



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

June 1, 2022

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

RE: **Notice of Exempt Modification for T-Mobile: CT11261C**  
**Crown Site ID# 841301**  
**426 River Road, Willington, CT 06279**  
**Latitude: 41° 53' 26.72" / Longitude: -72° 17' 21.77"**

Dear Ms. Bachman:

T-Mobile currently maintains four (4) antennas at the 100-foot mount on the existing 110-foot monopole tower located at 426 River Road, Willington CT. The property is owned by Willington Fire Dept Inc, and the tower is owned by Crown Castle. T-Mobile now intends to replace two (2) antennas and ancillary equipment at the 100ft level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

**Panned Modification:**

**Tower:**

Installed New:

- (2) Ericsson Air 6419 B41 Antennas
- (4) Ericsson-Radio 4460 B25+ B66 RRU
- (1) Hybrid Cable 6x24
- (1) Mount modification/ B+T Group Design

Remove:

- (2) EMS – RR90-17-XXPD Antennas
- (2) Ericsson Twin Style 1BX -KRY 112 144/2 TMAs
- (2) Ericsson Twin Style 1A-KRY 112 489/2 TMAs
- (8) 1-1/4" Coaxial Cables

**Ground:**

Install New:

- (1) 6160 AC V1 Cabinet
- (1) DUG20 IN 6201 Cabinet
- (1) RP 6651 IN 6160 Cabinet
- (1) PSU 4813 Voltage Booster

The Foundation for a Wireless World.  
CrownCastle.com

- (1) 150A Breaker For 6160

Remove:

- (6) RUS01 B2 Radio From 6201 Cabinet
- (2) Ericsson 4415 B66A Radios

The facility was approved by the Town of Willington Planning and Zoning Commission on August 15, 2000, by way of special permit. The Special permit was issued with Conditions that this exempt modification complies with.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Erika Wiecenski, First Selectwoman, Town of Willington, Michael D' Amato, Zoning Agent, Town of Willington. The Willington Fire Department – Property Owner Property owner and Crown Castle is the tower owner.

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

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

Sincerely,



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

Melanie A. Bachman

Page 3

Attachments

cc:

Erika Wiecenski, First Selectwoman  
Town of Willington  
40 Old Farms Road  
Willington, CT 06279  
860-487-3100

Michael D' Amato, Zoning Agent  
Town of Willington  
40 Old Farms Road  
Willington, CT 06279  
860-487-3123

Willington Fire Department – Property Owner  
PO Box 161  
Willington, CT 06279

Crown Castle - Tower Owner

TOWN OF WILLINGTON  
PLANNING AND ZONING COMMISSION

SPECIAL PERMIT

Date: 9/26/2000

This is to certify that the use: **Monopole Antenna Tower and Support Building for Wireless Communications Facility** located on **426 River Road** Assessors Map **34**, lot **10**, Zone **R80** has been approved with conditions by the Willington Planning and Zoning Commission on **8/15/2000** pursuant to **Section 13** of the Town of Willington Zoning Regulations, which findings are on file with the Commission.

Owner of Record: Willington Fire Department #1

  
Agent

Conditions:

- 1) Prior to the start of construction, any FCC and FAA approvals shall be provided to the zoning agent.
- 2) As stated at the public hearing, the applicant shall agree to comply with any technical revisions suggested by the town engineer and/or the zoning agent, and updated drawings to reflect those revisions shall be provided.
- 3) The driveway shall meet zoning regulations, as they may be waived by the zoning agent.
- 4) The elevation of the top of any antenna shall not exceed 642 feet above sea level.
- 5) The exterior lighting switch shall be arranged so any exterior lighting is not on all the time, but rather only when required by workers.
- 6) All easements shall be depicted on the final site plan
- 7) A gate shall be provided on the northeast access road at the location of the barbed wire fence.

Received for record October 25, 00  
At Licolen Danmair/Kelcie TC

Applicant should obtain a copy of the Zoning Regulations which detail specific requirements.

TOWN OF WILLINGTON  
Planning and Zoning Commission  
40 Old Farms Road, Willington, CT 06279

Application for: Special Permit X Amendment Site Plan Approval Modification

Location of property: 426 River Road, Willington, Connecticut 06279

Assessors Map #: 34 Assessors Lot #: 10 Existing Zone: R-80 Area of property: 12.6 acres

Historical District Certificate of Appropriateness is attached to this application (if applicable): N/A

Special Permit Requested: Construction of monopole and support building

Names, addresses and telephone numbers of owner/owners:

Willington Fire Department, Inc. #1 c/o Chief Tyler Millix, P.O. Box 161  
426 River Road, Willington, Connecticut 06279 (860-429-0288)

Name, address and telephone number of petitioner if other than owner:


N/A

Description of existing and proposed use of land and buildings:


Existing use: Willington Fire Department, Inc. facility

Proposed use: Construction of a monopole and support building for a wireless communications facility and improvements to existing access driveway pursuant to Sections 7.06.04 and 7.06.04.06 of the zoning regulations.

Please submit with this application form all data and maps required in Section 13 of the Zoning Regulations. The undersigned owner(s) of the property hereby authorizes the Planning and Zoning Commission or their agent to enter and inspect premises at any reasonable hour.

Signature of owner(s):  Date: May 12, 2000  
Tyler Millix, Chief  
Willington Fire Dept., Inc. #1 Date: \_\_\_\_\_

I (we) the undersigned petitioner(s) understand that the submission of inaccurate or incomplete information shall be grounds for denial of this application by the P.Z.C.

Signature(s):  Date: May 12, 2000  
Tyler Millix, Chief  
Willington Fire Dept., Inc. #1 Date: \_\_\_\_\_

\*List of property owners within five hundred (500) feet of subject property  
A SPECIAL attached hereto as Exhibit A.

# 426 RIVER RD

**Location** 426 RIVER RD

**Mblu** 34 / / 010-00 / /

**Acct#** 00242700

**Owner** WILLINGTON FIRE DEPT INC

**Assessment** \$383,350

**Appraisal** \$547,630

**PID** 4891

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$453,400	\$94,230	\$547,630
Assessment			
Valuation Year	Improvements	Land	Total
2018	\$317,390	\$65,960	\$383,350

## Owner of Record

**Owner** WILLINGTON FIRE DEPT INC  
**Co-Owner**  
**Address** P O BOX 161  
 WILLINGTON, CT 06279

**Sale Price** \$0  
**Certificate** 1  
**Book & Page** 80/355  
**Sale Date** 06/25/1980

## Building Information

### Building 1 : Section 1

**Year Built:** 1985  
**Living Area:** 4,266  
**Replacement Cost:** \$661,759  
**Building Percent Good:** 65  
**Replacement Cost**  
**Less Depreciation:** \$430,140

Building Attributes	
Field	Description
STYLE	Fire Station
MODEL	Industrial
Grade	A
Stories:	1
Occupancy	1.00

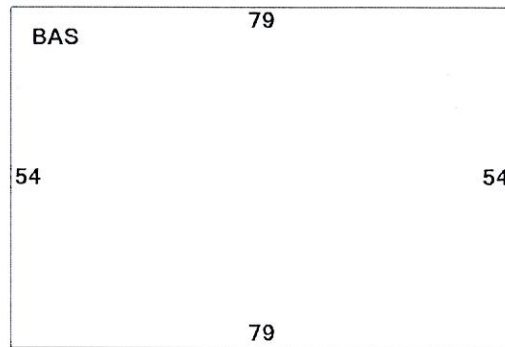
Exterior Wall 1	Typical
Exterior Wall 2	
Roof Structure	Typical
Roof Cover	Typical
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Typical
Interior Floor 2	
Heating Fuel	Typical
Heating Type	Floor Furnace
AC Type	Unit/AC
Bldg Use	MUN FIRE
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	None
Frame Type	Fireprf Steel
Baths/Plumbing	Average
Ceiling/Wall	-DESCRIPTION-
Rooms/Prtns	Average
Wall Height	14.00
% Conn Wall	

### Building Photo



(<http://images.vgsi.com/photos/WillingtonCTPhotos//00\00\18\23.jpg>)

### Building Layout



(ParcelSketch.ashx?pid=4891&bid=4891)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	4,266	4,266
		4,266	4,266

### Extra Features

Extra Features	Legend
No Data for Extra Features	

### Land

#### Land Use

Use Code	9032
Description	MUN FIRE
Zone	R80
Neighborhood	301

#### Land Line Valuation

Size (Acres)	13.16
Frontage	
Depth	
Assessed Value	\$65,960

**Outbuildings**

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LT1	LIGHTS-IN W/PL			1.00 UNITS	\$480	1
LT5	MERC VAP/FLU			1.00 UNITS	\$770	1
PAV1	PAVING-ASPHALT			15000.00 S.F.	\$21,000	1
SHD1	SHED FRAME			168.00 S.F.	\$1,010	1

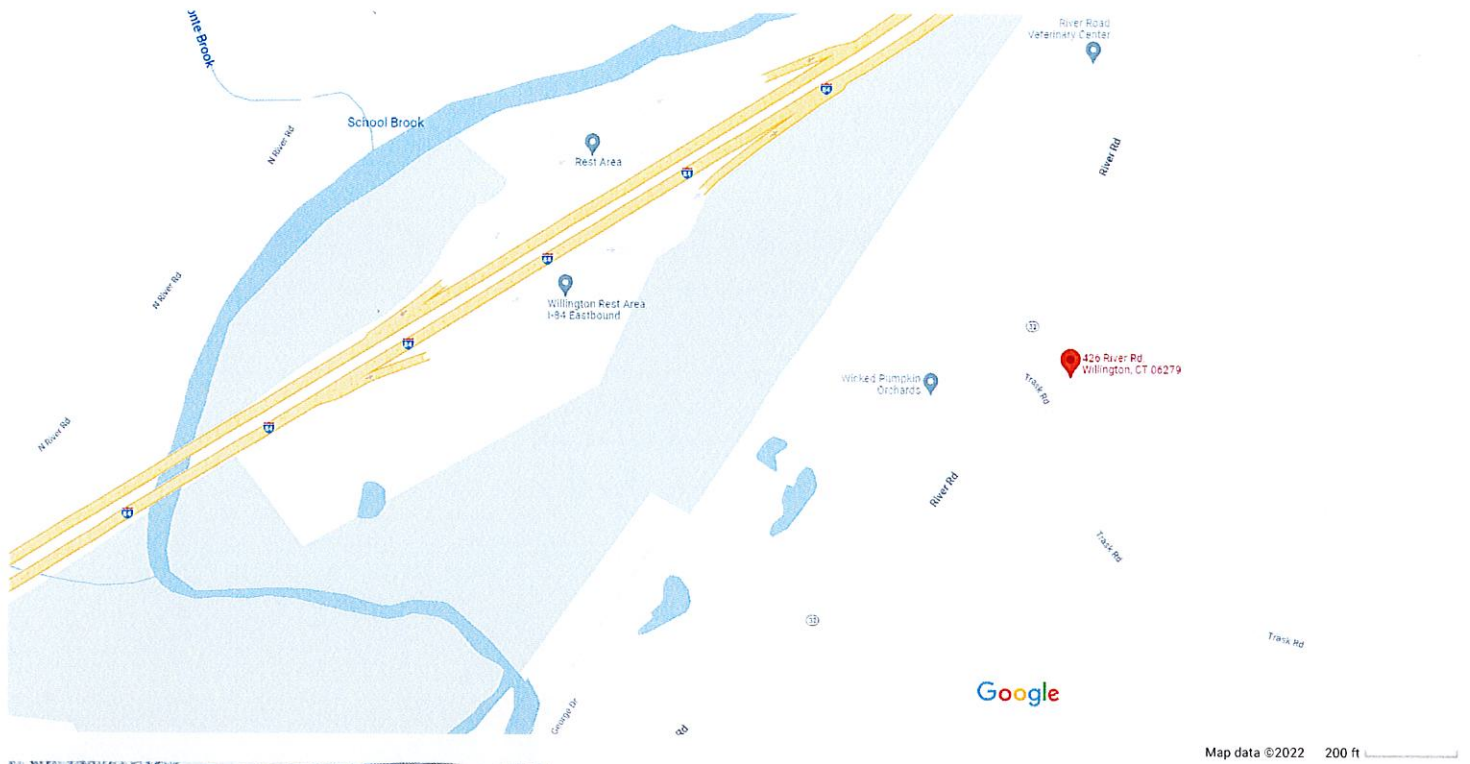
**Valuation History**

Appraisal			
Valuation Year	Improvements	Land	Total
2019	\$453,400	\$94,230	\$547,630

Assessment			
Valuation Year	Improvements	Land	Total
2019	\$317,390	\$65,960	\$383,350






Google Maps 426 River Rd



### 426 River Rd

Building

-   
Directions
-   
Save
-   
Nearby
-   
Send to phone
-   
Share

 426 River Rd, Willington, CT 06279

### Photos

**Barbadora, Jeff**

---

**From:** TrackingUpdates@fedex.com  
**Sent:** Thursday, June 2, 2022 11:11 AM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 777015496890: Your package has been delivered

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



Hi. Your package was  
delivered Thu, 06/02/2022 at  
11:06am.



Delivered to 40 OLD FARMS RD, WILLINGTON, CT 06279  
Received by S.SNIDER

**OBTAIN PROOF OF DELIVERY**

TRACKING NUMBER [777015496890](#)

<b>FROM</b>	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
<b>TO</b>	Town of Willington Erika Wiecenski- First Selectwoman 40 Old Farms Road WILLINGTON, CT, US, 06279
<b>REFERENCE</b>	799001.7680
<b>SHIPPER REFERENCE</b>	799001.7680
<b>SHIP DATE</b>	Wed 6/01/2022 06:18 PM
<b>DELIVERED TO</b>	Receptionist/Front Desk
<b>PACKAGING TYPE</b>	FedEx Pak
<b>ORIGIN</b>	WESTBOROUGH, MA, US, 01581
<b>DESTINATION</b>	WILLINGTON, CT, US, 06279
<b>SPECIAL HANDLING</b>	Deliver Weekday
<b>NUMBER OF PIECES</b>	1
<b>TOTAL SHIPMENT WEIGHT</b>	1.00 LB
<b>SERVICE TYPE</b>	FedEx Priority Overnight

**Barbadora, Jeff**

---

**From:** TrackingUpdates@fedex.com  
**Sent:** Thursday, June 2, 2022 11:11 AM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 777015520650: Your package has been delivered

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



Hi. Your package was  
delivered Thu, 06/02/2022 at  
11:06am.



Delivered to 40 OLD FARMS RD, WILLINGTON, CT 06279  
Received by S.SNIDER

**OBTAIN PROOF OF DELIVERY**

TRACKING NUMBER [777015520650](#)

<b>FROM</b>	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
<b>TO</b>	Town of Willington Michael D'Amato, Zoning Agent 40 Old Farms Road WILLINGTON, CT, US, 06279
<b>REFERENCE</b>	799001.7680
<b>SHIPPER REFERENCE</b>	799001.7680
<b>SHIP DATE</b>	Wed 6/01/2022 06:18 PM
<b>DELIVERED TO</b>	Receptionist/Front Desk
<b>PACKAGING TYPE</b>	FedEx Pak
<b>ORIGIN</b>	WESTBOROUGH, MA, US, 01581
<b>DESTINATION</b>	WILLINGTON, CT, US, 06279
<b>SPECIAL HANDLING</b>	Deliver Weekday
<b>NUMBER OF PIECES</b>	1
<b>TOTAL SHIPMENT WEIGHT</b>	1.00 LB
<b>SERVICE TYPE</b>	FedEx Priority Overnight



NATICK STATION  
 15 COMMON ST  
 NATICK, MA 01760-4762  
 (800)275-8777

06/02/2022 09:00 AM

Product	Qty	Unit Price	Price
PM Express 1-Day Flat Rate Env	1		\$26.95
Kansas City, MO 64114			
Flat Rate			
Signature Waiver			
Scheduled Delivery Date			
Fri 06/03/2022 06:00 PM			
Money Back Guarantee			
Tracking #:			
EI372188723US			
Insurance			
Up to \$100.00 included			
Total			\$26.95



PM Express 1-Day Flat Rate Env	1		\$26.95
Wilmington, CT 06279			
Flat Rate			
Signature Waiver			
Scheduled Delivery Date			
Fri 06/03/2022 06:00 PM			
Money Back Guarantee			
Tracking #:			
EI372188737US			
Insurance			
Up to \$100.00 included			
Total			\$26.95

Grand Total: \$53.90

Credit Card Remitted \$53.90  
 Card Name: VISA  
 Account #: XXXXXXXXXX5201  
 Approval #: 555459  
 Transaction #: 798  
 AID: A0000000980840 Chip  
 AL: US DEBIT  
 PIN: Not Required

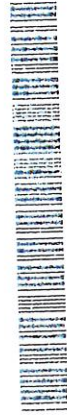
\*\*\*\*\*  
 Every household in the U.S. is now eligible to receive a third set of 8 free test kits.  
 Go to [www.covidtests.gov](http://www.covidtests.gov)  
 \*\*\*\*\*

Save this receipt as evidence of insurance. For information on filing an insurance claim go to <https://www.usps.com/help/claims.htm> or call 1-800-222-1811

Text your tracking number to 28777 (2USPS) to get the latest status. Standard Message and Data rates may apply. You may also visit [www.usps.com](http://www.usps.com) USPS Tracking or call 1-800-222-1811.

Preview your Mail  
 Track your Packages  
 Sign up for FREE @ <https://informedelivery.usps.com>

All sales final on stamps and postage. Refunds for guaranteed services only. Thank you for your business.



EI 372 188 737 US



EI 372 188 723 US

Date: **April 05, 2022**



Black & Veatch Corp.  
11401 Lamar Avenue  
Overland Park, KS 66211  
(913) 458-6909

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **T-Mobile Co-Locate**  
**Site Number:** CT11261C  
**Site Name:** TOLLAND/I-84/ FILL-IN

**Crown Castle Designation:** **BU Number:** 841301  
**Site Name:** WILLINGTON-RIVER RD  
**JDE Job Number:** 709756  
**Work Order Number:** 2095829  
**Order Number:** 609058 Rev. 0

**Engineering Firm Designation:** **Black & Veatch Corp. Project Number:** 406642

**Site Data:** **426 River Road, Willington, Tolland County, CT**  
**Latitude 41° 53' 26.72", Longitude -72° 17' 21.77"**  
**110 Foot - Monopole Tower**

Black & Veatch Corp. 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 - 65.8%**

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Kochakorn Mokaranurak

Respectfully submitted by:

Ping Jiang, P.E.  
Professional Engineer



Digitally signed by Ping Jiang  
Date: 2022.04.05 10:21:58-05'00'



## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 - Tower Component Stresses vs. Capacity - LC7

4.1) Recommendations

### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

## 1) INTRODUCTION

This tower is a 110 ft Monopole tower mapped by ADP Structural & Welding.

The tower has been modified multiple times in the past to accommodate additional loading.

The tower has been modified per reinforcement drawings prepared by GPD Group, Inc., in June of 2012. Reinforcement consists of addition of reinforcement plates at elevation 45.5' to 65.5' and addition of base plate stiffeners at elevation 0'. Refer to Legacy Modification Inspection Report by FDH Velocitel, Inc., in August of 2015. This modification has been considered effective in this analysis.

The tower has been modified per reinforcement drawings prepared by Aero Solutions, LLC. in January of 2015. Reinforcement consists of addition of reinforcement plates at elevation 1.5' to 86.5', addition of transition stiffeners at elevation 0' and (4) additional anchor rods with brackets. Refer to Modification Inspection Report by FDH Velocitel, Inc., in August of 2015. This modification has been considered effective in this analysis.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	118 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	2 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic Ss:</b>	0.174
<b>Seismic S1:</b>	0.063
<b>Service Wind Speed:</b>	60 mph
<b>Seismic Loading:</b>	Does not control per engineering judgment

**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)
100.0	100.0	1	cci tower mounts (v2.1)	Platform Mount [10.75' LP 712-1]	1 1	1-3/8 1-5/8
		2	ericsson	AIR 6419 B41_TMO w/ Mount Pipe		
		2	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		2	ericsson	RADIO 4460 B2/B25 B66_TMO		
		2	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		

**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)
110.0	113.0	3	ericsson	RRUS 11	2 4 12 2	3/8 3/4 7/8 Conduits
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		3	kmw communications	AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		6	powerwave technologies	7020.00		
		3	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe		
		6	powerwave technologies	TT19-08BP111-001		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		2	raycap	DC6-48-60-18-8F		
	110.0	1	cci tower mounts (v2.1)	Platform Mount [10.75' LP 712-1]		
		2	cci tower mounts (v2.1)	T-Arm Mount [TA 702-3]		
83.0	83.0	2	cci tower mounts (v2.1)	Side Arm Mount [SO 101-1]	2	1-5/8
		2	cci tower mounts (v2.1)	Side Arm Mount [SO 104-1]		
		2	commscope	NNH4-65A-R6 w/ Mount Pipe		
		2	raycap	RRFDC-3315-PF-48		
		2	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		2	samsung telecommunications	RF4439D-25A		
		2	samsung telecommunications	RF4440D-13A		
69.0	74.0	1	decibel	DB810M-XC	3	1/2
	72.0	1	dapa	48212S w/ Mount Pipe		
	71.0	1	decibel	DB201-F		
		1	cci tower mounts (v2.1)	Side Arm Mount [SO 201-1]		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4710168	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4710170	CCISITES
4-TOWER MANUFACTURER DRAWINGS	5113552	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	4945191	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5537030	CCISITES
4-POST-MODIFICATION INSPECTION	5822398	CCISITES
4-POST-MODIFICATION INSPECTION	5864402	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. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

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

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	17.5%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	27.1%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	41.4%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	41.1%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	47.6%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	54.9%	Pass
80 - 79.75	Pole + Reinf.	TP17.934x17.89x0.5625	Reinf. 6 Tension Rupture	46.2%	Pass
79.75 - 74.75	Pole + Reinf.	TP18.822x17.934x0.5375	Reinf. 6 Tension Rupture	53.3%	Pass
74.75 - 69.75	Pole + Reinf.	TP19.71x18.822x0.525	Reinf. 6 Tension Rupture	59.4%	Pass
69.75 - 64.75	Pole + Reinf.	TP20.598x19.71x0.5	Reinf. 6 Tension Rupture	65.2%	Pass
64.75 - 64.25	Pole + Reinf.	TP20.686x20.598x0.5	Reinf. 6 Tension Rupture	65.8%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	50.7%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	55.0%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	57.0%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	44.8%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	47.9%	Pass
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	49.0%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 4 Tension Rupture	51.1%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 4 Tension Rupture	53.3%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 4 Tension Rupture	54.2%	Pass
37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 5 Tension Rupture	53.0%	Pass
37 - 36.5	Pole + Reinf.	TP25.155x25.065x0.7	Reinf. 5 Tension Rupture	53.2%	Pass
36.5 - 36.25	Pole + Reinf.	TP25.2x25.155x0.9125	Reinf. 2 Tension Rupture	46.5%	Pass
36.25 - 34.25	Pole + Reinf.	TP25.562x25.2x0.8875	Reinf. 2 Tension Rupture	47.2%	Pass

34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.725	Reinf. 3 Tension Rupture	50.1%	Pass
34 - 29	Pole + Reinf.	TP26.51x25.607x0.7	Reinf. 3 Tension Rupture	51.8%	Pass
29 - 24	Pole + Reinf.	TP27.414x26.51x0.6875	Reinf. 3 Tension Rupture	53.4%	Pass
24 - 19	Pole + Reinf.	TP28.317x27.414x0.675	Reinf. 3 Tension Rupture	54.8%	Pass
19 - 14	Pole + Reinf.	TP29.221x28.317x0.6625	Reinf. 3 Tension Rupture	56.1%	Pass
14 - 9	Pole + Reinf.	TP30.125x29.221x0.6375	Reinf. 3 Tension Rupture	57.3%	Pass
9 - 4	Pole + Reinf.	TP31.028x30.125x0.6375	Reinf. 3 Tension Rupture	58.3%	Pass
4 - 1.17	Pole + Reinf.	TP31.54x31.028x0.625	Reinf. 3 Tension Rupture	58.9%	Pass
1.17 - 0.92	Pole + Reinf.	TP31.585x31.54x0.9375	Reinf. 7 Tension Yield	44.5%	Pass
0.92 - 0	Pole + Reinf.	TP31.751x31.585x0.9375	Reinf. 7 Tension Yield	44.7%	Pass
				Summary	
			Pole	54.9%	Pass
			Reinforcement	65.8%	Pass
			Overall	65.8%	Pass

**Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) - LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods (Original)	0	36.9	Pass
	Anchor Rods (Existing Modification)		40.6	Pass
	Stiffeners		35.0	Pass
	Base Plate		44.3	Pass
1	Base Foundation (Structure)	0	35.3	Pass
	Base Foundation (Soil Interaction)		36.3	Pass

<b>Structure Rating (max from all components) =</b>	<b>65.8%</b>
---	--------------

Notes:

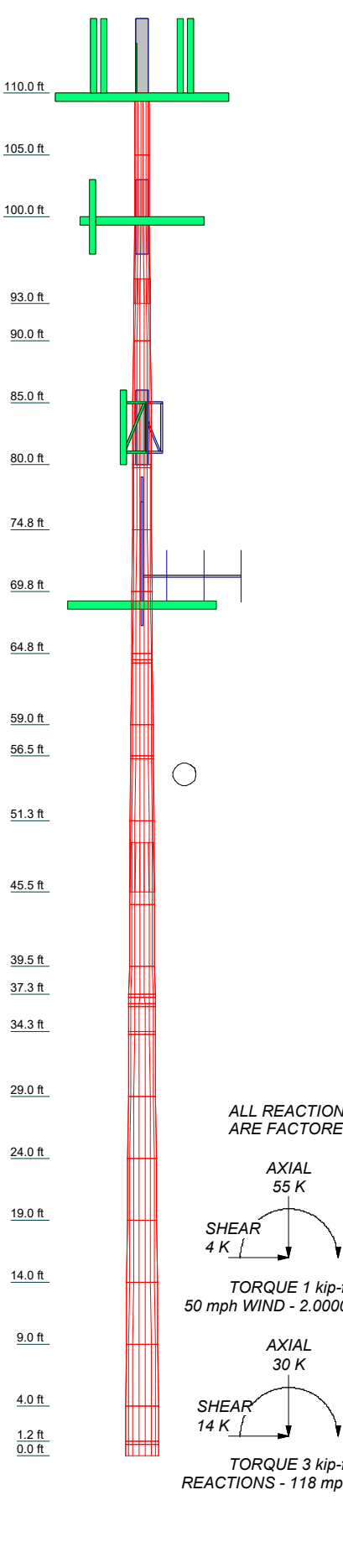
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity. Rating per TIA-222-H Section 15.5.
- 2) The anchor rod brackets were analyzed previously and found not govern the design. The anchor rods will control the design.

**4.1) Recommendations**

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

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

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)										Grade	Weight (K)	
				1	2	3	4	5	6	7	8	9	10			11
1	5.00	18	0.1875	0.1875												0.1
2	5.00	18	0.1875												0.1	
3	7.00	18	0.1875											2.00	0.2	
4	5.00	18	0.2500												0.2	
5	5.00	18	0.2500												0.2	
6	5.00	18	0.2500												0.2	
7	5.00	18	0.5375												0.5	
8	5.00	18	0.5375												0.5	
9	5.00	18	0.5250												0.5	
10	5.00	18	0.5000												0.5	
11	5.00	18	0.5000												0.5	
12	5.00	18	0.5000												0.5	
13	5.00	18	0.5000												0.7	
14	5.00	18	0.5000												0.7	
15	5.00	18	0.5000												0.9	
16	5.00	18	0.5000												0.9	
17	5.0675	18	0.9125											4.00	1.1	
18	5.00	18	0.7250												0.8	
19	5.00	18	0.7125												0.8	
20	5.00	18	0.7125												0.8	
21	5.00	18	0.7125												1.0	
22	5.00	18	0.7125												1.0	
23	5.00	18	0.7125												1.0	
24	5.00	18	0.6875												1.0	
25	5.00	18	0.6750												1.0	
26	5.00	18	0.6625												1.0	
27	5.00	18	0.6375												1.0	
28	5.00	18	0.6375												1.1	
29	5.00	18	0.6375												1.1	
30	5.00	18	0.6375												1.1	
31	5.00	18	0.6375												0.6	
32	5.00	18	0.6375												0.6	



### MATERIAL STRENGTH

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

- ### TOWER DESIGN NOTES
1. Tower is located in Tolland County, Connecticut.
  2. Tower designed for Exposure B to the TIA-222-H Standard.
  3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
  4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
  5. Deflections are based upon a 60 mph wind.
  6. Tower Risk Category II.
  7. Topographic Category 1 with Crest Height of 0.00 ft
  8. TOWER RATING: 65.8%

ALL REACTIONS ARE FACTORED

AXIAL 55 K  
 SHEAR 4 K  
 MOMENT 395 kip-ft

TORQUE 1 kip-ft  
 50 mph WIND - 2.0000 in ICE

AXIAL 30 K  
 SHEAR 14 K  
 MOMENT 1191 kip-ft

TORQUE 3 kip-ft  
 REACTIONS - 118 mph WIND

<b>BLACK &amp; VEATCH</b> Building a world of difference.	<b>Black &amp; Veatch Corp.</b> 11401 Lamar Avenue Overland Park, KS 66211 Phone: (913) 458-6909 FAX:		Job: <b>WILLINGTON-RIVER RD (BU #841301)</b> Project: <b>406642 (841301.2095829)</b> Client: Crown Castle Code: TIA-222-H Path:	Drawn by: Kochakorn Mokaranurak Date: 04/05/22	App'd: Scale: NTS 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 Tolland County, Connecticut.
- Tower base elevation above sea level: 516.00 ft.
- Basic wind speed of 118 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 2.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- TOWER RATING: 65.8%.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile  Include Bolts In Member Capacity  Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt.  Autocalc Torque Arm Areas  Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption  <div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
--	---	---



## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	110.00-105.00	5.00	0.00	18	13.0510	13.9010	0.1875	0.7500	A572-65 (65 ksi)
L2	105.00-100.00	5.00	0.00	18	13.9010	14.7510	0.1875	0.7500	A572-65 (65 ksi)
L3	100.00-93.00	7.00	2.00	18	14.7510	15.9410	0.1875	0.7500	A572-65 (65 ksi)
L4	93.00-90.00	5.00	0.00	18	15.2260	16.1139	0.2500	1.0000	A572-65 (65 ksi)
L5	90.00-85.00	5.00	0.00	18	16.1139	17.0018	0.2500	1.0000	A572-65 (65 ksi)
L6	85.00-80.00	5.00	0.00	18	17.0018	17.8896	0.2500	1.0000	A572-65 (65 ksi)
L7	80.00-79.75	0.25	0.00	18	17.8896	17.9340	0.5625	2.2500	A572-65 (65 ksi)
L8	79.75-74.75	5.00	0.00	18	17.9340	18.8219	0.5375	2.1500	A572-65 (65 ksi)
L9	74.75-69.75	5.00	0.00	18	18.8219	19.7098	0.5250	2.1000	A572-65 (65 ksi)
L10	69.75-64.75	5.00	0.00	18	19.7098	20.5977	0.5000	2.0000	A572-65 (65 ksi)
L11	64.75-64.25	0.50	0.00	18	20.5977	20.6865	0.5000	2.0000	A572-65 (65 ksi)
L12	64.25-64.00	0.25	0.00	18	20.6865	20.7308	0.7750	3.1000	A572-65 (65 ksi)
L13	64.00-59.00	5.00	0.00	18	20.7308	21.6187	0.7500	3.0000	A572-65 (65 ksi)
L14	59.00-56.50	2.50	0.00	18	21.6187	22.0627	0.7250	2.9000	A572-65 (65 ksi)
L15	56.50-56.25	0.25	0.00	18	22.0627	22.1071	0.9750	3.9000	A572-65 (65 ksi)
L16	56.25-51.25	5.00	0.00	18	22.1071	22.9949	0.9250	3.7000	A572-65 (65 ksi)
L17	51.25-45.50	5.75	4.00	18	22.9949	24.0160	0.9125	3.6500	A572-65 (65 ksi)
L18	45.50-44.50	5.00	0.00	18	22.8057	23.7093	0.7250	2.9000	A572-65 (65 ksi)
L19	44.50-39.50	5.00	0.00	18	23.7093	24.6128	0.7125	2.8500	A572-65 (65 ksi)
L20	39.50-37.25	2.25	0.00	18	24.6128	25.0194	0.7000	2.8000	A572-65 (65 ksi)
L21	37.25-37.00	0.25	0.00	18	25.0194	25.0646	0.7000	2.8000	A572-65 (65 ksi)
L22	37.00-36.50	0.50	0.00	18	25.0646	25.1550	0.7000	2.8000	A572-65 (65 ksi)
L23	36.50-36.25	0.25	0.00	18	25.1550	25.2001	0.9125	3.6500	A572-65 (65 ksi)
L24	36.25-34.25	2.00	0.00	18	25.2001	25.5616	0.8875	3.5500	A572-65 (65 ksi)
L25	34.25-34.00	0.25	0.00	18	25.5616	25.6068	0.7250	2.9000	A572-65 (65 ksi)
L26	34.00-29.00	5.00	0.00	18	25.6068	26.5103	0.7000	2.8000	A572-65 (65 ksi)
L27	29.00-24.00	5.00	0.00	18	26.5103	27.4139	0.6875	2.7500	A572-65 (65 ksi)
L28	24.00-19.00	5.00	0.00	18	27.4139	28.3174	0.6750	2.7000	A572-65 (65 ksi)
L29	19.00-14.00	5.00	0.00	18	28.3174	29.2210	0.6625	2.6500	A572-65 (65 ksi)
L30	14.00-9.00	5.00	0.00	18	29.2210	30.1246	0.6375	2.5500	A572-65 (65 ksi)
L31	9.00-4.00	5.00	0.00	18	30.1246	31.0281	0.6375	2.5500	A572-65 (65 ksi)
L32	4.00-1.17	2.83	0.00	18	31.0281	31.5396	0.6250	2.5000	A572-65 (65 ksi)
L33	1.17-0.92	0.25	0.00	18	31.5396	31.5847	0.9375	3.7500	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L34	0.92-0.00	0.92		18	31.5847	31.7510	0.9375	3.7500	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	13.2234	7.6554	160.0380	4.5665	6.6299	24.1388	320.2866	3.8284	1.9670	10.491
	14.0865	8.1612	193.9057	4.8683	7.0617	27.4588	388.0665	4.0814	2.1166	11.288
L2	14.0865	8.1612	193.9057	4.8683	7.0617	27.4588	388.0665	4.0814	2.1166	11.288
	14.9496	8.6671	232.2432	5.1700	7.4935	30.9926	464.7919	4.3344	2.2662	12.086
L3	14.9496	8.6671	232.2432	5.1700	7.4935	30.9926	464.7919	4.3344	2.2662	12.086
	16.1580	9.3753	293.9523	5.5925	8.0980	36.2992	588.2913	4.6885	2.4756	13.203
L4	15.7829	11.8835	336.7223	5.3165	7.7348	43.5334	673.8877	5.9429	2.2398	8.959
	16.3239	12.5880	400.2327	5.6317	8.1859	48.8932	800.9920	6.2952	2.3960	9.584
L5	16.3239	12.5880	400.2327	5.6317	8.1859	48.8932	800.9920	6.2952	2.3960	9.584
	17.2255	13.2925	471.2654	5.9469	8.6369	54.5642	943.1508	6.6475	2.5523	10.209
L6	17.2255	13.2925	471.2654	5.9469	8.6369	54.5642	943.1508	6.6475	2.5523	10.209
	18.1270	13.9971	550.2414	6.2621	9.0879	60.5464	1101.2068	6.9999	2.7086	10.834
L7	18.0788	30.9354	1173.4032	6.1511	9.0879	129.1166	2348.3505	15.4707	2.1586	3.837
	18.1239	31.0147	1182.4455	6.1669	9.1105	129.7895	2366.4469	15.5103	2.1664	3.851
L8	18.1278	29.6789	1134.7776	6.1758	9.1105	124.5573	2271.0484	14.8423	2.2104	4.112
	19.0293	31.1937	1317.5455	6.4910	9.5615	137.7965	2636.8247	15.5998	2.3667	4.403
L9	19.0313	30.4891	1289.5461	6.4954	9.5615	134.8682	2580.7890	15.2474	2.3887	4.55
	19.9329	31.9686	1486.5334	6.8106	10.0126	148.4667	2975.0229	15.9873	2.5449	4.847
L10	19.9367	30.4859	1421.2880	6.8195	10.0126	141.9503	2844.4461	15.2459	2.5889	5.178
	20.8383	31.8950	1627.6135	7.1347	10.4636	155.5498	3257.3687	15.9505	2.7452	5.49
L11	20.8383	31.8950	1627.6135	7.1347	10.4636	155.5498	3257.3687	15.9505	2.7452	5.49
	20.9284	32.0359	1649.2805	7.1662	10.5087	156.9440	3300.7311	16.0210	2.7608	5.522
L12	20.8860	48.9792	2453.3247	7.0686	10.5087	233.4561	4909.8776	24.4942	2.2768	2.938
	20.9311	49.0884	2469.7709	7.0843	10.5313	234.5178	4942.7916	24.5489	2.2846	2.948
L13	20.9350	47.5644	2399.0948	7.0932	10.5313	227.8068	4801.3465	23.7867	2.3286	3.105
	21.8365	49.6780	2733.3392	7.4084	10.9823	248.8856	5470.2750	24.8437	2.4849	3.313
L14	21.8404	48.0796	2651.7351	7.4173	10.9823	241.4551	5306.9595	24.0444	2.5289	3.488
	22.2912	49.1012	2824.3802	7.5749	11.2078	252.0005	5652.4768	24.5553	2.6070	3.596
L15	22.2526	65.2589	3666.3555	7.4861	11.2078	327.1243	7337.5353	32.6357	2.1670	2.223
	22.2977	65.3963	3689.5596	7.5019	11.2304	328.5336	7383.9740	32.7044	2.1748	2.231
L16	22.3054	62.1895	3525.2565	7.5196	11.2304	313.9034	7055.1517	31.1006	2.2628	2.446
	23.2070	64.7962	3987.3975	7.8348	11.6814	341.3450	7980.0416	32.4043	2.4191	2.615
L17	23.2089	63.9568	3940.2011	7.8393	11.6814	337.3047	7885.5868	31.9845	2.4411	2.675
	24.2457	66.9141	4512.4310	8.2017	12.2001	369.8675	9030.7996	33.4634	2.6208	2.872
L18	23.7797	50.8110	3129.8297	7.8386	11.5853	270.1554	6263.7778	25.4103	2.7378	3.776
	23.9632	52.8902	3529.9953	8.1594	12.0443	293.0842	7064.6354	26.4501	2.8968	3.996
L19	23.9651	52.0066	3474.7964	8.1639	12.0443	288.5012	6954.1651	26.0082	2.9188	4.097
	24.8826	54.0500	3900.6849	8.4846	12.5033	311.9720	7806.5025	27.0301	3.0779	4.32
L20	24.8845	53.1295	3838.2679	8.4891	12.5033	306.9800	7681.5863	26.5698	3.0999	4.428
	25.2974	54.0329	4037.4093	8.6334	12.7099	317.6593	8080.1311	27.0216	3.1714	4.531
L21	25.2974	54.0329	4037.4093	8.6334	12.7099	317.6593	8080.1311	27.0216	3.1714	4.531
	25.3433	54.1333	4059.9521	8.6494	12.7328	318.8572	8125.2463	27.0718	3.1794	4.542
L22	25.3433	54.1333	4059.9521	8.6494	12.7328	318.8572	8125.2463	27.0718	3.1794	4.542
	25.4350	54.3340	4105.2890	8.6815	12.7787	321.2597	8215.9798	27.1722	3.1953	4.565
L23	25.4023	70.2129	5213.2405	8.6061	12.7787	407.9625	10433.340	35.1131	2.8213	3.092
	25.4481	70.3437	5242.4411	8.6221	12.8017	409.5121	10491.780	35.1785	2.8292	3.101
L24	25.4520	68.4869	5114.5739	8.6310	12.8017	399.5238	10235.877	34.2500	2.8732	3.237
	25.8190	69.5050	5346.0778	8.7593	12.9853	411.7030	10699.190	34.7591	2.9368	3.309
L25	25.8441	57.1527	4454.0737	8.8170	12.9853	343.0095	8914.0082	28.5818	3.2228	4.445
	25.8899	57.2566	4478.4241	8.8330	13.0082	344.2762	8962.7411	28.6338	3.2308	4.456
L26	25.8938	55.3378	4337.0425	8.8419	13.0082	333.4076	8679.7917	27.6742	3.2748	4.678
	26.8113	57.3454	4826.3904	9.1627	13.4672	358.3800	9659.1315	28.6781	3.4338	4.905
L27	26.8132	56.3486	4747.0953	9.1671	13.4672	352.4920	9500.4369	28.1797	3.4558	5.027
	27.7307	58.3203	5263.0519	9.4879	13.9263	377.9231	10533.029	29.1657	3.6148	5.258

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L28	27.7327	57.2867	5174.6139	9.4923	13.9263	371.5726	10356.036	28.6488	3.6368	5.388
	28.6502	59.2226	5717.1253	9.8131	14.3853	397.4293	11441.773	29.6169	3.7959	5.624
L29	28.6521	58.1521	5618.8684	9.8175	14.3853	390.5989	11245.130	29.0816	3.8179	5.763
	29.5696	60.0521	6187.8123	10.1383	14.8443	416.8484	12383.766	30.0318	3.9769	6.003
L30	29.5735	57.8366	5969.9608	10.1471	14.8443	402.1726	11947.777	28.9238	4.0209	6.307
	30.4910	59.6649	6554.2035	10.4679	15.3033	428.2873	13117.031	29.8381	4.1799	6.557
L31	30.4910	59.6649	6554.2035	10.4679	15.3033	428.2873	13117.031	29.8381	4.1799	6.557
	31.4085	61.4932	7175.3718	10.7887	15.7623	455.2237	14360.185	30.7524	4.3390	6.806
L32	31.4104	60.3122	7043.3621	10.7931	15.7623	446.8487	14095.992	30.1619	4.3610	6.978
	31.9297	61.3268	7404.8085	10.9747	16.0221	462.1622	14819.360	30.6692	4.4510	7.122
L33	31.8815	91.0603	10773.774	10.8637	16.0221	672.4321	21561.725	45.5388	3.9010	4.161
	31.9274	91.1947	10821.561	10.8798	16.0450	674.4486	21657.361	45.6060	3.9089	4.17
L34	31.9274	91.1947	10821.561	10.8798	16.0450	674.4486	21657.361	45.6060	3.9089	4.17
	32.0962	91.6894	10998.633	10.9388	16.1295	681.8952	22011.739	45.8534	3.9382	4.201

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 110.00-105.00				1	1	1			
L2 105.00-100.00				1	1	1			
L3 100.00-93.00				1	1	1			
L4 93.00-90.00				1	1	1			
L5 90.00-85.00				1	1	1			
L6 85.00-80.00				1	1	1			
L7 80.00-79.75				1	1	0.887733			
L8 79.75-74.75				1	1	0.905226			
L9 74.75-69.75				1	1	0.905321			
L10 69.75-64.75				1	1	0.929499			
L11 64.75-64.25				1	1	0.92761			
L12 64.25-64.00				1	1	0.873476			
L13 64.00-59.00				1	1	0.877291			
L14 59.00-56.50				1	1	0.894771			
L15 56.50-56.25				1	1	0.838655			
L16 56.25-51.25				1	1	0.857295			
L17 51.25-45.50				1	1	0.860295			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L18 45.50-44.50				1	1	0.899647			
L19 44.50-39.50				1	1	0.896925			
L20 39.50-37.25				1	1	0.904672			
L21 37.25-37.00				1	1	1.05392			
L22 37.00-36.50				1	1	1.05168			
L23 36.50-36.25				1	1	0.928468			
L24 36.25-34.25				1	1	0.94483			
L25 34.25-34.00				1	1	1.00582			
L26 34.00-29.00				1	1	1.01989			
L27 29.00-24.00				1	1	1.01821			
L28 24.00-19.00				1	1	1.01783			
L29 19.00-14.00				1	1	1.01869			
L30 14.00-9.00				1	1	1.04033			
L31 9.00-4.00				1	1	1.02397			
L32 4.00-1.17				1	1	1.03502			
L33 1.17-0.92				1	1	0.737647			
L34 0.92-0.00				1	1	0.735465			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	No	Surface Ar (CaAa)	110.00 - 0.00	1	1	0.400 - 0.410	0.3750		0.22
***										
PL1.25x3.5-12	A	No	Surface Af (CaAa)	65.50 - 45.50	1	1	0.000 - 0.000	3.5000	9.5000	0.00
PL1.25x3.5-12	B	No	Surface Af (CaAa)	65.50 - 45.50	1	1	0.000 - 0.000	3.5000	9.5000	0.00
PL1.25x3.5-12	C	No	Surface Af (CaAa)	65.50 - 45.50	1	1	0.000 - 0.000	3.5000	9.5000	0.00
***										
CCI-SFP-06512535	A	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-06512535	B	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-06512535	B	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-06512535	C	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-06512525	A	No	Surface Af (CaAa)	56.50 - 31.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-06512520	B	No	Surface Af (CaAa)	56.50 - 36.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-06512520	C	No	Surface Af (CaAa)	56.50 - 36.50	1	1	0.000 - 0.000	6.5000	15.5000	0.00
CCI-SFP-04510025	A	No	Surface Af (CaAa)	81.50 - 56.50	1	1	0.000 - 0.000	4.5000	11.0000	0.00

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
CCI-SFP-04510025	B	No	Surface Af (CaAa)	81.50 - 56.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-04510025	C	No	Surface Af (CaAa)	81.50 - 56.50	1	1	0.000 0.000	4.5000	11.0000	0.00
***										

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
***									
LDF5-50A(7/8)	C	No	No	Inside Pole	110.00 - 0.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.33 0.33 0.33 0.33
FB-L98-002-XXX(3/8)	C	No	No	Inside Pole	110.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	110.00 - 0.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.58 0.58 0.58 0.58
2" innerduct conduit	C	No	No	Inside Pole	110.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.20 0.20 0.20 0.20
***									
HB158-21U6S24-xxM_TMO(1-5/8)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	2.50 2.50 2.50 2.50
HCS 6X12 6AWG(1-3/8)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.70 1.70 1.70 1.70
***									
HB158-21U6S12-XXXM-01(1-5/8)	B	No	No	Inside Pole	83.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.90 1.90 1.90 1.90
***									
LDF4-50A(1/2)	A	No	No	Inside Pole	69.00 - 0.00	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.15 0.15 0.15 0.15
***									

