



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

October 19, 2021

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

RE: **Notice of Exempt Modification for T-Mobile: CTHA853A**
Crown Site ID#876359
954 Norwich Road, Plainfield, CT 06062
Latitude: 41° 39' 31.46" / Longitude: -71° 55' 29.75"

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 130-foot mount level on the existing 130-foot monopole tower, located at 954 Norwich Road, Plainfield CT. The property is owned by CAYA Enterprises LLC. Crown Castle is the tower owner. T-Mobile now intends to replace six (6) antennas and ancillary equipment at the 130-ft level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Installed New:

- (3) Ericsson – AIR 6449 B41 Antenna
- (3) RFS – APXVAALL24_43-U-NA20 Antenna
- (3) Ericsson-Radio 460 B25+B66
- (3) Ericsson-Radio 4480 B71+B85
- (3) Ericsson – 6/24 4AWG HYBRID
- Replace Mount Pipes Per GDP MA 8/30/2021

Remove:

- (3) RFS- APXVTM14-ALU-120 Antenna
- (3) Commscope – NNW-65B-R4 Antenna
- (6) Alcatel Lucent – RRH2x50-800
- (3) Alcatel Lucent- PCS 1900MHZ 4x45W-65MHZ
- (3) Nokia FZHN
- (3) Hybrid Cables 1-1/4"
- (1) Hybrid Cable 7/8"

The Foundation for a Wireless World.

CrownCastle.com

Ground:

Install New:

- (1) 6160 Cabinet
- (1.) B160 Battery Cabinet
- (1.) BB 6648 In 6160 Cabinet
- (1) DUG20
- (1) RBS 6601
- (1.) CSR IXR V2 (Gen 2) Transport System
- (1.) PSU 4813 Voltage Booster

Remove:

- (1) Sprint Cabinet
- (1) Sprint Battery Cabinet
- (1) existing Steel Plinth

The facility was approved by the Town of Plainfield Planning and Zoning Commission by way of a Special Permit Application SP-99-08 on June 8th 199.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mr. Kevin Cunningham, First Selectman, Town of Plainfield, Ms. Mary Ann Chinatti, Planner & Zoning Supervisor, Town of Plainfield. CAYA Enterprises LLC as the landowner and Crown Castle is the tower owner.

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

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

Melanie A. Bachman

Page 3

Sincerely,



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

Attachments

cc:

Kevin Cunningham, First Selectman
Town of Plainfield
8 Community Avenue
Plainfield, CT 06374
860-230-3001

Mary Ann Chinatti, Planner & Zoning Supervisor
Town of Plainfield
8 Community Avenue
Plainfield, CT 06374
860-230-3028

CAYA Enterprises LLC
306 Kenyon Road
Hampton, CT 06247



COPY

Town Hall
8 Community Avenue
Plainfield, CT 06374

Telephone (860) 564-4071
Fax (860) 564-0612

THE PLAINFIELD TOWN HALL

PLAINFIELD • CENTRAL VILLAGE • MOOSUP • WAUREGAN

PLANNING AND ZONING COMMISSION

June 14, 1999

Sprint Spectrum L.P.
C/O Thomas J. Regan
Brown, Rudnick, Freed & Gesmer
185 Asylum St., 38th Fl.
Hartford, CT 06103-3402

Dear Applicant:

At its meeting on Tuesday, June 8, 1999, the Planning & Zoning Commission approved your request SP-99-08 for a Special Permit for property located at 954 Norwich Rd., Plainfield. Map 10, Block 133, Lot 15.

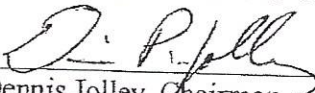
The Conditions are:

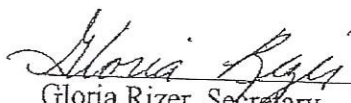

- A Zoning Permit, Building Permit and NDDH approval will need to be obtained prior to construction.
- Please file the enclosed notice on the Land Records of the town.

A copy of the Legal Notice is enclosed for your records and will appear in the Norwich Bulletin on Wednesday, June 16, 1999.

Yours Truly,

PLANNING & ZONING COMMISSION


Dennis Jolley, Chairman


Gloria Rizer, Secretary 

CC: Stanley Chuddy, Owner

TOWN OF PLAINFIELD
SPECIAL PERMIT RECORD

CORRECTED

In accordance with Section 8-3d of the Connecticut General Statutes and the Plainfield Zoning Regulations, this Record must be filed in the Town Land Records. The Town Clerk shall index this record in the Grantor Index under the name of the owner of Record of such property at the time the Special Permit is granted. The Special Permit is not effective until the Record is filed.

1. *Grantor(s): Chudy Stanley
(Last) (First) (Middle)
2. Assessor's Information 10 133 15
(Map) (Block) (Parcel)
3. Location of Property: 954 Norwich Rd., Plainfield
4. Zoning District in which property is located: C-1
5. Description of Project/Activity:
Construction of 130 ft. telecommunications tower and related equipment for the provision of wireless telecommunications service.
6. Special Permit granted under the following Sections of the Plainfield Zoning Regulations: Section 6.35 Wireless Telecommunication Facilities
7. Date Special Permit Granted: June 8, 1999
8. Approval is granted subject to the following conditions:
None
9. Reasons for granting Special Permit: None Stated.

The Planning and Zoning Commission finds that the proposed use or development satisfies all criteria identified within the Planning Zoning Regulations for the approval of a Special Permit.

I certify that this is a true Record of the Special Permit granted for the subject Property.

Dated at Plainfield, CT
this 27th day of July 1999

PLANNING AND ZONING COMMISSION

Jane M. Bissette
Secretary or Acting Clerk

* Correction made for the spelling of the Grantor.

Received For Record at Plainfield, CT
on 7/27/99 1:08 PM
Attest Helen Francis Coombs
Helen Francis Coombs, Town Clerk

954 NORWICH RD

Location 954 NORWICH RD

Mblu 010/ 013B/ 0015/ /

Acct# 00081500

Owner CAYA ENTERPRISES LLC

Assessment \$239,570

Appraisal \$342,250

PID 893

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$123,500	\$218,750	\$342,250
Assessment			
Valuation Year	Improvements	Land	Total
2020	\$86,440	\$153,130	\$239,570

Owner of Record

Owner CAYA ENTERPRISES LLC

Co-Owner

Address 306 KENYON RD
HAMPTON, CT 06247

Sale Price \$300,000

Certificate

Book & Page 0483/0730

Sale Date 12/29/2014

Instrument 08

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CAYA ENTERPRISES LLC	\$300,000		0483/0730	08	12/29/2014
CHUDY CARL L	\$0		0409/0144	29	04/02/2009
CHUDY GLADYS L	\$0		0397/0022	10	05/21/2008
CHUDY STANLEY V + GLADYS L	\$0		0189/0716		06/27/1989

Building Information

Building 1 : Section 1

Year Built: 1973

Living Area: 5,625

Replacement Cost: \$165,839

Building Percent Good: 73
Replacement Cost
Less Depreciation: \$121,060

Building Attributes

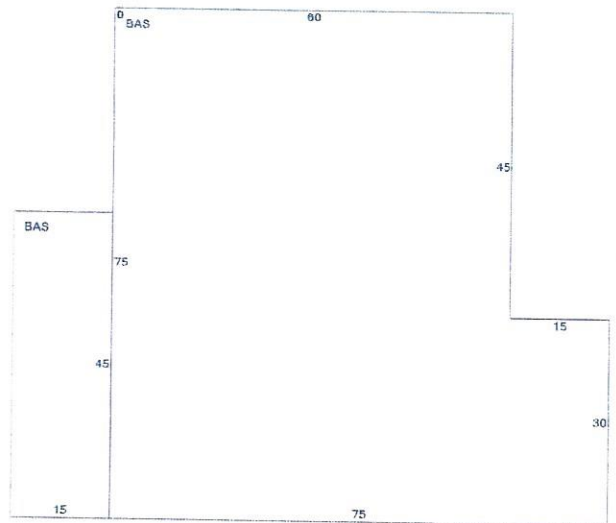
Field	Description
Style:	Light Indust
Model	Comm/Ind
Grade	D
Stories:	1
Occupancy	1.00
Exterior Wall 1	Pre-finish Metl
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Metal/Tin
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	None
Struct Class	
Bldg Use	AUTO REPR
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3030
Heat/AC	HEAT ONLY
Frame Type	STEEL
Baths/Plumbing	AVERAGE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	18.00
% Comn Wall	

Building Photo



(<http://images.vgsi.com/photos/PlainfieldCTPhotos/\00\00\63\91.jpg>)

Building Layout



(ParcelSketch.aspx?pid=893&bid=893)

Building Sub-Areas (sq ft)			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	5,625	5,625	
		5,625	5,625	

Extra Features

Extra Features					Legend
Code	Description	Size	Value	Bldg #	
OD1	Overhead Dr-Wood/Mtl	2.00 UNITS	\$520		1
OD1	Overhead Dr-Wood/Mtl	2.00 UNITS	\$720		1

Land

Land Use

Use Code 3320
 Description AUTO REPR
 Zone C
 Neighborhood 1010
 Alt Land Appr No
 Category

Land Line Valuation

Size (Acres) 4.5
 Frontage
 Depth
 Assessed Value \$153,130
 Appraised Value \$218,750

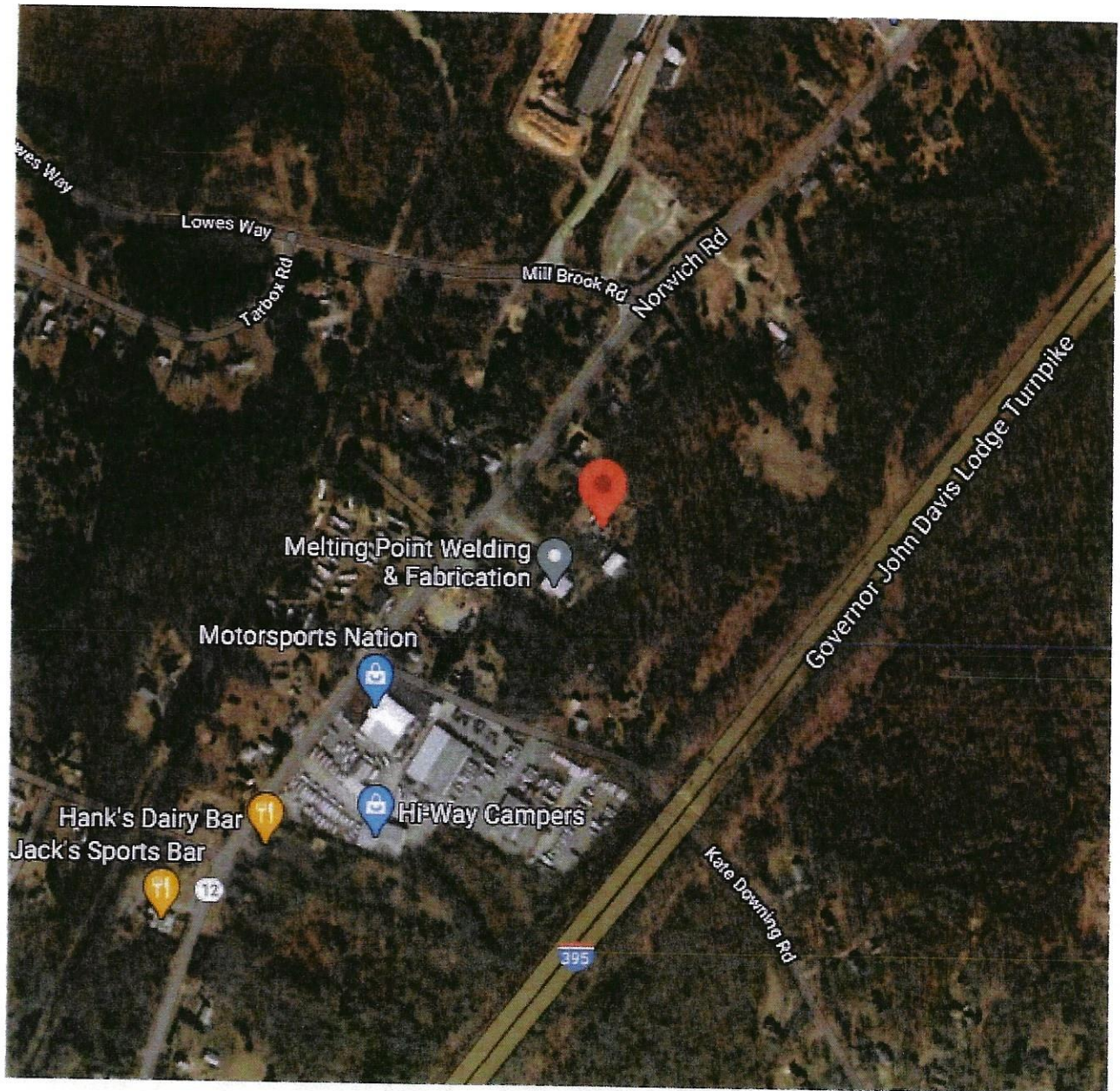
Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN1	Fence 4' Chain			600.00 L.F.	\$1,200	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$123,500	\$218,750	\$342,250
2019	\$123,500	\$218,750	\$342,250

Assessment			
Valuation Year	Improvements	Land	Total
2020	\$86,440	\$153,130	\$239,570
2019	\$86,440	\$153,130	\$239,570



Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, October 20, 2021 11:13 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 285101630621: Your package has been delivered

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Hi. Your package was
delivered Wed, 10/20/2021 at
11:00am.



Delivered to 8 COMMUNITY AVE, PLAINFIELD, CT 06374
Received by B.IANCCA

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [285101630621](#)

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

TO Town of Plainfield
Planning & Zoning Mary Ann Chinatti
8 Community Avenue
PLAINFIELD, CT, US, 06374

REFERENCE 799001.7680

SHIPPER REFERENCE 799001.7680

SHIP DATE Tue 10/19/2021 06:17 PM

DELIVERED TO Receptionist/Front Desk

PACKAGING TYPE FedEx Envelope

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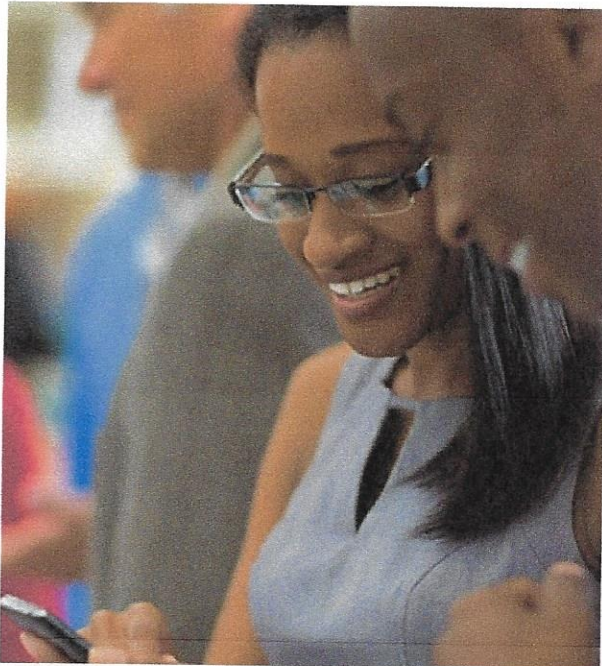
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SPECIAL HANDLING Deliver Weekday

NUMBER OF PIECES 1

TOTAL SHIPMENT WEIGHT 1.00 LB

SERVICE TYPE FedEx Priority Overnight



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Delivered to 8 COMMUNITY AVE, PLAINFIELD, CT 06374
Received by B.IANCCA

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [285101499011](#)

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

TO Town of Plainfield
First Selectman - Kevin Cunningham
8 Community Avenue
PLAINFIELD, CT, US, 06374

REFERENCE 799001.7680

SHIPPER REFERENCE 799001.7680

SHIP DATE Tue 10/19/2021 06:17 PM

DELIVERED TO Receptionist/Front Desk

PACKAGING TYPE FedEx Envelope

ORIGIN WESTBOROUGH, MA, US, 01581

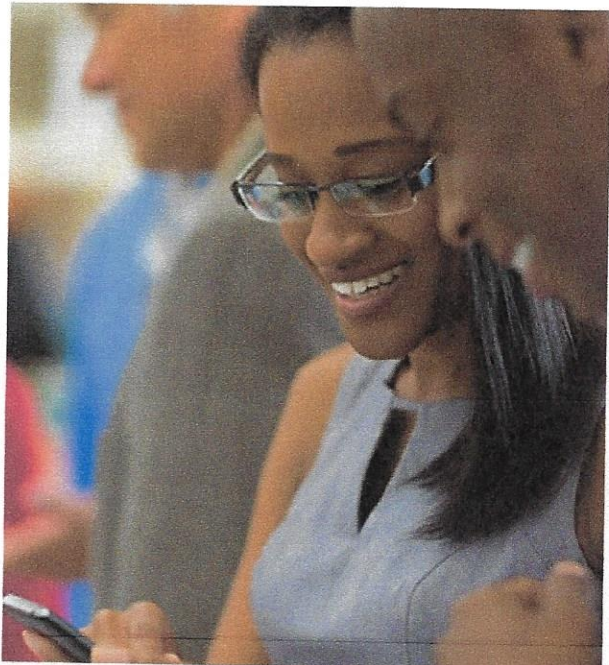
DESTINATION PLAINFIELD, CT, US, 06374

SPECIAL HANDLING Deliver Weekday

NUMBER OF PIECES 1

TOTAL SHIPMENT WEIGHT 1.00 LB

SERVICE TYPE FedEx Priority Overnight



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Hi. Your package was
delivered Wed, 10/20/2021 at
3:54pm.



Delivered to 306 KENYON RD, HAMPTON, CT 06247

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER [285101342720](#)
FROM Jeff Barbadora
1800 W. Park Drive
WESTBOROUGH, MA, US, 01581

TO CAYA Enterprises LLC
CAYA Enterprises LLC
306 Kenyon Road
HAMPTON, CT, US, 06247

REFERENCE 799001.7680

SHIPPER REFERENCE 799001.7680

SHIP DATE Tue 10/19/2021 06:17 PM

DELIVERED TO Residence

PACKAGING TYPE FedEx Envelope

ORIGIN WESTBOROUGH, MA, US, 01581

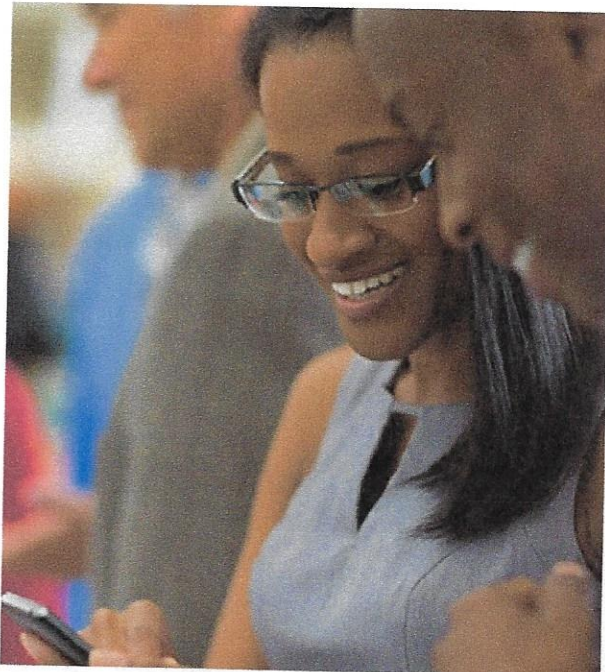
DESTINATION HAMPTON, CT, US, 06247

SPECIAL HANDLING Deliver Weekday
Residential Delivery

NUMBER OF PIECES 1

TOTAL SHIPMENT WEIGHT 1.00 LB

SERVICE TYPE FedEx Priority Overnight



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MORRISON HERSHFIELD

Date: **September 07, 2021**

Morrison Hershfield
1455 Lincoln Park, Suite 500
Atlanta, GA 30346
(770)379-8500

Subject: **Structural Analysis Report**

Carrier Designation:

Site Number: CTHA853A
Site Name: CT23XC402

Crown Castle Designation:

BU Number: 876359
Site Name: Norwich
JDE Job Number: 628844
Work Order Number: 2014907
Order Number: 538769 Rev. 2

Engineering Firm Designation:

Morrison Hershfield Project Number: CN7-449R1 / 2101398

Site Data:

954 Norwich Road, Plainfield, Windham County, CT 06062
Latitude 41° 39' 31.46", Longitude -71° 55' 29.75"
130 Foot – Summit Monopole Tower

Morrison Hershfield 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:

LC5: Proposed Equipment Configuration

Sufficient Capacity-71.7%

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:



G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

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1) INTRODUCTION

This tower is a 130 ft Summit Monopole tower designed by Paul J. Ford and Company.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	130.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	3	1-5/8
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	-	8' Mount Pipe [#P2.0 STD]		
		1	-	Platform Mount [LP 1201-1_KCKR-HR-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
116.0	116.0	3	ericsson	RRUS-11	-	-
		3	ericsson	RRUS12/RRUS A2		
		1	-	Side Arm Mount [SO 102-3]		
114.0	115.0	3	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	12 4 2	1-1/4 3/4 3/8
		3	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	7020.00		
		3	ericsson	RRUS 32		
		3	powerwave technologies	LGP21401		
		1	raycap	DC6-48-60-18-8C		
	114.0	1	raycap	DC6-48-60-18-8F		
		1	-	Platform Mount [LP 304-1_HR-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1616503	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1616546	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1446983	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	130 - 83	Pole	TP26.06x16x0.25	1	-11.61	1241.83	64.9	Pass
L2	83 - 43.25	Pole	TP34.068x24.8644x0.3125	2	-17.83	2030.16	71.7	Pass
L3	43.25 - 0	Pole	TP42.7x32.5333x0.375	3	-28.82	3139.28	68.9	Pass
							Summary	
						Pole (L2)	71.7	Pass
						Rating =	71.7	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	63.4	Pass
1	Base Plate		58.3	Pass
1	Base Foundation (Compared w/ Design Loads)	0	64.3	Pass

Structure Rating (max from all components) =	71.7%*
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Notes:

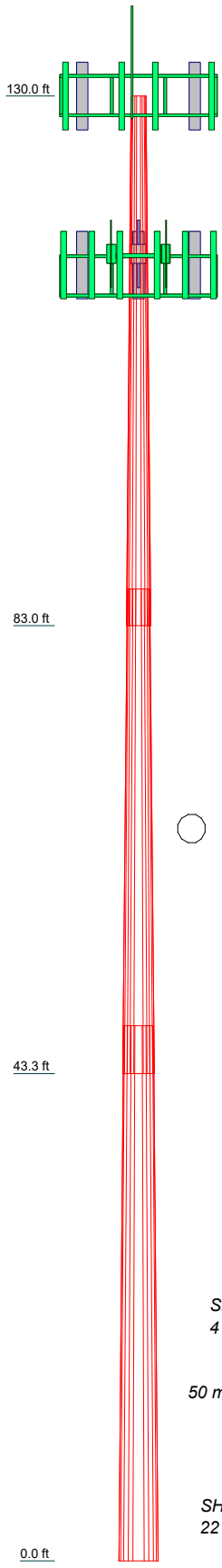
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Foundation capacity determined by comparing analysis reactions to original design reactions.
- 3) *Rating per TIA-222-H, Section 15.5.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	14.2
Length (ft)	47.00	43.00	47.50	14.2
Number of Sides	12	12	12	
Thickness (in)	0.2500	0.3125	0.3750	
Socket Length (ft)	3.25	4.25	32.5333	
Top Dia (in)	16.0000	24.8644	42.7000	
Bot Dia (in)	26.0600	34.0680		
Grade		A607-65		
Weight (K)	2.7	4.3	7.3	



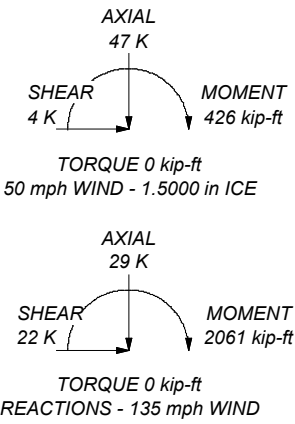
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 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 0.00 ft
8. TOWER RATING: 71.7%

ALL REACTIONS ARE FACTORED



Morrison Hershfield
 1455 Lincoln Park, Suite 500
 Atlanta, GA 30346
 Phone: (770)379-8500
 FAX: (770)379-8501

Job: CN7-449R1 / 2101398			
Project: 876359 / Norwich			
Client: Crown Castle USA	Drawn by: CSA	App'd:	
Code: TIA-222-H	Date: 09/07/21	Scale: NTS	
Path:			Dwg No. E-1

C:\Users\Carrin\Desktop\review\CN7-449R1_Retain_SBAAnalysis\CN7-449R1_BU_876359_IPO_20140910.dwg

Tower Input Data

The tower is a monopole.
 This tower is designed using the TIA-222-H standard.
 The following design criteria apply:
 Tower is located in Windham County, Connecticut.
 Tower base elevation above sea level: 182.00 ft.
 Basic wind speed of 135 mph.
 Risk Category II.
 Exposure Category B.
 Simplified Topographic Factor Procedure for wind speed-up calculations is used.
 Topographic Category: 1.
 Crest Height: 0.00 ft.
 Nominal ice thickness of 1.5000 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.
 A non-linear (P-delta) analysis was used.
 Pressures are calculated at each section.
 Stress ratio used in pole design is 1.
 Tower analysis based on target reliabilities in accordance with Annex S.
 Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
 Maximum demand-capacity ratio is: 1.05.
 Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|---|
| Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
✓ Use Code Stress Ratios
✓ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile

Include Bolts In Member Capacity

Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric | Distribute Leg Loads As Uniform
Assume Legs Pinned
✓ Assume Rigid Index Plate
✓ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
✓ Bypass Mast Stability Checks
✓ Use Azimuth Dish Coefficients
✓ Project Wind Area of Appurt.

