



10 INDUSTRIAL AVE,
SUITE 3
MAHWAH NJ 07430

PHONE: 201.684.0055
FAX: 201.684.0066

January 24, 2019

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

Notice of Exempt Modification
Brendan Street, Stafford Springs, CT 06076
Latitude- 41.9644111100
Longitude- -72.3048750000

Dear Ms. Bachman,

T-Mobile currently maintains (6) existing antennas 125' level of the existing 129' monopole on Brendan Street in Stafford Springs, Connecticut. The tower is owned by Crown Castle. The property is owned by Tiziani LLC. T-Mobile now intends to remove the (6) existing antennas and add (12) new 600/700/1900/2100 MHz antennas. These antennas would be installed at the same 125' level of the tower. T-Mobile intends to replace the existing antenna mounts with a new low-profile antenna platform. The modification will also include the addition of (4) remote radio heads, the removal of (12) coax, and the addition of (4) hybrid cables.

The tower was originally approved by the Connecticut Siting Council through Docket No. 165. T-Mobile was also approved for modifications to the tower facility on January 22, 2016, which included an extension of the tower.

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 David Perkins, Zoning Enforcement Officer for the Town of Stafford, Mary Mitta, First Selectman of the Town of Stafford, as well as the tower owner and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2).

1. The proposed modification will not result in an increase in the height of the existing structure
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications 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 Communications Commission safety standard.
5. The proposed modification 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-referenced telecommunications facility constitute an exempt modification under R.C.S.A. 16-50j-72(b)(2).

Sincerely,

Kyle Richers

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
908-447-4716
krichers@transcendwireless.com

cc: Mary Mitta- as elected official
David Perkins- as zoning official
Crown Castle- as tower owner
Tiziani LLC- as property owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Thursday, January 24, 2019 12:19 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11528C CSC EO



You have a package coming.

Scheduled Delivery Date: Friday, 01/25/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From: TRANSCEND WIRELESS

Tracking Number: [1ZV257424298654807](#)

Ship To: Mary Mitta
Town of Stafford
1 Main Street
Second Floor
STAFFORD SPRINGS, CT 060761412
US

UPS Service: UPS GROUND

Number of Packages: 1

Scheduled Delivery: 01/25/2019

Signature Required: A signature is required for package delivery

Weight: 1.0 LBS

Reference Number 1: CT11528C CSC EO



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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Thursday, January 24, 2019 12:21 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11528C CSC ZO



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Shipment Details

From: TRANSCEND WIRELESS

Tracking Number: [1ZV257424298284814](#)

Ship To: David Perkins
Town of Stafford
1 Main Street
First Floor
STAFFORD SPRINGS, CT 060761412
US

UPS Service: UPS GROUND

Number of Packages: 1

Scheduled Delivery: 01/25/2019

Signature Required: A signature is required for package delivery

Weight: 1.0 LBS

Reference Number 1: CT11528C CSC ZO



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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Thursday, January 24, 2019 12:23 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11528C CSC TO



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Scheduled Delivery Date: Monday, 01/28/2019

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Shipment Details

From: TRANSCEND WIRELESS
Tracking Number: [1ZV257424297934828](#)
Ship To: Crown Castle
2000 Corporate Drive
CANONSBURG, PA 153178564
US
UPS Service: UPS GROUND
Number of Packages: 1
Scheduled Delivery: 01/28/2019
Signature Required: A signature is required for package delivery
Weight: 1.0 LBS
Reference Number 1: CT11528C CSC TO



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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Thursday, January 24, 2019 12:25 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11275C CSC PO



A signature is required for package delivery

You have a package coming.

Scheduled Delivery Date: Friday, 01/25/2019

[Sign Now](#)



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This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From: TRANSCEND WIRELESS
Tracking Number: [1ZV257424297604836](#)
Ship To: Tiziani LLC
1014 Buckley Hwy
UNION, CT 060764800
US

46 BRENDAN ST

Location 46 BRENDAN ST

Mblu 49 / 4 /

Acct# 00284400

Owner TIZIANI LLC

Assessment \$190,680

Appraisal \$272,400

PID 3247

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$18,400	\$254,000	\$272,400

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$12,880	\$177,800	\$190,680

Owner of Record

Owner TIZIANI LLC
Co-Owner C/O TIZIANI GLENN+PETER
Address 1014 BUCKLEY HWY
UNION, CT 06076

Sale Price \$0
Certificate 1
Book & Page 334/ 507
Sale Date 02/26/1996
Instrument

