NOTICE OF MEETING

VILLAGE OF FOX POINT
PLAN COMMISSION

SCHWEMER HALL - MUNICIPAL BLDG.
7200 N. SANTA MONICA BLVD
FOX POINT, WI 53217

MONDAY
November 7, 2022
5:45 P.M.

NOTE: THE VILLAGE BOARD WILL BE MEETING IN PERSON AT VILLAGE HALL, WITH A REMOTE ATTENDANCE OPTION, PER THE HYBRID MEETING PROCEDURES FURTHER DESCRIBED IN SECTION 19-32 D. OF THE VILLAGE CODE. THIS MEETING IS OPEN TO ALL CITIZENS IN PERSON AT VILLAGE HALL, OR THROUGH THE ZOOM PARTICIPANT INFORMATION SHOWN BELOW, SUBJECT TO THE FOLLOWING: NO ASSURANCE IS PROVIDED TO THOSE PLAN COMMISSION MEMBERS AND CITIZENS INTENDING TO ATTEND REMOTELY THAT THE TECHNOLOGY WILL PERFORM SUFFICIENTLY TO ALLOW FOR THEIR PARTICIPATION AND THE MEETING WILL PROCEDE REGARDLESS. PUBLIC OFFICIALS AND CITIZENS WISHING TO ENSURE THEY CAN PARTICIPATE ARE ENCOURAGED TO ATTEND IN PERSON. CITIZENS ARE ENCOURAGED TO SUBMIT ANY COMMENTS IN WRITING IN ADVANCE OF THE MEETING TO THE VILLAGE MANAGER AT sbotcher@villageoffoxpoint.com

Zoom Participant Information
https://us02web.zoom.us/j/85692645334
Dial: (312) 626-6799
Meeting ID: 856 9264 5334

AGENDA

1. **Roll Call.**

2. **Approval of the minutes of the October 3, 2022 Plan Commission/Building Board meeting.**

3. **Review and Recommendation Re**: **a minor modification to the exiting Wireless facility at 8615 N Port Washington Road.**

   The Plan Commission will discuss and may make a recommendation to the Village Board regarding Crown Castle's application for a minor modification to the exiting wireless facility at 8615 N Port Washington Road.

4. **Adjourn**

NEXT PLAN COMMISSION MEETING: **MONDAY, December 5, 2022**

PLEASE NOTE: Upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals through sign language interpreters or other auxiliary aids. For additional information or to request these services, contact the Village Clerk at 351-8900. It is possible that members of, and possibly a quorum of members of, other governmental bodies of the municipality may be in

attendance at the above stated meeting to gather information; no action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice.

VILLAGE OF FOX POINT
PLAN COMMISSION MEETING MINUTES
OCTOBER 3, 2022

A meeting of the Fox Point Plan Commission was held by a combination of in-person and virtual attendance via telephonic and video conferencing on Monday, October 3, 2022. President Frazer called the meeting to order at 5:45 p.m. and noted there was a quorum of Plan Commission members present.

The Plan Commission roll call was taken by Deputy Village Clerk Treasurer Nathan Schafer:

Plan Commission:	President Douglas H. Frazer, Chairman
	Eric Fonstad, Commissioner (via Zoom)
	Robert Smith, Commissioner
	John Crichton, Commissioner
	Russ Yale, Commissioner
	Jay Craig, Commissioner
	William Langhoff, Commissioner
Building Board:	Justin Racinowski, Chairman (via Zoom)
	Sharon Kevil, Member (via Zoom)
	William Feldman, Member (via Zoom)

Staff present included Village Manager Scott Botcher and Village Deputy Clerk Treasurer Nathan Schafer.

Notice of the meeting was provided to the North Shore Now as necessary, and to all others as required by State open meetings laws and posted on the official bulletin board at 7200 N Santa Monica Boulevard, as well as the village website at www.villageoffoxpoint.com, as per 2015 Wisconsin Act 79 and as described in Village Ordinance Chapter 116-2, 116-2(C).

Approval of the Minutes of the September 6, 2022 Plan Commission Meeting

On motion of Chairman Frazer, seconded by Commissioner Crichton, and carried unanimously by roll call vote, the Commission approved the minutes of the September 6, 2022 Plan Commission meeting, approved with amendments.

Review and Recommendation RE: Maple Dale Indian Hill School, 8377 N Port Washington Road

On motion of Commissioner Fonstad, seconded by Commissioner Langhoff, and carried unanimously by roll call vote, the Commission recommended the Village Board approve the playground structures for Maple Dale Indian Hill School, 8377 N Port Washington Road.

Adjourn

On motion of Commissioner Frazer, seconded by Commissioner Smith and carried unanimously by roll call vote, the Plan Commission meeting adjourned at 6:06 p.m.

Respectfully Submitted,

Nathan L. Schafer
Deputy Village Clerk Treasurer

Scott Botcher

From: Eric Larson <elarson@ammr.net>
Sent: Friday, October 14, 2022 10:48 AM
To: Scott Brandmeier; Nathan Schafer; Scott Botcher
Cc: Michael Rakow; Kelly Meyer
Subject: RE: Conditional Use Permit - 8615 N Port Washington Road - Crown Castle

They do need to go to plan commission. They do not need a conditional use, assuming this is not a substantial modification.* This is the procedure, as described in the Village Code, and the highlighted paragraph is the complete approval process which merely requires Plan Commission recommendation and Village Board action:

745-23 D. Modifications. The construction of modifications to an existing mobile service support structure or mobile service facility, and any installation of a small wireless facility on an existing structure, shall be subject to the following requirements: [Amended 4-9-2019 by Ord. No. 2019-03]

...

(2) Not substantial modifications.

(a) Application information. The applicant shall submit a written application that describes the applicant's basis for concluding that the modification is not substantial, and all of the following information:

[1] The name and business address of, and the contact individual for, the applicant.

[2] The location of the affected support structure.

[3] The location of the proposed facility.

(b) Completeness determination within five days. The Village Building Inspector will determine whether the application is complete. If the application includes all of the foregoing information, the application shall be found to be complete. The Village Building Inspector must notify the applicant in writing within five days of receiving the application if it is found not to be complete, specifying in detail the required information that was incomplete. The applicant may resubmit as often as necessary until it is complete.

(c) Fee. Any petition shall be accompanied by a fee as set from time to time by the Village Board to defray the cost of review. Costs incurred by the Village in obtaining legal, planning, engineering and other technical and professional advice in connection with the review of the conditional use and preparation of the conditions to be improved shall be charged to the petitioner. Such fee shall not exceed the limits established by Wisconsin Statutes § 66.0404(4)(d).

(d) Determination. The Village Board shall make a decision on the application within a reasonable time after receipt of the Plan Commission recommendations, provided further that final action shall be taken within 45 days of receipt of a complete application unless the time is extended by the

petitioner. Said decision shall be stated in writing and a copy made a permanent part of the Village records. If approval is not granted, the reasons therefor will be included in such record.

(e) Limitations upon authority. The Village review and action in the matter shall be subject to the limitations imposed by Wisconsin Statutes § 66.0404(4), and such other laws as may apply which may include 47 U.S.C.A. § 1455. In the event the applicant believes the Village has exceeded its authority in this regard, the applicant shall notify the Village Board in writing and the Village Board reserves the right to reconsider the matter, to ensure that applicable laws are followed.

*If there's any question as to whether this is a substantial modification, let me know, but note that "substantial modification" is a defined term by State law, federal law, and our ordinance which defers to the State law definition. This is the statutory definition (66.0404(1)(s), Stats):

> "(s) "Substantial modification" means the modification of a mobile service support structure, including the mounting of an antenna on such a structure, that does any of the following:
>
> 1. For structures with an overall height of 200 feet or less, increases the overall height of the structure by more than 20 feet.
> 2. For structures with an overall height of more than 200 feet, increases the overall height of the structure by 10 percent or more.
> 3. Measured at the level of the appurtenance added to the structure as a result of the modification, increases the width of the support structure by 20 feet or more, unless a larger area is necessary for collocation.
> 4. Increases the square footage of an existing equipment compound to a total area of more than 2,500 square feet."

Bottom line, we are severely preempted. We can only do this limited review, which in practical effect does no more than ensure they're honest with us in their application and allows a Q & A with the public officials if there are any concerns.

Let me know if you have any questions or concerns.

Eric J. Larson

Municipal LAW
& LITIGATION GROUP

Municipal Law & Litigation Group, SC
Arenz, Molter, Macy, Riffle, Larson & Bitar
730 N. Grand Ave.
Waukesha, WI 53186
(262) 548-1340
elarson@ammr.net
Website: www.municipallawsc.com

VILLAGE OF FOX POINT

VILLAGE OF FOX POINT
7200 N Santa Monica Blvd
Fox Point, WI 53217
(414) 247-6622
www.villageoffoxpoint.com

Permit Number:

B- _____

OFFICE USE ONLY
Issued Date
Zoning

BUILDING PERMIT

Job Address 8615 N Port Washington Rd, Fox Point, WI 53217	**Building Type:** Residential ☐ Commercial ☑
Description of Work	
removing (6) antennas, (3) TMA. Adding (3) antennas, (3) radios.	
Estimated Cost of Project $ 15,000	

Owner/Occupant	
Business Name Crown Castle	Contact Name Christina Wilburn on Behalf of Crown Caste (Tower Owner) agent for T-Mobile
Address 3025 Highland Pkwy., Suite 400	City/State/Zip Downers Grove, IL 60515
Phone 773-628-4388	Email chrsitna.wilburn@crowncaslte.com

Cautionary Statement required when homeowner is applying for permit*

Contractor	
Company Name DYROS INC. (W)	Contact Name Ryan Nutt
Address 900 Lee Street,	City/State/Zip Elk Grove IL 60007
Phone 262-581-5883	Email r.nutt@dyros.net
Dwelling Contractor #	Dwelling Contractor Qualifier #

Square Footage Under Construction				
1st Floor	2nd Floor	Basement	Addition	Garage

Description		Rate	Amount
Project - Per $1,000 of estimated cost		$10.00	
Building Board		$75.00	
Footing early start - $230.00 one and two family; $305.00 commercial			
Plan Review - $275.00 one and two family; New Single Family Construction $330.00 plus $30.00/unit commercial			
State Seal		$75.00	
Razing, Interior Demolition $925.00 max/bld	$95.00 minimum plus	$0.13/sqft	
Moving buildings	$250.00 plus	$0.13/sqft	
Fuel tanks - Per 1,000 gallons		$25.00	
Re-inspection		$100.00	
Work started without permit		**Double**	
	Minimum Fee	**$70.00**	
Payable to: Village of Fox Point	**Total Permit Fee**		**$**

Applicant Signature Christina Wilburn **Date** 09/16/22

Rev 01/22

ISSUED PERMITS are available on the Village website under *PERMITS & LICENSES*

CROWN CASTLE

3025 Highland Pkwy Suite 510
Downers Grove, IL 60515

Phone: (773) 628-4388
www.crowncastle.com

September 16, 2022

WI - VILLAGE OF FOX POINT
Inspections
7200 N SANTA MONICA BLVD
FOX POINT, WI 53217

Via Walk-in

************NOTICE OF ELIGIBLE FACILITIES REQUEST************

RE: Request for Minor Modification to Existing Wireless Facility – Section 6409
Site Address: 8615 N Port Washington Rd, Fox Point, WI 53217
Crown Site Number: 827008 / Crown Site Name: River Point Shopping Cent
Customer Site Number: ML11046B / Application Number: 624081

Attention Inspections:

On behalf of T-Mobile Central LLC ("T-Mobile" or "Applicant"), Crown Castle USA Inc. ("Crown Castle") is pleased to submit this request to modify the existing wireless facility noted above through the collocation, replacement and/or removal of the Applicant's equipment as an eligible facilities request for a minor modification under Section 6409[1] and the rules of the Federal Communications Commission ("FCC").[2]

Section 6409 mandates that state and local governments must approve any eligible facilities request for the modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station. Under Section 6409, to toll the review period, if the reviewing authority determines that the application is incomplete, it must provide written notice to the applicant within 30 days, which clearly and specifically delineates all missing documents or information reasonably related to whether the request meets the federal requirements.[3] Additionally, if a state or local government, fails to issue any approvals required for this request within 60 days, these approvals are deemed granted. The FCC has clarified that the 30-day and 60-day deadlines begins when an applicant: (1) takes the first step required under state or local law; and (2) submits information sufficient to inform the jurisdiction that this modification qualifies under the federal law[4]. Please note that with the submission of this letter and enclosed items, the thirty and sixty-day review periods have started. Based on this filing, the deadline for written notice of incomplete application is October 16, 2022, and the deadline for issuance of approval is November 15, 2022.

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[1] Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6409 (2012) (codified at 47 U.S.C. § 1455).
[2] *Acceleration of Broadband Deployment by Improving Wireless Facility Siting Policies*, 29 FCC Rcd. 12865 (2014) (codified at 47 CFR § 1.6100); and *Implementation of State & Local Governments' Obligation to Approve Certain Wireless Facility Modification Requests Under Section 6409(a) of the Spectrum Act of 2012*, WT Docket No. 19-250 (June 10, 2020).
[3] *See* 47 CFR § 1.6100 (c)(3). [4] *See* 2020 Upgrade Order at paragraph 16.

CROWN CASTLE

3025 Highland Pkwy Suite 510
Downers Grove, IL 60515

Phone: (773) 628-4388
www.crowncastle.com

The proposed scope of work for this project includes:
Add or replace antennas and ancillary equipment as per plans for an existing carrier on an existing wireless communication facility.

At the end of this letter is a checklist of the applicable substantial change criteria under Section 6409. Additionally, please find enclosed the following information in support of this request:

(1) Concurrent Zoning and Building Permit;
(2) Construction Drawings;
(3) Structural Analysis; and
(4) Section 6409 Substantial Change Checklist.

As these documents indicate, (i) the modification involves the collocation, removal or replacement of transmission equipment; and (ii) such modification will not substantially change the physical dimensions of such tower or base station. As such, it is an "eligible facilities request" as defined in the FCC's rules to which the 60-day deadline for approval applies. Accordingly, Applicant requests all authorization necessary for this proposed minor modification under Section 6409.

Our goal is to work with you to obtain approvals earlier than the deadline. We will respond promptly to any request for related information you may have in connection with this request. Please let us know how we can work with you to expedite the approval process. We look forward to working with you on this important project, which will improve wireless telecommunication services in your community using collocation on existing infrastructure. If you have any questions, please do not hesitate to contact me.

Regards,

Christina Wilburn

Christina Wilburn
Site Acquisition Specialist
Crown Castle, Agent for Applicant
(773) 628-4388
Christina.Wilburn@crowncastle.com

CROWN CASTLE

3025 Highland Pkwy Suite 510
Downers Grove, IL 60515

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Section 6409 Substantial Change Checklist
Towers Outside of the Public Right of Way

The Federal Communications Commission has determined that a modification substantially changes the physical dimension of a wireless tower or base station under 47 U.S.C. § 1455(a) if it meets one of six enumerated criteria under 47 C.F.R. § 1.6100.

Criteria for Towers Outside the Public Rights of Way

YES/NO **NO**	Does the modification increase the height of the tower by more than the greater of: (a) 10% (b) or, the height of an additional antenna array plus separation of up to 20 feet from the top of the nearest existing antenna?
YES/NO **NO**	Does the modification add an appurtenance to the body of the tower that would protrude from the edge of the tower more than 20 feet or more than the width of the tower structure at the level of the appurtenance, whichever is greater?
YES/NO **NO**	Does the modification involve the installation of more than the standard number of new equipment cabinets for the technology involved or add more than four new equipment cabinets?
YES/NO **NO**	Does the modification entail any excavation or deployment outside the current site by more than 30 feet in any direction, not including any access or utility easements?
YES/NO **NO**	Does the modification defeat the concealment elements of the eligible support structure?
YES/NO **NO**	Does the modification violate conditions associated with the siting approval with the prior approval the tower or base station other than as specified in 47 C.F.R. § 1.6100(c)(7)(i) – (iv)?

