

March 22, 2024

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

**RE: Tower Share Application-T-Mobile Site No. CT11845A  
Crown Site ID#842861  
235-H Brainard Road, Hartford, CT 06114  
Latitude: 41° 43' 58.72" / Longitude: -72° 39' 43.47"**

Dear Ms. Bachman:

T-Mobile proposes to add nine (9) new antennas, one (1) new antenna mount and ancillary antenna equipment at the 78' mount level of the 100' monopole tower located at 235-H Brainard Road, Hartford, CT. T-Mobile will also add one (1) 10'x15' concrete pad with canopy on the ground inside the existing compound to support their radio equipment cabinets. The property is owned The Metropolitan District and tower are owned by Crown Castle. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

**Panned Modification:**

**Tower:**

Installed New:

- (3) Amphenol – APXVLL19P\_43-C-A20 - Antennas
- (3) Ericsson – AIR 6419-B41 - Antennas
- (3) RFS – APXVAALL24-43-U-NA20 - Antennas
- (3) Ericsson – 4460 B25+B66 – RRHs
- (3) Ericsson 4480 B71+B85 - RRHs
- (3) 1- 5/8" Hybrid Cables
- (1) Site Pro1 – RMQP-496-HK Platform Mount

**Ground:**

Install New:

- (1) 10'x15' Concrete Pad W/Canopy
- (1.) 6160 AC V1 Equipment Cabinet
- (1) B160 batter Cabinet
- (1.) H-Frame
- (1) Ice Bridge
- (1.) 225A PPC W/Camlock
- (1.) 200amp Meter

The Foundation for a Wireless World.

CrownCastle.com

- (1.) Telco Cabinet
- (2) Working lights W/Timing Switch

The facility was originally approved by the City of Hartford and as previously documented, attempts to obtain a copy (s) of the original approval have been futile.

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 Arunan Arulampalam, Mayor, City of Hartford, Erin Howard, Planning & Zoning Director, City of Hartford and The Metropolitan District, property owner and Crown Castle is the tower.

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.

Connecticut General Statute 16-50aa indicates the Council must approve the share use of telecommunication facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting the T-Mobile proposed loading. The structural analysis is included in the package.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in the City of Hartford. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 78-foot level of the existing 100-foot tower would have an insignificant visual impact on the area around the tower. T-Mobile ground equipment would be installed within the existing facility compound. T-Mobile shared use would therefore not cause any significant alteration in the physical or environmental characteristics

of the existing site. Additionally, as evidenced of the radio frequency emissions would not increase to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish has authorization to collocate their antennas on the cell tower.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting T-Mobile proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing tower. T-Mobile intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of residents and individuals traveling through City of Hartford.

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

Sincerely,



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

Attachments

cc:

Arunan Arulampalam, Mayor  
Hartford City Hall  
550 Main Street  
2<sup>nd</sup> Floor, Room 200  
Hartford, CT 06103  
860-757-9200

Erin Howard, Planning & Zoning Director  
Hartford City Hall  
260 Constitutional Plaza, 1<sup>st</sup> Floor.  
Hartford, CT 06103  
860-757-9200

The Metropolitan District, landowner  
555 Main Street  
Hartford, CT 06103

Crown Castle, Tower Owner

# Unofficial Property Record Card - Hartford, CT

## General Property Data

Parcel ID **300-817-009**  
Prior Parcel ID  
Property Owner **THE METROPOLITAN DISTRICT**  
Mailing Address **555 MAIN ST**  
City **HARTFORD**  
Mailing State **CT** Zip **06103-2915**  
ParcelZoning **ID-1**

Account Number  
Property Location **235-H BRAINARD RD**  
Property Use **SPECIAL ACTS**  
Most Recent Sale Date **12/16/2010**  
Legal Reference **06402-0246**  
Grantor **221-223 BRAINARD ROAD LLC**  
Sale Price **4,705,000**  
Land Area **127,613.000 acres**

## Current Property Assessment

Card 1 Value Building Value **0** Xtra Features Value **0** Land Value **601,580** Total Value **601,580**

## Building Description

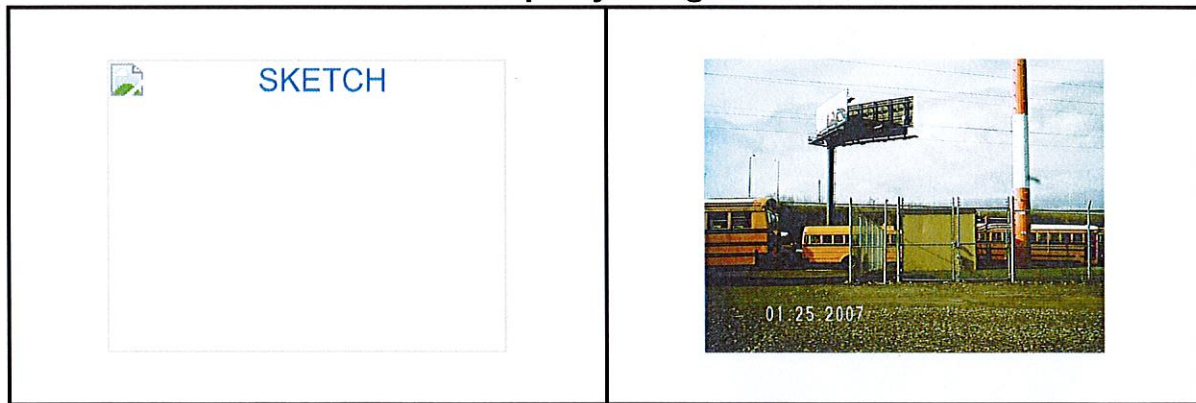
Building Style <b>N/A</b>	Foundation Type <b>N/A</b>	Flooring Type <b>N/A</b>
# of Living Units <b>0</b>	Frame Type <b>N/A</b>	Basement Floor <b>N/A</b>
Year Built <b>N/A</b>	Roof Structure <b>N/A</b>	Heating Type <b>N/A</b>
Building Grade <b>N/A</b>	Roof Cover <b>N/A</b>	Heating Fuel <b>N/A</b>
Building Condition <b>N/A</b>	Siding <b>N/A</b>	Air Conditioning <b>0%</b>
Finished Area (SF) <b>0</b>	Interior Walls <b>N/A</b>	# of Bsmt Garages <b>0</b>
Number Rooms <b>0</b>	# of Bedrooms <b>0</b>	# of Full Baths <b>0</b>
# of 3/4 Baths <b>0</b>	# of 1/2 Baths <b>0</b>	# of Other Fixtures <b>0</b>

## Legal Description

### Narrative Description of Property

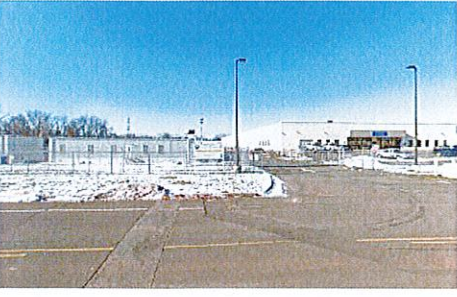
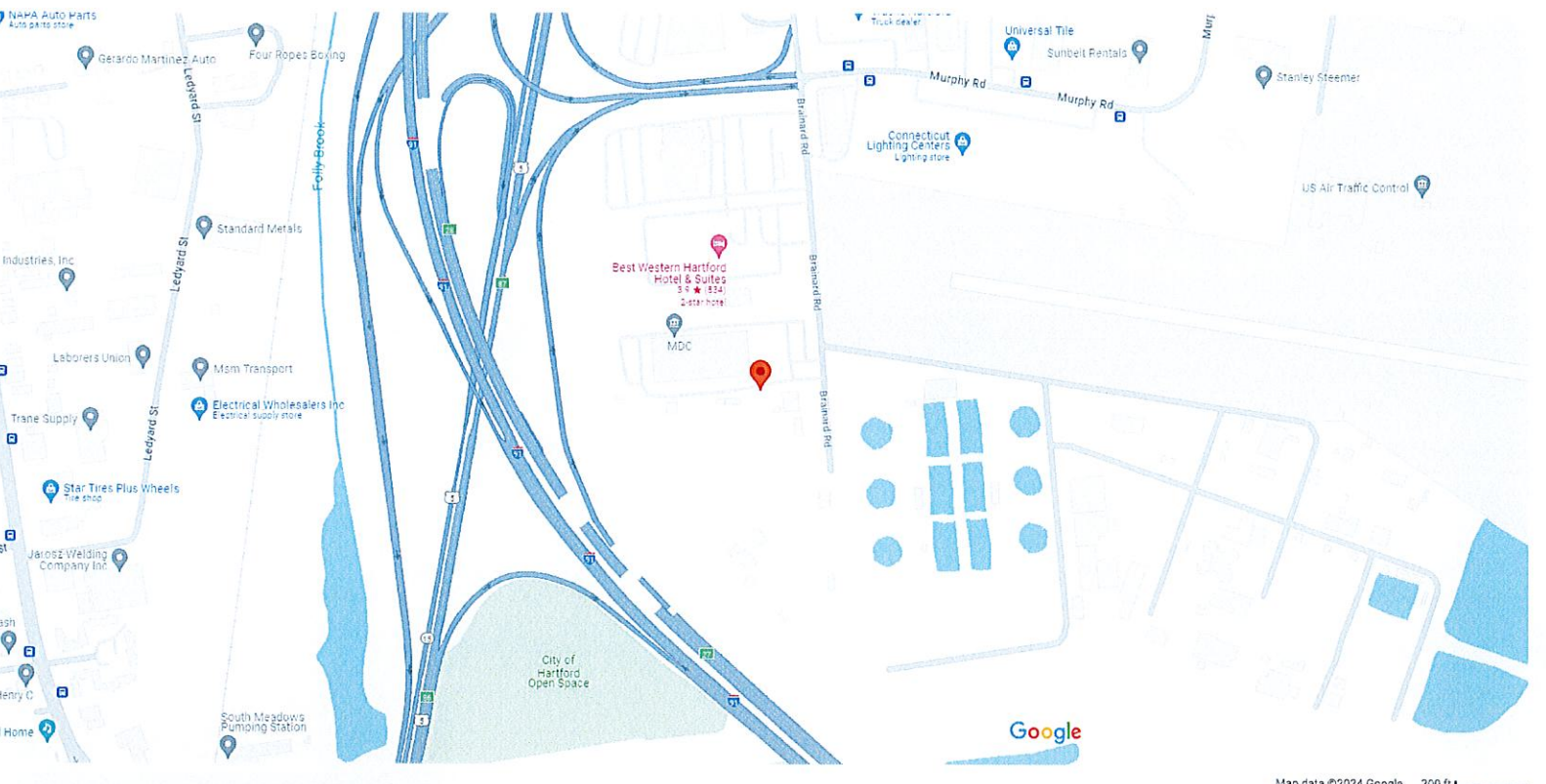
This property contains 127,613.000 acres of land mainly classified as SPECIAL ACTS with a(n) N/A style building, built about N/A , having N/A exterior and N/A roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

## Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.

# 235 Brainard Rd h



## 235 Brainard Rd h

- [Directions](#)
- [Save](#)
- [Nearby](#)
- [Send to phone](#)
- [Copy link](#)

235 Brainard Rd h, Hartford, CT 06114

### Photos

**Barbadora, Jeff**

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**From:** TrackingUpdates@fedex.com  
**Sent:** Monday, March 25, 2024 9:07 AM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 775653537097: Your package has been delivered

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.



Hi. Your package was  
delivered Mon, 03/25/2024 at  
9:00am.



Delivered to 260 CONSTITUTION PLZ 1, HARTFORD, CT 06103

[OBTAIN PROOF OF DELIVERY](#)

# How was your delivery ?



TRACKING NUMBER	<a href="#">775653537097</a>
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	City of Hartford Erin Howard, Planning & Zoning Dir 260 Constitutional Plaza 1st Floor HARTFORD, CT, US, 06103
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Fri 3/22/2024 05:40 PM
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	HARTFORD, CT, US, 06103
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Standard Overnight

**Barbadora, Jeff**

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**From:** TrackingUpdates@fedex.com  
**Sent:** Monday, March 25, 2024 9:40 AM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 775653608200: Your package has been delivered

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Hi. Your package was  
delivered Mon, 03/25/2024 at  
9:32am.



Delivered to 555 MAIN ST, HARTFORD, CT 06103  
Received by T.BURDEN

[OBTAIN PROOF OF DELIVERY](#)



# How was your delivery ?



TRACKING NUMBER	<a href="#">775653608200</a>
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	The Metropolitan District The Metropolitan District 555 Main Street HARTFORD, CT, US, 06103
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Fri 3/22/2024 05:40 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	HARTFORD, CT, US, 06103
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Standard Overnight

**Barbadora, Jeff**

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**From:** TrackingUpdates@fedex.com  
**Sent:** Monday, March 25, 2024 7:32 PM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 775653500090: Your package has been delivered

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.



Hi. Your package was  
delivered Mon, 03/25/2024 at  
9:27am.



[OBTAIN PROOF OF DELIVERY](#)

How was your delivery ?



TRACKING NUMBER	<a href="#">775653500090</a>
FROM	WESTBOROUGH, MA, US
TO	HARTFORD, CT, US
SHIP DATE	Fri 3/22/2024 05:39 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US
DESTINATION	HARTFORD, CT, US
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Standard Overnight



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Date: **February 15, 2024**



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

**Subject:** **Mount Analysis - Conditional Passing Report**

**Carrier Designation:** **T-Mobile Equipment Change-Out**  
**Carrier Site Number:** CT11845A  
**Carrier Site Name:** -

**Crown Castle Designation:** **BU Number:** 842861  
**Site Name:** EAST HARTFORD HOCHANUM  
**JDE Job Number:** 751349  
**Order Number:** 654558 Rev. 3

**Engineering Firm Designation:** **Trylon Report Designation:** 236231

**Site Data:** **223 Brainard Road, Hartford, Hartford County, CT, 06114**  
**Latitude 41°43'58.72" Longitude -72°39'43.47"**

**Structure Information:** **Tower Height & Type:** **96.8 ft Monopole**  
**Mount Elevation:** **78.0 ft**  
**Mount Width & Type:** **12.5 ft Platform**

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

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

**Platform**

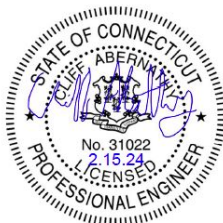
**Sufficient\***

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

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Steve Mustaro, P.E.

Respectfully Submitted by:  
Cliff Abernathy, P.E.



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## 1) INTRODUCTION

This is a proposed three sector 12.5 ft Platform, designed by Site Pro 1.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2021 IBC / 2022 Connecticut State Building Code
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	118 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor at Base:</b>	1.0
<b>Topographic Factor at Mount:</b>	1.0
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic S<sub>s</sub>:</b>	0.193
<b>Seismic S<sub>1</sub>:</b>	0.055
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb
<b>Man Live Load at Mount Pipes:</b>	500 lb

**Table 1 - Proposed Equipment Configuration**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
78.0	78.0	3	COMMSCOPE	VV-65A-R1_TMO	12.5 ft Platform [Site Pro 1 RMQP-496-HK]
		3	ERICSSON	AIR 6419 B41_TMO_CCIV2	
		3	RFS/CELWAVE	APXVAALL24_43-U-NA20_TMO	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	
		3	ERICSSON	RADIO 4480_TMOV2	

## 3) ANALYSIS PROCEDURE

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	654558 Rev. 3	CCI Sites
Mount Manufacturer Drawings	Site Pro 1	RMQP-496-HK	Trylon

### 3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision E).

**3.2) Assumptions**

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

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

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

**4) ANALYSIS RESULTS**

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2, 3, 4	Mount Pipe(s)	MP2	78.0	44.9	Pass
	Horizontal(s)	H1		12.1	Pass
	Standoff(s)	M2		14.0	Pass
	Bracing(s)	M71		38.2	Pass
	Handrail(s)	M57		31.1	Pass
	Kicker(s)	M108		19.9	Pass
	Mount Connection(s)	-		12.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>44.9%</b>
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Notes:

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

**4.1) Recommendations**

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

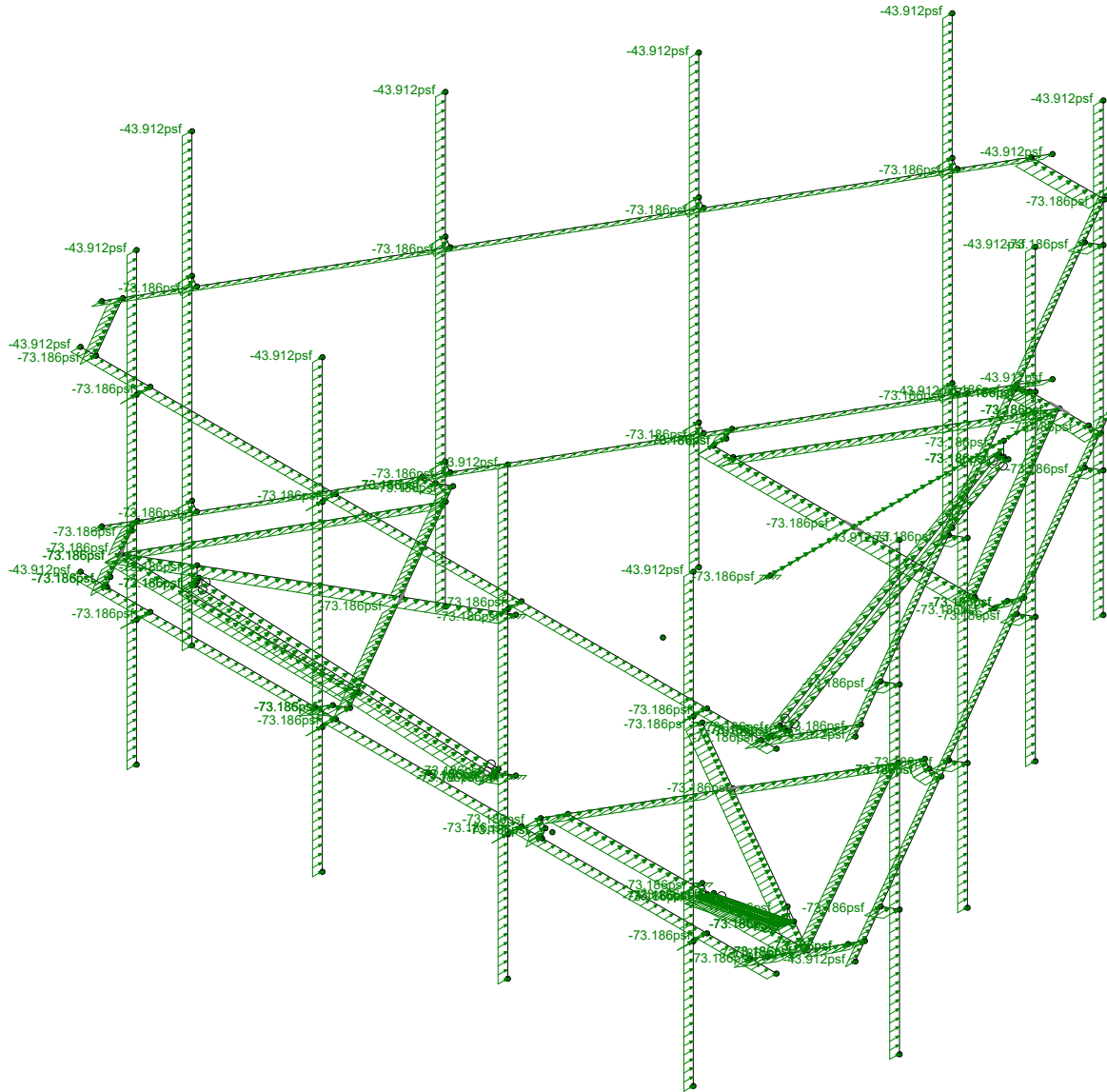
1. Site Pro 1 RMQP-496-HK.

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

**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**







Loads: BLC 2, Structure Wind Z  
Envelope Only Solution

Trylon

SMM

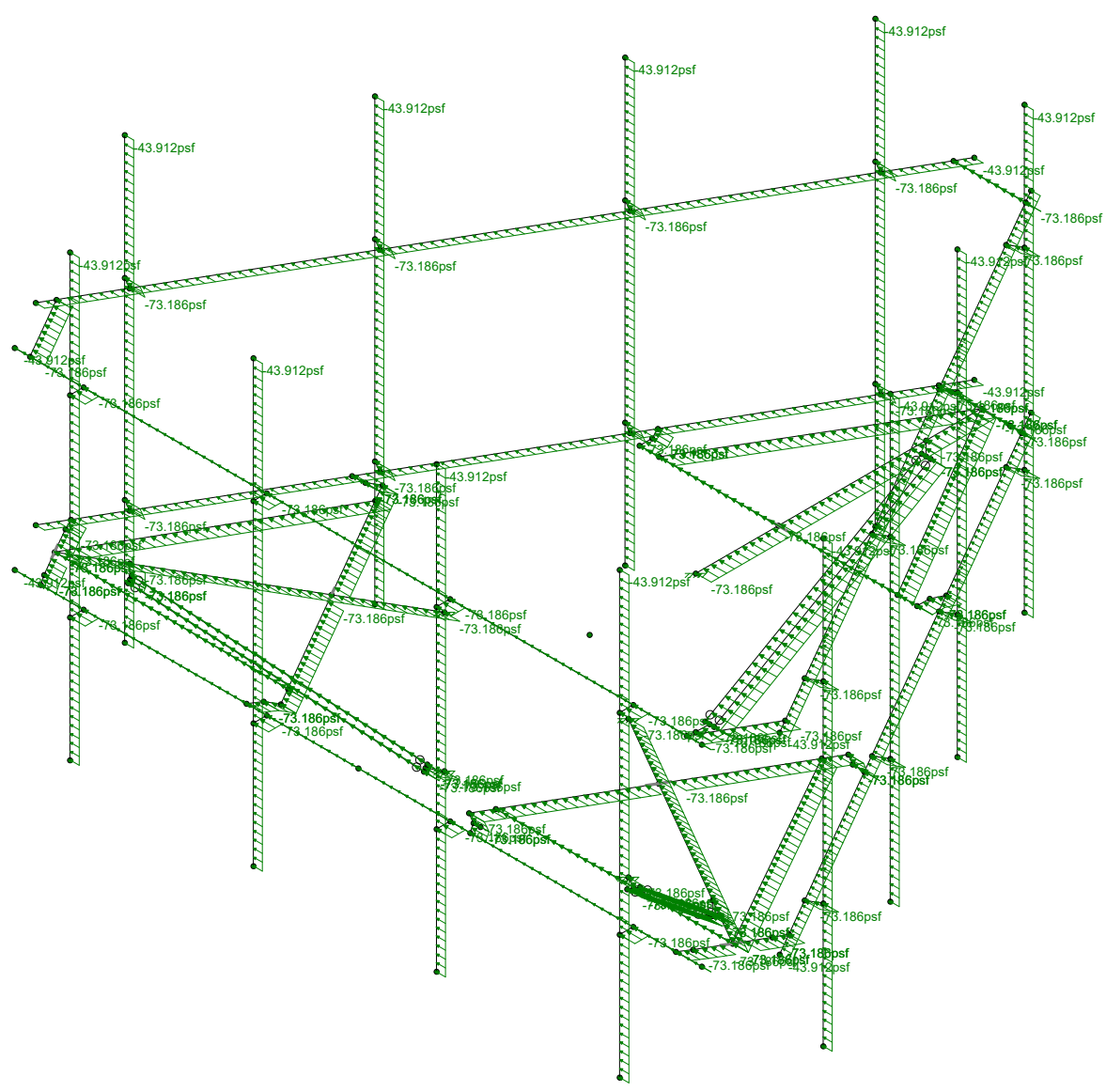
236231

842861

Wind Loads

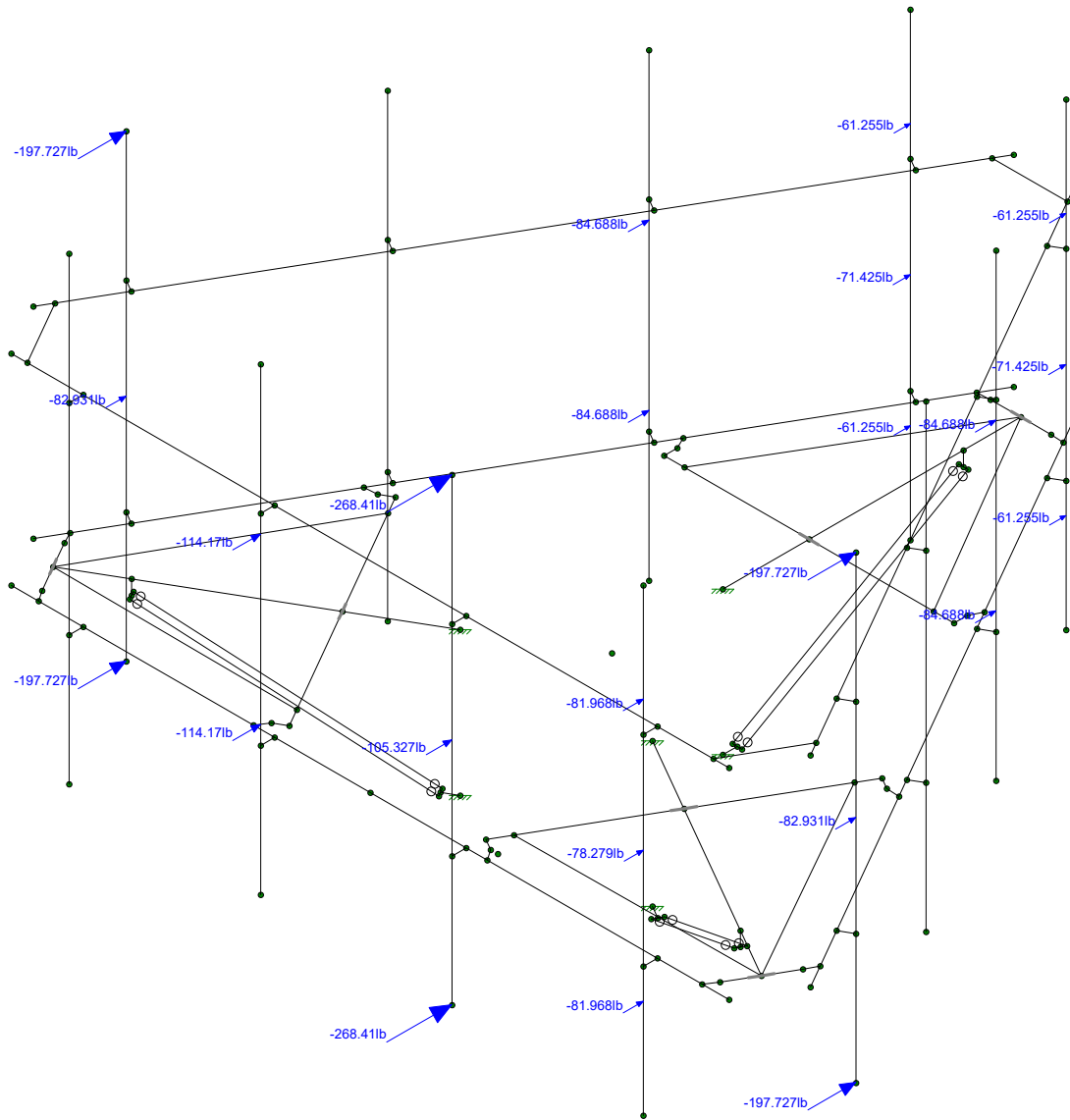
Feb 15, 2024 at 2:09 PM

842861\_loaded.r3d



Loads: BLC 3, Structure Wind X  
Envelope Only Solution

Trylon	842861	Wind Loads
SMM		Feb 15, 2024 at 2:09 PM
236231		842861_loaded.r3d

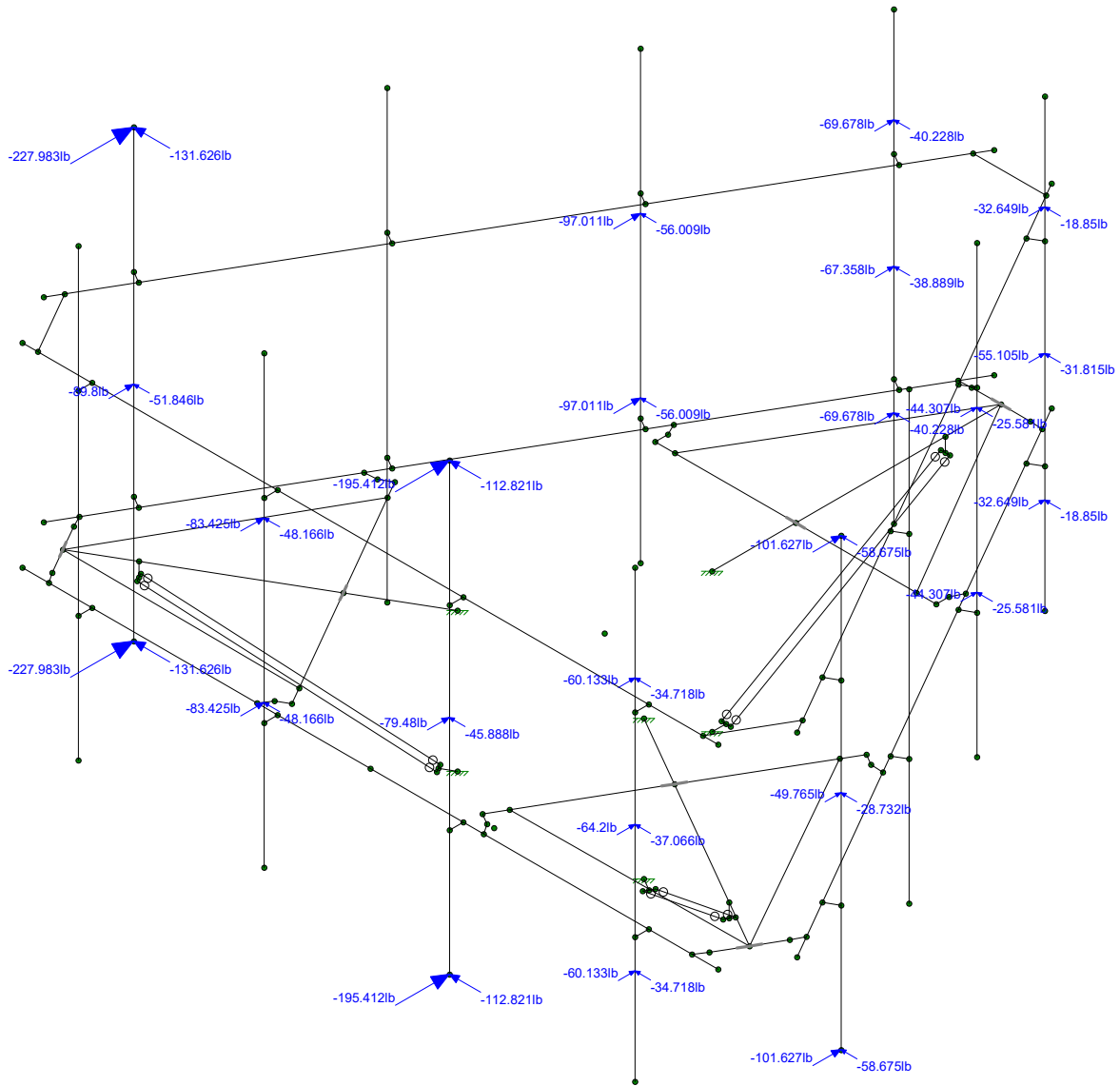


Loads: BLC 4, Wind Load 0 AZI  
Envelope Only Solution

Trylon
SMM
236231

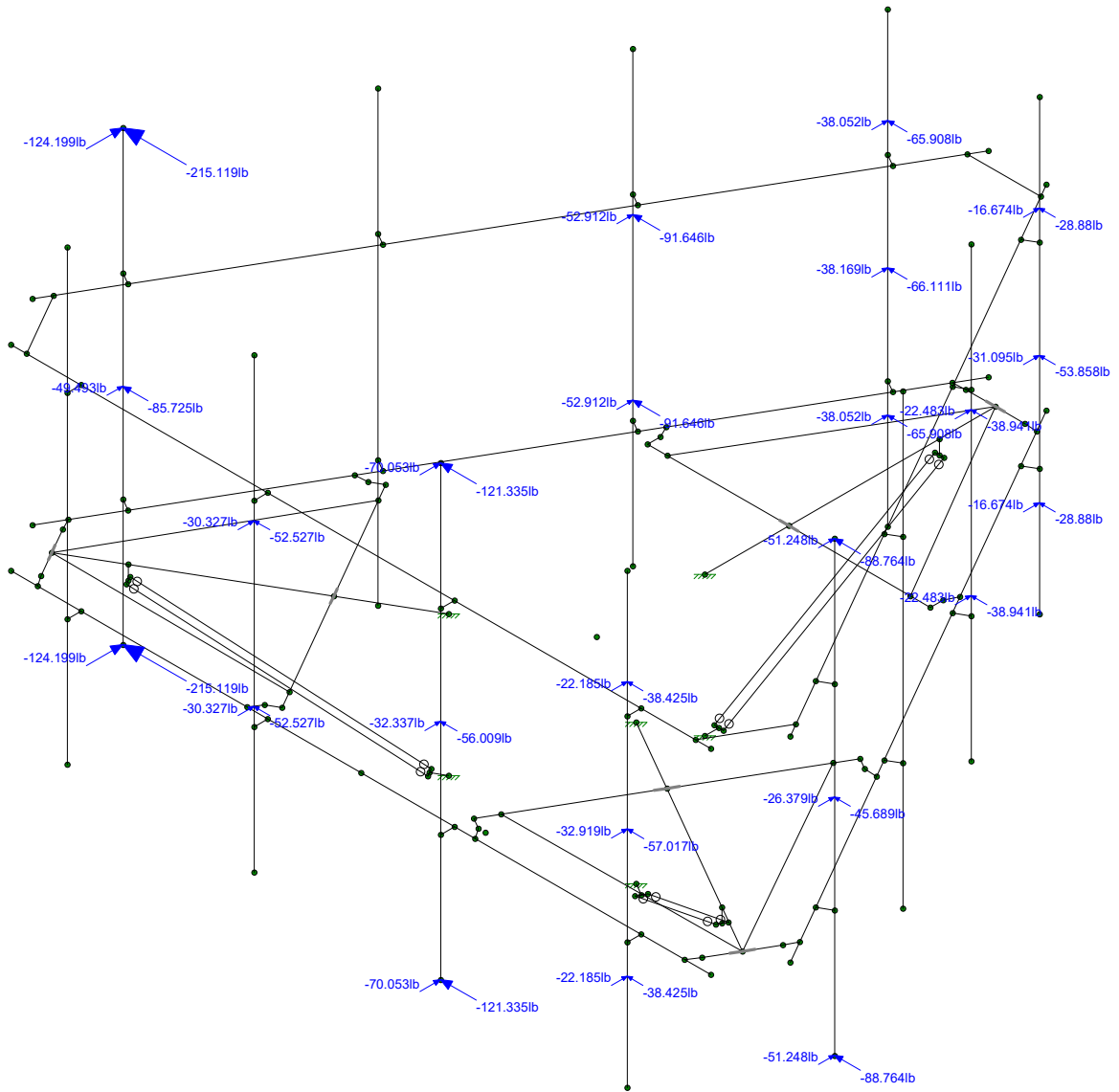
842861

Wind Loads
Feb 15, 2024 at 2:09 PM
842861_loaded.r3d



Loads: BLC 5, Wind Load 30 AZI  
Envelope Only Solution

Trylon	842861	Wind Loads
SMM		Feb 15, 2024 at 2:10 PM
236231		842861_loaded.r3d



Loads: BLC 7, Wind Load 60 AZI  
Envelope Only Solution

Trylon

SMM

236231

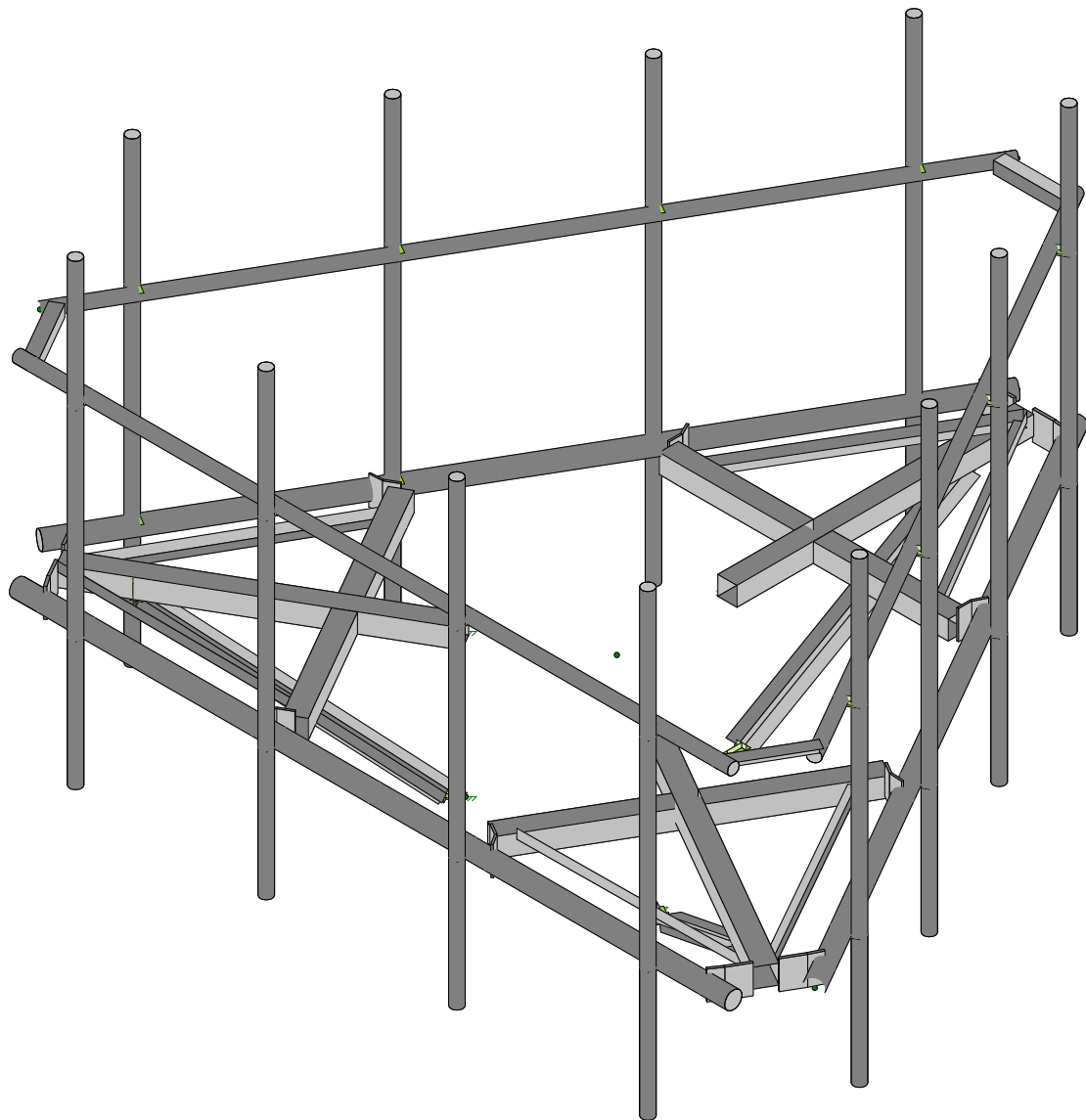
842861

Wind Loads

Feb 15, 2024 at 2:10 PM

842861\_loaded.r3d





Envelope Only Solution

Trylon	842861	Render
SMM		Feb 15, 2024 at 2:10 PM
236231		842861_loaded.r3d



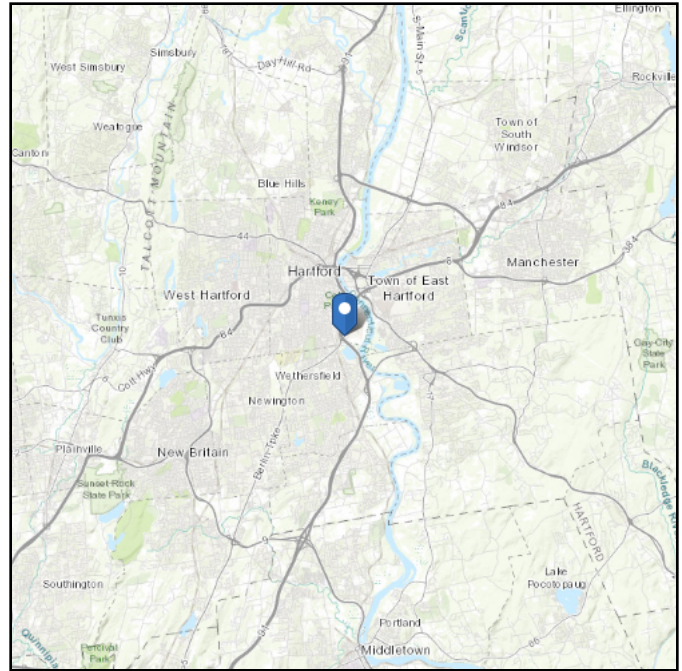
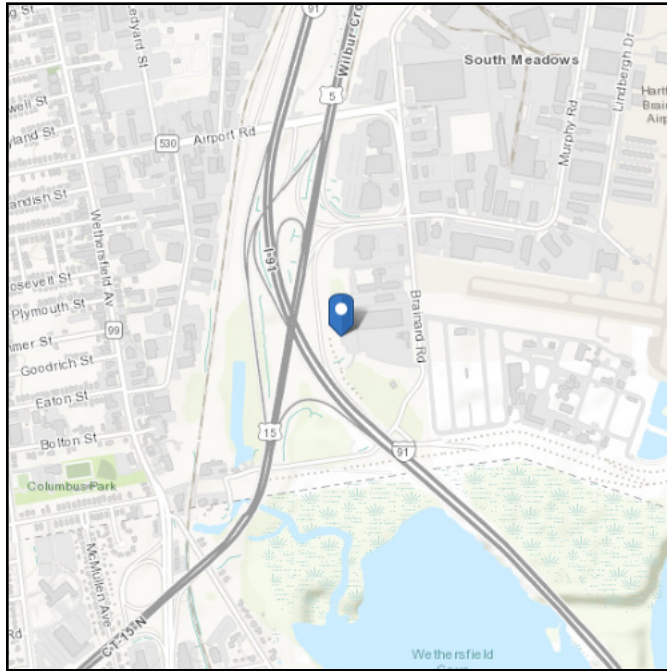
**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Latitude:** 41.732978  
**Longitude:** -72.662075  
**Elevation:** 9.69175231472924 ft (NAVD 88)



## Wind

### Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Tue Oct 10 2023

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

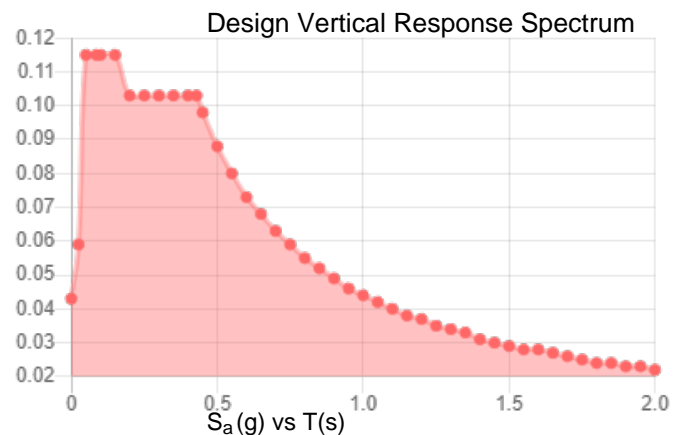
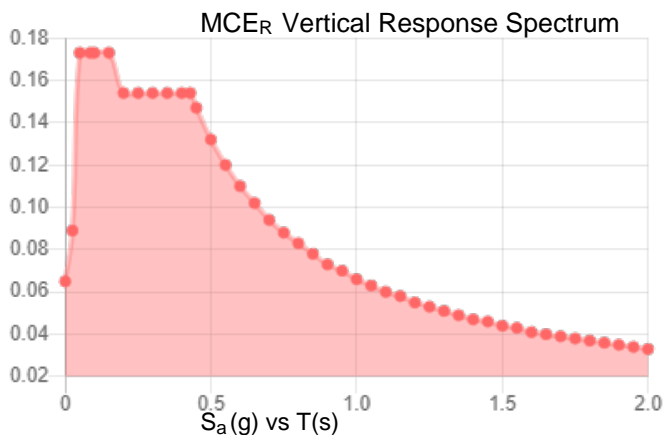
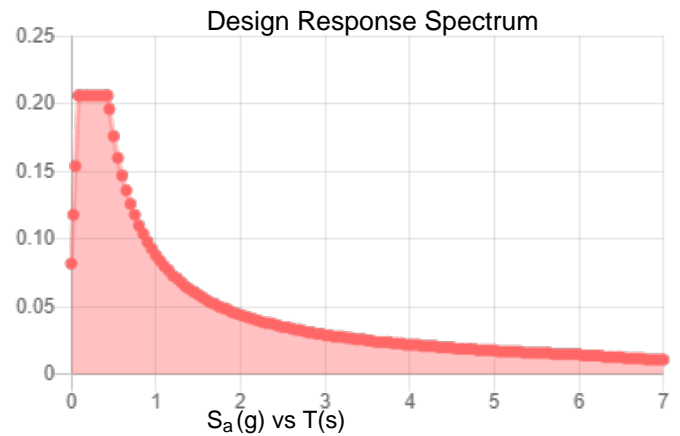
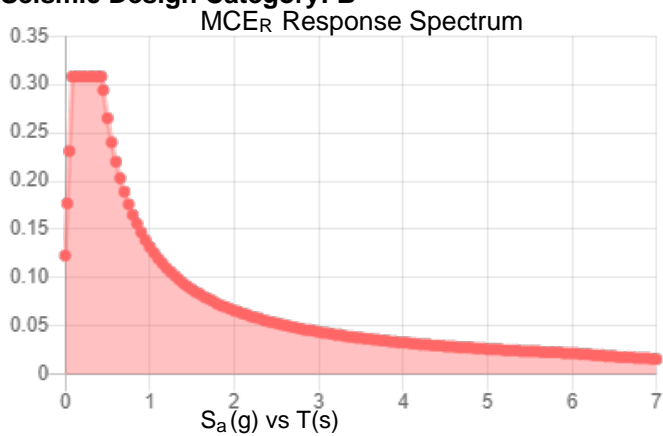
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:**

**Results:**

$S_s$ :	0.193	$S_{D1}$ :	0.088
$S_1$ :	0.055	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.104
$F_v$ :	2.4	PGA <sub>M</sub> :	0.166
$S_{MS}$ :	0.308	$F_{PGA}$ :	1.591
$S_{M1}$ :	0.132	$I_e$ :	1
$S_{DS}$ :	0.206	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:**

**Tue Oct 10 2023**

**Date Source:**

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

## Ice

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**Results:**

Ice Thickness: 1.50 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Tue Oct 10 2023

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

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

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# Trylon

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

## TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	236231
Carrier Site ID:	BU 842861
Carrier Site Name:	ST HARTFORD HOCHANU

CODES AND STANDARDS	
Building Code:	2021 IBC
Local Building Code:	2022 CTSCB
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	78.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	96.8	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Default	--
Ground Elevation:	10	ft.

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

WIND PARAMETERS		
Design Wind Speed:	118	mph
Wind Escalation Factor ( $K_s$ ):	1.00	--
Velocity Coefficient ( $K_z$ ):	1.20	--
Directionality Factor ( $K_d$ ):	0.95	--
Gust Effect Factor ( $G_h$ ):	1.00	--
Shielding Factor ( $K_a$ ):	0.90	--
Velocity Pressure ( $q_z$ ):	40.66	psf
Ground Elevation Factor ( $K_e$ ):	1.00	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness ( $t_i$ ):	1.50	in
Importance Factor ( $I_i$ ):	1.00	--
Ice Velocity Pressure ( $q_{zi}$ ):	6.62	psf
Mount Ice Thickness ( $t_{iz}$ ):	1.63	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	73.19	psf
Round Member Pressure:	43.91	psf
Ice Wind Pressure:	7.15	psf

SEISMIC PARAMETERS		
Importance Factor ( $I_e$ ):	1.00	--
Short Period Accel. ( $S_s$ ):	0.19	g
1 Second Accel. ( $S_1$ ):	0.06	g
Short Period Des. ( $S_{DS}$ ):	0.21	g
1 Second Des. ( $S_{D1}$ ):	0.09	g
Short Period Coeff. ( $F_a$ ):	1.60	--
1 Second Coeff. ( $F_v$ ):	2.40	--
Response Coefficient ( $C_s$ ):	0.10	--
Amplification Factor ( $A_s$ ):	1.20	--

## LOAD COMBINATIONS [LRFD]

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

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

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

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

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





## EQUIPMENT LOADING [CONT.]

<i>Appurtenance Name</i>	<i>Qty.</i>	<i>Elevation [ft]</i>	<i>--</i>	<i>EPA<sub>N</sub> (ft2)</i>	<i>EPA<sub>T</sub> (ft2)</i>	<i>Weight (lbs)</i>
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

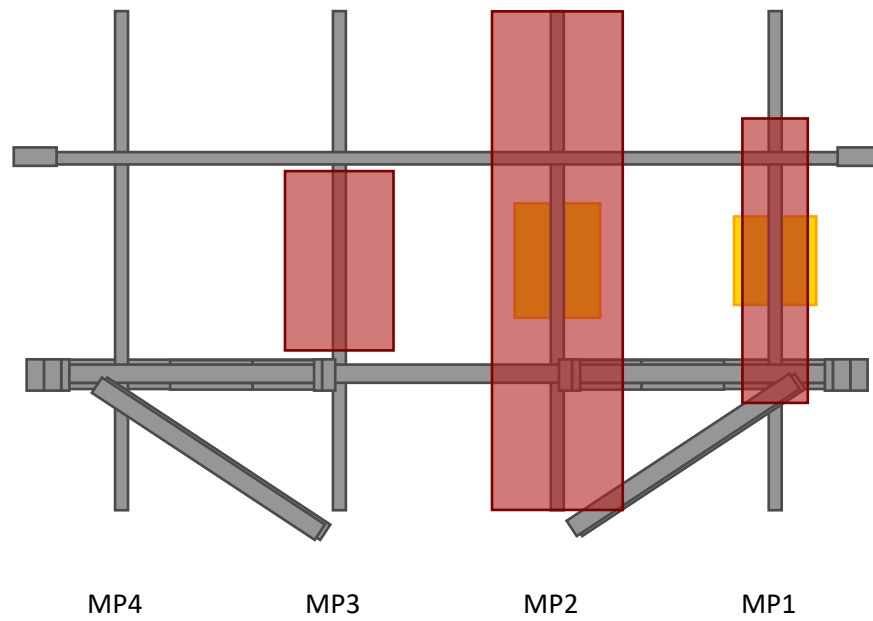








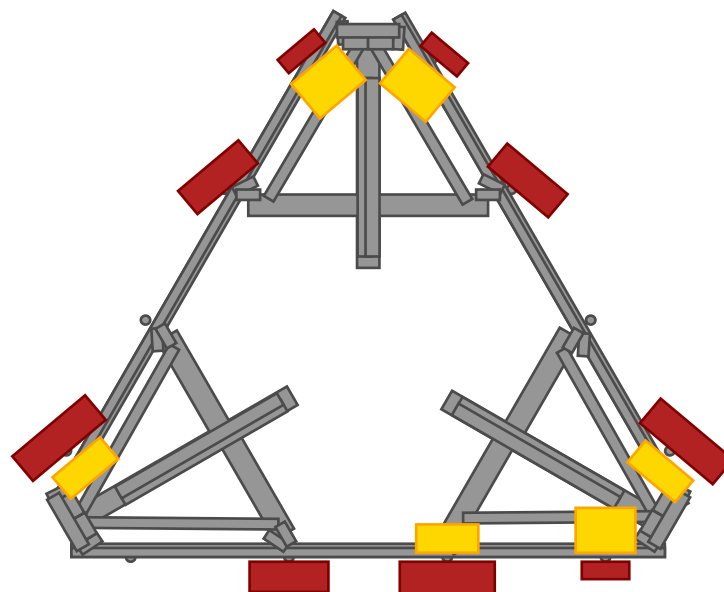
### ELEVATION VIEW



\*these drawings are intended to show approximate locations of equipment on the mount and should not be used to determine exact placement of equipment or additional hardware

\*\*Elevation View Shows Only One Sector

### PLAN VIEW





**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**







<chFc`YX'GhY'GYW]cb'GYlg'f'cb]bi YXL

	Šæ^	Ú@^	V'^	Ô•ã) Áæc	Tæ!æþ	Ô•ã) ÁÛÈ	ØÄ Gá	Q'Äl á	Q:Äl á	RÄl á
Í	Pæ á æP   ä  } æ	ÚÚÓ GÆ	Ó^æ	Þ  } ^	ØÉ HÁÓ:ÉÓ	V' ] ææ	FÆG	È G	È G	FÈG
İ	Ø* \Aæ á æP   ä  } È	ŠGH çGH çl	Ó^æ	Þ  } ^	ØHÍ ÁÓ:ÈHÍ	V' ] ææ	FÈJ	È JG	È JG	ÈG
Ï	Úæf   { } ÁÓæ^	PÚUÍ YÍ YÍ	Ó^æ	Þ  } ^	ØHÍ ÁÓ:ÈHÍ	V' ] ææ	HÈHÍ	Í È	Í È	FÈHÍ
J	Ó{ } ^ &ç) ÁÛæ•	ÚSÍ çÈHÍ Í	Ó^æ	Þ  } ^	ØHÍ ÁÓ:ÈHÍ	V' ] ææ	GÈG	ÈG	Í È Í	ÈÈF
FÈ	Sæ^!•	ŠGH çGH çH	Ó^æ	Þ  } ^	ØHÍ ÁÓ:ÈHÍ	V' ] ææ	ÈÈF	È HÍ	È HÍ	ÈÈFF

7c`X: cfa YX'GhY'GYW]cb'GYlg

	Šæ^	Ú@^	V'^	Ô•ã) Áæc	Tæ!æþ	Ô•ã) ÁÛ•	ØÄ Gá	Q'Äl á	Q:Äl á	RÄl á
F	ØØFCE	ÌØWFÈ YÈÈ	Ó^æ	Þ  } ^	ØÉ   HÁÚÁÓ:  H	V' ] ææ	È   F	È È Í	Í È F	ÈÈÈ H

>c]bh6ci bXUf m7 cbX]hcbg

	R ä öŠæ^	ÝÄÈ á	ÝÄÈ á	ZÄÈ á	ÝÁÚ] çÄ ÈÈÈá	ÝÁÚ] çÄ ÈÈÈá	ZÁÚ] çÄ ÈÈÈá
F	ÞÍJ	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }
G	ÞFH	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }
H	ÞFH	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }
I	ÞFHJ	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }
Í	ÞFÈ	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }
Ï	ÞFF	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }	Ú^æçä }

6 Uq]W@ UX'7 UqYq

	ÓSÓ/Ô• & ä ç)	Ôæ*    ^	ÝÁÓ:ææ	ÝÁÓ:ææ	ZÁÓ:ææ	R ä c	Ú] ä c	Öä ä~ çÈÈæçÚ ^ ÈÈÚ'   æÄÈÈ		
F	Ú\A^ ^æ @	ÖS		È			G		H	
G	Úç~ &c'   ^Á ä äÄ	Y ŠZ						FÈ		
H	Úç~ &c'   ^Á ä äÁ	Y ŠÝ						FÈ		
I	Y ä äÄŠ æÄÁÓZQ	Y ŠZ								
Í	Y ä äÄŠ æÄÈÁÓZQ	Þ  } ^								
İ	Y ä äÄŠ æÄÁ Í ÁÓZQ	Þ  } ^								
Ï	Y ä äÄŠ æÄÁ È ÁÓZQ	Þ  } ^								
Ì	Y ä äÄŠ æÄÁ È ÁÓZQ	Y ŠÝ								
J	Y ä äÄŠ æÄÁFGÁÓZQ	Þ  } ^								
FÈ	Y ä äÄŠ æÄÁFHÍ ÁÓZQ	Þ  } ^								
FF	Y ä äÄŠ æÄÁFÍ È ÁÓZQ	Þ  } ^								
FG	Ö^Á ^æ @	UŠF					G	FÈ	H	
FH	Ö^Áç~ &c'   ^Á ä äÄ	UŠG						FÈ		
FI	Ö^Áç~ &c'   ^Á ä äÁ	UŠH						FÈ		
FÍ	Ö^Á ä äÄŠ æÄÁÁÓZQ	UŠG								
Fİ	Ö^Á ä äÄŠ æÄÁ È ÁÓZQ	Þ  } ^								
FÌ	Ö^Á ä äÄŠ æÄÁ È ÁÓZQ	Þ  } ^								
FJ	Ö^Á ä äÄŠ æÄÁ È ÁÓZQ	UŠH								
GÈ	Ö^Á ä äÄŠ æÄÁFGÁÓZQ	Þ  } ^								
GF	Ö^Á ä äÄŠ æÄÁFHÍ ÁÓZQ	Þ  } ^								
GG	Ö^Á ä äÄŠ æÄÁFÍ È ÁÓZQ	Þ  } ^								
GH	Ú^ä{ æÄŠ æÄÄ	ÖSZ		ÈÈFG			G			
G	Ú^ä{ æÄŠ æÄÁ	ÖSÝ	ÈÈFG				G			
G	Šæ^   Šæ^ æÄÁFÁŠçD	Þ  } ^					F			
G	Šæ^   Šæ^ æÄÁGÁŠçD	Þ  } ^					F			



















**APPENDIX D**  
**ADDITIONAL CALCULATIONS**

**BOLT TOOL 1.5.3**

Project Data	
Job Code:	236231
Carrier Site ID:	BU 842861
Carrier Site Name:	ST HARTFORD HOCHAN

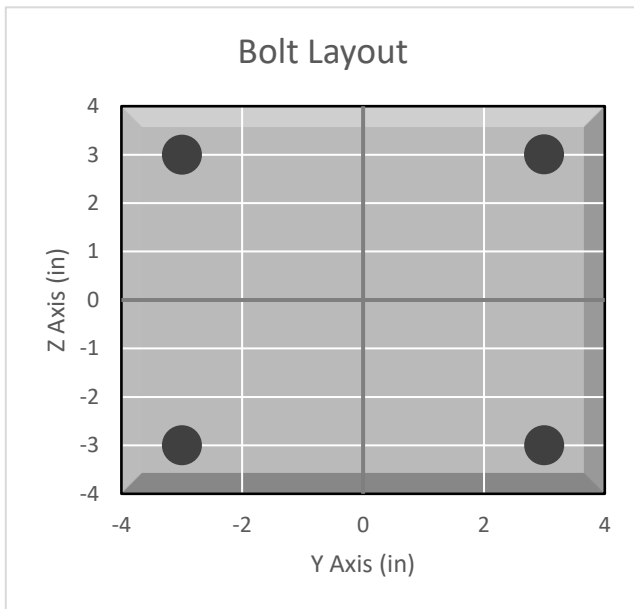
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