**Feed Line/Linear Appurtenances Section Areas**

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	110.00-105.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L2	105.00-100.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L3	100.00-93.00	C	0.000	0.000	0.000	0.000	0.03
		A	0.000	0.000	0.263	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.08
L4	93.00-90.00	A	0.000	0.000	0.112	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L5	90.00-85.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.06
L6	85.00-80.00	A	0.000	0.000	1.313	0.000	0.00
		B	0.000	0.000	1.125	0.000	0.01
		C	0.000	0.000	1.125	0.000	0.06
L7	80.00-79.75	A	0.000	0.000	0.197	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L8	79.75-74.75	A	0.000	0.000	3.938	0.000	0.00
		B	0.000	0.000	3.750	0.000	0.02
		C	0.000	0.000	3.750	0.000	0.06
L9	74.75-69.75	A	0.000	0.000	3.938	0.000	0.00
		B	0.000	0.000	3.750	0.000	0.02
		C	0.000	0.000	3.750	0.000	0.06
L10	69.75-64.75	A	0.000	0.000	4.375	0.000	0.00
		B	0.000	0.000	4.188	0.000	0.02
		C	0.000	0.000	4.188	0.000	0.06
L11	64.75-64.25	A	0.000	0.000	0.685	0.000	0.00
		B	0.000	0.000	0.667	0.000	0.00
		C	0.000	0.000	0.667	0.000	0.01
L12	64.25-64.00	A	0.000	0.000	0.343	0.000	0.00
		B	0.000	0.000	0.333	0.000	0.00
		C	0.000	0.000	0.333	0.000	0.00
L13	64.00-59.00	A	0.000	0.000	6.854	0.000	0.00
		B	0.000	0.000	6.667	0.000	0.02
		C	0.000	0.000	6.667	0.000	0.06
L14	59.00-56.50	A	0.000	0.000	3.427	0.000	0.00
		B	0.000	0.000	3.333	0.000	0.01
		C	0.000	0.000	3.333	0.000	0.03
L15	56.50-56.25	A	0.000	0.000	0.426	0.000	0.00
		B	0.000	0.000	0.417	0.000	0.00
		C	0.000	0.000	0.417	0.000	0.00
L16	56.25-51.25	A	0.000	0.000	8.521	0.000	0.00
		B	0.000	0.000	8.333	0.000	0.02
		C	0.000	0.000	8.333	0.000	0.06
L17	51.25-45.50	A	0.000	0.000	9.799	0.000	0.00
		B	0.000	0.000	9.583	0.000	0.02
		C	0.000	0.000	9.583	0.000	0.06
L18	45.50-44.50	A	0.000	0.000	1.121	0.000	0.00
		B	0.000	0.000	1.083	0.000	0.00
		C	0.000	0.000	1.083	0.000	0.01
L19	44.50-39.50	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	5.417	0.000	0.02
		C	0.000	0.000	5.417	0.000	0.06
L20	39.50-37.25	A	0.000	0.000	2.522	0.000	0.00
		B	0.000	0.000	2.438	0.000	0.01
		C	0.000	0.000	2.438	0.000	0.02
L21	37.25-37.00	A	0.000	0.000	0.280	0.000	0.00
		B	0.000	0.000	0.271	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L22	37.00-36.50	A	0.000	0.000	0.560	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.542	0.000	0.01
L23	36.50-36.25	A	0.000	0.000	0.551	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L24	36.25-34.25	A	0.000	0.000	4.408	0.000	0.00
		B	0.000	0.000	4.333	0.000	0.01
		C	0.000	0.000	2.167	0.000	0.02
L25	34.25-34.00	A	0.000	0.000	0.551	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L26	34.00-29.00	C	0.000	0.000	0.271	0.000	0.00
		A	0.000	0.000	8.313	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.02
L27	29.00-24.00	C	0.000	0.000	5.417	0.000	0.06
		A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.02
L28	24.00-19.00	C	0.000	0.000	5.417	0.000	0.06
		A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.02
L29	19.00-14.00	C	0.000	0.000	5.417	0.000	0.06
		A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.02
L30	14.00-9.00	C	0.000	0.000	5.417	0.000	0.06
		A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.02
L31	9.00-4.00	C	0.000	0.000	5.417	0.000	0.06
		A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.02
L32	4.00-1.17	C	0.000	0.000	5.417	0.000	0.06
		A	0.000	0.000	2.814	0.000	0.00
		B	0.000	0.000	5.417	0.000	0.01
L33	1.17-0.92	C	0.000	0.000	2.708	0.000	0.03
		A	0.000	0.000	0.009	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L34	0.92-0.00	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.035	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01

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

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	110.00-105.00	A	1.913	0.000	0.000	2.101	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L2	105.00-100.00	A	1.904	0.000	0.000	2.091	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L3	100.00-93.00	A	1.892	0.000	0.000	2.912	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.08
L4	93.00-90.00	A	1.883	0.000	0.000	1.248	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L5	90.00-85.00	A	1.874	0.000	0.000	2.062	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.06
L6	85.00-80.00	A	1.863	0.000	0.000	3.735	0.000	0.05
		B		0.000	0.000	1.684	0.000	0.03
		C		0.000	0.000	1.684	0.000	0.07
L7	80.00-79.75	A	1.857	0.000	0.000	0.383	0.000	0.00
		B		0.000	0.000	0.280	0.000	0.00
		C		0.000	0.000	0.280	0.000	0.01
L8	79.75-74.75	A	1.851	0.000	0.000	7.639	0.000	0.09
		B		0.000	0.000	5.601	0.000	0.08
		C		0.000	0.000	5.601	0.000	0.12
L9	74.75-69.75	A	1.839	0.000	0.000	7.615	0.000	0.09
		B		0.000	0.000	5.589	0.000	0.08
		C		0.000	0.000	5.589	0.000	0.12
L10	69.75-64.75	A	1.825	0.000	0.000	8.300	0.000	0.10
		B		0.000	0.000	6.287	0.000	0.09
		C		0.000	0.000	6.287	0.000	0.13
L11	64.75-64.25	A	1.818	0.000	0.000	1.231	0.000	0.01
		B		0.000	0.000	1.030	0.000	0.01

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L12	64.25-64.00	C	1.817	0.000	0.000	1.030	0.000	0.02
		A		0.000	0.000	0.615	0.000	0.01
		B		0.000	0.000	0.515	0.000	0.01
L13	64.00-59.00	C	1.809	0.000	0.000	0.515	0.000	0.01
		A		0.000	0.000	12.282	0.000	0.15
		B		0.000	0.000	10.285	0.000	0.14
L14	59.00-56.50	C	1.798	0.000	0.000	10.285	0.000	0.18
		A		0.000	0.000	6.124	0.000	0.07
		B		0.000	0.000	5.131	0.000	0.07
L15	56.50-56.25	C	1.794	0.000	0.000	5.131	0.000	0.09
		A		0.000	0.000	0.695	0.000	0.01
		B		0.000	0.000	0.594	0.000	0.01
L16	56.25-51.25	C	1.785	0.000	0.000	0.594	0.000	0.01
		A		0.000	0.000	13.876	0.000	0.16
		B		0.000	0.000	11.867	0.000	0.15
L17	51.25-45.50	C	1.766	0.000	0.000	11.867	0.000	0.19
		A		0.000	0.000	15.892	0.000	0.18
		B		0.000	0.000	13.608	0.000	0.17
L18	45.50-44.50	C	1.754	0.000	0.000	13.608	0.000	0.21
		A		0.000	0.000	1.827	0.000	0.02
		B		0.000	0.000	1.430	0.000	0.02
L19	44.50-39.50	C	1.741	0.000	0.000	1.430	0.000	0.03
		A		0.000	0.000	9.087	0.000	0.10
		B		0.000	0.000	7.129	0.000	0.09
L20	39.50-37.25	C	1.726	0.000	0.000	7.129	0.000	0.13
		A		0.000	0.000	4.075	0.000	0.04
		B		0.000	0.000	3.202	0.000	0.04
L21	37.25-37.00	C	1.720	0.000	0.000	3.202	0.000	0.06
		A		0.000	0.000	0.452	0.000	0.00
		B		0.000	0.000	0.356	0.000	0.00
L22	37.00-36.50	C	1.718	0.000	0.000	0.356	0.000	0.01
		A		0.000	0.000	0.904	0.000	0.01
		B		0.000	0.000	0.711	0.000	0.01
L23	36.50-36.25	C	1.717	0.000	0.000	0.711	0.000	0.01
		A		0.000	0.000	0.809	0.000	0.01
		B		0.000	0.000	0.713	0.000	0.01
L24	36.25-34.25	C	1.711	0.000	0.000	0.357	0.000	0.01
		A		0.000	0.000	6.462	0.000	0.07
		B		0.000	0.000	5.702	0.000	0.07
L25	34.25-34.00	C	1.706	0.000	0.000	2.851	0.000	0.05
		A		0.000	0.000	0.807	0.000	0.01
		B		0.000	0.000	0.712	0.000	0.01
L26	34.00-29.00	C	1.692	0.000	0.000	0.356	0.000	0.01
		A		0.000	0.000	12.543	0.000	0.13
		B		0.000	0.000	14.217	0.000	0.16
L27	29.00-24.00	C	1.663	0.000	0.000	7.109	0.000	0.13
		A		0.000	0.000	8.930	0.000	0.09
		B		0.000	0.000	14.159	0.000	0.16
L28	24.00-19.00	C	1.629	0.000	0.000	7.080	0.000	0.13
		A		0.000	0.000	8.861	0.000	0.09
		B		0.000	0.000	14.091	0.000	0.16
L29	19.00-14.00	C	1.586	0.000	0.000	7.045	0.000	0.12
		A		0.000	0.000	8.776	0.000	0.09
		B		0.000	0.000	14.005	0.000	0.15
L30	14.00-9.00	C	1.530	0.000	0.000	7.003	0.000	0.12
		A		0.000	0.000	8.664	0.000	0.08
		B		0.000	0.000	13.893	0.000	0.15
L31	9.00-4.00	C	1.445	0.000	0.000	6.946	0.000	0.12
		A		0.000	0.000	8.494	0.000	0.08
		B		0.000	0.000	13.723	0.000	0.14
L32	4.00-1.17	C	1.318	0.000	0.000	6.861	0.000	0.11
		A		0.000	0.000	4.219	0.000	0.04
		B		0.000	0.000	6.734	0.000	0.06
L33	1.17-0.92	C	1.204	0.000	0.000	3.367	0.000	0.06
		A		0.000	0.000	0.070	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L34	0.92-0.00	C	1.109	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	0.239	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00



Tower Section	Tower Elevation	Face or Leg	Ice Thickness	$A_R$	$A_F$	$C_{AA}$ In Face	$C_{AA}$ Out Face	Weight
<i>n</i>	ft	C	in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
				0.000	0.000	0.000	0.000	0.01

### Feed Line Center of Pressure

Section	Elevation	$CP_x$	$CP_z$	$CP_x$ Ice	$CP_z$ Ice
	ft	in	in	in	in
L1	110.00-105.00	-0.0591	-0.2932	-0.2652	-1.3154
L2	105.00-100.00	-0.0592	-0.2935	-0.2700	-1.3390
L3	100.00-93.00	-0.0592	-0.2937	-0.2750	-1.3641
L4	93.00-90.00	-0.0593	-0.2940	-0.2781	-1.3794
L5	90.00-85.00	-0.0593	-0.2942	-0.2800	-1.3884
L6	85.00-80.00	-0.0369	-0.1832	-0.2029	-1.0060
L7	80.00-79.75	-0.0200	-0.0992	-0.1241	-0.6155
L8	79.75-74.75	-0.0203	-0.1009	-0.1260	-0.6249
L9	74.75-69.75	-0.0210	-0.1040	-0.1295	-0.6422
L10	69.75-64.75	-0.0201	-0.0996	-0.1242	-0.6158
L11	64.75-64.25	-0.0147	-0.0728	-0.0922	-0.4573
L12	64.25-64.00	-0.0147	-0.0730	-0.0924	-0.4585
L13	64.00-59.00	-0.0150	-0.0742	-0.0938	-0.4650
L14	59.00-56.50	-0.0153	-0.0759	-0.0956	-0.4740
L15	56.50-56.25	-0.0114	-0.0565	-0.0940	-0.4335
L16	56.25-51.25	-0.0116	-0.0574	-0.0951	-0.4396
L17	51.25-45.50	-0.0119	-0.0592	-0.0971	-0.4511
L18	45.50-44.50	-0.0188	-0.0930	-0.1338	-0.6240
L19	44.50-39.50	-0.0191	-0.0945	-0.1339	-0.6269
L20	39.50-37.25	-0.0194	-0.0962	-0.1348	-0.6336
L21	37.25-37.00	-0.0195	-0.0968	-0.1350	-0.6357
L22	37.00-36.50	-0.0195	-0.0969	-0.1350	-0.6363
L23	36.50-36.25	-0.0135	-2.1118	-0.0925	-2.2713
L24	36.25-34.25	-0.0136	-2.1242	-0.0928	-2.2832
L25	34.25-34.00	-0.0137	-2.1361	-0.0931	-2.2946
L26	34.00-29.00	0.9761	-1.7726	0.7688	-1.9892
L27	29.00-24.00	2.1780	-1.3505	1.7922	-1.6435
L28	24.00-19.00	2.2271	-1.3810	1.8318	-1.6714
L29	19.00-14.00	2.2752	-1.4110	1.8708	-1.6960
L30	14.00-9.00	2.3225	-1.4404	1.9091	-1.7154
L31	9.00-4.00	2.3690	-1.4693	1.9472	-1.7252
L32	4.00-1.17	2.3052	-1.4431	1.8613	-1.6888
L33	1.17-0.92	-0.0598	-0.2967	-0.2367	-1.1741
L34	0.92-0.00	-0.0598	-0.2967	-0.2230	-1.1058

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

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L1	1	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L2	1	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000
L3	1	Safety Line 3/8	93.00 - 100.00	1.0000	1.0000
L4	1	Safety Line 3/8	90.00 - 93.00	1.0000	1.0000
L5	1	Safety Line 3/8	85.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L6	1	Safety Line 3/8	90.00 80.00 -	1.0000	1.0000
L6	30	CCI-SFP-04510025	85.00 80.00 -	1.0000	1.0000
L6	31	CCI-SFP-04510025	81.50 80.00 -	1.0000	1.0000
L6	32	CCI-SFP-04510025	81.50 80.00 -	1.0000	1.0000
L7	1	Safety Line 3/8	81.50 79.75 -	1.0000	1.0000
L7	30	CCI-SFP-04510025	80.00 79.75 -	1.0000	1.0000
L7	31	CCI-SFP-04510025	80.00 79.75 -	1.0000	1.0000
L7	32	CCI-SFP-04510025	80.00 79.75 -	1.0000	1.0000
L8	1	Safety Line 3/8	80.00 74.75 -	1.0000	1.0000
L8	30	CCI-SFP-04510025	79.75 74.75 -	1.0000	1.0000
L8	31	CCI-SFP-04510025	79.75 74.75 -	1.0000	1.0000
L8	32	CCI-SFP-04510025	79.75 74.75 -	1.0000	1.0000
L9	1	Safety Line 3/8	79.75 69.75 -	1.0000	1.0000
L9	30	CCI-SFP-04510025	74.75 69.75 -	1.0000	1.0000
L9	31	CCI-SFP-04510025	74.75 69.75 -	1.0000	1.0000
L9	32	CCI-SFP-04510025	74.75 69.75 -	1.0000	1.0000
L10	1	Safety Line 3/8	74.75 64.75 -	1.0000	1.0000
L10	19	PL1.25x3.5-12	69.75 64.75 -	1.0000	1.0000
L10	20	PL1.25x3.5-12	65.50 64.75 -	1.0000	1.0000
L10	21	PL1.25x3.5-12	65.50 64.75 -	1.0000	1.0000
L10	30	CCI-SFP-04510025	65.50 64.75 -	1.0000	1.0000
L10	31	CCI-SFP-04510025	69.75 64.75 -	1.0000	1.0000
L10	32	CCI-SFP-04510025	69.75 64.75 -	1.0000	1.0000
L11	1	Safety Line 3/8	69.75 64.25 -	1.0000	1.0000
L11	19	PL1.25x3.5-12	64.75 64.25 -	1.0000	1.0000
L11	20	PL1.25x3.5-12	64.75 64.25 -	1.0000	1.0000
L11	21	PL1.25x3.5-12	64.75 64.25 -	1.0000	1.0000
L11	30	CCI-SFP-04510025	64.75 64.25 -	1.0000	1.0000
L11	31	CCI-SFP-04510025	64.75 64.25 -	1.0000	1.0000
L11	32	CCI-SFP-04510025	64.75 64.25 -	1.0000	1.0000
L12	1	Safety Line 3/8	64.75 64.00 -	1.0000	1.0000
L12	19	PL1.25x3.5-12	64.25 64.00 -	1.0000	1.0000
L12	20	PL1.25x3.5-12	64.25 64.00 -	1.0000	1.0000
L12	21	PL1.25x3.5-12	64.25 64.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L12	30	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L12	31	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L12	32	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L13	1	Safety Line 3/8	59.00 - 64.00	1.0000	1.0000
L13	19	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	20	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	21	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	30	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L13	31	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L13	32	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L14	1	Safety Line 3/8	56.50 - 59.00	1.0000	1.0000
L14	19	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	20	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	21	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	30	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L14	31	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L14	32	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L15	1	Safety Line 3/8	56.25 - 56.50	1.0000	1.0000
L15	19	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	20	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	21	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	27	CCI-SFP-06512525	56.25 - 56.50	1.0000	1.0000
L15	28	CCI-SFP-06512520	56.25 - 56.50	1.0000	1.0000
L15	29	CCI-SFP-06512520	56.25 - 56.50	1.0000	1.0000
L16	1	Safety Line 3/8	51.25 - 56.25	1.0000	1.0000
L16	19	PL1.25x3.5-12	51.25 - 56.25	1.0000	1.0000
L16	20	PL1.25x3.5-12	51.25 - 56.25	1.0000	1.0000
L16	21	PL1.25x3.5-12	51.25 - 56.25	1.0000	1.0000
L16	27	CCI-SFP-06512525	51.25 - 56.25	1.0000	1.0000
L16	28	CCI-SFP-06512520	51.25 - 56.25	1.0000	1.0000
L16	29	CCI-SFP-06512520	51.25 - 56.25	1.0000	1.0000
L17	1	Safety Line 3/8	45.50 - 51.25	1.0000	1.0000
L17	19	PL1.25x3.5-12	45.50 - 51.25	1.0000	1.0000
L17	20	PL1.25x3.5-12	45.50 - 51.25	1.0000	1.0000
L17	21	PL1.25x3.5-12	45.50 - 51.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L17	27	CCI-SFP-06512525	51.25 45.50 -	1.0000	1.0000
L17	28	CCI-SFP-06512520	51.25 45.50 -	1.0000	1.0000
L17	29	CCI-SFP-06512520	51.25 45.50 -	1.0000	1.0000
L18	1	Safety Line 3/8	51.25 44.50 -	1.0000	1.0000
L18	27	CCI-SFP-06512525	45.50 44.50 -	1.0000	1.0000
L18	28	CCI-SFP-06512520	45.50 44.50 -	1.0000	1.0000
L18	29	CCI-SFP-06512520	45.50 44.50 -	1.0000	1.0000
L19	1	Safety Line 3/8	39.50 - 44.50	1.0000	1.0000
L19	27	CCI-SFP-06512525	39.50 - 44.50	1.0000	1.0000
L19	28	CCI-SFP-06512520	39.50 - 44.50	1.0000	1.0000
L19	29	CCI-SFP-06512520	39.50 - 44.50	1.0000	1.0000
L20	1	Safety Line 3/8	37.25 - 39.50	1.0000	1.0000
L20	27	CCI-SFP-06512525	37.25 - 39.50	1.0000	1.0000
L20	28	CCI-SFP-06512520	37.25 - 39.50	1.0000	1.0000
L20	29	CCI-SFP-06512520	37.25 - 39.50	1.0000	1.0000
L21	1	Safety Line 3/8	37.00 - 37.25	1.0000	1.0000
L21	27	CCI-SFP-06512525	37.00 - 37.25	1.0000	1.0000
L21	28	CCI-SFP-06512520	37.00 - 37.25	1.0000	1.0000
L21	29	CCI-SFP-06512520	37.00 - 37.25	1.0000	1.0000
L22	1	Safety Line 3/8	36.50 - 37.00	1.0000	1.0000
L22	27	CCI-SFP-06512525	36.50 - 37.00	1.0000	1.0000
L22	28	CCI-SFP-06512520	36.50 - 37.00	1.0000	1.0000
L22	29	CCI-SFP-06512520	36.50 - 37.00	1.0000	1.0000
L23	1	Safety Line 3/8	36.25 - 36.50	1.0000	1.0000
L23	23	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	24	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	25	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	26	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	27	CCI-SFP-06512525	36.25 - 36.50	1.0000	1.0000
L24	1	Safety Line 3/8	34.25 - 36.25	1.0000	1.0000
L24	23	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	24	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	25	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	26	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L24	27	CCI-SFP-06512525	34.25 - 36.25	1.0000	1.0000
L25	1	Safety Line 3/8	34.00 - 34.25	1.0000	1.0000
L25	23	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	24	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	25	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	26	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	27	CCI-SFP-06512525	34.00 - 34.25	1.0000	1.0000
L26	1	Safety Line 3/8	29.00 - 34.00	1.0000	1.0000
L26	23	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	24	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	25	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	26	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	27	CCI-SFP-06512525	31.50 - 34.00	1.0000	1.0000
L27	1	Safety Line 3/8	24.00 - 29.00	1.0000	1.0000
L27	23	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L27	24	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L27	25	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L27	26	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L28	1	Safety Line 3/8	19.00 - 24.00	1.0000	1.0000
L28	23	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L28	24	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L28	25	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L28	26	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L29	1	Safety Line 3/8	14.00 - 19.00	1.0000	1.0000
L29	23	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L29	24	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L29	25	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L29	26	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L30	1	Safety Line 3/8	9.00 - 14.00	1.0000	1.0000
L30	23	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L30	24	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L30	25	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L30	26	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L31	1	Safety Line 3/8	4.00 - 9.00	1.0000	1.0000
L31	23	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L31	24	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L31	25	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L31	26	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L32	1	Safety Line 3/8	1.17 - 4.00	1.0000	1.0000
L32	23	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L32	24	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L32	25	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L32	26	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L33	1	Safety Line 3/8	0.92 - 1.17	1.0000	1.0000
L34	1	Safety Line 3/8	0.00 - 0.92	1.0000	1.0000

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

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L6	30	CCI-SFP-04510025	80.00 - 81.50	Auto	0.4033
L6	31	CCI-SFP-04510025	80.00 - 81.50	Auto	0.4033
L6	32	CCI-SFP-04510025	80.00 - 81.50	Auto	0.4033
L7	30	CCI-SFP-04510025	79.75 - 80.00	Auto	0.5194
L7	31	CCI-SFP-04510025	79.75 - 80.00	Auto	0.5194
L7	32	CCI-SFP-04510025	79.75 - 80.00	Auto	0.5194
L8	30	CCI-SFP-04510025	74.75 - 79.75	Auto	0.4914
L8	31	CCI-SFP-04510025	74.75 - 79.75	Auto	0.4914
L8	32	CCI-SFP-04510025	74.75 - 79.75	Auto	0.4914
L9	30	CCI-SFP-04510025	69.75 - 74.75	Auto	0.4518
L9	31	CCI-SFP-04510025	69.75 - 74.75	Auto	0.4518
L9	32	CCI-SFP-04510025	69.75 - 74.75	Auto	0.4518
L10	19	PL1.25x3.5-12	64.75 - 65.50	Auto	0.2190
L10	20	PL1.25x3.5-12	64.75 - 65.50	Auto	0.2190
L10	21	PL1.25x3.5-12	64.75 - 65.50	Auto	0.2190
L10	30	CCI-SFP-04510025	64.75 - 69.75	Auto	0.4073
L10	31	CCI-SFP-04510025	64.75 - 69.75	Auto	0.4073
L10	32	CCI-SFP-04510025	64.75 - 69.75	Auto	0.4073
L11	19	PL1.25x3.5-12	64.25 - 64.75	Auto	0.2134
L11	20	PL1.25x3.5-12	64.25 - 64.75	Auto	0.2134
L11	21	PL1.25x3.5-12	64.25 - 64.75	Auto	0.2134
L11	30	CCI-SFP-04510025	64.25 - 64.75	Auto	0.3882
L11	31	CCI-SFP-04510025	64.25 - 64.75	Auto	0.3882
L11	32	CCI-SFP-04510025	64.25 - 64.75	Auto	0.3882
L12	19	PL1.25x3.5-12	64.00 - 64.25	Auto	0.3484

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L12	20	PL1.25x3.5-12	64.00 - 64.25	Auto	0.3484
L12	21	PL1.25x3.5-12	64.00 - 64.25	Auto	0.3484
L12	30	CCI-SFP-04510025	64.00 - 64.25	Auto	0.4932
L12	31	CCI-SFP-04510025	64.00 - 64.25	Auto	0.4932
L12	32	CCI-SFP-04510025	64.00 - 64.25	Auto	0.4932
L13	19	PL1.25x3.5-12	59.00 - 64.00	Auto	0.3124
L13	20	PL1.25x3.5-12	59.00 - 64.00	Auto	0.3124
L13	21	PL1.25x3.5-12	59.00 - 64.00	Auto	0.3124
L13	30	CCI-SFP-04510025	59.00 - 64.00	Auto	0.4652
L13	31	CCI-SFP-04510025	59.00 - 64.00	Auto	0.4652
L13	32	CCI-SFP-04510025	59.00 - 64.00	Auto	0.4652
L14	19	PL1.25x3.5-12	56.50 - 59.00	Auto	0.2663
L14	20	PL1.25x3.5-12	56.50 - 59.00	Auto	0.2663
L14	21	PL1.25x3.5-12	56.50 - 59.00	Auto	0.2663
L14	30	CCI-SFP-04510025	56.50 - 59.00	Auto	0.4293
L14	31	CCI-SFP-04510025	56.50 - 59.00	Auto	0.4293
L14	32	CCI-SFP-04510025	56.50 - 59.00	Auto	0.4293
L15	19	PL1.25x3.5-12	56.25 - 56.50	Auto	0.3797
L15	20	PL1.25x3.5-12	56.25 - 56.50	Auto	0.3797
L15	21	PL1.25x3.5-12	56.25 - 56.50	Auto	0.3797
L15	27	CCI-SFP-06512525	56.25 - 56.50	Auto	0.6660
L15	28	CCI-SFP-06512520	56.25 - 56.50	Auto	0.6660
L15	29	CCI-SFP-06512520	56.25 - 56.50	Auto	0.6660
L16	19	PL1.25x3.5-12	51.25 - 56.25	Auto	0.3311
L16	20	PL1.25x3.5-12	51.25 - 56.25	Auto	0.3311
L16	21	PL1.25x3.5-12	51.25 - 56.25	Auto	0.3311
L16	27	CCI-SFP-06512525	51.25 - 56.25	Auto	0.6398
L16	28	CCI-SFP-06512520	51.25 - 56.25	Auto	0.6398
L16	29	CCI-SFP-06512520	51.25 - 56.25	Auto	0.6398
L17	19	PL1.25x3.5-12	45.50 - 51.25	Auto	0.2769
L17	20	PL1.25x3.5-12	45.50 - 51.25	Auto	0.2769
L17	21	PL1.25x3.5-12	45.50 - 51.25	Auto	0.2769
L17	27	CCI-SFP-06512525	45.50 - 51.25	Auto	0.6106
L17	28	CCI-SFP-06512520	45.50 - 51.25	Auto	0.6106

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L17	29	CCI-SFP-06512520	45.50 - 51.25	Auto	0.6106
L18	27	CCI-SFP-06512525	44.50 - 45.50	Auto	0.5568
L18	28	CCI-SFP-06512520	44.50 - 45.50	Auto	0.5568
L18	29	CCI-SFP-06512520	44.50 - 45.50	Auto	0.5568
L19	27	CCI-SFP-06512525	39.50 - 44.50	Auto	0.5387
L19	28	CCI-SFP-06512520	39.50 - 44.50	Auto	0.5387
L19	29	CCI-SFP-06512520	39.50 - 44.50	Auto	0.5387
L20	27	CCI-SFP-06512525	37.25 - 39.50	Auto	0.5176
L20	28	CCI-SFP-06512520	37.25 - 39.50	Auto	0.5176
L20	29	CCI-SFP-06512520	37.25 - 39.50	Auto	0.5176
L21	27	CCI-SFP-06512525	37.00 - 37.25	Auto	0.5115
L21	28	CCI-SFP-06512520	37.00 - 37.25	Auto	0.5115
L21	29	CCI-SFP-06512520	37.00 - 37.25	Auto	0.5115
L22	27	CCI-SFP-06512525	36.50 - 37.00	Auto	0.5096
L22	28	CCI-SFP-06512520	36.50 - 37.00	Auto	0.5096
L22	29	CCI-SFP-06512520	36.50 - 37.00	Auto	0.5096
L23	23	CCI-SFP-06512535	36.25 - 36.50	Auto	0.5653
L23	24	CCI-SFP-06512535	36.25 - 36.50	Auto	0.5653
L23	25	CCI-SFP-06512535	36.25 - 36.50	Auto	0.5653
L23	26	CCI-SFP-06512535	36.25 - 36.50	Auto	0.5653
L23	27	CCI-SFP-06512525	36.25 - 36.50	Auto	0.5653
L24	23	CCI-SFP-06512535	34.25 - 36.25	Auto	0.5531
L24	24	CCI-SFP-06512535	34.25 - 36.25	Auto	0.5531
L24	25	CCI-SFP-06512535	34.25 - 36.25	Auto	0.5531
L24	26	CCI-SFP-06512535	34.25 - 36.25	Auto	0.5531
L24	27	CCI-SFP-06512525	34.25 - 36.25	Auto	0.5531
L25	23	CCI-SFP-06512535	34.00 - 34.25	Auto	0.5036
L25	24	CCI-SFP-06512535	34.00 - 34.25	Auto	0.5036
L25	25	CCI-SFP-06512535	34.00 - 34.25	Auto	0.5036
L25	26	CCI-SFP-06512535	34.00 - 34.25	Auto	0.5036
L25	27	CCI-SFP-06512525	34.00 - 34.25	Auto	0.5036
L26	23	CCI-SFP-06512535	29.00 - 34.00	Auto	0.4840
L26	24	CCI-SFP-06512535	29.00 - 34.00	Auto	0.4840
L26	25	CCI-SFP-06512535	29.00 - 34.00	Auto	0.4840



Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L26	26	CCI-SFP-06512535	29.00 - 34.00	Auto	0.4840
L26	27	CCI-SFP-06512525	31.50 - 34.00	Auto	0.4901
L27	23	CCI-SFP-06512535	24.00 - 29.00	Auto	0.4561
L27	24	CCI-SFP-06512535	24.00 - 29.00	Auto	0.4561
L27	25	CCI-SFP-06512535	24.00 - 29.00	Auto	0.4561
L27	26	CCI-SFP-06512535	24.00 - 29.00	Auto	0.4561
L28	23	CCI-SFP-06512535	19.00 - 24.00	Auto	0.4283
L28	24	CCI-SFP-06512535	19.00 - 24.00	Auto	0.4283
L28	25	CCI-SFP-06512535	19.00 - 24.00	Auto	0.4283
L28	26	CCI-SFP-06512535	19.00 - 24.00	Auto	0.4283
L29	23	CCI-SFP-06512535	14.00 - 19.00	Auto	0.4004
L29	24	CCI-SFP-06512535	14.00 - 19.00	Auto	0.4004
L29	25	CCI-SFP-06512535	14.00 - 19.00	Auto	0.4004
L29	26	CCI-SFP-06512535	14.00 - 19.00	Auto	0.4004
L30	23	CCI-SFP-06512535	9.00 - 14.00	Auto	0.3692
L30	24	CCI-SFP-06512535	9.00 - 14.00	Auto	0.3692
L30	25	CCI-SFP-06512535	9.00 - 14.00	Auto	0.3692
L30	26	CCI-SFP-06512535	9.00 - 14.00	Auto	0.3692
L31	23	CCI-SFP-06512535	4.00 - 9.00	Auto	0.3447
L31	24	CCI-SFP-06512535	4.00 - 9.00	Auto	0.3447
L31	25	CCI-SFP-06512535	4.00 - 9.00	Auto	0.3447
L31	26	CCI-SFP-06512535	4.00 - 9.00	Auto	0.3447
L32	23	CCI-SFP-06512535	1.50 - 4.00	Auto	0.3230
L32	24	CCI-SFP-06512535	1.50 - 4.00	Auto	0.3230
L32	25	CCI-SFP-06512535	1.50 - 4.00	Auto	0.3230
L32	26	CCI-SFP-06512535	1.50 - 4.00	Auto	0.3230

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft	Azimuth Adjustment t °	Placement ft	C <sub>A</sub> A <sub>Front</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>Side</sub> ft <sup>2</sup>	Weight K	
Lightning Rod 5/8"x4'	C	From Leg	0.00 0.00 2.00	0.0000	110.00	No Ice	0.25	0.25	0.00
						1/2" Ice	0.66	0.66	0.01
						1" Ice	0.97	0.97	0.01
						1" Ice	1.49	1.49	0.03
						2" Ice			
*** Platform Mount [10.75' LP 712-1]	C	None		0.0000	110.00	No Ice	21.97	21.97	1.20
						1/2" Ice	26.82	26.82	1.47
						1" Ice	31.67	31.67	1.75
						1" Ice	41.36	41.36	2.31
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) T-Arm Mount [TA 702-3]	C	None				0.0000	110.00	No Ice	4.75	4.75	0.34
								1/2" Ice	5.82	5.82	0.43
								Ice	6.98	6.98	0.55
								1" Ice	9.72	9.72	0.87
								2" Ice			
Transition Ladder	C	From Leg	2.00	0.00	-3.00	0.0000	110.00	No Ice	6.00	6.00	0.16
								1/2" Ice	8.00	8.00	0.24
								Ice	10.00	10.00	0.32
								1" Ice	14.00	14.00	0.48
								2" Ice			
8'x2" Mount Pipe	A	From Leg	3.00	0.00	0.00	0.0000	110.00	No Ice	1.90	1.90	0.03
								1/2" Ice	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice			
8'x2" Mount Pipe	B	From Leg	3.00	0.00	0.00	0.0000	110.00	No Ice	1.90	1.90	0.03
								1/2" Ice	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice			
8'x2" Mount Pipe	C	From Leg	3.00	0.00	0.00	0.0000	110.00	No Ice	1.90	1.90	0.03
								1/2" Ice	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.00	3.00	0.0000	110.00	No Ice	4.04	4.18	0.14
								1/2" Ice	4.42	4.57	0.21
								Ice	4.82	4.97	0.29
								1" Ice	5.63	5.79	0.48
								2" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.00	3.00	0.0000	110.00	No Ice	4.04	4.18	0.14
								1/2" Ice	4.42	4.57	0.21
								Ice	4.82	4.97	0.29
								1" Ice	5.63	5.79	0.48
								2" Ice			
QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.00	3.00	0.0000	110.00	No Ice	4.04	4.18	0.14
								1/2" Ice	4.42	4.57	0.21
								Ice	4.82	4.97	0.29
								1" Ice	5.63	5.79	0.48
								2" Ice			
AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe	A	From Leg	3.00	0.00	3.00	0.0000	110.00	No Ice	8.26	6.36	0.07
								1/2" Ice	8.82	7.54	0.14
								Ice	9.35	8.43	0.21
								1" Ice	10.42	10.24	0.39
								2" Ice			
AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe	B	From Leg	3.00	0.00	3.00	0.0000	110.00	No Ice	8.26	6.36	0.07
								1/2" Ice	8.82	7.54	0.14
								Ice	9.35	8.43	0.21
								1" Ice	10.42	10.24	0.39
								2" Ice			
AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe	C	From Leg	3.00	0.00	3.00	0.0000	110.00	No Ice	8.26	6.36	0.07
								1/2" Ice	8.82	7.54	0.14
								Ice	9.35	8.43	0.21
								1" Ice	10.42	10.24	0.39
								2" Ice			
P65-15-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0.00	3.00	0.0000	110.00	No Ice	3.93	2.80	0.06
								1/2" Ice	4.33	3.17	0.10
								Ice	4.73	3.55	0.15
								1" Ice	5.59	4.36	0.29
								2" Ice			
P65-15-XLH-RR w/ Mount Pipe	B	From Leg	4.00	0.00	3.00	0.0000	110.00	No Ice	3.93	2.80	0.06
								1/2" Ice	4.33	3.17	0.10
								Ice	4.73	3.55	0.15
								1" Ice	5.59	4.36	0.29
								2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
P65-15-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.0000	110.00	No Ice	3.93	2.80	0.06
			0.00			1/2"	4.33	3.17	0.10
			3.00			Ice	4.73	3.55	0.15
						1" Ice	5.59	4.36	0.29
						2" Ice			
(2) 7020.00	A	From Leg	4.00	0.0000	110.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
						2" Ice			
(2) 7020.00	B	From Leg	4.00	0.0000	110.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
						2" Ice			
(2) 7020.00	C	From Leg	4.00	0.0000	110.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
						2" Ice			
RRUS 32	A	From Leg	4.00	0.0000	110.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	B	From Leg	4.00	0.0000	110.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	C	From Leg	4.00	0.0000	110.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32 B2	A	From Leg	4.00	0.0000	110.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
RRUS 32 B2	B	From Leg	4.00	0.0000	110.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
RRUS 32 B2	C	From Leg	4.00	0.0000	110.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	110.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	110.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
(2) TT19-08BP111-001	A	From Leg	4.00	0.0000	110.00	No Ice	0.55	0.45	0.02
			0.00			1/2"	0.65	0.53	0.02
			3.00			Ice	0.75	0.63	0.03
						1" Ice	0.98	0.84	0.05
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) TT19-08BP111-001	B	From Leg	4.00		0.0000	110.00	No Ice	0.55	0.45	0.02
			0.00				1/2"	0.65	0.53	0.02
			3.00				Ice	0.75	0.63	0.03
							1" Ice	0.98	0.84	0.05
(2) TT19-08BP111-001	C	From Leg	4.00		0.0000	110.00	No Ice	0.55	0.45	0.02
			0.00				1/2"	0.65	0.53	0.02
			3.00				Ice	0.75	0.63	0.03
							1" Ice	0.98	0.84	0.05
RRUS 11	A	From Leg	3.00		0.0000	110.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	0.07
			3.00				Ice	3.21	1.49	0.10
							1" Ice	3.66	1.83	0.15
RRUS 11	B	From Leg	3.00		0.0000	110.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	0.07
			3.00				Ice	3.21	1.49	0.10
							1" Ice	3.66	1.83	0.15
RRUS 11	C	From Leg	3.00		0.0000	110.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	0.07
			3.00				Ice	3.21	1.49	0.10
							1" Ice	3.66	1.83	0.15
***										
Platform Mount [10.75' LP 712-1]	C	None			0.0000	100.00	No Ice	21.97	21.97	1.20
							1/2"	26.82	26.82	1.47
							Ice	31.67	31.67	1.75
							1" Ice	41.36	41.36	2.31
Transition Ladder	C	From Leg	2.00		0.0000	100.00	No Ice	6.00	6.00	0.16
			0.00				1/2"	8.00	8.00	0.24
			-3.00				Ice	10.00	10.00	0.32
							1" Ice	14.00	14.00	0.48
(2) 8'x2" Mount Pipe	B	From Leg	4.00		0.0000	100.00	No Ice	1.90	1.90	0.03
			0.00				1/2"	2.73	2.73	0.04
			0.00				Ice	3.40	3.40	0.06
							1" Ice	4.40	4.40	0.12
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.00		0.0000	100.00	No Ice	6.53	3.75	0.11
			0.00				1/2"	6.92	4.24	0.17
			0.00				Ice	7.31	4.75	0.23
							1" Ice	8.12	5.82	0.37
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	4.00		0.0000	100.00	No Ice	6.53	3.75	0.11
			0.00				1/2"	6.92	4.24	0.17
			0.00				Ice	7.31	4.75	0.23
							1" Ice	8.12	5.82	0.37
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00		0.0000	100.00	No Ice	14.69	6.87	0.18
			0.00				1/2"	15.46	7.55	0.31
			0.00				Ice	16.23	8.25	0.45
							1" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00		0.0000	100.00	No Ice	14.69	6.87	0.18
			0.00				1/2"	15.46	7.55	0.31
			0.00				Ice	16.23	8.25	0.45
							1" Ice	17.82	9.67	0.78
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00		0.0000	100.00	No Ice	1.97	1.59	0.07
			0.00				1/2"	2.15	1.75	0.09
			0.00				Ice	2.33	1.92	0.12
							1" Ice	2.72	2.28	0.17

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.0000	100.00		2" Ice			
			0.00				No Ice	1.97	1.59	0.07
			0.00				1/2"	2.15	1.75	0.09
							Ice	2.33	1.92	0.12
							1" Ice	2.72	2.28	0.17
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.0000	100.00		2" Ice			
			0.00				No Ice	2.14	1.69	0.11
			0.00				1/2"	2.32	1.85	0.13
							Ice	2.51	2.02	0.16
							1" Ice	2.91	2.39	0.22
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.0000	100.00		2" Ice			
			0.00				No Ice	2.14	1.69	0.11
			0.00				1/2"	2.32	1.85	0.13
							Ice	2.51	2.02	0.16
							1" Ice	2.91	2.39	0.22
***										
Side Arm Mount [SO 101-1]	A	From Leg	0.00	0.0000	83.00		2" Ice			
			0.00				No Ice	3.60	1.24	0.08
			0.00				1/2"	4.16	1.63	0.11
							Ice	4.79	2.11	0.15
							1" Ice	6.32	3.30	0.26
Side Arm Mount [SO 101-1]	C	From Leg	0.00	0.0000	83.00		2" Ice			
			0.00				No Ice	3.60	1.24	0.08
			0.00				1/2"	4.16	1.63	0.11
							Ice	4.79	2.11	0.15
							1" Ice	6.32	3.30	0.26
Side Arm Mount [SO 104-1]	A	From Face	0.00	0.0000	83.00		2" Ice			
			0.00				No Ice	1.51	0.67	0.10
			0.00				1/2"	1.82	0.93	0.14
							Ice	2.13	1.19	0.18
							1" Ice	2.75	1.71	0.26
Side Arm Mount [SO 104-1]	B	From Face	0.00	0.0000	83.00		2" Ice			
			0.00				No Ice	1.51	0.67	0.10
			0.00				1/2"	1.82	0.93	0.14
							Ice	2.13	1.19	0.18
							1" Ice	2.75	1.71	0.26
Mount Reinforcement Specifications	C	None		0.0000	83.00		2" Ice			
							No Ice	28.63	28.63	0.28
							1/2"	37.31	37.31	0.67
							Ice	45.80	45.80	0.94
							1" Ice	62.38	62.38	1.63
6'x2" Mount Pipe	A	From Face	1.00	0.0000	83.00		2" Ice			
			0.00				No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
							Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
6'x2" Mount Pipe	B	From Face	1.00	0.0000	83.00		2" Ice			
			0.00				No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
							Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
NNH4-65A-R6 w/ Mount Pipe	A	From Leg	1.00	0.0000	83.00		2" Ice			
			0.00				No Ice	5.66	3.05	0.11
			0.00				1/2"	6.04	3.39	0.17
							Ice	6.44	3.74	0.25
							1" Ice	7.27	4.48	0.43
NNH4-65A-R6 w/ Mount Pipe	C	From Leg	1.00	0.0000	83.00		2" Ice			
			0.00				No Ice	5.66	3.05	0.11
			0.00				1/2"	6.04	3.39	0.17
							Ice	6.44	3.74	0.25
							1" Ice	7.27	4.48	0.43
MT6407-77A w/ Mount Pipe	A	From Leg	1.00	0.0000	83.00		2" Ice			
			0.00				No Ice	4.91	2.68	0.10
			0.00				1/2"	5.26	3.14	0.14
						Ice	5.61	3.62	0.18	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
MT6407-77A w/ Mount Pipe	C	From Leg	1.00	0.0000	83.00	1" Ice	6.36	4.63	0.29
						2" Ice	4.91	2.68	0.10
						No Ice	5.26	3.14	0.14
						1/2" Ice	5.61	3.62	0.18
RF4439D-25A	A	From Leg	1.00	0.0000	83.00	1" Ice	6.36	4.63	0.29
						2" Ice	1.87	1.25	0.07
						No Ice	2.03	1.39	0.09
						1/2" Ice	2.21	1.54	0.11
RF4439D-25A	C	From Leg	1.00	0.0000	83.00	1" Ice	2.59	1.87	0.17
						2" Ice	1.87	1.25	0.07
						No Ice	2.03	1.39	0.09
						1/2" Ice	2.21	1.54	0.11
RF4440D-13A	A	From Leg	1.00	0.0000	83.00	1" Ice	2.59	1.87	0.17
						2" Ice	1.87	1.13	0.07
						No Ice	2.03	1.27	0.09
						1/2" Ice	2.21	1.41	0.11
RF4440D-13A	C	From Leg	1.00	0.0000	83.00	1" Ice	2.59	1.72	0.16
						2" Ice	1.87	1.13	0.07
						No Ice	2.03	1.27	0.09
						1/2" Ice	2.21	1.41	0.11
RRFDC-3315-PF-48	A	From Leg	1.00	0.0000	83.00	1" Ice	4.72	3.05	0.17
						2" Ice	3.71	2.19	0.02
						No Ice	3.95	2.39	0.05
						1/2" Ice	4.20	2.61	0.09
RRFDC-3315-PF-48	C	From Leg	1.00	0.0000	83.00	1" Ice	4.72	3.05	0.17
						2" Ice	3.71	2.19	0.02
						No Ice	3.95	2.39	0.05
						1/2" Ice	4.20	2.61	0.09
***									
Side Arm Mount [SO 201-1]	A	From Leg	1.00	0.0000	69.00	No Ice	1.78	2.61	0.10
						1/2" Ice	2.24	3.15	0.12
						Ice	2.75	3.73	0.14
						1" Ice	3.89	4.99	0.22
12' HSS 3x3x1/4	A	From Leg	2.00	0.0000	69.00	2" Ice	3.96	0.15	0.12
						No Ice	4.88	0.22	0.15
						1/2" Ice	5.80	0.30	0.18
						Ice	7.64	0.45	0.24
7'x2" Mount Pipe	A	From Leg	2.00	0.0000	69.00	2" Ice	1.66	1.66	0.03
						No Ice	2.39	2.39	0.04
						1/2" Ice	2.83	2.83	0.06
						Ice	3.71	3.71	0.10
7'x2" Mount Pipe	A	From Leg	2.00	0.0000	69.00	2" Ice	1.66	1.66	0.03
						No Ice	2.39	2.39	0.04
						1/2" Ice	2.83	2.83	0.06
						Ice	3.71	3.71	0.10
7'x2" Mount Pipe	A	From Leg	2.00	0.0000	69.00	2" Ice	1.66	1.66	0.03
						No Ice	2.39	2.39	0.04
						1/2" Ice	2.83	2.83	0.06
						Ice	3.71	3.71	0.10
DB201-F	A	From Leg	2.00	0.0000	69.00	2" Ice	0.40	0.40	0.01
						No Ice	0.72	0.72	0.01
						1/2" Ice			
						Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
			2.00			Ice 1.04	1.04	0.02
						1" Ice 1.68	1.68	0.02
						2" Ice		
DB810M-XC	A	From Leg	2.00	0.0000	69.00	No Ice 2.12	2.12	0.03
			0.00			1/2" 3.14	3.14	0.05
			5.00			Ice 4.18	4.18	0.07
						1" Ice 5.77	5.77	0.13
						2" Ice		
48212S w/ Mount Pipe	A	From Leg	2.00	0.0000	69.00	No Ice 4.20	2.56	0.04
			0.00			1/2" 4.74	3.07	0.07
			3.00			Ice 5.29	3.60	0.11
						1" Ice 6.46	4.70	0.22
						2" Ice		
***								

## Load Combinations

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

Comb. No.	Description
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	110 - 105	Pole	Max Tension	26	0.00	-0.00	-0.00
			Max. Compression	26	-11.26	1.35	-0.22
			Max. Mx	20	-4.07	29.59	-0.18
			Max. My	14	-4.06	0.48	-29.35
			Max. Vy	20	-4.55	29.59	-0.18
			Max. Vx	2	-4.56	0.40	29.01
L2	105 - 100	Pole	Max. Torque	24			0.54
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.69	1.58	-0.12
			Max. Mx	20	-4.29	52.72	-0.20
			Max. My	14	-4.28	0.57	-52.49
			Max. Vy	20	-4.70	52.72	-0.20
L3	100 - 93	Pole	Max. Vx	2	-4.71	0.41	52.17
			Max. Torque	24			0.54
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.53	8.34	2.44
			Max. Mx	20	-7.19	90.08	-0.06
			Max. My	2	-7.17	2.01	88.84
L4	93 - 90	Pole	Max. Vy	20	-7.18	90.08	-0.06
			Max. Vx	2	-7.35	2.01	88.84
			Max. Torque	2			2.20
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.24	8.62	2.57
			Max. Mx	20	-7.62	126.37	-0.78
L5	90 - 85	Pole	Max. My	2	-7.59	1.32	125.97
			Max. Vy	20	-7.33	126.37	-0.78
			Max. Vx	2	-7.50	1.32	125.97
			Max. Torque	2			2.20
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.81	8.86	2.69
L6	85 - 80	Pole	Max. Mx	20	-7.99	163.34	-1.50
			Max. My	2	-7.97	0.62	163.78
			Max. Vy	20	-7.46	163.34	-1.50
			Max. Vx	2	-7.63	0.62	163.78
			Max. Torque	2			2.20
			Max Tension	1	0.00	0.00	0.00
L7	80 - 79.75	Pole	Max. Compression	26	-25.73	11.06	4.30
			Max. Mx	20	-9.97	208.02	-2.11
			Max. My	2	-9.94	0.21	209.50
			Max. Vy	20	-9.71	208.02	-2.11
			Max. Vx	2	-10.00	0.21	209.50
			Max. Torque	2			2.72
L8	79.75 - 74.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.79	11.07	4.31
			Max. Mx	20	-10.01	210.44	-2.17
			Max. My	2	-9.98	0.14	212.00
			Max. Vy	20	-9.71	210.44	-2.17
			Max. Vx	2	-10.00	0.14	212.00
L8	79.75 - 74.75	Pole	Max. Torque	2			2.72
			Max Tension	1	0.00	0.00	0.00



Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L9	74.75 - 69.75	Pole	Max. Compression	26	-26.89	11.27	4.42
			Max. Mx	20	-10.70	259.40	-3.56
			Max. My	2	-10.67	-1.23	262.44
			Max. Vy	20	-9.88	259.40	-3.56
			Max. Vx	2	-10.18	-1.23	262.44
			Max. Torque	2			2.72
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.02	11.44	4.54
L10	69.75 - 64.75	Pole	Max. Mx	20	-11.40	309.20	-4.94
			Max. My	2	-11.37	-2.60	313.71
			Max. Vy	20	-10.05	309.20	-4.94
			Max. Vx	2	-10.34	-2.60	313.71
			Max. Torque	2			2.72
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.34	11.61	7.67
			L11	64.75 - 64.25	Pole	Max. Mx	20
Max. My	2	-12.54				-3.97	369.63
Max. Vy	20	-10.60				361.72	-5.19
Max. Vx	14	11.03				11.50	-364.65
Max. Torque	16						-3.12
Max Tension	1	0.00				0.00	0.00
Max. Compression	26	-30.48				11.62	7.68
L12	64.25 - 64	Pole				Max. Mx	20
			Max. My	2	-12.62	-4.11	375.15
			Max. Vy	20	-10.61	367.02	-5.33
			Max. Vx	14	11.04	11.65	-370.17
			Max. Torque	16			-3.12
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.56	11.63	7.69
			L13	64 - 59	Pole	Max. Mx	20
Max. My	2	-12.67				-4.18	377.91
Max. Vy	20	-10.62				369.68	-5.40
Max. Vx	14	11.06				11.72	-372.93
Max. Torque	16						-3.12
Max Tension	1	0.00				0.00	0.00
Max. Compression	26	-32.16				11.77	7.78
L14	59 - 56.5	Pole				Max. Mx	20
			Max. My	2	-13.67	-5.56	433.62
			Max. Vy	20	-10.82	423.25	-6.79
			Max. Vx	14	11.38	13.15	-428.99
			Max. Torque	16			-3.12
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.97	11.84	7.83
			L15	56.5 - 56.25	Pole	Max. Mx	20
Max. My	2	-14.17				-6.25	461.83
Max. Vy	20	-10.91				450.39	-7.48
Max. Vx	14	11.47				13.86	-457.54
Max. Torque	16						-3.11
Max Tension	1	0.00				0.00	0.00
Max. Compression	26	-33.07				11.85	7.83
L16	56.25 - 51.25	Pole				Max. Mx	20
			Max. My	2	-14.24	-6.31	464.67
			Max. Vy	20	-10.92	453.12	-7.55
			Max. Vx	14	11.48	13.93	-460.40
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.97	11.97	7.91
			L17	51.25 - 45.5	Pole	Max. Mx	20
Max. My	2	-15.46				-7.69	522.22
Max. Vy	20	-11.26				508.56	-8.94
Max. Vx	14	11.83				15.36	-518.65
Max. Torque	16						-3.11
Max Tension	1	0.00				0.00	0.00
Max. Compression	26	-35.64				12.02	7.94
Max. Mx	20	-15.92				528.35	-9.42

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L18	45.5 - 44.5	Pole	Max. My	2	-15.90	-8.18	542.75
			Max. Vy	20	-11.37	528.35	-9.42
			Max. Vx	14	11.95	15.86	-539.44
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.49	12.14	8.02
			Max. Mx	20	-17.91	586.11	-10.82
			Max. My	2	-17.89	-9.56	602.63
			Max. Vy	20	-11.71	586.11	-10.82
			Max. Vx	14	12.32	17.29	-600.10
L19	44.5 - 39.5	Pole	Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.08	12.25	8.10
			Max. Mx	20	-19.02	645.02	-12.21
			Max. My	2	-18.99	-10.94	663.66
			Max. Vy	20	-11.87	645.02	-12.21
			Max. Vx	14	12.47	18.71	-662.04
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.80	12.30	8.13
L20	39.5 - 37.25	Pole	Max. Mx	20	-19.52	671.79	-12.83
			Max. My	2	-19.50	-11.57	691.38
			Max. Vy	20	-11.94	671.79	-12.83
			Max. Vx	14	12.54	19.35	-690.16
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.89	12.31	8.14
			Max. Mx	20	-19.59	674.77	-12.90
			Max. My	2	-19.57	-11.64	694.47
			Max. Vy	20	-11.94	674.77	-12.90
L21	37.25 - 37	Pole	Max. Vx	14	12.54	19.42	-693.30
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.89	12.31	8.14
			Max. Mx	20	-19.59	674.77	-12.90
			Max. My	2	-19.57	-11.64	694.47
			Max. Vy	20	-11.94	674.77	-12.90
			Max. Vx	14	12.54	19.42	-693.30
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
L22	37 - 36.5	Pole	Max. Compression	26	-41.07	12.32	8.14
			Max. Mx	20	-19.72	680.74	-13.04
			Max. My	2	-19.70	-11.77	700.65
			Max. Vy	20	-11.96	680.74	-13.04
			Max. Vx	14	12.56	19.56	-699.57
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.18	12.32	8.15
			Max. Mx	20	-19.80	683.73	-13.11
			Max. My	2	-19.78	-11.84	703.74
L23	36.5 - 36.25	Pole	Max. Vy	20	-11.97	683.73	-13.11
			Max. Vx	14	12.57	19.63	-702.71
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.18	12.32	8.15
			Max. Mx	20	-19.80	683.73	-13.11
			Max. My	2	-19.78	-11.84	703.74
			Max. Vy	20	-11.97	683.73	-13.11
			Max. Vx	14	12.57	19.63	-702.71
			Max. Torque	16			-3.11
L24	36.25 - 34.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.01	12.36	8.21
			Max. Mx	20	-20.37	707.79	-13.66
			Max. My	2	-20.36	-12.40	728.58
			Max. Vy	20	-12.10	707.79	-13.66
			Max. Vx	14	12.71	20.20	-727.98
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.11	12.37	8.22
			Max. Mx	20	-20.44	710.82	-13.73
L25	34.25 - 34	Pole	Max. My	2	-20.42	-12.46	731.69
			Max. Vy	20	-12.11	710.82	-13.73
			Max. Vx	14	12.72	20.27	-731.16
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.11	12.37	8.22
			Max. Mx	20	-20.44	710.82	-13.73
			Max. My	2	-20.42	-12.46	731.69
			Max. Vy	20	-12.11	710.82	-13.73
			Max. Vx	14	12.72	20.27	-731.16
L26	34 - 29	Pole	Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.01	12.42	8.34
			Max. Mx	20	-21.75	772.02	-15.12
			Max. My	14	-21.72	21.68	-795.42
			Max. Vy	20	-12.39	772.02	-15.12
			Max. Vx	14	13.00	21.68	-795.42
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.01	12.42	8.34
L27	29 - 24	Pole	Max. Mx	20	-21.75	772.02	-15.12
			Max. My	14	-21.72	21.68	-795.42

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L28	24 - 19	Pole	Max. Compression	26	-45.89	12.43	8.43
			Max. Mx	20	-23.07	834.59	-16.50
			Max. My	14	-23.05	23.08	-861.05
			Max. Vy	20	-12.66	834.59	-16.50
			Max. Vx	14	13.27	23.08	-861.05
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.79	12.43	8.52
			Max. Mx	20	-24.42	898.17	-17.87
			Max. My	14	-24.41	24.47	-927.68
L29	19 - 14	Pole	Max. Vy	20	-12.79	898.17	-17.87
			Max. Vx	14	13.40	24.47	-927.68
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.69	12.42	8.60
			Max. Mx	20	-25.79	962.42	-19.24
			Max. My	14	-25.78	25.84	-994.97
			Max. Vy	20	-12.93	962.42	-19.24
			Max. Vx	14	13.53	25.84	-994.97
			Max. Torque	16			-3.11
L30	14 - 9	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.60	12.39	8.67
			Max. Mx	20	-27.18	1027.33	-20.59
			Max. My	14	-27.18	27.21	-1062.91
			Max. Vy	20	-13.06	1027.33	-20.59
			Max. Vx	14	13.66	27.21	-1062.91
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.50	12.34	8.72
			Max. Mx	20	-28.59	1092.89	-21.94
L31	9 - 4	Pole	Max. My	14	-28.59	28.56	-1131.47
			Max. Vy	20	-13.19	1092.89	-21.94
			Max. Vx	14	13.79	28.56	-1131.47
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.54	12.32	8.74
			Max. Mx	20	-29.40	1130.27	-22.70
			Max. My	14	-29.40	29.32	-1170.55
			Max. Vy	20	-13.26	1130.27	-22.70
			Max. Vx	14	13.86	29.32	-1170.55
L32	4 - 1.17	Pole	Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.62	12.32	8.74
			Max. Mx	20	-29.48	1133.58	-22.77
			Max. My	14	-29.48	29.38	-1174.01
			Max. Vy	20	-13.26	1133.58	-22.77
			Max. Vx	14	13.85	29.38	-1174.01
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.94	12.32	8.74
L33	1.17 - 0.92	Pole	Max. Mx	20	-29.75	1145.79	-23.01
			Max. My	14	-29.75	29.63	-1186.77
			Max. Vy	20	-13.29	1145.79	-23.01
			Max. Vx	14	13.89	29.63	-1186.77
			Max. Torque	16			-3.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.94	12.32	8.74
			Max. Mx	20	-29.75	1145.79	-23.01
			Max. My	14	-29.75	29.63	-1186.77
			Max. Vy	20	-13.29	1145.79	-23.01
L34	0.92 - 0	Pole	Max. Vx	14	13.89	29.63	-1186.77
			Max. Torque	16			-3.11

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	54.94	0.00	0.00
	Max. H <sub>x</sub>	20	29.76	13.28	-0.27
	Max. H <sub>z</sub>	3	22.32	-0.27	13.36
	Max. M <sub>x</sub>	2	1170.93	-0.27	13.36

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M <sub>z</sub>	8	1130.18	-13.02	0.27
	Max. Torsion	4	3.11	-6.70	11.71
	Min. Vert	11	22.32	-11.13	-6.48
	Min. H <sub>x</sub>	9	22.32	-13.02	0.27
	Min. H <sub>z</sub>	14	29.76	0.27	-13.88
	Min. M <sub>x</sub>	14	-1186.77	0.27	-13.88
	Min. M <sub>z</sub>	20	-1145.79	13.28	-0.27
	Min. Torsion	16	-3.11	6.87	-11.99

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	24.80	-0.00	-0.00	-2.19	3.24	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	29.76	0.27	-13.36	-1170.93	-21.73	-2.71
0.9 Dead+1.0 Wind 0 deg - No Ice	22.32	0.27	-13.36	-1155.07	-22.47	-2.63
1.2 Dead+1.0 Wind 30 deg - No Ice	29.76	6.70	-11.71	-1027.41	-583.85	-3.11
0.9 Dead+1.0 Wind 30 deg - No Ice	22.32	6.70	-11.71	-1013.42	-577.28	-3.02
1.2 Dead+1.0 Wind 60 deg - No Ice	29.76	11.56	-7.04	-615.60	-999.69	-2.68
0.9 Dead+1.0 Wind 60 deg - No Ice	22.32	11.56	-7.04	-606.99	-987.77	-2.61
1.2 Dead+1.0 Wind 90 deg - No Ice	29.76	13.02	-0.27	-28.35	-1130.18	-1.54
0.9 Dead+1.0 Wind 90 deg - No Ice	22.32	13.02	-0.27	-27.31	-1116.51	-1.51
1.2 Dead+1.0 Wind 120 deg - No Ice	29.76	11.13	6.48	560.49	-964.83	0.01
0.9 Dead+1.0 Wind 120 deg - No Ice	22.32	11.13	6.48	553.90	-953.31	-0.01
1.2 Dead+1.0 Wind 150 deg - No Ice	29.76	6.28	11.50	998.58	-540.63	1.55
0.9 Dead+1.0 Wind 150 deg - No Ice	22.32	6.28	11.50	986.31	-534.62	1.49
1.2 Dead+1.0 Wind 180 deg - No Ice	29.76	-0.27	13.88	1186.77	29.63	2.69
0.9 Dead+1.0 Wind 180 deg - No Ice	22.32	-0.27	13.88	1172.19	28.24	2.60
1.2 Dead+1.0 Wind 210 deg - No Ice	29.76	-6.87	11.99	1030.84	596.82	3.11
0.9 Dead+1.0 Wind 210 deg - No Ice	22.32	-6.87	11.99	1018.23	588.09	3.03
1.2 Dead+1.0 Wind 240 deg - No Ice	29.76	-11.63	7.08	608.80	1005.05	2.70
0.9 Dead+1.0 Wind 240 deg - No Ice	22.32	-11.63	7.08	601.63	991.05	2.64
1.2 Dead+1.0 Wind 270 deg - No Ice	29.76	-13.28	0.27	23.01	1145.79	1.56
0.9 Dead+1.0 Wind 270 deg - No Ice	22.32	-13.28	0.27	23.40	1129.96	1.53
1.2 Dead+1.0 Wind 300 deg - No Ice	29.76	-11.52	-6.70	-575.05	988.72	-0.01
0.9 Dead+1.0 Wind 300 deg - No Ice	22.32	-11.52	-6.70	-566.98	974.95	0.01
1.2 Dead+1.0 Wind 330 deg - No Ice	29.76	-6.24	-11.44	-1001.82	547.33	-1.57
0.9 Dead+1.0 Wind 330 deg - No Ice	22.32	-6.24	-11.44	-988.14	539.19	-1.52
1.2 Dead+1.0 Ice+1.0 Temp	54.94	-0.00	-0.00	-8.74	12.32	-0.00
1.2 Dead+1.0 Wind 0	54.94	0.05	-4.14	-394.73	7.24	-0.98

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 30	54.94	2.07	-3.61	-345.55	-180.83	-1.10
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 60	54.94	3.54	-2.12	-206.29	-317.40	-0.92
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90	54.94	4.05	-0.05	-13.85	-365.20	-0.50
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120	54.94	3.48	2.03	179.84	-312.09	0.05
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 150	54.94	1.98	3.56	322.98	-172.03	0.60
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	54.94	-0.05	4.15	377.60	17.43	0.98
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	54.94	-2.07	3.61	328.09	205.52	1.09
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	54.94	-3.53	2.11	188.68	341.88	0.92
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	54.94	-4.05	0.05	-3.66	389.90	0.50
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	54.94	-3.49	-2.03	-197.49	337.01	-0.06
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	54.94	-1.98	-3.56	-340.46	196.68	-0.60
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	24.80	0.06	-3.26	-285.61	-2.95	-0.65
Dead+Wind 30 deg - Service	24.80	1.64	-2.86	-250.79	-139.34	-0.75
Dead+Wind 60 deg - Service	24.80	2.82	-1.72	-150.88	-240.23	-0.65
Dead+Wind 90 deg - Service	24.80	3.18	-0.06	-8.41	-271.89	-0.38
Dead+Wind 120 deg - Service	24.80	2.72	1.58	134.43	-231.78	-0.00
Dead+Wind 150 deg - Service	24.80	1.53	2.81	240.69	-128.88	0.37
Dead+Wind 180 deg - Service	24.80	-0.06	3.39	286.35	9.47	0.65
Dead+Wind 210 deg - Service	24.80	-1.68	2.93	248.52	147.09	0.75
Dead+Wind 240 deg - Service	24.80	-2.84	1.73	146.12	246.14	0.65
Dead+Wind 270 deg - Service	24.80	-3.24	0.06	4.00	280.28	0.38
Dead+Wind 300 deg - Service	24.80	-2.81	-1.64	-141.07	242.18	0.00
Dead+Wind 330 deg - Service	24.80	-1.52	-2.79	-244.59	135.11	-0.37

### Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-24.80	0.00	0.00	24.80	0.00	0.000%
2	0.27	-29.76	-13.36	-0.27	29.76	13.36	0.000%
3	0.27	-22.32	-13.36	-0.27	22.32	13.36	0.000%
4	6.70	-29.76	-11.71	-6.70	29.76	11.71	0.000%
5	6.70	-22.32	-11.71	-6.70	22.32	11.71	0.000%
6	11.56	-29.76	-7.04	-11.56	29.76	7.04	0.000%
7	11.56	-22.32	-7.04	-11.56	22.32	7.04	0.000%
8	13.02	-29.76	-0.27	-13.02	29.76	0.27	0.000%
9	13.02	-22.32	-0.27	-13.02	22.32	0.27	0.000%
10	11.13	-29.76	6.48	-11.13	29.76	-6.48	0.000%
11	11.13	-22.32	6.48	-11.13	22.32	-6.48	0.000%
12	6.28	-29.76	11.50	-6.28	29.76	-11.50	0.000%
13	6.28	-22.32	11.50	-6.28	22.32	-11.50	0.000%
14	-0.27	-29.76	13.88	0.27	29.76	-13.88	0.000%
15	-0.27	-22.32	13.88	0.27	22.32	-13.88	0.000%
16	-6.87	-29.76	11.99	6.87	29.76	-11.99	0.000%
17	-6.87	-22.32	11.99	6.87	22.32	-11.99	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
18	-11.63	-29.76	7.08	11.63	29.76	-7.08	0.000%
19	-11.63	-22.32	7.08	11.63	22.32	-7.08	0.000%
20	-13.28	-29.76	0.27	13.28	29.76	-0.27	0.000%
21	-13.28	-22.32	0.27	13.28	22.32	-0.27	0.000%
22	-11.52	-29.76	-6.70	11.52	29.76	6.70	0.000%
23	-11.52	-22.32	-6.70	11.52	22.32	6.70	0.000%
24	-6.24	-29.76	-11.44	6.24	29.76	11.44	0.000%
25	-6.24	-22.32	-11.44	6.24	22.32	11.44	0.000%
26	0.00	-54.94	0.00	0.00	54.94	0.00	0.000%
27	0.05	-54.94	-4.14	-0.05	54.94	4.14	0.000%
28	2.07	-54.94	-3.61	-2.07	54.94	3.61	0.000%
29	3.54	-54.94	-2.12	-3.54	54.94	2.12	0.000%
30	4.05	-54.94	-0.05	-4.05	54.94	0.05	0.000%
31	3.48	-54.94	2.03	-3.48	54.94	-2.03	0.000%
32	1.98	-54.94	3.56	-1.98	54.94	-3.56	0.000%
33	-0.05	-54.94	4.15	0.05	54.94	-4.15	0.000%
34	-2.07	-54.94	3.61	2.07	54.94	-3.61	0.000%
35	-3.53	-54.94	2.11	3.53	54.94	-2.11	0.000%
36	-4.05	-54.94	0.05	4.05	54.94	-0.05	0.000%
37	-3.49	-54.94	-2.03	3.49	54.94	2.03	0.000%
38	-1.98	-54.94	-3.56	1.98	54.94	3.56	0.000%
39	0.06	-24.80	-3.26	-0.06	24.80	3.26	0.000%
40	1.64	-24.80	-2.86	-1.64	24.80	2.86	0.000%
41	2.82	-24.80	-1.72	-2.82	24.80	1.72	0.000%
42	3.18	-24.80	-0.06	-3.18	24.80	0.06	0.000%
43	2.72	-24.80	1.58	-2.72	24.80	-1.58	0.000%
44	1.53	-24.80	2.81	-1.53	24.80	-2.81	0.000%
45	-0.06	-24.80	3.39	0.06	24.80	-3.39	0.000%
46	-1.68	-24.80	2.93	1.68	24.80	-2.93	0.000%
47	-2.84	-24.80	1.73	2.84	24.80	-1.73	0.000%
48	-3.24	-24.80	0.06	3.24	24.80	-0.06	0.000%
49	-2.81	-24.80	-1.64	2.81	24.80	1.64	0.000%
50	-1.52	-24.80	-2.79	1.52	24.80	2.79	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001374
2	Yes	6	0.00000001	0.00013233
3	Yes	5	0.00000001	0.00099399
4	Yes	6	0.00000001	0.00052160
5	Yes	6	0.00000001	0.00018046
6	Yes	6	0.00000001	0.00068120
7	Yes	6	0.00000001	0.00023933
8	Yes	6	0.00000001	0.00011472
9	Yes	5	0.00000001	0.00087676
10	Yes	6	0.00000001	0.00052398
11	Yes	6	0.00000001	0.00018548
12	Yes	6	0.00000001	0.00047853
13	Yes	6	0.00000001	0.00016841
14	Yes	6	0.00000001	0.00019330
15	Yes	6	0.00000001	0.00006848
16	Yes	6	0.00000001	0.00071227
17	Yes	6	0.00000001	0.00024944
18	Yes	6	0.00000001	0.00053994
19	Yes	6	0.00000001	0.00018635
20	Yes	5	0.00000001	0.00089190
21	Yes	5	0.00000001	0.00043545
22	Yes	6	0.00000001	0.00054810
23	Yes	6	0.00000001	0.00019115
24	Yes	6	0.00000001	0.00060489
25	Yes	6	0.00000001	0.00021237
26	Yes	5	0.00000001	0.00080303
27	Yes	7	0.00000001	0.00024673

28	Yes	7	0.00000001	0.00027011
29	Yes	7	0.00000001	0.00027486
30	Yes	7	0.00000001	0.00020999
31	Yes	7	0.00000001	0.00023992
32	Yes	7	0.00000001	0.00024133
33	Yes	7	0.00000001	0.00023001
34	Yes	7	0.00000001	0.00029852
35	Yes	7	0.00000001	0.00028615
36	Yes	7	0.00000001	0.00024557
37	Yes	7	0.00000001	0.00029977
38	Yes	7	0.00000001	0.00030652
39	Yes	5	0.00000001	0.00013133
40	Yes	5	0.00000001	0.00014520
41	Yes	5	0.00000001	0.00021937
42	Yes	5	0.00000001	0.00007702
43	Yes	5	0.00000001	0.00011917
44	Yes	5	0.00000001	0.00010348
45	Yes	5	0.00000001	0.00014075
46	Yes	5	0.00000001	0.00024854
47	Yes	5	0.00000001	0.00014418
48	Yes	5	0.00000001	0.00007026
49	Yes	5	0.00000001	0.00013782
50	Yes	5	0.00000001	0.00018627

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	15.086	47	1.4593	0.0182
L2	105 - 100	13.575	47	1.4217	0.0170
L3	100 - 93	12.128	46	1.3535	0.0159
L4	95 - 90	10.775	46	1.2488	0.0124
L5	90 - 85	9.514	46	1.1606	0.0106
L6	85 - 80	8.365	46	1.0408	0.0086
L7	80 - 79.75	7.343	46	0.9116	0.0066
L8	79.75 - 74.75	7.296	46	0.9085	0.0066
L9	74.75 - 69.75	6.380	46	0.8409	0.0056
L10	69.75 - 64.75	5.538	46	0.7686	0.0048
L11	64.75 - 64.25	4.775	46	0.6904	0.0040
L12	64.25 - 64	4.703	46	0.6826	0.0039
L13	64 - 59	4.668	46	0.6800	0.0038
L14	59 - 56.5	3.985	46	0.6250	0.0033
L15	56.5 - 56.25	3.665	46	0.5966	0.0031
L16	56.25 - 51.25	3.634	46	0.5944	0.0030
L17	51.25 - 45.5	3.036	46	0.5488	0.0027
L18	49.5 - 44.5	2.837	46	0.5328	0.0026
L19	44.5 - 39.5	2.293	46	0.5003	0.0023
L20	39.5 - 37.25	1.801	46	0.4407	0.0020
L21	37.25 - 37	1.599	46	0.4139	0.0018
L22	37 - 36.5	1.578	46	0.4109	0.0018
L23	36.5 - 36.25	1.535	46	0.4050	0.0018
L24	36.25 - 34.25	1.514	46	0.4027	0.0017
L25	34.25 - 34	1.349	46	0.3837	0.0016
L26	34 - 29	1.329	46	0.3809	0.0016
L27	29 - 24	0.961	46	0.3230	0.0013
L28	24 - 19	0.653	46	0.2656	0.0010
L29	19 - 14	0.404	46	0.2087	0.0008
L30	14 - 9	0.216	46	0.1522	0.0006
L31	9 - 4	0.086	46	0.0953	0.0003
L32	4 - 1.17	0.015	46	0.0399	0.0001
L33	1.17 - 0.92	0.001	46	0.0087	0.0000
L34	0.92 - 0	0.001	46	0.0068	0.0000

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.00	Lightning Rod 5/8"x4'	47	15.086	1.4593	0.0182	5328
100.00	Platform Mount [10.75' LP 712-1]	46	12.128	1.3535	0.0159	3285
83.00	Side Arm Mount [SO 101-1]	46	7.940	0.9804	0.0077	2324
69.00	Side Arm Mount [SO 201-1]	46	5.419	0.7576	0.0047	3744

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	61.984	16	5.9168	0.0764
L2	105 - 100	55.870	16	5.7718	0.0712
L3	100 - 93	49.976	16	5.4985	0.0666
L4	95 - 90	44.427	16	5.1022	0.0514
L5	90 - 85	39.248	16	4.7561	0.0434
L6	85 - 80	34.522	16	4.2794	0.0353
L7	80 - 79.75	30.314	16	3.7597	0.0272
L8	79.75 - 74.75	30.118	16	3.7469	0.0270
L9	74.75 - 69.75	26.342	16	3.4695	0.0232
L10	69.75 - 64.75	22.868	16	3.1714	0.0198
L11	64.75 - 64.25	19.716	16	2.8506	0.0163
L12	64.25 - 64	19.420	16	2.8183	0.0159
L13	64 - 59	19.272	16	2.8074	0.0158
L14	59 - 56.5	16.453	16	2.5813	0.0136
L15	56.5 - 56.25	15.132	16	2.4643	0.0126
L16	56.25 - 51.25	15.004	16	2.4553	0.0126
L17	51.25 - 45.5	12.532	16	2.2672	0.0111
L18	49.5 - 44.5	11.714	16	2.2009	0.0106
L19	44.5 - 39.5	9.468	16	2.0665	0.0097
L20	39.5 - 37.25	7.434	16	1.8203	0.0081
L21	37.25 - 37	6.603	16	1.7093	0.0075
L22	37 - 36.5	6.513	16	1.6971	0.0074
L23	36.5 - 36.25	6.337	16	1.6727	0.0073
L24	36.25 - 34.25	6.250	16	1.6631	0.0072
L25	34.25 - 34	5.570	16	1.5846	0.0068
L26	34 - 29	5.487	16	1.5729	0.0067
L27	29 - 24	3.966	16	1.3338	0.0055
L28	24 - 19	2.694	16	1.0966	0.0043
L29	19 - 14	1.669	16	0.8613	0.0033
L30	14 - 9	0.890	16	0.6282	0.0023
L31	9 - 4	0.355	16	0.3932	0.0014
L32	4 - 1.17	0.064	16	0.1647	0.0006
L33	1.17 - 0.92	0.004	16	0.0359	0.0001
L34	0.92 - 0	0.003	16	0.0282	0.0001

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.00	Lightning Rod 5/8"x4'	16	61.984	5.9168	0.0764	1370
100.00	Platform Mount [10.75' LP 712-1]	16	49.976	5.4985	0.0666	867
83.00	Side Arm Mount [SO 101-1]	16	32.774	4.0379	0.0318	588
69.00	Side Arm Mount [SO 201-1]	16	22.374	3.1260	0.0194	923



## Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$KI/r$	A $in^2$	$P_u$ K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
L1	110 - 105 (1)	TP13.901x13.051x0.1875	5.00	0.00	0.0	8.1613	-4.06	477.43	0.009
L2	105 - 100 (2)	TP14.751x13.901x0.1875	5.00	0.00	0.0	8.6671	-4.28	507.03	0.008
L3	100 - 93 (3)	TP15.941x14.751x0.1875	7.00	0.00	0.0	9.1730	-7.17	536.62	0.013
L4	93 - 90 (4)	TP16.1139x15.226x0.25	5.00	0.00	0.0	12.588	-7.59	736.40	0.010
L5	90 - 85 (5)	TP17.0018x16.1139x0.25	5.00	0.00	0.0	13.292	-7.96	777.61	0.010
L6	85 - 80 (6)	TP17.8896x17.0018x0.25	5.00	0.00	0.0	13.997	-9.92	818.83	0.012
L7	80 - 79.75 (7)	TP17.934x17.8896x0.562	0.25	0.00	0.0	31.014	-9.97	1814.36	0.005
L8	79.75 - 74.75 (8)	TP18.8219x17.934x0.537	5.00	0.00	0.0	31.193	-10.65	1824.83	0.006
L9	74.75 - 69.75 (9)	TP19.7098x18.8219x0.52	5.00	0.00	0.0	31.968	-11.36	1870.16	0.006
L10	69.75 - 64.75 (10)	TP20.5977x19.7098x0.5	5.00	0.00	0.0	31.895	-12.53	1865.86	0.007
L11	64.75 - 64.25 (11)	TP20.6865x20.5977x0.5	0.50	0.00	0.0	32.035	-12.61	1874.10	0.007
L12	64.25 - 64 (12)	TP20.7308x20.6865x0.77	0.25	0.00	0.0	49.088	-12.66	2871.67	0.004
L13	64 - 59 (13)	TP21.6187x20.7308x0.75	5.00	0.00	0.0	49.678	-13.66	2906.16	0.005
L14	59 - 56.5 (14)	TP22.0627x21.6187x0.72	2.50	0.00	0.0	49.101	-14.16	2872.42	0.005
L15	56.5 - 56.25 (15)	TP22.1071x22.0627x0.97	0.25	0.00	0.0	65.396	-14.23	3825.69	0.004
L16	56.25 - 51.25 (16)	TP22.9949x22.1071x0.92	5.00	0.00	0.0	64.796	-15.45	3790.58	0.004
L17	51.25 - 45.5 (17)	TP24.016x22.9949x0.912	5.75	0.00	0.0	64.856	-15.89	3794.13	0.004
L18	45.5 - 44.5 (18)	TP23.7093x22.8057x0.72	5.00	0.00	0.0	52.890	-17.88	3094.08	0.006
L19	44.5 - 39.5 (19)	TP24.6128x23.7093x0.71	5.00	0.00	0.0	54.050	-18.99	3161.92	0.006
L20	39.5 - 37.25 (20)	TP25.0194x24.6128x0.7	2.25	0.00	0.0	54.032	-19.49	3160.93	0.006
L21	37.25 - 37 (21)	TP25.0646x25.0194x0.7	0.25	0.00	0.0	54.133	-19.56	3166.80	0.006
L22	37 - 36.5 (22)	TP25.155x25.0646x0.7	0.50	0.00	0.0	54.334	-19.69	3178.54	0.006
L23	36.5 - 36.25 (23)	TP25.2001x25.155x0.912	0.25	0.00	0.0	70.343	-19.77	4115.11	0.005
L24	36.25 - 34.25 (24)	TP25.5616x25.2001x0.88	2.00	0.00	0.0	69.505	-20.35	4066.04	0.005
L25	34.25 - 34 (25)	TP25.6068x25.5616x0.72	0.25	0.00	0.0	57.256	-20.42	3349.51	0.006
L26	34 - 29 (26)	TP26.5103x25.6068x0.7	5.00	0.00	0.0	57.345	-21.72	3354.70	0.006
L27	29 - 24 (27)	TP27.4139x26.5103x0.68	5.00	0.00	0.0	58.320	-23.05	3411.74	0.007
L28	24 - 19 (28)	TP28.3174x27.4139x0.67	5.00	0.00	0.0	59.222	-24.41	3464.52	0.007
L29	19 - 14 (29)	TP29.221x28.3174x0.662	5.00	0.00	0.0	60.052	-25.78	3513.05	0.007
L30	14 - 9 (30)	TP30.1246x29.221x0.637	5.00	0.00	0.0	59.664	-27.18	3490.40	0.008
L31	9 - 4 (31)	TP31.0281x30.1246x0.63	5.00	0.00	0.0	61.493	-28.59	3597.35	0.008
L32	4 - 1.17 (32)	TP31.5396x31.0281x0.62	2.83	0.00	0.0	61.326	-29.40	3587.62	0.008
L33	1.17 - 0.92	TP31.5847x31.5396x0.93	0.25	0.00	0.0	91.060	-29.41	5327.03	0.006

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L34	(33) 0.92 - 0 (34)	75 TP31.751x31.5847x0.937 5	0.92	0.00	0.0	3 91.194 7	-29.48	5334.89	0.006

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>rx</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M <sub>uy</sub> kip-ft	φM <sub>ry</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L1	110 - 105 (1)	TP13.901x13.051x0.1875	29.65	170.00	0.174	0.00	170.00	0.000
L2	105 - 100 (2)	TP14.751x13.901x0.1875	52.81	191.88	0.275	0.00	191.88	0.000
L3	100 - 93 (3)	TP15.941x14.751x0.1875	90.25	215.09	0.420	0.00	215.09	0.000
L4	93 - 90 (4)	TP16.1139x15.226x0.25	127.38	302.71	0.421	0.00	302.71	0.000
L5	90 - 85 (5)	TP17.0018x16.1139x0.25	165.17	337.82	0.489	0.00	337.82	0.000
L6	85 - 80 (6)	TP17.8896x17.0018x0.25	210.92	374.86	0.563	0.00	374.86	0.000
L7	80 - 79.75 (7)	TP17.934x17.8896x0.562 5	213.46	803.56	0.266	0.00	803.56	0.000
L8	79.75 - 74.75 (8)	TP18.8219x17.934x0.537 5	264.72	853.13	0.310	0.00	853.13	0.000
L9	74.75 - 69.75 (9)	TP19.7098x18.8219x0.52 5	316.83	919.19	0.345	0.00	919.19	0.000
L10	69.75 - 64.75 (10)	TP20.5977x19.7098x0.5	371.78	963.05	0.386	0.00	963.05	0.000
L11	64.75 - 64.25 (11)	TP20.6865x20.5977x0.5	377.36	971.68	0.388	0.00	971.68	0.000
L12	64.25 - 64 (12)	TP20.7308x20.6865x0.77 5	380.16	1451.96	0.262	0.00	1451.96	0.000
L13	64 - 59 (13)	TP21.6187x20.7308x0.75	436.54	1540.92	0.283	0.00	1540.92	0.000
L14	59 - 56.5 (14)	TP22.0627x21.6187x0.72 5	465.08	1560.20	0.298	0.00	1560.20	0.000
L15	56.5 - 56.25 (15)	TP22.1071x22.0627x0.97 5	467.95	2034.03	0.230	0.00	2034.03	0.000
L16	56.25 - 51.25 (16)	TP22.9949x22.1071x0.92 5	526.18	2113.35	0.249	0.00	2113.35	0.000
L17	51.25 - 45.5 (17)	TP24.016x22.9949x0.912 5	546.95	2148.71	0.255	0.00	2148.71	0.000
L18	45.5 - 44.5 (18)	TP23.7093x22.8057x0.72 5	607.50	1814.56	0.335	0.00	1814.56	0.000
L19	44.5 - 39.5 (19)	TP24.6128x23.7093x0.71 25	669.21	1931.50	0.346	0.00	1931.50	0.000
L20	39.5 - 37.25 (20)	TP25.0194x24.6128x0.7	697.23	1966.71	0.355	0.00	1966.71	0.000
L21	37.25 - 37 (21)	TP25.0646x25.0194x0.7	700.35	1974.13	0.355	0.00	1974.13	0.000
L22	37 - 36.5 (22)	TP25.155x25.0646x0.7	706.60	1989.00	0.355	0.00	1989.00	0.000
L23	36.5 - 36.25 (23)	TP25.2001x25.155x0.912 5	709.73	2535.39	0.280	0.00	2535.39	0.000
L24	36.25 - 34.25 (24)	TP25.5616x25.2001x0.88 75	734.83	2548.96	0.288	0.00	2548.96	0.000
L25	34.25 - 34 (25)	TP25.6068x25.5616x0.72 5	737.98	2131.50	0.346	0.00	2131.50	0.000
L26	34 - 29 (26)	TP26.5103x25.6068x0.7	801.49	2218.82	0.361	0.00	2218.82	0.000
L27	29 - 24 (27)	TP27.4139x26.5103x0.68 75	866.83	2339.82	0.370	0.00	2339.82	0.000
L28	24 - 19 (28)	TP28.3174x27.4139x0.67 5	933.17	2460.58	0.379	0.00	2460.58	0.000
L29	19 - 14 (29)	TP29.221x28.3174x0.662 5	1000.18	2580.82	0.388	0.00	2580.82	0.000
L30	14 - 9 (30)	TP30.1246x29.221x0.637 5	1067.82	2651.63	0.403	0.00	2651.63	0.000
L31	9 - 4 (31)	TP31.0281x30.1246x0.63 75	1136.08	2818.40	0.403	0.00	2818.40	0.000
L32	4 - 1.17 (32)	TP31.5396x31.0281x0.62 5	1175.00	2861.36	0.411	0.00	2861.36	0.000
L33	1.17 - 0.92	TP31.5847x31.5396x0.93	1175.00	4163.19	0.282	0.00	4163.19	0.000

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{nx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	$M_{uy}$ kip-ft	$\phi M_{ny}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L34	(33) 0.92 - 0 (34)	75 TP31.751x31.5847x0.937 5	1178.44	4175.68	0.282	0.00	4175.68	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	110 - 105 (1)	TP13.901x13.051x0.1875	4.56	143.23	0.032	0.10	172.01	0.001
L2	105 - 100 (2)	TP14.751x13.901x0.1875	4.71	152.11	0.031	0.10	194.00	0.001
L3	100 - 93 (3)	TP15.941x14.751x0.1875	7.35	160.99	0.046	1.29	217.30	0.006
L4	93 - 90 (4)	TP16.1139x15.226x0.25	7.50	220.92	0.034	1.29	306.92	0.004
L5	90 - 85 (5)	TP17.0018x16.1139x0.25	7.72	233.28	0.033	2.00	342.24	0.006
L6	85 - 80 (6)	TP17.8896x17.0018x0.25	10.17	245.65	0.041	2.65	379.48	0.007
L7	80 - 79.75 (7)	TP17.934x17.8896x0.562 5	10.17	544.31	0.019	2.65	828.06	0.003
L8	79.75 - 74.75 (8)	TP18.8219x17.934x0.537 5	10.34	547.45	0.019	2.65	876.61	0.003
L9	74.75 - 69.75 (9)	TP19.7098x18.8219x0.52 5	10.51	561.05	0.019	2.65	942.63	0.003
L10	69.75 - 64.75 (10)	TP20.5977x19.7098x0.5 5	11.16	559.76	0.020	3.12	985.20	0.003
L11	64.75 - 64.25 (11)	TP20.6865x20.5977x0.5 5	11.18	562.23	0.020	3.11	993.92	0.003
L12	64.25 - 64 (12)	TP20.7308x20.6865x0.77 5	11.19	861.50	0.013	3.11	1505.59	0.002
L13	64 - 59 (13)	TP21.6187x20.7308x0.75 5	11.38	871.85	0.013	3.11	1593.38	0.002
L14	59 - 56.5 (14)	TP22.0627x21.6187x0.72 5	11.47	861.73	0.013	3.11	1610.26	0.002
L15	56.5 - 56.25 (15)	TP22.1071x22.0627x0.97 5	11.49	1147.71	0.010	3.11	2123.99	0.001
L16	56.25 - 51.25 (16)	TP22.9949x22.1071x0.92 5	11.82	1137.17	0.010	3.11	2197.90	0.001
L17	51.25 - 45.5 (17)	TP24.016x22.9949x0.912 5	11.93	1138.24	0.010	3.11	2232.18	0.001
L18	45.5 - 44.5 (18)	TP23.7093x22.8057x0.72 5	12.27	928.22	0.013	3.11	1868.38	0.002
L19	44.5 - 39.5 (19)	TP24.6128x23.7093x0.71 25	12.43	948.58	0.013	3.11	1985.44	0.002
L20	39.5 - 37.25 (20)	TP25.0194x24.6128x0.7 5	12.50	948.28	0.013	3.11	2019.62	0.002
L21	37.25 - 37 (21)	TP25.0646x25.0194x0.7 5	12.50	950.04	0.013	3.11	2027.13	0.002
L22	37 - 36.5 (22)	TP25.155x25.0646x0.7 5	12.51	953.56	0.013	3.11	2042.19	0.002
L23	36.5 - 36.25 (23)	TP25.2001x25.155x0.912 5	12.52	1234.53	0.010	3.11	2625.83	0.001
L24	36.25 - 34.25 (24)	TP25.5616x25.2001x0.88 75	12.59	1219.81	0.010	3.11	2635.81	0.001
L25	34.25 - 34 (25)	TP25.6068x25.5616x0.72 5	12.60	1004.85	0.013	3.11	2189.60	0.001
L26	34 - 29 (26)	TP26.5103x25.6068x0.7 5	12.94	1006.41	0.013	3.11	2274.83	0.001
L27	29 - 24 (27)	TP27.4139x26.5103x0.68 75	13.21	1023.52	0.013	3.11	2395.62	0.001
L28	24 - 19 (28)	TP28.3174x27.4139x0.67 5	13.35	1039.36	0.013	3.11	2516.06	0.001
L29	19 - 14 (29)	TP29.221x28.3174x0.662 5	13.48	1053.91	0.013	3.11	2635.85	0.001
L30	14 - 9 (30)	TP30.1246x29.221x0.637 5	13.60	1047.12	0.013	3.11	2704.01	0.001
L31	9 - 4 (31)	TP31.0281x30.1246x0.63 75	13.73	1079.21	0.013	3.11	2872.27	0.001
L32	4 - 1.17 (32)	TP31.5396x31.0281x0.62 5	13.80	1076.28	0.013	3.11	2913.88	0.001
L33	1.17 - 0.92	TP31.5847x31.5396x0.93 5	13.79	1600.47	0.009	3.11	4282.89	0.001

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L34	(33) 0.92 - 0 (34)	75 TP31.751x31.5847x0.937 5	13.83	1609.15	0.009	3.11	4295.54	0.001

### Pole Interaction Design Data

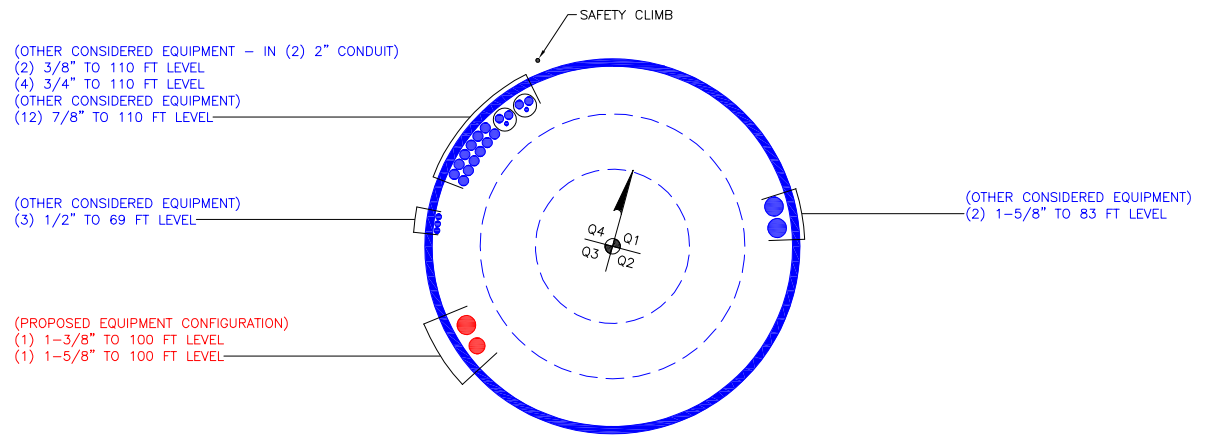
Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	110 - 105 (1)	0.009	0.174	0.000	0.032	0.001	0.184	1.050	4.8.2
L2	105 - 100 (2)	0.008	0.275	0.000	0.031	0.001	0.285	1.050	4.8.2
L3	100 - 93 (3)	0.013	0.420	0.000	0.046	0.006	0.436	1.050	4.8.2
L4	93 - 90 (4)	0.010	0.421	0.000	0.034	0.004	0.433	1.050	4.8.2
L5	90 - 85 (5)	0.010	0.489	0.000	0.033	0.006	0.501	1.050	4.8.2
L6	85 - 80 (6)	0.012	0.563	0.000	0.041	0.007	0.577	1.050	4.8.2
L7	80 - 79.75 (7)	0.005	0.266	0.000	0.019	0.003	0.272	1.050	4.8.2
L8	79.75 - 74.75 (8)	0.006	0.310	0.000	0.019	0.003	0.317	1.050	4.8.2
L9	74.75 - 69.75 (9)	0.006	0.345	0.000	0.019	0.003	0.351	1.050	4.8.2
L10	69.75 - 64.75 (10)	0.007	0.386	0.000	0.020	0.003	0.393	1.050	4.8.2
L11	64.75 - 64.25 (11)	0.007	0.388	0.000	0.020	0.003	0.396	1.050	4.8.2
L12	64.25 - 64 (12)	0.004	0.262	0.000	0.013	0.002	0.266	1.050	4.8.2
L13	64 - 59 (13)	0.005	0.283	0.000	0.013	0.002	0.288	1.050	4.8.2
L14	59 - 56.5 (14)	0.005	0.298	0.000	0.013	0.002	0.303	1.050	4.8.2
L15	56.5 - 56.25 (15)	0.004	0.230	0.000	0.010	0.001	0.234	1.050	4.8.2
L16	56.25 - 51.25 (16)	0.004	0.249	0.000	0.010	0.001	0.253	1.050	4.8.2
L17	51.25 - 45.5 (17)	0.004	0.255	0.000	0.010	0.001	0.259	1.050	4.8.2
L18	45.5 - 44.5 (18)	0.006	0.335	0.000	0.013	0.002	0.341	1.050	4.8.2
L19	44.5 - 39.5 (19)	0.006	0.346	0.000	0.013	0.002	0.353	1.050	4.8.2
L20	39.5 - 37.25 (20)	0.006	0.355	0.000	0.013	0.002	0.361	1.050	4.8.2
L21	37.25 - 37 (21)	0.006	0.355	0.000	0.013	0.002	0.361	1.050	4.8.2
L22	37 - 36.5 (22)	0.006	0.355	0.000	0.013	0.002	0.362	1.050	4.8.2
L23	36.5 - 36.25 (23)	0.005	0.280	0.000	0.010	0.001	0.285	1.050	4.8.2
L24	36.25 - 34.25 (24)	0.005	0.288	0.000	0.010	0.001	0.293	1.050	4.8.2
L25	34.25 - 34 (25)	0.006	0.346	0.000	0.013	0.001	0.353	1.050	4.8.2
L26	34 - 29 (26)	0.006	0.361	0.000	0.013	0.001	0.368	1.050	4.8.2
L27	29 - 24 (27)	0.007	0.370	0.000	0.013	0.001	0.377	1.050	4.8.2
L28	24 - 19 (28)	0.007	0.379	0.000	0.013	0.001	0.386	1.050	4.8.2
L29	19 - 14 (29)	0.007	0.388	0.000	0.013	0.001	0.395	1.050	4.8.2
L30	14 - 9 (30)	0.008	0.403	0.000	0.013	0.001	0.411	1.050	4.8.2
L31	9 - 4 (31)	0.008	0.403	0.000	0.013	0.001	0.411	1.050	4.8.2
L32	4 - 1.17 (32)	0.008	0.411	0.000	0.013	0.001	0.419	1.050	4.8.2
L33	1.17 - 0.92 (33)	0.006	0.282	0.000	0.009	0.001	0.288	1.050	4.8.2
L34	0.92 - 0 (34)	0.006	0.282	0.000	0.009	0.001	0.288	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	110 - 105	Pole	TP13.901x13.051x0.1875	1	-4.06	501.30	17.5	Pass	
L2	105 - 100	Pole	TP14.751x13.901x0.1875	2	-4.28	532.38	27.1	Pass	
L3	100 - 93	Pole	TP15.941x14.751x0.1875	3	-7.17	563.45	41.5	Pass	
L4	93 - 90	Pole	TP16.1139x15.226x0.25	4	-7.59	773.22	41.2	Pass	
L5	90 - 85	Pole	TP17.0018x16.1139x0.25	5	-7.96	816.49	47.7	Pass	
L6	85 - 80	Pole	TP17.8896x17.0018x0.25	6	-9.92	859.77	55.0	Pass	
L7	80 - 79.75	Pole	TP17.934x17.8896x0.5625	7	-9.97	1905.08	25.9	Pass	
L8	79.75 - 74.75	Pole	TP18.8219x17.934x0.5375	8	-10.65	1916.07	30.2	Pass	
L9	74.75 - 69.75	Pole	TP19.7098x18.8219x0.525	9	-11.36	1963.67	33.4	Pass	
L10	69.75 - 64.75	Pole	TP20.5977x19.7098x0.5	10	-12.53	1959.15	37.5	Pass	
L11	64.75 - 64.25	Pole	TP20.6865x20.5977x0.5	11	-12.61	1967.80	37.7	Pass	
L12	64.25 - 64	Pole	TP20.7308x20.6865x0.775	12	-12.66	3015.25	25.4	Pass	
L13	64 - 59	Pole	TP21.6187x20.7308x0.75	13	-13.66	3051.47	27.4	Pass	
L14	59 - 56.5	Pole	TP22.0627x21.6187x0.725	14	-14.16	3016.04	28.9	Pass	
L15	56.5 - 56.25	Pole	TP22.1071x22.0627x0.975	15	-14.23	4016.97	22.3	Pass	
L16	56.25 - 51.25	Pole	TP22.9949x22.1071x0.925	16	-15.45	3980.11	24.1	Pass	
L17	51.25 - 45.5	Pole	TP24.016x22.9949x0.9125	17	-15.89	3983.84	24.7	Pass	
L18	45.5 - 44.5	Pole	TP23.7093x22.8057x0.725	18	-17.88	3248.78	32.5	Pass	
L19	44.5 - 39.5	Pole	TP24.6128x23.7093x0.7125	19	-18.99	3320.02	33.6	Pass	
L20	39.5 - 37.25	Pole	TP25.0194x24.6128x0.7	20	-19.49	3318.98	34.4	Pass	
L21	37.25 - 37	Pole	TP25.0646x25.0194x0.7	21	-19.56	3325.14	34.4	Pass	
L22	37 - 36.5	Pole	TP25.155x25.0646x0.7	22	-19.69	3337.47	34.4	Pass	
L23	36.5 - 36.25	Pole	TP25.2001x25.155x0.9125	23	-19.77	4320.87	27.1	Pass	
L24	36.25 - 34.25	Pole	TP25.5616x25.2001x0.8875	24	-20.35	4269.34	27.9	Pass	
L25	34.25 - 34	Pole	TP25.6068x25.5616x0.725	25	-20.42	3516.99	33.6	Pass	
L26	34 - 29	Pole	TP26.5103x25.6068x0.7	26	-21.72	3522.43	35.0	Pass	
L27	29 - 24	Pole	TP27.4139x26.5103x0.6875	27	-23.05	3582.33	35.9	Pass	
L28	24 - 19	Pole	TP28.3174x27.4139x0.675	28	-24.41	3637.75	36.8	Pass	
L29	19 - 14	Pole	TP29.221x28.3174x0.6625	29	-25.78	3688.70	37.6	Pass	
L30	14 - 9	Pole	TP30.1246x29.221x0.6375	30	-27.18	3664.92	39.1	Pass	
L31	9 - 4	Pole	TP31.0281x30.1246x0.6375	31	-28.59	3777.22	39.2	Pass	
L32	4 - 1.17	Pole	TP31.5396x31.0281x0.625	32	-29.40	3767.00	39.9	Pass	
L33	1.17 - 0.92	Pole	TP31.5847x31.5396x0.9375	33	-29.41	5593.38	27.4	Pass	
L34	0.92 - 0	Pole	TP31.751x31.5847x0.9375	34	-29.48	5601.63	27.4	Pass	
							Summary		
							Pole (L6)	55.0	Pass
							<b>RATING =</b>	<b>55.0</b>	<b>Pass</b>