Autocalc Torque Arm Areas

Add IBC .6D+W Combination
Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs | Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
✓ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist.
Exemption
Use TIA-222-H Tension Splice
Exemption

<div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No
Appurtenances
Outside and Inside Corner Radii Are
Known |
|--|---|---|

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	130.00-83.00	47.00	3.25	12	16.0000	26.0600	0.2500	1.0000	A607-65 (65 ksi)
L2	83.00-43.25	43.00	4.25	12	24.8644	34.0680	0.3125	1.2500	A607-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	43.25-0.00	47.50		12	32.5333	42.7000	0.3750	1.5000	(65 ksi) A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	16.4762	12.6788	401.4426	5.6385	8.2880	48.4366	813.4316	6.2401	3.6180	14.472
	26.8911	20.7770	1766.6310	9.2400	13.4991	130.8705	3579.6733	10.2258	6.3141	25.256
L2	26.3514	24.7053	1900.8382	8.7896	12.8797	147.5836	3851.6135	12.1592	5.8261	18.644
	35.1596	33.9665	4939.9833	12.0845	17.6472	279.9298	10009.7454	16.7173	8.2927	26.537
L3	34.4904	38.8312	5125.7082	11.5127	16.8523	304.1554	10386.0744	19.1115	7.7139	20.57
	44.0740	51.1074	11685.9491	15.1524	22.1186	528.3313	23678.9011	25.1535	10.4386	27.836

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 130.00- 83.00				1	1	1			
L2 83.00- 43.25				1	1	1			
L3 43.25-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf

Safety Line 3/8"	C	No	Surface Ar (CaAa)	130.00 - 8.00	1	1	-0.450 -0.450	0.3750		0.22
Climbing Rungs	C	No	Surface Ar (CaAa)	130.00 - 8.00	1	1	-0.500 -0.400	0.7050		1.80

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	

HB158-21U6S24- xxM_TMO(1-5/8)	C	No	No	Inside Pole	130.00 - 8.00	3	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50

LDF6-50A(1-1/4)	A	No	No	Inside Pole	114.00 - 8.00	12	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
FB-L98B-002- 75000(3/8)	A	No	No	Inside Pole	114.00 - 8.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	114.00 - 8.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	A	No	No	Inside Pole	114.00 - 8.00	4	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	130.00-83.00	A	0.000	0.000	0.000	0.000	0.30
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.076	0.000	0.45
L2	83.00-43.25	A	0.000	0.000	0.000	0.000	0.38
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.293	0.000	0.38
L3	43.25-0.00	A	0.000	0.000	0.000	0.000	0.34
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.807	0.000	0.34

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	130.00-83.00	A	1.431	0.000	0.000	0.000	0.000	0.30
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	31.987	0.000	0.77
L2	83.00-43.25	A	1.359	0.000	0.000	0.000	0.000	0.38
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	27.053	0.000	0.65
L3	43.25-0.00	A	1.218	0.000	0.000	0.000	0.000	0.34
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	22.974	0.000	0.56

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	130.00-83.00	0.5177	0.3761	1.8947	1.3766
L2	83.00-43.25	0.5224	0.3795	2.0751	1.5077
L3	43.25-0.00	0.4209	0.3058	1.7254	1.2535

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	2	Safety Line 3/8"	83.00 - 130.00	1.0000	1.0000
L1	3	Climbing Rungs	83.00 - 130.00	1.0000	1.0000
L2	2	Safety Line 3/8"	43.25 - 83.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L2	3	Climbing Rungs	43.25 - 83.00	1.0000	1.0000
L3	2	Safety Line 3/8"	8.00 - 43.25	1.0000	1.0000
L3	3	Climbing Rungs	8.00 - 43.25	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	

Lighting Rod 3/4" x 6'	C	From Leg	0.00 0.00 3.00	0.0000	130.00	No Ice	0.00	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						1" Ice	0.00	0.00	0.00
						1 1/2" Ice	0.00	0.00	0.00
						2" Ice	0.00	0.00	0.00

6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						1 1/2" Ice	3.06	3.06	0.09
						2" Ice	3.06	3.06	0.09
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						1 1/2" Ice	3.06	3.06	0.09
						2" Ice	3.06	3.06	0.09
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						1 1/2" Ice	3.06	3.06	0.09
						2" Ice	3.06	3.06	0.09
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None		0.0000	130.00	No Ice	37.61	37.61	2.63
						1/2" Ice	45.62	45.62	3.48
						1" Ice	53.59	53.59	4.46
						1 1/2" Ice	69.65	69.65	6.85
						2" Ice	69.65	69.65	6.85

AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						1" Ice	6.02	3.38	0.23
						1 1/2" Ice	6.90	4.12	0.35
						2" Ice	6.90	4.12	0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						1" Ice	6.02	3.38	0.23
						1 1/2" Ice	6.90	4.12	0.35
						2" Ice	6.90	4.12	0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						1" Ice	6.02	3.38	0.23
						1 1/2" Ice	6.90	4.12	0.35
						2" Ice	6.90	4.12	0.35
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.45
						1 1/2" Ice	17.82	9.67	0.78
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.45
						1 1/2" Ice	17.82	9.67	0.78
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	130.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0.00			Ice 16.23	8.25	0.45
						1" Ice 17.82	9.67	0.78
						2" Ice		
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.0000	130.00	No Ice 2.14	1.69	0.11
			0.00			1/2" 2.32	1.85	0.13
			0.00			Ice 2.51	2.02	0.16
						1" Ice 2.91	2.39	0.22
						2" Ice		
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00	0.0000	130.00	No Ice 2.14	1.69	0.11
			0.00			1/2" 2.32	1.85	0.13
			0.00			Ice 2.51	2.02	0.16
						1" Ice 2.91	2.39	0.22
						2" Ice		
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.0000	130.00	No Ice 2.14	1.69	0.11
			0.00			1/2" 2.32	1.85	0.13
			0.00			Ice 2.51	2.02	0.16
						1" Ice 2.91	2.39	0.22
						2" Ice		
Radio 4480_TMOV2	A	From Leg	4.00	0.0000	130.00	No Ice 2.88	1.40	0.08
			0.00			1/2" 3.09	1.56	0.10
			0.00			Ice 3.31	1.73	0.13
						1" Ice 3.78	2.09	0.19
						2" Ice		
Radio 4480_TMOV2	C	From Leg	4.00	0.0000	130.00	No Ice 2.88	1.40	0.08
			0.00			1/2" 3.09	1.56	0.10
			0.00			Ice 3.31	1.73	0.13
						1" Ice 3.78	2.09	0.19
						2" Ice		
Radio 4480_TMOV2	B	From Leg	4.00	0.0000	130.00	No Ice 2.88	1.40	0.08
			0.00			1/2" 3.09	1.56	0.10
			0.00			Ice 3.31	1.73	0.13
						1" Ice 3.78	2.09	0.19
						2" Ice		
8' Mount Pipe [#P2.0 STD]	A	From Leg	4.00	0.0000	130.00	No Ice 1.90	1.90	0.03
			0.00			1/2" 2.73	2.73	0.04
			0.00			Ice 3.40	3.40	0.06
						1" Ice 4.40	4.40	0.12
						2" Ice		
8' Mount Pipe [#P2.0 STD]	B	From Leg	4.00	0.0000	130.00	No Ice 1.90	1.90	0.03
			0.00			1/2" 2.73	2.73	0.04
			0.00			Ice 3.40	3.40	0.06
						1" Ice 4.40	4.40	0.12
						2" Ice		
8' Mount Pipe [#P2.0 STD]	C	From Leg	4.00	0.0000	130.00	No Ice 1.90	1.90	0.03
			0.00			1/2" 2.73	2.73	0.04
			0.00			Ice 3.40	3.40	0.06
						1" Ice 4.40	4.40	0.12
						2" Ice		

RRUS-11	A	From Leg	2.00	0.0000	116.00	No Ice 2.78	1.19	0.05
			0.00			1/2" 2.99	1.33	0.07
			0.00			Ice 3.21	1.49	0.09
						1" Ice 3.66	1.83	0.15
						2" Ice		
RRUS-11	B	From Leg	2.00	0.0000	116.00	No Ice 2.78	1.19	0.05
			0.00			1/2" 2.99	1.33	0.07
			0.00			Ice 3.21	1.49	0.09
						1" Ice 3.66	1.83	0.15
						2" Ice		
RRUS-11	C	From Leg	2.00	0.0000	116.00	No Ice 2.78	1.19	0.05
			0.00			1/2" 2.99	1.33	0.07
			0.00			Ice 3.21	1.49	0.09
						1" Ice 3.66	1.83	0.15
						2" Ice		
RRUS12/RRUS A2	A	From Leg	2.00	0.0000	116.00	No Ice 3.14	1.84	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			1/2"	3.36	2.01	0.10
			0.00			Ice	3.59	2.20	0.13
						1" Ice	4.07	2.59	0.20
						2" Ice			
RRUS12/RRUS A2	B	From Leg	2.00	0.0000	116.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			0.00			Ice	3.59	2.20	0.13
						1" Ice	4.07	2.59	0.20
						2" Ice			
RRUS12/RRUS A2	C	From Leg	2.00	0.0000	116.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			0.00			Ice	3.59	2.20	0.13
						1" Ice	4.07	2.59	0.20
						2" Ice			
(2) 4' x 2" Pipe Mount	A	From Leg	2.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice			
(2) 4' x 2" Pipe Mount	B	From Leg	2.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice			
(2) 4' x 2" Pipe Mount	C	From Leg	2.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice			
Side Arm Mount [SO 102-3]	C	None		0.0000	116.00	No Ice	3.60	3.60	0.07
						1/2"	4.18	4.18	0.11
						Ice	4.75	4.75	0.14
						1" Ice	5.90	5.90	0.20
						2" Ice			

HPA-65R-BUUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	114.00	No Ice	12.25	8.33	0.10
			0.00			1/2"	13.19	9.23	0.19
			1.00			Ice	14.16	10.15	0.30
						1" Ice	16.14	12.05	0.54
						2" Ice			
HPA-65R-BUUU-H8 w/ Mount Pipe	B	From Leg	4.00	0.0000	114.00	No Ice	12.25	8.33	0.10
			0.00			1/2"	13.19	9.23	0.19
			1.00			Ice	14.16	10.15	0.30
						1" Ice	16.14	12.05	0.54
						2" Ice			
HPA-65R-BUUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.0000	114.00	No Ice	12.25	8.33	0.10
			0.00			1/2"	13.19	9.23	0.19
			1.00			Ice	14.16	10.15	0.30
						1" Ice	16.14	12.05	0.54
						2" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	114.00	No Ice	11.85	8.99	0.11
			0.00			1/2"	12.77	9.88	0.21
			1.00			Ice	13.71	10.79	0.32
						1" Ice	15.64	12.66	0.58
						2" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.00	0.0000	114.00	No Ice	11.85	8.99	0.11
			0.00			1/2"	12.77	9.88	0.21
			1.00			Ice	13.71	10.79	0.32
						1" Ice	15.64	12.66	0.58
						2" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.0000	114.00	No Ice	11.85	8.99	0.11
			0.00			1/2"	12.77	9.88	0.21
			1.00			Ice	13.71	10.79	0.32
						1" Ice	15.64	12.66	0.58
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
7770.00 w/ Mount Pipe	A	From Leg	4.00		0.0000	114.00	No Ice	5.75	4.25	0.06
			0.00				1/2"	6.18	5.01	0.10
			1.00				Ice	6.61	5.71	0.16
							1" Ice	7.49	7.16	0.29
							2" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.00		0.0000	114.00	No Ice	5.75	4.25	0.06
			0.00				1/2"	6.18	5.01	0.10
			1.00				Ice	6.61	5.71	0.16
							1" Ice	7.49	7.16	0.29
							2" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.00		0.0000	114.00	No Ice	5.75	4.25	0.06
			0.00				1/2"	6.18	5.01	0.10
			1.00				Ice	6.61	5.71	0.16
							1" Ice	7.49	7.16	0.29
							2" Ice			
RRUS 32	A	From Leg	4.00		0.0000	114.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.08	1.97	0.08
			1.00				Ice	3.32	2.17	0.10
							1" Ice	3.81	2.58	0.16
							2" Ice			
RRUS 32	B	From Leg	4.00		0.0000	114.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.08	1.97	0.08
			1.00				Ice	3.32	2.17	0.10
							1" Ice	3.81	2.58	0.16
							2" Ice			
RRUS 32	C	From Leg	4.00		0.0000	114.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.08	1.97	0.08
			1.00				Ice	3.32	2.17	0.10
							1" Ice	3.81	2.58	0.16
							2" Ice			
LGP21401	A	From Leg	4.00		0.0000	114.00	No Ice	1.10	0.21	0.01
			0.00				1/2"	1.24	0.27	0.02
			1.00				Ice	1.38	0.35	0.03
							1" Ice	1.69	0.52	0.05
							2" Ice			
LGP21401	B	From Leg	4.00		0.0000	114.00	No Ice	1.10	0.21	0.01
			0.00				1/2"	1.24	0.27	0.02
			1.00				Ice	1.38	0.35	0.03
							1" Ice	1.69	0.52	0.05
							2" Ice			
LGP21401	C	From Leg	4.00		0.0000	114.00	No Ice	1.10	0.21	0.01
			0.00				1/2"	1.24	0.27	0.02
			1.00				Ice	1.38	0.35	0.03
							1" Ice	1.69	0.52	0.05
							2" Ice			
(2) 7020.00	A	From Leg	4.00		0.0000	114.00	No Ice	0.10	0.17	0.00
			0.00				1/2"	0.15	0.24	0.01
			1.00				Ice	0.20	0.31	0.01
							1" Ice	0.33	0.48	0.02
							2" Ice			
(2) 7020.00	B	From Leg	4.00		0.0000	114.00	No Ice	0.10	0.17	0.00
			0.00				1/2"	0.15	0.24	0.01
			1.00				Ice	0.20	0.31	0.01
							1" Ice	0.33	0.48	0.02
							2" Ice			
(2) 7020.00	C	From Leg	4.00		0.0000	114.00	No Ice	0.10	0.17	0.00
			0.00				1/2"	0.15	0.24	0.01
			1.00				Ice	0.20	0.31	0.01
							1" Ice	0.33	0.48	0.02
							2" Ice			
DC6-48-60-18-8F	B	From Leg	2.00		0.0000	114.00	No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			0.00				Ice	1.64	1.64	0.06
							1" Ice	2.04	2.04	0.11
							2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
DC6-48-60-18-8C	C	From Leg	2.00	0.0000	114.00	No Ice	2.74	2.74	0.03
			0.00			1/2"	2.96	2.96	0.05
			1.00			Ice	3.20	3.20	0.08
						1" Ice	3.68	3.68	0.15
Platform Mount [LP 304-1_HR-1]	C	None		0.0000	114.00	No Ice	21.41	21.41	1.60
						1/2"	26.62	26.62	2.06
						Ice	31.66	31.66	2.60
						1" Ice	41.38	41.38	3.96
					2" Ice				

Load Combinations

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.59	0.10	-0.78
			Max. Mx	20	-11.61	475.76	-0.18
			Max. My	14	-11.61	0.02	-475.92
			Max. Vy	20	-14.65	475.76	-0.18
			Max. Vx	14	14.65	0.02	-475.92
			Max. Torque	10			
L2	83 - 43.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.76	0.10	-1.23
			Max. Mx	20	-17.83	1108.82	-0.32
			Max. My	14	-17.83	0.03	-1109.11
			Max. Vy	20	-18.03	1108.82	-0.32
			Max. Vx	14	18.03	0.03	-1109.11
			Max. Torque	10			
L3	43.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.30	0.10	-1.77
			Max. Mx	20	-28.82	2060.39	-0.47
			Max. My	14	-28.82	0.03	-2060.83
			Max. Vy	20	-22.05	2060.39	-0.47
			Max. Vx	14	22.05	0.03	-2060.83
			Max. Torque	10			

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	47.30	0.00	-4.22
	Max. H _x	21	21.63	22.02	-0.00
	Max. H _z	3	21.63	0.00	22.02
	Max. M _x	2	2059.88	0.00	22.02
	Max. M _z	8	2060.32	-22.02	-0.00
	Max. Torsion	22	0.32	19.07	11.01
	Min. Vert	19	21.63	19.07	-11.01
	Min. H _x	9	21.63	-22.02	-0.00
	Min. H _z	15	21.63	0.00	-22.02
	Min. M _x	14	-2060.83	0.00	-22.02
	Min. M _z	20	-2060.39	22.02	-0.00
	Min. Torsion	10	-0.32	-19.07	-11.01

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	24.04	0.00	0.00	0.37	0.02	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	28.84	-0.00	-22.02	-2059.88	0.03	-0.21
0.9 Dead+1.0 Wind 0 deg - No Ice	21.63	-0.00	-22.02	-2030.80	0.02	-0.21
1.2 Dead+1.0 Wind 30 deg -	28.84	11.01	-19.07	-1783.85	-1030.15	-0.06

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
No Ice						
0.9 Dead+1.0 Wind 30 deg - No Ice	21.63	11.01	-19.07	-1758.68	-1015.56	-0.06
1.2 Dead+1.0 Wind 60 deg - No Ice	28.84	19.07	-11.01	-1029.70	-1784.29	0.11
0.9 Dead+1.0 Wind 60 deg - No Ice	21.63	19.07	-11.01	-1015.23	-1759.01	0.11
1.2 Dead+1.0 Wind 90 deg - No Ice	28.84	22.02	0.00	0.47	-2060.32	0.25
0.9 Dead+1.0 Wind 90 deg - No Ice	21.63	22.02	0.00	0.35	-2031.12	0.24
1.2 Dead+1.0 Wind 120 deg - No Ice	28.84	19.07	11.01	1030.65	-1784.29	0.32
0.9 Dead+1.0 Wind 120 deg - No Ice	21.63	19.07	11.01	1015.93	-1759.01	0.31
1.2 Dead+1.0 Wind 150 deg - No Ice	28.84	11.01	19.07	1784.79	-1030.15	0.30
0.9 Dead+1.0 Wind 150 deg - No Ice	21.63	11.01	19.07	1759.38	-1015.56	0.30
1.2 Dead+1.0 Wind 180 deg - No Ice	28.84	-0.00	22.02	2060.83	0.03	0.21
0.9 Dead+1.0 Wind 180 deg - No Ice	21.63	-0.00	22.02	2031.50	0.02	0.21
1.2 Dead+1.0 Wind 210 deg - No Ice	28.84	-11.01	19.07	1784.80	1030.21	0.06
0.9 Dead+1.0 Wind 210 deg - No Ice	21.63	-11.01	19.07	1759.38	1015.60	0.06
1.2 Dead+1.0 Wind 240 deg - No Ice	28.84	-19.07	11.01	1030.65	1784.35	-0.11
0.9 Dead+1.0 Wind 240 deg - No Ice	21.63	-19.07	11.01	1015.93	1759.06	-0.11
1.2 Dead+1.0 Wind 270 deg - No Ice	28.84	-22.02	0.00	0.47	2060.39	-0.25
0.9 Dead+1.0 Wind 270 deg - No Ice	21.63	-22.02	0.00	0.35	2031.17	-0.24
1.2 Dead+1.0 Wind 300 deg - No Ice	28.84	-19.07	-11.01	-1029.71	1784.35	-0.32
0.9 Dead+1.0 Wind 300 deg - No Ice	21.63	-19.07	-11.01	-1015.23	1759.06	-0.31
1.2 Dead+1.0 Wind 330 deg - No Ice	28.84	-11.01	-19.07	-1783.85	1030.21	-0.30
0.9 Dead+1.0 Wind 330 deg - No Ice	21.63	-11.01	-19.07	-1758.69	1015.60	-0.30
1.2 Dead+1.0 Ice+1.0 Temp	47.30	-0.00	0.00	1.77	0.10	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	47.30	-0.00	-4.22	-422.24	0.11	-0.03
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	47.30	2.11	-3.66	-365.42	-211.95	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	47.30	3.66	-2.11	-210.18	-367.20	0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	47.30	4.22	0.00	1.89	-424.02	0.05
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	47.30	3.66	2.11	213.96	-367.19	0.06
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	47.30	2.11	3.66	369.20	-211.95	0.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	47.30	-0.00	4.22	426.02	0.11	0.03
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	47.30	-2.11	3.66	369.20	212.18	-0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	47.30	-3.66	2.11	213.96	367.42	-0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	47.30	-4.22	0.00	1.89	424.24	-0.05
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	47.30	-3.66	-2.11	-210.18	367.42	-0.06
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	47.30	-2.11	-3.66	-365.42	212.18	-0.05
Dead+Wind 0 deg - Service	24.04	0.00	-4.10	-380.30	0.03	-0.04

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 30 deg - Service	24.04	2.05	-3.55	-329.29	-190.32	-0.01
Dead+Wind 60 deg - Service	24.04	3.55	-2.05	-189.95	-329.66	0.02
Dead+Wind 90 deg - Service	24.04	4.10	0.00	0.39	-380.66	0.05
Dead+Wind 120 deg - Service	24.04	3.55	2.05	190.74	-329.66	0.06
Dead+Wind 150 deg - Service	24.04	2.05	3.55	330.08	-190.32	0.06
Dead+Wind 180 deg - Service	24.04	0.00	4.10	381.08	0.03	0.04
Dead+Wind 210 deg - Service	24.04	-2.05	3.55	330.08	190.37	0.01
Dead+Wind 240 deg - Service	24.04	-3.55	2.05	190.74	329.71	-0.02
Dead+Wind 270 deg - Service	24.04	-4.10	0.00	0.39	380.72	-0.05
Dead+Wind 300 deg - Service	24.04	-3.55	-2.05	-189.95	329.71	-0.06
Dead+Wind 330 deg - Service	24.04	-2.05	-3.55	-329.29	190.37	-0.06

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-24.04	0.00	0.00	24.04	0.00	0.000%
2	0.00	-28.84	-22.02	0.00	28.84	22.02	0.000%
3	0.00	-21.63	-22.02	0.00	21.63	22.02	0.000%
4	11.01	-28.84	-19.07	-11.01	28.84	19.07	0.000%
5	11.01	-21.63	-19.07	-11.01	21.63	19.07	0.000%
6	19.07	-28.84	-11.01	-19.07	28.84	11.01	0.000%
7	19.07	-21.63	-11.01	-19.07	21.63	11.01	0.000%
8	22.02	-28.84	0.00	-22.02	28.84	-0.00	0.000%
9	22.02	-21.63	0.00	-22.02	21.63	-0.00	0.000%
10	19.07	-28.84	11.01	-19.07	28.84	-11.01	0.000%
11	19.07	-21.63	11.01	-19.07	21.63	-11.01	0.000%
12	11.01	-28.84	19.07	-11.01	28.84	-19.07	0.000%
13	11.01	-21.63	19.07	-11.01	21.63	-19.07	0.000%
14	0.00	-28.84	22.02	0.00	28.84	-22.02	0.000%
15	0.00	-21.63	22.02	0.00	21.63	-22.02	0.000%
16	-11.01	-28.84	19.07	11.01	28.84	-19.07	0.000%
17	-11.01	-21.63	19.07	11.01	21.63	-19.07	0.000%
18	-19.07	-28.84	11.01	19.07	28.84	-11.01	0.000%
19	-19.07	-21.63	11.01	19.07	21.63	-11.01	0.000%
20	-22.02	-28.84	0.00	22.02	28.84	-0.00	0.000%
21	-22.02	-21.63	0.00	22.02	21.63	-0.00	0.000%
22	-19.07	-28.84	-11.01	19.07	28.84	11.01	0.000%
23	-19.07	-21.63	-11.01	19.07	21.63	11.01	0.000%
24	-11.01	-28.84	-19.07	11.01	28.84	19.07	0.000%
25	-11.01	-21.63	-19.07	11.01	21.63	19.07	0.000%
26	0.00	-47.30	0.00	0.00	47.30	-0.00	0.000%
27	0.00	-47.30	-4.22	0.00	47.30	4.22	0.000%
28	2.11	-47.30	-3.66	-2.11	47.30	3.66	0.000%
29	3.66	-47.30	-2.11	-3.66	47.30	2.11	0.000%
30	4.22	-47.30	0.00	-4.22	47.30	-0.00	0.000%
31	3.66	-47.30	2.11	-3.66	47.30	-2.11	0.000%
32	2.11	-47.30	3.66	-2.11	47.30	-3.66	0.000%
33	0.00	-47.30	4.22	0.00	47.30	-4.22	0.000%
34	-2.11	-47.30	3.66	2.11	47.30	-3.66	0.000%
35	-3.66	-47.30	2.11	3.66	47.30	-2.11	0.000%
36	-4.22	-47.30	0.00	4.22	47.30	-0.00	0.000%
37	-3.66	-47.30	-2.11	3.66	47.30	2.11	0.000%
38	-2.11	-47.30	-3.66	2.11	47.30	3.66	0.000%
39	0.00	-24.04	-4.10	0.00	24.04	4.10	0.000%
40	2.05	-24.04	-3.55	-2.05	24.04	3.55	0.000%
41	3.55	-24.04	-2.05	-3.55	24.04	2.05	0.000%
42	4.10	-24.04	0.00	-4.10	24.04	0.00	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
43	3.55	-24.04	2.05	-3.55	24.04	-2.05	0.000%
44	2.05	-24.04	3.55	-2.05	24.04	-3.55	0.000%
45	0.00	-24.04	4.10	0.00	24.04	-4.10	0.000%
46	-2.05	-24.04	3.55	2.05	24.04	-3.55	0.000%
47	-3.55	-24.04	2.05	3.55	24.04	-2.05	0.000%
48	-4.10	-24.04	0.00	4.10	24.04	0.00	0.000%
49	-3.55	-24.04	-2.05	3.55	24.04	2.05	0.000%
50	-2.05	-24.04	-3.55	2.05	24.04	3.55	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00002581
3	Yes	4	0.00000001	0.00080556
4	Yes	6	0.00000001	0.00018583
5	Yes	6	0.00000001	0.00005656
6	Yes	6	0.00000001	0.00018560
7	Yes	6	0.00000001	0.00005648
8	Yes	5	0.00000001	0.00003111
9	Yes	4	0.00000001	0.00081889
10	Yes	6	0.00000001	0.00018776
11	Yes	6	0.00000001	0.00005721
12	Yes	6	0.00000001	0.00018488
13	Yes	6	0.00000001	0.00005619
14	Yes	5	0.00000001	0.00002582
15	Yes	4	0.00000001	0.00080605
16	Yes	6	0.00000001	0.00018656
17	Yes	6	0.00000001	0.00005679
18	Yes	6	0.00000001	0.00018680
19	Yes	6	0.00000001	0.00005687
20	Yes	5	0.00000001	0.00003111
21	Yes	4	0.00000001	0.00081896
22	Yes	6	0.00000001	0.00018467
23	Yes	6	0.00000001	0.00005614
24	Yes	6	0.00000001	0.00018754
25	Yes	6	0.00000001	0.00005716
26	Yes	4	0.00000001	0.00001194
27	Yes	5	0.00000001	0.00047224
28	Yes	5	0.00000001	0.00060492
29	Yes	5	0.00000001	0.00060402
30	Yes	5	0.00000001	0.00047494
31	Yes	5	0.00000001	0.00061402
32	Yes	5	0.00000001	0.00061156
33	Yes	5	0.00000001	0.00047800
34	Yes	5	0.00000001	0.00061329
35	Yes	5	0.00000001	0.00061423
36	Yes	5	0.00000001	0.00047552
37	Yes	5	0.00000001	0.00060428
38	Yes	5	0.00000001	0.00060667
39	Yes	4	0.00000001	0.00008545
40	Yes	4	0.00000001	0.00034771
41	Yes	4	0.00000001	0.00034482
42	Yes	4	0.00000001	0.00008660
43	Yes	4	0.00000001	0.00036143
44	Yes	4	0.00000001	0.00034206
45	Yes	4	0.00000001	0.00008591
46	Yes	4	0.00000001	0.00035230
47	Yes	4	0.00000001	0.00035531
48	Yes	4	0.00000001	0.00008665
49	Yes	4	0.00000001	0.00033948
50	Yes	4	0.00000001	0.00035871

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 83	19.438	45	1.3759	0.0009
L2	86.25 - 43.25	8.202	45	0.9613	0.0004
L3	47.5 - 0	2.344	45	0.4672	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	Lighting Rod 3/4" x 6'	45	19.438	1.3759	0.0009	33071
116.00	RRUS-11	45	15.552	1.2570	0.0008	11811
114.00	HPA-65R-BUU-H8 w/ Mount Pipe	45	15.008	1.2395	0.0007	10334

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 83	105.190	14	7.4617	0.0050
L2	86.25 - 43.25	44.402	14	5.2107	0.0021
L3	47.5 - 0	12.686	14	2.5299	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	Lighting Rod 3/4" x 6'	14	105.190	7.4617	0.0050	6263
116.00	RRUS-11	14	84.165	6.8163	0.0040	2235
114.00	HPA-65R-BUU-H8 w/ Mount Pipe	14	81.225	6.7211	0.0039	1955

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	130 - 83 (1)	TP26.06x16x0.25	47.00	0.00	0.0	20.2171	-11.61	1182.70	0.010
L2	83 - 43.25 (2)	TP34.068x24.8644x0.3125	43.00	0.00	0.0	33.0511	-17.83	1933.49	0.009
L3	43.25 - 0 (3)	TP42.7x32.5333x0.375	47.50	0.00	0.0	51.1074	-28.82	2989.79	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	130 - 83 (1)	TP26.06x16x0.25	475.93	710.94	0.669	0.00	710.94	0.000
L2	83 - 43.25 (2)	TP34.068x24.8644x0.3125	1109.11	1493.72	0.743	0.00	1493.72	0.000
L3	43.25 - 0 (3)	TP42.7x32.5333x0.375	2060.82	2888.40	0.713	0.00	2888.40	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	130 - 83 (1)	TP26.06x16x0.25	14.65	354.81	0.041	0.21	783.82	0.000
L2	83 - 43.25 (2)	TP34.068x24.8644x0.3125	18.03	580.05	0.031	0.21	1675.88	0.000
L3	43.25 - 0 (3)	TP42.7x32.5333x0.375	22.05	896.94	0.025	0.21	3339.32	0.000