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

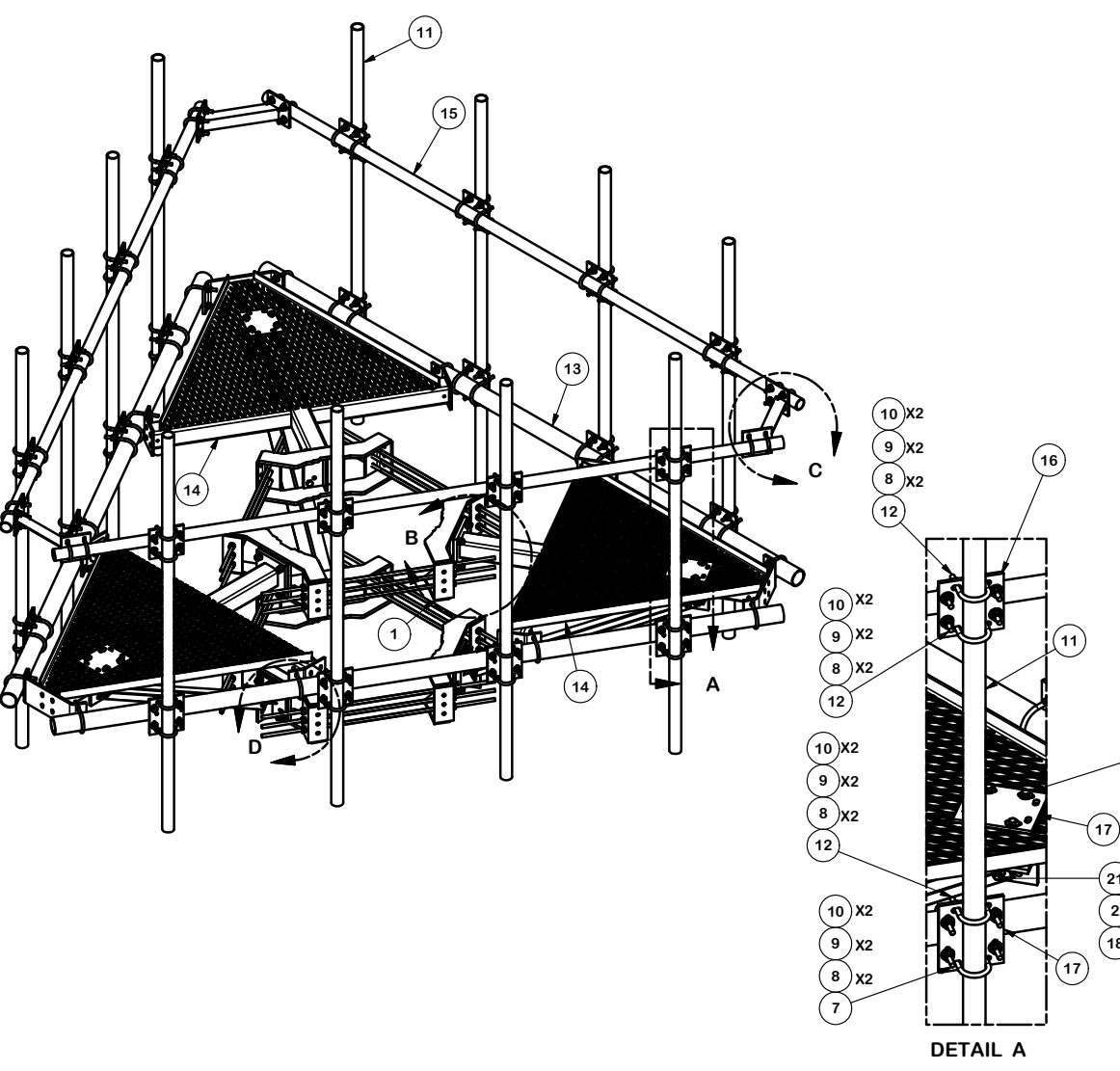
Connection Description
Standoff to Collar

Bolt Check*		
Tensile Capacity ( $\phi T_n$ ):	20340.1	lbs
Shear Capacity ( $\phi V_n$ ):	13805.8	lbs
Tension Force ( $T_u$ ):	2653.4	lbs
Shear Force ( $V_u$ ):	264.0	lbs
Tension Usage:	12.4%	--
Shear Usage:	1.8%	--
Interaction:	12.4%	Pass
Controlling Member:	M2	--
Controlling LC:	9	--

\*Rating per TIA-222-H Section 15.5



**APPENDIX E**  
**SUPPLEMENTAL DRAWINGS**



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMNT		68.16	408.95
2	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
3	60	A58NUT	5/8" HDG A325 HEX NUT		0.13	7.78
4	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	9.88
4	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	9.88
5	24	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	8.53
6	24	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.82
7	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.73	26.34
8	264	G12FW	1/2" HDG USS FLATWASHER		0.03	8.99
9	252	G12LW	1/2" HDG LOCKWASHER		0.01	3.50
10	252	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	18.03
11	12	P296	2-3/8" X 96" SCH. 40 GALVANIZED PIPE	96 in	30.76	369.08
12	84	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	61.46
13	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150 in	94.80	284.40
14	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
15	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	48.06	144.17
16	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
17	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
18	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
19	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
20	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
21	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
22	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
23	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
					TOTAL WT. #	2448.72

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

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**DESCRIPTION**  
 12' 6" LOW PROFILE PLATFORM  
 WITH TWELVE 2-3/8" ANTENNA MOUTING  
 PIPES, AND HANDRAIL

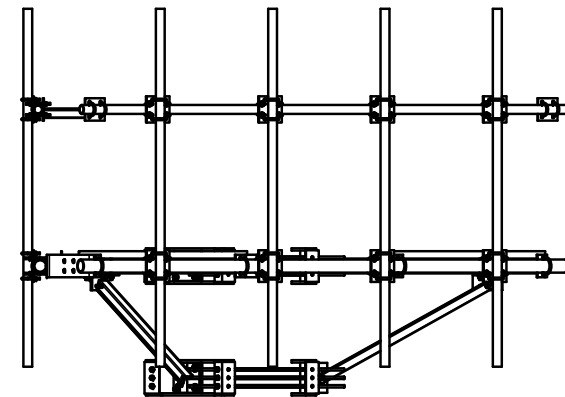
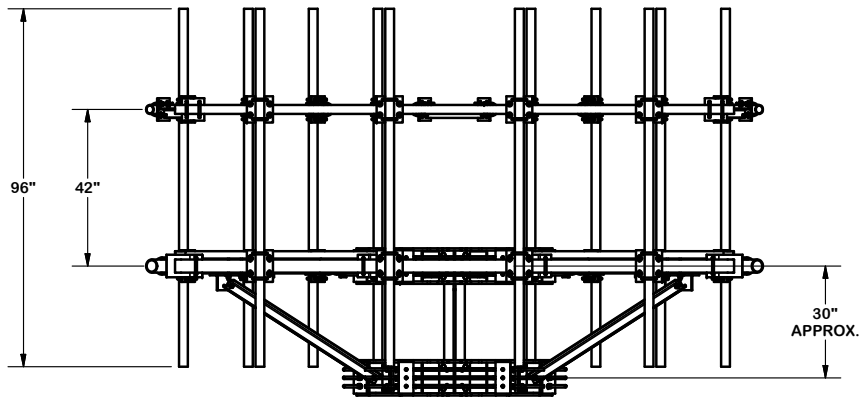
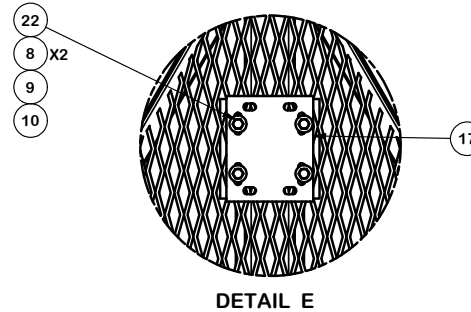
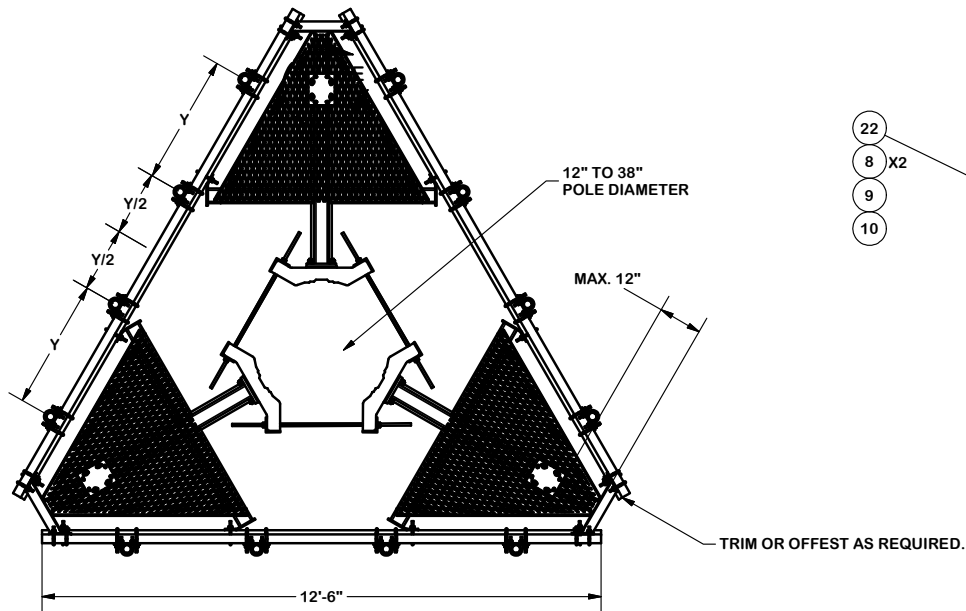
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CLASS 81	SUB 02	DRAWING USAGE CUSTOMER
CHECKED BY BMC 7/14/2014		

**SITE PRO 1**  
 Engineering Support Team:  
 1-888-753-7446

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

Part No. **RMQP-496-HK**  
 DWG. NO. **RMQP-496-HK**

PAGE 1 OF 3



**TOLERANCE NOTES**

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CPD NO. 4488	DRAWN BY CEK 7/14/2014	ENG. APPROVAL
CLASS 81	SUB 02	DRAWING USAGE CUSTOMER
CHECKED BY BMC 7/14/2014		

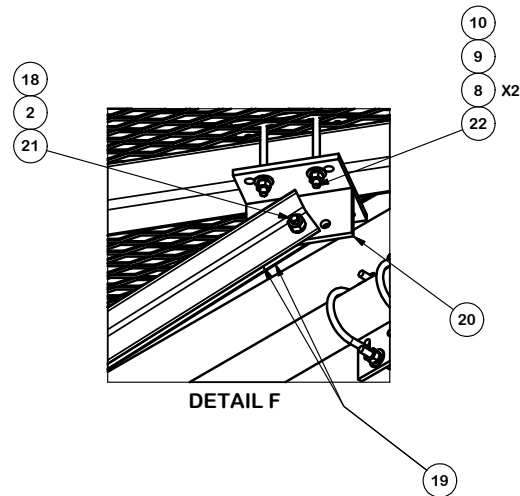
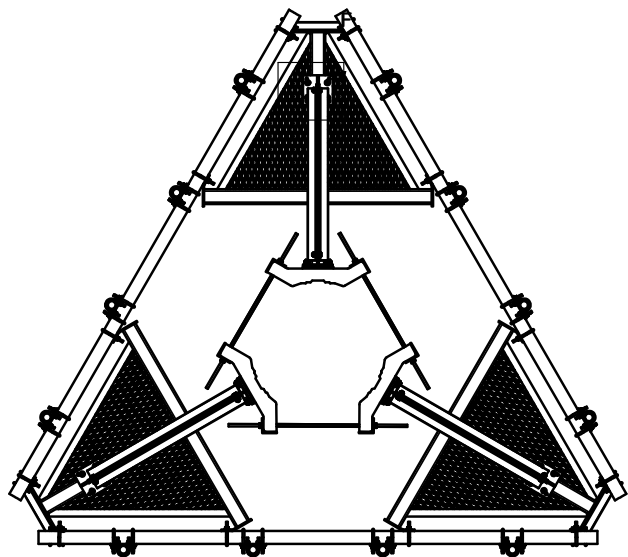
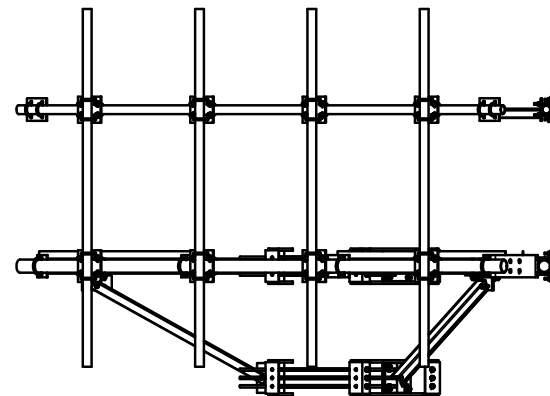
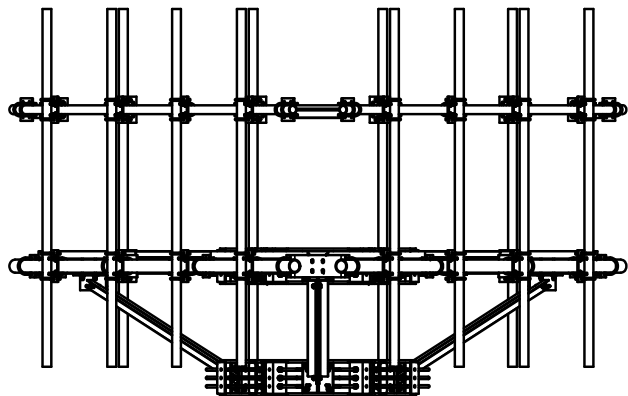


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DWG. NO. RMQP-496-HK





**TOLERANCE NOTES**

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CPD NO. <b>4488</b>	DRAWN BY <b>CEK 7/14/2014</b>	ENG. APPROVAL
CLASS <b>81</b>	SUB <b>02</b>	DRAWING USAGE <b>CUSTOMER</b>
CHECKED BY <b>BMC 7/14/2014</b>		



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PART NO. <b>RMQP-496-HK</b>	PAGE <b>3 OF 3</b>
DWG. NO. <b>RMQP-496-HK</b>	

Date: **January 10, 2024**



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

**Subject:** **Structural Modification Report**

**Carrier Designation:** **T-Mobile Co-Locate**  
**Site Number:** CT11845A

**Crown Castle Designation:** **BU Number:** 842861  
**Site Name:** EAST HARTFORD HOCHANUM  
**JDE Job Number:** 751349  
**Work Order Number:** 2276930  
**Order Number:** 654558 Rev. 3

**Engineering Firm Designation:** **Crown Castle Project Number:** 2276930

**Site Data:** **223 Brainard Road, Hartford, Hartford County, CT**  
**Latitude 41° 43' 58.72", Longitude -72° 39' 43.47"**  
**96.83 Foot - Monopole Tower**

Crown Castle is pleased to submit this “**Structural Modification 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 including the proposed modifications as outlined in the attached drawings, "Appendix D". Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

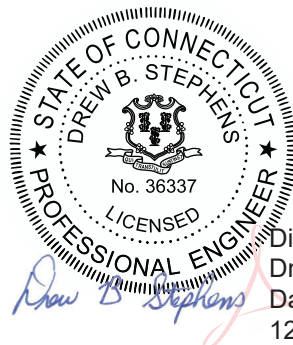
LC4: Modified Structure with Considered + Proposed Equipment Configuration **Sufficient Capacity - 90.9%**

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 – “Analysis Criteria”.

Structural analysis prepared by: Drew Stephens

Respectfully submitted by:

Drew B. Stephens, P.E.  
Senior Project Engineer



Digitally signed by  
Drew B Stephens  
Date: 2024.01.10  
12:10:18 -05'00'

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### 7) APPENDIX C

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### 8) APPENDIX D

Required Modification Drawings

## 1) INTRODUCTION

This tower is a 96.83 ft Monopole tower mapped by Tower Engineering Professionals in January of 2016.

The modification drawings designed by CCI and attached in Appendix D, have been considered in this analysis.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	118 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
78.0	78.0	3	commscope	VV-65A-R1_TMO w/ Mount Pipe	3	1-5/8
		3	ericsson	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		1	Site Pro 1	RMQP-496-HK		

**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)
103.0	103.0	3	ericsson	AIR 6419 B77G w/ Mount Pipe	6 2 1 1	1-1/4 7/8 3/8 conduit
		3	ericsson	AIR 6449 N77 w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	kathrein	80010965 w/ Mount Pipe		
		1	raycap	DC9-48-60-24-8C-EV		
	1	tower mounts	Platform Mount [LP 1201-1_KCKR-HR-1]			
	102.0	3	cci antennas	DMP65R-BU6e w/ Mount Pipe		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
3		ericsson	RRUS 4478 B14			
98.0	102.0	2	raycap	DC6-48-60-18-8F	4	7/8
	98.0	1	tower mounts	Side Arm Mount [SO 102-3]	2	3/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
86.0	88.0	1	antel	BXA-70063/4CF w/ Mount Pipe	8	1-5/8
		3	commscope	NHH-65B-R2B w/ Mount Pipe		
		3	commscope	NHHSS-65B-R2B w/ Mount Pipe		
		2	raycap	RRFDC-3315-PF-48		
		3	samsung telecommunications	CBRS RT4401-48A		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RF4439D-25A		
		3	samsung telecommunications	RF4440D-13A		
		1	swedcom	SCCP 2X6015 w/ Mount Pipe		
	1	swedcom	SLCP 2X6015 w/ Mount Pipe			
	86.0	1	tower mounts	Platform Mount [LP 303-1_KCKR-HR-1]		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	6049468	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	6049752	CCISITES
4-TOWER MANUFACTURER DRAWINGS	5210316	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Appendix D	ON FILE

#### 3.1) Analysis Method

tnxTower (version 8.2.2.0), 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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the reinforcing elements. These calculations are presented in Appendix C.

#### 3.2) Assumptions

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

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

#### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
96.83 - 91.83	Pole	TP26.519x25.75x0.1875	Pole	15.5%	Pass
91.83 - 86.83	Pole	TP27.287x26.519x0.1875	Pole	22.3%	Pass
86.83 - 81.83	Pole	TP28.056x27.287x0.1875	Pole	32.8%	Pass
81.83 - 80.11	Pole	TP28.875x28.056x0.1875	Pole	36.1%	Pass
80.11 - 75.11	Pole	TP28.621x27.945x0.2188	Pole	39.3%	Pass
75.11 - 70.11	Pole	TP29.296x28.621x0.2188	Pole	48.8%	Pass
70.11 - 65.11	Pole	TP29.972x29.296x0.2188	Pole	57.7%	Pass
65.11 - 60.11	Pole	TP30.647x29.972x0.2188	Pole	66.2%	Pass
60.11 - 55.11	Pole	TP31.323x30.647x0.2188	Pole	74.3%	Pass
55.11 - 50.11	Pole	TP31.998x31.323x0.2188	Pole	81.9%	Pass
50.11 - 45.11	Pole	TP32.674x31.998x0.2188	Pole	89.2%	Pass
45.11 - 44.09	Pole	TP33.375x32.674x0.2188	Pole	90.6%	Pass
44.09 - 39.09	Pole	TP33.126x32.374x0.2813	Pole	70.8%	Pass
39.09 - 34.09	Pole	TP33.877x33.126x0.2813	Pole	75.0%	Pass
34.09 - 29.09	Pole	TP34.628x33.877x0.2813	Pole	79.0%	Pass
29.09 - 24.09	Pole	TP35.38x34.628x0.2813	Pole	82.8%	Pass
24.09 - 19.09	Pole	TP36.131x35.38x0.2813	Pole	86.4%	Pass
19.09 - 14.09	Pole	TP36.883x36.131x0.2813	Pole	89.8%	Pass
14.09 - 12.38	Pole	TP37.14x36.883x0.2813	Pole	90.9%	Pass
12.38 - 12.13	Pole + Reinf.	TP37.178x37.14x0.4688	Reinf. 1 Tension Rupture	73.8%	Pass
12.13 - 7.13	Pole + Reinf.	TP37.929x37.178x0.4625	Reinf. 1 Tension Rupture	76.5%	Pass
7.13 - 2.83	Pole + Reinf.	TP38.574x37.929x0.4563	Reinf. 1 Tension Rupture	78.6%	Pass
2.83 - 2.58	Pole	TP38.612x38.574x0.2813	Pole	68.4%	Pass
2.58 - 0	Pole	TP39x38.612x0.2813	Pole	67.3%	Pass
				Summary	
			Pole	90.9%	Pass
			Reinforcement	78.6%	Pass
			Overall	90.9%	Pass

**Table 5 - Tower Component Stresses vs. Capacity - LC4**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	65.8	Pass
1	Base Plate		44.3	Pass
1	Base Foundation (Structure)	0	39.0	Pass
1	Base Foundation (Soil Interaction)		50.0	Pass
<b>Structure Rating (max from all components) =</b>				<b>90.9%</b>

Notes:

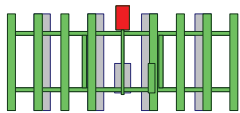
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

#### 4.1) Recommendations

Perform the modifications detailed in "Appendix D" to remedy the deficiencies identified in Crown Castle Work Order No. 2260094.

**APPENDIX A**  
**TNXTOWER OUTPUT**



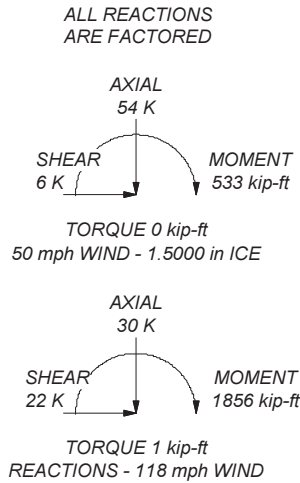
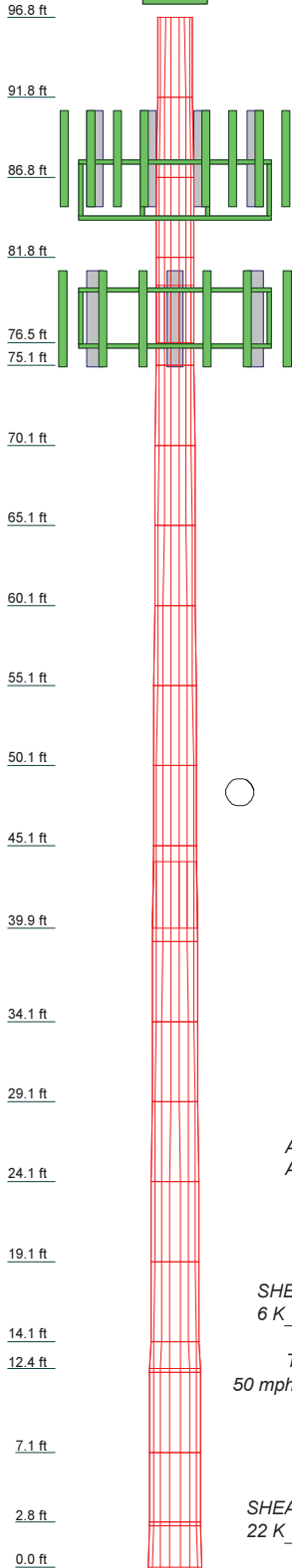


**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 90.9%



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.1875	3.61	25.7500	26.5186	A572-65	0.3
2	5.00	18	0.1875	3.61	26.5186	27.2871	A572-65	0.3
3	5.00	18	0.1875	3.61	27.2871	28.0557	A572-65	0.3
4	5.00	18	0.1875	3.61	28.0557	28.8242	A572-65	0.3
5	5.00	18	0.1875	3.61	28.8242	29.5928	A572-65	0.3
6	5.00	18	0.1875	3.61	29.5928	30.3613	A572-65	0.3
7	5.00	18	0.1875	3.61	30.3613	31.1300	A572-65	0.3
8	5.00	18	0.1875	3.61	31.1300	31.8987	A572-65	0.3
9	5.00	18	0.1875	3.61	31.8987	32.6674	A572-65	0.3
10	5.00	18	0.1875	3.61	32.6674	33.4361	A572-65	0.3
11	5.00	18	0.1875	3.61	33.4361	34.2048	A572-65	0.3
12	5.00	18	0.1875	3.61	34.2048	34.9735	A572-65	0.3
13	5.00	18	0.1875	3.61	34.9735	35.7422	A572-65	0.3
14	5.00	18	0.1875	3.61	35.7422	36.5109	A572-65	0.3
15	5.00	18	0.1875	3.61	36.5109	37.2796	A572-65	0.3
16	5.00	18	0.1875	3.61	37.2796	38.0483	A572-65	0.3
17	5.00	18	0.1875	3.61	38.0483	38.8170	A572-65	0.3
18	5.00	18	0.1875	3.61	38.8170	39.5857	A572-65	0.3
19	5.00	18	0.1875	3.61	39.5857	40.3544	A572-65	0.3
20	5.00	18	0.1875	3.61	40.3544	41.1231	A572-65	0.3
21	5.00	18	0.1875	3.61	41.1231	41.8918	A572-65	0.3
22	5.00	18	0.1875	3.61	41.8918	42.6605	A572-65	0.3
23	5.00	18	0.1875	3.61	42.6605	43.4292	A572-65	0.3
24	5.00	18	0.1875	3.61	43.4292	44.1979	A572-65	0.3
25	5.00	18	0.1875	3.61	44.1979	44.9666	A572-65	0.3
26	5.00	18	0.1875	3.61	44.9666	45.7353	A572-65	0.3
27	5.00	18	0.1875	3.61	45.7353	46.5040	A572-65	0.3
28	5.00	18	0.1875	3.61	46.5040	47.2727	A572-65	0.3
29	5.00	18	0.1875	3.61	47.2727	48.0414	A572-65	0.3
30	5.00	18	0.1875	3.61	48.0414	48.8101	A572-65	0.3
31	5.00	18	0.1875	3.61	48.8101	49.5788	A572-65	0.3
32	5.00	18	0.1875	3.61	49.5788	50.3475	A572-65	0.3
33	5.00	18	0.1875	3.61	50.3475	51.1162	A572-65	0.3
34	5.00	18	0.1875	3.61	51.1162	51.8849	A572-65	0.3
35	5.00	18	0.1875	3.61	51.8849	52.6536	A572-65	0.3
36	5.00	18	0.1875	3.61	52.6536	53.4223	A572-65	0.3
37	5.00	18	0.1875	3.61	53.4223	54.1910	A572-65	0.3
38	5.00	18	0.1875	3.61	54.1910	54.9597	A572-65	0.3
39	5.00	18	0.1875	3.61	54.9597	55.7284	A572-65	0.3
40	5.00	18	0.1875	3.61	55.7284	56.4971	A572-65	0.3
41	5.00	18	0.1875	3.61	56.4971	57.2658	A572-65	0.3
42	5.00	18	0.1875	3.61	57.2658	58.0345	A572-65	0.3
43	5.00	18	0.1875	3.61	58.0345	58.8032	A572-65	0.3
44	5.00	18	0.1875	3.61	58.8032	59.5719	A572-65	0.3
45	5.00	18	0.1875	3.61	59.5719	60.3406	A572-65	0.3
46	5.00	18	0.1875	3.61	60.3406	61.1093	A572-65	0.3
47	5.00	18	0.1875	3.61	61.1093	61.8780	A572-65	0.3
48	5.00	18	0.1875	3.61	61.8780	62.6467	A572-65	0.3
49	5.00	18	0.1875	3.61	62.6467	63.4154	A572-65	0.3
50	5.00	18	0.1875	3.61	63.4154	64.1841	A572-65	0.3
51	5.00	18	0.1875	3.61	64.1841	64.9528	A572-65	0.3
52	5.00	18	0.1875	3.61	64.9528	65.7215	A572-65	0.3
53	5.00	18	0.1875	3.61	65.7215	66.4902	A572-65	0.3
54	5.00	18	0.1875	3.61	66.4902	67.2589	A572-65	0.3
55	5.00	18	0.1875	3.61	67.2589	68.0276	A572-65	0.3
56	5.00	18	0.1875	3.61	68.0276	68.7963	A572-65	0.3
57	5.00	18	0.1875	3.61	68.7963	69.5650	A572-65	0.3
58	5.00	18	0.1875	3.61	69.5650	70.3337	A572-65	0.3
59	5.00	18	0.1875	3.61	70.3337	71.1024	A572-65	0.3
60	5.00	18	0.1875	3.61	71.1024	71.8711	A572-65	0.3
61	5.00	18	0.1875	3.61	71.8711	72.6398	A572-65	0.3
62	5.00	18	0.1875	3.61	72.6398	73.4085	A572-65	0.3
63	5.00	18	0.1875	3.61	73.4085	74.1772	A572-65	0.3
64	5.00	18	0.1875	3.61	74.1772	74.9459	A572-65	0.3
65	5.00	18	0.1875	3.61	74.9459	75.7146	A572-65	0.3
66	5.00	18	0.1875	3.61	75.7146	76.4833	A572-65	0.3
67	5.00	18	0.1875	3.61	76.4833	77.2520	A572-65	0.3
68	5.00	18	0.1875	3.61	77.2520	78.0207	A572-65	0.3
69	5.00	18	0.1875	3.61	78.0207	78.7894	A572-65	0.3
70	5.00	18	0.1875	3.61	78.7894	79.5581	A572-65	0.3
71	5.00	18	0.1875	3.61	79.5581	80.3268	A572-65	0.3
72	5.00	18	0.1875	3.61	80.3268	81.0955	A572-65	0.3
73	5.00	18	0.1875	3.61	81.0955	81.8642	A572-65	0.3
74	5.00	18	0.1875	3.61	81.8642	82.6329	A572-65	0.3
75	5.00	18	0.1875	3.61	82.6329	83.4016	A572-65	0.3
76	5.00	18	0.1875	3.61	83.4016	84.1703	A572-65	0.3
77	5.00	18	0.1875	3.61	84.1703	84.9390	A572-65	0.3
78	5.00	18	0.1875	3.61	84.9390	85.7077	A572-65	0.3
79	5.00	18	0.1875	3.61	85.7077	86.4764	A572-65	0.3
80	5.00	18	0.1875	3.61	86.4764	87.2451	A572-65	0.3
81	5.00	18	0.1875	3.61	87.2451	88.0138	A572-65	0.3
82	5.00	18	0.1875	3.61	88.0138	88.7825	A572-65	0.3
83	5.00	18	0.1875	3.61	88.7825	89.5512	A572-65	0.3
84	5.00	18	0.1875	3.61	89.5512	90.3199	A572-65	0.3
85	5.00	18	0.1875	3.61	90.3199	91.0886	A572-65	0.3
86	5.00	18	0.1875	3.61	91.0886	91.8573	A572-65	0.3
87	5.00	18	0.1875	3.61	91.8573	92.6260	A572-65	0.3
88	5.00	18	0.1875	3.61	92.6260	93.3947	A572-65	0.3
89	5.00	18	0.1875	3.61	93.3947	94.1634	A572-65	0.3
90	5.00	18	0.1875	3.61	94.1634	94.9321	A572-65	0.3
91	5.00	18	0.1875	3.61	94.9321	95.7008	A572-65	0.3
92	5.00	18	0.1875	3.61	95.7008	96.4695	A572-65	0.3
93	5.00	18	0.1875	3.61	96.4695	97.2382	A572-65	0.3
94	5.00	18	0.1875	3.61	97.2382	98.0069	A572-65	0.3
95	5.00	18	0.1875	3.61	98.0069	98.7756	A572-65	0.3
96	5.00	18	0.1875	3.61	98.7756	99.5443	A572-65	0.3
97	5.00	18	0.1875	3.61	99.5443	100.3130	A572-65	0.3
98	5.00	18	0.1875	3.61	100.3130	101.0817	A572-65	0.3
99	5.00	18	0.1875	3.61	101.0817	101.8504	A572-65	0.3
100	5.00	18	0.1875	3.61	101.8504	102.6191	A572-65	0.3

**Crown Castle**  
 2000 Corporate Drive  
 Canonsburg, PA 15317  
 The Pathway to Possible Phone: 724-416-2000  
 FAX:

Job: **BU# 842861**

Project:	Client: Crown Castle	Drawn by: DStephens	App'd:
Code: TIA-222-H	Date: 01/05/24	Scale: NTS	Dwg No. E-1
Path: C:\SDD Processing\842861\WQ 2276930 - SDD\Prod\842861_R.er			

## Tower Input Data

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

- 1) Tower is located in Hartford County, Connecticut.
- 2) Tower base elevation above sea level: 10.00 ft.
- 3) Basic wind speed of 118 mph.
- 4) Risk Category II.
- 5) Exposure Category C.
- 6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 7) Topographic Category: 1.
- 8) Crest Height: 0.00 ft.
- 9) Nominal ice thickness of 1.5000 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56 pcf.
- 12) A wind speed of 50 mph is used in combination with ice.
- 13) Temperature drop of 50 °F.
- 14) Deflections calculated using a wind speed of 60 mph.
- 15) TOWER RATING: 90.9%.
- 16) A non-linear (P-delta) analysis was used.
- 17) Pressures are calculated at each section.
- 18) Stress ratio used in pole design is 1.
- 19) Tower analysis based on target reliabilities in accordance with Annex S.
- 20) Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- 21) Maximum demand-capacity ratio is: 1.05.
- 22) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

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

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	96.83-91.83	5.00	0.00	18	25.7500	26.5186	0.1875	0.7500	A572-65 (65 ksi)
L2	91.83-86.83	5.00	0.00	18	26.5186	27.2871	0.1875	0.7500	A572-65 (65 ksi)
L3	86.83-81.83	5.00	0.00	18	27.2871	28.0557	0.1875	0.7500	A572-65 (65 ksi)
L4	81.83-76.50	5.33	3.61	18	28.0557	28.8750	0.1875	0.7500	A572-65 (65 ksi)

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
L5	76.50-75.11	5.00	0.00	18	27.9451	28.6206	0.2188	0.8750	A572-65 (65 ksi)
L6	75.11-70.11	5.00	0.00	18	28.6206	29.2962	0.2188	0.8750	A572-65 (65 ksi)
L7	70.11-65.11	5.00	0.00	18	29.2962	29.9717	0.2188	0.8750	A572-65 (65 ksi)
L8	65.11-60.11	5.00	0.00	18	29.9717	30.6472	0.2188	0.8750	A572-65 (65 ksi)
L9	60.11-55.11	5.00	0.00	18	30.6472	31.3227	0.2188	0.8750	A572-65 (65 ksi)
L10	55.11-50.11	5.00	0.00	18	31.3227	31.9983	0.2188	0.8750	A572-65 (65 ksi)
L11	50.11-45.11	5.00	0.00	18	31.9983	32.6738	0.2188	0.8750	A572-65 (65 ksi)
L12	45.11-39.92	5.19	4.17	18	32.6738	33.3750	0.2188	0.8750	A572-65 (65 ksi)
L13	39.92-39.09	5.00	0.00	18	32.3741	33.1255	0.2812	1.1250	A572-65 (65 ksi)
L14	39.09-34.09	5.00	0.00	18	33.1255	33.8769	0.2812	1.1250	A572-65 (65 ksi)
L15	34.09-29.09	5.00	0.00	18	33.8769	34.6283	0.2812	1.1250	A572-65 (65 ksi)
L16	29.09-24.09	5.00	0.00	18	34.6283	35.3797	0.2812	1.1250	A572-65 (65 ksi)
L17	24.09-19.09	5.00	0.00	18	35.3797	36.1311	0.2812	1.1250	A572-65 (65 ksi)
L18	19.09-14.09	5.00	0.00	18	36.1311	36.8825	0.2812	1.1250	A572-65 (65 ksi)
L19	14.09-12.38	1.72	0.00	18	36.8825	37.1403	0.2812	1.1250	A572-65 (65 ksi)
L20	12.38-12.13	0.25	0.00	18	37.1403	37.1778	0.4688	1.8750	A572-65 (65 ksi)
L21	12.13-7.13	5.00	0.00	18	37.1778	37.9292	0.4625	1.8500	A572-65 (65 ksi)
L22	7.13-2.83	4.29	0.00	18	37.9292	38.5743	0.4562	1.8250	A572-65 (65 ksi)
L23	2.83-2.58	0.25	0.00	18	38.5743	38.6118	0.2812	1.1250	A572-65 (65 ksi)
L24	2.58-0.00	2.58		18	38.6118	39.0000	0.2812	1.1250	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	26.1183	15.2129	1255.9016	9.0747	13.0810	96.0096	2513.4558	7.6079	4.2020	22.411
	26.8987	15.6703	1372.6225	9.3475	13.4714	101.8913	2747.0510	7.8366	4.3373	23.132
L2	26.8987	15.6703	1372.6225	9.3475	13.4714	101.8913	2747.0510	7.8366	4.3373	23.132
	27.6792	16.1277	1496.3600	9.6204	13.8619	107.9479	2994.6889	8.0654	4.4725	23.854
L3	27.6792	16.1277	1496.3600	9.6204	13.8619	107.9479	2994.6889	8.0654	4.4725	23.854
	28.4596	16.5851	1627.3189	9.8932	14.2523	114.1794	3256.7791	8.2941	4.6078	24.575
L4	28.4596	16.5851	1627.3189	9.8932	14.2523	114.1794	3256.7791	8.2941	4.6078	24.575
	29.2915	17.0726	1775.1038	10.1841	14.6685	121.0147	3552.5433	8.5379	4.7520	25.344
L5	28.8377	19.2507	1869.6927	9.8429	14.1961	131.7046	3741.8456	9.6272	4.5333	20.724
	29.0284	19.7198	2009.7099	10.0827	14.5393	138.2263	4022.0643	9.8618	4.6522	21.267
L6	29.0284	19.7198	2009.7099	10.0827	14.5393	138.2263	4022.0643	9.8618	4.6522	21.267
	29.7143	20.1888	2156.5487	10.3225	14.8824	144.9055	4315.9350	10.0963	4.7711	21.811
L7	29.7143	20.1888	2156.5487	10.3225	14.8824	144.9055	4315.9350	10.0963	4.7711	21.811
	30.4003	20.6578	2310.3711	10.5623	15.2256	151.7424	4623.7823	10.3309	4.8900	22.354
L8	30.4003	20.6578	2310.3711	10.5623	15.2256	151.7424	4623.7823	10.3309	4.8900	22.354
	31.0862	21.1269	2471.3396	10.8021	15.5688	158.7368	4945.9310	10.5654	5.0089	22.898
L9	31.0862	21.1269	2471.3396	10.8021	15.5688	158.7368	4945.9310	10.5654	5.0089	22.898
	31.7722	21.5959	2639.6163	11.0419	15.9120	165.8889	5282.7058	10.8000	5.1278	23.441
L10	31.7722	21.5959	2639.6163	11.0419	15.9120	165.8889	5282.7058	10.8000	5.1278	23.441
	32.4581	22.0649	2815.3634	11.2817	16.2551	173.1985	5634.4314	11.0346	5.2467	23.985

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L11	32.4581	22.0649	2815.3634	11.2817	16.2551	173.1985	5634.4314	11.0346	5.2467	23.985
	33.1441	22.5339	2998.7433	11.5215	16.5983	180.6658	6001.4325	11.2691	5.3656	24.528
L12	33.1441	22.5339	2998.7433	11.5215	16.5983	180.6658	6001.4325	11.2691	5.3656	24.528
	33.8561	23.0208	3197.3387	11.7705	16.9545	188.5835	6398.8846	11.5126	5.4890	25.093
L13	33.4665	28.6489	3727.8815	11.3930	16.4460	226.6734	7460.6683	14.3272	5.2028	18.499
	33.5931	29.3197	3995.9081	11.6597	16.8278	237.4593	7997.0741	14.6626	5.3351	18.969
L14	33.5931	29.3197	3995.9081	11.6597	16.8278	237.4593	7997.0741	14.6626	5.3351	18.969
	34.3561	29.9904	4276.4833	11.9265	17.2095	248.4959	8558.5937	14.9981	5.4673	19.439
L15	34.3561	29.9904	4276.4833	11.9265	17.2095	248.4959	8558.5937	14.9981	5.4673	19.439
	35.1191	30.6612	4569.8942	12.1932	17.5912	259.7831	9145.8016	15.3335	5.5996	19.91
L16	35.1191	30.6612	4569.8942	12.1932	17.5912	259.7831	9145.8016	15.3335	5.5996	19.91
	35.8821	31.3320	4876.4279	12.4600	17.9729	271.3211	9759.2724	15.6690	5.7318	20.38
L17	35.8821	31.3320	4876.4279	12.4600	17.9729	271.3211	9759.2724	15.6690	5.7318	20.38
	36.6451	32.0027	5196.3715	12.7267	18.3546	283.1098	10399.580	16.0044	5.8641	20.85
L18	36.6451	32.0027	5196.3715	12.7267	18.3546	283.1098	10399.580	16.0044	5.8641	20.85
	37.4081	32.6735	5530.0121	12.9935	18.7363	295.1492	11067.300	16.3399	5.9963	21.32
L19	37.4081	32.6735	5530.0121	12.9935	18.7363	295.1492	11067.300	16.3399	5.9963	21.32
	37.6698	32.9036	5647.6572	13.0850	18.8673	299.3364	11302.745	16.4549	6.0417	21.482
L20	37.6409	54.5603	9269.8447	13.0184	18.8673	491.3191	18551.886	27.2854	5.7117	12.185
	37.6791	54.6162	9298.3650	13.0317	18.8863	492.3327	18608.965	27.3133	5.7183	12.199
L21	37.6800	53.8972	9179.0736	13.0339	18.8863	486.0164	18370.225	26.9537	5.7293	12.388
	38.4430	55.0002	9754.2547	13.3007	19.2681	506.2396	19521.344	27.5054	5.8615	12.674
L22	38.4440	54.2661	9627.2567	13.3029	19.2681	499.6485	19267.181	27.1382	5.8725	12.871
	39.0989	55.2001	10132.991	13.5319	19.5957	517.1023	20279.317	27.6053	5.9861	13.12
L23	39.1259	34.1837	6332.7918	13.5940	19.5957	323.1722	12673.916	17.0951	6.2941	22.379
	39.1641	34.2172	6351.4499	13.6074	19.6148	323.8089	12711.257	17.1119	6.3007	22.402
L24	39.1641	34.2172	6351.4499	13.6074	19.6148	323.8089	12711.257	17.1119	6.3007	22.402
	39.5583	34.5637	6546.3751	13.7452	19.8120	330.4247	13101.364	17.2852	6.3690	22.645

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 96.83- 91.83				1	1	1			
L2 91.83- 86.83				1	1	1			
L3 86.83- 81.83				1	1	1			
L4 81.83- 76.50				1	1	1			
L5 76.50- 75.11				1	1	1			
L6 75.11- 70.11				1	1	1			
L7 70.11- 65.11				1	1	1			
L8 65.11- 60.11				1	1	1			
L9 60.11- 55.11				1	1	1			
L10 55.11- 50.11				1	1	1			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L11 50.11-45.11				1	1	1			
L12 45.11-39.92				1	1	1			
L13 39.92-39.09				1	1	1			
L14 39.09-34.09				1	1	1			
L15 34.09-29.09				1	1	1			
L16 29.09-24.09				1	1	1			
L17 24.09-19.09				1	1	1			
L18 19.09-14.09				1	1	1			
L19 14.09-12.38				1	1	1			
L20 12.38-12.13				1	1	1.04938			
L21 12.13-7.13				1	1	1.05425			
L22 7.13-2.83				1	1	1.06086			
L23 2.83-2.58				1	1	1			
L24 2.58-0.00				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
**86** HB158-21U6S12-XXXM-01(1-5/8)	B	No	Surface Ar (CaAa)	86.00 - 0.00	4	4	-0.330 -0.330	1.9900		1.90
*** CCI-65FP-065125	A	No	Surface Af (CaAa)	15.83 - 0.83	1	1	-0.100 0.100	6.5000	15.5000	0.00
CCI-65FP-065125	B	No	Surface Af (CaAa)	15.83 - 0.83	1	1	-0.200 -0.100	6.5000	15.5000	0.00
CCI-65FP-065125	C	No	Surface Af (CaAa)	15.83 - 0.83	1	1	-0.100 0.100	6.5000	15.5000	0.00

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
1/2" Cable (Lights)	C	No	No	Inside Pole	96.83 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.40 0.40 0.40 0.40
**103** FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	96.83 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
PWRT-606-S(7/8)	C	No	No	Inside Pole	96.83 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.89 0.89 0.89

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
LDF6-50A(1-1/4)	C	No	No	Inside Pole	96.83 - 0.00	6	2" Ice	0.00	0.89
							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
2" Flexible Conduit	C	No	No	Inside Pole	96.83 - 0.00	1	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
							**98**		
FB-L98B-235-XXX(3/8)	C	No	No	Inside Pole	96.83 - 0.00	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
							FB-L98B-034-XXX(3/8)	C	No
1/2" Ice	0.00	0.06							
1" Ice	0.00	0.06							
2" Ice	0.00	0.06							
PWRT-606-S(7/8)	C	No	No	Inside Pole	96.83 - 0.00	4			
							1/2" Ice	0.00	0.89
							1" Ice	0.00	0.89
							2" Ice	0.00	0.89
							LDF7-50A(1-5/8)	B	No
1/2" Ice	0.00	0.82							
1" Ice	0.00	0.82							
2" Ice	0.00	0.82							
**79**									
**78**									
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	No	Inside Pole	78.00 - 0.00	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

**Feed Line/Linear Appurtenances Section Areas**

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	96.83-91.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.05
L2	91.83-86.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.05
L3	86.83-81.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.319	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.05
L4	81.83-76.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.243	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.05
L5	76.50-75.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.106	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.01
L6	75.11-70.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L7	70.11-65.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L8	65.11-60.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub> <sub>A</sub> In Face	C <sub>AA</sub> <sub>A</sub> Out Face	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L9	60.11-55.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L10	55.11-50.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L11	50.11-45.11	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L12	45.11-39.92	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.131	0.000	0.10
		C	0.000	0.000	0.000	0.000	0.05
L13	39.92-39.09	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.661	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.01
L14	39.09-34.09	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L15	34.09-29.09	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L16	29.09-24.09	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L17	24.09-19.09	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.980	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.05
L18	19.09-14.09	A	0.000	0.000	1.888	0.000	0.00
		B	0.000	0.000	5.868	0.000	0.09
		C	0.000	0.000	1.888	0.000	0.05
L19	14.09-12.38	A	0.000	0.000	1.858	0.000	0.00
		B	0.000	0.000	3.223	0.000	0.03
		C	0.000	0.000	1.858	0.000	0.02
L20	12.38-12.13	A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	0.470	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L21	12.13-7.13	A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	9.397	0.000	0.09
		C	0.000	0.000	5.417	0.000	0.05
L22	7.13-2.83	A	0.000	0.000	4.650	0.000	0.00
		B	0.000	0.000	8.066	0.000	0.08
		C	0.000	0.000	4.650	0.000	0.04
L23	2.83-2.58	A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	0.470	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L24	2.58-0.00	A	0.000	0.000	1.896	0.000	0.00
		B	0.000	0.000	3.952	0.000	0.05
		C	0.000	0.000	1.896	0.000	0.03

**Feed Line/Linear Appurtenances Section Areas - With Ice**

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub> <sub>A</sub> In Face	C <sub>AA</sub> <sub>A</sub> Out Face	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	96.83-91.83	A	1.416	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.05
L2	91.83-86.83	A	1.408	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.05
L3	86.83-81.83	A	1.400	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	5.609	0.000	0.10
		C		0.000	0.000	0.000	0.000	0.05
L4	81.83-76.50	A	1.392	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	7.158	0.000	0.14
		C		0.000	0.000	0.000	0.000	0.05

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L5	76.50-75.11	A	1.386	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.867	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.01
L6	75.11-70.11	A	1.380	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.699	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.05
L7	70.11-65.11	A	1.370	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.687	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.05
L8	65.11-60.11	A	1.359	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.674	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.05
L9	60.11-55.11	A	1.348	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.660	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.05
L10	55.11-50.11	A	1.336	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.645	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.05
L11	50.11-45.11	A	1.323	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.628	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.05
L12	45.11-39.92	A	1.308	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.861	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.05
L13	39.92-39.09	A	1.298	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.097	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.01
L14	39.09-34.09	A	1.288	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.585	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.05
L15	34.09-29.09	A	1.269	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.562	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.05
L16	29.09-24.09	A	1.248	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.535	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.05
L17	24.09-19.09	A	1.222	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	6.502	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.05
L18	19.09-14.09	A	1.190	0.000	0.000	2.176	0.000	0.02
		B		0.000	0.000	8.639	0.000	0.16
		C		0.000	0.000	2.176	0.000	0.07
L19	14.09-12.38	A	1.164	0.000	0.000	2.137	0.000	0.02
		B		0.000	0.000	4.342	0.000	0.07
		C		0.000	0.000	2.137	0.000	0.03
L20	12.38-12.13	A	1.155	0.000	0.000	0.311	0.000	0.00
		B		0.000	0.000	0.632	0.000	0.01
		C		0.000	0.000	0.311	0.000	0.00
L21	12.13-7.13	A	1.127	0.000	0.000	6.211	0.000	0.04
		B		0.000	0.000	12.595	0.000	0.19
		C		0.000	0.000	6.211	0.000	0.09
L22	7.13-2.83	A	1.055	0.000	0.000	5.300	0.000	0.03
		B		0.000	0.000	10.703	0.000	0.16
		C		0.000	0.000	5.300	0.000	0.08
L23	2.83-2.58	A	0.993	0.000	0.000	0.307	0.000	0.00
		B		0.000	0.000	0.618	0.000	0.01
		C		0.000	0.000	0.307	0.000	0.00
L24	2.58-0.00	A	0.922	0.000	0.000	2.137	0.000	0.01
		B		0.000	0.000	5.303	0.000	0.08
		C		0.000	0.000	2.137	0.000	0.04

**Feed Line Center of Pressure**



Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L1	96.83-91.83	0.0000	0.0000	0.0000	0.0000
L2	91.83-86.83	0.0000	0.0000	0.0000	0.0000
L3	86.83-81.83	1.4503	-3.8997	1.2344	-3.3191
L4	81.83-76.50	1.6552	-4.4508	1.3962	-3.7542
L5	76.50-75.11	1.6563	-4.4536	1.3977	-3.7584
L6	75.11-70.11	1.6624	-4.4700	1.4043	-3.7760
L7	70.11-65.11	1.6717	-4.4949	1.4153	-3.8057
L8	65.11-60.11	1.6806	-4.5191	1.4260	-3.8343
L9	60.11-55.11	1.6894	-4.5425	1.4362	-3.8617
L10	55.11-50.11	1.6978	-4.5652	1.4459	-3.8880
L11	50.11-45.11	1.7060	-4.5873	1.4553	-3.9131
L12	45.11-39.92	1.7141	-4.6091	1.4643	-3.9374
L13	39.92-39.09	1.7149	-4.6112	1.4656	-3.9410
L14	39.09-34.09	1.7199	-4.6247	1.4698	-3.9520
L15	34.09-29.09	1.7283	-4.6473	1.4787	-3.9760
L16	29.09-24.09	1.7364	-4.6691	1.4869	-3.9981
L17	24.09-19.09	1.7443	-4.6903	1.4942	-4.0179
L18	19.09-14.09	0.5694	-4.1849	0.7425	-3.8016
L19	14.09-12.38	-0.4960	-3.7305	-0.1144	-3.5526
L20	12.38-12.13	-0.4975	-3.7404	-0.1158	-3.5599
L21	12.13-7.13	-0.5011	-3.7641	-0.1198	-3.5757
L22	7.13-2.83	-0.5074	-3.8056	-0.1296	-3.5979
L23	2.83-2.58	-0.5103	-3.8247	-0.1374	-3.6015
L24	2.58-0.00	-0.0742	-4.0133	0.2266	-3.6919

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L3	12	HB158-21U6S12-XXXM-01(1-5/8)	81.83 - 86.00	1.0000	1.0000
L4	12	HB158-21U6S12-XXXM-01(1-5/8)	76.50 - 81.83	1.0000	1.0000
L5	12	HB158-21U6S12-XXXM-01(1-5/8)	75.11 - 76.50	1.0000	1.0000
L6	12	HB158-21U6S12-XXXM-01(1-5/8)	70.11 - 75.11	1.0000	1.0000
L7	12	HB158-21U6S12-XXXM-01(1-5/8)	65.11 - 70.11	1.0000	1.0000
L8	12	HB158-21U6S12-XXXM-01(1-5/8)	60.11 - 65.11	1.0000	1.0000
L9	12	HB158-21U6S12-XXXM-01(1-5/8)	55.11 - 60.11	1.0000	1.0000
L10	12	HB158-21U6S12-XXXM-01(1-5/8)	50.11 - 55.11	1.0000	1.0000
L11	12	HB158-21U6S12-XXXM-01(1-5/8)	45.11 - 50.11	1.0000	1.0000
L12	12	HB158-21U6S12-XXXM-01(1-5/8)	39.92 - 45.11	1.0000	1.0000
L13	12	HB158-21U6S12-XXXM-01(1-5/8)	39.09 - 39.92	1.0000	1.0000
L14	12	HB158-21U6S12-XXXM-01(1-5/8)	34.09 - 39.09	1.0000	1.0000
L15	12	HB158-21U6S12-XXXM-01(1-5/8)	29.09 - 34.09	1.0000	1.0000
L16	12	HB158-21U6S12-XXXM-01(1-5/8)	24.09 - 29.09	1.0000	1.0000
L17	12	HB158-21U6S12-XXXM-01(1-5/8)	19.09 - 24.09	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L18	12	HB158-21U6S12-XXXM-01(1-5/8)	14.09 - 19.09	1.0000	1.0000
L18	25	CCI-65FP-065125	14.09 - 15.83	1.0000	1.0000
L18	26	CCI-65FP-065125	14.09 - 15.83	1.0000	1.0000
L18	27	CCI-65FP-065125	14.09 - 15.83	1.0000	1.0000
L19	12	HB158-21U6S12-XXXM-01(1-5/8)	12.37 - 14.09	1.0000	1.0000
L19	25	CCI-65FP-065125	12.37 - 14.09	1.0000	1.0000
L19	26	CCI-65FP-065125	12.37 - 14.09	1.0000	1.0000
L19	27	CCI-65FP-065125	12.37 - 14.09	1.0000	1.0000
L20	12	HB158-21U6S12-XXXM-01(1-5/8)	12.12 - 12.37	1.0000	1.0000
L20	25	CCI-65FP-065125	12.12 - 12.37	1.0000	1.0000
L20	26	CCI-65FP-065125	12.12 - 12.37	1.0000	1.0000
L20	27	CCI-65FP-065125	12.12 - 12.37	1.0000	1.0000
L21	12	HB158-21U6S12-XXXM-01(1-5/8)	7.12 - 12.12	1.0000	1.0000
L21	25	CCI-65FP-065125	7.12 - 12.12	1.0000	1.0000
L21	26	CCI-65FP-065125	7.12 - 12.12	1.0000	1.0000
L21	27	CCI-65FP-065125	7.12 - 12.12	1.0000	1.0000
L22	12	HB158-21U6S12-XXXM-01(1-5/8)	2.83 - 7.12	1.0000	1.0000
L22	25	CCI-65FP-065125	2.83 - 7.12	1.0000	1.0000
L22	26	CCI-65FP-065125	2.83 - 7.12	1.0000	1.0000
L22	27	CCI-65FP-065125	2.83 - 7.12	1.0000	1.0000
L23	12	HB158-21U6S12-XXXM-01(1-5/8)	2.58 - 2.83	1.0000	1.0000
L23	25	CCI-65FP-065125	2.58 - 2.83	1.0000	1.0000
L23	26	CCI-65FP-065125	2.58 - 2.83	1.0000	1.0000
L23	27	CCI-65FP-065125	2.58 - 2.83	1.0000	1.0000
L24	12	HB158-21U6S12-XXXM-01(1-5/8)	0.00 - 2.58	1.0000	1.0000
L24	25	CCI-65FP-065125	0.83 - 2.58	1.0000	1.0000
L24	26	CCI-65FP-065125	0.83 - 2.58	1.0000	1.0000
L24	27	CCI-65FP-065125	0.83 - 2.58	1.0000	1.0000

**Effective Width of Flat Linear Attachments / Feed Lines**

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L18	25	CCI-65FP-065125	14.09 - 15.83	Auto	0.0810
L18	26	CCI-65FP-065125	14.09 - 15.83	Auto	0.0810
L18	27	CCI-65FP-065125	14.09 - 15.83	Auto	0.0810
L19	25	CCI-65FP-065125	12.37 - 14.09	Auto	0.0740
L19	26	CCI-65FP-065125	12.37 - 14.09	Auto	0.0740

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L19	27	CCI-65FP-065125	12.37 - 14.09	Auto	0.0740
L20	25	CCI-65FP-065125	12.12 - 12.37	Auto	0.1208
L20	26	CCI-65FP-065125	12.12 - 12.37	Auto	0.1208
L20	27	CCI-65FP-065125	12.12 - 12.37	Auto	0.1208
L21	25	CCI-65FP-065125	7.12 - 12.12	Auto	0.1084
L21	26	CCI-65FP-065125	7.12 - 12.12	Auto	0.1084
L21	27	CCI-65FP-065125	7.12 - 12.12	Auto	0.1084
L22	25	CCI-65FP-065125	2.83 - 7.12	Auto	0.0878
L22	26	CCI-65FP-065125	2.83 - 7.12	Auto	0.0878
L22	27	CCI-65FP-065125	2.83 - 7.12	Auto	0.0878
L23	25	CCI-65FP-065125	2.58 - 2.83	Auto	0.0312
L23	26	CCI-65FP-065125	2.58 - 2.83	Auto	0.0312
L23	27	CCI-65FP-065125	2.58 - 2.83	Auto	0.0312
L24	25	CCI-65FP-065125	0.83 - 2.58	Auto	0.0271
L24	26	CCI-65FP-065125	0.83 - 2.58	Auto	0.0271
L24	27	CCI-65FP-065125	0.83 - 2.58	Auto	0.0271

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
Flash Beacon Lighting	C	None		0.0000	105.00
3.5" x 4' Pipe (3STD)	C	None		0.0000	103.00
Beacon Stand	C	None		0.0000	100.00
Top Hat **103**	C	None		0.0000	98.00
80010965 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00
80010965 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00
80010965 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00
RRUS 32 B2	A	From Leg	4.00 0.00 -1.00	0.0000	103.00
RRUS 32 B2	B	From Leg	4.00 0.00 -1.00	0.0000	103.00
RRUS 32 B2	C	From Leg	4.00 0.00 -1.00	0.0000	103.00
RRUS 32 B66	A	From Leg	4.00 0.00 -1.00	0.0000	103.00
RRUS 32 B66	B	From Leg	4.00 0.00 -1.00	0.0000	103.00
RRUS 32 B66	C	From Leg	4.00 0.00 -1.00	0.0000	103.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RRUS 4478 B14	A	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 4478 B14	B	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 4478 B14	C	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 32 B30	A	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 32 B30	B	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 32 B30	C	From Leg	-1.00 4.00 0.00	0.0000	103.00
AIR 6449 N77 w/ Mount Pipe	A	From Leg	-1.00 4.00 0.00	0.0000	103.00
AIR 6449 N77 w/ Mount Pipe	B	From Leg	0.00 4.00 0.00	0.0000	103.00
AIR 6449 N77 w/ Mount Pipe	C	From Leg	0.00 4.00 0.00	0.0000	103.00
AIR 6419 B77G w/ Mount Pipe	A	From Leg	0.00 4.00 0.00	0.0000	103.00
AIR 6419 B77G w/ Mount Pipe	B	From Leg	0.00 4.00 0.00	0.0000	103.00
AIR 6419 B77G w/ Mount Pipe	C	From Leg	0.00 4.00 0.00	0.0000	103.00
DMP65R-BU6e w/ Mount Pipe	A	From Leg	0.00 4.00 0.00	0.0000	103.00
DMP65R-BU6e w/ Mount Pipe	B	From Leg	-1.00 4.00 0.00	0.0000	103.00
DMP65R-BU6e w/ Mount Pipe	C	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 4449 B5/B12	A	From Leg	-1.00 4.00 0.00	0.0000	103.00
RRUS 4449 B5/B12	B	From Leg	0.00 4.00 0.00	0.0000	103.00
RRUS 4449 B5/B12	C	From Leg	0.00 4.00 0.00	0.0000	103.00
DC9-48-60-24-8C-EV	C	From Leg	0.00 4.00 0.00	0.0000	103.00
14.5' x 2.5" Horizontal Pipe	A	From Leg	0.00 4.00 0.00	0.0000	103.00
14.5' x 2.5" Horizontal Pipe	B	From Leg	0.00 4.00 0.00	0.0000	103.00
14.5' x 2.5" Horizontal Pipe	C	From Leg	0.00 4.00	0.0000	103.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.00		
3' x 2" Pipe Mount	A	From Leg	0.00 2.00	0.0000	103.00
			0.00		
3' x 2" Pipe Mount	B	From Leg	0.00 2.00	0.0000	103.00
			0.00		
3' x 2" Pipe Mount	C	From Leg	0.00 2.00	0.0000	103.00
			0.00		
7' x 2" Mount Pipe	A	From Leg	0.00 1.00	0.0000	98.00
			0.00		
7' x 2" Mount Pipe	B	From Leg	0.00 1.00	0.0000	98.00
			0.00		
7' x 2" Mount Pipe	C	From Leg	0.00 1.00	0.0000	98.00
			0.00		
Platform Mount [LP 1201-1_KCKR-HR-1] **98**	C	None	0.00	0.0000	103.00
DC6-48-60-18-8F	A	From Leg	1.00 0.00	0.0000	98.00
			4.00		
DC6-48-60-18-8F	B	From Leg	1.00 0.00	0.0000	98.00
			4.00		
7' x 2" Mount Pipe	A	From Leg	1.00 0.00	0.0000	98.00
			0.00		
7' x 2" Mount Pipe	B	From Leg	1.00 0.00	0.0000	98.00
			0.00		
7' x 2" Mount Pipe	C	From Leg	1.00 0.00	0.0000	98.00
			0.00		
Side Arm Mount [SO 102-3] **86**	C	None	0.00	0.0000	98.00
BXA-70063/4CF w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	86.00
			2.00		
SCCP 2X6015 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	86.00
			2.00		
SLCP 2X6015 w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	86.00
			2.00		
NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	86.00
			2.00		
NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	86.00
			2.00		
NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	86.00
			2.00		
NHHSS-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	86.00
			2.00		
NHHSS-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	86.00
			2.00		
NHHSS-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	86.00