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

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



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



Site BU: 841301  
Work Order: 2095829

**Pole Geometry**

Copyright © 2019 Crown Castle

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	110	17	2	18	13.051	15.941	0.1875	Auto	A572-65
2	95	49.5	4	18	15.23	24.016	0.25	Auto	A572-65
3	49.5	49.5	0	18	22.81	31.751	0.3125	Auto	A572-65

**Reinforcement Configuration**

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number																		
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	46.75	64.25	plate	PL 3.5" x 1.25"	3		E1						E1					E1					
2	1.17	36.5	plate	CCI-SFP-065125	3						E2									E2		E2	
3	1.17	37.25	plate	CCI-SFP-065125	1									E2									
4	34.25	56.5	plate	CCI-SFP-065125	1												E2						
5	36.5	56.5	plate	CCI-SFP-065125	2						E2											E2	
6	56.5	80	plate	CCI-SFP-045100	3						E2						E2					E2	
7	0	1.17	plate	ARB2 (7.25" x 1.25")	3			E2				E2								E2			
8	0	1.17	plate	ARB1 (7.25" x 1.25")	1																E2		
9																							
10																							

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	3.5	1.25	4.375	0.625	PC 8.8 - M20 (100)	15	PC 8.8 - M20 (100)	15.000	12.000	2.813	1.1875	A572-65
2	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
3	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
4	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
5	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	19.000	6.563	1.1875	A572-65
6	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	1.1875	A572-65
7	1.25	7.25	9.0625	3.625	Welded	n/a	Welded	n/a	0.000	9.063	0.0000	A572-65
8	1.25	7.25	9.0625	3.625	Welded	n/a	Welded	n/a	0.000	9.063	0.0000	A572-65

**Connection Details for Custom Reinforcements**

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
PL 3.5" x 1.25"	Top	5	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	5	N	3	3	-	-	-	-	-	-	-	-	-
ARB2 (7.25" x 1.25")	Top	-	-	-	-	70	None	-	-	-	-	43	0.375	-
	Bottom	-	-	-	-	70	CJP Groove	6.5	1.25	45	0.5625	-	-	-
ARB1 (7.25" x 1.25")	Top	-	-	-	-	70	None	-	-	-	-	82	0.375	-
	Bottom	-	-	-	-	70	CJP Groove	7.25	1.25	45	0.5625	-	-	-

# TNX Geometry Input

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

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	110 - 105	5		18	13.051	13.901	0.1875	A572-65	1.000
2	105 - 100	5		18	13.901	14.751	0.1875	A572-65	1.000
3	100 - 95	7	2	18	14.751	15.941	0.1875	A572-65	1.000
4	95 - 90	5		18	15.226	16.114	0.25	A572-65	1.000
5	90 - 85	5		18	16.114	17.002	0.25	A572-65	1.000
6	85 - 80	5		18	17.002	17.890	0.25	A572-65	1.000
7	80 - 79.75	0.25		18	17.890	17.934	0.5625	A572-65	0.888
8	79.75 - 74.75	5		18	17.934	18.822	0.5375	A572-65	0.905
9	74.75 - 69.75	5		18	18.822	19.710	0.525	A572-65	0.905
10	69.75 - 64.75	5		18	19.710	20.598	0.5	A572-65	0.929
11	64.75 - 64.25	0.5		18	20.598	20.686	0.5	A572-65	0.928
12	64.25 - 64	0.25		18	20.686	20.731	0.775	A572-65	0.873
13	64 - 59	5		18	20.731	21.619	0.75	A572-65	0.877
14	59 - 56.5	2.5		18	21.619	22.063	0.725	A572-65	0.895
15	56.5 - 56.25	0.25		18	22.063	22.107	0.975	A572-65	0.839
16	56.25 - 51.25	5		18	22.107	22.995	0.925	A572-65	0.857
17	51.25 - 49.5	5.75	4	18	22.995	24.016	0.9125	A572-65	0.860
18	49.5 - 44.5	5		18	22.806	23.709	0.725	A572-65	0.900
19	44.5 - 39.5	5		18	23.709	24.613	0.7125	A572-65	0.897
20	39.5 - 37.25	2.25		18	24.613	25.019	0.7	A572-65	0.905
21	37.25 - 37	0.25		18	25.019	25.065	0.7	A572-65	1.054
22	37 - 36.5	0.5		18	25.065	25.155	0.7	A572-65	1.052
23	36.5 - 36.25	0.25		18	25.155	25.200	0.9125	A572-65	0.928
24	36.25 - 34.25	2		18	25.200	25.562	0.8875	A572-65	0.945
25	34.25 - 34	0.25		18	25.562	25.607	0.725	A572-65	1.006
26	34 - 29	5		18	25.607	26.510	0.7	A572-65	1.020
27	29 - 24	5		18	26.510	27.414	0.6875	A572-65	1.018
28	24 - 19	5		18	27.414	28.317	0.675	A572-65	1.018
29	19 - 14	5		18	28.317	29.221	0.6625	A572-65	1.019
30	14 - 9	5		18	29.221	30.125	0.6375	A572-65	1.040
31	9 - 4	5		18	30.125	31.028	0.6375	A572-65	1.024
32	4 - 1.17	2.83		18	31.028	31.540	0.625	A572-65	1.035
33	1.17 - 0.92	0.25		18	31.540	31.585	0.9375	A572-65	0.738
34	0.92 - 0	0.92		18	31.585	31.751	0.9375	A572-65	0.735

## TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
1	110 - 105	4.06	29.65	4.56	
2	105 - 100	4.28	52.81	4.71	
3	100 - 95	7.17	90.25	7.35	
4	95 - 90	7.59	127.38	7.50	
5	90 - 85	7.97	165.19	7.63	
6	85 - 80	9.92	210.92	10.17	
7	80 - 79.75	9.97	213.46	10.17	
8	79.75 - 74.75	10.65	264.72	10.34	
9	74.75 - 69.75	11.36	316.83	10.51	
10	69.75 - 64.75	12.53	371.78	11.16	
11	64.75 - 64.25	12.61	377.36	11.18	
12	64.25 - 64	12.66	380.16	11.19	
13	64 - 59	13.66	436.54	11.38	
14	59 - 56.5	14.16	465.08	11.47	
15	56.5 - 56.25	14.23	467.95	11.49	
16	56.25 - 51.25	15.45	526.18	11.82	
17	51.25 - 49.5	15.89	546.95	11.93	
18	49.5 - 44.5	17.88	607.50	12.27	
19	44.5 - 39.5	18.99	669.21	12.43	
20	39.5 - 37.25	19.49	697.23	12.50	
21	37.25 - 37	19.56	700.35	12.50	
22	37 - 36.5	19.69	706.60	12.51	
23	36.5 - 36.25	19.77	709.73	12.52	
24	36.25 - 34.25	20.35	734.83	12.59	
25	34.25 - 34	20.42	737.98	12.60	
26	34 - 29	21.72	801.49	12.94	
27	29 - 24	23.05	866.83	13.21	
28	24 - 19	24.41	933.17	13.35	
29	19 - 14	25.78	1000.18	13.48	
30	14 - 9	27.18	1067.82	13.60	
31	9 - 4	28.59	1136.08	13.73	
32	4 - 1.17	29.40	1175.00	13.80	
33	1.17 - 0.92	29.48	1178.44	13.79	
34	0.92 - 0	29.75	1191.14	13.83	

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	17.5%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	27.1%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	41.4%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	41.1%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	47.6%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	54.9%	Pass
80 - 79.75	Pole + Reinf.	TP17.934x17.89x0.5625	Reinf. 6 Tension Rupture	46.2%	Pass
79.75 - 74.75	Pole + Reinf.	TP18.822x17.934x0.5375	Reinf. 6 Tension Rupture	53.3%	Pass
74.75 - 69.75	Pole + Reinf.	TP19.71x18.822x0.525	Reinf. 6 Tension Rupture	59.4%	Pass
69.75 - 64.75	Pole + Reinf.	TP20.598x19.71x0.5	Reinf. 6 Tension Rupture	65.2%	Pass
64.75 - 64.25	Pole + Reinf.	TP20.686x20.598x0.5	Reinf. 6 Tension Rupture	65.8%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	50.7%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	55.0%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	57.0%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	44.8%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	47.9%	Pass
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	49.0%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 4 Tension Rupture	51.1%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 4 Tension Rupture	53.3%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 4 Tension Rupture	54.2%	Pass
37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 5 Tension Rupture	53.0%	Pass
37 - 36.5	Pole + Reinf.	TP25.155x25.065x0.7	Reinf. 5 Tension Rupture	53.2%	Pass
36.5 - 36.25	Pole + Reinf.	TP25.2x25.155x0.9125	Reinf. 2 Tension Rupture	46.5%	Pass
36.25 - 34.25	Pole + Reinf.	TP25.562x25.2x0.8875	Reinf. 2 Tension Rupture	47.2%	Pass
34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.725	Reinf. 3 Tension Rupture	50.1%	Pass
34 - 29	Pole + Reinf.	TP26.51x25.607x0.7	Reinf. 3 Tension Rupture	51.8%	Pass
29 - 24	Pole + Reinf.	TP27.414x26.51x0.6875	Reinf. 3 Tension Rupture	53.4%	Pass
24 - 19	Pole + Reinf.	TP28.317x27.414x0.675	Reinf. 3 Tension Rupture	54.8%	Pass
19 - 14	Pole + Reinf.	TP29.221x28.317x0.6625	Reinf. 3 Tension Rupture	56.1%	Pass
14 - 9	Pole + Reinf.	TP30.125x29.221x0.6375	Reinf. 3 Tension Rupture	57.3%	Pass
9 - 4	Pole + Reinf.	TP31.028x30.125x0.6375	Reinf. 3 Tension Rupture	58.3%	Pass
4 - 1.17	Pole + Reinf.	TP31.54x31.028x0.625	Reinf. 3 Tension Rupture	58.9%	Pass
1.17 - 0.92	Pole + Reinf.	TP31.585x31.54x0.9375	Reinf. 7 Tension Yield	44.5%	Pass
0.92 - 0	Pole + Reinf.	TP31.751x31.585x0.9375	Reinf. 7 Tension Yield	44.7%	Pass
				Summary	
			Pole	54.9%	Pass
			Reinforcement	65.8%	Pass
			Overall	65.8%	Pass

# Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity* (100% Max. Allowable)								
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8
110 - 105	194	n/a	194	8.16	n/a	8.16	17.5%								
105 - 100	232	n/a	232	8.67	n/a	8.67	27.1%								
100 - 95	275	n/a	275	9.17	n/a	9.17	41.4%								
95 - 90	400	n/a	400	12.59	n/a	12.59	41.1%								
90 - 85	471	n/a	471	13.29	n/a	13.29	47.6%								
85 - 80	550	n/a	550	14.00	n/a	14.00	54.9%								
80 - 79.75	554	617	1171	14.03	13.50	27.53	25.8%						46.2%		
79.75 - 74.75	642	675	1317	14.74	13.50	28.24	29.8%						53.3%		
74.75 - 69.75	739	736	1474	15.44	13.50	28.94	33.3%						59.4%		
69.75 - 64.75	844	799	1643	16.15	13.50	29.65	36.6%						65.2%		
64.75 - 64.25	855	806	1661	16.22	13.50	29.72	37.0%						65.8%		
64.25 - 64	861	1609	2470	16.25	26.63	42.88	25.1%	50.7%					44.6%		
64 - 59	978	1741	2719	16.96	26.63	43.58	27.3%	55.0%					48.5%		
59 - 56.5	1040	1809	2849	17.31	26.63	43.93	28.3%	57.0%					50.2%		
56.5 - 56.25	1046	2609	3656	17.34	37.50	54.84	22.2%	44.8%			35.7%	35.7%			
56.25 - 51.25	1179	2807	3987	18.05	37.50	55.55	23.8%	47.9%			38.2%	38.2%			
51.25 - 49.5	1228	2879	4107	18.29	37.50	55.79	24.4%	49.0%			39.1%	39.1%			
49.5 - 44.5	1604	1943	3547	23.21	24.38	47.58	31.9%				51.1%	51.1%			
44.5 - 39.5	1798	2083	3880	24.10	24.38	48.48	33.4%				53.3%	53.3%			
39.5 - 37.25	1889	2147	4036	24.51	24.38	48.88	34.0%				54.2%	54.2%			
37.25 - 37	1900	2183	4083	24.55	32.50	57.05	34.2%			36.0%	43.7%	53.0%			
37 - 36.5	1921	2197	4118	24.64	32.50	57.14	34.3%			36.2%	43.9%	53.2%			
36.5 - 36.25	2005	3274	5279	24.68	40.63	65.31	30.5%		46.5%	36.8%	37.5%				
36.25 - 34.25	2093	3363	5456	25.04	40.63	65.67	31.0%		47.2%	37.4%	38.1%				
34.25 - 34	2029	2436	4465	25.09	32.50	57.59	34.3%		49.4%	50.1%					
34 - 29	2254	2598	4852	25.98	32.50	58.48	35.5%		51.0%	51.8%					
29 - 24	2496	2765	5261	26.88	32.50	59.38	36.6%		52.5%	53.4%					
24 - 19	2754	2938	5691	27.78	32.50	60.28	37.6%		54.0%	54.8%					
19 - 14	3029	3116	6145	28.67	32.50	61.17	38.5%		55.2%	56.1%					
14 - 9	3322	3299	6621	29.57	32.50	62.07	39.4%		56.4%	57.3%					
9 - 4	3633	3488	7121	30.46	32.50	62.96	40.4%		57.4%	58.3%					
4 - 1.17	3817	3597	7415	30.97	32.50	63.47	41.0%		57.9%	58.9%					
1.17 - 0.92	3857	7043	10899	31.02	36.25	67.27	29.7%							44.5%	43.6%
0.92 - 0	3918	7103	11021	31.18	36.25	67.43	29.9%							44.7%	43.8%

Note: Section capacity checked using 5 degree increments.  
 \*Rating per TIA-222-H Section 15.5.

# Monopole Base Plate Connection

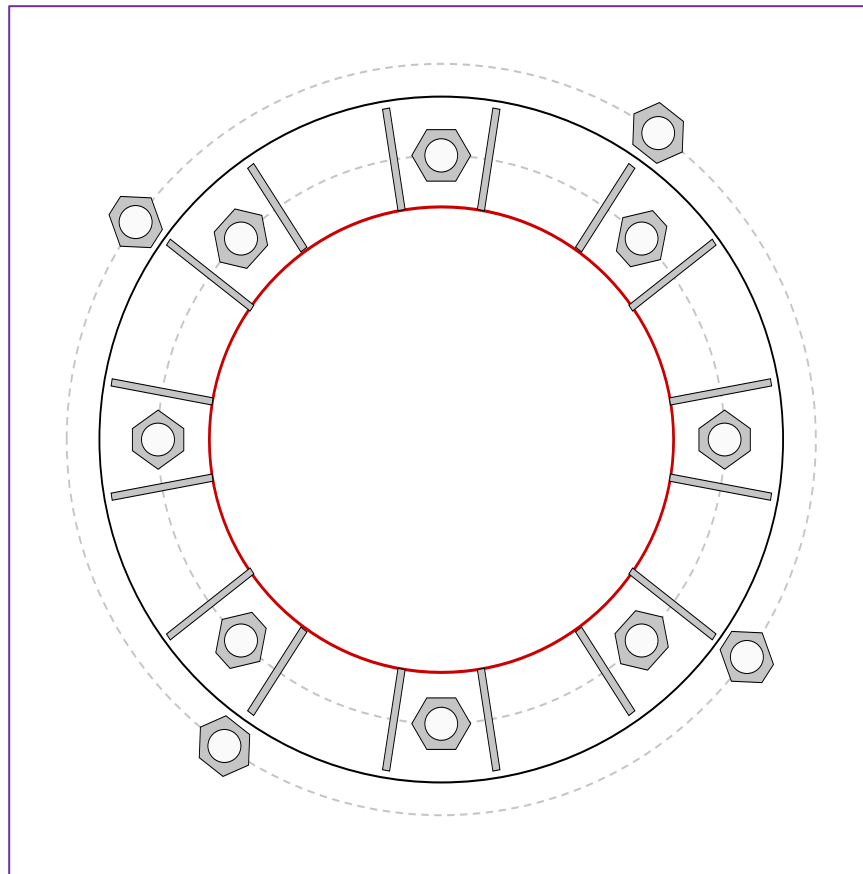


Site Info	
BU #	841301
Site Name	WILLINGTON-RIVER RD
Order #	609058 Rev. 0

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

Applied Loads	
Moment (kip-ft)	1191.14
Axial Force (kips)	29.75
Shear Force (kips)	13.83

\*TIA-222-H Section 15.5 Applied



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

**Anchor Rod Data**  
 GROUP 1: (8) 2-1/4"  $\phi$  bolts (A615-75 N;  $F_y=75$  ksi,  $F_u=100$  ksi) on 38.75" BC  
 GROUP 2: (4) 2-1/4"  $\phi$  bolts (A193 Gr. B7 N;  $F_y=105$  ksi,  $F_u=125$  ksi) on 51.25" BC

**Base Plate Data**  
 46.75" OD x 1.5" Plate (A572-60;  $F_y=60$  ksi,  $F_u=75$  ksi)

**Stiffener Data**  
 (16) 18"H x 7"W x 0.5"T, Notch: 0.5"  
 plate:  $F_y=70$  ksi ; weld:  $F_y=70$  ksi  
 horiz. weld: 0.5" groove, 45° dbl bevel, 0.375" fillet  
 vert. weld: 0.375" fillet

**Pole Data**  
 31.751" x 0.3125" 18-sided pole (A572-65;  $F_y=65$  ksi,  $F_u=80$  ksi)

**Anchor Rod Summary** (units of kips, kip-in)  
 GROUP 1:  
 $P_{u_t} = 94.56$                        $\phi P_{n_t} = 243.75$                       **Stress Rating**  
 $V_u = 1.73$                                $\phi V_n = 149.1$                               **36.9%**  
 $M_u = n/a$                                $\phi M_n = n/a$                               **Pass**

GROUP 2:  
 $P_{u_t} = 129.98$                        $\phi P_{n_t} = 304.69$                       **Stress Rating**  
 $V_u = 0$                                    $\phi V_n = 186.38$                               **40.6%**  
 $M_u = n/a$                                $\phi M_n = n/a$                               **Pass**

**Base Plate Summary**  
 Max Stress (ksi): 25.1 (Roark's Flexural)  
 Allowable Stress (ksi): 54  
 Stress Rating: **44.3%** **Pass**

**Stiffener Summary**  
 Horizontal Weld: **35.0%** **Pass**  
 Vertical Weld: **13.7%** **Pass**  
 Plate Flexure+Shear: **4.7%** **Pass**  
 Plate Tension+Shear: **17.3%** **Pass**  
 Plate Compression: **21.8%** **Pass**

**Pole Summary**  
 Punching Shear: **4.9%** **Pass**

# CCIplate

Elevation (ft) 0 (Base)

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

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

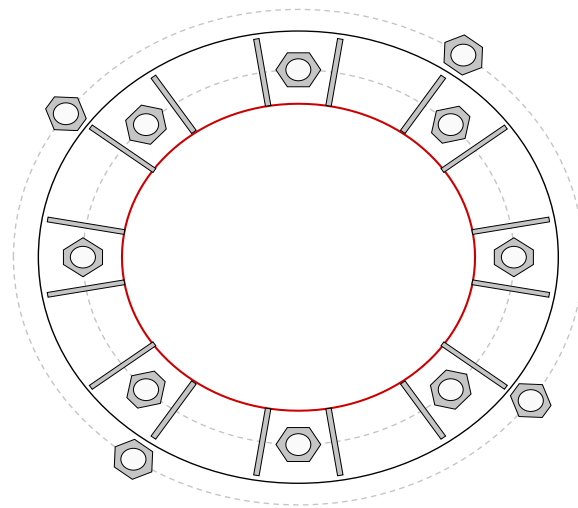
## Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, $\eta$	$I_{br}$ (in)	Thread Type	Area Override, in <sup>2</sup>	Tension Only
1	1	0	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
2	1	45	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
3	1	90	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
4	1	135	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
5	1	180	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
6	1	225	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
7	1	270	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
8	1	315	2.25	A615-75	38.75	0.5	0.9375	N-Included		No
9	2	54.646763	2.25	A193 Gr. B7	51.25	0.5	0.9375	N-Included		No
10	2	144.646763	2.25	A193 Gr. B7	51.25	0.5	0.9375	N-Included		No
11	2	234.646763	2.25	A193 Gr. B7	51.25	0.5	0.9375	N-Included		No
12	2	324.646763	2.25	A193 Gr. B7	51.25	0.5	0.9375	N-Included		No

## Custom Stiffener Connection

Stiffener	Stiffener Group ID	Location (deg.)	Width (in)	Height (in)	Thickness (in)	H. Notch (in)	V. Notch (in)	Grade (ksi)	Weld Type	Groove Depth (in)	Groove Angle (deg.)	H. Fillet Weld Size (in)	V. Fillet Weld Size (in)	Weld Strength (ksi)
1	1	9.64676296	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
2	1	35.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
3	1	54.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
4	1	80.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
5	1	99.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
6	1	125.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
7	1	144.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
8	1	170.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
9	1	189.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
10	1	215.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
11	1	234.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
12	1	260.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
13	1	279.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
14	1	305.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
15	1	324.646763	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70
16	1	350.353237	7	18	0.5	0.5	0.5	70	Both	0.5	45	0.375	0.375	70

## Plot Graphic



# Pier and Pad Foundation



BU #: 841301  
 Site Name: WILLINGTON-RIVER  
 App. Number: 609058 Rev. 0

TIA-222 Revision: H  
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:   
 Block Foundation?:   
 Rectangular Pad?:

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	29.76	kips
Base Shear, $Vu_{comp}$ :	13.82	kips
Moment, $M_u$ :	1191.14	ft-kips
Tower Height, $H$ :	110	ft
BP Dist. Above Fdn, $bp_{dist}$ :	4.625	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	160.76	13.82	8.2%	Pass
Bearing Pressure (ksf)	15.00	1.62	10.8%	Pass
Overturning (kip*ft)	3527.97	1279.39	36.3%	Pass
Pier Flexure (Comp.) (kip*ft)	5183.20	1239.51	22.8%	Pass
Pier Compression (kip)	17184.96	52.44	0.3%	Pass
Pad Flexure (kip*ft)	1677.22	441.13	25.0%	Pass
Pad Shear - 1-way (kips)	553.09	78.69	13.6%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.164	0.023	13.2%	Pass
Flexural 2-way (Comp) (kip*ft)	2004.63	743.71	35.3%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$ :	6	ft
Ext. Above Grade, $E$ :	1	ft
Pier Rebar Size, $Sc$ :	10	
Pier Rebar Quantity, $mc$ :	32	
Pier Tie/Spiral Size, $St$ :	3	
Pier Tie/Spiral Quantity, $mt$ :	3	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	35.3%
Soil Rating*:	36.3%

Pad Properties		
Depth, $D$ :	5	ft
Pad Width, $W_1$ :	22	ft
Pad Thickness, $T$ :	2.5	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	8	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	19	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	3	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	125	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	20.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	36	degrees
SPT Blow Count, $N_{blows}$ :		
Base Friction, $\mu$ :	0.35	
Neglected Depth, $N$ :	2.50	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, $gw$ :	n/a	ft

<--Toggle between Gross and Net

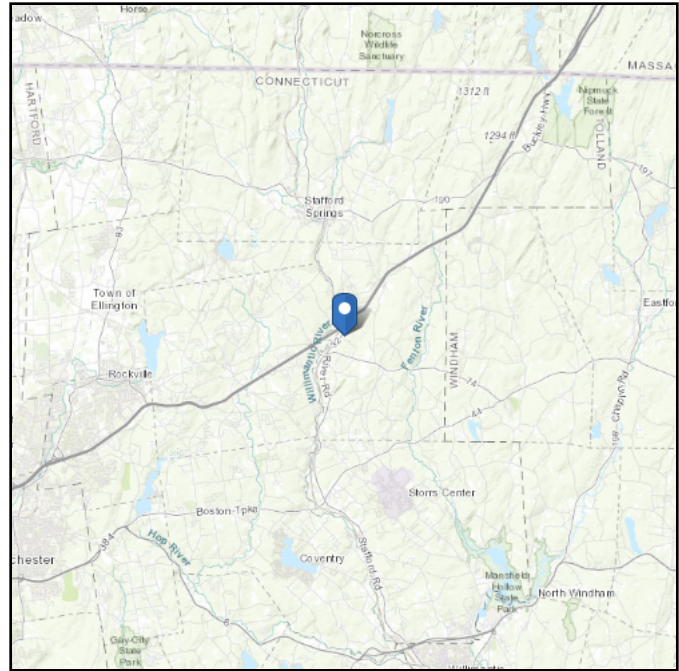
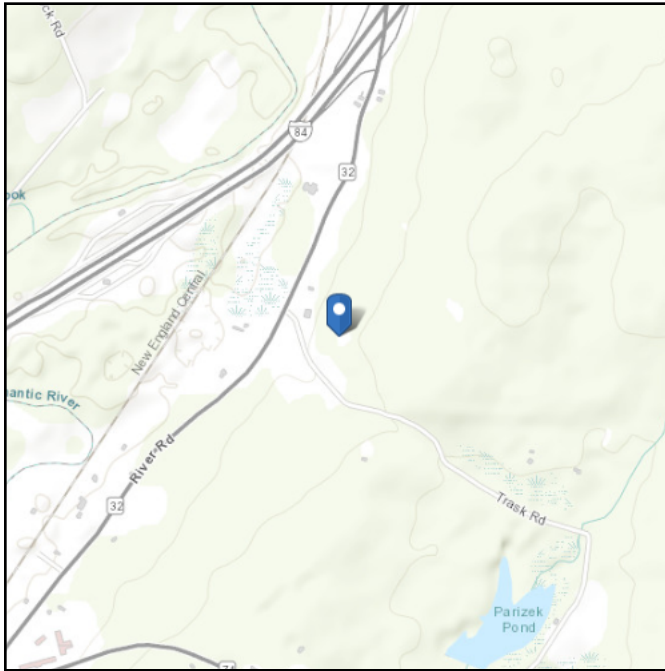


# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 515.88 ft (NAVD 88)  
**Latitude:** 41.890756  
**Longitude:** -72.289381



## Wind

### Results:

Wind Speed	<del>125 Vmph</del> 118 Vmph per ASCE 7-16 base on state requirements
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	102 Vmph

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

Date Accessed: Tue Apr 05 2022

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

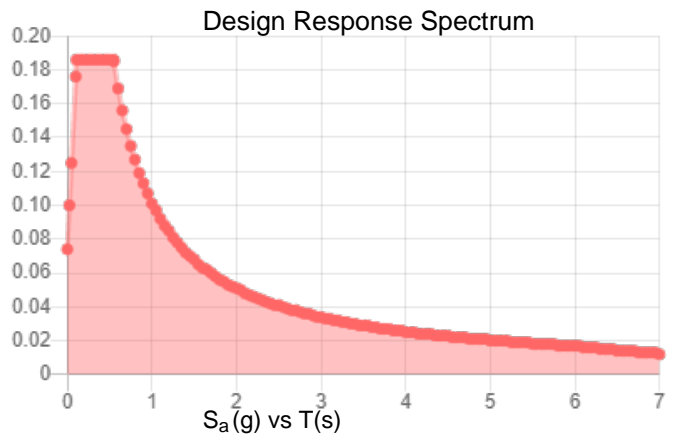
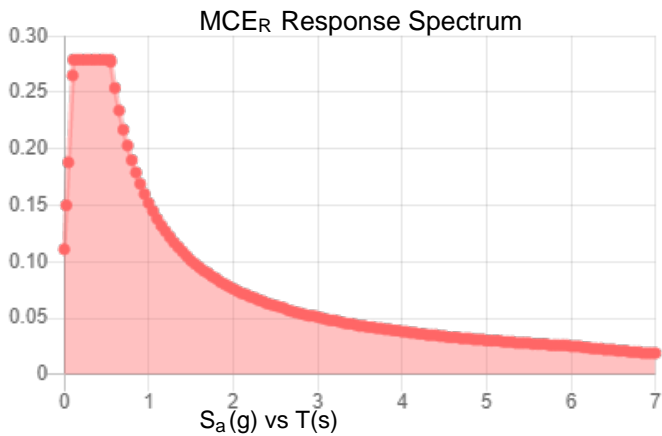
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.174	$S_{DS}$ :	0.186
$S_1$ :	0.063	$S_{D1}$ :	0.101
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.086
$S_{MS}$ :	0.279	PGA <sub>M</sub> :	0.138
$S_{M1}$ :	0.152	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:** Tue Apr 05 2022

**Date Source:**

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

## Ice

---

**Results:**

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

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

**Date Accessed:** Tue Apr 05 2022

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

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

---

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

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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

Date: March 30, 2022



B+T Group  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
towersupport@btgrp.com

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

**Carrier Designation:** T-Mobile Equipment Change-Out  
**Carrier Site Number:** CT11261C  
**Carrier Site Name:** Tolland/I-84/ Fill-In

**Crown Castle Designation:** BU Number: 841301  
Site Name: Willington-River Rd  
JDE Job Number: 709756  
Order Number: 609058, Rev.0

**Engineering Firm Designation:** B+T Group Report Designation: 135909.002.01

**Site Data:** 426 River Road, Willington, CT, Tolland County, 06279.  
Latitude 41° 53' 26.72" Longitude -72° 17' 21.77"

**Structure Information:** Tower Height & Type: 110 ft. Monopole  
Mount Elevation: 100 ft.  
Mount Type: 10.75 ft. Platform Mount

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

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

**Platform Mount**

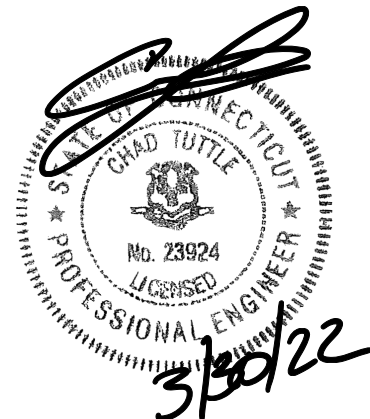
**Sufficient**

\*Sufficient upon completion of the recommendations listed in the Section 4.1 of this report.

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount structural analysis prepared by: Erika Ruiz

Respectfully submitted by: B&T Engineering, Inc.  
COA: PEC.0001564 Expires: 02/01/2023



Chad E. Tuttle, P.E.

## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Documents Provided

### 3) ANALYSIS PROCEDURE

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity

4.1) Recommendations

### 5) APPENDIX A

Wire Frame and Rendered Models

### 6) APPENDIX B

Software Input Calculations

### 7) APPENDIX C

Software Analysis Output

## 1) INTRODUCTION

This is an existing 3 - sector 10.75' Platform Mount, analyzed by B+T Group and mapped by Paul J. Ford & Company & RKS.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2018 Connecticut State Building Code
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	118 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor at Base:</b>	1
<b>Topographic Factor at Mount:</b>	1
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic S<sub>s</sub>:</b>	0.18
<b>Seismic S<sub>1</sub>:</b>	0.055
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb.
<b>Man Live Load at Mount Pipes:</b>	500 lb.

**Table 1 - Proposed Equipment Configuration**

Mount Centerline (ft.)	Antenna Centerline (ft.)	Number of Antennas	Manufacturer	Model / Type	Mount / Modification Details
100	100	2	Ericsson	AIR 6419 B41 TMO	10.75 ft. Platform Mount
		2	RFS/Celwave	APXVAALL24 43-U-NA20 TMO	
		2	Ericsson	Radio 4449 B71 B85A T-Mobile	
		2	Ericsson	Radio 4460 B2/B25 B66 TMO	

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
CCI Order	Proposed Loading Existing Loading	Date: 03/23/2022	Crown Castle
RFDS		Date: 03/07/2022	
Previous MA	B+T Group	Date: 06/04/2019	On File
Mount Mapping	Paul J. Ford & Company & RKS	Date: 04/06/2019	Crown Castle

## 3) ANALYSIS PROCEDURE

### 3.1) Analysis Method

RISA-3D (Version 19.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

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

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Mount Analysis* (Revision E). In addition, this analysis is in accordance with OTHER SOW.

### 3.2) Assumptions

1. The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design, TIA Standards, and/or manufacturer's specifications.
2. The configuration of antennas, mounts, and other appurtenances are as specified in Table-1.
3. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected members unless otherwise specified in this report.
4. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
5. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
6. Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
7. The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
8. The following material grades were assumed (Unless Noted Otherwise):
  - (a) Connection Bolts : ASTM A325
  - (b) Steel Pipe : ASTM A53 (GR. 35)
  - (c) HSS (Round) : ASTM 500 (GR. B-42)
  - (d) HSS (Rectangular) : ASTM 500 (GR. B-46)
  - (e) Channel : ASTM A36 (GR. 36)
  - (f) Steel Solid Rod : ASTM A36 (GR. 36)
  - (g) Steel Plate : ASTM A36 (GR. 36)
  - (h) Steel Angle : ASTM A36 (GR. 36)
  - (i) UNISTRUT : ASTM A570 (GR. 33)

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

#### 4) ANALYSIS RESULTS

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

Notes	Component	Centerline (ft.)	Critical Member	% Capacity	Pass / Fail
1	Main Horizontals	100	2	46.7	Pass
	Mount Pipes		60	53.7	Pass
	Inner Channels		9	33.9	Pass
	Support Angles		69	16.2	Pass
	Support Rails		61	45.8	Pass
	Connection Angles		71	40.5	Pass

<b>Structure Rating (max from all components) =</b>	<b>53.7%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.

#### 4.1) Recommendations

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

1. Add SitePro1 Support Rail Kit Part# HRK-12, 3'-0" above the Main horizontal

No modifications are required at this time provided that the above-listed changes are completed.



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



Envelope Only Solution

B+T Group

MSP

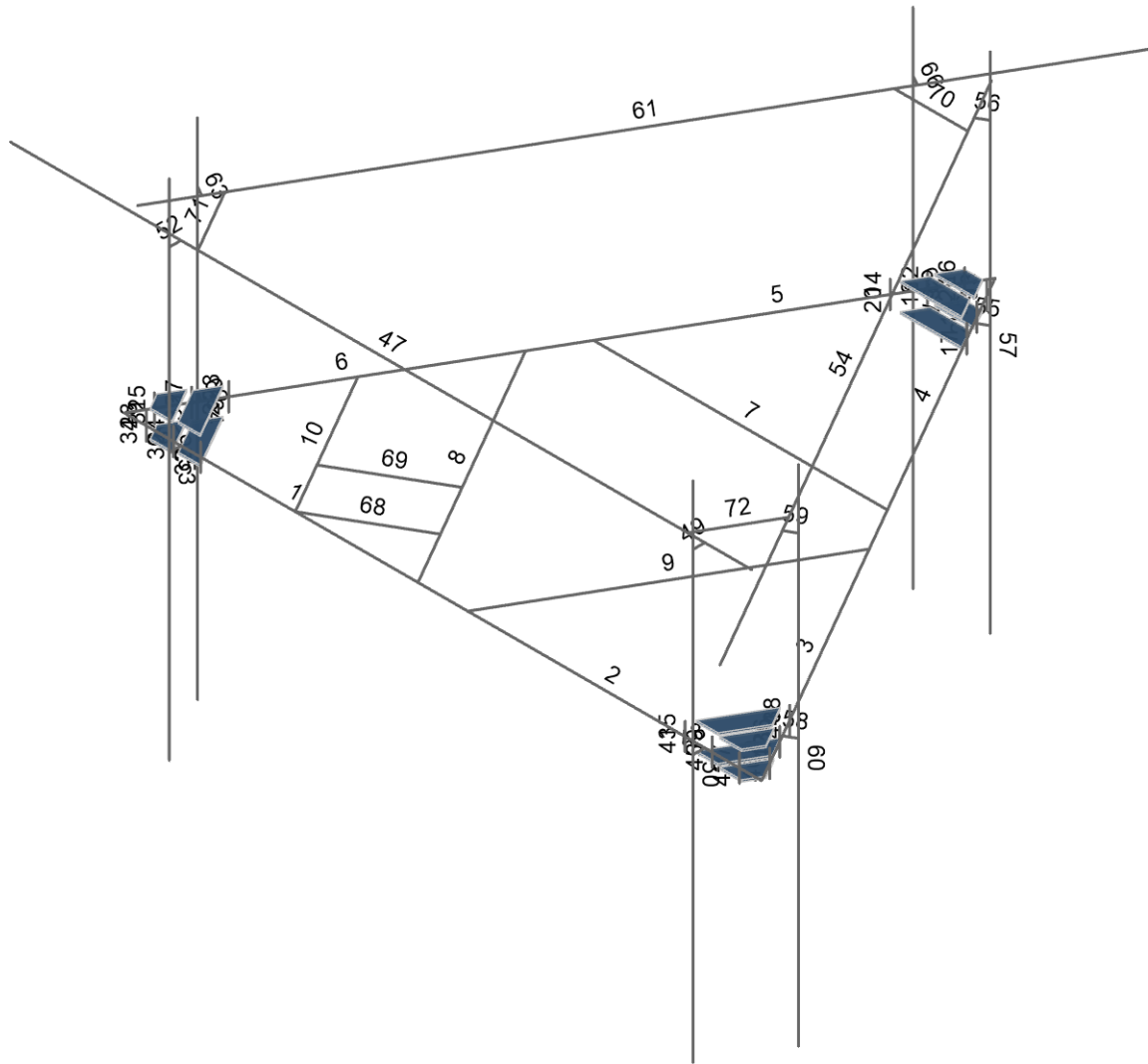
135909.002.01

841301 - Willington-River Rd

SK-1

Mar 30, 2022

135909\_002\_01\_Willington-River ...

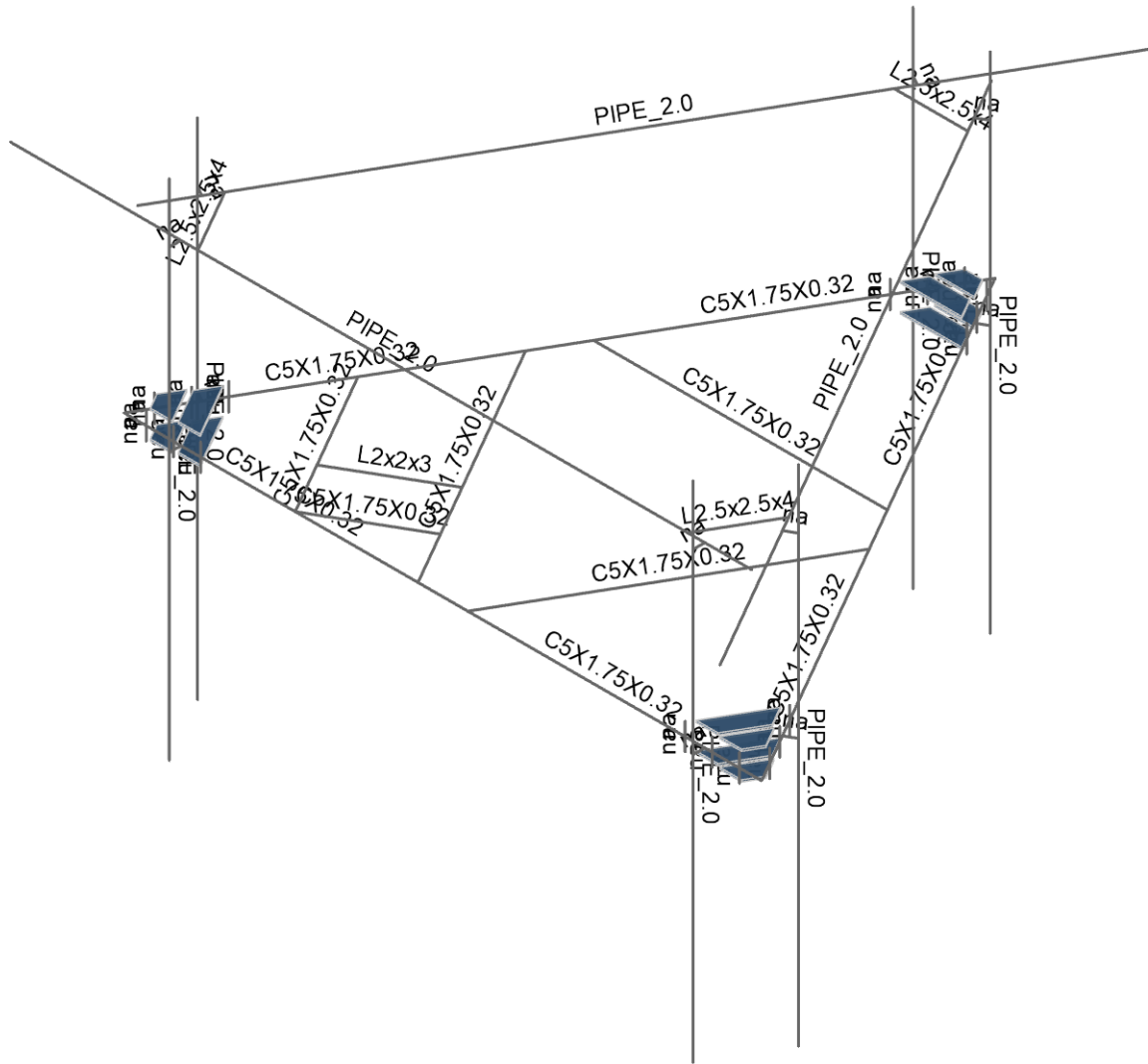


Envelope Only Solution

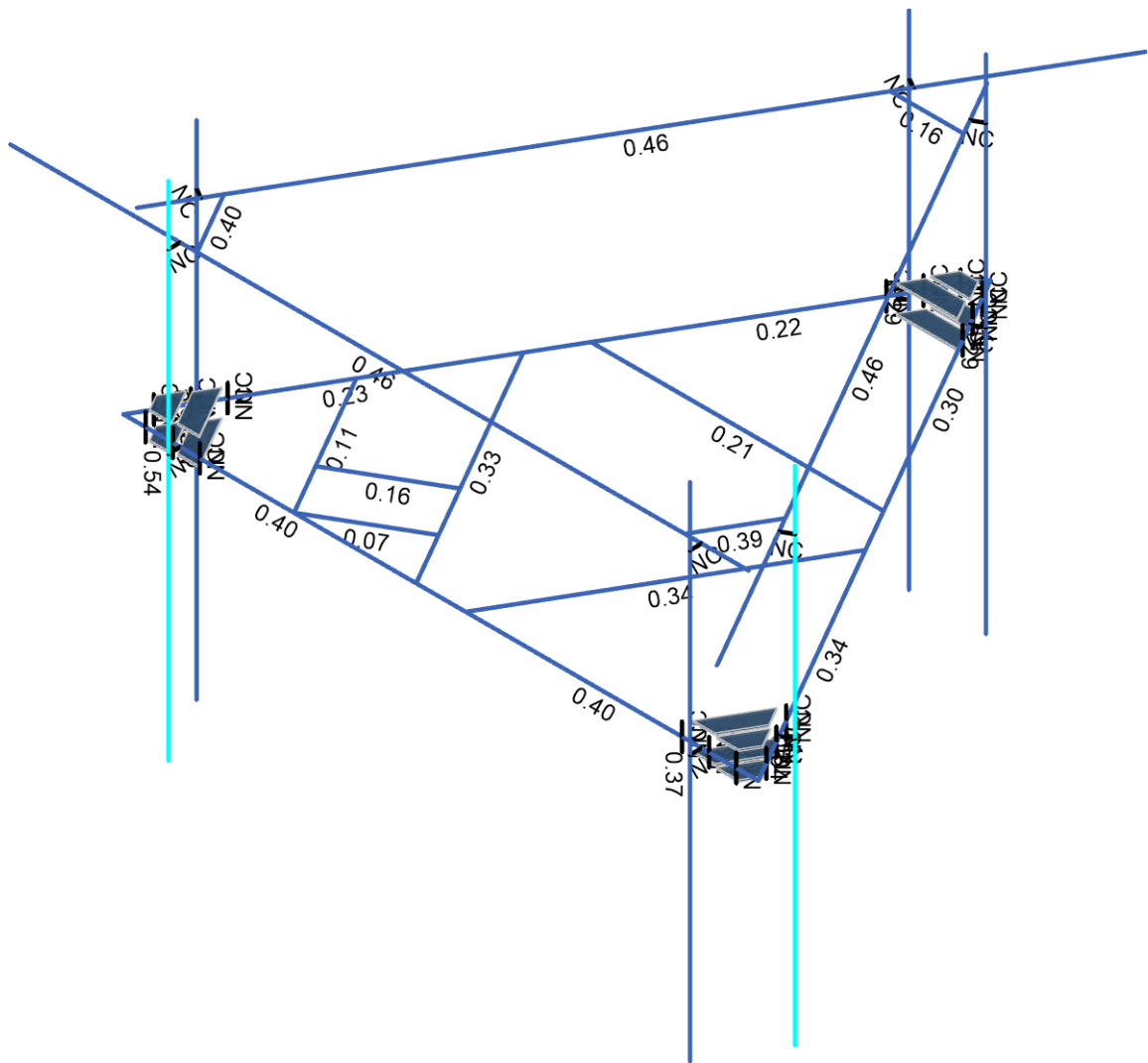
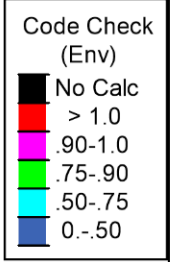
B+T Group  
MSP  
135909.002.01

841301 - Willington-River Rd

SK-2  
Mar 30, 2022  
135909\_002\_01\_Willington-River ...



