



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

September 22, 2022

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

RE: **Notice of Exempt Modification for T-Mobile: CT11711A**
Crown Site#806377
197 South Street, Vernon, CT 06066
Latitude: 41° 51' 12.51" / Longitude: -72° 27' 7.52"

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 84' level of the 132' self-support tower located at 197 South Street, Vernon, CT. T-Mobile to remove all their equipment at the 84' level of the tower. T-Mobile to remove Sprint antenna equipment at the 130' level of the tower and replace with nine (9) new antennas and ancillary equipment. 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 @130'-0"

- (3) Ericsson – AIR6419 B41 Antennas
- (3) RFS APXVAALL24_43-U-NA20 Antennas
- (3) Commscope – W-65B-R1 Antennas
- (3) Ericsson-Radio 4480_B71+B85 RRH
- (3) Ericsson- 4460 B25+B66 RRH
- (3) Hybrid Cable (1-5/8")
- (3) Valmont Antenna Mounts

Remove: @130'-0"

- (3) RFS-APXVSP18-C-A20 Antenna
- (3) RFS- APXVTM14-C-120 Antennas
- (3) Alcatel Lucent -TD-RRH8x20-25 RRH
- (3) Alcatel Lucent -1900 MHZ RRH
- (3) Alcatel Lucent -800MHZ RRH
- (3) Antenna Mounts

Remove all T-Mobile Equipment at the 84'-0" level

- (3) RFS APXVAALL24_43-U-NA20 Antennas
- (3) Ericsson Air32 KRD901146-1_B66A_B2A
- (3) Ericsson Air21 KRC118023-1_B2A_B4P
- (3) Ericsson-Radio 4449_B71+B85 RRH
- (3) Generic Twin Style 1B – AWS TMAs
- (10) Coaxial Cables 7/8"
- (3) Hybrid Cables
- (3) Sector Antenna Mounts

Ground:

Install New:

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

Remove:

- (1) S12000 ODE Cabinet
- (2.) DUW30
- (6) RU22

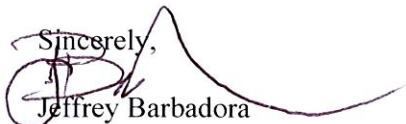
The facility was approved by the Connecticut Siting Council Docket NO. 58A on April 22, 1987.

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 Daniel Champagne, Mayor, Town of Vernon and Ashley Stephens, Town Planner, Town of Vernon. 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:

Daniel Champagne, Mayor
Town of Vernon
14 Park Place
Vernon, CT 06066
860-870-3670

Ashley Stephens, Town Planner
Town of Vernon
55 West Main Street, 2nd Floor
Vernon, CT 06066
860-870-3640

Crown Castle, Property & Tower Owner

AN APPLICATION FOR AN AMENDMENT TO THE : CONNECTICUT SITING
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY :
AND PUBLIC NEED FOR TELECOMMUNICATIONS : COUNCIL
TOWERS AND ASSOCIATED EQUIPMENT TO PROVIDE
CELLULAR SERVICE IN HARTFORD, MIDDLESEX,
AND TOLLAND COUNTIES. : April 22, 1987

DECISION AND ORDER

The Connecticut Siting Council (Council) hereby amends the Certificate of Environmental Compatibility and Public Need issued pursuant to sections 16-50g through 16-50x of the Connecticut General Statutes of Connecticut (CGS) for the construction, operation, and maintenance of cellular mobile telephone telecommunications towers and associated equipment in Hartford, Tolland, and Middlesex Counties to permit the relocation of the Vernon tower 250 feet to the west, subject to the conditions below.

1. The tower shall be no taller than necessary to provide the proposed service, and in no event shall exceed a total height, including antennas, of 143 feet.
2. The Certificate holder shall submit a development and management plan (D&M plan) for the Vernon site, pursuant to sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA). The D&M plan shall provide plans for evergreen screening around the fenced perimeter of the tower site.
3. This facility shall be constructed, operated, and maintained as specified in the Council's record and in the plan required by order number 2.

CROWN ATLANTIC COMPANY, LLC

PMB 353

4017 WASHINGTON RD

MCMURRAY, PA 15317-2520

Neighborhood Number

12000

Neighborhood Name

General Commercial B

TAXING DISTRICT INFORMATION

Jurisdiction Name

Town of Vernon

Area

146

Routing Number

10609

Site Description

Topography

Public Utilities

Street or Road

Neighborhood

Zoning:

Legal Acres:

0.0000

Transfer of Ownership

Valuation Record					
Assessment Year	2016	2021			
Reason for Change	2016 Reval	2021 Reval			
Market	L	0	0		
	I	458380	458380		
	T	458380	458380		
70% Assessed/Use	L	0	0		
	I	320870	320870		
	T	320870	320870		



Land Size				
Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Factor	

Physical Characteristics

Tax ID 39-065B-0016B

Printed 03/09/2022

01

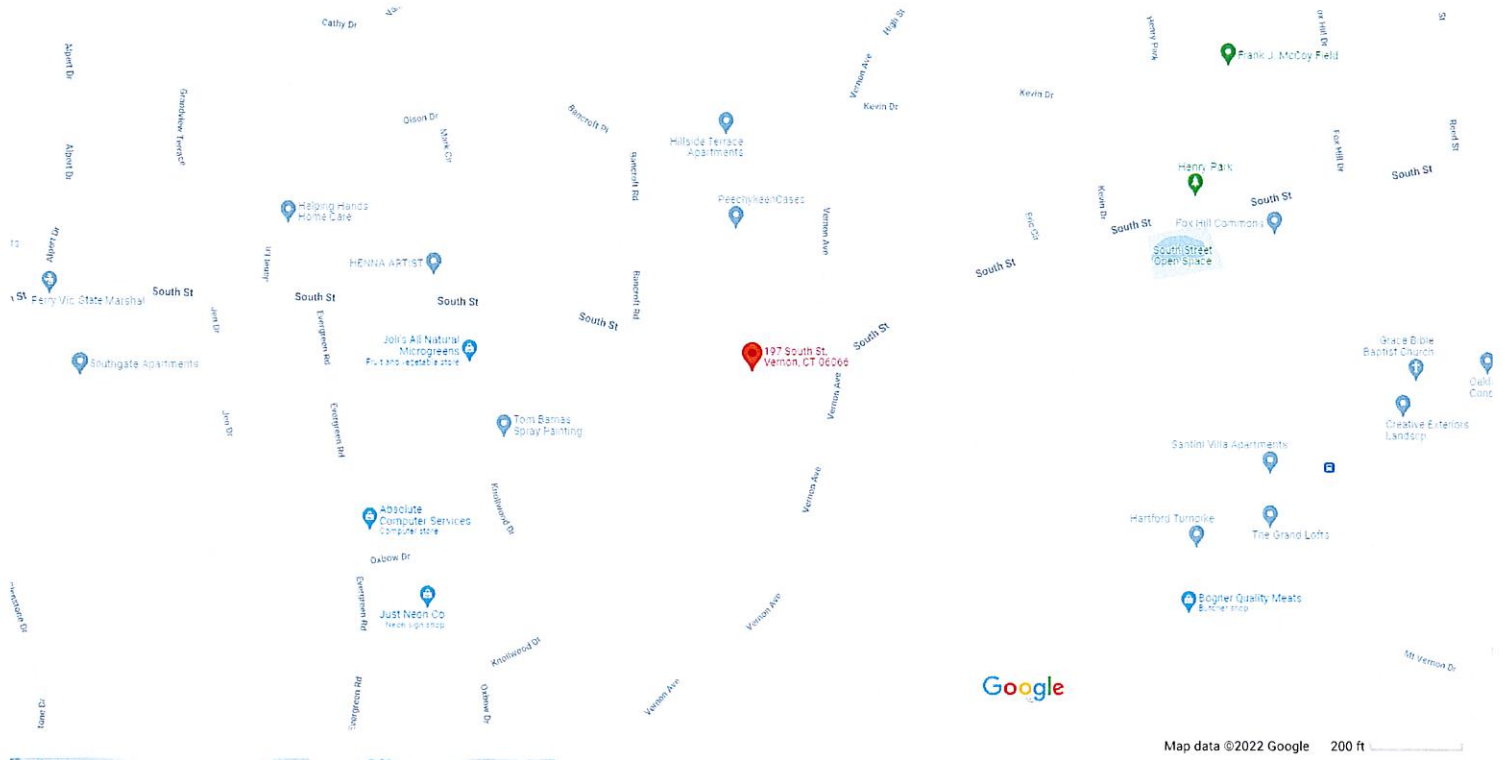
CELL TOWER

Special Features

Description

Summary of Improvements								
ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond	Size or Area
01	TOWERSUP	0.00		Avg	2010	2010	AV	650

197 South St



197 South St



197 South St, Vernon, CT 06066
VG4X+3M Vernon, Connecticut

Photos

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Monday, September 26, 2022 9:49 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 770012611849: Your package has been delivered

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Hi. Your package was
delivered Mon, 09/26/2022 at
9:39am.



Delivered to 14 PARK PL, VERNON, CT 06066
Received by M.BURGOS

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [770012611849](#)

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Vernon Daniel Champagne, Mayor 14 Park Place VERNON, CT, US, 06066
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Thu 9/22/2022 05:45 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	VERNON, CT, US, 06066
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: Monday, September 26, 2022 9:51 AM
To: Barbadora, Jeff
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Hi. Your package was
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9:44am.



Delivered to 55 W MAIN ST, VERNON, CT 06066
Received by A.STEVENS

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [770012645641](#)

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Vernon Ashley Stephens, Town Planner 55 West Main Street, 2nd Floor VERNON, CT, US, 06066
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
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SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **June 29, 2022**



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

Subject: Structural Analysis Report

Carrier Designation:

Site Number: CT11711A
Site Name: CT60XC935

Crown Castle Designation:

BU Number: 806377
Site Name: HRT 084 943242
JDE Job Number: 721887
Work Order Number: 2130321
Order Number: 621887 Rev. 0

Engineering Firm Designation:

TEP Project Number: 217456.715627

Site Data:

197 South St., Vernon, Tolland County, CT 06066
Latitude 41° 51' 12.51", Longitude -72° 27' 7.52"
132 Foot - Self-Supporting Tower

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

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

LC7: Proposed Equipment Configuration

Sufficient Capacity - 76.3%

This analysis utilizes an ultimate 3-second gust wind speed of 118 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: Alix D. Hyppolite / CLT

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

06/29/2022

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1) INTRODUCTION

This tower is a 132-ft self-supporting tower designed by Rohn. The tower has been modified per reinforcement drawings prepared by SSOE, Inc. in May of 2015.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	118 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	130.0	3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	3	1-5/8
		3	Ericsson	AIR 6419 B41_TMO w/ Mount Pipe		
		3	Commscope	VV-65B-R1_TMO w/ Mount Pipe		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	Radio 4480_TMOV2		
		3	Site Pro 1	VFA10-HD-S Sector Frame		
46.0	47.0	1	Lucent	KS24019-L112A	1	1/2

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)
130.0	141.0	1	Decibel	DB413-B	4	7/8
	136.0	1	Telewave	ANT450D6-9		
	130.0	1	Telewave	ANT450D6-9		
117.0	119.0	3	Samsung Telecom.	MT6407-77A w/ Mount Pipe	2 6	1-5/8 7/8
	117.0	2	Andrew	LBX-6515DS-T0M w/ Mount Pipe		
		1	Andrew	LNx-6514DS-T4M w/ Mount Pipe		
		6	Andrew	SBNHH-1D65B w/ Mount Pipe		
		1	Tower Mounts	Sector Mount [SM 505-3]		
	115.0	3	Samsung Telecom.	CBRS		
		3	Samsung Telecom.	RFV01U-D2A		
		3	Samsung Telecom.	RFV01U-D1A		
		2	RFS Celwave	DB-T1-6Z-8AB-0Z		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
104.0	106.0	3	Ericsson	AIR 6419 B77G_CCIV2 w/ Mount Pipe	15 4 3	7/8 13/16 3/8
	104.0	2	CCI Antennas	TPA65R-BU6D_CCIV2 w/ Mount Pipe		
		1	CCI Antennas	TPA65R-BU8D_CCIV2 w/ Mount Pipe		
		2	CCI Antennas	DMP65R-BU6D w/ Mount Pipe		
		1	CCI Antennas	DMP65R-BU8D w/ Mount Pipe		
		3	Ericsson	RRUS 32 B30		
		3	Ericsson	RRUS 32 B2		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		1	Raycap	DC9-48-60-24-8C-EV_CCIV2		
		2	Raycap	DC6-48-60-18-8F		
		1	Tower Mounts	Sector Mount [SM 503-3]		
	102.0	3	Ericsson	AIR 6449 B77D		
94.0	94.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-1/2
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Commscope MTC3975083 (3)		
84.0	84.0	3	Ericsson	AIR 21 B2A B4P w/ Mount Pipe	10 2 1	7/8 1-3/8 1-5/8
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	Ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	Ericsson	KRY 112 144/1		
		3	Ericsson	RADIO 4449 B12/B71		
		3	Site Pro 1	VFA12-U Sector Frame		
63.0	63.0	1	Lucent	SB1-190BB	1	1/2
		1	Redline Comm.	RDL-3000		
		1	Siae Microelettronica	ALFOPLUS2_CCIV3		
		1	Tower Mounts	Side Arm Mount [SO 311-1]		
56.0	59.0	1	Maxrad	GPS-TMG-20N	1	1/2
	56.0	1	Tower Mounts	Side Arm Mount [SO 305-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	1014866	CCISites
Tower Foundation Drawings	1014812	CCISites
Tower Manufacturer Drawings	529704	CCISites
Tower Reinforcement Drawings	5678760	CCISites
Post-Modification Inspection	5849707	CCISites

3.1) Analysis Method

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

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ΦP_{allow} (k)	% Capacity	Pass / Fail
T1	132 - 120	Leg	ROHN 2 STD	2	-6.24	38.68	16.1	Pass
T2	120 - 100	Leg	ROHN 2.5 STD	27	-25.03	59.99	41.7	Pass
T3	100 - 93.3333	Leg	ROHN 3 STD	57	-32.72	74.44	44.0	Pass
T4	93.3333 - 86.6667	Leg	ROHN 3 STD	66	-40.69	74.41	54.7	Pass
T5	86.6667 - 80	Leg	ROHN 3 STD	75	-50.14	96.10	52.2	Pass
T6	80 - 60	Leg	ROHN 3 X-STR	87	-75.60	99.05	76.3	Pass
T7	60 - 40	Leg	ROHN 4 X-STR	108	-99.87	167.91	59.5	Pass
T8	40 - 20	Leg	ROHN 5 X-STR	129	-120.82	211.31	57.2	Pass
T9	20 - 10	Leg	ROHN 5 X-STR	144	-132.14	211.31	62.5	Pass
T10	10 - 0	Leg	ROHN 5 X-STR	153	-142.41	265.94	53.5	Pass
T1	132 - 120	Diagonal	L1 3/4x1 3/4x3/16	16	-1.35	11.55	11.7	Pass
T2	120 - 100	Diagonal	L1 3/4x1 3/4x3/16	33	-3.17	6.66	47.6	Pass
T3	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	60	-3.88	15.16	25.6	Pass
T4	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	69	-4.10	13.54	30.3	Pass
T5	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	78	-5.09	12.58	40.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ΦP_{allow} (k)	% Capacity	Pass / Fail
T6	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	91	-4.97	9.53	52.2	Pass
T7	60 - 40	Diagonal	L3x3x3/16	112	-5.33	13.25	40.2	Pass
T8	40 - 20	Diagonal	L3x3x1/4	133	-6.18	11.51	53.7	Pass
T9	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	148	-6.27	17.40	36.0	Pass
T10	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	157	-6.92	16.01	43.2	Pass
T5	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	83	-0.87	3.92	22.2	Pass
T10	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	161	-2.47	6.01	41.1	Pass
T1	132 - 120	Top Girt	L2x2x3/16	6	-0.09	6.09	1.5	Pass
T2	120 - 100	Top Girt	L2x2x3/16	29	-0.43	6.09	7.1	Pass
							Summary	
						Leg (T6)	76.3	Pass
						Diagonal (T8)	53.7	Pass
						Secondary Horizontal (T10)	41.1	Pass
						Top Girt (T2)	7.1	Pass
						Bolt Checks	65.0	Pass
						RATING =	76.3	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	51.9	Pass
1,2	Base Foundation Structural	-	7.3	Pass
1,2	Base Foundation Soil Interaction	-	58.2	Pass

Structure Rating (max from all components) =	76.3%
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Notes:

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

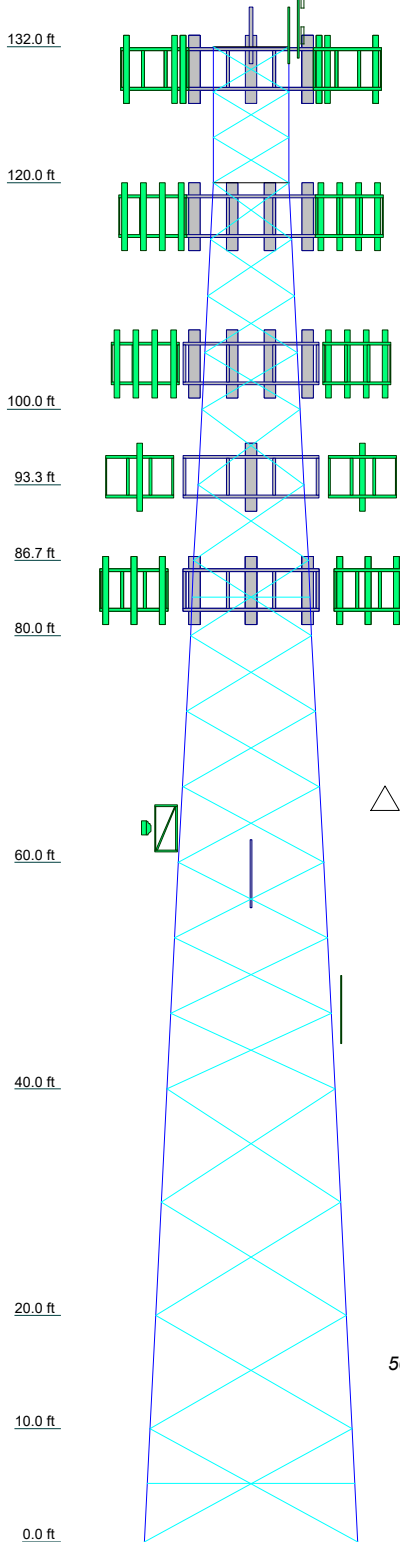
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs	ROHN 2 STD	ROHN 2.5 STD	ROHN 3 STD	ROHN 3 STD	ROHN 3 X-STR	ROHN 4 X-STR	ROHN 5 X-STR	ROHN 5 X-STR	ROHN 5 X-STR	ROHN 5 X-STR
Leg Grade										
Diagonals										
Diagonal Grade										
Top Girts										
Sec. Horizontals										
Face Width (ft)	6.60417	6.64583	8.6875	9.35417	10.1198	10.6875	12.7604	14.7708	16.7708	17.7708
# Panels @ (ft)	3 @ 4	4 @ 5	0.4	0.4	0.5	1.4	2.0	2.5	1.4	1.6
Weight (K)	0.5	0.9	0.4	0.4	0.5	1.4	2.0	2.5	1.4	1.6



MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16	B	L2 1/2x2 1/2x3/16

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

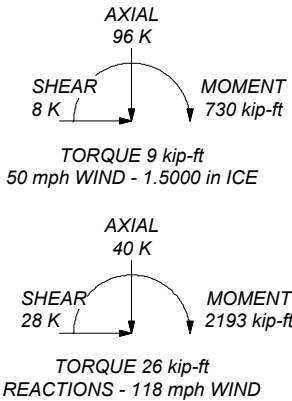
1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0'
8. TOWER RATING: 76.3%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 148 K
SHEAR: 17 K

UPLIFT: -119 K
SHEAR: 15 K



 Tower Engineering Professionals	Tower Engineering Professionals 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350		Job: HRT 084 943242 (BU 806377)	
	Project: TEP No. 217456.715627			
	Client: Crown Castle	Drawn by: jfisher	App'd:	
	Code: TIA-222-H	Date: 06/29/22	Scale: NTS	
	Path: C:\Users\jfisher\Desktop\Temp\hrt806377_2130321_LC7.eri		Dwg No. E-1	

tnxTower Tower Engineering Professionals 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job HRT 084 943242 (BU 806377)	Page 1 of 28
	Project TEP No. 217456.715627	Date 09:32:10 06/29/22
	Client Crown Castle	Designed by jfisher

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 132' above the ground line.

The base of the tower is set at an elevation of 0' above the ground line.

The face width of the tower is 6'7-1/4" at the top and 18'9-1/4" at the base.

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

The following design criteria apply:

Tower is located in Tolland County, Connecticut.

Tower base elevation above sea level: 655'.

Basic wind speed of 118 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0'.

Nominal ice thickness of 1.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

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

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

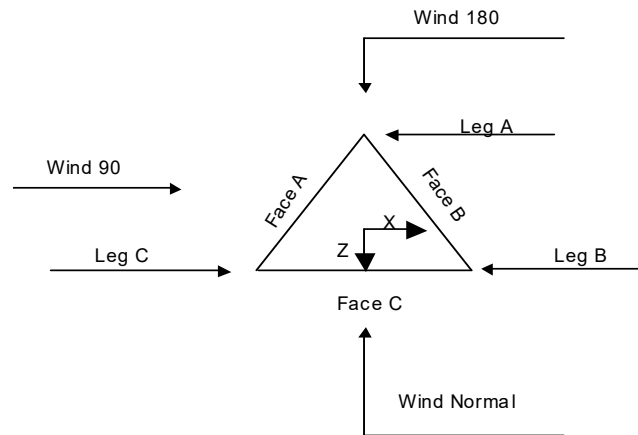
Maximum demand-capacity ratio is: 1.05.

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

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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	132'-120'			6'7-3/16"	1	12'
T2	120'-100'			6'7-13/16"	1	20'
T3	100'-93'3-31/32"			8'8-9/32"	1	6'8-1/32"
T4	93'3-31/32"-86'8-1/32"			9'4-3/16"	1	6'8-1/32"
T5	86'8-1/32"-80'			10'1-7/16"	1	6'8-1/32"
T6	80'-60'			10'8-9/32"	1	20'
T7	60'-40'			12'9-1/8"	1	20'
T8	40'-20'			14'9-1/4"	1	20'
T9	20'-10'			16'9-1/4"	1	10'
T10	10'-0'			17'9-1/4"	1	10'

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	132'-120'	4'	X Brace	No	No	0.0000	0.0000
T2	120'-100'	5'	X Brace	No	No	0.0000	0.0000
T3	100'-93'3-31/32"	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T4	93'3-31/32"-86'8-1/32"	6'8-1/32"	X Brace	No	No	0.0000	0.0000

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Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T5	86'8-1/32"-80'	6'8-1/32"	X Brace	No	Yes	0.0000	0.0000
T6	80'-60'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T7	60'-40'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T8	40'-20'	10'	X Brace	No	No	0.0000	0.0000
T9	20'-10'	10'	X Brace	No	No	0.0000	0.0000
T10	10'-0'	10'	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 132'-120'	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 120'-100'	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 100'-93'3-31/32"	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 93'3-31/32"-86'8-1/32"	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 86'8-1/32"-80'	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 80'-60'	Pipe	ROHN 3 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 60'-40'	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 40'-20'	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T9 20'-10'	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 10'-0'	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 132'-120'	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 120'-100'	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry (cont'd)

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<i>Tower Elevation</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
<i>ft</i>						
T5 86'8"-1/32"-80'	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T10 10'-0'	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Gusset Area (per face)</i>	<i>Gusset Thickness</i>	<i>Gusset Grade</i>	<i>Adjust. Factor A_f</i>	<i>Adjust. Factor A_r</i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals</i>	<i>Double Angle Stitch Bolt Spacing Horizontals</i>	<i>Double Angle Stitch Bolt Spacing Redundants</i>
<i>ft</i>	<i>ft²</i>	<i>in</i>					<i>in</i>	<i>in</i>	<i>in</i>
T1 132'-120'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T2 120'-100'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T3 100'-93'3"-31/32"	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T4 93'3"-31/32"-86'8"-1/32"	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T5 86'8"-1/32"-80'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T6 80'-60'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T7 60'-40'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T8 40'-20'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T9 20'-10'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000
T10 10'-0'	0.00	0.3750	A36 (36 ksi)	1.03	1	1.05	0.0000	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Calc K Single Angles</i>	<i>Calc K Solid Rounds</i>	<i>Legs</i>	<i>K Factors¹</i>						
				<i>X Brace Diags</i>	<i>K Brace Diags</i>	<i>Single Diags</i>	<i>Girts</i>	<i>Horiz.</i>	<i>Sec. Horiz.</i>	<i>Inner Brace</i>
				<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>
<i>ft</i>										
T1 132'-120'	Yes	Yes	1	1	1	1	1	1	1	1
T2 120'-100'	Yes	Yes	1	1	1	1	1	1	1	1
T3 100'-93'3"-31/32"	Yes	Yes	1	1	1	1	1	1	1	1
T4 93'3"-31/32"-8	Yes	Yes	1	1	1	1	1	1	1	1

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Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T3 100'-93'3-31/32" 2"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 93'3-31/32"-86' 8-1/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 86'8-1/32"-80'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80'-60'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60'-40'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40'-20'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20'-10'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 10'-0'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 132'-120'	Flange	0.6250	4	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325X		A325N		A325N		A325N		A325N	
T2 120'-100'	Flange	0.7500	4	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325X		A325N		A325N		A325N		A325N	
T3 100'-93'3-31/32" 2"	Flange	0.0000	0	0.6250	1	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T4 93'3-31/32"-86' 8-1/32"	Flange	0.0000	0	0.6250	1	0.5000	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T5 86'8-1/32"-80'	Flange	0.8750	4	0.6250	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	1
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T6 80'-60'	Flange	0.8750	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T7 60'-40'	Flange	1.0000	4	0.6250	1	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T8 40'-20'	Flange	1.0000	4	0.6250	1	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T9 20'-10'	Flange	0.0000	0	0.6250	1	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325X		A325X		A325N		A325N		A325N		A325N		A325N	
T10 10'-0'	Flange	1.0000	0	0.7500	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	1
		A449		A325X		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Step Pegs (5/8" SR) 7.5-in w/ 30" Step	B	No	No	Ar (CaAa)	40' - 0'	0.0000	0.5	1	1	0.3130	0.3130		0.52
Step Pegs (5/8" SR) 7.5-in w/ 30" Step	C	No	No	Ar (CaAa)	40' - 0'	0.0000	0.5	1	1	0.3130	0.3130		0.52
Step Pegs (5/8" SR) 7.5-in w/ 30" Step	A	No	No	Ar (CaAa)	132' - 0'	0.0000	0.5	1	1	0.3130	0.3130		0.52
Safety Line 3/8	A	No	No	Ar (CaAa)	132' - 0'	0.0000	0.5	1	1	0.3750	0.3750		0.22
B Face													
Feedline Ladder (Af)	B	No	No	Af (CaAa)	63' - 0'	0.0000	-0.43	1	1	3.0000	3.0000		8.40
LDF4-50A(1/ 2)	B	No	No	Ar (CaAa)	56' - 0'	0.0000	-0.47	1	1	0.5000	0.6250		0.15
HB078-1-08U 3-M3J(7/8)	B	No	No	Ar (CaAa)	130' - 0'	0.0000	-0.44	4	4	0.5000	1.0900		0.78
LCF12-50J(1/ 2) ***	B	No	No	Ar (CaAa)	63' - 0'	0.0000	-0.425	1	1	0.5000	0.6400		0.15
HB158-21U6S 24-xxM_TMO (1-5/8)	B	No	No	Ar (CaAa)	130' - 0'	0.0000	0.415	3	3	0.5000	1.9960		2.50
LDF4-50A(1/ 2)	B	No	No	Ar (CaAa)	46' - 0'	0.0000	0.39	1	1	0.5000	0.6250		0.15
A Face													
Feedline Ladder (Af)	A	No	No	Af (CaAa)	117' - 0'	0.0000	0.4	1	1	3.0000	3.0000		8.40
HB158-1-08U 8-S8J18(1-5/8)	A	No	No	Ar (CaAa)	117' - 0'	0.0000	0.43	2	2	0.5000	1.9800		1.30
LDF5-50A(7/ 8) ***	A	No	No	Ar (CaAa)	117' - 0'	0.0000	0.39	6	6	0.5000	1.0900		0.33
LDF5-50A(7/ 8)	C	No	No	Ar (CaAa)	104' - 0'	0.0000	-0.38	15	9	0.5000	1.0900		0.33
PWRT-608-S(13/16)	C	No	No	Ar (CaAa)	104' - 0'	1.5000	-0.43	3	3	0.5000	0.8200		0.62
FB-L98B-034- XXX(3/8)	C	No	No	Ar (CaAa)	104' - 0'	0.0000	-0.45	2	2	0.3937	0.3937		0.06
2" Flexible Conduit	C	No	No	Ar (CaAa)	104' - 0'	0.0000	-0.46	1	1	0.5000	2.0000		0.34
FB-L98B-235- XXX(3/8)	C	No	No	Ar (CaAa)	104' - 0'	0.0000	-0.46	1	1	0.3900	0.3900		0.06
PWRT-608-S(13/16) ***	C	No	No	Ar (CaAa)	104' - 0'	0.0000	-0.47	1	1	0.5000	0.8200		0.62
T-Bracket ***	B	No	No	Af (CaAa)	94' - 0'	-10.000 0	0.45	1	1	1.5000	1.5000		4.20
AL5-50(7/8)	B	No	No	Ar (CaAa)	84' - 0'	-10.000 0	0.45	8	2	0.5000	1.1000		0.26
AL5-50(7/8)	B	No	No	Ar (CaAa)	84' - 0'	-8.0000	0.462	2	1	0.5000	1.1000		0.26
HCS 6X12	B	No	No	Ar (CaAa)	84' - 0'	-12.000 0	0.435	2	2	0.5000	1.3800		1.70
6AWG(1-3/8) MLE	B	No	No	Ar (CaAa)	84' - 0'	-12.000	0.455	1	1	0.5000	1.6250		1.07

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
HYBRID 9POWER/18F IBER RL 2(1-5/8) ***								0					
CU12PSM9P6 XXX(1-1/2) *****	B	No	No	Ar (CaAa)	94' - 0'	-5.0000	0.433	1	1	0.5000	1.6000		2.35

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	132'-120'	A	0.000	0.000	0.826	0.000	0.01
		B	0.000	0.000	10.348	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
T2	120'-100'	A	0.000	0.000	27.726	0.000	0.24
		B	0.000	0.000	20.696	0.000	0.21
		C	0.000	0.000	9.123	0.000	0.03
T3	100'-93'3-31/32"	A	0.000	0.000	10.792	0.000	0.09
		B	0.000	0.000	7.172	0.000	0.08
		C	0.000	0.000	15.205	0.000	0.05
T4	93'3-31/32"-86'8-1/32"	A	0.000	0.000	10.792	0.000	0.09
		B	0.000	0.000	9.632	0.000	0.11
		C	0.000	0.000	15.205	0.000	0.05
T5	86'8-1/32"-80'	A	0.000	0.000	10.792	0.000	0.09
		B	0.000	0.000	15.786	0.000	0.14
		C	0.000	0.000	15.205	0.000	0.05
T6	80'-60'	A	0.000	0.000	32.376	0.000	0.27
		B	0.000	0.000	61.358	0.000	0.51
		C	0.000	0.000	45.615	0.000	0.16
T7	60'-40'	A	0.000	0.000	32.376	0.000	0.27
		B	0.000	0.000	72.321	0.000	0.66
		C	0.000	0.000	45.615	0.000	0.16
T8	40'-20'	A	0.000	0.000	32.376	0.000	0.27
		B	0.000	0.000	74.072	0.000	0.67
		C	0.000	0.000	46.241	0.000	0.17
T9	20'-10'	A	0.000	0.000	16.188	0.000	0.14
		B	0.000	0.000	37.036	0.000	0.34
		C	0.000	0.000	23.120	0.000	0.08
T10	10'-0'	A	0.000	0.000	16.188	0.000	0.14

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
		B	0.000	0.000	37.036	0.000	0.34
		C	0.000	0.000	23.120	0.000	0.08

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T1	132'-120'	A	1.458	0.000	0.000	7.823	0.000	0.09
		B		0.000	0.000	25.876	0.000	0.35
		C		0.000	0.000	0.000	0.000	0.00
T2	120'-100'	A	1.438	0.000	0.000	71.654	0.000	0.94
		B		0.000	0.000	51.491	0.000	0.69
		C		0.000	0.000	19.802	0.000	0.23
T3	100'-93'3-31/32"	A	1.420	0.000	0.000	27.187	0.000	0.36
		B		0.000	0.000	17.734	0.000	0.24
		C		0.000	0.000	32.806	0.000	0.39
T4	93'3-31/32"-86'8-1/32"	A	1.410	0.000	0.000	27.102	0.000	0.35
		B		0.000	0.000	23.529	0.000	0.34
		C		0.000	0.000	32.697	0.000	0.38
T5	86'8-1/32"-80'	A	1.399	0.000	0.000	27.011	0.000	0.35
		B		0.000	0.000	37.415	0.000	0.50
		C		0.000	0.000	32.581	0.000	0.38
T6	80'-60'	A	1.375	0.000	0.000	80.422	0.000	1.04
		B		0.000	0.000	142.395	0.000	1.88
		C		0.000	0.000	96.967	0.000	1.12
T7	60'-40'	A	1.329	0.000	0.000	79.275	0.000	1.01
		B		0.000	0.000	166.093	0.000	2.25
		C		0.000	0.000	95.504	0.000	1.09
T8	40'-20'	A	1.263	0.000	0.000	77.608	0.000	0.96
		B		0.000	0.000	173.574	0.000	2.27
		C		0.000	0.000	99.056	0.000	1.09
T9	20'-10'	A	1.178	0.000	0.000	37.740	0.000	0.45
		B		0.000	0.000	83.997	0.000	1.07
		C		0.000	0.000	48.002	0.000	0.51
T10	10'-0'	A	1.056	0.000	0.000	36.201	0.000	0.41
		B		0.000	0.000	79.958	0.000	0.97
		C		0.000	0.000	45.794	0.000	0.46