If all questions in the above section are answered "NO," then the modification does not constitute a substantial change to the existing tower under 47 C.F.R. § 1.6100.

Date: **August 11, 2022**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate Site Number:**	ML11046B
Crown Castle Designation:	**BU Number:**	827008
	Site Name:	River Point Shopping Cent
	JDE Job Number:	723751
	Work Order Number:	2147834
	Order Number:	624081 Rev. 2
Engineering Firm Designation:	**Crown Castle Project Number:**	2147834
Site Data:	**8615 N Port Washington Rd, Fox Point, Milwaukee County, WI** **Latitude *43° 10' 33.63"*, Longitude *-87° 54' 54.28"*** **130 Foot - Monopole Tower**	

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 115 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Nicholas Palladino

Respectfully submitted by:

Maribel Dentinger
Maribel Dentinger, P.E.
Senior Project Engineer

Maribel Dentinger
Digitally signed by Maribel Dentinger
Date: 2022.08.12 14:46:49 -04'00'

WISCONSIN
MARIBEL DENTINGER
E-44782-6
PITTSBURGH PA
PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 130 ft Monopole tower designed by PIROD MANUFACTURES INC. The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	115 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	40 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
125.0	127.0	3	commscope	FFVV-65C-R3-V1_TMO w/ Mount Pipe	1 12 2	3/8 7/8 1-1/2
		2	commscope	HCS 2.0 Part 1		
		3	nokia	AEHC w/ Mount Pipe		
		3	nokia	AHFIG_TMO		
	125.0	3	nokia	AHLOA_T-MOBILE		
		1	tower mounts	Sabre M.O.V.E Platform		

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)
115.0	115.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	3499149	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	3903109	CCISITES
4-TOWER MANUFACTURER DRAWINGS	3499150	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	9823584	CCISITES
4-POST-MODIFICATION INSPECTION	10262128	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	130 - 90	Pole	P24x.375	1	-10.93	920.56	46.1	Pass
L2	90 - 60	Pole	P36x.375	2	-16.44	1564.60	39.3	Pass
L3	60 - 30	Pole	P36x.375	3	-22.05	1564.60	63.1	Pass
L4	30 - 0	Pole	P36x.375	4	-27.81	1564.60	89.0	Pass
							Summary	
						Pole (L4)	89.0	Pass
						Rating =	89.0	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	88.6	Pass
1	Base Plate	0	96.4	Pass
1	Base Foundation (Structure)	0	46.8	Pass
1	Base Foundation (Soil Interaction)	0	19.9	Pass
1	Flange Connection	90	37.9	Pass
1	Flange Connection	60	61.0	Pass
1	Flange Connection	30	98.0	Pass

Structure Rating (max from all components) =	98%

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

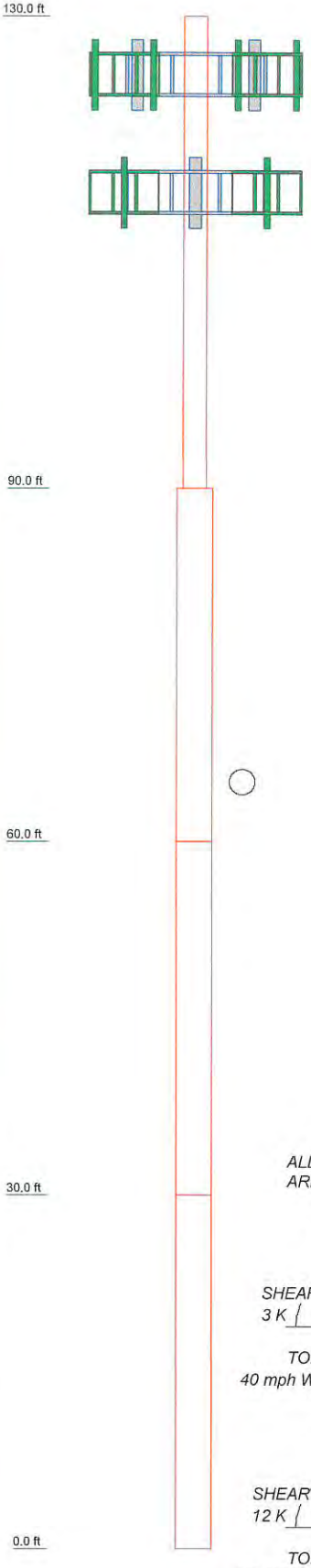
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x.375	40.00	A53-B-35	3.8
2	P36x.375	30.00	A53-B-42	4.3
3	P36x.375	30.00		4.3
4	P36x.375	30.00		4.3
				16.6



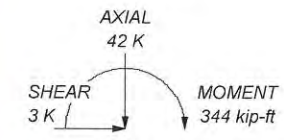
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A53-B-42	42 ksi	63 ksi

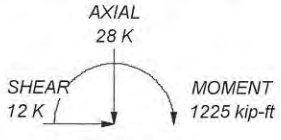
TOWER DESIGN NOTES

1. Tower is located in Milwaukee County, Wisconsin.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 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: 89%

ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
40 mph WIND - 1.5000 in ICE



TORQUE 0 kip-ft
REACTIONS - 115 mph WIND

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

Job: *827008*			
Project:			
Client: Crown Castle	Drawn by: NPalladino		App'd:
Code: TIA-222-H	Date: 08/11/22		Scale: NTS
Path: C:\Users\npalladino\SAPI Work Area\827008\WO 2147834 - SA\Prod\827008_LC7.eri			Dwg No. E-1

Tower Input Data

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

- Tower is located in Milwaukee County, Wisconsin.
- Tower base elevation above sea level: 685.00 ft.
- Basic wind speed of 115 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 40 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	130.00-90.00	40.00	P24x.375	A53-B-35 (35 ksi)	
L2	90.00-60.00	30.00	P36x.375	A53-B-42 (42 ksi)	
L3	60.00-30.00	30.00	P36x.375	A53-B-42 (42 ksi)	
L4	30.00-0.00	30.00	P36x.375	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 130.00-90.00				1	1	1			
L2 90.00-60.00				1	1	1			
L3 60.00-30.00				1	1	1			
L4 30.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
***											
**											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
LDF2-50(3/8)	C	No	No	Inside Pole	125.00 - 0.00	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
LDF5-50A(7/8)	C	No	No	Inside Pole	125.00 - 0.00	12	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
HCS 2.0 Part 3(1-1/2)	C	No	No	Inside Pole	125.00 - 0.00	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00
***									
***									
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*									
CU12PSM9P6XXX (1-1/2)	C	No	No	Inside Pole	115.00 - 0.00	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
							2" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-90.00	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	0.32
L2	90.00-60.00	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	0.29
L3	60.00-30.00	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	0.29
L4	30.00-0.00	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	0.29

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-90.00	A	1.438	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	0.32
L2	90.00-60.00	A	1.384	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	0.29
L3	60.00-30.00	A	1.315	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	0.29
L4	30.00-0.00	A	1.178	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	0.29

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-90.00	0.0000	0.0000	0.0000	0.0000
L2	90.00-60.00	0.0000	0.0000	0.0000	0.0000
L3	60.00-30.00	0.0000	0.0000	0.0000	0.0000
L4	30.00-0.00	0.0000	0.0000	0.0000	0.0000

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
***					
AEHC w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
AEHC w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
AEHC w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
HCS 2.0 Part 1	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
HCS 2.0 Part 1	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
AHFIG_TMO	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
AHFIG_TMO	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
AHFIG_TMO	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	125.00
(2) 2.4" Dia. x 10-ft Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	125.00
(2) 2.4" Dia. x 10-ft Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	125.00
(2) 2.4" Dia. x 10-ft Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	125.00
Sabre M.O.V.E Platform	C	None		0.0000	125.00
***					
**					
*					
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	115.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	115.00
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	115.00
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	115.00
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	115.00
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	115.00
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	115.00
TA08025-B605	B	From Leg	4.00 0.00 0.00	0.0000	115.00
TA08025-B605	C	From Leg	4.00 0.00 0.00	0.0000	115.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	115.00
Commscope MC-PK8-DSH	C	None		0.0000	115.00
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	115.00
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	115.00
(2) 8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	115.00
* FFVV-65C-R3-V1_TMO w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	125.00
FFVV-65C-R3-V1_TMO w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	125.00
FFVV-65C-R3-V1_TMO w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	125.00
AHLOA_T-MOBILE	A	From Leg	4.00 0.00 0.00	0.0000	125.00
AHLOA_T-MOBILE	B	From Leg	4.00 0.00 0.00	0.0000	125.00
AHLOA_T-MOBILE	C	From Leg	4.00 0.00 0.00	0.0000	125.00

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
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

Comb. No.	Description
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	130 - 90	Pole	Max Tension	2	0.00	0.00	-0.00
			Max. Compression	26	-19.75	-0.29	0.62
			Max. Mx	8	-10.93	-251.67	-0.38
			Max. My	2	-10.93	0.47	253.32
			Max. Vy	8	8.56	-251.67	-0.38
			Max. Vx	2	-8.62	0.47	253.32
			Max. Torque	11			0.30
L2	90 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.14	-0.29	0.62
			Max. Mx	8	-16.44	-534.27	-0.83
			Max. My	2	-16.44	0.92	537.54
			Max. Vy	8	10.26	-534.27	-0.83
			Max. Vx	2	-10.31	0.92	537.54
			Max. Torque	11			0.30
L3	60 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.44	-0.29	0.62
			Max. Mx	8	-22.05	-862.02	-1.28
			Max. My	2	-22.05	1.37	866.93
			Max. Vy	8	11.56	-862.02	-1.28
			Max. Vx	2	-11.61	1.37	866.93
			Max. Torque	11			0.30
L4	30 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.54	-0.29	0.62
			Max. Mx	8	-27.81	-1218.71	-1.71
			Max. My	2	-27.81	1.80	1225.20
			Max. Vy	8	12.18	-1218.71	-1.71
			Max. Vx	2	-12.23	1.80	1225.20
			Max. Torque	11			0.30

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	41.54	0.00	3.44
	Max. H_x	20	27.82	12.16	0.01
	Max. H_z	2	27.82	0.01	12.21
	Max. M_x	2	1225.20	0.01	12.21
	Max. M_z	8	1218.71	-12.16	-0.01
	Max. Torsion	11	0.30	-10.54	-6.12
	Min. Vert	19	20.86	10.52	-6.09
	Min. H_x	8	27.82	-12.16	-0.01
	Min. H_z	14	27.82	-0.01	-12.21
	Min. M_x	14	-1224.84	-0.01	-12.21
	Min. M_z	20	-1218.53	12.16	0.01
	Min. Torsion	23	-0.30	10.54	6.12

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	23.18	0.00	0.00	-0.14	-0.07	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	27.82	-0.01	-12.21	-1225.20	1.80	0.11
0.9 Dead+1.0 Wind 0 deg - No Ice	20.86	-0.01	-12.21	-1209.11	1.80	0.11
1.2 Dead+1.0 Wind 30 deg - No Ice	27.82	6.07	-10.57	-1060.15	-607.76	-0.04
0.9 Dead+1.0 Wind 30 deg - No Ice	20.86	6.07	-10.57	-1046.21	-599.78	-0.04
1.2 Dead+1.0 Wind 60 deg - No Ice	27.82	10.52	-6.09	-611.06	-1054.51	-0.19
0.9 Dead+1.0 Wind 60 deg - No Ice	20.86	10.52	-6.09	-603.01	-1040.67	-0.19
1.2 Dead+1.0 Wind 90 deg - No Ice	27.82	12.16	0.01	1.71	-1218.71	-0.28
0.9 Dead+1.0 Wind 90 deg - No Ice	20.86	12.16	0.01	1.73	-1202.73	-0.28
1.2 Dead+1.0 Wind 120 deg - No Ice	27.82	10.54	6.12	613.98	-1056.40	-0.30
0.9 Dead+1.0 Wind 120 deg - No Ice	20.86	10.54	6.12	605.97	-1042.53	-0.30
1.2 Dead+1.0 Wind 150 deg - No Ice	27.82	6.09	10.58	1061.67	-611.04	-0.24
0.9 Dead+1.0 Wind 150 deg - No Ice	20.86	6.09	10.58	1047.80	-603.01	-0.24
1.2 Dead+1.0 Wind 180 deg - No Ice	27.82	0.01	12.21	1224.84	-1.98	-0.11
0.9 Dead+1.0 Wind 180 deg - No Ice	20.86	0.01	12.21	1208.84	-1.93	-0.11
1.2 Dead+1.0 Wind 210 deg - No Ice	27.82	-6.07	10.57	1059.78	607.58	0.05
0.9 Dead+1.0 Wind 210 deg - No Ice	20.86	-6.07	10.57	1045.94	599.65	0.05
1.2 Dead+1.0 Wind 240 deg - No Ice	27.82	-10.52	6.09	610.70	1054.33	0.19
0.9 Dead+1.0 Wind 240 deg - No Ice	20.86	-10.52	6.09	602.74	1040.54	0.19
1.2 Dead+1.0 Wind 270 deg - No Ice	27.82	-12.16	-0.01	-2.07	1218.53	0.28
0.9 Dead+1.0 Wind 270 deg - No Ice	20.86	-12.16	-0.01	-2.00	1202.59	0.28
1.2 Dead+1.0 Wind 300 deg - No Ice	27.82	-10.54	-6.12	-614.34	1056.22	0.30
0.9 Dead+1.0 Wind 300 deg - No Ice	20.86	-10.54	-6.12	-606.24	1042.40	0.30
1.2 Dead+1.0 Wind 330 deg	27.82	-6.09	-10.58	-1062.04	610.86	0.24

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
- No Ice						
0.9 Dead+1.0 Wind 330 deg - No Ice	20.86	-6.09	-10.58	-1048.07	602.88	0.24
1.2 Dead+1.0 Ice+1.0 Temp	41.54	0.00	0.00	-0.62	-0.29	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	41.54	-0.00	-3.44	-343.63	-0.06	0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	41.54	1.72	-2.98	-297.55	-171.11	-0.01
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	41.54	2.97	-1.72	-171.94	-296.39	-0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	41.54	3.44	0.00	-0.45	-342.35	-0.04
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	41.54	2.98	1.72	170.97	-296.66	-0.05
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	41.54	1.72	2.98	296.38	-171.58	-0.04
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	41.54	0.00	3.44	342.19	-0.61	-0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	41.54	-1.72	2.98	296.11	170.43	0.01
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	41.54	-2.97	1.72	170.50	295.72	0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	41.54	-3.44	-0.00	-0.99	341.67	0.04
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	41.54	-2.98	-1.72	-172.41	295.99	0.05
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	41.54	-1.72	-2.98	-297.82	170.90	0.04
Dead+Wind 0 deg - Service	23.18	-0.00	-3.13	-311.66	0.41	0.03
Dead+Wind 30 deg - Service	23.18	1.56	-2.71	-269.69	-154.60	-0.01
Dead+Wind 60 deg - Service	23.18	2.70	-1.56	-155.49	-268.20	-0.05
Dead+Wind 90 deg - Service	23.18	3.12	0.00	0.33	-309.96	-0.07
Dead+Wind 120 deg - Service	23.18	2.70	1.57	156.02	-268.68	-0.08
Dead+Wind 150 deg - Service	23.18	1.56	2.71	269.87	-155.43	-0.06
Dead+Wind 180 deg - Service	23.18	0.00	3.13	311.36	-0.56	-0.03
Dead+Wind 210 deg - Service	23.18	-1.56	2.71	269.39	154.45	0.01
Dead+Wind 240 deg - Service	23.18	-2.70	1.56	155.19	268.05	0.05
Dead+Wind 270 deg - Service	23.18	-3.12	-0.00	-0.63	309.81	0.07
Dead+Wind 300 deg - Service	23.18	-2.70	-1.57	-156.32	268.53	0.08
Dead+Wind 330 deg - Service	23.18	-1.56	-2.71	-270.17	155.28	0.06