Envelope Only Solution		
B+T Group	841301 - Willington-River Rd	SK-3
MSP		Mar 30, 2022
135909.002.01		135909_002_01_Willington-River ...

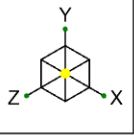


Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

B+T Group
MSP
135909.002.01

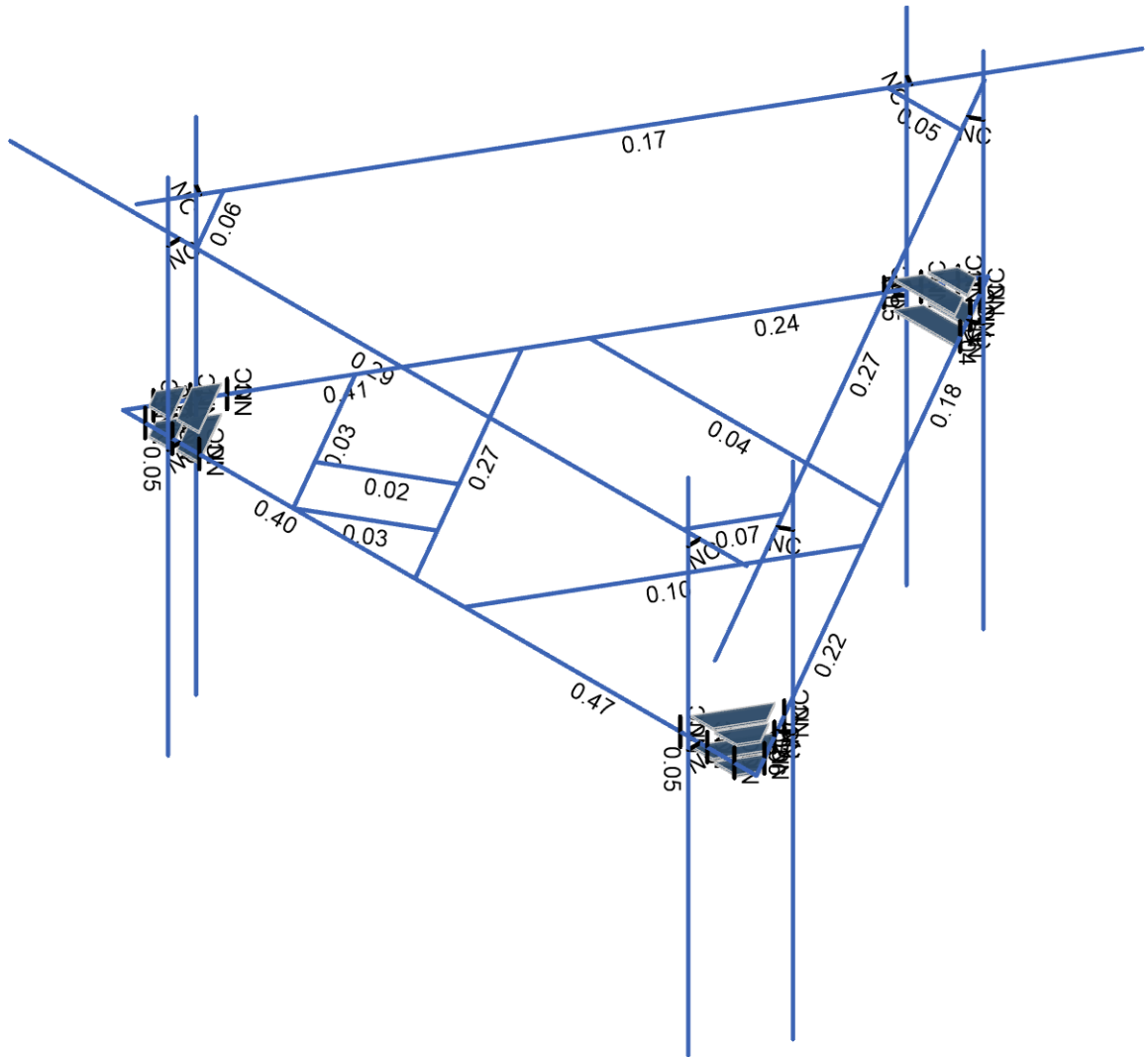
841301 - Willington-River Rd
------------------------------

SK-4
Mar 30, 2022
135909_002_01_Willington-River ...



Shear Check (Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0-.50



Member Shear Checks Displayed (Enveloped)  
Envelope Only Solution

B+T Group
MSP
135909.002.01

841301 - Willington-River Rd
------------------------------

SK-5
Mar 30, 2022
135909_002_01_Willington-River ...

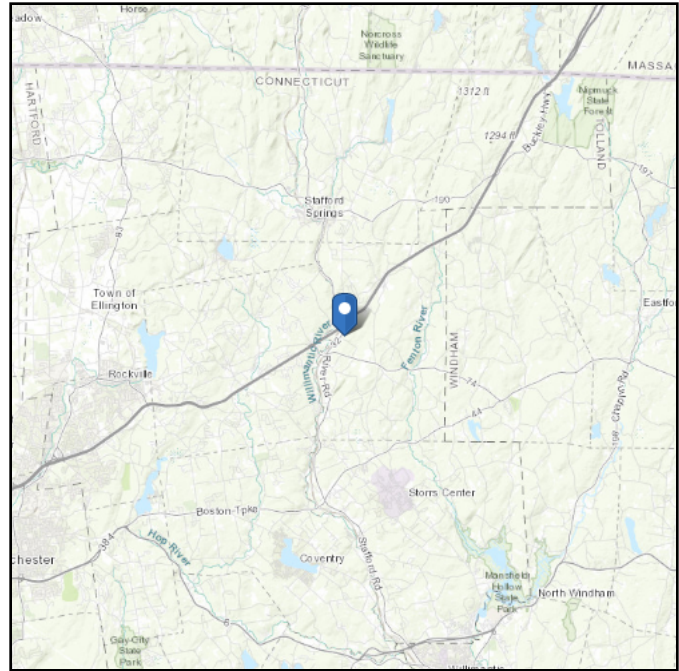
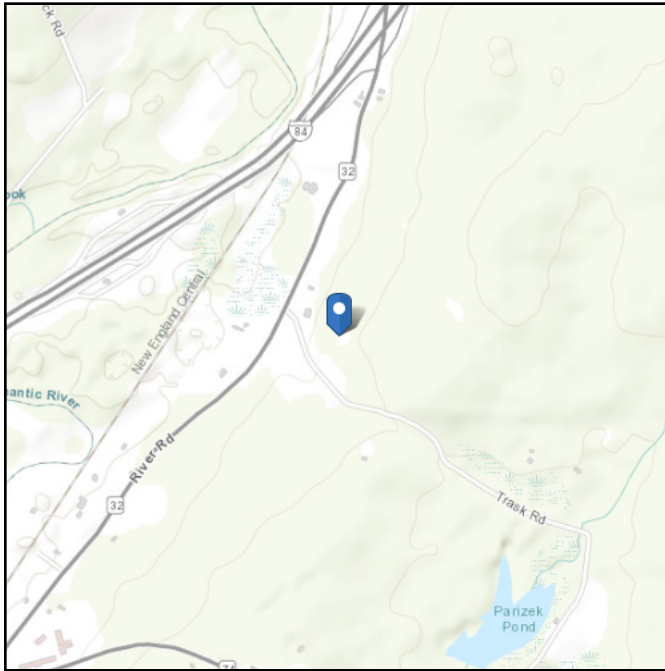
**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 515.88 ft (NAVD 88)  
**Latitude:** 41.890756  
**Longitude:** -72.289381



## Wind

### Results:

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

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
Date Accessed: Sat Mar 26 2022

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

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

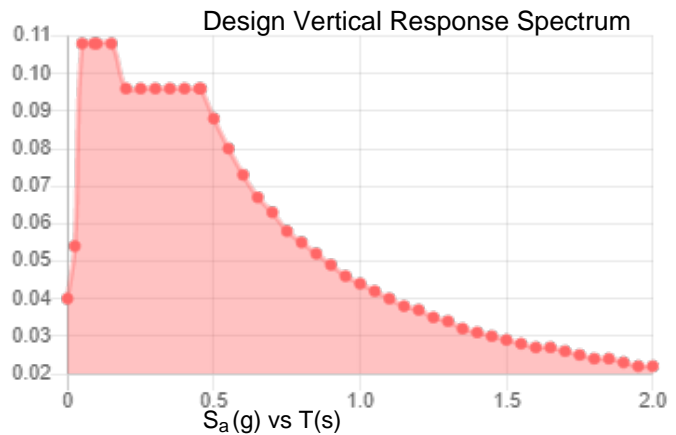
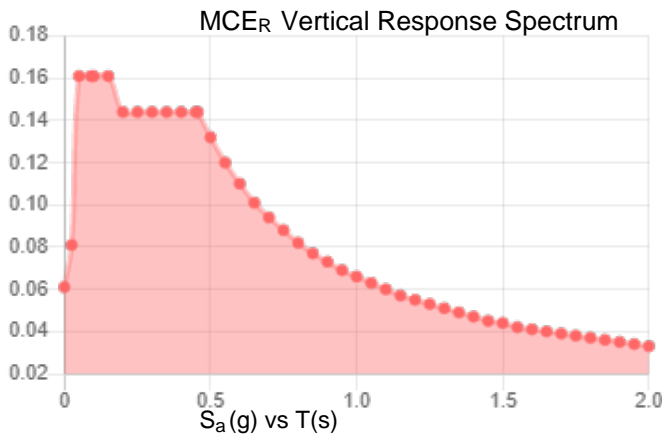
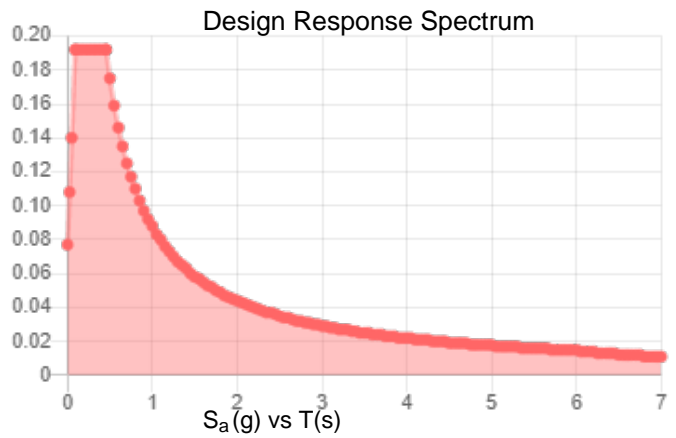
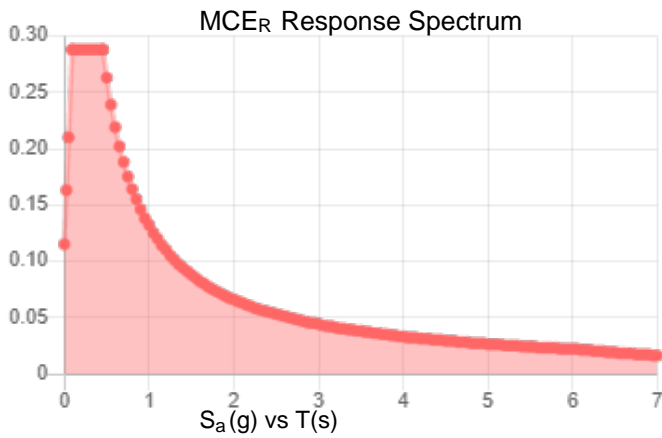


**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

$S_s$ :	0.18	$S_{D1}$ :	0.088
$S_1$ :	0.055	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.096
$F_v$ :	2.4	PGA <sub>M</sub> :	0.153
$S_{MS}$ :	0.288	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.132	$I_e$ :	1
$S_{DS}$ :	0.192	$C_v$ :	0.7

**Seismic Design Category** B



**Data Accessed:** Sat Mar 26 2022

**Date Source:**

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

## Ice

---

**Results:**

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

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

**Date Accessed:** Sat Mar 26 2022

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

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

---

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

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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

PROJECT	<b>135909.002.01 - Willington-R</b>		<b>KSC</b>
SUBJECT	<b>Platform Mount Analysis</b>		
DATE	<b>03/30/22</b>	PAGE	OF



**B+T GRP**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 (918) 587-4630

Tower Type	:	Monopole	
Ground Elevation	$Z_s$ :	516	ft [ASCE7 Hazard Tool]
Tower Height	:	110.00	ft
Mount Elevation	:	100.00	ft
Antenna Elevation	:	100.00	ft
Crest Height	:	0	ft
Risk Category	:	II	[Table 2-1 ]
Exposure Category	:	B	[Sec. 2.6.5.1.2]
Topography Category	:	1.00	[Sec. 2.6.6.2]
Wind Velocity	$V$ :	118	mph [ASCE7 Hazard Tool]
Ice wind Velocity	$V_i$ :	50	mph [ASCE7 Hazard Tool]
Service Velocity	$V_s$ :	30	mph [ASCE7 Hazard Tool]
Base Ice thickness	$t_i$ :	1.50	in [ASCE7 Hazard Tool]
Seismic Design Cat.	:	B	[ASCE7 Hazard Tool]
	$S_S$ :	0.18	
	$S_1$ :	0.06	
	$S_{DS}$ :	0.19	
	$S_{D1}$ :	0.09	
Gust Factor	$G_h$ :	1.00	[Sec. 16.6]
Pressure Coefficient	$K_z$ :	0.99	[Sec. 2.6.5.2]
Topography Factor	$K_{zt}$ :	1.00	[Sec. 2.6.6]
Elevation Factor	$K_e$ :	0.98	[Sec. 2.6.8]
Directionality Factor	$K_d$ :	0.95	[Sec. 16.6]
Shielding Factor	$K_a$ :	0.90	[Sec. 16.6]
Design Ice Thickness	$t_{iz}$ :	1.68	in [Sec. 2.6.10]
Importance Factor	$I_e$ :	1	[Table 2-3 ]
Response Coefficient	$C_s$ :	0.096	[Sec. 2.7.7.1]
Amplification	$A_s$ :	2.636364	[Sec. 16.7]
	$q_z$ :	32.85	psf

PROJECT	<b>135909.002.01 - Willington-R</b>	<b>KSC</b>
SUBJECT	<b>Platform Mount Analysis</b>	
DATE	<b>03/30/22</b>	PAGE OF



Manufacturer	Model	Qty	Aspect Ratio	C <sub>a</sub>	EPA <sub>N</sub> (ft <sup>2</sup> )	EPA <sub>T</sub> (ft <sup>2</sup> )	EPA <sub>N-Ice</sub> (ft <sup>2</sup> )	EPA <sub>T-Ice</sub> (ft <sup>2</sup> )	F <sub>A No Ice (N)</sub>	F <sub>A No Ice (T)</sub>	F <sub>A Ice (N)</sub>	F <sub>A Ice (T)</sub>
				flat/round								
RFS/CELWAVE	\PXVAALL24_43-U NA20_TMO	0.5	4.00	1.27	7.99	2.83	9.43	4.08	0.30	0.11	0.05	0.02
RFS/CELWAVE	\PXVAALL24_43-U NA20_TMO	0.5	4.00	1.27	7.99	2.83	9.43	4.08	0.30	0.11	0.05	0.02
ERICSSON	ADIO 4449 B71 B85A_T-MOBII	1	1.36	1.20	1.64	1.32	2.44	2.06	0.06	0.05	0.01	0.01
ERICSSON	RADIO 4460 B2/B25 B66_TMO	1	1.13	1.20	1.78	1.40	2.61	2.16	0.06	0.05	0.01	0.01
ERICSSON	AIR 6419 B41_TMO	0.5	1.73	1.20	2.63	1.14	3.34	1.70	0.09	0.04	0.02	0.01
ERICSSON	AIR 6419 B41_TMO	0.5	1.73	1.20	2.63	1.14	3.34	1.70	0.09	0.04	0.02	0.01
RFS/CELWAVE	\PXVAALL24_43-U NA20_TMO	0.5	4.00	1.27	7.99	2.83	9.43	4.08	0.30	0.11	0.05	0.02
RFS/CELWAVE	\PXVAALL24_43-U NA20_TMO	0.5	4.00	1.27	7.99	2.83	9.43	4.08	0.30	0.11	0.05	0.02
ERICSSON	ADIO 4449 B71 B85A_T-MOBII	1	1.36	1.20	1.64	1.32	2.44	2.06	0.06	0.05	0.01	0.01
ERICSSON	RADIO 4460 B2/B25 B66_TMO	1	1.13	1.20	1.78	1.40	2.61	2.16	0.06	0.05	0.01	0.01
ERICSSON	AIR 6419 B41_TMO	0.5	1.73	1.20	2.63	1.14	3.34	1.70	0.09	0.04	0.02	0.01
ERICSSON	AIR 6419 B41_TMO	0.5	1.73	1.20	2.63	1.14	3.34	1.70	0.09	0.04	0.02	0.01

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



**Node Coordinates**

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	1	0	0	0	
2	2	0	0	3.103258	
3	3	2.6875	0	-1.551629	
4	4	0	0	-6.206515	
5	5	-5.375	0	3.103258	
6	6	-2.6875	0	-1.551629	
7	7	-2.477795	0	-1.914849	
8	8	2.477795	0	-1.914849	
9	9	-0.41941	0	3.103258	
10	10	-2.897205	0	-1.188409	
11	11	2.897205	0	-1.188409	
12	12	0.41941	0	3.103258	
13	13	-3.931624	0	0.603258	
14	14	-0.645833	0.224167	-5.087899	
15	15	-0.1875	0.224167	-5.881756	
16	16	0.1875	0.224167	-5.881756	
17	17	0.645833	0.224167	-5.087899	
18	18	0.645833	0	-5.087899	
19	19	-0.416667	0	-5.484828	
20	20	0.1875	0	-5.881756	
21	21	-0.645833	0	-5.087899	
22	22	0.416667	0	-5.484828	
23	23	-0.1875	0	-5.881756	
24	24	-0.645833	-0.224167	-5.087899	
25	25	-0.1875	-0.224167	-5.881756	
26	26	0.1875	-0.224167	-5.881756	
27	27	0.645833	-0.224167	-5.087899	
28	28	-0.416667	0.224167	-5.484828	
29	29	0.416667	0.224167	-5.484828	
30	30	-0.416667	-0.224167	-5.484828	
31	31	0.416667	-0.224167	-5.484828	
32	32	-4.083333	0.224167	3.103258	
33	33	-5.	0.224167	3.103258	
34	34	-5.1875	0.224167	2.778498	
35	35	-4.729167	0.224167	1.984642	
36	36	-4.729167	0	1.984642	
37	37	-4.541667	0	3.103258	
38	38	-5.1875	0	2.778498	
39	39	-4.083333	0	3.103258	
40	40	-4.958333	0	2.38157	
41	41	-5.	0	3.103258	
42	42	-4.083333	-0.224167	3.103258	
43	43	-5.	-0.224167	3.103258	
44	44	-5.1875	-0.224167	2.778498	
45	45	-4.729167	-0.224167	1.984642	
46	46	-4.541667	0.224167	3.103258	
47	47	-4.958333	0.224167	2.38157	
48	48	-4.541667	-0.224167	3.103258	
49	49	-4.958333	-0.224167	2.38157	
50	50	4.729167	0.224167	1.984642	
51	51	5.1875	0.224167	2.778498	
52	52	5.	0.224167	3.103258	
53	53	4.083333	0.224167	3.103258	
54	54	4.083333	0	3.103258	
55	55	4.958333	0	2.38157	



**Node Coordinates (Continued)**

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
56	56	5.	0	3.103258	
57	57	4.729167	0	1.984642	
58	58	4.541667	0	3.103258	
59	59	5.1875	0	2.778498	
60	60	4.729167	-0.224167	1.984642	
61	61	5.1875	-0.224167	2.778498	
62	62	5.	-0.224167	3.103258	
63	63	4.083333	-0.224167	3.103258	
64	64	4.958333	0.224167	2.38157	
65	65	4.541667	0.224167	3.103258	
66	66	4.958333	-0.224167	2.38157	
67	67	4.541667	-0.224167	3.103258	
68	68	-0.5	0	2.963672	
69	69	0.5	0	2.963672	
70	70	2.816615	0	-1.048823	
71	71	2.316615	0	-1.914849	
72	72	-2.316615	0	-1.914849	
73	73	-2.816615	0	-1.048823	
74	74	-1.07735	0	1.963672	
75	75	1.07735	0	1.963672	
76	76	2.239265	0	-0.048823	
77	77	1.161915	0	-1.914849	
78	78	-1.161915	0	-1.914849	
79	79	-2.239265	0	-0.048823	
80	80	5.375	0	3.103258	
81	81	-7.291333	3	3.103258	
82	82	5.208333	3	3.103258	
83	83	4.416667	0	3.103258	
84	84	4.416667	0	3.301591	
85	85	4.416667	3	3.103258	
86	86	4.416667	3	3.301591	
87	87	4.416667	4	3.301591	
88	88	4.416667	-4.5	3.301591	
89	89	-4.416667	0	3.103258	
90	90	-4.416667	0	3.301591	
91	91	-4.416667	3	3.103258	
92	92	-4.416667	3	3.301591	
93	93	-4.416667	4	3.301591	
94	94	-4.416667	-4.5	3.301591	
95	95	0.083333	3	-6.062178	
96	96	0.479167	0	-5.376574	
97	97	0.650928	0	-5.475741	
98	98	0.479167	3	-5.376574	
99	99	0.650928	3	-5.475741	
100	100	0.650928	4	-5.475741	
101	101	0.650928	-4.5	-5.475741	
102	102	4.895833	0	2.273317	
103	103	5.067595	0	2.17415	
104	104	4.895833	3	2.273317	
105	105	5.067595	3	2.17415	
106	106	5.067595	4	2.17415	
107	107	5.067595	-4.5	2.17415	
108	108	-5.291667	3	2.95892	
109	109	-4.895833	0	2.273317	
110	110	-5.067595	0	2.17415	

**Node Coordinates (Continued)**

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
111	111	-4.895833	3	2.273317	
112	112	-5.067595	3	2.17415	
113	113	-5.067595	4	2.17415	
114	114	-5.067595	-4.5	2.17415	
115	115	-0.479167	0	-5.376574	
116	116	-0.650928	0	-5.475741	
117	117	-0.479167	3	-5.376574	
118	118	-0.650928	3	-5.475741	
119	119	-0.650928	4	-5.475741	
120	120	-0.650928	-4.5	-5.475741	
121	121	-2.488249	0	3.103258	
122	122	-0.93662	0	2.207424	
123	123	-2.988249	0	2.237232	
124	124	-1.43662	0	1.341399	
125	125	-1.658308	0	0.957424	
126	126	1.658308	0	0.957424	
127	127	0	0	-1.914849	
128	128	6.333167	3	4.762851	
129	129	0.958167	3	-7.866109	
130	130	0.622332	3	-5.128605	
131	131	-0.622332	3	-5.128605	
132	132	-4.752668	3	2.025348	
133	133	-4.130337	3	3.103258	
134	134	4.130337	3	3.103258	
135	135	4.752668	3	2.025348	

**Node Boundary Conditions**

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	125	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	126	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	127	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

**Hot Rolled Steel Properties**

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

**Hot Rolled Steel Section Sets**

	Label	Shape	Type	Design List	Material	Design Rule	Area [in <sup>2</sup> ]	Iyy [in <sup>4</sup> ]	Izz [in <sup>4</sup> ]	J [in <sup>4</sup> ]
1	MF-H1	C5X1.75X0.32	Beam	Channel	A36 Gr.36	Typical	2.515	0.615	8.352	0.079
2	MF-P1	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
3	F1-SA1	C5X1.75X0.32	Beam	Channel	A36 Gr.36	Typical	2.515	0.615	8.352	0.079
4	F1-SA2	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	0.722	0.271	0.271	0.009
5	Support Rail	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
6	F1-CA1	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	0.692	0.692	0.026





**Member Primary Data**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	5	2	180	MF-H1	Beam	Channel	A36 Gr.36	Typical
2	2	80	2		MF-H1	Beam	Channel	A36 Gr.36	Typical
3	3	80	3	180	MF-H1	Beam	Channel	A36 Gr.36	Typical
4	4	4	3		MF-H1	Beam	Channel	A36 Gr.36	Typical
5	5	4	6	180	MF-H1	Beam	Channel	A36 Gr.36	Typical
6	6	5	6		MF-H1	Beam	Channel	A36 Gr.36	Typical
7	7	7	8	180	F1-SA1	Beam	Channel	A36 Gr.36	Typical
8	8	9	10	180	F1-SA1	Beam	Channel	A36 Gr.36	Typical
9	9	11	12	180	F1-SA1	Beam	Channel	A36 Gr.36	Typical
10	10	121	13		F1-SA1	Beam	Channel	A36 Gr.36	Typical
11	11	18	17		RIGID	None	None	RIGID	Typical
12	12	19	28		RIGID	None	None	RIGID	Typical
13	13	20	16		RIGID	None	None	RIGID	Typical
14	14	21	14		RIGID	None	None	RIGID	Typical
15	15	22	29		RIGID	None	None	RIGID	Typical
16	16	23	15		RIGID	None	None	RIGID	Typical
17	17	27	18		RIGID	None	None	RIGID	Typical
18	18	30	19		RIGID	None	None	RIGID	Typical
19	19	26	20		RIGID	None	None	RIGID	Typical
20	20	24	21		RIGID	None	None	RIGID	Typical
21	21	31	22		RIGID	None	None	RIGID	Typical
22	22	25	23		RIGID	None	None	RIGID	Typical
23	23	36	35		RIGID	None	None	RIGID	Typical
24	24	37	46		RIGID	None	None	RIGID	Typical
25	25	38	34		RIGID	None	None	RIGID	Typical
26	26	39	32		RIGID	None	None	RIGID	Typical
27	27	40	47		RIGID	None	None	RIGID	Typical
28	28	41	33		RIGID	None	None	RIGID	Typical
29	29	45	36		RIGID	None	None	RIGID	Typical
30	30	48	37		RIGID	None	None	RIGID	Typical
31	31	44	38		RIGID	None	None	RIGID	Typical
32	32	42	39		RIGID	None	None	RIGID	Typical
33	33	49	40		RIGID	None	None	RIGID	Typical
34	34	43	41		RIGID	None	None	RIGID	Typical
35	35	54	53		RIGID	None	None	RIGID	Typical
36	36	55	64		RIGID	None	None	RIGID	Typical
37	37	56	52		RIGID	None	None	RIGID	Typical
38	38	57	50		RIGID	None	None	RIGID	Typical
39	39	58	65		RIGID	None	None	RIGID	Typical
40	40	59	51		RIGID	None	None	RIGID	Typical
41	41	63	54		RIGID	None	None	RIGID	Typical
42	42	66	55		RIGID	None	None	RIGID	Typical
43	43	62	56		RIGID	None	None	RIGID	Typical
44	44	60	57		RIGID	None	None	RIGID	Typical
45	45	67	58		RIGID	None	None	RIGID	Typical
46	46	61	59		RIGID	None	None	RIGID	Typical
47	47	81	82		Support Rail	Beam	Pipe	A53 Gr.B	Typical
48	48	83	84		RIGID	None	None	RIGID	Typical
49	49	85	86		RIGID	None	None	RIGID	Typical
50	50	87	88		MF-P1	Column	Pipe	A53 Gr.B	Typical
51	51	89	90		RIGID	None	None	RIGID	Typical
52	52	91	92		RIGID	None	None	RIGID	Typical
53	53	93	94		MF-P1	Column	Pipe	A53 Gr.B	Typical
54	54	128	95		Support Rail	Beam	Pipe	A53 Gr.B	Typical
55	55	96	97		RIGID	None	None	RIGID	Typical



**Member Primary Data (Continued)**

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
56	56	98	99		RIGID	None	None	RIGID	Typical
57	57	100	101		MF-P1	Column	Pipe	A53 Gr.B	Typical
58	58	102	103		RIGID	None	None	RIGID	Typical
59	59	104	105		RIGID	None	None	RIGID	Typical
60	60	106	107		MF-P1	Column	Pipe	A53 Gr.B	Typical
61	61	129	108		Support Rail	Beam	Pipe	A53 Gr.B	Typical
62	62	109	110		RIGID	None	None	RIGID	Typical
63	63	111	112		RIGID	None	None	RIGID	Typical
64	64	113	114		MF-P1	Column	Pipe	A53 Gr.B	Typical
65	65	115	116		RIGID	None	None	RIGID	Typical
66	66	117	118		RIGID	None	None	RIGID	Typical
67	67	119	120		MF-P1	Column	Pipe	A53 Gr.B	Typical
68	68	121	122		F1-SA1	Beam	Channel	A36 Gr.36	Typical
69	69	123	124	270	F1-SA2	Beam	Single Angle	A36 Gr.36	Typical
70	70	131	130	180	F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
71	71	133	132	180	F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
72	72	135	134	180	F1-CA1	Beam	Single Angle	A36 Gr.36	Typical

**Member Advanced Data**

	Label	Physical	Deflection Ratio Options	Seismic DR
1	1	Yes	N/A	None
2	2	Yes	N/A	None
3	3	Yes	N/A	None
4	4	Yes	N/A	None
5	5	Yes	N/A	None
6	6	Yes	N/A	None
7	7	Yes	N/A	None
8	8	Yes	N/A	None
9	9	Yes	N/A	None
10	10	Yes	N/A	None
11	11	Yes	** NA **	None
12	12	Yes	** NA **	None
13	13	Yes	** NA **	None
14	14	Yes	** NA **	None
15	15	Yes	** NA **	None
16	16	Yes	** NA **	None
17	17	Yes	** NA **	None
18	18	Yes	** NA **	None
19	19	Yes	** NA **	None
20	20	Yes	** NA **	None
21	21	Yes	** NA **	None
22	22	Yes	** NA **	None
23	23	Yes	** NA **	None
24	24	Yes	** NA **	None
25	25	Yes	** NA **	None
26	26	Yes	** NA **	None
27	27	Yes	** NA **	None
28	28	Yes	** NA **	None
29	29	Yes	** NA **	None
30	30	Yes	** NA **	None
31	31	Yes	** NA **	None
32	32	Yes	** NA **	None
33	33	Yes	** NA **	None
34	34	Yes	** NA **	None
35	35	Yes	** NA **	None

**Member Advanced Data (Continued)**

	Label	Physical	Deflection Ratio Options	Seismic DR
36	36	Yes	** NA **	None
37	37	Yes	** NA **	None
38	38	Yes	** NA **	None
39	39	Yes	** NA **	None
40	40	Yes	** NA **	None
41	41	Yes	** NA **	None
42	42	Yes	** NA **	None
43	43	Yes	** NA **	None
44	44	Yes	** NA **	None
45	45	Yes	** NA **	None
46	46	Yes	** NA **	None
47	47	Yes	N/A	None
48	48	Yes	** NA **	None
49	49	Yes	** NA **	None
50	50	Yes	** NA **	None
51	51	Yes	** NA **	None
52	52	Yes	** NA **	None
53	53	Yes	** NA **	None
54	54	Yes	N/A	None
55	55	Yes	** NA **	None
56	56	Yes	** NA **	None
57	57	Yes	** NA **	None
58	58	Yes	** NA **	None
59	59	Yes	** NA **	None
60	60	Yes	** NA **	None
61	61	Yes	N/A	None
62	62	Yes	** NA **	None
63	63	Yes	** NA **	None
64	64	Yes	** NA **	None
65	65	Yes	** NA **	None
66	66	Yes	** NA **	None
67	67	Yes	** NA **	None
68	68	Yes	N/A	None
69	69	Yes	N/A	None
70	70	Yes	N/A	None
71	71	Yes	N/A	None
72	72	Yes	N/A	None

**Hot Rolled Steel Design Parameters**

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
1	1	MF-H1	5.375	Lbyy	Lateral
2	2	MF-H1	5.375	Lbyy	Lateral
3	3	MF-H1	5.375	Lbyy	Lateral
4	4	MF-H1	5.375	Lbyy	Lateral
5	5	MF-H1	5.375	Lbyy	Lateral
6	6	MF-H1	5.375	Lbyy	Lateral
7	7	F1-SA1	4.956	Lbyy	Lateral
8	8	F1-SA1	4.956	Lbyy	Lateral
9	9	F1-SA1	4.956	Lbyy	Lateral
10	10	F1-SA1	2.887	Lbyy	Lateral
11	47	Support Rail	12.5	Lbyy	Lateral
12	50	MF-P1	8.5	Lbyy	Lateral
13	53	MF-P1	8.5	Lbyy	Lateral
14	54	Support Rail	12.5	Lbyy	Lateral
15	57	MF-P1	8.5	Lbyy	Lateral

**Hot Rolled Steel Design Parameters (Continued)**

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
16	60	MF-P1	8.5	Lbyy	Lateral
17	61	Support Rail	12.5	Lbyy	Lateral
18	64	MF-P1	8.5	Lbyy	Lateral
19	67	MF-P1	8.5	Lbyy	Lateral
20	68	F1-SA1	1.792	Lbyy	Lateral
21	69	F1-SA2	1.792	Lbyy	Lateral
22	70	F1-CA1	1.245	Lbyy	Lateral
23	71	F1-CA1	1.245	Lbyy	Lateral
24	72	F1-CA1	1.245	Lbyy	Lateral

**Member Point Loads (BLC 1 : Dead)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Y	-0.075	%5
2	53	Y	-0.075	%80
3	53	Y	-0.073	%20
4	53	Y	-0.109	%70
5	53	Y	0	0
6	50	Y	-0.048	%5
7	50	Y	-0.048	%35
8	50	Y	0	0
9	50	Y	0	0
10	50	Y	0	0
11	60	Y	-0.075	%5
12	60	Y	-0.075	%80
13	60	Y	-0.073	%20
14	60	Y	-0.109	%70
15	60	Y	0	0
16	57	Y	-0.048	%5
17	57	Y	-0.048	%35
18	57	Y	0	0
19	57	Y	0	0
20	57	Y	0	0

**Member Point Loads (BLC 2 : 0 Wind - No Ice)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Z	-0.299	%5
2	53	Z	-0.299	%80
3	53	Z	-0.058	%20
4	53	Z	-0.063	%70
5	53	Z	0	0
6	50	Z	-0.093	%5
7	50	Z	-0.093	%35
8	50	Z	0	0
9	50	Z	0	0
10	50	Z	0	0
11	60	Z	-0.299	%5
12	60	Z	-0.299	%80
13	60	Z	-0.058	%20
14	60	Z	-0.063	%70
15	60	Z	0	0
16	57	Z	-0.093	%5
17	57	Z	-0.093	%35
18	57	Z	0	0



**Member Point Loads (BLC 2 : 0 Wind - No Ice) (Continued)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
19	57	Z	0	0
20	57	Z	0	0

**Member Point Loads (BLC 3 : 90 Wind - No Ice)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	X	-0.106	%5
2	53	X	-0.106	%80
3	53	X	-0.047	%20
4	53	X	-0.05	%70
5	53	X	0	0
6	50	X	-0.04	%5
7	50	X	-0.04	%35
8	50	X	0	0
9	50	X	0	0
10	50	X	0	0
11	60	X	-0.106	%5
12	60	X	-0.106	%80
13	60	X	-0.047	%20
14	60	X	-0.05	%70
15	60	X	0	0
16	57	X	-0.04	%5
17	57	X	-0.04	%35
18	57	X	0	0
19	57	X	0	0
20	57	X	0	0

**Member Point Loads (BLC 4 : 0 Wind - Ice)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Z	-0.054	%5
2	53	Z	-0.054	%80
3	53	Z	-0.011	%20
4	53	Z	-0.011	%70
5	53	Z	0	0
6	50	Z	-0.017	%5
7	50	Z	-0.017	%35
8	50	Z	0	0
9	50	Z	0	0
10	50	Z	0	0
11	60	Z	-0.054	%5
12	60	Z	-0.054	%80
13	60	Z	-0.011	%20
14	60	Z	-0.011	%70
15	60	Z	0	0
16	57	Z	-0.017	%5
17	57	Z	-0.017	%35
18	57	Z	0	0
19	57	Z	0	0
20	57	Z	0	0



**Member Point Loads (BLC 5 : 90 Wind - Ice)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	X	-0.019	%5
2	53	X	-0.019	%80
3	53	X	-0.008	%20
4	53	X	-0.009	%70
5	53	X	0	0
6	50	X	-0.007	%5
7	50	X	-0.007	%35
8	50	X	0	0
9	50	X	0	0
10	50	X	0	0
11	60	X	-0.019	%5
12	60	X	-0.019	%80
13	60	X	-0.008	%20
14	60	X	-0.009	%70
15	60	X	0	0
16	57	X	-0.007	%5
17	57	X	-0.007	%35
18	57	X	0	0
19	57	X	0	0
20	57	X	0	0

**Member Point Loads (BLC 6 : 0 Wind - Service)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Z	-0.019	%5
2	53	Z	-0.019	%80
3	53	Z	-0.004	%20
4	53	Z	-0.004	%70
5	53	Z	0	0
6	50	Z	-0.006	%5
7	50	Z	-0.006	%35
8	50	Z	0	0
9	50	Z	0	0
10	50	Z	0	0
11	60	Z	-0.019	%5
12	60	Z	-0.019	%80
13	60	Z	-0.004	%20
14	60	Z	-0.004	%70
15	60	Z	0	0
16	57	Z	-0.006	%5
17	57	Z	-0.006	%35
18	57	Z	0	0
19	57	Z	0	0
20	57	Z	0	0

**Member Point Loads (BLC 7 : 90 Wind - Service)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	X	-0.007	%5
2	53	X	-0.007	%80
3	53	X	-0.003	%20
4	53	X	-0.003	%70
5	53	X	0	0
6	50	X	-0.003	%5

**Member Point Loads (BLC 7 : 90 Wind - Service) (Continued)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
7	50	X	-0.003	%35
8	50	X	0	0
9	50	X	0	0
10	50	X	0	0
11	60	X	-0.007	%5
12	60	X	-0.007	%80
13	60	X	-0.003	%20
14	60	X	-0.003	%70
15	60	X	0	0
16	57	X	-0.003	%5
17	57	X	-0.003	%35
18	57	X	0	0
19	57	X	0	0
20	57	X	0	0

**Member Point Loads (BLC 8 : Ice)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Y	-0.222	%5
2	53	Y	-0.222	%80
3	53	Y	-0.057	%20
4	53	Y	-0.061	%70
5	53	Y	0	0
6	50	Y	-0.076	%5
7	50	Y	-0.076	%35
8	50	Y	0	0
9	50	Y	0	0
10	50	Y	0	0
11	60	Y	-0.222	%5
12	60	Y	-0.222	%80
13	60	Y	-0.057	%20
14	60	Y	-0.061	%70
15	60	Y	0	0
16	57	Y	-0.076	%5
17	57	Y	-0.076	%35
18	57	Y	0	0
19	57	Y	0	0
20	57	Y	0	0

**Member Point Loads (BLC 9 : 0 Seismic)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Z	-0.038	%5
2	53	Z	-0.038	%80
3	53	Z	-0.019	%20
4	53	Z	-0.028	%70
5	53	Z	0	0
6	50	Z	-0.024	%5
7	50	Z	-0.024	%35
8	50	Z	0	0
9	50	Z	0	0
10	50	Z	0	0
11	60	Z	-0.038	%5
12	60	Z	-0.038	%80
13	60	Z	-0.019	%20



**Member Point Loads (BLC 9 : 0 Seismic) (Continued)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
14	60	Z	-0.028	%70
15	60	Z	0	0
16	57	Z	-0.024	%5
17	57	Z	-0.024	%35
18	57	Z	0	0
19	57	Z	0	0
20	57	Z	0	0

**Member Point Loads (BLC 10 : 90 Seismic)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	X	-0.038	%5
2	53	X	-0.038	%80
3	53	X	-0.019	%20
4	53	X	-0.028	%70
5	53	X	0	0
6	50	X	-0.024	%5
7	50	X	-0.024	%35
8	50	X	0	0
9	50	X	0	0
10	50	X	0	0
11	60	X	-0.038	%5
12	60	X	-0.038	%80
13	60	X	-0.019	%20
14	60	X	-0.028	%70
15	60	X	0	0
16	57	X	-0.024	%5
17	57	X	-0.024	%35
18	57	X	0	0
19	57	X	0	0
20	57	X	0	0

**Member Point Loads (BLC 15 : Maint LL 1)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	54	Y	-0.25	%5

**Member Point Loads (BLC 16 : Maint LL 2)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	3	Y	-0.25	%5

**Member Point Loads (BLC 17 : Maint LL 3)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	61	Y	-0.25	%5

**Member Point Loads (BLC 18 : Maint LL 4)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	5	Y	-0.25	%5





**Member Point Loads (BLC 19 : Maint LL 5)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	47	Y	-0.25	%95

**Member Point Loads (BLC 20 : Maint LL 6)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	2	Y	-0.25	%5

**Member Point Loads (BLC 21 : Maint LL 7)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	54	Y	-0.25	%95

**Member Point Loads (BLC 22 : Maint LL 8)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	4	Y	-0.25	%5

**Member Point Loads (BLC 23 : Maint LL 9)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	61	Y	-0.25	%95

**Member Point Loads (BLC 24 : Maint LL 10)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%5

**Member Point Loads (BLC 25 : Maint LL 11)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	8	Y	-0.25	%50

**Member Point Loads (BLC 26 : Maint LL 12)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	9	Y	-0.25	%50

**Member Point Loads (BLC 27 : Maint LL 13)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	7	Y	-0.25	%50

**Member Point Loads (BLC 28 : Maint LL 14)**

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	47	Y	-0.25	%5



**Member Point Loads (BLC 29 : Maint LL 15)**

Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25 %5

**Member Distributed Loads (BLC 2 : 0 Wind - No Ice)**

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.019	-0.019	0 %100
2	2	Z	-0.019	-0.019	0 %100
3	3	Z	-0.019	-0.019	0 %100
4	4	Z	-0.019	-0.019	0 %100
5	5	Z	-0.019	-0.019	0 %100
6	6	Z	-0.019	-0.019	0 %100
7	7	Z	-0.019	-0.019	0 %100
8	8	Z	-0.019	-0.019	0 %100
9	9	Z	-0.019	-0.019	0 %100
10	10	Z	-0.017	-0.017	0 %100
11	47	Z	-0.007	-0.007	0 %100
12	50	Z	-0.007	-0.007	0 %100
13	53	Z	-0.007	-0.007	0 %100
14	54	Z	-0.007	-0.007	0 %100
15	57	Z	-0.007	-0.007	0 %100
16	60	Z	-0.007	-0.007	0 %100
17	61	Z	-0.007	-0.007	0 %100
18	64	Z	-0.007	-0.007	0 %100
19	67	Z	-0.007	-0.007	0 %100
20	68	Z	-0.016	-0.016	0 %100
21	69	Z	-0.007	-0.007	0 %100
22	70	Z	-0.008	-0.008	0 %100
23	71	Z	-0.008	-0.008	0 %100
24	72	Z	-0.008	-0.008	0 %100

**Member Distributed Loads (BLC 3 : 90 Wind - No Ice)**

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.019	-0.019	0 %100
2	2	X	-0.019	-0.019	0 %100
3	3	X	-0.019	-0.019	0 %100
4	4	X	-0.019	-0.019	0 %100
5	5	X	-0.019	-0.019	0 %100
6	6	X	-0.019	-0.019	0 %100
7	7	X	-0.019	-0.019	0 %100
8	8	X	-0.019	-0.019	0 %100
9	9	X	-0.019	-0.019	0 %100
10	10	X	-0.017	-0.017	0 %100
11	47	X	-0.007	-0.007	0 %100
12	50	X	-0.007	-0.007	0 %100
13	53	X	-0.007	-0.007	0 %100
14	54	X	-0.007	-0.007	0 %100
15	57	X	-0.007	-0.007	0 %100
16	60	X	-0.007	-0.007	0 %100
17	61	X	-0.007	-0.007	0 %100
18	64	X	-0.007	-0.007	0 %100
19	67	X	-0.007	-0.007	0 %100
20	68	X	-0.016	-0.016	0 %100
21	69	X	-0.007	-0.007	0 %100



**Member Distributed Loads (BLC 3 : 90 Wind - No Ice) (Continued)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
22	70	X	-0.008	-0.008	0	%100
23	71	X	-0.008	-0.008	0	%100
24	72	X	-0.008	-0.008	0	%100

**Member Distributed Loads (BLC 4 : 0 Wind - Ice)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.006	-0.006	0	%100
2	2	Z	-0.006	-0.006	0	%100
3	3	Z	-0.006	-0.006	0	%100
4	4	Z	-0.006	-0.006	0	%100
5	5	Z	-0.006	-0.006	0	%100
6	6	Z	-0.006	-0.006	0	%100
7	7	Z	-0.006	-0.006	0	%100
8	8	Z	-0.006	-0.006	0	%100
9	9	Z	-0.006	-0.006	0	%100
10	10	Z	-0.006	-0.006	0	%100
11	47	Z	-0.002	-0.002	0	%100
12	50	Z	-0.002	-0.002	0	%100
13	53	Z	-0.002	-0.002	0	%100
14	54	Z	-0.002	-0.002	0	%100
15	57	Z	-0.002	-0.002	0	%100
16	60	Z	-0.002	-0.002	0	%100
17	61	Z	-0.002	-0.002	0	%100
18	64	Z	-0.002	-0.002	0	%100
19	67	Z	-0.002	-0.002	0	%100
20	68	Z	-0.005	-0.005	0	%100
21	69	Z	-0.004	-0.004	0	%100
22	70	Z	-0.004	-0.004	0	%100
23	71	Z	-0.004	-0.004	0	%100
24	72	Z	-0.004	-0.004	0	%100

**Member Distributed Loads (BLC 5 : 90 Wind - Ice)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.006	-0.006	0	%100
2	2	X	-0.006	-0.006	0	%100
3	3	X	-0.006	-0.006	0	%100
4	4	X	-0.006	-0.006	0	%100
5	5	X	-0.006	-0.006	0	%100
6	6	X	-0.006	-0.006	0	%100
7	7	X	-0.006	-0.006	0	%100
8	8	X	-0.006	-0.006	0	%100
9	9	X	-0.006	-0.006	0	%100
10	10	X	-0.006	-0.006	0	%100
11	47	X	-0.002	-0.002	0	%100
12	50	X	-0.002	-0.002	0	%100
13	53	X	-0.002	-0.002	0	%100
14	54	X	-0.002	-0.002	0	%100
15	57	X	-0.002	-0.002	0	%100
16	60	X	-0.002	-0.002	0	%100
17	61	X	-0.002	-0.002	0	%100
18	64	X	-0.002	-0.002	0	%100
19	67	X	-0.002	-0.002	0	%100
20	68	X	-0.005	-0.005	0	%100