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
T1	132'-120'	2.8276	-2.2458	3.0072	-5.6152
T2	120'-100'	5.1147	-10.6992	5.3959	-13.3291
T3	100'-93'3-31/32"	12.6034	-8.6803	14.1997	-9.5730
T4	93'3-31/32"-86'8-1/32"	14.0615	-7.7538	16.5561	-7.8694
T5	86'8-1/32"-80'	16.1788	-4.6418	19.0707	-4.2546
T6	80'-60'	20.5980	-4.0320	23.9782	-3.4041
T7	60'-40'	20.7136	-7.0493	25.1330	-8.0562
T8	40'-20'	24.7872	-7.9839	29.1809	-7.6489
T9	20'-10'	25.1349	-8.1387	30.3503	-8.1658

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Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
T10	10'-0"	23.5336	-7.6630	28.8926	-8.0411

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	120.00 - 132.00	0.6000	0.6000
T1	4	Safety Line 3/8	120.00 - 132.00	0.6000	0.6000
T1	8	HB078-1-08U3-M3J(7/8)	120.00 - 130.00	0.6000	0.6000
T1	14	HB158-21U6S24-xxM_TMO (1-5/8)	120.00 - 130.00	0.6000	0.6000
T2	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	100.00 - 120.00	0.6000	0.6000
T2	4	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T2	8	HB078-1-08U3-M3J(7/8)	100.00 - 120.00	0.6000	0.6000
T2	14	HB158-21U6S24-xxM_TMO (1-5/8)	100.00 - 120.00	0.6000	0.6000
T2	17	Feedline Ladder (Af)	100.00 - 117.00	0.6000	0.6000
T2	18	HB158-1-08U8-S8J18(1-5/8)	100.00 - 117.00	0.6000	0.6000
T2	19	LDF5-50A(7/8)	100.00 - 117.00	0.6000	0.6000
T2	24	LDF5-50A(7/8)	100.00 - 104.00	0.6000	0.6000
T2	28	PWRT-608-S(13/16)	100.00 - 104.00	0.6000	0.6000
T2	29	FB-L98B-034-XXX(3/8)	100.00 - 104.00	0.6000	0.6000
T2	30	2" Flexible Conduit	100.00 - 104.00	0.6000	0.6000
T2	31	FB-L98B-235-XXX(3/8)	100.00 - 104.00	0.0000	0.0000
T2	32	PWRT-608-S(13/16)	100.00 - 104.00	0.6000	0.6000
T3	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	93.33 - 100.00	0.6000	0.6000
T3	4	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T3	8	HB078-1-08U3-M3J(7/8)	93.33 - 100.00	0.6000	0.6000
T3	14	HB158-21U6S24-xxM_TMO (1-5/8)	93.33 - 100.00	0.6000	0.6000
T3	17	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T3	18	HB158-1-08U8-S8J18(1-5/8)	93.33 - 100.00	0.6000	0.6000
T3	19	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T3	24	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T3	28	PWRT-608-S(13/16)	93.33 - 100.00	0.6000	0.6000
T3	29	FB-L98B-034-XXX(3/8)	93.33 - 100.00	0.6000	0.6000
T3	30	2" Flexible Conduit	93.33 - 100.00	0.6000	0.6000
T3	31	FB-L98B-235-XXX(3/8)	93.33 - 100.00	0.0000	0.0000
T3	32	PWRT-608-S(13/16)	93.33 - 100.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T3	34	T-Bracket	93.33 - 94.00	0.6000	0.6000
T3	43	CU12PSM9P6XXX(1-1/2)	93.33 - 94.00	0.6000	0.6000
T4	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	86.67 - 93.33	0.6000	0.6000
T4	4	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T4	8	HB078-1-08U3-M3J(7/8)	86.67 - 93.33	0.6000	0.6000
T4	14	HB158-21U6S24-xxM_TMO (1-5/8)	86.67 - 93.33	0.6000	0.6000
T4	17	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T4	18	HB158-1-08U8-S8J18(1-5/8)	86.67 - 93.33	0.6000	0.6000
T4	19	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T4	24	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T4	28	PWRT-608-S(13/16)	86.67 - 93.33	0.6000	0.6000
T4	29	FB-L98B-034-XXX(3/8)	86.67 - 93.33	0.6000	0.6000
T4	30	2" Flexible Conduit	86.67 - 93.33	0.6000	0.6000
T4	31	FB-L98B-235-XXX(3/8)	86.67 - 93.33	0.0000	0.0000
T4	32	PWRT-608-S(13/16)	86.67 - 93.33	0.6000	0.6000
T4	34	T-Bracket	86.67 - 93.33	0.6000	0.6000
T4	43	CU12PSM9P6XXX(1-1/2)	86.67 - 93.33	0.6000	0.6000
T5	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	80.00 - 86.67	0.6000	0.6000
T5	4	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T5	8	HB078-1-08U3-M3J(7/8)	80.00 - 86.67	0.6000	0.6000
T5	14	HB158-21U6S24-xxM_TMO (1-5/8)	80.00 - 86.67	0.6000	0.6000
T5	17	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T5	18	HB158-1-08U8-S8J18(1-5/8)	80.00 - 86.67	0.6000	0.6000
T5	19	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T5	24	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T5	28	PWRT-608-S(13/16)	80.00 - 86.67	0.6000	0.6000
T5	29	FB-L98B-034-XXX(3/8)	80.00 - 86.67	0.6000	0.6000
T5	30	2" Flexible Conduit	80.00 - 86.67	0.6000	0.6000
T5	31	FB-L98B-235-XXX(3/8)	80.00 - 86.67	0.0000	0.0000
T5	32	PWRT-608-S(13/16)	80.00 - 86.67	0.6000	0.6000
T5	34	T-Bracket	80.00 - 86.67	0.6000	0.6000
T5	38	AL5-50(7/8)	80.00 - 84.00	0.6000	0.6000
T5	39	AL5-50(7/8)	80.00 - 84.00	0.6000	0.6000
T5	40	HCS 6X12 6AWG(1-3/8)	80.00 - 84.00	0.6000	0.6000
T5	41	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	80.00 - 84.00	0.6000	0.6000
T5	43	CU12PSM9P6XXX(1-1/2)	80.00 - 86.67	0.6000	0.6000
T6	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	60.00 - 80.00	0.6000	0.6000
T6	4	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T6	6	Feedline Ladder (Af)	60.00 - 63.00	0.6000	0.6000
T6	8	HB078-1-08U3-M3J(7/8)	60.00 - 80.00	0.6000	0.6000
T6	9	LCF12-50J(1/2)	60.00 - 63.00	0.6000	0.6000
T6	14	HB158-21U6S24-xxM_TMO (1-5/8)	60.00 - 80.00	0.6000	0.6000
T6	17	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T6	18	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T6	19	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.6000
T6	24	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.6000
T6	28	PWRT-608-S(13/16)	60.00 - 80.00	0.6000	0.6000
T6	29	FB-L98B-034-XXX(3/8)	60.00 - 80.00	0.6000	0.6000
T6	30	2" Flexible Conduit	60.00 - 80.00	0.6000	0.6000
T6	31	FB-L98B-235-XXX(3/8)	60.00 - 80.00	0.0000	0.0000
T6	32	PWRT-608-S(13/16)	60.00 - 80.00	0.6000	0.6000
T6	34	T-Bracket	60.00 - 80.00	0.6000	0.6000
T6	38	AL5-50(7/8)	60.00 - 80.00	0.6000	0.6000
T6	39	AL5-50(7/8)	60.00 - 80.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T6	40	HCS 6X12 6AWG(1-3/8)	60.00 - 80.00	0.6000	0.6000
T6	41	MLE HYBRID	60.00 - 80.00	0.6000	0.6000
		9POWER/18FIBER RL			
		2(1-5/8)			
T6	43	CU12PSM9P6XXX(1-1/2)	60.00 - 80.00	0.6000	0.6000
T7	3	Step Pegs (5/8" SR) 7.5-in w/	40.00 - 60.00	0.6000	0.6000
		30" Step			
T7	4	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T7	7	LDF4-50A(1/2)	40.00 - 56.00	0.6000	0.6000
T7	8	HB078-1-08U3-M3J(7/8)	40.00 - 60.00	0.6000	0.6000
T7	9	LCF12-50J(1/2)	40.00 - 60.00	0.6000	0.6000
T7	14	HB158-21U6S24-xxM_TMO	40.00 - 60.00	0.6000	0.6000
		(1-5/8)			
T7	15	LDF4-50A(1/2)	40.00 - 46.00	0.6000	0.6000
T7	17	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T7	18	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T7	19	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.6000
T7	24	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.6000
T7	28	PWRT-608-S(13/16)	40.00 - 60.00	0.6000	0.6000
T7	29	FB-L98B-034-XXX(3/8)	40.00 - 60.00	0.6000	0.6000
T7	30	2" Flexible Conduit	40.00 - 60.00	0.6000	0.6000
T7	31	FB-L98B-235-XXX(3/8)	40.00 - 60.00	0.0000	0.0000
T7	32	PWRT-608-S(13/16)	40.00 - 60.00	0.6000	0.6000
T7	34	T-Bracket	40.00 - 60.00	0.6000	0.6000
T7	38	AL5-50(7/8)	40.00 - 60.00	0.6000	0.6000
T7	39	AL5-50(7/8)	40.00 - 60.00	0.6000	0.6000
T7	40	HCS 6X12 6AWG(1-3/8)	40.00 - 60.00	0.6000	0.6000
T7	41	MLE HYBRID	40.00 - 60.00	0.6000	0.6000
		9POWER/18FIBER RL			
		2(1-5/8)			
T7	43	CU12PSM9P6XXX(1-1/2)	40.00 - 60.00	0.6000	0.6000
T8	1	Step Pegs (5/8" SR) 7.5-in w/	20.00 - 40.00	0.6000	0.6000
		30" Step			
T8	2	Step Pegs (5/8" SR) 7.5-in w/	20.00 - 40.00	0.6000	0.6000
		30" Step			
T8	3	Step Pegs (5/8" SR) 7.5-in w/	20.00 - 40.00	0.6000	0.6000
		30" Step			
T8	4	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T8	6	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T8	7	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T8	8	HB078-1-08U3-M3J(7/8)	20.00 - 40.00	0.6000	0.6000
T8	9	LCF12-50J(1/2)	20.00 - 40.00	0.6000	0.6000
T8	14	HB158-21U6S24-xxM_TMO	20.00 - 40.00	0.6000	0.6000
		(1-5/8)			
T8	15	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T8	17	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T8	18	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T8	19	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.6000
T8	24	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.6000
T8	28	PWRT-608-S(13/16)	20.00 - 40.00	0.6000	0.6000
T8	29	FB-L98B-034-XXX(3/8)	20.00 - 40.00	0.6000	0.6000
T8	30	2" Flexible Conduit	20.00 - 40.00	0.6000	0.6000
T8	31	FB-L98B-235-XXX(3/8)	20.00 - 40.00	0.0000	0.0000
T8	32	PWRT-608-S(13/16)	20.00 - 40.00	0.6000	0.6000
T8	34	T-Bracket	20.00 - 40.00	0.6000	0.6000
T8	38	AL5-50(7/8)	20.00 - 40.00	0.6000	0.6000
T8	39	AL5-50(7/8)	20.00 - 40.00	0.6000	0.6000
T8	40	HCS 6X12 6AWG(1-3/8)	20.00 - 40.00	0.6000	0.6000
T8	41	MLE HYBRID	20.00 - 40.00	0.6000	0.6000
		9POWER/18FIBER RL			
		2(1-5/8)			

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T8	43	CU12PSM9P6XXX(1-1/2)	20.00 - 40.00	0.6000	0.6000
T9	1	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	10.00 - 20.00	0.6000	0.6000
T9	2	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	10.00 - 20.00	0.6000	0.6000
T9	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	10.00 - 20.00	0.6000	0.6000
T9	4	Safety Line 3/8	10.00 - 20.00	0.6000	0.6000
T9	6	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T9	7	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T9	8	HB078-1-08U3-M3J(7/8)	10.00 - 20.00	0.6000	0.6000
T9	9	LCF12-50J(1/2)	10.00 - 20.00	0.6000	0.6000
T9	14	HB158-21U6S24-xxM_TMO (1-5/8)	10.00 - 20.00	0.6000	0.6000
T9	15	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T9	17	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T9	18	HB158-1-08U8-S8J18(1-5/8)	10.00 - 20.00	0.6000	0.6000
T9	19	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T9	24	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T9	28	PWRT-608-S(13/16)	10.00 - 20.00	0.6000	0.6000
T9	29	FB-L98B-034-XXX(3/8)	10.00 - 20.00	0.6000	0.6000
T9	30	2" Flexible Conduit	10.00 - 20.00	0.6000	0.6000
T9	31	FB-L98B-235-XXX(3/8)	10.00 - 20.00	0.0000	0.0000
T9	32	PWRT-608-S(13/16)	10.00 - 20.00	0.6000	0.6000
T9	34	T-Bracket	10.00 - 20.00	0.6000	0.6000
T9	38	AL5-50(7/8)	10.00 - 20.00	0.6000	0.6000
T9	39	AL5-50(7/8)	10.00 - 20.00	0.6000	0.6000
T9	40	HCS 6X12 6AWG(1-3/8)	10.00 - 20.00	0.6000	0.6000
T9	41	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	10.00 - 20.00	0.6000	0.6000
T9	43	CU12PSM9P6XXX(1-1/2)	10.00 - 20.00	0.6000	0.6000
T10	1	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	0.00 - 10.00	0.6000	0.6000
T10	2	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	0.00 - 10.00	0.6000	0.6000
T10	3	Step Pegs (5/8" SR) 7.5-in w/ 30" Step	0.00 - 10.00	0.6000	0.6000
T10	4	Safety Line 3/8	0.00 - 10.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T10	7	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T10	8	HB078-1-08U3-M3J(7/8)	0.00 - 10.00	0.6000	0.6000
T10	9	LCF12-50J(1/2)	0.00 - 10.00	0.6000	0.6000
T10	14	HB158-21U6S24-xxM_TMO (1-5/8)	0.00 - 10.00	0.6000	0.6000
T10	15	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T10	17	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T10	18	HB158-1-08U8-S8J18(1-5/8)	0.00 - 10.00	0.6000	0.6000
T10	19	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T10	24	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T10	28	PWRT-608-S(13/16)	0.00 - 10.00	0.6000	0.6000
T10	29	FB-L98B-034-XXX(3/8)	0.00 - 10.00	0.6000	0.6000
T10	30	2" Flexible Conduit	0.00 - 10.00	0.6000	0.6000
T10	31	FB-L98B-235-XXX(3/8)	0.00 - 10.00	0.0000	0.0000
T10	32	PWRT-608-S(13/16)	0.00 - 10.00	0.6000	0.6000
T10	34	T-Bracket	0.00 - 10.00	0.6000	0.6000
T10	38	AL5-50(7/8)	0.00 - 10.00	0.6000	0.6000
T10	39	AL5-50(7/8)	0.00 - 10.00	0.6000	0.6000
T10	40	HCS 6X12 6AWG(1-3/8)	0.00 - 10.00	0.6000	0.6000
T10	41	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	0.00 - 10.00	0.6000	0.6000

<i>tnxTower</i> <i>Tower Engineering Professionals</i> 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	HRT 084 943242 (BU 806377)	Page	14 of 28
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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T10	43	CU12PSM9P6XXX(1-1/2)	0.00 - 10.00	0.6000	0.6000

Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horiz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>

4" x 5' Pipe	A	From Leg	0.00 0' 3'	0.0000	130'	No Ice 1.60 1/2" Ice 1.94 1" Ice 2.26 2" Ice 2.92	1.60 1.94 2.26 2.92	0.05 0.06 0.08 0.13
4" x 5' Pipe	B	From Leg	0.00 0' 3'	0.0000	130'	No Ice 1.60 1/2" Ice 1.94 1" Ice 2.26 2" Ice 2.92	1.60 1.94 2.26 2.92	0.05 0.06 0.08 0.13
130								
VV-65B-R1_TMO w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	130'	No Ice 8.15 1/2" Ice 8.70 1" Ice 9.22 2" Ice 10.28	5.43 6.56 7.41 9.18	0.07 0.13 0.20 0.36
VV-65B-R1_TMO w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	130'	No Ice 8.15 1/2" Ice 8.70 1" Ice 9.22 2" Ice 10.28	5.43 6.56 7.41 9.18	0.07 0.13 0.20 0.36
VV-65B-R1_TMO w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	130'	No Ice 8.15 1/2" Ice 8.70 1" Ice 9.22 2" Ice 10.28	5.43 6.56 7.41 9.18	0.07 0.13 0.20 0.36
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	130'	No Ice 6.58 1/2" Ice 7.06 1" Ice 7.57 2" Ice 8.62	3.50 3.90 4.32 5.20	0.11 0.16 0.22 0.36
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	130'	No Ice 6.58 1/2" Ice 7.06 1" Ice 7.57 2" Ice 8.62	3.50 3.90 4.32 5.20	0.11 0.16 0.22 0.36
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	130'	No Ice 6.58 1/2" Ice 7.06 1" Ice 7.57 2" Ice 8.62	3.50 3.90 4.32 5.20	0.11 0.16 0.22 0.36
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	130'	No Ice 14.69 1/2" Ice 15.46 1" Ice 16.23 2" Ice 17.82	6.87 7.55 8.25 9.67	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	130'	No Ice 14.69 1/2" Ice 15.46 1" Ice 16.23 2" Ice 17.82	6.87 7.55 8.25 9.67	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	130'	No Ice 14.69 1/2" Ice 15.46	6.87 7.55	0.18 0.31

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0'			1" Ice 16.23	8.25	0.45
						2" Ice 17.82	9.67	0.78
ANT450D6-9	A	From Leg	1.00	0.0000	130'	No Ice 1.40	1.40	0.02
			0'			1/2" Ice 2.50	2.50	0.02
			6'			1" Ice 3.60	3.60	0.03
						2" Ice 5.80	5.80	0.04
ANT450D6-9	A	From Leg	1.00	0.0000	130'	No Ice 1.40	1.40	0.02
			0'			1/2" Ice 2.50	2.50	0.02
			0'			1" Ice 3.60	3.60	0.03
						2" Ice 5.80	5.80	0.04
DB413-B	B	From Leg	1.00	0.0000	130'	No Ice 2.55	2.55	0.03
			0'			1/2" Ice 4.59	4.59	0.04
			11'			1" Ice 6.63	6.63	0.05
						2" Ice 10.71	10.71	0.07
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.0000	130'	No Ice 2.14	1.69	0.11
			0'			1/2" Ice 2.32	1.85	0.13
			0'			1" Ice 2.51	2.02	0.16
						2" Ice 2.91	2.39	0.22
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00	0.0000	130'	No Ice 2.14	1.69	0.11
			0'			1/2" Ice 2.32	1.85	0.13
			0'			1" Ice 2.51	2.02	0.16
						2" Ice 2.91	2.39	0.22
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.0000	130'	No Ice 2.14	1.69	0.11
			0'			1/2" Ice 2.32	1.85	0.13
			0'			1" Ice 2.51	2.02	0.16
						2" Ice 2.91	2.39	0.22
Radio 4480_TMOV2	A	From Leg	4.00	0.0000	130'	No Ice 2.88	1.40	0.08
			0'			1/2" Ice 3.09	1.56	0.10
			0'			1" Ice 3.31	1.73	0.13
						2" Ice 3.78	2.09	0.19
Radio 4480_TMOV2	B	From Leg	4.00	0.0000	130'	No Ice 2.88	1.40	0.08
			0'			1/2" Ice 3.09	1.56	0.10
			0'			1" Ice 3.31	1.73	0.13
						2" Ice 3.78	2.09	0.19
Radio 4480_TMOV2	C	From Leg	4.00	0.0000	130'	No Ice 2.88	1.40	0.08
			0'			1/2" Ice 3.09	1.56	0.10
			0'			1" Ice 3.31	1.73	0.13
						2" Ice 3.78	2.09	0.19
2.4" Dia x 8-ft Mount Pipe	A	From Leg	4.00	0.0000	130'	No Ice 1.90	1.90	0.03
			0'			1/2" Ice 2.73	2.73	0.04
			0'			1" Ice 3.40	3.40	0.06
						2" Ice 4.40	4.40	0.12
2.4" Dia x 8-ft Mount Pipe	B	From Leg	4.00	0.0000	130'	No Ice 1.90	1.90	0.03
			0'			1/2" Ice 2.73	2.73	0.04
			0'			1" Ice 3.40	3.40	0.06
						2" Ice 4.40	4.40	0.12
2.4" Dia x 8-ft Mount Pipe	C	From Leg	4.00	0.0000	130'	No Ice 1.90	1.90	0.03
			0'			1/2" Ice 2.73	2.73	0.04
			0'			1" Ice 3.40	3.40	0.06
						2" Ice 4.40	4.40	0.12
Site Pro 1 VFA10-HD-S	A	From Leg	2.00	0.0000	130'	No Ice 11.40	7.00	0.55
			0'			1/2" Ice 17.30	11.30	0.65
			0'			1" Ice 22.60	15.30	0.80
						2" Ice 35.00	24.20	0.95
Site Pro 1 VFA10-HD-S	B	From Leg	2.00	0.0000	130'	No Ice 11.40	7.00	0.55
			0'			1/2" Ice 17.30	11.30	0.65
			0'			1" Ice 22.60	15.30	0.80

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	Client	Crown Castle	Designed by	jfisher

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Site Pro 1 VFA10-HD-S	C	From Leg	2.00 0' 0'	0.0000	130'	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	35.00 11.40 17.30 22.60 35.00	24.20 7.00 11.30 15.30 24.20	0.95 0.55 0.65 0.80 0.95
117									
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
CBRS	A	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	1.54 1.79 2.06 2.67	0.61 0.80 1.02 1.51	0.02 0.04 0.05 0.09
CBRS	B	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	1.54 1.79 2.06 2.67	0.61 0.80 1.02 1.51	0.02 0.04 0.05 0.09
CBRS	C	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	1.54 1.79 2.06 2.67	0.61 0.80 1.02 1.51	0.02 0.04 0.05 0.09
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
LBX-6515DS-T0M w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	8.63 9.19 9.72 10.81	6.10 7.28 8.17 9.98	0.05 0.11 0.19 0.36
LBX-6515DS-T0M w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	8.63 9.19 9.72 10.81	6.10 7.28 8.17 9.98	0.05 0.11 0.19 0.36
LNx-6514DS-T4M w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.06 0.13 0.20 0.38
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0' -2'	0.0000	117'	2" Ice 5.93 No Ice 4.80 1/2" Ice 5.07 1" Ice 5.35 2" Ice 5.93	2.81 2.00 2.19 2.39 2.81	0.21 0.04 0.08 0.12 0.21
RFV01U-D2A	A	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	B	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	C	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D1A	A	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	B	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	C	From Leg	4.00 0' -2'	0.0000	117'	No Ice 1.88 1/2" Ice 2.05 1" Ice 2.22 2" Ice 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
2.4" Dia x 6-ft Pipe	A	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1.43 1/2" Ice 1.93 1" Ice 2.30 2" Ice 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
2.4" Dia x 6-ft Pipe	B	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1.43 1/2" Ice 1.93 1" Ice 2.30 2" Ice 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
2.4" Dia x 6-ft Pipe	C	From Leg	4.00 0' 0'	0.0000	117'	No Ice 1.43 1/2" Ice 1.93 1" Ice 2.30 2" Ice 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
Sector Mount [SM 505-3]	C	None		0.0000	117'	No Ice 31.66 1/2" Ice 44.64 1" Ice 57.44 2" Ice 82.68	31.66 44.64 57.44 82.68	1.73 2.36 3.19 5.45
104								
AIR 6419 B77G_CCIV2 w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	104'	No Ice 4.00 1/2" Ice 4.31 1" Ice 4.63 2" Ice 5.31	2.62 3.02 3.44 4.34	0.08 0.12 0.16 0.26
AIR 6419 B77G_CCIV2 w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	104'	No Ice 4.00 1/2" Ice 4.31 1" Ice 4.63 2" Ice 5.31	2.62 3.02 3.44 4.34	0.08 0.12 0.16 0.26
AIR 6419 B77G_CCIV2 w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	104'	No Ice 4.00 1/2" Ice 4.31 1" Ice 4.63	2.62 3.02 3.44	0.08 0.12 0.16

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
AIR 6449 B77D	A	From Leg	4.00 0' -2'	0.0000	104'	2" Ice 5.31 No Ice 3.64 1/2" Ice 4.00 1" Ice 4.37 2" Ice 5.16	4.34 1.72 2.02 2.33 2.99	0.26 0.08 0.11 0.14 0.22
AIR 6449 B77D	B	From Leg	4.00 0' -2'	0.0000	104'	No Ice 3.64 1/2" Ice 4.00 1" Ice 4.37 2" Ice 5.16	1.72 2.02 2.33 2.99	0.08 0.11 0.14 0.22
AIR 6449 B77D	C	From Leg	4.00 0' -2'	0.0000	104'	No Ice 3.64 1/2" Ice 4.00 1" Ice 4.37 2" Ice 5.16	1.72 2.02 2.33 2.99	0.08 0.11 0.14 0.22
TPA65R-BU6D_CCIV2 w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 11.96 1/2" Ice 12.70 1" Ice 13.46 2" Ice 15.02	5.97 6.63 7.30 8.69	0.09 0.18 0.28 0.51
TPA65R-BU6D_CCIV2 w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 11.96 1/2" Ice 12.70 1" Ice 13.46 2" Ice 15.02	5.97 6.63 7.30 8.69	0.09 0.18 0.28 0.51
TPA65R-BU8D_CCIV2 w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 15.89 1/2" Ice 16.81 1" Ice 17.76 2" Ice 19.70	7.89 8.74 9.60 11.37	0.12 0.23 0.36 0.66
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 11.96 1/2" Ice 12.70 1" Ice 13.46 2" Ice 15.02	5.97 6.63 7.30 8.69	0.11 0.20 0.30 0.53
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 11.96 1/2" Ice 12.70 1" Ice 13.46 2" Ice 15.02	5.97 6.63 7.30 8.69	0.11 0.20 0.30 0.53
DMP65R-BU8D w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 15.89 1/2" Ice 16.81 1" Ice 17.76 2" Ice 19.70	7.89 8.74 9.60 11.37	0.14 0.25 0.38 0.68
DC6-48-60-18-8F	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1.21 1/2" Ice 1.89 1" Ice 2.11 2" Ice 2.57	1.21 1.89 2.11 2.57	0.03 0.05 0.08 0.14
DC6-48-60-18-8F	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1.21 1/2" Ice 1.89 1" Ice 2.11 2" Ice 2.57	1.21 1.89 2.11 2.57	0.03 0.05 0.08 0.14
RRUS 32 B30	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 2.73 1/2" Ice 2.95 1" Ice 3.18 2" Ice 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B30	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 2.73 1/2" Ice 2.95 1" Ice 3.18 2" Ice 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B30	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 2.73 1/2" Ice 2.95 1" Ice 3.18 2" Ice 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
DC9-48-60-24-8C-EV_CCIV 2	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.20 3.68	2.74 2.96 3.20 3.68	0.02 0.04 0.07 0.14
RRUS 4478 B14	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 32 B2	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 4449 B5/B12	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	B	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	C	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
(2) 2.4" Dia x 5-ft Pipe	A	From Leg	4.00 0' 0'	0.0000	104'	No Ice 1/2" Ice 1" Ice 2" Ice	1.20 1.50 1.81 2.47	1.20 1.50 1.81 2.47	0.02 0.03 0.04 0.08
(2) 2.4" Dia x 5-ft Pipe	B	From Leg	4.00	0.0000	104'	No Ice	1.20	1.20	0.02

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	Client	Crown Castle	Designed by	jfisher

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0'			1/2" Ice	1.50	1.50	0.03
			0'			1" Ice	1.81	1.81	0.04
						2" Ice	2.47	2.47	0.08
(2) 2.4" Dia x 5-ft Pipe	C	From Leg	4.00	0.0000	104'	No Ice	1.20	1.20	0.02
			0'			1/2" Ice	1.50	1.50	0.03
			0'			1" Ice	1.81	1.81	0.04
						2" Ice	2.47	2.47	0.08
2.4" Dia x 6-ft Pipe	A	From Leg	4.00	0.0000	104'	No Ice	1.43	1.43	0.02
			0'			1/2" Ice	1.93	1.93	0.03
			0'			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia x 6-ft Pipe	B	From Leg	4.00	0.0000	104'	No Ice	1.43	1.43	0.02
			0'			1/2" Ice	1.93	1.93	0.03
			0'			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia x 6-ft Pipe	C	From Leg	4.00	0.0000	104'	No Ice	1.43	1.43	0.02
			0'			1/2" Ice	1.93	1.93	0.03
			0'			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
Sector Mount [SM 503-3]	C	None		0.0000	104'	No Ice	30.43	30.43	1.69
						1/2" Ice	43.02	43.02	2.30
						1" Ice	55.43	55.43	3.10
						2" Ice	79.89	79.89	5.27
94									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00	0.0000	94'	No Ice	8.01	4.23	0.11
			0'			1/2" Ice	8.52	4.69	0.19
			0'			1" Ice	9.04	5.16	0.29
						2" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00	0.0000	94'	No Ice	8.01	4.23	0.11
			0'			1/2" Ice	8.52	4.69	0.19
			0'			1" Ice	9.04	5.16	0.29
						2" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.0000	94'	No Ice	8.01	4.23	0.11
			0'			1/2" Ice	8.52	4.69	0.19
			0'			1" Ice	9.04	5.16	0.29
						2" Ice	10.11	6.12	0.52
TA08025-B604	A	From Leg	4.00	0.0000	94'	No Ice	1.96	0.98	0.06
			0'			1/2" Ice	2.14	1.11	0.08
			0'			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
TA08025-B604	B	From Leg	4.00	0.0000	94'	No Ice	1.96	0.98	0.06
			0'			1/2" Ice	2.14	1.11	0.08
			0'			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
TA08025-B604	C	From Leg	4.00	0.0000	94'	No Ice	1.96	0.98	0.06
			0'			1/2" Ice	2.14	1.11	0.08
			0'			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
TA08025-B605	A	From Leg	4.00	0.0000	94'	No Ice	1.96	1.13	0.08
			0'			1/2" Ice	2.14	1.27	0.09
			0'			1" Ice	2.32	1.41	0.11
						2" Ice	2.71	1.72	0.16
TA08025-B605	B	From Leg	4.00	0.0000	94'	No Ice	1.96	1.13	0.08
			0'			1/2" Ice	2.14	1.27	0.09
			0'			1" Ice	2.32	1.41	0.11
						2" Ice	2.71	1.72	0.16
TA08025-B605	C	From Leg	4.00	0.0000	94'	No Ice	1.96	1.13	0.08

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0'			1/2" Ice	2.14	0.09
			0'			1" Ice	2.32	0.11
						2" Ice	2.71	0.16
RDIDC-9181-PF-48	A	From Leg	4.00	0.0000	94'	No Ice	2.01	0.02
			0'			1/2" Ice	2.19	0.04
			0'			1" Ice	2.37	0.06
						2" Ice	2.76	0.11
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Leg	4.00	0.0000	94'	No Ice	1.90	0.03
			0'			1/2" Ice	2.73	0.04
			0'			1" Ice	3.40	0.06
						2" Ice	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Leg	4.00	0.0000	94'	No Ice	1.90	0.03
			0'			1/2" Ice	2.73	0.04
			0'			1" Ice	3.40	0.06
						2" Ice	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Leg	4.00	0.0000	94'	No Ice	1.90	0.03
			0'			1/2" Ice	2.73	0.04
			0'			1" Ice	3.40	0.06
						2" Ice	4.40	0.12
Commscope MTC3975083 (3)	C	None		0.0000	94'	No Ice	23.85	1.26
						1/2" Ice	34.12	1.80
						1" Ice	44.39	2.35
						2" Ice	64.93	3.43
84								
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	84'	No Ice	3.14	0.11
			0'			1/2" Ice	3.45	0.16
			0'			1" Ice	3.77	0.23
						2" Ice	4.43	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	84'	No Ice	3.14	0.11
			0'			1/2" Ice	3.45	0.16
			0'			1" Ice	3.77	0.23
						2" Ice	4.43	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	84'	No Ice	3.14	0.11
			0'			1/2" Ice	3.45	0.16
			0'			1" Ice	3.77	0.23
						2" Ice	4.43	0.38
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.0000	84'	No Ice	14.69	0.19
			0'			1/2" Ice	15.46	0.31
			0'			1" Ice	16.23	0.46
						2" Ice	17.82	0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00	0.0000	84'	No Ice	14.69	0.19
			0'			1/2" Ice	15.46	0.31
			0'			1" Ice	16.23	0.46
						2" Ice	17.82	0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00	0.0000	84'	No Ice	14.69	0.19
			0'			1/2" Ice	15.46	0.31
			0'			1" Ice	16.23	0.46
						2" Ice	17.82	0.79
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	84'	No Ice	3.76	0.19
			6'			1/2" Ice	4.12	0.25
			0'			1" Ice	4.48	0.32
						2" Ice	5.24	0.48
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.0000	84'	No Ice	3.76	0.19
			6'			1/2" Ice	4.12	0.25
			0'			1" Ice	4.48	0.32
						2" Ice	5.24	0.48
AIR 32 B2A/B66AA w/	C	From Leg	4.00	0.0000	84'	No Ice	3.76	0.19