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement
			Horz	Lateral		
			ft	ft	°	ft
MT6407-77A w/ Mount Pipe	A	From Leg	2.00	4.00	0.0000	86.00
			0.00	2.00		
MT6407-77A w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
MT6407-77A w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
RF4440D-13A	A	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
(2) RF4440D-13A	C	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
CBRS RT4401-48A	A	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
CBRS RT4401-48A	B	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
CBRS RT4401-48A	C	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
RF4439D-25A	A	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
RF4439D-25A	B	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
RF4439D-25A	C	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
RRFDC-3315-PF-48	A	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
RRFDC-3315-PF-48	B	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
6' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.0000	86.00
			2.00	4.00		
Platform Mount [LP 303-1_KCKR-HR-1] **79** **78**	C	None			0.0000	86.00
VV-65A-R1_TMO w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	78.00
			0.00	4.00		
VV-65A-R1_TMO w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	78.00
			0.00	4.00		
VV-65A-R1_TMO w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	78.00
			0.00	4.00		
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	78.00
			0.00	4.00		
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	78.00
			0.00	4.00		
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	78.00
			0.00	4.00		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00		0.0000	78.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.00		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
RADIO 4460 B2/B25 B66_TMO	A	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
RADIO 4460 B2/B25 B66_TMO	B	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
RADIO 4460 B2/B25 B66_TMO	C	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
Radio 4480_TMOV2	A	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
Radio 4480_TMOV2	B	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
Radio 4480_TMOV2	C	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
8' x 2" Mount Pipe	A	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
8' x 2" Mount Pipe	B	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
8' x 2" Mount Pipe	C	From Leg	0.00		
			4.00	0.0000	78.00
			0.00		
Site Pro 1 RMQP-496-HK	C	None	0.00	0.0000	78.00

## 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

Comb. No.	Description
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

**Maximum Member Forces**

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	96.83 - 91.83	Pole	Max Tension	26	0.00	0.00	0.00
			Max. Compression	26	-16.26	0.29	-0.17
			Max. Mx	20	-7.02	85.93	-0.06
			Max. My	14	-7.02	0.11	-85.88
			Max. Vy	20	-8.93	85.93	-0.06
			Max. Vx	2	-8.93	0.11	85.75
			Max. Torque	24			0.20
L2	91.83 - 86.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.89	0.29	-0.17
			Max. Mx	20	-7.39	131.54	-0.07
			Max. My	14	-7.39	0.11	-131.50
			Max. Vy	20	-9.32	131.54	-0.07
			Max. Vx	2	-9.32	0.11	131.37
			Max. Torque	24			0.20
L3	86.83 - 81.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.35	1.11	-0.21
			Max. Mx	20	-11.35	202.35	0.12
			Max. My	2	-11.34	0.71	202.02
			Max. Vy	20	-13.90	202.35	0.12
			Max. Vx	2	-13.96	0.71	202.02
			Max. Torque	22			0.79
L4	81.83 - 76.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.62	1.07	-0.18
			Max. Mx	20	-11.51	226.35	0.14
			Max. My	2	-11.50	0.70	226.14
			Max. Vy	20	-14.04	226.35	0.14



Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	76.5 - 75.11	Pole	Max. Vx	2	-14.09	0.70	226.14
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.21	0.94	-0.11
			Max. Mx	20	-16.30	308.72	0.18
			Max. My	2	-16.29	0.67	308.85
			Max. Vy	20	-18.32	308.72	0.18
L6	75.11 - 70.11	Pole	Max. Vx	2	-18.38	0.67	308.85
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.11	0.82	-0.04
			Max. Mx	20	-16.92	401.13	0.22
			Max. My	2	-16.91	0.64	401.60
			Max. Vy	20	-18.68	401.13	0.22
L7	70.11 - 65.11	Pole	Max. Vx	2	-18.73	0.64	401.60
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.02	0.69	0.03
			Max. Mx	20	-17.56	495.26	0.26
			Max. My	2	-17.56	0.61	496.08
			Max. Vy	20	-19.01	495.26	0.26
L8	65.11 - 60.11	Pole	Max. Vx	2	-19.07	0.61	496.08
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.94	0.56	0.10
			Max. Mx	20	-18.24	591.04	0.30
			Max. My	2	-18.23	0.57	592.21
			Max. Vy	20	-19.34	591.04	0.30
L9	60.11 - 55.11	Pole	Max. Vx	2	-19.39	0.57	592.21
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.88	0.43	0.18
			Max. Mx	20	-18.93	688.39	0.35
			Max. My	2	-18.93	0.54	689.91
			Max. Vy	20	-19.65	688.39	0.35
L10	55.11 - 50.11	Pole	Max. Vx	2	-19.70	0.54	689.91
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.83	0.30	0.26
			Max. Mx	20	-19.66	787.24	0.39
			Max. My	2	-19.65	0.50	789.11
			Max. Vy	20	-19.94	787.24	0.39
L11	50.11 - 45.11	Pole	Max. Vx	2	-19.99	0.50	789.11
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.80	0.17	0.33
			Max. Mx	20	-20.40	887.50	0.44
			Max. My	2	-20.39	0.46	889.72
			Max. Vy	20	-20.21	887.50	0.44
L12	45.11 - 39.92	Pole	Max. Vx	2	-20.27	0.46	889.72
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.99	0.14	0.35
			Max. Mx	20	-20.55	908.11	0.45
			Max. My	2	-20.55	0.45	910.41
			Max. Vy	20	-20.27	908.11	0.45
L13	39.92 - 39.09	Pole	Max. Vx	2	-20.32	0.45	910.41
			Max. Torque	22			0.79
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.71	0.01	0.43
			Max. Mx	20	-21.77	1010.24	0.49

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
L14	39.09 - 34.09	Pole	Max. My	2	-21.76	0.41	1012.89			
			Max. Vy	20	-20.62	1010.24	0.49			
			Max. Vx	2	-20.67	0.41	1012.89			
			Max. Torque	22			0.79			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-44.82	-0.13	0.51			
			Max. Mx	20	-22.65	1113.89	0.54			
			Max. My	2	-22.65	0.36	1116.89			
			Max. Vy	20	-20.89	1113.89	0.54			
			Max. Vx	2	-20.94	0.36	1116.89			
L15	34.09 - 29.09	Pole	Max. Torque	22			0.79			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-45.95	-0.27	0.59			
			Max. Mx	20	-23.56	1218.83	0.59			
			Max. My	2	-23.56	0.32	1222.18			
			Max. Vy	20	-21.14	1218.83	0.59			
			Max. Vx	2	-21.19	0.32	1222.18			
			Max. Torque	22			0.79			
			Max Tension	1	0.00	0.00	0.00			
			L16	29.09 - 24.09	Pole	Max. Compression	26	-47.09	-0.41	0.67
Max. Mx	20	-24.50				1324.96	0.64			
Max. My	2	-24.49				0.27	1328.67			
Max. Vy	8	21.37				-1324.77	0.29			
Max. Vx	2	-21.42				0.27	1328.67			
Max. Torque	22						0.78			
Max Tension	1	0.00				0.00	0.00			
Max. Compression	26	-48.24				-0.55	0.75			
Max. Mx	20	-25.45				1432.19	0.69			
Max. My	2	-25.45				0.22	1436.26			
L17	24.09 - 19.09	Pole	Max. Vy	8	21.58	-1432.12	0.31			
			Max. Vx	2	-21.63	0.22	1436.26			
			Max. Torque	22			0.78			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-49.45	-0.68	0.83			
			Max. Mx	8	-26.42	-1540.45	0.33			
			Max. My	2	-26.42	0.17	1544.81			
			Max. Vy	8	21.76	-1540.45	0.33			
			Max. Vx	2	-21.81	0.17	1544.81			
			Max. Torque	22			0.78			
L18	19.09 - 14.09	Pole	Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-49.90	-0.73	0.87			
			Max. Mx	8	-26.75	-1577.82	0.34			
			Max. My	2	-26.75	0.16	1582.25			
			Max. Vy	8	21.83	-1577.82	0.34			
			Max. Vx	2	-21.88	0.16	1582.25			
			Max. Torque	22			0.78			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-49.99	-0.74	0.87			
			Max. Mx	8	-26.84	-1583.27	0.34			
L19	14.09 - 12.375	Pole	Max. My	2	-26.84	0.15	1587.72			
			Max. Vy	8	21.82	-1583.27	0.34			
			Max. Vx	2	-21.87	0.15	1587.72			
			Max. Torque	22			0.78			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-51.78	-0.87	0.97			
			Max. Mx	8	-28.27	-1693.02	0.37			
			Max. My	2	-28.27	0.10	1697.69			
			Max. Vy	8	22.07	-1693.02	0.37			
			Max. Vx	2	-22.12	0.10	1697.69			
L20	12.375 - 12.125	Pole	Max. Torque	22			0.78			
			Max Tension	1	0.00	0.00	0.00			
			Max. Compression	26	-51.78	-0.87	0.97			
			Max. Mx	8	-28.27	-1693.02	0.37			
			Max. My	2	-28.27	0.10	1697.69			
			Max. Vy	8	22.07	-1693.02	0.37			
			Max. Vx	2	-22.12	0.10	1697.69			
			Max. Torque	22			0.78			
			Max Tension	1	0.00	0.00	0.00			
			L21	12.125 - 7.125	Pole	Max. Compression	26	-51.78	-0.87	0.97
Max. Mx	8	-28.27				-1693.02	0.37			
Max. My	2	-28.27				0.10	1697.69			
Max. Vy	8	22.07				-1693.02	0.37			
Max. Vx	2	-22.12				0.10	1697.69			
Max. Torque	22						0.78			
Max Tension	1	0.00				0.00	0.00			
L22	7.125 -	Pole				Max. Compression	26	-51.78	-0.87	0.97
						Max. Mx	8	-28.27	-1693.02	0.37
						Max. My	2	-28.27	0.10	1697.69
			Max. Vy	8	22.07	-1693.02	0.37			
			Max. Vx	2	-22.12	0.10	1697.69			
			Max. Torque	22			0.78			
			Max Tension	1	0.00	0.00	0.00			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	2.833		Max. Compression	26	-53.31	-0.98	1.05
			Max. Mx	8	-29.51	-1788.19	0.39
			Max. My	2	-29.51	0.05	1793.05
			Max. Vy	8	22.27	-1788.19	0.39
			Max. Vx	2	-22.32	0.05	1793.05
L23	2.833 - 2.583	Pole	Max. Torque	22			0.78
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.37	-0.98	1.06
			Max. Mx	8	-29.57	-1793.76	0.39
			Max. My	2	-29.57	0.05	1798.63
			Max. Vy	8	22.27	-1793.76	0.39
			Max. Vx	2	-22.32	0.05	1798.63
			Max. Torque	22			0.78
L24	2.583 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.00	-1.05	1.10
			Max. Mx	8	-30.08	-1851.41	0.41
			Max. My	2	-30.08	0.02	1856.40
			Max. Vy	8	22.37	-1851.41	0.41
			Max. Vx	2	-22.42	0.02	1856.40
			Max. Torque	22			0.78

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	54.00	0.00	6.22
	Max. H <sub>x</sub>	20	30.10	22.35	0.00
	Max. H <sub>z</sub>	2	30.10	0.00	22.40
	Max. M <sub>x</sub>	2	1856.40	0.00	22.40
	Max. M <sub>z</sub>	8	1851.41	-22.35	-0.00
	Max. Torsion	22	0.78	19.35	11.20
	Min. Vert	23	22.58	19.35	11.20
	Min. H <sub>x</sub>	8	30.10	-22.35	-0.00
	Min. H <sub>z</sub>	14	30.10	-0.00	-22.40
	Min. M <sub>x</sub>	14	-1855.13	-0.00	-22.40
	Min. M <sub>z</sub>	20	-1850.99	22.35	0.00
	Min. Torsion	10	-0.78	-19.35	-11.20

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	25.09	0.00	0.00	-0.51	-0.19	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	30.10	-0.00	-22.40	-1856.40	0.02	-0.50
0.9 Dead+1.0 Wind 0 deg - No Ice	22.58	-0.00	-22.40	-1831.85	0.07	-0.49
1.2 Dead+1.0 Wind 30 deg - No Ice	30.10	11.17	-19.39	-1607.66	-925.60	-0.12
0.9 Dead+1.0 Wind 30 deg - No Ice	22.58	11.17	-19.39	-1586.37	-913.39	-0.12
1.2 Dead+1.0 Wind 60 deg - No Ice	30.10	19.35	-11.20	-928.32	-1603.27	0.28
0.9 Dead+1.0 Wind 60 deg - No Ice	22.58	19.35	-11.20	-915.96	-1582.16	0.29
1.2 Dead+1.0 Wind 90 deg - No Ice	30.10	22.35	0.00	-0.41	-1851.41	0.61

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 90 deg - No Ice	22.58	22.35	0.00	-0.24	-1827.03	0.61
1.2 Dead+1.0 Wind 120 deg - No Ice	30.10	19.35	11.20	927.45	-1603.52	0.78
0.9 Dead+1.0 Wind 120 deg - No Ice	22.58	19.35	11.20	915.42	-1582.40	0.77
1.2 Dead+1.0 Wind 150 deg - No Ice	30.10	11.18	19.40	1606.62	-926.02	0.73
0.9 Dead+1.0 Wind 150 deg - No Ice	22.58	11.18	19.40	1585.66	-913.81	0.73
1.2 Dead+1.0 Wind 180 deg - No Ice	30.10	0.00	22.40	1855.13	-0.46	0.50
0.9 Dead+1.0 Wind 180 deg - No Ice	22.58	0.00	22.40	1830.90	-0.41	0.49
1.2 Dead+1.0 Wind 210 deg - No Ice	30.10	-11.17	19.39	1606.38	925.17	0.13
0.9 Dead+1.0 Wind 210 deg - No Ice	22.58	-11.17	19.39	1585.43	913.06	0.13
1.2 Dead+1.0 Wind 240 deg - No Ice	30.10	-19.35	11.20	927.04	1602.85	-0.28
0.9 Dead+1.0 Wind 240 deg - No Ice	22.58	-19.35	11.20	915.01	1581.83	-0.28
1.2 Dead+1.0 Wind 270 deg - No Ice	30.10	-22.35	-0.00	-0.89	1850.99	-0.61
0.9 Dead+1.0 Wind 270 deg - No Ice	22.58	-22.35	-0.00	-0.72	1826.71	-0.61
1.2 Dead+1.0 Wind 300 deg - No Ice	30.10	-19.35	-11.20	-928.74	1603.08	-0.78
0.9 Dead+1.0 Wind 300 deg - No Ice	22.58	-19.35	-11.20	-916.38	1582.06	-0.78
1.2 Dead+1.0 Wind 330 deg - No Ice	30.10	-11.18	-19.40	-1607.91	925.58	-0.74
0.9 Dead+1.0 Wind 330 deg - No Ice	22.58	-11.18	-19.40	-1586.61	913.47	-0.74
1.2 Dead+1.0 Ice+1.0 Temp	54.00	0.00	0.00	-1.10	-1.05	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	54.00	-0.00	-6.22	-533.43	-0.95	-0.14
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	54.00	3.10	-5.39	-462.07	-266.22	-0.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	54.00	5.37	-3.11	-267.22	-460.45	0.04
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	54.00	6.21	0.00	-1.09	-531.58	0.13
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	54.00	5.38	3.11	265.01	-460.55	0.18
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	54.00	3.10	5.39	459.79	-266.40	0.19
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	54.00	0.00	6.22	531.05	-1.15	0.14
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	54.00	-3.10	5.39	459.69	264.12	0.06
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	54.00	-5.37	3.11	264.84	458.35	-0.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	54.00	-6.21	-0.00	-1.30	529.48	-0.13
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	54.00	-5.38	-3.11	-267.40	458.45	-0.18
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	54.00	-3.10	-5.39	-462.18	264.30	-0.19
Dead+Wind 0 deg - Service	25.09	-0.00	-5.46	-449.60	-0.12	-0.13
Dead+Wind 30 deg - Service	25.09	2.72	-4.73	-389.41	-224.11	-0.03
Dead+Wind 60 deg - Service	25.09	4.72	-2.73	-225.01	-388.10	0.07
Dead+Wind 90 deg - Service	25.09	5.45	0.00	-0.47	-448.14	0.15
Dead+Wind 120 deg - Service	25.09	4.72	2.73	224.06	-388.16	0.20
Dead+Wind 150 deg - Service	25.09	2.72	4.73	388.41	-224.21	0.19
Dead+Wind 180 deg - Service	25.09	0.00	5.46	448.54	-0.24	0.13

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 210 deg - Service	25.09	-2.72	4.73	388.35	223.75	0.03
Dead+Wind 240 deg - Service	25.09	-4.72	2.73	223.95	387.74	-0.07
Dead+Wind 270 deg - Service	25.09	-5.45	-0.00	-0.59	447.78	-0.15
Dead+Wind 300 deg - Service	25.09	-4.72	-2.73	-225.12	387.80	-0.20
Dead+Wind 330 deg - Service	25.09	-2.72	-4.73	-389.47	223.85	-0.19

## 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	-25.09	0.00	0.00	25.09	0.00	0.000%
2	-0.00	-30.10	-22.40	0.00	30.10	22.40	0.000%
3	-0.00	-22.58	-22.40	0.00	22.58	22.40	0.000%
4	11.17	-30.10	-19.39	-11.17	30.10	19.39	0.000%
5	11.17	-22.58	-19.39	-11.17	22.58	19.39	0.000%
6	19.35	-30.10	-11.20	-19.35	30.10	11.20	0.000%
7	19.35	-22.58	-11.20	-19.35	22.58	11.20	0.000%
8	22.35	-30.10	0.00	-22.35	30.10	-0.00	0.000%
9	22.35	-22.58	0.00	-22.35	22.58	-0.00	0.000%
10	19.35	-30.10	11.20	-19.35	30.10	-11.20	0.000%
11	19.35	-22.58	11.20	-19.35	22.58	-11.20	0.000%
12	11.18	-30.10	19.40	-11.18	30.10	-19.40	0.000%
13	11.18	-22.58	19.40	-11.18	22.58	-19.40	0.000%
14	0.00	-30.10	22.40	-0.00	30.10	-22.40	0.000%
15	0.00	-22.58	22.40	-0.00	22.58	-22.40	0.000%
16	-11.17	-30.10	19.39	11.17	30.10	-19.39	0.000%
17	-11.17	-22.58	19.39	11.17	22.58	-19.39	0.000%
18	-19.35	-30.10	11.20	19.35	30.10	-11.20	0.000%
19	-19.35	-22.58	11.20	19.35	22.58	-11.20	0.000%
20	-22.35	-30.10	-0.00	22.35	30.10	0.00	0.000%
21	-22.35	-22.58	-0.00	22.35	22.58	0.00	0.000%
22	-19.35	-30.10	-11.20	19.35	30.10	11.20	0.000%
23	-19.35	-22.58	-11.20	19.35	22.58	11.20	0.000%
24	-11.18	-30.10	-19.40	11.18	30.10	19.40	0.000%
25	-11.18	-22.58	-19.40	11.18	22.58	19.40	0.000%
26	0.00	-54.00	0.00	0.00	54.00	0.00	0.000%
27	-0.00	-54.00	-6.22	0.00	54.00	6.22	0.000%
28	3.10	-54.00	-5.39	-3.10	54.00	5.39	0.000%
29	5.37	-54.00	-3.11	-5.37	54.00	3.11	0.000%
30	6.21	-54.00	0.00	-6.21	54.00	-0.00	0.000%
31	5.38	-54.00	3.11	-5.38	54.00	-3.11	0.000%
32	3.10	-54.00	5.39	-3.10	54.00	-5.39	0.000%
33	0.00	-54.00	6.22	-0.00	54.00	-6.22	0.000%
34	-3.10	-54.00	5.39	3.10	54.00	-5.39	0.000%
35	-5.37	-54.00	3.11	5.37	54.00	-3.11	0.000%
36	-6.21	-54.00	-0.00	6.21	54.00	0.00	0.000%
37	-5.38	-54.00	-3.11	5.38	54.00	3.11	0.000%
38	-3.10	-54.00	-5.39	3.10	54.00	5.39	0.000%
39	-0.00	-25.09	-5.46	0.00	25.09	5.46	0.000%
40	2.72	-25.09	-4.73	-2.72	25.09	4.73	0.000%
41	4.72	-25.09	-2.73	-4.72	25.09	2.73	0.000%
42	5.45	-25.09	0.00	-5.45	25.09	-0.00	0.000%
43	4.72	-25.09	2.73	-4.72	25.09	-2.73	0.000%
44	2.72	-25.09	4.73	-2.72	25.09	-4.73	0.000%
45	0.00	-25.09	5.46	-0.00	25.09	-5.46	0.000%
46	-2.72	-25.09	4.73	2.72	25.09	-4.73	0.000%
47	-4.72	-25.09	2.73	4.72	25.09	-2.73	0.000%
48	-5.45	-25.09	-0.00	5.45	25.09	0.00	0.000%
49	-4.72	-25.09	-2.73	4.72	25.09	2.73	0.000%
50	-2.72	-25.09	-4.73	2.72	25.09	4.73	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	0.00015200
3	Yes	5	0.00000001	0.00006639
4	Yes	6	0.00000001	0.00033251
5	Yes	6	0.00000001	0.00010622
6	Yes	6	0.00000001	0.00033103
7	Yes	6	0.00000001	0.00010570
8	Yes	5	0.00000001	0.00016996
9	Yes	5	0.00000001	0.00007657
10	Yes	6	0.00000001	0.00033994
11	Yes	6	0.00000001	0.00010897
12	Yes	6	0.00000001	0.00032731
13	Yes	6	0.00000001	0.00010437
14	Yes	5	0.00000001	0.00014893
15	Yes	5	0.00000001	0.00006492
16	Yes	6	0.00000001	0.00033463
17	Yes	6	0.00000001	0.00010697
18	Yes	6	0.00000001	0.00033580
19	Yes	6	0.00000001	0.00010743
20	Yes	5	0.00000001	0.00016690
21	Yes	5	0.00000001	0.00007509
22	Yes	6	0.00000001	0.00032756
23	Yes	6	0.00000001	0.00010438
24	Yes	6	0.00000001	0.00034052
25	Yes	6	0.00000001	0.00010903
26	Yes	4	0.00000001	0.00000001
27	Yes	6	0.00000001	0.00028703
28	Yes	6	0.00000001	0.00035521
29	Yes	6	0.00000001	0.00035495
30	Yes	6	0.00000001	0.00028554
31	Yes	6	0.00000001	0.00035579
32	Yes	6	0.00000001	0.00035339
33	Yes	6	0.00000001	0.00028614
34	Yes	6	0.00000001	0.00035530
35	Yes	6	0.00000001	0.00035471
36	Yes	6	0.00000001	0.00028574
37	Yes	6	0.00000001	0.00035450
38	Yes	6	0.00000001	0.00035777
39	Yes	4	0.00000001	0.00035787
40	Yes	5	0.00000001	0.00010083
41	Yes	5	0.00000001	0.00009988
42	Yes	4	0.00000001	0.00036526
43	Yes	5	0.00000001	0.00010746
44	Yes	5	0.00000001	0.00009667
45	Yes	4	0.00000001	0.00035519
46	Yes	5	0.00000001	0.00010285
47	Yes	5	0.00000001	0.00010375
48	Yes	4	0.00000001	0.00036555
49	Yes	5	0.00000001	0.00009741
50	Yes	5	0.00000001	0.00010828

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96.83 - 91.83	15.705	39	1.3509	0.0020
L2	91.83 - 86.83	14.299	39	1.3342	0.0019
L3	86.83 - 81.83	12.915	39	1.3082	0.0019

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	81.83 - 76.5	11.564	39	1.2712	0.0017
L5	80.11 - 75.11	11.109	39	1.2557	0.0016
L6	75.11 - 70.11	9.807	39	1.2241	0.0015
L7	70.11 - 65.11	8.555	39	1.1655	0.0013
L8	65.11 - 60.11	7.370	39	1.0965	0.0011
L9	60.11 - 55.11	6.262	39	1.0183	0.0010
L10	55.11 - 50.11	5.240	39	0.9321	0.0009
L11	50.11 - 45.11	4.312	39	0.8390	0.0007
L12	45.11 - 39.92	3.485	39	0.7398	0.0006
L13	44.09 - 39.09	3.329	39	0.7189	0.0006
L14	39.09 - 34.09	2.602	39	0.6652	0.0005
L15	34.09 - 29.09	1.951	39	0.5767	0.0004
L16	29.09 - 24.09	1.395	39	0.4858	0.0003
L17	24.09 - 19.09	0.934	39	0.3929	0.0003
L18	19.09 - 14.09	0.572	39	0.2985	0.0002
L19	14.09 - 12.375	0.309	39	0.2029	0.0001
L20	12.375 - 12.125	0.242	39	0.1702	0.0001
L21	12.125 - 7.125	0.234	39	0.1673	0.0001
L22	7.125 - 2.833	0.090	39	0.1075	0.0001
L23	2.833 - 2.583	0.016	39	0.0553	0.0000
L24	2.583 - 0	0.014	39	0.0504	0.0000

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
105.00	Flash Beacon Lighting	39	15.705	1.3509	0.0020	13282
103.00	3.5" x 4' Pipe (3STD)	39	15.705	1.3509	0.0020	13282
100.00	Beacon Stand	39	15.705	1.3509	0.0020	13282
98.00	Top Hat	39	15.705	1.3509	0.0020	13282
86.00	BXA-70063/4CF w/ Mount Pipe	39	12.688	1.3029	0.0018	8624
78.00	VV-65A-R1_TMO w/ Mount Pipe	39	10.555	1.2422	0.0015	7898

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96.83 - 91.83	64.891	2	5.5851	0.0078
L2	91.83 - 86.83	59.084	2	5.5164	0.0076
L3	86.83 - 81.83	53.369	2	5.4091	0.0073
L4	81.83 - 76.5	47.788	2	5.2574	0.0066
L5	80.11 - 75.11	45.908	2	5.1939	0.0063
L6	75.11 - 70.11	40.531	2	5.0637	0.0058
L7	70.11 - 65.11	35.358	2	4.8215	0.0051
L8	65.11 - 60.11	30.460	2	4.5358	0.0045
L9	60.11 - 55.11	25.881	2	4.2123	0.0039
L10	55.11 - 50.11	21.658	2	3.8556	0.0033
L11	50.11 - 45.11	17.822	2	3.4700	0.0028
L12	45.11 - 39.92	14.403	2	3.0593	0.0023
L13	44.09 - 39.09	13.759	2	2.9728	0.0022
L14	39.09 - 34.09	10.751	2	2.7506	0.0020
L15	34.09 - 29.09	8.062	2	2.3843	0.0017
L16	29.09 - 24.09	5.762	2	2.0082	0.0013
L17	24.09 - 19.09	3.860	2	1.6241	0.0010
L18	19.09 - 14.09	2.363	2	1.2336	0.0008
L19	14.09 - 12.375	1.278	2	0.8382	0.0005
L20	12.375 - 12.125	1.001	2	0.7031	0.0004
L21	12.125 - 7.125	0.965	2	0.6910	0.0004
L22	7.125 - 2.833	0.370	2	0.4441	0.0002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L23	2.833 - 2.583	0.068	2	0.2284	0.0001
L24	2.583 - 0	0.056	2	0.2083	0.0001

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
105.00	Flash Beacon Lighting	2	64.891	5.5851	0.0078	3293
103.00	3.5" x 4' Pipe (3STD)	2	64.891	5.5851	0.0078	3293
100.00	Beacon Stand	2	64.891	5.5851	0.0078	3293
98.00	Top Hat	2	64.891	5.5851	0.0078	3293
86.00	BXA-70063/4CF w/ Mount Pipe	2	52.432	5.3876	0.0073	2138
78.00	VV-65A-R1_TMO w/ Mount Pipe	2	43.620	5.1381	0.0061	1951

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	96.83 - 95.83	TP26.5186x25.75x0.1875	5.00	0.00	0.0	15.304	-6.74	895.30	0.008
	4								
	15.395					-6.81	900.66	0.008	
	8								
	15.487					-6.88	906.01	0.008	
L2	93.83 - 92.83	TP27.2871x26.5186x0.1875	5.00	0.00	0.0	15.578	-6.95	911.36	0.008
	8								
	15.670					-7.02	916.71	0.008	
	3								
	15.761					-7.10	922.06	0.008	
L3	90.83 - 89.83	TP28.0557x27.2871x0.1875	5.00	0.00	0.0	15.853	-7.17	927.41	0.008
	2								
	15.944					-7.24	932.77	0.008	
	7								
	16.036					-7.31	938.12	0.008	
L4	87.83 - 86.83	TP28.875x28.0557x0.1875	5.33	0.00	0.0	16.127	-7.39	943.47	0.008
	7								
	16.219					-10.99	948.82	0.012	
	2								
	16.310					-11.08	954.17	0.012	
L5	84.83 - 83.83	TP28.6206x27.9451x0.2188	5.00	0.00	0.0	16.402	-11.16	959.52	0.012
	6								
	16.493					-11.25	964.88	0.012	
	1								
	16.585					-11.35	970.23	0.012	
L4	81.83 - 80.11	TP28.875x28.0557x0.1875	5.33	0.00	0.0	16.742	-11.51	979.43	0.012
	4								
L5	80.11 - 76.5	TP28.6206x27.9451x0.2188	5.00	0.00	0.0	17.072	-8.76	998.75	0.009
	6								
L5	80.11 - 76.5	TP28.6206x27.9451x0.2188	5.00	0.00	0.0	19.589	-7.36	1145.98	0.006
	4								



Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
	76.5 - 75.11					19.719 8	-16.29	1153.61	0.014
L6	75.11 - 74.11	TP29.2962x28.6206x0.21 88	5.00	0.00	0.0	19.813 6	-16.41	1159.09	0.014
	74.11 - 73.11					19.907 4	-16.54	1164.58	0.014
	73.11 - 72.11					20.001 2	-16.66	1170.07	0.014
	72.11 - 71.11					20.095 0	-16.79	1175.56	0.014
	71.11 - 70.11					20.188 8	-16.91	1181.04	0.014
L7	70.11 - 69.11	TP29.9717x29.2962x0.21 88	5.00	0.00	0.0	20.282 6	-17.04	1186.53	0.014
	69.11 - 68.11					20.376 4	-17.17	1192.02	0.014
	68.11 - 67.11					20.470 2	-17.30	1197.51	0.014
	67.11 - 66.11					20.564 0	-17.43	1203.00	0.014
	66.11 - 65.11					20.657 8	-17.56	1208.48	0.015
L8	65.11 - 64.11	TP30.6472x29.9717x0.21 88	5.00	0.00	0.0	20.751 6	-17.69	1213.97	0.015
	64.11 - 63.11					20.845 4	-17.82	1219.46	0.015
	63.11 - 62.11					20.939 2	-17.96	1224.95	0.015
	62.11 - 61.11					21.033 1	-18.09	1230.43	0.015
	61.11 - 60.11					21.126 9	-18.23	1235.92	0.015
L9	60.11 - 59.11	TP31.3227x30.6472x0.21 88	5.00	0.00	0.0	21.220 7	-18.37	1241.41	0.015
	59.11 - 58.11					21.314 5	-18.51	1246.90	0.015
	58.11 - 57.11					21.408 3	-18.64	1252.38	0.015
	57.11 - 56.11					21.502 1	-18.79	1257.87	0.015
	56.11 - 55.11					21.595 9	-18.93	1263.36	0.015
L10	55.11 - 54.11	TP31.9983x31.3227x0.21 88	5.00	0.00	0.0	21.689 7	-19.07	1268.85	0.015
	54.11 - 53.11					21.783 5	-19.21	1274.33	0.015
	53.11 - 52.11					21.877 3	-19.36	1279.82	0.015
	52.11 - 51.11					21.971 1	-19.50	1285.31	0.015
	51.11 - 50.11					22.064 9	-19.65	1290.80	0.015
L11	50.11 - 49.11	TP32.6738x31.9983x0.21 88	5.00	0.00	0.0	22.158 7	-19.80	1296.29	0.015
	49.11 - 48.11					22.252 5	-19.94	1301.77	0.015
	48.11 - 47.11					22.346 3	-20.09	1307.26	0.015
	47.11 - 46.11					22.440 1	-20.24	1312.75	0.015
	46.11 - 45.11					22.533 9	-20.39	1318.24	0.015
L12	45.11 - 44.09	TP33.375x32.6738x0.218 8	5.19	0.00	0.0	22.629 6	-20.55	1323.83	0.016
	44.09 - 39.92					23.020 8	-9.56	1346.72	0.007
L13	44.09 - 39.92	TP33.1255x32.3741x0.28 13	5.00	0.00	0.0	29.208 3	-12.04	1708.69	0.007
	39.92 - 39.09					29.319	-21.76	1715.20	0.013

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L14	39.09 - 38.09	TP33.8769x33.1255x0.28 13	5.00	0.00	0.0	7 29.453	-21.94	1723.05	0.013
	8 29.588					-22.11	1730.90	0.013	
	0 29.722					-22.29	1738.74	0.013	
	1 29.856					-22.47	1746.59	0.013	
	3 29.990					-22.65	1754.44	0.013	
L15	34.09 - 33.09	TP34.6283x33.8769x0.28 13	5.00	0.00	0.0	4 30.124	-22.83	1762.29	0.013
	6 30.258					-23.01	1770.14	0.013	
	7 30.392					-23.19	1777.98	0.013	
	9 30.527					-23.38	1785.83	0.013	
	1 30.661					-23.56	1793.68	0.013	
L16	29.09 - 28.09	TP35.3797x34.6283x0.28 13	5.00	0.00	0.0	2 30.795	-23.75	1801.53	0.013
	4 30.929					-23.93	1809.38	0.013	
	5 31.063					-24.12	1817.22	0.013	
	7 31.197					-24.31	1825.07	0.013	
	8 31.332					-24.49	1832.92	0.013	
L17	24.09 - 23.09	TP36.1311x35.3797x0.28 13	5.00	0.00	0.0	0 31.466	-24.68	1840.77	0.013
	1 31.600					-24.87	1848.62	0.013	
	3 31.734					-25.06	1856.46	0.014	
	4 31.868					-25.25	1864.31	0.014	
	6 32.002					-25.45	1872.16	0.014	
L18	19.09 - 18.09	TP36.8825x36.1311x0.28 13	5.00	0.00	0.0	7 32.136	-25.64	1880.01	0.014
	9 32.271					-25.83	1887.86	0.014	
	1 32.405					-26.03	1895.70	0.014	
	2 32.539					-26.22	1903.55	0.014	
	4 32.673					-26.42	1911.40	0.014	
L19	14.09 - 12.375 (19)	TP37.1403x36.8825x0.28 13	1.71	0.00	0.0	5 32.903	-26.75	1924.86	0.014
L20	12.375 - 12.125 (20)	TP37.1778x37.1403x0.46 88	0.25	0.00	0.0	6 54.616	-26.84	3195.05	0.008
L21	12.125 - 11.125	TP37.9292x37.1778x0.46 25	5.00	0.00	0.0	2 54.117	-27.12	3165.89	0.009
	8 54.338					-27.40	3178.80	0.009	
	4 54.559					-27.69	3191.70	0.009	
	0 54.779					-27.98	3204.61	0.009	
	6 55.000					-28.27	3217.51	0.009	
L22	7.125 - 6.052	TP38.5743x37.9292x0.45 63	4.29	0.00	0.0	2 54.499	-28.57	3188.22	0.009
	6.052 - 4.979					6 54.733	-28.89	3201.89	0.009
						1			

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
	4.979 - 3.906					54.966	-29.20	3215.55	0.009
	3.906 - 2.833					6 55.200	-29.51	3229.21	0.009
L23	2.833 - 2.583 (23)	TP38.6118x38.5743x0.28 13	0.25	0.00	0.0	1 34.217	-29.57	2001.71	0.015
L24	2.583 - 1.2915 1.2915 - 0	TP39x38.6118x0.2813	2.58	0.00	0.0	2 5 34.390 34.563	-29.82 -30.08	2011.84 2021.98	0.015 0.015

**Pole Bending Design Data**

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>nx</sub> kip-ft	Ratio M <sub>ux</sub> / φM <sub>nx</sub>	M <sub>uy</sub> kip-ft	φM <sub>ny</sub> kip-ft	Ratio M <sub>uy</sub> / φM <sub>ny</sub>
L1	96.83 - 95.83	TP26.5186x25.75x0.1875	50.84	538.12	0.094	0.00	538.12	0.000
	95.83 - 94.83		59.50	543.34	0.110	0.00	543.34	0.000
	94.83 - 93.83		68.24	548.57	0.124	0.00	548.57	0.000
	93.83 - 92.83		77.05	553.82	0.139	0.00	553.82	0.000
	92.83 - 91.83		85.94	559.06	0.154	0.00	559.06	0.000
L2	91.83 - 90.83	TP27.2871x26.5186x0.18 75	94.91	564.32	0.168	0.00	564.32	0.000
	90.83 - 89.83		103.96	569.59	0.183	0.00	569.59	0.000
	89.83 - 88.83		113.08	574.86	0.197	0.00	574.86	0.000
	88.83 - 87.83		122.28	580.14	0.211	0.00	580.14	0.000
	87.83 - 86.83		131.56	585.43	0.225	0.00	585.43	0.000
L3	86.83 - 85.83	TP28.0557x27.2871x0.18 75	147.38	590.72	0.249	0.00	590.72	0.000
	85.83 - 84.83		161.01	596.02	0.270	0.00	596.02	0.000
	84.83 - 83.83		174.71	601.33	0.291	0.00	601.33	0.000
	83.83 - 82.83		188.51	606.64	0.311	0.00	606.64	0.000
	82.83 - 81.83		202.38	611.96	0.331	0.00	611.96	0.000
L4	81.83 - 80.11	TP28.875x28.0557x0.187 5	226.42	621.11	0.365	0.00	621.11	0.000
	80.11 - 76.5		135.18	640.38	0.211	0.00	640.38	0.000
L5	80.11 - 76.5	TP28.6206x27.9451x0.21 88	148.40	772.65	0.192	0.00	772.65	0.000
	76.5 - 75.11		309.03	781.17	0.396	0.00	781.17	0.000
L6	75.11 - 74.11	TP29.2962x28.6206x0.21 88	327.42	787.31	0.416	0.00	787.31	0.000
	74.11 - 73.11		345.88	793.46	0.436	0.00	793.46	0.000
	73.11 - 72.11		364.42	799.62	0.456	0.00	799.62	0.000
	72.11 - 71.11		383.02	805.79	0.475	0.00	805.79	0.000
	71.11 - 70.11		401.70	811.97	0.495	0.00	811.97	0.000
L7	70.11 - 69.11	TP29.9717x29.2962x0.21 88	420.44	818.15	0.514	0.00	818.15	0.000
	69.11 - 68.11		439.25	824.35	0.533	0.00	824.35	0.000
	68.11 - 67.11		458.13	830.56	0.552	0.00	830.56	0.000
	67.11 - 66.11		477.08	836.77	0.570	0.00	836.77	0.000
	66.11 - 65.11		496.09	843.00	0.588	0.00	843.00	0.000
L8	65.11 - 64.11	TP30.6472x29.9717x0.21 88	515.17	849.23	0.607	0.00	849.23	0.000
	64.11 - 63.11		534.34	855.48	0.625	0.00	855.48	0.000
	63.11 - 62.11		553.57	861.73	0.642	0.00	861.73	0.000
	62.11 - 61.11		572.86	867.98	0.660	0.00	867.98	0.000
	61.11 - 60.11		592.21	874.25	0.677	0.00	874.25	0.000
L9	60.11 - 59.11	TP31.3227x30.6472x0.21 88	611.63	880.52	0.695	0.00	880.52	0.000
	59.11 - 58.11		631.11	886.80	0.712	0.00	886.80	0.000
	58.11 - 57.11		650.65	893.09	0.729	0.00	893.09	0.000
	57.11 - 56.11		670.25	899.38	0.745	0.00	899.38	0.000
	56.11 - 55.11		689.91	905.68	0.762	0.00	905.68	0.000
L10	55.11 - 54.11	TP31.9983x31.3227x0.21 88	709.64	911.99	0.778	0.00	911.99	0.000

Section No.	Elevation ft	Size	$M_{ux}$	$\phi M_{nx}$	Ratio	$M_{uy}$	$\phi M_{ny}$	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
	54.11 - 53.11		729.42	918.31	0.794	0.00	918.31	0.000
	53.11 - 52.11		749.26	924.62	0.810	0.00	924.62	0.000
	52.11 - 51.11		769.16	930.96	0.826	0.00	930.96	0.000
	51.11 - 50.11		789.11	937.29	0.842	0.00	937.29	0.000
L11	50.11 - 49.11	TP32.6738x31.9983x0.21 88	809.12	943.62	0.857	0.00	943.62	0.000
	49.11 - 48.11		829.19	949.98	0.873	0.00	949.98	0.000
	48.11 - 47.11		849.32	956.33	0.888	0.00	956.33	0.000
	47.11 - 46.11		869.49	962.67	0.903	0.00	962.67	0.000
	46.11 - 45.11		889.73	969.03	0.918	0.00	969.03	0.000
L12	45.11 - 44.09	TP33.375x32.6738x0.218 8	910.41	975.52	0.933	0.00	975.52	0.000
	44.09 - 39.92		446.26	1002.12	0.445	0.00	1002.12	0.000
L13	44.09 - 39.92	TP33.1255x32.3741x0.28 13	549.49	1381.14	0.398	0.00	1381.14	0.000
	39.92 - 39.09		1012.89	1390.11	0.729	0.00	1390.11	0.000
L14	39.09 - 38.09	TP33.8769x33.1255x0.28 13	1033.58	1400.92	0.738	0.00	1400.92	0.000
	38.09 - 37.09		1054.33	1411.76	0.747	0.00	1411.76	0.000
	37.09 - 36.09		1075.13	1422.62	0.756	0.00	1422.62	0.000
	36.09 - 35.09		1095.98	1433.50	0.765	0.00	1433.50	0.000
	35.09 - 34.09		1116.89	1444.41	0.773	0.00	1444.41	0.000
L15	34.09 - 33.09	TP34.6283x33.8769x0.28 13	1137.85	1455.33	0.782	0.00	1455.33	0.000
	33.09 - 32.09		1158.86	1466.28	0.790	0.00	1466.28	0.000
	32.09 - 31.09		1179.92	1477.25	0.799	0.00	1477.25	0.000
	31.09 - 30.09		1201.03	1488.23	0.807	0.00	1488.23	0.000
	30.09 - 29.09		1222.18	1499.24	0.815	0.00	1499.24	0.000
L16	29.09 - 28.09	TP35.3797x34.6283x0.28 13	1243.38	1510.27	0.823	0.00	1510.27	0.000
	28.09 - 27.09		1264.64	1521.32	0.831	0.00	1521.32	0.000
	27.09 - 26.09		1285.94	1532.38	0.839	0.00	1532.38	0.000
	26.09 - 25.09		1307.28	1543.47	0.847	0.00	1543.47	0.000
	25.09 - 24.09		1328.67	1554.58	0.855	0.00	1554.58	0.000
L17	24.09 - 23.09	TP36.1311x35.3797x0.28 13	1350.11	1565.70	0.862	0.00	1565.70	0.000
	23.09 - 22.09		1371.58	1576.84	0.870	0.00	1576.84	0.000
	22.09 - 21.09		1393.10	1588.00	0.877	0.00	1588.00	0.000
	21.09 - 20.09		1414.66	1599.18	0.885	0.00	1599.18	0.000
	20.09 - 19.09		1436.26	1610.38	0.892	0.00	1610.38	0.000
L18	19.09 - 18.09	TP36.8825x36.1311x0.28 13	1457.89	1621.59	0.899	0.00	1621.59	0.000
	18.09 - 17.09		1479.57	1632.83	0.906	0.00	1632.83	0.000
	17.09 - 16.09		1501.28	1644.07	0.913	0.00	1644.07	0.000
	16.09 - 15.09		1523.03	1655.33	0.920	0.00	1655.33	0.000
	15.09 - 14.09		1544.82	1666.62	0.927	0.00	1666.62	0.000
L19	14.09 - 12.375 (19)	TP37.1403x36.8825x0.28 13	1582.25	1686.00	0.938	0.00	1686.00	0.000
L20	12.375 - 12.125 (20)	TP37.1778x37.1403x0.46 88	1587.72	3048.16	0.521	0.00	3048.16	0.000
L21	12.125 - 11.125	TP37.9292x37.1778x0.46 25	1609.62	3033.88	0.531	0.00	3033.88	0.000
	11.125 - 10.125		1631.57	3058.82	0.533	0.00	3058.82	0.000
	10.125 - 9.125		1653.56	3083.87	0.536	0.00	3083.87	0.000
	9.125 - 8.125		1675.60	3109.01	0.539	0.00	3109.01	0.000
	8.125 - 7.125		1697.69	3134.26	0.542	0.00	3134.26	0.000
L22	7.125 - 6.052	TP38.5743x37.9292x0.45 63	1721.45	3120.29	0.552	0.00	3120.29	0.000
	6.052 - 4.979		1745.27	3147.25	0.555	0.00	3147.25	0.000
	4.979 - 3.906		1769.13	3174.32	0.557	0.00	3174.32	0.000
	3.906 - 2.833		1793.05	3201.51	0.560	0.00	3201.51	0.000
L23	2.833 - 2.583 (23)	TP38.6118x38.5743x0.28 13	1798.63	1797.54	1.001	0.00	1797.54	0.000
L24	2.583 - 1.2915	TP39x38.6118x0.2813	1827.49	1812.35	1.008	0.00	1812.35	0.000
	1.2915 - 0		1856.40	1827.18	1.016	0.00	1827.18	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	$\phi V_n$	Ratio	Actual	$\phi T_n$	Ratio
			$V_u$ K	K	$\frac{V_u}{\phi V_n}$	$T_u$ kip-ft	$\frac{T_u}{\phi T_n}$	
L1	96.83 - 95.83	TP26.5186x25.75x0.1875	8.63	268.59	0.032	0.00	604.89	0.000
	95.83 - 94.83		8.70	270.20	0.032	0.00	612.15	0.000
	94.83 - 93.83		8.78	271.80	0.032	0.00	619.44	0.000
	93.83 - 92.83		8.86	273.41	0.032	0.00	626.78	0.000
	92.83 - 91.83		8.93	275.01	0.032	0.00	634.16	0.000
L2	91.83 - 90.83	TP27.2871x26.5186x0.1875	9.01	276.62	0.033	0.00	641.59	0.000
	90.83 - 89.83		9.09	278.22	0.033	0.00	649.06	0.000
	89.83 - 88.83		9.16	279.83	0.033	0.00	656.57	0.000
	88.83 - 87.83		9.24	281.44	0.033	0.00	664.13	0.000
	87.83 - 86.83		9.32	283.04	0.033	0.00	671.73	0.000
L3	86.83 - 85.83	TP28.0557x27.2871x0.1875	13.60	284.65	0.048	0.62	679.37	0.001
	85.83 - 84.83		13.68	286.25	0.048	0.62	687.05	0.001
	84.83 - 83.83		13.77	287.86	0.048	0.79	694.78	0.001
	83.83 - 82.83		13.84	289.46	0.048	0.79	702.55	0.001
	82.83 - 81.83		13.92	291.07	0.048	0.79	710.37	0.001
L4	81.83 - 80.11	TP28.875x28.0557x0.1875	14.05	293.83	0.048	0.79	723.91	0.001
	80.11 - 76.5		9.99	299.62	0.033	0.35	752.75	0.000
L5	80.11 - 76.5	TP28.6206x27.9451x0.2188	8.28	343.79	0.024	0.39	849.46	0.000
	76.5 - 75.11		18.37	346.08	0.053	0.75	860.81	0.001
L6	75.11 - 74.11	TP29.2962x28.6206x0.2188	18.44	347.73	0.053	0.75	869.02	0.001
	74.11 - 73.11		18.51	349.38	0.053	0.75	877.27	0.001
	73.11 - 72.11		18.58	351.02	0.053	0.75	885.55	0.001
	72.11 - 71.11		18.65	352.67	0.053	0.75	893.88	0.001
	71.11 - 70.11		18.72	354.31	0.053	0.75	902.24	0.001
L7	70.11 - 69.11	TP29.9717x29.2962x0.2188	18.79	355.96	0.053	0.75	910.65	0.001
	69.11 - 68.11		18.85	357.61	0.053	0.75	919.09	0.001
	68.11 - 67.11		18.92	359.25	0.053	0.75	927.58	0.001
	67.11 - 66.11		18.99	360.90	0.053	0.75	936.09	0.001
	66.11 - 65.11		19.06	362.55	0.053	0.75	944.65	0.001
L8	65.11 - 64.11	TP30.6472x29.9717x0.2188	19.12	364.19	0.053	0.75	953.25	0.001
	64.11 - 63.11		19.20	365.84	0.052	0.50	961.89	0.001
	63.11 - 62.11		19.26	367.48	0.052	0.50	970.57	0.001
	62.11 - 61.11		19.33	369.13	0.052	0.50	979.28	0.001
	61.11 - 60.11		19.39	370.78	0.052	0.50	988.03	0.001
L9	60.11 - 59.11	TP31.3227x30.6472x0.2188	19.45	372.42	0.052	0.50	996.83	0.001
	59.11 - 58.11		19.52	374.07	0.052	0.50	1005.66	0.000
	58.11 - 57.11		19.58	375.71	0.052	0.50	1014.53	0.000
	57.11 - 56.11		19.64	377.36	0.052	0.50	1023.44	0.000
	56.11 - 55.11		19.70	379.01	0.052	0.50	1032.39	0.000
L10	55.11 - 54.11	TP31.9983x31.3227x0.2188	19.76	380.65	0.052	0.50	1041.38	0.000
	54.11 - 53.11		19.82	382.30	0.052	0.50	1050.41	0.000
	53.11 - 52.11		19.88	383.95	0.052	0.50	1059.47	0.000
	52.11 - 51.11		19.93	385.59	0.052	0.50	1068.58	0.000
	51.11 - 50.11		19.99	387.24	0.052	0.50	1077.72	0.000
L11	50.11 - 49.11	TP32.6738x31.9983x0.2188	20.05	388.89	0.052	0.50	1086.91	0.000
	49.11 - 48.11		20.10	390.53	0.051	0.50	1096.12	0.000
	48.11 - 47.11		20.16	392.18	0.051	0.50	1105.39	0.000
	47.11 - 46.11		20.21	393.82	0.051	0.50	1114.69	0.000
	46.11 - 45.11		20.27	395.47	0.051	0.50	1124.03	0.000
L12	45.11 - 44.09	TP33.375x32.6738x0.2188	20.32	397.15	0.051	0.50	1133.59	0.000
	44.09 - 39.92		9.34	404.01	0.023	0.22	1173.12	0.000
L13	44.09 - 39.92	TP33.1255x32.3741x0.28	11.31	502.79	0.022	0.28	1468.83	0.000

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
		13						
L14	39.92 - 39.09		20.67	514.56	0.040	0.50	1480.05	0.000
	39.09 - 38.09	TP33.8769x33.1255x0.28	20.73	516.91	0.040	0.50	1493.62	0.000
		13						
	38.09 - 37.09		20.78	519.27	0.040	0.50	1507.26	0.000
	37.09 - 36.09		20.83	521.62	0.040	0.50	1520.96	0.000
	36.09 - 35.09		20.89	523.98	0.040	0.50	1534.72	0.000
	35.09 - 34.09		20.94	526.33	0.040	0.50	1548.54	0.000
L15	34.09 - 33.09	TP34.6283x33.8769x0.28	20.99	528.69	0.040	0.50	1562.42	0.000
		13						
	33.09 - 32.09		21.04	531.04	0.040	0.50	1576.38	0.000
	32.09 - 31.09		21.09	533.39	0.040	0.50	1590.38	0.000
	31.09 - 30.09		21.14	535.75	0.039	0.50	1604.46	0.000
	30.09 - 29.09		21.19	538.10	0.039	0.50	1618.58	0.000
L16	29.09 - 28.09	TP35.3797x34.6283x0.28	21.24	540.46	0.039	0.50	1632.78	0.000
		13						
	28.09 - 27.09		21.28	542.81	0.039	0.50	1647.04	0.000
	27.09 - 26.09		21.33	545.17	0.039	0.50	1661.36	0.000
	26.09 - 25.09		21.38	547.52	0.039	0.50	1675.74	0.000
	25.09 - 24.09		21.42	549.88	0.039	0.50	1690.18	0.000
L17	24.09 - 23.09	TP36.1311x35.3797x0.28	21.46	552.23	0.039	0.50	1704.68	0.000
		13						
	23.09 - 22.09		21.51	554.59	0.039	0.50	1719.25	0.000
	22.09 - 21.09		21.55	556.94	0.039	0.50	1733.88	0.000
	21.09 - 20.09		21.59	559.29	0.039	0.50	1748.58	0.000
	20.09 - 19.09		21.63	561.65	0.039	0.50	1763.33	0.000
L18	19.09 - 18.09	TP36.8825x36.1311x0.28	21.67	564.00	0.038	0.50	1778.14	0.000
		13						
	18.09 - 17.09		21.70	566.36	0.038	0.50	1793.02	0.000
	17.09 - 16.09		21.74	568.71	0.038	0.50	1807.95	0.000
	16.09 - 15.09		21.78	571.07	0.038	0.50	1822.95	0.000
	15.09 - 14.09		21.81	573.42	0.038	0.50	1838.02	0.000
L19	14.09 -	TP37.1403x36.8825x0.28	21.88	577.46	0.038	0.50	1863.99	0.000
	12.375 (19)	13						
L20	12.375 -	TP37.1778x37.1403x0.46	21.87	958.51	0.023	0.50	3081.43	0.000
	12.125 (20)	88						
L21	12.125 -	TP37.9292x37.1778x0.46	21.93	949.77	0.023	0.50	3066.33	0.000
	11.125	25						
	11.125 -		21.98	953.64	0.023	0.50	3091.38	0.000
	10.125							
	10.125 -		22.02	957.51	0.023	0.50	3116.53	0.000
	9.125							
	9.125 - 8.125		22.07	961.38	0.023	0.50	3141.79	0.000
	8.125 - 7.125		22.12	965.25	0.023	0.50	3167.14	0.000
L22	7.125 - 6.052	TP38.5743x37.9292x0.45	22.17	956.47	0.023	0.50	3152.34	0.000
		63						
	6.052 - 4.979		22.22	960.57	0.023	0.50	3179.42	0.000
	4.979 - 3.906		22.27	964.66	0.023	0.50	3206.60	0.000
	3.906 - 2.833		22.32	968.76	0.023	0.50	3233.91	0.000
L23	2.833 - 2.583	TP38.6118x38.5743x0.28	22.32	600.51	0.037	0.50	2015.80	0.000
	(23)	13						
L24	2.583 -	TP39x38.6118x0.2813	22.38	603.55	0.037	0.50	2036.27	0.000
	1.2915							
	1.2915 - 0		22.42	606.59	0.037	0.50	2056.83	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\phi P_n$	$\phi M_{nx}$	$\phi M_{ny}$	$\phi V_n$	$\phi T_n$			
L1	96.83 - 95.83	0.008	0.094	0.000	0.032	0.000	0.103	1.050	
	95.83 - 94.83	0.008	0.110	0.000	0.032	0.000	0.118	1.050	
	94.83 - 93.83	0.008	0.124	0.000	0.032	0.000	0.133	1.050	