**Member Distributed Loads (BLC 5 : 90 Wind - Ice) (Continued)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
21	69	X	-0.004	-0.004	0	%100
22	70	X	-0.004	-0.004	0	%100
23	71	X	-0.004	-0.004	0	%100
24	72	X	-0.004	-0.004	0	%100

**Member Distributed Loads (BLC 6 : 0 Wind - Service)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.001	-0.001	0	%100
2	2	Z	-0.001	-0.001	0	%100
3	3	Z	-0.001	-0.001	0	%100
4	4	Z	-0.001	-0.001	0	%100
5	5	Z	-0.001	-0.001	0	%100
6	6	Z	-0.001	-0.001	0	%100
7	7	Z	-0.001	-0.001	0	%100
8	8	Z	-0.001	-0.001	0	%100
9	9	Z	-0.001	-0.001	0	%100
10	10	Z	-0.001	-0.001	0	%100
11	47	Z	-0.0002	-0.0002	0	%100
12	50	Z	-0.0002	-0.0002	0	%100
13	53	Z	-0.0002	-0.0002	0	%100
14	54	Z	-0.0002	-0.0002	0	%100
15	57	Z	-0.0002	-0.0002	0	%100
16	60	Z	-0.0002	-0.0002	0	%100
17	61	Z	-0.0002	-0.0002	0	%100
18	64	Z	-0.0002	-0.0002	0	%100
19	67	Z	-0.0002	-0.0002	0	%100
20	68	Z	-0.001	-0.001	0	%100
21	69	Z	-0.0005	-0.0005	0	%100
22	70	Z	-0.0005	-0.0005	0	%100
23	71	Z	-0.0005	-0.0005	0	%100
24	72	Z	-0.0005	-0.0005	0	%100

**Member Distributed Loads (BLC 7 : 90 Wind - Service)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.001	-0.001	0	%100
2	2	X	-0.001	-0.001	0	%100
3	3	X	-0.001	-0.001	0	%100
4	4	X	-0.001	-0.001	0	%100
5	5	X	-0.001	-0.001	0	%100
6	6	X	-0.001	-0.001	0	%100
7	7	X	-0.001	-0.001	0	%100
8	8	X	-0.001	-0.001	0	%100
9	9	X	-0.001	-0.001	0	%100
10	10	X	-0.001	-0.001	0	%100
11	47	X	-0.0002	-0.0002	0	%100
12	50	X	-0.0002	-0.0002	0	%100
13	53	X	-0.0002	-0.0002	0	%100
14	54	X	-0.0002	-0.0002	0	%100
15	57	X	-0.0002	-0.0002	0	%100
16	60	X	-0.0002	-0.0002	0	%100
17	61	X	-0.0002	-0.0002	0	%100
18	64	X	-0.0002	-0.0002	0	%100
19	67	X	-0.0002	-0.0002	0	%100

**Member Distributed Loads (BLC 7 : 90 Wind - Service) (Continued)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
20	68	X	-0.001	-0.001	0	%100
21	69	X	-0.0005	-0.0005	0	%100
22	70	X	-0.0005	-0.0005	0	%100
23	71	X	-0.0005	-0.0005	0	%100
24	72	X	-0.0005	-0.0005	0	%100

**Member Distributed Loads (BLC 8 : Ice)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.014	-0.014	0	%100
2	2	Y	-0.014	-0.014	0	%100
3	3	Y	-0.014	-0.014	0	%100
4	4	Y	-0.014	-0.014	0	%100
5	5	Y	-0.014	-0.014	0	%100
6	6	Y	-0.014	-0.014	0	%100
7	7	Y	-0.014	-0.014	0	%100
8	8	Y	-0.014	-0.014	0	%100
9	9	Y	-0.014	-0.014	0	%100
10	10	Y	-0.014	-0.014	0	%100
11	47	Y	-0.008	-0.008	0	%100
12	50	Y	-0.008	-0.008	0	%100
13	53	Y	-0.008	-0.008	0	%100
14	54	Y	-0.008	-0.008	0	%100
15	57	Y	-0.008	-0.008	0	%100
16	60	Y	-0.008	-0.008	0	%100
17	61	Y	-0.008	-0.008	0	%100
18	64	Y	-0.008	-0.008	0	%100
19	67	Y	-0.008	-0.008	0	%100
20	68	Y	-0.014	-0.014	0	%100
21	69	Y	-0.009	-0.009	0	%100
22	70	Y	-0.011	-0.011	0	%100
23	71	Y	-0.011	-0.011	0	%100
24	72	Y	-0.011	-0.011	0	%100

**Member Distributed Loads (BLC 9 : 0 Seismic)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.002	-0.002	0	%100
2	2	Z	-0.002	-0.002	0	%100
3	3	Z	-0.002	-0.002	0	%100
4	4	Z	-0.002	-0.002	0	%100
5	5	Z	-0.002	-0.002	0	%100
6	6	Z	-0.002	-0.002	0	%100
7	7	Z	-0.002	-0.002	0	%100
8	8	Z	-0.002	-0.002	0	%100
9	9	Z	-0.002	-0.002	0	%100
10	10	Z	-0.002	-0.002	0	%100
11	47	Z	-0.0009	-0.0009	0	%100
12	50	Z	-0.0009	-0.0009	0	%100
13	53	Z	-0.0009	-0.0009	0	%100
14	54	Z	-0.0009	-0.0009	0	%100
15	57	Z	-0.0009	-0.0009	0	%100
16	60	Z	-0.0009	-0.0009	0	%100
17	61	Z	-0.0009	-0.0009	0	%100
18	64	Z	-0.0009	-0.0009	0	%100



**Member Distributed Loads (BLC 9 : 0 Seismic) (Continued)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
19	67	Z	-0.0009	-0.0009	0	%100
20	68	Z	-0.002	-0.002	0	%100
21	69	Z	-0.0006	-0.0006	0	%100
22	70	Z	-0.001	-0.001	0	%100
23	71	Z	-0.001	-0.001	0	%100
24	72	Z	-0.001	-0.001	0	%100

**Member Distributed Loads (BLC 10 : 90 Seismic)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.002	-0.002	0	%100
2	2	X	-0.002	-0.002	0	%100
3	3	X	-0.002	-0.002	0	%100
4	4	X	-0.002	-0.002	0	%100
5	5	X	-0.002	-0.002	0	%100
6	6	X	-0.002	-0.002	0	%100
7	7	X	-0.002	-0.002	0	%100
8	8	X	-0.002	-0.002	0	%100
9	9	X	-0.002	-0.002	0	%100
10	10	X	-0.002	-0.002	0	%100
11	47	X	-0.0009	-0.0009	0	%100
12	50	X	-0.0009	-0.0009	0	%100
13	53	X	-0.0009	-0.0009	0	%100
14	54	X	-0.0009	-0.0009	0	%100
15	57	X	-0.0009	-0.0009	0	%100
16	60	X	-0.0009	-0.0009	0	%100
17	61	X	-0.0009	-0.0009	0	%100
18	64	X	-0.0009	-0.0009	0	%100
19	67	X	-0.0009	-0.0009	0	%100
20	68	X	-0.002	-0.002	0	%100
21	69	X	-0.0006	-0.0006	0	%100
22	70	X	-0.001	-0.001	0	%100
23	71	X	-0.001	-0.001	0	%100
24	72	X	-0.001	-0.001	0	%100

**Member Distributed Loads (BLC 30 : BLC 1 Transient Area Loads)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.002	-0.002	3.115	3.541
2	1	Y	-0.002	-0.003	3.541	3.966
3	1	Y	-0.003	-0.004	3.966	4.392
4	8	Y	-0.004	-0.004	0.118	1.037
5	68	Y	-0.003	-0.003	0.597	1.402
6	6	Y	-0.006	-0.006	3.247	4.755
7	8	Y	-0.007	-0.007	2.842	4.195
8	10	Y	-0.008	-0.008	1.804	2.804
9	69	Y	-0.008	-0.008	0.005	1.792
10	1	Y	-0.007021	-0.008	0.538	3.225
11	6	Y	-0.006	-0.006	1.128	2.697
12	10	Y	-0.006	-0.006	0.735	1.95
13	5	Y	-0.005	-0.005	4.768	5.375
14	7	Y	-0.003	-0.005	0	1.487
15	8	Y	-0.006	-0.005	3.469	4.956
16	2	Y	-0.004	-0.004	4.742	5.375
17	8	Y	-0.007	-0.004	0	1.487



Company : B+T Group  
 Designer : MSP  
 Job Number : 135909.002.01  
 Model Name : 841301 - Willington-River Rd

3/30/2022  
 6:37:01 PM  
 Checked By : \_\_\_\_\_

**Member Distributed Loads (BLC 30 : BLC 1 Transient Area Loads) (Continued)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
18	9	Y	-0.003	-0.004	3.469	4.956
19	2	Y	-0.003	-0.008	0.537	1.612
20	2	Y	-0.008	-0.012	1.612	2.688
21	2	Y	-0.012	-0.014	2.688	3.763
22	3	Y	-0.005	-0.008	0.537	2.15
23	3	Y	-0.008	-0.01	2.15	3.762
24	9	Y	-0.012	-0.009	0	2.478
25	9	Y	-0.009	-0.006	2.478	4.956
26	4	Y	-0.005	-0.005	4.768	5.375
27	7	Y	-0.003	-0.005	3.469	4.956
28	9	Y	-0.006	-0.005	0	1.487
29	4	Y	-0.005	-0.008	0.537	2.15
30	4	Y	-0.008	-0.01	2.15	3.762
31	5	Y	-0.003	-0.008	0.537	1.612
32	5	Y	-0.008	-0.012	1.612	2.687
33	5	Y	-0.012	-0.014	2.687	3.762
34	7	Y	-0.006	-0.009	0	2.478
35	7	Y	-0.009	-0.012	2.478	4.956

**Member Distributed Loads (BLC 31 : BLC 8 Transient Area Loads)**

Member	Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	9	Y	-0.002	-0.004	3.469	4.956
2	2	Y	-0.002	-0.006	0.537	1.612
3	2	Y	-0.006	-0.009	1.612	2.688
4	2	Y	-0.009	-0.011	2.688	3.763
5	3	Y	-0.004	-0.006	0.537	2.15
6	3	Y	-0.006	-0.008	2.15	3.762
7	9	Y	-0.01	-0.007	0	2.478
8	9	Y	-0.007	-0.005	2.478	4.956
9	4	Y	-0.004	-0.004	4.768	5.375
10	7	Y	-0.002	-0.004	3.469	4.956
11	9	Y	-0.005	-0.004	0	1.487
12	4	Y	-0.004	-0.006	0.537	2.15
13	4	Y	-0.006	-0.008	2.15	3.762
14	5	Y	-0.002	-0.006	0.537	1.612
15	5	Y	-0.006	-0.009	1.612	2.687
16	5	Y	-0.009	-0.011	2.687	3.762
17	7	Y	-0.005	-0.007	0	2.478
18	7	Y	-0.007	-0.01	2.478	4.956
19	1	Y	-0.002	-0.002	3.118	3.548
20	1	Y	-0.002	-0.002	3.548	3.978
21	1	Y	-0.002	-0.003	3.978	4.408
22	8	Y	-0.003	-0.003	0.114	1.037
23	68	Y	-0.002	-0.002	0.605	1.411
24	6	Y	-0.005	-0.005	3.247	4.755
25	8	Y	-0.006	-0.006	2.842	4.195
26	10	Y	-0.007	-0.007	1.804	2.804
27	69	Y	-0.007	-0.007	0.005	1.792
28	1	Y	-0.0005622	-0.007	0.538	3.225
29	6	Y	-0.005	-0.005	1.128	2.697
30	10	Y	-0.005	-0.005	0.735	1.95
31	5	Y	-0.004	-0.004	4.768	5.375
32	7	Y	-0.002	-0.004	0	1.487
33	8	Y	-0.005	-0.004	3.469	4.956
34	2	Y	-0.004	-0.004	4.742	5.375

**Member Distributed Loads (BLC 31 : BLC 8 Transient Area Loads) (Continued)**

Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
35	8	Y	-0.006	-0.004	0 1.487

**Member Area Loads (BLC 1 : Dead)**

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	121	122	9	121	Y	Two Way	-0.01
2	123	13	10	124	Y	Two Way	-0.01
3	36	39	121	13	Y	Two Way	-0.01
4	73	79	78	72	Y	Two Way	-0.01
5	9	74	75	69	Y	Two Way	-0.01
6	12	11	57	54	Y	Two Way	-0.01
7	76	77	71	70	Y	Two Way	-0.01
8	7	8	18	21	Y	Two Way	-0.01

**Member Area Loads (BLC 8 : Ice)**

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	121	122	9		Y	Two Way	-0.008
2	123	13	10	124	Y	Two Way	-0.008
3	36	39	121	13	Y	Two Way	-0.008
4	73	79	78	72	Y	Two Way	-0.008
5	9	74	75	69	Y	Two Way	-0.008
6	12	11	57	54	Y	Two Way	-0.008
7	76	77	71	70	Y	Two Way	-0.008
8	7	8	18	21	Y	Two Way	-0.008

**Node Loads and Enforced Displacements (BLC 11 : Live Load a)**

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s <sup>2</sup> /ft, k*s <sup>2</sup> *ft)]
1	89	L	Y	-0.5
2	115	L	Y	-0.5
3	102	L	Y	-0.5

**Node Loads and Enforced Displacements (BLC 12 : Live Load b)**

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s <sup>2</sup> /ft, k*s <sup>2</sup> *ft)]
1	83	L	Y	-0.5
2	109	L	Y	-0.5
3	96	L	Y	-0.5

**Basic Load Cases**

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
1	Dead	DL	-1		20		8
2	0 Wind - No Ice	WLZ			20	24	
3	90 Wind - No Ice	WLX			20	24	
4	0 Wind - Ice	WLZ			20	24	
5	90 Wind - Ice	WLX			20	24	
6	0 Wind - Service	WLZ			20	24	
7	90 Wind - Service	WLX			20	24	
8	Ice	OL1			20	24	8
9	0 Seismic	ELZ			20	24	
10	90 Seismic	ELX			20	24	
11	Live Load a	LL		3			





**Basic Load Cases (Continued)**

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
12	Live Load b	LL		3			
13	Live Load c	LL					
14	Live Load d	LL					
15	Maint LL 1	LL			1		
16	Maint LL 2	LL			1		
17	Maint LL 3	LL			1		
18	Maint LL 4	LL			1		
19	Maint LL 5	LL			1		
20	Maint LL 6	LL			1		
21	Maint LL 7	LL			1		
22	Maint LL 8	LL			1		
23	Maint LL 9	LL			1		
24	Maint LL 10	LL			1		
25	Maint LL 11	LL			1		
26	Maint LL 12	LL			1		
27	Maint LL 13	LL			1		
28	Maint LL 14	LL			1		
29	Maint LL 15	LL			1		
30	BLC 1 Transient Area Loads	None				35	
31	BLC 8 Transient Area Loads	None				35	

**Load Combinations**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4 Dead	Yes	Y	1	1.4						
2	1.2 D + 1.0 - 0 W	Yes	Y	1	1.2	2	1				
3	1.2 D + 1.0 - 30 W	Yes	Y	1	1.2	2	0.866	3	0.5		
4	1.2 D + 1.0 - 60 W	Yes	Y	1	1.2	3	0.866	2	0.5		
5	1.2 D + 1.0 - 90 W	Yes	Y	1	1.2	3	1				
6	1.2 D + 1.0 - 120 W	Yes	Y	1	1.2	3	0.866	2	-0.5		
7	1.2 D + 1.0 - 150 W	Yes	Y	1	1.2	2	-0.866	3	0.5		
8	1.2 D + 1.0 - 180 W	Yes	Y	1	1.2	2	-1				
9	1.2 D + 1.0 - 210 W	Yes	Y	1	1.2	2	-0.866	3	-0.5		
10	1.2 D + 1.0 - 240 W	Yes	Y	1	1.2	3	-0.866	2	-0.5		
11	1.2 D + 1.0 - 270 W	Yes	Y	1	1.2	3	-1				
12	1.2 D + 1.0 - 300 W	Yes	Y	1	1.2	3	-0.866	2	0.5		
13	1.2 D + 1.0 - 330 W	Yes	Y	1	1.2	2	0.866	3	-0.5		
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
26	1.2 D + 1.0 E - 0	Yes	Y	1	1.2	9	1				
27	1.2 D + 1.0 E - 30	Yes	Y	1	1.2	9	0.866	10	0.5		
28	1.2 D + 1.0 E - 60	Yes	Y	1	1.2	10	0.866	9	0.5		
29	1.2 D + 1.0 E - 90	Yes	Y	1	1.2	10	1				
30	1.2 D + 1.0 E - 120	Yes	Y	1	1.2	10	0.866	9	-0.5		
31	1.2 D + 1.0 E - 150	Yes	Y	1	1.2	9	-0.866	10	0.5		
32	1.2 D + 1.0 E - 180	Yes	Y	1	1.2	9	-1				



**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
33	1.2 D + 1.0 E - 210	Yes	Y	1	1.2	9	-0.866	10	-0.5		
34	1.2 D + 1.0 E - 240	Yes	Y	1	1.2	10	-0.866	9	-0.5		
35	1.2 D + 1.0 E - 270	Yes	Y	1	1.2	10	-1				
36	1.2 D + 1.0 E - 300	Yes	Y	1	1.2	10	-0.866	9	0.5		
37	1.2 D + 1.0 E - 330	Yes	Y	1	1.2	9	0.866	10	-0.5		
38	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5
39	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5
40	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
41	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
42	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
43	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
44	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
45	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
46	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
47	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5
48	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
49	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
50	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
51	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
52	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
53	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
54	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
55	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
56	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
57	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
58	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
59	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
60	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
61	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
62	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			13	1.5
63	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	13	1.5
64	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	13	1.5
65	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			13	1.5
66	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	13	1.5
67	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	13	1.5
68	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			13	1.5
69	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	13	1.5
70	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	13	1.5
71	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			13	1.5
72	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	13	1.5
73	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	13	1.5
74	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			14	1.5
75	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	14	1.5
76	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	14	1.5
77	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			14	1.5
78	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	14	1.5
79	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	14	1.5
80	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			14	1.5
81	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	14	1.5
82	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	14	1.5
83	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			14	1.5
84	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	14	1.5
85	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	14	1.5
86	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					15	1.5
87	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					16	1.5

**Load Combinations (Continued)**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
88	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					17	1.5
89	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					18	1.5
90	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					19	1.5
91	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					20	1.5
92	1.2 D + 1.5 LL Maint (7)	Yes	Y	1	1.2					21	1.5
93	1.2 D + 1.5 LL Maint (8)	Yes	Y	1	1.2					22	1.5
94	1.2 D + 1.5 LL Maint (9)	Yes	Y	1	1.2					23	1.5
95	1.2 D + 1.5 LL Maint (10)	Yes	Y	1	1.2					24	1.5
96	1.2 D + 1.5 LL Maint (11)	Yes	Y	1	1.2					25	1.5
97	1.2 D + 1.5 LL Maint (12)	Yes	Y	1	1.2					26	1.5
98	1.2 D + 1.5 LL Maint (13)	Yes	Y	1	1.2					27	1.5
99	1.2 D + 1.5 LL Maint (14)	Yes	Y	1	1.2					28	1.5
100	1.2 D + 1.5 LL Maint (15)	Yes	Y	1	1.2					29	1.5

**Envelope Node Reactions**

Node Label	X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC		
1	125	max	0.876	5	2.214	19	1.617	3	0.043	3	0.158	5	0.623	21
2		min	-0.887	11	0.625	13	-1.616	9	-1.3	21	-0.14	11	-0.067	3
3	126	max	0.836	6	2.751	22	1.582	13	0.331	13	0.147	7	0.208	13
4		min	-0.828	12	0.889	99	-1.586	7	-0.726	7	-0.156	13	-0.402	7
5	127	max	0.971	4	1.128	38	0.414	2	0.011	88	0.094	10	0.782	86
6		min	-0.968	10	-0.048	8	-0.411	8	-0.017	20	-0.099	4	-0.304	99
7	Totals:	max	2.422	5	5.598	14	3.456	2						
8		min	-2.421	11	2.42	8	-3.456	8						

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

Member	Shape	Code Check	Loc[ft]	LC	Shear	Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	1	C5X1.75X0.32	0.397	4.983	22	0.402	0.952	z	2	33.292	81.492	2.09	11.182	2.113	H1-1b
2	2	C5X1.75X0.32	0.4	4.983	18	0.467	0.952	z	8	33.292	81.492	2.09	11.182	2.037	H1-1b
3	3	C5X1.75X0.32	0.344	4.983	2	0.219	0.952	z	99	33.292	81.492	2.09	11.182	2.069	H1-1b
4	4	C5X1.75X0.32	0.302	4.983	3	0.176	0.952	z	11	33.292	81.492	2.09	11.182	1.47	H1-1b
5	5	C5X1.75X0.32	0.216	4.983	2	0.236	0.952	z	10	33.292	81.492	2.09	11.182	1.688	H1-1b
6	6	C5X1.75X0.32	0.232	4.983	2	0.406	0.952	z	9	33.292	81.492	2.09	11.182	2.176	H1-1b
7	7	C5X1.75X0.32	0.211	2.478	2	0.036	2.478	y	22	38.075	81.492	2.09	11.182	1.355	H1-1b
8	8	C5X1.75X0.32	0.329	2.478	19	0.272	2.478	y	19	38.075	81.492	2.09	11.182	1.423	H1-1b
9	9	C5X1.75X0.32	0.339	2.478	21	0.098	2.478	y	21	38.075	81.492	2.09	11.182	1.368	H1-1b
10	10	C5X1.75X0.32	0.114	0	13	0.028	0.992	z	13	62.947	81.492	2.09	11.182	1.247	H1-1b
11	47	PIPE 2.0	0.458	2.865	99	0.294	2.995	8	6.296	32.13	1.872	1.872	3	H1-1b	
12	50	PIPE 2.0	0.366	3.984	17	0.047	3.984	7	13.511	32.13	1.872	1.872	3	H1-1b	
13	53	PIPE 2.0	0.537	4.073	8	0.053	3.984	2	13.511	32.13	1.872	1.872	3	H1-1b	
14	54	PIPE 2.0	0.458	2.865	86	0.268	3.125	7	6.296	32.13	1.872	1.872	3	H1-1b	
15	57	PIPE 2.0	0.286	3.984	9	0.043	3.984	8	13.511	32.13	1.872	1.872	3	H1-1b	
16	60	PIPE 2.0	0.537	4.073	8	0.056	3.984	86	13.511	32.13	1.872	1.872	3	H1-1b	
17	61	PIPE 2.0	0.458	2.865	88	0.174	11.458	9	6.296	32.13	1.872	1.872	2.909	H1-1b	
18	64	PIPE 2.0	0.252	3.984	13	0.034	3.984	2	13.511	32.13	1.872	1.872	2.951	H1-1b	
19	67	PIPE 2.0	0.291	1.062	88	0.046	3.984	88	13.511	32.13	1.872	1.872	2.951	H1-1b	
20	68	C5X1.75X0.32	0.071	0	18	0.034	0.896	z	18	73.777	81.492	2.09	11.182	1.637	H1-1b
21	69	L2x2x3	0.162	1.792	19	0.015	1.792	z	17	19.918	23.393	0.558	1.239	1.5	H2-1
22	70	L2.5x2.5x4	0.164	0	88	0.052	1.245	y	88	36.655	38.556	1.114	2.537	1.366	H2-1
23	71	L2.5x2.5x4	0.405	0	8	0.064	0	y	9	36.655	38.556	1.114	2.537	1.5	H2-1
24	72	L2.5x2.5x4	0.394	0	7	0.074	1.245	y	8	36.655	38.556	1.114	2.537	1.5	H2-1

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

T-Mobile Existing Facility

Site ID: CT11261C

TOLLAND/I-84/ FILL-IN  
426 River Road  
Willington, Connecticut 06279

**April 21, 2022**

**EBI Project Number: 6222002671**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>28.56%</b>

April 21, 2022

T-Mobile

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

Emissions Analysis for Site: CT11261C - TOLLAND/I-84/ FILL-IN

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **426 River Road** in **Willington, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 426 River Road in Willington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.
- 8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.
- 9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.
- 11) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 12) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 13) The antennas used in this modeling are the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative

estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 14) The antenna mounting height centerline of the proposed antennas is 100 feet above ground level (AGL).
- 15) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 16) All calculations were done with respect to uncontrolled / general population threshold limits.



## T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd / 22.05 dBd / 15.55 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts
ERP (W):	31,011.95	ERP (W):	31,011.95	ERP (W):	31,011.95
Antenna A1 MPE %:	<b>12.62%</b>	Antenna B1 MPE %:	<b>12.62%</b>	Antenna C1 MPE %:	<b>12.62%</b>
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	13	Channel Count:	13	Channel Count:	13
Total TX Power (W):	560.00 Watts	Total TX Power (W):	560.00 Watts	Total TX Power (W):	560.00 Watts
ERP (W):	17,868.72	ERP (W):	17,868.72	ERP (W):	17,868.72
Antenna A2 MPE %:	<b>9.60%</b>	Antenna B2 MPE %:	<b>9.60%</b>	Antenna C2 MPE %:	<b>9.60%</b>

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	22.22%
VoiceStream	0.49%
Willington FD	2.06%
AT&T	3.79%
Site Total MPE % :	28.56%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	22.22%
T-Mobile Sector B Total:	22.22%
T-Mobile Sector C Total:	22.22%
Site Total MPE % :	28.56%

T-Mobile Maximum MPE Power Values (Sector A)							
T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2500 MHz LTE IC & 2C Traffic	1	9619.47	100.0	39.14	2500 MHz LTE IC & 2C Traffic	1000	3.91%
T-Mobile 2500 MHz LTE IC & 2C Broadcast	1	717.84	100.0	2.92	2500 MHz LTE IC & 2C Broadcast	1000	0.29%
T-Mobile 2500 MHz NR Traffic	1	19238.94	100.0	78.28	2500 MHz NR Traffic	1000	7.83%
T-Mobile 2500 MHz NR Broadcast	1	1435.69	100.0	5.84	2500 MHz NR Broadcast	1000	0.58%
T-Mobile 600 MHz LTE	2	591.73	100.0	4.82	600 MHz LTE	400	1.20%
T-Mobile 600 MHz NR	1	1577.94	100.0	6.42	600 MHz NR	400	1.61%
T-Mobile 700 MHz LTE	2	695.22	100.0	5.66	700 MHz LTE	467	1.21%
T-Mobile 1900 MHz GSM	4	1052.26	100.0	17.13	1900 MHz GSM	1000	1.71%
T-Mobile 1900 MHz LTE	2	2104.51	100.0	17.13	1900 MHz LTE	1000	1.71%
T-Mobile 2100 MHz LTE	2	2649.42	100.0	21.56	2100 MHz LTE	1000	2.16%
						<b>Total:</b>	<b>22.22%</b>

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

## Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	22.22%
Sector B:	22.22%
Sector C:	22.22%
T-Mobile Maximum MPE % (Sector A):	22.22%
Site Total:	28.56%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **28.56%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

308583

**CROWN CASTLE - STA PROPERTY**  
8000 AVALON BLVD., SUITE 700  
ALPHARETTA, GA 30009

DATE 6-1-22

32-61/1110

PAY  
TO THE  
ORDER OF

Connecticut Sitting Council  
Six hundred twenty five dollars

\$ 625.00

DOLLARS  Security Features  
Included  
Details on Back

VOID AFTER 180 DAYS

**CHASE** 

JPMorgan Chase Bank, N.A.  
www.Chase.com

FOR CT11261C-841301-709756-609058



⑈ 308583 ⑈ ⑆ 111000614 ⑆

484638126⑈

# T-Mobile

**T-MOBILE SITE NUMBER: CT11261C**

**T-MOBILE SITE NAME: TOLLAND/I-84/ FILL-IN**

**SITE TYPE: MONOPOLE**

**TOWER HEIGHT: 110'-0"**

**BUSINESS UNIT #: 841301**

**SITE ADDRESS: 426 RIVER ROAD  
WILLINGTON, CT 06279**

**COUNTY: TOLLAND**

**JURISDICTION: CONNECTICUT**

**T-MOBILE ANCHOR SITE CONFIGURATION: 67D5D998E ODE+6160 SITING COUNCIL**

T-Mobile

4 SYLVAN WAY  
PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300  
CHARLOTTE, NC 28277

B+T GRP

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

T-MOBILE  
SITE NUMBER: CT11261C

BU #: 841301  
WILLINGTON-RIVER RD

426 RIVER ROAD  
WILLINGTON, CT 06279

EXISTING  
110'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DWG./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR

**SITE INFORMATION**

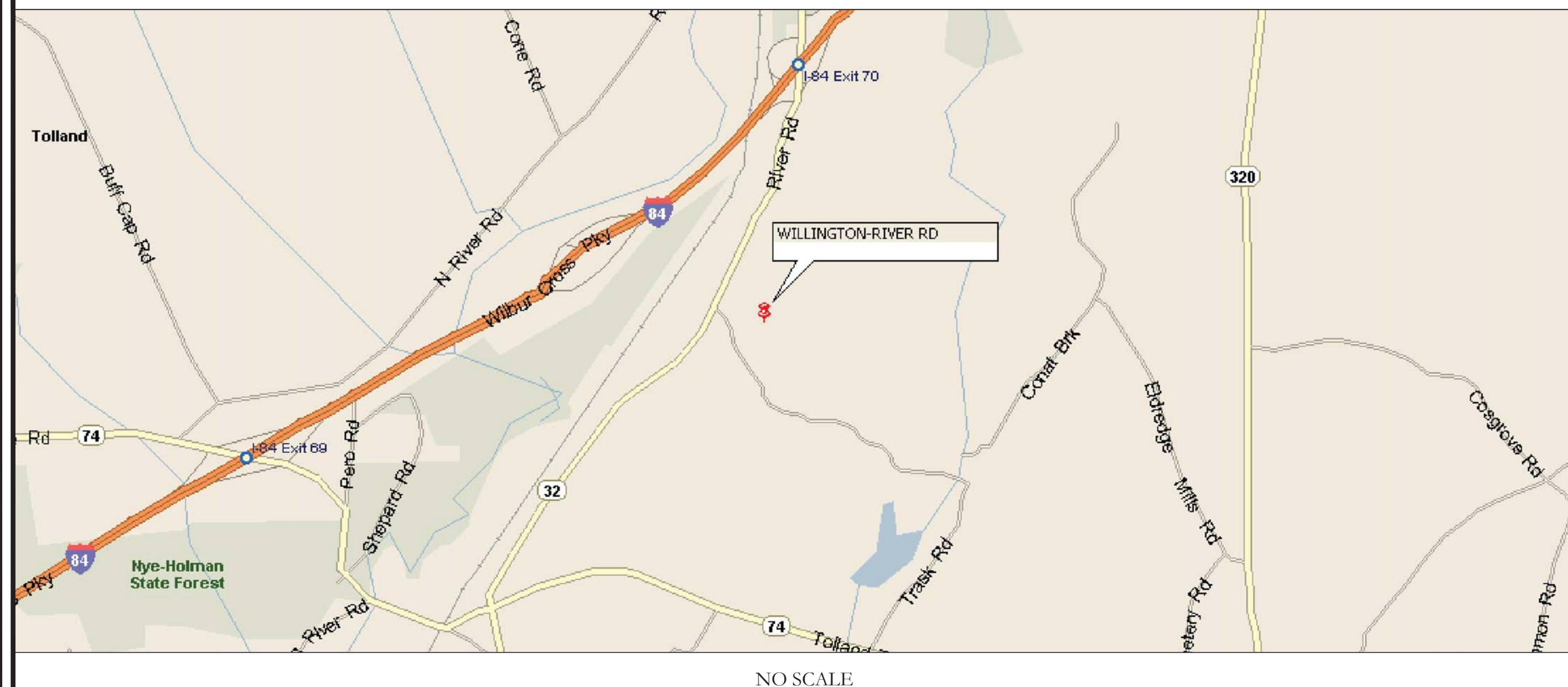
CROWN CASTLE USA INC. WILLINGTON-RIVER RD  
SITE NAME:  
SITE ADDRESS: 426 RIVER ROAD  
WILLINGTON, CT 06279  
COUNTY: TOLLAND  
MAP/PARCEL #: 34/010-00  
AREA OF CONSTRUCTION: EXISTING  
LATITUDE: 41.890755°  
LONGITUDE: -72.289380°  
LAT/LONG TYPE: NAD83  
GROUND ELEVATION: 537'  
CURRENT ZONING: R80  
JURISDICTION: CONNECTICUT SITING COUNCIL  
OCCUPANCY CLASSIFICATION: U  
TYPE OF CONSTRUCTION: IIB  
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION  
PROPERTY OWNER: WILLINGTON FIRE DEPT INC  
P O BOX 161  
WILLINGTON, CT 06279  
TOWER OWNER: CROWN CASTLE  
2000 CORPORATE DRIVE  
CANONSBURG, PA 15317  
CARRIER/APPLICANT: T-MOBILE  
35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002  
ELECTRIC PROVIDER: NORTHEAST UTILITIES  
(800) 286-5000  
TELCO PROVIDER: LIGHTTOWER  
(855) 91-FIBER

**DRAWING INDEX**

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

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 24X36. 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.

**LOCATION MAP**



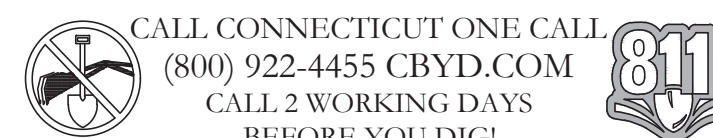
**APPLICABLE CODES/REFERENCE DOCUMENTS**

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

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

**REFERENCE DOCUMENTS:**

STRUCTURAL ANALYSIS:	BLACK & VEATCH
DATED:	4/5/22
MOUNT ANALYSIS:	B+T GROUP
DATED:	3/30/22
RFDS REVISION:	8
DATED:	3/7/22
ORDER ID:	609058
REVISION:	0



**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 (2) ANTENNAS
- REMOVE (4) TMAs
- REMOVE (8) 1-1/4" COAX CABLES
- INSTALL (2) ANTENNAS
- INSTALL (2) RADIOS
- INSTALL (1) ERICSSON - 6/24 4AWG HYBRID TRUNK
- INSTALL MOUNT MODIFICATIONS REQUIRED PER MOUNT MODIFICATIONS DESIGN BY B+T GROUP DATED MARCH 30, 2022

**GROUND SCOPE OF WORK:**

- REMOVE (6) RUS01 B2 RADIOS FROM 6201 CABINET
- REMOVE (2) RADIOS
- INSTALL (1) 6160 AC V1 CABINET
- INSTALL (1) B160 BATTERY CABINET
- INSTALL (1) DUG20 IN 6201 CABINET
- INSTALL (1) RP 6651 IN 6160 CABINET
- INSTALL (1) PSU 4813 vR4A VOLTAGE BOOSTER KIT IN 6160 CABINET
- INSTALL (1) CSR IXRe V2 (Gen2) ROUTER IN 6160 CABINET
- UPGRADE PBC TO FULL 24-SLOT PANEL
- UPGRADE 6201 BREAKER TO 125A
- INSTALL (1) 150A BREAKER FOR 6160

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

**APPROVALS**

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.	_____	_____
LAND USE PLANNER	_____	_____
T-MOBILE	_____	_____
OPERATIONS	_____	_____
RF	_____	_____
NETWORK	_____	_____
BACKHAUL	_____	_____
CONSTRUCTION MANAGER	_____	_____

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.



B&T ENGINEERING, INC.

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

SHEET NUMBER: **T-1** REVISION: **0**

**PROJECT TEAM**

A&E FIRM: B+T GROUP  
1717 S. BOULDER AVE.  
TULSA, OK 74119  
MARVIN PHILLIPS  
MARVIN.PHILLIPS@BTGRP.COM  
CROWN CASTLE USA INC. DISTRICT CONTACTS:  
3530 TORINGDON WAY, SUITE 300  
CHARLOTTE, NC 28277  
TRICIA PELON - PROJECT MANAGER  
TRICIA.PELON@CROWNCastle.COM  
JASON D'AMICO - CONSTRUCTION MANAGER  
JASON.DAMICO@CROWNCastle.COM

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.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED--STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS--STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED--STD-10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA-1019-A--2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS." IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
6. 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.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
9. 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.
10. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
11. 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.
12. 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.
13. 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.
14. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
15. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
16. 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.
17. 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.
18. 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.
19. 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.
20. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
21. 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 (WFF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS: #4 BARS AND SMALLER.....40 ksi #5 BARS AND LARGER.....60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS: CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.....3" CONCRETE EXPOSED TO EARTH OR WEATHER: #6 BARS AND LARGER.....2" #5 BARS AND SMALLER.....1-1/2" CONCRETE NOT EXPOSED TO EARTH OR WEATHER: SLAB AND WALLS.....3/4" BEAMS AND COLUMNS.....1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- 1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR--CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN--2, XHHW, XHHW--2, THW, THW--2, RHW, OR RHW--2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN--2, XHHW, XHHW--2, THW, THW--2, RHW, OR RHW--2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI--CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI--CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN--2, XHHW, XHHW--2, THW, THW--2, RHW, OR RHW--2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP--STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL--CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID--TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID--TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION--TYPE AND APPROVED FOR THE LOCATION USED. SET NEW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON--PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER--ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY--COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY--COATED OR NON--CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T--MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METEERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE table with columns for SYSTEM, CONDUCTOR, and COLOR. Rows include 120/240V, 10 and 120/208V, 30 configurations.

\* SEE NEC 210.5(C)(1) AND (2) \*\* POLARITY MARKED AT TERMINATION

ABBREVIATIONS:

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

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

T-Mobile logo with address: 4 SYLVAN WAY PARSIPPANY, NJ 07054

CROWN CASTLE logo with address: 3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277

B+T GRP logo with address: 1717 S. BOULDER SUITE 300 TULSA, OK 74119 PH: (918) 587-4630 www.btgrp.com

T-MOBILE SITE NUMBER: CT11261C BU #: 841301 WILLINGTON-RIVER RD 426 RIVER ROAD WILLINGTON, CT 06279 EXISTING 110'-0" MONOPOLE

ISSUED FOR: table with columns REV, DATE, DRWN, DESCRIPTION, DES./QA. Shows REV A on 4/28/22 by DAS for PRELIMINARY REVIEW, and REV 0 on 5/11/22 by DAS for CONSTRUCTION.

Professional Engineer seal for B&T ENGINEERING, INC. with signature and date 5/11/22. Text: IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT. SHEET NUMBER: T-2 REVISION: 0

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



**T-Mobile**

4 SYLVAN WAY  
 PARSIPPANY, NJ 07054

**CROWN CASTLE**

3530 TORINGDON WAY, SUITE 300  
 CHARLOTTE, NC 28277

**B+T GRP**

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

T-MOBILE  
 SITE NUMBER: **CT11261C**

BU #: **841301**  
**WILLINGTON-RIVER RD**

426 RIVER ROAD  
 WILLINGTON, CT 06279

EXISTING  
 110'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR

B&T ENGINEERING, INC.

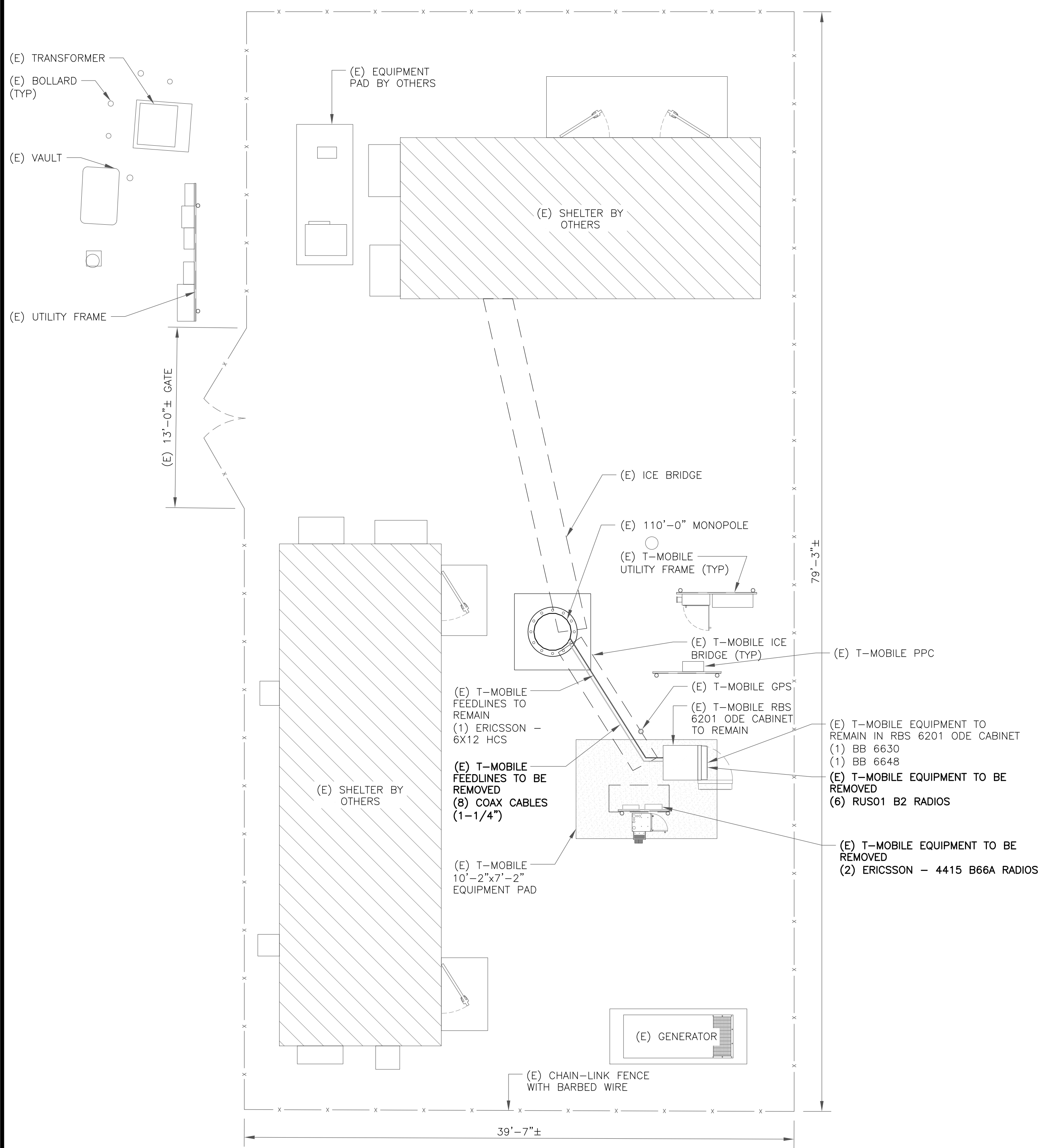
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

1 OVERALL SITE PLAN

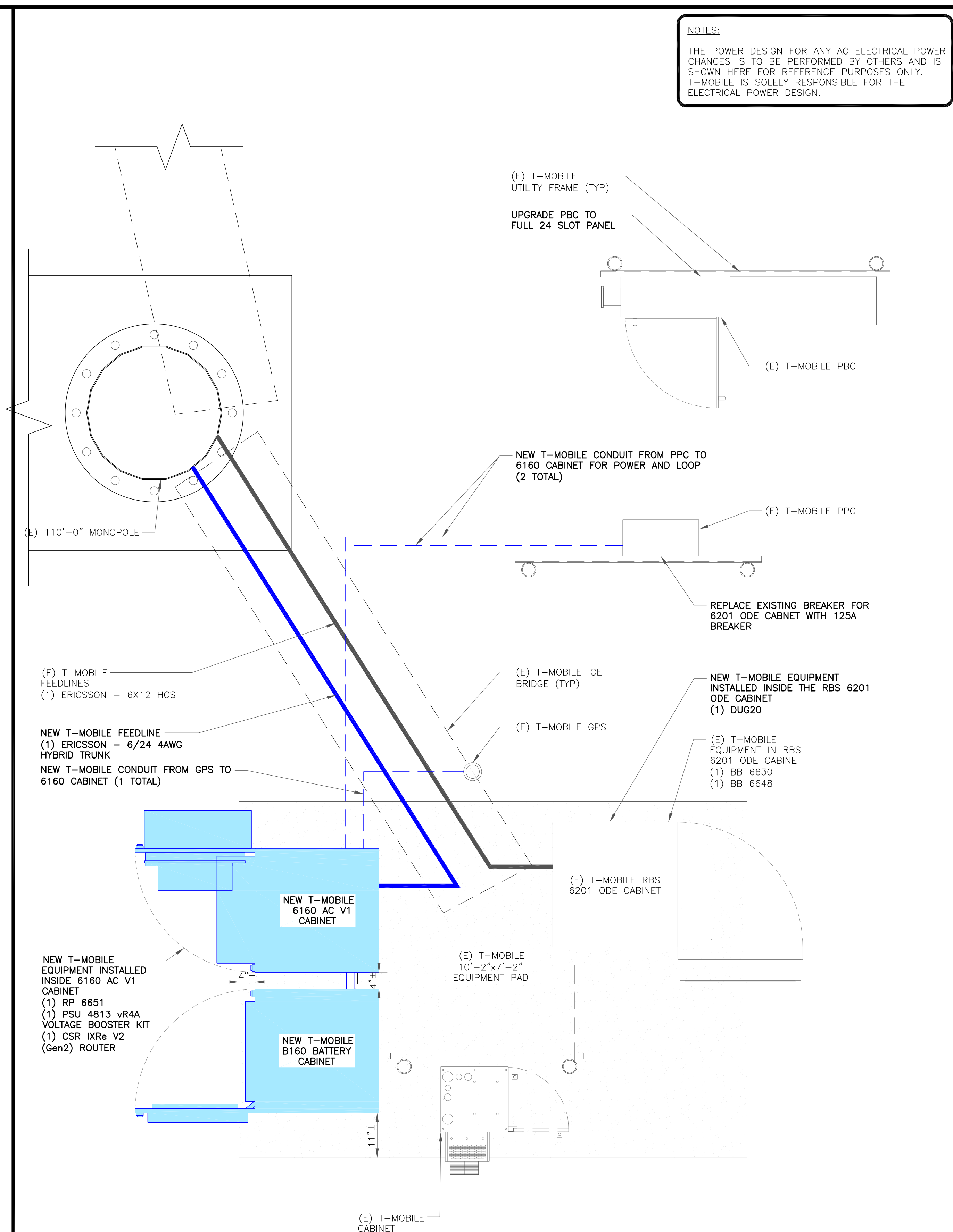
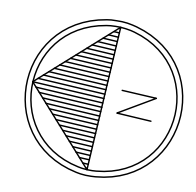
SCALE: 1" = 100'-0" (FULL SIZE)  
 1" = 200'-0" (11x17)

SHEET NUMBER: **C-1.1** REVISION: **0**

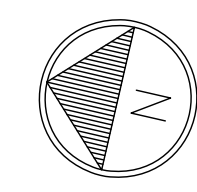
RUSH\_135909.003.01\_841301\_WILINGTON-RIVER\_RD.dwg - Sheet: C-1.2 - User: lisa.rider - May 11, 2022 - 11:23am



1 SITE PLAN  
 SCALE: 3/16"=1'-0" (FULL SIZE)  
 3/32"=1'-0" (11x17)



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



**T-Mobile**  
 4 SYLVAN WAY  
 PARSIPPANY, NJ 07054

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

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

T-MOBILE  
 SITE NUMBER: **CT11261C**  
 BU #: **841301**  
**WILINGTON-RIVER RD**  
 426 RIVER ROAD  
 WILINGTON, CT 06279  
 EXISTING  
 110'-0" MONOPOLE

