29.305	0.000%
17	-16.732	-43.085	29.305	16.732	43.085	-29.305	0.000%
18	-29.153	-57.447	16.909	29.153	57.447	-16.909	0.000%
19	-29.153	-43.085	16.909	29.153	43.085	-16.909	0.000%
20	-33.687	-57.447	-0.040	33.687	57.447	0.040	0.000%
21	-33.687	-43.085	-0.040	33.687	43.085	0.040	0.000%
22	-29.114	-57.447	-17.009	29.114	57.447	17.009	0.000%
23	-29.114	-43.085	-17.009	29.114	43.085	17.009	0.000%
24	-16.799	-57.447	-29.368	16.799	57.447	29.368	0.000%
25	-16.799	-43.085	-29.368	16.799	43.085	29.368	0.000%
26	0.000	-81.722	0.000	0.000	81.722	-0.000	0.000%
27	-0.016	-81.722	-8.022	0.016	81.722	8.022	0.000%
28	3.981	-81.722	-6.955	-3.981	81.722	6.955	0.000%
29	6.914	-81.722	-4.017	-6.914	81.722	4.017	0.000%
30	7.998	-81.722	0.025	-7.998	81.722	-0.025	0.000%
31	6.926	-81.722	4.033	-6.926	81.722	-4.033	0.000%
32	3.999	-81.722	6.955	-3.999	81.722	-6.955	0.000%
33	0.026	-81.722	8.018	-0.026	81.722	-8.018	0.000%
34	-3.971	-81.722	6.941	3.971	81.722	-6.941	0.000%
35	-6.914	-81.722	4.004	6.914	81.722	-4.004	0.000%
36	-7.990	-81.722	-0.011	7.990	81.722	0.011	0.000%
37	-6.909	-81.722	-4.029	6.910	81.722	4.029	0.000%
38	-3.989	-81.722	-6.956	3.989	81.722	6.956	0.000%
39	-0.016	-47.873	-8.112	0.016	47.873	8.112	0.000%
40	4.020	-47.873	-7.036	-4.020	47.873	7.036	0.000%
41	6.982	-47.873	-4.067	-6.982	47.873	4.067	0.000%
42	8.078	-47.873	0.027	-8.078	47.873	-0.027	0.000%
43	6.994	-47.873	4.079	-6.994	47.873	-4.079	0.000%
44	4.036	-47.873	7.032	-4.036	47.873	-7.032	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
45	0.029	-47.873	8.106	-0.029	47.873	-8.106	0.000%
46	-4.008	-47.873	7.019	4.008	47.873	-7.019	0.000%
47	-6.983	-47.873	4.050	6.983	47.873	-4.050	0.000%
48	-8.069	-47.873	-0.010	8.069	47.873	0.010	0.000%
49	-6.973	-47.873	-4.074	6.973	47.873	4.074	0.000%
50	-4.024	-47.873	-7.034	4.024	47.873	7.034	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	0.00084953
3	Yes	4	0.00000001	0.00052450
4	Yes	5	0.00000001	0.00071424
5	Yes	5	0.00000001	0.00032596
6	Yes	5	0.00000001	0.00072277
7	Yes	5	0.00000001	0.00033025
8	Yes	4	0.00000001	0.00093629
9	Yes	4	0.00000001	0.00058687
10	Yes	5	0.00000001	0.00075553
11	Yes	5	0.00000001	0.00034644
12	Yes	5	0.00000001	0.00070153
13	Yes	5	0.00000001	0.00031967
14	Yes	4	0.00000001	0.00083425
15	Yes	4	0.00000001	0.00051748
16	Yes	5	0.00000001	0.00073818
17	Yes	5	0.00000001	0.00033816
18	Yes	5	0.00000001	0.00073074
19	Yes	5	0.00000001	0.00033418
20	Yes	4	0.00000001	0.00071445
21	Yes	4	0.00000001	0.00043299
22	Yes	5	0.00000001	0.00070952
23	Yes	5	0.00000001	0.00032379
24	Yes	5	0.00000001	0.00074437
25	Yes	5	0.00000001	0.00034112
26	Yes	4	0.00000001	0.00001881
27	Yes	5	0.00000001	0.00022968
28	Yes	5	0.00000001	0.00025746
29	Yes	5	0.00000001	0.00025715
30	Yes	5	0.00000001	0.00022728
31	Yes	5	0.00000001	0.00025991
32	Yes	5	0.00000001	0.00025861
33	Yes	5	0.00000001	0.00023104
34	Yes	5	0.00000001	0.00026256
35	Yes	5	0.00000001	0.00026209
36	Yes	5	0.00000001	0.00023048
37	Yes	5	0.00000001	0.00025996
38	Yes	5	0.00000001	0.00026155
39	Yes	4	0.00000001	0.00006853
40	Yes	4	0.00000001	0.00022154
41	Yes	4	0.00000001	0.00022845
42	Yes	4	0.00000001	0.00006972
43	Yes	4	0.00000001	0.00026173
44	Yes	4	0.00000001	0.00021419
45	Yes	4	0.00000001	0.00007446

46	Yes	4	0.00000001	0.00024965
47	Yes	4	0.00000001	0.00023858
48	Yes	4	0.00000001	0.00006423
49	Yes	4	0.00000001	0.00022053
50	Yes	4	0.00000001	0.00025429

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.667	21.965	45	1.324	0.006
L2	128 - 76.25	13.620	45	1.089	0.002
L3	82 - 37	5.164	45	0.635	0.001
L4	44 - 0	1.403	45	0.293	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.000	Side Arm Mount [SO 102-3]	45	21.965	1.324	0.006	32099
158.000	(2) SBNHH-1D65B w/ Mount Pipe	45	21.418	1.310	0.006	32099
153.000	L 2.5x2.5x1/4x12'	45	20.055	1.276	0.005	22928
150.000	AIR 6419 B41_TMO w/ Mount Pipe	45	19.242	1.255	0.004	16049
145.000	4' x 2" Horizontal Pipe Mount	45	17.904	1.220	0.004	10699
144.000	Radiowaves HP3-11	45	17.639	1.213	0.004	10030
142.000	(2) 6' x 3" Mount Pipe	45	17.114	1.199	0.003	8916
136.000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	45	15.572	1.154	0.003	6687
118.000	7770.00 w/ Mount Pipe	45	11.385	0.999	0.001	5242
108.000	MX08FRO665-20 w/ Mount Pipe	45	9.380	0.901	0.001	5486
61.000	KS24019-L112A	45	2.735	0.436	0.000	6093
50.000	2' x 2" Pipe Mount	45	1.808	0.341	0.000	6017

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.667	92.373	2	5.571	0.024
L2	128 - 76.25	57.294	2	4.584	0.008
L3	82 - 37	21.716	2	2.673	0.003
L4	44 - 0	5.899	2	1.234	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.000	Side Arm Mount [SO 102-3]	2	92.373	5.571	0.024	7759
158.000	(2) SBNHH-1D65B w/ Mount Pipe	2	90.074	5.515	0.023	7759
153.000	L 2.5x2.5x1/4x12'	2	84.343	5.372	0.020	5542
150.000	AIR 6419 B41_TMO w/ Mount Pipe	2	80.928	5.285	0.018	3878
145.000	4' x 2" Horizontal Pipe Mount	2	75.304	5.138	0.016	2584
144.000	Radiowaves HP3-11	2	74.192	5.108	0.015	2423
142.000	(2) 6' x 3" Mount Pipe	2	71.983	5.047	0.014	2153
136.000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	2	65.502	4.857	0.011	1613
118.000	7770.00 w/ Mount Pipe	2	47.895	4.205	0.006	1259
108.000	MX08FRO665-20 w/ Mount Pipe	2	39.458	3.793	0.004	1315
61.000	KS24019-L112A	2	11.497	1.832	0.002	1450
50.000	2' x 2" Pipe Mount	2	7.598	1.436	0.001	1431

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	160 - 123.667 (1)	TP29.05x18.87x0.188	36.333	0.000	0.0	16.693	-12.060	943.213	0.013
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	51.750	0.000	0.0	40.278	-27.844	2356.250	0.012
L3	76.25 - 37 (3)	TP52.32x39.715x0.344	45.000	0.000	0.0	55.361	-39.784	3156.660	0.013
L4	37 - 0 (4)	TP62x49.672x0.406	44.000	0.000	0.0	80.572	-57.431	4464.570	0.013

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	160 - 123.667 (1)	TP29.05x18.87x0.188	324.873	531.888	0.611	0.000	531.888	0.000
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	1318.700	2023.500	0.652	0.000	2023.500	0.000
L3	76.25 - 37 (3)	TP52.32x39.715x0.344	2370.158	3219.825	0.736	0.000	3219.825	0.000
L4	37 - 0 (4)	TP62x49.672x0.406	3768.108	5609.658	0.672	0.000	5609.658	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	160 - 123.667 (1)	TP29.05x18.87x0.188	14.862	292.958	0.051	1.411	712.485	0.002
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	25.685	706.875	0.036	1.279	2488.867	0.001
L3	76.25 - 37 (3)	TP52.32x39.715x0.344	29.651	971.584	0.031	1.572	4274.492	0.000
L4	37 - 0 (4)	TP62x49.672x0.406	33.893	1414.040	0.024	1.571	7661.250	0.000

Pole Interaction Design Data

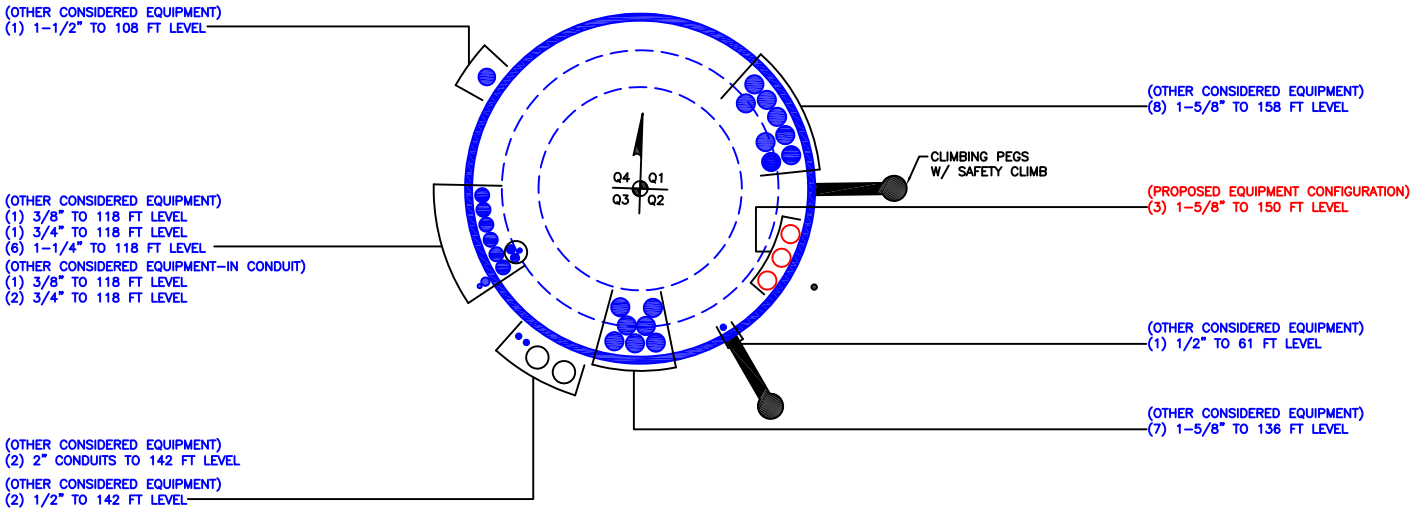
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 123.667 (1)	0.013	0.611	0.000	0.051	0.002	0.626 ✔	1.050	4.8.2 ✔
L2	123.667 - 76.25 (2)	0.012	0.652	0.000	0.036	0.001	0.665 ✔	1.050	4.8.2 ✔
L3	76.25 - 37 (3)	0.013	0.736	0.000	0.031	0.000	0.750 ✔	1.050	4.8.2 ✔
L4	37 - 0 (4)	0.013	0.672	0.000	0.024	0.000	0.685 ✔	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	160 - 123.667	Pole	TP29.05x18.87x0.188	1	-12.060	990.374	59.7	Pass
L2	123.667 - 76.25	Pole	TP41.95x27.461x0.313	2	-27.844	2474.062	63.3	Pass
L3	76.25 - 37	Pole	TP52.32x39.715x0.344	3	-39.784	3314.493	71.4	Pass
L4	37 - 0	Pole	TP62x49.672x0.406	4	-57.431	4687.798	65.3	Pass
							Summary	
						Pole (L3)	71.4	Pass
						RATING =	**71.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806382

APPENDIX C

ADDITIONAL CALCULATIONS

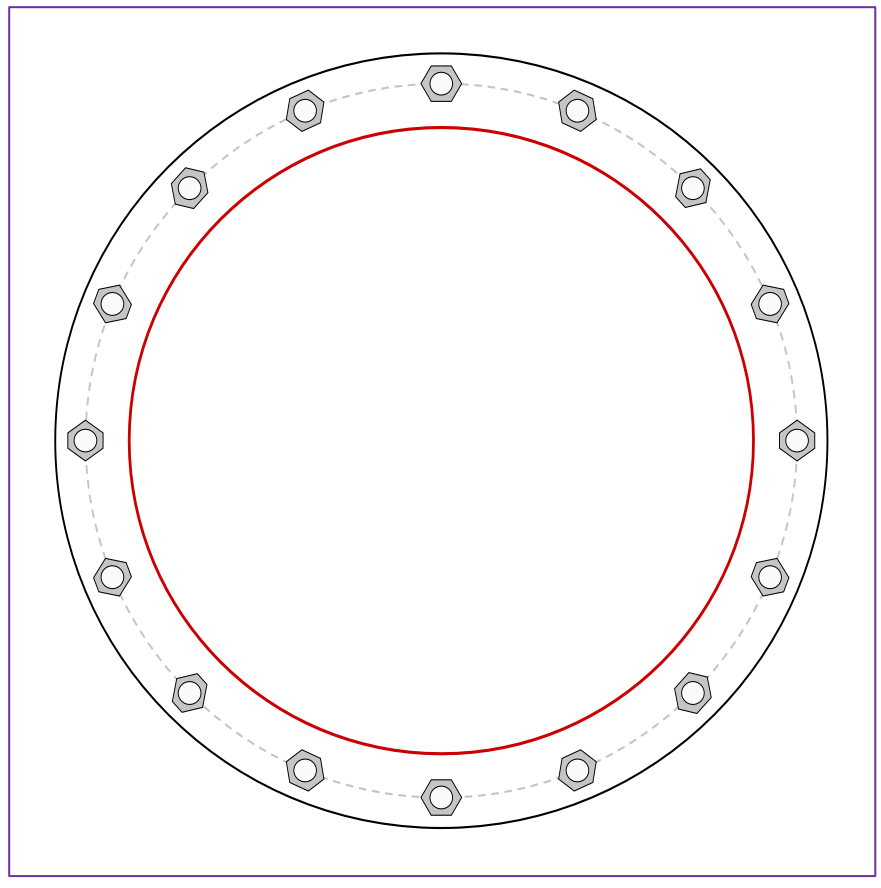
Monopole Base Plate Connection

Site Info	
BU #	806382
Site Name	HRT 082 943274, CT
Order #	621455 Rev#0

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

Applied Loads	
Moment (kip-ft)	3768.11
Axial Force (kips)	57.43
Shear Force (kips)	33.89

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 70.69" BC

Base Plate Data

76.69" OD x 2.75" Plate (S-128; Fy=60 ksi, Fu=80 ksi)

Stiffener Data

N/A

Pole Data

62" x 0.40625" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 156.26	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.12	ϕVn = 149.1	**61.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	18.86	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**33.3%**	**Pass**

Drilled Pier Foundation

BU # :	806382
Site Name:	HRT 082 943274, CT
Order Number:	621455 Rev 0
TIA-222 Revison:	H
Tower Type:	Monopole

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Applied Loads	Comp.	Uplift
Moment (kip-ft)	3768.11	
Axial Force (kips)	57.43	
Shear Force (kips)	33.89	

Material Properties			Rebar 2, Fy Override (ksi)	Rebar 3, Fy Override (ksi)
Concrete Strength, f'c:	4	ksi		
Rebar Strength, Fy:	60	ksi		
Tie Yield Strength, Fyt:	60	ksi		

Pier Design Data		
Depth	20	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 20' below grade		
Pier Diameter	7.5	ft
Rebar Quantity	36	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing	9	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	5.00	-
Soil Safety Factor	2.34	-
Max Moment (kip-ft)	3894.75	-
Rating*	*54.2%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	390.26	-
End Bearing (kips)	1079.34	-
Weight of Concrete (kips)	163.02	-
Total Capacity (kips)	1469.60	-
Axial (kips)	220.45	-
Rating*	*14.3%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	4.67	-
Critical Moment (kip-ft)	3893.90	-
Critical Moment Capacity	9399.15	-
Rating*	*39.5%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	15.46	-
Critical Shear (kip)	576.52	-
Critical Shear Capacity	991.64	-
Rating*	*55.4%*	-

Structural Foundation Rating*	**55.4%**
Soil Interaction Rating*	**54.2%**

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	N/A	# of Layers	4

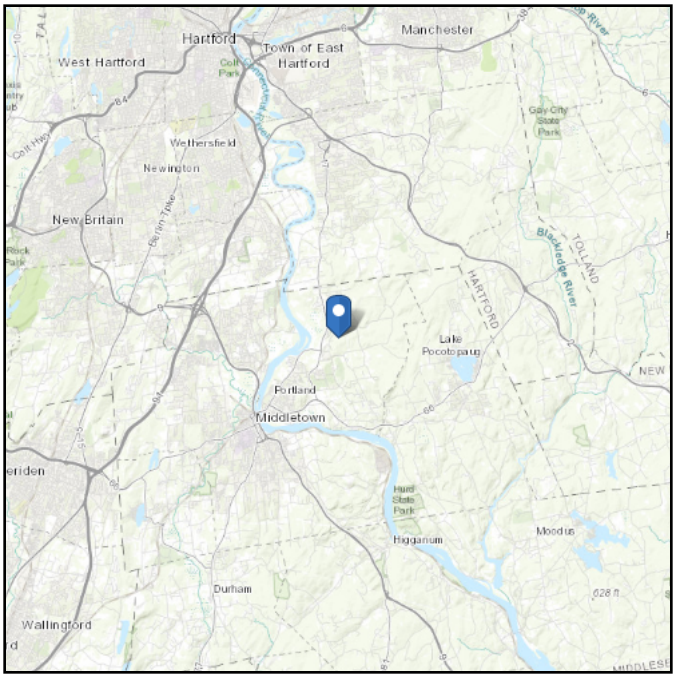
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	1	1	100	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	1	6	5	110	150	0	34	0.187	0.187				6	Cohesionless
3	6	9.5	3.5	115	150	0	38	0.702	0.702				11	Cohesionless
4	9.5	20	10.5	145	150	0	45	1.780	1.780			30	50	Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 316.81 ft (NAVD 88)
Latitude: 41.608306
Longitude: -72.591544



Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	91 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: Thu Jun 30 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.