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
Mount Pipe			6' 0'			1/2" Ice 4.12 1" Ice 4.48 2" Ice 5.24	3.49 3.84 4.58	0.25 0.32 0.48
KRY 112 144/1	A	From Leg	4.00 0' 0'	0.0000	84'	No Ice 0.35 1/2" Ice 0.43 1" Ice 0.51 2" Ice 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	B	From Leg	4.00 0' 0'	0.0000	84'	No Ice 0.35 1/2" Ice 0.43 1" Ice 0.51 2" Ice 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Leg	4.00 0' 0'	0.0000	84'	No Ice 0.35 1/2" Ice 0.43 1" Ice 0.51 2" Ice 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
RADIO 4449 B12/B71	A	From Leg	4.00 0' 0'	0.0000	84'	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.33	1.15 1.29 1.44 1.75	0.08 0.09 0.11 0.16
RADIO 4449 B12/B71	B	From Leg	4.00 0' 0'	0.0000	84'	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.33	1.15 1.29 1.44 1.75	0.08 0.09 0.11 0.16
RADIO 4449 B12/B71	C	From Leg	4.00 0' 0'	0.0000	84'	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.33	1.15 1.29 1.44 1.75	0.08 0.09 0.11 0.16
Sitepro VFA12-U (1)	A	From Leg	2.00 0' 0'	0.0000	84'	No Ice 8.93 1/2" Ice 15.18 1" Ice 21.43 2" Ice 33.93	4.46 8.51 12.56 20.66	0.30 0.40 0.50 0.71
Sitepro VFA12-U (1)	B	From Leg	2.00 0' 0'	0.0000	84'	No Ice 8.93 1/2" Ice 15.18 1" Ice 21.43 2" Ice 33.93	4.46 8.51 12.56 20.66	0.30 0.40 0.50 0.71
Sitepro VFA12-U (1)	C	From Leg	2.00 0' 0'	0.0000	84'	No Ice 8.93 1/2" Ice 15.18 1" Ice 21.43 2" Ice 33.93	4.46 8.51 12.56 20.66	0.30 0.40 0.50 0.71
63 RDL-3000	C	From Leg	3.00 0' 0'	0.0000	63'	No Ice 1.01 1/2" Ice 1.13 1" Ice 1.27 2" Ice 1.56	0.26 0.34 0.42 0.61	0.01 0.01 0.02 0.04
ALFOPLUS2_CCIV3	C	From Leg	3.00 0' 0'	0.0000	63'	No Ice 1.07 1/2" Ice 1.20 1" Ice 1.34 2" Ice 1.64	0.56 0.67 0.78 1.03	0.03 0.03 0.05 0.07
Side Arm Mount [SO 311-1]	C	From Leg	1.50 0' 0'	0.0000	63'	No Ice 1.67 1/2" Ice 2.43 1" Ice 3.21 2" Ice 4.84	4.53 6.41 8.37 12.72	0.06 0.10 0.15 0.28
56 GPS-TMG-20N	A	From Leg	3.00 0' 3'	0.0000	56'	No Ice 0.13 1/2" Ice 0.18 1" Ice 0.24 2" Ice 0.37	0.13 0.18 0.24 0.37	0.00 0.00 0.01 0.01

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Side Arm Mount [SO 305-1]	A	From Leg	1.50 0' 0'	0.0000	56'	No Ice 1/2" Ice 1" Ice 2" Ice	0.53 0.78 1.06 1.73	1.52 2.07 2.66 3.91	0.03 0.04 0.06 0.13
46									
KS24019-L112A	B	From Leg	1.00 0' 1'	0.0000	46'	No Ice 1/2" Ice 1" Ice 2" Ice	0.08 0.13 0.19 0.35	0.08 0.13 0.19 0.35	0.01 0.01 0.01 0.02
2.4" Dia x 2.5-ft Mount Pipe	B	From Leg	0.50 0' 0'	0.0000	46'	No Ice 1/2" Ice 1" Ice 2" Ice	0.46 0.62 0.78 1.15	0.46 0.62 0.78 1.15	0.01 0.01 0.02 0.04

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft ²	Weight K
SB1-190BB	C	Paraboloid w/Shroud (HP)	From Leg	3.00 0' 0'	-12.0000		63'	1.25	No Ice 1/2" Ice 1" Ice 2" Ice	1.23 1.40 1.57 1.91	0.01 0.02 0.03 0.04

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	132	Leg	A325X	0.6250	4	0.85	20.34	0.042	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	1.41	6.79	0.208	1.05	Member Block Shear
T2	120	Top Girt	A325X	0.6250	1	0.12	7.83	0.015	1.05	Member Bearing
		Leg	A325X	0.7500	4	4.20	30.10	0.140	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	3.20	6.79	0.471	1.05	Member Block Shear
T3	100	Top Girt	A325X	0.6250	1	0.43	7.83	0.055	1.05	Member Bearing
		Diagonal	A325X	0.6250	1	3.77	7.83	0.482	1.05	Member Bearing
T4	93.3333	Diagonal	A325X	0.6250	1	4.08	7.83	0.521	1.05	Member Bearing
T5	86.6667	Leg	A325X	0.8750	4	8.88	41.56	0.214	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	5.06	7.83	0.647	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.87	5.46	0.159	1.05	Member Block Shear

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T6	80	Leg	A325X	0.8750	4	14.61	41.56	0.352	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	4.92	7.83	0.629	1.05	Member Bearing
T7	60	Leg	A325X	1.0000	4	19.74	54.52	0.362	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	5.34	7.83	0.683	1.05	Member Bearing
T8	40	Leg	A325X	1.0000	4	24.15	54.52	0.443	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	6.11	11.70	0.522	1.05	Member Bearing
T9	20	Diagonal	A325X	0.6250	1	6.27	11.70	0.536	1.05	Member Bearing
T10	10	Diagonal	A325X	0.7500	1	6.37	14.14	0.450	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	2.47	9.53	0.259	1.05	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 120	ROHN 2 STD	12'	4'	61.0 K=1.00	1.0745	-6.24	36.84	0.169 ¹
T2	120 - 100	ROHN 2.5 STD	20'3/8"	5'1/8"	63.4 K=1.00	1.7040	-25.03	57.13	0.438 ¹
T3	100 - 93.3333	ROHN 3 STD	6'8-5/32'	6'8-5/32'	68.9 K=1.00	2.2285	-32.72	70.89	0.462 ¹
T4	93.3333 - 86.6667	ROHN 3 STD	6'8-5/32'	6'8-5/32'	68.9 K=1.00	2.2285	-40.69	70.87	0.574 ¹
T5	86.6667 - 80	ROHN 3 STD	6'8-1/32'	3'5-5/32'	35.4 K=1.00	2.2285	-50.14	91.52	0.548 ¹
T6	80 - 60	ROHN 3 X-STR	20'15/32"	6'8-5/32'	70.5 K=1.00	3.0159	-75.60	94.34	0.801 ¹
T7	60 - 40	ROHN 4 X-STR	20'3/8"	6'8-5/32'	54.3 K=1.00	4.4074	-99.87	159.91	0.625 ¹
T8	40 - 20	ROHN 5 X-STR	20'3/8"	10'1/4"	65.4 K=1.00	6.1120	-120.82	201.25	0.600 ¹
T9	20 - 10	ROHN 5 X-STR	10'1/4"	10'1/4"	65.4 K=1.00	6.1120	-132.14	201.25	0.657 ¹
T10	10 - 0	ROHN 5 X-STR	10'1/4"	5'1-13/16"	33.6 K=1.00	6.1120	-142.41	253.28	0.562 ¹

¹ P_u / φP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 120	L1 3/4x1 3/4x3/16	7'8-7/8"	3'7-11/16"	127.1	0.6211	-1.35	11.00	0.123 ¹

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	Client	Crown Castle	Designed by	jfisher

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	120 - 100	L1 3/4x1 3/4x3/16	9'9-19/32"	4'9-15/32"	K=1.00 167.4	0.6211	-3.17	6.34	0.500 ¹
T3	100 - 93.3333	L2 1/2x2 1/2x3/16	11'2-5/8"	5'6-1/4"	K=1.00 133.7	0.9023	-3.88	14.44	0.269 ¹
T4	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11'9-19/32"	5'10-3/32"	K=1.00 141.5	0.9023	-4.10	12.89	0.318 ¹
T5	86.6667 - 80	L2 1/2x2 1/2x3/16	12'4-5/16"	6'19/32"	K=1.00 146.8	0.9023	-5.09	11.98	0.425 ¹
T6	80 - 60	L2 1/2x2 1/2x3/16	14'1-3/32"	6'11-17/32"	K=1.00 168.7	0.9023	-4.97	9.07	0.548 ¹
T7	60 - 40	L3x3x3/16	15'10-13/16"	7'9-23/32"	K=1.00 157.2	1.0900	-5.33	12.62	0.422 ¹
T8	40 - 20	L3x3x1/4	19'1-3/16"	9'5-13/32"	K=1.00 193.9	1.4400	-6.18	10.96	0.564 ¹
T9	20 - 10	L3 1/2x3 1/2x1/4	19'11-17/32"	9'10-9/16"	K=1.00 170.9	1.6900	-6.27	16.57	0.378 ¹
T10	10 - 0	L3 1/2x3 1/2x1/4	20'9-31/32"	10'3-19/32"	K=1.00 178.1	1.6900	-6.92	15.25	0.454 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	86.6667 - 80	L1 1/2x1 1/2x3/16	10'4-13/16"	4'11-1/32"	K=1.00 201.1	0.5273	-0.87	3.73	0.233 ¹
T10	10 - 0	L2 1/2x2 1/2x3/16	18'3-1/8"	8'9-1/8"	K=1.00 212.4	0.9023	-2.47	5.72	0.432 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 120	L2x2x3/16	6'7-3/16"	6'2-1/32"	K=1.00 187.8	0.7150	-0.09	5.80	0.016 ¹
T2	120 - 100	L2x2x3/16	6'7-13/16"	6'2-1/32"	K=1.00 187.8	0.7150	-0.43	5.80	0.075 ¹

¹ P_u / φP_n controls

Tension Checks

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Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 120	ROHN 2 STD	12'	4'	61.0	1.0745	3.39	48.35	0.070 ¹
T2	120 - 100	ROHN 2.5 STD	20'3/8"	5'1/8"	63.4	1.7040	16.80	76.68	0.219 ¹
T3	100 - 93.3333	ROHN 3 STD	6'8-5/32'	6'8-5/32'	68.9	2.2285	22.04	100.28	0.220 ¹
T4	93.3333 - 86.6667	ROHN 3 STD	6'8-5/32'	6'8-5/32'	68.9	2.2285	28.68	100.28	0.286 ¹
T5	86.6667 - 80	ROHN 3 STD	6'8-1/32'	3'3"	33.5	2.2285	36.30	100.28	0.362 ¹
T6	80 - 60	ROHN 3 X-STR	20'15/32"	6'8-5/32'	70.5	3.0159	58.44	135.72	0.431 ¹
T7	60 - 40	ROHN 4 X-STR	20'3/8"	6'8-5/32'	54.3	4.4074	78.95	198.34	0.398 ¹
T8	40 - 20	ROHN 5 X-STR	20'3/8"	10'1/4"	65.4	6.1120	96.59	275.04	0.351 ¹
T9	20 - 10	ROHN 5 X-STR	10'1/4"	10'1/4"	65.4	6.1120	105.92	275.04	0.385 ¹
T10	10 - 0	ROHN 5 X-STR	10'1/4"	4'10-7/16"	31.8	6.1120	114.39	275.04	0.416 ¹

¹ P_u / φP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 120	L1 3/4x1 3/4x3/16	7'8-7/8"	3'7-11/16"	84.0	0.3604	1.41	15.68	0.090 ¹
T2	120 - 100	L1 3/4x1 3/4x3/16	9'9-19/32"	4'9-15/32"	109.8	0.3604	3.20	15.68	0.204 ¹
T3	100 - 93.3333	L2 1/2x2 1/2x3/16	11'2-5/8"	5'6-1/4"	86.9	0.5713	3.77	24.85	0.152 ¹
T4	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11'9-19/32"	5'10-3/32"	91.8	0.5713	4.08	24.85	0.164 ¹
T5	86.6667 - 80	L2 1/2x2 1/2x3/16	12'4-5/16"	6'19/32"	95.2	0.5713	5.06	24.85	0.204 ¹
T6	80 - 60	L2 1/2x2 1/2x3/16	13'5-7/8"	6'7-29/32"	104.5	0.5713	4.92	24.85	0.198 ¹
T7	60 - 40	L3x3x3/16	15'10-13/16"	7'9-23/32"	101.3	0.7120	5.34	30.97	0.173 ¹
T8	40 - 20	L3x3x1/4	19'1-3/16"	9'5-13/32"	124.0	0.9394	6.11	45.79	0.133 ¹
T9	20 - 10	L3 1/2x3 1/2x1/4	19'11-17/32"	9'10-9/16"	110.1	1.1269	6.27	54.94	0.114 ¹
T10	10 - 0	L3 1/2x3 1/2x1/4	20'9-31/32"	10'3-19/32"	114.9	1.1034	6.37	53.79	0.118 ¹

¹ P_u / φP_n controls

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Secondary Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	$\frac{\phi P_n}{P_u}$
T5	86.6667 - 80	L1 1/2x1 1/2x3/16	10'4-13/16"	4'11-1/32"	265.5	0.2900	0.87	12.62	0.069 ¹
T10	10 - 0	L2 1/2x2 1/2x3/16	18'3-1/8"	8'9-1/8"	274.4	0.5713	2.47	24.85	0.099 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	$\frac{\phi P_n}{P_u}$
T1	132 - 120	L2x2x3/16	6'7-3/16"	6'2-1/32"	124.6	0.4308	0.12	18.74	0.006 ¹
T2	120 - 100	L2x2x3/16	6'7-13/16"	6'2-1/32"	124.6	0.4308	0.43	18.74	0.023 ¹

¹ P_u / φP_n controls

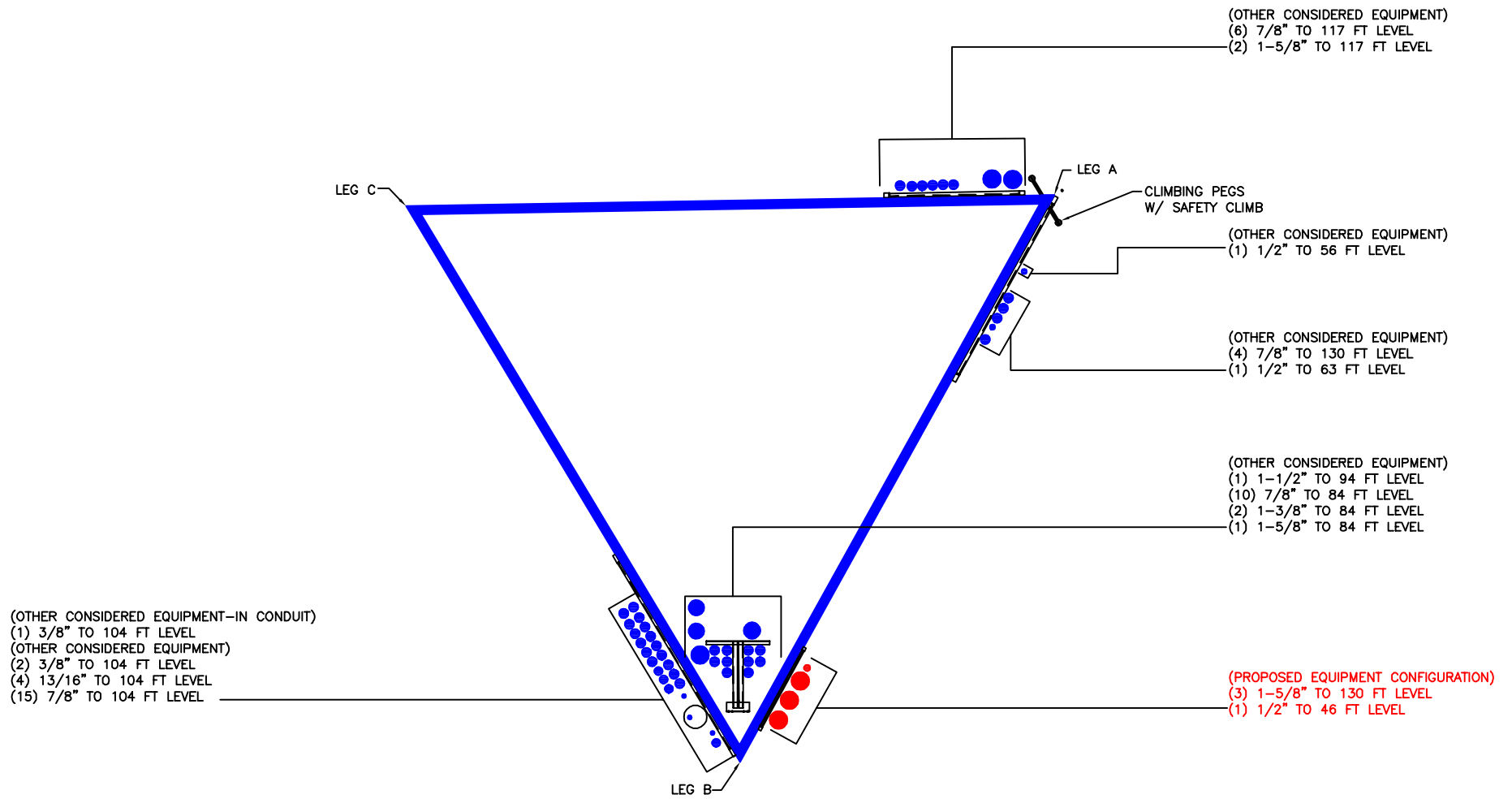
Section Capacity Table

Section No.	Elevation	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	132 - 120	Leg	ROHN 2 STD	2	-6.24	38.68	16.1	Pass
T2	120 - 100	Leg	ROHN 2.5 STD	27	-25.03	59.99	41.7	Pass
T3	100 - 93.3333	Leg	ROHN 3 STD	57	-32.72	74.44	44.0	Pass
T4	93.3333 - 86.6667	Leg	ROHN 3 STD	66	-40.69	74.41	54.7	Pass
T5	86.6667 - 80	Leg	ROHN 3 STD	75	-50.14	96.10	52.2	Pass
T6	80 - 60	Leg	ROHN 3 X-STR	87	-75.60	99.05	76.3	Pass
T7	60 - 40	Leg	ROHN 4 X-STR	108	-99.87	167.91	59.5	Pass
T8	40 - 20	Leg	ROHN 5 X-STR	129	-120.82	211.31	57.2	Pass
T9	20 - 10	Leg	ROHN 5 X-STR	144	-132.14	211.31	62.5	Pass
T10	10 - 0	Leg	ROHN 5 X-STR	153	-142.41	265.94	53.5	Pass
T1	132 - 120	Diagonal	L1 3/4x1 3/4x3/16	16	-1.35	11.55	11.7	Pass
T2	120 - 100	Diagonal	L1 3/4x1 3/4x3/16	33	-3.17	6.66	47.6	Pass
T3	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	60	-3.88	15.16	25.6	Pass
T4	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	69	-4.10	13.54	30.3	Pass
T5	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	78	-5.09	12.58	40.5	Pass
T6	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	91	-4.97	9.53	52.2	Pass
T7	60 - 40	Diagonal	L3x3x3/16	112	-5.33	13.25	40.2	Pass
T8	40 - 20	Diagonal	L3x3x1/4	133	-6.18	11.51	53.7	Pass
T9	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	148	-6.27	17.40	36.0	Pass
T10	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	157	-6.92	16.01	43.2	Pass
T5	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	83	-0.87	3.92	22.2	Pass
T10	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	161	-2.47	6.01	41.1	Pass
T1	132 - 120	Top Girt	L2x2x3/16	6	-0.09	6.09	1.5	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T2	120 - 100	Top Girt	L2x2x3/16	29	-0.43	6.09	7.1	Pass
Summary								
						Leg (T6)	76.3	Pass
						Diagonal (T8)	53.7	Pass
						Secondary Horizontal (T10)	41.1	Pass
						Top Girt (T2)	7.1	Pass
						Bolt Checks	65.0	Pass
RATING =							76.3	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C

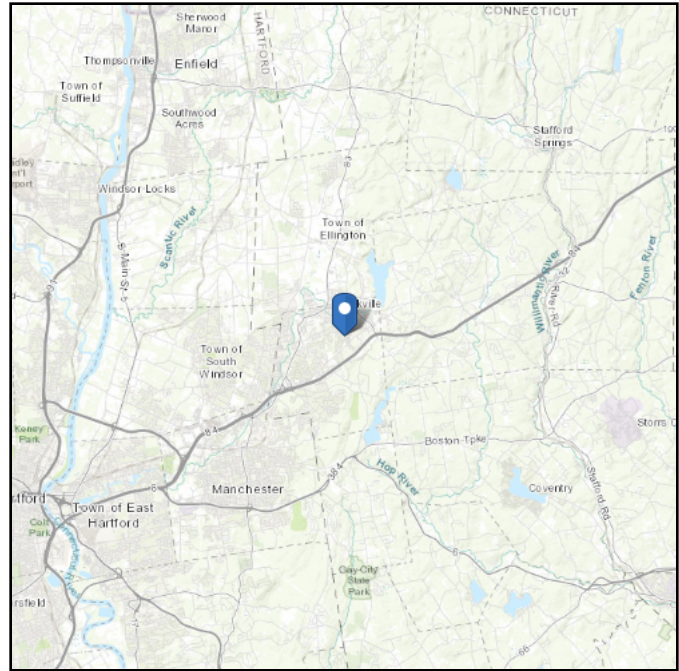
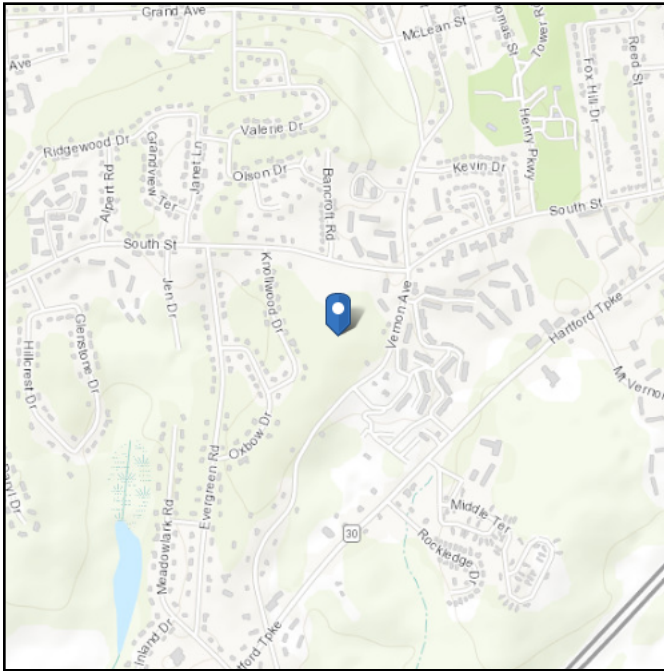
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 654.83 ft (NAVD 88)
Latitude: 41.853475
Longitude: -72.452089



Wind

Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Jun 28 2022

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

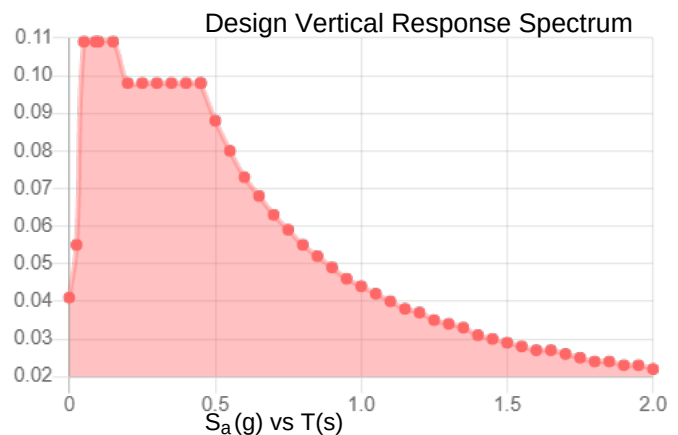
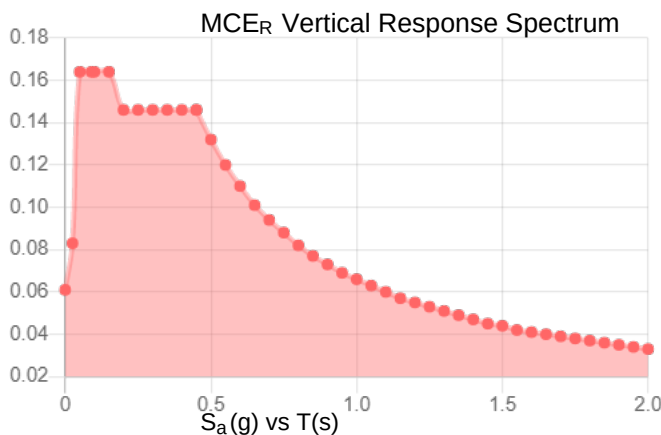
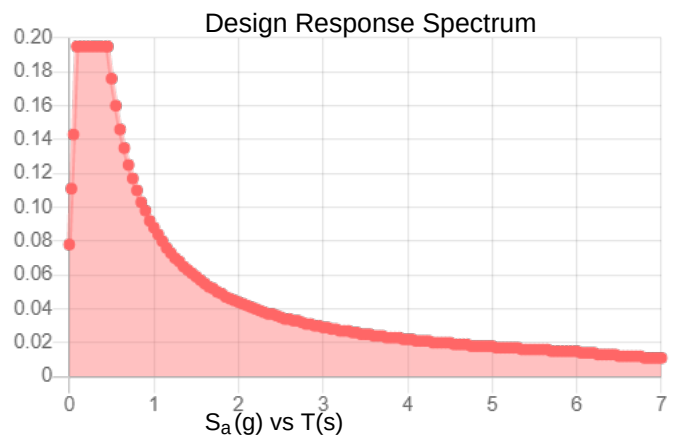
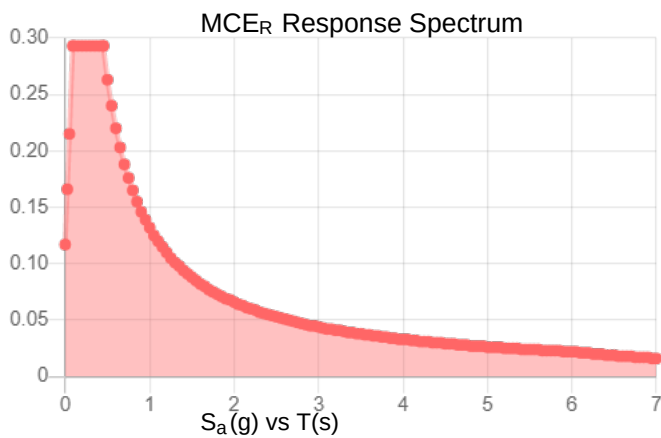
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

Results:

S_S :	0.183	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.098
F_v :	2.4	PGA _M :	0.156
S_{MS} :	0.293	F_{PGA} :	1.6
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.195	C_v :	0.7

Seismic Design Category B



Data Accessed: Tue Jun 28 2022

Date Source:

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

Results:

Ice Thickness: 1.50 in.
Concurrent Temperature: 5 F
Gust Speed 50 mph

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

Date Accessed: Tue Jun 28 2022

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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Self Support Anchor Rod Capacity



Site Info	
BU #	806377
Site Name	HRT 084 943242
Order #	611887 Rev. 0

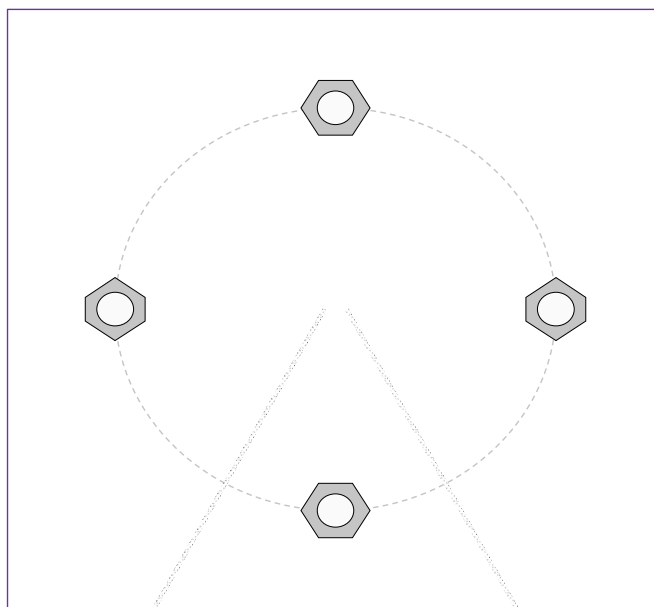
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	1.375

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	148.00	119.00
Shear Force (kips)	17.00	15.00

*TIA-222-H Section 15.5 Applied

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

*Anchor Rod Eccentricity Applied



Connection Properties

Analysis Results

Anchor Rod Data

(4) 1" ϕ bolts (A449 N; $F_y=92$ ksi, $F_u=120$ ksi)
 l_{ar} (in): 1.375

Anchor Rod Summary

(units of kips, kip-in)

$P_{u,t} = 29.75$	$\phi P_{n,t} = 54.54$	Stress Rating
$V_u = 3.75$	$\phi V_n = 35.34$	51.9%
$M_u = n/a$	$\phi M_n = n/a$	Pass

SST Unit Base Foundation



BU #: 806377
 Site Name: HRT 084 943242
 App. Number: 611887 Rev. 0

TIA-222 Revision: H

Top & Bot. Pad Rein. Different?:	☐
Tower Centroid Offset?:	☒
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Global Moment, M :	2193	ft-kips
Global Axial, P :	40	kips
Global Shear, V :	28	kips
Leg Compression, P_{comp} :	148	kips
Leg Comp. Shear, V_{u,comp} :	17	kips
Leg Uplift, P_{uplift} :	119	kips
Leg Uplift. Shear, V_{u,uplift} :	15	kips
Tower Height, H :	132	ft
Base Face Width, BW :	18.77	ft
BP Dist. Above Fdn, bp_{dist} :	2.375	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, dpier :	3.3	ft
Ext. Above Grade, E :	2.30	ft
Pier Rebar Size, Sc :	9	
Pier Rebar Quantity, mc :	12	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Quantity, mt :	2	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	4.25	in

Pad Properties		
Depth, D :	2.60	ft
Pad Width, W₁ :	24.00	ft
Pad Thickness, T :	4.20	ft
Pad Rebar Size (Bottom dir. 2), Sp₂ :	8	
Pad Rebar Quantity (Bottom dir. 2), mp₂ :	24	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, F'c :	3	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	115	pcf
Ultimate Gross Bearing, Qult :	30.000	ksf
Cohesion, Cu :	0.000	ksf
Friction Angle, φ :	33	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.4	
Neglected Depth, N :	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	16	ft

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	110.02	28.00	24.2%	Pass
Bearing Pressure (ksf)	22.50	1.77	7.9%	Pass
Overturning (kip*ft)	4276.30	2489.30	58.2%	Pass
Pier Flexure (Comp.) (kip*ft)	875.38	39.10	4.3%	Pass
Pier Flexure (Tension) (kip*ft)	653.04	34.50	5.0%	Pass
Pier Compression (kip)	4119.38	152.51	3.5%	Pass
Pad Flexure (kip*ft)	3850.11	135.04	3.3%	Pass
Pad Shear - 1-way (kips)	1086.07	19.62	1.7%	Pass
Pad Shear - Comp 2-way (ksi)	0.164	0.013	7.3%	Pass
Flexural 2-way (Comp) (kip*ft)	1648.65	23.46	1.4%	Pass
Pad Shear - Tension 2-way (ksi)	0.164	0.011	6.5%	Pass
Flexural 2-way (Tension) (kip*ft)	1648.65	20.70	1.2%	Pass

*Rating per TIA-222-H Section 15.5

Structural Rating*:	7.3%
Soil Rating*:	58.2%

<-- Toggle between Gross and Net

Date: **June 24, 2022**

INFINIGY

Infinigy
500 West Office Center Drive, Suite 150
Fort Washington, PA 19034
518-690-0790
structural@infinigy.com

Subject: Mount Replacement Analysis Report

Carrier Designation: T-Mobile Equipment Change Out
Carrier Site Number: CT11731A
Carrier Site Name: Crown Castle SST

Crown Castle Designation: **Crown Castle BU Number:** 806377
Crown Castle Site Name: HRT 084 943242
Crown Castle JDE Job Number: 721887
Crown Castle Order Number: 621887 Rev. 0

Engineering Firm Designation: **Infinigy Report Designation:** 1039-Z0001-B

Site Data: **197 South St., Vernon, Tolland County, CT, 06066**
Latitude 41°51'12.51" Longitude -72°27'7.52"

Structure Information: **Tower Height & Type:** 132.0 ft Self Support
Mount Elevation: 130.0 ft
Mount Type: 10.5 ft Sector Frame

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

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

Sector Frame

Sufficient

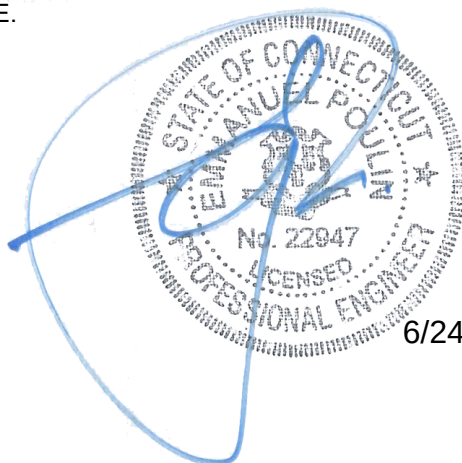
***See Section 4.1 of this report for the loading and structural modifications required in order for the mount to support the loading listed in Table 1.**

This analysis utilizes an ultimate 3-second gust wind speed of 118 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: Farhad Ahmadyar

Respectfully Submitted by: Emmanuel Poulin, P.E.

structural@infinigy.com



6/24/22

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Mount Modification Design Drawings (MDD) / Supplemental Drawings

1) INTRODUCTION

This is a proposed 3-sector 10.5 ft Sector Frame, designed by Site Pro 1.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	118 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.177
Seismic S_1:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
130.0	130.0	3	COMMSCOPE	VV-65B-R1_TMO	10.5 ft Sector Frame (Site Pro 1: VFA10-HD-S)
		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	621887 Rev. 0	CCI Sites
Loading Document	T-Mobile	RFDS Version: 7	TSA
Mount Manufacturer Drawings	Site Pro 1	VFA10-HD-S	Infinigy
Previous Mount Replacement Analysis Report	Infinigy	10073773	CCI Sites

3.1) Analysis Method

RISA-3D (Version 20.0.0), 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.

Infinigy Mount Analysis Tool V2.3.2, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *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	Q345 (GR 36)
Square/ Rectangular HSS Tube	Q235-GB (GR 35)
Pipe	Q235-GB (GR 35)
Threaded Rods	SAE J429 (GR 2)

This analysis may be affected if any assumptions are not valid or have been made in error. Infinigy 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 (Sector Frame, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3	Mount Pipe(s)	MP1	130.0	33.8	Pass
	Horizontal(s)	HOR2		20.0	Pass
	Standoff(s)	SA2		21.0	Pass
	Bracing(s)	M8		41.6	Pass
	Connection Plate(s)	M36		27.1	Pass
	Mount Connection(s)	--		13.4	Pass

Structure Rating (max from all components) =	41.6%
---	--------------

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.