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u$	$M_{ux}$	$M_{uy}$	$V_u$	$T_u$			
		$\phi P_n$	$\phi M_{nx}$	$\phi M_{ny}$	$\phi V_n$	$\phi T_n$			
L2	93.83 - 92.83	0.008	0.139	0.000	0.032	0.000	0.148	1.050	
	92.83 - 91.83	0.008	0.154	0.000	0.032	0.000	0.162	1.050	
	91.83 - 90.83	0.008	0.168	0.000	0.033	0.000	0.177	1.050	
	90.83 - 89.83	0.008	0.183	0.000	0.033	0.000	0.191	1.050	
	89.83 - 88.83	0.008	0.197	0.000	0.033	0.000	0.206	1.050	
	88.83 - 87.83	0.008	0.211	0.000	0.033	0.000	0.220	1.050	
L3	87.83 - 86.83	0.008	0.225	0.000	0.033	0.000	0.234	1.050	
	86.83 - 85.83	0.012	0.249	0.000	0.048	0.001	0.263	1.050	
	85.83 - 84.83	0.012	0.270	0.000	0.048	0.001	0.284	1.050	
	84.83 - 83.83	0.012	0.291	0.000	0.048	0.001	0.305	1.050	
	83.83 - 82.83	0.012	0.311	0.000	0.048	0.001	0.325	1.050	
	82.83 - 81.83	0.012	0.331	0.000	0.048	0.001	0.345	1.050	
L4	81.83 - 80.11	0.012	0.365	0.000	0.048	0.001	0.379	1.050	
	80.11 - 76.5	0.009	0.211	0.000	0.033	0.000	0.221	1.050	
L5	80.11 - 76.5	0.006	0.192	0.000	0.024	0.000	0.199	1.050	
	76.5 - 75.11	0.014	0.396	0.000	0.053	0.001	0.413	1.050	
L6	75.11 - 74.11	0.014	0.416	0.000	0.053	0.001	0.433	1.050	
	74.11 - 73.11	0.014	0.436	0.000	0.053	0.001	0.453	1.050	
	73.11 - 72.11	0.014	0.456	0.000	0.053	0.001	0.473	1.050	
	72.11 - 71.11	0.014	0.475	0.000	0.053	0.001	0.493	1.050	
L7	71.11 - 70.11	0.014	0.495	0.000	0.053	0.001	0.512	1.050	
	70.11 - 69.11	0.014	0.514	0.000	0.053	0.001	0.531	1.050	
	69.11 - 68.11	0.014	0.533	0.000	0.053	0.001	0.550	1.050	
	68.11 - 67.11	0.014	0.552	0.000	0.053	0.001	0.569	1.050	
	67.11 - 66.11	0.014	0.570	0.000	0.053	0.001	0.587	1.050	
	66.11 - 65.11	0.015	0.588	0.000	0.053	0.001	0.606	1.050	
L8	65.11 - 64.11	0.015	0.607	0.000	0.053	0.001	0.624	1.050	
	64.11 - 63.11	0.015	0.625	0.000	0.052	0.001	0.642	1.050	
	63.11 - 62.11	0.015	0.642	0.000	0.052	0.001	0.660	1.050	
	62.11 - 61.11	0.015	0.660	0.000	0.052	0.001	0.677	1.050	
L9	61.11 - 60.11	0.015	0.677	0.000	0.052	0.001	0.695	1.050	
	60.11 - 59.11	0.015	0.695	0.000	0.052	0.001	0.712	1.050	
	59.11 - 58.11	0.015	0.712	0.000	0.052	0.000	0.729	1.050	
	58.11 - 57.11	0.015	0.729	0.000	0.052	0.000	0.746	1.050	
L10	57.11 - 56.11	0.015	0.745	0.000	0.052	0.000	0.763	1.050	
	56.11 - 55.11	0.015	0.762	0.000	0.052	0.000	0.779	1.050	
	55.11 - 54.11	0.015	0.778	0.000	0.052	0.000	0.796	1.050	
	54.11 - 53.11	0.015	0.794	0.000	0.052	0.000	0.812	1.050	
	53.11 - 52.11	0.015	0.810	0.000	0.052	0.000	0.828	1.050	
	52.11 - 51.11	0.015	0.826	0.000	0.052	0.000	0.844	1.050	
L11	51.11 - 50.11	0.015	0.842	0.000	0.052	0.000	0.860	1.050	
	50.11 - 49.11	0.015	0.857	0.000	0.052	0.000	0.875	1.050	
	49.11 - 48.11	0.015	0.873	0.000	0.051	0.000	0.891	1.050	
	48.11 - 47.11	0.015	0.888	0.000	0.051	0.000	0.906	1.050	
L12	47.11 - 46.11	0.015	0.903	0.000	0.051	0.000	0.921	1.050	
	46.11 - 45.11	0.015	0.918	0.000	0.051	0.000	0.936	1.050	
	45.11 - 44.09	0.016	0.933	0.000	0.051	0.000	0.951	1.050	
	44.09 - 39.92	0.007	0.445	0.000	0.023	0.000	0.453	1.050	
	44.09 - 39.92	0.007	0.398	0.000	0.022	0.000	0.405	1.050	
	39.92 - 39.09	0.013	0.729	0.000	0.040	0.000	0.743	1.050	
L14	39.09 - 38.09	0.013	0.738	0.000	0.040	0.000	0.752	1.050	
	38.09 - 37.09	0.013	0.747	0.000	0.040	0.000	0.761	1.050	
	37.09 - 36.09	0.013	0.756	0.000	0.040	0.000	0.770	1.050	
	36.09 - 35.09	0.013	0.765	0.000	0.040	0.000	0.779	1.050	
L15	35.09 - 34.09	0.013	0.773	0.000	0.040	0.000	0.788	1.050	
	34.09 - 33.09	0.013	0.782	0.000	0.040	0.000	0.796	1.050	
	33.09 - 32.09	0.013	0.790	0.000	0.040	0.000	0.805	1.050	
	32.09 - 31.09	0.013	0.799	0.000	0.040	0.000	0.813	1.050	
	31.09 - 30.09	0.013	0.807	0.000	0.039	0.000	0.822	1.050	
	30.09 - 29.09	0.013	0.815	0.000	0.039	0.000	0.830	1.050	
L16	29.09 - 28.09	0.013	0.823	0.000	0.039	0.000	0.838	1.050	
	28.09 - 27.09	0.013	0.831	0.000	0.039	0.000	0.846	1.050	
	27.09 - 26.09	0.013	0.839	0.000	0.039	0.000	0.854	1.050	
	26.09 - 25.09	0.013	0.847	0.000	0.039	0.000	0.862	1.050	
L17	25.09 - 24.09	0.013	0.855	0.000	0.039	0.000	0.870	1.050	
	24.09 - 23.09	0.013	0.862	0.000	0.039	0.000	0.877	1.050	
	23.09 - 22.09	0.013	0.870	0.000	0.039	0.000	0.885	1.050	
	22.09 - 21.09	0.014	0.877	0.000	0.039	0.000	0.892	1.050	
	21.09 - 20.09	0.014	0.885	0.000	0.039	0.000	0.900	1.050	

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u$	$M_{ux}$	$M_{uy}$	$V_u$	$T_u$			
L18	20.09 - 19.09	0.014	0.892	0.000	0.039	0.000	0.907	1.050	
	19.09 - 18.09	0.014	0.899	0.000	0.038	0.000	0.914	1.050	
	18.09 - 17.09	0.014	0.906	0.000	0.038	0.000	0.921	1.050	
	17.09 - 16.09	0.014	0.913	0.000	0.038	0.000	0.928	1.050	
	16.09 - 15.09	0.014	0.920	0.000	0.038	0.000	0.935	1.050	
L19	15.09 - 14.09	0.014	0.927	0.000	0.038	0.000	0.942	1.050	
	14.09 - 12.375 (19)	0.014	0.938	0.000	0.038	0.000	0.954	1.050	
L20	12.375 - 12.125 (20)	0.008	0.521	0.000	0.023	0.000	0.530	1.050	
L21	12.125 - 11.125	0.009	0.531	0.000	0.023	0.000	0.540	1.050	
	11.125 - 10.125	0.009	0.533	0.000	0.023	0.000	0.543	1.050	
	10.125 - 9.125	0.009	0.536	0.000	0.023	0.000	0.545	1.050	
L22	9.125 - 8.125	0.009	0.539	0.000	0.023	0.000	0.548	1.050	
	8.125 - 7.125	0.009	0.542	0.000	0.023	0.000	0.551	1.050	
	7.125 - 6.052	0.009	0.552	0.000	0.023	0.000	0.561	1.050	
	6.052 - 4.979	0.009	0.555	0.000	0.023	0.000	0.564	1.050	
	4.979 - 3.906	0.009	0.557	0.000	0.023	0.000	0.567	1.050	
L23	3.906 - 2.833 (23)	0.009	0.560	0.000	0.023	0.000	0.570	1.050	
	2.833 - 2.583	0.015	1.001	0.000	0.037	0.000	1.017	1.050	
L24	2.583 - 1.2915	0.015	1.008	0.000	0.037	0.000	1.025	1.050	
	1.2915 - 0	0.015	1.016	0.000	0.037	0.000	1.032	1.050	

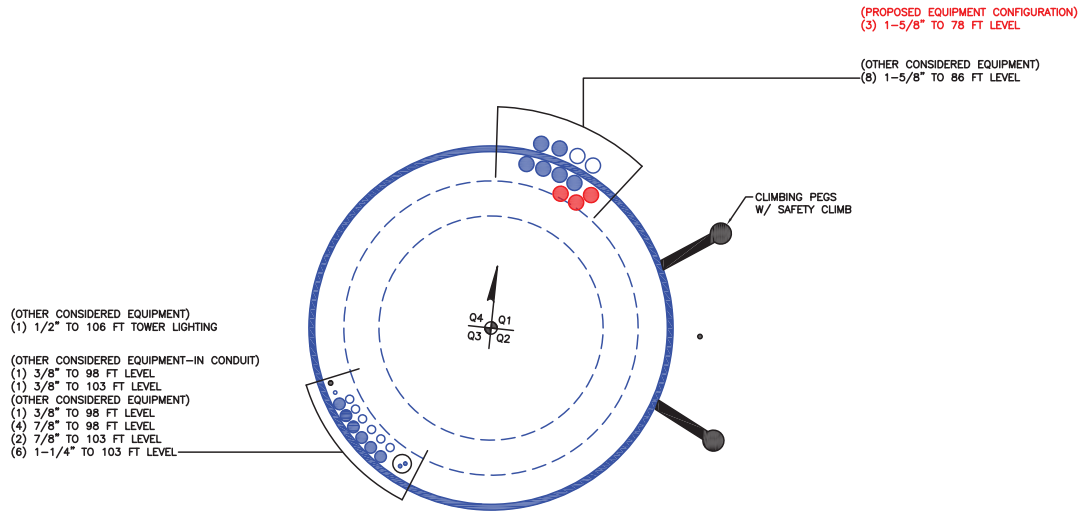
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	96.83 - 91.83	Pole	TP26.5186x25.75x0.1875	1	-7.02	962.55	15.5	Pass	
L2	91.83 - 86.83	Pole	TP27.2871x26.5186x0.1875	2	-7.39	990.64	22.3	Pass	
L3	86.83 - 81.83	Pole	TP28.0557x27.2871x0.1875	3	-11.35	1018.74	32.8	Pass	
L4	81.83 - 76.5	Pole	TP28.875x28.0557x0.1875	4	-11.51	1028.40	36.1	Pass	
L5	76.5 - 75.11	Pole	TP28.6206x27.9451x0.2188	5	-16.29	1211.29	39.3	Pass	
L6	75.11 - 70.11	Pole	TP29.2962x28.6206x0.2188	6	-16.91	1240.09	48.8	Pass	
L7	70.11 - 65.11	Pole	TP29.9717x29.2962x0.2188	7	-17.56	1268.90	57.7	Pass	
L8	65.11 - 60.11	Pole	TP30.6472x29.9717x0.2188	8	-18.23	1297.72	66.2	Pass	
L9	60.11 - 55.11	Pole	TP31.3227x30.6472x0.2188	9	-18.93	1326.53	74.2	Pass	
L10	55.11 - 50.11	Pole	TP31.9983x31.3227x0.2188	10	-19.65	1355.34	81.9	Pass	
L11	50.11 - 45.11	Pole	TP32.6738x31.9983x0.2188	11	-20.39	1384.15	89.2	Pass	
L12	45.11 - 39.92	Pole	TP33.375x32.6738x0.2188	12	-20.55	1390.02	90.6	Pass	
L13	39.92 - 39.09	Pole	TP33.1255x32.3741x0.2813	13	-21.76	1800.96	70.8	Pass	
L14	39.09 - 34.09	Pole	TP33.8769x33.1255x0.2813	14	-22.65	1842.16	75.0	Pass	
L15	34.09 - 29.09	Pole	TP34.6283x33.8769x0.2813	15	-23.56	1883.36	79.0	Pass	
L16	29.09 - 24.09	Pole	TP35.3797x34.6283x0.2813	16	-24.49	1924.57	82.8	Pass	
L17	24.09 - 19.09	Pole	TP36.1311x35.3797x0.2813	17	-25.45	1965.77	86.4	Pass	
L18	19.09 - 14.09	Pole	TP36.8825x36.1311x0.2813	18	-26.42	2006.97	89.7	Pass	
L19	14.09 - 12.375	Pole	TP37.1403x36.8825x0.2813	19	-26.75	2021.10	90.8	Pass	
L20	12.375 - 12.125	Pole	TP37.1778x37.1403x0.4688	20	-26.84	3354.80	50.5	Pass	
L21	12.125 - 7.125	Pole	TP37.9292x37.1778x0.4625	21	-28.27	3378.39	52.5	Pass	
L22	7.125 - 2.833	Pole	TP38.5743x37.9292x0.4563	22	-29.51	3390.67	54.3	Pass	
L23	2.833 - 2.583	Pole	TP38.6118x38.5743x0.2813	23	-29.57	2101.80	96.8	Pass	
L24	2.583 - 0	Pole	TP39x38.6118x0.2813	24	-30.08	2123.08	98.3	Pass	
							Summary		
							Pole (L24)	98.3	Pass
							<b>RATING =</b>	<b>98.3</b>	<b>Pass</b>

**\*NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**



**APPENDIX B**  
**BASE LEVEL DRAWING**



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

Site BU: 842861  
Work Order: 2276930



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**Pole Geometry**

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	96.83	20.33	3.61	18	25.75	28.875	0.1875	Auto	A572-65
2	80.11	40.19	4.17	18	27.95	33.375	0.21875	Auto	A572-65
3	44.09	44.09	0	18	32.37	39	0.28125	Auto	A572-65

**Reinforcement Configuration**

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	2.833	12.375	plate	CCI-AFP-065125	3																		
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	42	PC 8.8 - M20 (100)	42.000	19.000	6.563	1.1875	A572-65

# TNX Geometry Input

Increment (ft):  [Export to TNX](#)

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	96.83 - 91.83	5		18	25.750	26.519	0.1875	A572-65	1.000
2	91.83 - 86.83	5		18	26.519	27.287	0.1875	A572-65	1.000
3	86.83 - 81.83	5		18	27.287	28.056	0.1875	A572-65	1.000
4	81.83 - 80.11	5.33	3.61	18	28.056	28.875	0.1875	A572-65	1.000
5	80.11 - 75.11	5		18	27.945	28.621	0.21875	A572-65	1.000
6	75.11 - 70.11	5		18	28.621	29.296	0.21875	A572-65	1.000
7	70.11 - 65.11	5		18	29.296	29.972	0.21875	A572-65	1.000
8	65.11 - 60.11	5		18	29.972	30.647	0.21875	A572-65	1.000
9	60.11 - 55.11	5		18	30.647	31.323	0.21875	A572-65	1.000
10	55.11 - 50.11	5		18	31.323	31.998	0.21875	A572-65	1.000
11	50.11 - 45.11	5		18	31.998	32.674	0.21875	A572-65	1.000
12	45.11 - 44.09	5.19	4.17	18	32.674	33.375	0.21875	A572-65	1.000
13	44.09 - 39.09	5		18	32.374	33.126	0.28125	A572-65	1.000
14	39.09 - 34.09	5		18	33.126	33.877	0.28125	A572-65	1.000
15	34.09 - 29.09	5		18	33.877	34.628	0.28125	A572-65	1.000
16	29.09 - 24.09	5		18	34.628	35.380	0.28125	A572-65	1.000
17	24.09 - 19.09	5		18	35.380	36.131	0.28125	A572-65	1.000
18	19.09 - 14.09	5		18	36.131	36.883	0.28125	A572-65	1.000
19	14.09 - 12.375	1.715		18	36.883	37.140	0.28125	A572-65	1.000
20	12.375 - 12.125	0.25		18	37.140	37.178	0.46875	A572-65	1.049
21	12.125 - 7.125	5		18	37.178	37.929	0.4625	A572-65	1.054
22	7.125 - 2.833	4.292		18	37.929	38.574	0.45625	A572-65	1.061
23	2.833 - 2.583	0.25		18	38.574	38.612	0.28125	A572-65	1.000
24	2.583 - 0	2.583		18	38.612	39.000	0.28125	A572-65	1.000

## TNX Section Forces

Increment (ft):		TNX Output				
	5	Section Height (ft)		$P_u$ (K)	$M_{ux}$ (kip-ft)	$V_u$ (K)
1	96.83 - 91.83	7.02	85.95	8.93		
2	91.83 - 86.83	7.39	131.56	9.32		
3	86.83 - 81.83	11.35	202.38	13.92		
4	81.83 - 80.11	11.51	226.42	14.05		
5	80.11 - 75.11	16.29	309.03	18.37		
6	75.11 - 70.11	16.91	401.70	18.72		
7	70.11 - 65.11	17.56	496.09	19.06		
8	65.11 - 60.11	18.23	592.21	19.39		
9	60.11 - 55.11	18.93	689.91	19.70		
10	55.11 - 50.11	19.65	789.11	19.99		
11	50.11 - 45.11	20.39	889.72	20.27		
12	45.11 - 44.09	20.55	910.41	20.32		
13	44.09 - 39.09	21.76	1012.89	20.67		
14	39.09 - 34.09	22.65	1116.89	20.94		
15	34.09 - 29.09	23.56	1222.18	21.19		
16	29.09 - 24.09	24.49	1328.67	21.42		
17	24.09 - 19.09	25.45	1436.26	21.63		
18	19.09 - 14.09	26.42	1544.81	21.81		
19	14.09 - 12.375	26.75	1582.25	21.88		
20	12.375 - 12.125	26.84	1587.72	21.87		
21	12.125 - 7.125	28.27	1697.69	22.12		
22	7.125 - 2.833	29.51	1793.05	22.32		
23	2.833 - 2.583	29.57	1261.23	22.32		
24	2.583 - 0	30.08	1261.23	22.42		

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
96.83 - 91.83	Pole	TP26.519x25.75x0.1875	Pole	15.5%	Pass
91.83 - 86.83	Pole	TP27.287x26.519x0.1875	Pole	22.3%	Pass
86.83 - 81.83	Pole	TP28.056x27.287x0.1875	Pole	32.8%	Pass
81.83 - 80.11	Pole	TP28.875x28.056x0.1875	Pole	36.1%	Pass
80.11 - 75.11	Pole	TP28.621x27.945x0.2188	Pole	39.3%	Pass
75.11 - 70.11	Pole	TP29.296x28.621x0.2188	Pole	48.8%	Pass
70.11 - 65.11	Pole	TP29.972x29.296x0.2188	Pole	57.7%	Pass
65.11 - 60.11	Pole	TP30.647x29.972x0.2188	Pole	66.2%	Pass
60.11 - 55.11	Pole	TP31.323x30.647x0.2188	Pole	74.3%	Pass
55.11 - 50.11	Pole	TP31.998x31.323x0.2188	Pole	81.9%	Pass
50.11 - 45.11	Pole	TP32.674x31.998x0.2188	Pole	89.2%	Pass
45.11 - 44.09	Pole	TP33.375x32.674x0.2188	Pole	90.6%	Pass
44.09 - 39.09	Pole	TP33.126x32.374x0.2813	Pole	70.8%	Pass
39.09 - 34.09	Pole	TP33.877x33.126x0.2813	Pole	75.0%	Pass
34.09 - 29.09	Pole	TP34.628x33.877x0.2813	Pole	79.0%	Pass
29.09 - 24.09	Pole	TP35.38x34.628x0.2813	Pole	82.8%	Pass
24.09 - 19.09	Pole	TP36.131x35.38x0.2813	Pole	86.4%	Pass
19.09 - 14.09	Pole	TP36.883x36.131x0.2813	Pole	89.8%	Pass
14.09 - 12.38	Pole	TP37.14x36.883x0.2813	Pole	90.9%	Pass
12.38 - 12.13	Pole + Reinf.	TP37.178x37.14x0.4688	Reinf. 1 Tension Rupture	73.8%	Pass
12.13 - 7.13	Pole + Reinf.	TP37.929x37.178x0.4625	Reinf. 1 Tension Rupture	76.5%	Pass
7.13 - 2.83	Pole + Reinf.	TP38.574x37.929x0.4563	Reinf. 1 Tension Rupture	78.6%	Pass
2.83 - 2.58	Pole	TP38.612x38.574x0.2813	Pole	68.4%	Pass
2.58 - 0	Pole	TP39x38.612x0.2813	Pole	67.3%	Pass
				Summary	
			Pole	90.9%	Pass
			Reinforcement	78.6%	Pass
			Overall	90.9%	Pass

## Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity*	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
96.83 - 91.83	1372	n/a	1372	15.67	n/a	15.67	15.5%	
91.83 - 86.83	1496	n/a	1496	16.13	n/a	16.13	22.3%	
86.83 - 81.83	1627	n/a	1627	16.58	n/a	16.58	32.8%	
81.83 - 80.11	1673	n/a	1673	16.74	n/a	16.74	36.1%	
80.11 - 75.11	2009	n/a	2009	19.72	n/a	19.72	39.3%	
75.11 - 70.11	2156	n/a	2156	20.19	n/a	20.19	48.8%	
70.11 - 65.11	2310	n/a	2310	20.66	n/a	20.66	57.7%	
65.11 - 60.11	2470	n/a	2470	21.13	n/a	21.13	66.2%	
60.11 - 55.11	2639	n/a	2639	21.60	n/a	21.60	74.3%	
55.11 - 50.11	2814	n/a	2814	22.06	n/a	22.06	81.9%	
50.11 - 45.11	2998	n/a	2998	22.53	n/a	22.53	89.2%	
45.11 - 44.09	3036	n/a	3036	22.63	n/a	22.63	90.6%	
44.09 - 39.09	3994	n/a	3994	29.32	n/a	29.32	70.8%	
39.09 - 34.09	4275	n/a	4275	29.99	n/a	29.99	75.0%	
34.09 - 29.09	4568	n/a	4568	30.66	n/a	30.66	79.0%	
29.09 - 24.09	4875	n/a	4875	31.33	n/a	31.33	82.8%	
24.09 - 19.09	5194	n/a	5194	32.00	n/a	32.00	86.4%	
19.09 - 14.09	5528	n/a	5528	32.67	n/a	32.67	89.8%	
14.09 - 12.38	5646	n/a	5646	32.90	n/a	32.90	90.9%	
12.38 - 12.13	5685	3603	9288	32.94	24.38	57.31	57.8%	73.8%
12.13 - 7.13	6039	3744	9783	33.61	24.38	57.98	60.3%	76.5%
7.13 - 2.83	6354	3867	10221	34.18	24.38	58.56	62.4%	78.6%
2.83 - 2.58	6349	n/a	6349	34.22	n/a	34.22	68.4%	
2.58 - 0	6544	n/a	6544	34.56	n/a	34.56	67.3%	

Note: Section capacity checked using 5 degree increments.

Rating per TIA-222-H Section 15.5.



# Monopole Base Plate Connection



Site Info	
BU #	842861
Site Name	East Hartford Hochanun
Order #	654558 - Rev. 3

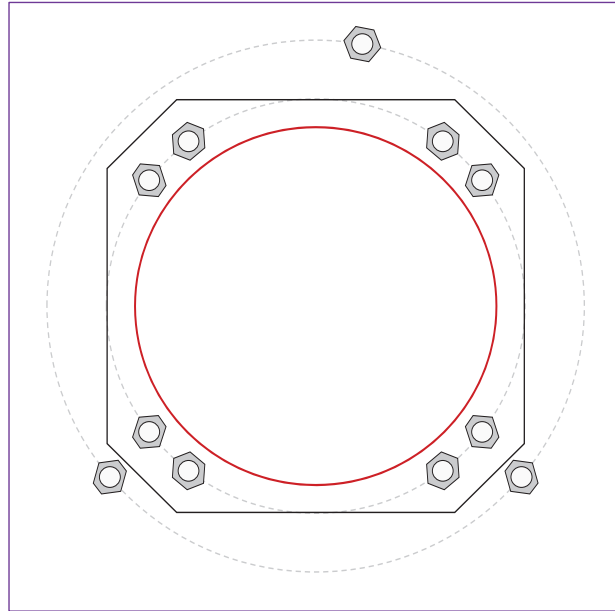
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
$I_{ar}$ (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	1856.40
Axial Force (kips)	30.08
Shear Force (kips)	22.42

\*TIA-222-H Section 15.5 Applied

Adjusted Pole Reactions	
Moment (kip-ft)	1261.23
Axial Force (kips)	30.08
Shear Force (kips)	22.42

\*Reactions to enter in CClpole; BARB CL = 2.833 ft



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

Anchor Rod Data	
GROUP 1: (8) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 45.2" BC <i>Anchor Spacing: 6 in</i>	
GROUP 2: (3) 2-1/4" $\phi$ bolts (A193 Gr. B7 N; $F_y=105$ ksi, $F_u=125$ ksi) on 58" BC <i>pos. (deg): 80, 220, 320</i>	
Base Plate Data	
45" W x 2.75" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi); Clip: 7.5 in	
Stiffener Data	
N/A	
Pole Data	
39" x 0.28125" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)	

Anchor Rod Summary		(units of kips, kip-in)
GROUP 1:		
$Pu\_t = 165.66$	$\phi Pn\_t = 243.75$	<b>Stress Rating</b>
$Vu = 2.8$	$\phi Vn = 149.1$	<b>64.7%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>
GROUP 2: (BARB)		
$Pu\_t = 210.65$	$\phi Pn\_t = 304.69$	<b>Stress Rating</b>
$Vu = 0$	$\phi Vn = 186.38$	<b>65.8%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>
Base Plate Summary		
Max Stress (ksi):	20.94	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	<b>44.3%</b>	<b>Pass</b>

# CCiplate

Elevation (ft) 0 (Base)

note: Bending interaction not considered when Grout Considered = "Yes"

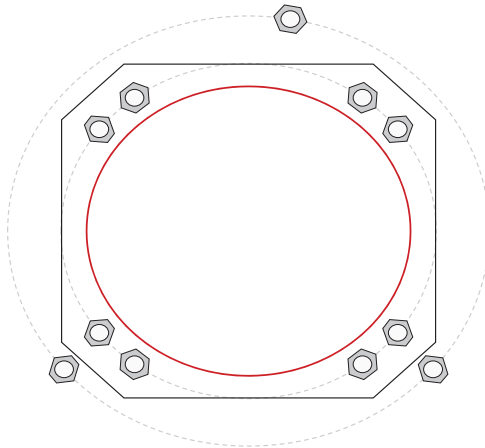
Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	2.833
2	No	No	No	No	Yes	

Include Pole Reactions in Report

## Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, $\eta$ :	$l_p$ (in):	Thread Type	Area Override, in <sup>2</sup>	Tension Only
1	1	37.3718503	2.25	A615-75	45.2	0.5	1.375	N-Included		No
2	1	52.6281497	2.25	A615-75	45.2	0.5	1.375	N-Included		No
3	1	127.37185	2.25	A615-75	45.2	0.5	1.375	N-Included		No
4	1	142.62815	2.25	A615-75	45.2	0.5	1.375	N-Included		No
5	1	217.37185	2.25	A615-75	45.2	0.5	1.375	N-Included		No
6	1	232.62815	2.25	A615-75	45.2	0.5	1.375	N-Included		No
7	1	307.37185	2.25	A615-75	45.2	0.5	1.375	N-Included		No
8	1	322.62815	2.25	A615-75	45.2	0.5	1.375	N-Included		No
9	2	80	2.25	A193 Gr. B7	58	0.5	0	N-Included		No
10	2	220	2.25	A193 Gr. B7	58	0.5	0	N-Included		No
11	2	320	2.25	A193 Gr. B7	58	0.5	0	N-Included		No

## Plot Graphic



### Drilled Pier Foundation

BU # :	842861
Site Name:	East Hartford Hochanum
Order Number:	654558 Rev. 3
TIA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	1856.4	
Axial Force (kips)	30.1	
Shear Force (kips)	22.4	

Material Properties	
Concrete Strength, f <sub>c</sub> :	3 ksi
Rebar Strength, F <sub>y</sub> :	60 ksi
Tie Yield Strength, F <sub>y</sub> :	40 ksi

Pier Design Data	
Depth	44.75 ft
Ext. Above Grade	0.25 ft
Pier Section 1	
<i>From 0.25' above grade to 44.75' below grade</i>	
Pier Diameter	7.5 ft
Rebar Quantity	22
Rebar Size	10
Rebar Cage Diameter	81 in
Tie Size	
Tie Spacing	in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

#### Analysis Results

Soil Lateral Check	Compression	Uplift
D <sub>reqd</sub> (ft from TOC)	7.92	-
Soil Safety Factor	9.25	-
Max Moment (kip-ft)	2018.83	-
Rating*	13.7%	-

Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	432.91	-
End Bearing (kips)	77.04	-
Weight of Concrete (kips)	237.86	-
Total Capacity (kips)	509.94	-
Axial (kips)	267.96	-
Rating*	50.0%	-

Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	7.58	-
Critical Moment (kip-ft)	2018.40	-
Critical Moment Capacity	4934.90	-
Rating*	39.0%	-

Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	21.49	-
Critical Shear (kip)	178.95	-
Critical Shear Capacity	509.77	-
Rating*	33.4%	-

Structural Foundation Rating*	39.0%
Soil Interaction Rating*	50.0%

\*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Design Options	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Consider non-tapered moment capacity:	<input type="checkbox"/>
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

#### Soil Profile

Groundwater Depth	8.5
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# of Layers	13
-------------	----

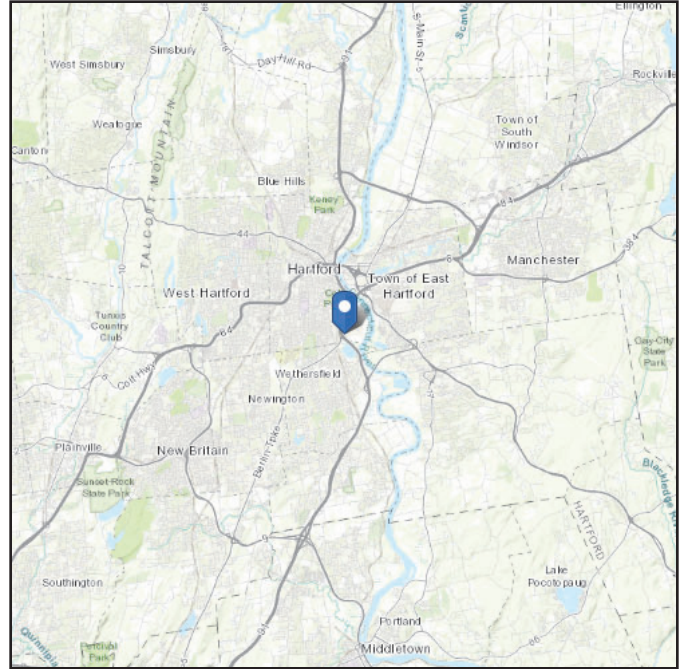
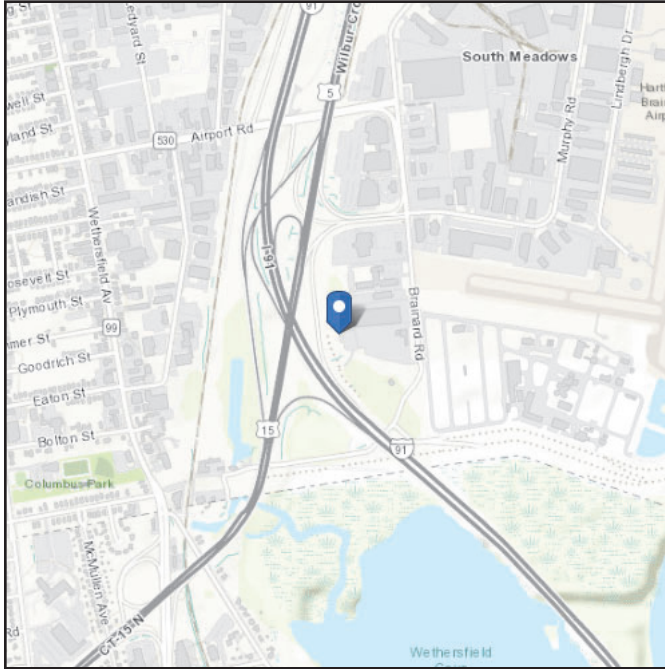
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ <sub>soil</sub> (pcf)	γ <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	1	1	108	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	1	3.5	2.5	114	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.5	3.75	0.25	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
4	3.75	6	2.25	110	150	0.775	0	0.426	0.426	0.66	0.66			Cohesive
5	6	8.5	2.5	112	150	0	34	0.000	0.000	0.38	0.38			Cohesionless
6	8.5	13.5	5	49.6	87.6	0	34	0.000	0.000	0.51	0.51			Cohesionless
7	13.5	18.5	5	50.6	87.6	0	38	0.00	0.00	0.71	0.71			Cohesionless
8	18.5	23.5	5	51.6	87.6	0	45	0.00	0.00	1.05	1.05			Cohesionless
9	23.5	28.5	5	50.6	87.6	0	35	0.00	0.00	0.90	0.90			Cohesionless
10	28.5	33.5	5	47.6	87.6	0.8	0	0.44	0.44	0.68	0.68			Cohesive
11	33.5	38.5	5	47.6	87.6	0.25	0	0.14	0.14	0.25	0.25			Cohesive
12	38.5	43.5	5	47.6	87.6	0.2	0	0.11	0.11	0.20	0.20			Cohesive
13	43.5	44.75	1.25	47.6	87.6	0.45	0	0.25	0.25	0.45	0.45	2.325		Cohesive

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** E - Soft Clay Soil

**Latitude:** 41.732978  
**Longitude:** -72.662075  
**Elevation:** 9.69175231472924 ft (NAVD 88)



## Wind

### Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
Date Accessed: Sat Dec 09 2023

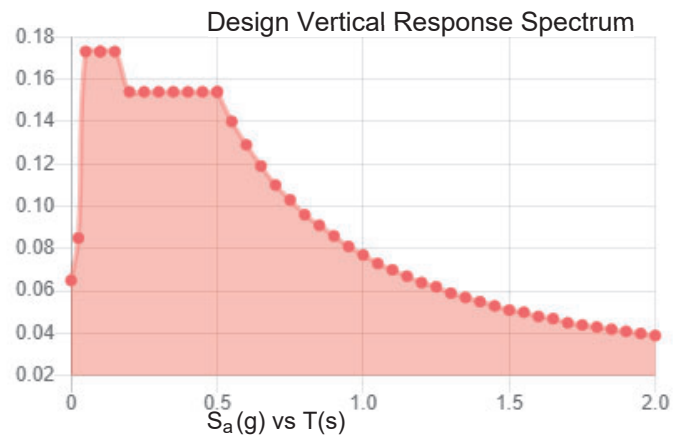
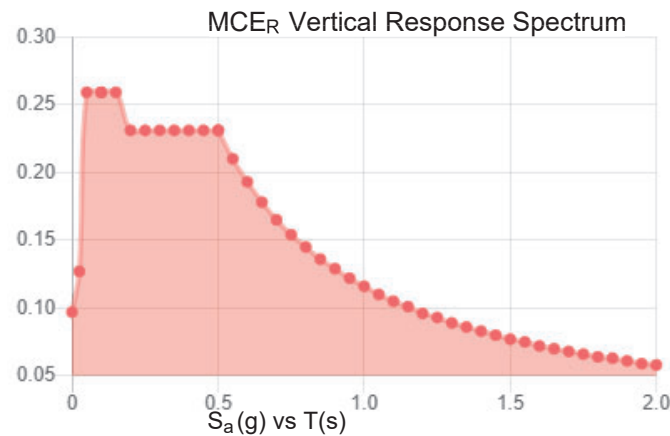
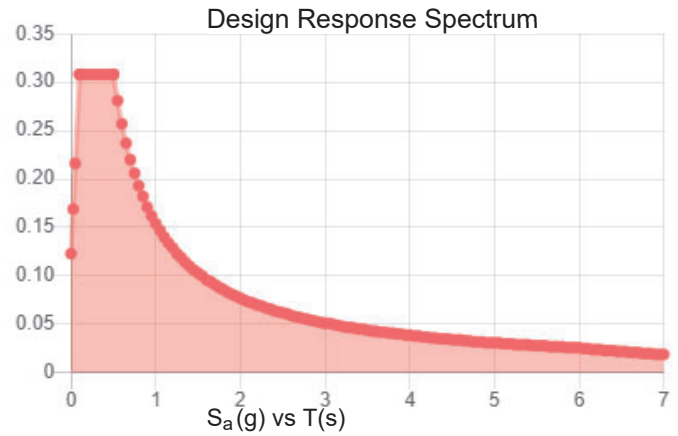
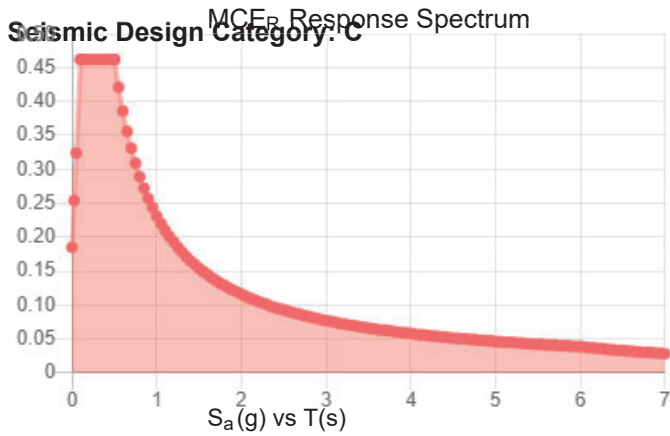
Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance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

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

**Site Soil Class:** E - Soft Clay Soil

**Results:**

$S_s$ :	0.193	$S_{D1}$ :	0.154
$S_1$ :	0.055	$T_L$ :	6
$F_a$ :	2.4	PGA :	0.104
$F_v$ :	4.2	PGA <sub>M</sub> :	0.248
$S_{MS}$ :	0.462	$F_{PGA}$ :	2.378
$S_{M1}$ :	0.231	$I_e$ :	1
$S_{DS}$ :	0.308	$C_v$ :	0.7



**Data Accessed:** Sat Dec 09 2023

**Date Source:**

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

## Ice

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### Results:

Ice Thickness: 1.50 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Sat Dec 09 2023

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

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

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

**APPENDIX D**  
**REQUIRED MODIFICATION DRAWINGS**



# TOWER MODIFICATION DRAWINGS

**SITE NAME:** EAST HARTFORD HOCHANUM  
**BU NUMBER:** 842861

**SITE ADDRESS:**  
 223 BRAINARD ROAD  
 HARTFORD, CT 06114  
 HARTFORD COUNTY, USA

**PROJECT CONTACTS:**

**1. CROWN PROJECT MANAGER**

BRIAN BECKHAM  
 (205) 909-2030  
 BRIAN.BECKHAM@CROWNCastle.COM  
 TWO CHASE CORPORATE DRIVE, SUITE 105  
 BIRMINGHAM, AL 35244

**2. CROWN DESIGN ENGINEER (EOR)**

DREW B. STEPHENS, P.E.  
 (724) 416-2000  
 EOR.APPROVAL@CROWNCastle.COM  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317

**TOWER INFORMATION**

TOWER MAPPED BY / DOC #: TEP / CCISITES DOC # 5210316  
 TOWER HEIGHT / TYPE: 96.83 FT MONOPOLE TOWER  
 TOWER LOCATION: LAT 41° 43' 58.72"  
 DATUM: (NAD 1983) LONG -72° 39' 43.47"  
 ELEV 10 FT AMSL

STRUCTURAL DESIGN DRAWING: CCI / WO # 2276930  
 STRUCTURAL ANALYSIS REPORT: TEP / WO # 2260094  
 STRUCTURAL ANALYSIS DATE: 12/15/23  
 ORDER #: 654558 REV # 3  
 CCISITES DOCUMENT ID: 11239682

**CODE COMPLIANCE**

THIS MODIFICATION DESIGN IS BASED ON THE REQUIREMENTS OF TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES BASED UPON AN ULTIMATE 3-SECOND GUST WIND SPEED OF 118 MPH WITH NO ICE AS REQUIRED BY THE 2022 CONNECTICUT STATE BUILDING CODE, 50 MPH WITH 1.5 INCH ICE THICKNESS, 60 MPH UNDER SERVICE LOADS, EXPOSURE CATEGORY C, AND RISK CATEGORY II.

HOT WORK INCLUDED	
N/A	BASE GRINDING ONLY
N/A	BASE WELDING (AND GRINDING)
X	AERIAL GRINDING ONLY
N/A	AERIAL WELDING (AND GRINDING)

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011

**SAFETY CLIMB: 'LOOK UP'**  
 THE INTEGRITY OF THE WIRE ROPE SAFETY CLIMB SYSTEM SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER REINFORCEMENTS AND EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF ANY WIRE ROPE SAFETY CLIMB 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, OR IMPACT TO THE ANCHORAGE POINTS IN ANY WAY. ANY COMPROMISED SAFETY CLIMB MUST BE REPORTED TO YOUR CROWN POC FOR RESOLUTION, INCLUDING EXISTING CONDITIONS.



DRAWINGS INCLUDED	
SHEET NUMBER	DESCRIPTION
S-1	TITLE PAGE
S-2	MODIFICATION INSPECTION CHECKLIST
S-3	NOTES
S-4	POLE MODIFICATION SCHEDULE
S-5	TOWER SECTION

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NO.	DATE	DESCRIPTION
REVISIONS		
		BY
Digitally signed by Drew B Stephens Date: 2024.01.10 12:10:37 -05'00'		
<b>SITE NAME:</b> EAST HARTFORD HOCHANUM <b>BU NUMBER:</b> 842861 <b>WO NUMBER:</b> 2276930 <b>SITE ADDRESS:</b> 223 BRAINARD ROAD HARTFORD, CT 06114 HARTFORD COUNTY, USA <b>ENGINER BY:</b> DBS <b>DATE:</b> 01/09/24 <b>DFT BY:</b> SL <b>DATE:</b> 01/08/24 <b>DFT/QA BY:</b> SL <b>DATE:</b> 01/09/24 <b>APRVD BY:</b> DBS <b>DATE:</b> 01/10/24 <b>SCALE:</b> N.T.S.		
<b>TITLE PAGE</b>		
<b>S-1</b>	REV	0



CON-FRM-10354 MI CHECKLIST			
REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC	BRIEF DESCRIPTION
<b>PRE-CONSTRUCTION</b>			
N/A	FOR APPROVED SHOP DRAWINGS	CON-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS ALONG WITH EOR RFI FORM DETAILING ANY CHANGES FROM THE ORIGINAL DESIGN TO THE GC FOR REVIEW AND APPROVAL.
X	FABRICATION INSPECTION	CON-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CON-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CON-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIALS USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION REPORT	CON-SOW-10007 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CON-SOW-10007	PACKING/SHIPPING LIST FOR ALL MATERIAL USED DURING CONSTRUCTION OF THE MODIFICATION
ADDITIONAL TESTING AND INSPECTIONS:			
N/A			
<b>CONSTRUCTION</b>			
N/A	FOUNDATION INSPECTIONS	CON-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TEST	CON-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
N/A	EARTHWORK: SOIL COMPACTION	CON-SOW-10144	FOUNDATION SOIL COMPACTION SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
N/A	EARTHWORK: BEARING CAPACITY	CON-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
N/A	MICROPILE/ROCK ANCHOR	CON-SOW-10144	MICROPILE/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT. ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS AND GENERAL NOTES PAGE TWO.
X	POST-INSTALLED ANCHOR ROD VERIFICATION	CON-SOW-10007 CON-FRM-10358	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
N/A	ELEPHANT ARMOR	OPS-SOW-10331	PHOTOS SHALL BE SUBMITTED IN ACCORDANCE WITH SECTION 6 FOR INCLUSION IN THE MI REPORT
N/A	FIELD CERTIFIED WELD INSPECTION	CON-SOW-10069 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
N/A	FIELD NDE	CON-STD-10159 CON-SOW-10007	A NDE OF THE FIELD WELDS IN ACCORDANCE WITH CON-STD-10159 AND ANY ADDITIONAL NDE REQUIREMENTS NOTED IN THESE DESIGN DOCUMENTS
X	ON-SITE COLD GALVANIZING VERIFICATION	CON-STD-10149 CON-FRM-10358	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
N/A	TENSION TWIST AND PLUMB	CON-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB
N/A	TOWER PLUMB DELIVERABLES	CON-SOW-10007	THE CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THE TOWER PLUMB CONDITION SEE REQUIREMENTS ON GENERAL NOTES SHEET PAGE TWO
N/A	CANISTER DRAWINGS	CON-SOW-10007	THE CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF ANY FINAL FABRICATION OR PARTS DRAWINGS PROVIDED BY THE CANISTER VENDOR
X	GC AS-BUILT DRAWINGS	CON-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED
ADDITIONAL TESTING AND INSPECTIONS:			
N/A			
<b>POST-CONSTRUCTION</b>			
X	CONSTRUCTION COMPLIANCE LETTER	CON-SOW-10007 CON-FRM-10358	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS
X	POST-INSTALLED ANCHOR ROD PULL TESTS	CON-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CON-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
N/A	BOLT HOLE INSTALLATION VERIFICATION REPORT	CON-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE HOLE SIZE AND CONDITION OF 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCH LIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CON-PRC-10263 CON-FRM-10285	FINAL PUNCH LIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION/APPROVAL.
X	MI INSPECTOR RECORD DRAWING(S)	CON-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			
N/A			

THE MI CHECKLIST SHALL BE REVIEWED PRIOR TO THE START OF CONSTRUCTION. ALL PARTIES TO THE MODIFICATION SHALL UNDERSTAND CROWN REQUIREMENTS AND INSPECTION DOCUMENTATION THAT IS APPLICABLE TO THE SCOPE OF WORK THEY ARE PERFORMING. ERRORS ON THE MI CHECKLIST SHALL BE BROUGHT TO THE ATTENTION OF THE CROWN POC AND EOR AS SOON AS POSSIBLE.

## MODIFICATION INSPECTION NOTES

### GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, IN ACCORDANCE WITH APPLICABLE CROWN STANDARDS, AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF. AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN POC) FOR EVALUATION.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (CROWN POC).

REFER TO CROWN CON-SOW-10007, "MODIFICATION INSPECTION", FOR FURTHER DETAILS AND REQUIREMENTS.

### SERVICE LEVEL COMMITMENT

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON-SITE.



### REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
  - POST-CONSTRUCTION PHOTOGRAPHS
  - FINAL INFELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. FOR A COMPLETE LIST OF PHOTOS SEE CROWN DOCUMENT # CED-SOW-10007.



			
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NO.	DATE	DESCRIPTION REVISIONS	BY
			
Digitally signed by Drew B. Stephens Date: 2024.01.10 12:10:44 -05'00'			
SITE NAME: EAST HARTFORD HOUSHORN BU NUMBER: 94261 WO NUMBER: 2276930 SITE ADDRESS: 223 BRAINARD ROAD HARTFORD, CT 06114 HARTFORD COUNTY, USA ENG/QA BY: DBS DATE: 01/09/24 DFT BY: SL DATE: 01/08/24 DFT/QA BY: SL DATE: 01/09/24 APP/VD BY: DBS DATE: 01/10/24 SCALE: N.T.S.			
<b>MODIFICATION INSPECTION CHECKLIST</b>			
<b>S-2</b>			REV <b>0</b>

**GENERAL NOTES**

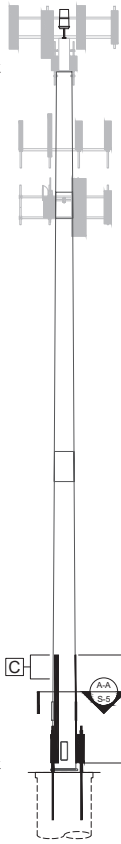
- The General Contractor (GC) shall reference CON-STD-10159, "Tower Modification Construction Specifications", as a continuation of the following General Notes. The GC shall keep a printed or electronic copy of this document with the Structural Design Drawings (SDD) at all times, in a location accessible to all Contractor Personnel, and shall ensure that all Contractor Personnel are aware of the information enclosed within the General Notes and CON-STD-10159.
- The Contract Documents are the property of Crown Castle (Crown). They are provided to the GC and its Lower Tier Contractors and material suppliers for the limited purpose of use in completing the Work for this Site, and shall be kept in strict confidence and not disclosed to any third parties. The Contract Documents shall not be used for any other purpose whatsoever without the prior written consent of Crown.
- Detail drawings, including notes and tables, shall govern over general notes and typical details. Contact the Crown Point of Contact (POC) and Engineer of Record (EOR) for clarification as needed.
- Do not scale drawings.
- Any Work performed without a prefabrication mapping is done at the risk of the GC and/or fabricator. All dimensions of existing structural elements are assumed based on the available documentation and are preliminary until field-verified by the GC, unless noted otherwise (UNO). Where discrepancies are found, GC shall contact the Crown POC and EOR through RFI.
- For this analysis and modification, the tower has been assumed to be in good condition without any structural defects, UNO. If the GC discovers any indication of an existing structural defect, contact the Crown POC and EOR immediately.
- 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 GC 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 standard CED-STD-10253, "Rigging Program", including the required involvement of a qualified engineer for class IV construction to certify the supporting structure(s) in accordance with the ANSI/TIA-322 (latest edition).
- The structural integrity of the modification design extends to the complete condition only. The GC must be cognizant that the removal of any structural component of an existing tower has the potential to cause the partial or complete collapse of the structure. All necessary precautions must be taken to ensure structural integrity, including, but not limited to, engineering assessment of construction stresses with installation maximum wind speed and/or temporary bracing and shoring.
- Aerial and underground utilities and facilities may or may not be shown on the drawings. The GC shall take every precaution to preserve and protect these items, which may include aerial or underground power lines, telephone lines, water lines, sewer lines, cable television facilities, pipelines, structures and other public and private improvements within or adjacent to the Work area. The responsibility for determining the actual on-site location of these items shall rest exclusively with the GC.
- All manufacturer's hardware assembly instructions shall be followed, UNO. Conflicting notes shall be brought to the attention of the EOR and the Crown POC.

- The GC shall fabricate all required items per the materials specified below, UNO on the detail drawing sheets. If the GC finds for any component that the materials have not been clearly specified, the GC shall submit an RFI to the EOR to confirm the required material.  
All structural elements shall be new and shall conform to the following requirements, UNO:  
Monopoles:  
  - Structural shapes and plates: ASTM A572 Grade 65 (FY = 65 KSI)
  - Welding electrodes, SMAW: E80XX
  - Welding electrodes, FCAW: E8XT-XX
  - Welding electrodes, GMAW: ER80S-X
Self-Support and Guyed Towers:  
  - Structural shapes and plates: ASTM A572 Grade 50 (FY = 50 KSI)
  - Welding electrodes, SMAW: E70XX
  - Welding electrodes, FCAW: E7XT-XX
  - Welding electrodes, GMAW: ER70S-X
All tower types:  
  - Steel angle: ASTM A572 Grade 50 (FY = 50 KSI)
  - Solid rod: ASTM A36 (FY = 36 KSI)
  - Pipe/tube (round): ASTM A500 Grade C (FY = 50 KSI)
  - Pipe/tube (square): ASTM A500 Grade C (FY = 50 KSI)
  - Bolts: ASTM F3125 Grade A325 Type 1
  - U-bolts: ASTM A307 Grade A, or SAE J429 Grade 2
  - Nuts: ASTM A563 Grade DH
  - Washers: ASTM F436 Type 1
  - Guy Wires: ASTM A475 Grade EHS
  - Bridge Strand: ASTM A586 Grade 1
- After fabrication, hot-dip galvanize all steel items. UNO. Galvanize per ASTM A123, ASTM A153/A153M, or ASTM A653 G90, as applicable. ASTM A490 bolts shall not be hot-dip galvanized, but shall instead be coated with Magni 565 or EOR approved equivalent, per ASTM F2833.
- Contractor Personnel shall not drill holes in any new or existing structural members, other than those drilled holes shown on structural drawings, without the approval of the EOR.
- For a list of Crown-approved cold galvanizing compounds, refer to CON-STD-10149, "Tower Protective Coatings Guidelines".
- All exposed structural steel as the result of this scope of Work including welds (after final inspection of the weld by the CWI), field drilled holes, and shaft interiors (where accessible), shall be cleaned and two (2) coats cold galvanizing shall be applied by brush in accordance with CON-STD-10149, "Tower Protective Coatings Guidelines". Photo documentation is required to be submitted to the MI Inspector.
- If removal of existing modifications is required per the modification scope, the GC shall clean and cold galvanize any existing empty bolt holes, UNO. If additional unexpected, oversized, or slotted holes are found, the GC shall contact the EOR and Crown POC for guidance prior to proceeding with the modifications.
- All Work involving base plate grout scope items or resulting in disturbance of base plate grout shall reference ENG-STD-10323, "Base Plate Grout", and shall follow any Base Plate Grout Removal Notes contained herein.
- If scope of modification involves bark removal or installation, the GC shall reference CED-SOW-10265, "Tree Concealment for Monopoles", as well as CED-STD-10395, "Installation Guidelines for Bark Surfaces".

- If scope of modification involves concealment components including branching, the GC shall reference CED-CAT-10398 "Monopole Concealed Decorative Structures (CDS) Approved Components". All new branch installations require tethering.
- If scope of modification involves cathodic protection, the GC shall reference CED-SOW-10397, "Cathodic Protection Installation, Replacement, and Enhancement".
- All tower grounding affected by the Work shall be repaired or replaced in accordance with OPS-STD-10090, "Tower Grounding", and OPS-BUL-10133, "Grounding Repair Recommendation".
- If scope of modification requires removal or covering of tower ID tag, the tag must be replaced.
- Any hardware removed from the existing tower shall be replaced with new hardware of equal size and quality, UNO. No existing fasteners shall be reused.
- All joints using ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods shall be snug tightened, UNO.
- A nut locking device shall be installed on all proposed and/or replaced snug tightened ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods.
- All joints are bearing type connections UNO. If no bolt length is given in the Bill of Materials, the connection may include threads in the shear planes, and the GC is responsible for sizing the length of the bolt.
- Blind bolts shall be installed per the installation specifications on the corresponding Approved Fastener sheets contained in CON-CAT-10300, "Monopole Standard Drawings and Approved Reinforcement Components".
- If ASTM A325 or A490 bolts, and/or threaded rods are specified to be pre-tensioned, these shall be installed and tightened to the pretensioned condition according to the requirements of the RCSC Specification for Structural Joints Using ASTM High Strength Bolts.
- All proposed and/or replaced bolts shall be of sufficient length such that the end of the bolt be at least flush with the face of the nut. It is not permitted for the bolt end to be below the face of the nut after tightening is completed.

																						
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<table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			NO.	DATE	DESCRIPTION	BY	REVISIONS															
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<table border="1"> <tr> <td> <b>SITE NAME:</b> EAST HARTFORD HOCHAMUM  <b>BU NUMBER:</b> 842861  <b>WO NUMBER:</b> 2276930  <b>SITE ADDRESS:</b>            223 BRAINARD ROAD            HARTFORD, CT 06114            HARTFORD COUNTY, USA         </td> <td> <b>ENG/QR BY:</b> DBS  <b>DATE:</b> 01/09/24         </td> </tr> <tr> <td> <b>DFT BY:</b> SL  <b>DATE:</b> 01/08/24         </td> <td> <b>DFT/IGA BY:</b> SL  <b>DATE:</b> 01/09/24         </td> </tr> <tr> <td> <b>APR/YD BY:</b> DBS  <b>DATE:</b> 01/10/24         </td> <td> <b>SCALE:</b> N.T.S.         </td> </tr> </table>			<b>SITE NAME:</b> EAST HARTFORD HOCHAMUM <b>BU NUMBER:</b> 842861 <b>WO NUMBER:</b> 2276930 <b>SITE ADDRESS:</b> 223 BRAINARD ROAD HARTFORD, CT 06114 HARTFORD COUNTY, USA	<b>ENG/QR BY:</b> DBS <b>DATE:</b> 01/09/24	<b>DFT BY:</b> SL <b>DATE:</b> 01/08/24	<b>DFT/IGA BY:</b> SL <b>DATE:</b> 01/09/24	<b>APR/YD BY:</b> DBS <b>DATE:</b> 01/10/24	<b>SCALE:</b> N.T.S.														
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<b>NOTES</b>																						
<b>S-3</b>		<table border="1"> <tr> <th>REV</th> </tr> <tr> <td>0</td> </tr> </table>	REV	0																		
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96.8 FT



POLE ELEVATION

POLE SPECIFICATIONS								
TOWER TAPER	0.1484375 IN/FT							
BASE PL. STEEL	ASTM A572 GRADE 50 (50 KSI)							
ANCHOR RODS	2 1/4"Ø #18J ASTM A615 GRADE 75							
EXISTING SHAFT SECTION DATA								
SHAFT SECTION	SECTION SHAPE	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	SECTION GRADE (KSI)	FLANGE PLATE GRADE (KSI)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS OR OF ROUND SECTION (IN)	
							@ TOP	@ BOTTOM
1	18-SIDED	20.33	0.18750	65	-	43	25.750	28.875
2	18-SIDED	40.19	0.21875	65	-	50	27.500	33.375
3	16-SIDED	44.09	0.28125	65	-	-	32.370	39.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

POLE MODIFICATION SCHEDULE		
ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A 0.0	INSTALL NEW ANCHOR RODS W/ BOLT-ON ANCHOR ROD BRACKETS	S-5
B 0.8 - 15.8	INSTALL NEW FLAT PLATE REINFORCEMENT	S-4
C 12.5 - 15.8	REMOVE & REPLACE EXISTING STEP BOLTS AS REQUIRED	S-5
D N/A	PAINT ALL NEW MODIFICATIONS TO MATCH EXISTING TOWER FINISH (PER CON-STD-10148)	N/A
E N/A	INSTALL NEW OBSTRUCTED CLIMB FACILITIES SIGNAGE (PER CON-CAT-10306)	N/A

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN, LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.

FOR PARTS NOT DETAILED WITHIN THE DRAWING AND STARTING WITH "CCI-", SEE THE FOLLOWING CATALOG FOR DETAILS: CON-CAT-10306; MONOPOLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS

BOLT COUNT BY LENGTH	
LENGTH	QUANTITY
SHORT	57
MEDIUM	45
LONG	0
<b>TOTAL</b>	<b>102</b>

CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE										
BOTTOM ELEVATION	TOP ELEVATION	PART NUMBER	FLAT / DEGREES (°)	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAX INTERMEDIATE BOLT SPACING	BOLT QUANTITY PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	TOTAL BOLT QUANTITY	TOTAL STEEL WEIGHT (BLACK)
0'-10"	15'-10"	CCI-ARFP-15-06512515	4, 10, 17	15	14	1'-7"	34	414.4	102	1243.2
<b>TOTAL</b>									102	1243.2

NOTES:

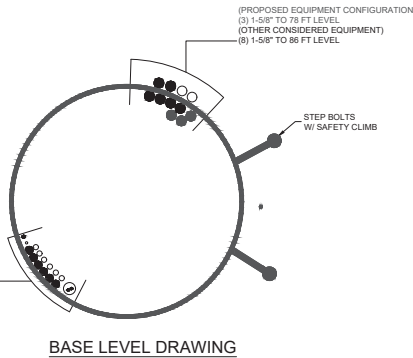
- FASTENERS MAY BE USED ON THIS PROJECT AS INDICATED IN THE FOLLOWING TABLES:  

NEXGEN2	APPROVED	SPECIALTY FASTENERS	NA
---------	----------	---------------------	----
- ORDERING INFORMATION AND INSTALLATION DETAILS FOR APPROVED FASTENERS CAN BE FOUND IN CON-CAT-10300.  
 ALL BOLT-ON ANCHOR ROD BRACKETS ARE TO BE INSTALLED CENTERED ON ITS DESIGNATED FLAT OR AZIMUTH, UNO, WITH A TOLERANCE FROM CENTER OF THE FLAT OR AZIMUTH AS FOLLOWS:  

ALLOWABLE FLAT PLATE CENTERING TOLERANCE	3/8"
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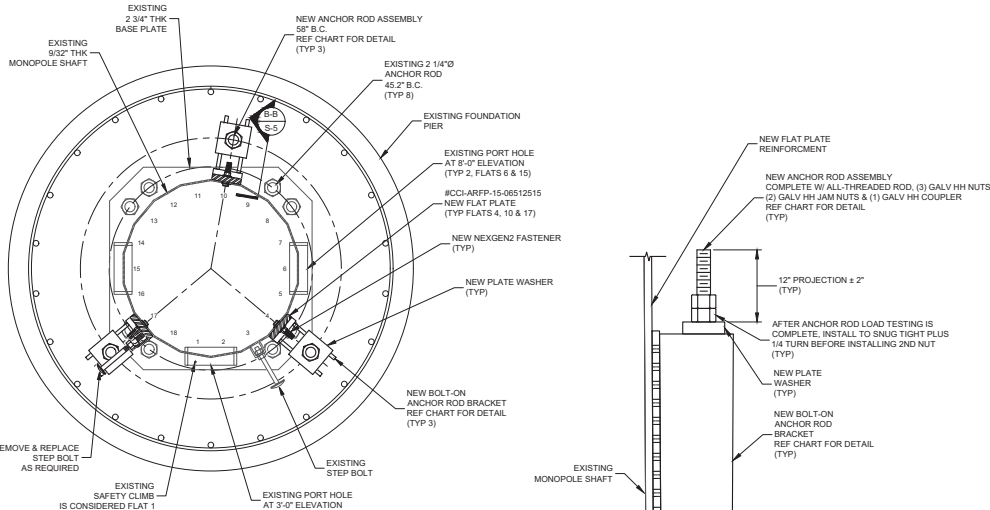
 GC SHALL REDLINE ALL DEVIATIONS FROM CENTER, INCLUDING THOSE WITHIN TOLERANCE.
- IF UNEXPECTED HOLES ARE FOUND IN A LOCATION WHERE THE BOLT-ON ANCHOR ROD BRACKETS ARE PROPOSED TO BE INSTALLED, THE GC SHALL NOT PLACE NEW BOLT HOLES WITHIN A CENTER-TO-CENTER DISTANCE OF 3 TIMES THE DIAMETER OF THE LARGER OF THE TWO HOLES, WITHOUT EOR APPROVAL. EXISTING HOLES MAY INCLUDE BUT ARE NOT LIMITED TO EMPTY BOLT HOLES AND JACKING NUTS WITH CENTER HOLES.