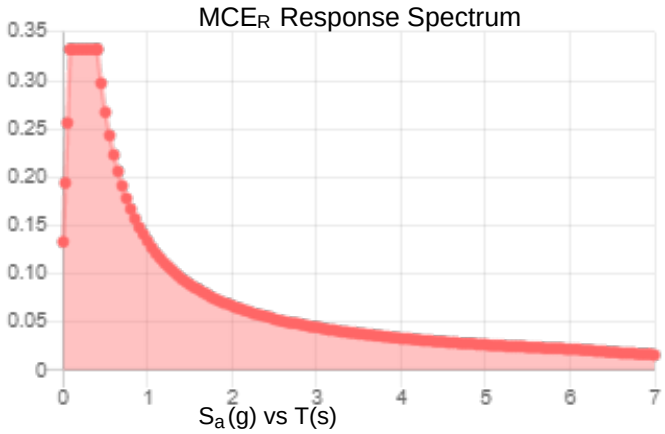
Seismic

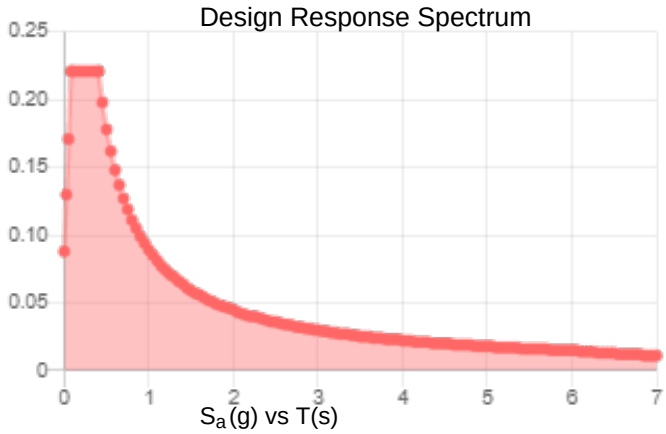
Site Soil Class: D - Default (see Section 11.4.3)

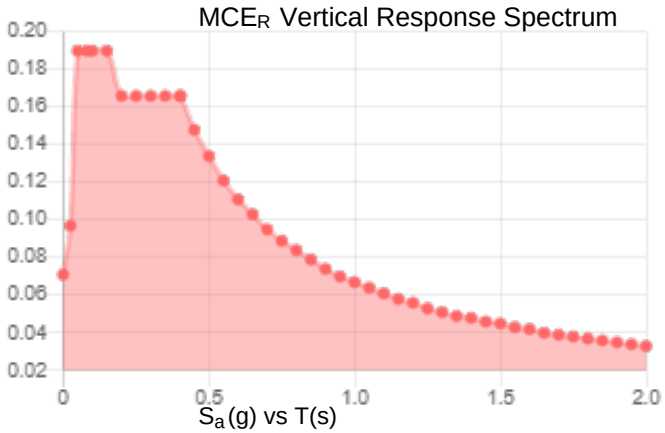
Results:

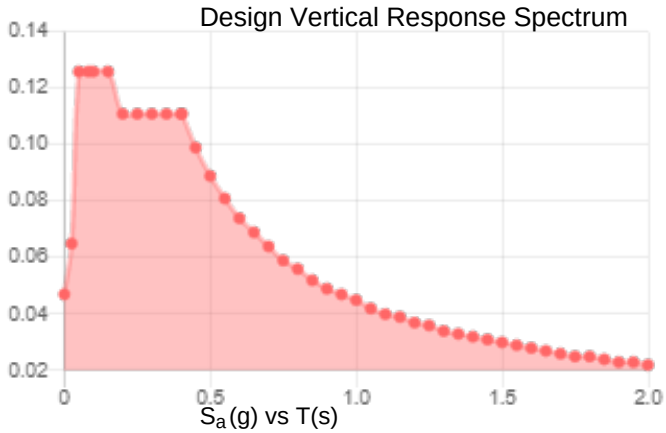
S_S :	0.207	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.115
F_v :	2.4	PGA_M :	0.18
S_{MS} :	0.332	F_{PGA} :	1.57
S_{M1} :	0.134	I_e :	1
S_{DS} :	0.221	C_v :	0.715

Seismic Design Category B









Data Accessed: **Thu Jun 30 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Jun 30 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: **June 28, 2022**

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

Subject:	**Mount Analysis - Conditional Passing Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11252A
	Carrier Site Name:	Portland Rt. 66/Rt. 151
Crown Castle Designation:	**BU Number:**	806382
	Site Name:	HRT 082 943274
	JDE Job Number:	721478
	Order Number:	621455 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	212129
Site Data:	**74 Goodrich Lane, Portland, Middlesex County, CT, 06480**	
	Latitude 41°36'29.9" Longitude -72°35'29.56"	
Structure Information:	**Tower Height & Type:**	**160.0 ft Monopole**
	Mount Elevation:	**150.0 ft**
	Mount Width & Type:	**12.5 ft Platform**

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

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

Platform **Sufficient***

***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Ioana Gurgu

Respectfully Submitted by:
Cliff Abernathy, P.E.

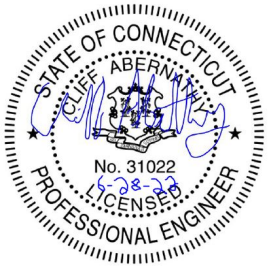


TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 12.5 ft Platform, previously analyzed by Trylon.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.50 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.180
Seismic S_1:	0.063
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
150.0	152.0	3	Commscope	VV-65B-R1_TMO	12.5 ft Platform
		3	Ericsson	AIR 6419 B41_TMO	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO	
		3	Ericsson	Radio 4480_TMOV2	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	621455, Rev. 0	CCI Sites
Structural Analysis Report	B+T Group	994464	CCI Sites
Exposure Category Determination	Crown Castle	613955	CCI Sites
Mount Analysis Report	Trylon	994226	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)	MP4	150.0	60.7	Pass
	Horizontal(s)	H1		59.0	Pass
	Standoff(s)	M16		77.5	Pass
	Bracing(s)	M23		73.1	Pass
	Handrail(s)	M19		61.0	Pass
	Plate(s)	M9		53.7	Pass
	Mount Connection(s)	-		61.5	Pass

Structure Rating (max from all components) =	77.5%

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. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. In order to install the new RFS/Celwave / APXVAALL24_43-U-NA20_TMO antennas replace the existing pipe mount from position #4 for each sector with new 2.375" O.D., Sch. 40, 96" long pipe. The new pipes will be connected to the each face horizontal with (2) 1/2" U-bolts (4 U-bolts per pipe).
2. Installation of (4) new 1/2" U-bolts for the existing pipes from positions #2 and #3, on each sector.

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

APPENDIX A

WIRE FRAME AND RENDERED MODELS

Envelope Only Solution

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IG		June 28, 2022 at 5:10 PM
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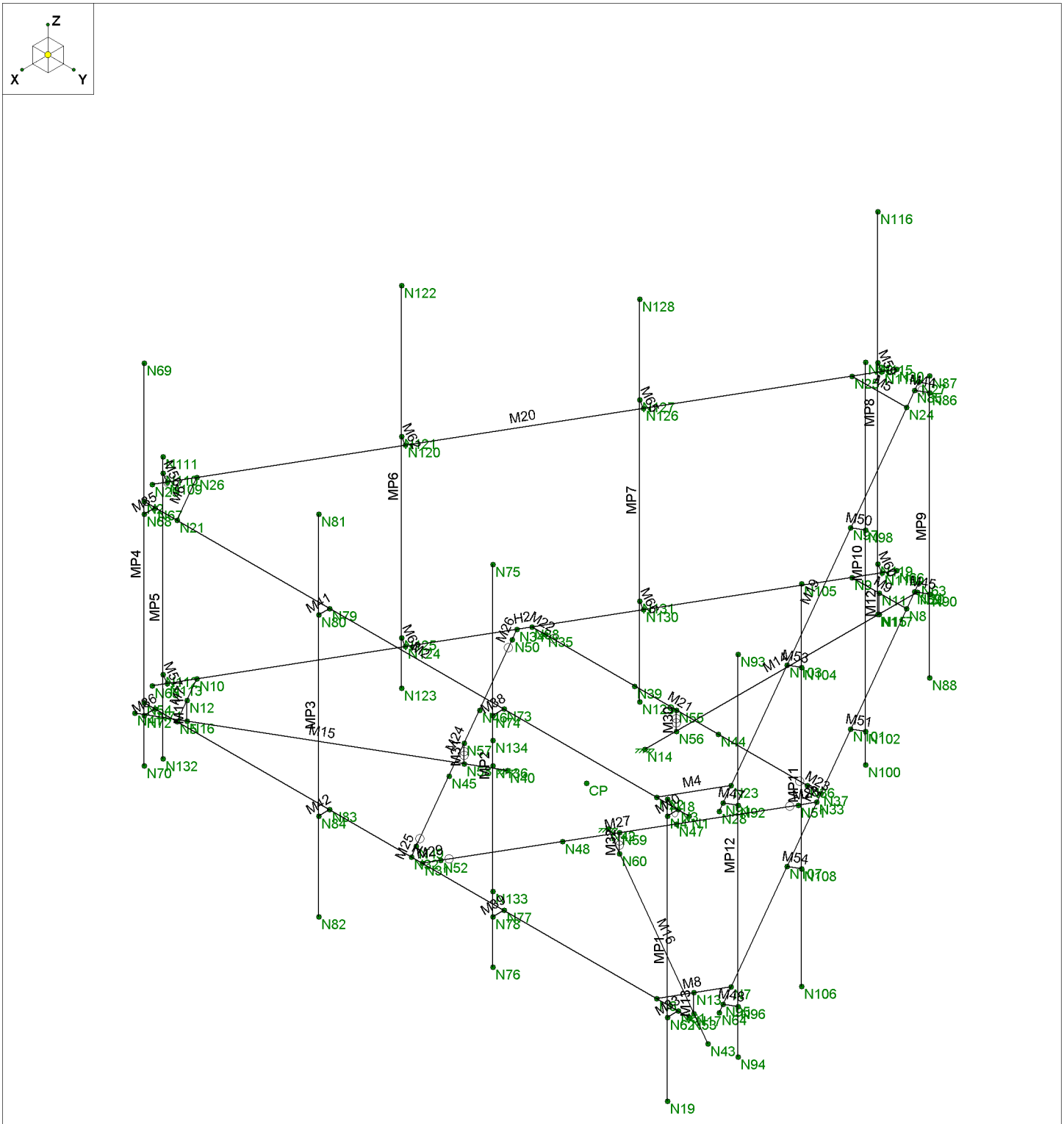

Envelope Only Solution

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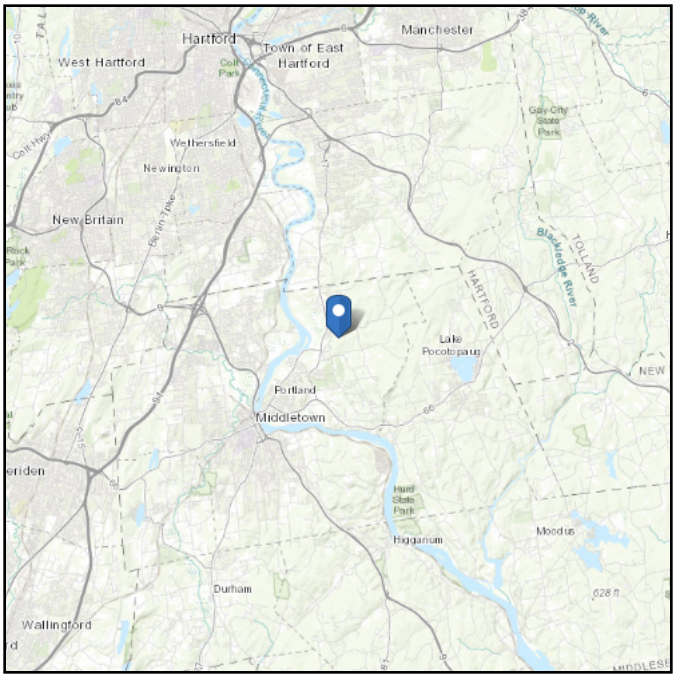
APPENDIX B

SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	316.81 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.608306
Soil Class:	D - Stiff Soil	**Longitude:**	-72.591544



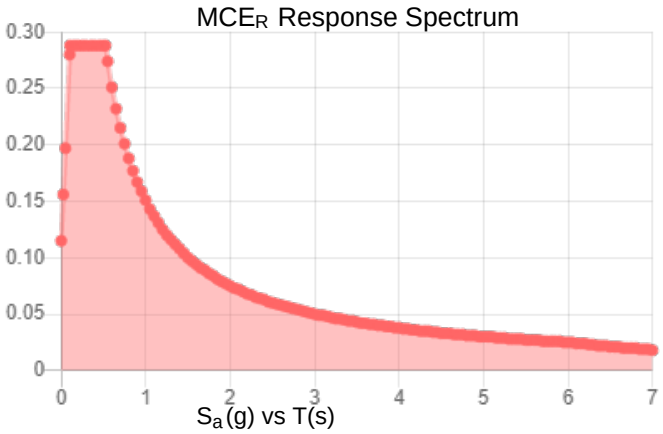
Seismic

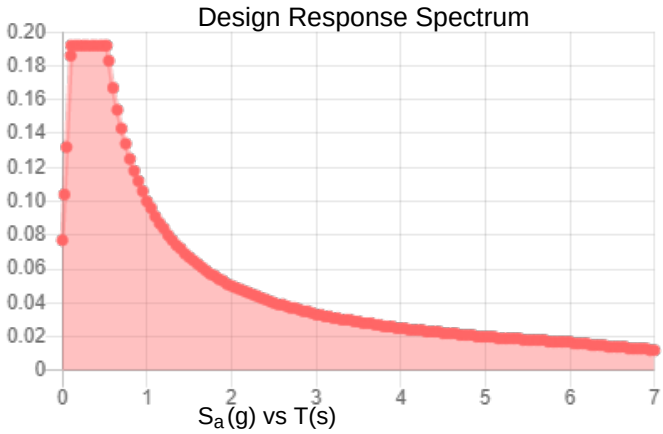
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.18	S_{DS} :	0.192
S_1 :	0.063	S_{D1} :	0.1
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.288	PGA_M :	0.146
S_{M1} :	0.151	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: **Mon Jun 27 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Jun 27 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 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	212129
Carrier Site ID:	CT11252A
Carrier Site Name:	Portland Rt 66/Rt. 151