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-23.18	0.00	0.00	23.18	0.00	0.000%
2	-0.01	-27.82	-12.21	0.01	27.82	12.21	0.000%
3	-0.01	-20.86	-12.21	0.01	20.86	12.21	0.000%
4	6.07	-27.82	-10.57	-6.07	27.82	10.57	0.000%
5	6.07	-20.86	-10.57	-6.07	20.86	10.57	0.000%
6	10.52	-27.82	-6.09	-10.52	27.82	6.09	0.000%
7	10.52	-20.86	-6.09	-10.52	20.86	6.09	0.000%
8	12.16	-27.82	0.01	-12.16	27.82	-0.01	0.000%
9	12.16	-20.86	0.01	-12.16	20.86	-0.01	0.000%
10	10.54	-27.82	6.12	-10.54	27.82	-6.12	0.000%
11	10.54	-20.86	6.12	-10.54	20.86	-6.12	0.000%
12	6.09	-27.82	10.58	-6.09	27.82	-10.58	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
13	6.09	-20.86	10.58	-6.09	20.86	-10.58	0.000%
14	0.01	-27.82	12.21	-0.01	27.82	-12.21	0.000%
15	0.01	-20.86	12.21	-0.01	20.86	-12.21	0.000%
16	-6.07	-27.82	10.57	6.07	27.82	-10.57	0.000%
17	-6.07	-20.86	10.57	6.07	20.86	-10.57	0.000%
18	-10.52	-27.82	6.09	10.52	27.82	-6.09	0.000%
19	-10.52	-20.86	6.09	10.52	20.86	-6.09	0.000%
20	-12.16	-27.82	-0.01	12.16	27.82	0.01	0.000%
21	-12.16	-20.86	-0.01	12.16	20.86	0.01	0.000%
22	-10.54	-27.82	-6.12	10.54	27.82	6.12	0.000%
23	-10.54	-20.86	-6.12	10.54	20.86	6.12	0.000%
24	-6.09	-27.82	-10.58	6.09	27.82	10.58	0.000%
25	-6.09	-20.86	-10.58	6.09	20.86	10.58	0.000%
26	0.00	-41.54	0.00	0.00	41.54	0.00	0.000%
27	-0.00	-41.54	-3.44	0.00	41.54	3.44	0.000%
28	1.72	-41.54	-2.98	-1.72	41.54	2.98	0.000%
29	2.97	-41.54	-1.72	-2.97	41.54	1.72	0.000%
30	3.44	-41.54	0.00	-3.44	41.54	-0.00	0.000%
31	2.98	-41.54	1.72	-2.98	41.54	-1.72	0.000%
32	1.72	-41.54	2.98	-1.72	41.54	-2.98	0.000%
33	0.00	-41.54	3.44	-0.00	41.54	-3.44	0.000%
34	-1.72	-41.54	2.98	1.72	41.54	-2.98	0.000%
35	-2.97	-41.54	1.72	2.97	41.54	-1.72	0.000%
36	-3.44	-41.54	-0.00	3.44	41.54	0.00	0.000%
37	-2.98	-41.54	-1.72	2.98	41.54	1.72	0.000%
38	-1.72	-41.54	-2.98	1.72	41.54	2.98	0.000%
39	-0.00	-23.18	-3.13	0.00	23.18	3.13	0.000%
40	1.56	-23.18	-2.71	-1.56	23.18	2.71	0.000%
41	2.70	-23.18	-1.56	-2.70	23.18	1.56	0.000%
42	3.12	-23.18	0.00	-3.12	23.18	-0.00	0.000%
43	2.70	-23.18	1.57	-2.70	23.18	-1.57	0.000%
44	1.56	-23.18	2.71	-1.56	23.18	-2.71	0.000%
45	0.00	-23.18	3.13	-0.00	23.18	-3.13	0.000%
46	-1.56	-23.18	2.71	1.56	23.18	-2.71	0.000%
47	-2.70	-23.18	1.56	2.70	23.18	-1.56	0.000%
48	-3.12	-23.18	-0.00	3.12	23.18	0.00	0.000%
49	-2.70	-23.18	-1.57	2.70	23.18	1.57	0.000%
50	-1.56	-23.18	-2.71	1.56	23.18	2.71	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00052941
3	Yes	4	0.00000001	0.00023797
4	Yes	6	0.00000001	0.00006866
5	Yes	5	0.00000001	0.00060639
6	Yes	6	0.00000001	0.00006929
7	Yes	5	0.00000001	0.00061239
8	Yes	4	0.00000001	0.00070250
9	Yes	4	0.00000001	0.00040251
10	Yes	6	0.00000001	0.00006828
11	Yes	5	0.00000001	0.00060302
12	Yes	6	0.00000001	0.00007017
13	Yes	5	0.00000001	0.00062008
14	Yes	4	0.00000001	0.00059519
15	Yes	4	0.00000001	0.00030244
16	Yes	6	0.00000001	0.00006886
17	Yes	5	0.00000001	0.00060847
18	Yes	6	0.00000001	0.00006797
19	Yes	5	0.00000001	0.00060053
20	Yes	4	0.00000001	0.00082355
21	Yes	4	0.00000001	0.00049890
22	Yes	6	0.00000001	0.00007026

23	Yes	5	0.00000001	0.00062102
24	Yes	6	0.00000001	0.00006863
25	Yes	5	0.00000001	0.00060593
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00053901
28	Yes	5	0.00000001	0.00061495
29	Yes	5	0.00000001	0.00061442
30	Yes	5	0.00000001	0.00053649
31	Yes	5	0.00000001	0.00061146
32	Yes	5	0.00000001	0.00061241
33	Yes	5	0.00000001	0.00053509
34	Yes	5	0.00000001	0.00060910
35	Yes	5	0.00000001	0.00060829
36	Yes	5	0.00000001	0.00053465
37	Yes	5	0.00000001	0.00061392
38	Yes	5	0.00000001	0.00061430
39	Yes	4	0.00000001	0.00007022
40	Yes	4	0.00000001	0.00040086
41	Yes	4	0.00000001	0.00041342
42	Yes	4	0.00000001	0.00007702
43	Yes	4	0.00000001	0.00039006
44	Yes	4	0.00000001	0.00042028
45	Yes	4	0.00000001	0.00007065
46	Yes	4	0.00000001	0.00040397
47	Yes	4	0.00000001	0.00039069
48	Yes	4	0.00000001	0.00007818
49	Yes	4	0.00000001	0.00042369
50	Yes	4	0.00000001	0.00039422

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 90	14.791	39	0.8450	0.0008
L2	90 - 60	8.056	39	0.6953	0.0004
L3	60 - 30	4.039	39	0.5678	0.0003
L4	30 - 0	1.130	39	0.3403	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	AEHC w/ Mount Pipe	39	13.906	0.8261	0.0007	73857
115.00	MX08FRO665-21 w/ Mount Pipe	39	12.154	0.7883	0.0006	24619

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 90	58.180	2	3.3243	0.0031
L2	90 - 60	31.695	2	2.7362	0.0015
L3	60 - 30	15.892	2	2.2348	0.0010
L4	30 - 0	4.446	2	1.3388	0.0005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	AEHC w/ Mount Pipe	2	54.702	3.2500	0.0029	18914
115.00	MX08FRO665-21 w/ Mount Pipe	2	47.810	3.1017	0.0024	6304

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	130 - 90 (1)	P24x.375	40.00	0.00	0.0	27.832 5	-10.93	876.73	0.012
L2	90 - 60 (2)	P36x.375	30.00	0.00	0.0	41.969 7	-16.44	1490.10	0.011
L3	60 - 30 (3)	P36x.375	30.00	0.00	0.0	41.969 7	-22.05	1490.10	0.015
L4	30 - 0 (4)	P36x.375	30.00	0.00	0.0	41.969 7	-27.81	1490.10	0.019

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	130 - 90 (1)	P24x.375	253.34	538.74	0.470	0.00	538.74	0.000
L2	90 - 60 (2)	P36x.375	537.55	1338.81	0.402	0.00	1338.81	0.000
L3	60 - 30 (3)	P36x.375	866.93	1338.81	0.648	0.00	1338.81	0.000
L4	30 - 0 (4)	P36x.375	1225.20	1338.81	0.915	0.00	1338.81	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	130 - 90 (1)	P24x.375	8.62	263.02	0.033	0.24	546.31	0.000
L2	90 - 60 (2)	P36x.375	10.31	454.19	0.023	0.24	1094.28	0.000
L3	60 - 30 (3)	P36x.375	11.61	454.19	0.026	0.24	1094.28	0.000
L4	30 - 0 (4)	P36x.375	12.23	454.19	0.027	0.11	1094.28	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 90 (1)	0.012	0.470	0.000	0.033	0.000	0.484	1.050	4.8.2

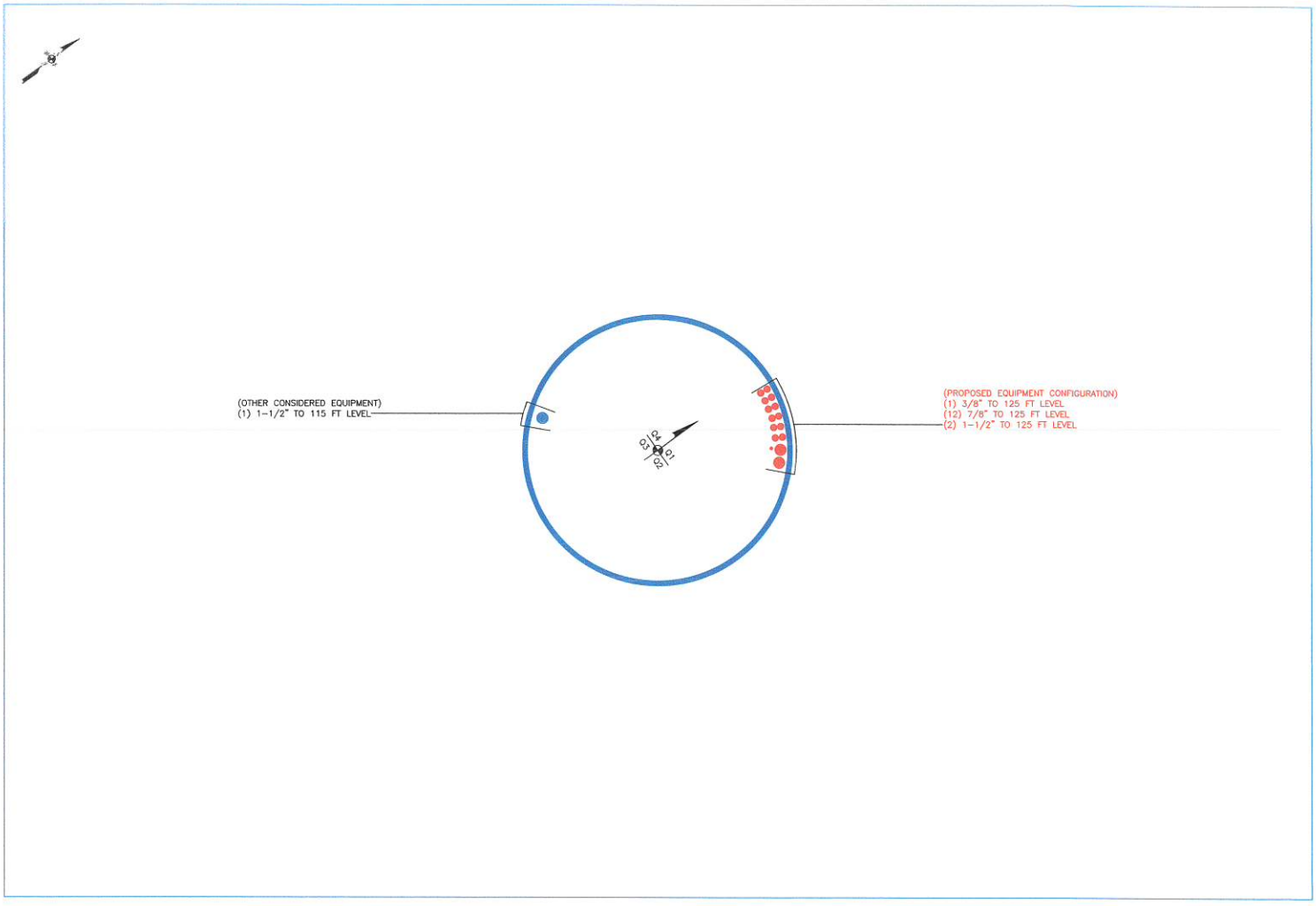
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L2	90 - 60 (2)	0.011	0.402	0.000	0.023	0.000	0.413	1.050	4.8.2
L3	60 - 30 (3)	0.015	0.648	0.000	0.026	0.000	0.663	1.050	4.8.2
L4	30 - 0 (4)	0.019	0.915	0.000	0.027	0.000	0.935	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	130 - 90	Pole	P24x.375	1	-10.93	920.56	46.1	Pass
L2	90 - 60	Pole	P36x.375	2	-16.44	1564.60	39.3	Pass
L3	60 - 30	Pole	P36x.375	3	-22.05	1564.60	63.1	Pass
L4	30 - 0	Pole	P36x.375	4	-27.81	1564.60	89.0	Pass
							Summary	
						Pole (L4)	89.0	Pass
						RATING =	**89.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 115 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 3/8" TO 125 FT LEVEL
(12) 7/8" TO 125 FT LEVEL
(2) 1-1/2" TO 125 FT LEVEL
A1
A2
A3

APPENDIX C

ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

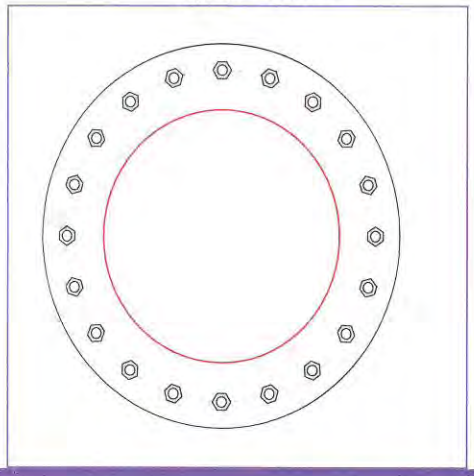
Elevation = 90 ft.

BU #	827008
Site Name	ver Point Shopping Ce
Order #	624081 Rev. 2
TIA-222 Revision	H

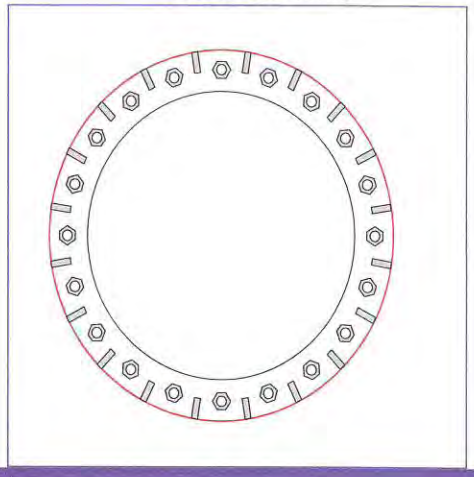
Applied Loads	
Moment (kip-ft)	253.34
Axial Force (kips)	10.93
Shear Force (kips)	8.62

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 31.5" BC

Top Plate Data

36.5" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

27.375" ID x 1.125" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

(20) 3.5"H x 2"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.375" fillet
vert. weld: 0.375" fillet

Top Pole Data

24" x 0.375" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	18.75	
Allowable (kips)	54.54	
Stress Rating:	**32.7%**	Pass

Top Plate Capacity

Max Stress (ksi):	10.37	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**21.9%**	Pass
Tension Side Stress Rating:	**15.3%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	12.90	(Roark's Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**37.9%**	Pass
Tension Side Stress Rating:	**N/A**	

Top Stiffener Capacity

Horizontal Weld:	**N/A**
Vertical Weld:	**N/A**
Plate Flexure+Shear:	**N/A**
Plate Tension+Shear:	**N/A**
Plate Compression:	**N/A**

Bottom Stiffener Capacity

Horizontal Weld:	**22.6%**	Pass
Vertical Weld:	**13.6%**	Pass
Plate Flexure+Shear:	**9.2%**	Pass
Plate Tension+Shear:	**18.3%**	Pass
Plate Compression:	**24.7%**	Pass

Top Pole Capacity

Punching Shear:	**N/A**

Bottom Pole Capacity

Punching Shear:	**8.1%**	Pass

Monopole Flange Plate Connection

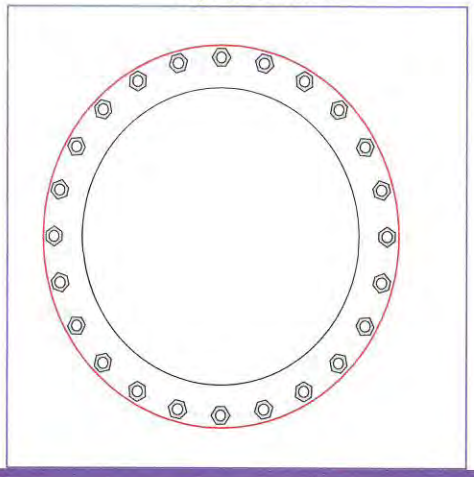
Elevation = 60 ft.