- (OTHER CONSIDERED EQUIPMENT)
- (1) 12" TO 106 FT TOWER LIGHTING
  - (OTHER CONSIDERED EQUIPMENT-IN CONDUIT)
  - (1) 3/8" TO 98 FT LEVEL
  - (1) 3/8" TO 103 FT LEVEL
  - (OTHER CONSIDERED EQUIPMENT)
  - (1) 3/8" TO 88 FT LEVEL
  - (4) 7/8" TO 88 FT LEVEL
  - (2) 7/8" TO 103 FT LEVEL
  - (6) 1-1/4" TO 103 FT LEVEL



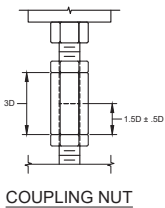
BASE LEVEL DRAWING

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NO.	DATE	DESCRIPTION	BY
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Digitally signed by Drew B Stephens Date: 2024.01.10 12:11:01 -05'00'			
SITE NAME: EAST HARTFORD HOUSANUM BU NUMBER: 842861 WO NUMBER: 2276930 SITE ADDRESS: 223 BRAINARD ROAD HARTFORD, CT 06114 HARTFORD COUNTY, USA ENG'GR BY: DBS DATE: 01/05/24 DFT BY: SL DATE: 01/08/24 DFT/QA BY: SL DATE: 01/09/24 APR/YD BY: DBS DATE: 01/10/24 SCALE: N.T.S.			
POLE MODIFICATION SCHEDULE			
<b>S-4</b>			REV <b>0</b>

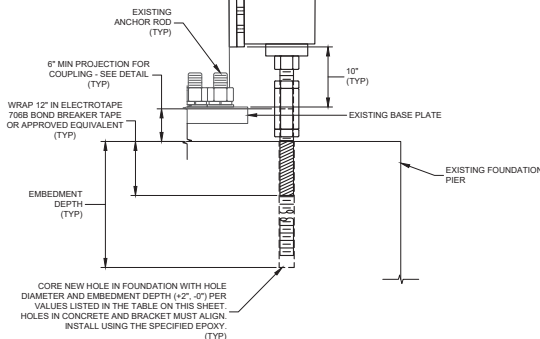


**TOWER SECTION**  
A-A  
S-5

ANCHOR ROD SPECIFICATIONS	
CCI BARB PART #	CCI-BARB-225-15
CCI AR PART #	CUSTOM
DIAMETER	2 1/4"
QUANTITY	3
MATERIAL	A193 GR B7
HOLE DIAMETER	2 1/2"
TARGET TENSION LOAD	190 KIPS
EPOXY	AF3SLVE RE-500-V3
EMBEDMENT DEPTH	6'-0" 6'-6"
INSTALLED LENGTH	12'-6" 13'-0"



**COUPLING NUT**



**ANCHOR ROD DETAIL**  
B-B  
S-5  
TYP FOR ALL ANCHOR RODS

- NOTES:**
- PLATE WASHER SHALL FULLY BEAR ON GUSSET PLATES.
  - REFERENCE CON-CAT-10300 (CURRENT VERSION) FOR ANCHOR ROD DIMENSIONS.
  - RODS SHALL BE GALVANIZED FROM THE TOP OF THE PROJECTION TO 15" BELOW THE SURFACE OF THE CONCRETE, AT A MINIMUM.
  - CORED HOLES SHALL BE MECHANICALLY ROUGHENED USING A CARBIDE HOLE ROUGHENER OR EQUIVALENT. BRUSHING WITH A NYLON OR WIRE BRUSH SHALL BE USED IN THE PROCESS OF HOLE CLEANING, BUT DOES NOT SATISFY THE HOLE ROUGHENING REQUIREMENT.
  - FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS FOR HOLE CLEANING.
  - ALL HOLES SHALL BE DRY PRIOR TO PLACING EPOXY.
  - CONTRACTOR SHALL CHOOSE THE EPOXY TO BE USED FROM THE TABLE ON THIS SHEET. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF THREADED ROD AND EPOXY, AS WELL AS ALL INSTALLATION INSTRUCTIONS AND REQUIREMENTS, INCLUDING BASE TEMPERATURE REQUIREMENTS.
  - TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY EOR IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
  - ONCE ALL RESIN AND GROUT HAVE CURED, NEW ANCHOR ROD REINFORCING SHALL BE TARGET TENSIONED TO THE VALUE LISTED IN THE TABLE ON THIS SHEET. SEE ENG-PRC-10119: PULL-OUT TESTING POST-INSTALLED ANCHOR RODS, FOR SPECIFICATIONS.
  - CONTRACTOR SHALL VERIFY THAT A PULL TEST IS ABLE TO BE PERFORMED USING THE ANCHOR ROD PROJECTION SHOWN.
  - WHEN COMPLETED WITH EPOXY INSTALLATION, THE TOP OF THE EPOXY SHALL BE EQUAL TO OR HIGHER THAN THE TOP OF THE FOUNDATION, SUCH THAT WATER IS NOT ABLE TO COLLECT IN THE ANNULAR AREA AROUND THE EXPOSED PORTION OF THE ANCHOR ROD.
  - GC SHALL PROVIDE PHOTO WITH MEASUREMENT OF ANCHOR ROD THREAD ENGAGEMENT INTO COUPLING NUT PRIOR TO INSTALLING ANCHOR ROD EXTENSION. PHOTOS SHALL BE INCLUDED IN MODIFICATION INSPECTION. END OF ANCHOR ROD EXTENSION SHALL BE FLUSH WITH END OF ANCHOR ROD ONCE INSTALLED INTO COUPLING NUT.
  - IF ANCHOR ROD IS FIELD-CUT, GC SHALL PROVIDE PHOTOS OF THE COLD-GALVANIZED ROD ENDS TAKEN PRIOR TO COUPLING NUT INSTALLATION.
  - WHERE SITE CONSTRAINTS ALLOW OR REQUIRE, THE COUPLER MAY BE USED AS THE BOTTOM NUT TO ENGAGE THE BOTTOM BEARING PLATE TO THE BRACKET. THIS SHALL BE COMMUNICATED IN AN RFI FROM THE GC TO THE EOR WHEN REQUIRED.

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		<p>NO. DATE DESCRIPTION BY</p>	<p>REVISIONS</p>
<p>SITE NAME: EAST HARTFORD HIGHWAY</p> <p>BU NUMBER: 942861</p> <p>WO NUMBER: 2276930</p> <p>SITE ADDRESS: 223 BRAINARD ROAD HARTFORD, CT 06114 HARTFORD COUNTY, USA</p> <p>ENG'OR BY: DBS DATE: 01/09/24</p> <p>DFT BY: SL DATE: 01/08/24</p> <p>DFT/QA BY: SL DATE: 01/09/24</p> <p>APR'VD BY: DBS DATE: 01/10/24</p> <p>SCALE: N.T.S.</p>		<p>Digitally signed by Drew B Stephens Date: 2024.01.10 12:11:14 -05'00'</p>	
<p><b>TOWER SECTION</b></p>		<p>S-5 REV 0</p>	



FOX HILL TELECOM

## Radio Frequency Emissions Analysis Report

# T Mobile™

Site ID: CT11845A

223 Brainard Road  
Hartford, CT 06114

February 2, 2024

Fox Hill Telecom Project Number: 240045

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	33.17 %



February 2, 2024

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

## Emissions Analysis for Site: **CT11845A**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **223 Brainard Road, Hartford, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

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



FOX HILL TELECOM

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

Additional details can be found in FCC OET 65.



## CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **223 Brainard Road, Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

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

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

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

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

Equation 9 per FCC OET65 for Far Field Modeling

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

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

ERP = Effective Radiated Power from antenna (watts)

R = Distance from the antenna (meters)

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





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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	4	40
LTE	700 MHz	2	20
LTE	1900 MHz (PCS)	4	35
5G	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	4	60
LTE / 5G NR	2500 MHz (BRS)	8	30

*Table 1: Channel Data Table*



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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAALL24_43-U-NA20	78
A	2	Commscope VV-65A-R1	78
A	3	Ericsson AIR6419 B41	78
B	1	RFS APXVAALL24_43-U-NA20	78
B	2	Commscope VV-65A-R1	78
B	3	Ericsson AIR6419 B41	78
C	1	RFS APXVAALL24_43-U-NA20	78
C	2	Commscope VV-65A-R1	78
C	3	Ericsson AIR6419 B41	78

*Table 2: Antenna Data*

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



## RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	6	200	4,678.48	3.36
Antenna A2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	12	540	20,432.87	3.74
Antenna A3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	240	33,900.90	6.62
Sector A Composite MPE%							<b>13.72</b>
Antenna B1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	6	200	4,678.48	3.36
Antenna B2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	12	540	20,432.87	3.74
Antenna B3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	240	33,900.90	6.62
Sector B Composite MPE%							<b>13.72</b>
Antenna C1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	6	200	4,678.48	3.36
Antenna C2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	12	540	20,432.87	3.74
Antenna C3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	240	33,900.90	6.62
Sector C Composite MPE%							<b>13.72</b>

*Table 3: T-MOBILE Emissions Levels*



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

<b>Site Composite MPE%</b>	
<b>Carrier</b>	<b>MPE%</b>
T-MOBILE – Max Per Sector Value	<b>13.72 %</b>
AT&T	9.30 %
Verizon Wireless	10.15 %
<b>Site Total MPE %:</b>	<b>33.17 %</b>

*Table 4: All Carrier MPE Contributions*

T-MOBILE Sector A Total:	13.72 %
T-MOBILE Sector B Total:	13.72 %
T-MOBILE Sector C Total:	13.72 %
Site Total:	33.17 %

*Table 5: Site MPE Summary*



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

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	4	926.96	78	11.08	600 MHz	400	2.77%
T-Mobile 700 MHz LTE	2	485.32	78	2.76	700 MHz	467	0.59%
T-Mobile 1900 MHz (PCS) LTE	4	1,256.23	78	9.70	1900 MHz (PCS)	1000	0.97%
T-Mobile 1900 MHz (PCS) 5G	4	1,435.69	78	11.10	1900 MHz (PCS)	1000	1.11%
T-Mobile 2100 MHz (AWS) LTE	4	2,416.30	78	16.60	2100 MHz (AWS)	1000	1.66%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	4,237.61	78	66.20	2500 MHz (BRS)	1000	6.62%
						<b>Total:</b>	<b>13.72 %</b>

Table 6: T-MOBILE Maximum Sector MPE Power Values



## Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	13.72 %
Sector B:	13.72 %
Sector C:	13.72 %
T-MOBILE Maximum Total (per sector):	13.72 %
Site Total:	33.17 %
Site Compliance Status:	<b>COMPLIANT</b>

The estimated composite MPE value for this site assuming all carriers present is **33.17 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

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

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

# T-Mobile

**T-MOBILE SITE NUMBER:** CT11845A  
**T-MOBILE SITE NAME:** CT11845A  
**SITE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 96'-10"

**BUSINESS UNIT #:** 842861  
**SITE ADDRESS:** 223 BRAINARD ROAD  
 HARTFORD, CT 06114  
**COUNTY:** HARTFORD  
**JURISDICTION:** CONNECTICUT  
**SITING COUNCIL**

## T-MOBILE REPLACEMENT SITE CONFIGURATION: 67E5A998E 6160

T-Mobile  
 35 GRIFFIN ROAD  
 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:  
**CT11845A**

BU #: 842861  
**EAST HARTFORD  
 HOCHANUM**

223 BRAINARD ROAD  
 HARTFORD, CT 06114

EXISTING  
 96'-10" MONOPOLE

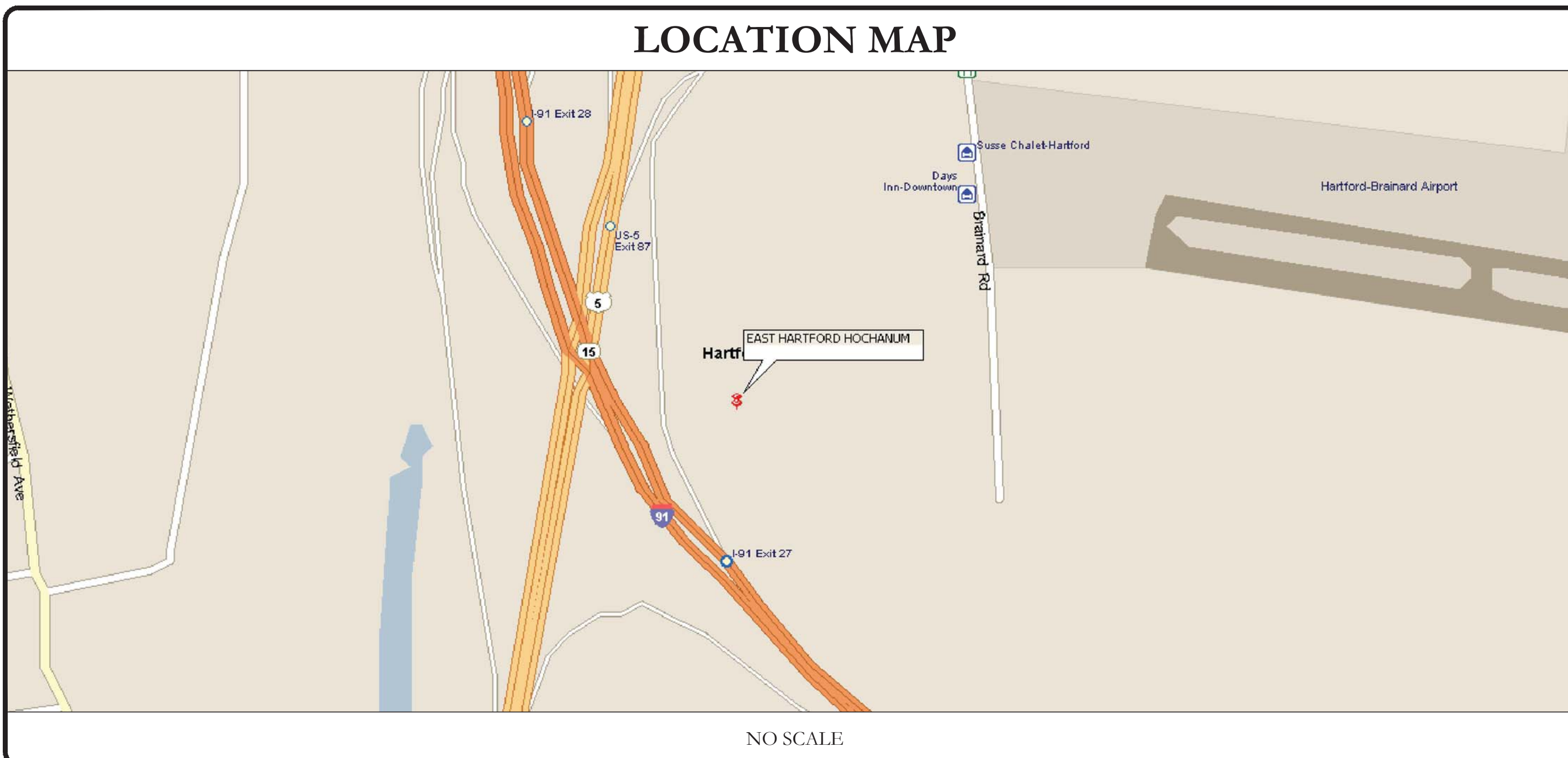
### ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/25/23	TDG	PRELIMINARY REVIEW	LR
B	2/23/24	TDG	PRELIMINARY REVIEW	LR
0	3/10/24	TDG	CONSTRUCTION	LR

SITE INFORMATION	
CROWN CASTLE USA INC. SITE NAME:	EAST HARTFORD HOCHANUM
SITE ADDRESS:	223 BRAINARD ROAD HARTFORD, CT 06114
COUNTY:	HARTFORD
MAP/PARCEL #:	300817009
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.732978°
LONGITUDE:	-72.662075°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	14 FT
CURRENT ZONING:	ID-1 (INDUSTRIAL DISTRICT)
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:	THE METROPOLITAN DISTRICT 555 MAIN ST HARTFORD, CT 06103-2915
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	NORTHEAST UTILITIES 800-286-2000
TELCO PROVIDER:	AT&T 866-620-6900

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	CONCRETE PAD DETAILS
C-4	ANTENNA/CABLE SCHEDULE & DETAILS
C-5	PLUMBING DIAGRAM
C-6.1	EQUIPMENT SPECS
C-6.2	EQUIPMENT SPECS
C-7	CANOPY DETAILS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
G-4	GROUNDING SCHEMATIC
ATTACHED	MOUNT SPECIFICATIONS

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



PROJECT DESCRIPTION	
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.	
TOWER SCOPE OF WORK:	
<ul style="list-style-type: none"> <li>INSTALL (1) SITE PRO1 - RMQP-496-HK PLATFORM MOUNT</li> <li>INSTALL (9) ANTENNAS</li> <li>INSTALL (6) RRHS</li> <li>INSTALL (3) 1-5/8" HYBRID CABLES</li> </ul>	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> <li>INSTALL (1) 10'-0"X15'-0" CONCRETE PAD IN 10'-0"X15'-0" LEASE AREA</li> <li>INSTALL (1) 10'-0"X15'-0" OVERHEAD CANOPY</li> <li>INSTALL (2) WORK LIGHTS W/ 30-60 MIN TIMER SWITCH</li> <li>INSTALL (1) 6160 AC V1 CABINET</li> <li>INSTALL (1) B160 BATTERY CABINET</li> <li>INSTALL (1) H-FRAME</li> <li>INSTALL (1) 225A PPC W/ CAMLOCK</li> <li>INSTALL (1) 200A METER</li> <li>INSTALL (1) TELCO CABINET</li> <li>INSTALL (1) FIBER SLACK BOX</li> <li>INSTALL ICE BRIDGE (±35'-0" LONG)</li> </ul>	
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.	

PROJECT TEAM	
A&E FIRM:	B+T GROUP 1717 S. BOULDER AVE. TULSA, OK 74119 WALTER SMITH WSMITH@BTGRP.COM
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TRICIA PELON - PROJECT MANAGER TRICIA.PELON@CROWNCastle.COM
	JACOB KARABASZ - CONSTRUCTION MANAGER JACOB.KARABASZ@CROWNCastle.COM
NOTE: PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.	

APPLICABLE CODES/REFERENCE DOCUMENTS	
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:	
CODE TYPE	CODE
BUILDING	2022 CONNECTICUT SBC/IBC 2021
MECHANICAL	2022 CONNECTICUT SBC/IMC 2021
ELECTRICAL	2022 CONNECTICUT SBC/NEC 2020
REFERENCE DOCUMENTS:	
STRUCTURAL ANALYSIS:	CROWN CASTLE
DATED:	1/10/24
MOUNT ANALYSIS:	TRYLON
DATED:	2/15/23
RFDS REVISION:	1
DATED:	3/4/24
ORDER ID:	654558
REVISION:	3
INSTALLER NOTE: NO PROPOSED LOADING TO BE ADDED UNTIL TOWER MODIFICATIONS ARE INSTALLED PER TOWER MODIFICATION DESIGN BY CROWN CASTLE DATED JANUARY 10, 2024.	
CALL CONNECTICUT ONE CALL (800) 922-4455 CBYD.COM CALL 2 WORKING DAYS BEFORE YOU DIG!	

APPROVALS		
APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.	_____	_____
LAND USE PLANNER	_____	_____
T-MOBILE	_____	_____
OPERATIONS	_____	_____
RF	_____	_____
NETWORK	_____	_____
BACKHAUL	_____	_____
CONSTRUCTION MANAGER	_____	_____
THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.		

MTS ENGINEERING P.L.L.C.  
 BER:2386985  
 Expires 3/31/24

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: <b>T-1</b>	REVISION: <b>0</b>
-----------------------------	-----------------------

154567.006.01.0001\_842861\_EAST\_HARTFORD\_HOCHANUM.dwg - Sheet1-1 - User: liso.rider - Mar 10, 2024 - 7:13pm

**CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:**

- 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.
- "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.
- 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.
- 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).
- ALL SITE WORK TO COMPLY WITH QAS--STD--10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED--STD--10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA--1019--A--2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- 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.
- 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.
- 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.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- 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:**

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTI-OXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- 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.
- 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).
- 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:**

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

**CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:**

- 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.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- 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.
- 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.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:  
#4 BARS AND SMALLER.....40 ksi  
#5 BARS AND LARGER.....60 ksi
- 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"
- 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:**

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- 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.
- 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.
- 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).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- ALL THE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- 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.
- 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.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI--CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- 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.
- 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).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT) OR METAL--CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID--TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID--TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION--TYPE AND APPROVED FOR THE LOCATION USED. SET SIZING FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEC AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOULD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T--MOBILE".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

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

**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



35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002



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



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**T-MOBILE SITE NUMBER:**  
**CT11845A**


**BU #: 842861**  
**EAST HARTFORD**  
**HOCHANUM**

223 BRAINARD ROAD  
HARTFORD, CT 06114

EXISTING  
96'-10" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/25/23	TDG	PRELIMINARY REVIEW	LR
B	2/23/24	TDG	PRELIMINARY REVIEW	LR
0	3/10/24	TDG	CONSTRUCTION	LR



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BER:2386985  
Expires 3/31/24

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**SHEET NUMBER:** T-2 **REVISION:** 0



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

1 OVERALL SITE PLAN  
SCALE: 1" = 60'-0" (FULL SIZE)  
1" = 120'-0" (11x17)



← (E) OVERHEAD UTILITY LINE (TYP)  
← (E) UTILITY POLE (TYP)

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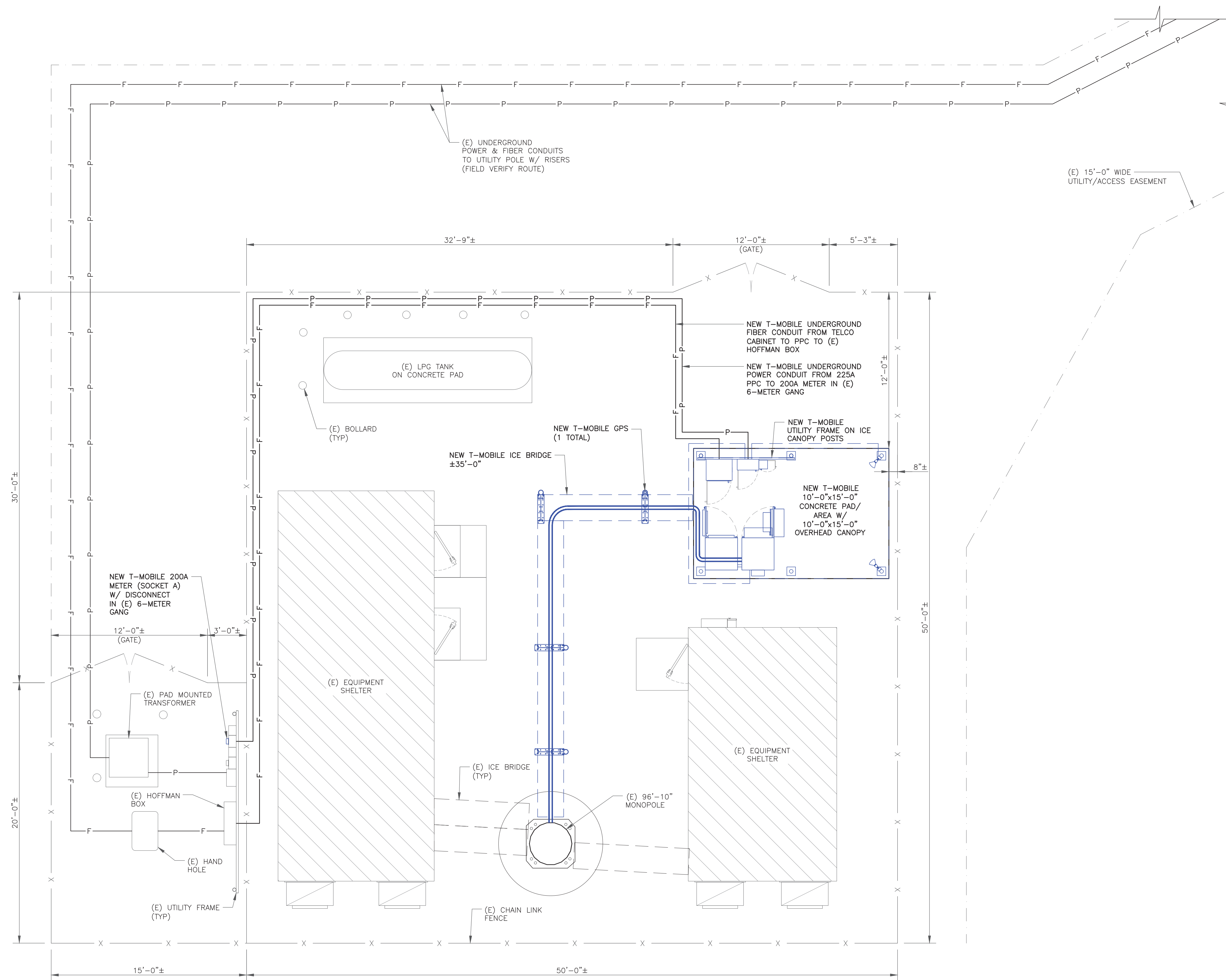


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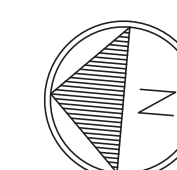
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1 SITE PLAN  
SCALE: 1/4"=1'-0" (FULL SIZE)  
1/8"=1'-0" (11x17)



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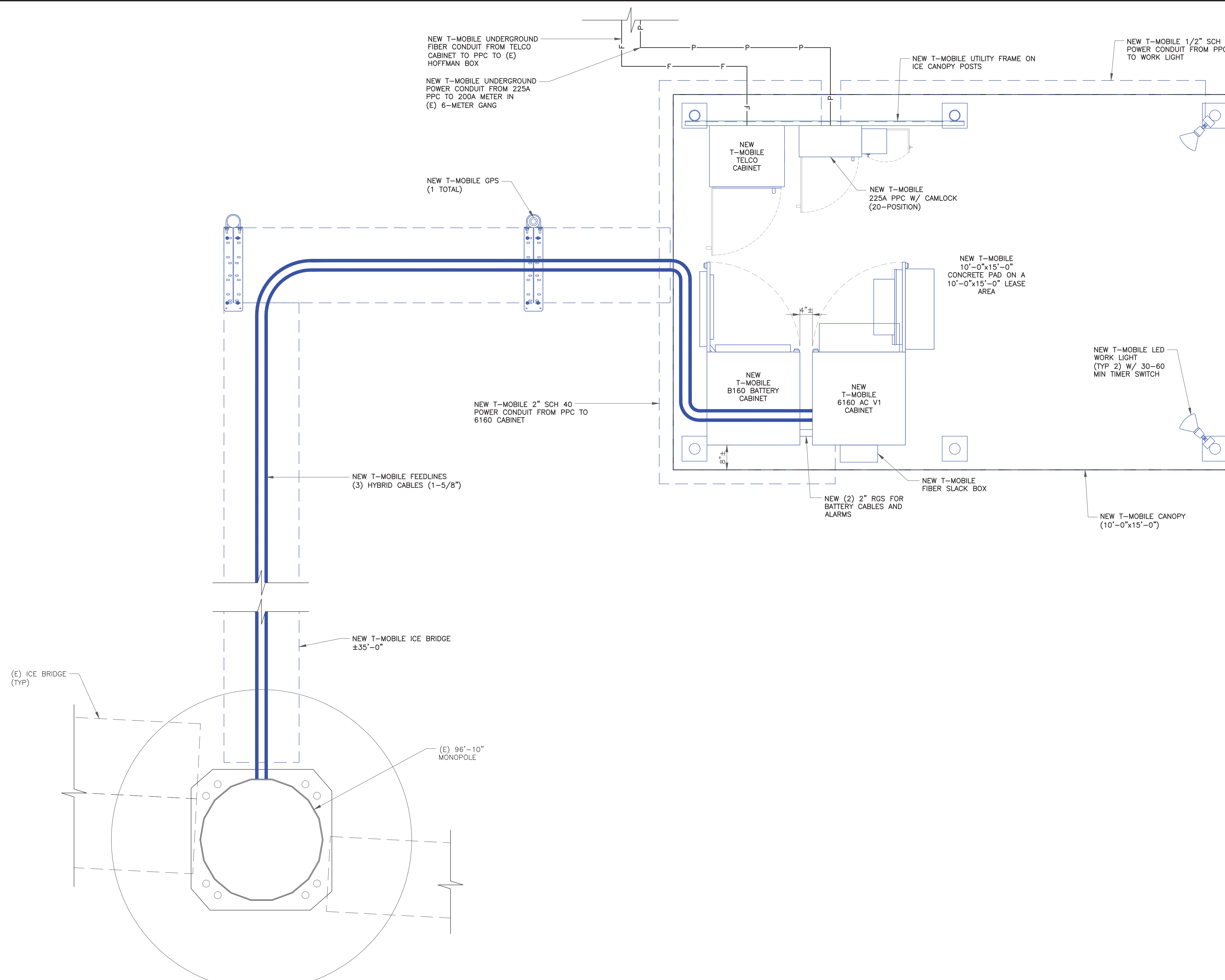
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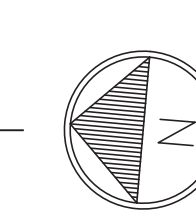
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1 ENLARGED SITE PLAN  
SCALE: 1" = 6'-0" (FULL SIZE)  
3/4" = 1'-0" (11x17)  
3/8" = 1'-0" (11x17)



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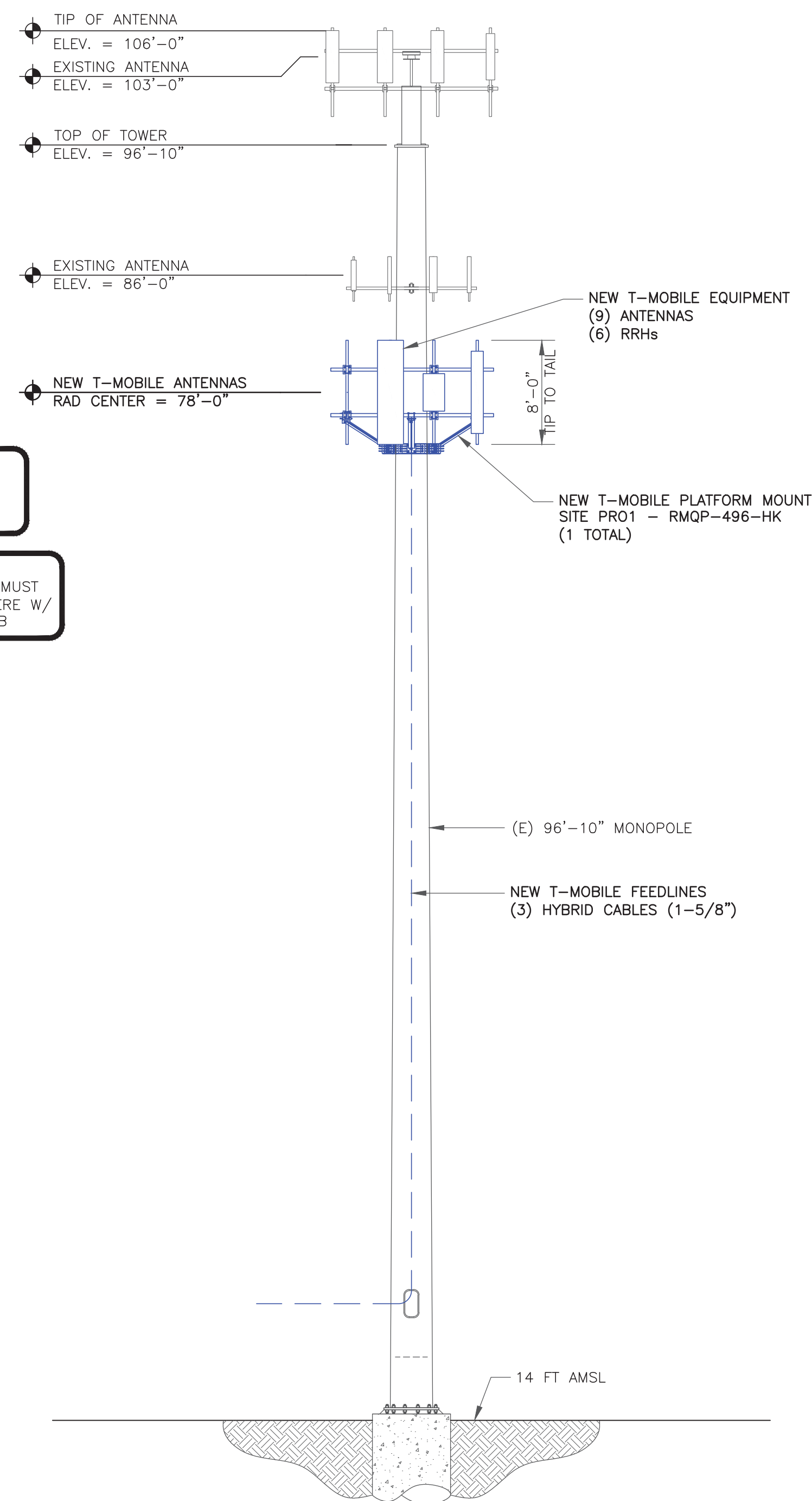
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**C-2**

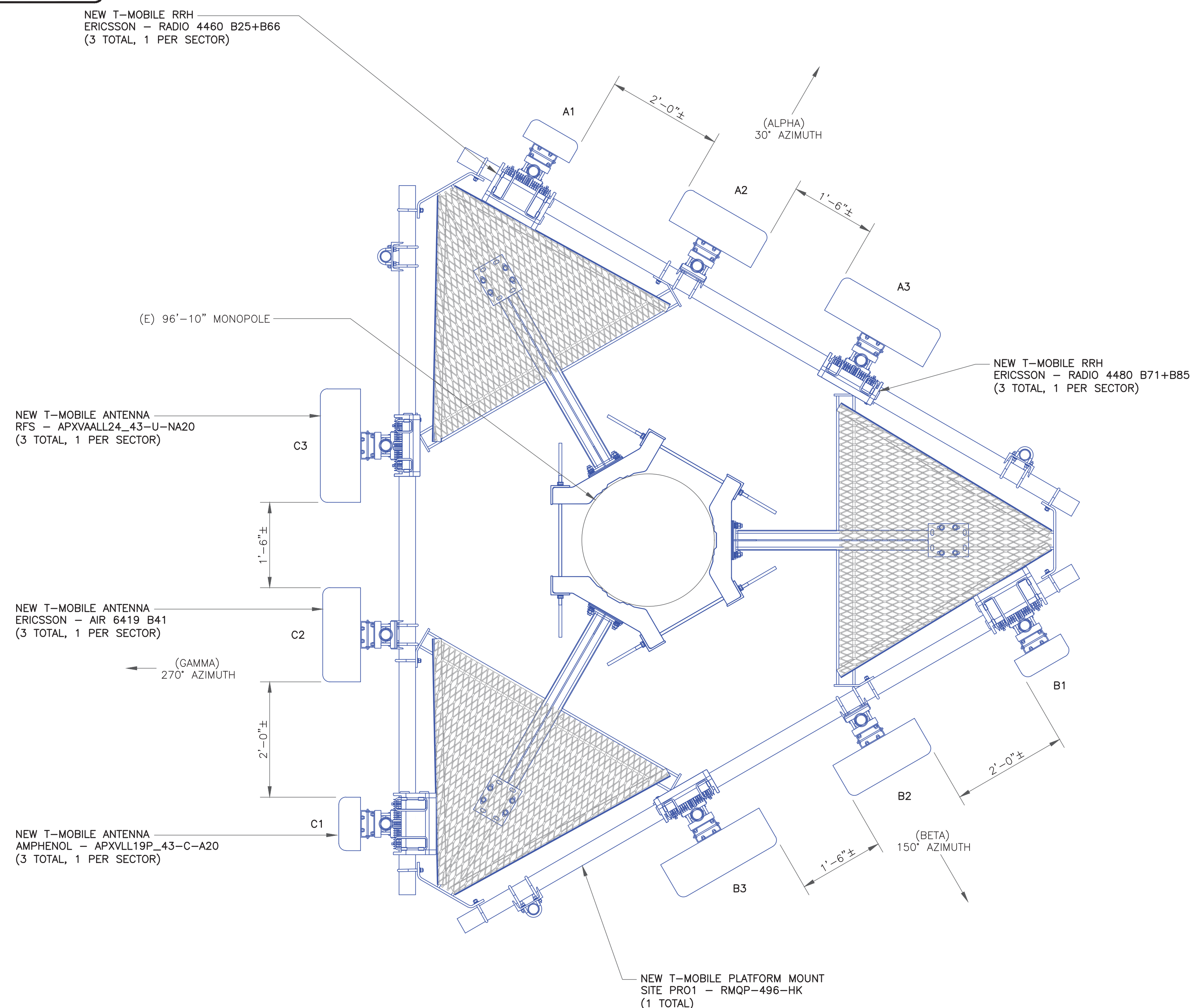
REVISION:

**0**

**INSTALLER NOTE:**  
NO PROPOSED LOADING TO BE  
ADDED UNTIL TOWER MODIFICATIONS  
ARE INSTALLED PER TOWER  
MODIFICATION DESIGN BY CROWN  
CASTLE DATED JANUARY 10, 2024.



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



**2 FINAL ANTENNA LAYOUT**  
SCALE: 3/4"=1'-0" (FULL SIZE)  
3/8"=1'-0" (11x17)



154567.006.01.000.1\_842861\_EAST\_HARTFORD\_HOCHANUM.dwg - Sheet: C-2 - User: lisc.rider - Mar 10, 2024 - 7:14pm



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:  
**CT11845A**

BU #: 842861  
**EAST HARTFORD  
HOCHANUM**

223 BRAINARD ROAD  
HARTFORD, CT 06114

EXISTING  
96'-10" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/25/23	TDG	PRELIMINARY REVIEW	LR
B	2/23/24	TDG	PRELIMINARY REVIEW	LR
0	3/10/24	TDG	CONSTRUCTION	LR



MTS ENGINEERING P.L.L.C.  
BER:2386985  
Expires 3/31/24

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SHEET NUMBER:

**C-3**

REVISION:

**0**

STRUCTURAL DESIGN NOTES:

ALL LOADS DERIVED FROM REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, ASCE 7.

BUILDING & COMMUNICATION STRUCTURES:

- WIND LOADS: IBC 2018 & ASCE 7-16  
V = 94 MPH ULTIMATE WIND SPEED  
EXPOSURE CATEGORY = C; TOPOGRAPHIC CATEGORY = 1.  
IMPORTANCE FACTOR = 1.0.
- SEISMIC LOADS: IBC 2018 & ASCE 7-16  
STRUCTURE CLASS = II; SITE CLASS = D.  
SS = 0.36 ; S1 = 0.188 ; SDS = 0.363

CONCRETE NOTES:

- PRIOR TO EXCAVATION, CHECK THE AREA FOR UNDERGROUND FACILITIES.
- ALL CONCRETE SHALL BE IN ACCORDANCE WITH CHAPTER 19 OF THE IBC & ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION & HAVE THE FOLLOWING PROPERTIES:  
A MINIMUM 7-DAY COMPRESSIVE STRENGTH (f'c) OF 2,500 PSI.  
B CEMENT SHALL BE "LOW-ALKALI" TYPE IIA (MODERATE SULFATE RESISTANCE, AIR ENTRAINING) CONFORMING TO ASTM C150.  
C MAXIMUM WATER/CEMENT RATIO OF 0.45 AND AIR-ENTRAINED 4% TO 7%.  
D CONCRETE PROPORTIONING SHALL BE DESIGNED BY AN APPROVED LABORATORY. TOLERANCES IN ACCORDANCE WITH ACI 117. COPIES OF CONCRETE MIX SHALL BE SUBMITTED TO THE CROWN CASTLE CONSTRUCTION MANAGER FOR REVIEW PRIOR TO PLACEMENT.  
E ALL AGGREGATE USED IN CONCRETE SHALL CONFORM TO ASTM C33. USE ONLY AGGREGATES KNOWN NOT TO CAUSE EXCESSIVE SHRINKAGE. MAXIMUM AGGREGATE SIZE TO BE 3/4".  
F MAXIMUM SLUMP: REFER TO GEOTECHNICAL REPORT FOR CONFIRMATION OF ANY ASSUMPTIONS MADE DURING DESIGN.
- FORMWORK FOR CONCRETE SHALL CONFORM TO ACI 347. TOLERANCES FOR FINISHED CONCRETE SURFACES SHALL MEET CLASS-C REQUIREMENTS. IN NO CASE SHALL FINISHED CONCRETE SURFACES EXCEED THE FOLLOWING VALUES AS MEASURED FROM NEAT PLAN LINES AND FINISHED GRADES: ± 1/4" VERTICAL, ± 1" HORIZONTAL.
- CHAMFER ALL EXPOSED CORNERS AND FILLET ENTRANT ANGLES 3/4" U.N.O.
- CONCRETE FINISHING: CONCRETE SURFACES SHALL BE FINISHED IN ACCORDANCE WITH ACI. PROVIDE ROUGH FINISH FOR ALL SURFACES NOT EXPOSED TO VIEW AND SMOOTH FINISH FOR ALL OTHERS, U.N.O.
- STEEL REINFORCEMENT AND CONCRETE SHOULD BE PLACED IMMEDIATELY UPON COMPLETION OF THE FOUNDATION EXCAVATION. CONTRACTOR SHALL NOT ALLOW A COLD JOINT TO FORM IN THE CONCRETE. PORTION AT GRADE SHOULD BE FORMED. TEMPORARY CASING MAY BE REQUIRED TO PREVENT CAVING PRIOR TO CONCRETE PLACEMENT.

REINFORCING STEEL NOTES:

- ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615. VERTICAL/HORIZONTAL BARS SHALL BE GRADE 60; TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. ALL REINFORCING STEEL SHALL HAVE 3" (± 3/8") OF CONCRETE COVER, U.N.O.
- ALL BAR BENDS, HOOKS, SPLICES AND OTHER REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ACI 315.
- ALL BARS SHALL BE SPLICED WITH A MINIMUM LAP OF 48 BAR DIAMETERS. LAP SPLICES OF DEFORMED BARS IN TENSION ZONES SHALL BE CLASS-B SPLICES. WELDING OF BARS IS NOT PERMITTED.
- AT ALL CORNERS AND WALL INTERSECTIONS, PROVIDE BENT HORIZONTAL BARS TO MATCH THE HORIZONTAL REINFORCING STEEL.
- PROVIDE VERTICAL DOWELS IN FOOTINGS AND AT CONSTRUCTION JOINTS TO MATCH VERTICAL REINFORCING BAR SIZE AND SPACING.
- ACI-APPROVED PLASTIC-COATED BAR CHAIRS OR PRECAST CONCRETE BLOCKS SHALL BE PROVIDED FOR SUPPORT OF ALL GRADE-CAST REINFORCING STEEL & SHALL BE SUFFICIENT IN NUMBER TO PREVENT SAGGING. METAL CLIPS OR SUPPORTS SHALL NOT BE PLACED IN CONTACT WITH THE FORMS OR THE SUB-GRADE.
- DOWELS AND ANCHOR BOLTS SHALL BE WIRED OR OTHERWISE HELD IN CORRECT POSITION PRIOR TO PLACING CONCRETE. IN NO CASE SHALL DOWELS OR ANCHOR BOLTS BE "STABBED" INTO FRESHLY-POURED CONCRETE.

FOUNDATION NOTES:

- THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.
- THE GEOTECHNICAL ENGINEER (OR INSPECTOR) SHALL INSPECT THE EXCAVATION PRIOR TO THE PLACEMENT OF CONCRETE AND SHALL PROVIDE A NOTICE OF INSPECTION FOR THE BUILDING INSPECTOR FOR REVIEW AND RECORDS PURPOSES.
- THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS NECESSARY TO SUPPORT THE EXCAVATION DURING CONSTRUCTION.
- REBAR AT BOTTOM OF FOUNDATIONS SHALL BE BONDED TO SITE GROUNDING SYSTEM (WHEN APPLICABLE). SEE ADDITIONAL DETAILS ON APPROVED A&E CONSTRUCTION DRAWINGS.
- ALL FOOTINGS TO BE PLACED ON FIRM, UNDISTURBED, INORGANIC MATERIAL. PROOF ROLL SUB-GRADE PRIOR TO PLACING CONCRETE WHERE THE MATERIAL HAS BEEN DISTURBED BY EQUIPMENT. UNACCEPTABLE/DISTURBED MATERIAL SHALL BE OVER-EXCAVATED AND REPLACED WITH "LEAN CONCRETE FILL". THE GEOTECHNICAL REPORT SHALL BE REVIEWED AND ADHERED TO FOR SPECIFIC RECOMMENDATIONS.
- STRUCTURAL BACKFILL SHALL BE GRANULAR FREE-DRAINING MATERIAL FREE OF DEBRIS, ORGANICS, REFUSE AND OTHERWISE DELETERIOUS MATERIALS. MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 6" IN DEPTH AND COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED PER ASTM D1557 (MODIFIED PROCTOR). THE GEOTECHNICAL REPORT SHALL BE REVIEWED AND ADHERED TO FOR SPECIFIC RECOMMENDATIONS.

SOIL NOTES:

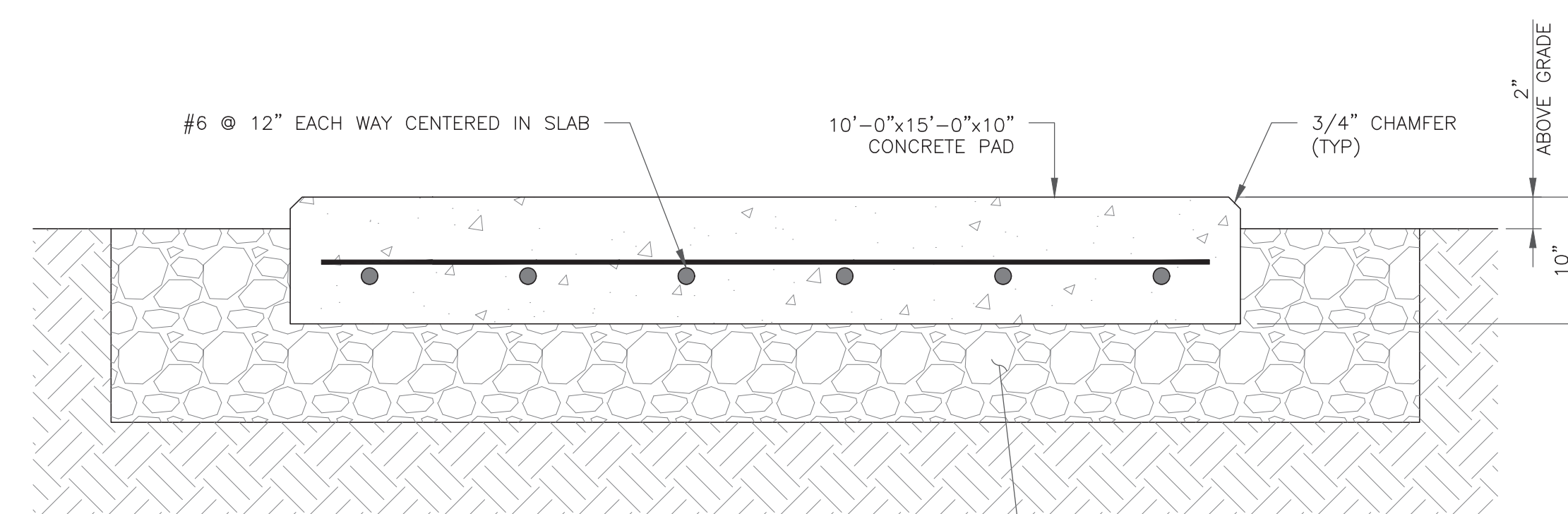
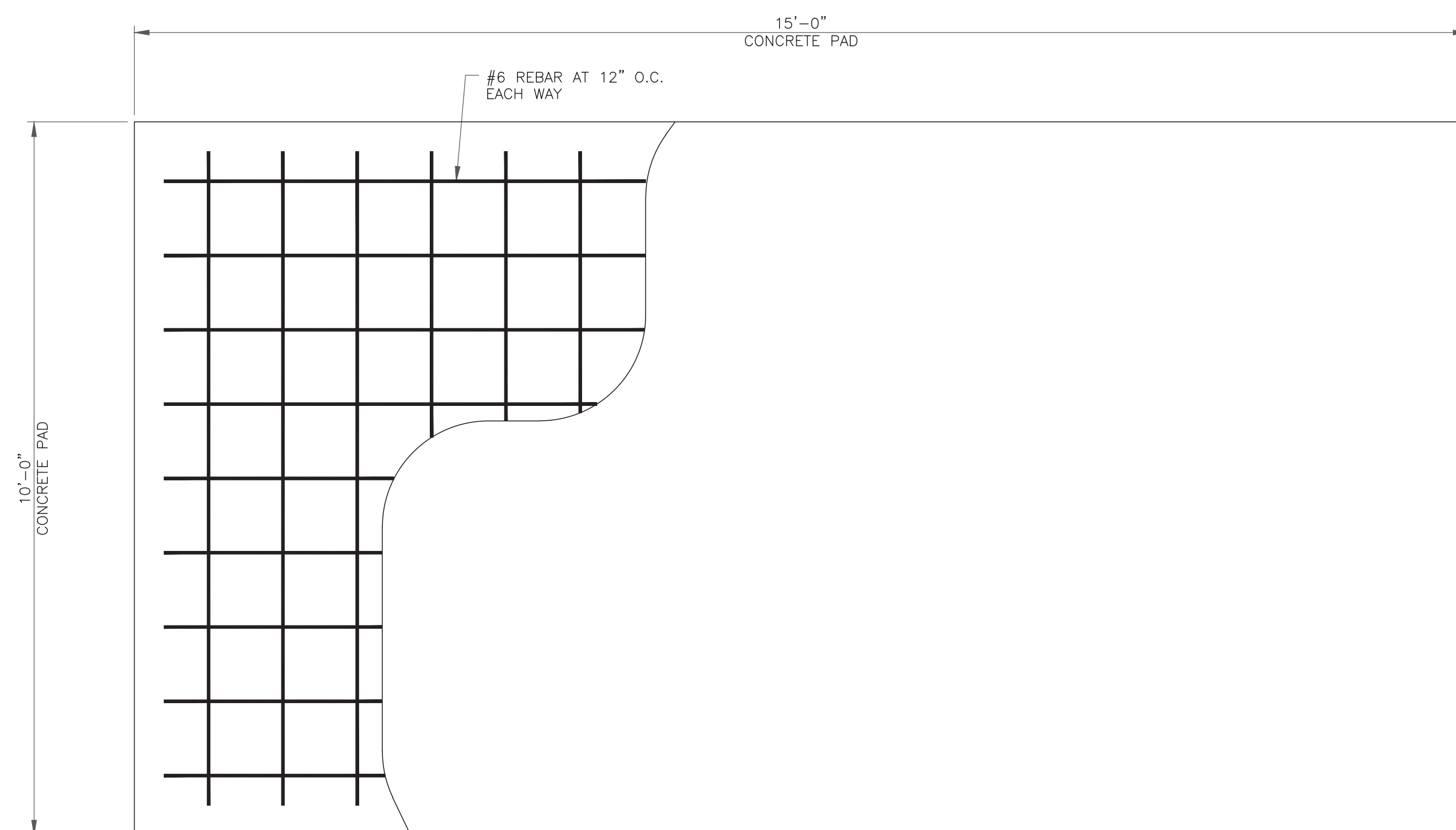
- FOUNDATION DESIGN BASED ON THE PRESUMPTIVE MINIMUM SOIL PARAMETERS IN ACCORDANCE WITH THE IBC, CBC AND TIA. WHEN A SITE SPECIFIC GEOTECHNICAL REPORT IS AVAILABLE ON CCISITES AND THE ENGINEER AND THE CONTRACTOR SHALL ADHERE TO ALL RECOMMENDATIONS PROVIDED THEREIN.
- ALL FOUNDATIONS TO BE PLACED ON FIRM, UNDISTURBED, INORGANIC MATERIAL. PROOF ROLL SUB-GRADE PRIOR TO PLACING CONCRETE WHERE THE MATERIAL HAS BEEN DISTURBED BY EQUIPMENT. UNACCEPTABLE/DISTURBED MATERIAL SHALL BE OVER-EXCAVATED AND REPLACED WITH STRUCTURAL BACKFILL.
- STRUCTURAL BACKFILL SHALL BE GRANULAR FREE-DRAINING MATERIAL FREE OF DEBRIS, ORGANICS, REFUSE AND OTHERWISE DELETERIOUS MATERIALS. MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 6" IN DEPTH AND COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED PER ASTM D1557 (MODIFIED PROCTOR). THE GEOTECHNICAL REPORT SHALL BE REVIEWED AND ADHERED TO FOR SPECIFIC RECOMMENDATIONS.

MECHANICAL ANCHOR NOTES:

- HILTI PRODUCTS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, AS INCLUDED IN THE ADHESIVE PACKAGING.
- CONTRACTOR SHALL AVOID DRILLING HOLES IN VERTICAL/HORIZONTAL REINFORCING BARS.
- HOLES MUST BE WIRE BRUSHED AND BLASTED WITH COMPRESSED AIR PRIOR TO INSTALLATION.
- TEMPERATURES/METHODS/WORKING TIME/ETC. ARE TO BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
- REFERENCE ICC-ES ESR-1917 REPORT.

INSTALLER NOTE:

REINFORCING SHALL HAVE MINIMUM 3" CONCRETE COVER WHEN CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.



SLAB SHALL BEAR ON 6" OF 3/4" WASHED ANGULAR GRAVEL COMPACTED TO 95% OF MAXIMUM LABORATORY DENSITY DETERMINED IN ACCORDANCE W/ ASTM D698 (STANDARD PROCTOR). MATERIAL SHOULD BE WITHIN 3% OF OPTIMUM MOISTURE AT TIME OF COMPACTION.