Table 4 - Tieback Connection Data Table

Tower Connection Node No.	Existing / Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb) ²	Notes
N182	Proposed	850.5	Leg	ROHN 2 STD	1,934.0	1,2

Notes:

- 1) Tieback connection point is within 25% of either end of the connected tower member
- 2) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances*

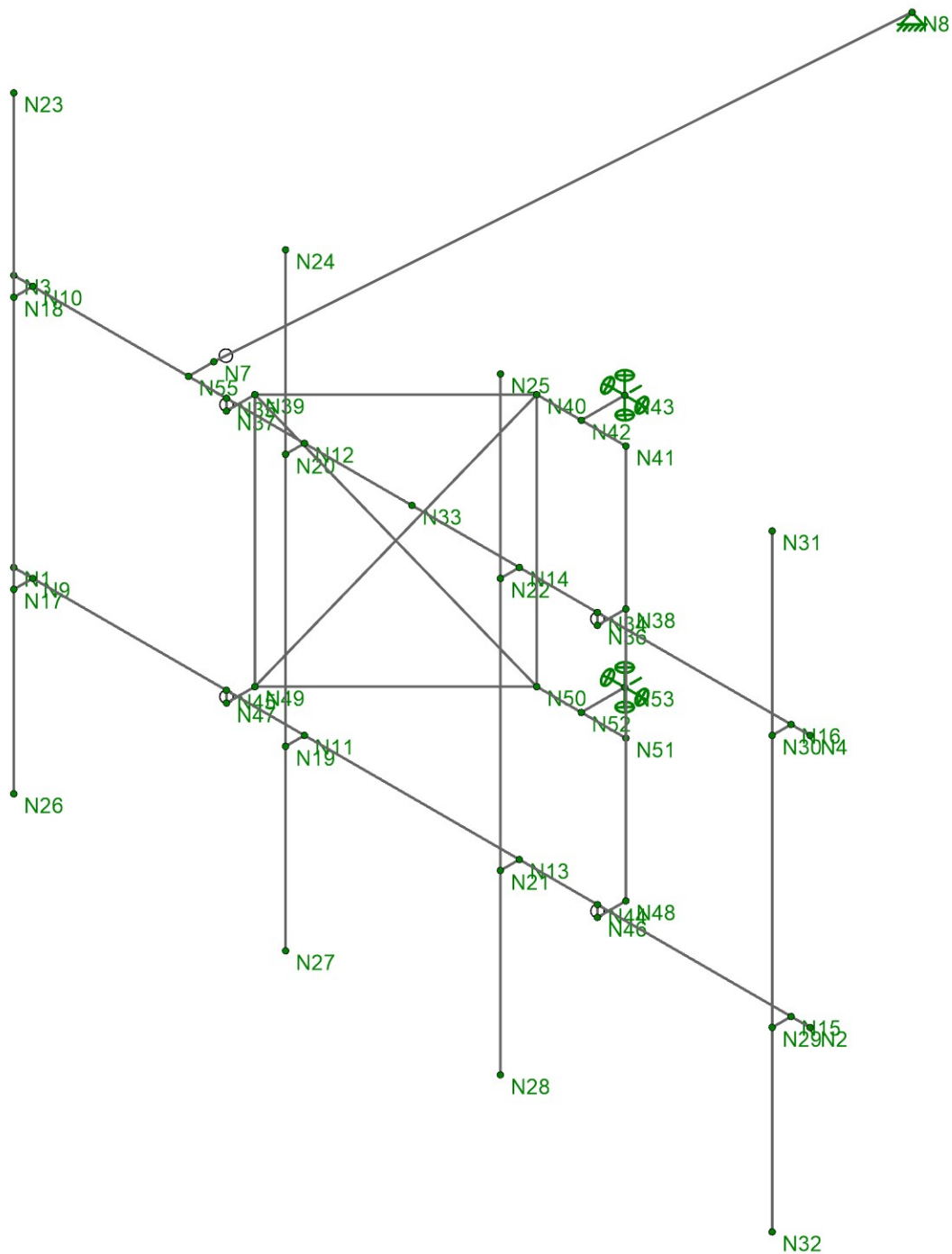
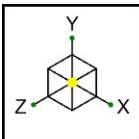
4.1) Recommendations

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

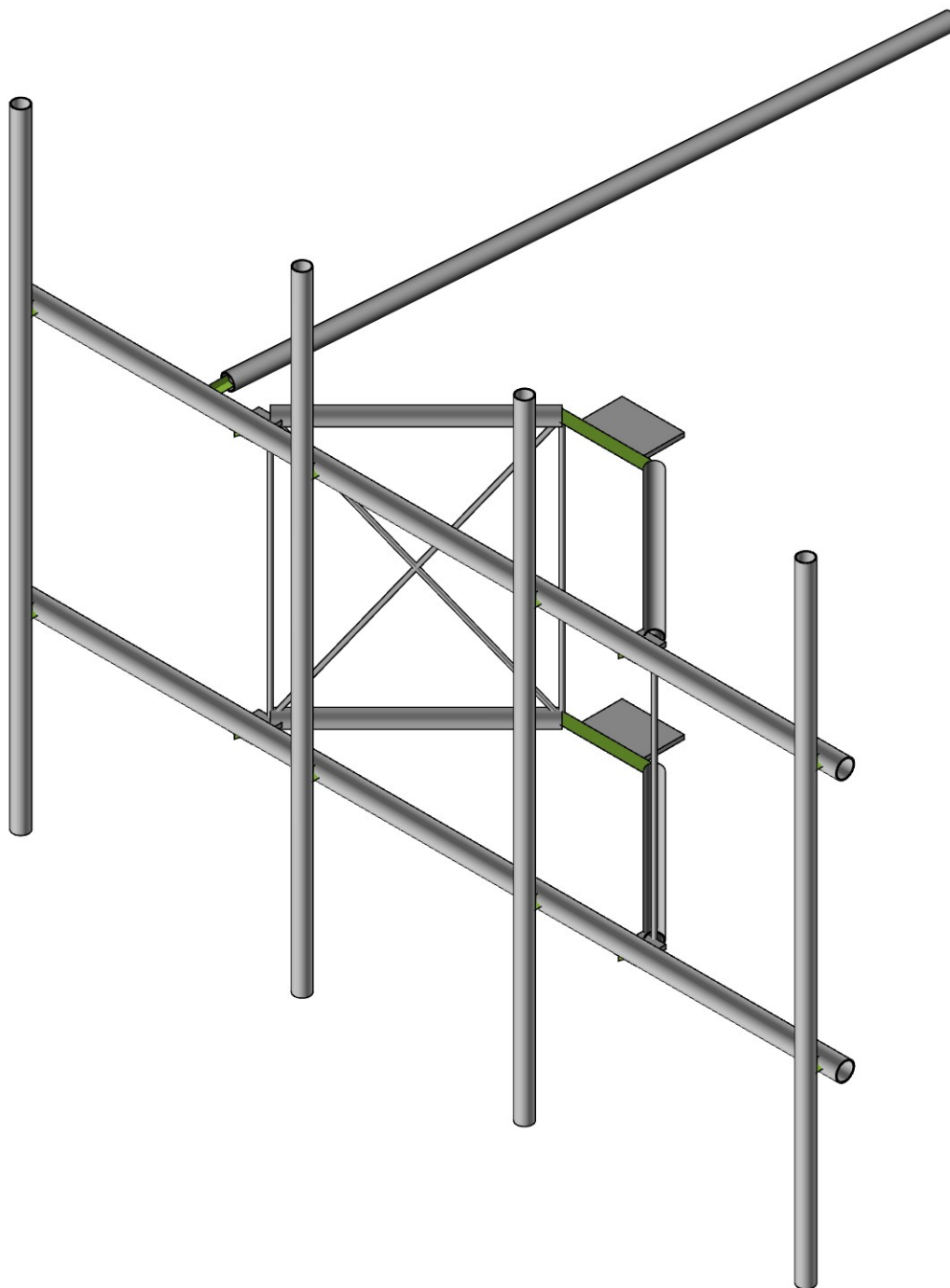
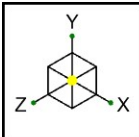
1. Installation of (1) Site Pro 1 VFA10-HD-S sector frame and (4) 2.0 STD 8' long mount pipes per sector.

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

APPENDIX A
WIRE FRAME AND RENDERED MODELS



Infinigy	806377	WIREFRAME1
FA		Jun 24, 2022
1039-Z0001-B		806377_loaded.r3d



Infinigy

FA

1039-Z0001-B

806377

RENDERED2

Jun 24, 2022

806377_loaded.r3d

APPENDIX B
SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION		
Site Name:	HRT 084 943242	
Carrier:	T-Mobile	
Engineer:	Farhad Ahmadyar	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	654.83	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	3	
Centerline AGL:	130.00	ft
Tower Height AGL:	132.00	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	0.977	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Height Esc. Fact. (K_{iz}):	1.147	
Gust Effect Factor (G_h):	1.000	
Shielding Factor (K_a):	0.900	
Velocity Pressure Co. (K_z):	1.065	(Mount Elev)

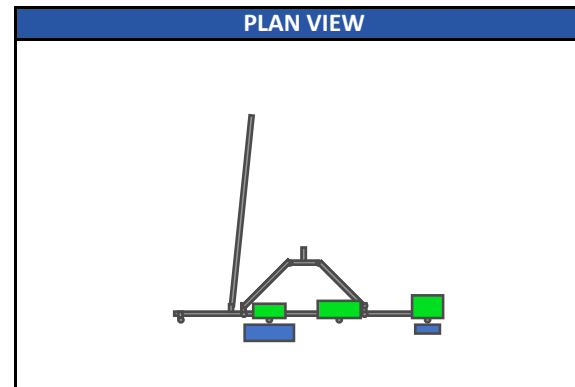
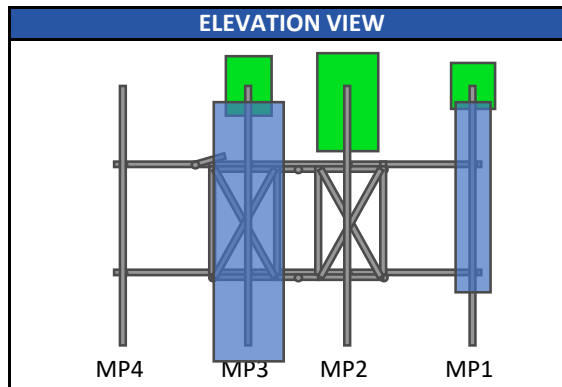
CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	118	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1	in
Radial Ice Thickness (t_{iz}):	1.147	in
Flat Pressure:	70.449	psf
Round Pressure:	42.270	psf
Ice Wind Pressure:	7.589	psf

SEISMIC DATA		
Short-Period Accel. (S_s):	0.177	g
1-Second Accel. (S_1):	0.064	g
Short-Period Design (S_{DS}):	0.189	
1-Second Design (S_{D1}):	0.102	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	
Seismic Importance (I_e):	1.000	
Seismic Response Co. (C_s):	0.094	
Total App. Weight:	478.068	lb
Total Shear Force (V_s):	45.130	lb
Hor. Seismic Load (E_h):	45.130	lb
Vert. Seismic Load (E_v):	18.052	lb *

*For reference only. Per TIA rev H section 16.7, E_v is not applicable to mounts

Program Inputs

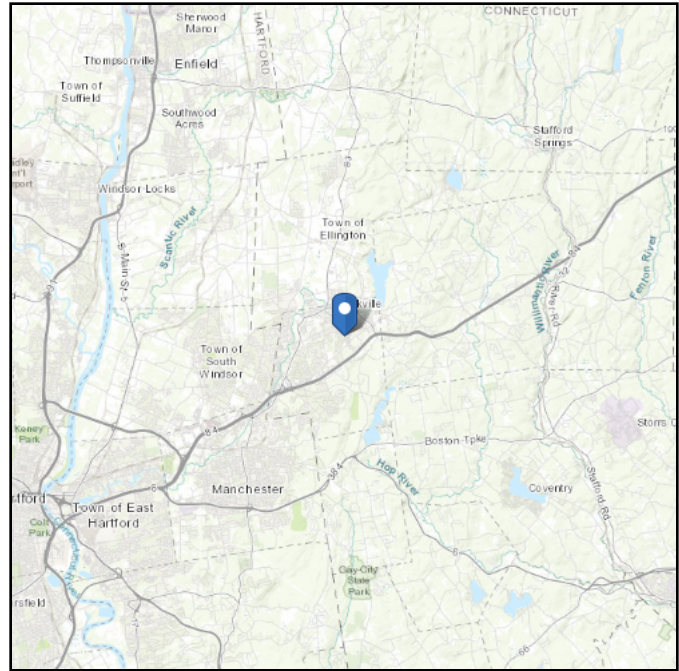
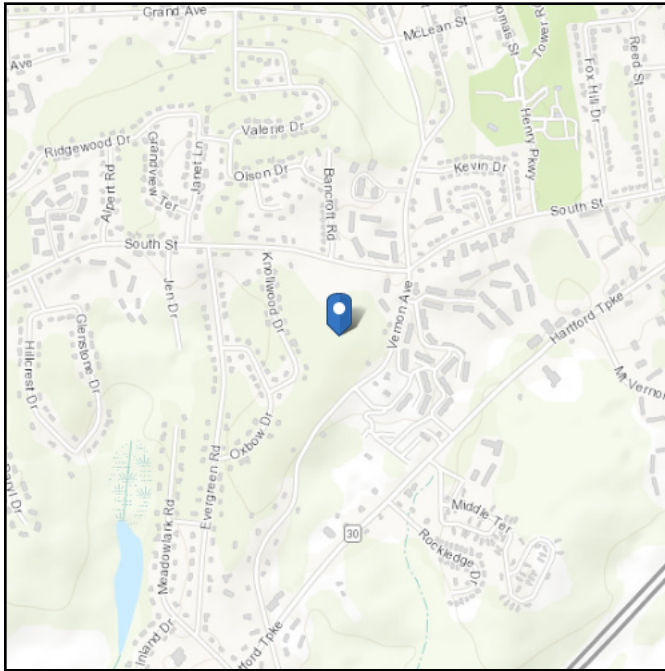
[illegible]

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 654.83 ft (NAVD 88)
Latitude: 41.853475
Longitude: -72.452089



Wind

Results:

Wind Speed	118 Vmph per 2018 Connecticut State Building Code
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	101 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Thu Jun 23 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 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

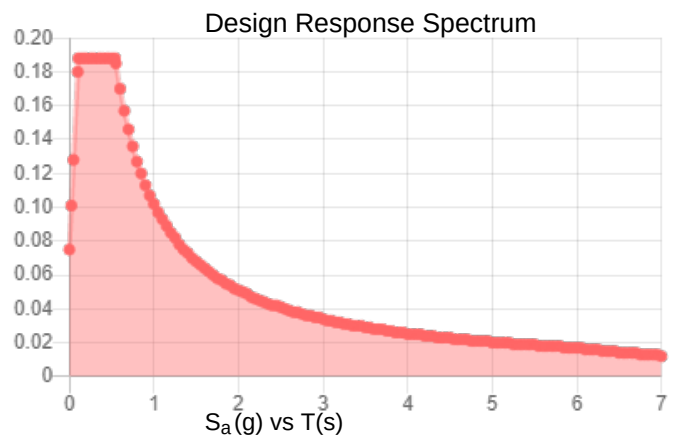
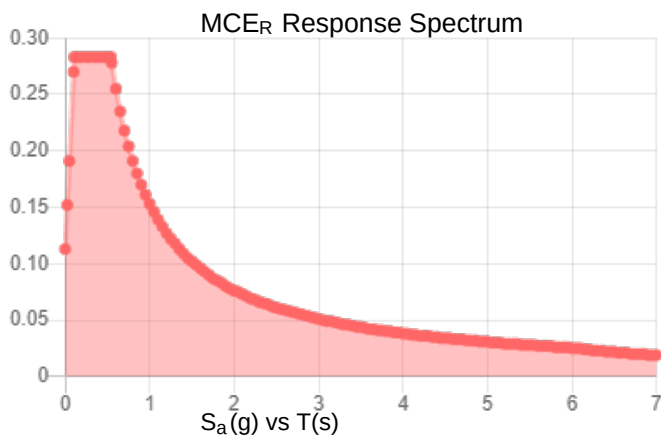
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.177	S_{DS} :	0.188
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.088
S_{MS} :	0.283	PGA_M :	0.141
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed: Thu Jun 23 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.

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 5 F
Gust Speed 50 mph

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

Date Accessed: Thu Jun 23 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.

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

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APPENDIX C
SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N7	N55		RIGID	None	None	RIGID	Typical
2	M3	N38	N51		Bracing	VBrace	BAR	Q345	Typical
3	M4	N41	N48		Bracing	VBrace	BAR	Q345	Typical
4	M5	N40	N49		Bracing	VBrace	BAR	Q345	Typical
5	M6	N39	N50		Bracing	VBrace	BAR	Q345	Typical
6	M7	N38	N48		Bracing	VBrace	BAR	Q345	Typical
7	M8	N41	N51		Bracing	VBrace	BAR	Q345	Typical
8	M9	N40	N50		Bracing	VBrace	BAR	Q345	Typical
9	M10	N39	N49		Bracing	VBrace	BAR	Q345	Typical
10	M11	N53	N52	90	Pivot Plate	Beam	RECT	Q345	Typical
11	M12	N15	N29		RIGID	None	None	RIGID	Typical
12	M13	N50	N51		RIGID	None	None	RIGID	Typical
13	M14	N16	N30		RIGID	None	None	RIGID	Typical
14	SA2	N51	N48		Standoff	Beam	Pipe	Q235-GB	Typical
15	M16	N13	N21		RIGID	None	None	RIGID	Typical
16	SA4	N50	N49		Standoff	Beam	Pipe	Q235-GB	Typical
17	M18	N14	N22		RIGID	None	None	RIGID	Typical
18	M19	N48	N46	90	Conn. Plate	Beam	RECT	Q345	Typical
19	M20	N11	N19		RIGID	None	None	RIGID	Typical
20	M21	N49	N47	90	Conn. Plate	Beam	RECT	Q345	Typical
21	M22	N12	N20		RIGID	None	None	RIGID	Typical
22	M23	N44	N46		RIGID	None	None	RIGID	Typical
23	M24	N9	N17		RIGID	None	None	RIGID	Typical
24	M25	N45	N47		RIGID	None	None	RIGID	Typical
25	M26	N10	N18		RIGID	None	None	RIGID	Typical
26	M27	N43	N42	90	Pivot Plate	Beam	RECT	Q345	Typical
27	MP1	N31	N32		Mount Pipe	Column	Pipe	Q235-GB	Typical
28	M29	N40	N41		RIGID	None	None	RIGID	Typical
29	MP2	N25	N28		Mount Pipe	Column	Pipe	Q235-GB	Typical
30	SA1	N41	N38		Standoff	Beam	Pipe	Q235-GB	Typical
31	MP3	N24	N27		Mount Pipe	Column	Pipe	Q235-GB	Typical
32	SA3	N40	N39		Standoff	Beam	Pipe	Q235-GB	Typical
33	MP4	N23	N26		Mount Pipe	Column	Pipe	Q235-GB	Typical
34	M35	N38	N36	90	Conn. Plate	Beam	RECT	Q345	Typical
35	M36	N39	N37	90	Conn. Plate	Beam	RECT	Q345	Typical
36	M37	N34	N36		RIGID	None	None	RIGID	Typical
37	TB1	N7	N8		Tieback	Beam	Pipe	Q235-GB	Typical
38	M39	N35	N37		RIGID	None	None	RIGID	Typical
39	HOR2	N1	N2		Face Horizontal	Beam	Pipe	Q235-GB	Typical
40	HOR1	N3	N4		Face Horizontal	Beam	Pipe	Q235-GB	Typical

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e ⁻⁶ F ⁻¹]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	Q345	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
4	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
5	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
6	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
7	Q235-GB	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
8	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
9	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1	Face Horizontal	PIPE 2.5	Beam	Pipe	Q235-GB	Typical	1.61	1.45	1.45	2.89
2	Tieback	PIPE 2.0	Beam	Pipe	Q235-GB	Typical	1.02	0.627	0.627	1.25
3	Standoff	PIPE 2.0	Beam	Pipe	Q235-GB	Typical	1.02	0.627	0.627	1.25
4	Bracing	0.625"S.R.	VBrace	BAR	Q345	Typical	0.307	0.007	0.007	0.015
5	Mount Pipe	PIPE 2.0	Column	Pipe	Q235-GB	Typical	1.02	0.627	0.627	1.25
6	Conn. Plate	PL0.625X3.5	Beam	RECT	Q345	Typical	2.188	0.071	2.233	0.253
7	Pivot Plate	PL0.625X9.5	Beam	RECT	Q345	Typical	5.938	0.193	44.655	0.741

Node Coordinates

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
1	N1	-63	0	33.67	
2	N2	63	0	33.67	
3	N3	-63	40	33.67	
4	N4	63	40	33.67	
5	N7	-35.35	40	29.67	
6	N8	-24.965133	43	-70.426852	
7	N9	-60	0	33.67	
8	N10	-60	40	33.67	
9	N11	-17	0	33.67	
10	N12	-17	40	33.67	
11	N13	17	0	33.67	
12	N14	17	40	33.67	
13	N15	60	0	33.67	
14	N16	60	40	33.67	
15	N17	-60	0	36.67	
16	N18	-60	40	36.67	
17	N19	-17	0	36.67	
18	N20	-17	40	36.67	
19	N21	17	0	36.67	
20	N22	17	40	36.67	
21	N23	-60	68	36.67	
22	N24	-17	68	36.67	
23	N25	17	68	36.67	
24	N26	-60	-28	36.67	
25	N27	-17	-28	36.67	
26	N28	17	-28	36.67	
27	N29	60	0	36.67	
28	N30	60	40	36.67	
29	N31	60	68	36.67	
30	N32	60	-28	36.67	
31	N33	0	40	33.67	
32	N34	29.35	40	33.67	
33	N35	-29.35	40	33.67	
34	N36	29.35	38.25	33.67	
35	N37	-29.35	38.25	33.67	
36	N38	29.35	38.25	29.17	
37	N39	-29.35	38.25	29.17	
38	N40	-7.05	38.25	6.87	
39	N41	7.05	38.25	6.87	
40	N42	0	38.25	6.87	
41	N43	0	38.25	0	
42	N44	29.35	0	33.67	
43	N45	-29.35	0	33.67	
44	N46	29.35	-1.75	33.67	

Node Coordinates (Continued)

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
45	N47	-29.35	-1.75	33.67	
46	N48	29.35	-1.75	29.17	
47	N49	-29.35	-1.75	29.17	
48	N50	-7.05	-1.75	6.87	
49	N51	7.05	-1.75	6.87	
50	N52	0	-1.75	6.87	
51	N53	0	-1.75	0	
52	N55	-35.35	40	33.67	

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Channel Conn.	a [in]	Function
1	M3	Bracing	50.937	Lbyy	0.65	0.65	N/A	N/A	Lateral
2	M4	Bracing	50.937	Lbyy	0.65	0.65	N/A	N/A	Lateral
3	M5	Bracing	50.937	Lbyy	0.65	0.65	N/A	N/A	Lateral
4	M6	Bracing	50.937	Lbyy	0.65	0.65	N/A	N/A	Lateral
5	M7	Bracing	40	Lbyy	0.65	0.65	N/A	N/A	Lateral
6	M8	Bracing	40	Lbyy	0.65	0.65	N/A	N/A	Lateral
7	M9	Bracing	40	Lbyy	0.65	0.65	N/A	N/A	Lateral
8	M10	Bracing	40	Lbyy	0.65	0.65	N/A	N/A	Lateral
9	M11	Pivot Plate	6.87				N/A	N/A	Lateral
10	SA2	Standoff	31.537	Lbyy			N/A	N/A	Lateral
11	SA4	Standoff	31.537	Lbyy			N/A	N/A	Lateral
12	M19	Conn. Plate	4.5	Lbyy			N/A	N/A	Lateral
13	M21	Conn. Plate	4.5	Lbyy			N/A	N/A	Lateral
14	M27	Pivot Plate	6.87				N/A	N/A	Lateral
15	MP1	Mount Pipe	96	Lbyy			N/A	N/A	Lateral
16	MP2	Mount Pipe	96	Lbyy			N/A	N/A	Lateral
17	SA1	Standoff	31.537	Lbyy			N/A	N/A	Lateral
18	MP3	Mount Pipe	96	Lbyy			N/A	N/A	Lateral
19	SA3	Standoff	31.537	Lbyy			N/A	N/A	Lateral
20	MP4	Mount Pipe	96	Lbyy			N/A	N/A	Lateral
21	M35	Conn. Plate	4.5	Lbyy			N/A	N/A	Lateral
22	M36	Conn. Plate	4.5	Lbyy			N/A	N/A	Lateral
23	TB1	Tieback	100.679	Lbyy			N/A	N/A	Lateral
24	HOR2	Face Horizontal	126	Lbyy			N/A	N/A	Lateral
25	HOR1	Face Horizontal	126	Lbyy			N/A	N/A	Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
1	Self Weight	DL		-1			8	
2	Wind Load AZI 0	WLZ					16	
3	Wind Load AZI 30	None					16	
4	Wind Load AZI 60	None					16	
5	Wind Load AZI 90	WLX					16	
6	Wind Load AZI 120	None					16	
7	Wind Load AZI 150	None					16	
8	Wind Load AZI 180	None					16	
9	Wind Load AZI 210	None					16	
10	Wind Load AZI 240	None					16	
11	Wind Load AZI 270	None					16	
12	Wind Load AZI 300	None					16	
13	Wind Load AZI 330	None					16	
14	Distr. Wind Load Z	WLZ						40

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
15	Distr. Wind Load X	WLX						40
16	Ice Weight	OL1					8	40
17	Ice Wind Load AZI 0	OL2					16	
18	Ice Wind Load AZI 30	None					16	
19	Ice Wind Load AZI 60	None					16	
20	Ice Wind Load AZI 90	OL3					16	
21	Ice Wind Load AZI 120	None					16	
22	Ice Wind Load AZI 150	None					16	
23	Ice Wind Load AZI 180	None					16	
24	Ice Wind Load AZI 210	None					16	
25	Ice Wind Load AZI 240	None					16	
26	Ice Wind Load AZI 270	None					16	
27	Ice Wind Load AZI 300	None					16	
28	Ice Wind Load AZI 330	None					16	
29	Distr. Ice Wind Load Z	OL2						40
30	Distr. Ice Wind Load X	OL3						40
31	Seismic Load Z	ELZ			-0.283		8	
32	Seismic Load X	ELX	-0.283				8	
33	Service Live Loads	LL				1		
34	Maintenance Load Lm1	LL				1		
35	Maintenance Load Lm2	LL				1		
36	Maintenance Load Lm3	LL				1		
37	Maintenance Load Lm4	LL				1		

Load Combinations

	Description	Solve P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4							
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15		
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5	
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866	
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1	
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866	
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5	
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15		
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5	
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866	
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1	
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866	
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5	
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15		
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5	
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866	
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1	
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866	
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5	
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15		
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5	
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866	
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1	
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866	
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5	
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1					
27	1.2D + 1.0Di + 1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30
28	1.2D + 1.0Di + 1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30
29	1.2D + 1.0Di + 1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
30	1.2D + 1.0Di + 1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.238	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.238	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.238	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.238	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.238	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.238	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.238	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.238	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.238	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.238	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.238	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.238	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.862	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.862	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.862	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.862	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.862	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.862	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.862	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.862	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.862	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.862	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.862	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.862	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.259	14	0.259	15		33	1.5
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.259	14	0.224	15	0.129	33	1.5
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.259	14	0.129	15	0.224	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.259	14		15	0.259	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.259	14	-0.129	15	0.224	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.259	14	-0.224	15	0.129	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.259	14	-0.259	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.259	14	-0.224	15	-0.129	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.259	14	-0.129	15	-0.224	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.259	14		15	-0.259	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.259	14	0.129	15	-0.224	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.259	14	0.224	15	-0.129	33	1.5
75	1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.065	14	0.065	15	
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.065	14	0.056	15	0.032
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.065	14	0.032	15	0.056
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.065	14		15	0.065
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.065	14	-0.032	15	0.056
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.065	14	-0.056	15	0.032
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.065	14	-0.065	15	
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.065	14	-0.056	15	-0.032
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.065	14	-0.032	15	-0.056

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.065	14		15	-0.065
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.065	14	0.032	15	-0.056
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.065	14	0.056	15	-0.032
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.065	14	0.065	15	
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.065	14	0.056	15	0.032
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.065	14	0.032	15	0.056
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.065	14		15	0.065
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.065	14	-0.032	15	0.056
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.065	14	-0.056	15	0.032
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.065	14	-0.065	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.065	14	-0.056	15	-0.032
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.065	14	-0.032	15	-0.056
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.065	14		15	-0.065
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.065	14	0.032	15	-0.056
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.065	14	0.056	15	-0.032
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.065	14	0.065	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.065	14	0.056	15	0.032
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.065	14	0.032	15	0.056
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.065	14		15	0.065
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.065	14	-0.032	15	0.056
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.065	14	-0.056	15	0.032
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.065	14	-0.065	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.065	14	-0.056	15	-0.032
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.065	14	-0.032	15	-0.056
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.065	14		15	-0.065
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.065	14	0.032	15	-0.056
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.065	14	0.056	15	-0.032
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.065	14	0.065	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.065	14	0.056	15	0.032
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.065	14	0.032	15	0.056
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.065	14		15	0.065
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.065	14	-0.032	15	0.056
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.065	14	-0.056	15	0.032
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.065	14	-0.065	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.065	14	-0.056	15	-0.032
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.065	14	-0.032	15	-0.056
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.065	14		15	-0.065
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.065	14	0.032	15	-0.056
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.065	14	0.056	15	-0.032

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		15	63.2	0
3	Total General		15	63.2	0
4					
5	Hot Rolled Steel				
6	Q235-GB	PIPE 2.0	9	610.8	0.177
7	Q235-GB	PIPE 2.5	2	252	0.115
8	Q345	0.625"S.R.	8	363.7	0.032
9	Q345	PL0.625X3.5	4	18	0.011
10	Q345	PL0.625X9.5	2	13.7	0.023
11	Total HR Steel		25	1258.3	0.358

Envelope Node Reactions

Node Label			X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N8	max	67.963	13	44.591	36	789.803	18	0	123	0	123	0	123
2		min	-63.2	19	-10.643	18	-838.35	12	0	1	0	1	0	1
3	N43	max	996.84	116	1067.195	32	1261.948	25	-139.483	59	256.959	18	0	123
4		min	-1379.502	86	255.703	25	-2452.271	7	-406.941	29	-264.726	12	0	1
5	N53	max	1333.072	79	1014.566	38	1590.319	27	-102.436	19	608.762	6	0	123
6		min	-956.872	121	263.568	19	36.113	20	-407.957	38	-471.464	24	0	1
7	Totals:	max	924.549	6	2075.314	36	1704.646	2						
8		min	-924.549	24	720.617	55	-1704.645	20						

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

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	M8	0.625"S.R.	0.416	40	76	0.001	40	27	2339.328	9946.8	96.768	96.768	1	H1-1a
2	M7	0.625"S.R.	0.411	40	76	0.008	0	80	2339.328	9946.8	96.768	96.768	1	H1-1a
3	M10	0.625"S.R.	0.365	40	112	0.006	40	78	2339.328	9946.8	96.768	96.768	1	H1-1a
4	M9	0.625"S.R.	0.359	40	123	0.001	40	27	2339.328	9946.8	96.768	96.768	1	H1-1a
5	MP1	PIPE 2.0	0.338	28	84	0.052	68	76	14916.096	32130	1871.625	1871.625	1	H1-1b
6	MP4	PIPE 2.0	0.276	68	117	0.042	68	122	14916.096	32130	1871.625	1871.625	1	H1-1b
7	M36	PL0.625X3.5	0.271	4.5	13	0.277	0	y 7	68591.516	70875	922.852	5167.97	1.713	H1-1b
8	MP3	PIPE 2.0	0.252	68	8	0.033	28	3	14916.096	32130	1871.625	1871.625	1	H1-1b
9	M19	PL0.625X3.5	0.238	4.5	81	0.093	0	y 3	68591.516	70875	922.852	5167.97	1.313	H1-1b
10	M4	0.625"S.R.	0.232	0	81	0.011	50.937	81	1442.594	9946.8	96.768	96.768	1	H1-1a*
11	M35	PL0.625X3.5	0.23	4.5	2	0.184	4.5	y 8	68591.516	70875	922.852	5167.97	1.823	H1-1b
12	M21	PL0.625X3.5	0.21	4.5	119	0.08	0	y 13	68591.516	70875	922.852	5167.97	1.372	H1-1b
13	SA2	PIPE 2.0	0.21	0	80	0.08	31.537	78	29576.459	32130	1871.625	1871.625	1	H1-1b
14	M5	0.625"S.R.	0.205	0	117	0.008	50.937	123	1442.594	9946.8	96.768	96.768	1	H1-1a*
15	SA1	PIPE 2.0	0.202	0	83	0.057	31.537	76	29576.459	32130	1871.625	1871.625	1	H1-1b
16	HOR2	PIPE 2.5	0.2	93.188	82	0.087	34.125	8	20573.263	50715	3596.25	3596.25	1	H1-1b
17	HOR1	PIPE 2.5	0.197	93.188	8	0.078	34.125	3	20573.263	50715	3596.25	3596.25	1	H1-1b
18	SA3	PIPE 2.0	0.173	0	117	0.051	0	13	29576.459	32130	1871.625	1871.625	1	H1-1b
19	M11	PL0.625X9.5	0.171	0	28	0.017	0	y 79	178237.694	192375	2504.882	38074.22	1.668	H1-1b
20	SA4	PIPE 2.0	0.17	0	122	0.066	31.537	122	29576.459	32130	1871.625	1871.625	1	H1-1b
21	M27	PL0.625X9.5	0.168	0	31	0.018	0	y 86	178237.694	192375	2504.882	38074.22	1.353	H1-1b
22	MP2	PIPE 2.0	0.158	28	8	0.035	28	7	14916.096	32130	1871.625	1871.625	1	H1-1b
23	TB1	PIPE 2.0	0.067	50.339	6	0.004	100.679	36	13815.904	32130	1871.625	1871.625	1	H1-1b
24	M3	0.625"S.R.	0	50.937	123	0.008	50.937	13	1442.594	9946.8	96.768	96.768	1	H1-1a
25	M6	0.625"S.R.	0	50.937	123	0.004	0	12	1442.594	9946.8	96.768	96.768	1	H1-1a

Envelope AISI S100-07: LRFD Member Cold Formed Steel Code Checks

No Data to Print...														
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APPENDIX D
ADDITIONAL CALCUATIONS

INFINIGY⁸

Bolt Calculation Tool, V1.6.1

PROJECT DATA		
Site Name:	HRT 084 943242	
Site Number:	806377	
Connection Description:	Mount to Tower	

MAXIMUM BOLT LOADS		
Bolt Tension:	1675.70	lbs
Bolt Shear:	421.72	lbs

WORST CASE BOLT LOADS ¹		
Bolt Tension:	1675.70	lbs
Bolt Shear:	268.81	lbs

BOLT PROPERTIES		
Bolt Type:	Threaded Rod	-
Bolt Diameter:	0.625	in
Bolt Grade:	Other	-
Yield Strength:	57	ksi
Ultimate Strength:	74	ksi
# of Threaded Rods:	4	-
Threads Excluded?	No	-

¹ Worst case bolt loads correspond to Load combination #31 on member M27 in RISAs-3D, which causes the maximum demand on the bolts.