BU #	827008
Site Name	ver Point Shopping Ce
Order #	624081 Rev. 2
TIA-222 Revision	H

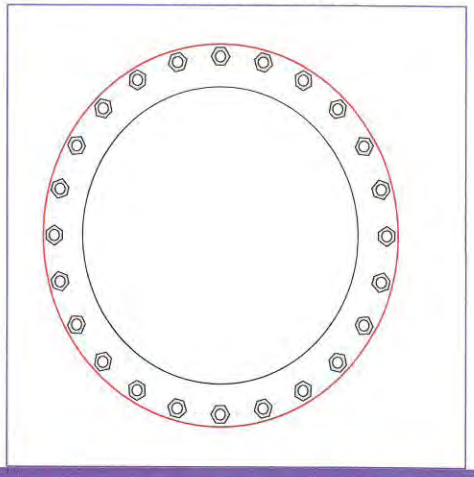
Applied Loads	
Moment (kip-ft)	537.55
Axial Force (kips)	16.44
Shear Force (kips)	10.31

**TIA-222-H Section 15.5 Applied*

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(24) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 33" BC

Top Plate Data

27.375" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

27.375" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	31.88	
Allowable (kips)	54.54	
Stress Rating:	**55.7%**	Pass

Top Plate Capacity

Max Stress (ksi):	20.75	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**61.0%**	Pass
Tension Side Stress Rating:	**11.4%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	20.75	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**61.0%**	Pass
Tension Side Stress Rating:	**11.4%**	Pass

Monopole Flange Plate Connection

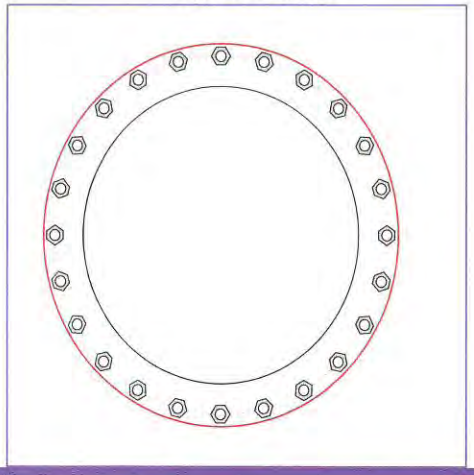
Elevation = 30 ft.

BU #	827008
Site Name	ver Point Shopping Ce
Order #	624081 Rev. 2
TIA-222 Revision	H

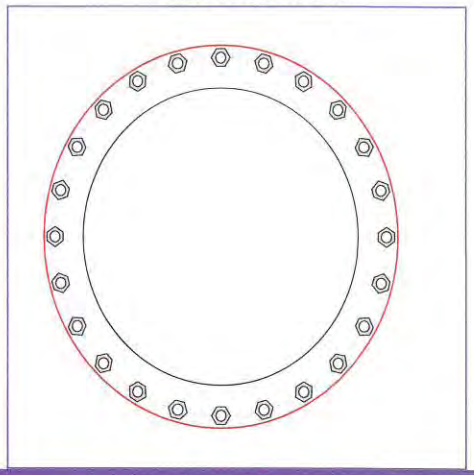
Applied Loads	
Moment (kip-ft)	866.93
Axial Force (kips)	22.05
Shear Force (kips)	11.61

**TIA-222-H Section 15.5 Applied*

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(24) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 33" BC

Top Plate Data

27.375" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

27.375" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	51.60	
Allowable (kips)	54.53	
Stress Rating:	**90.1%**	Pass

Top Plate Capacity

Max Stress (ksi):	33.36	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**98.0%**	Pass
Tension Side Stress Rating:	**27.0%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	33.36	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**98.0%**	Pass
Tension Side Stress Rating:	**27.0%**	Pass

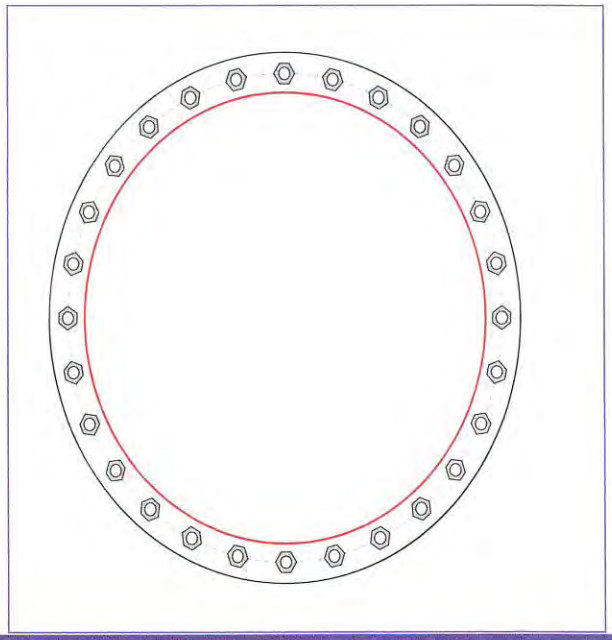
Monopole Base Plate Connection

Site Info	
BU #	827008
Site Name	ver Point Shopping Ce
Order #	624081 Rev. 2

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.625

Applied Loads	
Moment (kip-ft)	1225.20
Axial Force (kips)	27.81
Shear Force (kips)	12.23

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(28) 1" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 39" BC

Base Plate Data

42.375" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_t = 52.85	ϕPn_t = 56.81	**Stress Rating**
Vu = 0.44	ϕVn = 36.82	**88.6%**
Mu = 0.46	ϕMn = 15.75	Pass

Base Plate Summary		
Max Stress (ksi):	32.8	(Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**96.4%**	Pass

Drilled Pier Foundation

BU # :	827008
Site Name:	River Point Shopping Cent
Order Number:	624081 Rev. 2
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1225.2	
Axial Force (kips)	27.82	
Shear Force (kips)	12.21	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	23	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 23' below grade		
Pier Diameter	4.5	ft
Rebar Quantity	24	
Rebar Size	10	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	18	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results	Compression	Uplift
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	8.04	-
Soil Safety Factor	6.37	-
Max Moment (kip-ft)	1350.35	-
Rating*	*19.9%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	346.97	-
End Bearing (kips)	319.20	-
Weight of Concrete (kips)	67.28	-
Total Capacity (kips)	666.17	-
Axial (kips)	95.10	-
Rating*	*13.6%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	8.06	-
Critical Moment (kip-ft)	1350.35	-
Critical Moment Capacity	2749.24	-
Rating*	*46.8%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	19.54	-
Critical Shear (kip)	89.45	-
Critical Shear Capacity	331.02	-
Rating*	*25.7%*	-

Shear-Friction Methodology is Applied

Structural Foundation Rating*	**46.8%**
Soil Interaction Rating*	**19.9%**

*Rating per TIA-222-H Section 15.5

CROWN CASTLE

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

Go to Soil Calculations

Soil Profile

Groundwater Depth: N/A

\# of Layers: 2

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	7	7	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	7	23	16	120	150	4		2.045	2.045			24		Cohesive

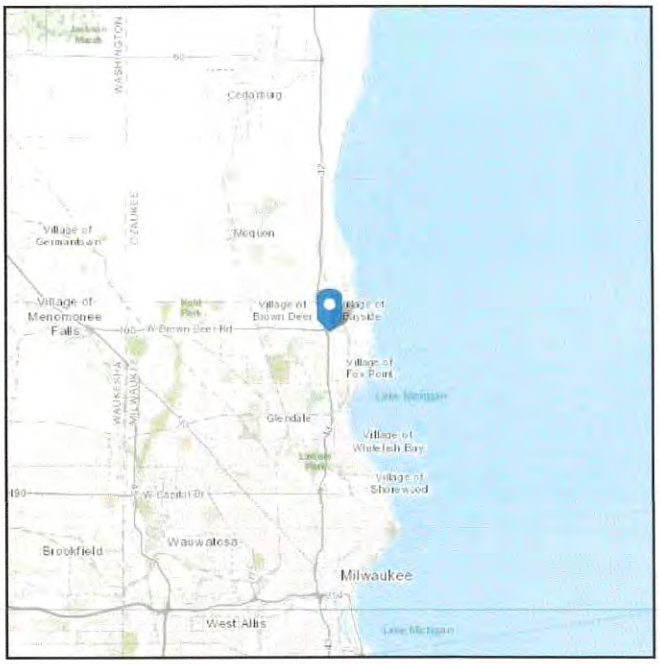
Version 5.0.4

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 685.18 ft (NAVD 88)
Latitude: 43.176008
Longitude: -87.915078



Wind

Results:

Wind Speed:	115 Vmph
10-year MRI	76 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

Data Accessed: Fri Mar 26 2021

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

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2.

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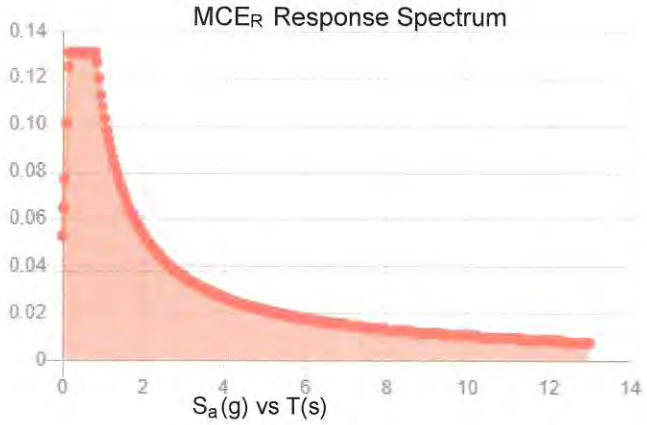
Seismic

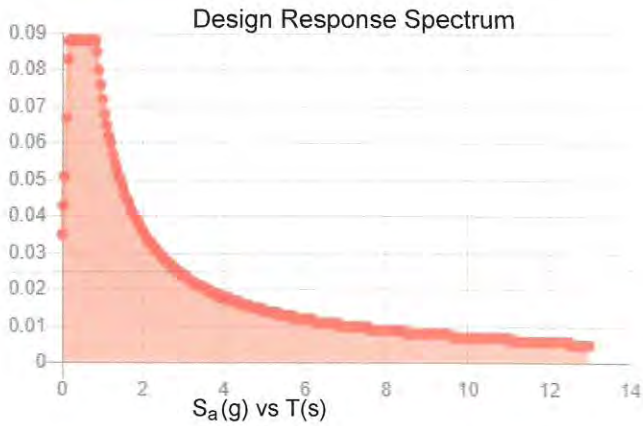
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.082	S_{DS} :	0.088
S_1 :	0.045	S_{D1} :	0.072
F_a :	1.6	T_L :	12
F_v :	2.4	PGA :	0.039
S_{MS} :	0.131	PGA_M :	0.062
S_{M1} :	0.108	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Fri Mar 26 2021

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

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AMERICAN SOCIETY OF CIVIL ENGINEERS

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	-5 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Mar 26 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

T-Mobile

T-MOBILE SITE NUMBER: ML11046B
T-MOBILE SITE NAME: RIVER POINT SHOPPING CENTER
T-MOBILE PROJECT: L600

BUSINESS UNIT #: 827008
SITE ADDRESS: 8615 N PORT WASHINGTON RD, FOX POINT, WI 53217
COUNTY: MILWAUKEE
SITE TYPE: MONOPOLE
TOWER HEIGHT: 130'-0"

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	RIVER POINT SHOPPING CENT
BU NUMBER:	827008
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 8550 W. BRYN MAWR AVE, SUITE 100 CHICAGO, IL 60631
SITE ADDRESS:	8615 N PORT WASHINGTON RD FOX POINT, WI 53217
COUNTY:	MILWAUKEE
LATITUDE:	43.176008°
LONGITUDE:	-87.915078°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	679.1' AMSL
AREA OF CONSTRUCTION:	EXISTING
CURRENT ZONING:	
MAP/PARCEL #:	0538989001
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	NORTH SHORE CENTERS PARTNERS 555 W BROWN DEER RD #220 BAYSIDE, WI 53217
JURISDICTION:	WI - VILLAGE OF FOX POINT
ELECTRIC PROVIDER:	WE ENERGIES
TELCO PROVIDER:	EVERSTREAM

PROJECT TEAM

A&E FIRM:	IRISH TOWER 4603 BERMUDA DRIVE SUGAR LAND, TX 77479 JACOB.GORALSKI@IRISHTOWER.COM
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3025 HIGHLAND PKWY, SUITE 510 DOWNERS GROVE, IL 60515 PAUL SLIFER - PROJECT MANAGER PAUL.SLIFER@CROWNCASTLE.COM PATRICK GABREL - CONSTRUCTION MANAGER PATRICK.GABREL@CROWNCASTLE.COM DALE GRAY - AES DALE.GRAY@CROWNCASTLE.COM

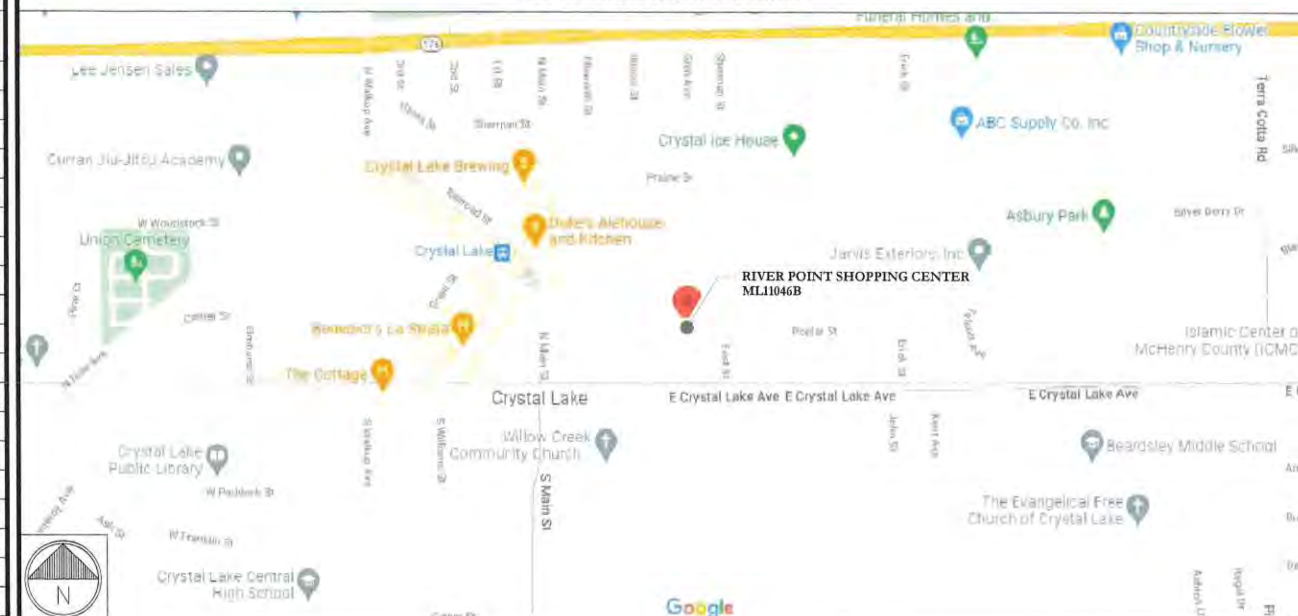
DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	SITE PLAN
C-1.2	EXISTING AND FINAL EQUIPMENT PLANS
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	EQUIPMENT DETAILS & COAX COLOR CODING
C-4	EQUIPMENT SPECIFICATIONS
C-5	ICE BRIDGE DETAIL
E-1	PANEL SCHEDULES & ONE-LINE DIAGRAM
E-2	ELECTRICAL DETAILS
G-1	TYPICAL GROUNDING SCHEMATIC
G-2	GROUNDING DETAILS
ATTACHED	PLUMBING DIAGRAM

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 22X34. 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.