1 NOT USED  
SCALE: NOT TO SCALE

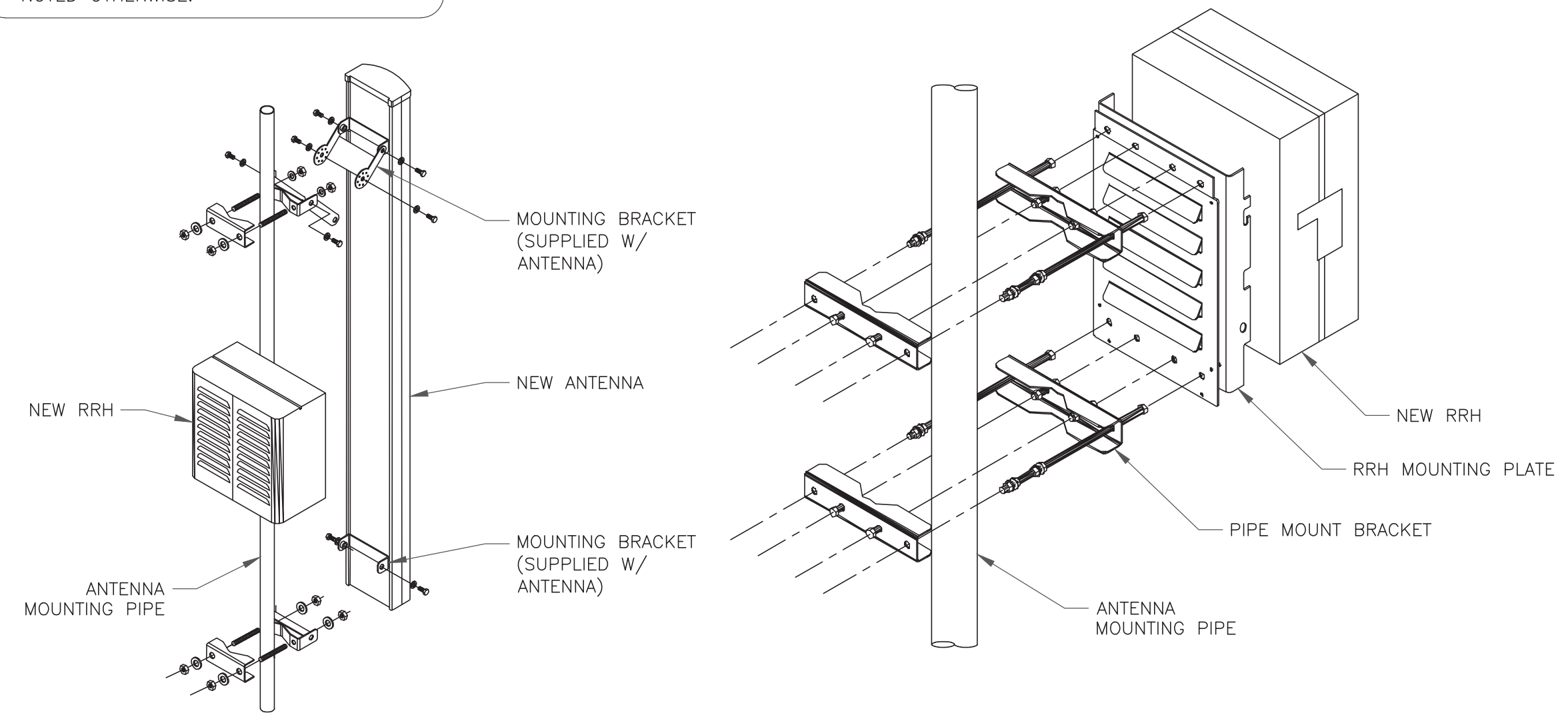
2 CONCRETE PAD DETAIL  
SCALE: NOT TO SCALE

RF SYSTEM SCHEDULE										
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A1	N1900/L2100/L1900	AMPHENOL	APXVLL19P_43-C-A20	30°	-	-	78'-0"	4460 B25+B66	(1) 1-5/8" HYBRID (100M LONG)
	A2	N2500	ERICSSON	AIR 6419 B41	30°	-	-	-	-	
	A3	N600/L600/L700	RFS/CELWAVE	APXVAALL24_43-U-NA20	30°	-	-	78'-0"	4480 B71+B85	
	A4	-	-	-	-	-	-	-	-	
BETA	B1	N1900/L2100/L1900	AMPHENOL	APXVLL19P_43-C-A20	150°	-	-	78'-0"	4480 B71+B85	(1) 1-5/8" HYBRID (100M LONG)
	B2	N2500	ERICSSON	AIR 6419 B41	150°	-	-	-	-	
	B3	N600/L600/L700	RFS/CELWAVE	APXVAALL24_43-U-NA20	150°	-	-	78'-0"	4480 B71+B85	
	B4	-	-	-	-	-	-	-	-	
GAMMA	C1	N1900/L2100/L1900	AMPHENOL	APXVLL19P_43-C-A20	270°	-	-	78'-0"	4460 B25+B66	(1) 1-5/8" HYBRID (100M LONG)
	C2	N2500	ERICSSON	AIR 6419 B41	270°	-	-	-	-	
	C3	N600/L600/L700	RFS/CELWAVE	APXVAALL24_43-U-NA20	270°	-	-	78'-0"	4480 B71+B85	
	C4	-	-	-	-	-	-	-	-	

1 ANTENNA AND CABLE SCHEDULE  
SCALE: NOT TO SCALE

INSTALLER NOTES:

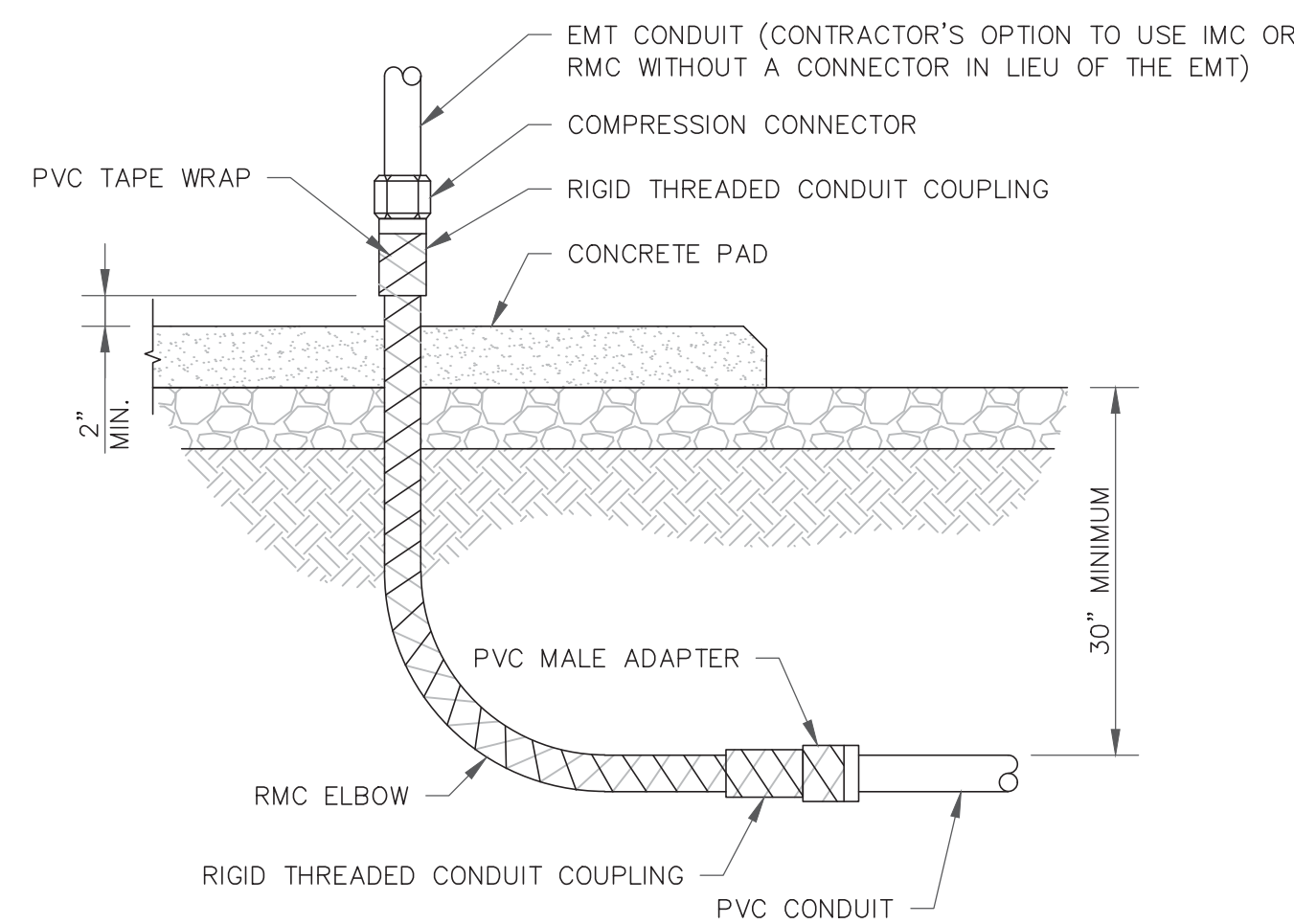
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



2 ANTENNA WITH RRH MOUNTING DETAIL  
SCALE: NOT TO SCALE

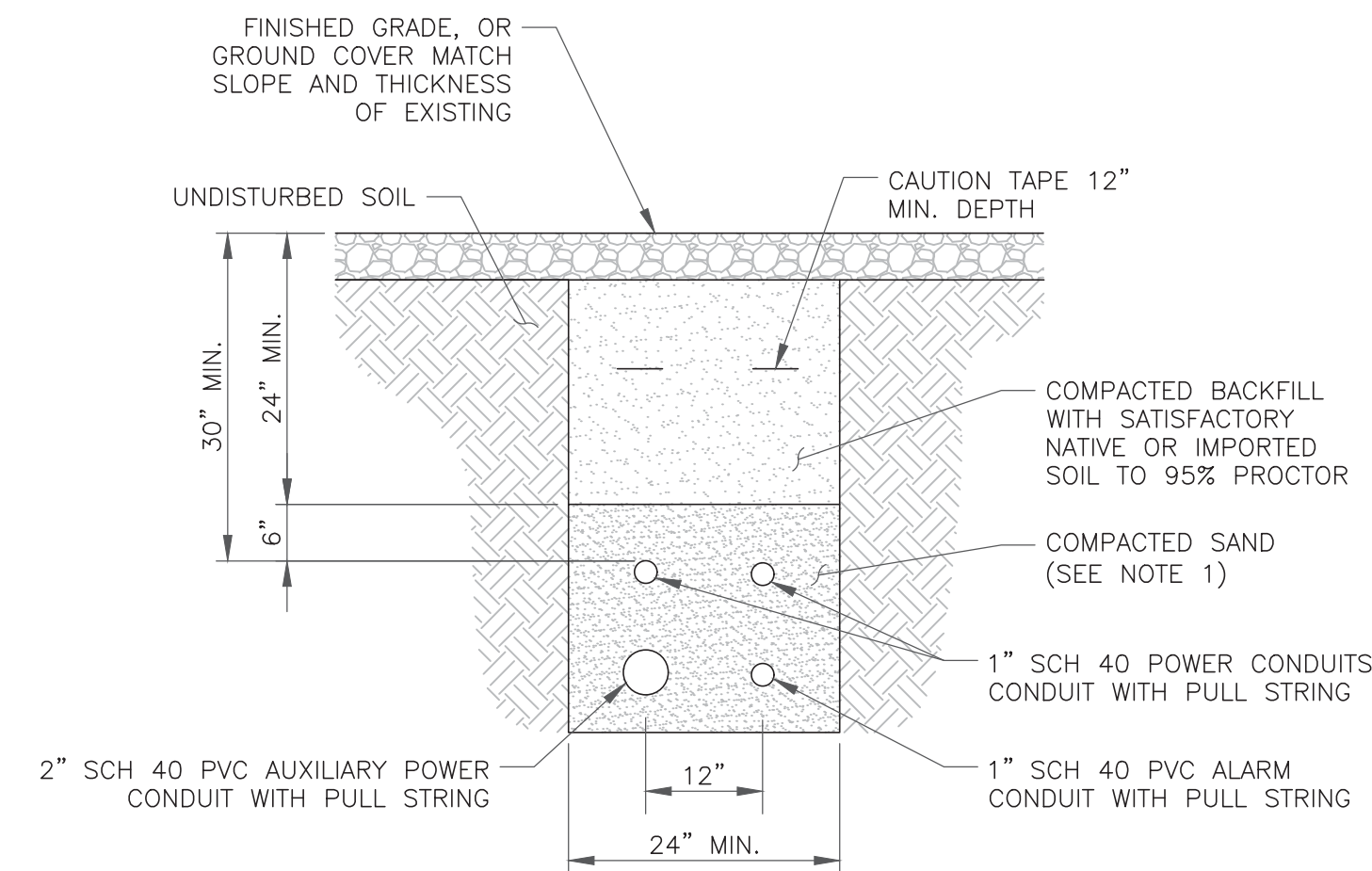
INSTALLER NOTE:

1. LEAN CONCRETE, RED-COLORED TOP, MAY BE USED IN PLACE OF COMPACTED SAND



ALL METAL CONDUIT INSTALLED IN DIRECT CONTACT WITH THE EARTH SHALL BE CONSIDERED TO BE INSTALLED IN A SEVERELY CORROSIVE ENVIRONMENT AND IS REQUIRED TO HAVE SUPPLEMENTAL PROTECTION AGAINST CORROSION (NEC ARTICLE 342.10(B) & 344.10(B)(1)). THIS PROTECTION SHALL EITHER BE AN APPROVED MANUFACTURER INSTALLED PROTECTIVE COATING ON THE CONDUIT OR SHALL BE (2) LAYERS OF 10 MIL PVC PIPE WRAP TAPE INSTALLED USING OPPOSING SPIRAL WRAPS. ON VERTICAL PIPE THE OUTSIDE LAYER OF TAPE SHALL BE WRAPPED SO AS TO PROVIDE SHEDDING OF WATER (i.e. TAPE SHOULD WRAP IN AN UPWARD DIRECTION WITH LOWER WRAP BEING BENEATH THE WRAP ABOVE). SPIRAL WRAPS SHALL HAVE A MINIMUM OF 1/4" OVERLAP WITH THE PRECEDING TAPE WRAP. ANY OTHER METHODS OF CORROSION PROTECTION SHALL REQUIRE APPROVAL BY THE ENGINEER OF RECORD PRIOR TO BEING USED.

3 CONDUIT STUB UP DETAIL  
SCALE: NOT TO SCALE



4 TRENCH DETAIL  
SCALE: NOT TO SCALE

T-Mobile

35 GRIFFIN ROAD  
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:  
CT11845A

BU #: 842861  
EAST HARTFORD  
HOCHANUM

223 BRAINARD ROAD  
HARTFORD, CT 06114

EXISTING  
96'-10" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/25/23	TDG	PRELIMINARY REVIEW	LR
B	2/23/24	TDG	PRELIMINARY REVIEW	LR
0	3/10/24	TDG	CONSTRUCTION	LR



MTS ENGINEERING P.L.L.C.  
BER:2386985  
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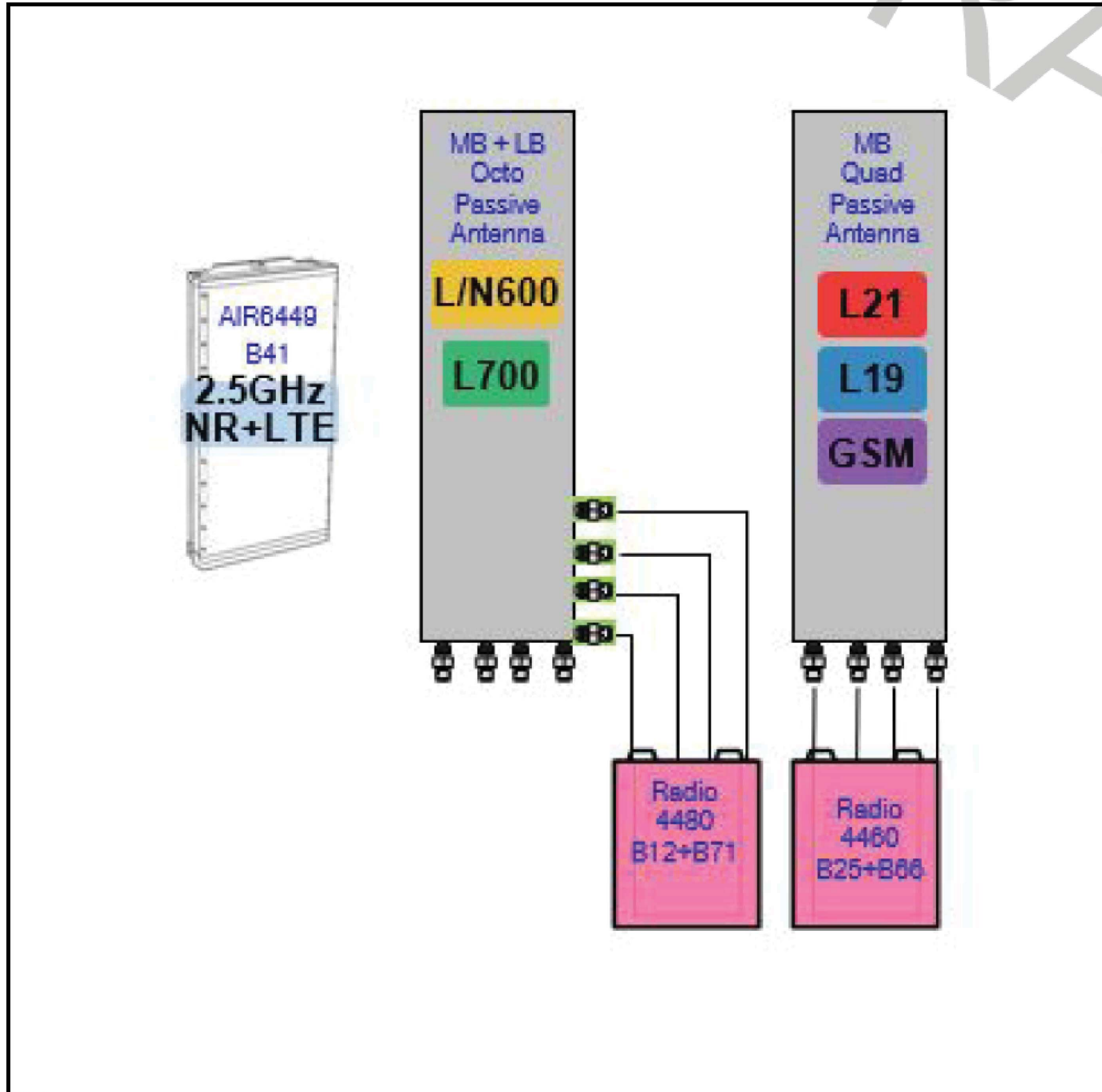
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SHEET NUMBER:

C-4

REVISION:

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1 PLUMBING DIAGRAM  
SCALE: NOT TO SCALE

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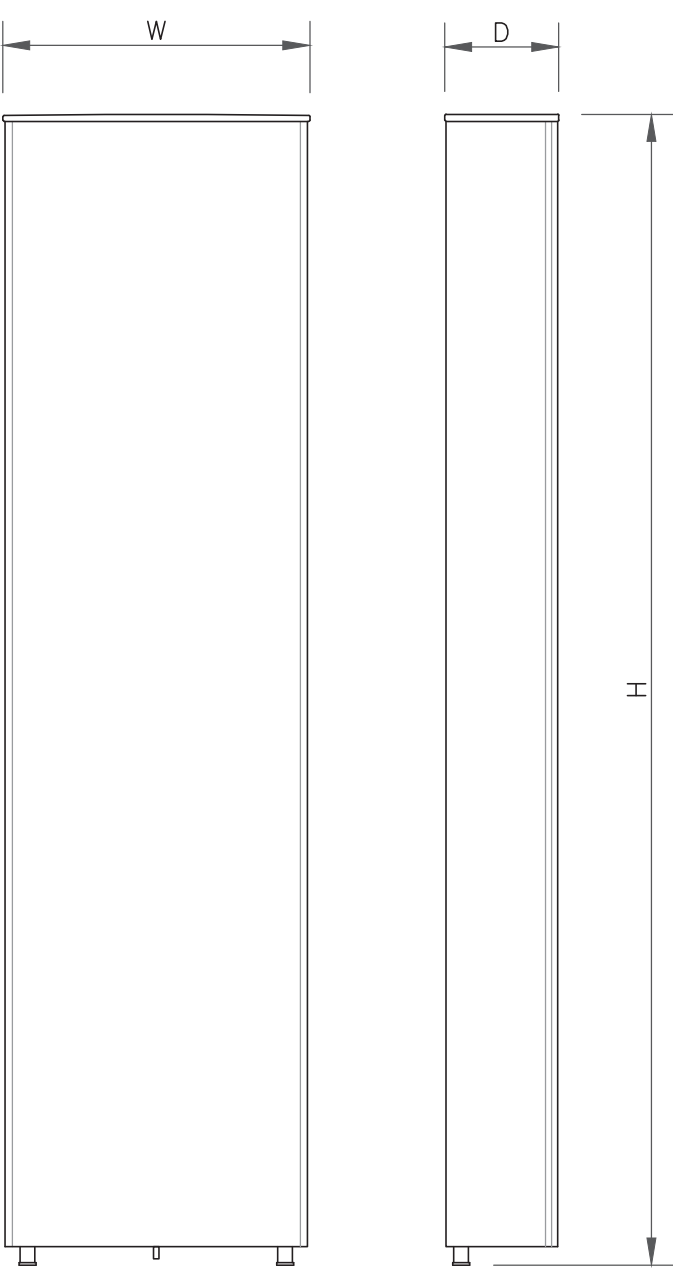
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C-5

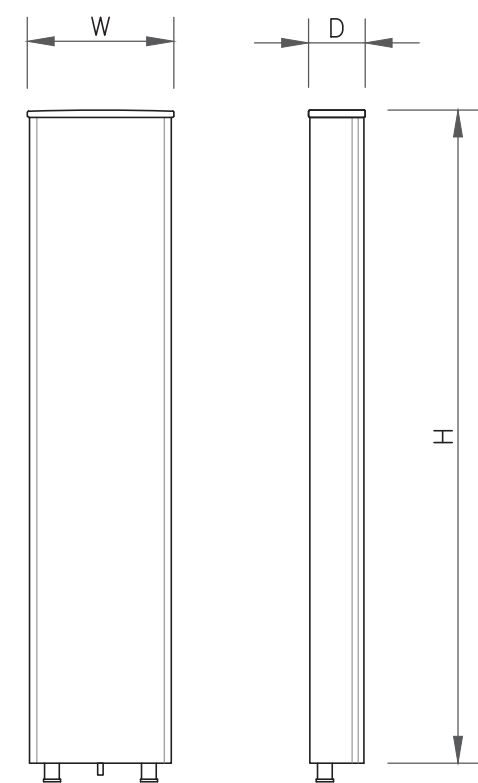
REVISION:

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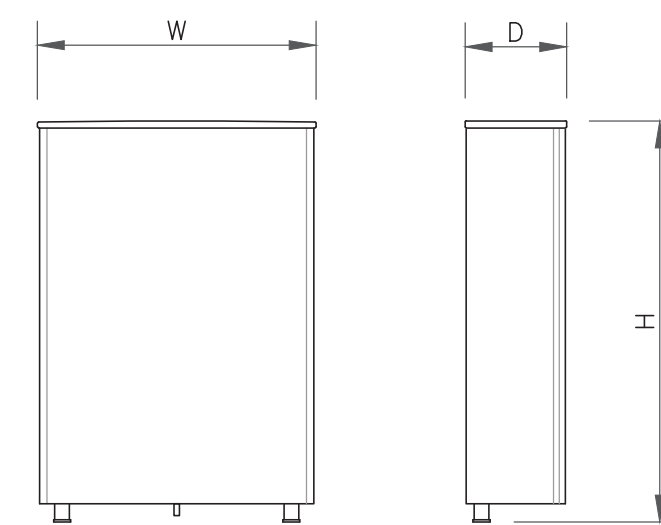
ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APXVAALL24_43-U-NA20
WIDTH	24.0"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.9 LBS

1 ANTENNA SPECS  
SCALE: NOT TO SCALE



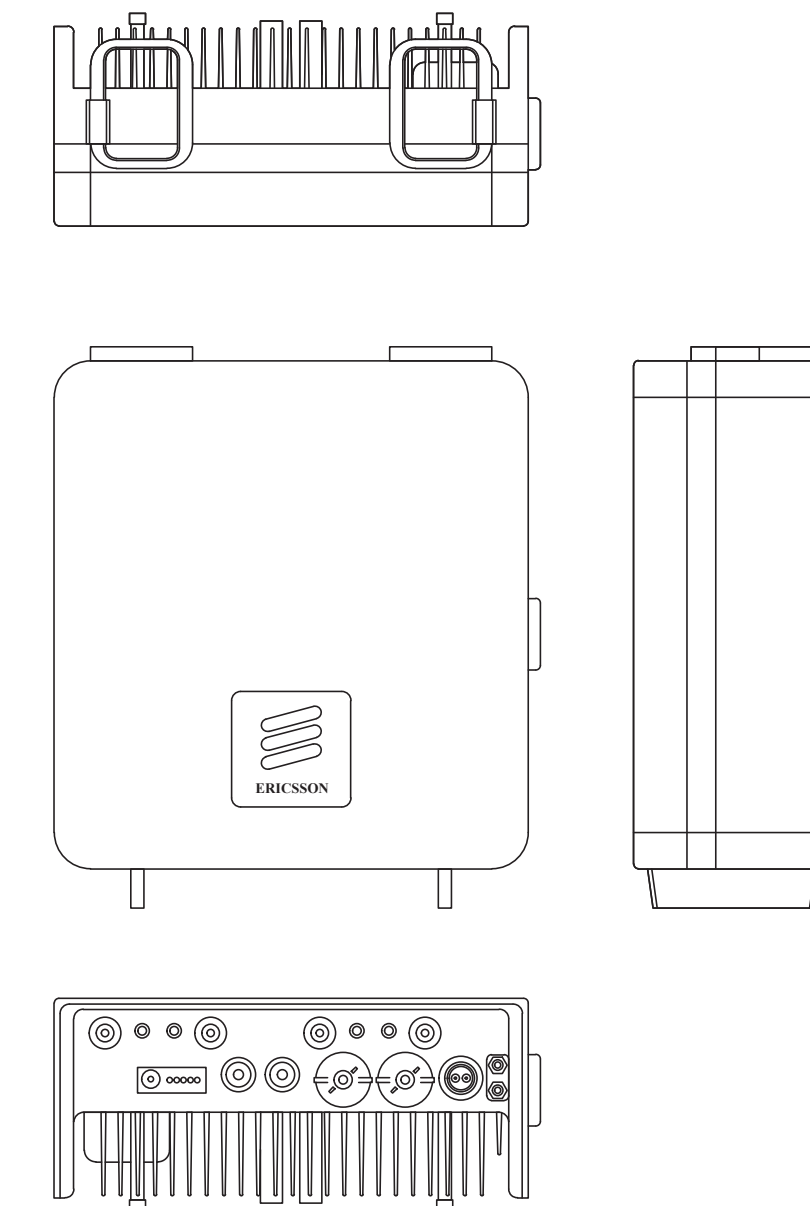
ANTENNA SPECS	
MANUFACTURER	AMPHENOL
MODEL #	APXVLL19P_43-C-A20
WIDTH	11.3"
DEPTH	4.60"
HEIGHT	75.8"
WEIGHT	42.0 LBS

2 ANTENNA SPECS  
SCALE: NOT TO SCALE



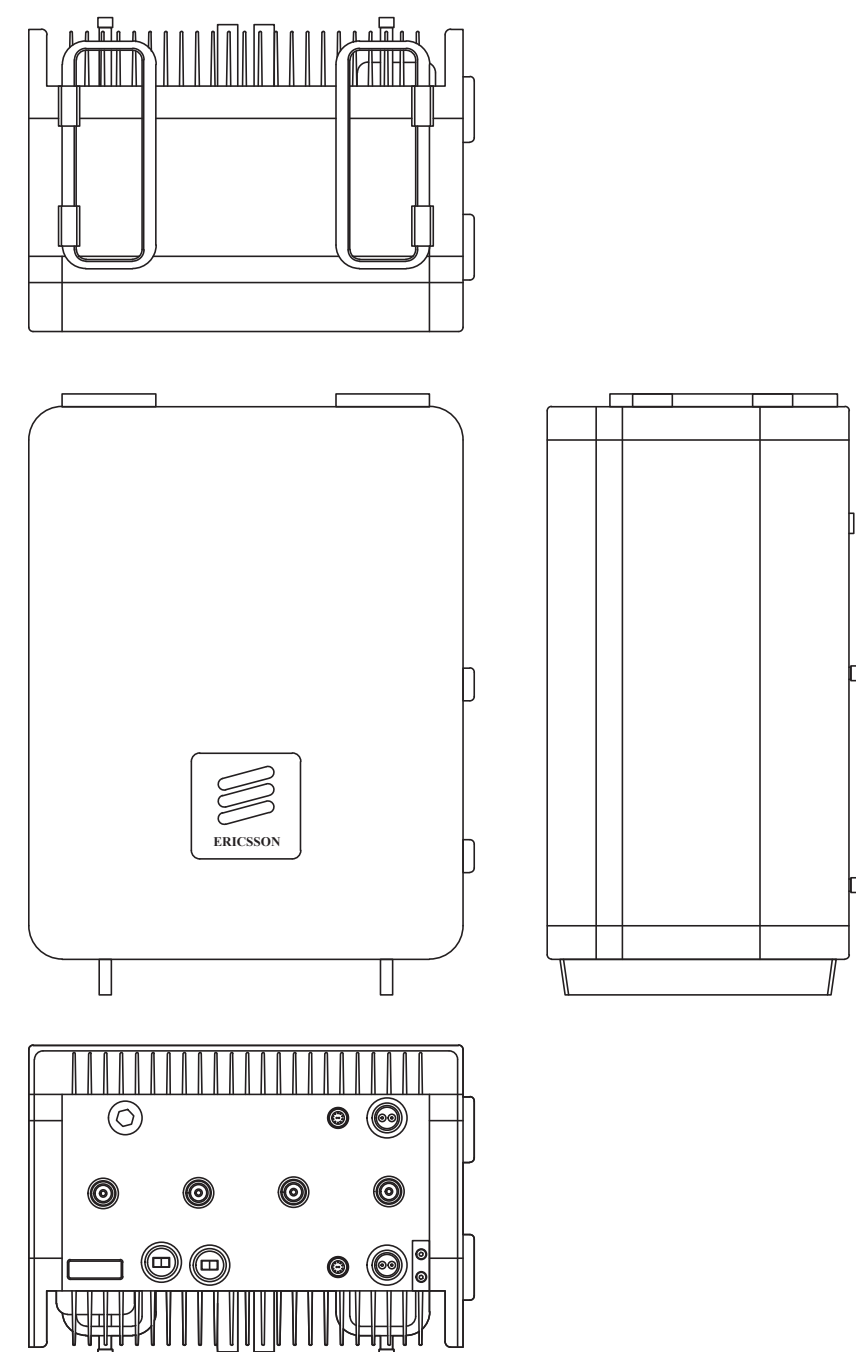
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6419 B41
WIDTH	20.91"
DEPTH	9.02"
HEIGHT	36.25"
WEIGHT	96.50 LBS

3 ANTENNA SPECS  
SCALE: NOT TO SCALE



RRU SPECS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4480 B71+B85
WIDTH	15.70"
DEPTH	7.50"
HEIGHT	22.0"
WEIGHT	81.0 LBS

4 RRU SPECS  
SCALE: NOT TO SCALE



RRU SPECS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4460 B25+B66
WIDTH	15.10"
DEPTH	11.90"
HEIGHT	17.0"
WEIGHT	109.0 LBS

5 RRU SPECS  
SCALE: NOT TO SCALE

6 NOT USED  
SCALE: NOT TO SCALE

7 NOT USED  
SCALE: NOT TO SCALE

8 NOT USED  
SCALE: NOT TO SCALE

**T-Mobile**  
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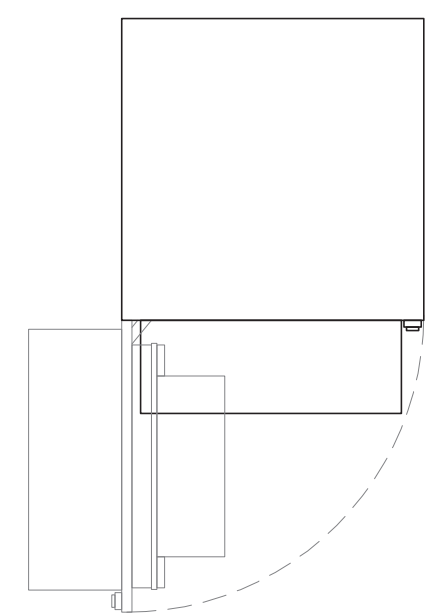
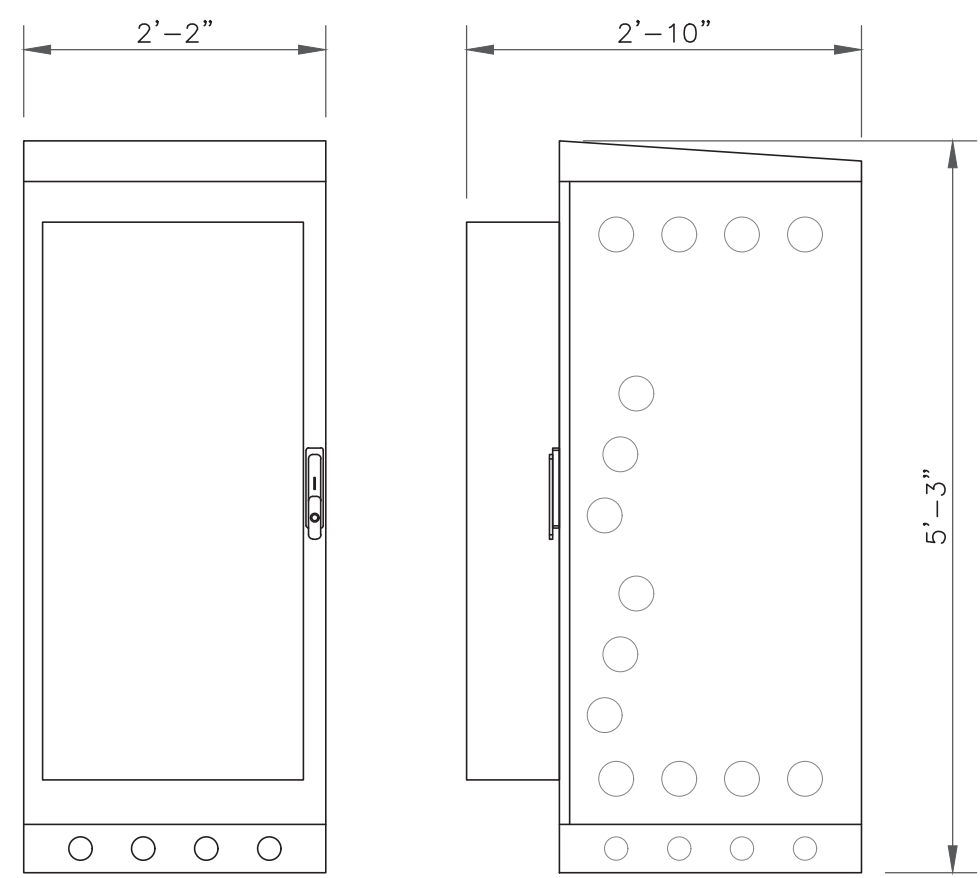


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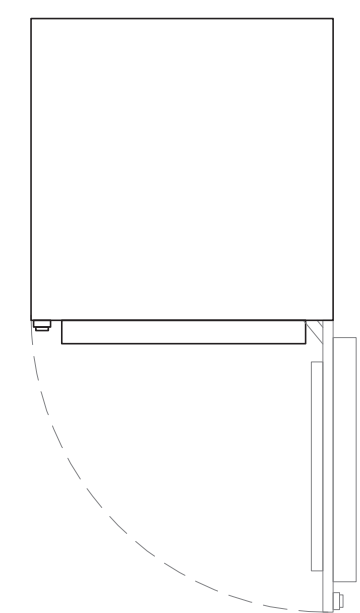
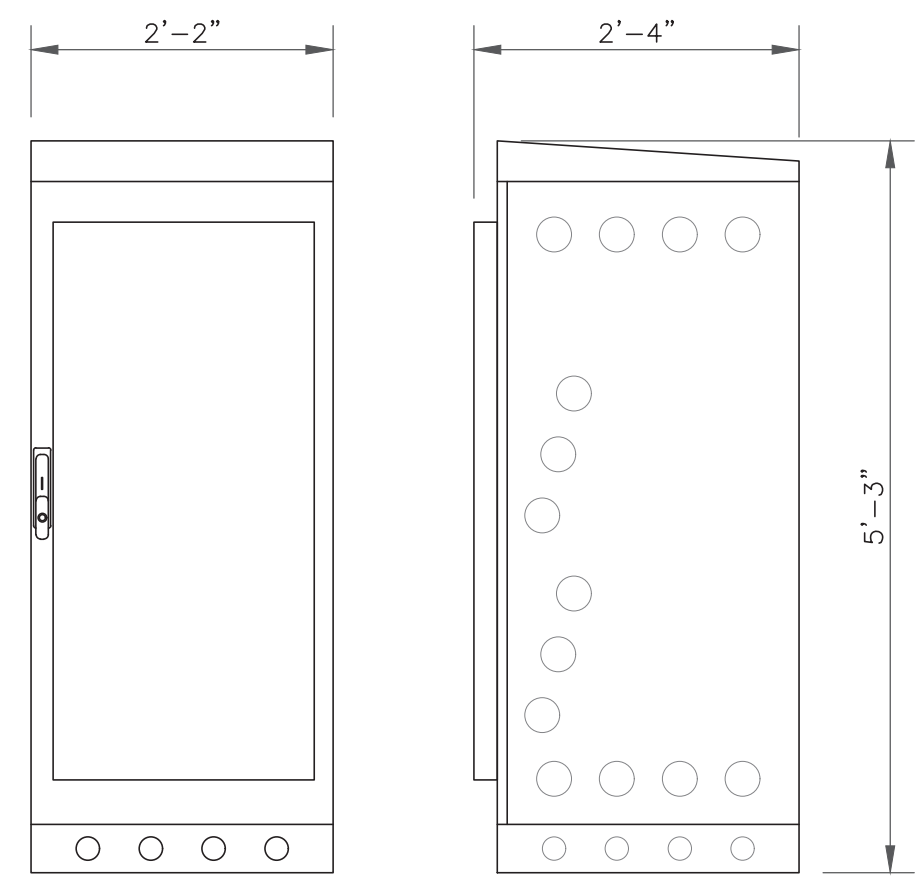
SHEET NUMBER: **C-6.1** REVISION: **0**





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

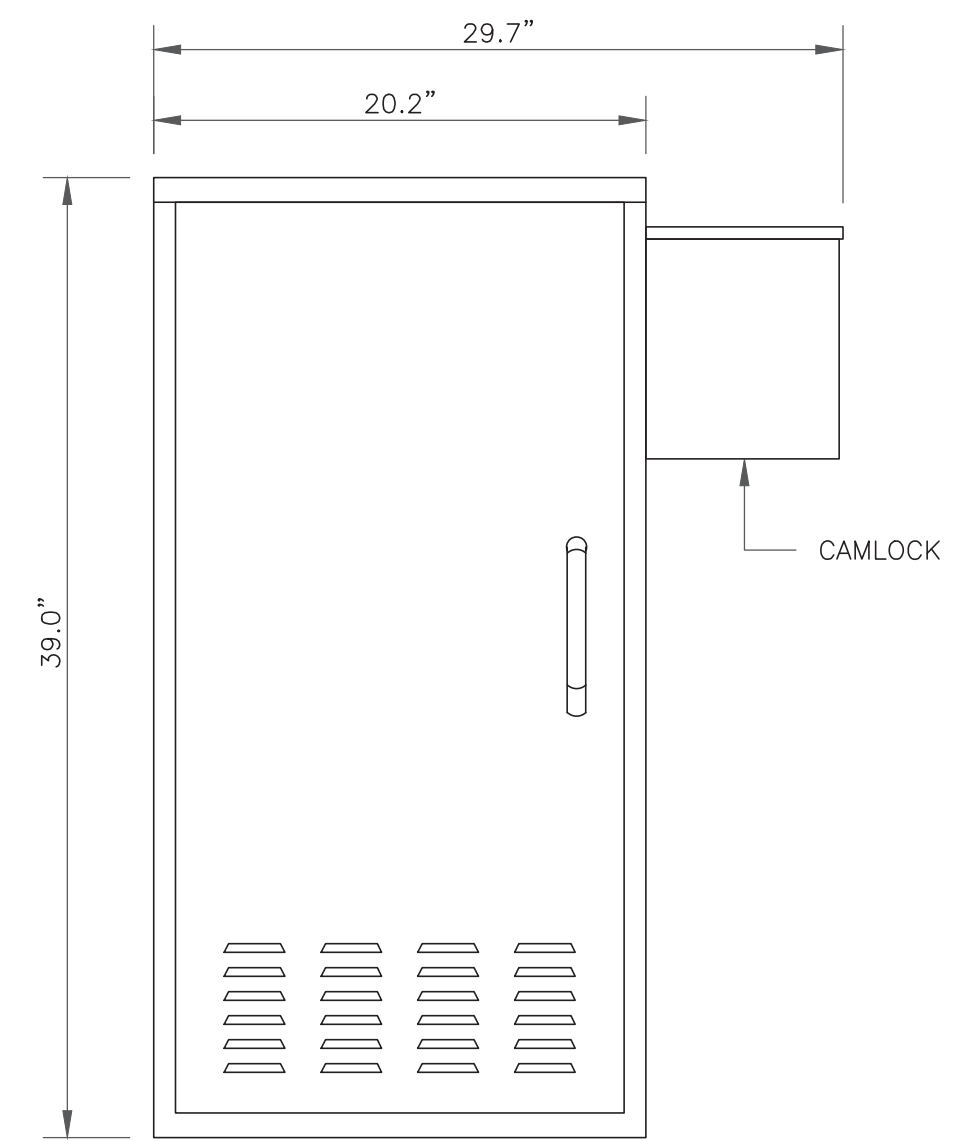
1 ERICSSON - 6160  
 SCALE: NOT TO SCALE



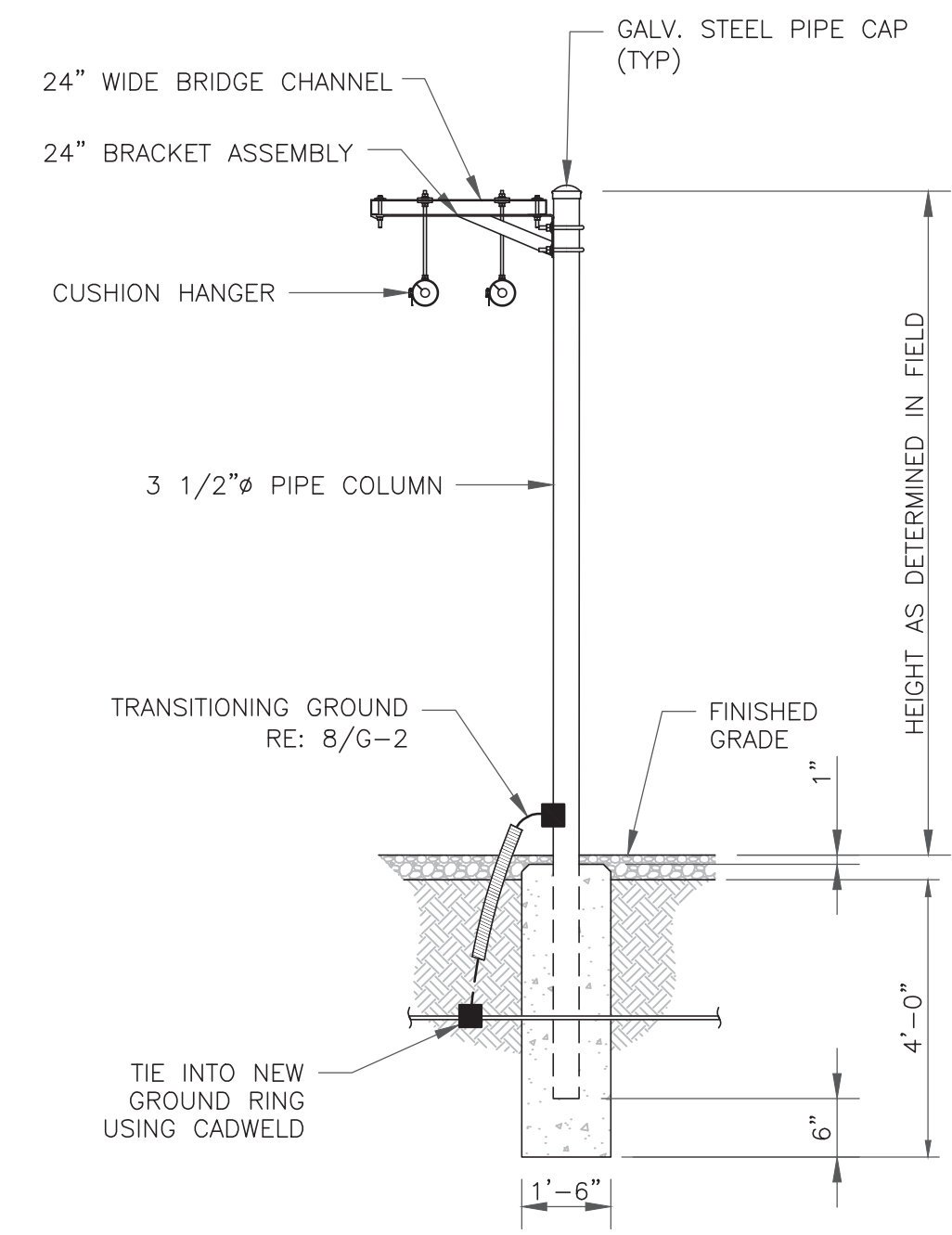
**EQUIPMENT NOTES:**  
 HEIGHTxWIDTHxDEPTH: 63.0" x 26.0" x 28.0"  
 (1600.0mm x 660.0mm x 711.0mm)  
 WEIGHT (EMPTY): 295 LBS (134 kg)  
 WEIGHT (FULLY LOADED): 2,000 LBS (908 kg)

2 ERICSSON - B160  
 SCALE: NOT TO SCALE

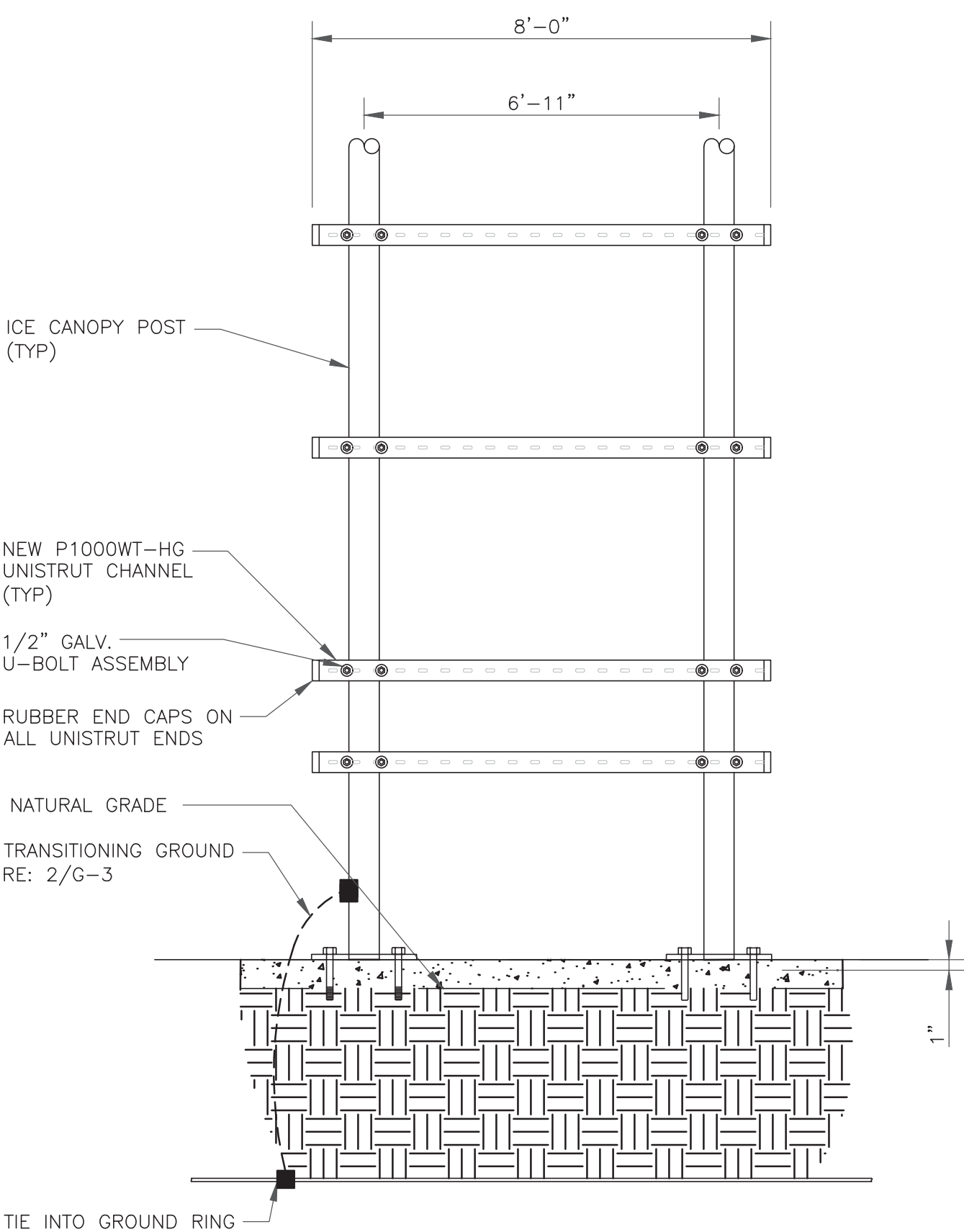
**DELTA PPC SPECIFICATIONS**  
 DIMENSIONS (WxHxD): 29.7" x 39.0" x 11.2"  
 WEIGHT: APPROXIMATELY 71 LBS.  
 VOLTAGE: 240/120 VAC, SINGLE PHASE  
 AMPERAGE: 225A  
 FAULT CURRENT RATING: 65kAIC  
 MAIN BREAKERS: EATON 225A, BR SERIES  
 TRANSFER TYPE: SLIDE BAR MECHANICAL INTERLOCK  
 DISTRIBUTION: 20-POSITION, 225A LOAD CENTER  
 BRANCH BREAKERS: 30A, 240VAC, EATON  
 GENERATOR RECEPTACLE: CAMLOCK CONNECTORS



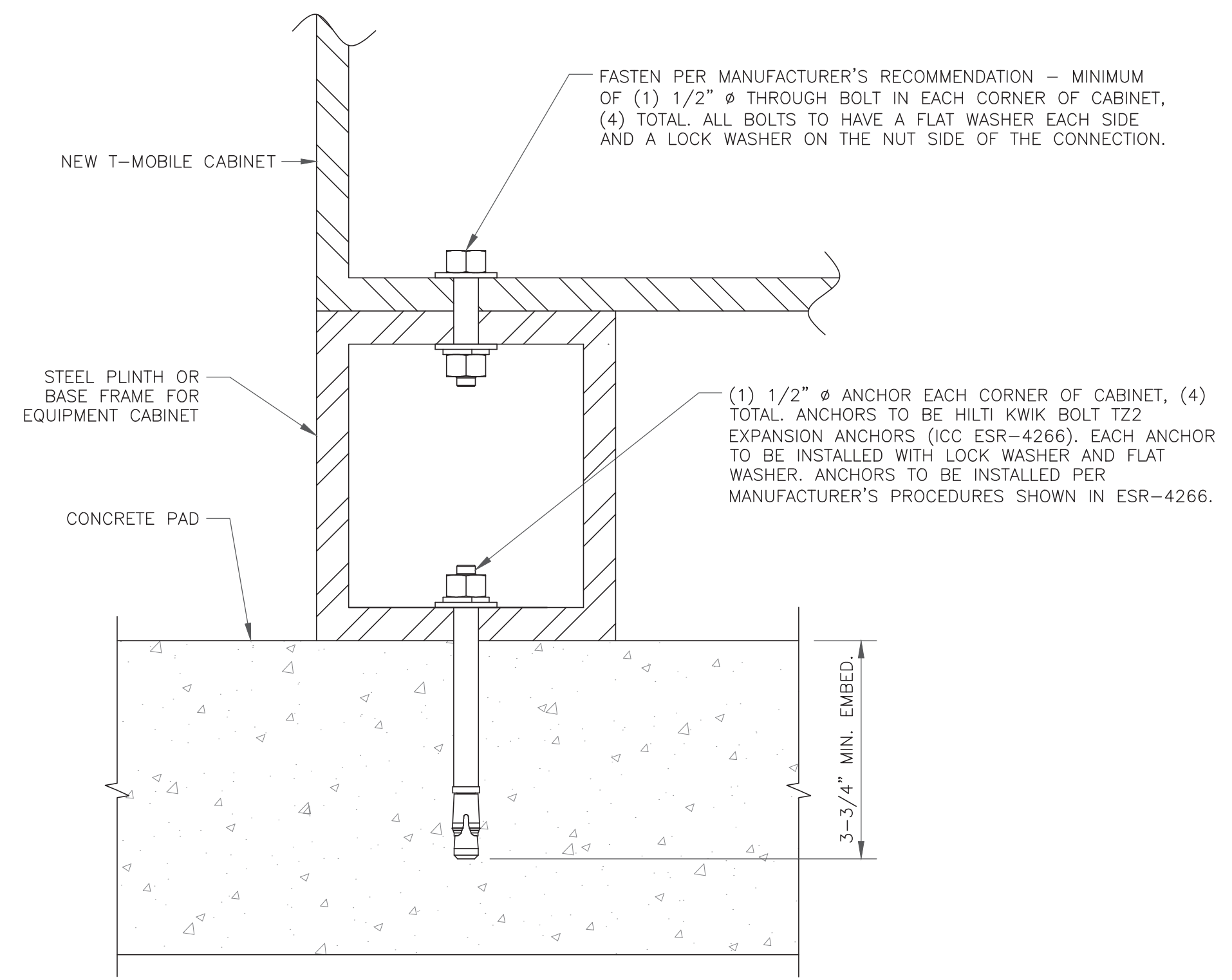
3 DELTA - PPC W/ CAMLOCK  
 SCALE: NOT TO SCALE



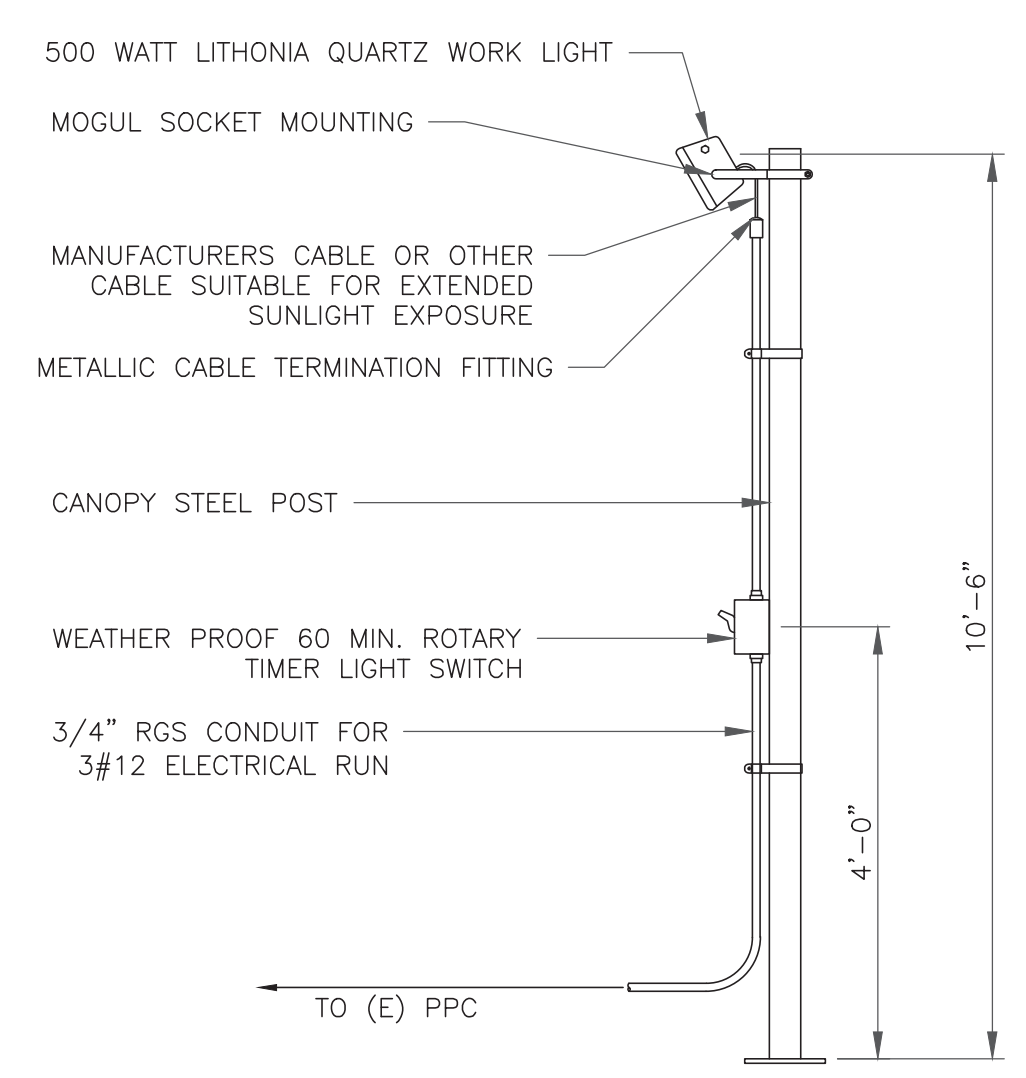
4 ICE BRIDGE DETAIL  
 SCALE: NOT TO SCALE



5 UTILITY FRAME ELEVATION ON CONCRETE PAD  
 SCALE: NOT TO SCALE



6 CABINET ANCHOR DETAIL  
 SCALE: NOT TO SCALE



7 WORK LIGHT W/ TIMER SWITCH DETAIL  
 SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:  
**CT11845A**

BU #: 842861  
**EAST HARTFORD  
 HOCHANUM**

223 BRAINARD ROAD  
 HARTFORD, CT 06114

EXISTING  
 96'-10" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	10/25/23	TDG	PRELIMINARY REVIEW	LR
B	2/23/24	TDG	PRELIMINARY REVIEW	LR
0	3/10/24	TDG	CONSTRUCTION	LR