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	2018 CSBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	150.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	160.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	316.81	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	130	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.11	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	45.09	psf
Ground Elevation Factor (K_e):	0.99	--

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}):	6.99	psf
Mount Ice Thickness (t_{iz}):	1.75	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	81.15	psf
Round Member Pressure:	48.69	psf
Ice Wind Pressure:	7.55	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.180	g
1 Second Accel (S_1):	0.063	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.10	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

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

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

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

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

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

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA$_N$ (ft2)	EPA$_T$ (ft2)	Weight (lbs)
AIR 6419 B41_TMO	3	152	No Ice	7	2.83	96.50
--	--	--	w/ Ice	8.69	4.17	171.83
APXVAALL24_43-U-NA20_TMO	3	152	No Ice	14.67	5.32	149.90
--	--	--	w/ Ice	17.04	7.41	428.34
VV-65B-R1_TMO	3	152	No Ice	7.92	3.80	41.67
--	--	--	w/ Ice	9.06	4.90	174.90
RADIO 4460 B2/B25 B66_TMO	3	152	No Ice	2.14	1.69	109.00
--	--	--	w/ Ice	2.59	2.09	91.14
Radio 4480_TMOV2	3	152	No Ice	2.88	1.40	81.00
--	--	--	w/ Ice	3.40	1.82	90.42
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			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			
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			w/ Ice			
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			w/ Ice			
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			w/ Ice			
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			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 6419 B41_TMO	3	152	1.00	1.11	0.95	1.75	45.26	6.69
XVAALL24_43-U-NA20_T	3	152	1.00	1.11	0.95	1.75	45.26	6.69
VV-65B-R1_TMO	3	152	1.00	1.11	0.95	1.75	45.26	6.69
ADIO 4460 B2/B25 B66_TM	3	152	1.00	1.11	0.95	1.75	45.26	6.69
Radio 4480_TMOV2	3	152	1.00	1.11	0.95	1.75	45.26	6.69

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	*Qty.*	--	*0°* *180°*	*30°* *210°*	*60°* *240°*	*90°* *270°*	*120°* *300°*	*150°* *330°*
AIR 6419 B41_TMO	3	No Ice	285.12	157.73	242.66	115.27	242.66	157.73
--	--	w/ Ice	52.33	31.92	45.53	25.12	45.53	31.92
APXVAALL24_43-U-NA20_TMC	3	No Ice	597.52	311.90	502.32	216.69	502.32	311.90
--	--	w/ Ice	102.66	59.13	88.15	44.62	88.15	59.13
VV-65B-R1_TMO	3	No Ice	322.45	196.57	280.49	154.61	280.49	196.57
--	--	w/ Ice	54.56	35.79	48.31	29.54	48.31	35.79
RADIO 4460 B2/B25 B66_TMO	3	No Ice	87.13	73.28	82.51	68.67	82.51	73.28
--	--	w/ Ice	15.58	13.36	14.84	12.62	14.84	13.36
Radio 4480_TMOV2	3	No Ice	117.24	71.99	102.15	56.90	102.15	71.99
--	--	w/ Ice	20.47	13.34	18.09	10.96	18.09	13.34
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		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						
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		No Ice						
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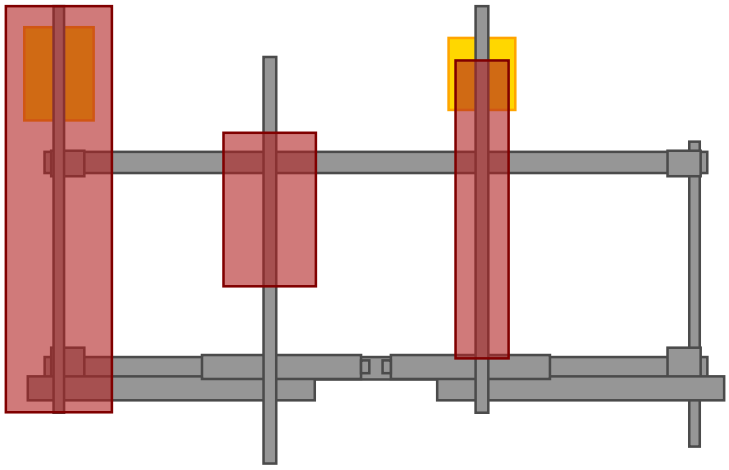
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
AIR 6419 B41_TMO	3	152	96.5	11.12
APXVAALL24_43-U-NA20_TMO	3	152	149.9	17.27
VV-65B-R1_TMO	3	152	41.67	4.80
RADIO 4460 B2/B25 B66_TMO	3	152	109	12.56
Radio 4480_TMOV2	3	152	81	9.33

ELEVATION VIEW

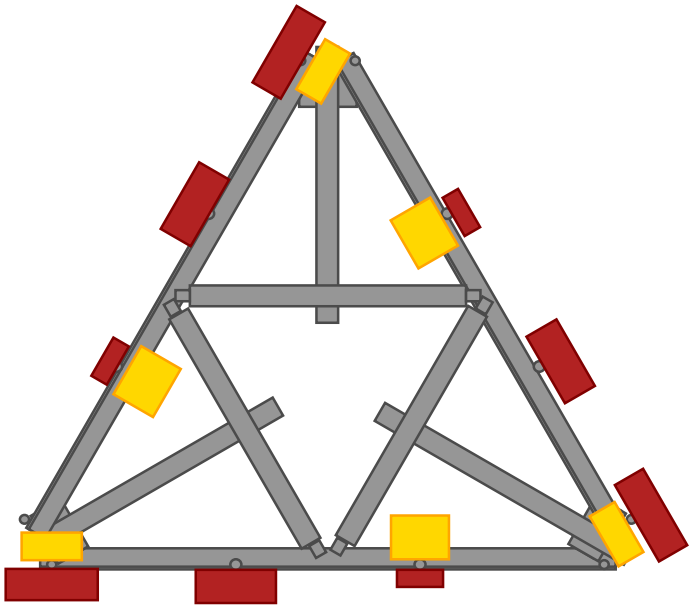


MP4 MP3 MP2 MP1

*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 6419 B41_TMO	3	152	MP3/MP7/MP11	60/180/300
APXVAALL24_43-U-NA20_TMO	3	152	MP4/MP8/MP12	60/180/300
VV-65B-R1_TMO	3	152	MP2/MP6/MP10	60/180/300
RADIO 4460 B2/B25 B66_TMO	3	152	MP2/MP6/MP10	60/180/300
Radio 4480_TMOV2	3	152	MP4/MP8/MP12	60/180/300

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 (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	a325	29000	11154	.3	.65	.49	89	1.5	105	1.2
2	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
4	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
5	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
6	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
7	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
8	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
9	SAE J429, Gr 2	29000	11154	.3	.65	.49	57	1.5	74	1.2

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 L...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	C5X6.7	C5X6.7	Beam	Channel	A36 Gr.36	Typical	1.97	.47	7.48	.055
2	HSS4X4X4	HSS4X4X4	Beam	Tube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
3	L4X4X4	L4X4X4	Beam	Single A...	A36 Gr.36	Typical	1.93	3	3	.044
4	LL2.5x2.5x4	LL2.5x2.5x4x0	Beam	Double A...	A36 Gr.36	Typical	2.38	2.57	1.38	.052
5	Pl 3"x0.375"	Pl 3"x0.375"	Beam	RECT	A36 Gr.36	Typical	1.125	.013	.844	.049

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design L...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
6	PIPE_2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	PIPE_2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
8	Pl 6"x0.5"	Pl 6"x0.5"	Beam	RECT	A36 Gr.36	Typical	3	.063	9	.237
9	Pl 9"x0.5"	Pl 9"x0.5"	Beam	RECT	A36 Gr.36	Typical	4.5	.094	30.375	.362

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1	162T125-18	Beam	None	A653 SS ...	Typical	.078	.013	.042	9e-6

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	N14	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N40	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N42	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Self Weight	DL			-1		24		6	
2	Structure Wind X	WLX						66		
3	Structure Wind Y	WLY						66		
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	66	6	
13	Ice Structure Wind X	OL2						66		
14	Ice Structure Wind Y	OL3						66		
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	-.115				24			
24	Seismic Load Y	ELY		-.115			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			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			
34	Maintenance Load 1 (Lm)	None					1			
35	Maintenance Load 2 (Lm)	None					1			
36	Maintenance Load 3 (Lm)	None					1			
37	Maintenance Load 4 (Lm)	None					1			
38	Maintenance Load 5 (Lm)	None					1			
39	Maintenance Load 6 (Lm)	None					1			
40	Maintenance Load 7 (Lm)	None					1			
41	Maintenance Load 8 (Lm)	None					1			
42	Maintenance Load 9 (Lm)	None					1			
43	Maintenance Load 10 (Lm)	None					1			
44	Maintenance Load 11 (Lm)	None					1			
45	Maintenance Load 12 (Lm)	None					1			
46	BLC 1 Transient Area Loads	None						76		
47	BLC 12 Transient Area Loads	None						76		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4DL	Yes	Y		DL	1.4																				
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3		4	1														
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1														
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1														
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1														
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1														
7	1.2DL + 1WL 120 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1														
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-.707	3	.707	10	1														
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-.866	3	.5	11	1														
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1														
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1														
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1														
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1														
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1														
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1														
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1WL 330 AZI	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1														
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1														
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1														
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1														
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1														
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1														
23	0.9DL + 1WL 120 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1														

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1DLi + 1WLi 0 ...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1DLi + 1WLi 30...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1DLi + 1WLi 45...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1DLi + 1WLi 60...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1DLi + 1WLi 90...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1DLi + 1WLi 12...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1DLi + 1WLi 13...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1DLi + 1WLi 15...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1DLi + 1WLi 18...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1WLi 21...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1DLi + 1WLi 22...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1DLi + 1WLi 24...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1DLi + 1WLi 27...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1WLi 30...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1DLi + 1WLi 31...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1DLi + 1WLi 33...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2Sds)DL + 1E 0 ...	Yes	Y		DL	1.2...	23	1	24																	
51	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.866	24	.5																
52	(1.2+0.2Sds)DL + 1E 4...	Yes	Y		DL	1.2...	23	.707	24	.707																
53	(1.2+0.2Sds)DL + 1E 6...	Yes	Y		DL	1.2...	23	.5	24	.866																
54	(1.2+0.2Sds)DL + 1E 9...	Yes	Y		DL	1.2...	23		24	1																
55	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.5	24	.866																
56	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.707	24	.707																
57	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.866	24	.5																
58	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-1	24																	
59	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.866	24	-.5																
60	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.707	24	-.707																
61	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.5	24	-.866																
62	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23		24	-1																
63	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.5	24	-.866																
64	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.707	24	-.707																
65	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.866	24	-.5																
66	(0.9-0.2Sds)DL + 1E 0 ...	Yes	Y		DL	.862	23	1	24																	
67	(0.9-0.2Sds)DL + 1E 30...	Yes	Y		DL	.862	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1E 45...	Yes	Y		DL	.862	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1E 60...	Yes	Y		DL	.862	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1E 90...	Yes	Y		DL	.862	23		24	1																
71	(0.9-0.2Sds)DL + 1E 12...	Yes	Y		DL	.862	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1E 13...	Yes	Y		DL	.862	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1E 15...	Yes	Y		DL	.862	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1E 18...	Yes	Y		DL	.862	23	-1	24																	
75	(0.9-0.2Sds)DL + 1E 21...	Yes	Y		DL	.862	23	-.866	24	-.5																
76	(0.9-0.2Sds)DL + 1E 22...	Yes	Y		DL	.862	23	-.707	24	-.707																
77	(0.9-0.2Sds)DL + 1E 24...	Yes	Y		DL	.862	23	-.5	24	-.866																
78	(0.9-0.2Sds)DL + 1E 27...	Yes	Y		DL	.862	23		24	-1																
79	(0.9-0.2Sds)DL + 1E 30...	Yes	Y		DL	.862	23	.5	24	-.866																
80	(0.9-0.2Sds)DL + 1E 31...	Yes	Y		DL	.862	23	.707	24	-.707																
81	(0.9-0.2Sds)DL + 1E 33...	Yes	Y		DL	.862	23	.866	24	-.5																
82	1.2DL + 1Lv1	Yes	Y		DL	1.2	25	1.5																		

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
83	1.2DL + 1Lv2	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1Lv3	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1Lv4	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1Lv5	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1Lv6	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1Lv7	Yes	Y		DL	1.2	31	1.5																		
89	1.2DL + 1Lv8	Yes	Y		DL	1.2	32	1.5																		
90	1.2DL + 1Lv9	Yes	Y		DL	1.2	33	1.5																		
91	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.053	3		4	.053												
92	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.046	3	.027	5	.053												
93	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.038	3	.038	6	.053												
94	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.027	3	.046	7	.053												
95	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2		3	.053	8	.053												
96	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.027	3	.046	9	.053												
97	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.038	3	.038	10	.053												
98	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.046	3	.027	11	.053												
99	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.053	3		4	-.053												
100	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.046	3	-.027	5	-.053												
101	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.038	3	-.038	6	-.053												
102	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	-.027	3	-.046	7	-.053												
103	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2		3	-.053	8	-.053												
104	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.027	3	-.046	9	-.053												
105	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.038	3	-.038	10	-.053												
106	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	34	1.5	2	.046	3	-.027	11	-.053												
107	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.053	3		4	.053												
108	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.046	3	.027	5	.053												
109	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.038	3	.038	6	.053												
110	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.027	3	.046	7	.053												
111	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2		3	.053	8	.053												
112	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.027	3	.046	9	.053												
113	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.038	3	.038	10	.053												
114	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.046	3	.027	11	.053												
115	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.053	3		4	-.053												
116	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.046	3	-.027	5	-.053												
117	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.038	3	-.038	6	-.053												
118	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	-.027	3	-.046	7	-.053												
119	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2		3	-.053	8	-.053												
120	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.027	3	-.046	9	-.053												
121	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.038	3	-.038	10	-.053												
122	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	35	1.5	2	.046	3	-.027	11	-.053												
123	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.053	3		4	.053												
124	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.046	3	.027	5	.053												
125	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.038	3	.038	6	.053												
126	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.027	3	.046	7	.053												
127	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2		3	.053	8	.053												
128	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.027	3	.046	9	.053												
129	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.038	3	.038	10	.053												
130	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.046	3	.027	11	.053												
131	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.053	3		4	-.053												
132	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.046	3	-.027	5	-.053												
133	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.038	3	-.038	6	-.053												
134	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	-.027	3	-.046	7	-.053												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
135	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2		3	-.053	8	-.053											
136	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.027	3	-.046	9	-.053											
137	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.038	3	-.038	10	-.053											
138	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	36	1.5	2	.046	3	-.027	11	-.053											
139	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.053	3		4	.053											
140	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.046	3	.027	5	.053											
141	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.038	3	.038	6	.053											
142	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.027	3	.046	7	.053											
143	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2		3	.053	8	.053											
144	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.027	3	.046	9	.053											
145	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.038	3	.038	10	.053											
146	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.046	3	.027	11	.053											
147	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.053	3		4	-.053											
148	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.046	3	-.027	5	-.053											
149	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.038	3	-.038	6	-.053											
150	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	-.027	3	-.046	7	-.053											
151	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2		3	-.053	8	-.053											
152	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.027	3	-.046	9	-.053											
153	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.038	3	-.038	10	-.053											
154	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	37	1.5	2	.046	3	-.027	11	-.053											
155	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.053	3		4	.053											
156	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.046	3	.027	5	.053											
157	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.038	3	.038	6	.053											
158	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.027	3	.046	7	.053											
159	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2		3	.053	8	.053											
160	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.027	3	.046	9	.053											
161	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.038	3	.038	10	.053											
162	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.046	3	.027	11	.053											
163	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.053	3		4	-.053											
164	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.046	3	-.027	5	-.053											
165	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.038	3	-.038	6	-.053											
166	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	-.027	3	-.046	7	-.053											
167	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2		3	-.053	8	-.053											
168	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.027	3	-.046	9	-.053											
169	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.038	3	-.038	10	-.053											
170	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	38	1.5	2	.046	3	-.027	11	-.053											
171	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.053	3		4	.053											
172	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.046	3	.027	5	.053											
173	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.038	3	.038	6	.053											
174	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.027	3	.046	7	.053											
175	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2		3	.053	8	.053											
176	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.027	3	.046	9	.053											
177	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.038	3	.038	10	.053											
178	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.046	3	.027	11	.053											
179	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.053	3		4	-.053											
180	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.046	3	-.027	5	-.053											
181	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.038	3	-.038	6	-.053											
182	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	-.027	3	-.046	7	-.053											
183	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2		3	-.053	8	-.053											
184	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.027	3	-.046	9	-.053											
185	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.038	3	-.038	10	-.053											
186	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	39	1.5	2	.046	3	-.027	11	-.053											