CALL WISCONSIN ONE CALL
(800) 242-8511
CALL 3 WORKING DAYS BEFORE YOU DIG!

LOCATION MAP



NO SCALE

PROJECT DESCRIPTION

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

TOWER SCOPE OF WORK:
- REMOVE (3) ANDREW - HBXX-6516DS-A2M ANTENNAS
- INSTALL (3) COMMSCOPE - FFVV-65C-R3-V1 ANTENNAS
- INSTALL (3) NOKIA - AHLOA RRHS

GROUND SCOPE OF WORK:
- INSTALL 12'-0" ICE BRIDGE
- REMOVE (2) ASIBs
- REMOVE (2) ASIKs
- REMOVE (1) FSMF
- REMOVE (1) ABIA
- REMOVE (5) ABILs
- REMOVE (3) ABICs
- REMOVE (1) AMIA
- INSTALL (2) ASILs
- INSTALL (4) ABIOs

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

APPLICABLE CODES & REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2015 IBC W/ AMENDMENTS
MECHANICAL	2015 IMC W/ AMENDMENTS
ELECTRICAL	2017 NEC W/ AMENDMENTS

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	CROWN CASTLE
DATED:	08/11/2022
MOUNT ANALYSIS:	TOWER ENGINEERING PROFESSIONALS
DATED:	8/4/2022
RFDS REVISION:	3
DATED:	4/4/2022
ORDER ID:	624081
REVISION:	0

Jacob R Goralski — Digitally signed by Jacob R Goralski Date: 2022.08.19 16:00:57 -05'00'

INSTALLER NOTE:
CONTRACTOR SHALL REFER TO STRUCTURAL ANALYSIS AND COORDINATE COAX LAYOUT WITH SITE CONSTRUCTION MANAGER AND TOWER OWNER.

T-Mobile
8550 W. BRYN MAWR AVE, SUITE 100
CHICAGO, IL 60631

CROWN CASTLE
3025 HIGHLAND PKWY, SUITE 510
DOWNERS GROVE, IL 60515

IRISH TOWER
GENERAL CONSTRUCTION | ENGINEERING | PROJECT MANAGEMENT
4603 Bermuda Drive, Sugar Land, TX 77479
(281) 796-2651 irishtower.com

T-MOBILE SITE NUMBER : ML11046B
BU #: 827008
RIVER POINT SHOPPING CENT
8615 N PORT WASHINGTON RD
FOX POINT, WI 53217
EXISTING 130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/19/2022	GRV	FINAL	JRG

JACOB GORALSKI 43884-6 SUGAR LAND, TX — WISCONSIN PROFESSIONAL ENGINEER
08/19/2022
EXPIRATION: 7/31/2024

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:	REVISION:
T-1	0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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

** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

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

GREENFIELD GROUNDING NOTES:

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

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CHICAGO, IL 60631

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DOWNERS GROVE, IL 60515

IRISH TOWER
GENERAL CONSTRUCTION | ENGINEERING | PROJECT MANAGEMENT
4603 Bermuda Drive, Sugar Land, TX 77479
(281) 796-2651 Irishtower.com

T-MOBILE SITE NUMBER :
ML11046B
BU #: **827008**
RIVER POINT SHOPPING CENT

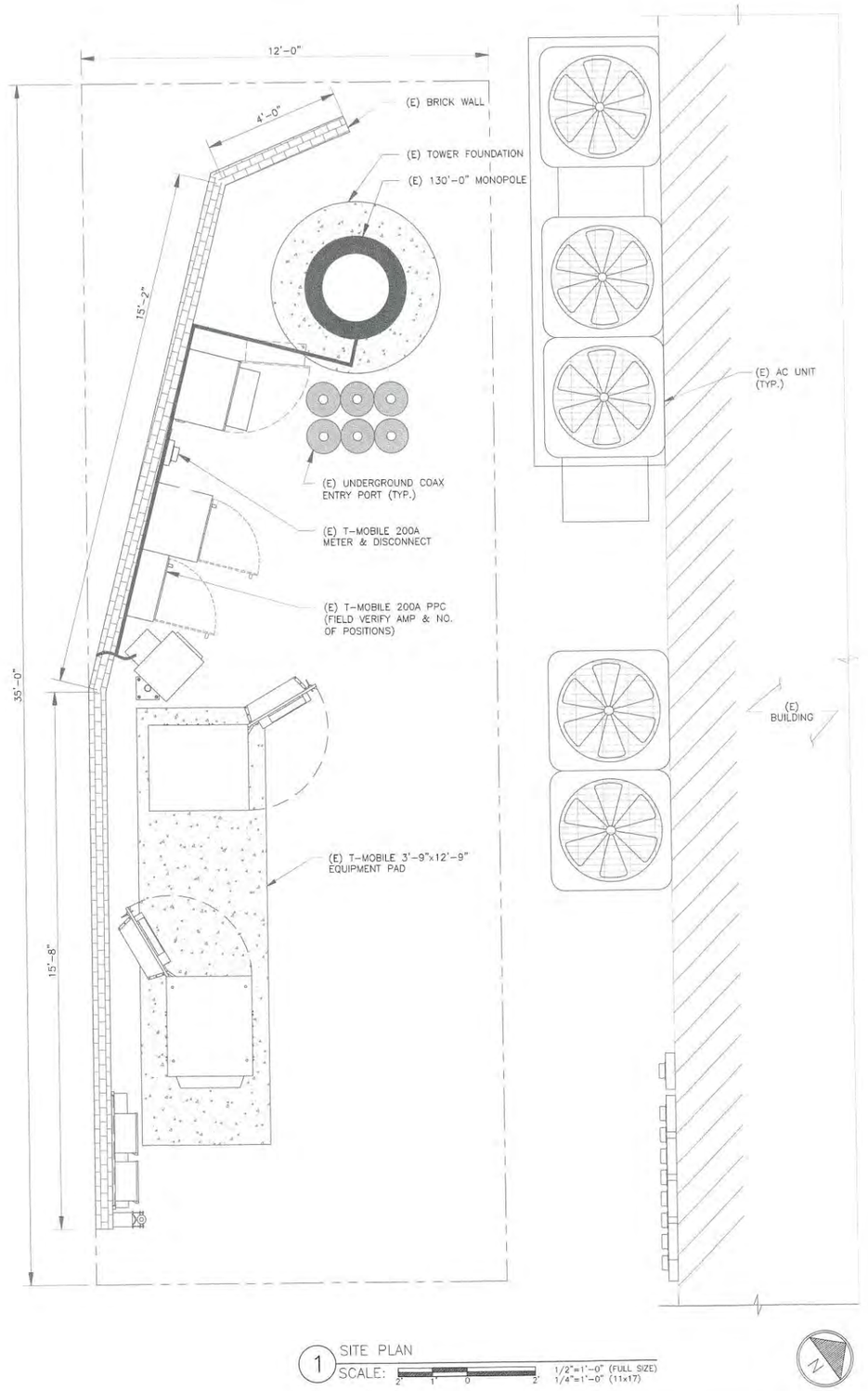
8615 N PORT WASHINGTON RD
FOX POINT, WI 53217

EXISTING 130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/19/2022	GRV	FINAL	JRG

JACOB GORALSKI
43884-6
SUGAR LAND, TX
WISCONSIN PROFESSIONAL ENGINEER
08/19/2022
EXPIRATION: 7/31/2024



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

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08/19/2022

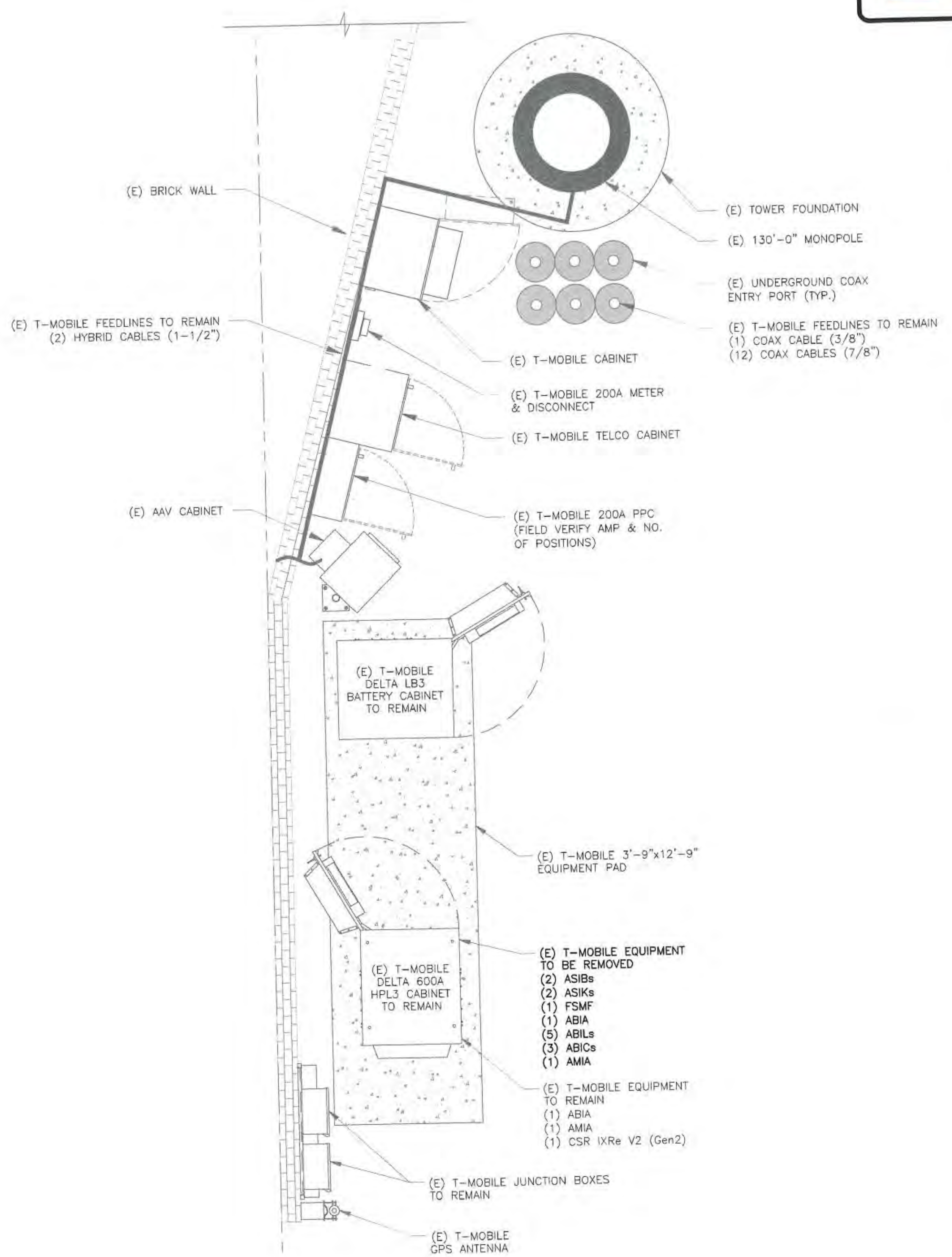
WISCONSIN
JACOB GORALSKI
43884-6
SUGAR LAND, TX
PROFESSIONAL ENGINEER

EXPIRATION: 7/31/2024

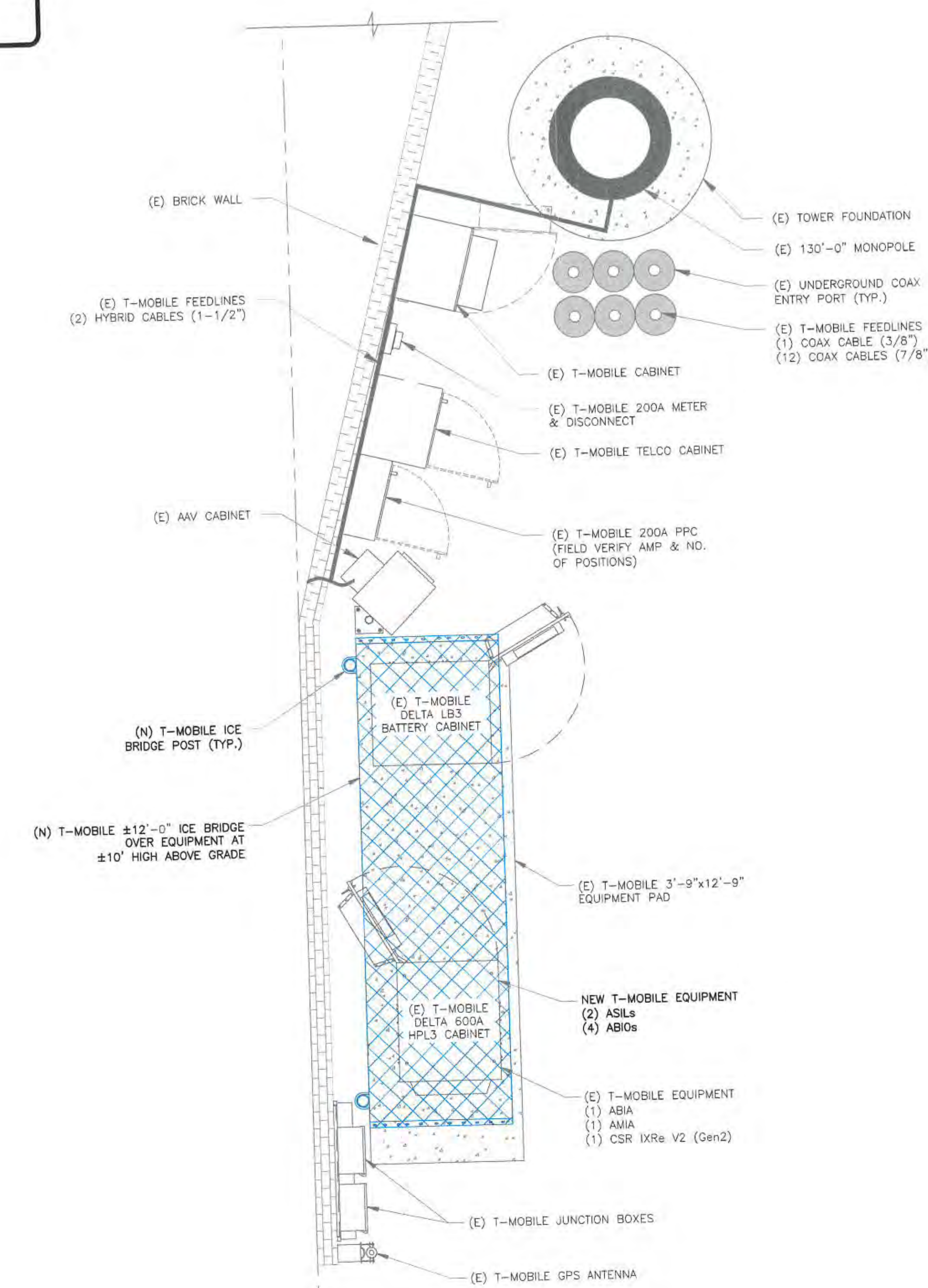
SHEET NUMBER: C-1.1
REVISION: 0

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW



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



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

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EXISTING 130'-0" MONOPOLE

ISSUED FOR:

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0	08/19/2022	GRV	FINAL	JRG

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08/19/2022
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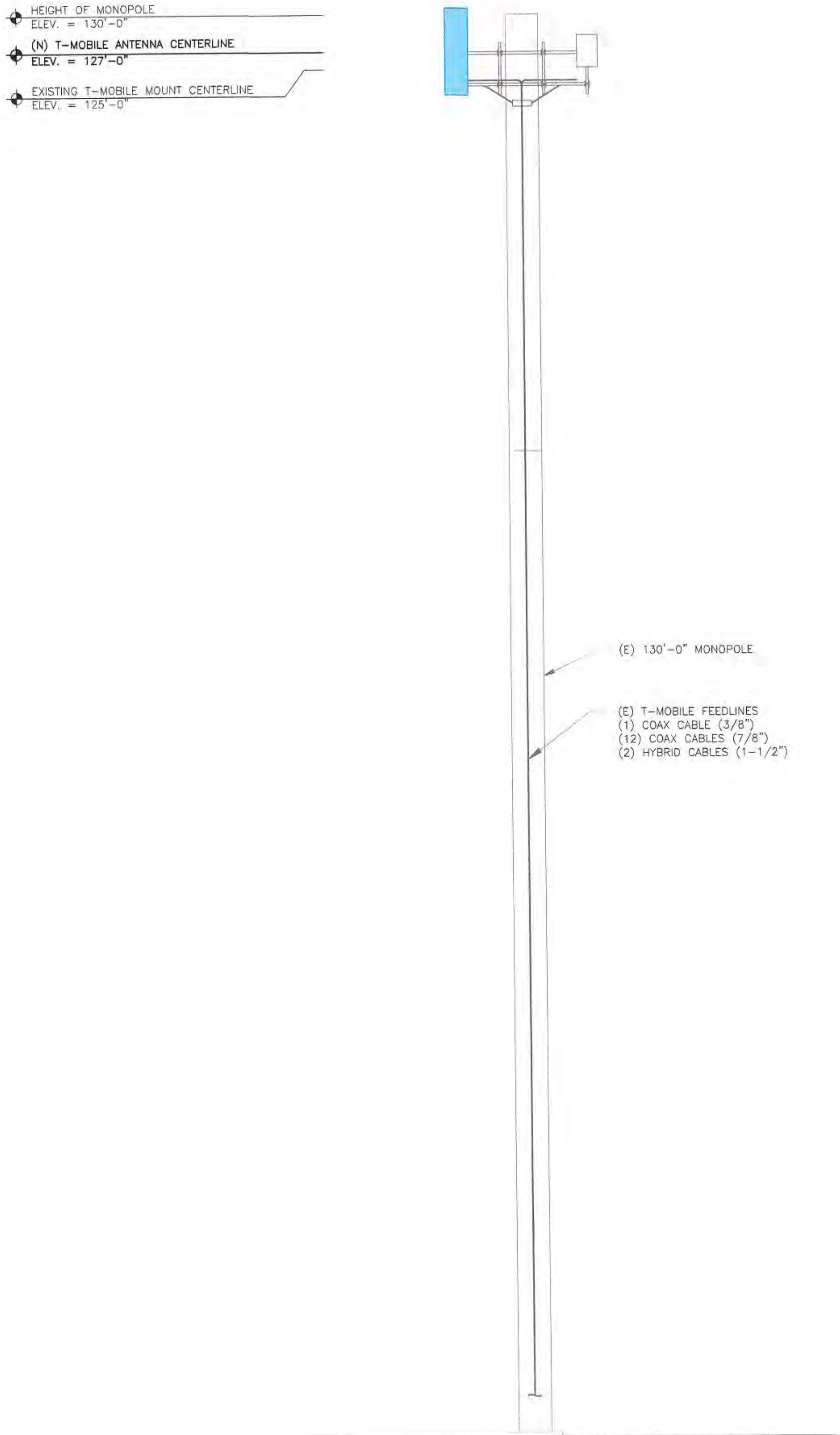
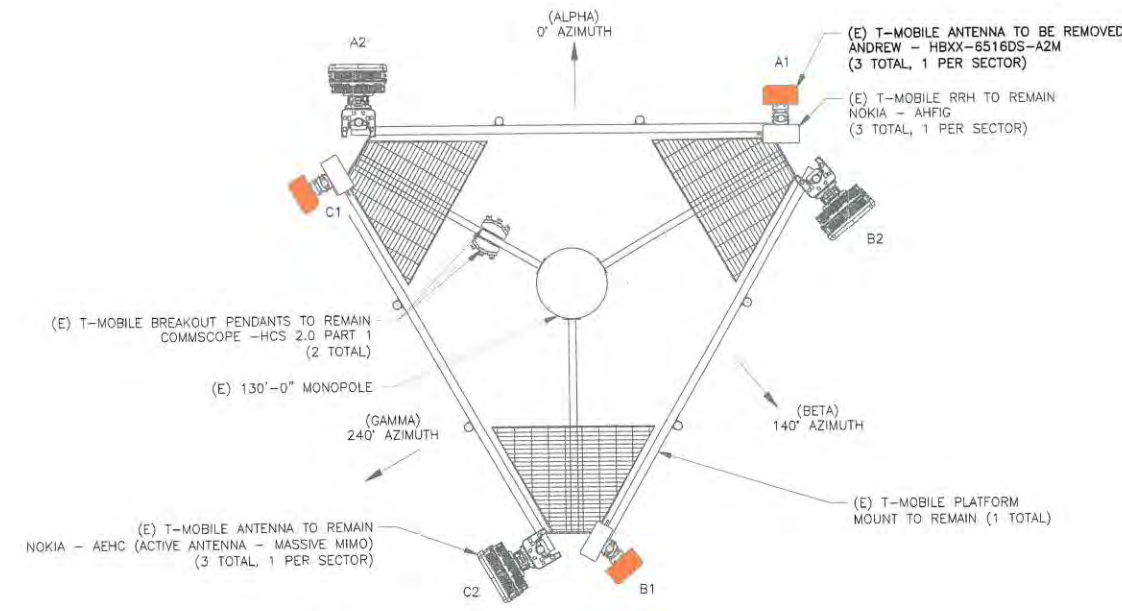
SHEET NUMBER:	REVISION:
C-1.2	0



1 EXISTING ELEVATION
SCALE: NOT TO SCALE



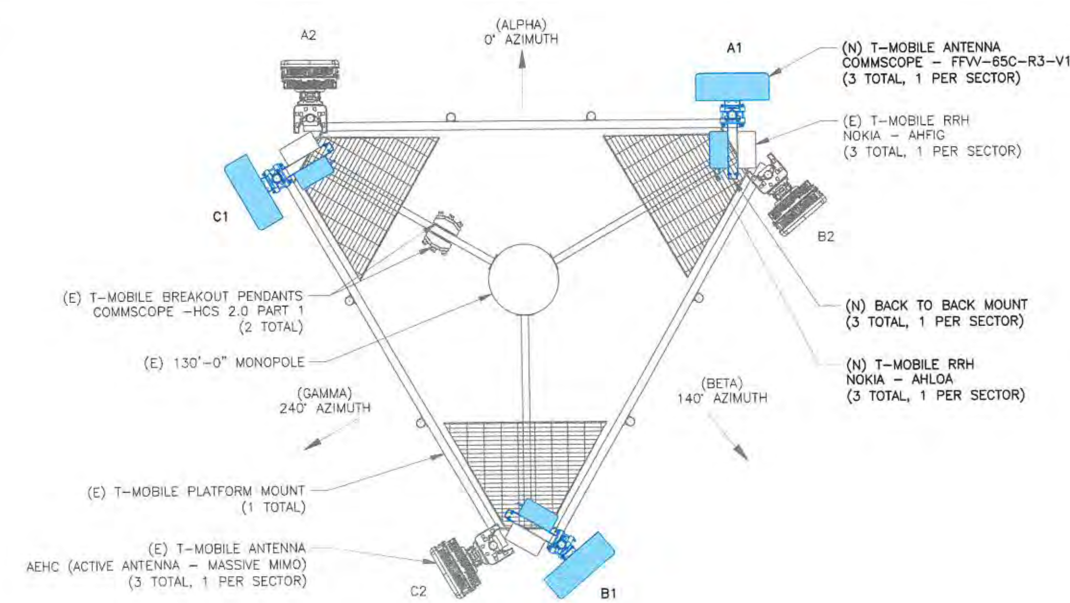
2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW

INSTALLER NOTE:

CONTRACTOR SHALL REFER TO STRUCTURAL ANALYSIS AND COORDINATE COAX LAYOUT WITH SITE CONSTRUCTION MANAGER AND TOWER OWNER.



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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WISCONSIN
JACOB GORALSKI
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SUGAR LAND, TX
PROFESSIONAL ENGINEER
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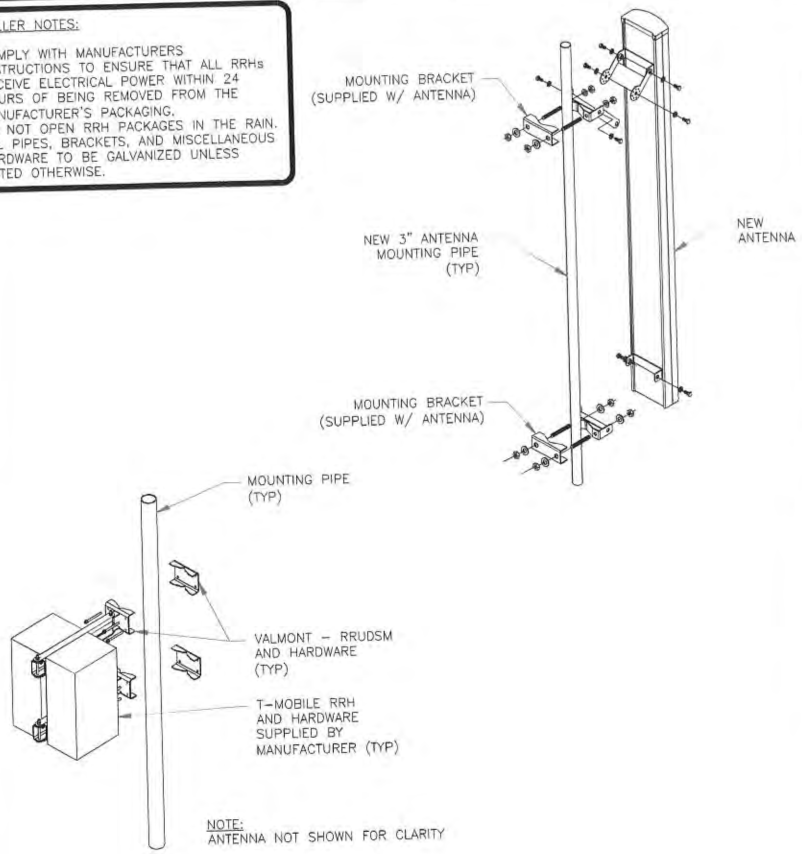
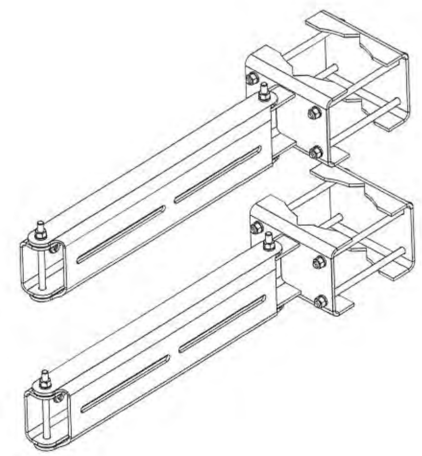
SHEET NUMBER:	REVISION:
C-2	0

INSTALLER NOTES:

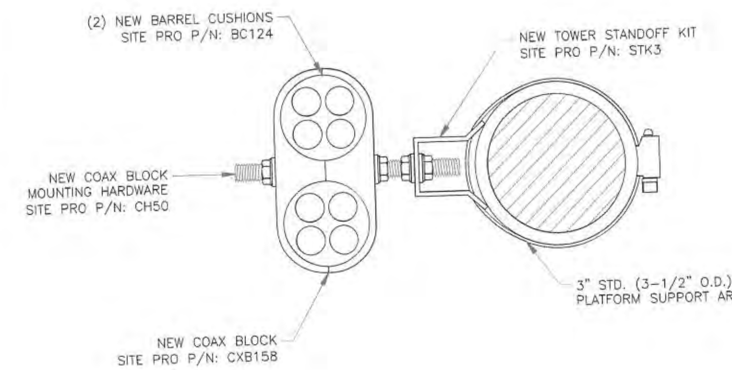
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



1 MOUNTING DETAIL
SCALE: NOT TO SCALE



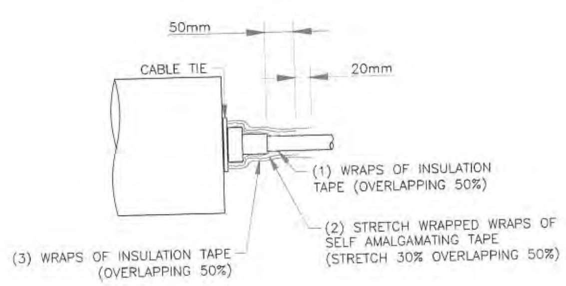
2 RRH MOUNTING DETAIL
SCALE: NOT TO SCALE



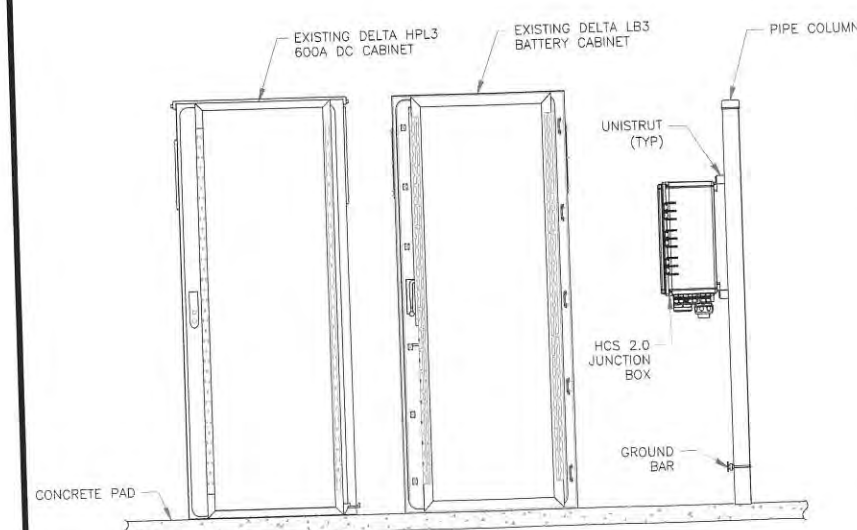
3 RF JUMPER DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTE:

JUMPERS TO BE TORQUED TO 221.27 IN/LBS



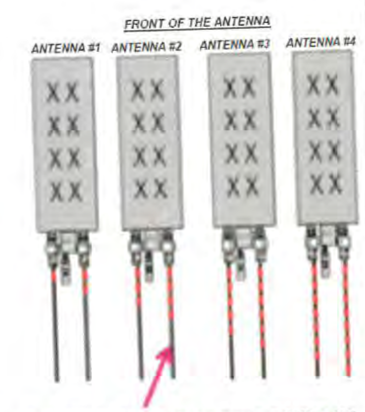
4 RF JUMPER CONNECTION
SCALE: NOT TO SCALE



5 GROUND EQUIPMENT ELEVATION
SCALE: NOT TO SCALE

Coax Color Coding

SECTOR A	RED
SECTOR B	GREEN
SECTOR C	BLUE
SECTOR D	YELLOW
SECTOR E	WHITE
SECTOR F	PURPLE
LMU	BROWN + SECTOR COLOR BANDS (1 & 2)
FIBER ID	GRAY
UNUSED COAX	PINK
MICROWAVE	ORANGE
DWE T-1'S + GPS DOWNLINK CABLE	ID W/LABEL MAKER



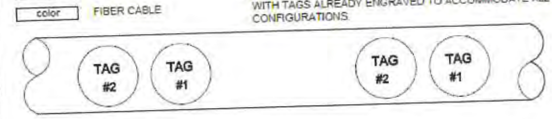
EXAMPLE: COAX WITH FOUR BANDS OF RED TAPE WILL REPRESENT ALPHA SECTOR AND THE 4TH PORT OF ANTENNA

COLOR CODING NOTES:

color	GSM
color	UMTS 1900
color	UMTS AWS
color	LTE
color	FIBER CABLE

METALLIC TAG NOTES:

1. TWO METALLIC TAGS SHALL BE ATTACHED AT EACH END OF EVERY CABLE LONGER THAN (3) THREE FEET
2. CABLE LESS THAN (3) THREE FEET WILL HAVE TWO METALLIC TAGS ATTACHED AT THE CENTER OF THE CABLE.
3. TAGS WILL BE FASTENED WITH STAINLESS STEEL ZIP TIES APPROPRIATE FOR CABLE DIAMETER.
4. STANDARDIZED METALLIC TAG KIT WILL BE ASSEMBLED WITH TAGS ALREADY ENGRAVED TO ACCOMMODATE ALL CONFIGURATIONS.