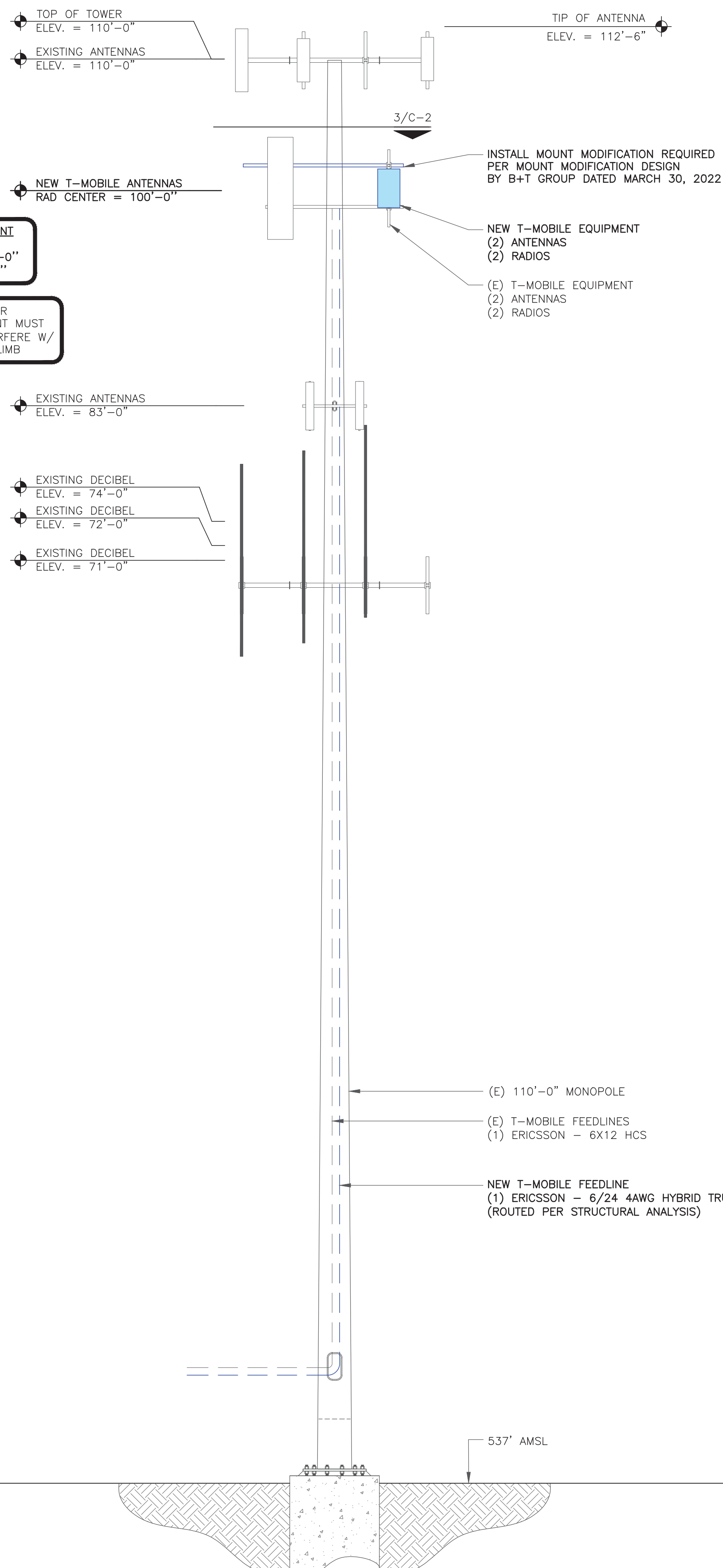
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR

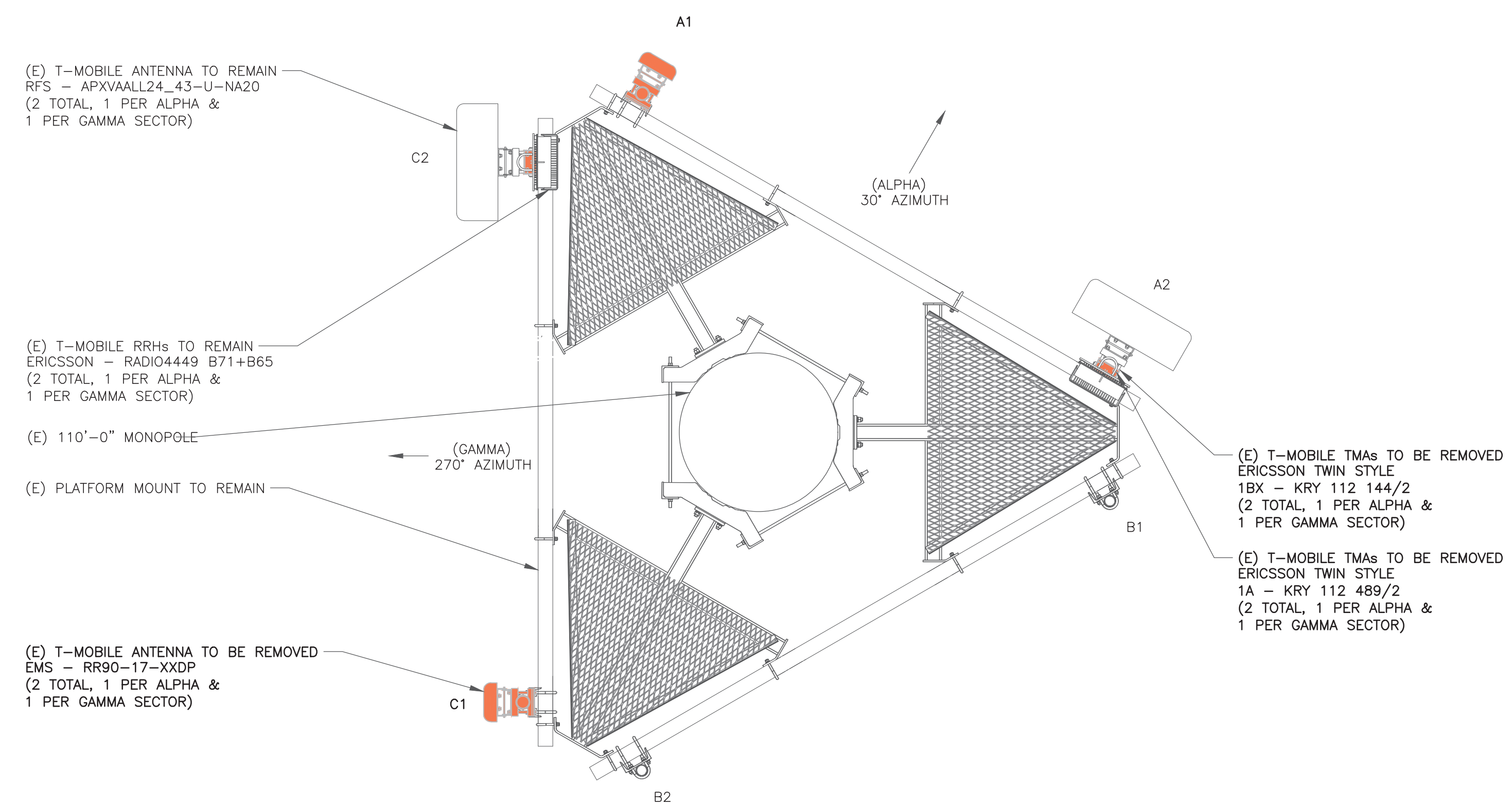
B&T ENGINEERING, INC.  
 IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: **C-1.2** REVISION: **0**

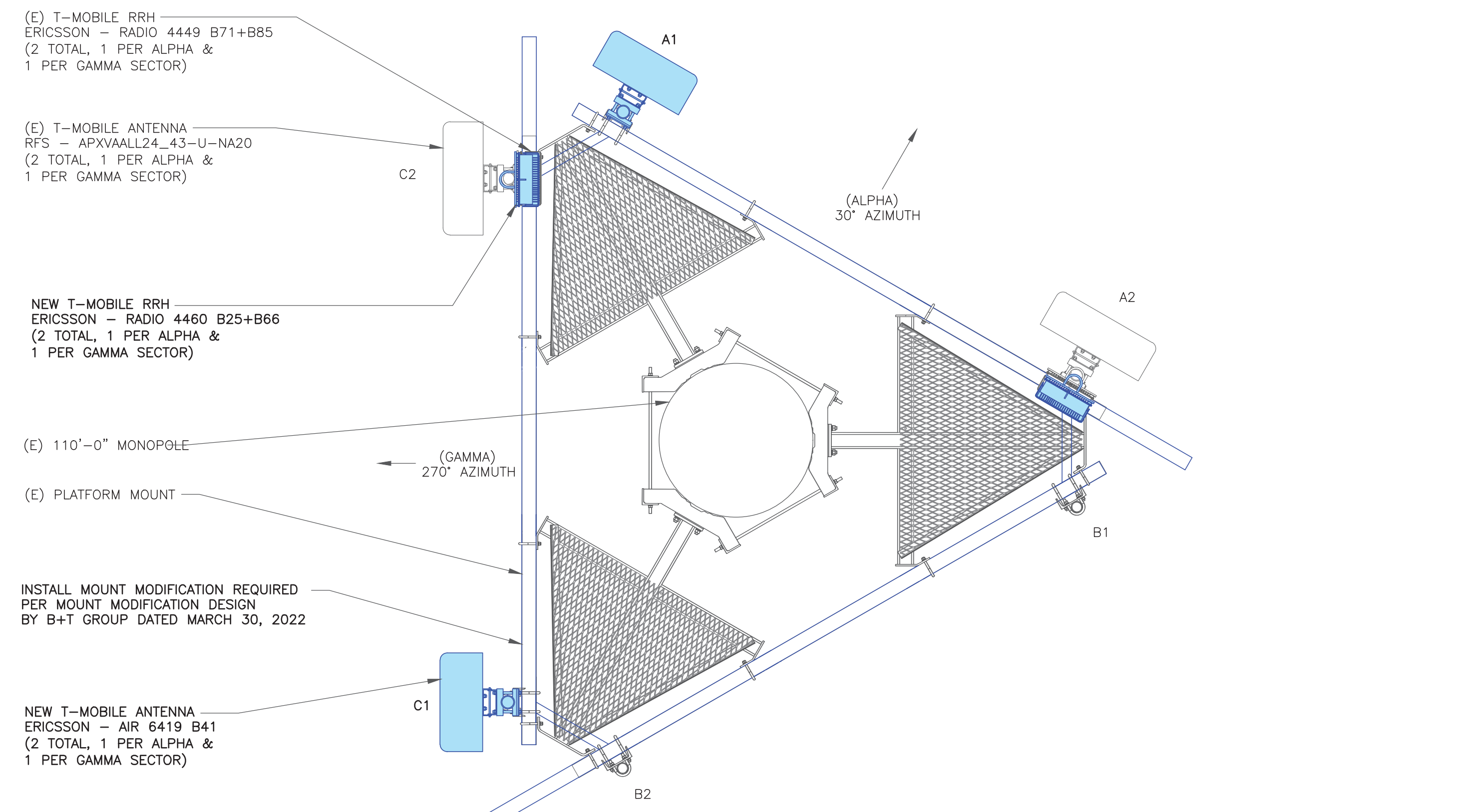




1 FINAL ELEVATION  
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT  
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT  
SCALE: NOT TO SCALE

**T-Mobile**  
4 SYLVAN WAY  
PARSIPPANY, NJ 07054

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

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

T-MOBILE  
SITE NUMBER: CT11261C  
BU #: 841301  
WILLINGTON-RIVER RD  
426 RIVER ROAD  
WILLINGTON, CT 06279  
EXISTING  
110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR

*[Professional Engineer Seal]*  
B&T ENGINEERING, INC.  
IT IS A VIOLATION OF LAW FOR ANY PERSON,  
UNLESS THEY ARE ACTING UNDER THE DIRECTION  
OF A LICENSED PROFESSIONAL ENGINEER,  
TO ALTER THIS DOCUMENT.

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

T-MOBILE  
SITE NUMBER: **CT11261C**

BU #: **841301**  
**WILLINGTON-RIVER RD**

426 RIVER ROAD  
WILLINGTON, CT 06279

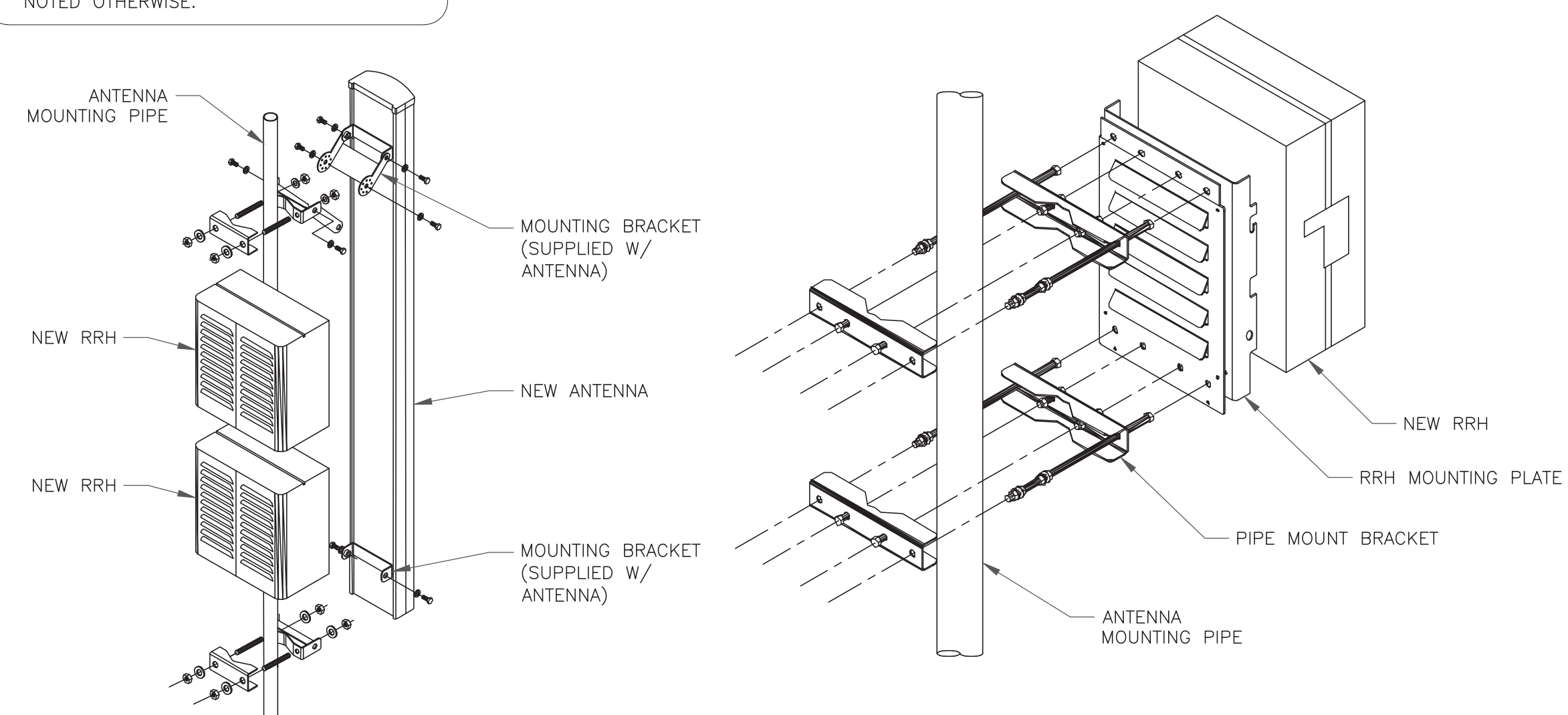
EXISTING  
110'-0" MONOPOLE

RF SYSTEM SCHEDULE										
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A1	L2500/N2500	ERICSSON	AIR 6419 B41	30°	0°	-	100'-0"	-	(1) ERICSSON - 6X12 HCS  (1) ERICSSON - 6/24 4AWG HYBRID TRUNK
	A2	L700/L600/N600; L2100/L1900/G1900	RFS	APXVAALL24_43-U-NA20	30°	0°	-	100'-0"	(1) ERICSSON - RADIO 4449 B71+B85 (1) ERICSSON - RADIO 4460 B25+B66	
BETA	B1	-	-	-	-	-	-	-	-	
	B2	-	-	-	-	-	-	-	-	
GAMMA	C1	L2500/N2500	ERICSSON	AIR 6419 B41	270°	0°	-	100'-0"	-	
	C2	L700/L600/N600; L2100/L1900/G1900	RFS	APXVAALL24_43-U-NA20	270°	0°	-	100'-0"	(1) ERICSSON - RADIO 4449 B71+B85 (1) ERICSSON - RADIO 4460 B25+B66	

1 ANTENNA AND CABLE SCHEDULE  
SCALE: NOT TO SCALE

**INSTALLER NOTES:**

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



2 ANTENNA WITH RRHs MOUNTING DETAIL  
SCALE: NOT TO SCALE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR



B&T ENGINEERING, INC.

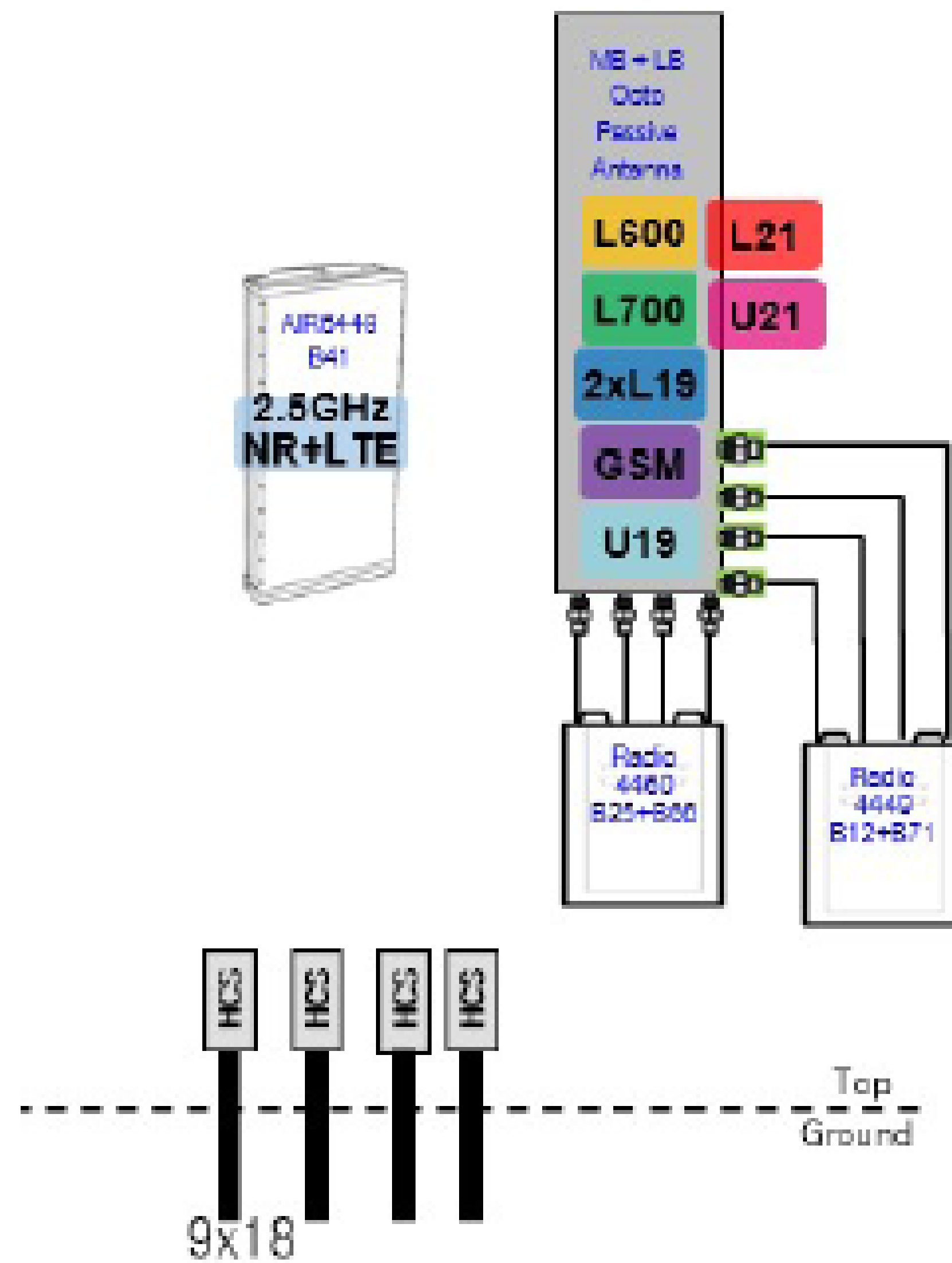
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

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

Section 3 - Proposed Template Images

67D5A998E.jpg

Final Config: 67D5A998E



Notes:

1 PLUMBING DIAGRAM  
SCALE: NOT TO SCALE

**T-Mobile**  
4 SYLVAN WAY  
PARSIPPANY, NJ 07054

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

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

T-MOBILE  
SITE NUMBER: **CT11261C**  
  
BU #: 841301  
**WILLINGTON-RIVER RD**  
  
426 RIVER ROAD  
WILLINGTON, CT 06279  
  
EXISTING  
110'-0" MONOPOLE

ISSUED FOR:

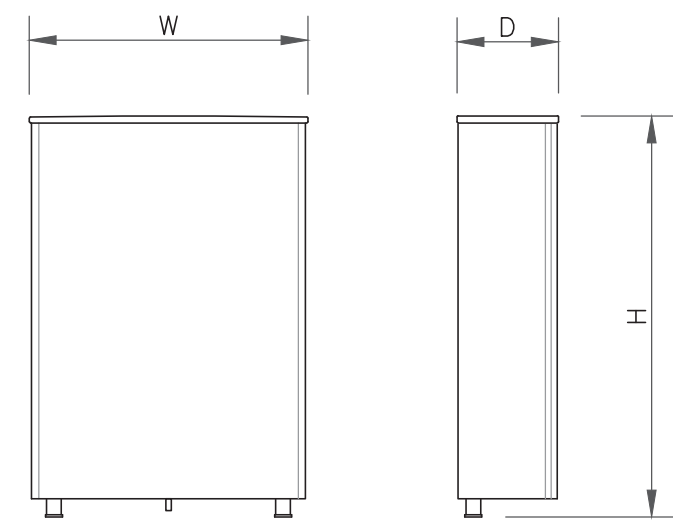
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR



B&T ENGINEERING, INC.

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

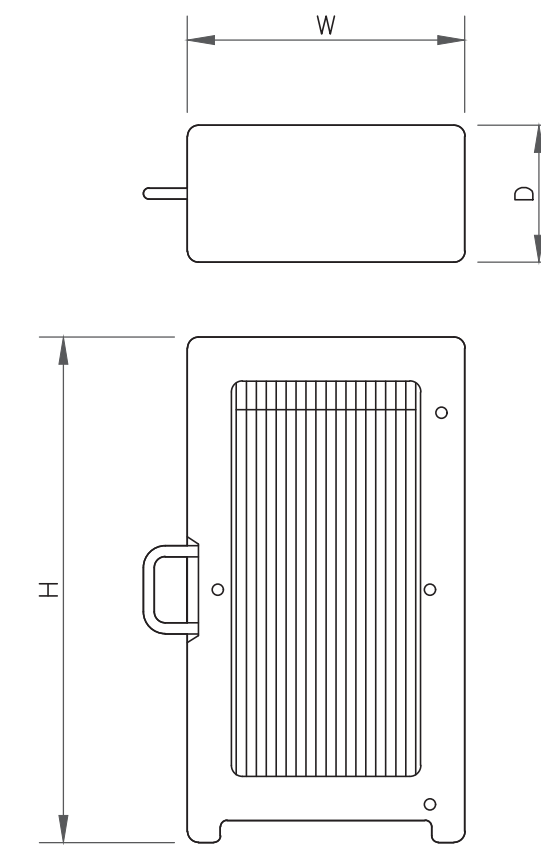
SHEET NUMBER: **C-4** REVISION: **0**



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

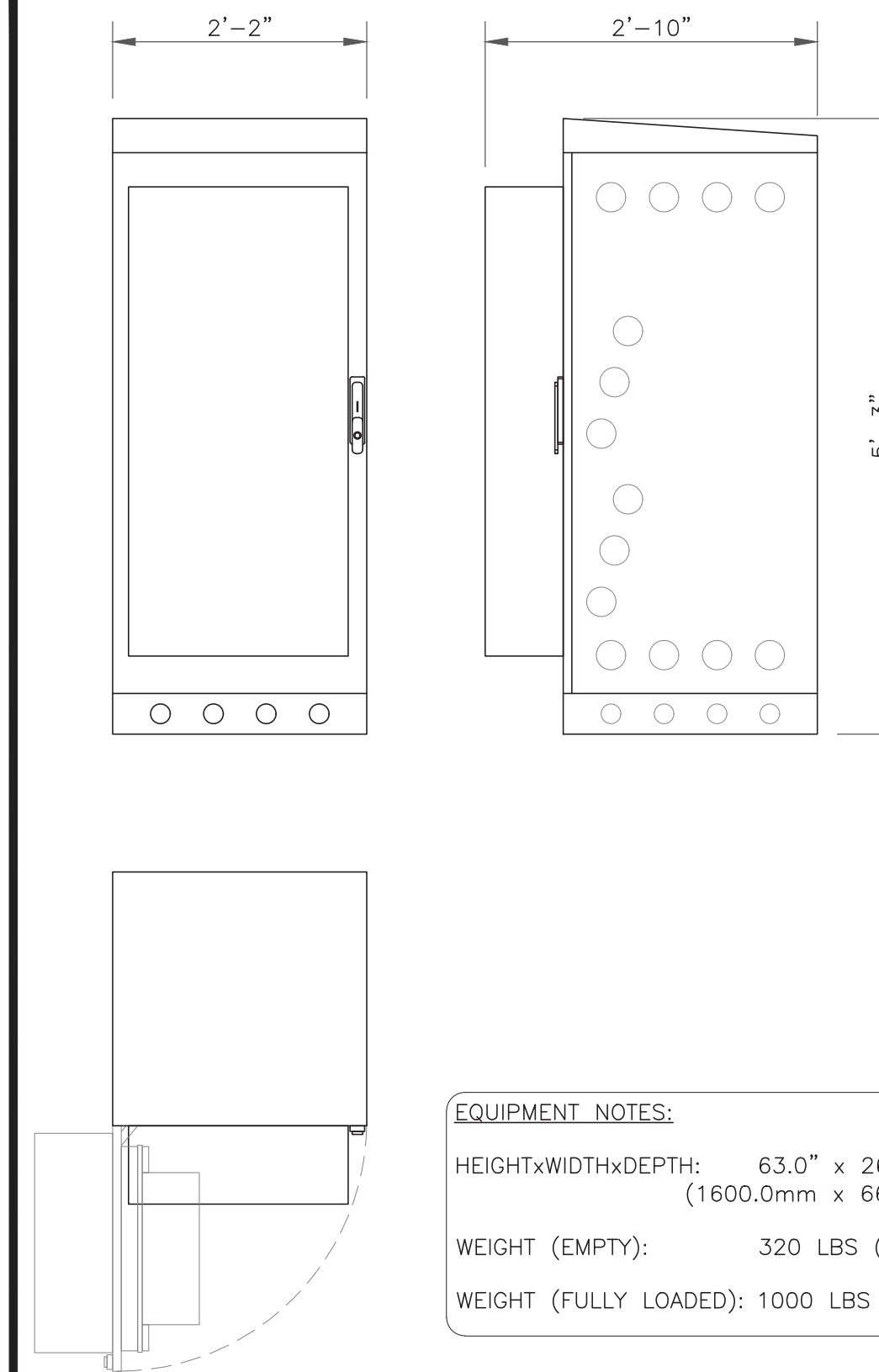
1 ANTENNA SPECS  
SCALE: NOT TO SCALE

2 NOT USED  
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4460 B25+B66
WIDTH	15.10"
DEPTH	11.90"
HEIGHT	17.00"
WEIGHT	109.00 LBS

3 RRU SPECS  
SCALE: NOT TO SCALE



EQUIPMENT NOTES:	
HEIGHTxWIDTHxDEPTH:	63.0" x 26.0" x 34.0" (1600.0mm x 660.0mm x 864.0mm)
WEIGHT (EMPTY):	320 LBS (145 kg)
WEIGHT (FULLY LOADED):	1000 LBS (454 kg)

4 ERICSSON - 6160  
SCALE: NOT TO SCALE

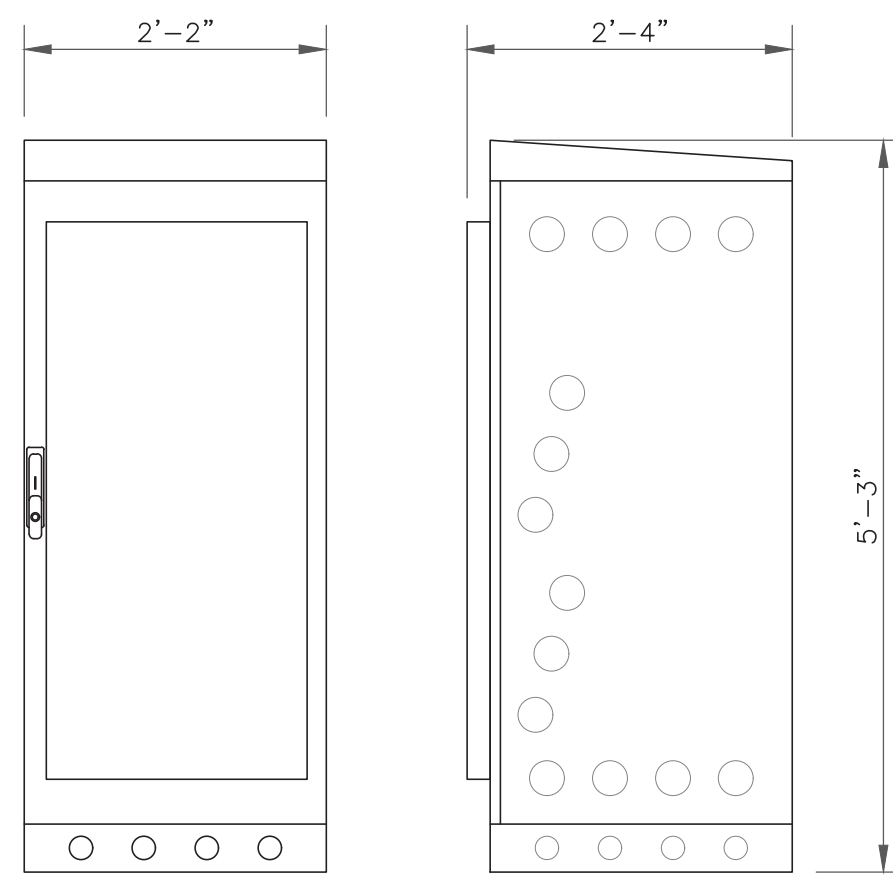
**T-Mobile**  
4 SYLVAN WAY  
PARSIPPANY, NJ 07054

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

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

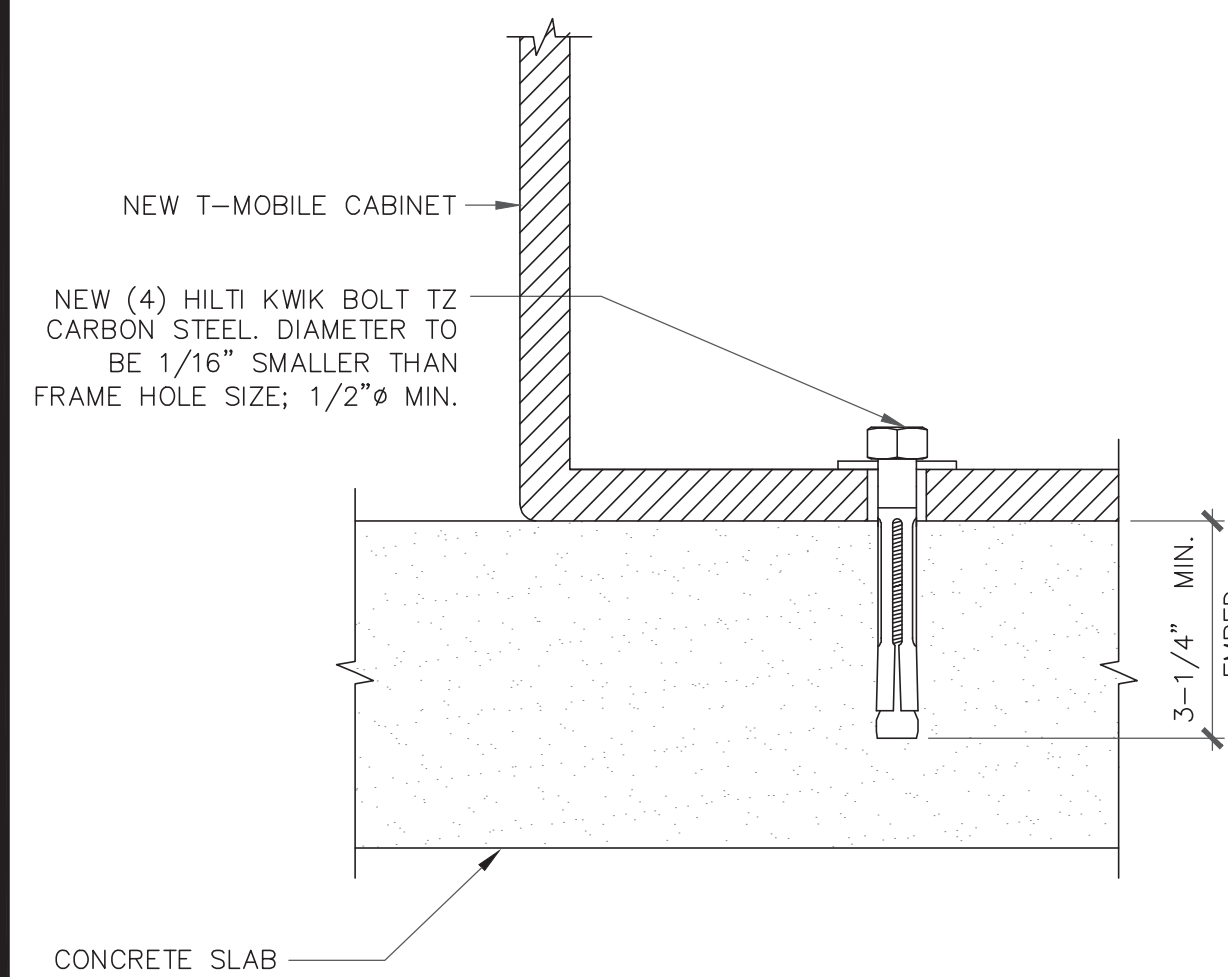
T-MOBILE  
SITE NUMBER: **CT11261C**  
  
BU #: **841301**  
**WILLINGTON-RIVER RD**  
  
426 RIVER ROAD  
WILLINGTON, CT 06279  
  
EXISTING  
110'-0" MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR



EQUIPMENT NOTES:	
HEIGHTxWIDTHxDEPTH:	63.0" x 26.0" x 28.0" (1600.0mm x 660.0mm x 711.0mm)
WEIGHT (EMPTY):	295 LBS (134 kg)
WEIGHT (FULLY LOADED):	2000 LBS (908 kg)

5 ERICSSON - B160  
SCALE: NOT TO SCALE



6 CABINET ANCHOR DETAIL  
SCALE: NOT TO SCALE

7 NOT USED  
SCALE: NOT TO SCALE

8 NOT USED  
SCALE: NOT TO SCALE



B&T ENGINEERING, INC.

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

SHEET NUMBER: **C-5** REVISION: **0**

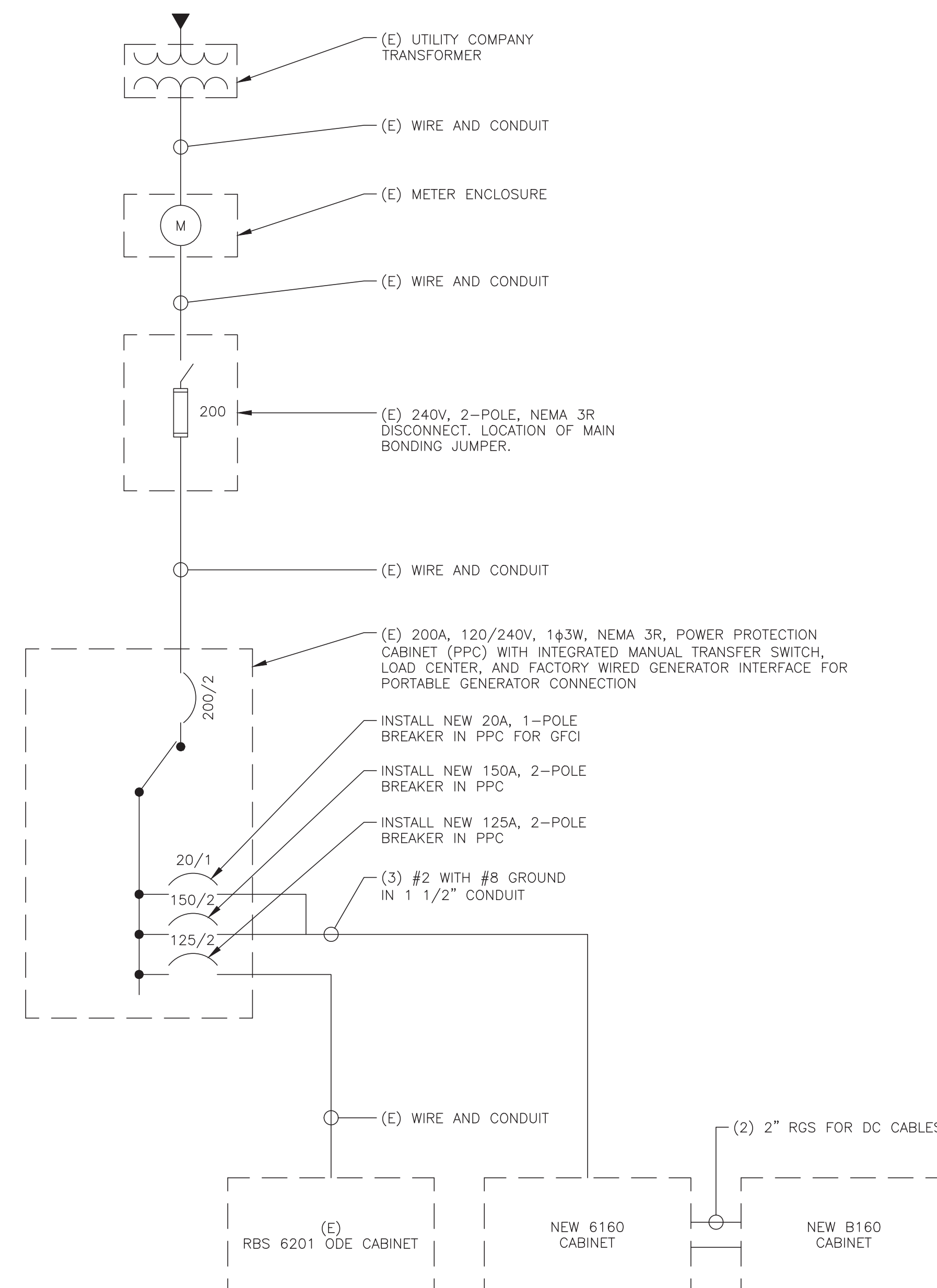
FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD
			L1	L2			
EQUIPMENT	2	60A	1	2	30A	2	EQUIPMENT
6160 CABINET	2	150A	3	4			
GFCI	1	20A	5	6			
			7	8	125A	2	ODE 6201
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
FIBER	1	20A	29	30			

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

REPLACE EXISTING BREAKER IN POSITION 10 AND 12 WITH A NEW 2P 125A BREAKER  
 INSTALL NEW 2P 150A BREAKER IN POSITION 5 AND 7  
 INSTALL NEW 1P 20A BREAKER IN POSITION 9  
 REPLACE EXISTING WIRES FOR EXISTING ODE 6201 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #2G AWG. MINIMUM CONDUIT SIZE TO BE 2".  
 IF 150A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL Q012040M200RB (OR APPROVED EQUAL).  
 UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.  
 FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING PHOTOS

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

1 AC PANEL SCHEDULE  
 SCALE: NOT TO SCALE



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

2 ONE LINE DIAGRAM  
 SCALE: NOT TO SCALE

**T-Mobile**  
 4 SYLVAN WAY  
 PARSIPPANY, NJ 07054

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

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

T-MOBILE  
 SITE NUMBER: **CT11261C**  
 BU #: **841301**  
**WILLINGTON-RIVER RD**  
 426 RIVER ROAD  
 WILLINGTON, CT 06279  
 EXISTING  
 110'-0" MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR

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

SHEET NUMBER: <b>E-1</b>	REVISION: <b>0</b>
-----------------------------	-----------------------

T-Mobile

4 SYLVAN WAY  
PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300  
CHARLOTTE, NC 28277

B+T GRP

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

T-MOBILE  
SITE NUMBER: CT11261C

BU #: 841301  
WILLINGTON-RIVER RD

426 RIVER ROAD  
WILLINGTON, CT 06279

EXISTING  
110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR



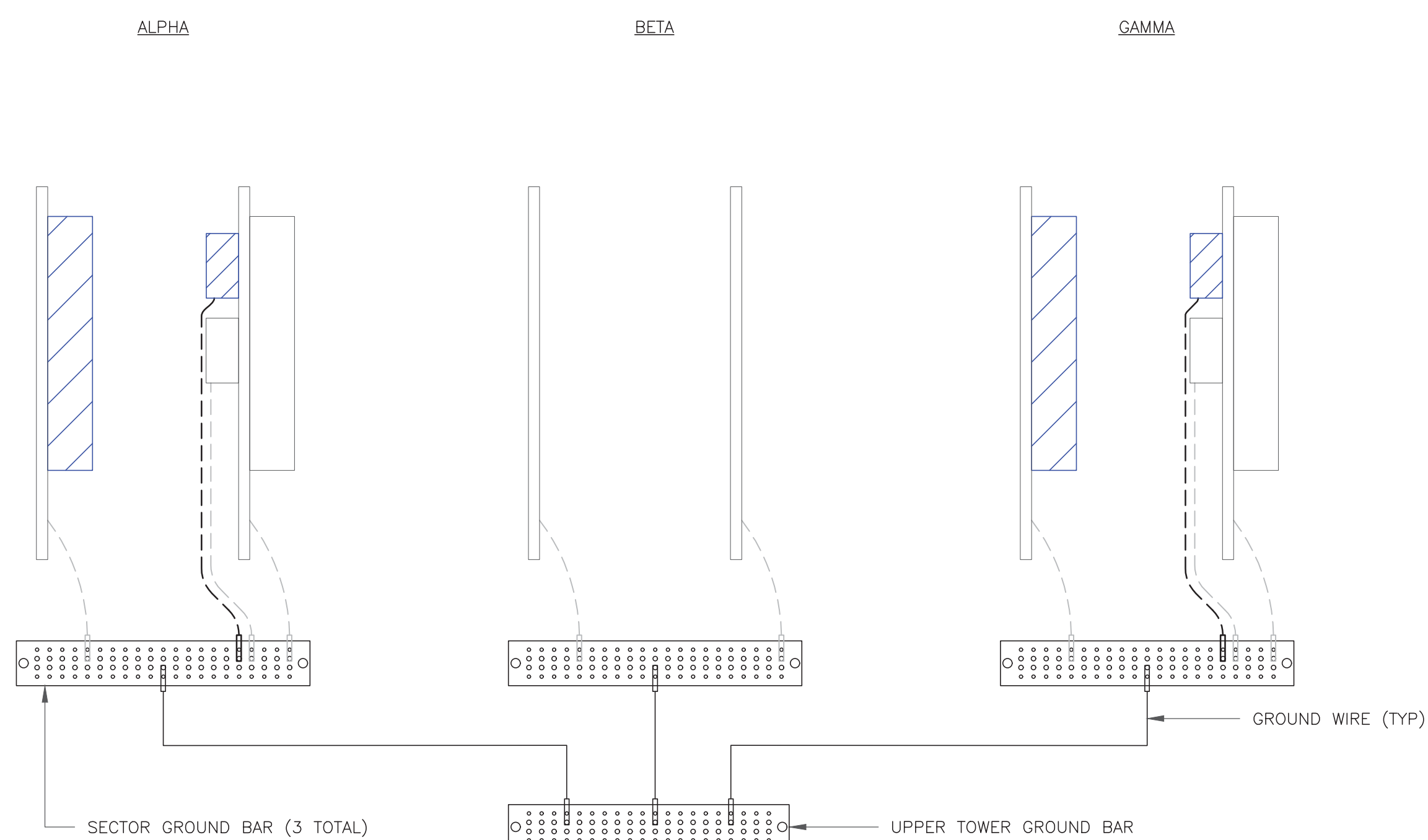
B&T ENGINEERING, INC.