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
187	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.053	3		4	.053											
188	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.046	3	.027	5	.053											
189	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.038	3	.038	6	.053											
190	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.027	3	.046	7	.053											
191	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2		3	.053	8	.053											
192	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.027	3	.046	9	.053											
193	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.038	3	.038	10	.053											
194	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.046	3	.027	11	.053											
195	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.053	3		4	-.053											
196	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.046	3	-.027	5	-.053											
197	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.038	3	-.038	6	-.053											
198	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	-.027	3	-.046	7	-.053											
199	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2		3	-.053	8	-.053											
200	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.027	3	-.046	9	-.053											
201	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.038	3	-.038	10	-.053											
202	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	40	1.5	2	.046	3	-.027	11	-.053											
203	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.053	3		4	.053											
204	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.046	3	.027	5	.053											
205	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.038	3	.038	6	.053											
206	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.027	3	.046	7	.053											
207	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2		3	.053	8	.053											
208	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.027	3	.046	9	.053											
209	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.038	3	.038	10	.053											
210	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.046	3	.027	11	.053											
211	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.053	3		4	-.053											
212	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.046	3	-.027	5	-.053											
213	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.038	3	-.038	6	-.053											
214	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	-.027	3	-.046	7	-.053											
215	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2		3	-.053	8	-.053											
216	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.027	3	-.046	9	-.053											
217	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.038	3	-.038	10	-.053											
218	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	41	1.5	2	.046	3	-.027	11	-.053											
219	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.053	3		4	.053											
220	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.046	3	.027	5	.053											
221	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.038	3	.038	6	.053											
222	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.027	3	.046	7	.053											
223	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2		3	.053	8	.053											
224	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.027	3	.046	9	.053											
225	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.038	3	.038	10	.053											
226	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.046	3	.027	11	.053											
227	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.053	3		4	-.053											
228	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.046	3	-.027	5	-.053											
229	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.038	3	-.038	6	-.053											
230	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	-.027	3	-.046	7	-.053											
231	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2		3	-.053	8	-.053											
232	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.027	3	-.046	9	-.053											
233	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.038	3	-.038	10	-.053											
234	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	42	1.5	2	.046	3	-.027	11	-.053											
235	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.053	3		4	.053											
236	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.046	3	.027	5	.053											
237	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.038	3	.038	6	.053											
238	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.027	3	.046	7	.053											

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
239	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2		3	.053	8	.053											
240	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.027	3	.046	9	.053											
241	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.038	3	.038	10	.053											
242	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.046	3	.027	11	.053											
243	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.053	3		4	-.053											
244	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.046	3	-.027	5	-.053											
245	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.038	3	-.038	6	-.053											
246	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	-.027	3	-.046	7	-.053											
247	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2		3	-.053	8	-.053											
248	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.027	3	-.046	9	-.053											
249	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.038	3	-.038	10	-.053											
250	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	43	1.5	2	.046	3	-.027	11	-.053											
251	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.053	3		4	.053											
252	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.046	3	.027	5	.053											
253	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.038	3	.038	6	.053											
254	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.027	3	.046	7	.053											
255	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2		3	.053	8	.053											
256	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.027	3	.046	9	.053											
257	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.038	3	.038	10	.053											
258	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.046	3	.027	11	.053											
259	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.053	3		4	-.053											
260	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.046	3	-.027	5	-.053											
261	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.038	3	-.038	6	-.053											
262	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	-.027	3	-.046	7	-.053											
263	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2		3	-.053	8	-.053											
264	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.027	3	-.046	9	-.053											
265	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.038	3	-.038	10	-.053											
266	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	44	1.5	2	.046	3	-.027	11	-.053											
267	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.053	3		4	.053											
268	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.046	3	.027	5	.053											
269	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.038	3	.038	6	.053											
270	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.027	3	.046	7	.053											
271	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2		3	.053	8	.053											
272	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.027	3	.046	9	.053											
273	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.038	3	.038	10	.053											
274	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.046	3	.027	11	.053											
275	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.053	3		4	-.053											
276	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.046	3	-.027	5	-.053											
277	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.038	3	-.038	6	-.053											
278	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	-.027	3	-.046	7	-.053											
279	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2		3	-.053	8	-.053											
280	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.027	3	-.046	9	-.053											
281	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.038	3	-.038	10	-.053											
282	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	45	1.5	2	.046	3	-.027	11	-.053											

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	N14	max	870.037	18	713.973	22	3907.132	34	241.264	30	12146.802	2	2794.91	14
2		min	-11237.5...	42	-718.232	30	-1125.059	26	-369.894	6	-7556.015	26	-2809.415	6
3	N40	max	5638.853	48	721.061	23	3906.827	39	6353.287	31	3619.44	31	1725.985	2

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
4		min	-489.926	24	-9723.423	47	-1075.748	31	-10283.7...	7	-6043.117	7	-1721.148	10
5	N42	max	5626.134	37	9726.076	37	3904.648	45	10370.983	13	3713.179	21	1611.102	9
6		min	-555.27	29	-654.224	29	-1075.453	21	-6307.516	21	-5915.659	13	-1624.479	17
7	Totals:	max	6347.817	2	6117.394	6	10470.821	35						
8		min	-6347.817	10	-6117.395	14	2783.568	75						

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

	Member	Shape	Code Check	Loc[in]	LC	She...	Loc[in]	Dir	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M16	HSS4X4X4	.814	75	13	.119	75	y	46	67846...	139518	16180.5	16180.5	2...	H1-1b
2	M14	HSS4X4X4	.783	75	2	.119	75	y	35	67846...	139518	16180.5	16180.5	2...	H1-1b
3	M24	L4X4X4	.768	36	38	.063	36	z	10	39977....	62532	3137.5...	6065.2...	1...	H2-1
4	M27	L4X4X4	.767	36	45	.064	36	z	16	39977....	62532	3137.5...	6055.6	1...	H2-1
5	M21	L4X4X4	.761	36	34	.063	36	z	5	39977....	62532	3137.5...	6055.6...	1...	H2-1
6	M15	HSS4X4X4	.751	75	7	.120	75	y	41	67846...	139518	16180.5	16180.5	2...	H1-1b
7	M19	LL2.5x2.5x4x0	.641	100	14	.568	7.812	y	8	17892....	77112	4440.96	2750.7...	2...	H1-1b
8	MP4	PIPE_2.0	.637	36	10	.234	36		11	14916....	32130	1871.6...	1871.6...	1	H1-1b
9	MP12	PIPE_2.0	.635	36	15	.233	36		17	14916....	32130	1871.6...	1871.6...	1...	H1-1b
10	MP8	PIPE_2.0	.635	36	5	.239	36		6	14916....	32130	1871.6...	1871.6...	1	H1-1b
11	M2	LL2.5x2.5x4x0	.623	100	9	.568	7.813	y	2	17892....	77112	4440.96	2750.7...	2...	H1-1b
12	MP10	PIPE_2.5	.613	88	4	.140	88		17	30038....	50715	3596.25	3596.25	1	H1-1b
13	M20	LL2.5x2.5x4x0	.612	100	3	.570	7.812	y	13	17892....	77112	4440.96	2750.7...	2...	H1-1b
14	H3	C5X6.7	.594	146.875	5	.616	76.562	y	48	4719.0...	63828	1603.7...	4647.2...	1	H1-1b
15	MP6	PIPE_2.5	.594	84	9	.159	84		6	30038....	50715	3596.25	3596.25	1	H1-1b
16	H2	C5X6.7	.587	146.875	10	.616	76.562	y	37	4719.0...	63828	1603.7...	4647.2...	1	H1-1b
17	H1	C5X6.7	.581	146.875	16	.620	76.562	y	42	4719.0...	63828	1603.7...	4647.2...	1	H1-1b
18	M9	Pl 9"x0.5"	.564	7.5	34	.204	7.5	y	11	82572....	145800	1518.75	24354....	1	H1-1b
19	M7	Pl 9"x0.5"	.556	7.5	40	.204	7.5	y	17	82572....	145800	1518.75	27337.5	1...	H1-1b
20	M8	Pl 9"x0.5"	.554	7.5	45	.196	7.5	y	6	82572....	145800	1518.75	27337.5	1...	H1-1b
21	MP11	PIPE_2.5	.551	68	4	.159	68		14	30038....	50715	3596.25	3596.25	1	H1-1b
22	MP7	PIPE_2.5	.549	72	9	.142	72		2	30038....	50715	3596.25	3596.25	1	H1-1b
23	MP2	PIPE_2.5	.546	84	15	.146	84		11	30038....	50715	3596.25	3596.25	2...	H1-1b
24	MP3	PIPE_2.5	.503	72	14	.149	72		8	30038....	50715	3596.25	3596.25	1...	H1-1b
25	M4	Pl 6"x0.5"	.388	15	9	.120	0	y	9	55297....	97200	1012.5	11320....	1	H1-1b
26	M5	Pl 6"x0.5"	.386	0	14	.116	0	y	14	55297....	97200	1012.5	12150	2...	H1-1b
27	M6	Pl 6"x0.5"	.383	15	3	.119	15	y	3	55297....	97200	1012.5	11320....	1	H1-1b
28	MP9	PIPE_2.0	.333	51.75	4	.213	51.75		6	20866....	32130	1871.6...	1871.6...	1	H1-1b
29	MP5	PIPE_2.0	.327	51.75	10	.207	51.75		11	20866....	32130	1871.6...	1871.6...	1	H1-1b
30	MP1	PIPE_2.0	.308	51.75	15	.207	51.75		17	20866....	32130	1871.6...	1871.6...	2...	H1-1b
31	M29	Pl 3"x0.375"	.285	3.75	14	.095	0	y	16	34218....	36450	284.766	2267.1...	1	H1-1b
32	M25	Pl 3"x0.375"	.271	0	6	.094	3.75	y	11	34218....	36450	284.766	2267.1...	1	H1-1b
33	M23	Pl 3"x0.375"	.241	3.75	2	.092	0	y	6	34218....	36450	284.766	2267.1...	1	H1-1b
34	M22	Pl 3"x0.375"	.221	0	17	.092	3.75	y	6	34218....	36450	284.766	2267.1...	1	H1-1b
35	M26	Pl 3"x0.375"	.215	3.75	8	.094	0	y	11	34218....	36450	284.766	2267.1...	1	H1-1b
36	M28	Pl 3"x0.375"	.199	0	11	.094	3.75	y	16	34218....	36450	284.766	2267.1...	1	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

Trylon

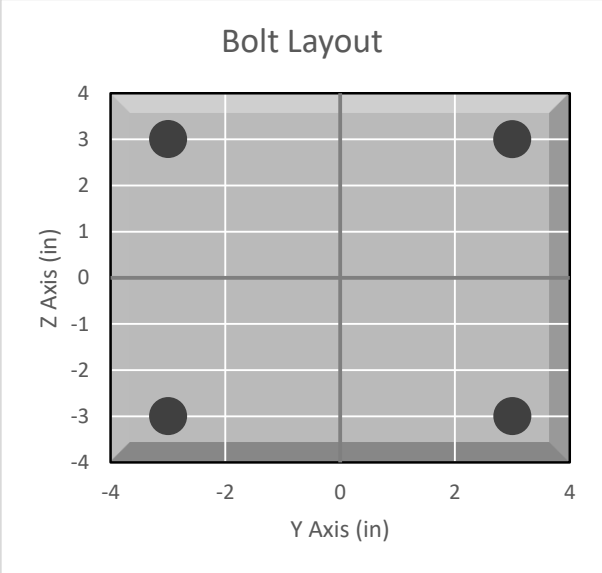
Analysis date: 6/28/2022

BOLT TOOL 1.5.2

Project Data	
Job Code:	212129
Carrier Site ID:	CT11652A
Carrier Site Name:	Portland Rt 66/Rt. 151

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

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



Connection Description
Standoff to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	13124.4	lbs
Shear Force (V_u):	809.1	lbs
Tension Usage:	61.5%	--
Shear Usage:	5.6%	--
Interaction:	61.5%	Pass
Controlling Member:	M16	--
Controlling LC:	13	--

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

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

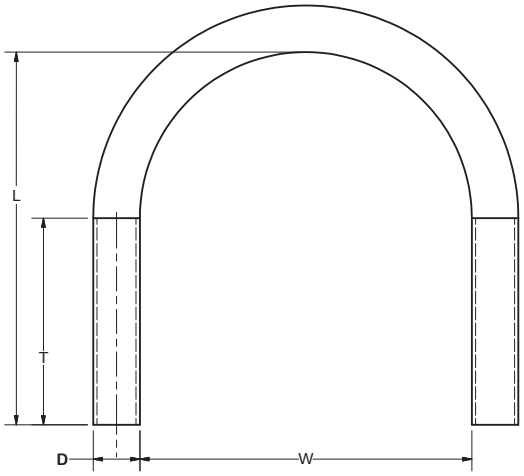
APPENDIX E

SUPPLEMENTAL DRAWINGS

SITE PRO 1

A valmont COMPANY

U-bolts



Features: Includes nuts, locks, and flat washers, long thread lengths. Hot-dip galvanized.

Construction: SAE J429 Gr. 2. Coarse threads.

Design Criteria: Conforms to the minimum requirements as stated in SAE J429 (Latest Revision) Grade 2 Stud, Rolled or Cut CNC threads. SAE J429 Grade 2 (Yield Fy = 57 ksi / Tensile Fu = 74 ksi). All finished goods are Hot Dip Galvanized in accordance with ASTM A123 requirements.

Part #	Diameter (D)	Width (W)	Length (L)	Thread (T)	Weight
UB3200	3/8”	2”	3”	1-1/4”	0.40 lb.
UB3212	3/8”	2-1/2”	3-5/8”	1-3/4”	0.45 lb.
UB3300	3/8”	3”	4-1/4”	2”	0.50 lb.
UB3312	3/8”	3-1/2”	4-3/4”	2”	0.50 lb.
UB3418	3/8”	4”	5-3/4”	2-1/2”	0.60 lb.
UB1400	1/2”	2”	4”	2”	0.65 lb.
UB1212	1/2”	2-1/2”	4-1/2”	2”	0.65 lb.
UB1300	1/2”	3”	5”	2”	0.70 lb.
UB1358	1/2”	3-5/8”	5-1/2”	3”	0.75 lb.
UB1306	1/2”	3-5/8”	6”	3”	0.80 lb.
UB1418	1/2”	4-1/8”	6”	3”	0.90 lb.
UB1458	1/2”	4-5/8”	7”	3”	0.90 lb.
UB5258	5/8”	2-5/8”	4-1/2”	2”	1.20 lb.
UB5358	5/8”	3-5/8”	6”	3”	1.45 lb.
UB5458	5/8”	4-5/8”	7”	3”	1.60 lb.

valmont
PiROD
MICROFLECT

New York, NY 888-438-7761
Los Angeles, CA 888-776-1937
Salem, OR 888-880-9191
Atlanta, GA 866-901-0603
Plymouth, IN 888-753-7446
Dallas, TX 888-809-5151

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

T-Mobile

Site ID: CT11252A

Portland Rt. 66/Rt. 151
74 Goodrich Lane
Portland, CT 06480

August 10, 2022

Fox Hill Telecom Project Number: 221561

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**31.64 %**

Fox Hill Telecom

August 10, 2022

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

Emissions Analysis for Site: **CT11252A – Portland Rt. 66/Rt. 151**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **74 Goodrich Lane, Portland, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). 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.