Pole Interaction Design Data

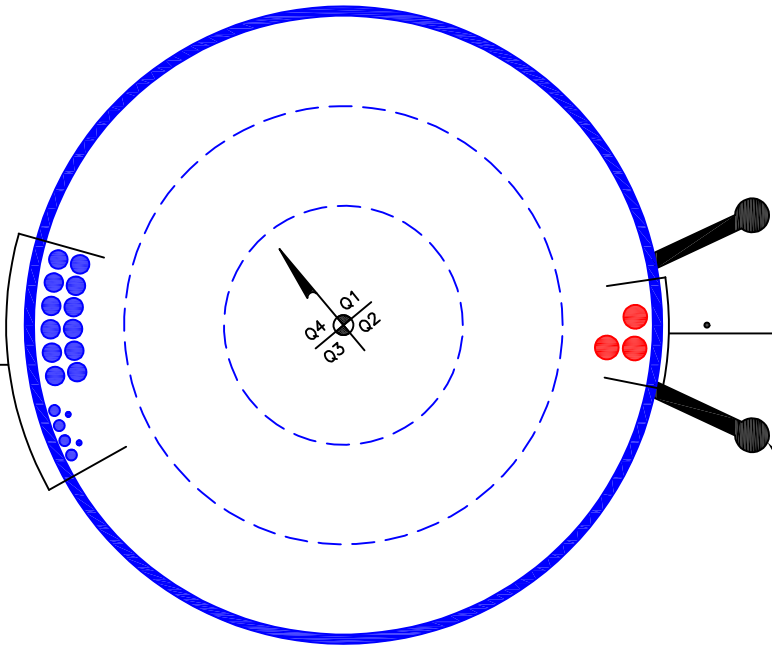
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 83 (1)	0.010	0.669	0.000	0.041	0.000	0.681	1.050	4.8.2
L2	83 - 43.25 (2)	0.009	0.743	0.000	0.031	0.000	0.753	1.050	4.8.2
L3	43.25 - 0 (3)	0.010	0.713	0.000	0.025	0.000	0.724	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	130 - 83	Pole	TP26.06x16x0.25	1	-11.61	1241.83	64.9	Pass
L2	83 - 43.25	Pole	TP34.068x24.8644x0.3125	2	-17.83	2030.16	71.7	Pass
L3	43.25 - 0	Pole	TP42.7x32.5333x0.375	3	-28.82	3139.28	68.9	Pass
Summary								
Pole (L2)							71.7	Pass
RATING =							71.7	Pass

APPENDIX B
BASE LEVEL DRAWING

(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 114 FT LEVEL
(4) 3/4" TO 114 FT LEVEL
(12) 1-1/4" TO 114 FT LEVEL



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

CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

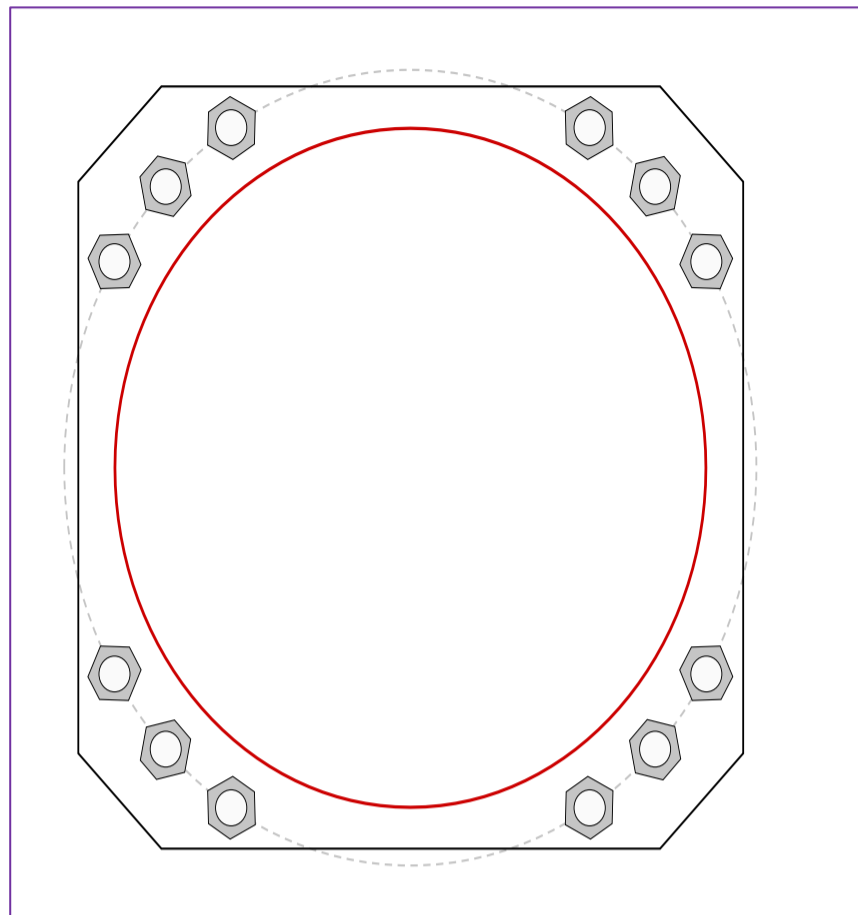


Site Info	
BU #	876359
Site Name	Norwich
Order #	538769 Rev.2

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.5

Applied Loads	
Moment (kip-ft)	2060.83
Axial Force (kips)	28.82
Shear Force (kips)	22.05

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 50" BC <i>Anchor Spacing: 6 in</i>
Base Plate Data
48" W x 3" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi); Clip: 6 in
Stiffener Data
N/A
Pole Data
42.7" x 0.375" 12-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>
$P_{u,t} = 162.33$	$\phi P_{n,t} = 243.75$	Stress Rating
$V_u = 1.84$	$\phi V_n = 149.1$	63.4%
$M_u = n/a$	$\phi M_n = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	27.56	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	58.3%	Pass

Job No.	CN7-449R1
Project No.	2101398
BU#:	876359
Site Name:	Norwich
App#:	538769 Rev.2
Date:	9/7/2021



Foundation Reaction Comparison - Rev. H					
Reactions	Original Design Reactions	Modified Design Reactions*	Current Analysis Reactions	% Capacity	Pass / Fail
MOMENT (kip-ft)	2260.0	3051.0	2061.0	64.3%	Pass
SHEAR (kips)	26.0	35.1	22.0	59.7%	Pass

*Original design reactions were multiplied by 1.35 for comparison to the current reactions as allowed by ANSI/TIA-222-H, Section 15.6.2.

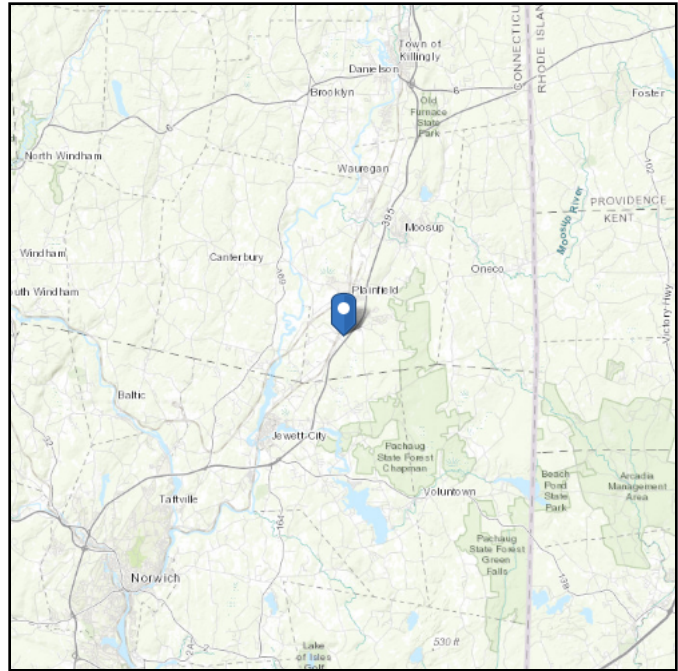
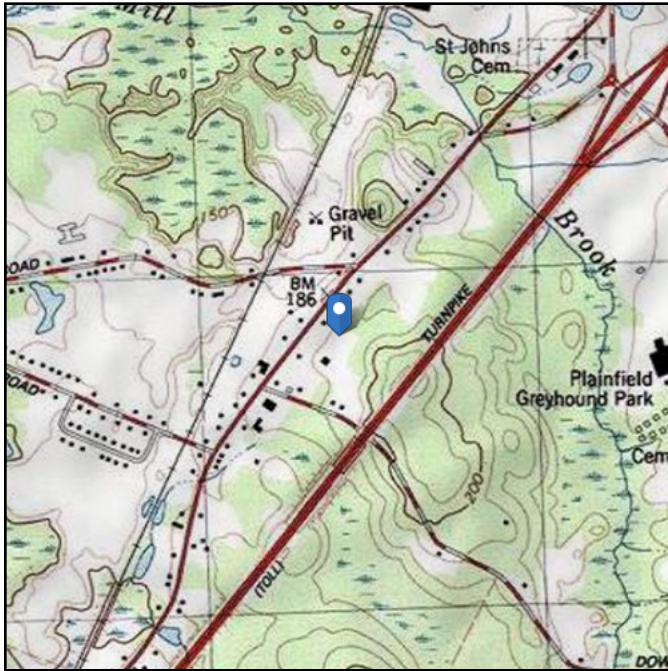
Design reactions were taken from the tower drawings by Summit Manufacturing, LLC., CCIsites document # 1446983

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 181.69 ft (NAVD 88)
Latitude: 41.658739
Longitude: -71.924931



Wind

Results:

Wind Speed:	131 Vmph	135 mph Ultimate Wind Speed per Plainfield City Exception.
10-year MRI	79 Vmph	
25-year MRI	89 Vmph	
50-year MRI	98 Vmph	
100-year MRI	107 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

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).

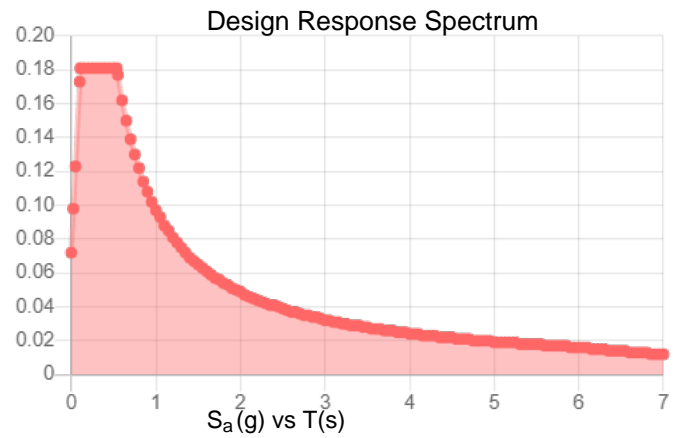
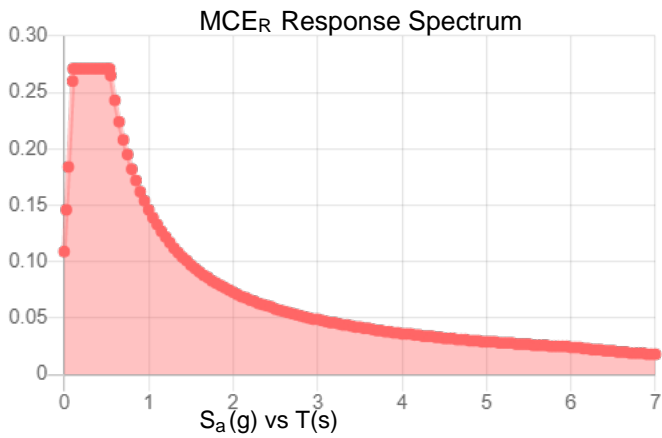
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.17	S_{DS} :	0.181
S_1 :	0.061	S_{D1} :	0.097
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.085
S_{MS} :	0.271	PGA _M :	0.136
S_{M1} :	0.146	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Mon Sep 06 2021

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in. $\text{Ice Thickness} = 2 \times 0.75 = 1.5 \text{ in}$

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Mon Sep 06 2021

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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Date: **July 21, 2021**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
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518-690-0790
structural@infinigy.com

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Subject: **Mount Analysis Report**

Carrier Designation: **T-Mobile Retain**
Carrier Site Number: CTNH814A
Carrier Site Name: CT33XC588

Crown Castle Designation: **Crown Castle BU Number:** 876392
Crown Castle Site Name: NEW HARTFORD / EXECUTIVE GREET
Crown Castle JDE Job Number: 673847
Crown Castle Order Number: 575185 Rev. 0

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

Site Data: **115 Industrial Park Road, New Hartford, Litchfield County, CT, 06057**
Latitude 41°53'10.48", Longitude -72°57'58.10"

Structure Information: **Tower Height & Type:** **168.0 ft Monopole**
Mount Elevation: **157.0 ft**
Mount Type: **14.0 ft Platform**

Dear Darcy Tarr,

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

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

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

This analysis has been performed in accordance with the 2018 Connecticut State Building Code and Appendix N based upon an ultimate 3-second gust wind speed of 120 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Andrew Gloriani, E.I.T.

Respectfully Submitted by:
Emmanuel Poulin, P.E.
518-690-0790
structural@infinigy.com
CT PE License No. 22947

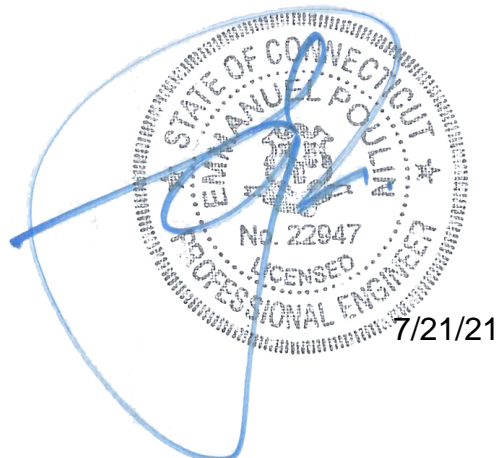


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Additional Calculations

1) INTRODUCTION

This is an existing 3 sector 14.0 ft Platform, designed by Summit Manufacturing and mapped by Paul J. Ford & Company.

The mount has been modified per reinforcement drawings prepared by Paul J. Ford & Company in May of 2018. Reinforcement consists of installation of a reinforcement kit (Site Pro 1 Part No. PRK-1245L) for all sectors.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 Connecticut State Building Code and Appendix N
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.180
Seismic S₁:	0.065
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
157.0	157.0	3	Ericsson	AIR6449 B41_T-MOBILE	14.0 ft Platform
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO	
		3	Ericsson	RADIO 4480 B71_TMO	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	575185 Rev. 0	CCI Sites
Loading Document	T-Mobile	RFDS Version: 1	TSA
Mount Mapping Documents	Paul J. Ford & Company	9400072	CCI Sites
Mount Modification Report	Paul J. Ford & Company	7562749	CCI Sites

3.1) Analysis Method

RISA-3D (Version 19.0.3), 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 V2.1.6, 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 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

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

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

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3	Mount Pipe(s)	MP10	157.0	53.6	Pass
	Horizontal(s)	MH1		67.7	Pass
	Standoff(s)	MS2		36.9	Pass
	Handrail(s)	MR2		26.6	Pass
	Kicker(s)	MK1		28.0	Pass
	Mount Connection(s)	-		24.7	Pass

Structure Rating (max from all components) =	67.7%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for detailed mount connection calculations.
- 3) All sectors are typical

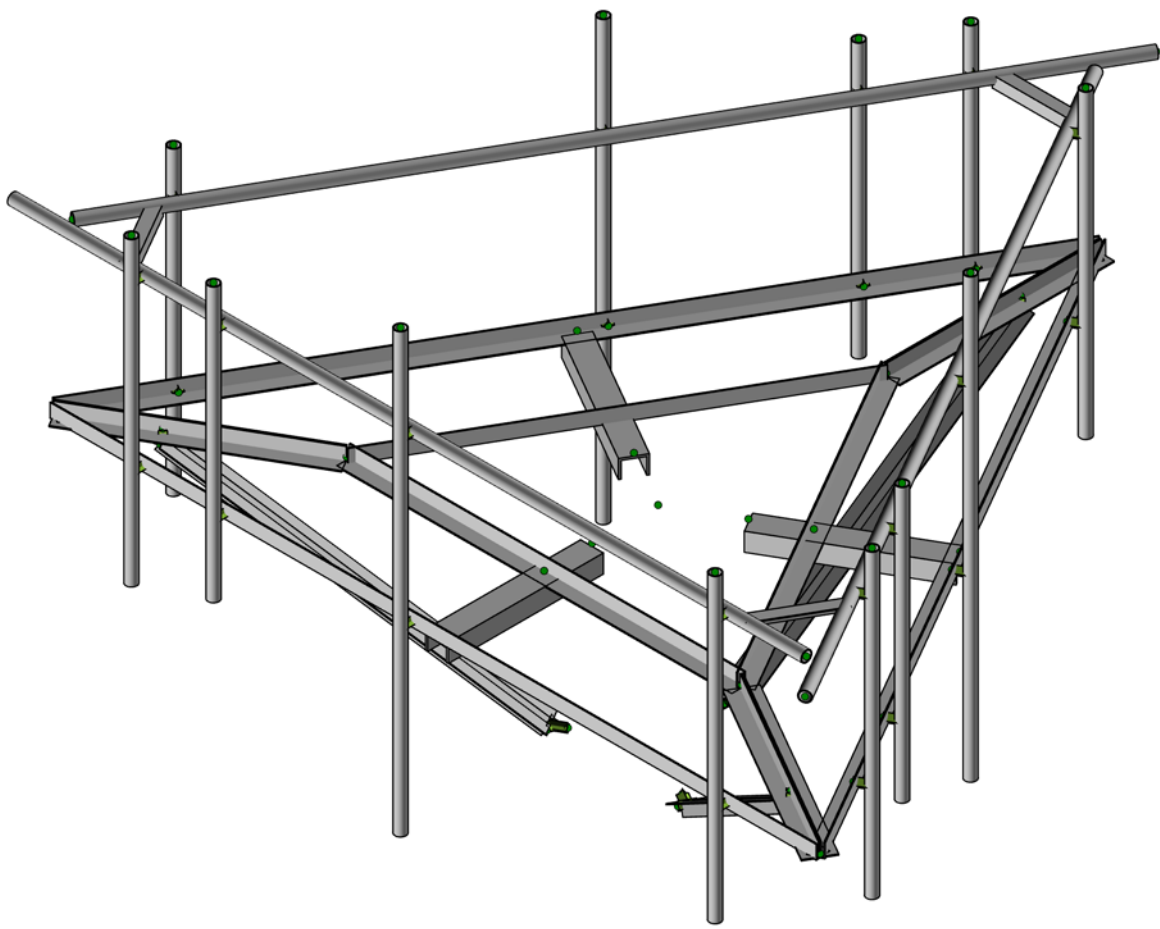
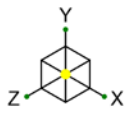
4.1) Recommendations

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

1. Installation of Site Pro 1 HRK14 handrail kit.
2. Installation of (1) 8' long pipe 2.0 STD per sector for proposed antennas.

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

APPENDIX A
WIRE FRAME AND RENDERED MODELS



Infinigy Engineering, PLLC

AG

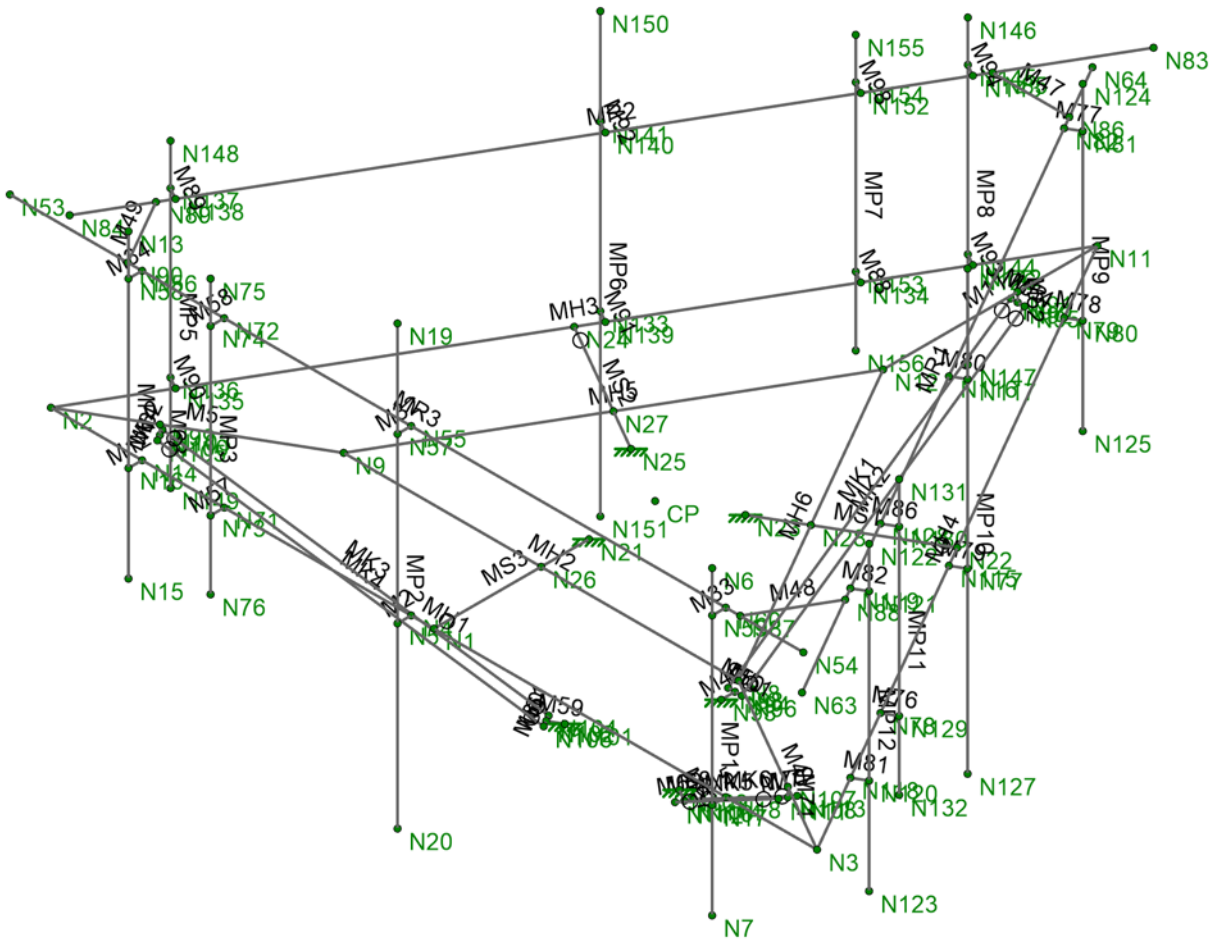
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Render

Jul 16, 2021

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Wireframe

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APPENDIX B
SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION		
Client:	Crown Castle	
Carrier:	T-Mobile	
Engineer:	Andrew Gloriani	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	566.99	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	157.00	ft
Tower Height AGL:	168.00	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):	0.980	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_r):	1.000	

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

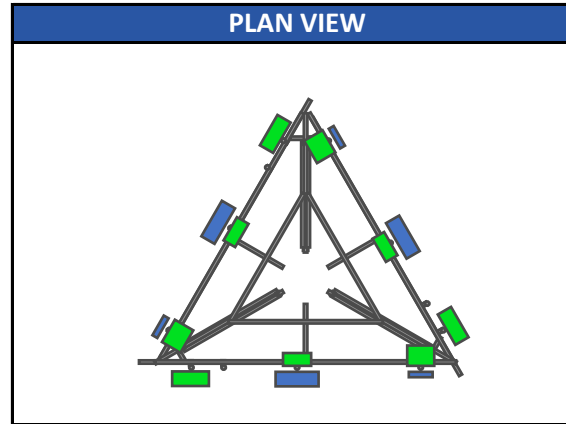
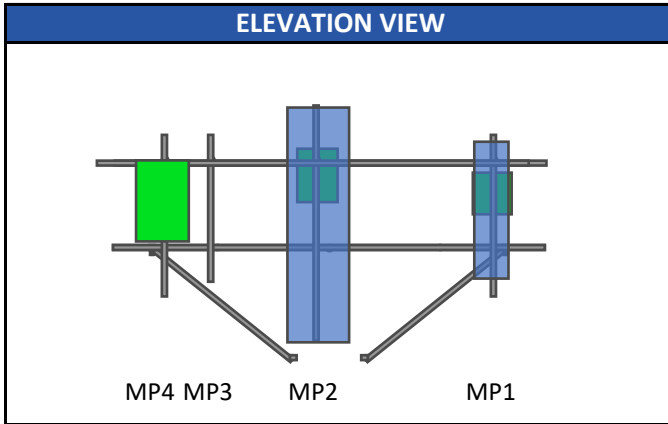
WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	120	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	2.0	in
Flat Pressure:	95.496	psf
Round Pressure:	57.298	psf
Ice Wind Pressure:	9.948	psf

SEISMIC DATA		
Short-Period Accel. (S_s):	0.180	g
1-Second Accel. (S_1):	0.065	g
Short-Period Design (S_{DS}):	0.192	
1-Second Design (S_{D1}):	0.104	
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	



Infinigy Load Calculator V2.1.6

Program Inputs



Infinigy Load Calculator V2.1.6

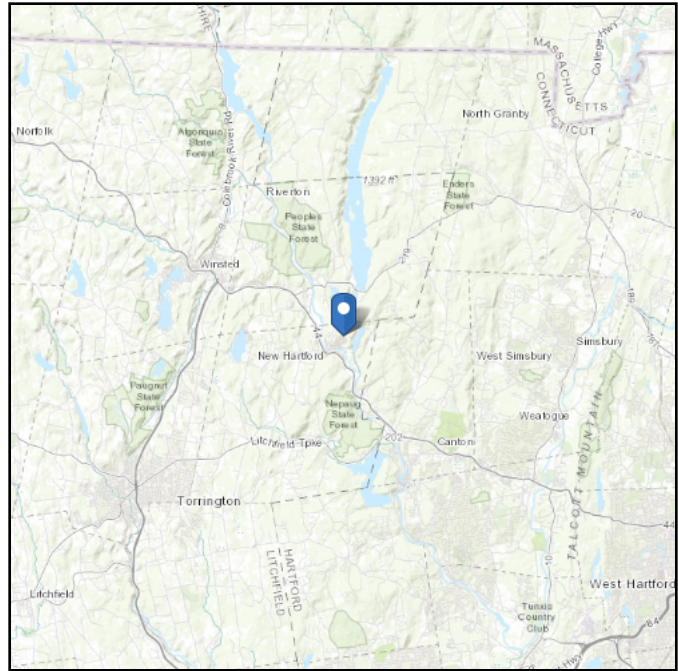
APPURTENANCE INFORMATION												
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft ²)	EPA_T (ft ²)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)	
ERICSSON AIR6449 B41_T-MOBILE	157.0	3	0.90	47.75	5.27	2.03	226.47	87.24	114.63	33.01	MP4	
RFS/CELWAVE APX16DWV-16DWV-S-E-A20	157.0	3	0.90	47.75	6.26	1.50	269.01	64.46	41.00	11.81	MP1	
RFS/CELWAVE APXVAALL24_43-U-NA20_TMO	157.0	3	0.90	47.75	14.67	5.32	630.42	228.62	149.90	43.17	MP2	
ERICSSON RADIO 4460 B2/B25 B66_TMO	157.0	3	0.90	47.75	2.14	1.69	91.93	72.45	109.00	31.39	MP1	
ERICSSON RADIO 4480 B71_TMO	157.0	3	0.90	47.75	2.85	1.38	122.57	59.43	92.60	26.67	MP2	

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 566.99 ft (NAVD 88)
Latitude: 41.886244
Longitude: -72.966139



Wind

Results:

Wind Speed:
10-year MRI
25-year MRI
50-year MRI
100-year MRI

120 Vmph per Litchfield County Requirements

76 Vmph
85 Vmph
90 Vmph
97 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

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).