ANTENNA AND COAXIAL CABLE SCHEDULE

1. ALL ANTENNAS SHALL BE FURNISHED WITH DOWNTILT BRACKETS. CONTRACTOR SHALL COORDINATE REQUIRED MECHANICAL DOWNTILT FOR EACH ANTENNA WITH RF ENGINEER. ANTENNA DOWNTILT SHALL BE SET AND VERIFIED BY A SMART LEVEL.
2. CONTRACTOR SHALL INSTALL COLOR CODE RINGS ON EACH OF THE HYBRID CABLES AND JUMPER CABLES WITH UV RESISTANT TAPE. ALL CABLE SHALL BE MARKED AT TOP AND BOTTOM WITH 2" COLOR TAPE OR STENCIL TAG. COLOR TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRONICS.

6 COAX COLOR CODING
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER :
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BU #: **827008**
RIVER POINT SHOPPING CENT

8615 N PORT WASHINGTON RD
FOX POINT, WI 53217

EXISTING 130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/19/2022	GRV	FINAL	JRG

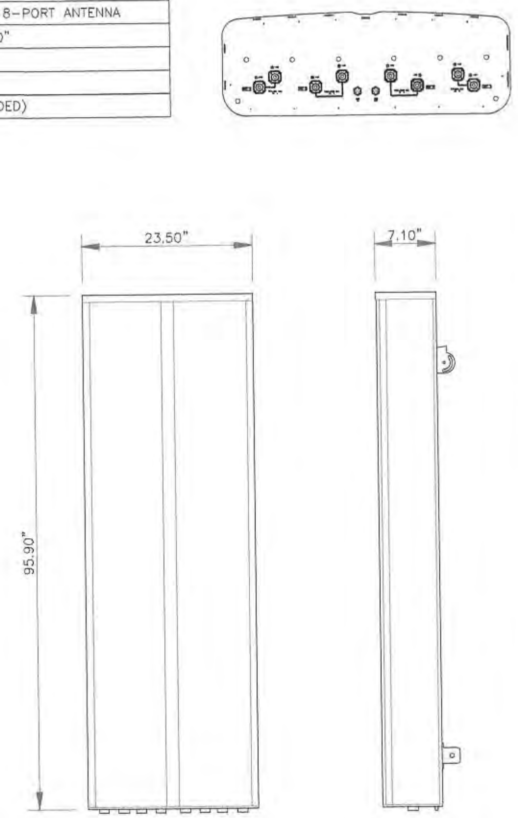
08/19/2022
WISCONSIN
JACOB GORALSKI
43884-6
SUGAR LAND, TX
PROFESSIONAL ENGINEER
EXPIRATION: 7/31/2024

SHEET NUMBER: C-3

REVISION: 0

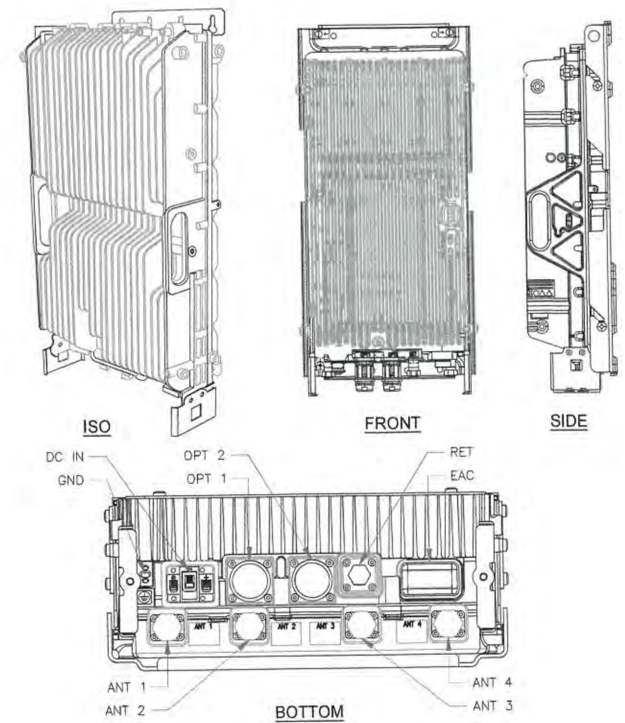
MANUFACTURER:	COMMSCOPE
MODEL:	FFVV-65C-R3-V1 8-PORT ANTENNA
DIMENSIONS (HxWxD):	95.90"x25.20"x9.30"
WEIGHT:	124.60 LBS
BAND:	MULTIBAND
MOUNTING KIT:	BSAMNT-4 (INCLUDED)

NOTE:
RF CONNECTORS (4.3-10 FEMALE)



1 COMMSCOPE FFVV-65C-R3-V1 ANTENNA
SCALE: NOT TO SCALE

MANUFACTURER:	NOKIA
MODEL:	AHLOA
DIMENSIONS (HxWxD):	22.1"x12.1"x7.4"
WEIGHT:	83.5 LBS



2 NOKIA AHLOA RRH
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile
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CHICAGO, IL 60631

CROWN CASTLE
3025 HIGHLAND PKWY, SUITE 510
DOWNERS GROVE, IL 60515

IRISH TOWER
GENERAL CONSTRUCTION | ENGINEERING | PROJECT MANAGEMENT
4603 Bermuda Drive, Sugar Land, TX 77479
(281) 796-2651 irishtower.com

T-MOBILE SITE NUMBER :
ML11046B
BU #: **827008**
RIVER POINT SHOPPING CENT

8615 N PORT WASHINGTON RD
FOX POINT, WI 53217

EXISTING 130'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/19/2022	GRV	FINAL	JRG

08/19/2022
WISCONSIN
JACOB GORALSKI
43884-6
SUGAR LAND, TX
PROFESSIONAL ENGINEER
EXPIRATION: 7/31/2024

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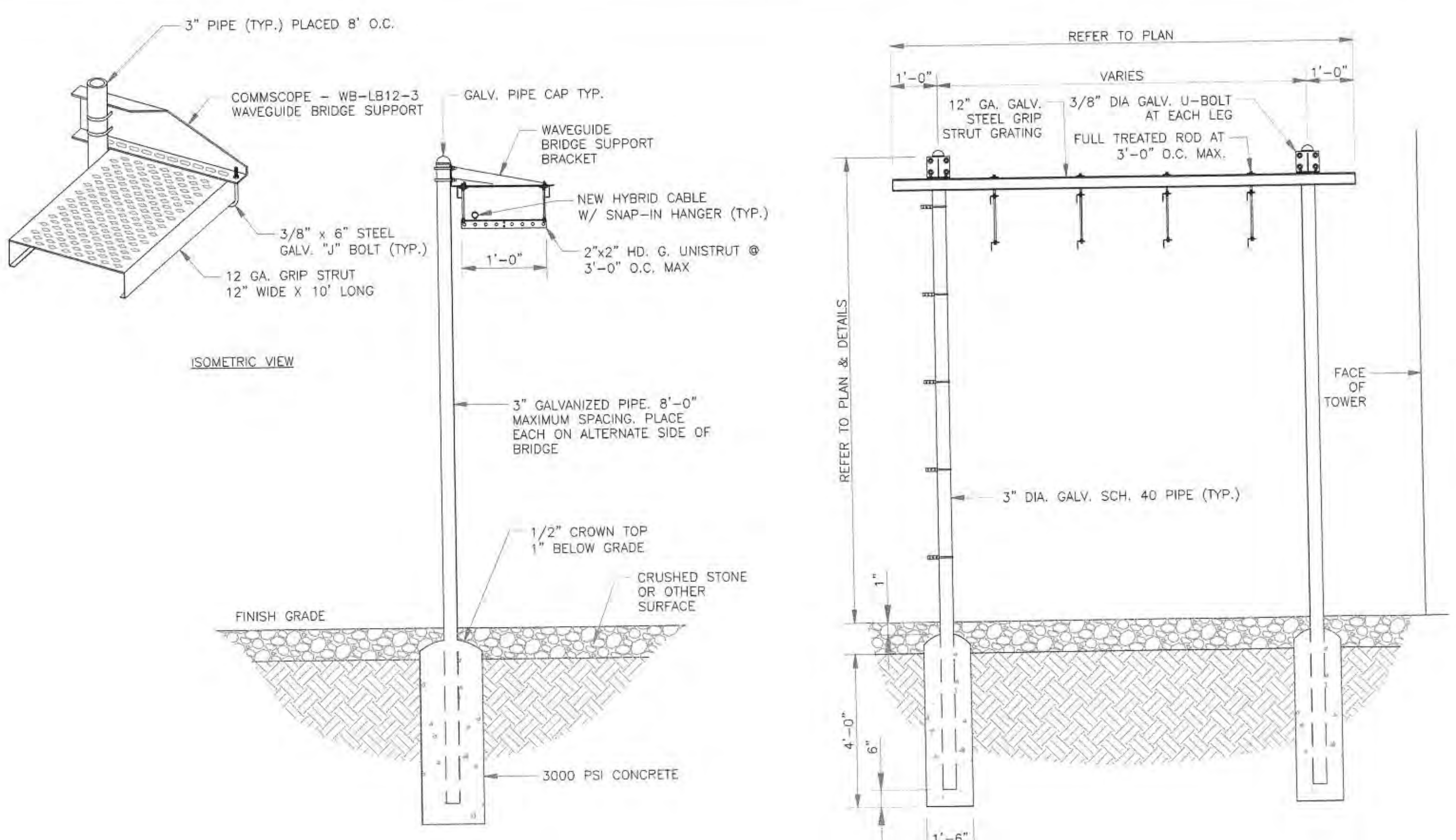
SHEET NUMBER: C-4
REVISION: 0



1 ICE BRIDGE DETAIL
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE

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SHEET NUMBER:	REVISION:
C-5	0

NOTE:
PPC WAS NOT ACCESSIBLE TO FIELD CREW AT THE TIME OF SITEWALK

PPC 200A, 120/240VAC, 1φ/3W, 60HZ, M. BKR, 10KAIC

CKT	DESCRIPTION	POLE	AMP			AMP	POLE	DESCRIPTION	CKT
1									13
2									14
3									15
4									16
5									17
6									18
7									19
8									20
9									21
10	DELTA 600A HPL3 CABINET	4	200						22
11									23
12									24

* DENOTES NEW OR MODIFIED BREAKERS

1 EXISTING PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTE:
PPC WAS NOT ACCESSIBLE TO FIELD CREW AT THE TIME OF SITEWALK

THIS PANEL SCHEDULE IS TO BE UTILIZED AS REFERENCE ONLY. GC TO FIELD VERIFY EXISTING ACTIVE BREAKERS AND AMPERAGE AND MAINTAIN BREAKERS FOR MISCELLANEOUS SITE COMPONENTS AS REQUIRED

PPC 200A, 120/240VAC, 1φ/3W, 60HZ, M. BKR, 10KAIC

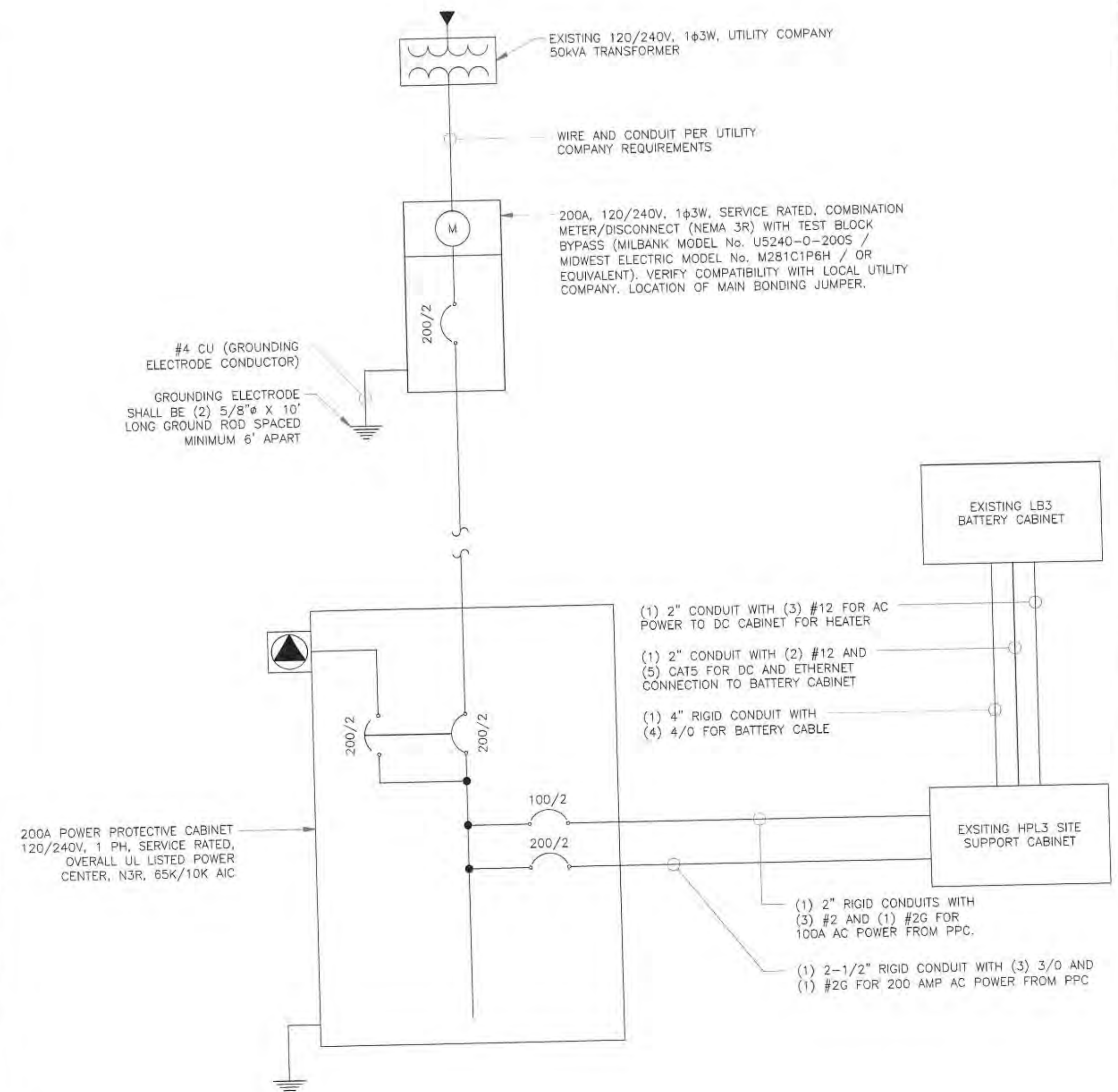
CKT	DESCRIPTION	POLE	AMP			AMP	POLE	DESCRIPTION	CKT
1									13
2									14
3									15
4									16
5									17
6									18
7									19
8									20
9									21
10	DELTA 600A HPL3 CABINET	4	200						22
11						100	2	*FUTURE T-MOBILE 100A BREAKER	23
12									24