General population 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 & 700 MHz 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 2500 MHz (BRS) 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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **74 Goodrich Lane, Portland, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

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

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

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAALL24_43-U-NA20	152
A	2	Commscope VV-65B-R1	152
A	3	Ericsson AIR6419 B41	152
B	1	RFS APXVAALL24_43-U-NA20	152
B	2	Commscope VV-65B-R1	152
B	3	Ericsson AIR6419 B41	152
C	1	RFS APXVAALL24_43-U-NA20	152
C	2	Commscope VV-65B-R1	152
C	3	Ericsson AIR6419 B41	152

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.13
Antenna A2	Commscope VV-65B-R1	1900 MHz (PCS) / 2100 MHz (AWS)	16.55 / 16.85	8	320	14,976.45	2.53
Antenna A3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	3.81
						Sector A Composite MPE%	**7.47**
Antenna B1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.13
Antenna B2	Commscope VV-65B-R1	1900 MHz (PCS) / 2100 MHz (AWS)	16.55 / 16.85	8	320	14,976.45	2.53
Antenna B3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	3.81
						Sector B Composite MPE%	**7.47**
Antenna C1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.13
Antenna C2	Commscope VV-65B-R1	1900 MHz (PCS) / 2100 MHz (AWS)	16.55 / 16.85	8	320	14,976.45	2.53
Antenna C3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	3.81
						Sector C Composite MPE%	**7.47**

Table 3: T-MOBILE Emissions Levels

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

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**7.47 %**
DISH	7.83 %
AT&T	8.42 %
Verizon Wireless	7.82 %
Clearwire	0.10 %
Site Total MPE %:	**31.64 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	7.47 %
T-MOBILE Sector B Total:	7.47 %
T-MOBILE Sector C Total:	7.47 %
Site Total:	31.64 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	926.96	152	3.13	600 MHz	400	0.78%
T-Mobile 700 MHz LTE	2	485.32	152	1.64	700 MHz	467	0.35%
T-Mobile 1900 MHz (PCS) LTE	4	1,807.42	152	12.19	1900 MHz (PCS)	1000	1.22%
T-Mobile 2100 MHz (AWS) LTE	4	1,936.69	152	13.07	2100 MHz (AWS)	1000	1.31%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	2,825.08	152	38.12	2500 MHz (BRS)	1000	3.81%
						Total:	**7.47%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

The anticipated maximum composite contributions from the T-MOBILE facility as well as the site composite emissions 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:	7.47 %
Sector B:	7.47 %
Sector C:	7.47 %
T-MOBILE Maximum Total (per sector):	7.47 %
Site Total:	31.64 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **31.64 %** 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.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Holden, MA 01520
(978)660-3998

T-MOBILE SITE NUMBER: CT11252A
T-MOBILE SITE NAME: PORTLAND RT. 66/RT. 151
SITE TYPE: MONOPOLE
TOWER HEIGHT: 160'-0"
BUSINESS UNIT #: 806382
SITE ADDRESS: 74 GOODRICH LANE PORTLAND, CT 06480
COUNTY: MIDDLESEX
JURISDICTION: CONNECTICUT SITING COUNCIL

T-MOBILE ANCHOR SITE CONFIGURATION: 67E5D998E OUTDOOR

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	HRT 082 943274
SITE ADDRESS:	74 GOODRICH LANE PORTLAND, CT 06480
COUNTY:	MIDDLESEX
MAP/PARCEL #:	084/0009
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.608306°
LONGITUDE:	-72.591544°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	319'
CURRENT ZONING:	RESIDENTIAL
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:	HALE JOAN J, CROWN ATLANTIC, L.L.C PMB 353 MCMURRAY, PA 15317
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	CONNECTICUT LIGHT AND POWER COMPANY (860) 947-2000
TELCO PROVIDER:	LIGHTOWER (855) 913-4237

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:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065 TRICIA PELON - PROJECT MANAGER TRICIA.PELON@CROWNCASTLE.COM JASON D'AMICO - CONSTRUCTION MANAGER JASON.DAMICO@CROWNCASTLE.COM

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
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ATTACHED	U-BOLT SPECS

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

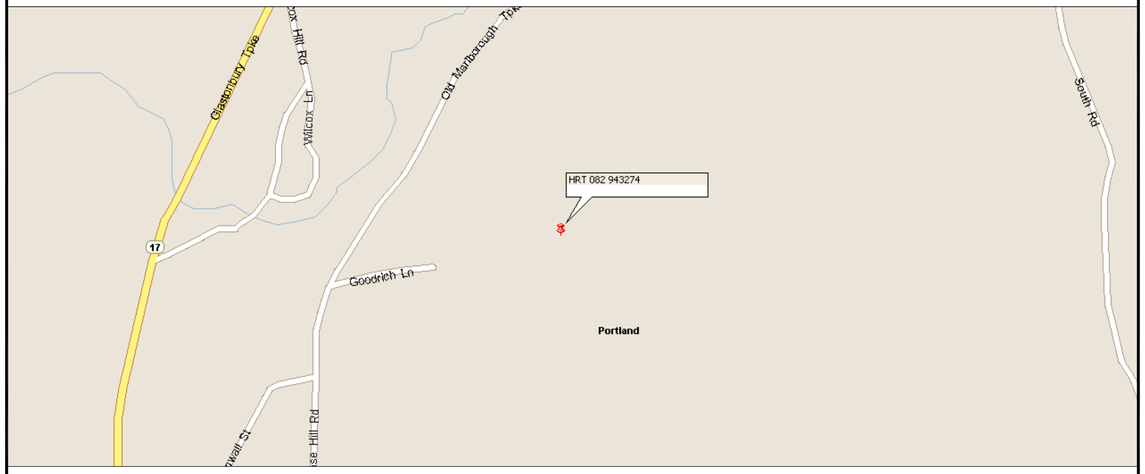
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (12) ANTENNAS
- REMOVE (18) RRHs
- REMOVE (3) TMAs
- REMOVE (6) 1-5/8" COAX CABLES
- REMOVE (1) 9x18 HCS HYBRID TRUNK
- REMOVE (4) HYBRID CABLE
- REMOVE (3) T-ARM MOUNT
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHs
- INSTALL (3) 6/24 HYBRID CABLE
- INSTALL MOUNT MODIFICATIONS PER MOUNT ANALYSIS BY TRYLON DATED JUNE 28, 2022

GROUND SCOPE OF WORK:
- REMOVE (1) DUW30 FROM RBS 6131 ODE CABINET
- REMOVE (1) BB 5216 FROM RBS 6131 ODE CABINET
- REMOVE (6) RU22 RADIOS FROM RBS 6131 ODE CABINET
- REMOVE (1) 66EC CABINET
- REMOVE (1) CDMA CABINET
- INSTALL (1) RP 6651, (1) PSU 4813 VR4A (KIT) IN RBS 6131 ODE CABINET
- INSTALL (1) 6160 AC V1 CABINET WITH (1) RP 6651, (1) PSU 4813 VR4A (KIT), (1)CSR IXRE V2 (GEN2), AND ADD 125 AMP BREAKER FOR 6160
- INSTALL SERVICE UPGRADE TO INCREASE POWER TO 200A
- INSTALL (1) B160 BATTERY CABINET

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	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	B+T GROUP
DATED:	6/30/22
MOUNT ANALYSIS:	TRYLON
DATED:	6/28/22
RFDS REVISION:	10
DATED:	4/26/22
ORDER ID:	621455
REVISION:	0

CALL CONNECTICUT ONE CALL
(800) 922-4455 CBYD.COM
CALL 2 WORKING DAYS BEFORE YOU DIG!

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
MTS TELECOM, L.L.C.
1717 S. BOULDER,
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
btwo@btgrp.com

T-MOBILE SITE NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
0	8/9/22	BLJ	CONSTRUCTION	LR
1	8/12/22	BEH	CONSTRUCTION	LR

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: T-1

REVISION: 1

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.

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, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

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).

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CROWN CASTLE

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PH: (918) 587-4630
btwo@btgrp.com

T-MOBILE SITE NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

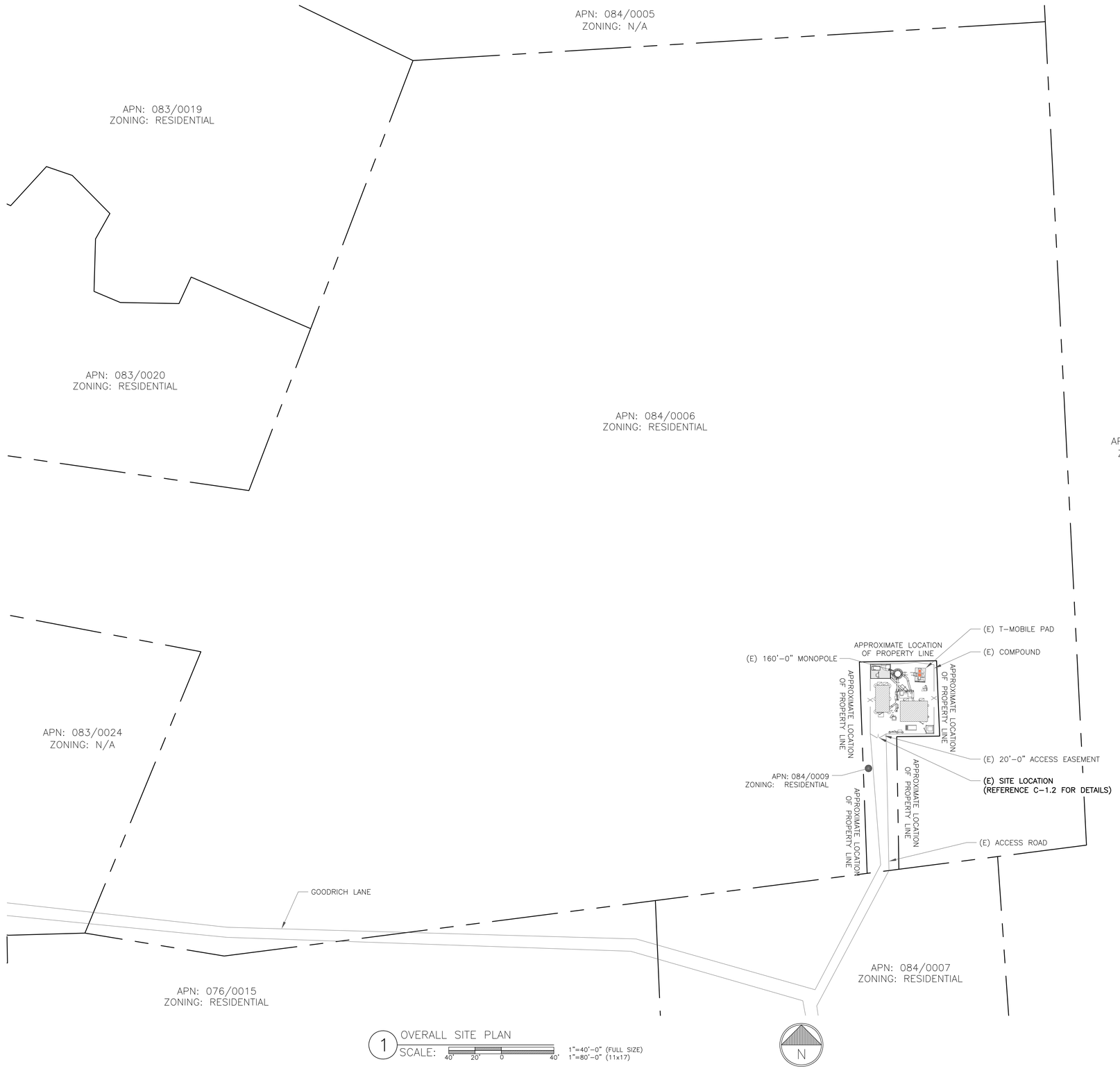
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
0	8/9/22	BLJ	CONSTRUCTION	LR
1	8/12/22	BEH	CONSTRUCTION	LR

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: T-2

REVISION: 1



1 OVERALL SITE PLAN
SCALE: 40' 20' 0 40' 1"=40'-0" (FULL SIZE) 1"=80'-0" (11x17)

SITE PLAN DISCLAIMER:

PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM TAX ASSESORS DATA. 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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T-MOBILE SITE
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160'-0" MONOPOLE

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STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

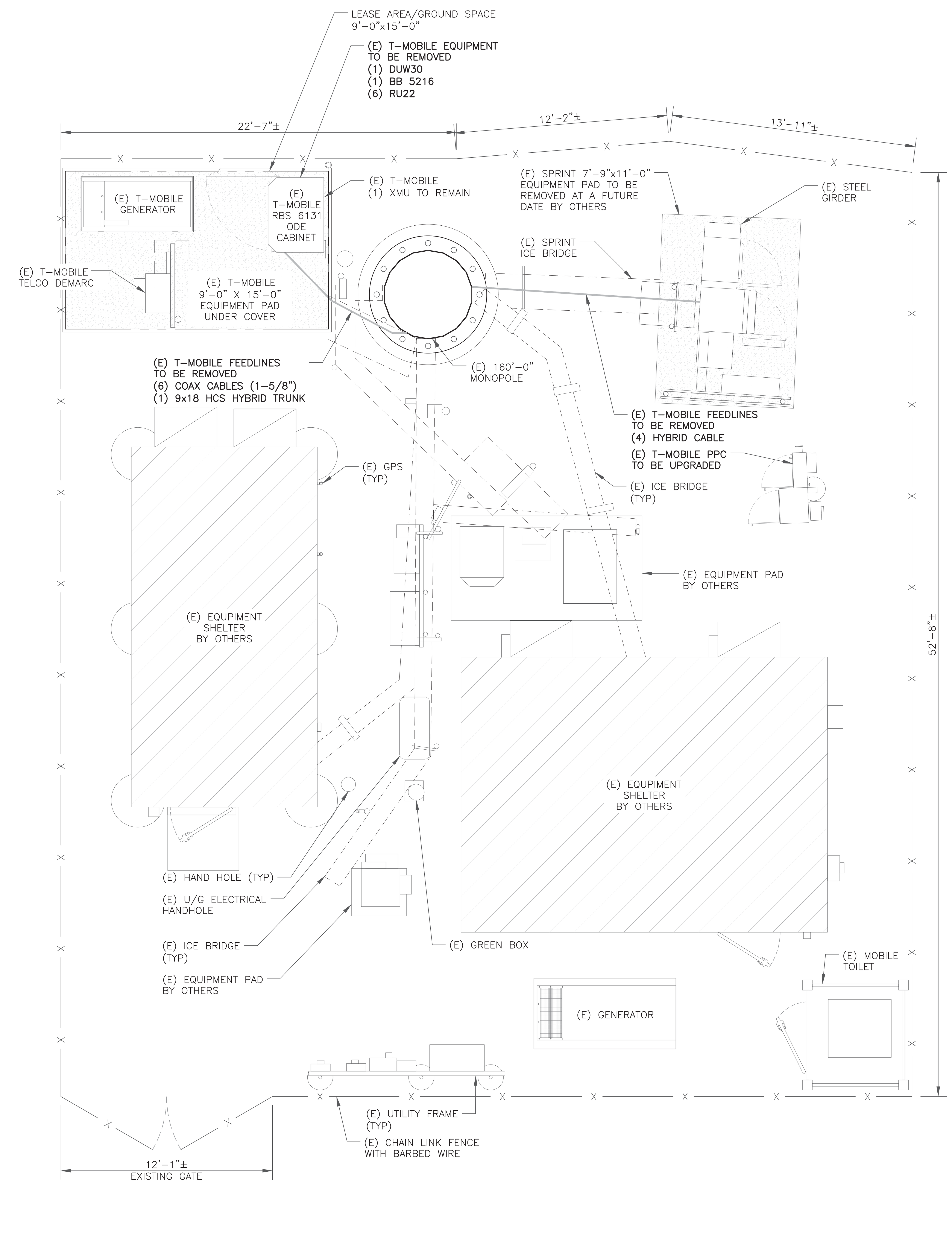
SHEET NUMBER: C-1.1

REVISION: 1

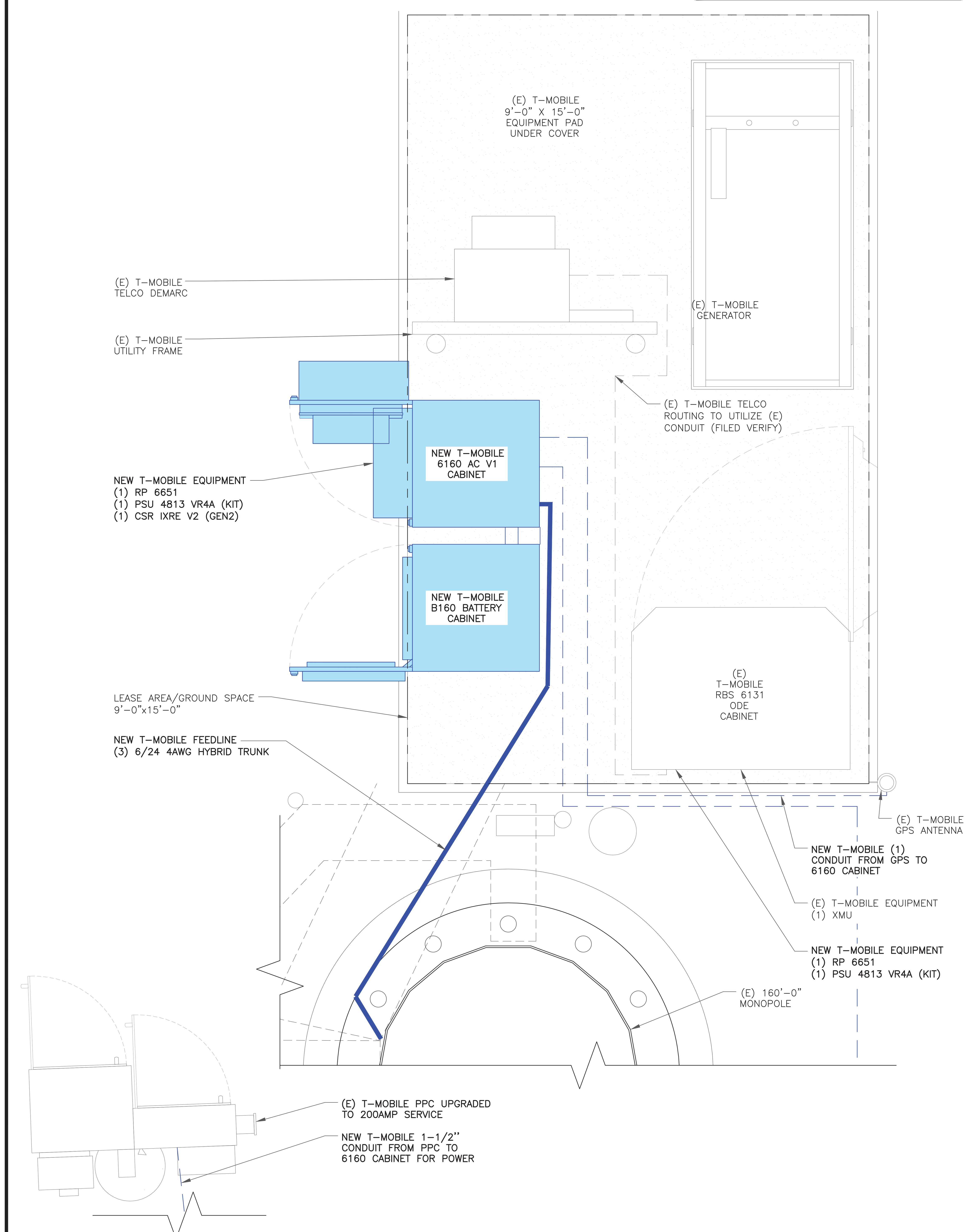
81363.025.01_806382_HRT 082 943274.dwg – Sheet:C-1.1 – User: lisa.rider – Aug 12, 2022 – 8:54pm

NOTES:

THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.