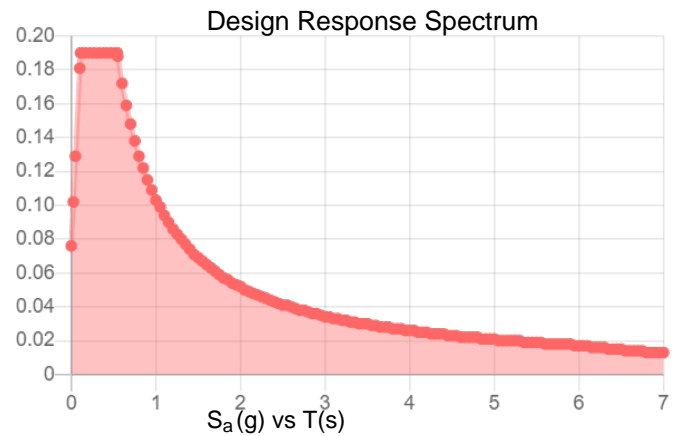
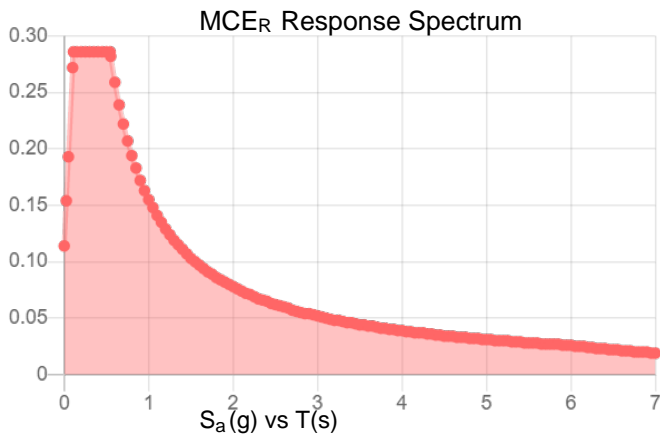
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.178	S_{DS} :	0.19
S_1 :	0.065	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.089
S_{MS} :	0.286	PGA _M :	0.142
S_{M1} :	0.155	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Fri Jul 16 2021

Date Source:

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

Ice

Results:

Ice Thickness: 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: Fri Jul 16 2021

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.

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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	MH1	N2	N3	270	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N4	N5		RIGID	None	None	RIGID	Typical
3	MP1	N6	N7		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
4	M4	N8	N3	180	Corner Horizontals	Beam	Double Angle (No Gap)	A36 Gr.36	Typical
5	M5	N9	N2	180	Corner Horizontals	Beam	Double Angle (No Gap)	A36 Gr.36	Typical
6	MH2	N8	N9	270	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
7	MH4	N3	N11	270	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
8	MH3	N11	N2	270	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
9	MH5	N9	N12	270	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
10	MH6	N12	N8	270	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
11	M11	N12	N11	180	Corner Horizontals	Beam	Double Angle (No Gap)	A36 Gr.36	Typical
12	M12	N14	N16		RIGID	None	None	RIGID	Typical
13	MP4	N13	N15		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
14	MS3	N21	N1	90	Standoff 1	Beam	Channel	A36 Gr.36	Typical
15	M15	N18	N17		RIGID	None	None	RIGID	Typical
16	MP2	N19	N20		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
17	MS1	N23	N22	90	Standoff 1	Beam	Channel	A36 Gr.36	Typical
18	MS2	N25	N24	90	Standoff 1	Beam	Channel	A36 Gr.36	Typical
19	MR3	N53	N54	270	Handrail	Beam	Pipe	A53 Gr.B	Typical
20	M32	N55	N57		RIGID	None	None	RIGID	Typical
21	M33	N60	N59		RIGID	None	None	RIGID	Typical
22	M34	N56	N58		RIGID	None	None	RIGID	Typical
23	MR1	N63	N64	270	Handrail	Beam	Pipe	A53 Gr.B	Typical
24	MR2	N83	N84	270	Handrail	Beam	Pipe	A53 Gr.B	Typical
25	M47	N86	N85	90	Handrail Angle	Beam	Single Angle	A36 Gr.36	Typical
26	M48	N87	N88	90	Handrail Angle	Beam	Single Angle	A36 Gr.36	Typical
27	M49	N89	N90	90	Handrail Angle	Beam	Single Angle	A36 Gr.36	Typical
28	M46	N93	N94		RIGID	None	None	RIGID	Typical
29	M50	N94	N98		RIGID	None	None	RIGID	Typical
30	M51	N96	N94		RIGID	None	None	RIGID	Typical
31	M52	N91	N92		RIGID	None	None	RIGID	Typical
32	M53	N92	N97		RIGID	None	None	RIGID	Typical
33	M54	N95	N92		RIGID	None	None	RIGID	Typical
34	MK2	N95	N96	180	Angle Kickers	VBrace	Single Angle	A36 Gr.36	Typical
35	MK1	N97	N98	90	Angle Kickers	VBrace	Single Angle	A36 Gr.36	Typical
36	M59	N101	N102		RIGID	None	None	RIGID	Typical
37	M60	N102	N106		RIGID	None	None	RIGID	Typical
38	M61	N104	N102		RIGID	None	None	RIGID	Typical
39	M67	N109	N110		RIGID	None	None	RIGID	Typical
40	M68	N110	N114		RIGID	None	None	RIGID	Typical
41	M69	N112	N110		RIGID	None	None	RIGID	Typical
42	M62	N103	N100		RIGID	None	None	RIGID	Typical
43	M63	N99	N100		RIGID	None	None	RIGID	Typical
44	M64	N100	N105		RIGID	None	None	RIGID	Typical
45	MK3	N103	N104	180	Angle Kickers	VBrace	Single Angle	A36 Gr.36	Typical
46	MK4	N105	N106	90	Angle Kickers	VBrace	Single Angle	A36 Gr.36	Typical
47	M70	N111	N108		RIGID	None	None	RIGID	Typical
48	M71	N107	N108		RIGID	None	None	RIGID	Typical
49	M72	N108	N113		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
50	MK5	N111	N112	180	Angle Kickers	VBrace	Single Angle	A36 Gr.36	Typical
51	MK6	N113	N114	90	Angle Kickers	VBrace	Single Angle	A36 Gr.36	Typical
52	M57	N71	N73		RIGID	None	None	RIGID	Typical
53	M58	N72	N74		RIGID	None	None	RIGID	Typical
54	MP3	N75	N76		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
55	M76	N78	N129		RIGID	None	None	RIGID	Typical
56	M77	N82	N81		RIGID	None	None	RIGID	Typical
57	M78	N79	N80		RIGID	None	None	RIGID	Typical
58	M79	N115	N77		RIGID	None	None	RIGID	Typical
59	M80	N116	N117		RIGID	None	None	RIGID	Typical
60	M81	N118	N120		RIGID	None	None	RIGID	Typical
61	M82	N119	N121		RIGID	None	None	RIGID	Typical
62	MP12	N122	N123		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
63	MP9	N124	N125		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
64	MP10	N126	N127		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
65	M86	N128	N130		RIGID	None	None	RIGID	Typical
66	MP11	N131	N132		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
67	M88	N134	N153		RIGID	None	None	RIGID	Typical
68	M89	N138	N137		RIGID	None	None	RIGID	Typical
69	M90	N135	N136		RIGID	None	None	RIGID	Typical
70	M91	N139	N133		RIGID	None	None	RIGID	Typical
71	M92	N140	N141		RIGID	None	None	RIGID	Typical
72	M93	N142	N144		RIGID	None	None	RIGID	Typical
73	M94	N143	N145		RIGID	None	None	RIGID	Typical
74	MP8	N146	N147		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
75	MP5	N148	N149		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
76	MP6	N150	N151		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
77	M98	N152	N154		RIGID	None	None	RIGID	Typical
78	MP7	N155	N156		Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		42	105	0
3	Total General		42	105	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	C4x5x4x0.4375	3	102	153.593
7	A36 Gr.36	L2.5x2.5x3	9	503.3	128.581
8	A36 Gr.36	L3X3X4	6	763.8	311.877
9	A36 Gr.36	LL3x3x4x0	3	141	115.15
10	A53 Gr.B	PIPE_2.0	15	1386	400.882
11	Total HR Steel		36	2896	1110.083

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed Area	(Member)
1	Self Weight	DL			-1		30		3
2	Wind Load AZI 0	WLZ					60		
3	Wind Load AZI 30	None					60		
4	Wind Load AZI 60	None					60		
5	Wind Load AZI 90	WLX					60		
6	Wind Load AZI 120	None					60		
7	Wind Load AZI 150	None					60		
8	Wind Load AZI 180	None					60		
9	Wind Load AZI 210	None					60		
10	Wind Load AZI 240	None					60		
11	Wind Load AZI 270	None					60		
12	Wind Load AZI 300	None					60		
13	Wind Load AZI 330	None					60		
14	Distr. Wind Load Z	WLZ						78	
15	Distr. Wind Load X	WLX						78	
16	Ice Weight	OL1					30	78	3
17	Ice Wind Load AZI 0	OL2					60		
18	Ice Wind Load AZI 30	None					60		
19	Ice Wind Load AZI 60	None					60		
20	Ice Wind Load AZI 90	OL3					60		
21	Ice Wind Load AZI 120	None					60		
22	Ice Wind Load AZI 150	None					60		
23	Ice Wind Load AZI 180	None					60		
24	Ice Wind Load AZI 210	None					60		
25	Ice Wind Load AZI 240	None					60		
26	Ice Wind Load AZI 270	None					60		
27	Ice Wind Load AZI 300	None					60		
28	Ice Wind Load AZI 330	None					60		
29	Distr. Ice Wind Load Z	OL2						78	
30	Distr. Ice Wind Load X	OL3						78	
31	Seismic Load Z	ELZ			-0.285		30		
32	Seismic Load X	ELX	-0.285				30		
33	Service Live Loads	LL				1			
34	Maintenance Load 1	LL				1			
35	Maintenance Load 2	LL				1			
36	Maintenance Load 3	LL				1			
37	Maintenance Load 4	LL				1			
38	Maintenance Load 5	LL				1			
39	Maintenance Load 6	LL				1			
40	Maintenance Load 7	LL				1			
41	Maintenance Load 8	LL				1			
42	Maintenance Load 9	LL				1			
43	Maintenance Load 10	LL				1			
44	Maintenance Load 11	LL				1			
45	Maintenance Load 12	LL				1			
46	BLC 1 Transient Area Loads	None						30	
47	BLC 16 Transient Area Loads	None						30	



Load Combinations

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
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	0.5
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
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				

Load Combinations (Continued)

Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
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	0.25	14	0.25	15			33	1.5	
64 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.25	14	0.217	15	0.125		33	1.5	
65 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.25	14	0.125	15	0.217		33	1.5	
66 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.25	14		15	0.25		33	1.5	
67 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.25	14	-0.125	15	0.217		33	1.5	
68 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.25	14	-0.217	15	0.125		33	1.5	
69 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.25	14	-0.25	15			33	1.5	
70 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.25	14	-0.217	15	-0.125		33	1.5	
71 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.25	14	-0.125	15	-0.217		33	1.5	
72 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.25	14		15	-0.25		33	1.5	
73 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.25	14	0.125	15	-0.217		33	1.5	
74 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.25	14	0.217	15	-0.125		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	0.063	14	0.063	15			
77 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.063	14	0.054	15	0.031		
78 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.063	14	0.031	15	0.054		
79 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.063	14		15	0.063		
80 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.063	14	-0.031	15	0.054		
81 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.063	14	-0.054	15	0.031		
82 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.063	14	-0.063	15			
83 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.063	14	-0.054	15	-0.031		
84 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.063	14	-0.031	15	-0.054		
85 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.063	14		15	-0.063		
86 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.063	14	0.031	15	-0.054		
87 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.063	14	0.054	15	-0.031		
88 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.063	14	0.063	15			
89 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.063	14	0.054	15	0.031		
90 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.063	14	0.031	15	0.054		
91 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.063	14		15	0.063		
92 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.063	14	-0.031	15	0.054		
93 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.063	14	-0.054	15	0.031		
94 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.063	14	-0.063	15			
95 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.063	14	-0.054	15	-0.031		
96 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.063	14	-0.031	15	-0.054		
97 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.063	14		15	-0.063		
98 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.063	14	0.031	15	-0.054		



Company : Infinigy Engineering, PLLC
 Designer : AG
 Job Number : 1039-Z0001-B
 Model Name : 876392

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Load Combinations (Continued)

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.063	14	0.054	15	-0.031
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.063	14	0.063	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.063	14	0.054	15	0.031
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.063	14	0.031	15	0.054
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.063	14		15	0.063
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.063	14	-0.031	15	0.054
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.063	14	-0.054	15	0.031
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.063	14	-0.063	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.063	14	-0.054	15	-0.031
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.063	14	-0.031	15	-0.054
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.063	14		15	-0.063
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.063	14	0.031	15	-0.054
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.063	14	0.054	15	-0.031
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.063	14	0.063	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.063	14	0.054	15	0.031
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.063	14	0.031	15	0.054
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.063	14		15	0.063
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.063	14	-0.031	15	0.054
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.063	14	-0.054	15	0.031
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.063	14	-0.063	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.063	14	-0.054	15	-0.031
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.063	14	-0.031	15	-0.054
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.063	14		15	-0.063
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.063	14	0.031	15	-0.054
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.063	14	0.054	15	-0.031
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.063	14	0.063	15	
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.063	14	0.054	15	0.031
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.063	14	0.031	15	0.054
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.063	14		15	0.063
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.063	14	-0.031	15	0.054
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.063	14	-0.054	15	0.031
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.063	14	-0.063	15	
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.063	14	-0.054	15	-0.031
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.063	14	-0.031	15	-0.054
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.063	14		15	-0.063
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.063	14	0.031	15	-0.054
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.063	14	0.054	15	-0.031
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.063	14	0.063	15	
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.063	14	0.054	15	0.031
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.063	14	0.031	15	0.054
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.063	14		15	0.063
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.063	14	-0.031	15	0.054
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.063	14	-0.054	15	0.031
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.063	14	-0.063	15	
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.063	14	-0.054	15	-0.031
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.063	14	-0.031	15	-0.054
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.063	14		15	-0.063
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.063	14	0.031	15	-0.054
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.063	14	0.054	15	-0.031



Load Combinations (Continued)

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
148	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	40	1.5	2	0.063	14	0.063	15	
149	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	40	1.5	3	0.063	14	0.054	15	0.031
150	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	40	1.5	4	0.063	14	0.031	15	0.054
151	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	40	1.5	5	0.063	14		15	0.063
152	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	40	1.5	6	0.063	14	-0.031	15	0.054
153	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	40	1.5	7	0.063	14	-0.054	15	0.031
154	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	40	1.5	8	0.063	14	-0.063	15	
155	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	40	1.5	9	0.063	14	-0.054	15	-0.031
156	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	40	1.5	10	0.063	14	-0.031	15	-0.054
157	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	40	1.5	11	0.063	14		15	-0.063
158	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	40	1.5	12	0.063	14	0.031	15	-0.054
159	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	40	1.5	13	0.063	14	0.054	15	-0.031
160	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	41	1.5	2	0.063	14	0.063	15	
161	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	41	1.5	3	0.063	14	0.054	15	0.031
162	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	41	1.5	4	0.063	14	0.031	15	0.054
163	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	41	1.5	5	0.063	14		15	0.063
164	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	41	1.5	6	0.063	14	-0.031	15	0.054
165	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	41	1.5	7	0.063	14	-0.054	15	0.031
166	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	41	1.5	8	0.063	14	-0.063	15	
167	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	41	1.5	9	0.063	14	-0.054	15	-0.031
168	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	41	1.5	10	0.063	14	-0.031	15	-0.054
169	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	41	1.5	11	0.063	14		15	-0.063
170	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	41	1.5	12	0.063	14	0.031	15	-0.054
171	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	41	1.5	13	0.063	14	0.054	15	-0.031
172	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	42	1.5	2	0.063	14	0.063	15	
173	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	42	1.5	3	0.063	14	0.054	15	0.031
174	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	42	1.5	4	0.063	14	0.031	15	0.054
175	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	42	1.5	5	0.063	14		15	0.063
176	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	42	1.5	6	0.063	14	-0.031	15	0.054
177	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	42	1.5	7	0.063	14	-0.054	15	0.031
178	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	42	1.5	8	0.063	14	-0.063	15	
179	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	42	1.5	9	0.063	14	-0.054	15	-0.031
180	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	42	1.5	10	0.063	14	-0.031	15	-0.054
181	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	42	1.5	11	0.063	14		15	-0.063
182	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	42	1.5	12	0.063	14	0.031	15	-0.054
183	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	42	1.5	13	0.063	14	0.054	15	-0.031
184	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	43	1.5	2	0.063	14	0.063	15	
185	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	43	1.5	3	0.063	14	0.054	15	0.031
186	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	43	1.5	4	0.063	14	0.031	15	0.054
187	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	43	1.5	5	0.063	14		15	0.063
188	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	43	1.5	6	0.063	14	-0.031	15	0.054
189	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	43	1.5	7	0.063	14	-0.054	15	0.031
190	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	43	1.5	8	0.063	14	-0.063	15	
191	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	43	1.5	9	0.063	14	-0.054	15	-0.031
192	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	43	1.5	10	0.063	14	-0.031	15	-0.054
193	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	43	1.5	11	0.063	14		15	-0.063
194	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	43	1.5	12	0.063	14	0.031	15	-0.054
195	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	43	1.5	13	0.063	14	0.054	15	-0.031
196	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	44	1.5	2	0.063	14	0.063	15	



Load Combinations (Continued)

Description		Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
197	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	44	1.5	3	0.063	14	0.054	15	0.031	
198	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	44	1.5	4	0.063	14	0.031	15	0.054	
199	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	44	1.5	5	0.063	14		15	0.063	
200	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	44	1.5	6	0.063	14	-0.031	15	0.054	
201	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	44	1.5	7	0.063	14	-0.054	15	0.031	
202	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	44	1.5	8	0.063	14	-0.063	15		
203	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	44	1.5	9	0.063	14	-0.054	15	-0.031	
204	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	44	1.5	10	0.063	14	-0.031	15	-0.054	
205	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	44	1.5	11	0.063	14		15	-0.063	
206	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	44	1.5	12	0.063	14	0.031	15	-0.054	
207	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	44	1.5	13	0.063	14	0.054	15	-0.031	
208	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	45	1.5	2	0.063	14	0.063	15		
209	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	45	1.5	3	0.063	14	0.054	15	0.031	
210	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	45	1.5	4	0.063	14	0.031	15	0.054	
211	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	45	1.5	5	0.063	14		15	0.063	
212	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	45	1.5	6	0.063	14	-0.031	15	0.054	
213	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	45	1.5	7	0.063	14	-0.054	15	0.031	
214	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	45	1.5	8	0.063	14	-0.063	15		
215	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	45	1.5	9	0.063	14	-0.054	15	-0.031	
216	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	45	1.5	10	0.063	14	-0.031	15	-0.054	
217	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	45	1.5	11	0.063	14		15	-0.063	
218	1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	45	1.5	12	0.063	14	0.031	15	-0.054	

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	N21	max	2363.61	4	1887.586	35	1181.848	2	-438.403	16	1992.162	4	249.807	4
2		min	-2358.526	10	196.316	16	-1146.825	20	-4780.277	35	-1991.08	10	-249.821	10
3	N23	max	1716.424	4	1896.024	28	2474.666	14	2341.312	37	2580.438	10	4201.965	28
4		min	-1686.935	22	182.116	20	-2498.087	8	382.047	17	-2580.396	4	205.799	20
5	N25	max	1749.425	17	1894.373	31	2404.819	25	2471.484	32	2769.909	12	-498.474	24
6		min	-1783.168	11	184.078	24	-2419.988	7	-55.275	24	-2769.098	6	-4116.677	31
7	N101	max	43.386	24	2193.808	31	1532.76	31	3.666	24	17.032	15	2.909	24
8		min	-2654.866	31	-17.408	24	-25.043	24	-275.287	31	-17.299	9	-474.12	31
9	N93	max	5.468	54	2201.571	27	70.618	20	550.184	27	19.167	23	13.201	23
10		min	-5.457	60	-31.647	20	-3076.776	27	-7.912	20	-19.464	5	-13.418	5
11	N109	max	2664.598	35	2201.681	35	1538.619	35	4.502	15	16.857	19	476.897	35
12		min	-62.531	16	-32.746	16	-36.097	16	-275.021	34	-17.145	13	-7.065	16
13	Totals:	max	4757.491	17	11731.218	36	4937.458	2						
14		min	-4757.494	11	2362.414	54	-4937.456	8						

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

Member	Shape	Code Check	Loc[in]	LC	Shear	Check	Loc[in]	DirL	Cphi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	MH1	L3X3X4	0.677	168	34	0.104	84	z	3515778.129	46656	1688.138	2160.605	1	H2-1
2	MH4	L3X3X4	0.677	168	38	0.105	84	z	2715778.129	46656	1688.138	2160.605	1	H2-1
3	MH3	L3X3X4	0.674	0	38	0.106	84	z	3115778.129	46656	1688.138	2160.605	1	H2-1
4	MP10	PIPE 2.0	0.536	57	6	0.097	21	12	14916.096	32130	1871.625	1871.625	1.823	H1-1b
5	MP2	PIPE 2.0	0.535	57	2	0.097	21	8	14916.096	32130	1871.625	1871.625	2.129	H1-1b



Company : Infinigy Engineering, PLLC
 Designer : AG
 Job Number : 1039-Z0001-B
 Model Name : 876392

7/16/2021
 12:51:28 PM
 Checked By : _____

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

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
6	MP6	PIPE 2.0	0.535	57	10	0.094	21	4			14916.096	32130	1871.625	1871.625	1.833	H1-1b
7	M49	L2.5x2.5x3	0.388	0	8	0.086	16.856	y	3		27191.718	29192.4	872.574	1971.83	1.5	H2-1
8	M11	LL3x3x4x0	0.384	47	37	0.067	29.865	y	29		76373.943	93312	6480	4360.702	2.151	H1-1b
9	M4	LL3x3x4x0	0.383	47	33	0.066	29.865	y	37		76373.943	93312	6480	4360.702	2.138	H1-1b
10	M5	LL3x3x4x0	0.381	47	28	0.067	29.865	y	33		76373.943	93312	6480	4360.702	2.075	H1-1b
11	M48	L2.5x2.5x3	0.38	0	12	0.086	16.856	y	7		27191.718	29192.4	872.574	1971.83	1.5	H2-1
12	M47	L2.5x2.5x3	0.37	0	4	0.085	16.856	y	11		27191.718	29192.4	872.574	1971.83	1.5	H2-1
13	MS2	C4x5x4x0.4375	0.369	0	31	0.091	10.271	y	13		154033.99	172054.109	14060.936	26608.316	3	H1-1b
14	MS1	C4x5x4x0.4375	0.368	0	28	0.091	10.271	y	9		154033.99	172054.109	14060.936	26608.316	3	H1-1b
15	MS3	C4x5x4x0.4375	0.359	0	35	0.077	10.271	y	5		154033.99	172054.109	14060.936	26608.316	3	H1-1b
16	MK1	L2.5x2.5x3	0.28	38.511	27	0.003	75.45	z	36		8306.98	29192.4	872.574	1507.336	1.136	H2-1
17	MK6	L2.5x2.5x3	0.28	38.511	35	0.003	75.45	z	36		8306.98	29192.4	872.574	1507.336	1.136	H2-1
18	MK4	L2.5x2.5x3	0.279	38.511	31	0.003	75.45	z	36		8306.98	29192.4	872.574	1507.336	1.136	H2-1
19	MK2	L2.5x2.5x3	0.279	38.511	38	0.003	75.45	y	36		8306.98	29192.4	872.574	1507.336	1.136	H2-1
20	MK5	L2.5x2.5x3	0.279	38.511	34	0.003	75.45	y	36		8306.98	29192.4	872.574	1507.336	1.136	H2-1
21	MK3	L2.5x2.5x3	0.278	38.511	30	0.003	75.45	y	36		8306.98	29192.4	872.574	1507.336	1.136	H2-1
22	MR2	PIPE 2.0	0.266	87	5	0.219	29	4			17855.085	32130	1871.625	1871.625	1	H1-1b
23	MR3	PIPE 2.0	0.264	87	9	0.223	29	8			17855.085	32130	1871.625	1871.625	1	H1-1b
24	MR1	PIPE 2.0	0.26	87	13	0.219	29	12			17855.085	32130	1871.625	1871.625	1	H1-1b
25	MP5	PIPE 2.0	0.26	44.688	31	0.14	44.688	10			22356.067	32130	1871.625	1871.625	2.273	H1-1b
26	MP9	PIPE 2.0	0.256	44.688	27	0.138	44.688	5			22356.067	32130	1871.625	1871.625	2.449	H1-1b
27	MP12	PIPE 2.0	0.254	44.688	35	0.152	9.625	12			22356.067	32130	1871.625	1871.625	2.436	H1-1b
28	MP1	PIPE 2.0	0.253	44.688	35	0.139	44.688	13			22356.067	32130	1871.625	1871.625	2.417	H1-1b
29	MP8	PIPE 2.0	0.252	44.688	27	0.149	9.625	4			22356.067	32130	1871.625	1871.625	2.457	H1-1b
30	MP4	PIPE 2.0	0.247	44.688	31	0.151	9.625	8			22356.067	32130	1871.625	1871.625	2.391	H1-1b
31	MP11	PIPE 2.0	0.233	45	9	0.143	45	11			23808.54	32130	1871.625	1871.625	1.572	H1-1b
32	MP7	PIPE 2.0	0.232	45	13	0.137	45	3			23808.54	32130	1871.625	1871.625	1.648	H1-1b
33	MP3	PIPE 2.0	0.216	45	5	0.141	45	7			23808.54	32130	1871.625	1871.625	1.544	H1-1b
34	MH6	L3X3X4	0.184	43.297	16	0.015	43.297	Z	28		14847.125	46656	1688.138	3193.443	1.386	H2-1
35	MH5	L3X3X4	0.176	43.297	20	0.015	43.297	Z	38		14847.125	46656	1688.138	3201.846	1.401	H2-1
36	MH2	L3X3X4	0.169	43.297	16	0.015	43.297	Z	30		14847.125	46656	1688.138	3174.732	1.355	H2-1

APPENDIX D
ADDITIONAL CALCUATIONS

Bolt Calculation Tool, V1.4

PROJECT DATA	
Site Name:	NEW HARTFORD / EXECUTIVE GREEN
Site Number:	876392
Job Code:	1039-Z0001-B
Connection Description:	Standoff to Tower

APPLIED LOADS		
Bolt Tension:	13483.64	lbs
Bolt Shear:	1797.10	lbs

BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	1	in
Bolt Grade:	A325	-
# of Bolts:	2	-
Threads Excluded?	No	-

BOLT CHECK		
Tensile Strength	54516.96	
Shear Strength	35342.92	
Tensile Usage	24.7%	
Shear Usage	5.1%	
Interaction Check	0.06	≤1.05
Result	Pass	



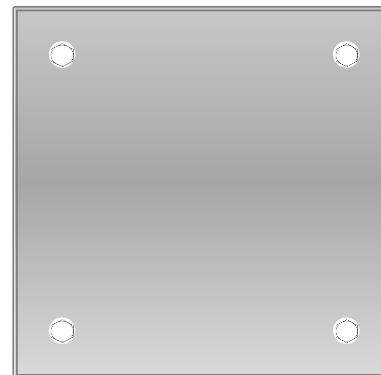
Bolt Calculation Tool, V1.4

PROJECT DATA	
Site Name:	NEW HARTFORD / EXECUTIVE GREEN
Site Number:	876392
Job Code:	1039-Z0001-B
Connection Description:	Kicker to Collar

APPLIED LOADS		
Bolt Tension:	0.00	lbs
Bolt Shear:	550.92	lbs

BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	0.625	in
Bolt Grade:	A325	-
# of Bolts:	4	-
Threads Excluded?	No	-