Member Information
I nodes of M11, M27,

BOLT CHECK		
Tensile Strength	12543.09	
Shear Strength	8513.59	
Max Tensile Usage	13.4%	
Max Shear Usage	5.0%	
Interaction Check (Worst Case)	0.02	≤1.05
Result	Pass	



APPENDIX E

MOUNT MODIFICATION DESIGN DRAWINGS (MDD) / SUPPLEMENTAL DRAWINGS



TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
BENDS ARE $\pm 1/2$ DEGREE
ALL OTHER MACHINING ($\pm 0.030"$)
ALL OTHER ASSEMBLY ($\pm 0.060"$)

**10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH ONE STIFF ARMS**

CHECKED BY	
BMC	12/12/2017

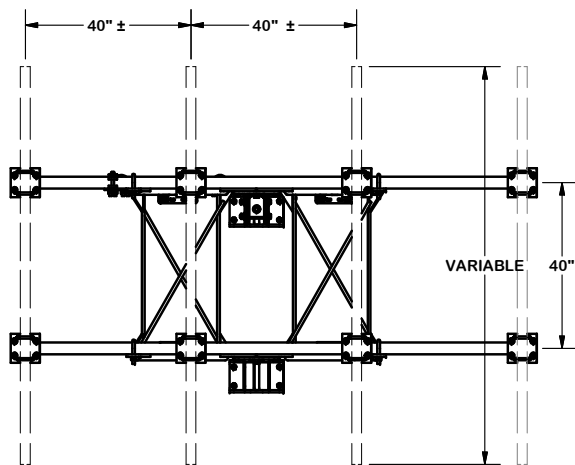
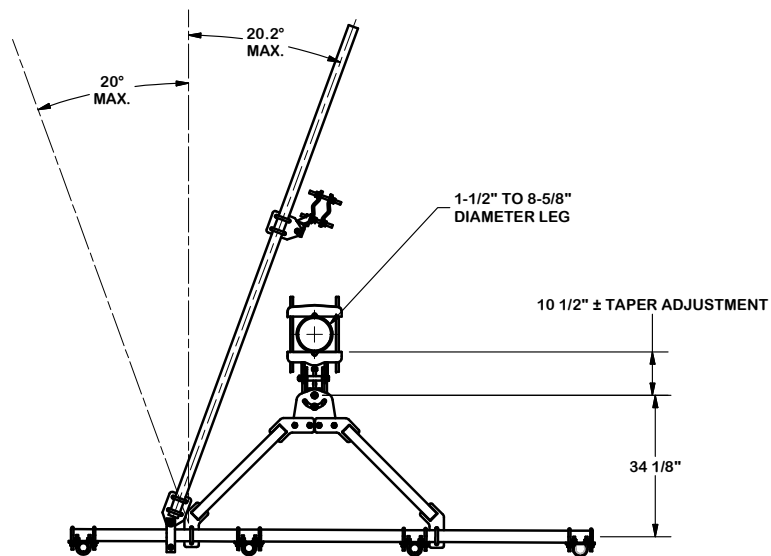
Locations:
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Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

VFA10-HD-S

VFA10-HD-S

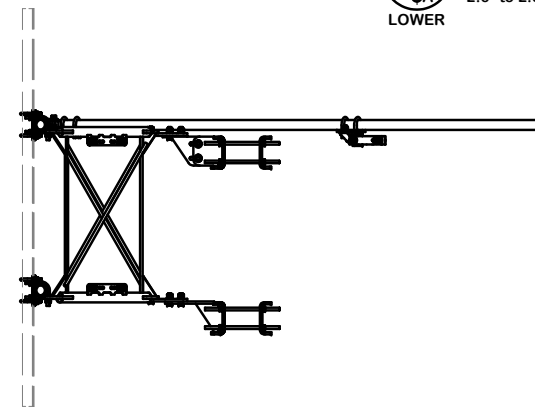
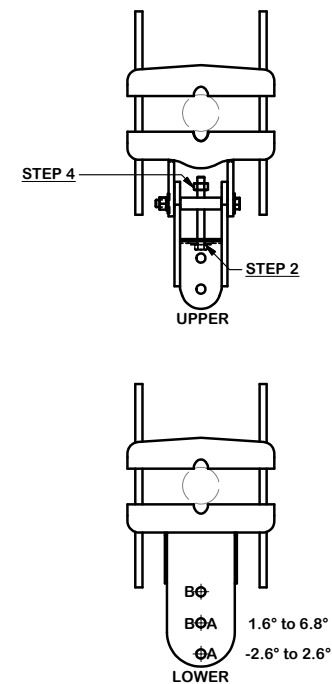
PAGE
1 OF 4

B	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
A	UPDATED ANGLE CALIBRATING PROCEDURE PAGE 2		CEK	12/12/2017
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				



ANGLE CALIBRATING PROCEDURE:

1. MEASURE TOWER TAPER AND PICK LOWER BRACKET HOLE:
 - HOLE A = -2.6° TO 2.6°
 - HOLE B = 1.6° TO 6.8°
2. USE CALIBRATING BOLT TO ADJUST FRAME TO DESIRED TAPER
3. TORQUE LOCKING BOLTS TO 100 ft.-lbs.
4. ADVANCE LOCKING NUT TO POSITIONING PLATE, THEN TIGHTEN.



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION

10' 6" HEAVY DUTY
 V-FRAME ASSEMBLY
 WITH ONE STIFF ARMS

CPD NO.

DRAWN BY

ENG. APPROVAL

CLASS

SUB

DRAWING USAGE

CHECKED BY

BMC 12/12/2017

PART NO.

VFA10-HD-S

DWG. NO.

VFA10-HD-S

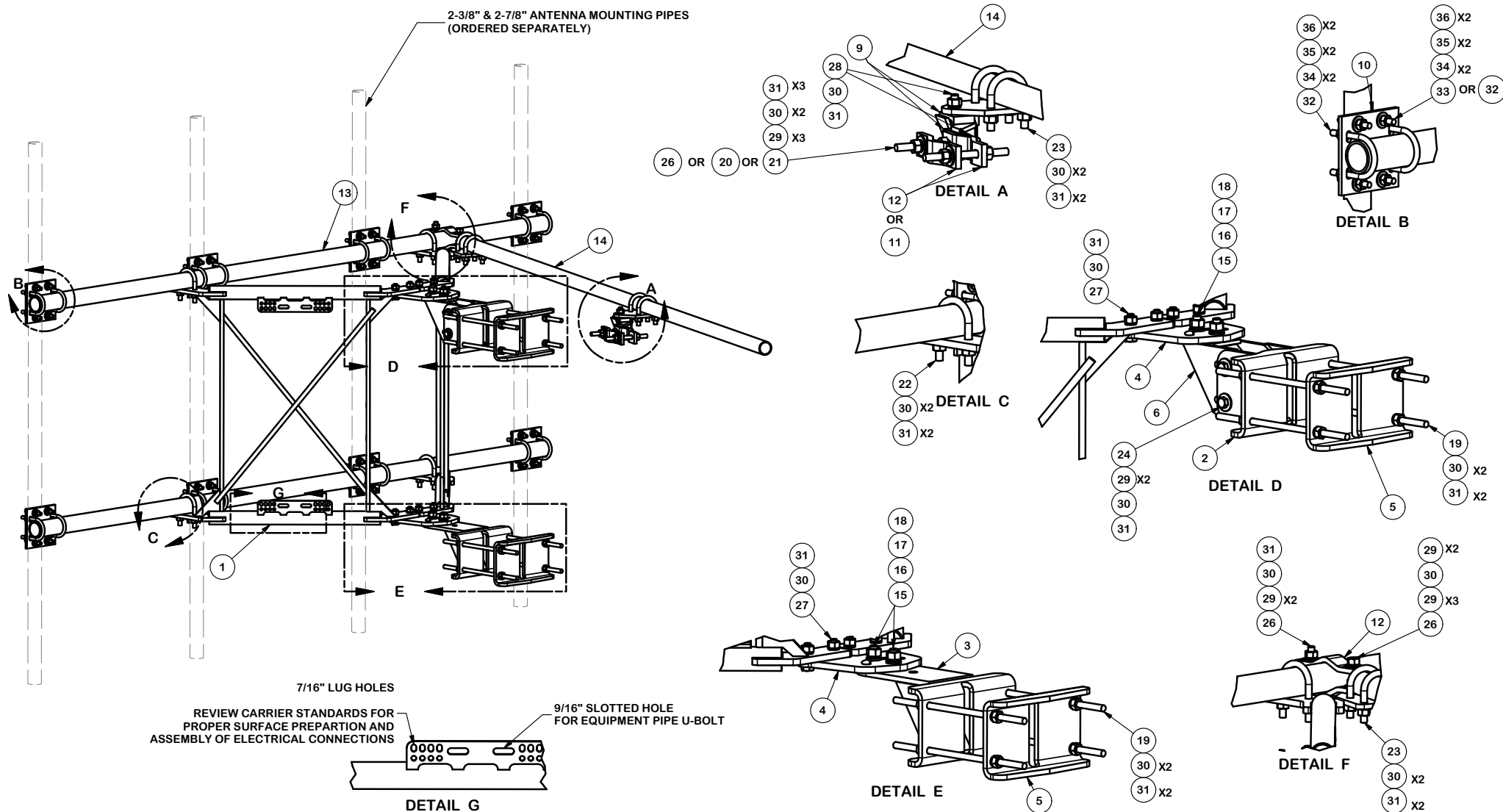


A valmont COMPANY

Engineering
 Support Team:
 1-888-753-7446

Locations:
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 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

B	UPDATED BCAM VERSION 1 TO BCAM VERSION 2	CEK	6/29/2018
A	UPDATED ANGLE CALIBRATING PROCEDURE PAGE 2	CEK	12/12/2017
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REVISION HISTORY			



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DESCRIPTION

10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH ONE STIFF ARMS

CPD NO.

DRAWN BY

ENG. APPROVAL

CLASS

SUB

DRAWING USAGE

CHECKED BY

BMC 12/12/2017

PART NO.

VFA10-HD-S

DWG. NO.

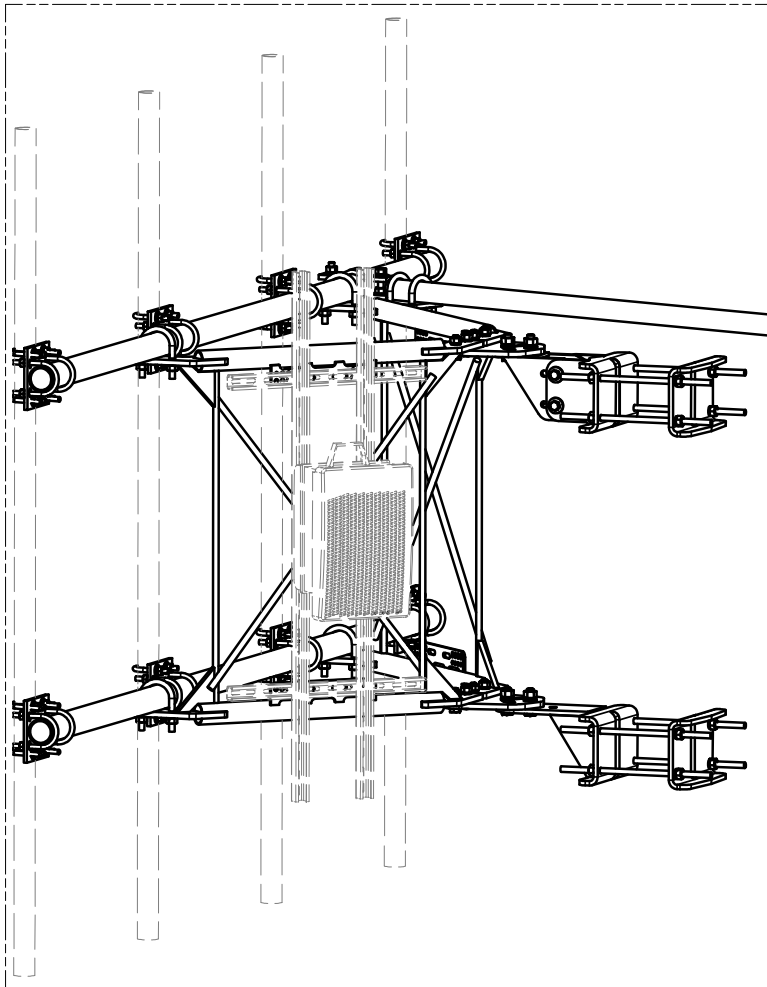
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Support Team:
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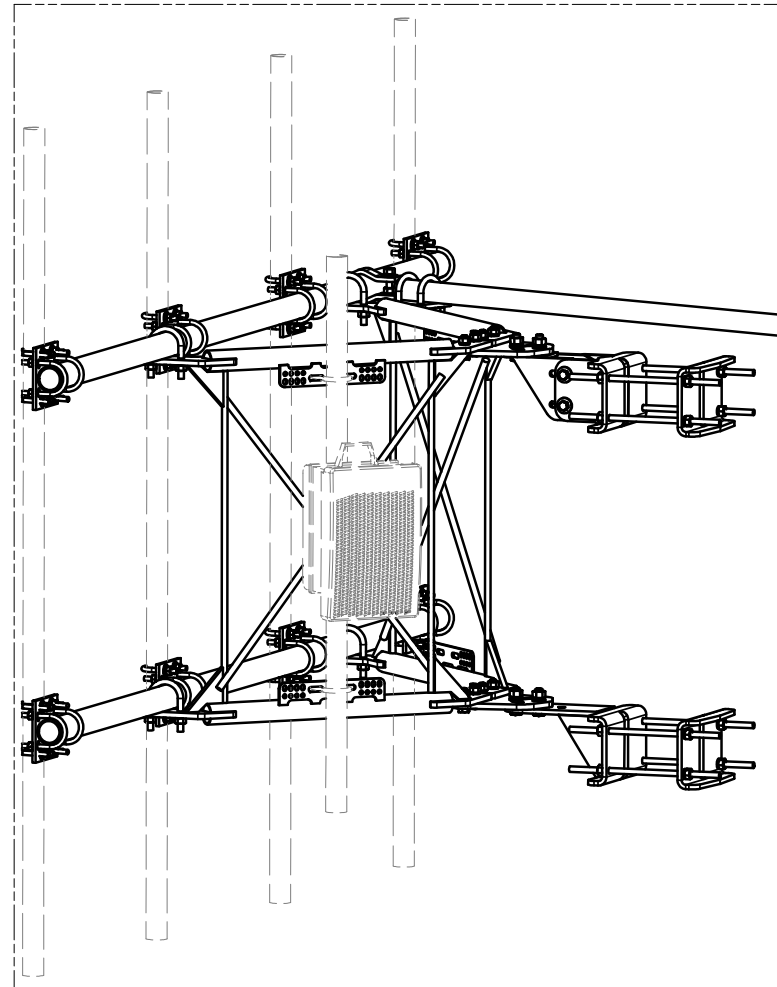
Locations:
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B	UPDATED BCAM VERSION 1 TO BCAM VERSION 2	CEK	6/29/2018
A	UPDATED ANGLE CALIBRATING PROCEDURE PAGE 2	CEK	12/12/2017
REV	DESCRIPTION OF REVISIONS	CPD	BY DATE
REVISION HISTORY			



UNISTRUT AND HARDWARE
SOLD SEPARATELY.

REQUIRES 3/8" HARDWARE



EQUIPMENT PIPE AND HARDWARE
SOLD SEPARATELY.

REQUIRES 1/2" HARDWARE
AND 2-3/8" TO 4-1/2" O.D. PIPE

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
BENDS ARE $\pm 1/2$ DEGREE
ALL OTHER MACHINING ($\pm 0.030"$)
ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION

10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH ONE STIFF ARMS

CPD NO.	DRAWN BY CEK 7/3/2017	ENG. APPROVAL
CLASS 81	SUB 02	DRAWING USAGE CUSTOMER
	CHECKED BY BMC 12/12/2017	



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Support Team:
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Salem, OR
Dallas, TX

PART NO.	VFA10-HD-S
DWG. NO.	VFA10-HD-S

B	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
A	UPDATED ANGLE CALIBRATING PROCEDURE PAGE 2		CEK	12/12/2017
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				



FOX HILL TELECOM

Radio Frequency Emissions Analysis Report



Site ID: CT11711A

Crown Castle SST
197 South Street
Vernon, CT 06066

August 30, 2022

Fox Hill Telecom Project Number: 221565

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	67.48 %



August 30, 2022

T-MOBILE

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

Emissions Analysis for Site: **CT11711A – Crown Castle SST**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **197 South Street, Vernon, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2500 MHz (BRS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



FOX HILL TELECOM

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 **197 South Street, Vernon, 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
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	4	40
LTE / 5G NR	2500 MHz (BRS)	8	20

Table 1: Channel Data Table



The following 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	130
A	2	Commscope VV-65B-R1	130
A	3	Ericsson AIR6419 B41	130
B	1	RFS APXVAALL24_43-U-NA20	130
B	2	Commscope VV-65B-R1	130
B	3	Ericsson AIR6419 B41	130
C	1	RFS APXVAALL24_43-U-NA20	130
C	2	Commscope VV-65B-R1	130
C	3	Ericsson AIR6419 B41	130

Table 2: Antenna Data

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



RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.57
Antenna A2	Commscope VV-65B-R1	1900 MHz (PCS) / 2100 MHz (AWS)	16.55 / 16.85	9	335	15,654.24	3.66
Antenna A3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	5.28
Sector A Composite MPE%							10.51
Antenna B1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.57
Antenna B2	Commscope VV-65B-R1	1900 MHz (PCS) / 2100 MHz (AWS)	16.55 / 16.85	9	335	15,654.24	3.66
Antenna B3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	5.28
Sector B Composite MPE%							10.51
Antenna C1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.57
Antenna C2	Commscope VV-65B-R1	1900 MHz (PCS) / 2100 MHz (AWS)	16.55 / 16.85	9	335	15,654.24	3.66
Antenna C3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	5.28
Sector C Composite MPE%							10.51

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	10.51 %
DISH	2.05 %
AT&T	37.73 %
Verizon Wireless	14.93 %
XM Satellite Radio	0.14 %
Town	0.89 %
MetroPCS	1.12 %
Clearwire	0.11 %
Site Total MPE %:	67.48 %

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	10.51 %
T-MOBILE Sector B Total:	10.51 %
T-MOBILE Sector C Total:	10.51 %
Site Total:	67.48 %

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 ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	926.96	130	4.33	600 MHz	400	1.08%
T-Mobile 700 MHz LTE	2	485.32	130	2.27	700 MHz	467	0.49%
T-Mobile 1900 MHz (PCS) LTE	4	1,807.42	130	16.90	1900 MHz (PCS)	1000	1.69%
T-Mobile 1900 MHz (PCS) GSM	1	677.78	130	1.58	1900 MHz (PCS)	1000	0.16%
T-Mobile 2100 MHz (AWS) LTE	4	1,936.69	130	18.11	2100 MHz (AWS)	1000	1.81%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	2,825.08	130	52.84	2500 MHz (BRS)	1000	5.28%
						Total:	10.51 %

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:	10.51 %
Sector B:	10.51 %
Sector C:	10.51 %
T-MOBILE Maximum Total (per sector):	10.51 %
Site Total:	67.48 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **67.48 %** 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:CT11711A

T-MOBILE SITE NAME: CROWN CASTLE SST

SITE TYPE: SELF SUPPORT TOWER

TOWER HEIGHT: 132'-0"

T-MOBILE ANCHOR SITE CONFIGURATION: 67E5D998E OUTDOOR

BUSINESS UNIT #:806377

SITE ADDRESS: 197 SOUTH ST
VERNON, CT 06066

COUNTY: TOLLAND

JURISDICTION: CONNECTICUT

SITING COUNCIL

T-Mobile

4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

B+T GRP

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

T-MOBILE SITE NUMBER:
CT11711A

BU #: 806377
HRT 084 943242

197 SOUTH ST
VERNON, CT 06066

EXISTING
132'-0" SELF SUPPORT
TOWER

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	DAS	PRELIMINARY REVIEW	CV
B	8/10/22	BLJ	PRELIMINARY REVIEW	ANP
0	9/9/22	MLC	CONSTRUCTION	ANP

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

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

SHEET NUMBER:
T-1

REVISION:
0

SITE INFORMATION	
CROWN CASTLE USA INC. SITE NAME:	HRT 084 943242
SITE ADDRESS:	197 SOUTH ST VERNON, CT 06066
COUNTY:	TOLLAND
MAP/PARCEL #:	39065B0016A
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.853475°
LONGITUDE:	-72.452089°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	625'
CURRENT ZONING:	R-22
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:	CONNECTICUT WATER CO 93 WEST MAIN ST CLINTON, CT 06413
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054
ELECTRIC PROVIDER:	NORTHEAST UTILITIES (800) 286-2000
TELCO PROVIDER:	T.B.D.

DRAWING INDEX	
SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	CODE SUMMARY
T-3	CODE SUMMARY
T-4	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5.1	EQUIPMENT SPECS
C-5.2	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
ATTACHED	MOUNT 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.

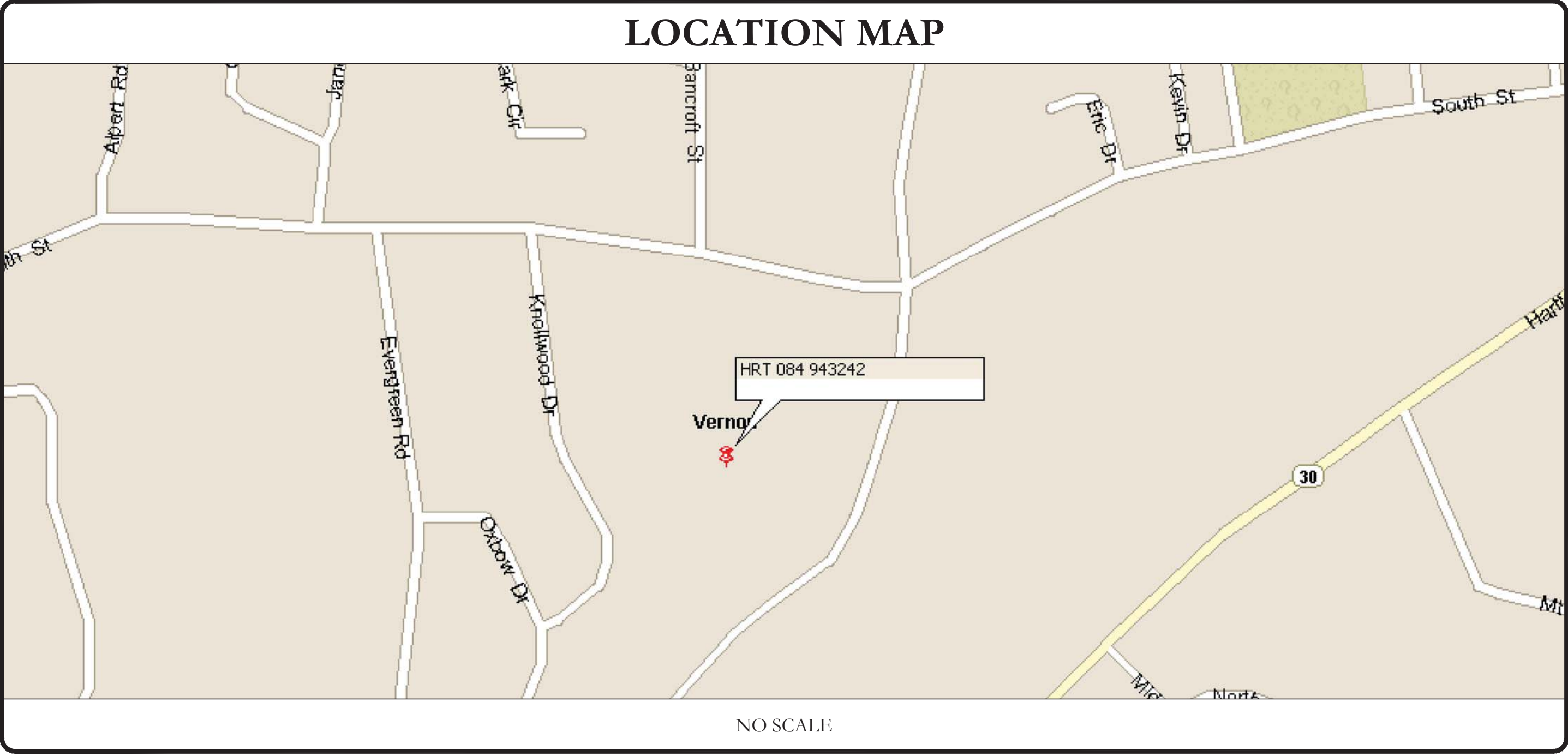
TOWER SCOPE OF WORK:

- REMOVE (15) ANTENNAS
- REMOVE (12) RRHs
- REMOVE (3) TMAs
- REMOVE (10) 7/8" COAX CABLES
- REMOVE (3) HYBRID CABLES
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHs
- INSTALL (3) 1-5/8" HYBRID TRUNK 6/24 4AWG
- INSTALL (3) VALMONT VFA10-HD SECTOR FRAMES

GROUND SCOPE OF WORK:

- REMOVE (1) S12000 OUTDOOR CABINET (NORTEL)
- REMOVE (2) DUW30, (6) RU22 RRU
- INSTALL (1) ENCLOSURE 6160 AC V1 CABINET
- INSTALL (1) B160 BATTERY CABINET
- INSTALL (1) PSU 4813 VR4A (KIT)
- INSTALL (1) AAV CABINET
- INSTALL (1) RP 6651, (1) PSU 4813 VR4A (KIT), (1) CSR IXRE V2 (GEN2) IN ENCLOSURE 6160 AC V1 CABINET.
- INSTALL (1) 2'-0"x7'-0" ICE BRIDGE

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



APPLICABLE CODES/REFERENCE DOCUMENTS

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

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

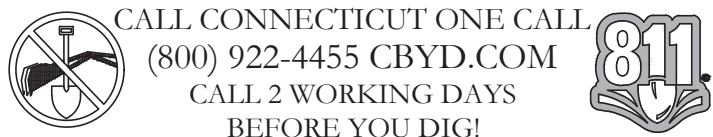
REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	TOWER ENGINEERING PROFESSIONALS
DATED:	6/29/22
MOUNT ANALYSIS:	INFINIGY
DATED:	6/24/22
RFDS REVISION:	7
DATED:	5/20/22
ORDER ID:	621887
REVISION:	0

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.



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." 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.

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-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
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 GROUNDDED 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).

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.
- 4.1. 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. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
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. CONJIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SUEW FITTING 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 SPECIMATE 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

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

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T-MOBILE SITE NUMBER:
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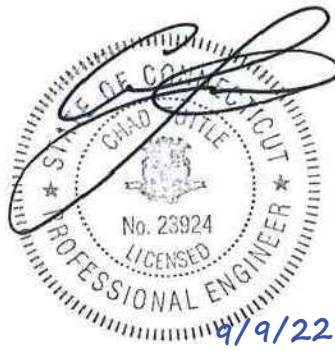
BU #: 806377
HRT 084 943242

197 SOUTH ST
VERNON, CT 06066

EXISTING
132'-0" SELF SUPPORT
TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	DAS	PRELIMINARY REVIEW	CV
B	8/10/22	BLJ	PRELIMINARY REVIEW	ANP
0	9/9/22	MLC	CONSTRUCTION	ANP



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SITE PLAN DISCLAIMER:

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

1 OVERALL SITE PLAN
SCALE: 50' 25' 0' 50' 1" = 50'-0" (FULL SIZE)
1" = 100'-0" (11x17)



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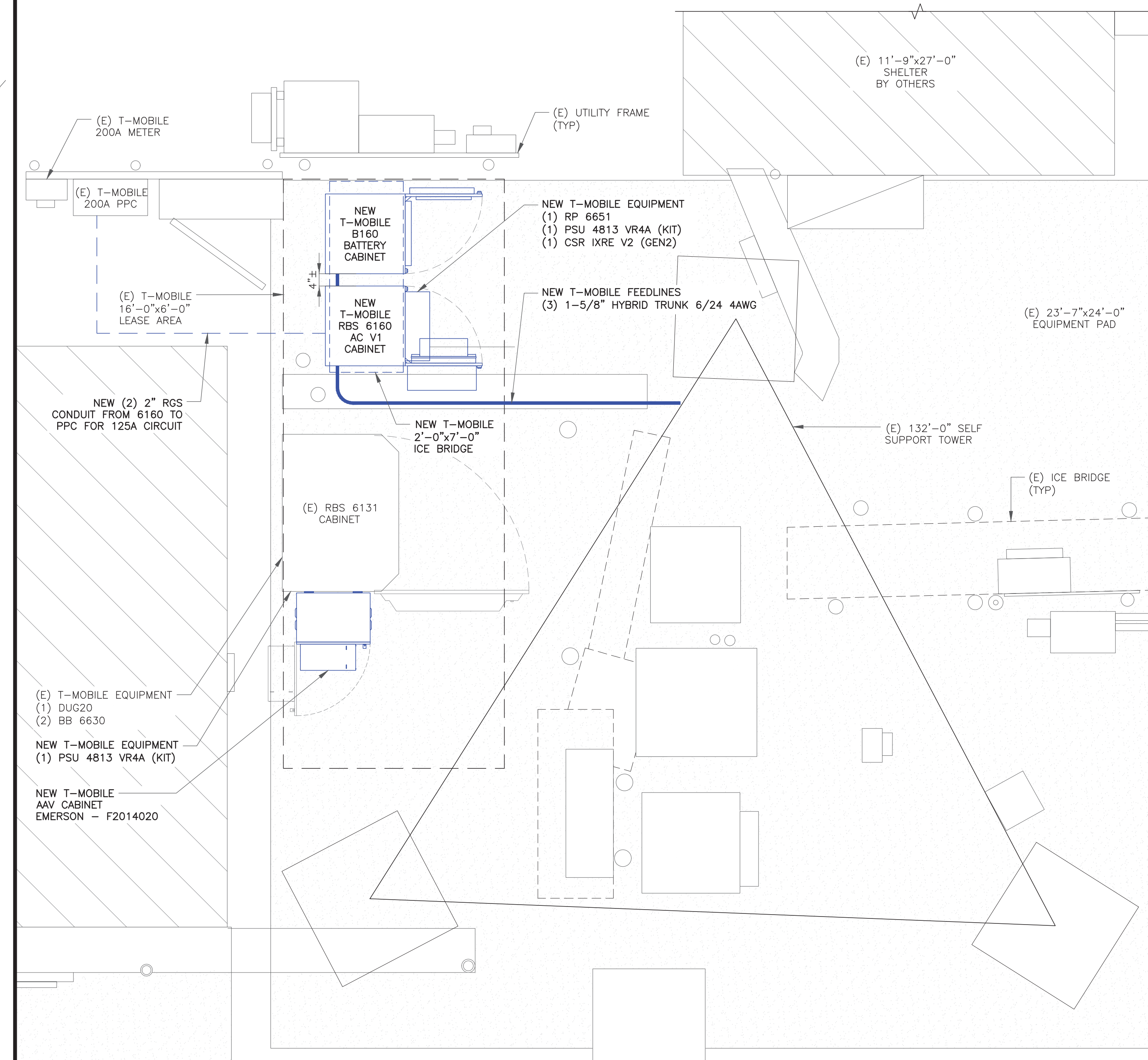
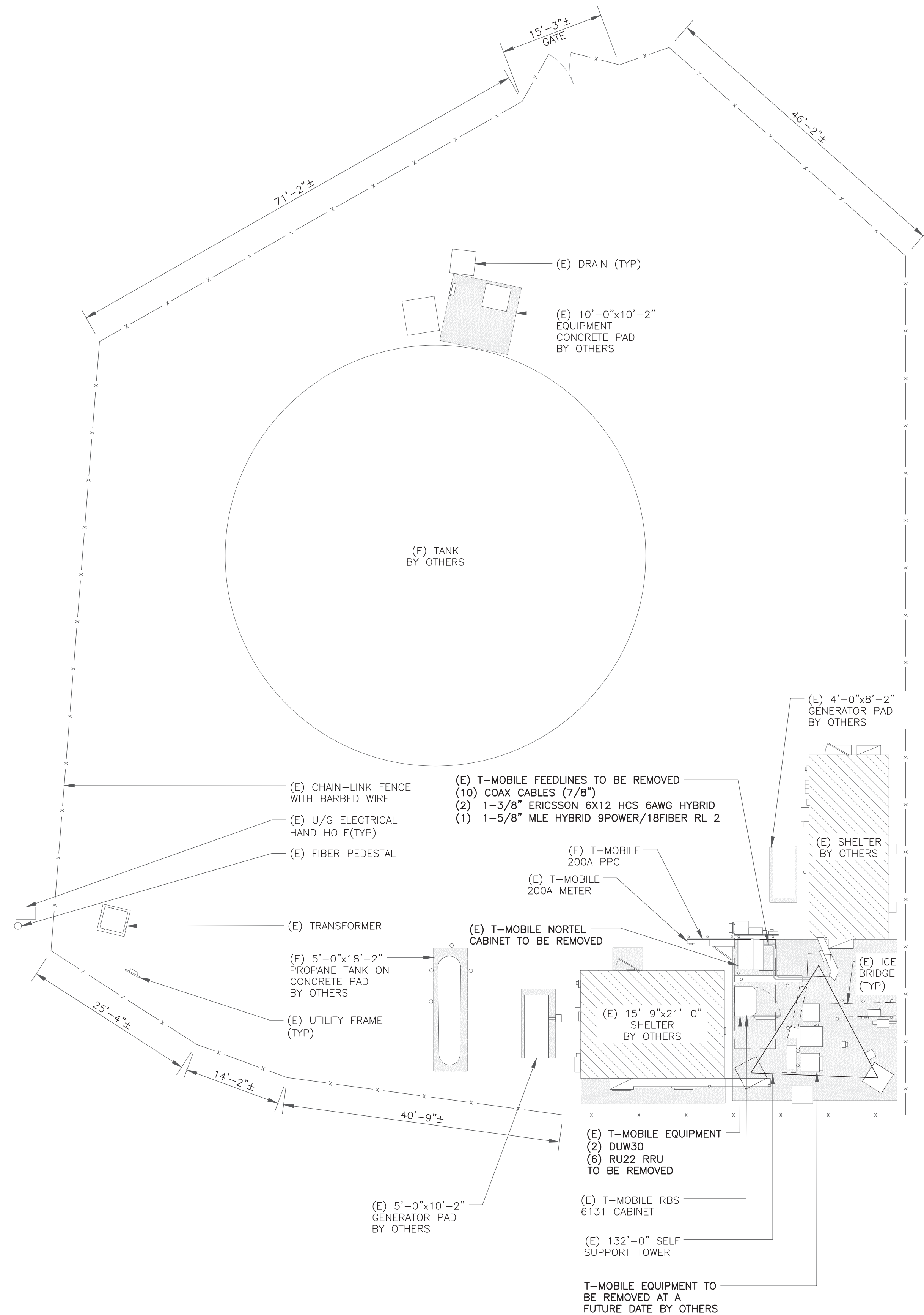
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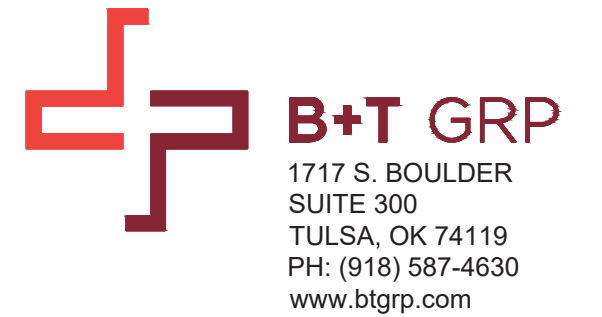