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:

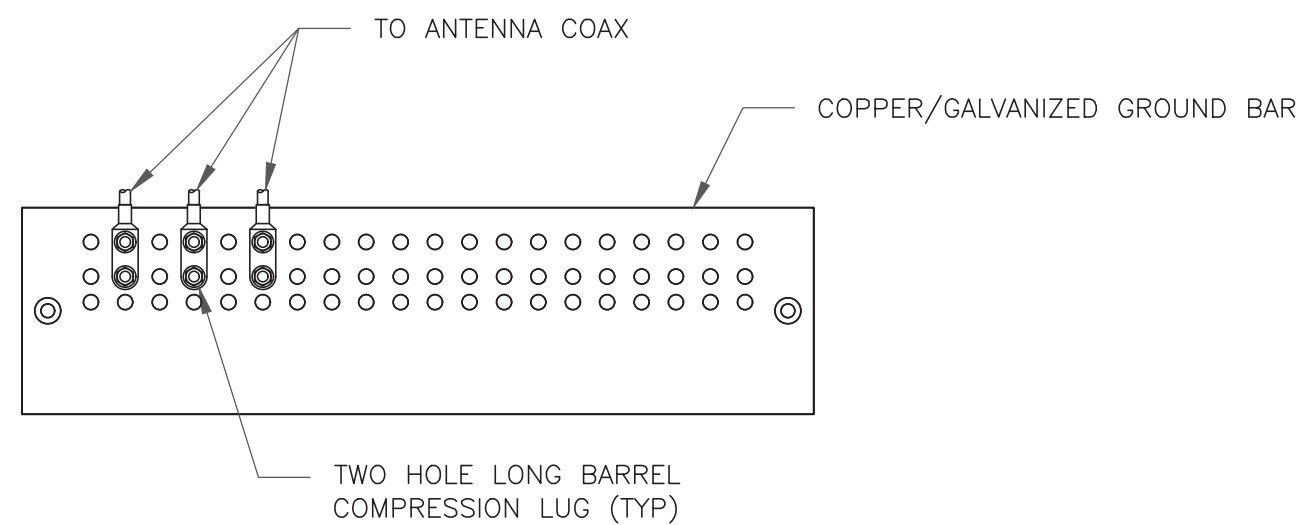
G-1

0



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

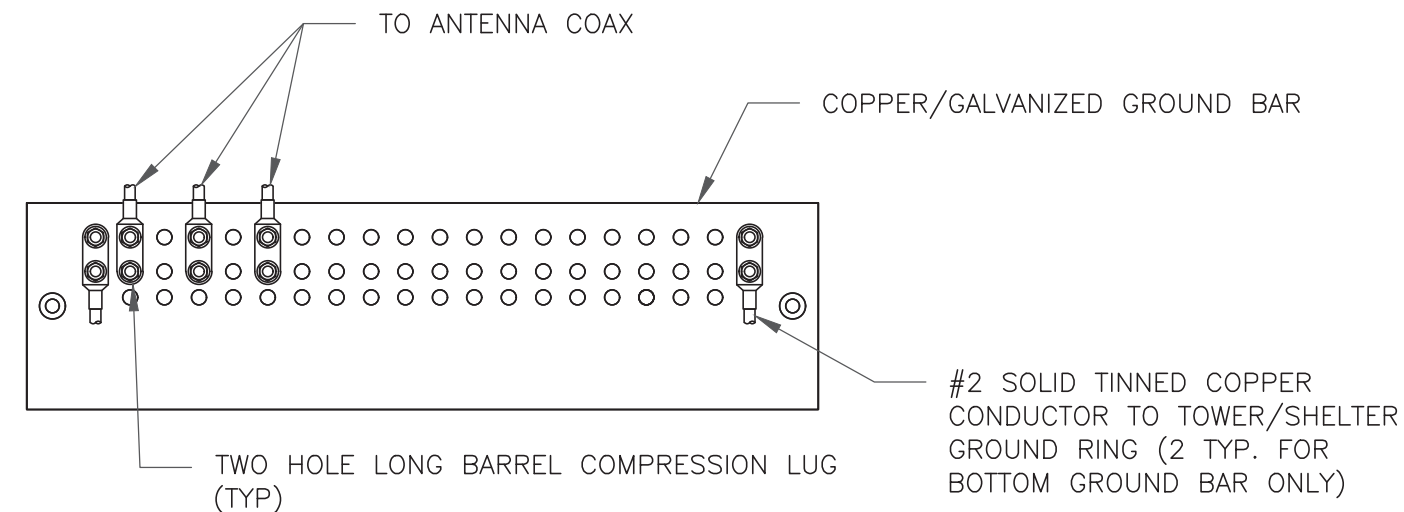
1 ANTENNA GROUNDING DIAGRAM  
SCALE: NOT TO SCALE



NOTES:

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

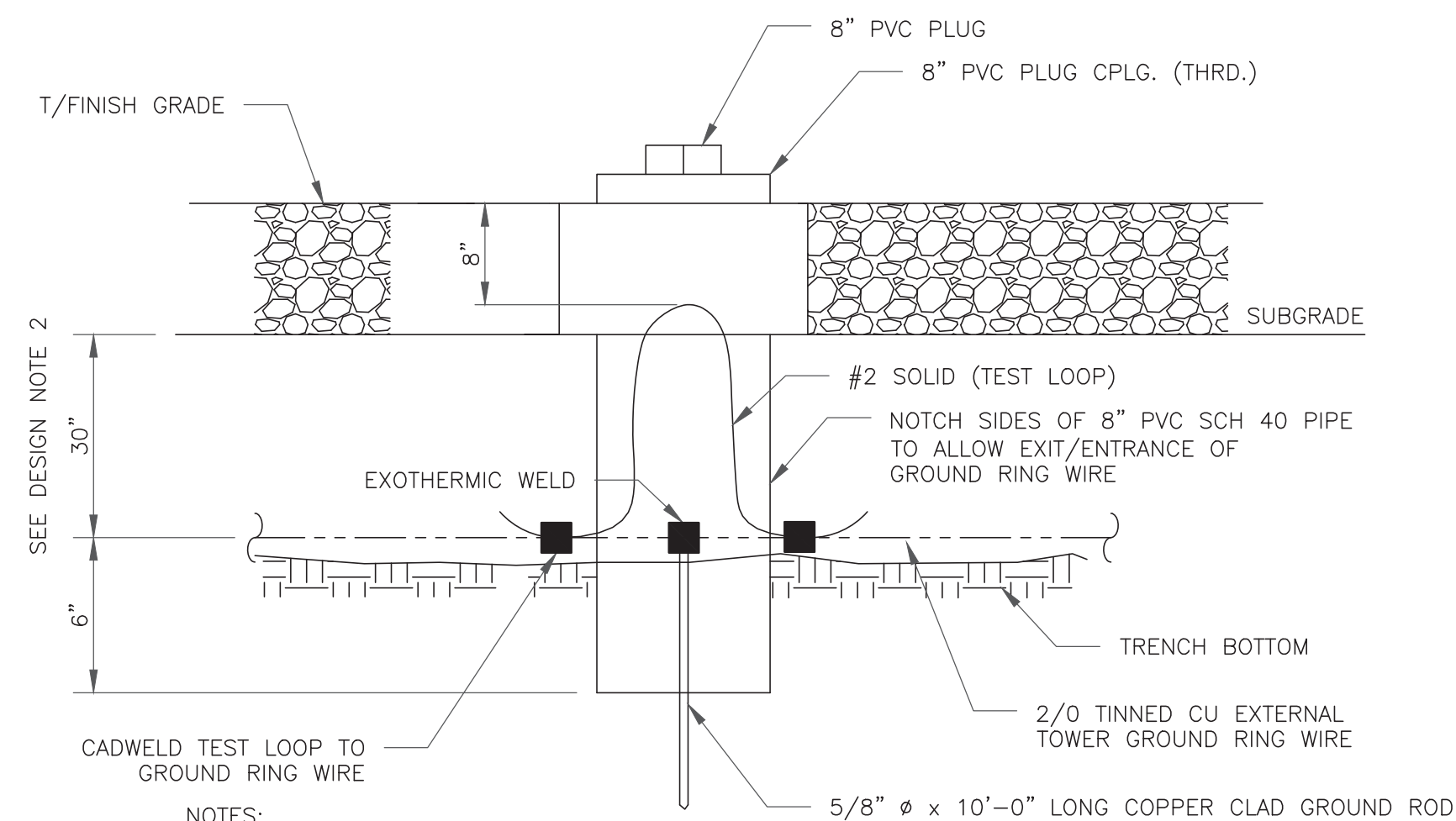
1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTES:

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

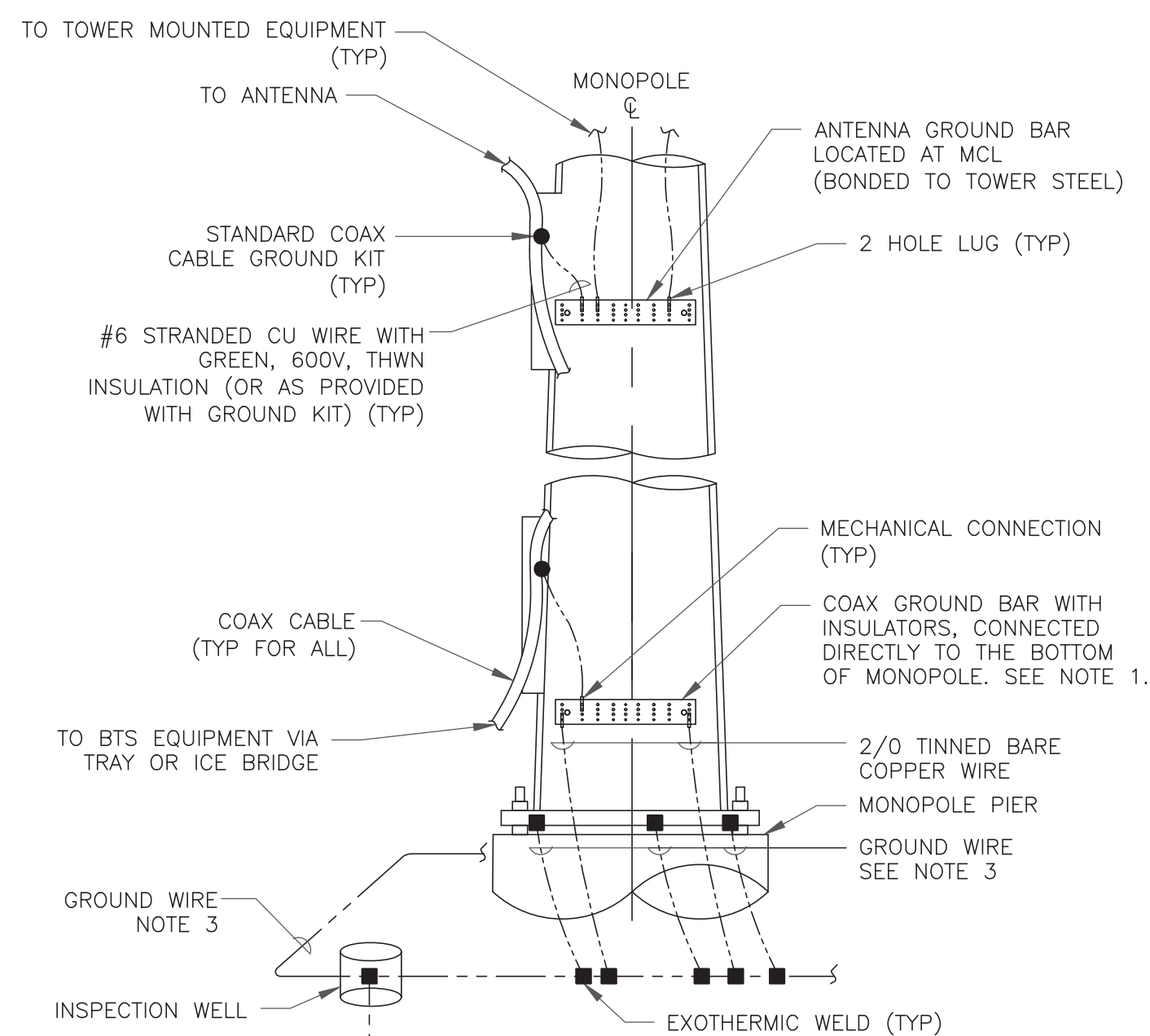
2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTES:

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

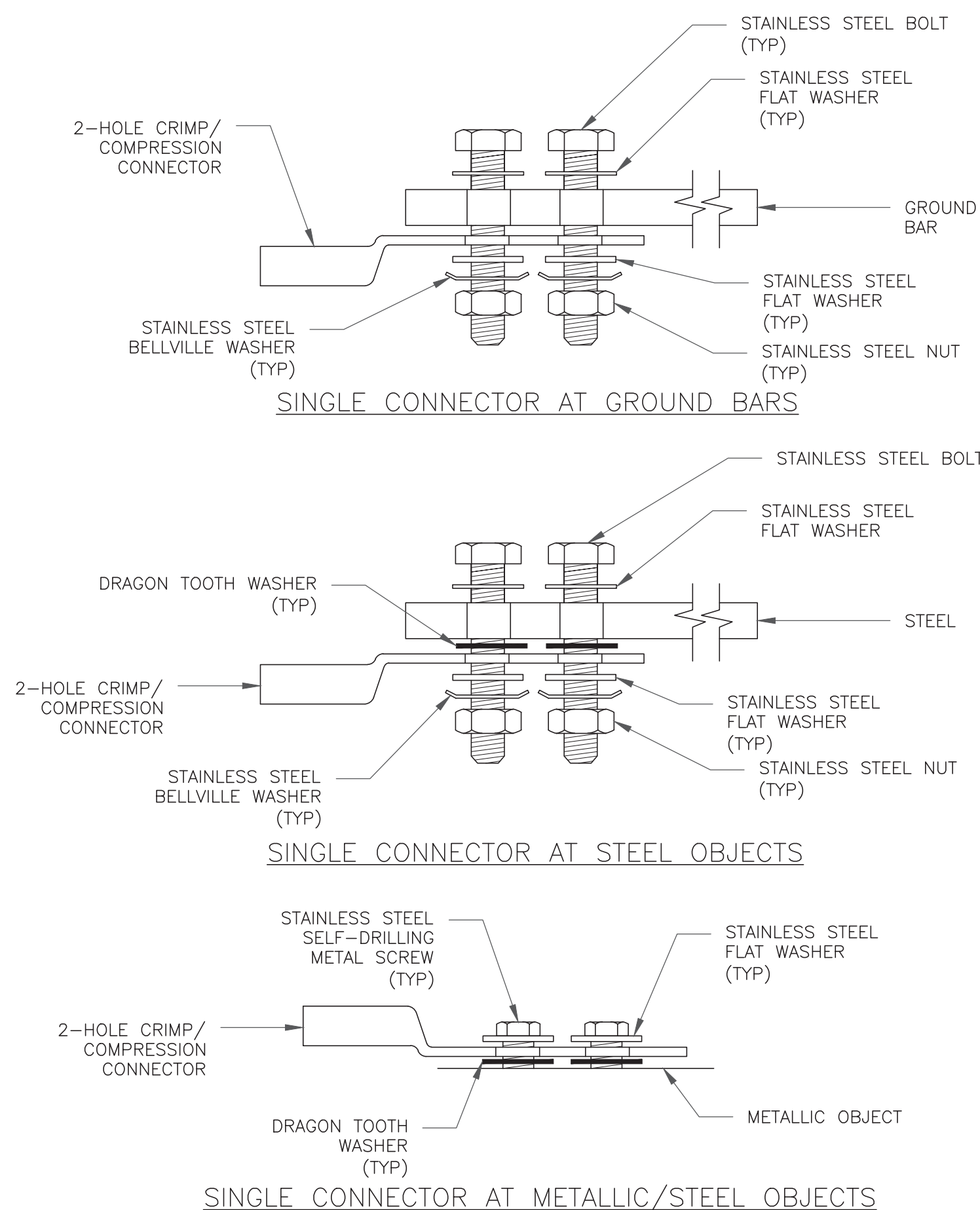
3 INSPECTION WELL DETAIL  
SCALE: NOT TO SCALE



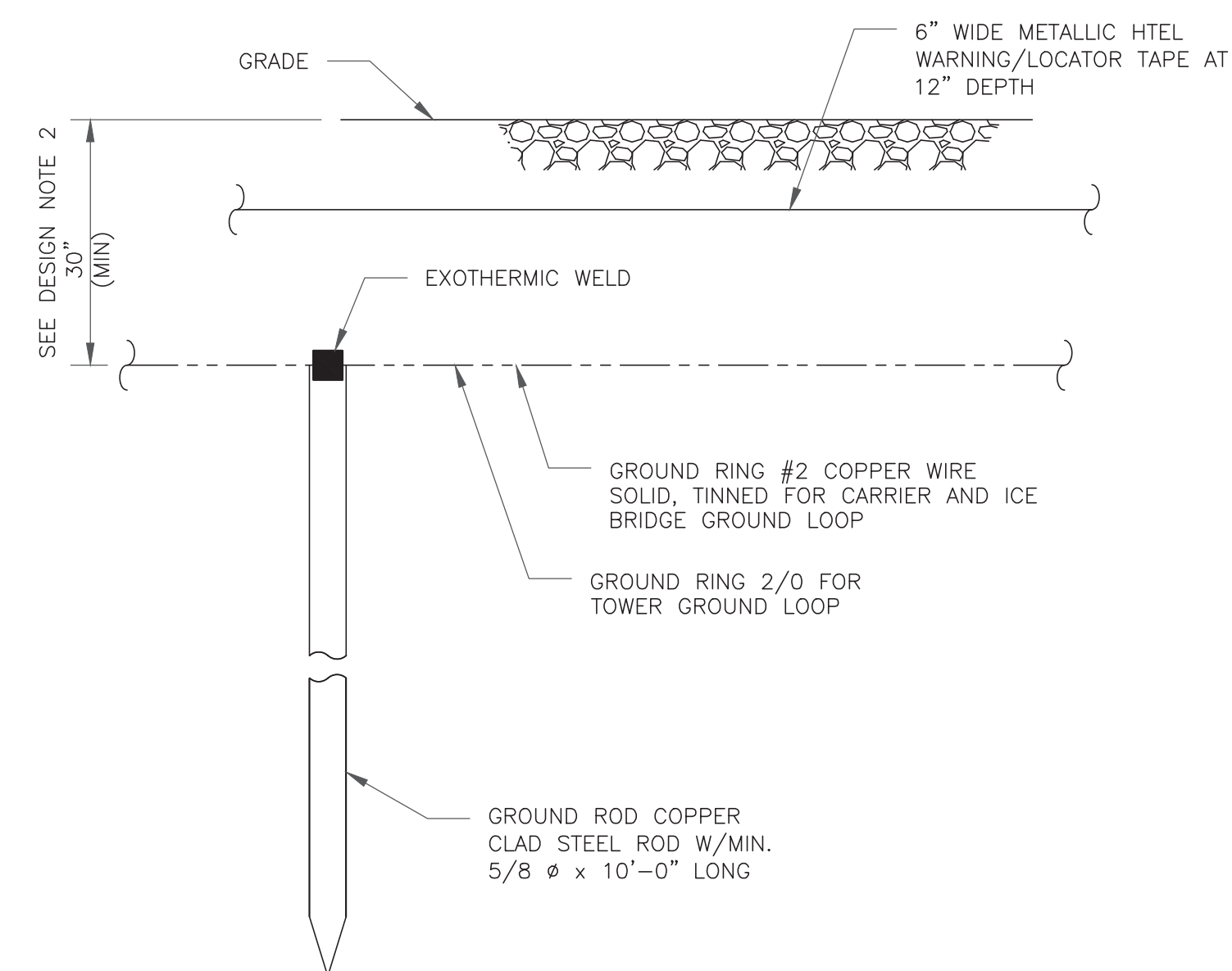
NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING  
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS  
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL  
SCALE: NOT TO SCALE

T-Mobile

4 SYLVAN WAY  
PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300  
CHARLOTTE, NC 28277

B+T GRP

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

T-MOBILE  
SITE NUMBER: CT11261C

BU #: 841301  
WILLINGTON-RIVER RD

426 RIVER ROAD  
WILLINGTON, CT 06279

EXISTING  
110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR



B&T ENGINEERING, INC.

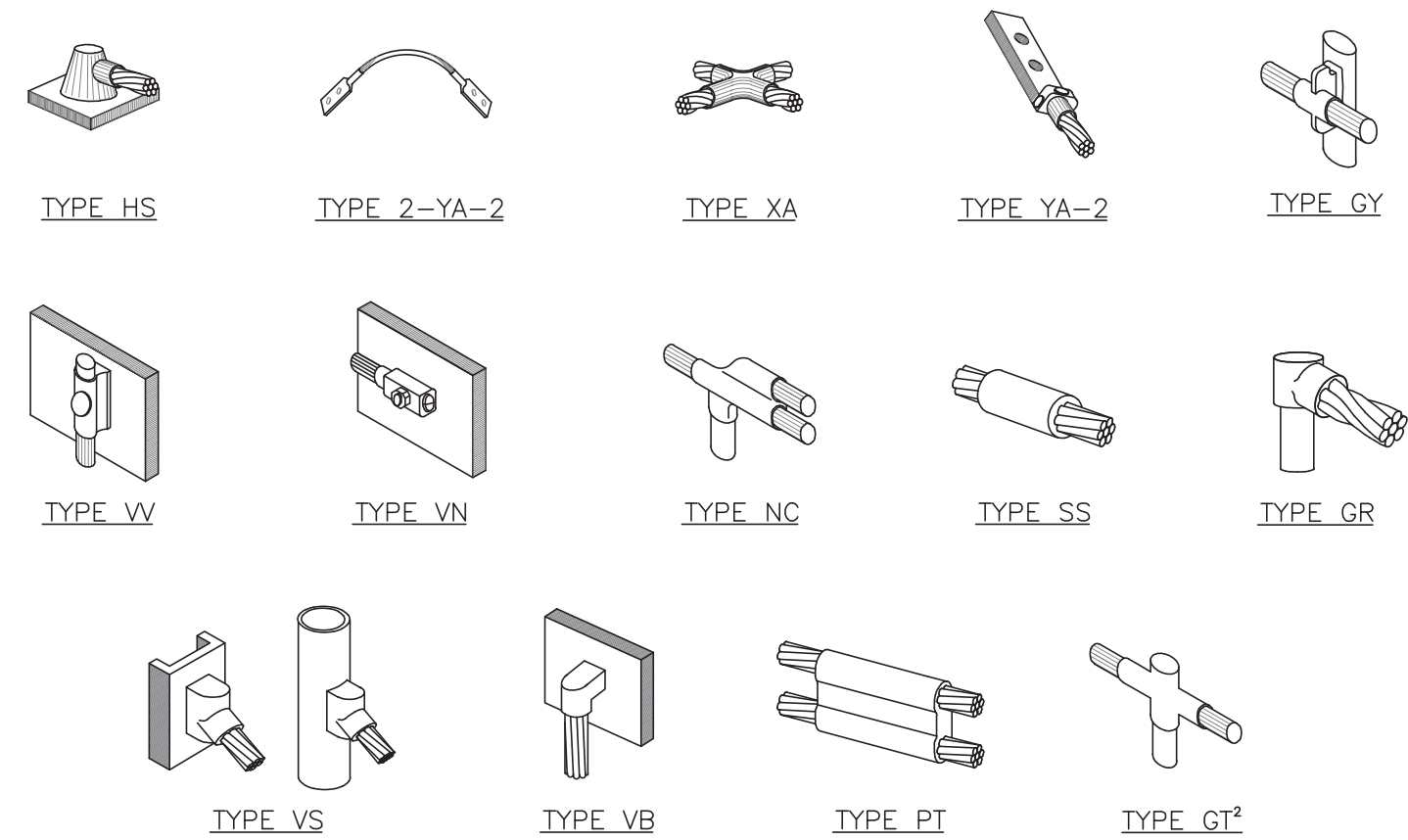
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER:

G-2

REVISION:

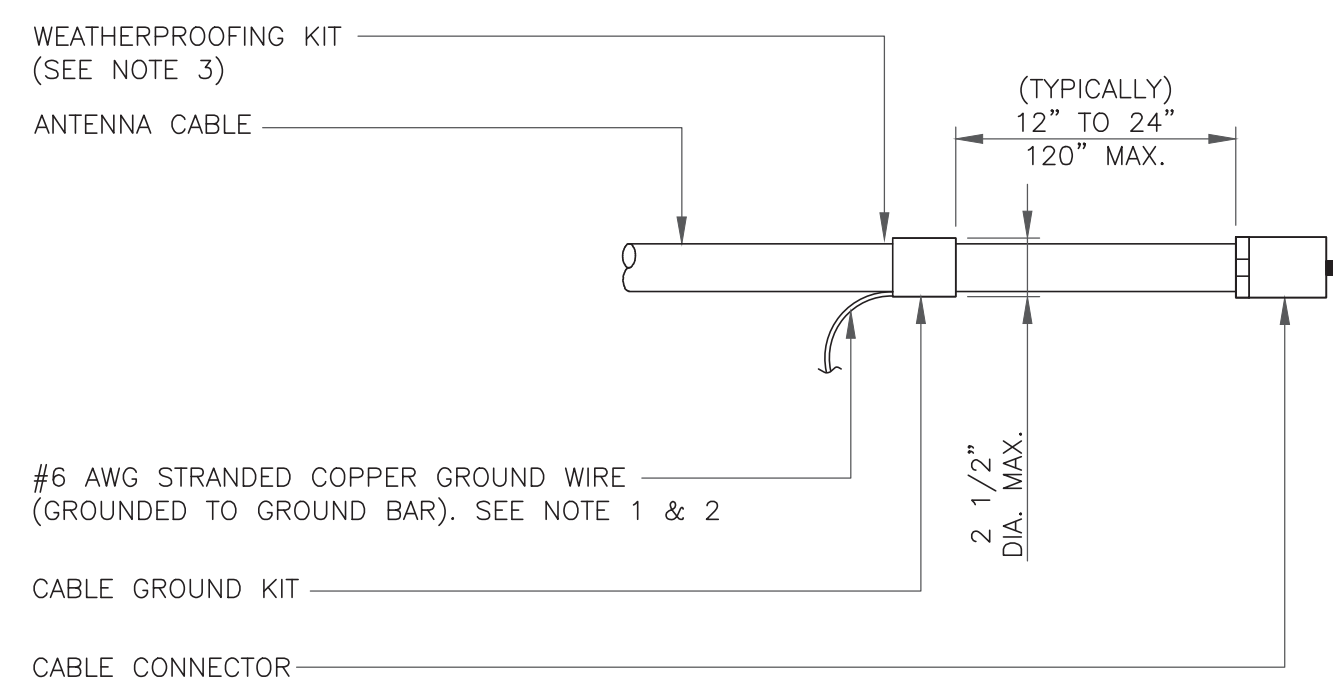
0



**NOTE:**

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

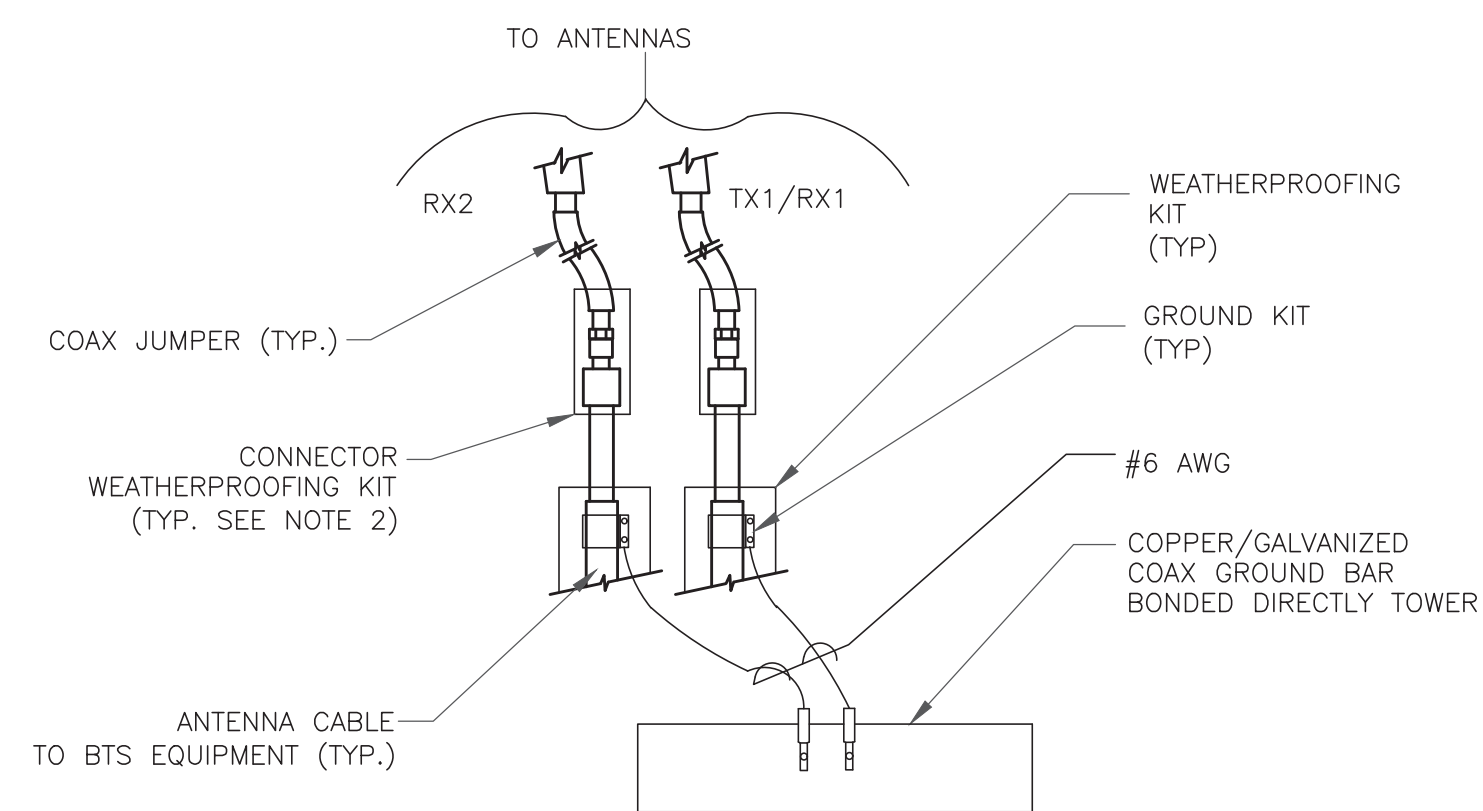
**1 CADWELD GROUNDING CONNECTIONS**  
SCALE: NOT TO SCALE



**NOTES:**

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

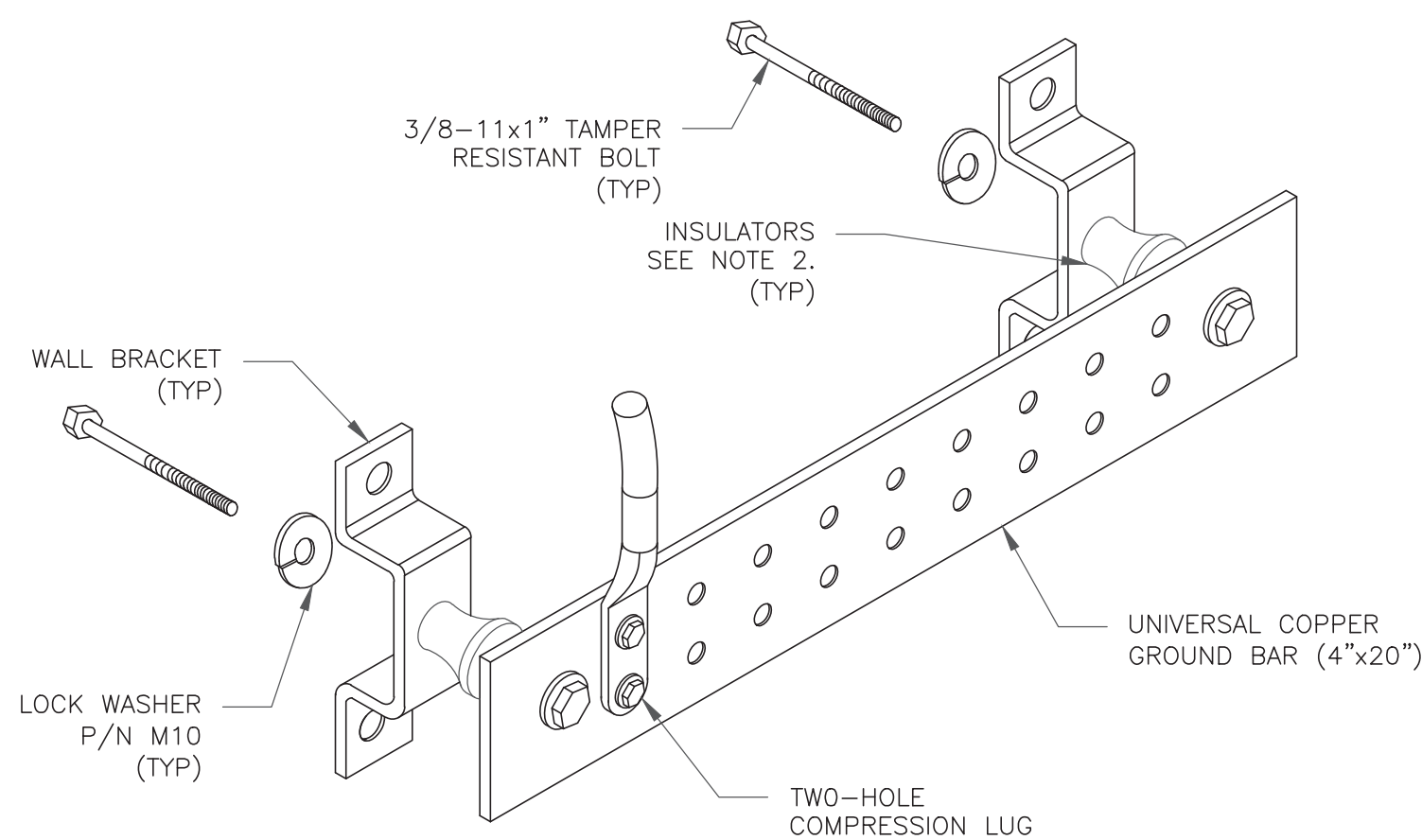
**3 CABLE GROUND KIT CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

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

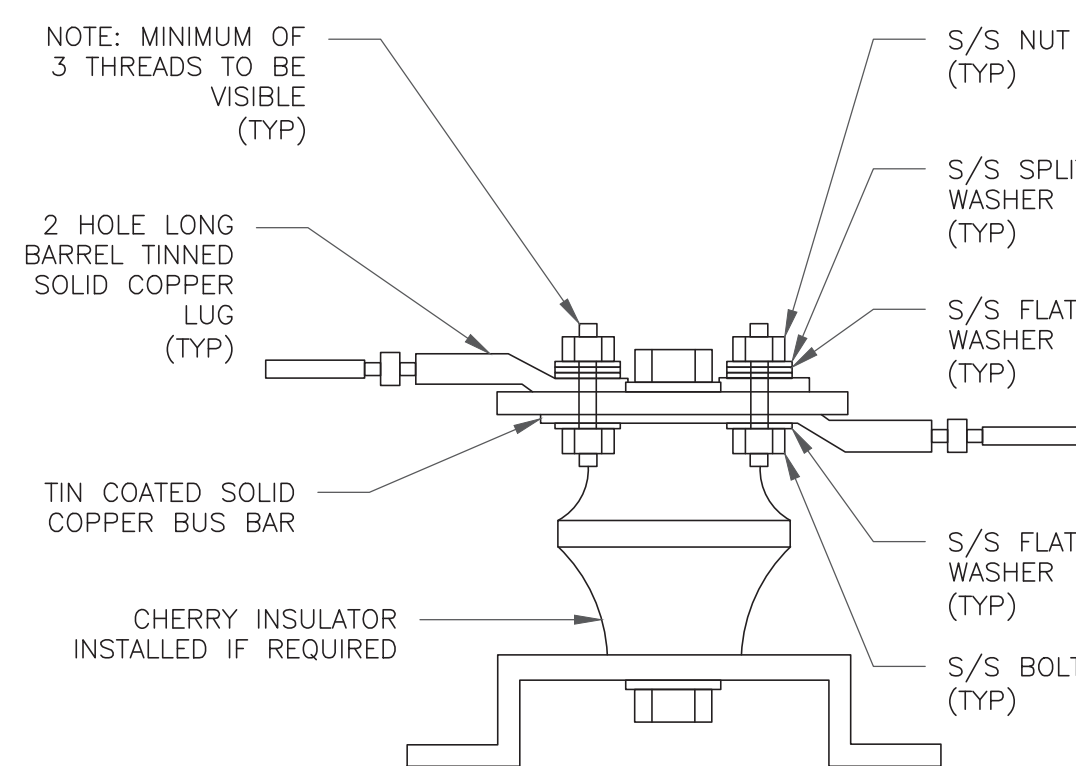
**4 GROUND CABLE CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

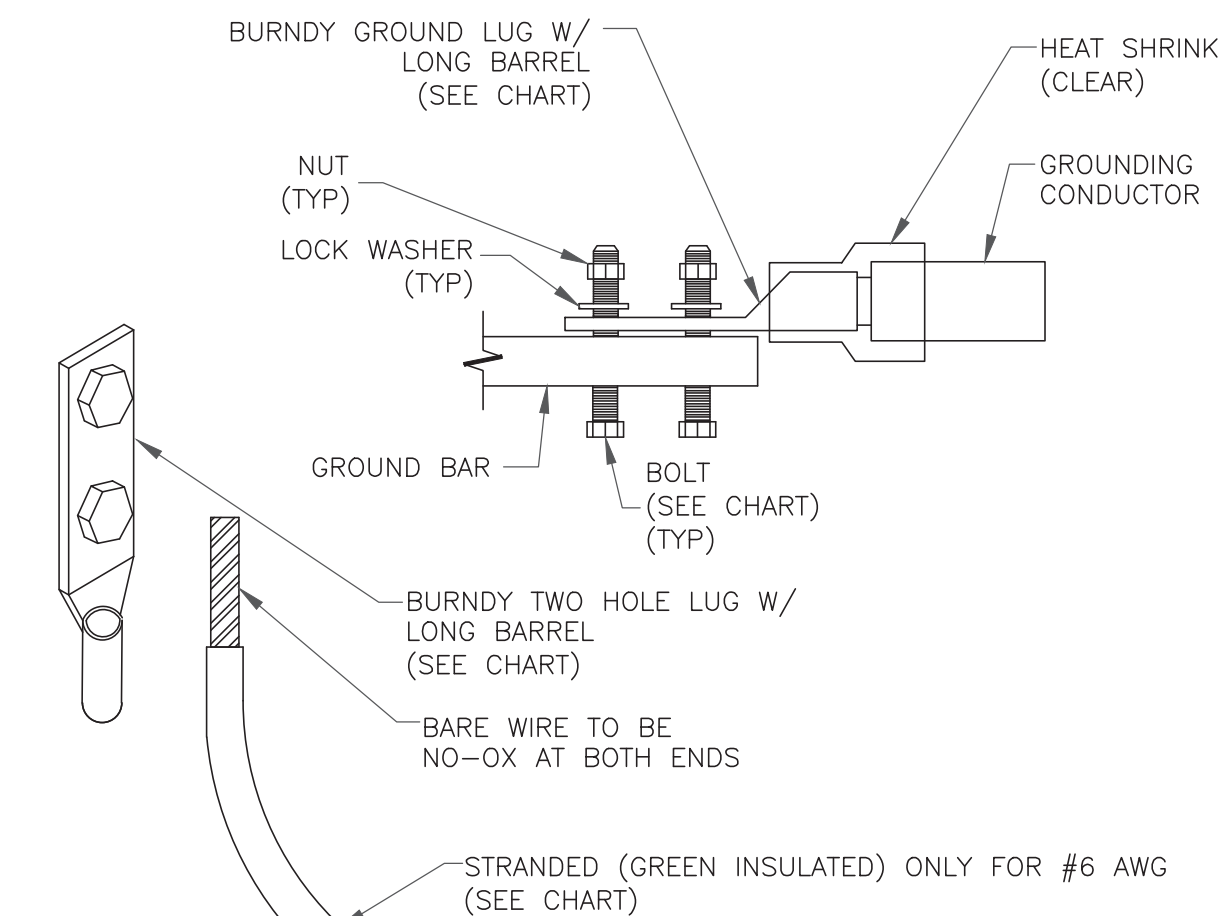
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION. CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR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

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



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

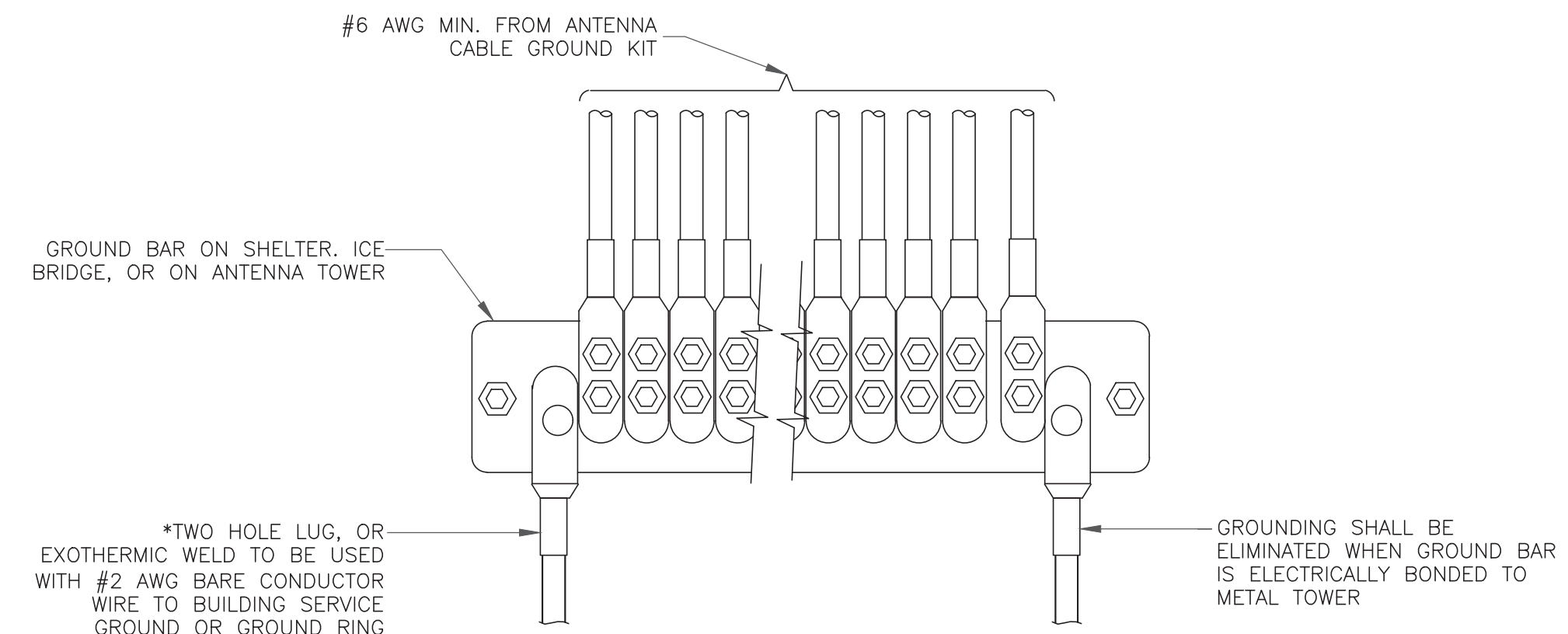
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



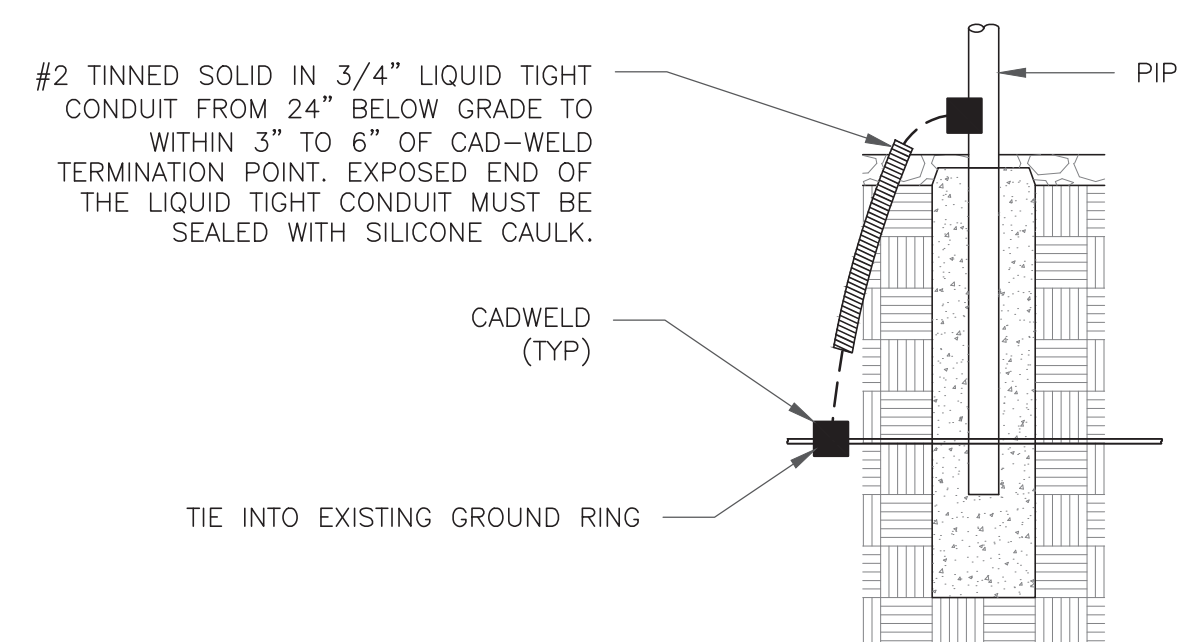
**NOTES:**

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

**2 MECHANICAL LUG CONNECTION**  
SCALE: NOT TO SCALE



**5 GROUNDWIRE INSTALLATION**  
SCALE: NOT TO SCALE



**8 TRANSITIONING GROUND DETAIL**  
SCALE: NOT TO SCALE

**T-Mobile**

4 SYLVAN WAY  
PARSIPPANY, NJ 07054

**CROWN CASTLE**

3530 TORINGDON WAY, SUITE 300  
CHARLOTTE, NC 28277

**B+T GRP**

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

T-MOBILE  
SITE NUMBER: CT11261C

BU #: 841301  
WILLINGTON-RIVER RD

426 RIVER ROAD  
WILLINGTON, CT 06279

EXISTING  
110'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	4/28/22	DAS	PRELIMINARY REVIEW	LR
0	5/11/22	DAS	CONSTRUCTION	LR



B&T ENGINEERING, INC.

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

SHEET NUMBER:

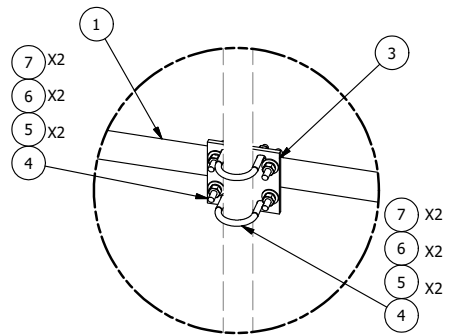
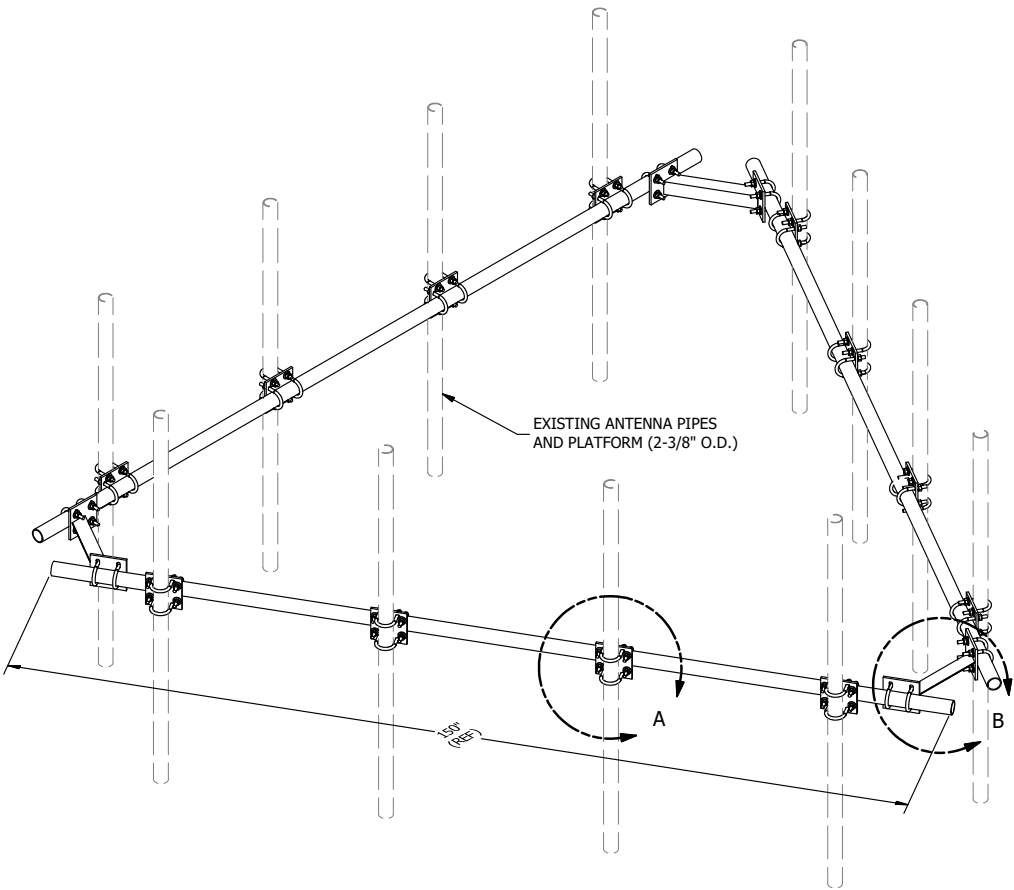
**G-3**

REVISION:

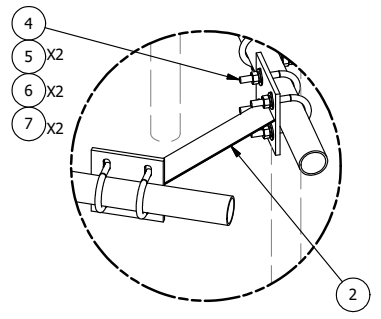
**0**



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	44.50
4	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	37.51
5	120	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.09
6	120	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
TOTAL WT. #						272.43



DETAIL A



DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP	CEK		7/10/2014
REVISION HISTORY				

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

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

DESCRIPTION			
<b>HANDRAIL KIT FOR 12'-6" FACE</b>			
CPD NO.	DRAWN BY	ENG. APPROVAL	
	KC8 5/30/2012		
CLASS	SUB	DRAWING USAGE	CHECKED BY
81	01	CUSTOMER	BMC 7/13/2014

 <b>A valmont COMPANY</b>	Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX	
	Engineering Support Team: 1-888-753-7446	
PART NO.	<b>HRK12</b>	PAGE 1 OF 1
DWG. NO.	<b>HRK12</b>	