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Tensile Usage	0.0%	
Shear Usage	4.0%	
Interaction Check	0.00	≤1.05
Result	Pass	



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

T-Mobile Existing Facility

Site ID: CTHA853A

876359

954 Norwich Road
Plainfield, Connecticut 06062

October 5, 2021

EBI Project Number: 6221005723

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	20.73%

October 5, 2021

T-Mobile

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

Emissions Analysis for Site: CTHA853A - 876359

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **954 Norwich Road in Plainfield, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 954 Norwich Road in Plainfield, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 7) 1 LTE Traffic channel (LTE IC and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.
- 8) 1 LTE Broadcast channel (LTE IC and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.
- 9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.
- 11) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 12) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 13) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied

specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 14) The antenna mounting height centerline of the proposed antennas is 130 feet above ground level (AGL).
- 15) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 16) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43- U-NA20	Make / Model:	RFS APXVAALL24_43- U-NA20	Make / Model:	RFS APXVAALL24_43- U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Channel Count:	13	Channel Count:	13	Channel Count:	13
Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts
ERP (W):	17,868.72	ERP (W):	17,868.72	ERP (W):	17,868.72
Antenna A1 MPE %:	5.52%	Antenna B1 MPE %:	5.52%	Antenna C1 MPE %:	5.52%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A2 MPE %:	8.50%	Antenna B2 MPE %:	8.50%	Antenna C2 MPE %:	8.50%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	14.02%
AT&T	6.71%
Site Total MPE % :	20.73%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	14.02%
T-Mobile Sector B Total:	14.02%
T-Mobile Sector C Total:	14.02%
Site Total MPE % :	20.73%

T-Mobile Maximum MPE Power Values (Sector A)							
T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 600 MHz LTE	2	591.73	130.0	2.77	600 MHz LTE	400	0.69%
T-Mobile 600 MHz NR	1	1577.94	130.0	3.69	600 MHz NR	400	0.92%
T-Mobile 700 MHz LTE	2	695.22	130.0	3.25	700 MHz LTE	467	0.70%
T-Mobile 1900 MHz GSM	4	1052.26	130.0	9.84	1900 MHz GSM	1000	0.98%
T-Mobile 1900 MHz LTE	2	2104.51	130.0	9.84	1900 MHz LTE	1000	0.98%
T-Mobile 2100 MHz LTE	2	2649.42	130.0	12.39	2100 MHz LTE	1000	1.24%
T-Mobile 2500 MHz LTE IC & 2C Traffic	1	11044.63	130.0	25.82	2500 MHz LTE IC & 2C Traffic	1000	2.58%
T-Mobile 2500 MHz LTE IC & 2C Broadcast	1	1074.06	130.0	2.51	2500 MHz LTE IC & 2C Broadcast	1000	0.25%
T-Mobile 2500 MHz NR Traffic	1	22089.26	130.0	51.65	2500 MHz NR Traffic	1000	5.16%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	130.0	5.02	2500 MHz NR Broadcast	1000	0.50%
						Total:	14.02%

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	14.02%
Sector B:	14.02%
Sector C:	14.02%
T-Mobile Maximum MPE % (Sector A):	14.02%
Site Total:	20.73%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **20.73%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

T-Mobile

T-MOBILE SITE NUMBER: CTHA853A

T-MOBILE SITE NAME: CTHA853A_CROWN_876359_NORWICH

SITE TYPE: MONOPOLE

TOWER HEIGHT: 130'-0"

BUSINESS UNIT #: 876359

**SITE ADDRESS: 954 NORWICH ROAD
PLAINFIELD, CT 06062**

COUNTY: WINDHAM

JURISDICTION: CONNECTICUT SITING COUNCIL

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67E5A998E 6160

T-Mobile

35 GRIFFIN ROAD
BLOOMFIELD, CT 06002



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



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

**T-MOBILE SITE NUMBER:
CTHA853A**

**BU #: 876359
NORWICH**

954 NORWICH ROAD
PLAINFIELD, CT 06062

EXISTING
130'-0" MONOPOLE

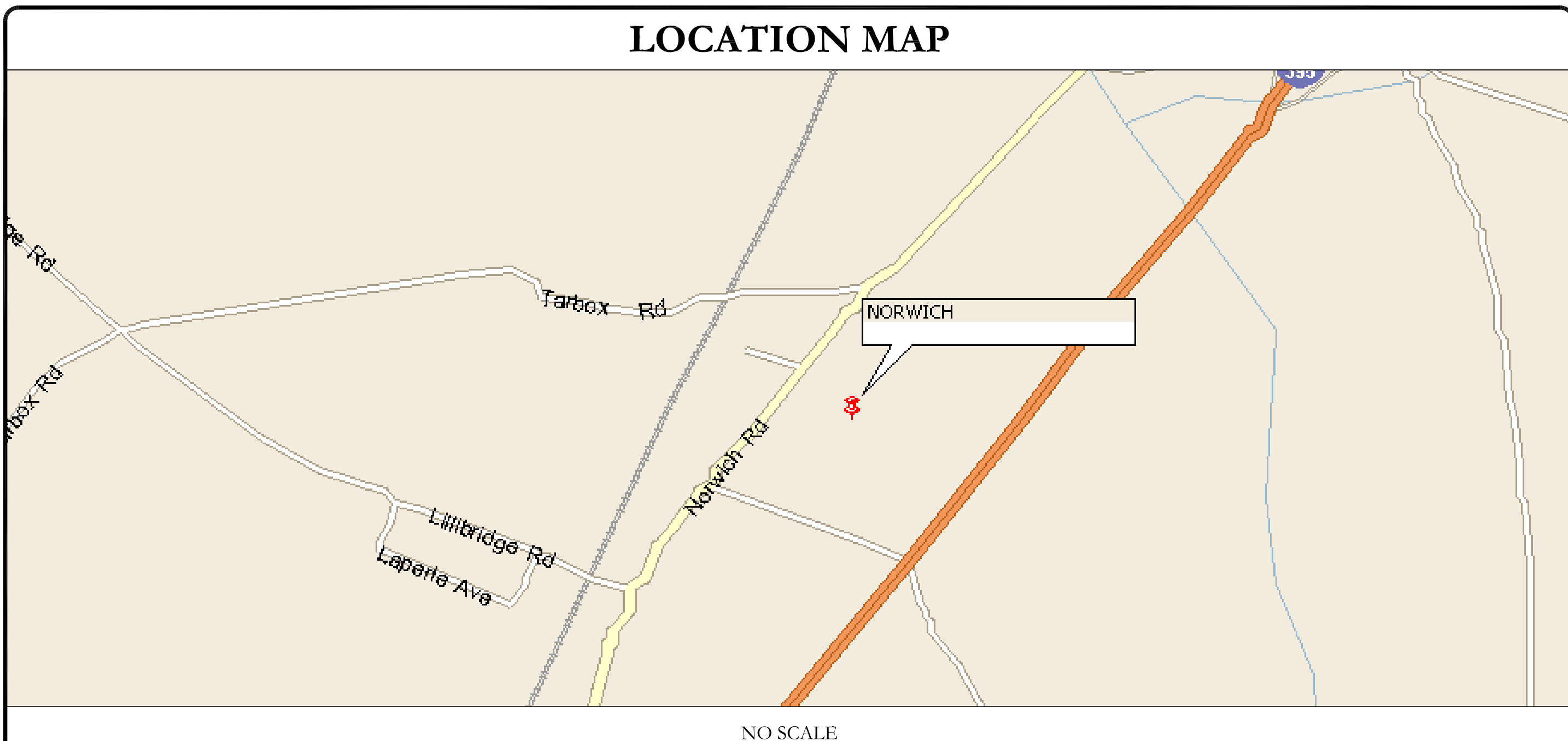
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/10/21	JTS	CONSTRUCTION	MTJ
1	9/3/21	MA/AY	CONSTRUCTION	JHW
2	9/16/21	KT	CONSTRUCTION	KT

SITE INFORMATION	
CROWN CASTLE USA INC. SITE NAME:	NORWICH
SITE ADDRESS:	954 NORWICH ROAD PLAINFIELD, CT 06062
COUNTY:	WINDHAM
MAP/PARCEL #:	010-013B-0015
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.658739°
LONGITUDE:	-71.924931°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	187 FT
CURRENT ZONING:	COMM (COMMERCIAL)
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:	CAYA ENTERPRISES LLC 306 KENYON RD HAMPTON, CT 06247
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	NOT AVAILABLE
TELCO PROVIDER:	NOT AVAILABLE

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

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



PROJECT TEAM	
A&E FIRM:	B+T GROUP 1717 S. BOULDER AVE. TULSA, OK 74119 MARVIN PHILLIPS marvin.phillips@btgrp.com
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065

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

PROJECT DESCRIPTION	
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.	
TOWER SCOPE OF WORK: <ul style="list-style-type: none"> REMOVE (6) ANTENNAS REMOVE (12) RADIOS REMOVE (3) HYBRID CABLES (1-1/4") REMOVE (1) HYBRID CABLE (7/8") INSTALL (6) ANTENNAS INSTALL (6) RADIOS INSTALL (3) HYBRID CABLES (6X24) REPLACE MOUNT PIPES PER MOUNT ANALYSIS BY GPD DATED AUGUST 30, 2021 	
GROUND SCOPE OF WORK: <ul style="list-style-type: none"> REMOVE (1) SPRINT EQUIPMENT CABINET REMOVE (1) SPRINT BATTERY CABINET REMOVE (1) EXISTING STEEL PLINTH INSTALL (1) 6160 SITE SUPPORT CABINET INSTALL (1) B160 BATTERY CABINET INSTALL (3) BB 6648 INSTALL (1) DUG20 INSTALL (1) RBS 6601 INSTALL (1) PSU 4813 VOLTAGE BOOSTER INSTALL (1) CSR IXRE V2 (GEN 2) TRANSPORT SYSTEM 	
NOTE: THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.	

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 WITH AMENDMENTS
MECHANICAL	2015 IMC WITH AMENDMENTS
ELECTRICAL	2017 NEC
REFERENCE DOCUMENTS:	
STRUCTURAL ANALYSIS:	MORRISON HERSHFIELD
DATED:	9/07/2021
MOUNT ANALYSIS:	GPD
DATED:	8/30/2021
AC ELECTRICAL POWER DESIGN:	BY OTHERS
DATED:	
RFDS REVISION:	1
DATED:	7/9/21
ORDER ID:	538769
REVISION:	2

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.

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

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: 2
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79791.004.01_NORWICH.dwg - SheetT-1 - User: Kevin.Turkoll - Sep 16, 2021 - 1:29pm

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

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 GROUNDING 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 ANTI-OXIDANT 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 (WFF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS: #4 BARS AND SMALLER.....40 ksi #5 BARS AND LARGER.....60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS: CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.....3" CONCRETE EXPOSED TO EARTH OR WEATHER: #6 BARS AND LARGER.....2" #5 BARS AND SMALLER.....1-1/2" CONCRETE NOT EXPOSED TO EARTH OR WEATHER: SLAB AND WALLS.....3/4" BEAMS AND COLUMNS.....1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- 1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. 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 THE 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/IEEC AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET WORK FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIEMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKOUT 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 table with columns: SYSTEM, CONDUCTOR, COLOR. Rows include 120/240V, 10; 120/208V, 30; 277/480V, 30; and DC VOLTAGE.

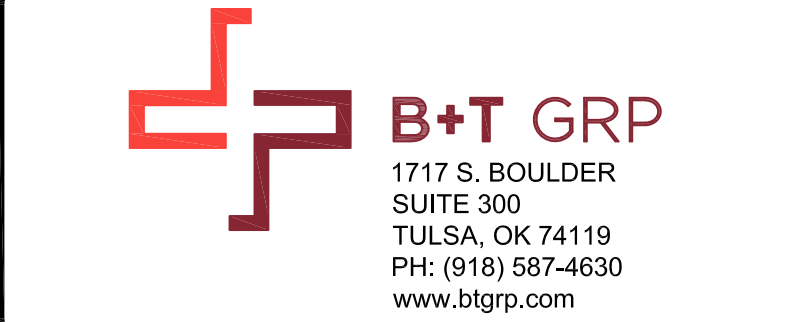
APWA UNIFORM COLOR CODE:

- WHITE PROPOSED EXCAVATION
PINK TEMPORARY SURVEY MARKINGS
RED ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE POTABLE WATER
PURPLE RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN SEWERS AND DRAIN LINES

* 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



T-MOBILE SITE NUMBER: CTHA853A
BU #: 876359 NORWICH
954 NORWICH ROAD PLAINFIELD, CT 06062
EXISTING 130'-0" MONOPOLE

ISSUED FOR: table with columns: REV, DATE, DRWN, DESCRIPTION, DES./QA. Rows show revision history for construction.

Professional Engineer seal for B&T ENGINEERING, INC. License No. 25924, expires 2/10/22. Includes text: 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-2 REVISION: 2

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



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 BLOOMFIELD, CT 06002

CROWN CASTLE

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

B+T GRP

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

T-MOBILE SITE NUMBER:
CTHA853A

BU #: 876359
NORWICH

954 NORWICH ROAD
 PLAINFIELD, CT 06062

EXISTING
 130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/10/21	JTS	CONSTRUCTION	MTJ
1	9/3/21	MA/AY	CONSTRUCTION	JHW
2	9/16/21	KT	CONSTRUCTION	KT

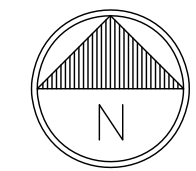
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SHEET NUMBER:
C-1.1

REVISION:
2

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



79791.004.01_NORWICH.dwg - Sheet: C-1.1 - User: kevin.turkoll - Sep 16, 2021 - 1:25pm

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

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EXISTING
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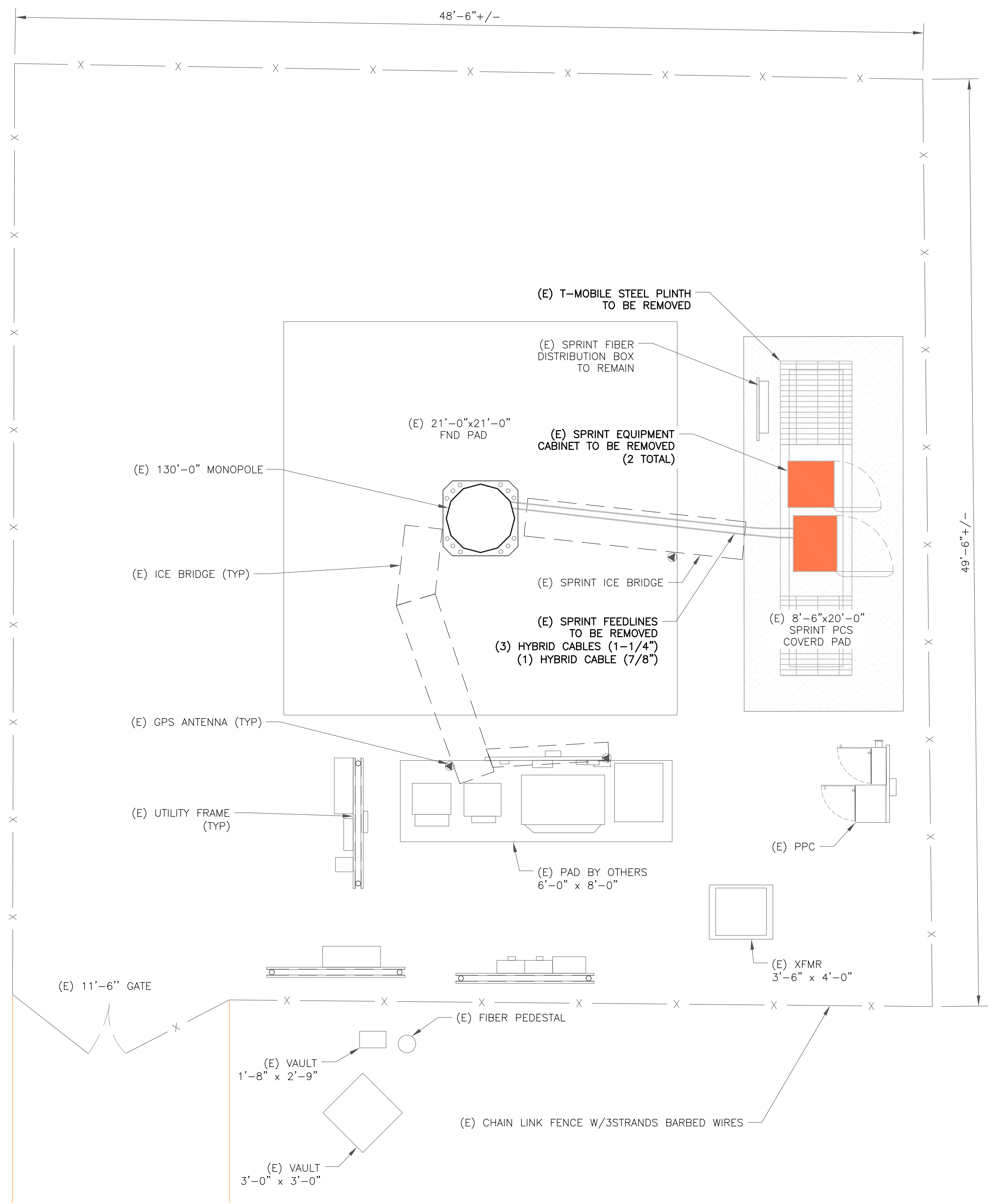
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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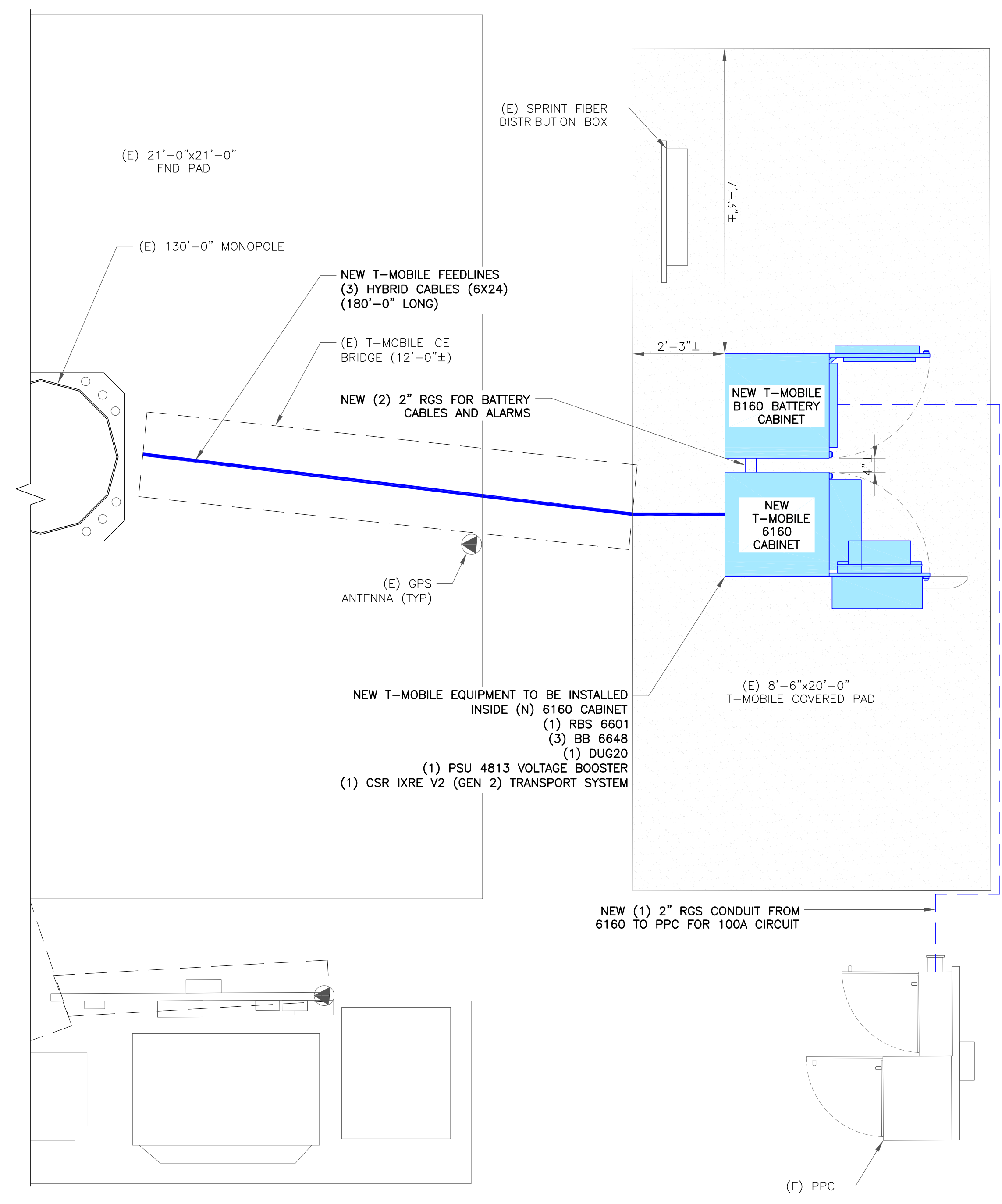
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SHEET NUMBER: C-1.2
REVISION: 2

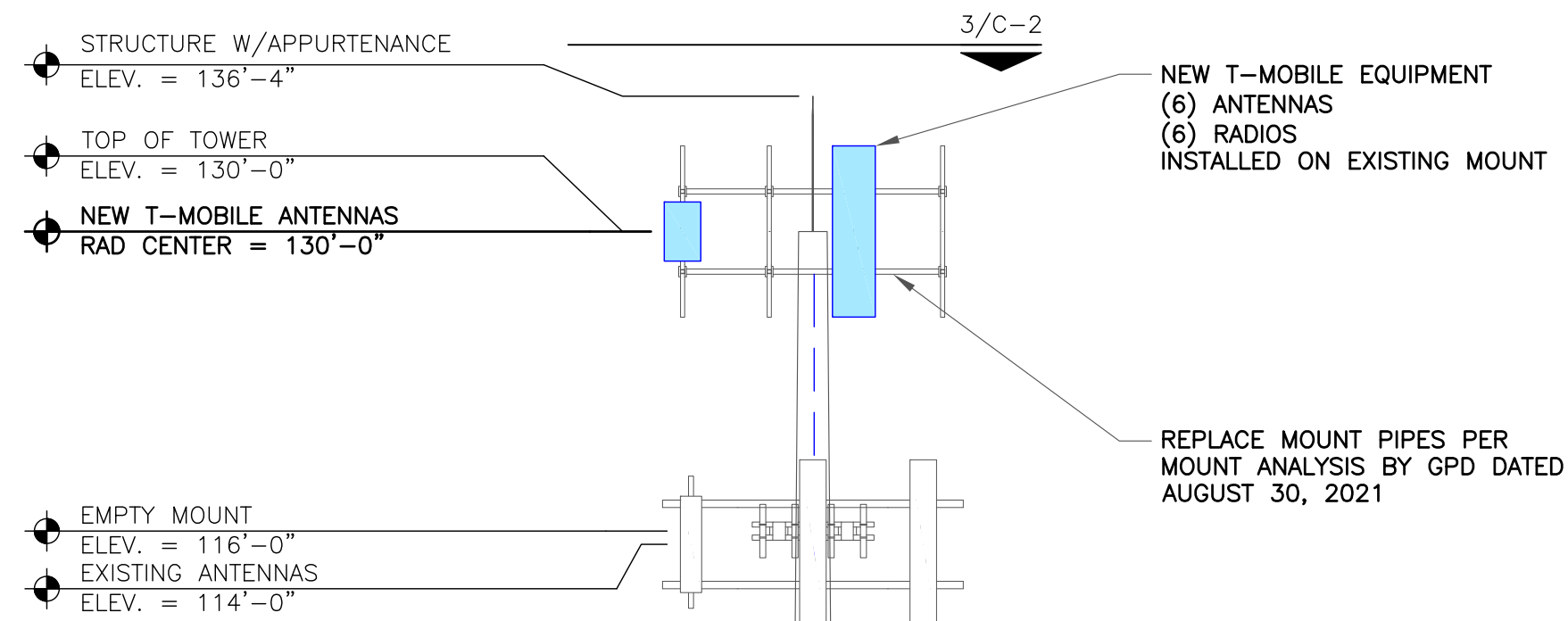


1 SITE PLAN
 SCALE: 1/4"=1'-0" (FULL SIZE)
 1/8"=1'-0" (11x17)



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

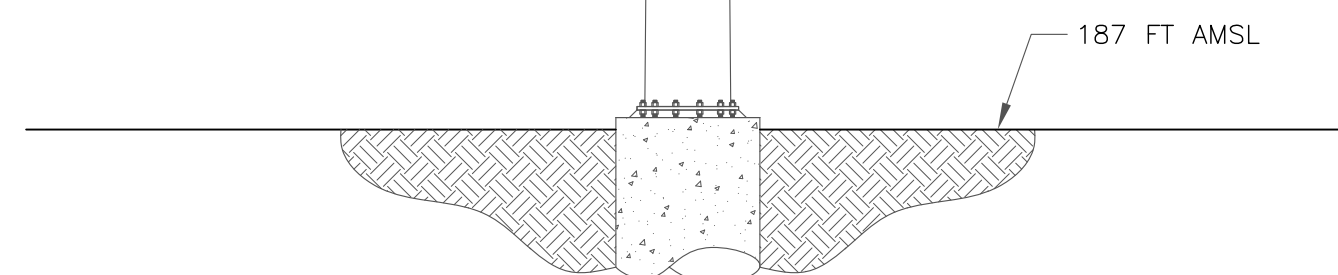
79791.004.01_NORWICH.dwg - Sheet: C-1.2 - User: kevin.turkoll - Sep. 16, 2021 - 1:25pm



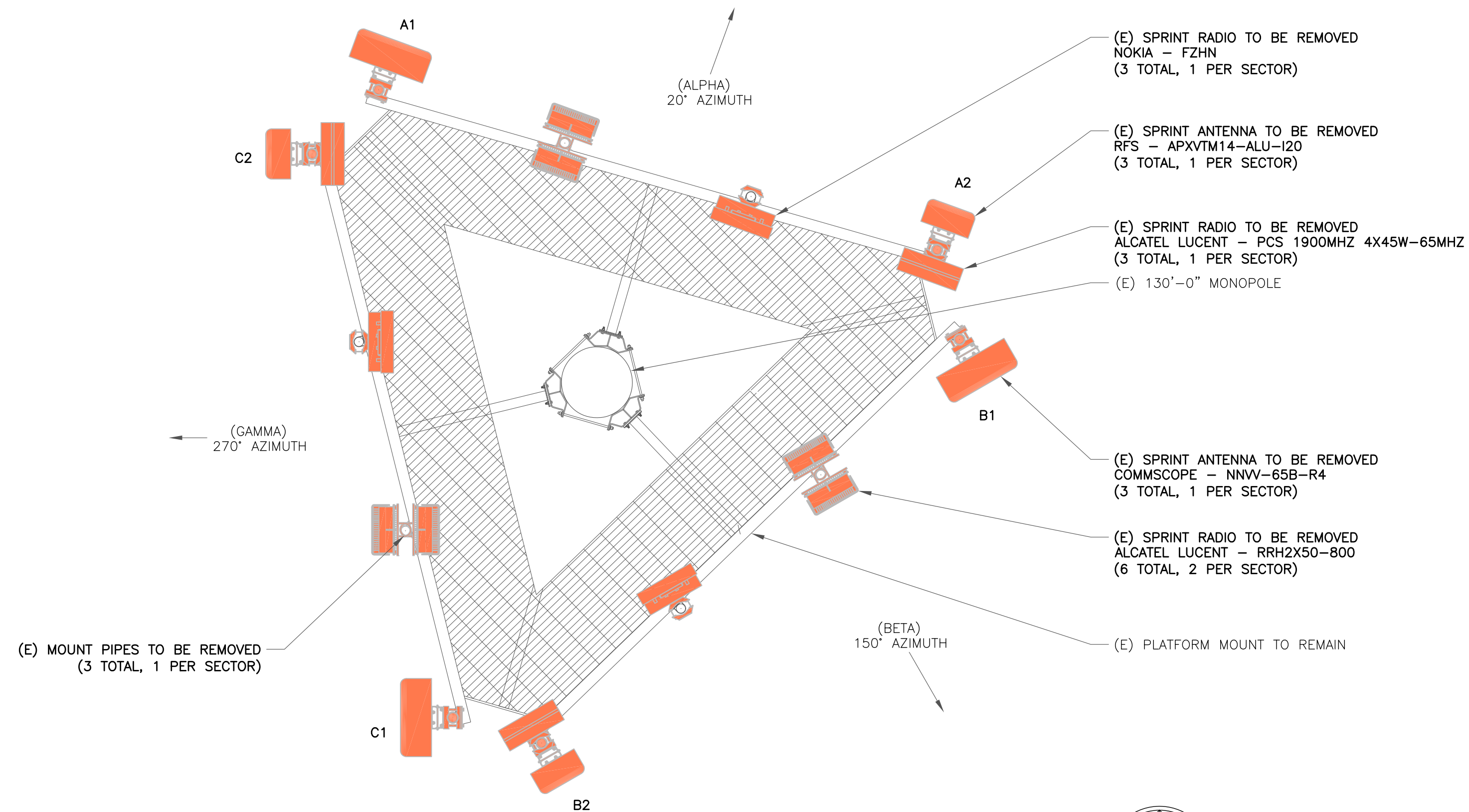
T-MOBILE EQUIPMENT

ANTENNA CL: 130'-0"
MOUNT CL: 130'-0"