* DENOTES NEW OR MODIFIED BREAKERS

2 FINAL PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTES:

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



3 ONE-LINE DIAGRAM
SCALE: NOT TO SCALE

T · · Mobile · · ·

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WISCONSIN
JACOB GORALSKI
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SUGAR LAND, TX
PROFESSIONAL ENGINEER

EXPIRATION: 7/31/2024

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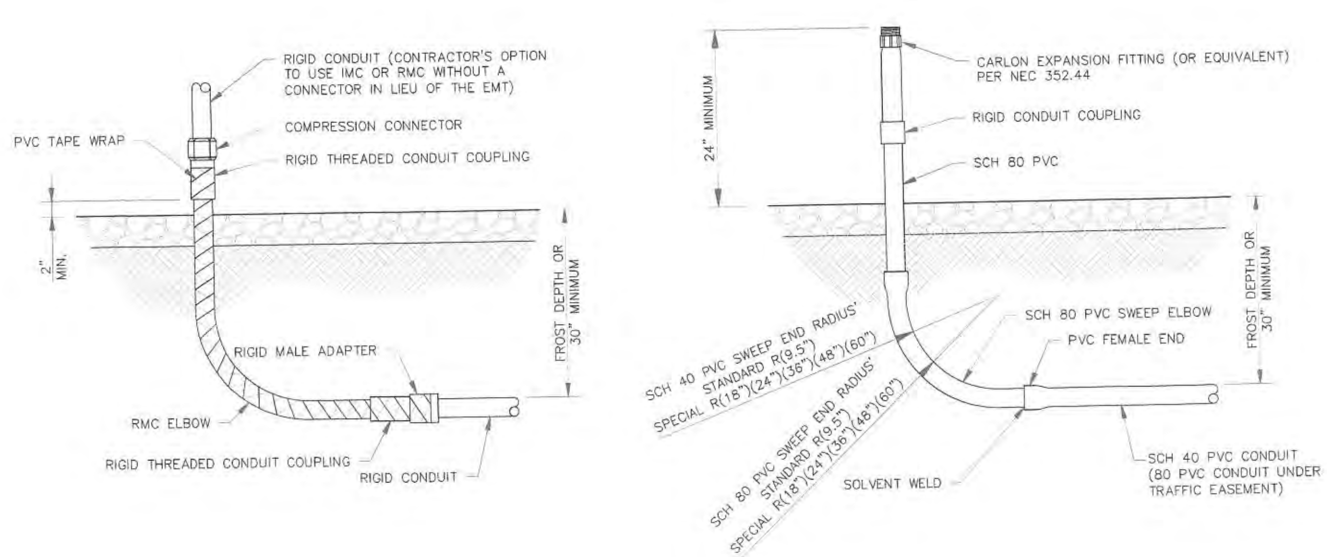
SHEET NUMBER: E-1

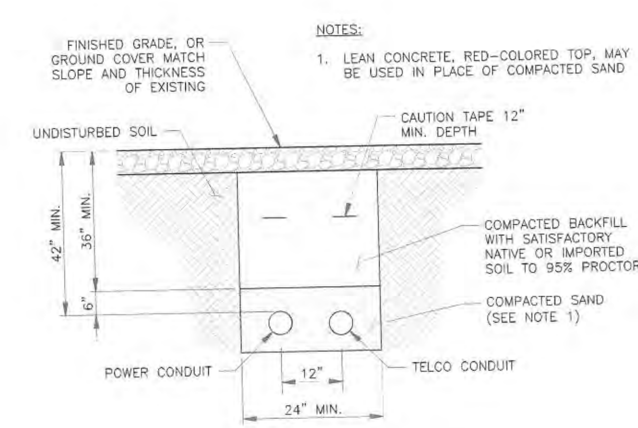
REVISION: 0

INSTALLER NOTES:

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.



1 CONDUIT STUB UP DETAILS
SCALE: NOT TO SCALE



NOTES:

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

2 TRENCH DETAIL
SCALE: NOT TO SCALE

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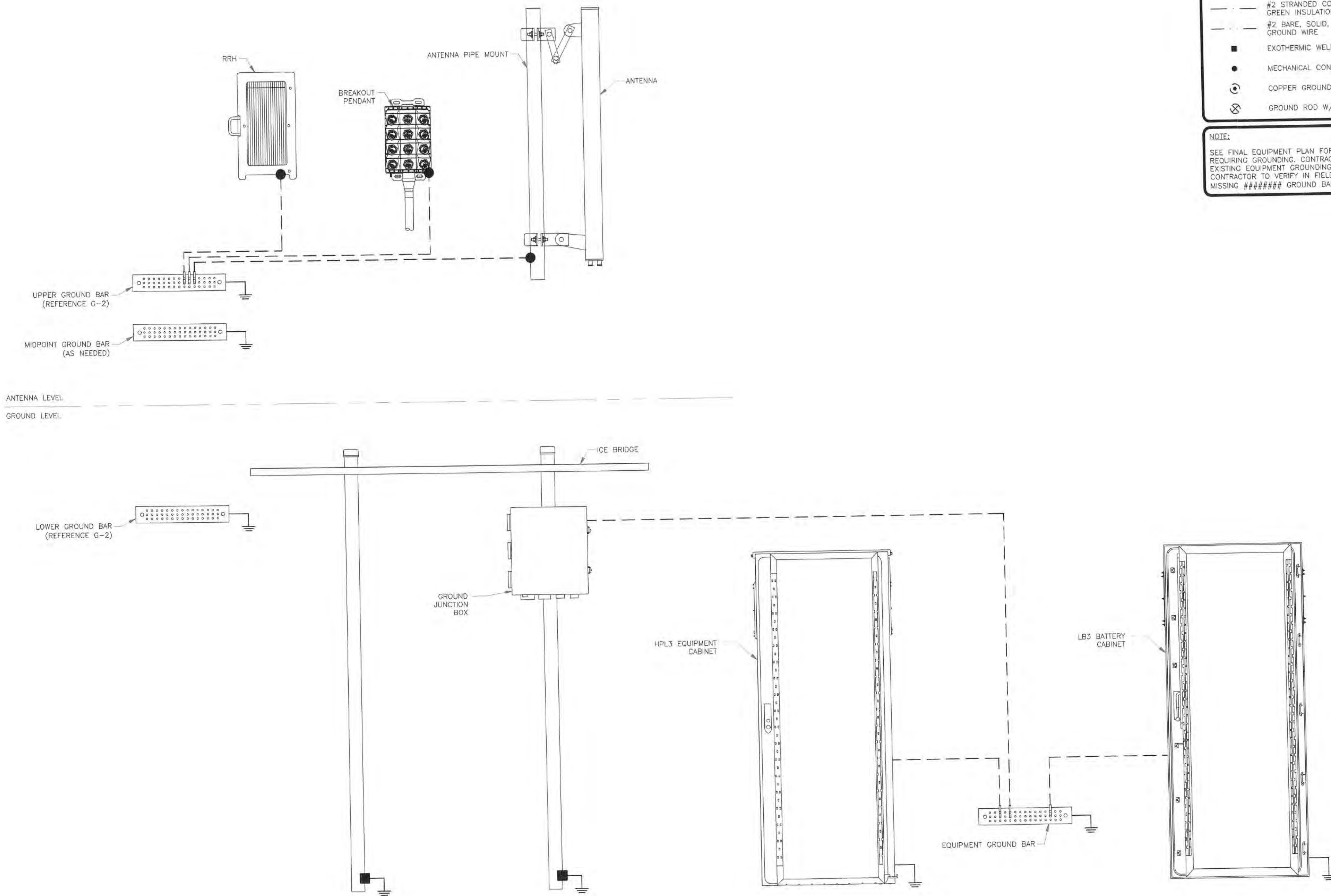
SHEET NUMBER: E-2
REVISION: 0



1 TYPICAL FINAL GROUNDING SCHEMATIC
SCALE: NOT TO SCALE

GROUNDING PLAN LEGEND:

Symbol	Description
— — —	#6 STRANDED COPPER WITH GREEN INSULATION GROUND WIRE
— · —	#2 STRANDED COPPER WITH GREEN INSULATION GROUND WIRE
— · · —	#2 BARE, SOLID, TINNED COPPER GROUND WIRE
■	EXOTHERMIC WELD
●	MECHANICAL CONNECTION
⊙	COPPER GROUND ROD
⊗	GROUND ROD W/ TEST WELL

NOTE:

SEE FINAL EQUIPMENT PLAN FOR NEW EQUIPMENT REQUIRING GROUNDING. CONTRACTOR TO VERIFY EXISTING EQUIPMENT GROUNDING IN FIELD. CONTRACTOR TO VERIFY IN FIELD AND INSTALL ANY MISSING ######## GROUND BARS ON SITE.

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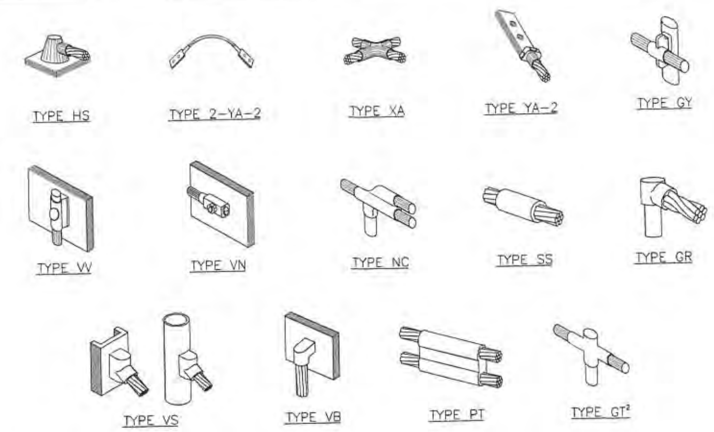
SHEET NUMBER: G-1
REVISION: 0

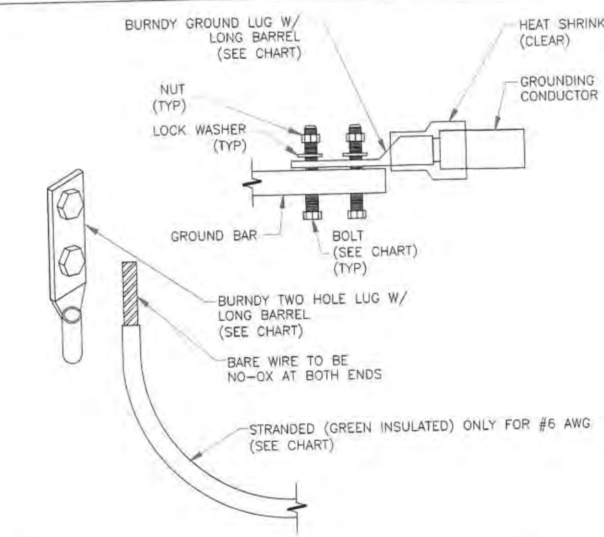


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

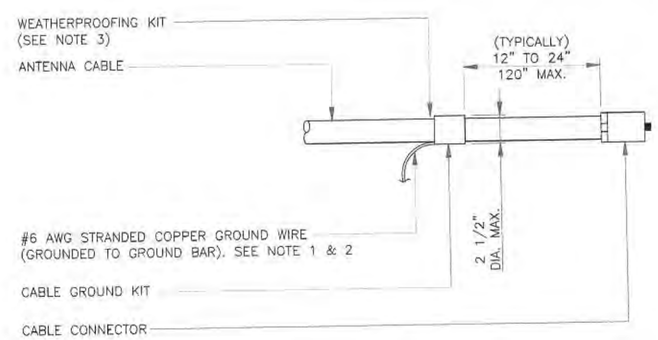
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

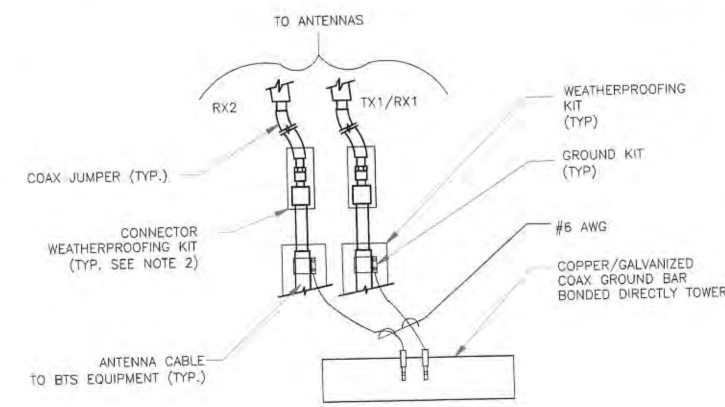
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

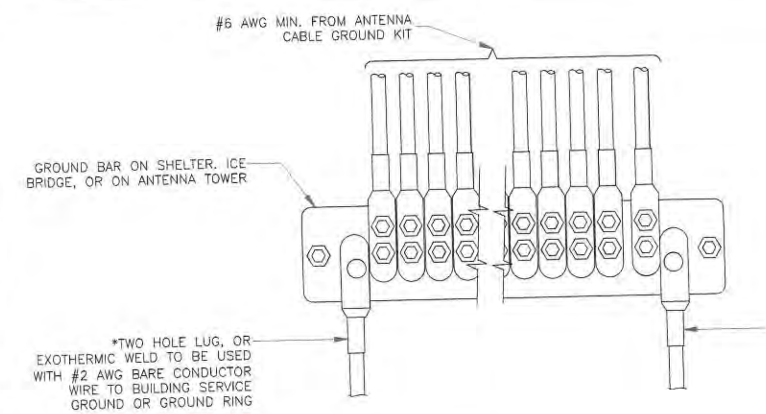
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



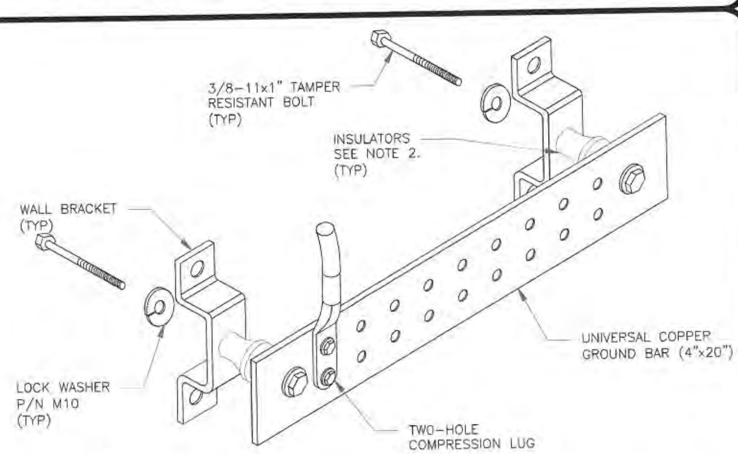
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



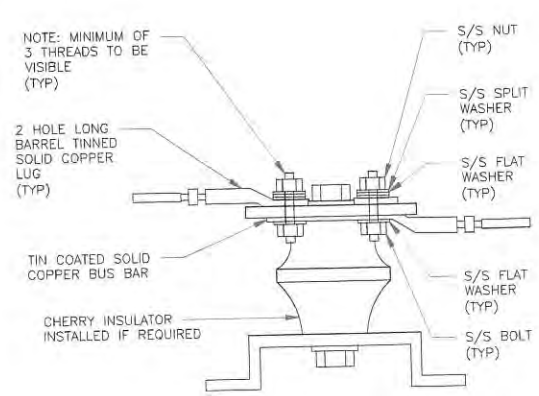
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



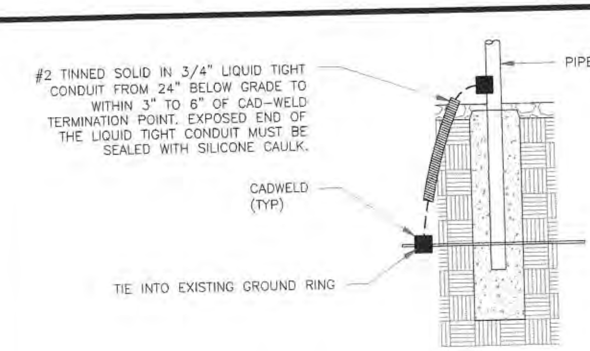
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

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G-2	0