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
TIZIANI LLC	\$0	1	334/ 507		02/26/1996
TIZIANI GLENN+PETER	\$60,000	2	195/ 177	25	04/20/1982

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0
Building Percent Good:
Replacement Cost Less Depreciation: \$0

Building Attributes

Field	Description
Style	Vacant Ind
Model	
Grade:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Fireplaces	
Extra Openings	
Prefab Fpl(s)	
Attic Type	
Bsmt Type	
Bsmt Garage(s)	
Fin Bsmnt	
Fn. Bmt. Qual.	
Unfin Area	

Building Photo



(<http://images.vgsi.com/photos2/StaffordCTPhotos//\00\01\26\1>)

Building Layout

(<http://images.vgsi.com/photos2/StaffordCTPhotos//Sketches/32>)

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 300
Description Ind Land
Zone A
Neighborhood 502
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 14.5
Frontage
Depth
Assessed Value \$177,800
Appraised Value \$254,000

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN1	FENCE-4' CHAIN			1440 L.F.	\$600	1
SHD1	Shed	MS	Masonry	600 S.F.	\$4,800	1
SHD1	Shed	MS	Masonry	200 S.F.	\$1,600	1
SHD1	Shed	MS	Masonry	200 S.F.	\$1,600	1
PAV1	Paving Asphalt			10000 S.F.	\$9,800	1

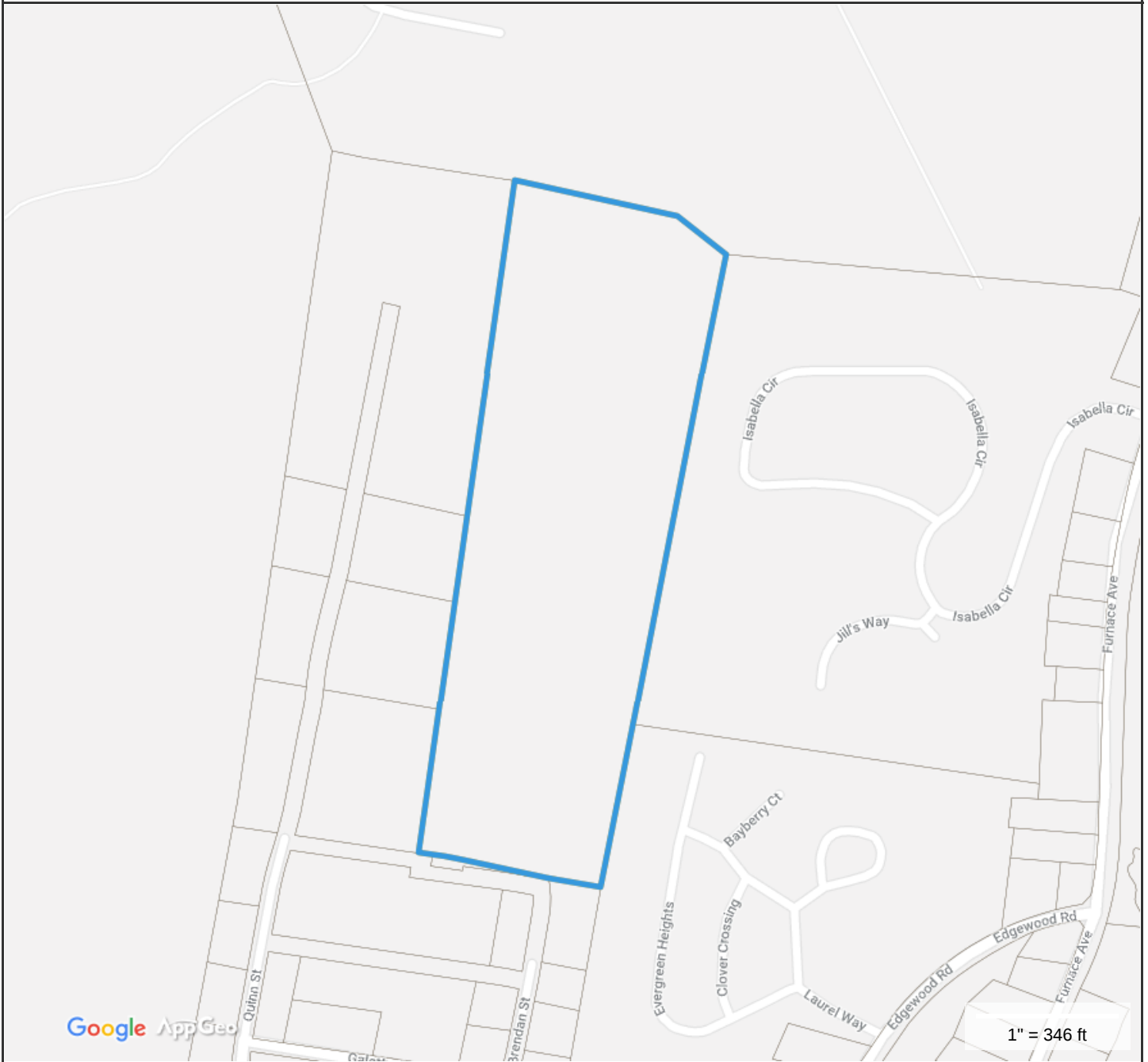
Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$18,400	\$254,000	\$272,400
2016	\$18,400	\$254,000	\$272,400
2014	\$5,400	\$254,000	\$259,400