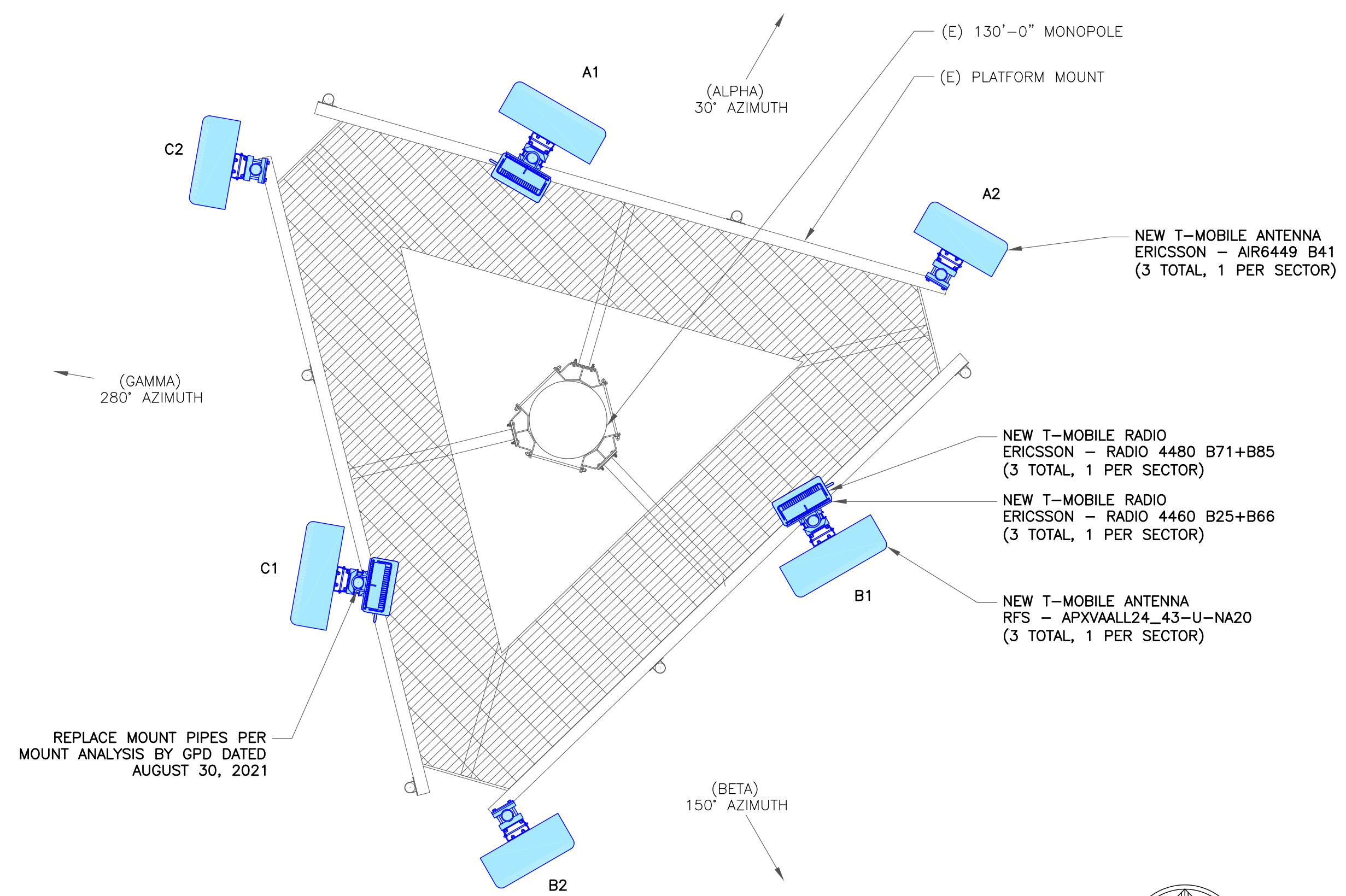
ANY AND ALL TOWER
MOUNTED EQUIPMENT MUST
NOT TRAP OR INTERFERE W/
EXISTING SAFETY CLIMB



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE



35 GRIFFIN ROAD
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T-MOBILE SITE NUMBER:
CTHA853A

BU #: 876359
NORWICH

954 NORWICH ROAD
PLAINFIELD, CT 06062

EXISTING
130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/10/21	JTS	CONSTRUCTION	MTJ
1	9/3/21	MA/AY	CONSTRUCTION	JHW
2	9/16/21	KT	CONSTRUCTION	KT



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SHEET NUMBER:

C-2

REVISION:

2

T-MOBILE SITE NUMBER:
CTHA853A

BU #: **876359**
NORWICH

954 NORWICH ROAD
PLAINFIELD, CT 06062

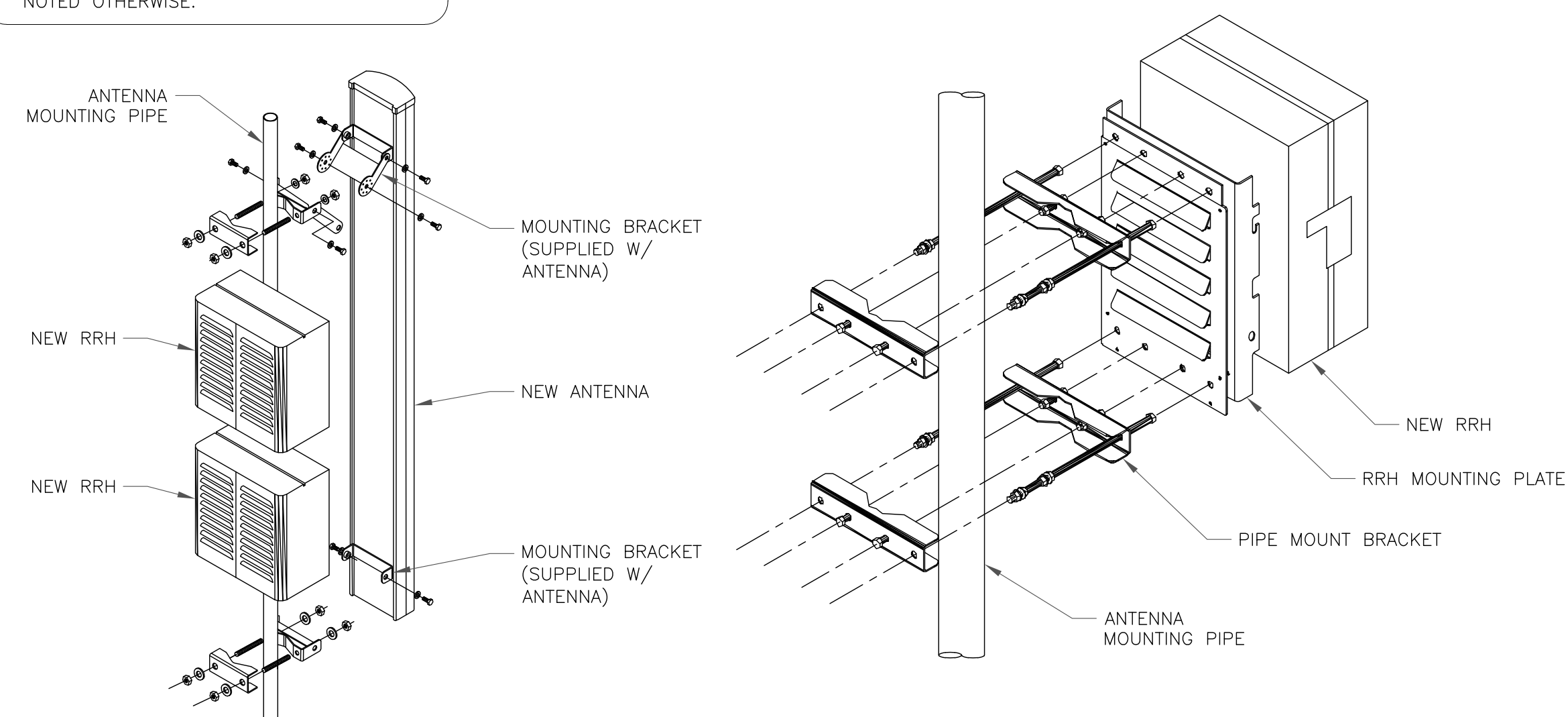
EXISTING
130'-0" MONOPOLE

RF SYSTEM SCHEDULE										
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A1	L700/L600/N600/ L2100/L1900/ G1900	RFS	APXVAALL24_43-U-NA20	30°	0°	2°/2°/2°/2°	130'-0"	(1) 4480 B71+B85 (1) 4460 B25+B66	(1) HYBRID (6X24)
	A2	L2500/N2500	ERICSSON	AIR6449 B41	30°	0°	2°/2°	130'-0"	-	-
BETA	B1	L700/L600/N600/ L2100/L1900/ G1900	RFS	APXVAALL24_43-U-NA20	150°	0°	2°/2°/2°/2°	130'-0"	(1) 4480 B71+B85 (1) 4460 B25+B66	(1) HYBRID (6X24)
	B2	L2500/N2500	ERICSSON	AIR6449 B41	150°	0°	2°/2°	130'-0"	-	-
GAMMA	C1	L700/L600/ N600/L2100/ L1900/G1900	RFS	APXVAALL24_43-U-NA20	280°	0°	2°/2°/2°/2°	130'-0"	(1) 4480 B71+B85 (1) 4460 B25+B66	(1) HYBRID (6X24)
	C2	L2500/N2500	ERICSSON	AIR6449 B41	280°	0°	2°/2°	130'-0"	-	-

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/10/21	JTS	CONSTRUCTION	MTJ
1	9/3/21	MA/AY	CONSTRUCTION	JHW
2	9/16/21	KT	CONSTRUCTION	KT



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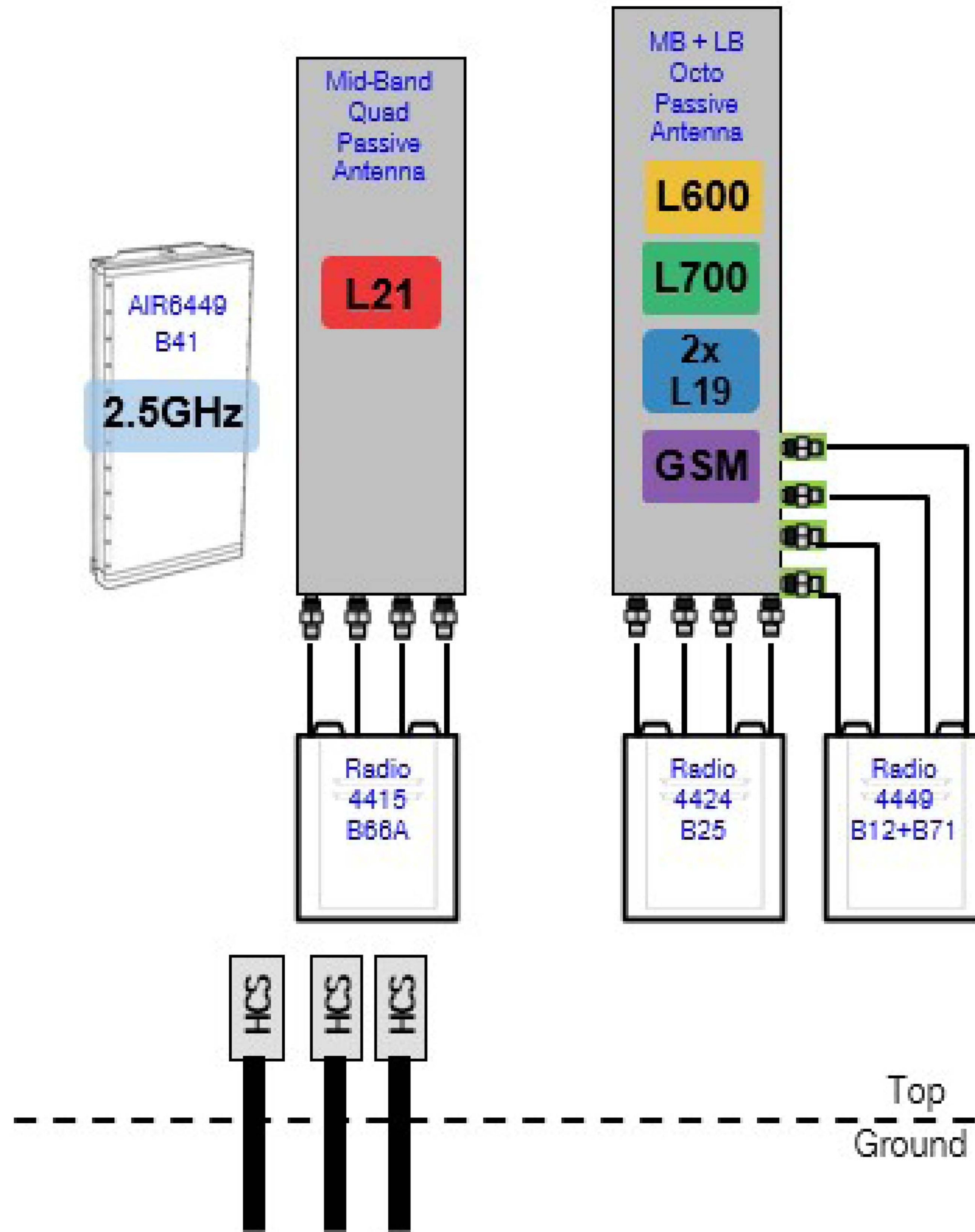
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SHEET NUMBER:

C-3

REVISION:

2



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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

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T-MOBILE SITE NUMBER:
CTHA853A

BU #: **876359**
NORWICH

954 NORWICH ROAD
PLAINFIELD, CT 06062

EXISTING
130'-0" MONOPOLE

ISSUED FOR:

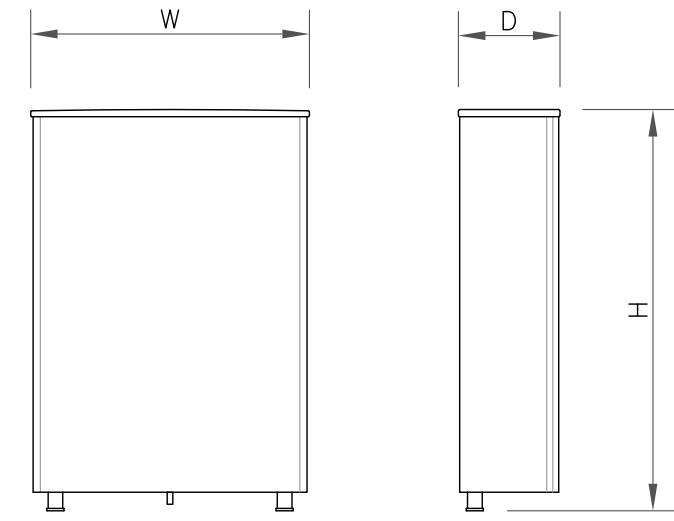
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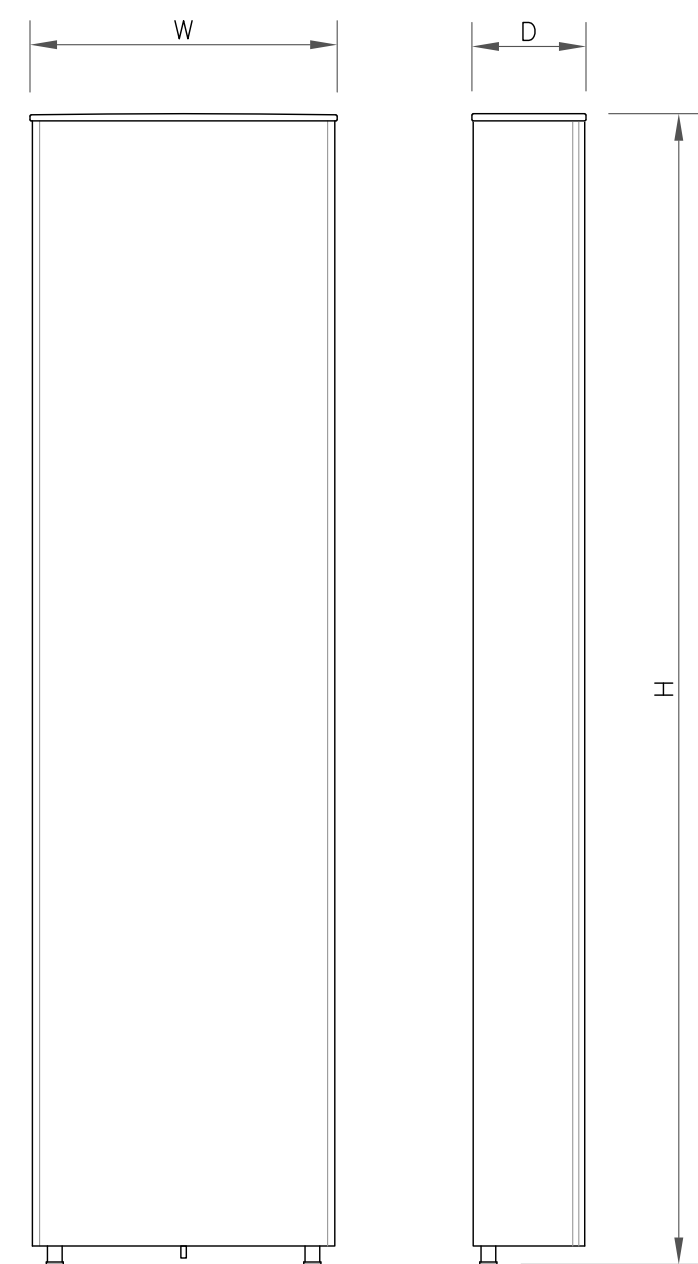
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SHEET NUMBER: **C-4** REVISION: **2**



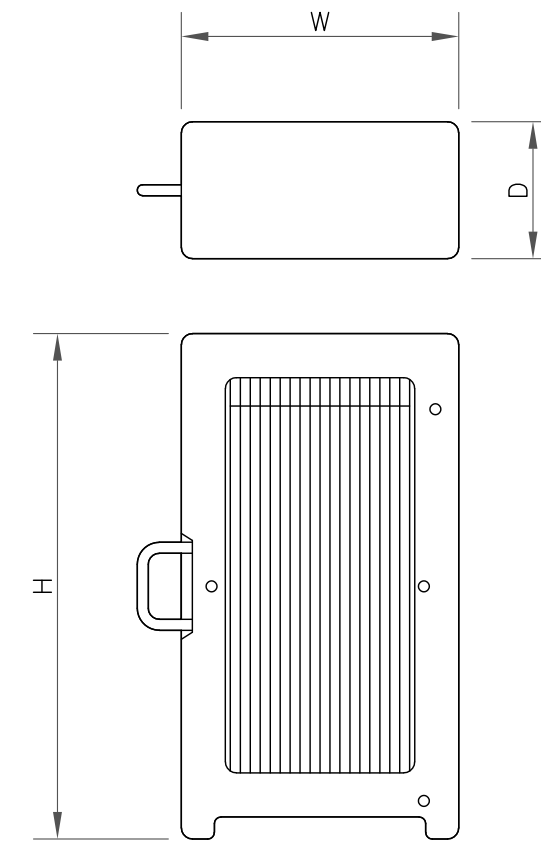
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6449 B41
WIDTH	20.51"
DEPTH	8.54"
HEIGHT	33.11"
WEIGHT	114.63 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



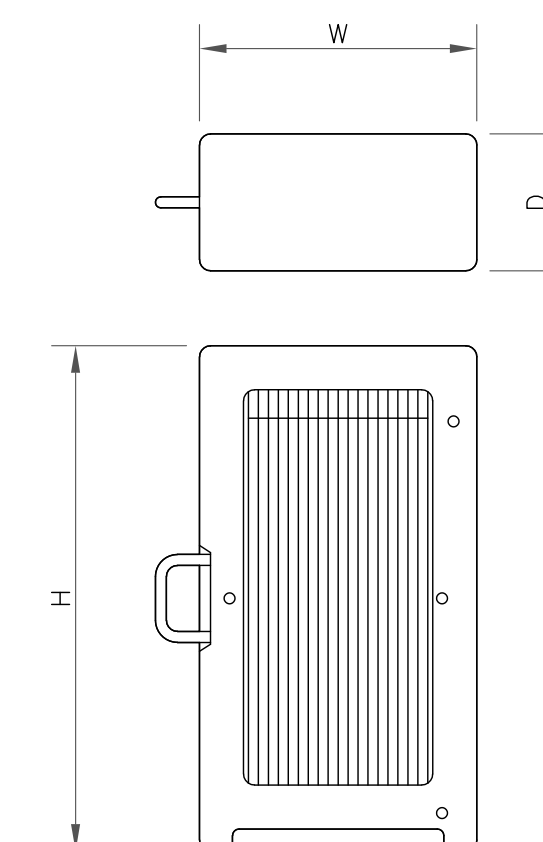
ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAALL24_43-U-NA20
WIDTH	24.00"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.90 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4480 B71+B85
WIDTH	15.7"
DEPTH	7.5"
HEIGHT	22.0"
WEIGHT	81.0 LBS

3 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4460 B25+B66
WIDTH	15.1"
DEPTH	11.9"
HEIGHT	17.0"
WEIGHT	109.0 LBS

4 RRU SPECS
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
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BU #: **876359**
NORWICH

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EXISTING
130'-0" MONOPOLE

ISSUED FOR:

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1	9/3/21	MA/AY	CONSTRUCTION	JHW
2	9/16/21	KT	CONSTRUCTION	KT



ERICSSON 6160 SSC
WEIGHT: 60.0 LBS
SIZE (HxWxD): 63"x25.6"x33.5" IN.



BATTERY CABINET SPECIFICATIONS	
MODEL #	B160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	26"
DEPTH	26"
WEIGHT	

6 ERICSSON B160 BATTERY CABINET
SCALE: NOT TO SCALE

5 ERICSSON 6160 SSC
SCALE: NOT TO SCALE

7 NOT USED
SCALE: NOT TO SCALE

8 NOT USED
SCALE: NOT TO SCALE



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SHEET NUMBER: **C-5** REVISION: **2**

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T-MOBILE SITE NUMBER:
CTHA853A

BU #: **876359**
NORWICH

954 NORWICH ROAD
PLAINFIELD, CT 06062

EXISTING
130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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E-1

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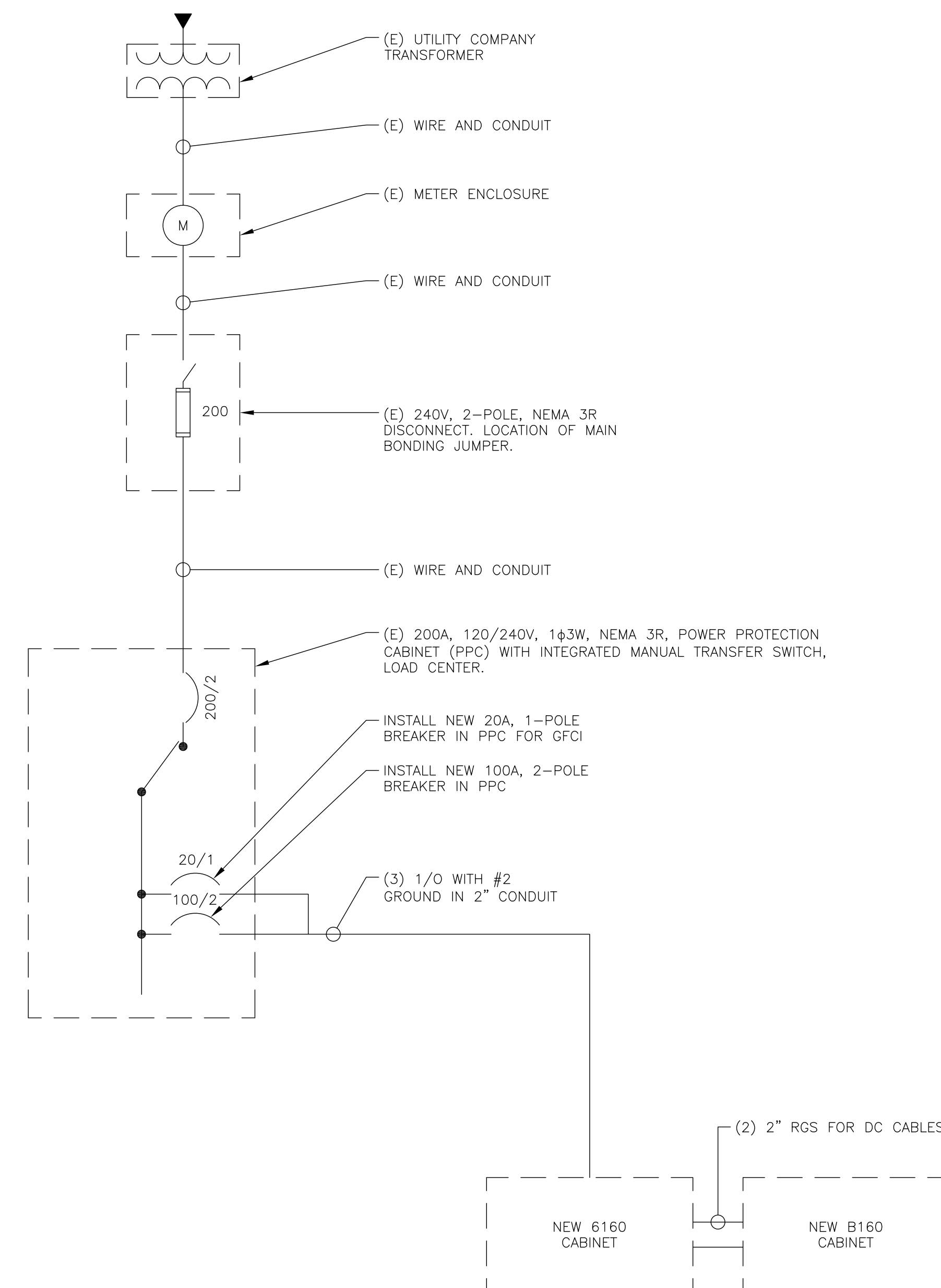
2

FINAL PANEL SCHEDULE										
LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD			
			L1	L2						
6160 CABINET	2	100A	1	2	60A	2	SURGE			
			3	4						
			5	6				20A	1	GFI (B160)
			7	8				10A	1	SPARE
			9	10	15A	1	N/A			
FAN	1	20A	11	12						

RATED VOLTAGE: 120/240 _____ 1 PHASE, 3 WIRE
 RATED AMPS: 100 200 400 _____
 MAIN LUGS ONLY MAIN 200 AMPS BREAKER FUSED SWITCH HINGED DOOR KEYPED DOOR LATCH
 FUSED CIRCUIT BREAKER BRANCH DEVICES _____ TO BE GFCI BREAKERS FULL NEUTRAL BUS GROUND BAR
 ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL

BRANCH POLES: 12 24 30 42
 CABINET: SURFACE FLUSH
 APPROVED MF'S: _____
 NEMA 1 3R 4X

REPLACE EXISTING BREAKER IN POSITION 1 AND 3 WITH A NEW 2P 100A BREAKER
 INSTALL NEW BREAKER IN POSITION 6 WITH A NEW 1P 20A BREAKER
 REPLACE EXISTING WIRES FOR NEW 6160 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #2G AWG. MINIMUM CONDUIT SIZE TO BE 2".
 IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL Q012040M200RB (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



NOTES:

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

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

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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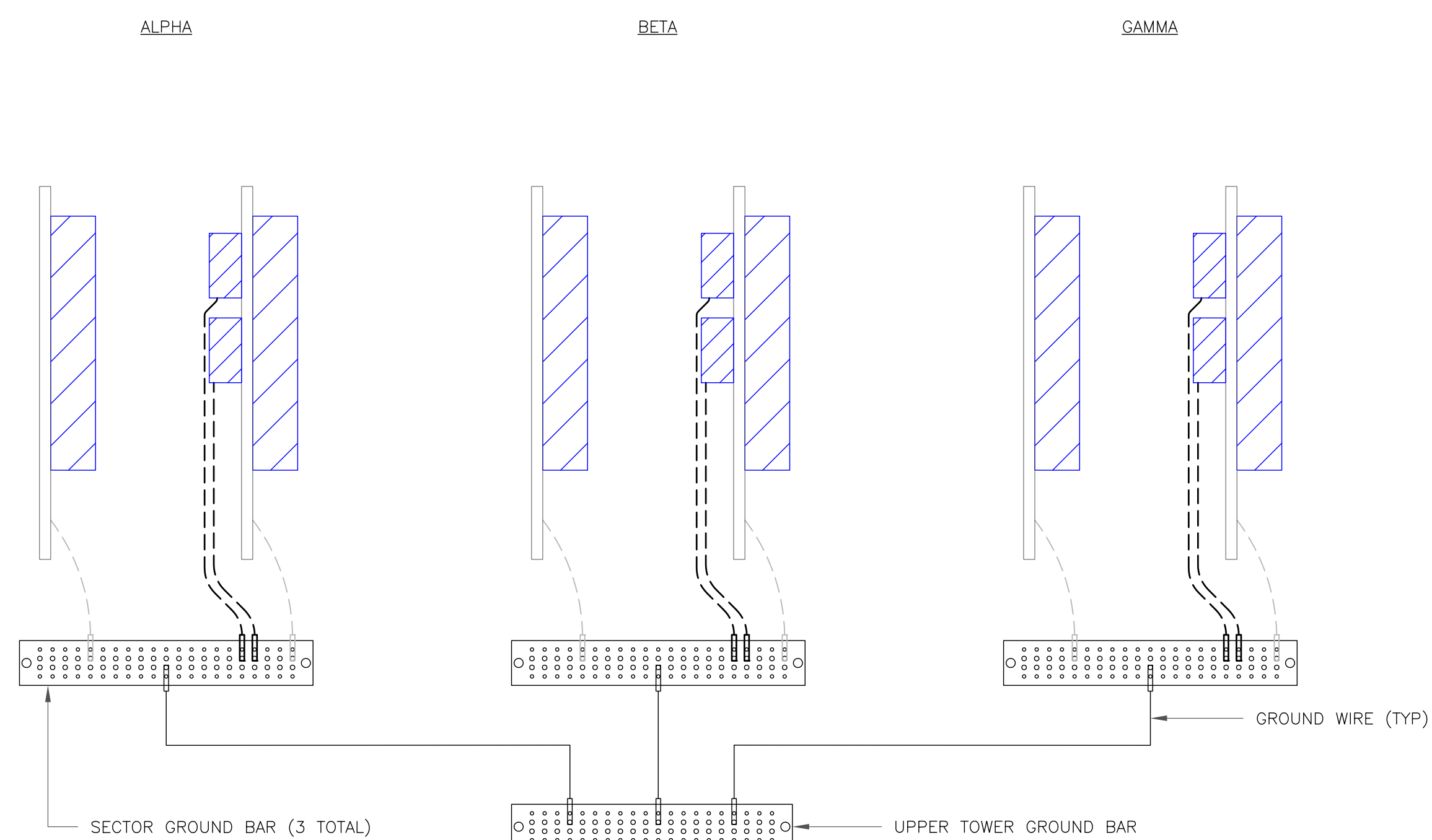
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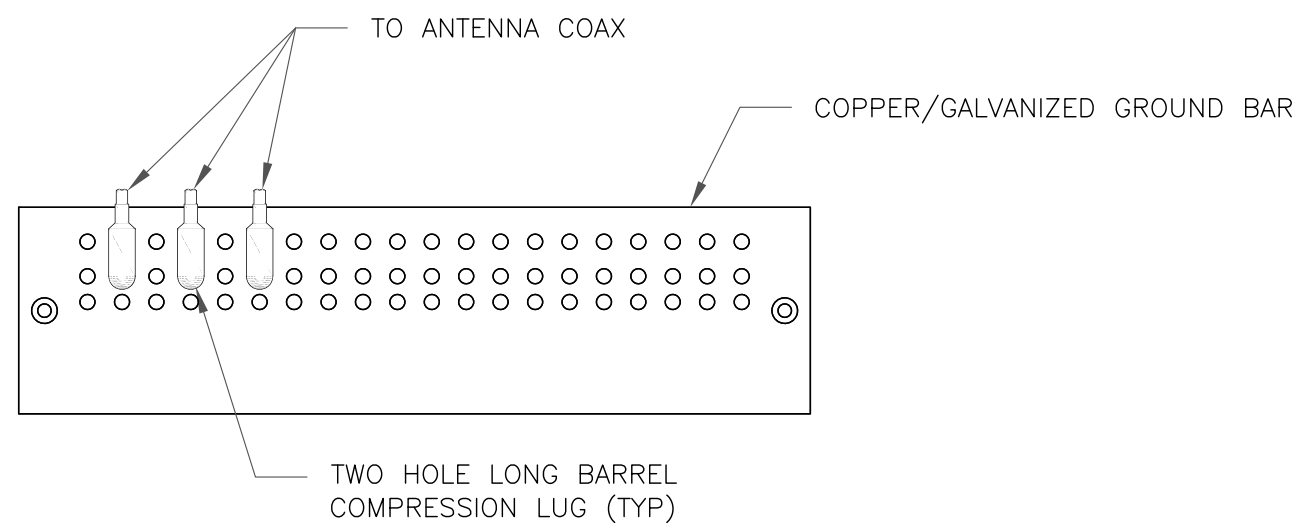
REVISION:

2



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

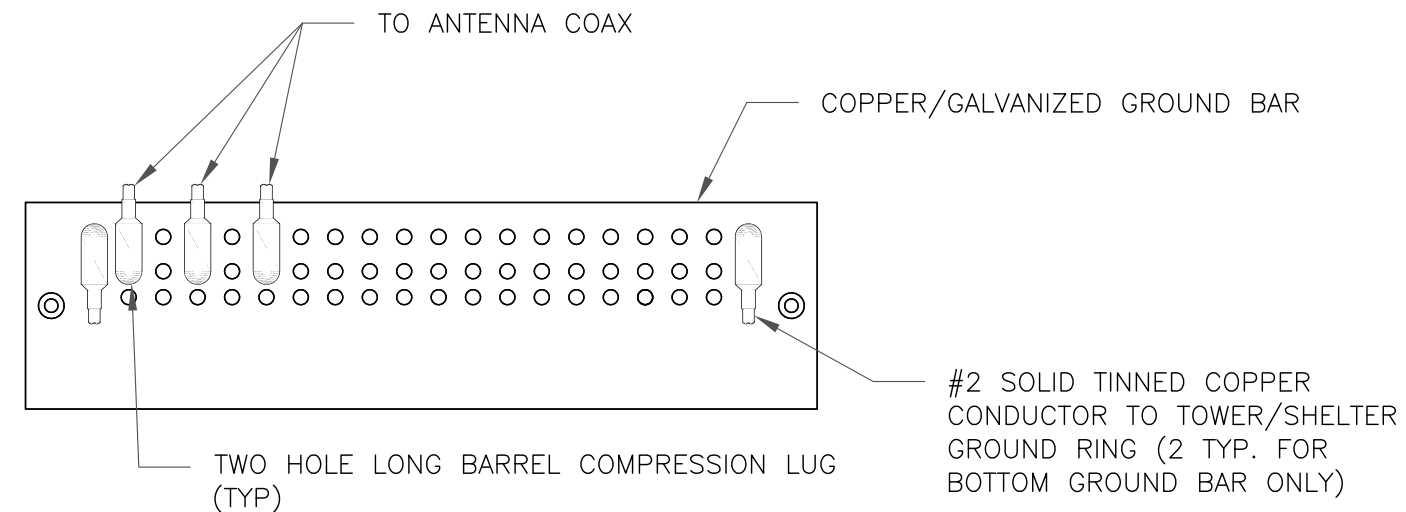
1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE



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.

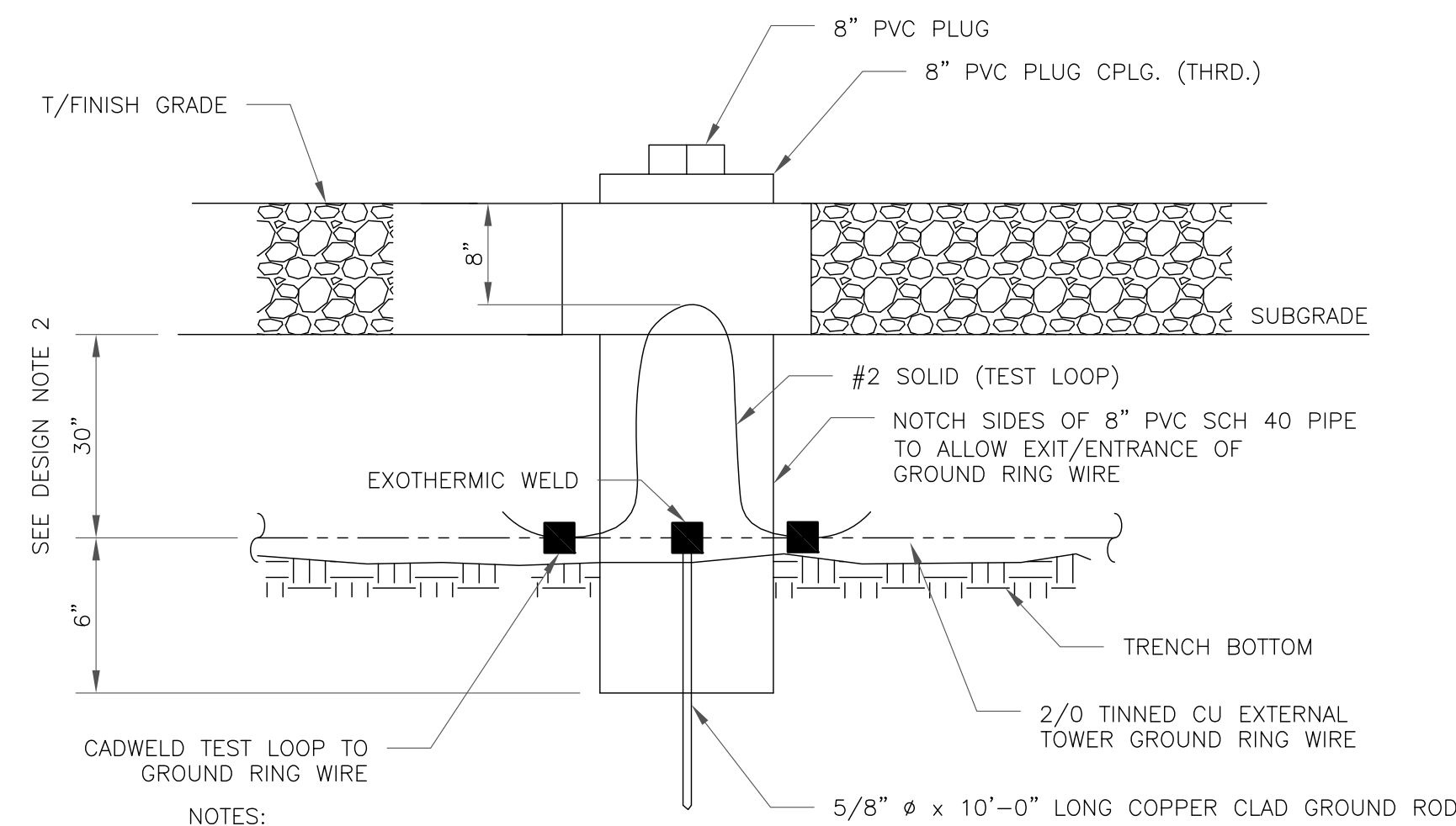
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



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.

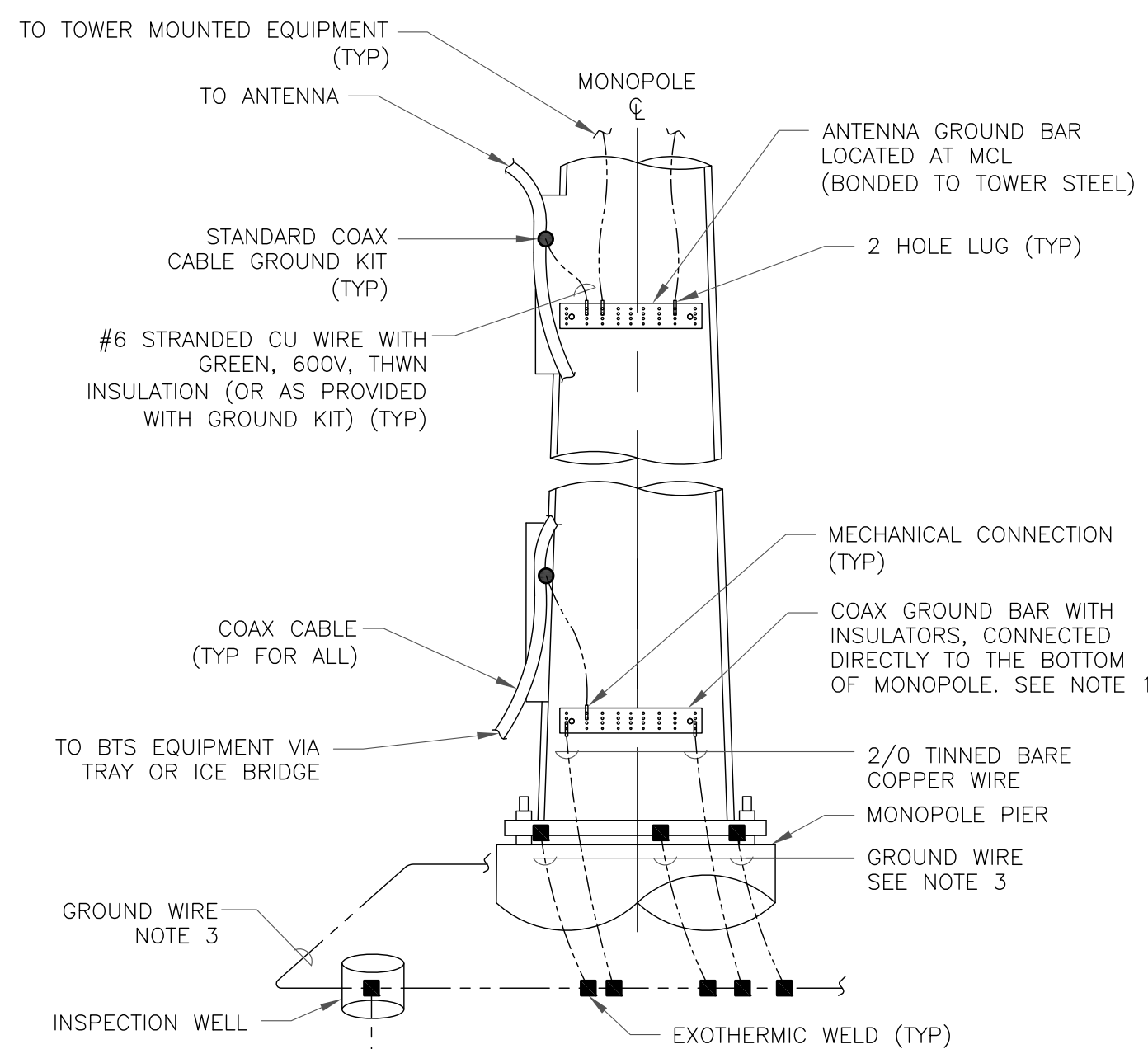
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



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).

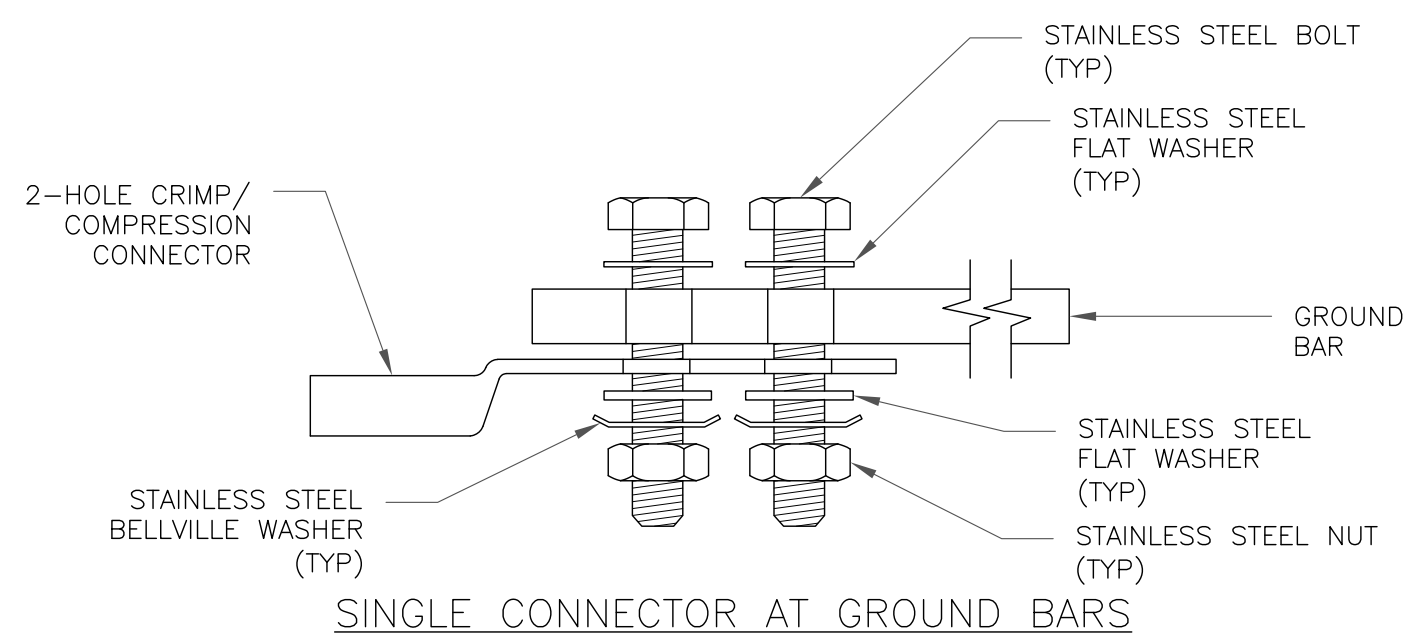
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



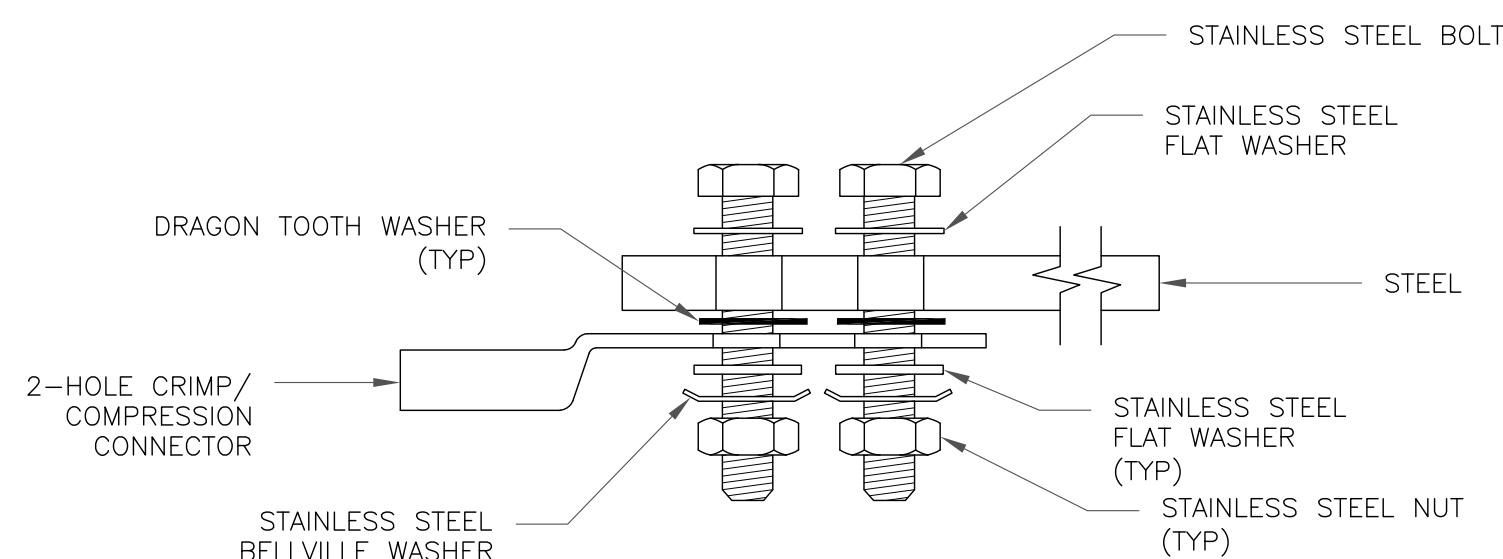
NOTES:

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.

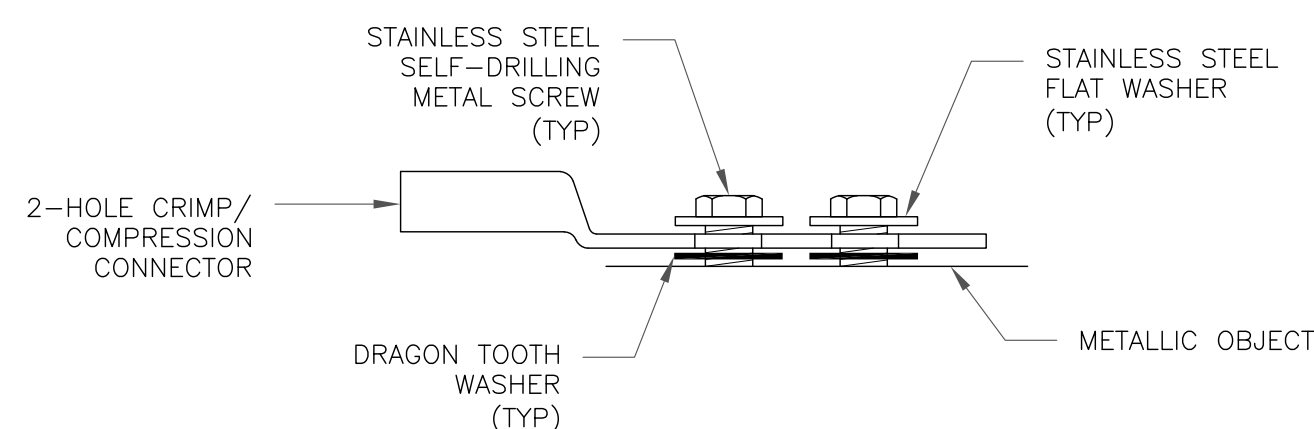
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

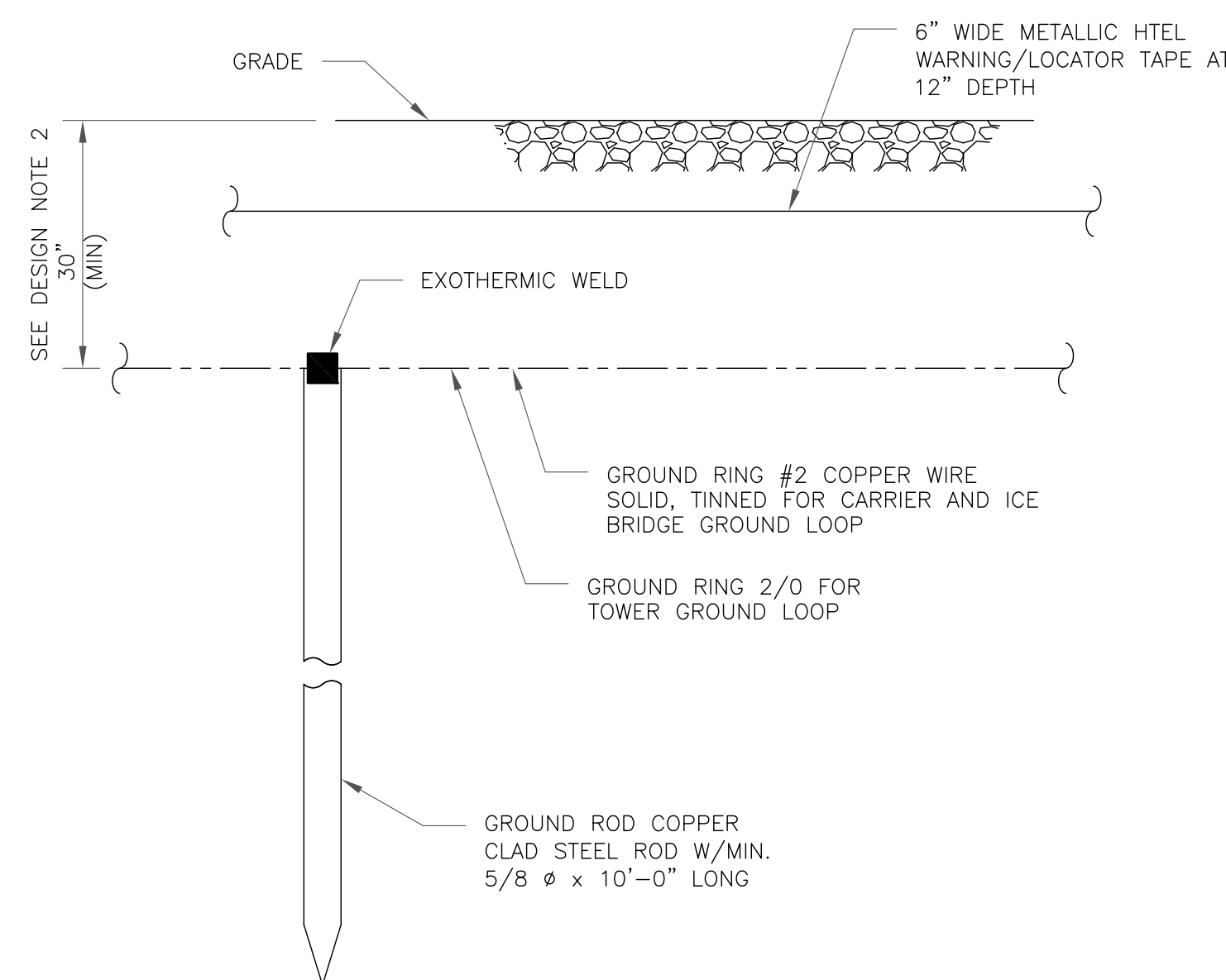


SINGLE CONNECTOR AT STEEL OBJECTS



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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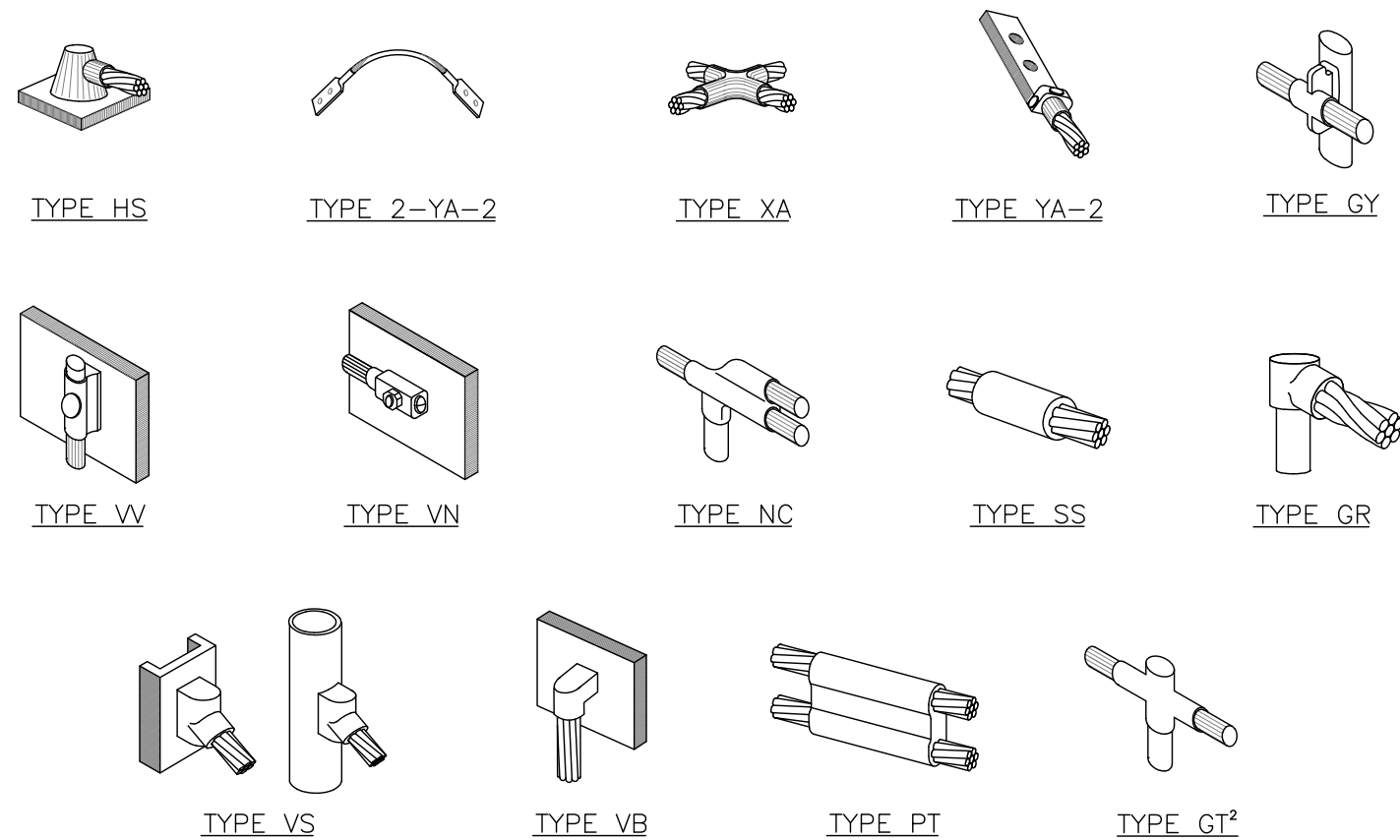
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G-2