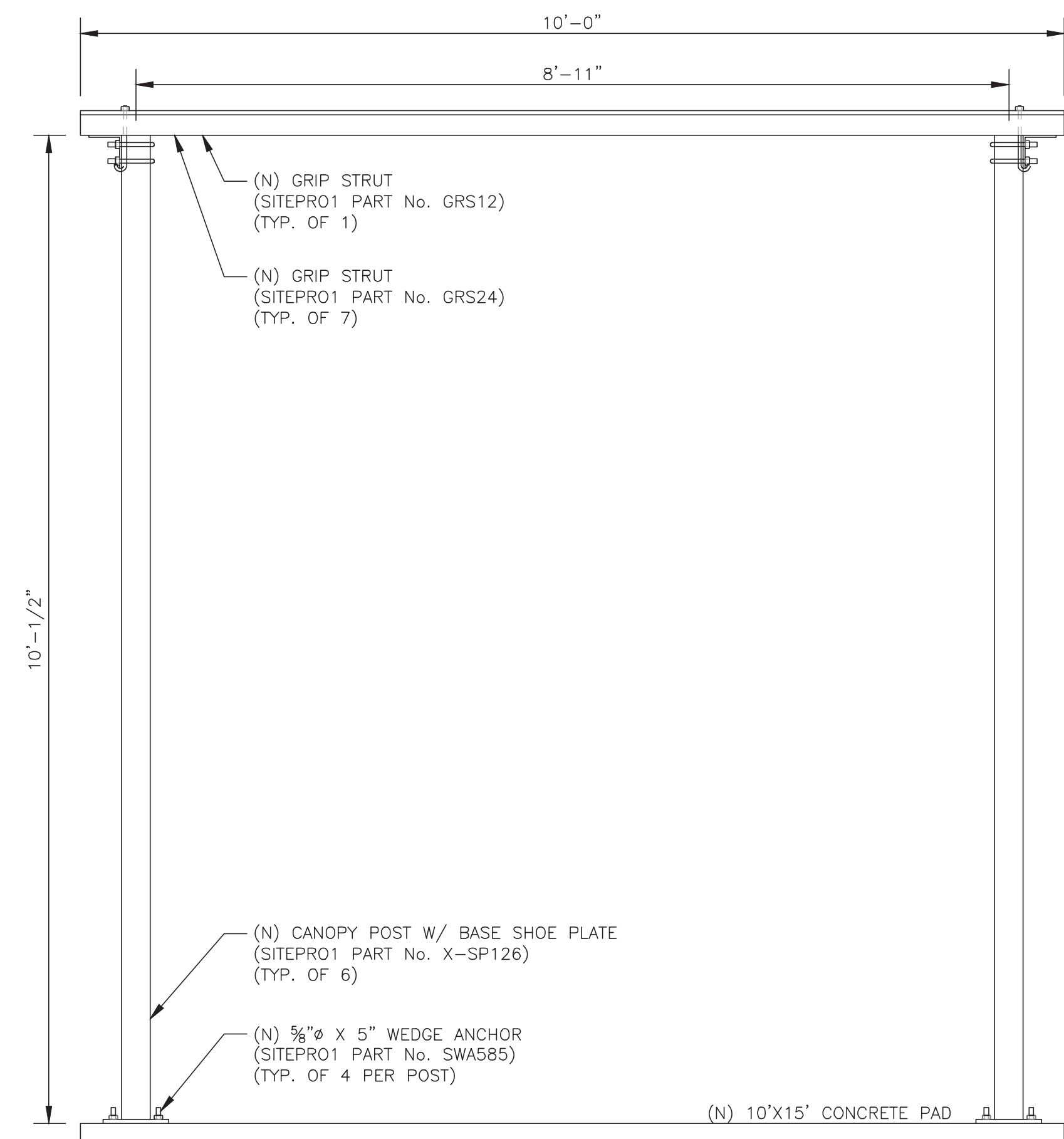
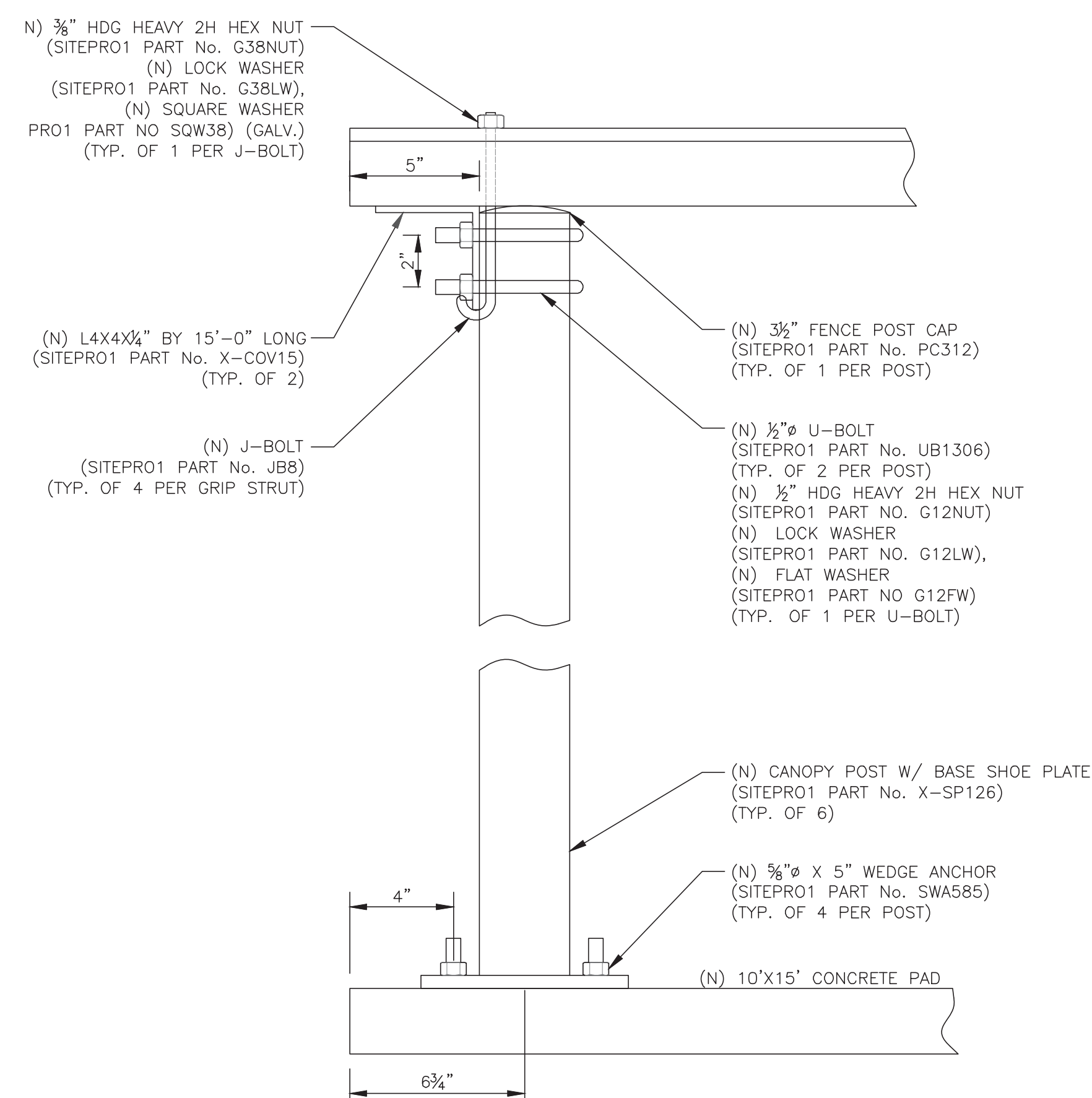
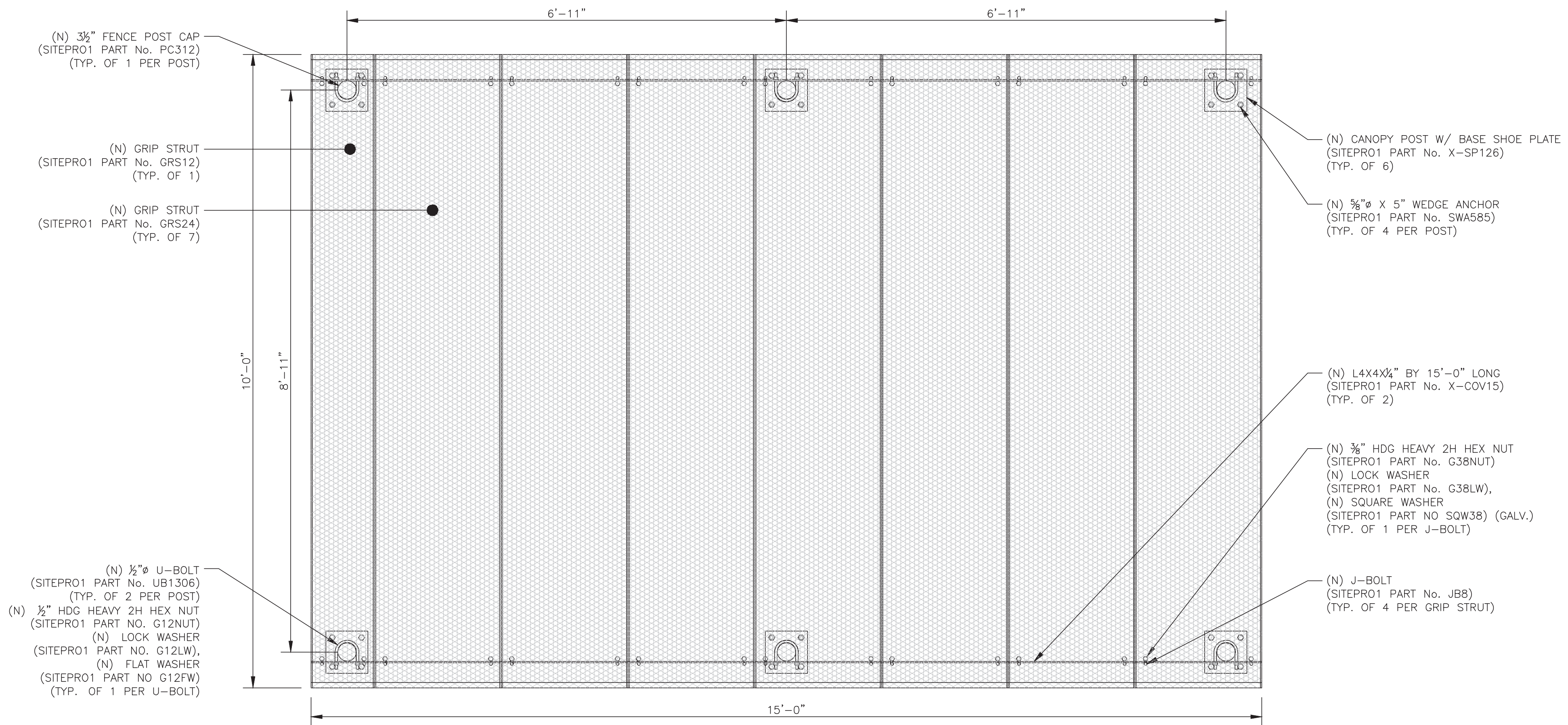


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SHEET NUMBER: **C-6.2** REVISION: **0**

154567.006.01.0001\_842861\_EAST\_HARTFORD\_HOCHANUM.dwg - Sheet: C-6.2 - User: lisa.rider - Mar 10, 2024 - 7:14pm



1 ICE CANOPY SPECS  
SCALE: NOT TO SCALE

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SHEET NUMBER: **C-7** REVISION: **0**

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223 BRAINARD ROAD  
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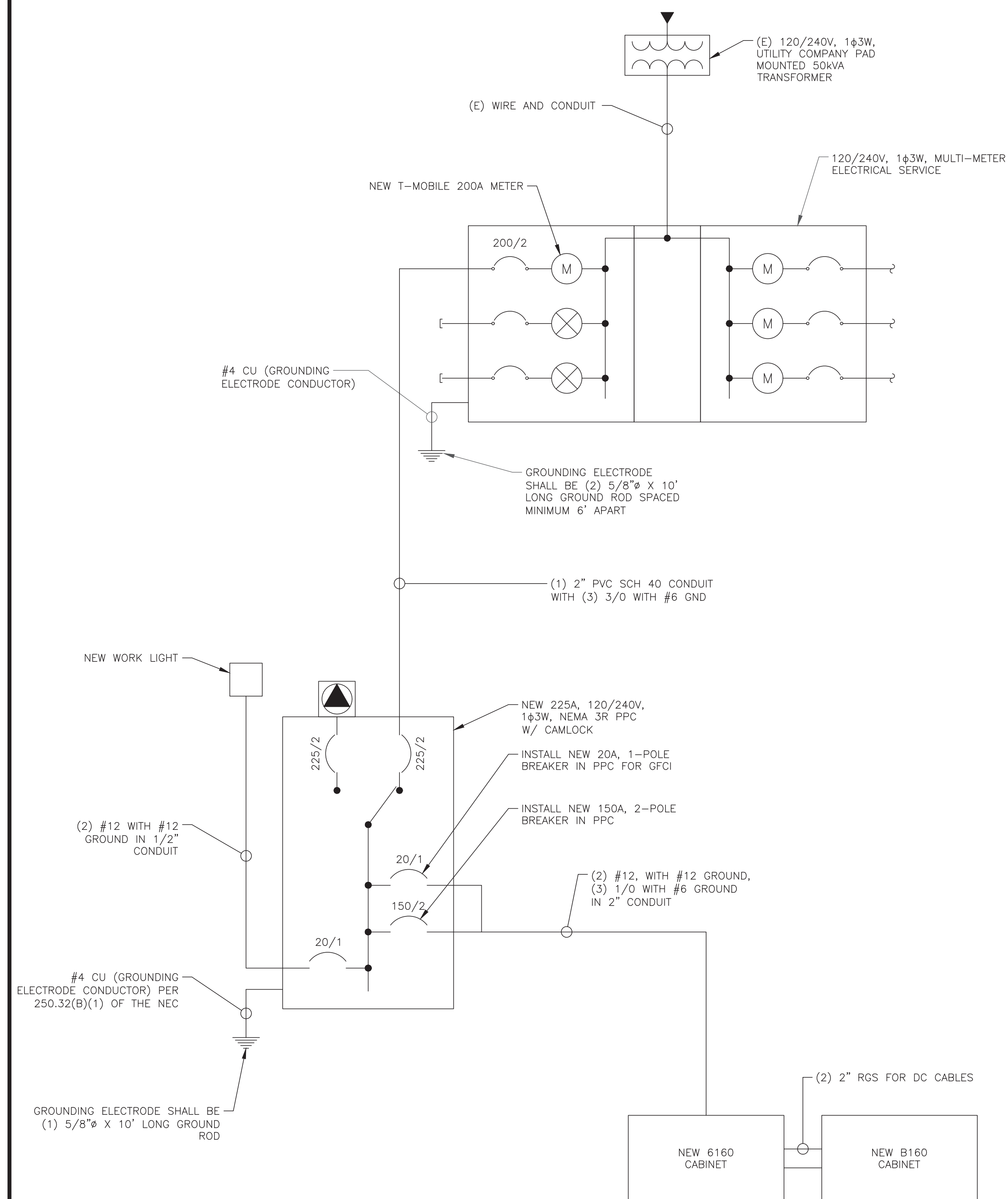
**E-1**

REVISION:

**0**

**NOTES:**

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



2 ONE LINE DIAGRAM  
SCALE: NOT TO SCALE

FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD
			L1	L2			
6160 CABINET	2	150A	1	2			
GFCI	1	20A	5	6			
WORK LIGHT	1	20A	7	8			
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			

RATED VOLTAGE: <input checked="" type="checkbox"/> 120/240 <input type="checkbox"/> 277/480	1 PHASE, 3 WIRE	BRANCH POLES: <input type="checkbox"/> 12 <input checked="" type="checkbox"/> 20 <input type="checkbox"/> 30 <input type="checkbox"/> 42	APPROVED MF'RS
RATED AMPS: <input type="checkbox"/> 100 <input checked="" type="checkbox"/> 225 <input type="checkbox"/> 400		CABINET: <input type="checkbox"/> SURFACE <input type="checkbox"/> FLUSH	NEMA <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 3R <input type="checkbox"/> 4X
<input type="checkbox"/> MAIN LUGS ONLY <input checked="" type="checkbox"/> MAIN 225 AMPS <input checked="" type="checkbox"/> BREAKER <input type="checkbox"/> FUSED SWITCH		<input checked="" type="checkbox"/> HINGED DOOR	<input checked="" type="checkbox"/> KEYED DOOR LATCH
<input type="checkbox"/> FUSED <input checked="" type="checkbox"/> CIRCUIT BREAKER <input type="checkbox"/> BRANCH DEVICES		<input type="checkbox"/> TO BE GFCI BREAKERS	<input type="checkbox"/> FULL NEUTRAL BUS <input type="checkbox"/> GROUND BAR
ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL			

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

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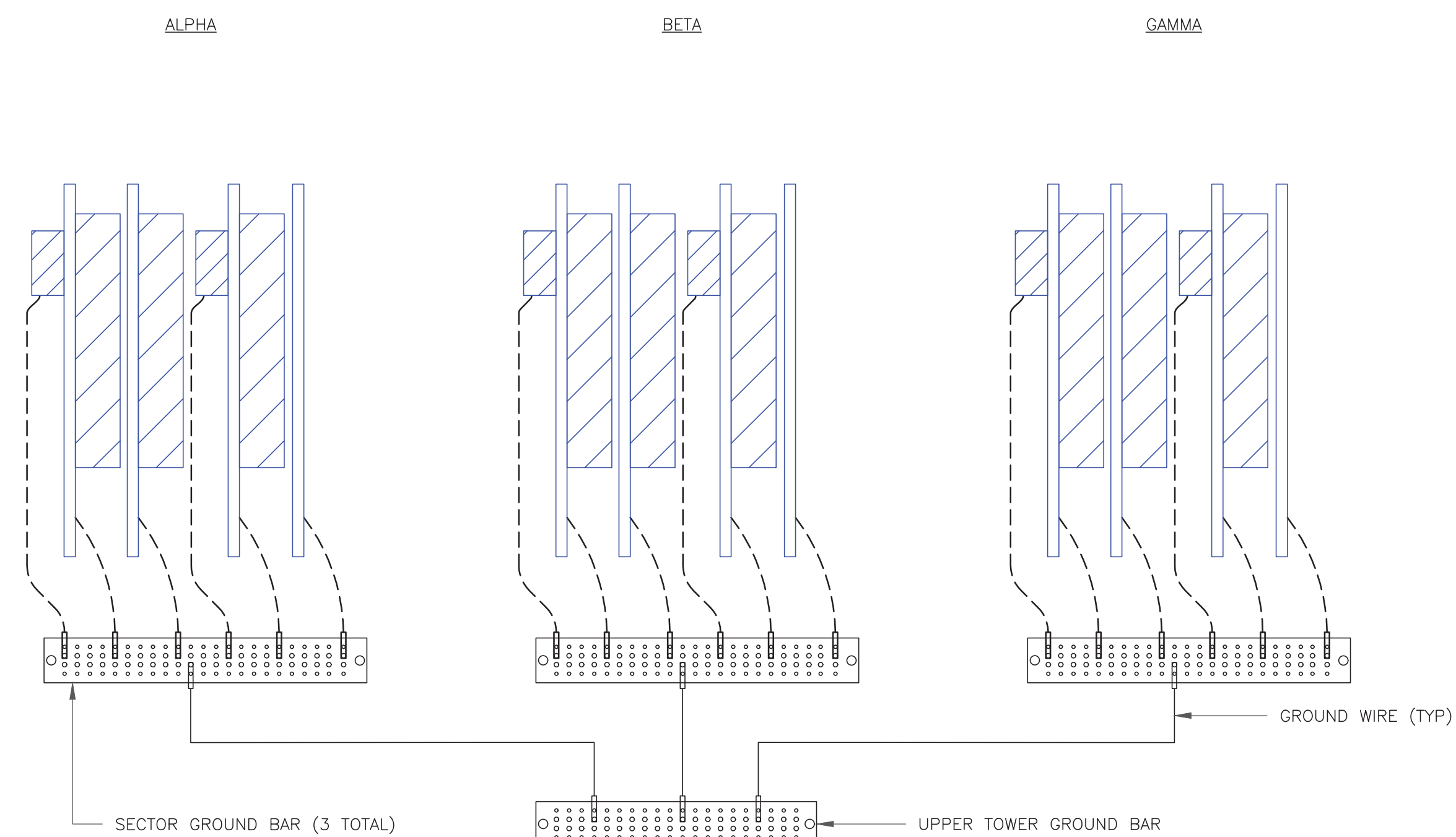
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**G-1**

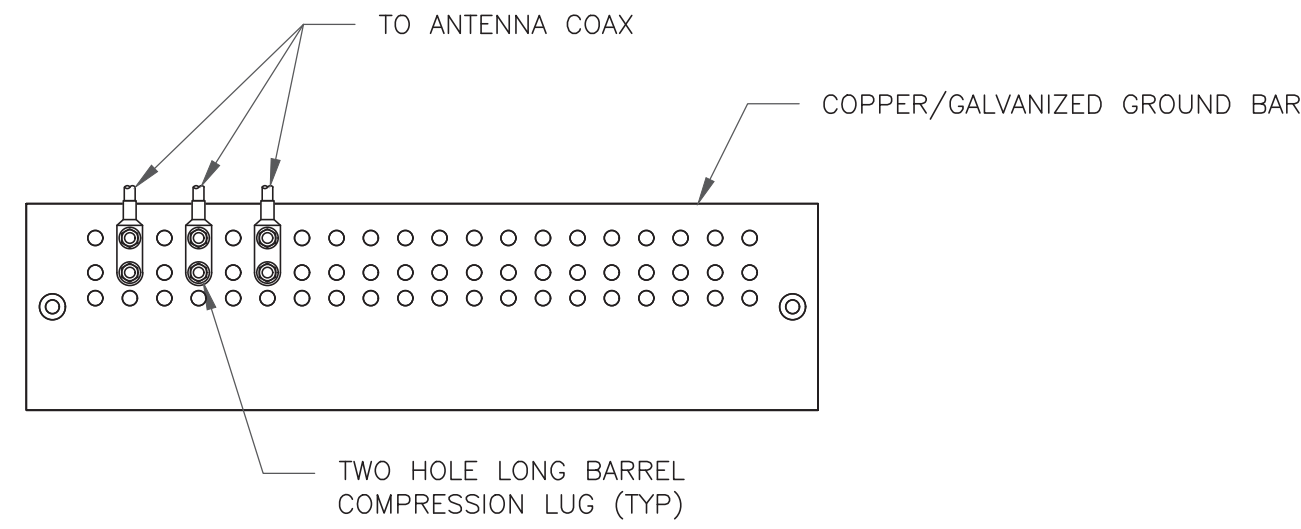
**REVISION:**

**0**



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

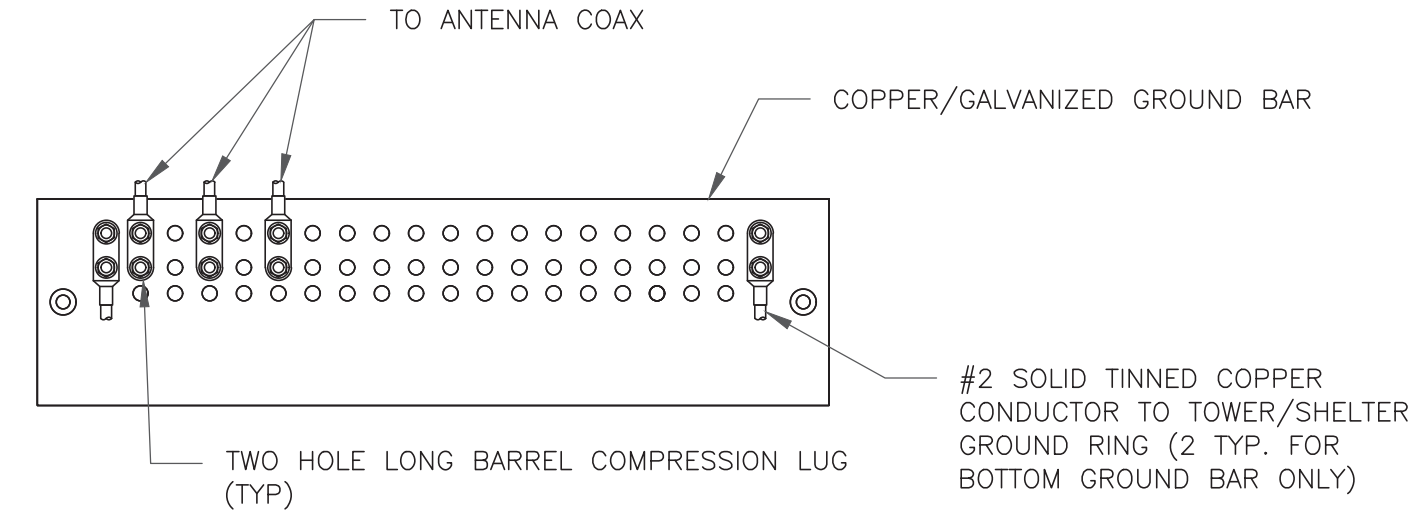
**1** ANTENNA GROUNDING DIAGRAM  
SCALE: NOT TO SCALE



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.

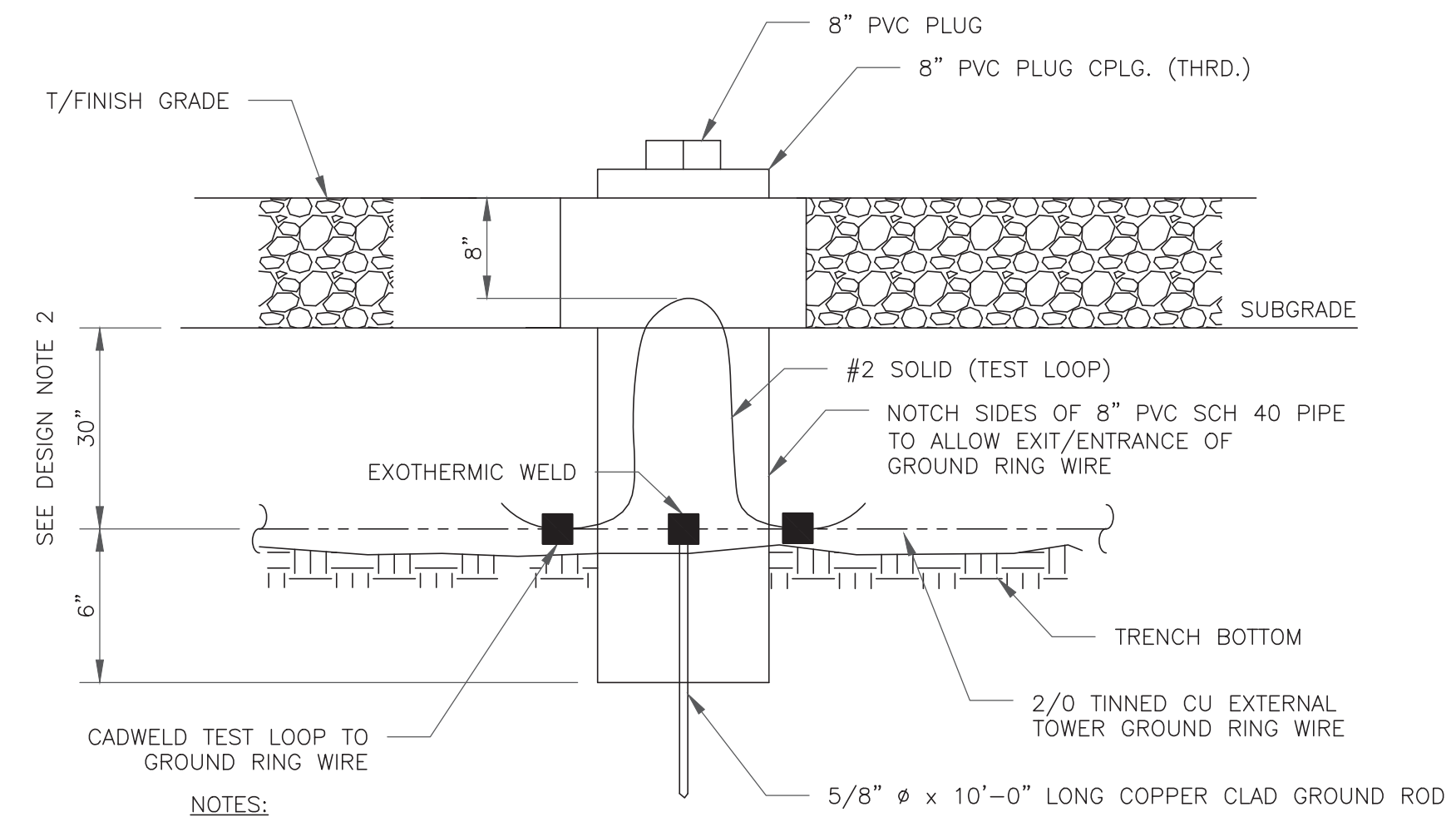
1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



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.

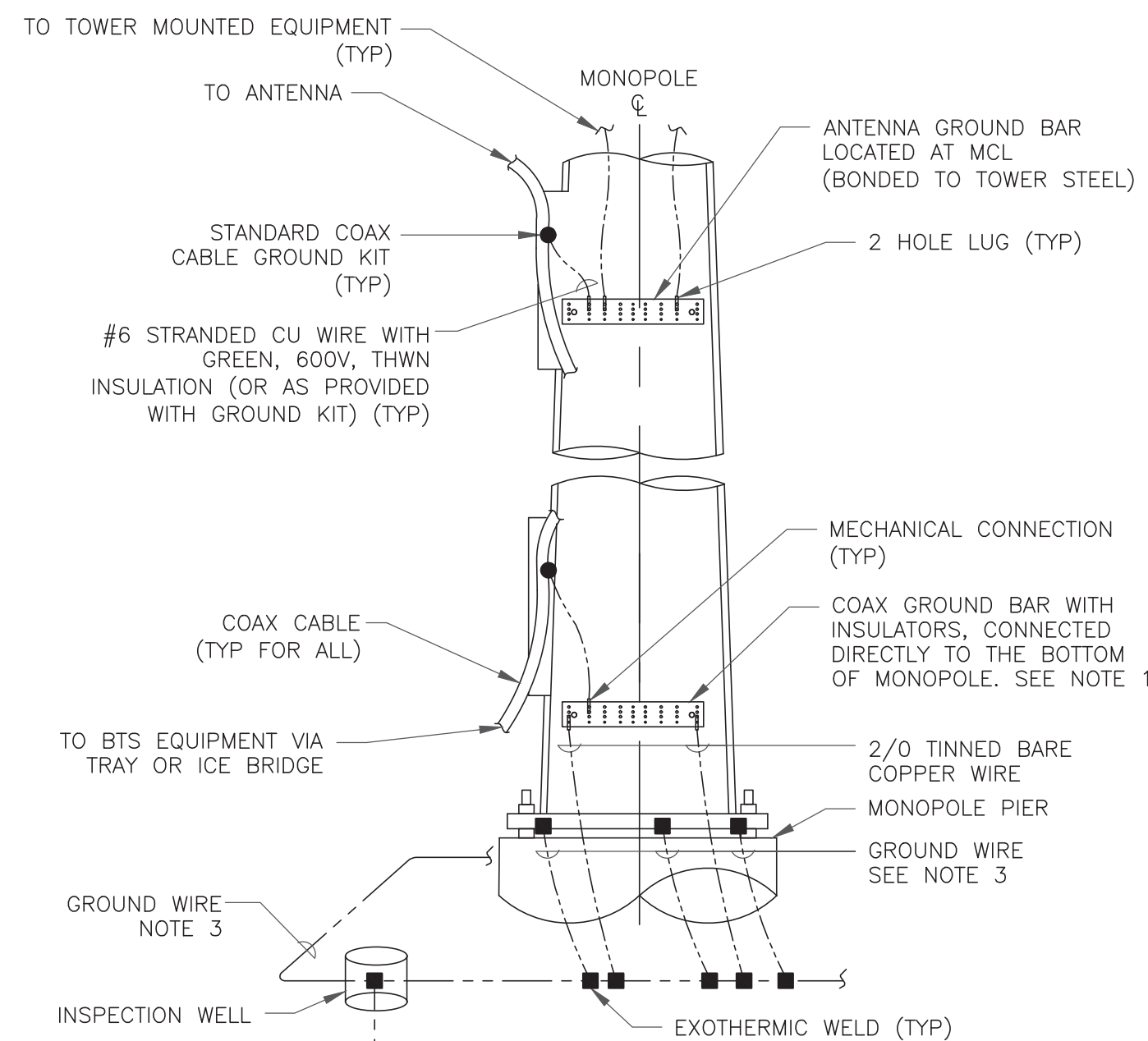
2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE



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).

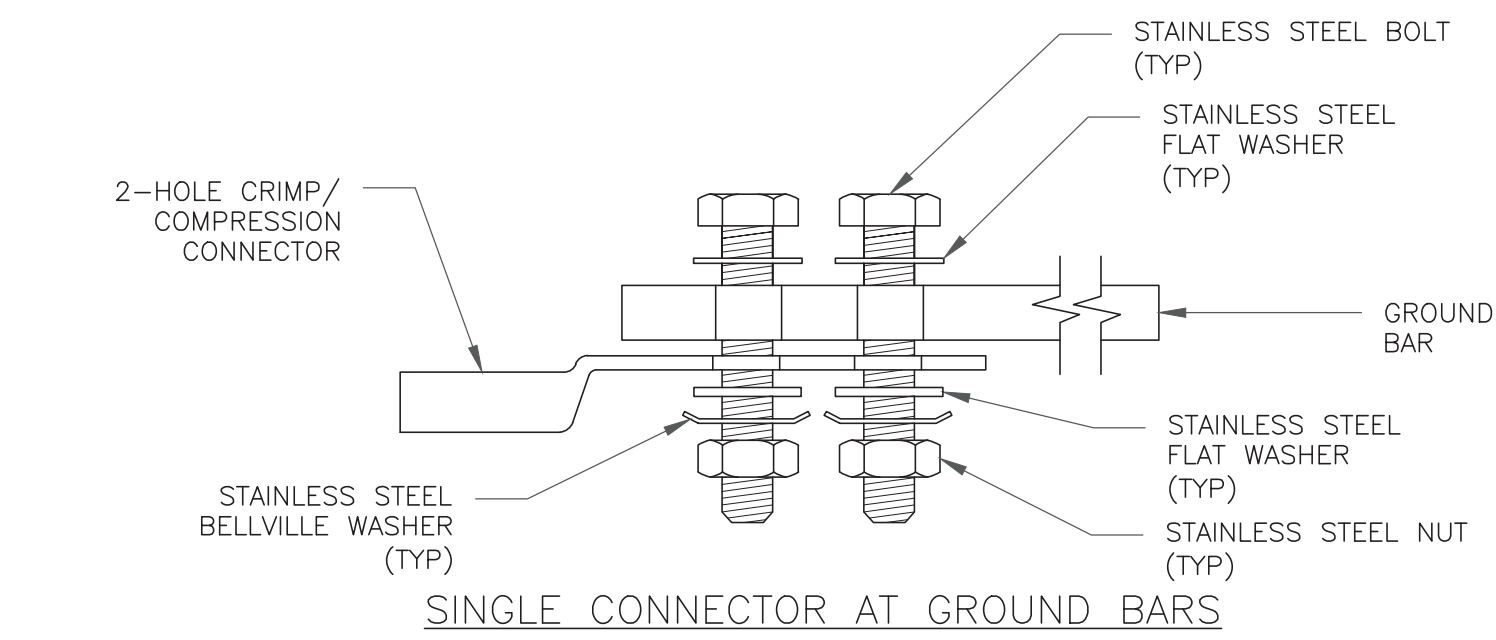
3 INSPECTION WELL DETAIL  
SCALE: NOT TO SCALE



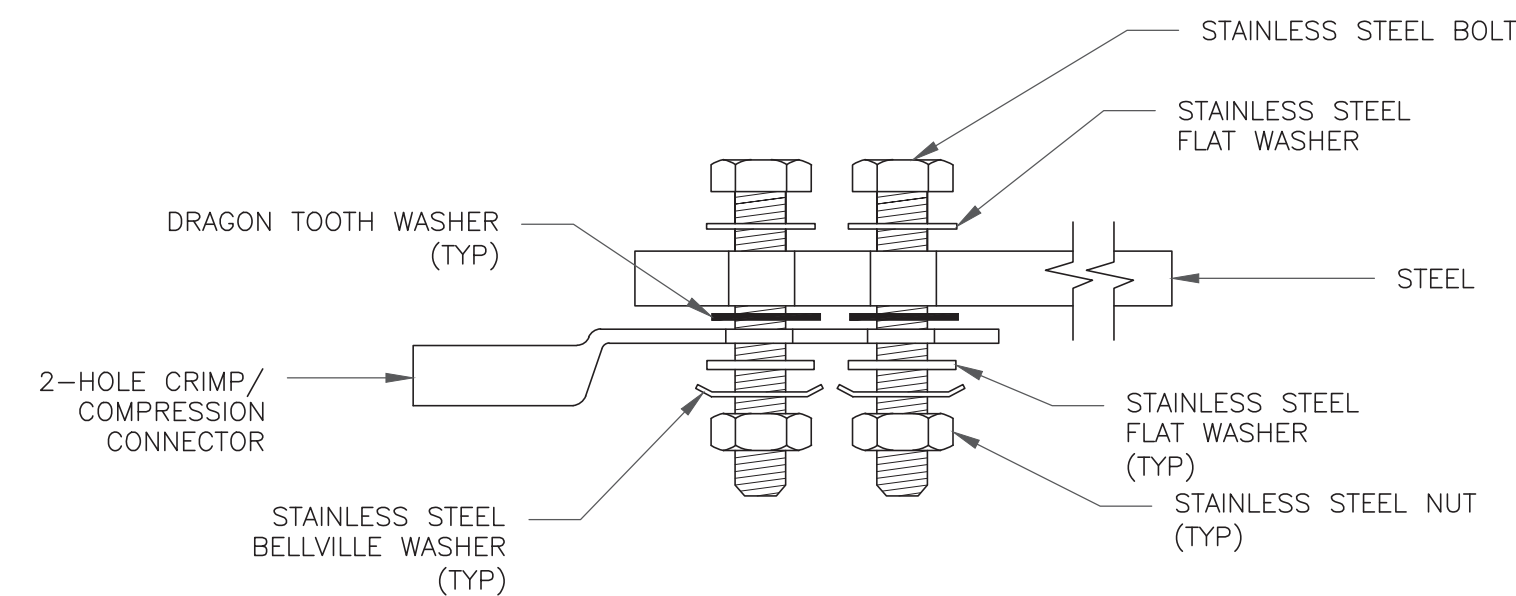
NOTES:

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.

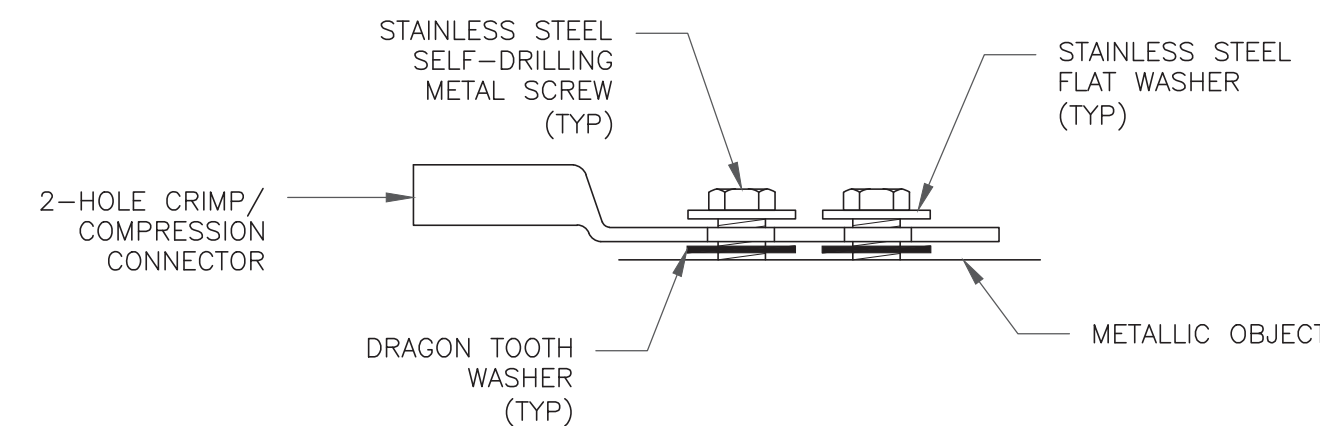
4 TYPICAL ANTENNA CABLE GROUNDING  
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

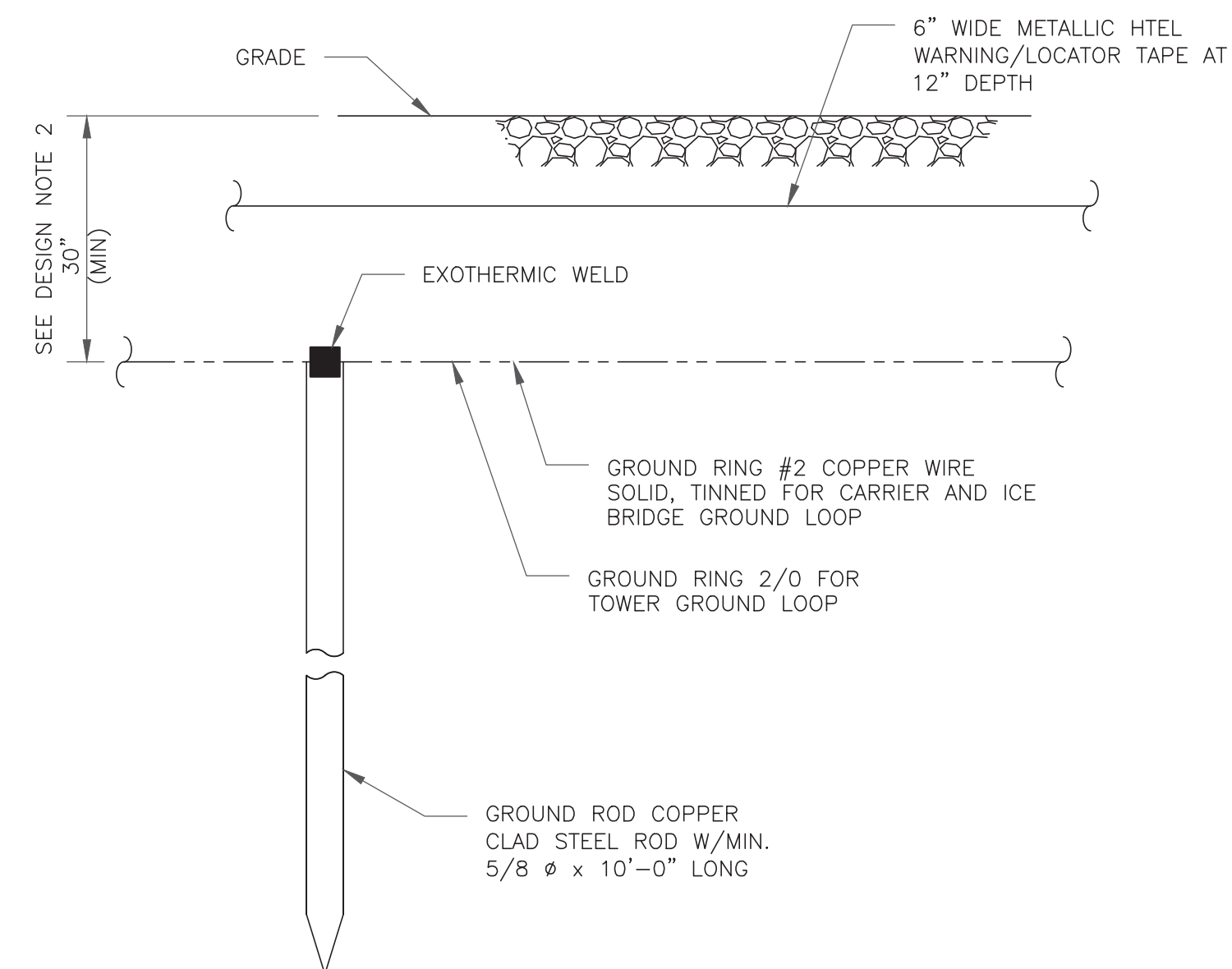


SINGLE CONNECTOR AT STEEL OBJECTS



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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T-MOBILE SITE NUMBER:  
**CT11845A**

BU #: 842861  
**EAST HARTFORD  
HOCHANUM**

223 BRAINARD ROAD  
HARTFORD, CT 06114

EXISTING  
96'-10" MONOPOLE

ISSUED FOR:

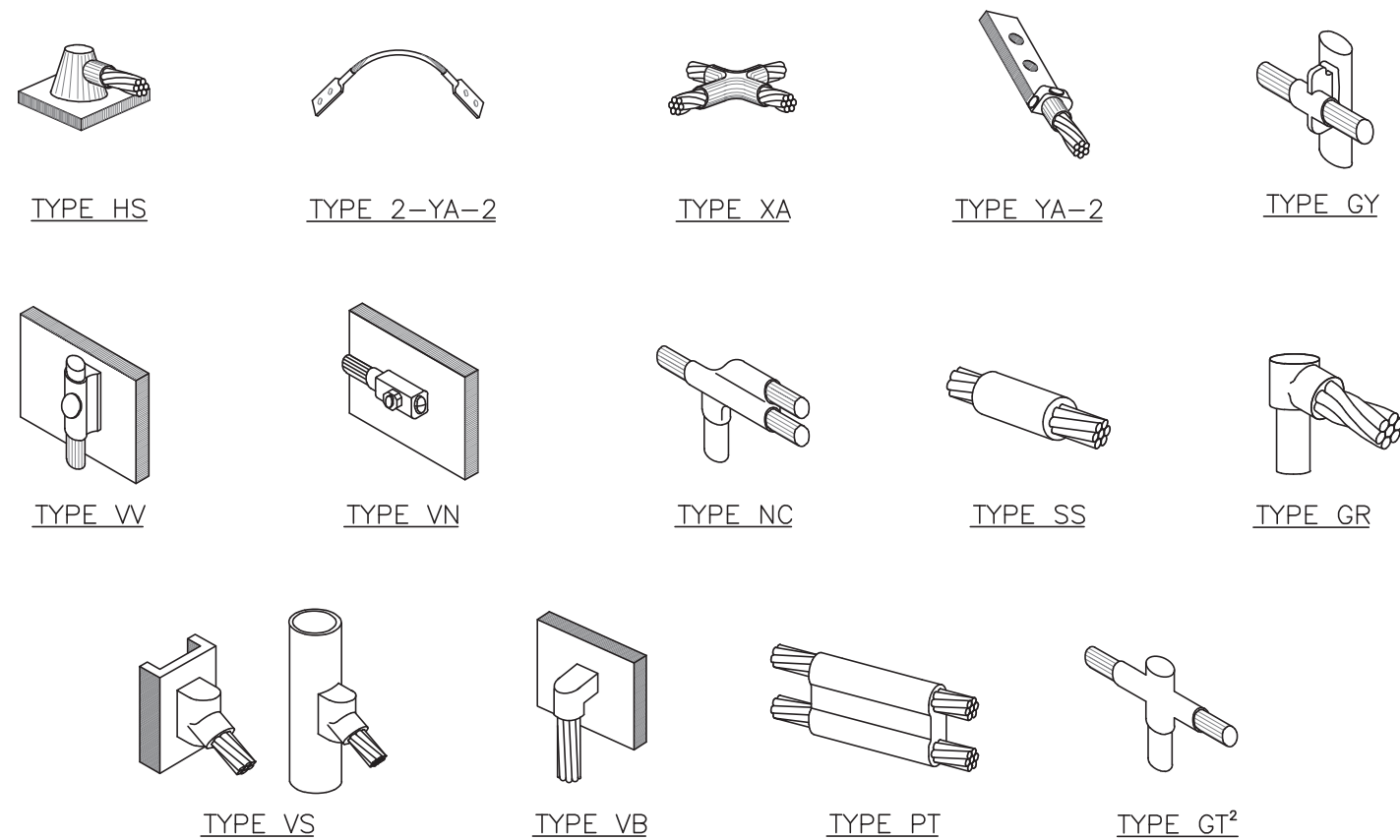
REV	DATE	DRWN	DESCRIPTION	DES./QA
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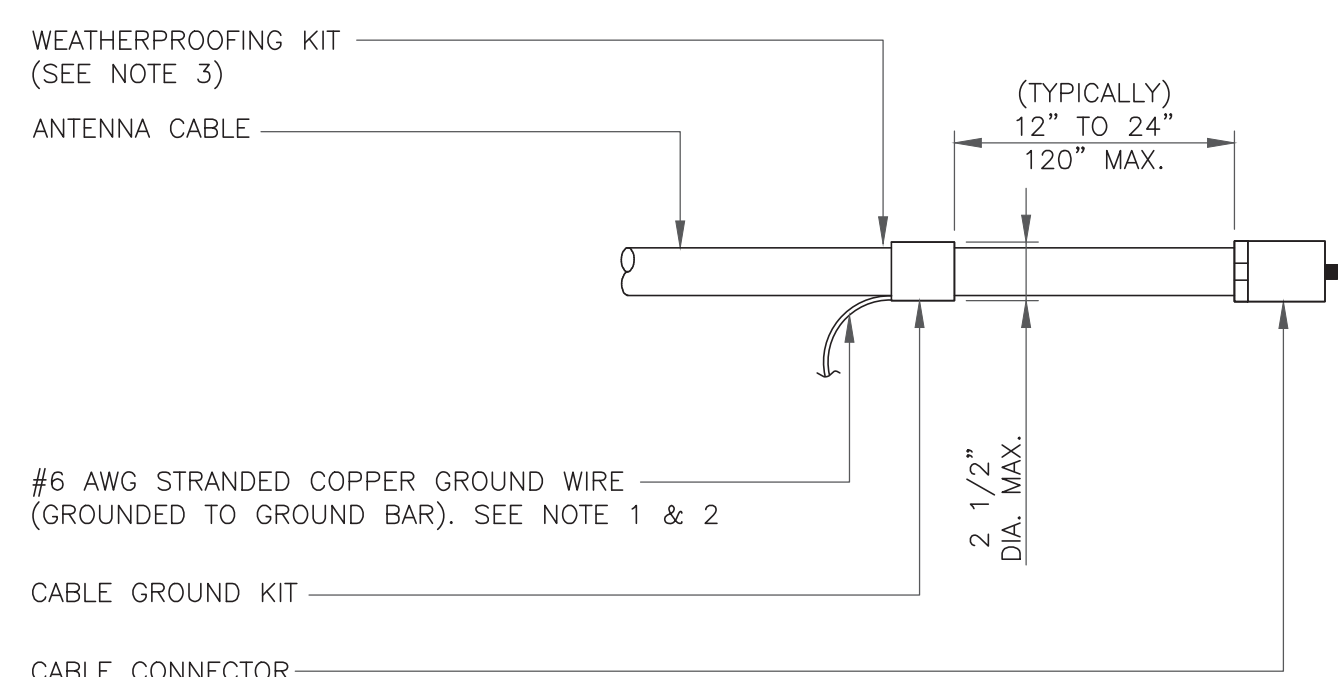
SHEET NUMBER: **G-2** REVISION: **0**



**NOTE:**

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

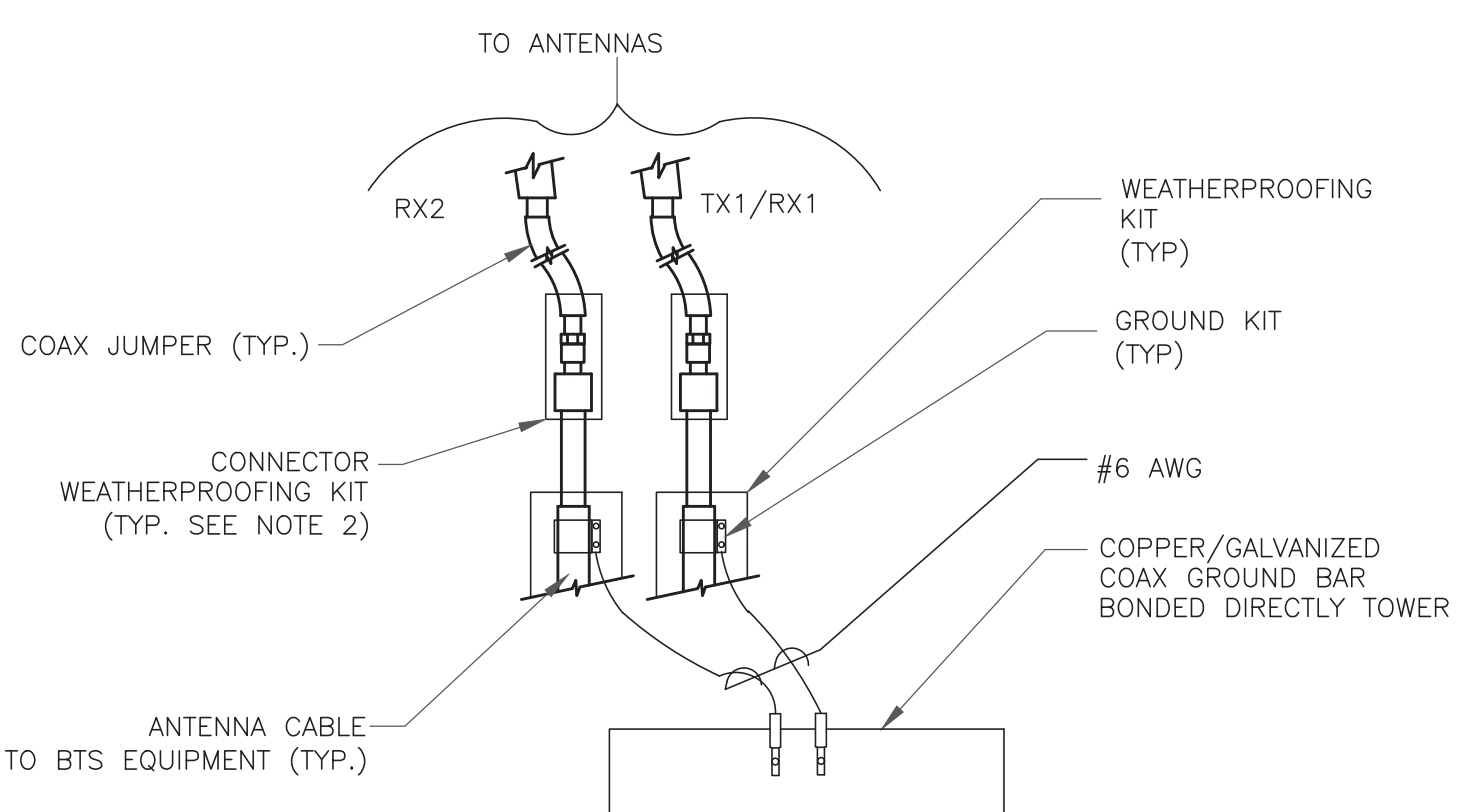
**1 CADWELD GROUNDING CONNECTIONS**  
SCALE: NOT TO SCALE



**NOTES:**

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

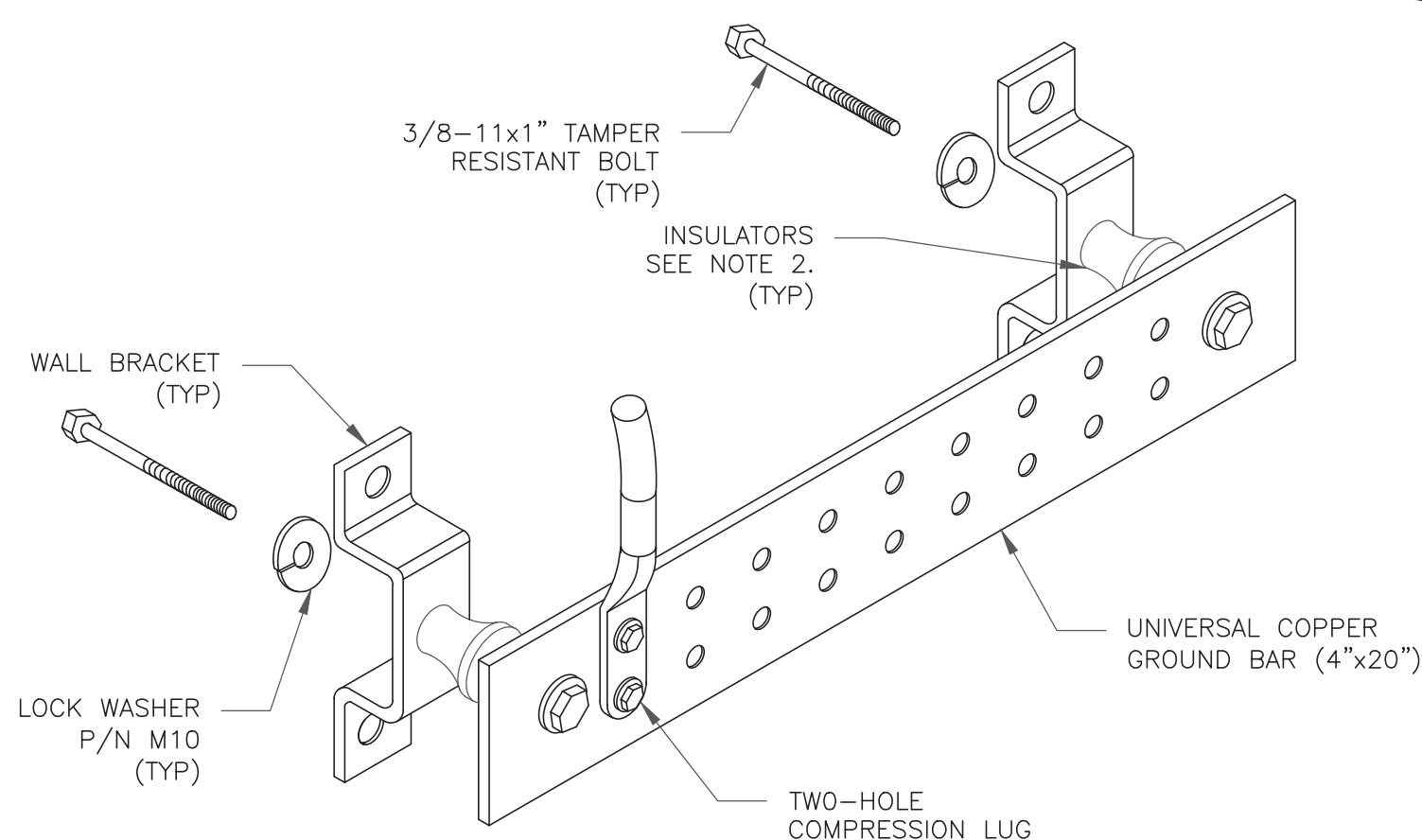
**3 CABLE GROUND KIT CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

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

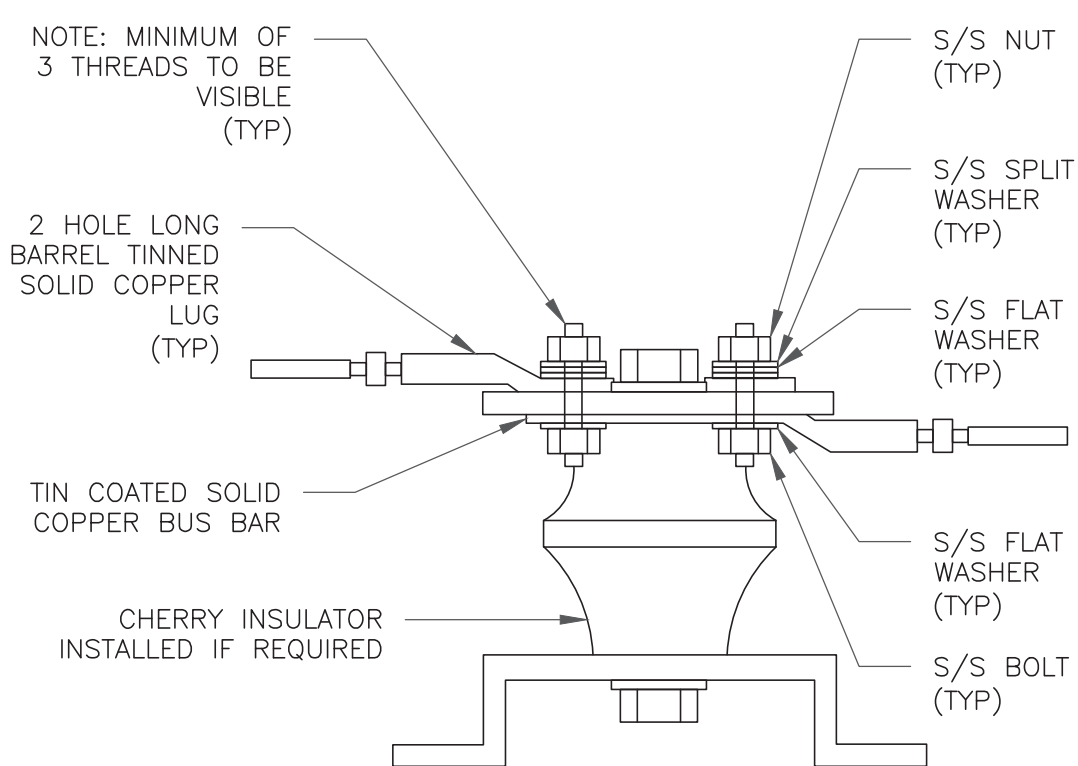
**4 GROUND CABLE CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

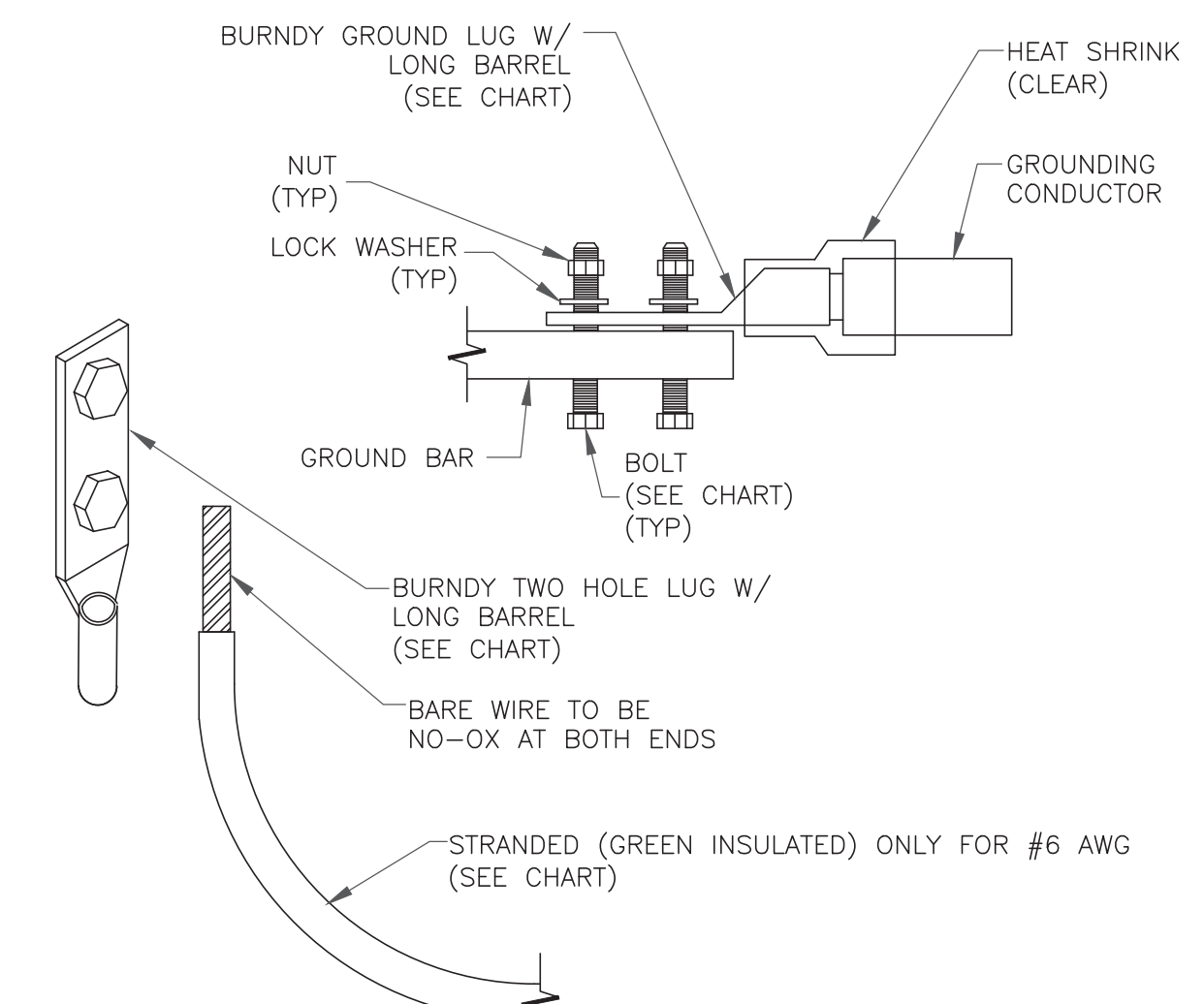
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR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