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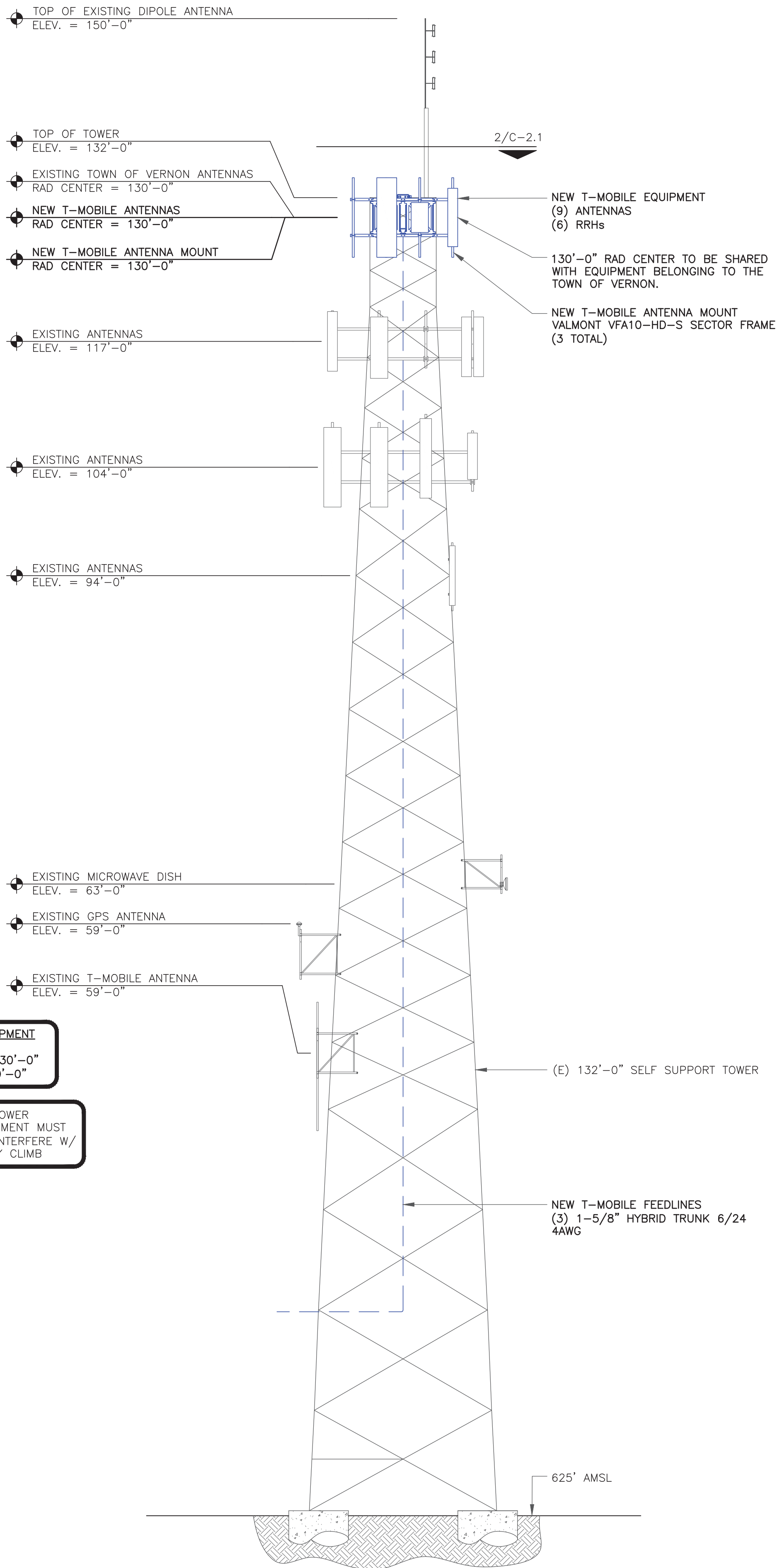
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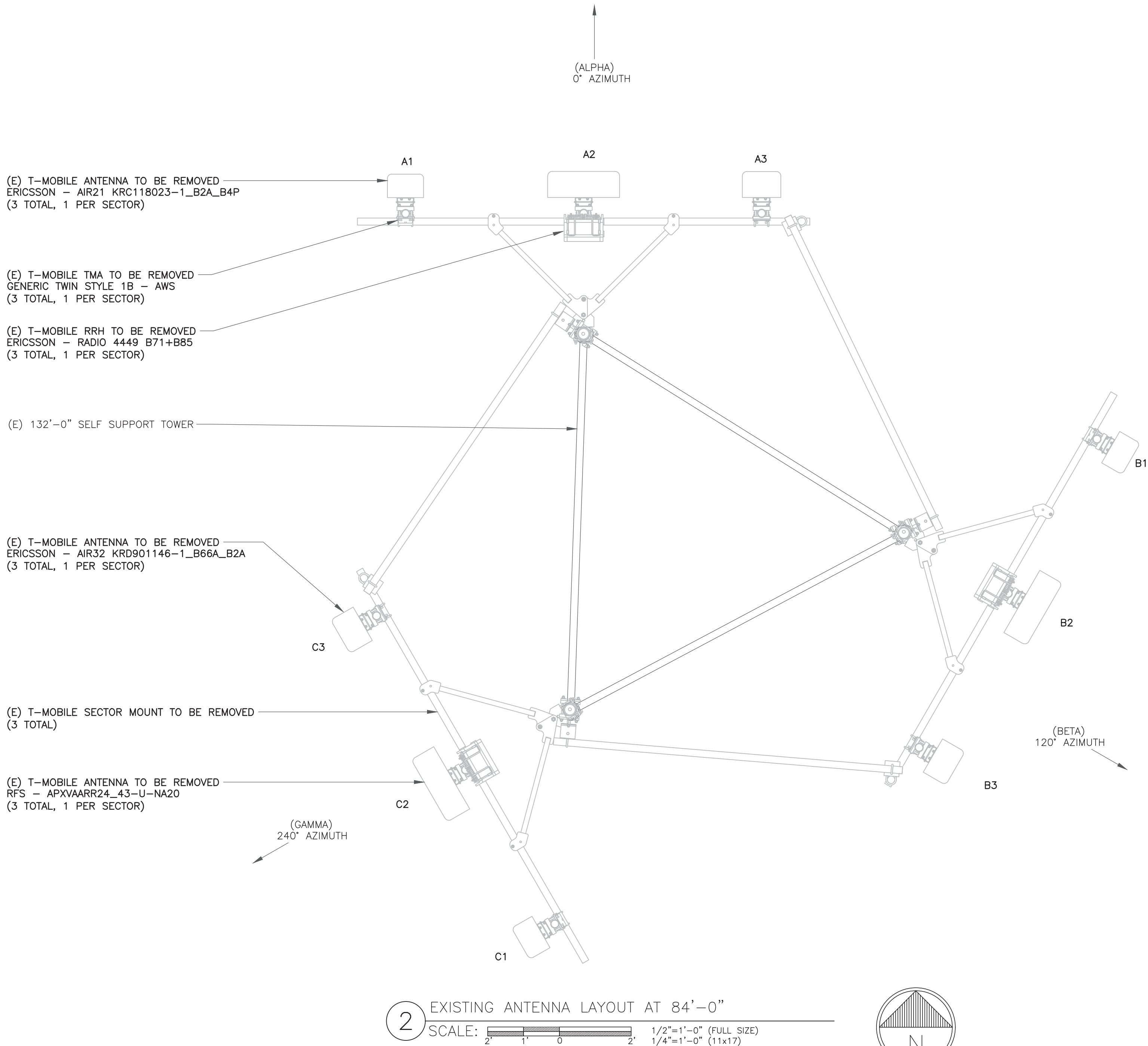
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T-MOBILE EQUIPMENT
ANTENNA CL: 130'-0"
MOUNT CL: 130'-0"

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

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



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(E) T-MOBILE ANTENNA TO BE REMOVED
RFS - APXVTM14-C-120
(3 TOTAL, 1 PER SECTOR)

(E) T-MOBILE T-ARM MOUNT TO BE REMOVED
(3 TOTAL)

(E) T-MOBILE ANTENNA TO BE REMOVED
RFS - APXVSP18-C-A20
(3 TOTAL, 1 PER SECTOR)

(E) 132'-0" SELF SUPPORT TOWER

(E) TOWN OF VERNON ANTENNA
DECIBEL - DB413-B
(1 TOTAL)

(E) T-MOBILE RRH TO BE REMOVED
ALCATEL LUCENT - 800MHZ 2X50W RRH W/FILTER (BELOW)
(3 TOTAL, 1 PER SECTOR)

(E) T-MOBILE RRH TO BE REMOVED
ALCATEL LUCENT - 1900MHZ RRH (65MHZ) (ABOVE)
(3 TOTAL, 1 PER SECTOR)

(E) T-MOBILE RRH TO BE REMOVED
ALCATEL LUCENT - TD-RRH8X20-25
(3 TOTAL, 1 PER SECTOR)

1 EXISTING ANTENNA LAYOUT AT 130'-0"
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)

NEW T-MOBILE ANTENNA
COMMScope - VV-65B-R1
(3 TOTAL, 1 PER SECTOR)

NEW T-MOBILE RRH
ERICSSON - 4460 B25+B66
(3 TOTAL, 1 PER SECTOR)

(E) 132'-0" SELF SUPPORT TOWER

(E) TOWN OF VERNON ANTENNA
DECIBEL - DB413-B
(1 TOTAL)

NEW T-MOBILE ANTENNA MOUNT
VALMONT VFA10-HD-S SECTOR FRAME
(3 TOTAL)

NEW T-MOBILE RRH
ERICSSON - 4480 B71+B85
(3 TOTAL, 1 PER SECTOR)

NEW T-MOBILE ANTENNA
RFS - APXVAALL24_43-U-NA20
(3 TOTAL, 1 PER SECTOR)

NEW T-MOBILE ANTENNA
ERICSSON - AIR 6419 B41
(3 TOTAL, 1 PER SECTOR)

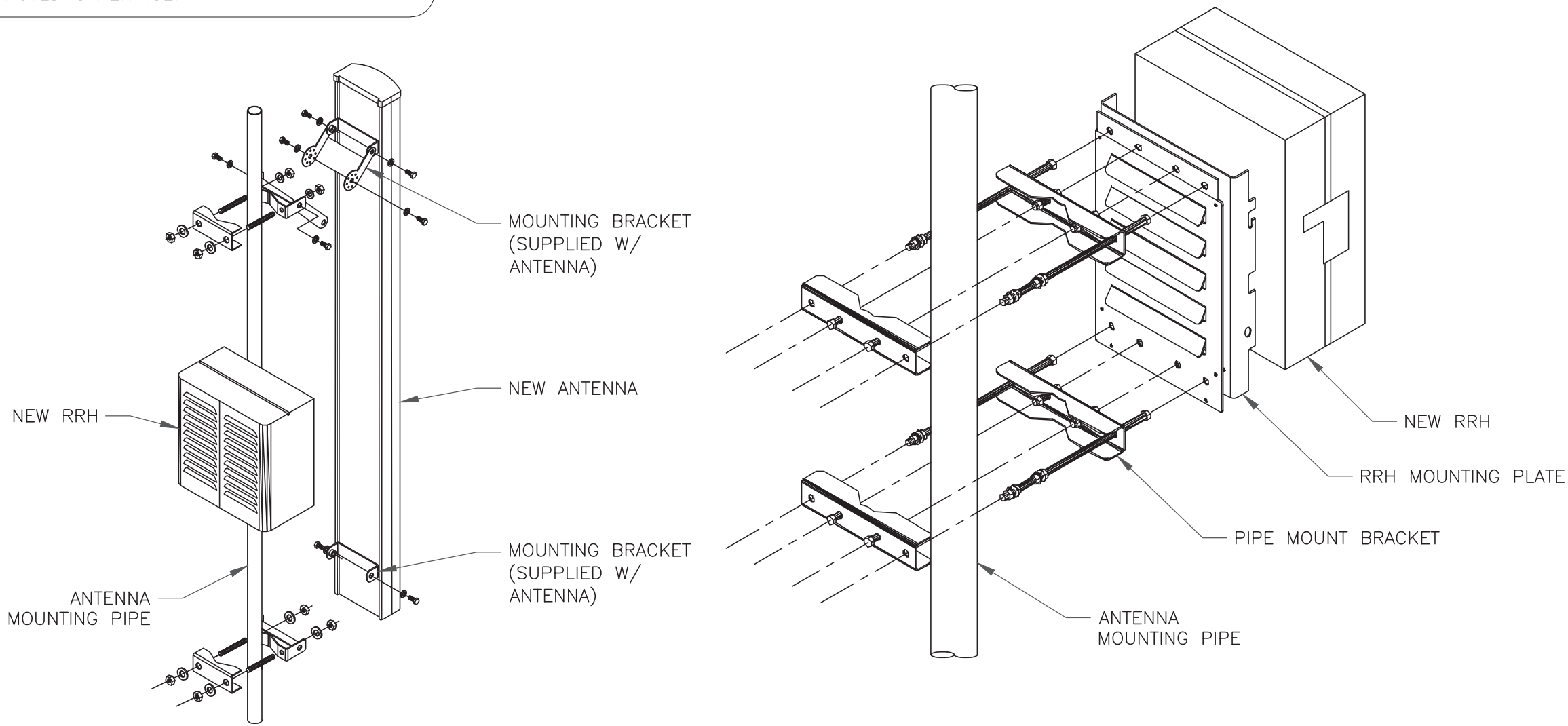
2 FINAL ANTENNA LAYOUT AT 130'-0"
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)

RF SYSTEM SCHEDULE										
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A1	L2100/L1900/G1900	COMMSCOPE	WV-65B-R1	0°	0°	-	130'-0"	(1) ERICSSON - RADIO 4460 B25+B66	(1) 1-5/8" HYBRID TRUNK 6/24 4AWG
	A2	L2500/N2500	ERICSSON	AIR 6419 B41	0°	0°	-	130'-0"	-	
	A3	L700/L600/N600	RFS	APXVAALL24_43-U-NA20	0°	0°	-	130'-0"	(1) ERICSSON - RADIO 4480 B71+B85	
BETA	B1	L2100/L1900/G1900	COMMSCOPE	WV-65B-R1	120°	0°	-	130'-0"	(1) ERICSSON - RADIO 4460 B25+B66	(1) 1-5/8" HYBRID TRUNK 6/24 4AWG
	B2	L2500/N2500	ERICSSON	AIR 6419 B41	120°	0°	-	130'-0"	-	
	B3	L700/L600/N600	RFS	APXVAALL24_43-U-NA20	120°	0°	-	130'-0"	(1) ERICSSON - RADIO 4480 B71+B85	
GAMMA	C1	L2100/L1900/G1900	COMMSCOPE	WV-65B-R1	240°	0°	-	130'-0"	(1) ERICSSON - RADIO 4460 B25+B66	(1) 1-5/8" HYBRID TRUNK 6/24 4AWG
	C2	L2500/N2500	ERICSSON	AIR 6419 B41	240°	0°	-	130'-0"	-	
	B3	L700/L600/N600	RFS	APXVAALL24_43-U-NA20	240°	0°	-	130'-0"	(1) ERICSSON - 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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T-MOBILE SITE NUMBER:
CT11711A

BU #: **806377**
HRT 084 943242

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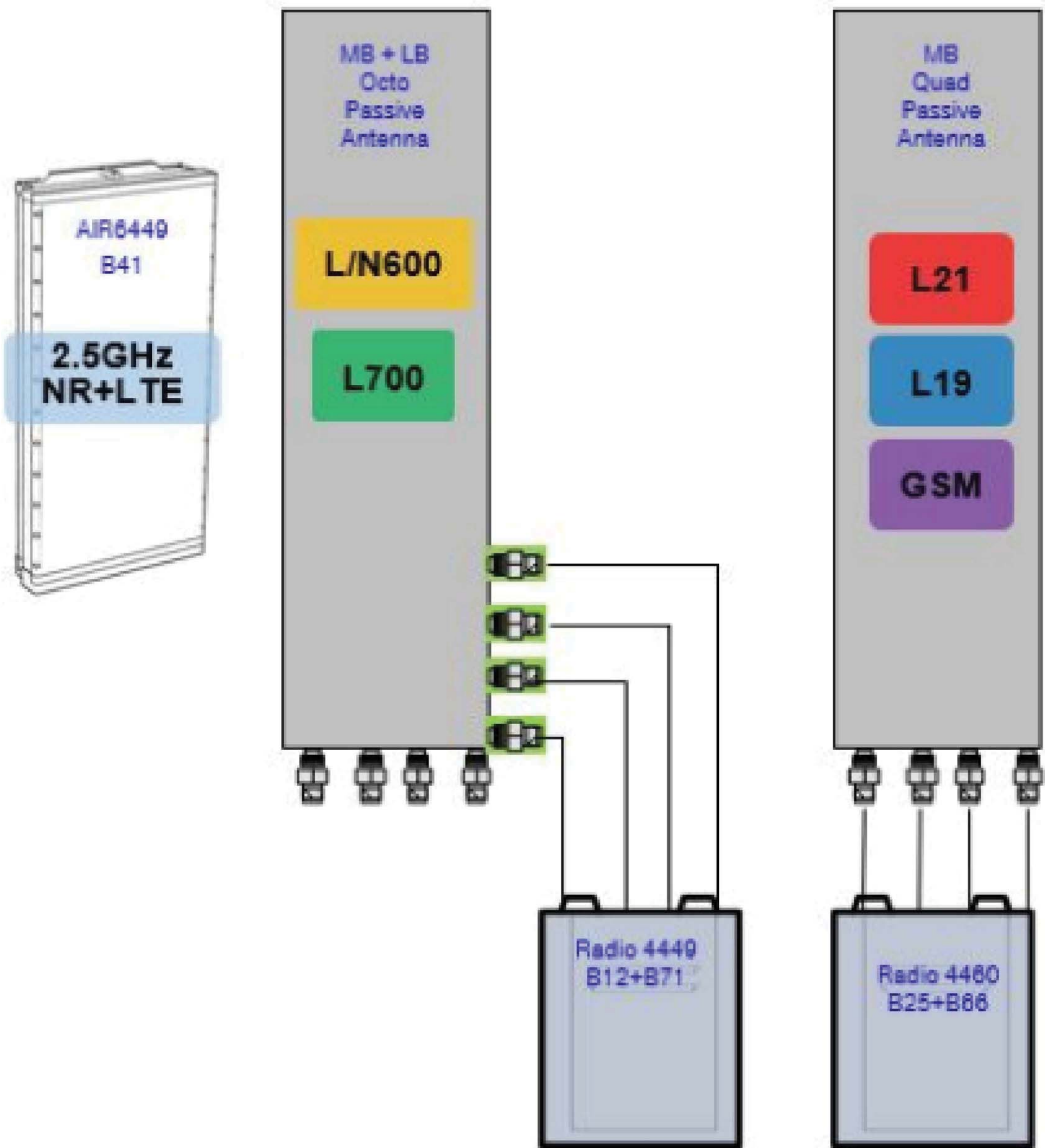
C-3

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Section 3 - Proposed Template Images

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Notes:

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BER:2386985
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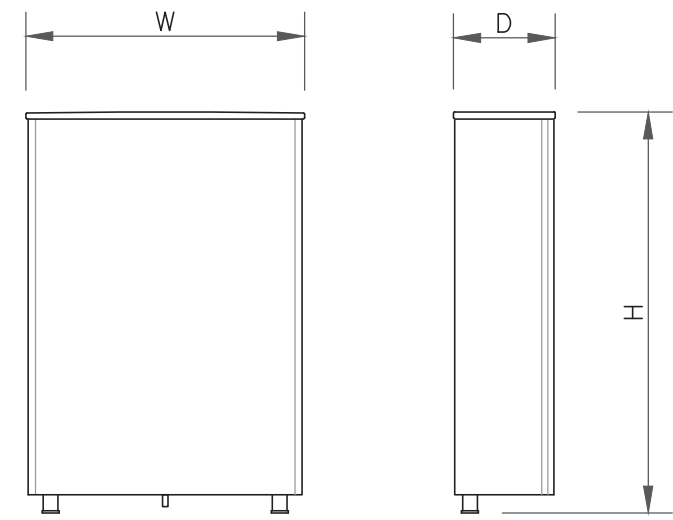
IT IS A VIOLATION OF LAW FOR ANY PERSON,
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SHEET NUMBER:

C-4

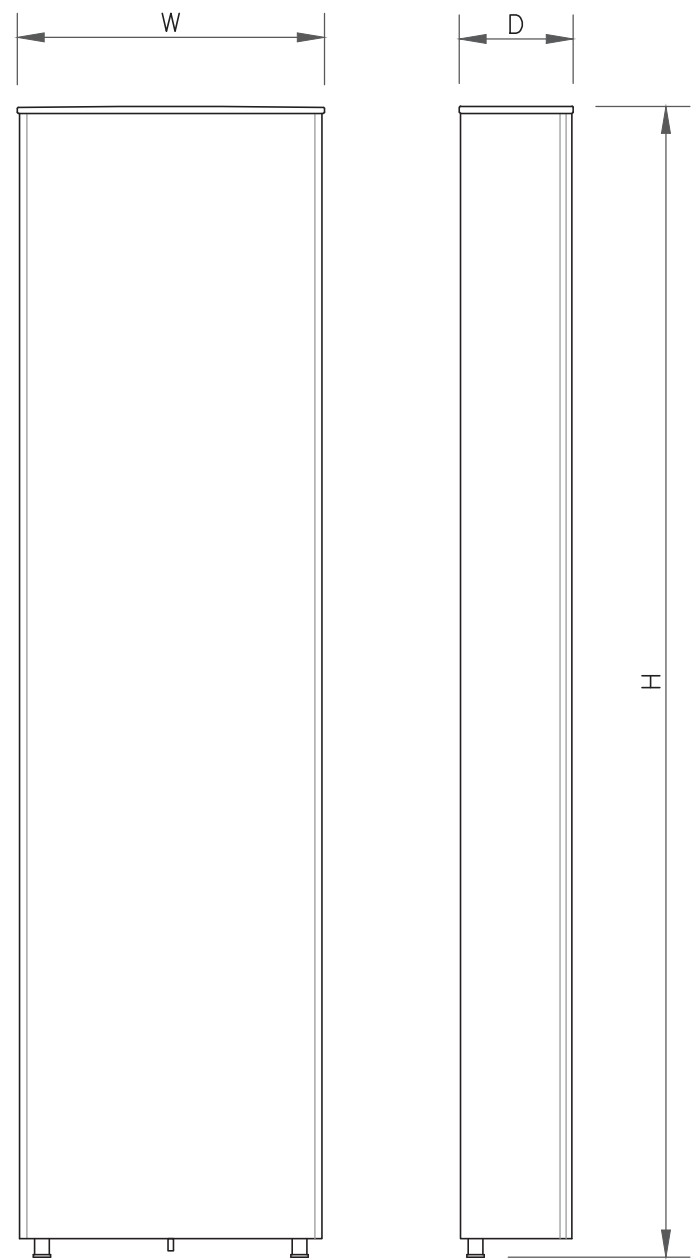
REVISION:

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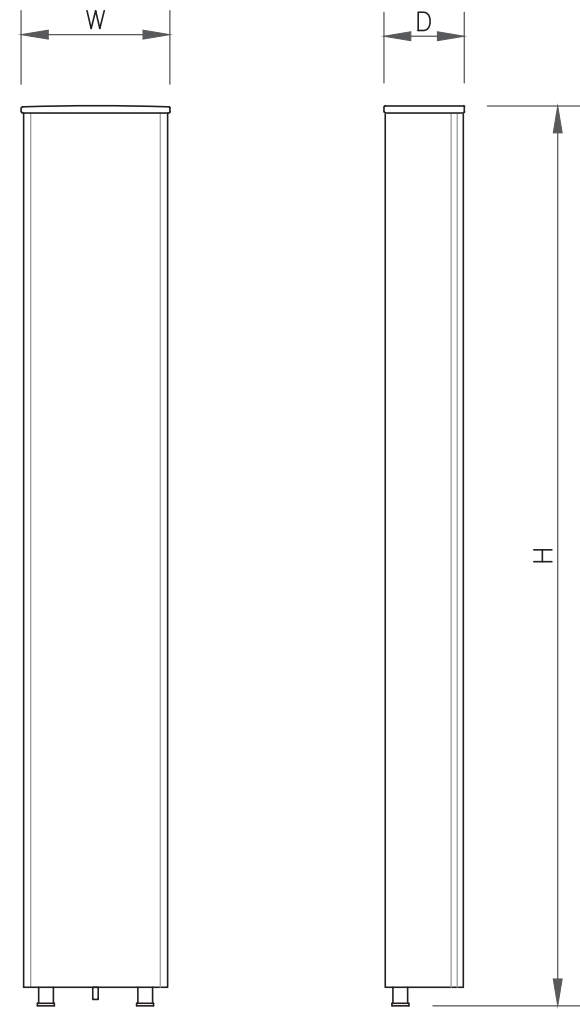
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR 6419 B41
WIDTH	20.91"
DEPTH	9.02"
HEIGHT	36.25"
WEIGHT	96.50 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



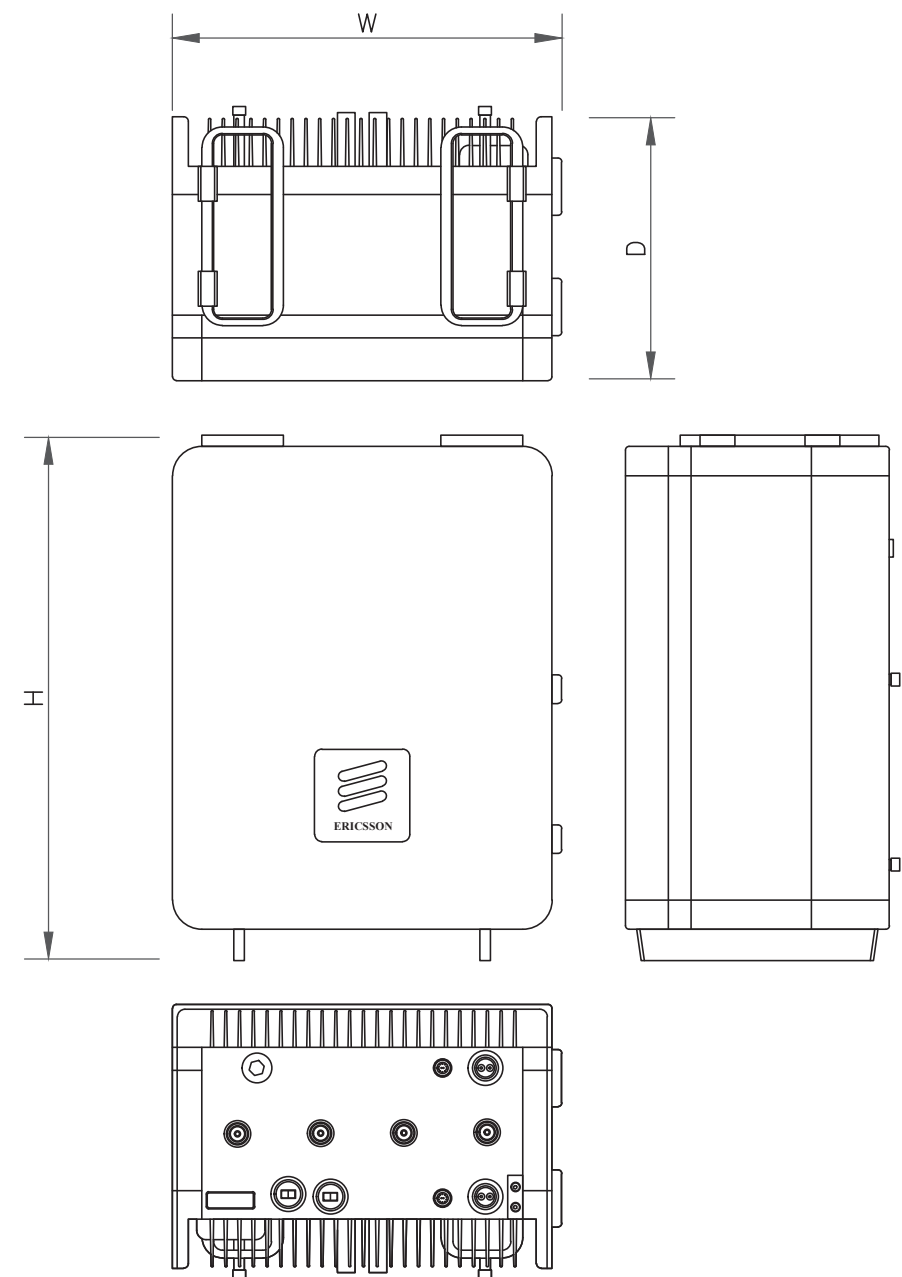
ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAALL24_43-U NA20
WIDTH	24.00"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.90 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



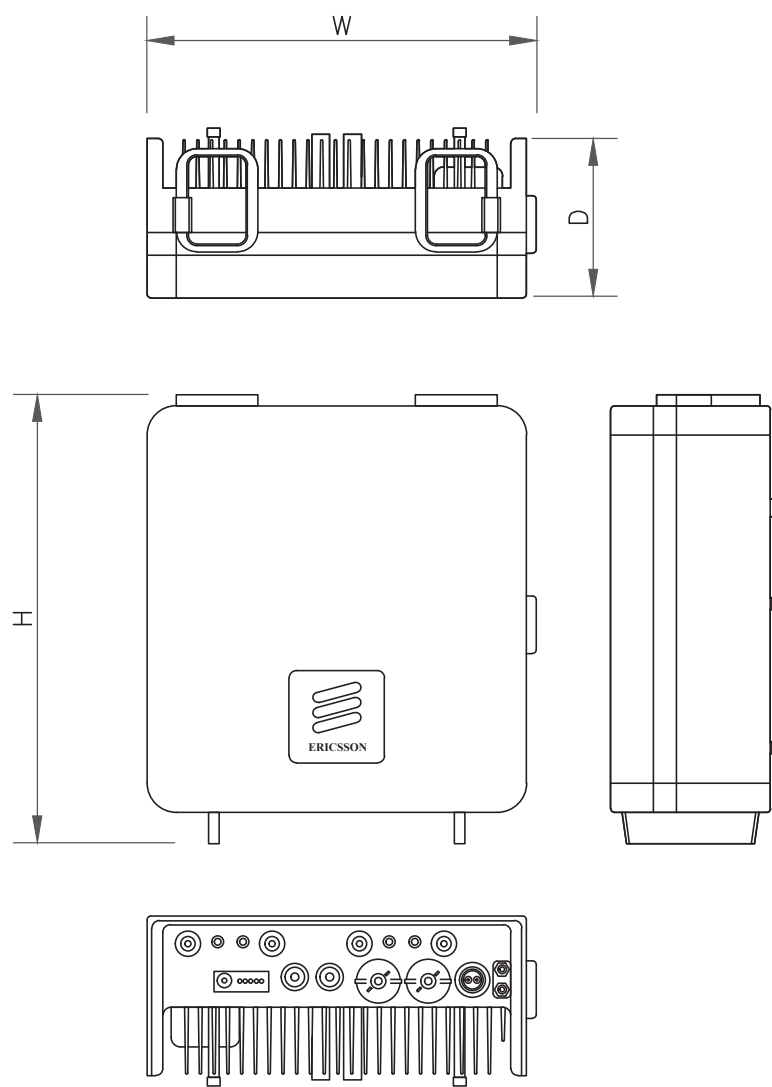
ANTENNA SPECS	
MANUFACTURER	COMMSCOPE
MODEL #	VV-65B-R1
WIDTH	12.01"
DEPTH	4.65"
HEIGHT	70.35"
WEIGHT	41.67 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