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$12,880	\$177,800	\$190,680
2016	\$12,880	\$177,800	\$190,680
2014	\$3,780	\$177,800	\$181,580

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CT11528C



Property Information

Property ID 09013134-49/4
Location 46 BRENDAN ST
Owner TIZIANI LLC



**MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT**

CRCOG makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.



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

T-Mobile Existing Facility

Site ID: CT11528C

CT528/Crown Castle MP
46 Brendan Street
Stafford Springs, CT 06076

December 27, 2018

EBI Project Number: 6218007673

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	21.31 %



December 27, 2018

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11528C – CT528/Crown Castle MP**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **46 Brendan Street, Stafford Springs, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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) frequency band 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 **46 Brendan Street, Stafford Springs, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.
- 2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 5) 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.



- 6) 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.
- 7) The antennas used in this modeling are the **Ericsson AIR21 B2A/B4P & Ericsson AIR32 B2A/B66Aa** for 1900 MHz (PCS) and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. 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 manufactures supplied specifications, minus 10 dB for directional panel, 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.
- 8) The antenna mounting height centerline of the proposed antennas is **126 feet** above ground level (AGL).
- 9) 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.
- 10) 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	Sector:	D
Antenna #:	1	Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	126 feet	Height (AGL):	126 feet	Height (AGL):	126 feet	Height (AGL):	126 feet
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	1	Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	15	Total TX Power(W):	15	Total TX Power(W):	15	Total TX Power(W):	15
ERP (W):	583.57	ERP (W):	583.57	ERP (W):	583.57	ERP (W):	583.57
Antenna A1 MPE%	0.15	Antenna B1 MPE%	0.15	Antenna C1 MPE%	0.15	Antenna D1 MPE%	0.15
Antenna #:	2	Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	126 feet	Height (AGL):	126 feet	Height (AGL):	126 feet	Height (AGL):	126 feet
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	2	Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	80	Total TX Power(W):	80	Total TX Power(W):	80	Total TX Power(W):	80
ERP (W):	3,112.36	ERP (W):	3,112.36	ERP (W):	3,112.36	ERP (W):	3,112.36
Antenna A2 MPE%	0.78	Antenna B2 MPE%	0.78	Antenna C2 MPE%	0.78	Antenna D2 MPE%	0.78
Antenna #:	3	Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	126 feet	Height (AGL):	126 feet	Height (AGL):	126 feet	Height (AGL):	126 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	1.44	Antenna B3 MPE%	1.44	Antenna C3 MPE%	1.44	Antenna D3 MPE%	1.44

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	2.37 %
AT&T	5.70 %
Verizon Wireless	5.84 %
Sprint	6.24 %
Nextel	1.16 %
Site Total MPE %:	21.31 %

T-Mobile Sector A Total:	2.37 %
T-Mobile Sector B Total:	2.37 %
T-Mobile Sector C Total:	2.37 %
T-Mobile Sector D Total:	2.37 %
Site Total:	21.31 %



T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile_Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz GSM	1	583.57	126	1.46	PCS - 1900 MHz	1000.00	0.15%
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	126	7.77	PCS - 1900 MHz	1000.00	0.78%
T-Mobile 600 MHz LTE	2	788.97	126	3.93	600 MHz	400.00	0.98%
T-Mobile 700 MHz LTE	2	432.54	126	2.16	700 MHz	467.00	0.46%
						Total:	2.37%



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:	2.37 %
Sector B:	2.37 %
Sector C:	2.37 %
Sector D:	2.37 %
T-Mobile Maximum MPE % (Per Sector):	2.37 %
Site Total:	21.31 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **21.31%** 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.