**6 GROUND BAR DETAIL**  
SCALE: NOT TO SCALE



**7 LUG DETAIL**  
SCALE: NOT TO SCALE

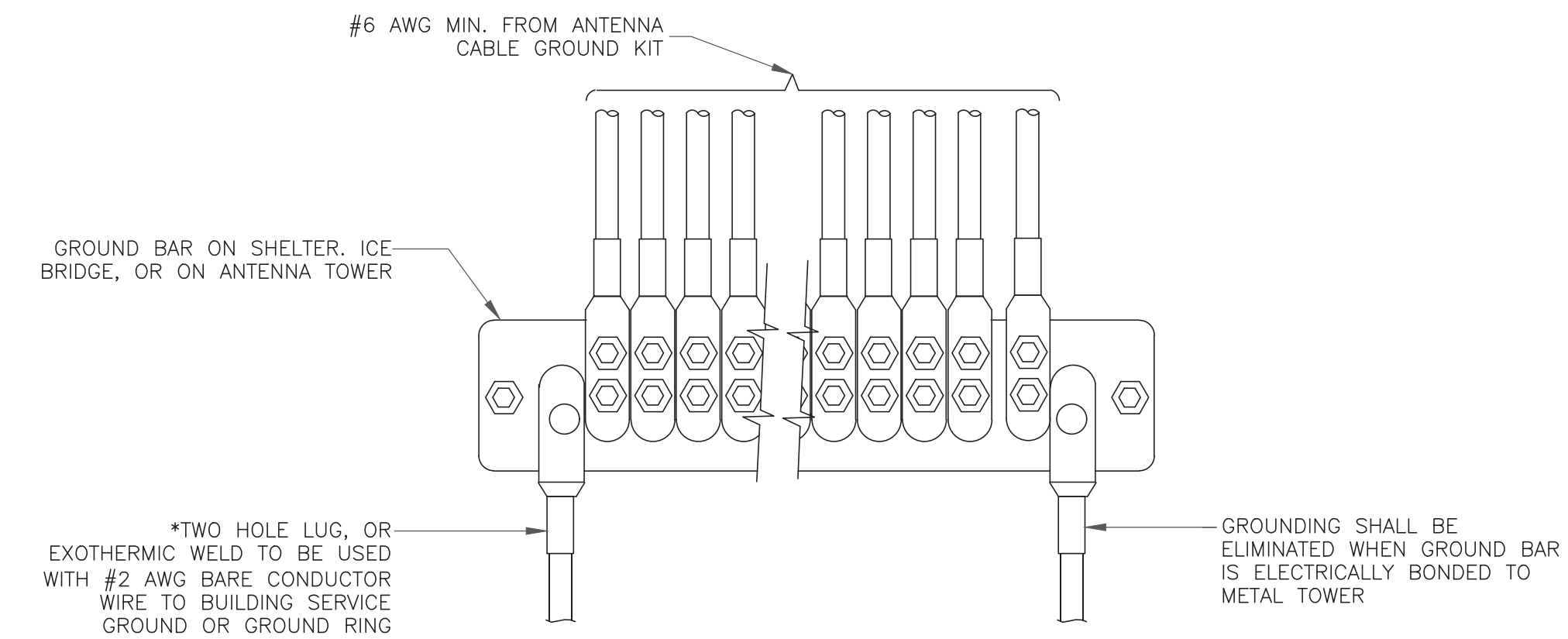
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



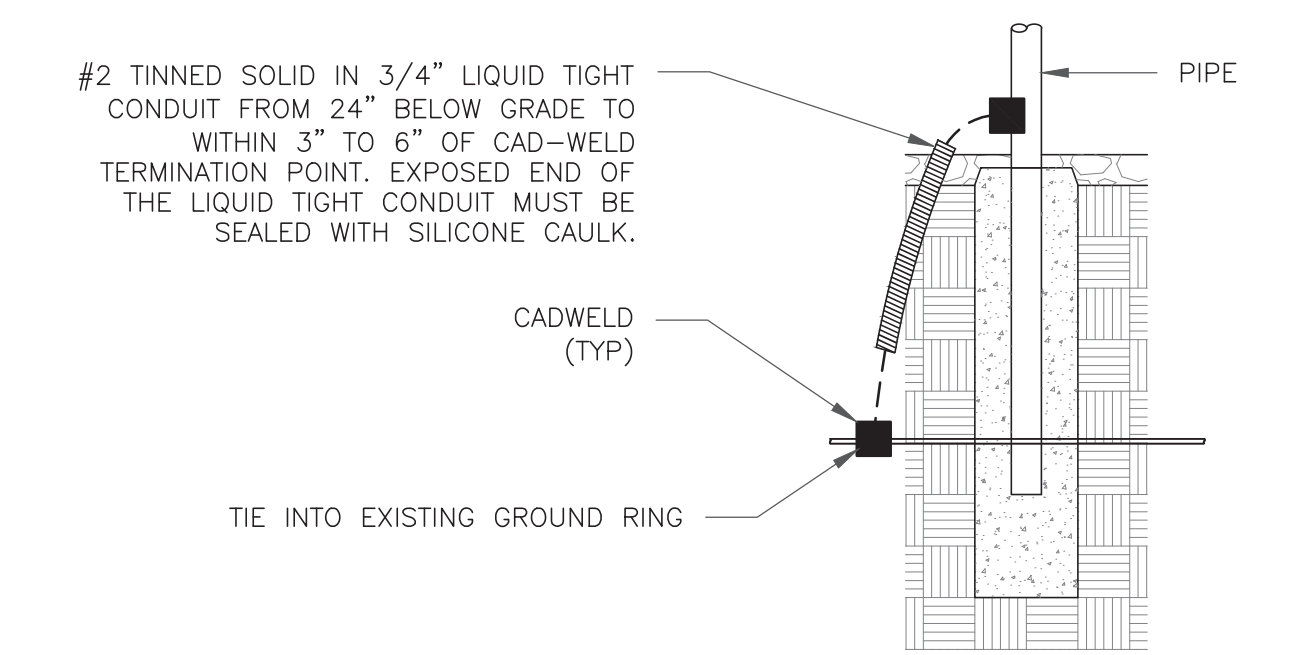
**NOTES:**

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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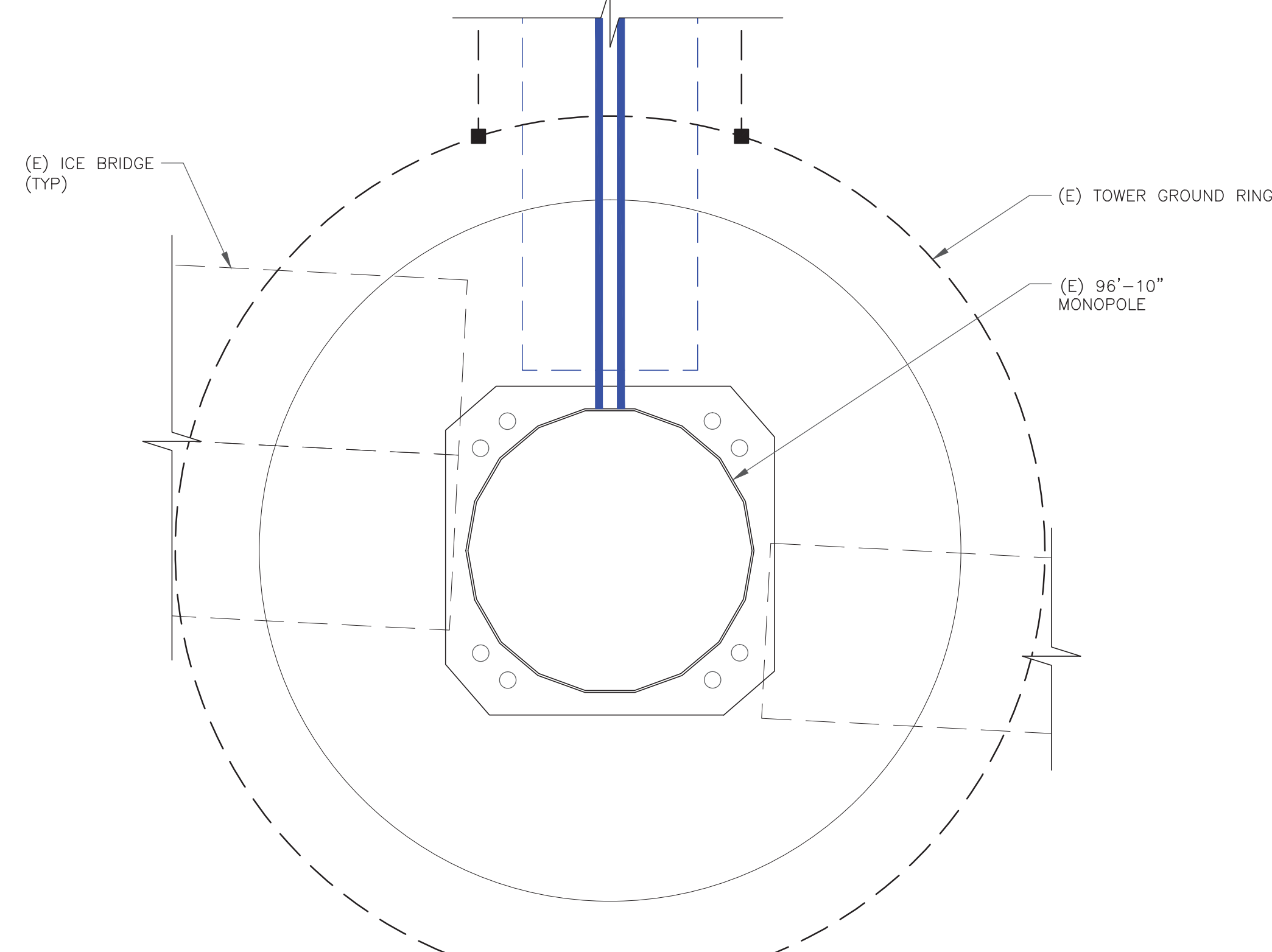
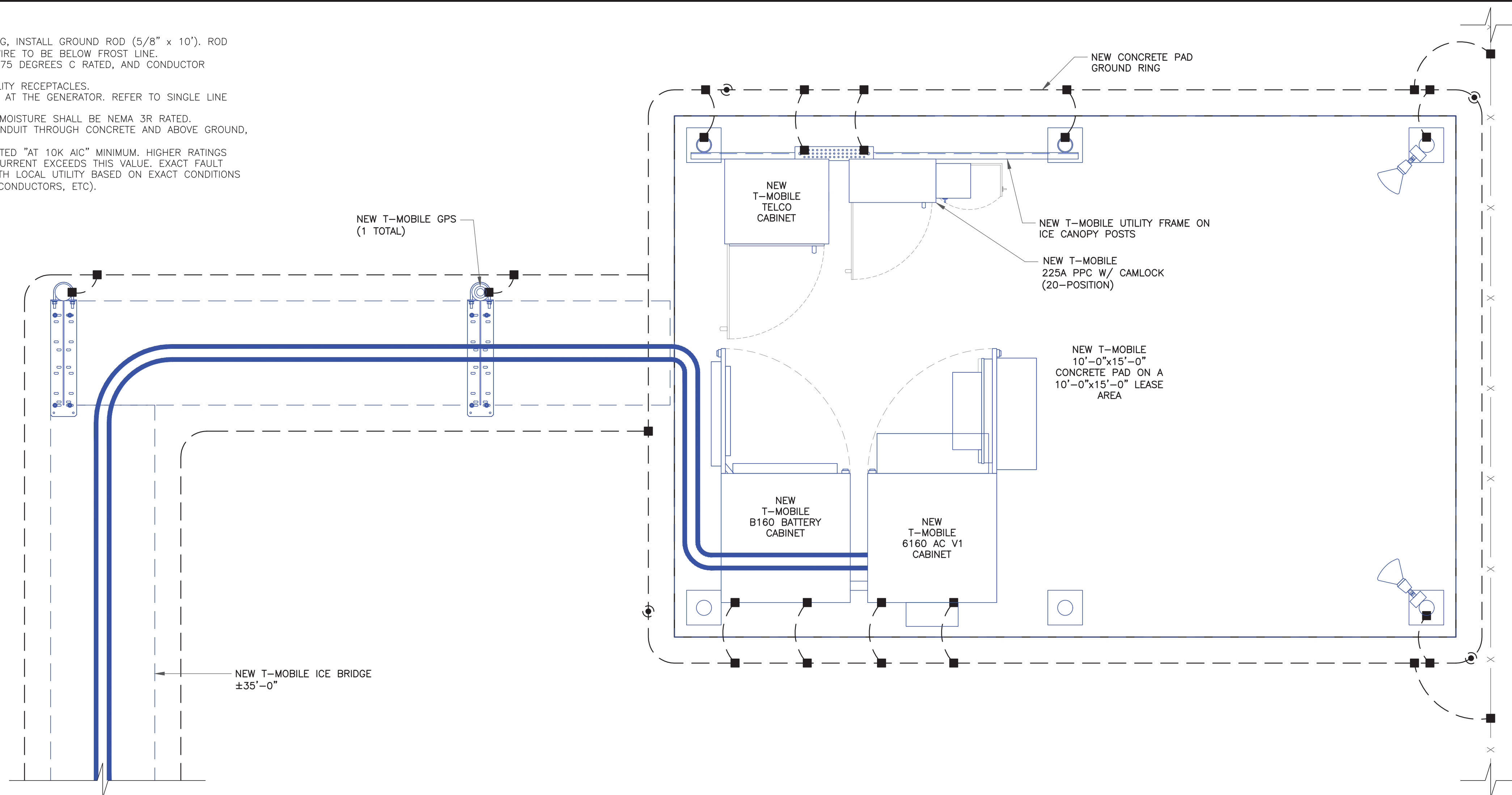
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SHEET NUMBER: **G-3** REVISION: **0**

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**GROUNDING NOTES:**

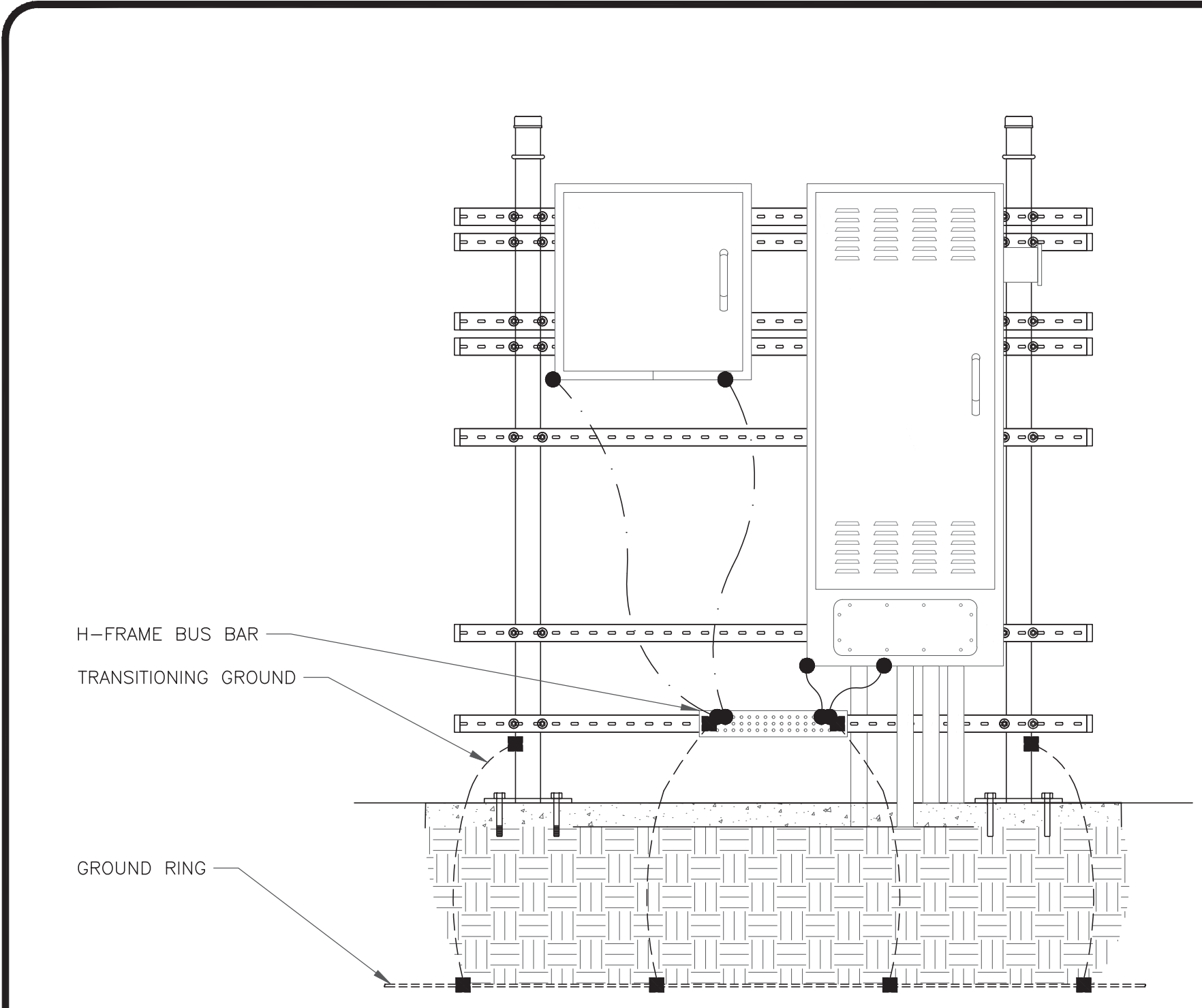
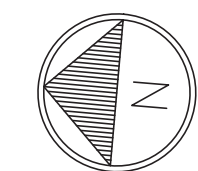
1. IF MORE THAN 20' FROM EXISTING GROUND RING, INSTALL GROUND ROD (5/8" x 10'). ROD SPACING: 8' MAX. TOP OF ROD AND GROUND WIRE TO BE BELOW FROST LINE.
2. ALL GROUND CONDUCTORS SHALL BE COPPER, 75 DEGREES C RATED, AND CONDUCTOR INSULATION BE THWN OR THHN.
3. GROUND FAULT PROTECTION REQUIRED FOR UTILITY RECEPTACLES.
4. GENERATOR NEUTRAL SHALL NOT BE GROUNDED AT THE GENERATOR. REFER TO SINGLE LINE DETAIL, SHEET E-1.
5. EQUIPMENT LOCATED OUTSIDE OR EXPOSED TO MOISTURE SHALL BE NEMA 3R RATED.
6. CONTRACTOR SHALL USE SCHEDULE 80 PVC CONDUIT THROUGH CONCRETE AND ABOVE GROUND, UNLESS OTHERWISE NOTED.
7. ALL NEWLY INSTALLED EQUIPMENT SHALL BE RATED "AT 10K AIC" MINIMUM. HIGHER RATINGS SHALL BE REQUIRED WHERE AVAILABLE FAULT CURRENT EXCEEDS THIS VALUE. EXACT FAULT CURRENT AVAILABLE SHALL BE COORDINATED WITH LOCAL UTILITY BASED ON EXACT CONDITIONS (XFMR SIZE, PERCENT IMPEDANCE, LENGTH OF CONDUCTORS, ETC).



**GROUNDING PLAN LEGEND:**

- GROUND WIRE
- EXOTHERMIC WELD
- MECHANICAL CONNECTION
- ⊙ GROUND ROD
- ⊗ TEST GROUND ROD WITH INSPECTION SLEEVE
- #6 AWG STRANDED & INSULATED
- - - #2 AWG SOLID COPPER TINNED
- #2 AWG STRANDED & INSULATED

1 GROUNDING SCHEMATIC  
SCALE: 1" = 6'-0" (FULL SIZE)  
3/4" = 1'-0" (11x17)  
3/8" = 1'-0" (11x17)



2 H-FRAME GROUNDING SCHEMATIC  
SCALE: NOT TO SCALE

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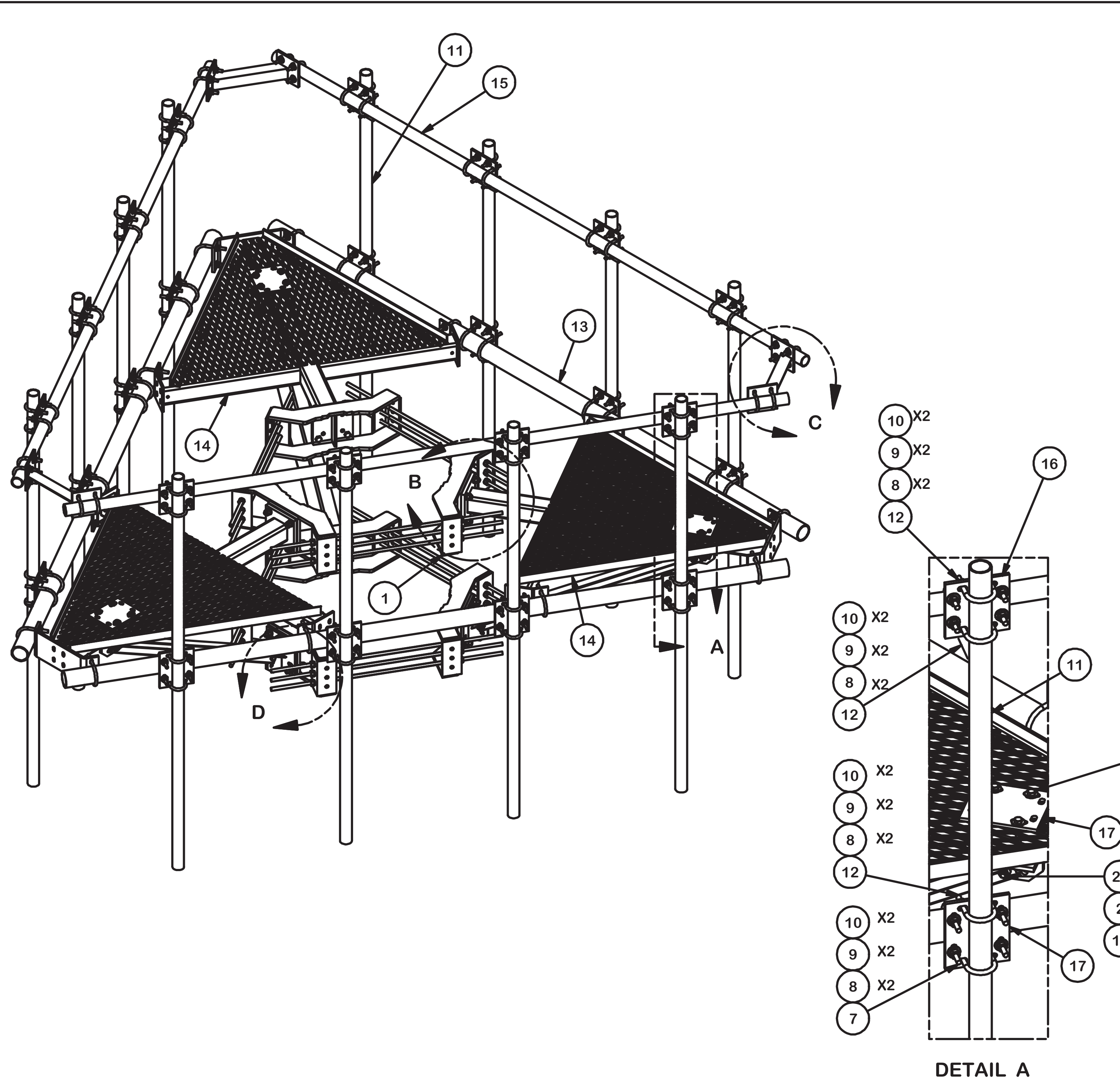
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Expires 3/31/24

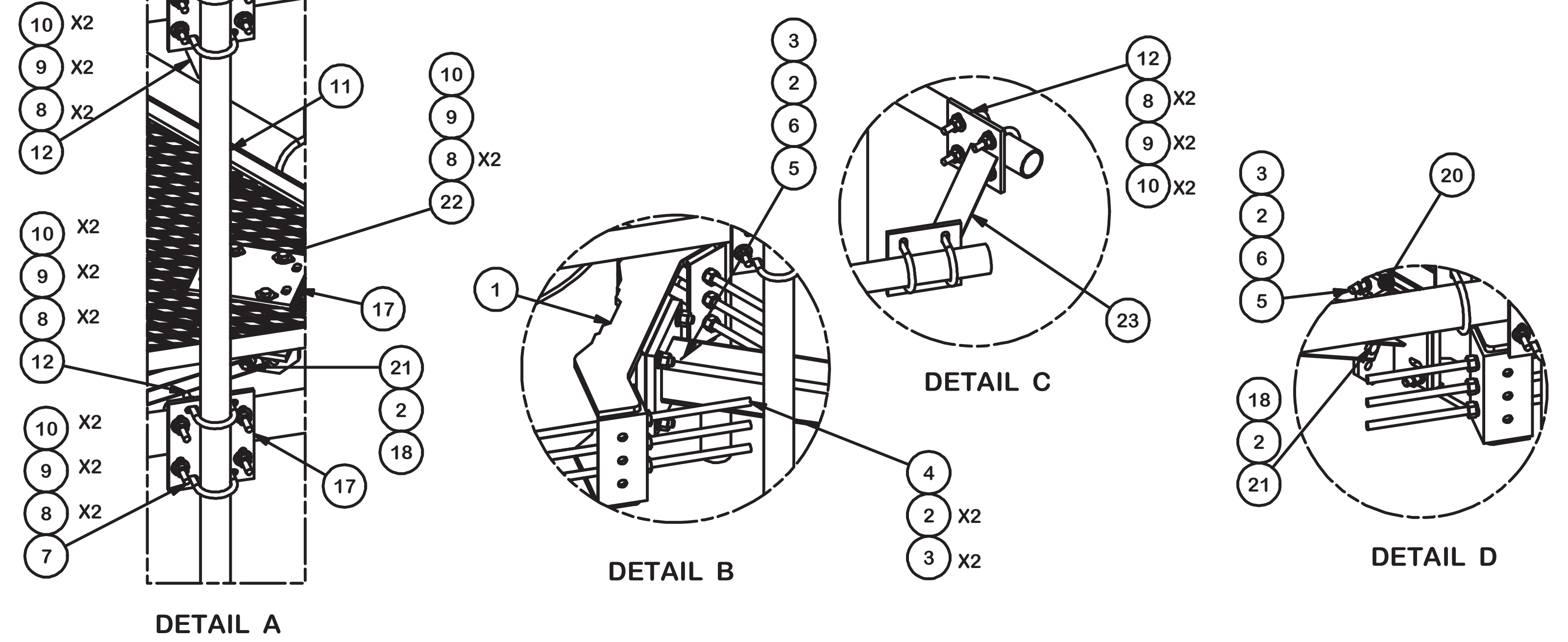
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: **G-4** REVISION: **0**

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PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMENT		68.81	412.85
2	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
3	60	A58NUT	5/8" HDG A325 HEX NUT		0.13	7.79
4	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		2.09	37.63
4	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		4.18	75.27
5	24	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	8.54
6	24	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.82
7	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.83	29.82
8	264	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	9.00
9	252	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	3.50
10	252	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	18.05
11	12	P296	2-3/8" X 96" SCH. 40 GALVANIZED PIPE	96 in	30.76	369.08
12	84	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	52.51
13	3	P3150	3-1/2" X 150" (3" SCH 40) GALVANIZED PIPE	150 in	94.80	284.40
14	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
15	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
16	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
17	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
18	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
19	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
20	6	X-TBW	T-BRACKET WELDMENT		13.60	81.60
21	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
22	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	5 1/2 in	0.41	4.91
23	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
					TOTAL WT. #	2445.81



REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
B	RELOCATED MOUNT PIPE POSITIONS	4488	JET	5/23/2021
A	CHANGED X-253992 TO X-TBW	4488	CEK	9/20/2018
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				

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

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

DESCRIPTION 12' 6" LOW PROFILE PLATFORM WITH TWELVE 2-3/8" ANTENNA MOUNTING PIPES, AND SUPPORT RAIL			
CPD NO. 4488	DRAWN BY CEK 7/14/2014	ENG. APPROVAL	
CLASS 81	SUB 02	DRAWING USAGE CUSTOMER	CHECKED BY BMC 7/14/2014

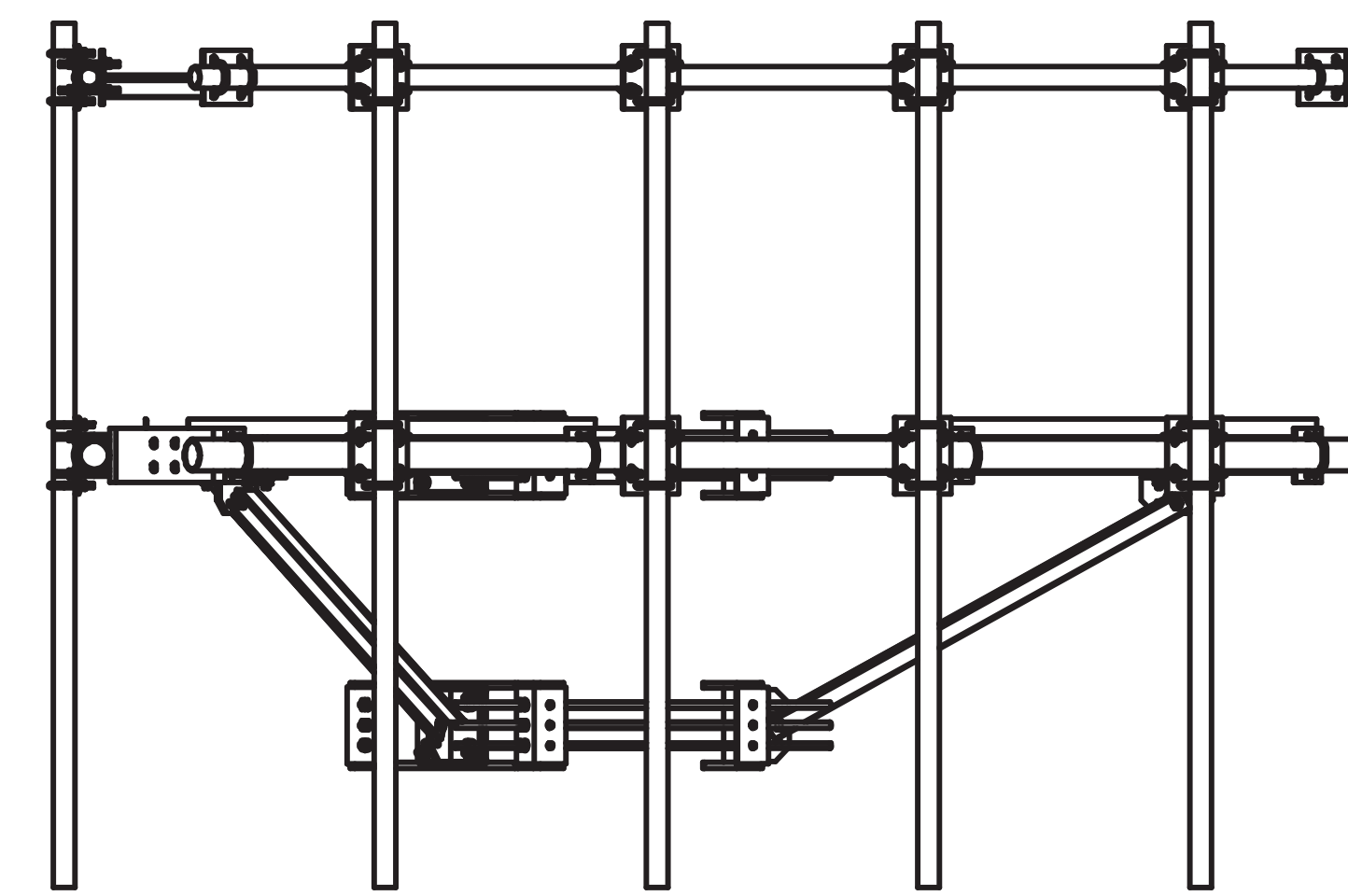
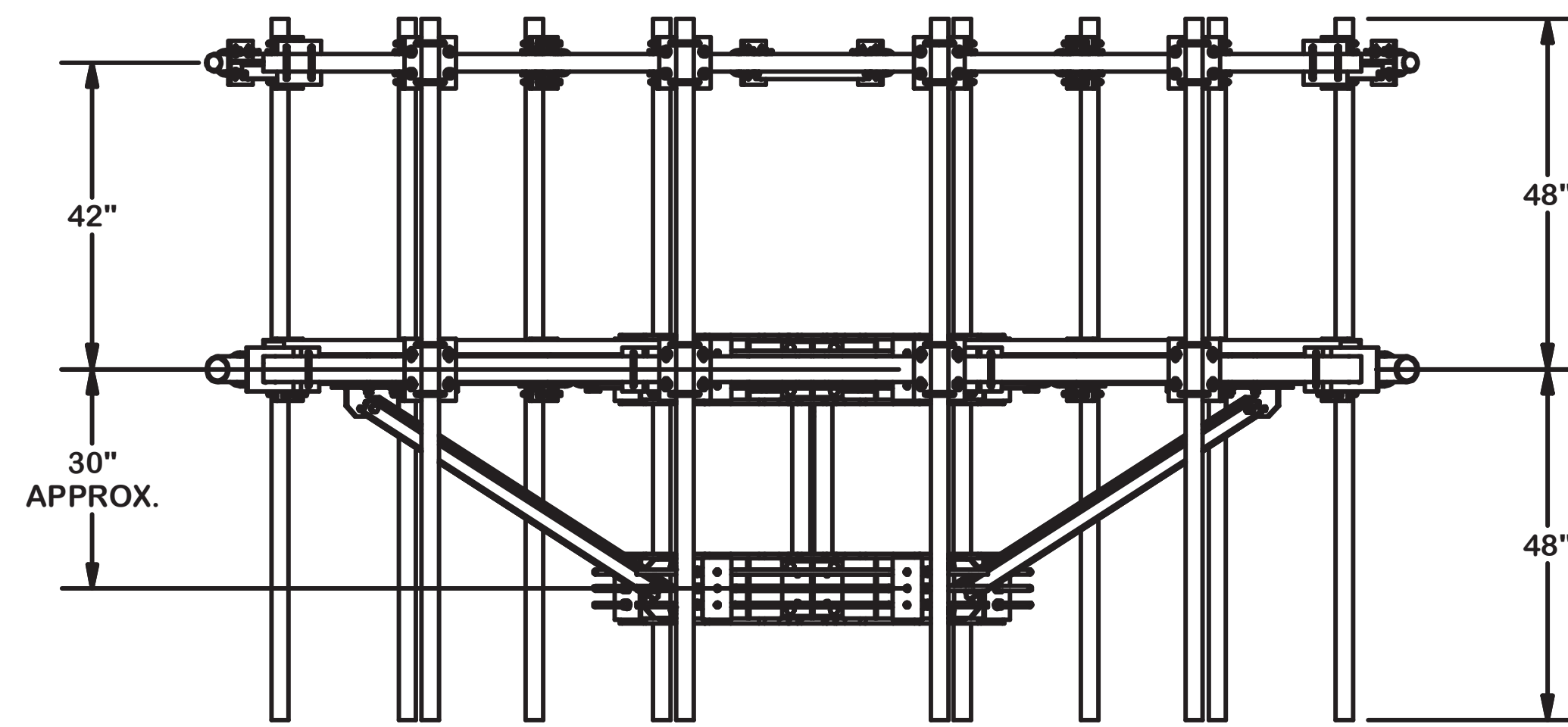
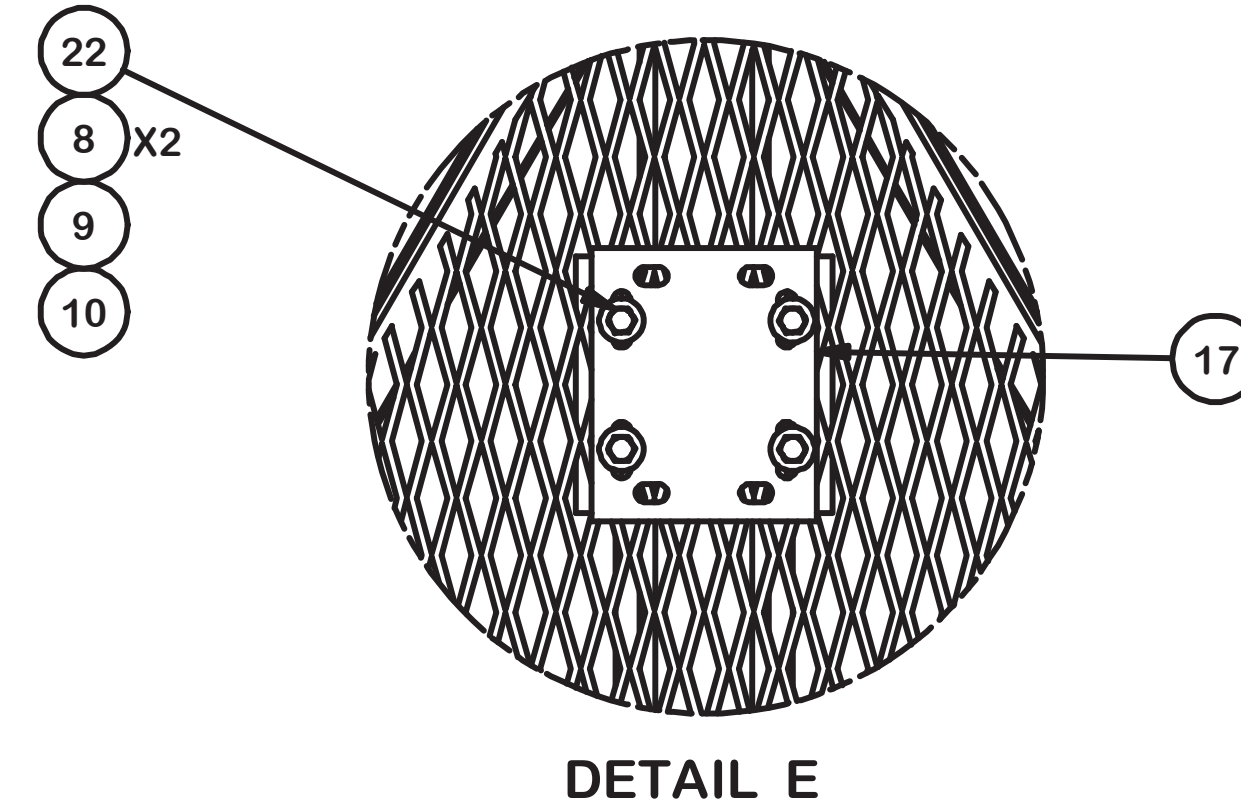
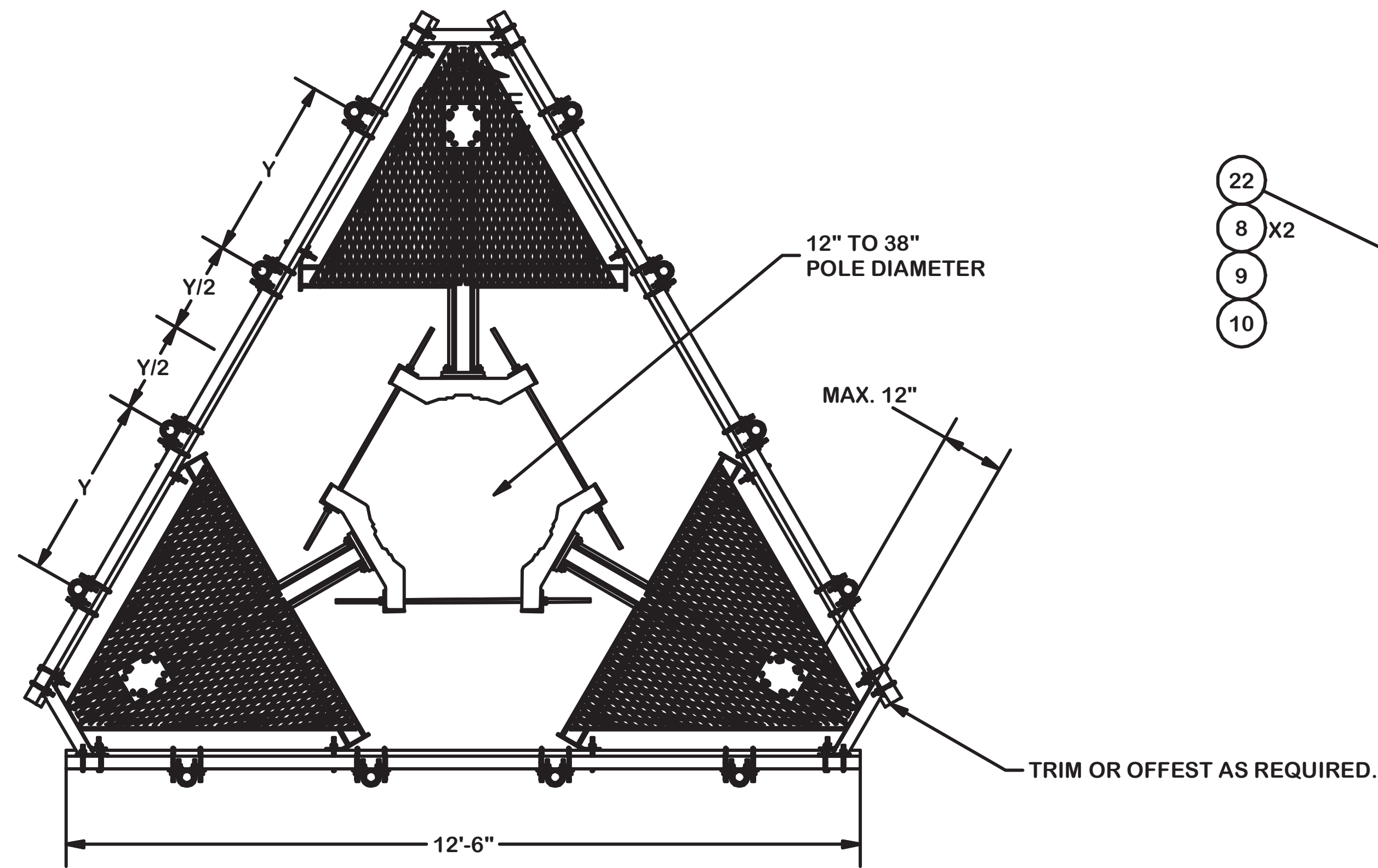
**Engineering Support Team:**  
1-888-753-7446

A valmont COMPANY

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

PART NO. <b>RMQP-496-HK</b>	1 PAGE OF 3
DWG. NO. <b>RMQP-496-HK</b>	





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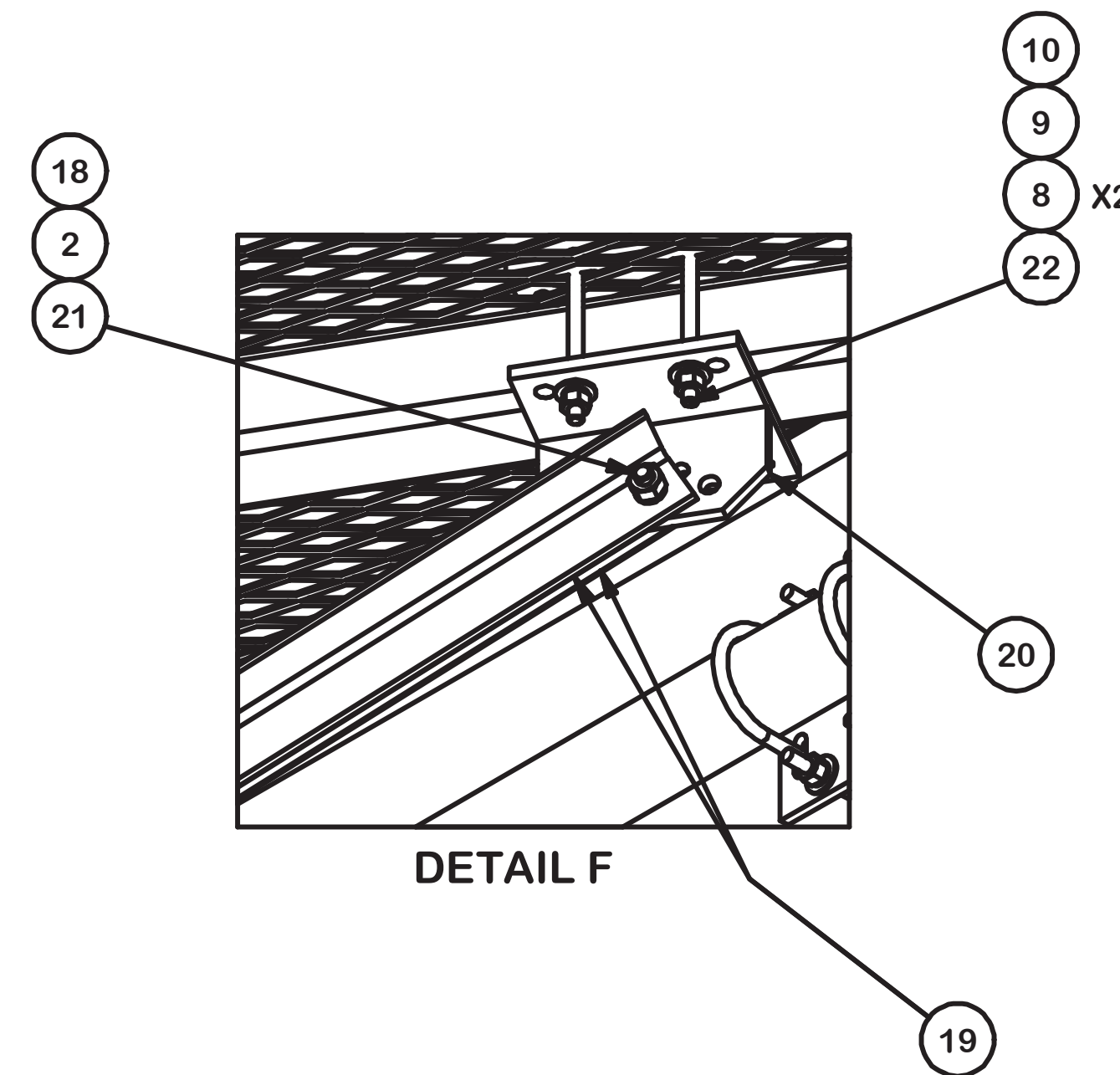
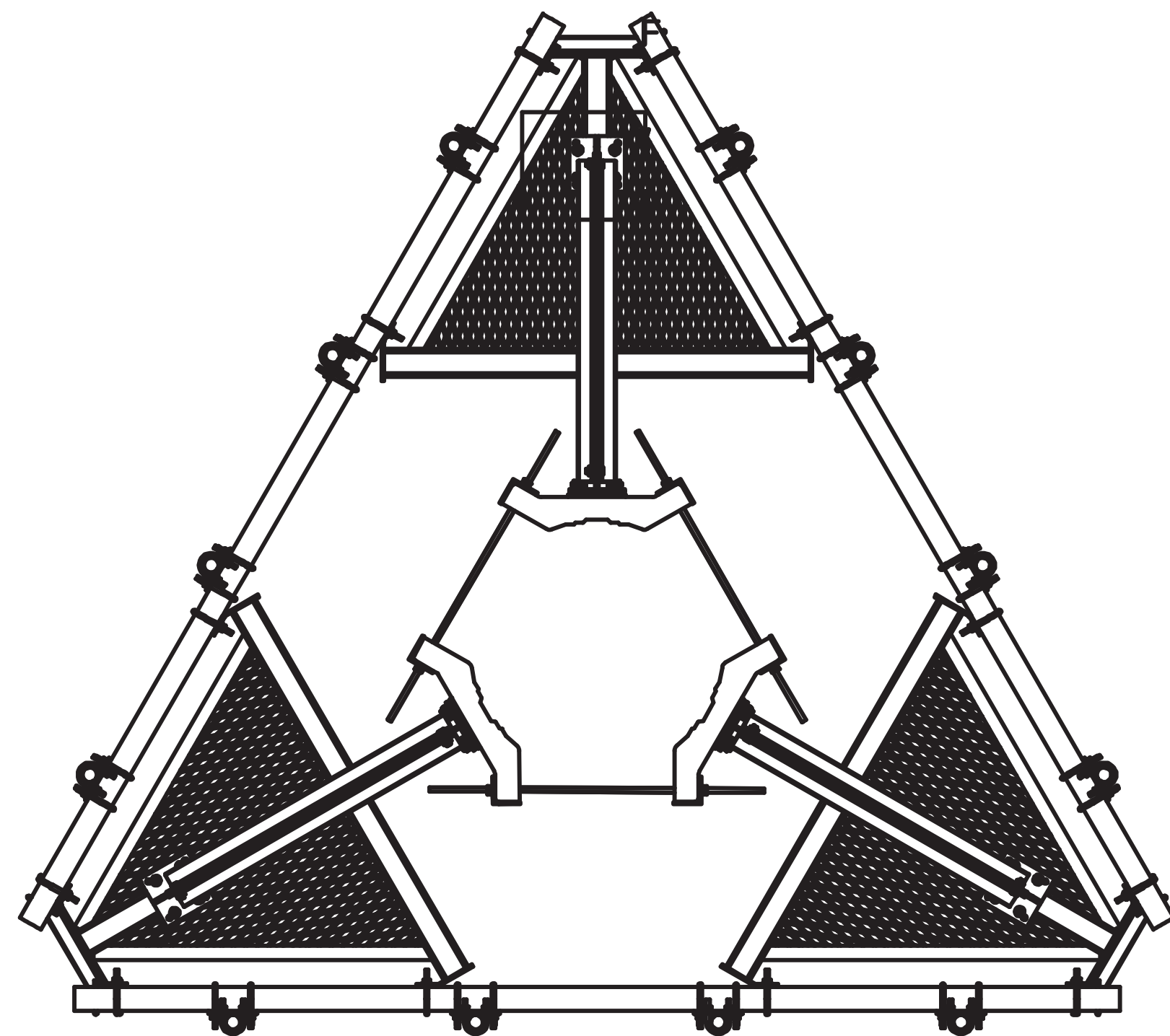
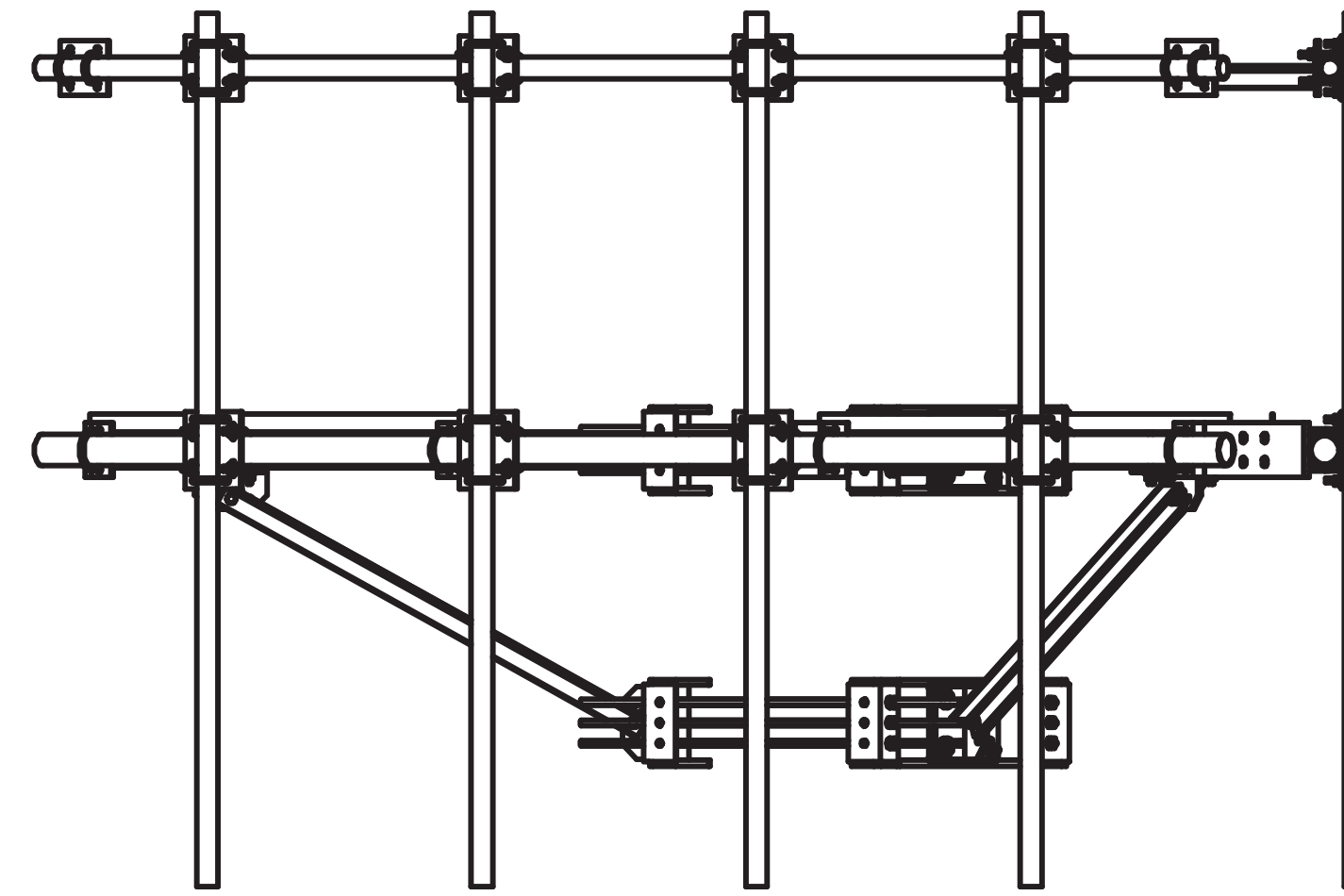
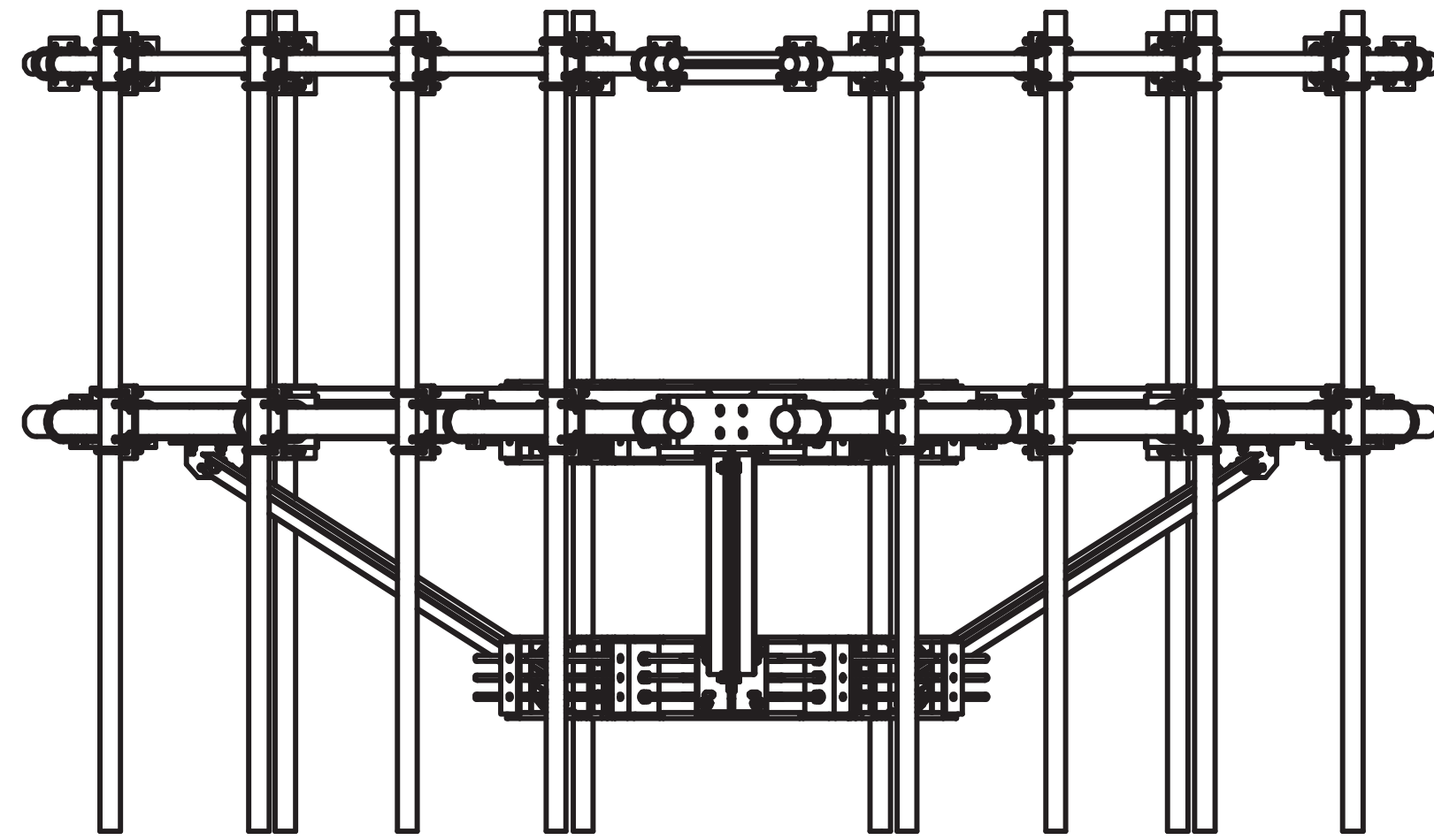
DESCRIPTION  
 12' 6" LOW PROFILE PLATFORM  
 WITH TWELVE 2-3/8" ANTENNA MOUNTING  
 PIPES, AND SUPPORT RAIL

**SITE PRO 1**  
 A valmont COMPANY  
 Engineering Support Team:  
 1-888-753-7446  
 Locations:  
 New York, NY  
 Atlanta, GA  
 Los Angeles, CA  
 Plymouth, IN  
 Salem, OR  
 Dallas, TX

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
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REVISION HISTORY				

CPD NO.	DRAWN BY	ENG. APPROVAL
4488	CEK 7/14/2014	
CLASS	SUB	DRAWING USAGE
81	02	CUSTOMER
CHECKED BY	DATE	
BMC	7/14/2014	

PART NO.	DWG. NO.
RMQP-496-HK	RMQP-496-HK



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PART NO.

**RMQP-496-HK**

DWG. NO.

**RMQP-496-HK**

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BMC 7/14/2014		

PART NO.	<b>RMQP-496-HK</b>
DWG. NO.	<b>RMQP-496-HK</b>

THIS CHECK PRINTED ON DOCCHECK GHOST PAPER AND HAS A GRAPHIC WATERMARK ON REVERSE SIDE

**CROWN CASTLE USA INC.**  
2000 CORPORATE DRIVE  
CANONSBURG PA 15317  
724-416-2000

**JPMorgan Chase Bank, N.A.**  
DALLAS TX  
32-61/1110

**2944339**

SIX HUNDRED TWENTY FIVE AND 00/100\*\*\*\*\*

DATE 03/13/24

\$\*\*\*\*\*625.00

Pay To Connecticut Siting Council  
The Ten Franklin Square  
Order Of New Britain CT 06051

2695915

*Robert A. Celli* VP and Controller  
*[Signature]* Assist. Controller

VOID AFTER 180 DAYS

⑈ 2944339⑈ ⑆ 111000614⑆ 103410453⑈

Check No 2944339  
Check Date 03/13/24  
Stub 1 of 1

CKRQ ZAP 654558 842861	03/11/24	Invoice Summ	625.00	625.00
			625.00	625.00