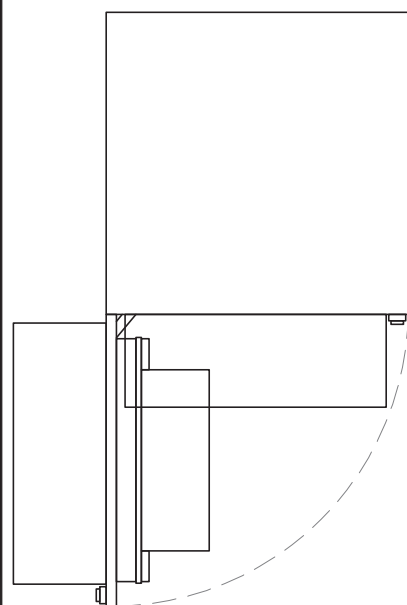
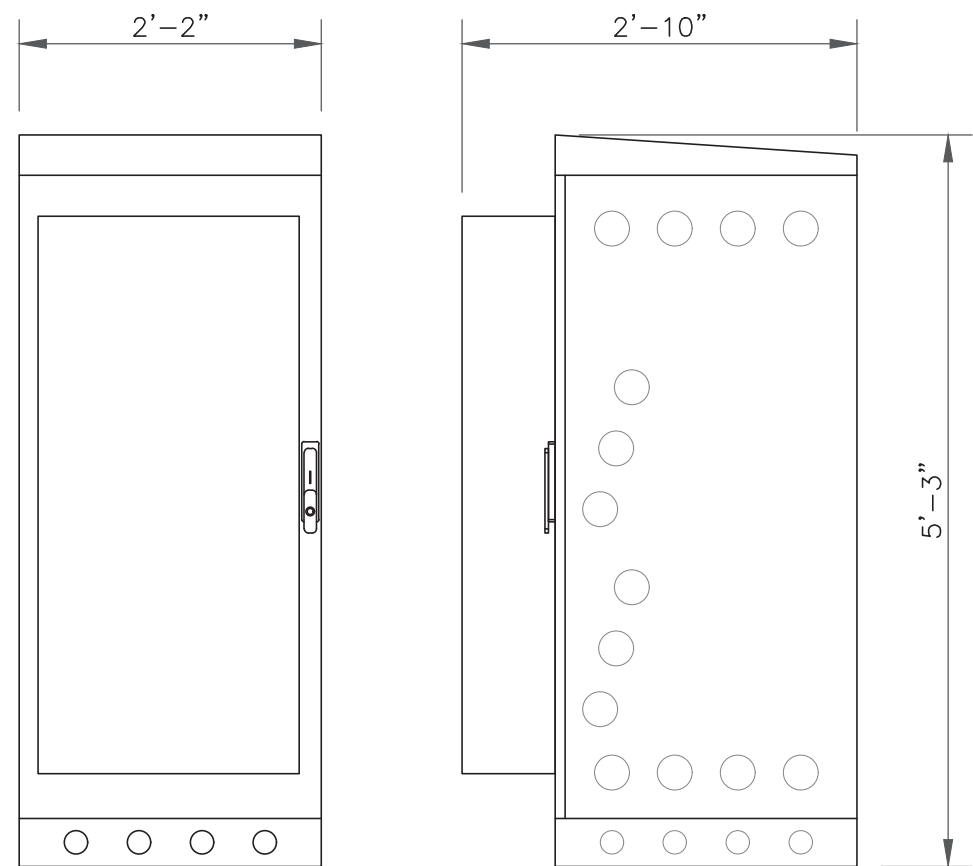
RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4460 B25+B66
WIDTH	15.10"
DEPTH	11.9"
HEIGHT	17.0"
WEIGHT	109.0 LBS

4 RRU SPECS
SCALE: NOT TO SCALE



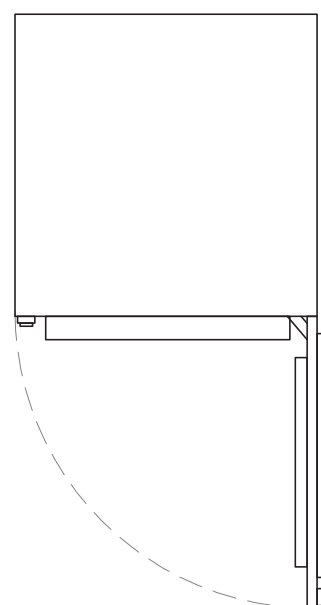
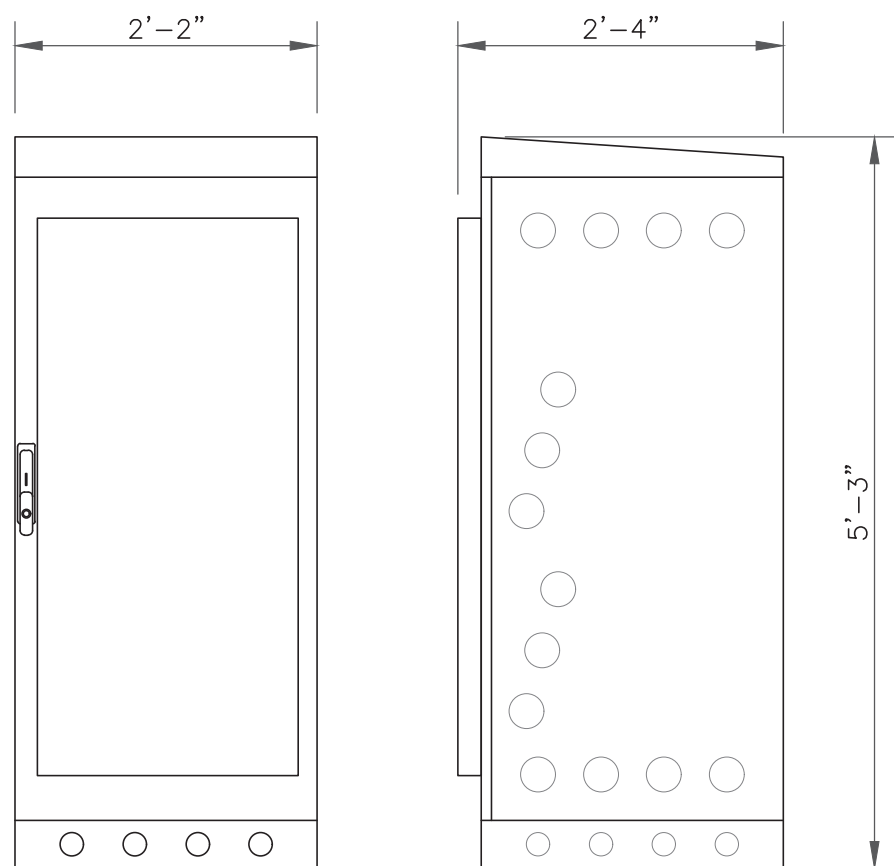
RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4480 B71+B85
WIDTH	15.7"
DEPTH	7.5"
HEIGHT	22"
WEIGHT	81.0 LBS

5 RRU SPECS
SCALE: NOT TO SCALE



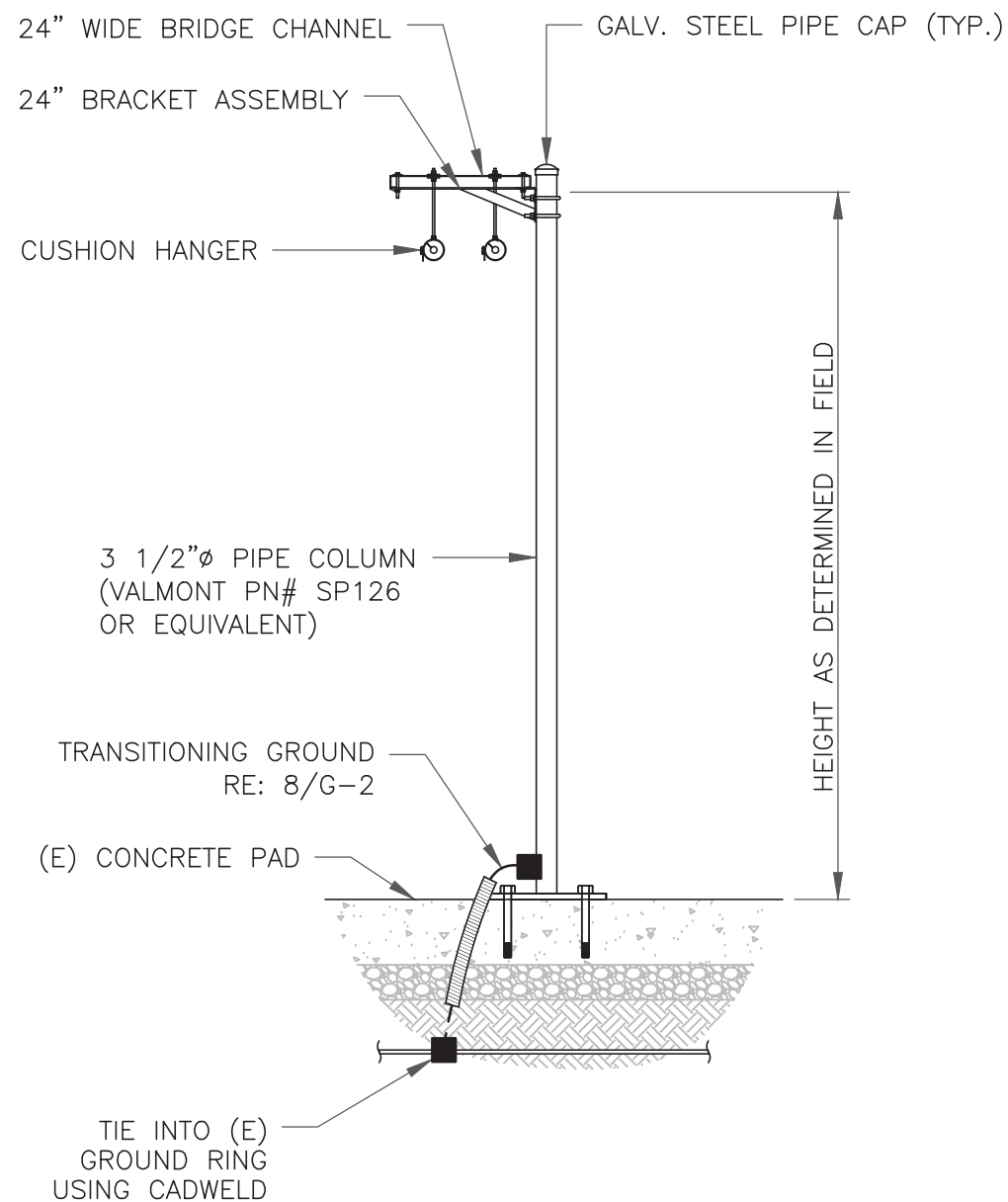
EQUIPMENT NOTES:
HEIGHTxWIDTHxDEPTH: 63.0" x 26.0" x 34.0"
(1600.0mm x 660.0mm x 864.0mm)
WEIGHT (EMPTY): 320 LBS (145 kg)
WEIGHT (FULLY LOADED): 1,500 LBS (681 kg)

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 ICE BRIDGE DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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SUITE 300
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PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CT11711A

BU #: **806377**
HRT 084 943242

197 SOUTH ST
VERNON, CT 06066

EXISTING
132'-0" SELF SUPPORT
TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	7/18/22	DAS	PRELIMINARY REVIEW	CV
B	8/10/22	BLJ	PRELIMINARY REVIEW	ANP
0	9/9/22	MLC	CONSTRUCTION	ANP



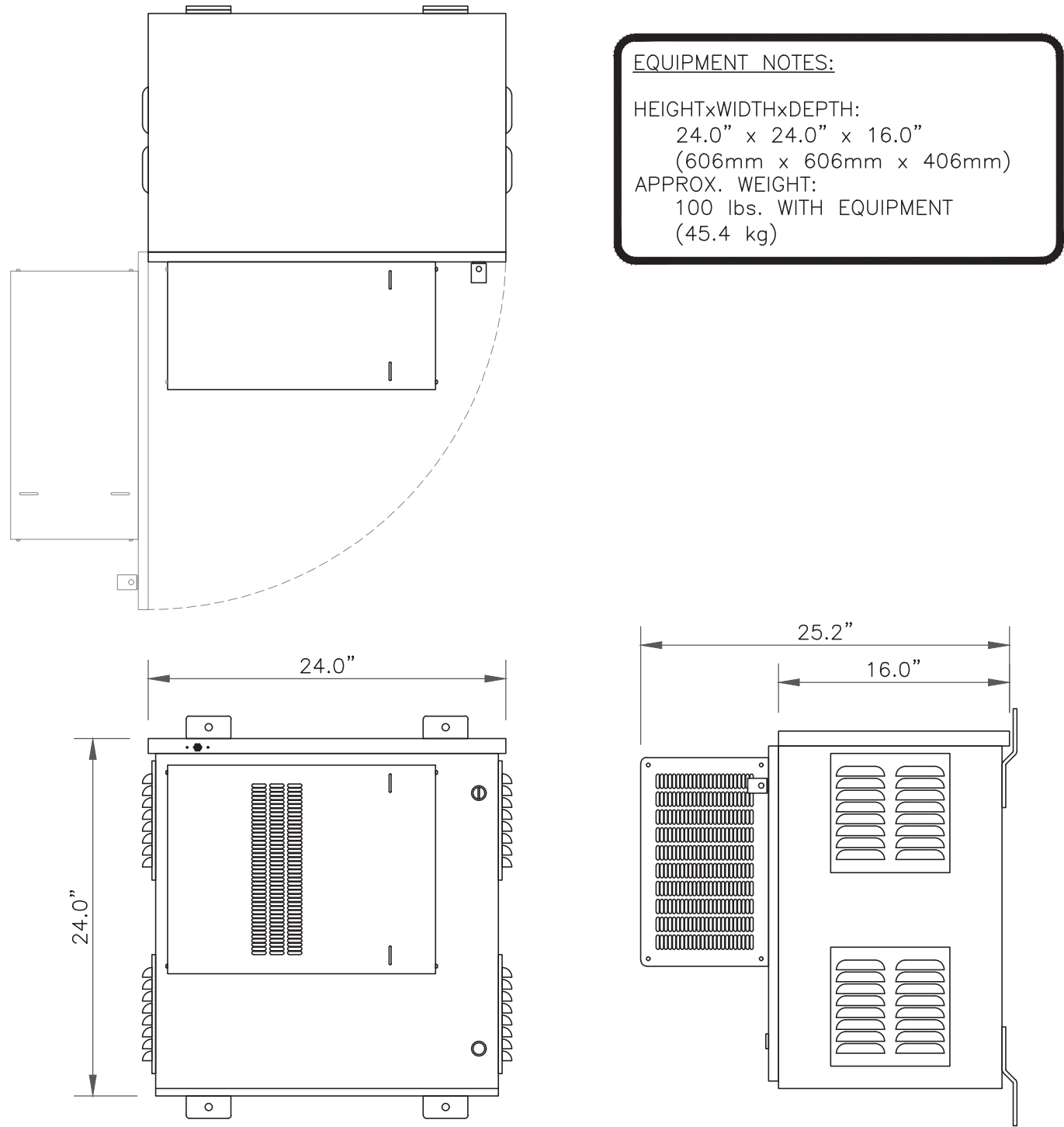
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EQUIPMENT NOTES:
HEIGHTxWIDTHxDEPTH:
24.0" x 24.0" x 16.0"
(606mm x 606mm x 406mm)
APPROX. WEIGHT:
100 lbs. WITH EQUIPMENT
(45.4 kg)

1 EMERSON — F2014020
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

7 NOT USED
SCALE: NOT TO SCALE



4 SYLVAN WAY
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NOTES:

1. PANEL SCHEDULE PENDING FIELD VERIFICATION.

FINAL PANEL SCHEDULE						
LOAD	POLES	AMPS	BUS		AMPS	POLES
			L1	L2		
SURGE	2	60A	1	2	20A	1
			3	4	125A	2
GFCI	1	20A	5	6		
			7	8	125A	2
			9	10		
			11	12		
			13	14		
			15	16		
			17	18		
			19	20		
			21	22		
			23	24		

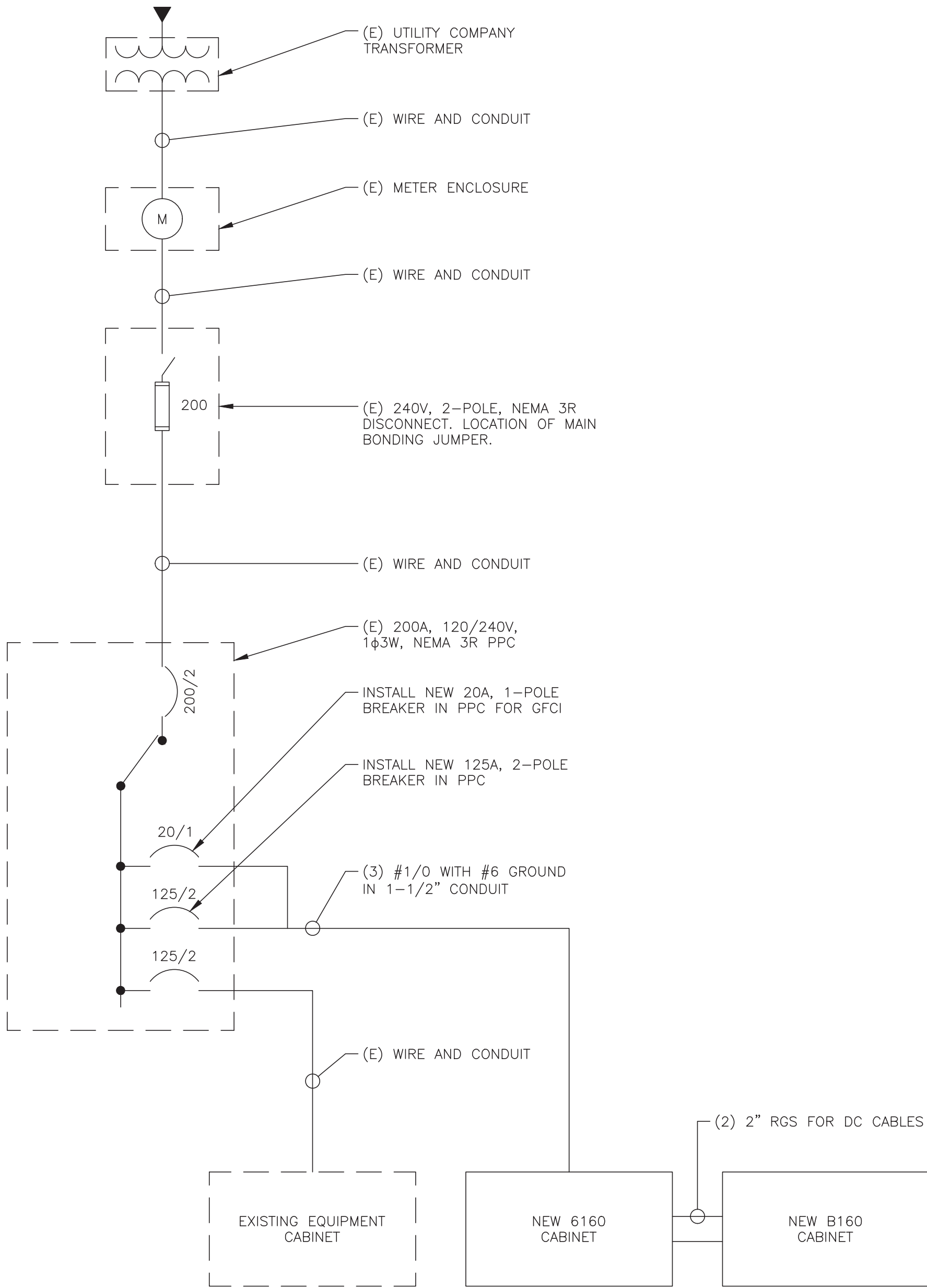
RATED VOLTAGE: ☒ 120/240 ☐ _____ 1 PHASE, 3 WIRE		BRANCH POLES: ☐ 12 ☒ 24 ☐ 30 ☐ 42		APPROVED MF'RS	
RATED AMPS: ☐ 100 ☒ 200 ☐ 400 ☐ _____		CABINET: ☒ SURFACE ☐ FLUSH		NEMA ☐ 1 ☒ 3R ☐ 4X	
☐ MAIN LUGS ONLY ☒ MAIN 200 AMPS ☒ BREAKER ☐ FUSED SWITCH		☒ HINGED DOOR		☒ KEYED DOOR LATCH	
☐ FUSED ☒ CIRCUIT BREAKER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

INSTALL NEW 2P 125A BREAKER IN POSITIONS 8 AND 10
INSTALL NEW 1P 20A BREAKER IN POSITION 5
IF 125A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING DOCUMENTS AND PHOTOS

1 FINAL T-MOBILE PANEL DETAIL
SCALE: NOT TO SCALE

NOTES:

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



2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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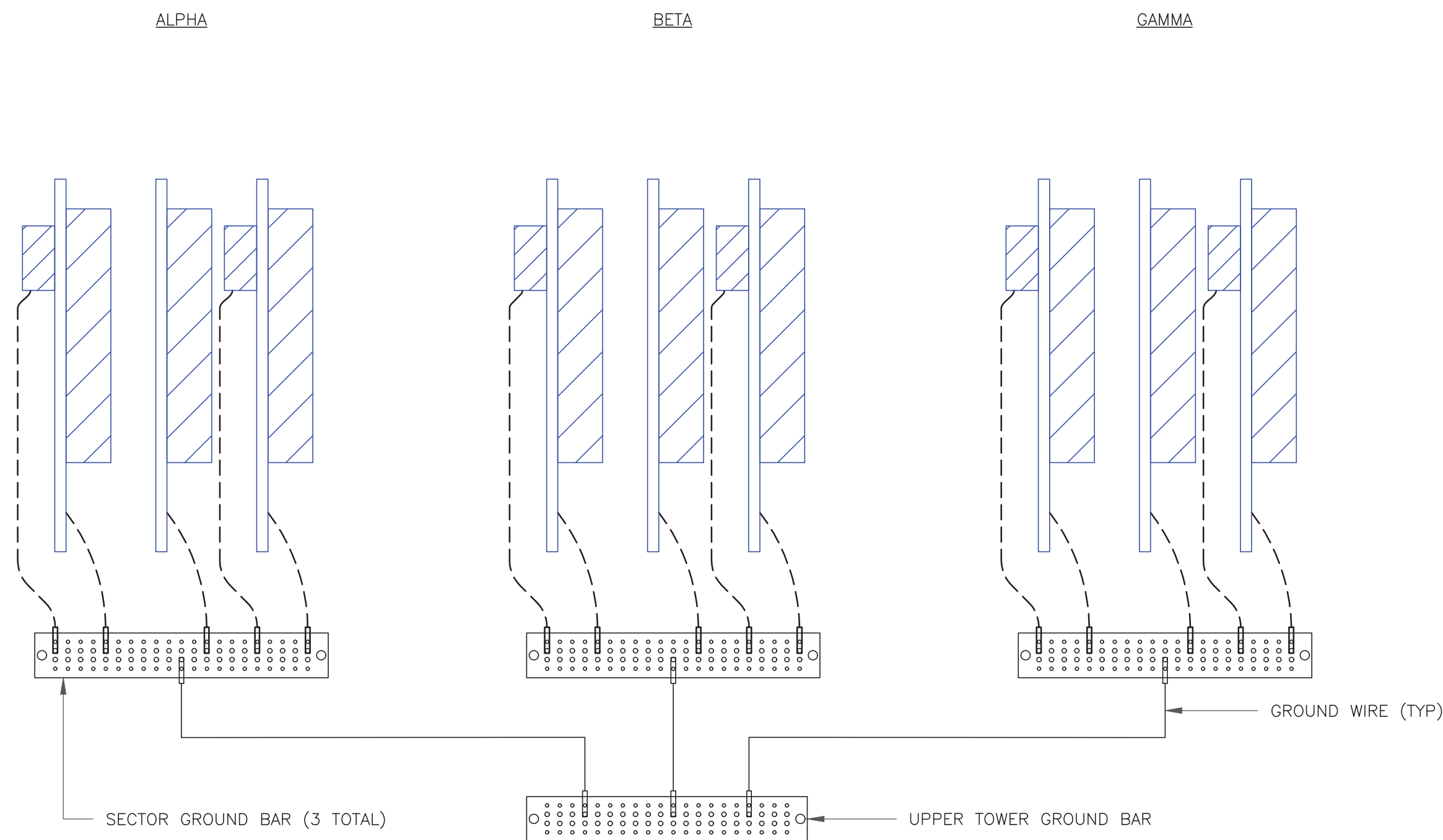
SHEET NUMBER:

E-1

REVISION:

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7/8785.005.01_HRT_084_943242.dwg - Sheet:G-1 - User: ashley.pope - Sep 09, 2022 - 9:45am



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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE



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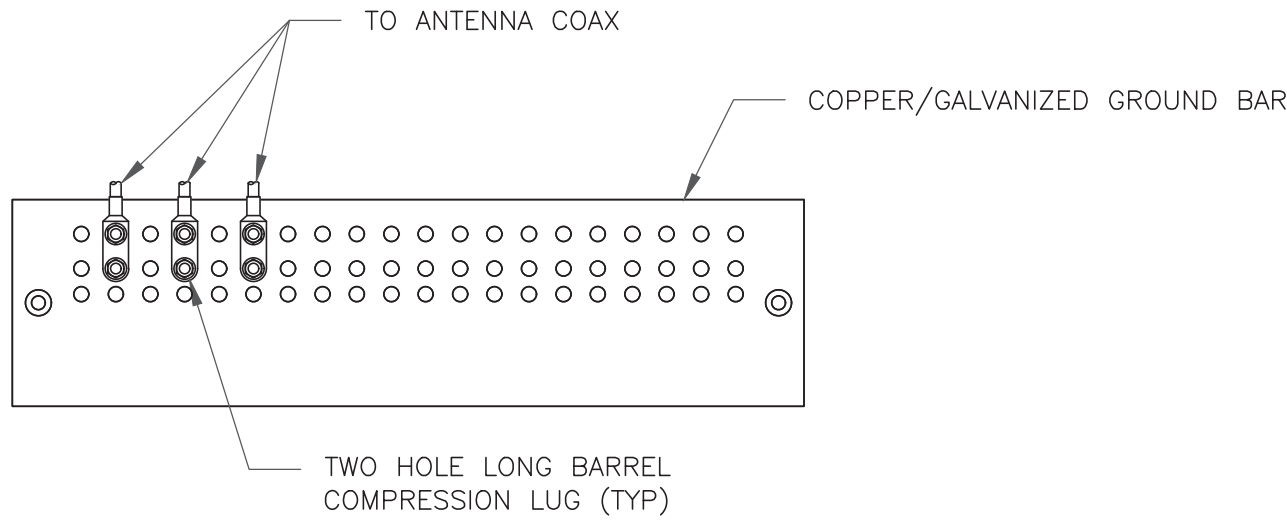
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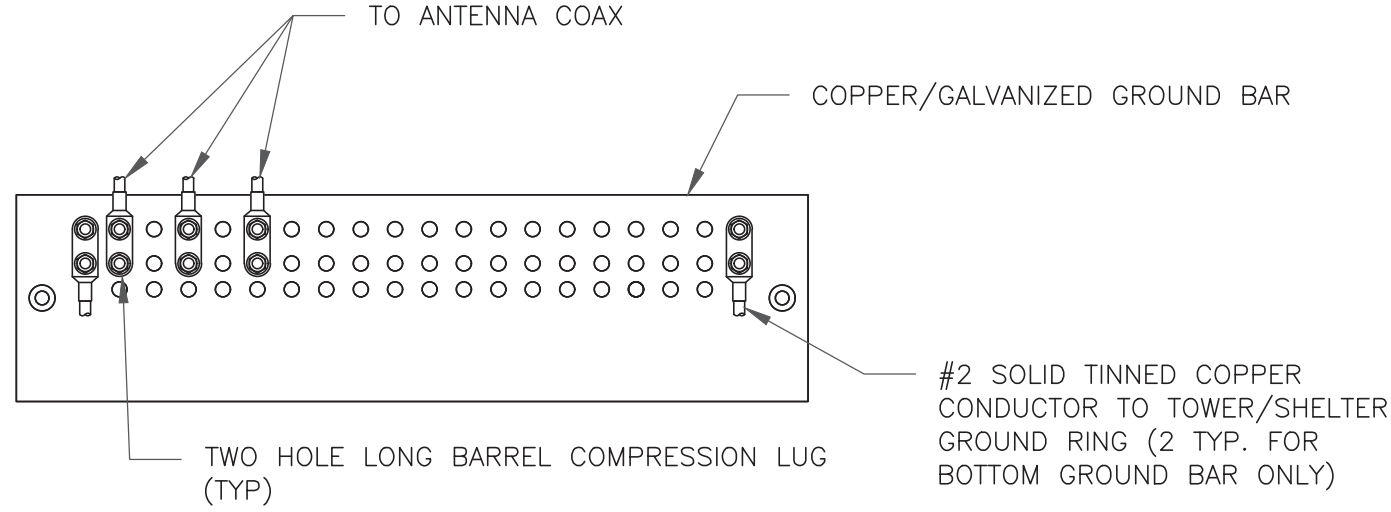
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NOTES:

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.

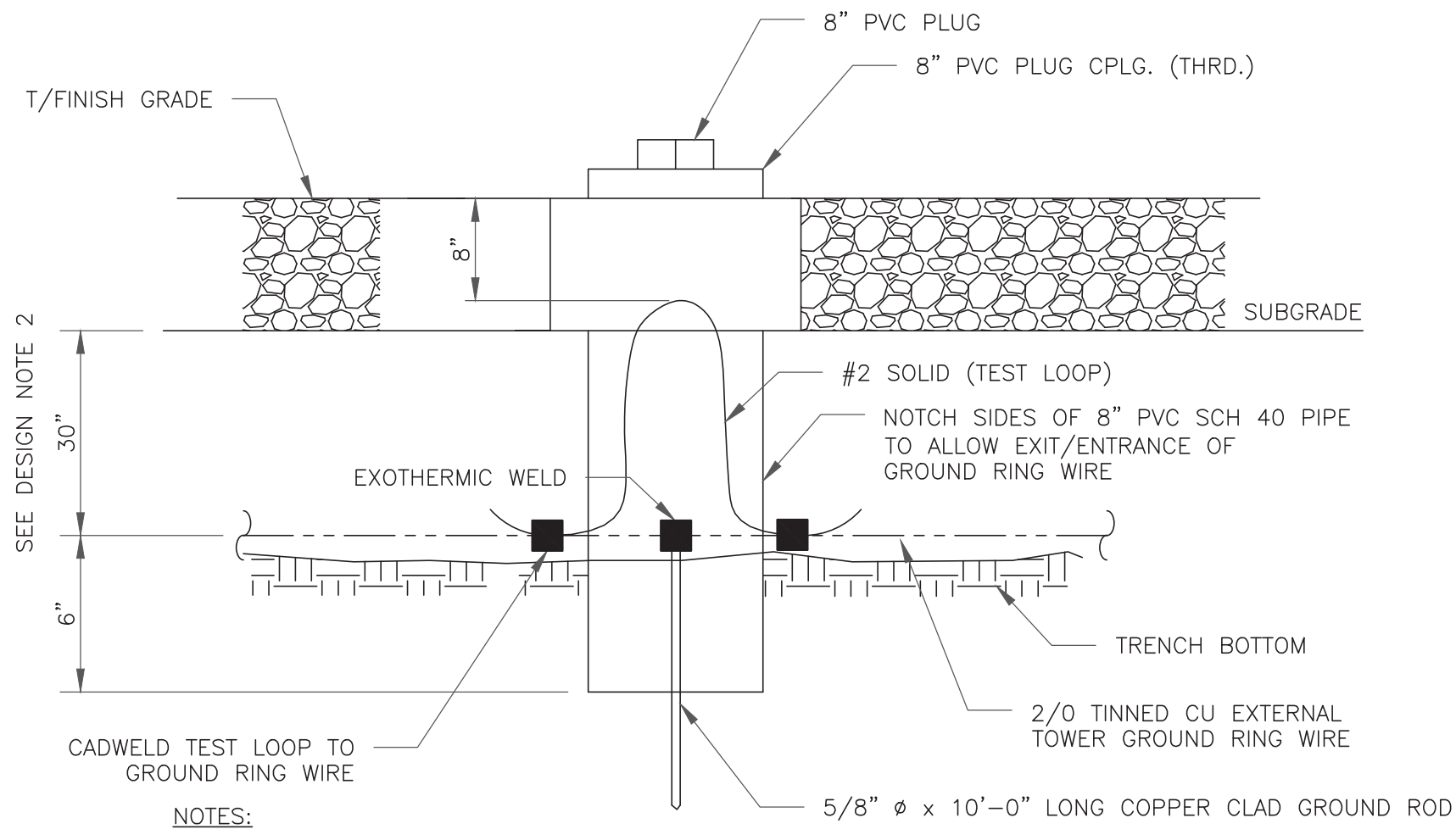
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



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.