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



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

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T-MOBILE SITE NUMBER: **CT11252A**

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74 GOODRICH LANE
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EXISTING
160'-0" MONOPOLE

ISSUED FOR:

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1	8/12/22	BEH	CONSTRUCTION	LR

STATE OF CONNECTICUT LICENSED PROFESSIONAL ENGINEER No. 23024
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
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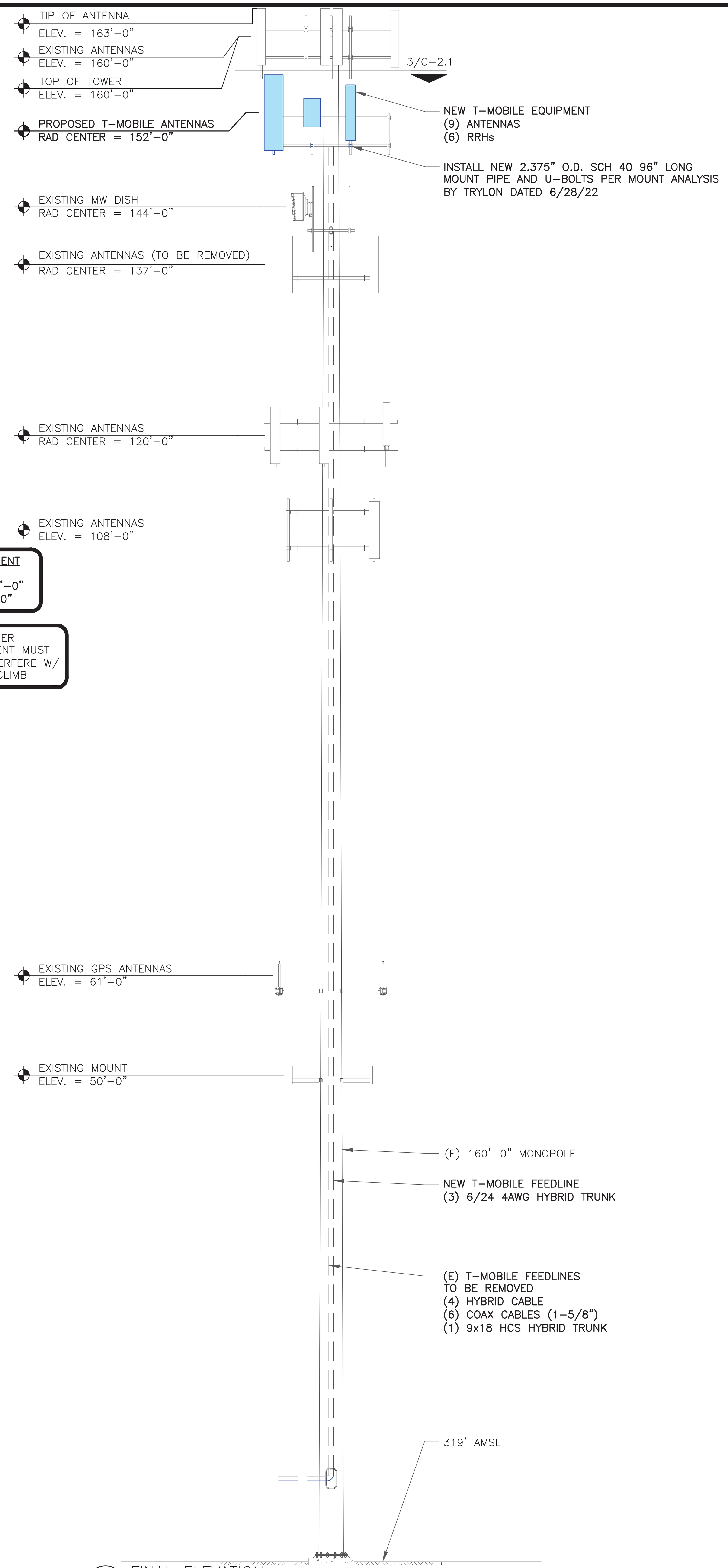
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: C-1.2

REVISION: 1

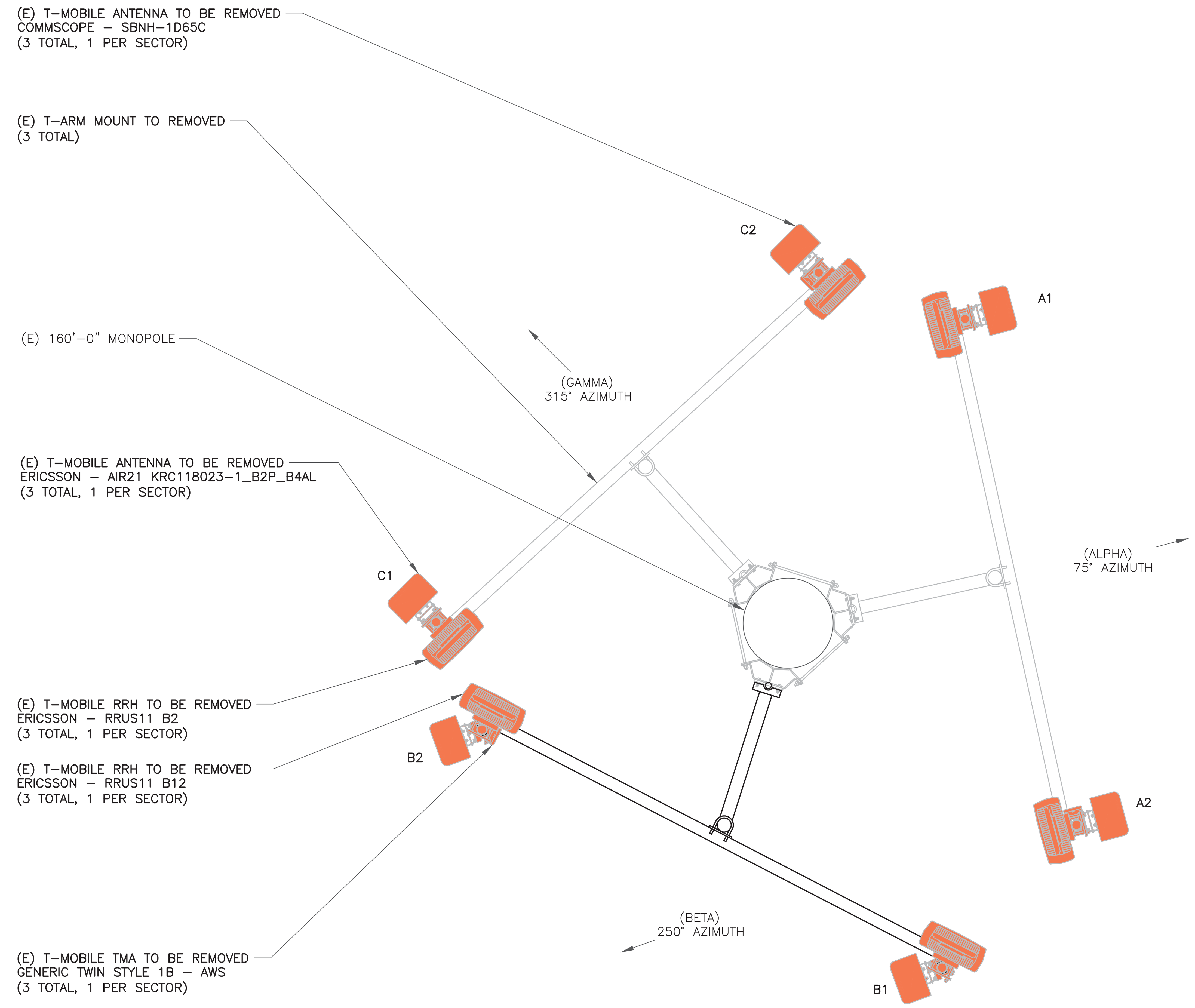


T-MOBILE EQUIPMENT

ANTENNA CL: 152'-0"
MOUNT CL: 150'-0"

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

1 FINAL ELEVATION
SCALE: 8' 6' 4' 2' 0 8' — 1/8"=1'-0" (FULL SIZE) 1/16"=1'-0" (11x17)



2 EXISTING ANTENNA LAYOUT (MCL@ 136'-0")
SCALE: 1' 6" 0 1' — 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

N

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T-MOBILE SITE NUMBER: **CT11252A**

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74 GOODRICH LANE
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EXISTING
160'-0" MONOPOLE

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STATE OF CONNECTICUT
No. 23924
LICENSED PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
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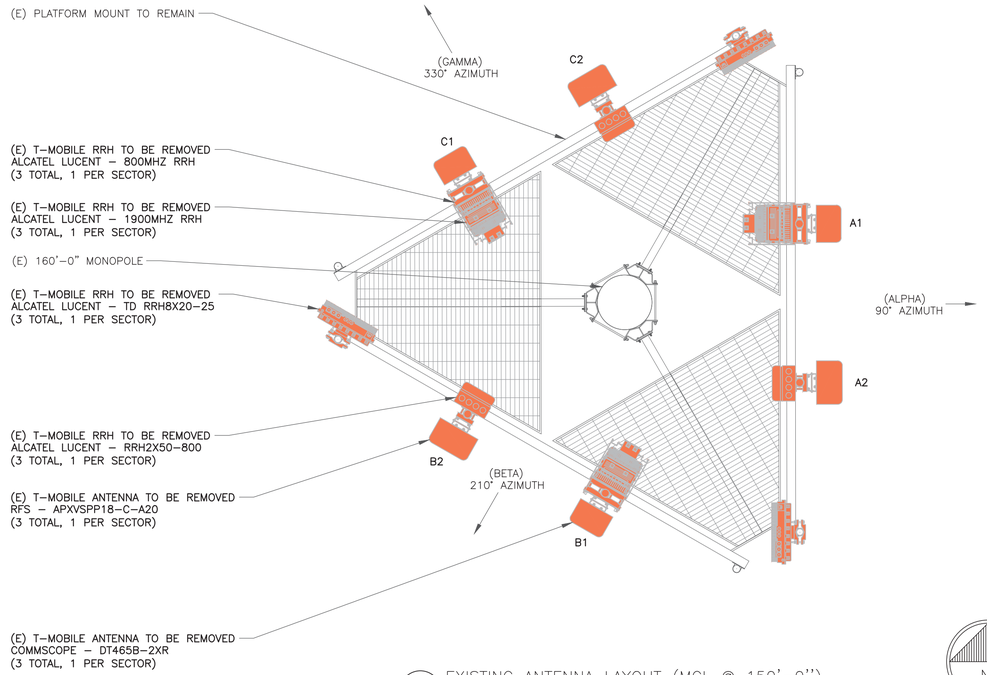
SHEET NUMBER: C-2
REVISION: 1

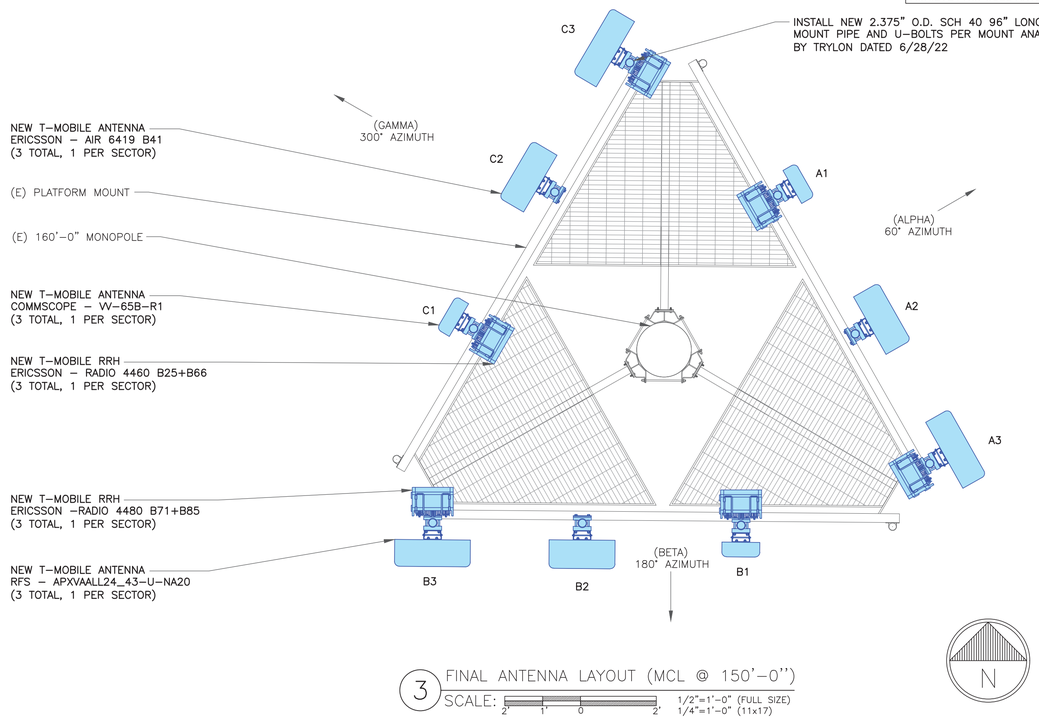


2 EXISTING ANTENNA LAYOUT (MCL @ 150'-0")
SCALE: 2' 1' 0 2' 1/2"=1'-0" (FULL SIZE) 1/4"=1'-0" (11x17)

CONTRACTOR SHALL RE-ORIENT ANTENNA MOUNT(s) AS NECESSARY TO ACHIEVE PROPOSED ANTENNA AZIMUTHS

INSTALLER NOTE:

NO PROPOSED LOADING TO BE ADDED UNTIL MOUNT MODIFICATIONS ARE INSTALLED PER MOUNT MODIFICATION DESIGN BY TRYLON DATED JUNE 28, 2022.