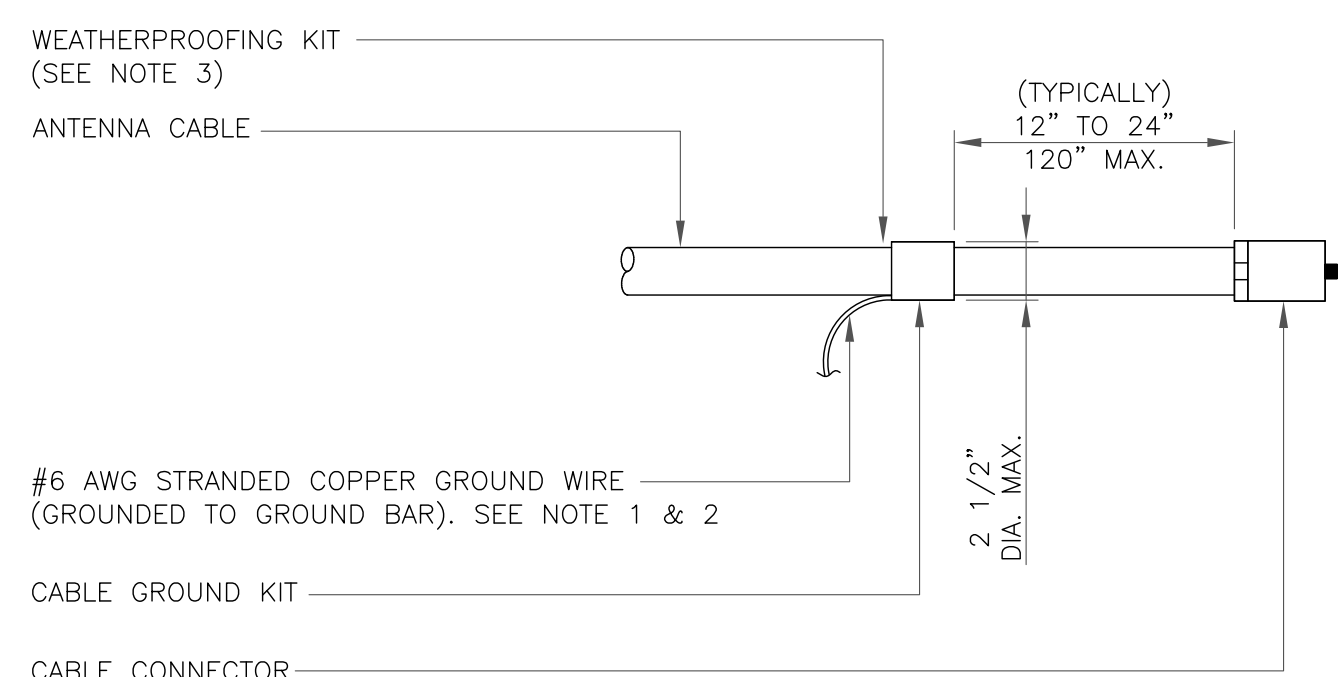
REVISION:

2



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.

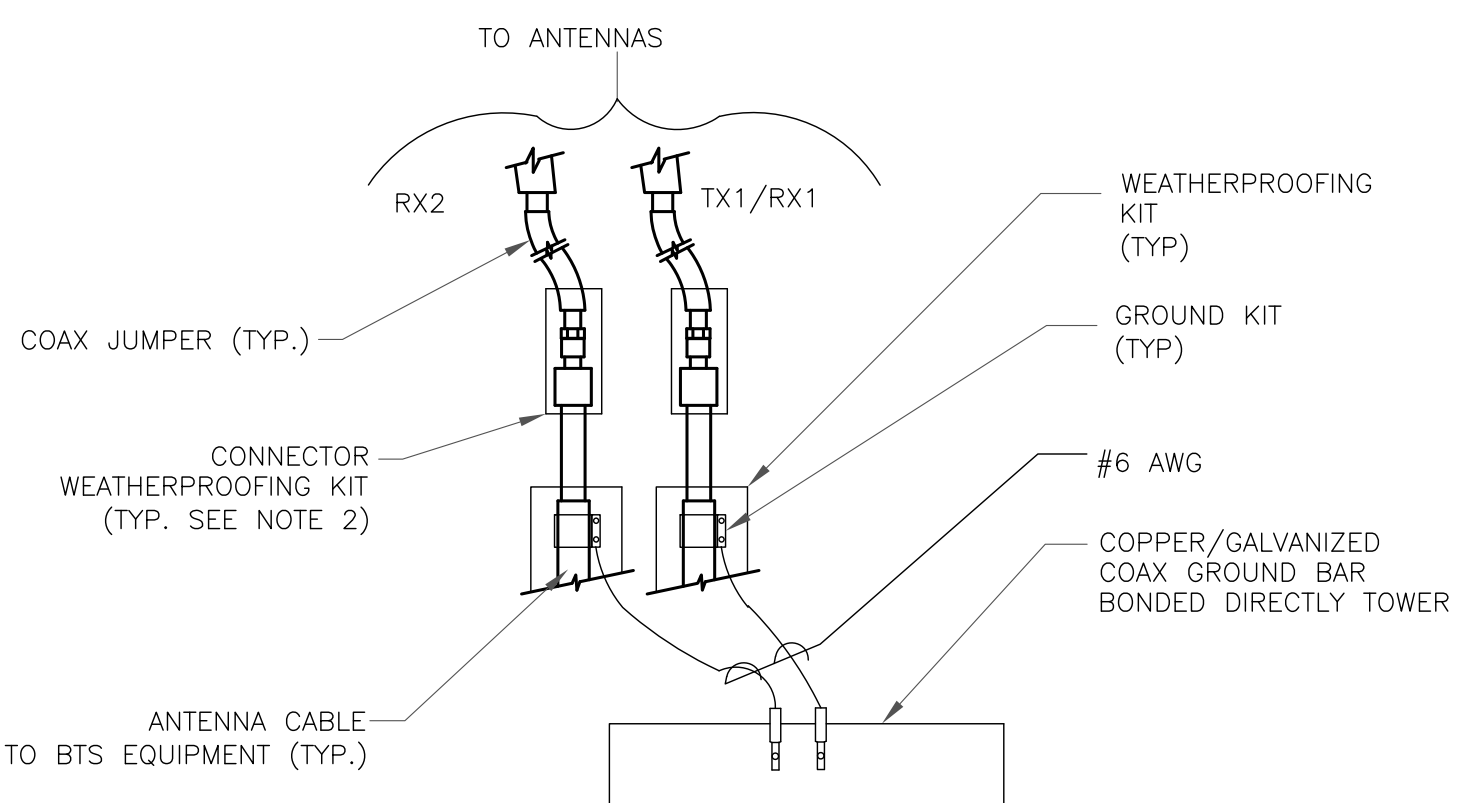
1 CADWELD GROUNDING CONNECTIONS
 SCALE: NOT TO SCALE



WEATHERPROOFING KIT (SEE NOTE 3)
 ANTENNA CABLE
 (TYPICALLY) 12" TO 24" 120" MAX.
 #6 AWG STRANDED COPPER GROUND WIRE (GROUNDED TO GROUND BAR). SEE NOTE 1 & 2
 2 1/2" DIA. MAX.
 CABLE GROUND KIT
 CABLE CONNECTOR

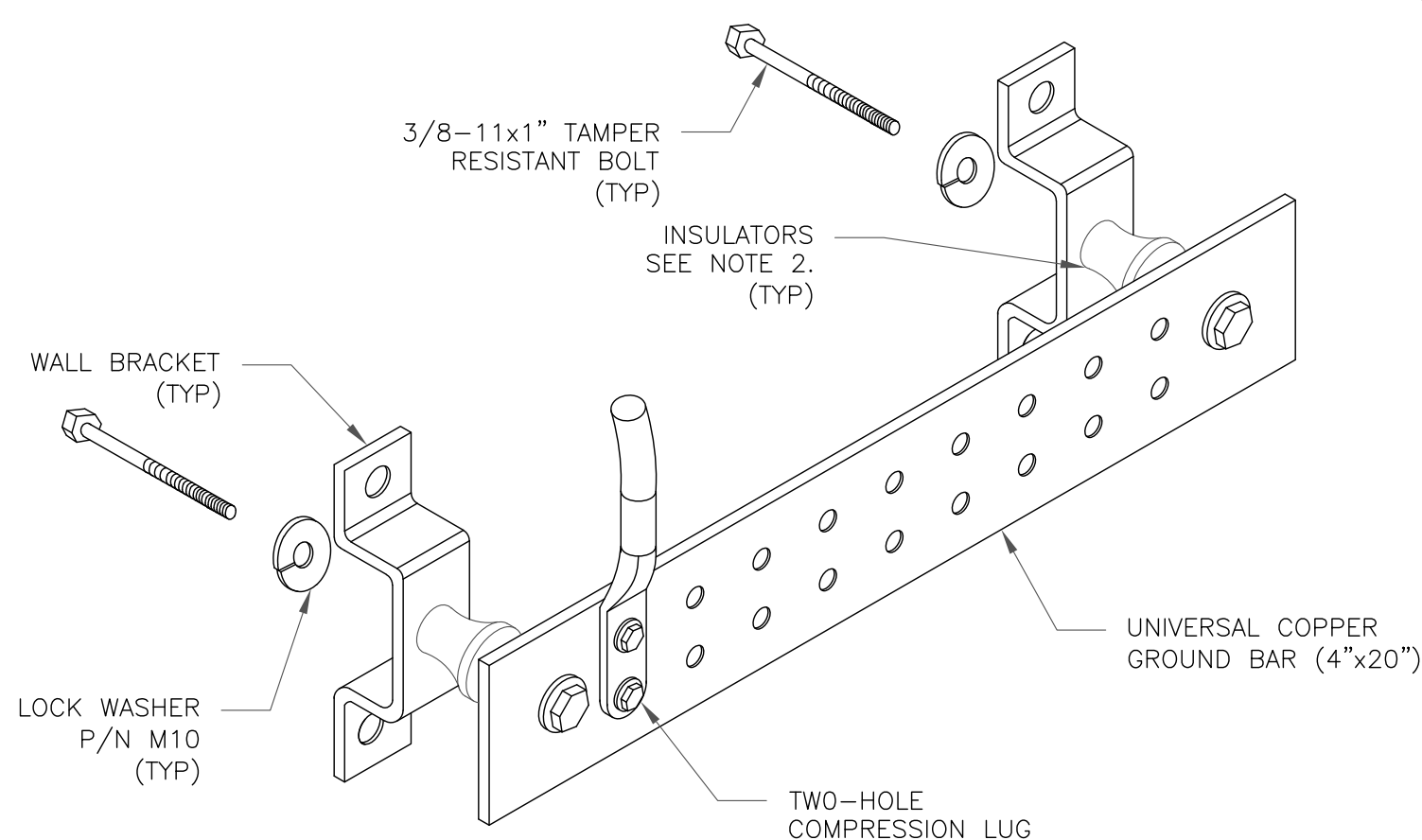
NOTES:
 1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
 2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
 3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

3 CABLE GROUND KIT CONNECTION
 SCALE: NOT TO SCALE



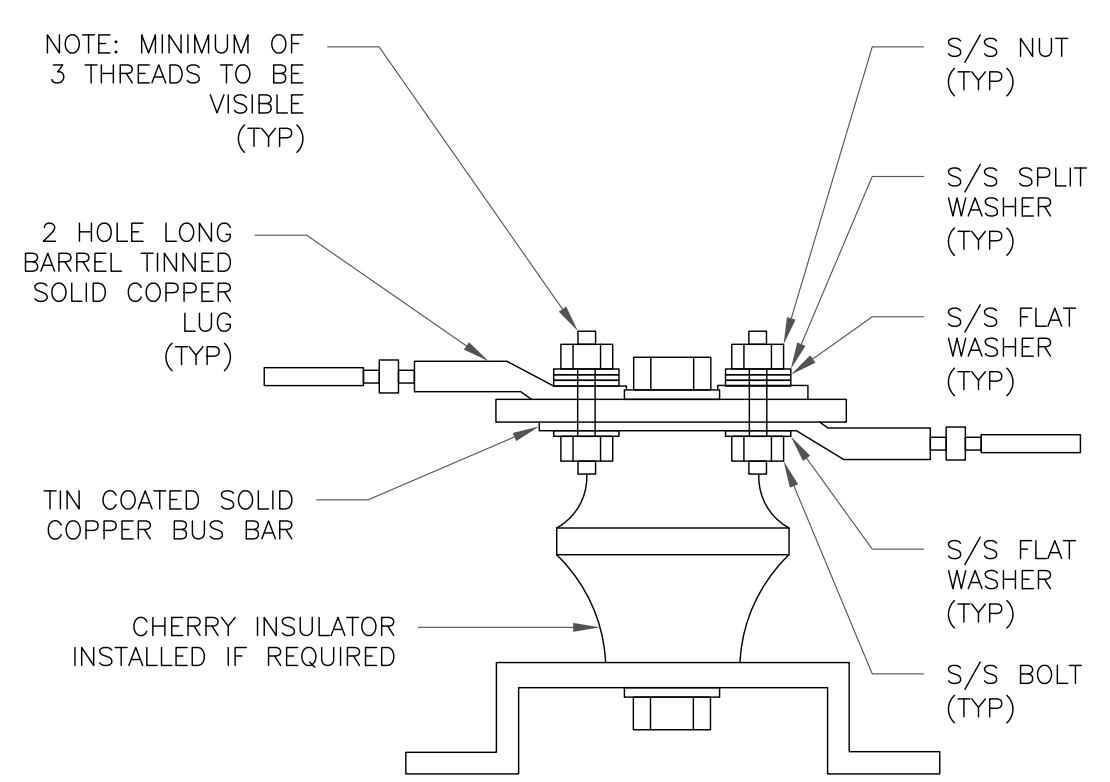
TO ANTENNAS
 RX2 TX1/RX1
 WEATHERPROOFING KIT (TYP)
 GROUND KIT (TYP)
 #6 AWG
 COPPER/GALVANIZED COAX GROUND BAR BONDED DIRECTLY TOWER
 COAX JUMPER (TYP.)
 CONNECTOR WEATHERPROOFING KIT (TYP. SEE NOTE 2)
 ANTENNA CABLE TO BTS EQUIPMENT (TYP.)

4 GROUND CABLE CONNECTION
 SCALE: NOT TO SCALE



3/8-11x1" TAMPER RESISTANT BOLT (TYP)
 INSULATORS SEE NOTE 2. (TYP)
 WALL BRACKET (TYP)
 LOCK WASHER P/N M10 (TYP)
 UNIVERSAL COPPER GROUND BAR (4"x20")
 TWO-HOLE COMPRESSION LUG

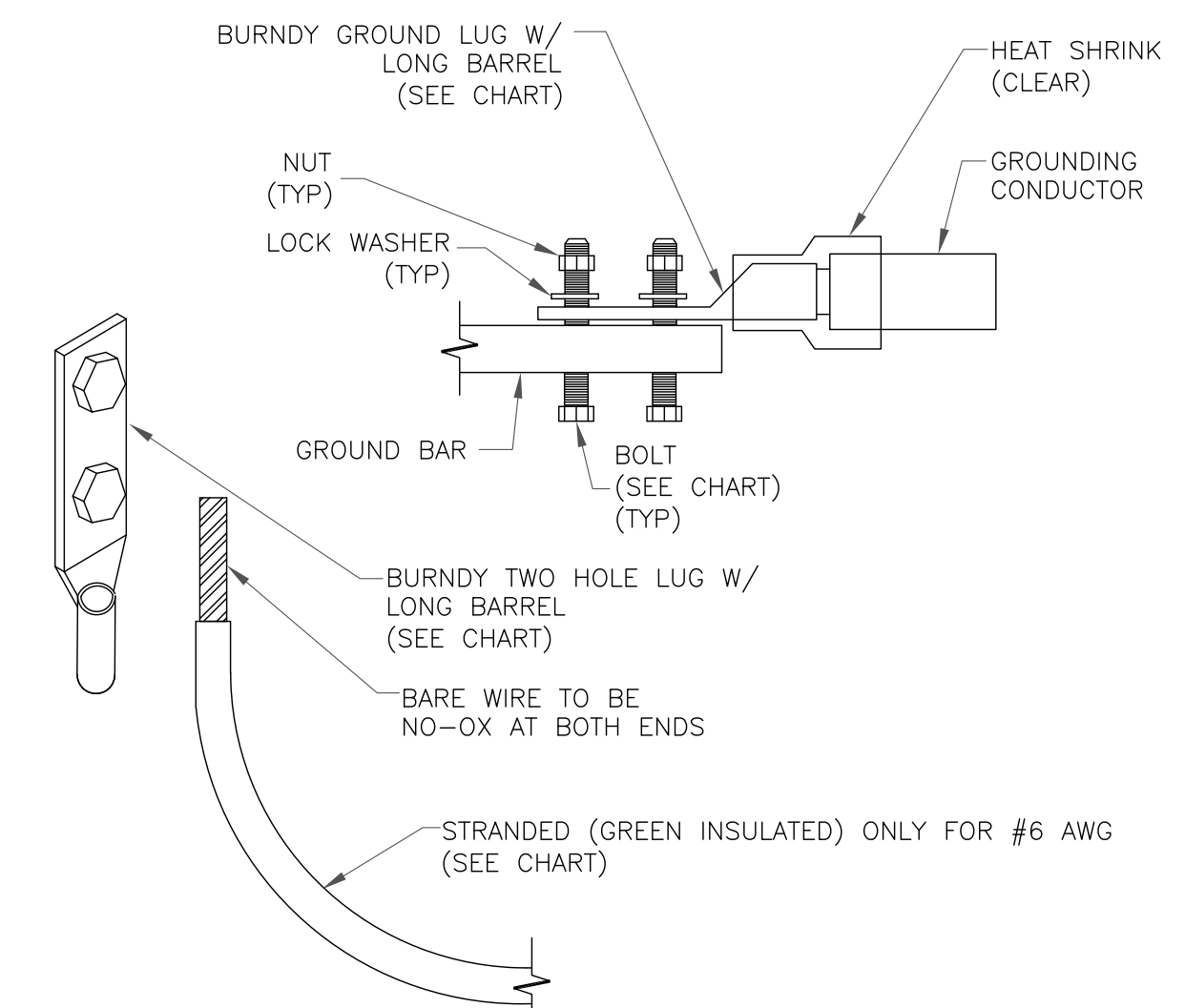
6 GROUND BAR DETAIL
 SCALE: NOT TO SCALE



NOTE: MINIMUM OF 3 THREADS TO BE VISIBLE (TYP)
 2 HOLE LONG BARREL TINNED SOLID COPPER LUG (TYP)
 TIN COATED SOLID COPPER BUS BAR
 CHERRY INSULATOR INSTALLED IF REQUIRED
 S/S NUT (TYP)
 S/S SPLIT WASHER (TYP)
 S/S FLAT WASHER (TYP)
 S/S FLAT WASHER (TYP)
 S/S BOLT (TYP)

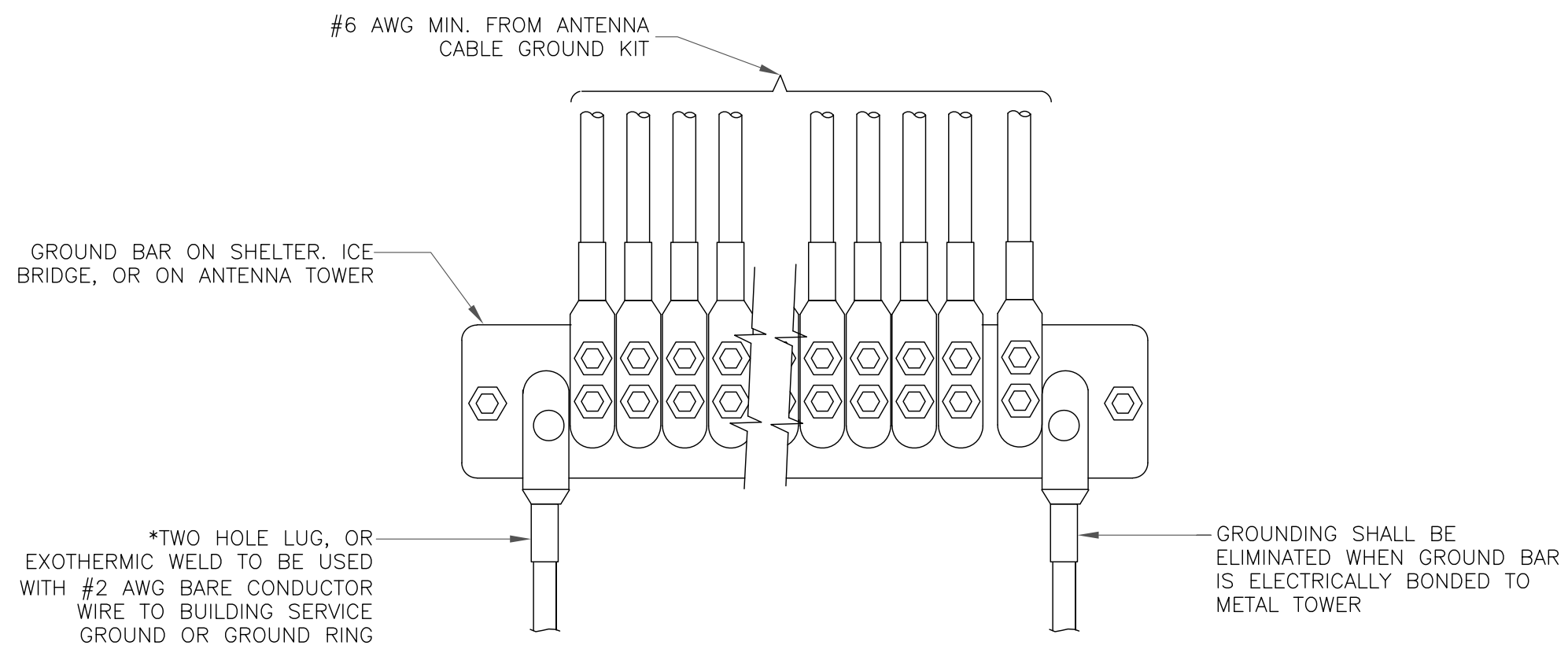
7 LUG DETAIL
 SCALE: NOT TO SCALE

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

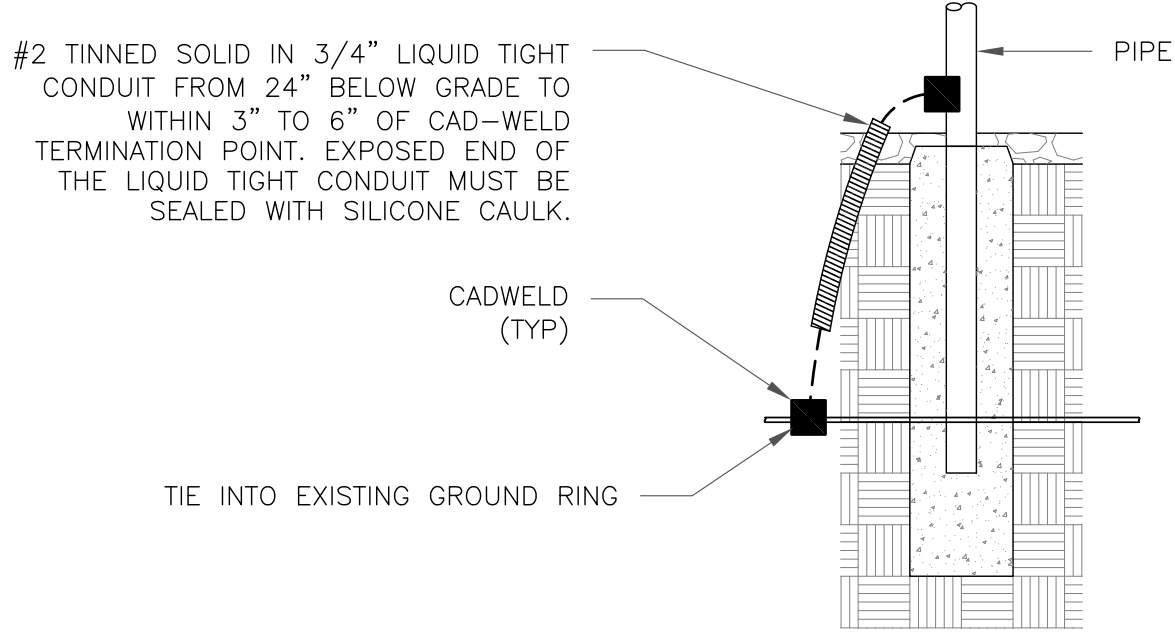


NOTES:
 1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

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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