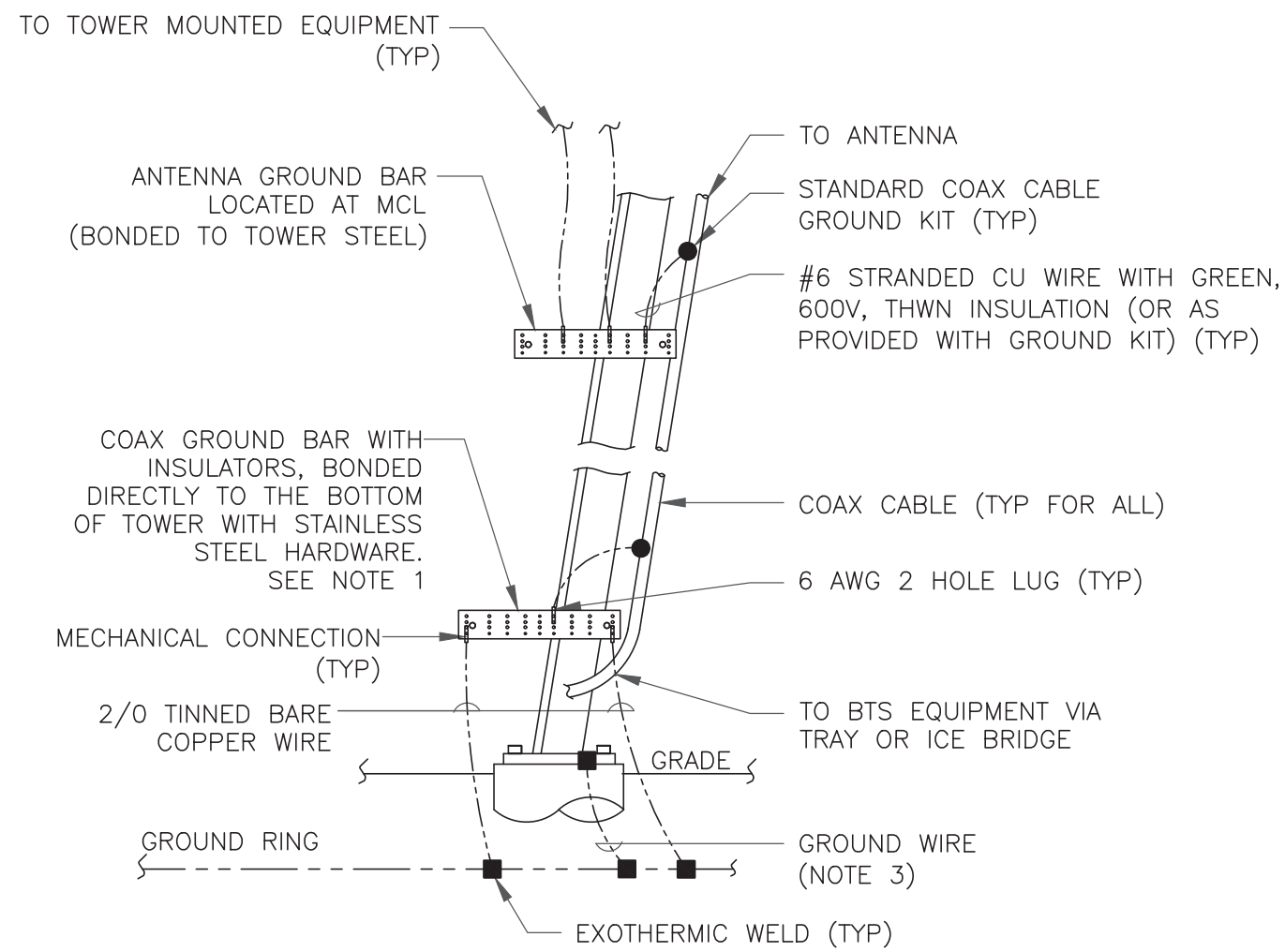
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



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)

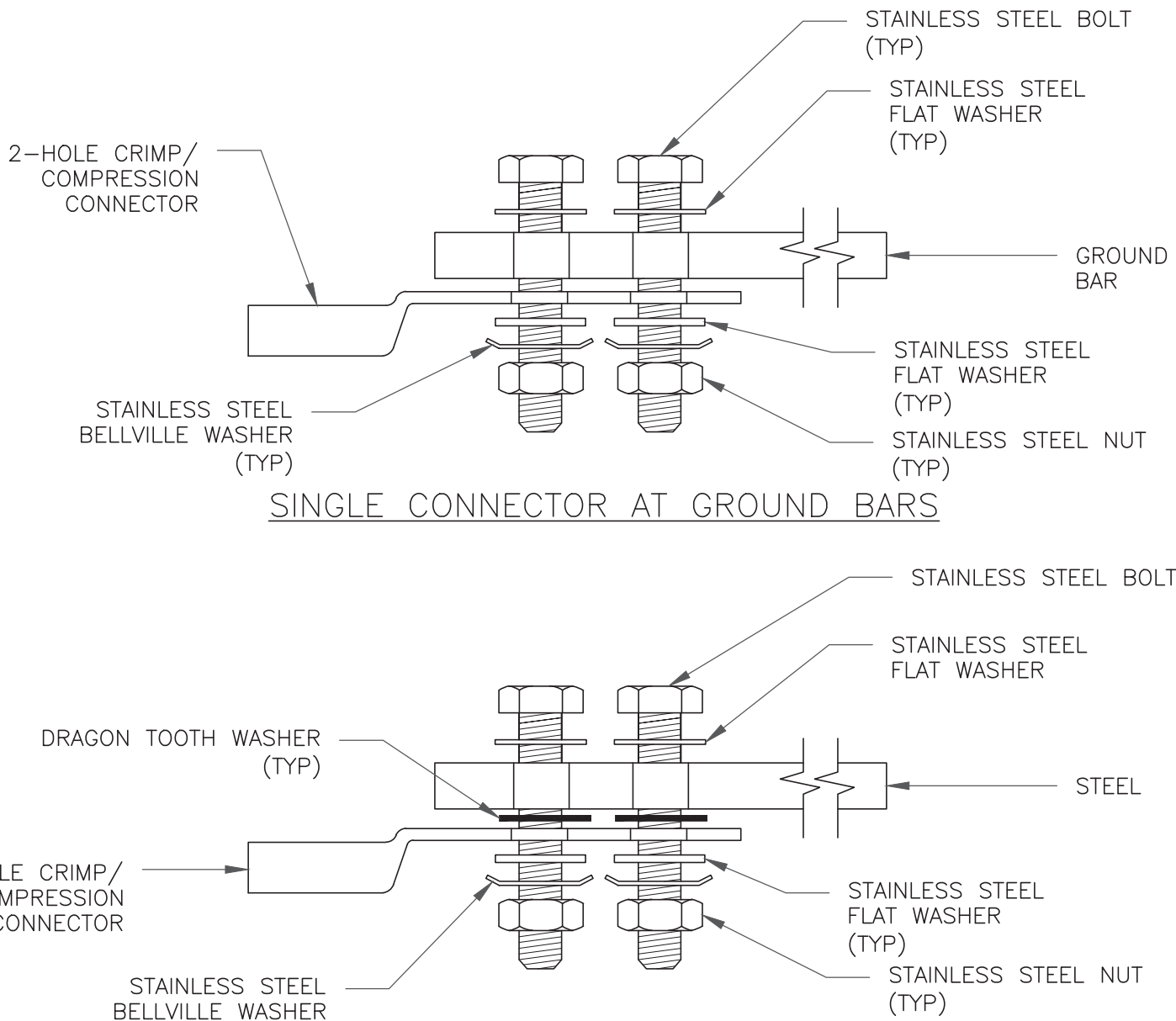
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



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.

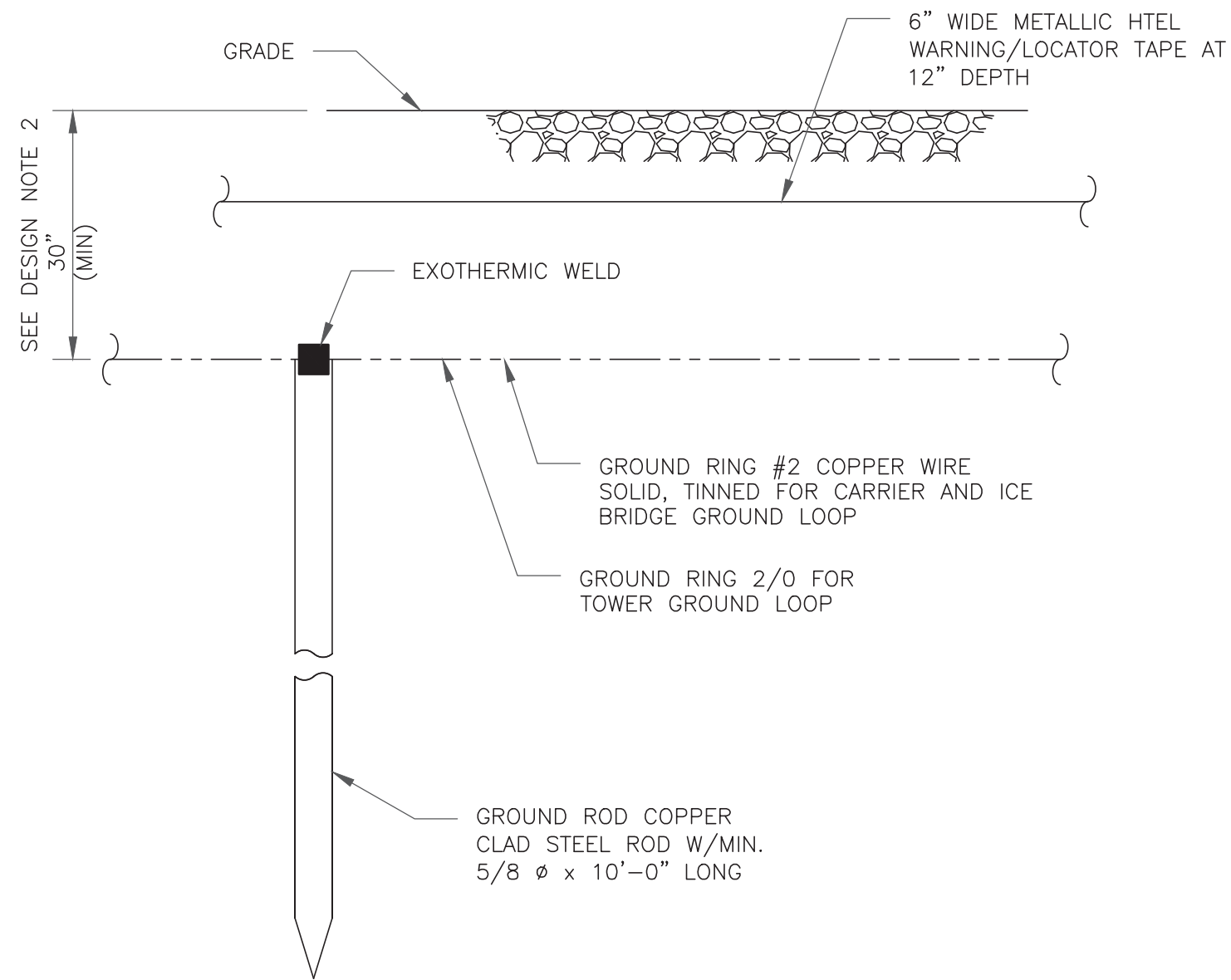
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
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BU #: **806377**
HRT 084 943242

197 SOUTH ST
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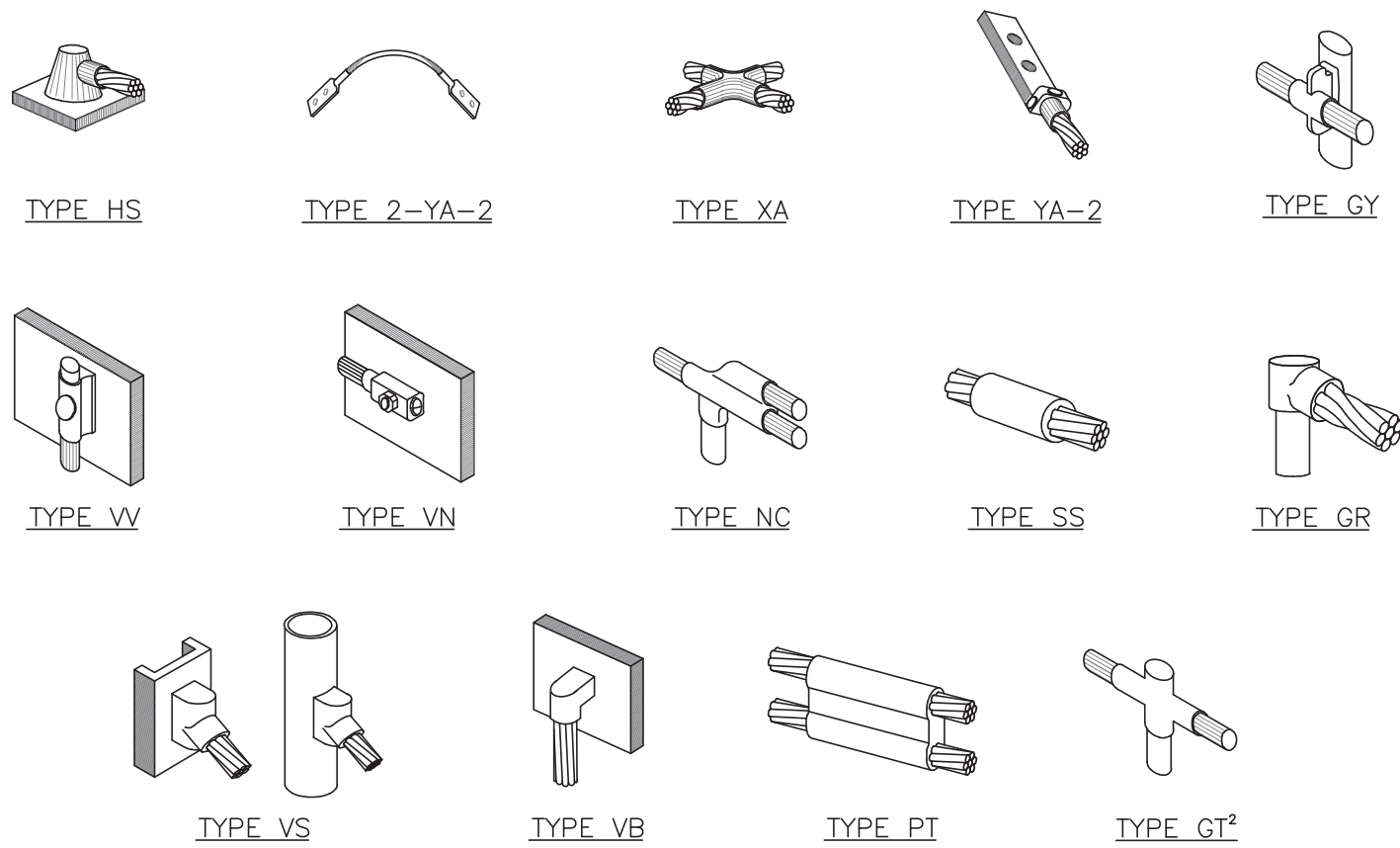
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G-2

REVISION:

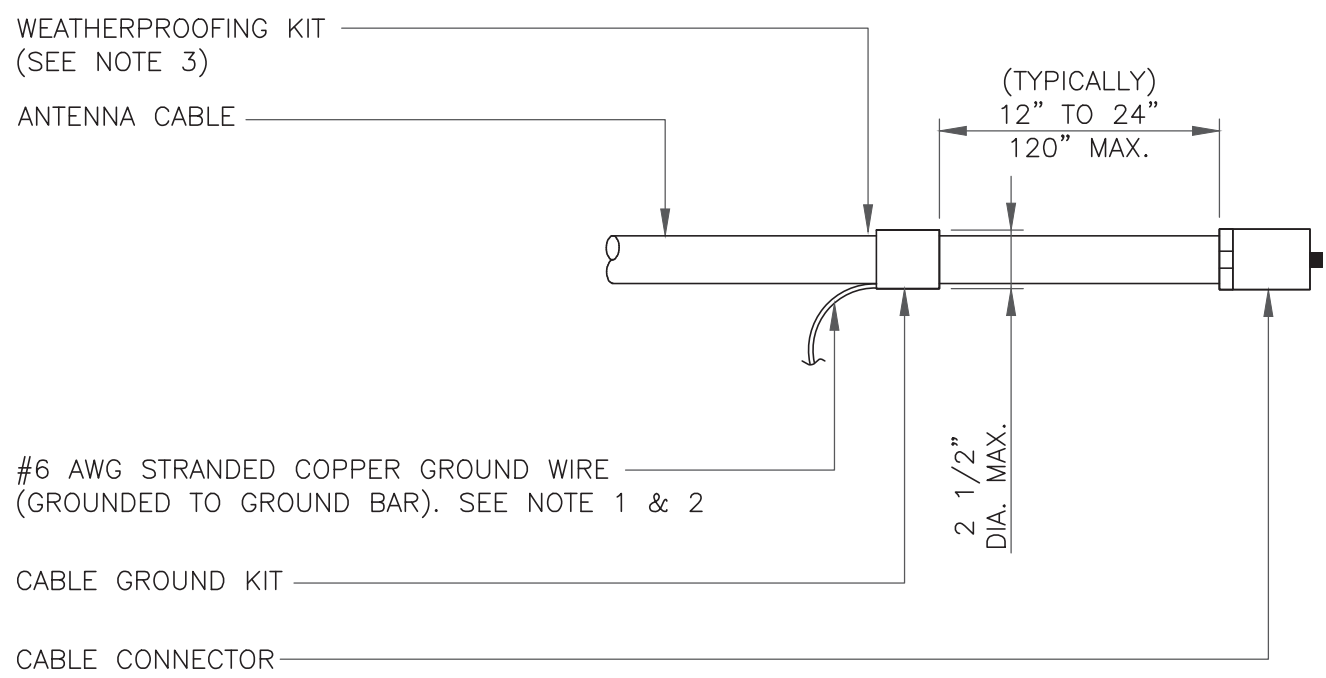
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NOTE:

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

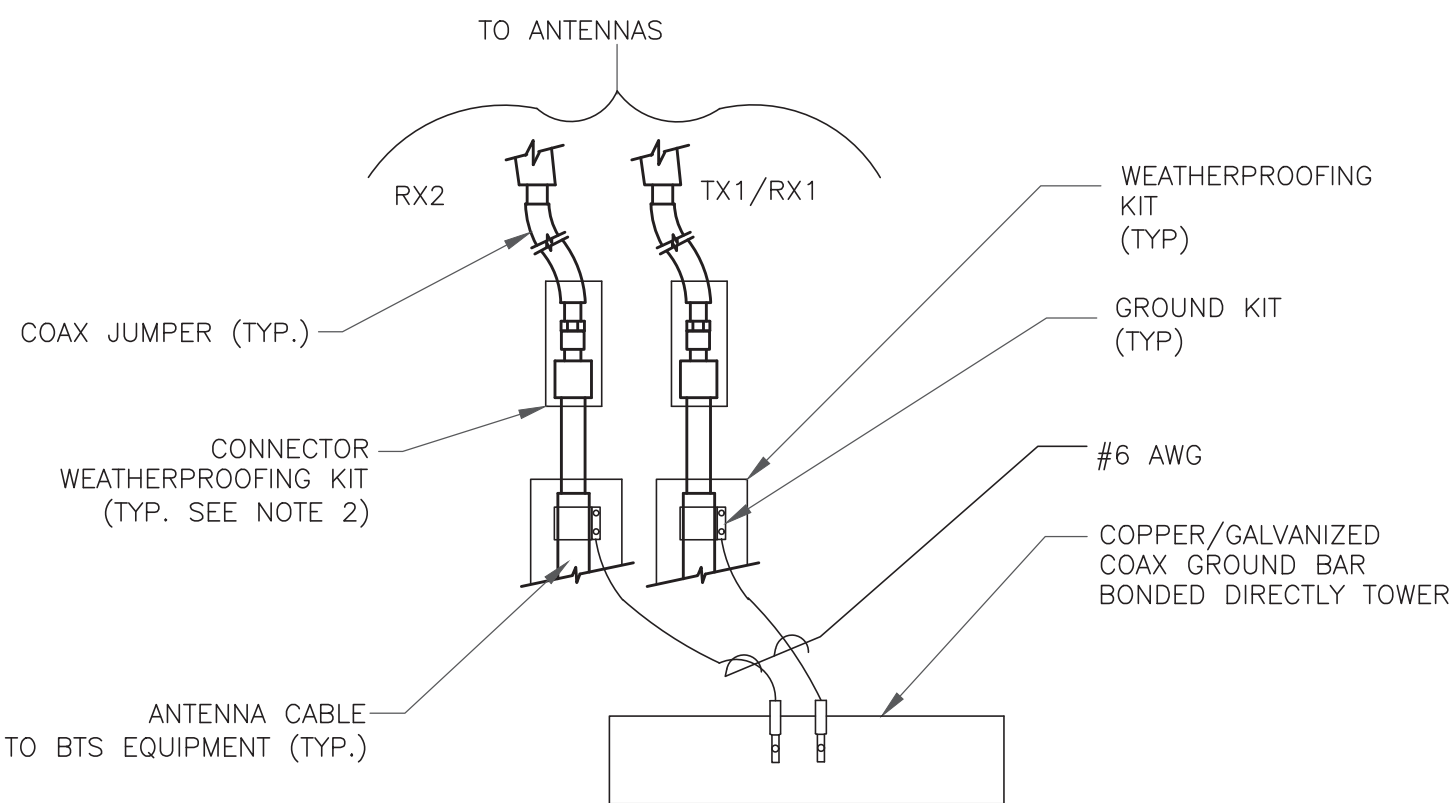
1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

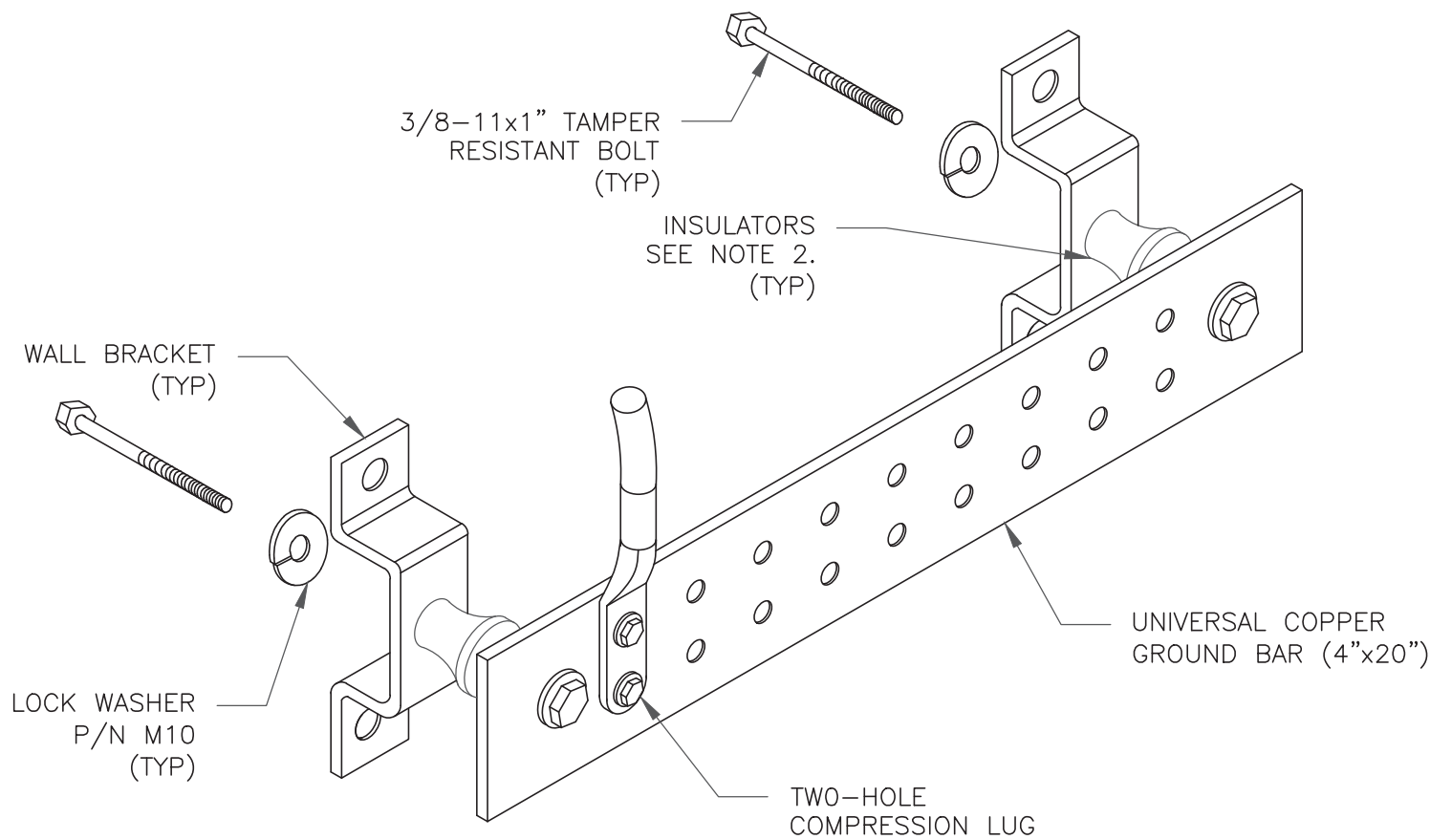
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. 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.

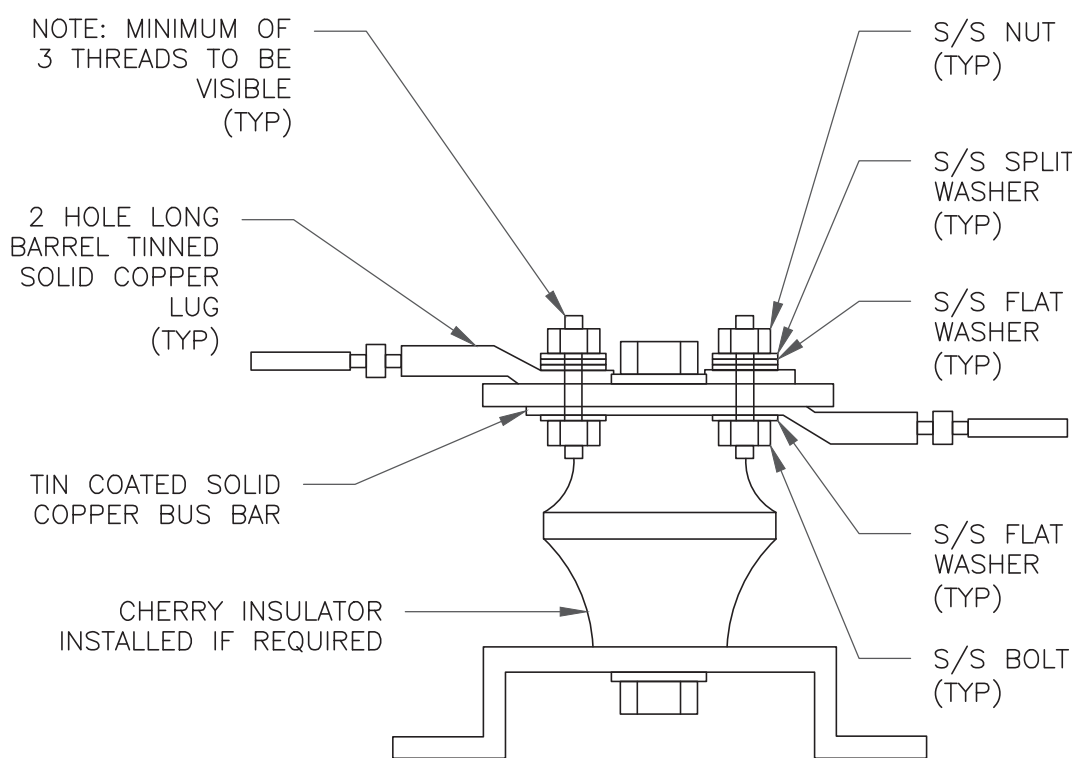
4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



NOTES:

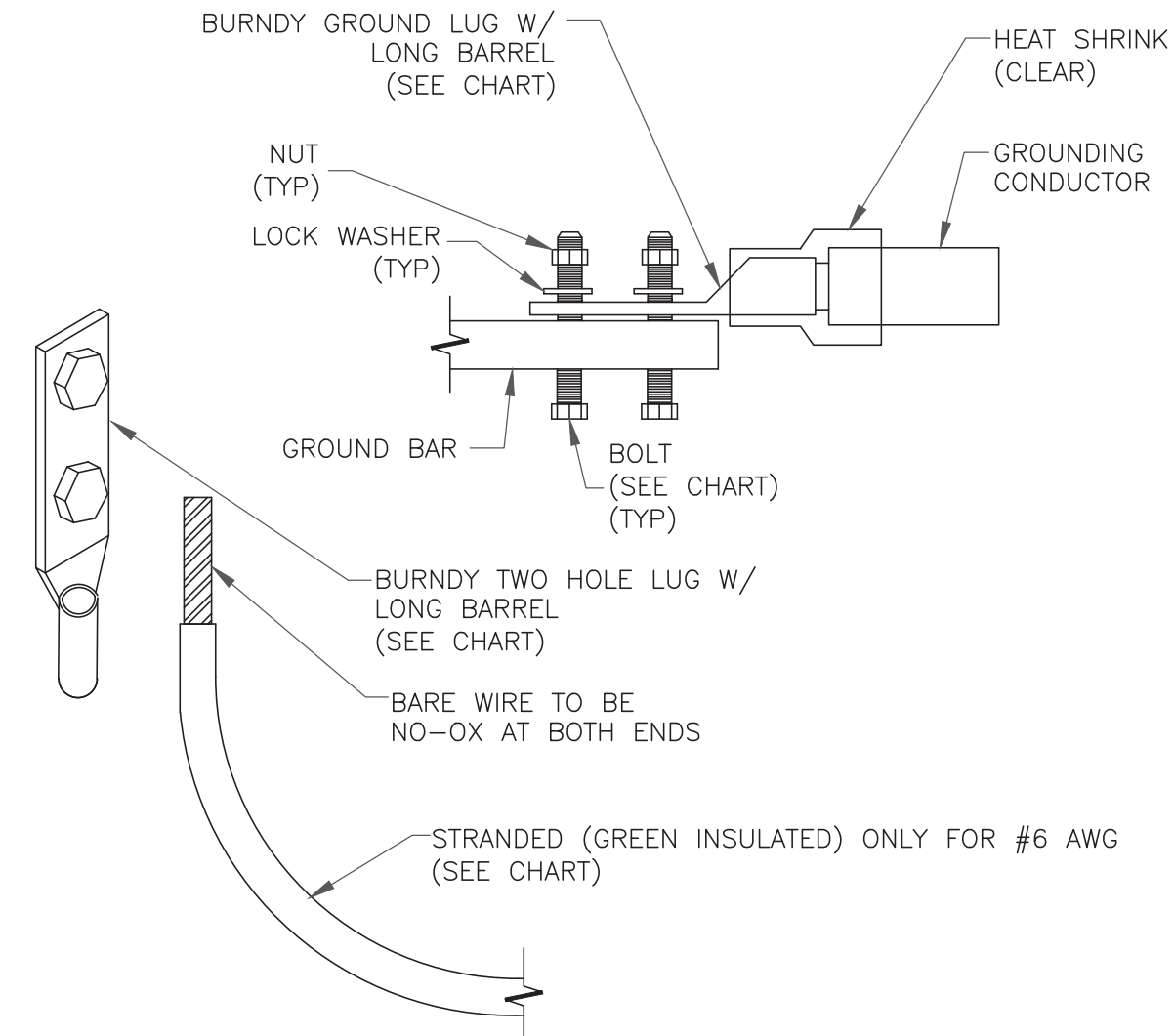
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STG-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR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

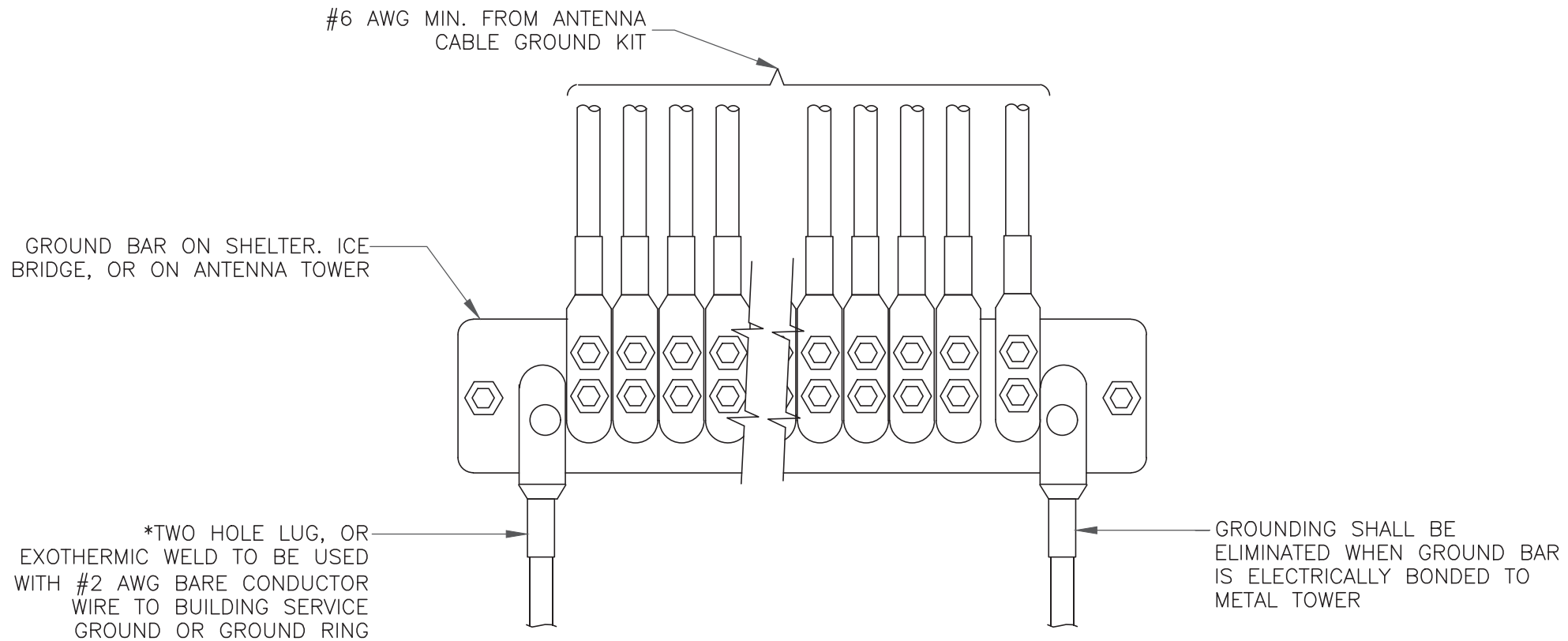
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



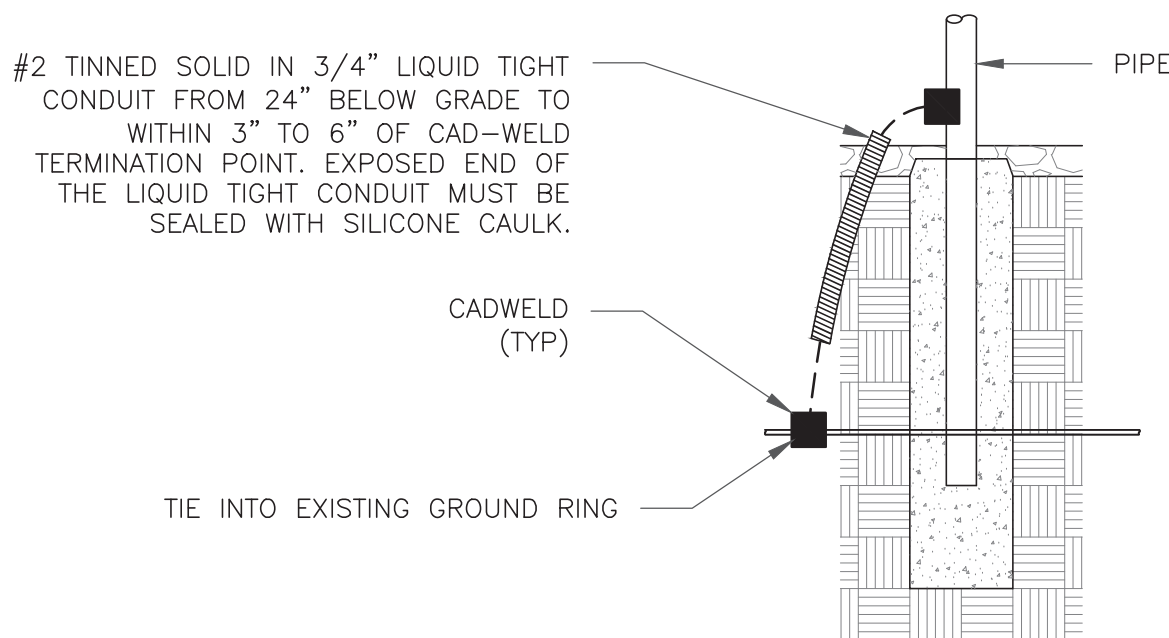
NOTES:

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

2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

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G-3

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