3 FINAL ANTENNA LAYOUT (MCL @ 150'-0")
SCALE: 2' 1' 0 2' 1/2"=1'-0" (FULL SIZE) 1/4"=1'-0" (11x17)

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T-MOBILE SITE
NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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1	8/12/22	BEH	CONSTRUCTION	LR

STATE OF CONNECTICUT
GREGORY R. ROUTHIER
No. 23024
REGISTERED
PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: C-2.1

REVISION: 1

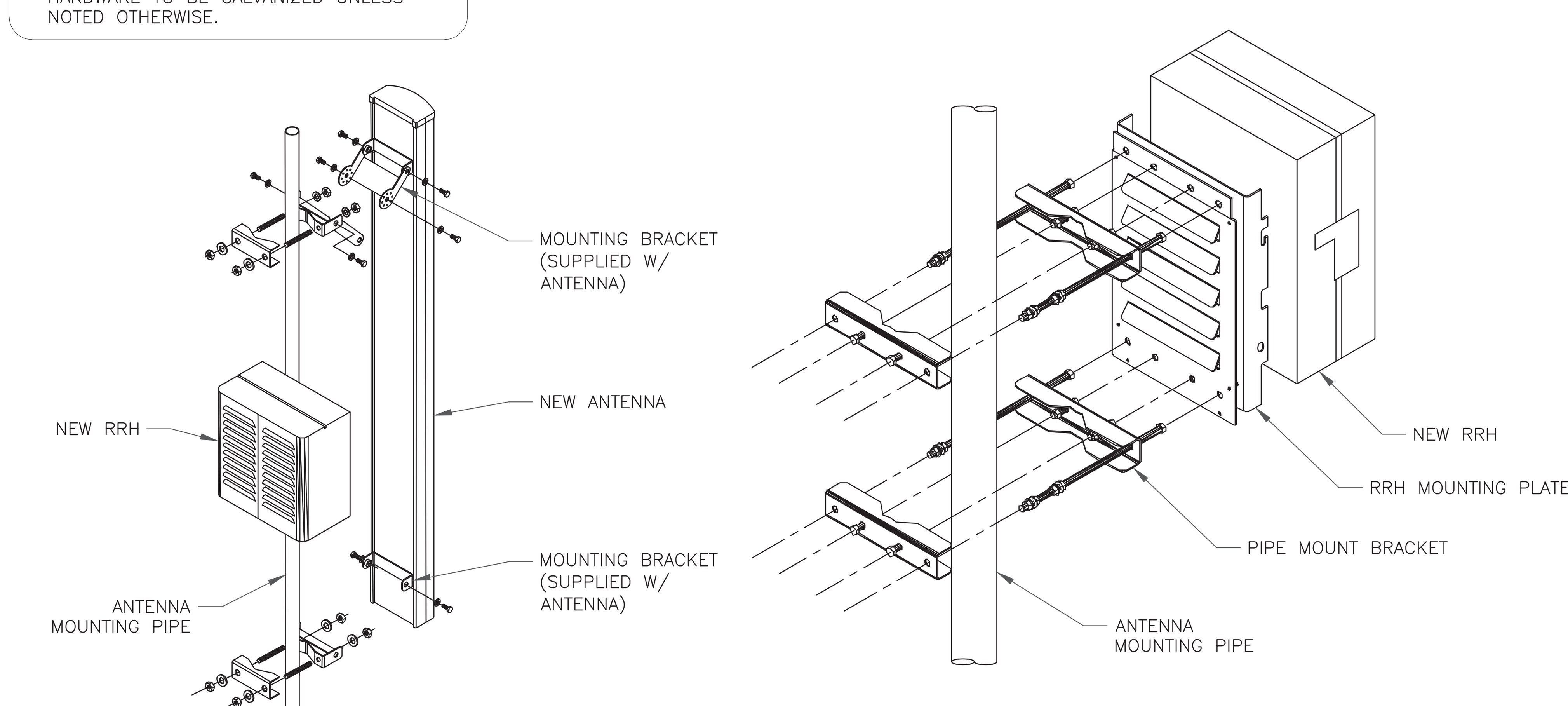
RF SYSTEM SCHEDULE

SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
	A1	L2100/L1900	COMMSCOPE	VV-65B-R1	60°	0°	2°/2°	152'-0"	(1) RADIO 4460 B25+B66	-
	A2	L2500/N2500	ERICSSON	AIR 6419 B41	60°	0°	-	152'-0"	-	(1) 6/24 4AWG HYBRID TRUNK
	A3	L700/L600/N600	RFS	APXVAALL24_43-U-NA20	60°	0°	2°/2°	152'-0"	(1) RADIO 4480 B71+B85	-
	B1	L2100/L1900	COMMSCOPE	VV-65B-R1	180°	0°	2°/2°	152'-0"	(1) RADIO 4460 B25+B66	-
	B2	L2500/N2500	ERICSSON	AIR 6419 B41	180°	0°	-	152'-0"	-	(1) 6/24 4AWG HYBRID TRUNK
	B3	L700/L600/N600	RFS	APXVAALL24_43-U-NA20	180°	0°	2°/2°	152'-0"	(1) RADIO 4480 B71+B85	-
	C1	L2100/L1900	COMMSCOPE	VV-65B-R1	300°	0°	2°/2°	152'-0"	(1) RADIO 4460 B25+B66	-
	C2	L2500/N2500	ERICSSON	AIR 6419 B41	300°	0°	-	152'-0"	-	(1) 6/24 4AWG HYBRID TRUNK
	C3	L700/L600/N600	RFS	APXVAALL24_43-U-NA20	300°	0°	2°/2°	152'-0"	(1) RADIO 4480 B71+B85	-

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



2 ANTENNA WITH RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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btwo@btgrp.com

T-MOBILE SITE NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
0	8/9/22	BLJ	CONSTRUCTION	LR
1	8/12/22	BEH	CONSTRUCTION	LR

8/12/22

MTS ENGINEERING P.L.L.C.
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Expires 3/31/23

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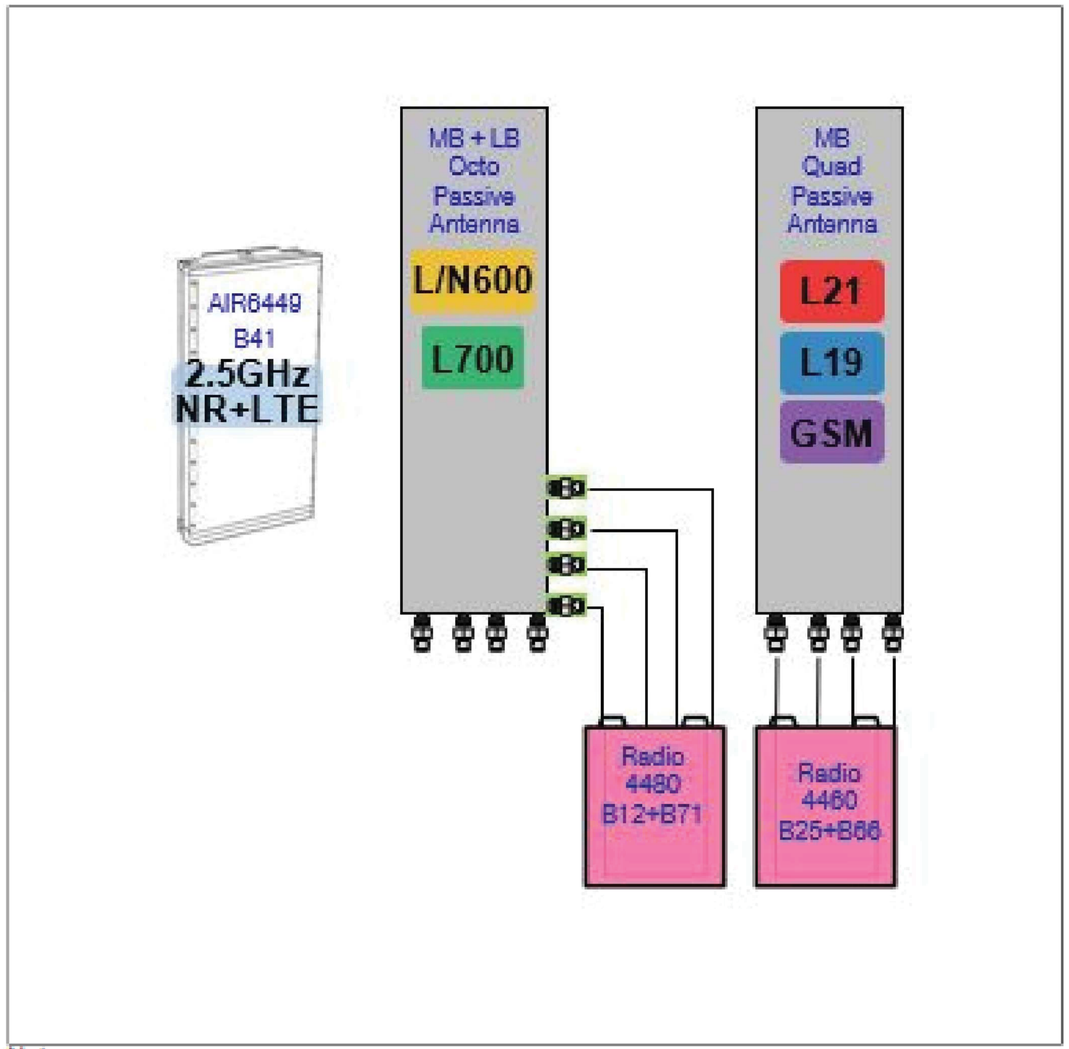
SHEET NUMBER: C-3
REVISION: 1

Section 3 - Proposed Template Images

67E5A998E.JPG



Notes:

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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EXISTING
160'-0" MONOPOLE

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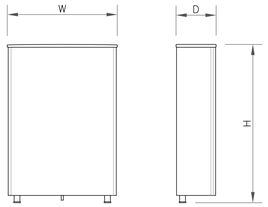
1	8/12/22	BEH	CONSTRUCTION	LR

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

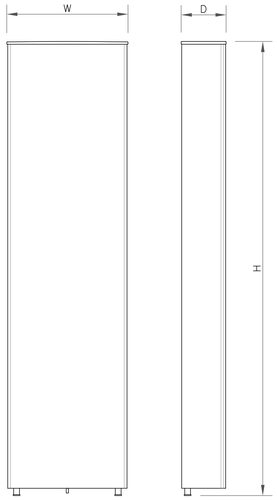
SHEET NUMBER: C-4

REVISION: 1



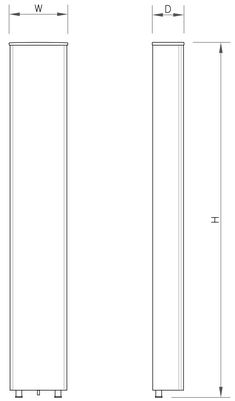
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR 6419 B41
WIDTH	20.91"
DEPTH	9.02"
HEIGHT	36.25"
WEIGHT	96.5 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



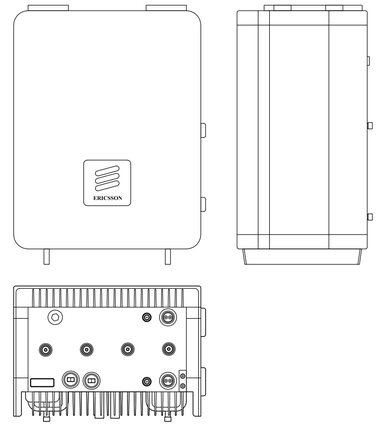
ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAALL24_43-U-NA20
WIDTH	8.50"
DEPTH	24.00"
HEIGHT	95.90"
WEIGHT	149.90 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



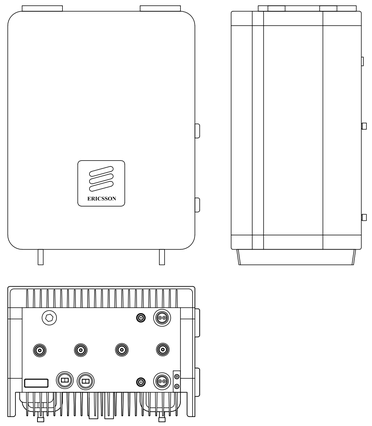
ANTENNA SPECS	
MANUFACTURER	COMMSCOPE
MODEL #	VV-65B-R1
WIDTH	12.01"
DEPTH	4.65"
HEIGHT	70.35"
WEIGHT	41.67 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



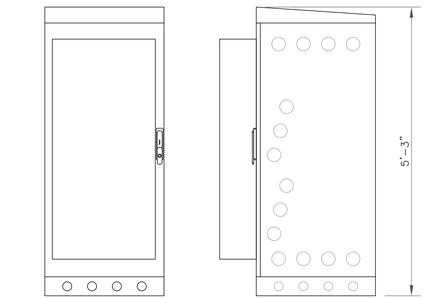
RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4460 B25+B66
WIDTH	15.1"
DEPTH	11.9"
HEIGHT	17"
WEIGHT	109.0 LBS

4 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4480 B71+B85
WIDTH	15.70"
DEPTH	7.50"
HEIGHT	22"
WEIGHT	81.00 LBS

5 RRU SPECS
SCALE: NOT TO SCALE



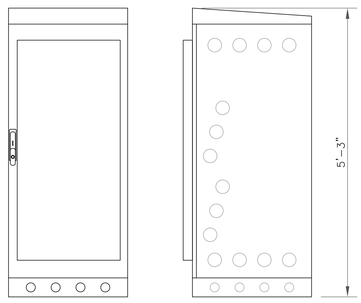
EQUIPMENT NOTES:

HEIGHTxWIDTHxDEPTH: 63.0" x 26.0" x 34.0"
(1600.0mm x 660.0mm x 864.0mm)

WEIGHT (EMPTY): 320 LBS (145 kg)

WEIGHT (FULLY LOADED): 1,500 LBS (681 kg)

6 ERICSSON - 6160
SCALE: NOT TO SCALE



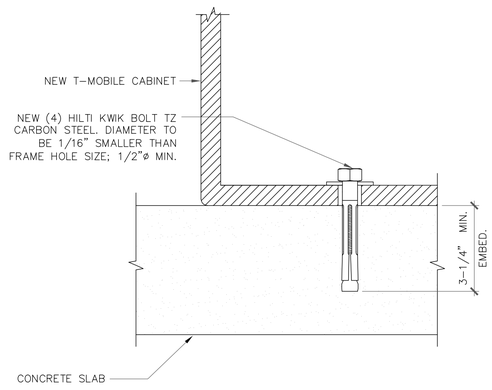
EQUIPMENT NOTES:

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): 2,000 LBS (908 kg)

7 ERICSSON - B160
SCALE: NOT TO SCALE



8 CABINET ANCHOR DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

B+T GRP
MTS TELECOM, L.L.C.
1717 S. BOULDER,
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
btwo@btgrp.com

T-MOBILE SITE
NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
0	8/9/22	BLJ	CONSTRUCTION	LR
1	8/12/22	BEH	CONSTRUCTION	LR

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: C-5

REVISION: 1

FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
TELEPHONE BTS	2	50A	1	2	20A	1	TELEPHONE CABINET
			3	4	100A	2	6131
FIBER	1	20A	5	6			
6160 CABINET	2	125A	7	8	15A	1	SAFETY LIGHT
			9	10	20A	1	GFCI
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			

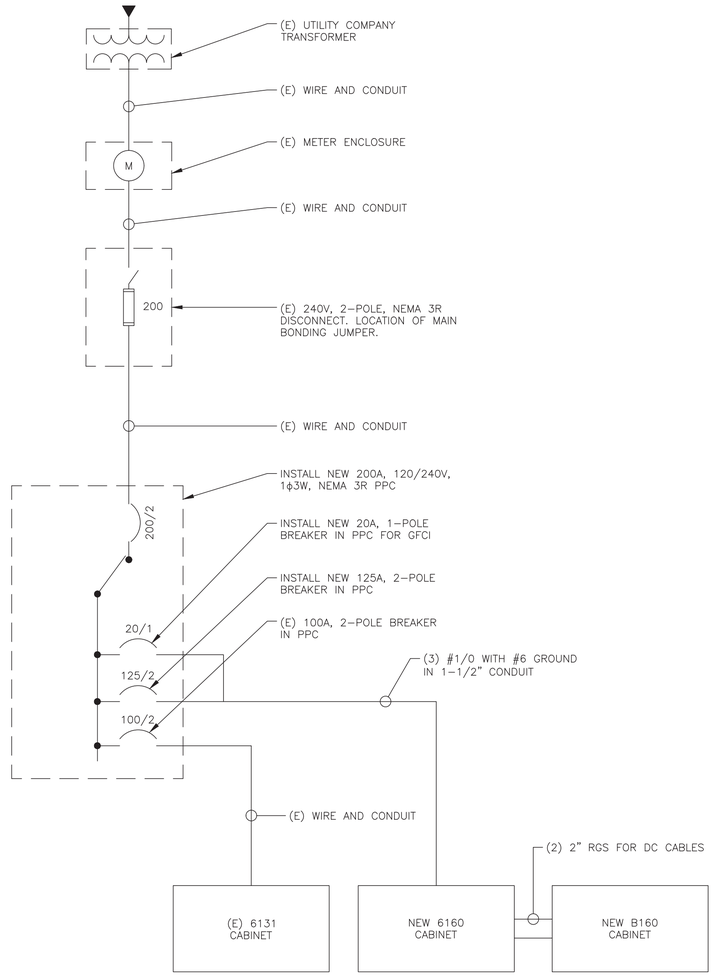
RATED VOLTAGE: ■120/240 □_____, 1 PHASE, 3 WIRE	BRANCH POLES: □12 ■24 □30 □42	APPROVED MF'RS	
RATED AMPS: □100 ■200 □400 □_____,	CABINET: ■SURFACE □FLUSH	NEMA □1 ■3R □4X	
□MAIN LUGS ONLY MAIN 200 AMPS ■BREAKER □FUSED SWITCH	■HINGED DOOR	■KEYED DOOR LATCH	
□FUSED ■CIRCUIT BREAKER BRANCH DEVICES	□_____ 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 NEW 2P 125A BREAKER IN POSITION 7 AND 9.

1 FINAL T-MOBILE 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, OR XHHW-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

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

B+T GRP
MTS TELECOM, L.L.C.
1717 S. BOULDER,
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
btwc@btgrp.com

T-MOBILE SITE NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
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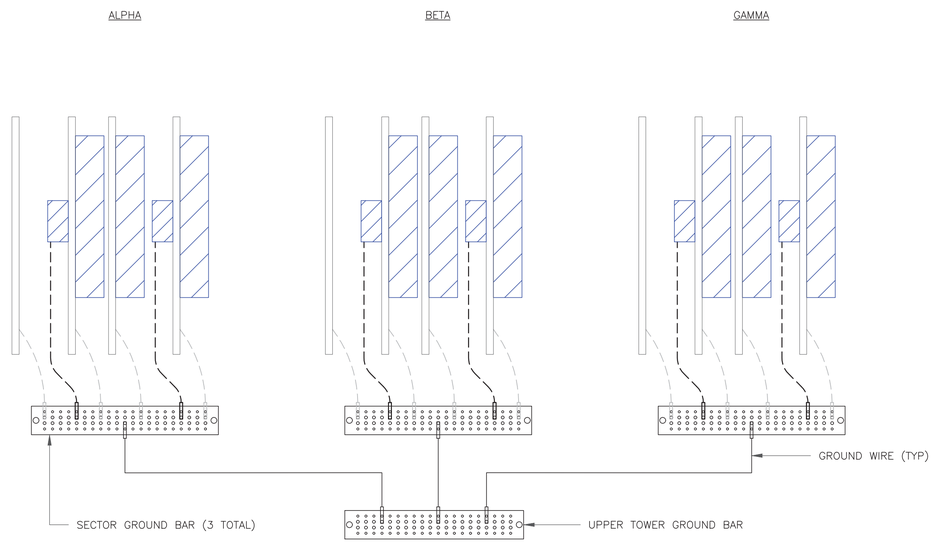
1	8/12/22	BEH	CONSTRUCTION	LR

STATE OF CONNECTICUT
CHRISTOPHER M. LAVOIE
No. 23024
LICENSED
PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: E-1

REVISION: 1



NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile

4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

B+T GRP

MTS TELECOM, L.L.C.
1717 S. BOULDER,
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TULSA, OK 74119
PH: (918) 587-4630
btwc@btgrp.com

T-MOBILE SITE
NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

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A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
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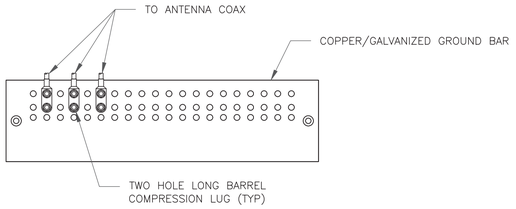
1	8/12/22	BEH	CONSTRUCTION	LR

STATE OF CONNECTICUT
CHRISTOPHER LEE
No. 23024
LICENSED
PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: G-1

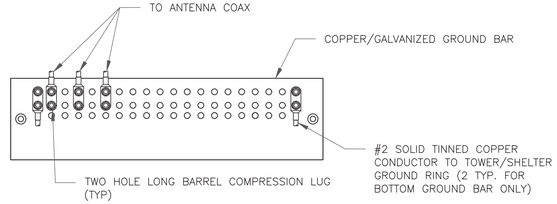
REVISION: 1



NOTES:

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

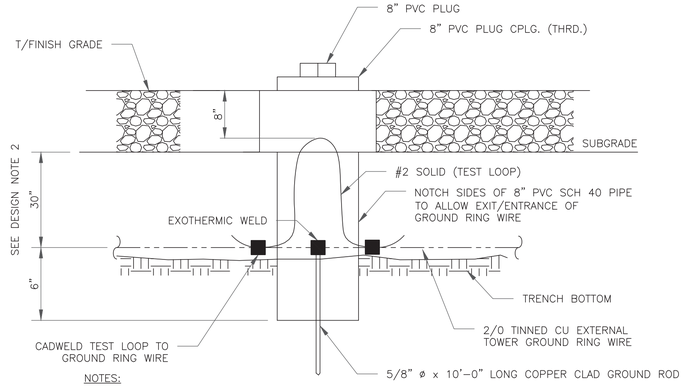
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

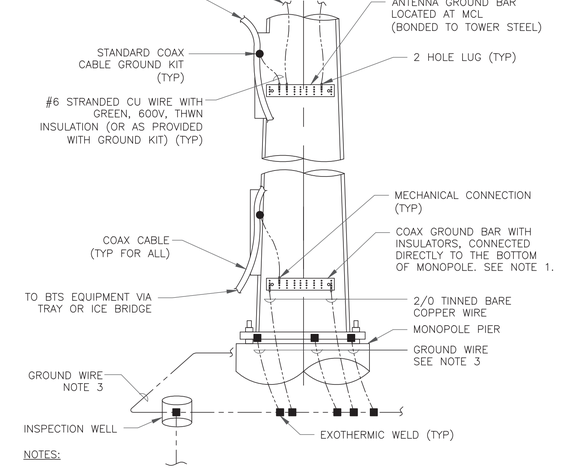
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

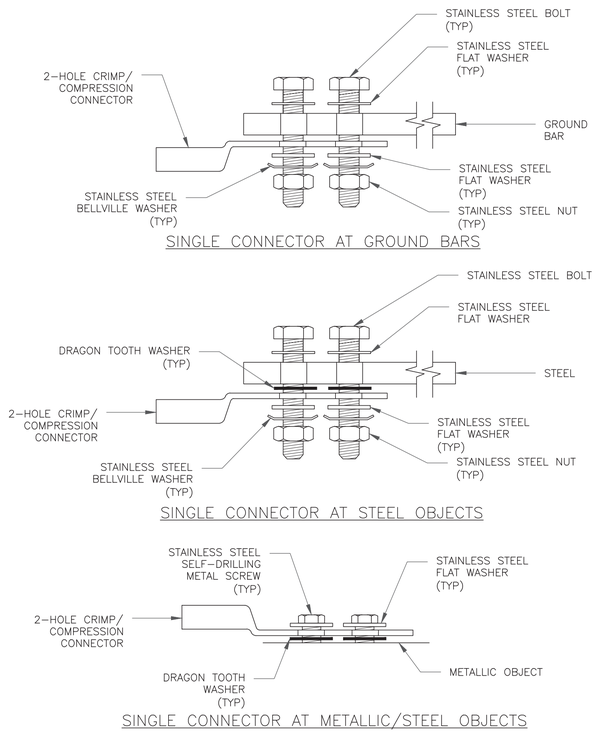
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



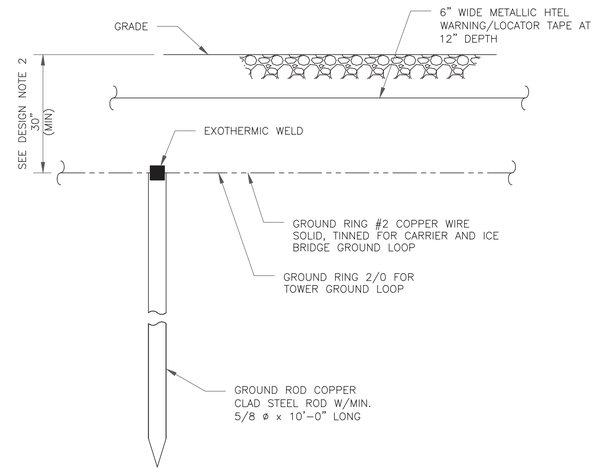
NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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
btwc@btgrp.com

T-MOBILE SITE NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

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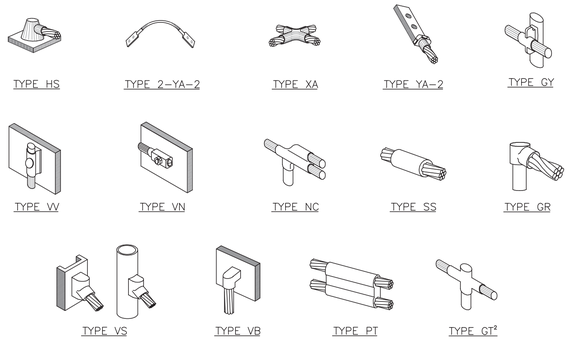
1	8/12/22	BEH	CONSTRUCTION	LR

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
8/12/22

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

SHEET NUMBER: G-2

REVISION: 1

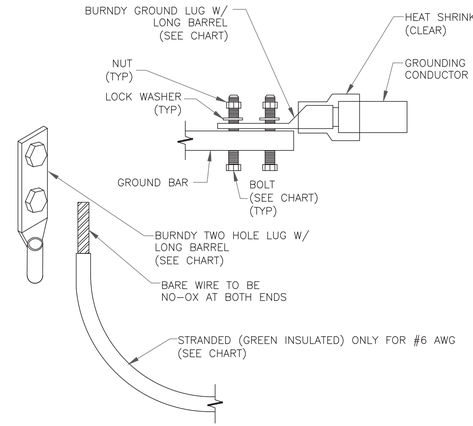


NOTE:

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

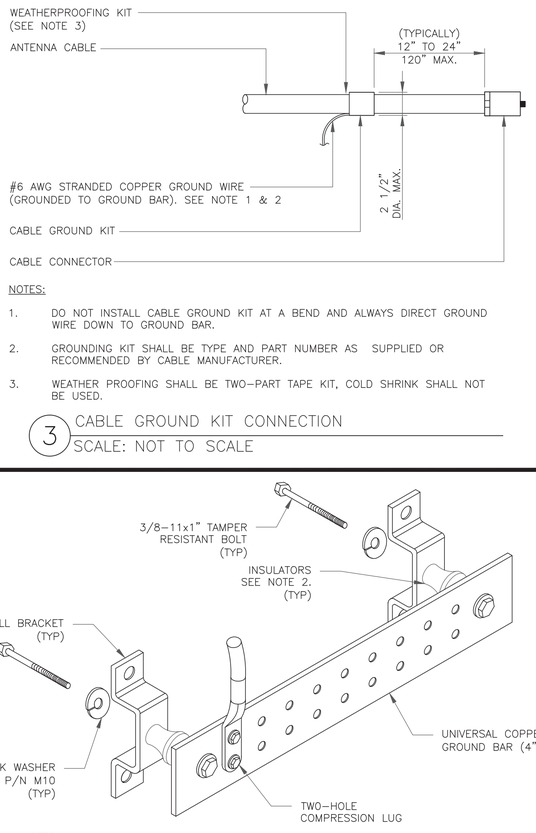
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



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.

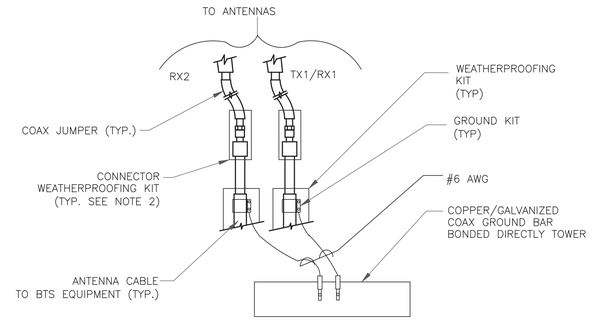
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



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.

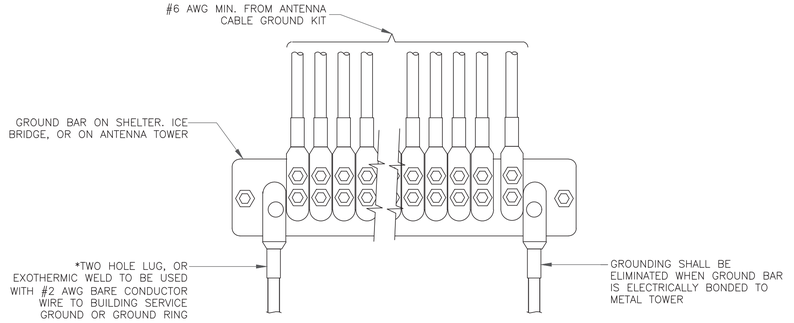
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



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

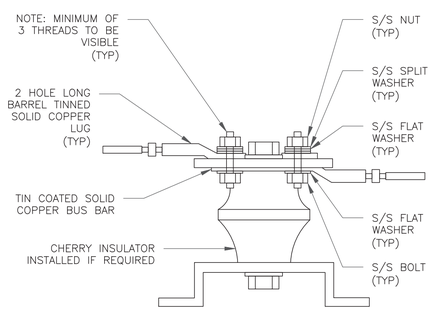


5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE

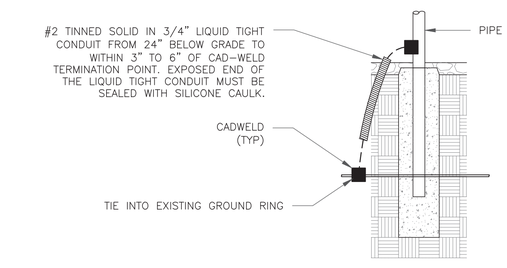
NOTES:

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

B+T GRP
MTS TELECOM, L.L.C.
1717 S. BOULDER,
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
btwc@btgrp.com

T-MOBILE SITE NUMBER: **CT11252A**

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING
160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	ANP	PRELIMINARY REVIEW	MTJ
0	8/9/22	BLJ	CONSTRUCTION	LR
1	8/12/22	BEH	CONSTRUCTION	LR

MTS ENGINEERING P.L.L.C.
BER:2386985
Expires 3/31/23

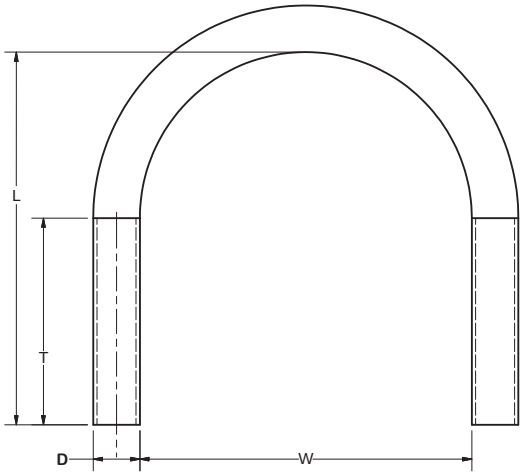
SHEET NUMBER: G-3

REVISION: 1

SITE PRO 1

A valmont COMPANY

U-bolts



Features: Includes nuts, locks, and flat washers, long thread lengths. Hot-dip galvanized.

Construction: SAE J429 Gr. 2. Coarse threads.

Design Criteria: Conforms to the minimum requirements as stated in SAE J429 (Latest Revision) Grade 2 Stud, Rolled or Cut CNC threads. SAE J429 Grade 2 (Yield Fy = 57 ksi / Tensile Fu = 74 ksi). All finished goods are Hot Dip Galvanized in accordance with ASTM A123 requirements.

Part #	Diameter (D)	Width (W)	Length (L)	Thread (T)	Weight
UB3200	3/8”	2”	3”	1-1/4”	0.40 lb.
UB3212	3/8”	2-1/2”	3-5/8”	1-3/4”	0.45 lb.
UB3300	3/8”	3”	4-1/4”	2”	0.50 lb.
UB3312	3/8”	3-1/2”	4-3/4”	2”	0.50 lb.
UB3418	3/8”	4”	5-3/4”	2-1/2”	0.60 lb.
UB1400	1/2”	2”	4”	2”	0.65 lb.
UB1212	1/2”	2-1/2”	4-1/2”	2”	0.65 lb.
UB1300	1/2”	3”	5”	2”	0.70 lb.
UB1358	1/2”	3-5/8”	5-1/2”	3”	0.75 lb.
UB1306	1/2”	3-5/8”	6”	3”	0.80 lb.
UB1418	1/2”	4-1/8”	6”	3”	0.90 lb.
UB1458	1/2”	4-5/8”	7”	3”	0.90 lb.
UB5258	5/8”	2-5/8”	4-1/2”	2”	1.20 lb.
UB5358	5/8”	3-5/8”	6”	3”	1.45 lb.
UB5458	5/8”	4-5/8”	7”	3”	1.60 lb.

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