Date: **November 30, 2018**

Chanhdara Ratsavong
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277



Black & Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-8145

Subject: **Structural Analysis Report**

Carrier Designation: **T-Mobile Co-Locate**
Carrier Site Number: CT11528C
Carrier Site Name: CT528

Crown Castle Designation: **Crown Castle BU Number:** 806365
Crown Castle Site Name: HRT 303 943203
Crown Castle JDE Job Number: 533750
Crown Castle Work Order Number: 1664273
Crown Castle Order Number: 460512 Rev. 0

Engineering Firm Designation: **Black & Veatch Corp. Project Number:** 400087

Site Data: **Brendon & Quinn Streets, Stafford, Tolland County, CT**
Latitude 41° 57' 51.2", Longitude -72° 18' 17.8"
129 Foot - Monopole Tower

Dear Chanhdara Ratsavong,

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:

LC4.7: Proposed Equipment Configuration

Sufficient Capacity

This analysis utilizes an ultimate 3-second gust wind speed of 124 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Keerati Pongrungsap/Changzhi Zang

Respectfully submitted by:

Ping Jiang, P.E.
Professional Engineer



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tnxTower Output

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1) INTRODUCTION

This tower is a 129 ft Monopole tower designed by Valmont.

This tower has been modified per reinforcement drawings prepared by Paul J. Ford in March of 2015. Reinforcement consists of the addition of transition stiffeners and flat plate reinforcement from 0.5' to 20.5' and 39' to 59'. Refer to Modification Inspection Report by FDH in June of 2015. This modification has been considered effective in this analysis.

This tower has been modified per reinforcement drawings prepared by Paul J. Ford in May of 2015. Reinforcement consists of the addition of a tower extension, anchor rods and brackets, and flat plate reinforcement from 0.5' to 40.5' and 54' to 94'. Refer to Modification Inspection Report by ETS in March of 2016. This modification has been considered effective in this analysis.

The tower has been proposed to modify as per the Modification design by Black & Veatch Company, in July of 2018. Reinforcement consists of addition of plate reinforcement at elevations 0' – 100.9'. All mentioned modifications are considered as effective and are considered in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	124 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
125.0	126.0	4	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	4	1 5/8
		4	ericsson	AIR 32 B2a/B66Aa w/ Mount Pipe		
		4	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		4	ericsson	RADIO 4449 B12/B71		
	125.0	1	site pro 1	F4P-12W 12' Fortress Quad Platform		
		1	site pro 1	F4P-HRK12 12'Hand Rail Kit		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
116.0	117.0	3	alcatel lucent	AWS4 (B66) 4X45 RRH	12 2	7/8 1 1/4
		3	alcatel lucent	B13 RRH 4X30		
		3	alcatel lucent	PCS B25 RRH4X30		
		2	rfs celwave	DB-B1-6C-12AB-0Z		
		6	andrew	LNX-8513DS-VTM w/ Mount Pipe		
		6	andrew	SBNH-1D8585C w/ Mount Pipe		
	116.0	1	cci tower mounts	Platform Mount [LP 602-1]		
105.0	107.5	1	cci tower mounts	Miscellaneous [NA 510-1]	1 3	7/8 1 1/4
	105.0	1	cci tower mounts	Platform Mount [LP 1201-1]		
	104.0	3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ		
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8X20-25		
		3	commscope	NNVV-65B-R4 w/ Mount Pipe		
3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe				
94.0	97.0	3	ericsson	RRUS 11	1 2 12 1	3/8 3/4 1 1/4 2"conduit
	95.0	3	communication components inc.	DTMABP7819VG12A		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP13519		
		6	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe		
		3	powerwave technologies	TT08-19DB111-001		
		2	raycap	DC6-48-60-18-8F		
	0	cci tower mounts	Side Arm Mount [SO 102-3]			
94.0	1	cci tower mounts	Platform Mount [LP 714-1]			
60.0	60.0	1	cci tower mounts	Side Arm Mount [SO 701-1]	1	1/2
		1	gps	GPS_A		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	262167	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Tower Engineering Professionals (Mapped)	2294383	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont Industries, Inc.	2046046	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	5577072	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	5664687	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Black & Veatch Corp.	7700293	CCISITES
4-POST-MODIFICATION INSPECTION	FDH Engineering, Inc.	5734218	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solution, PLLC.	6133277	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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.

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

3.2) Assumptions

- 1) Tower and structures were built and have been maintained in accordance with the manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 3) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. The existing/proposed loading on the structure is based on CAD level drawings and carrier orders provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

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
129 - 124	Pole	TP16x16x0.375	Pole	7.7%	Pass
124 - 119	Pole	TP16x16x0.375	Pole	24.5%	Pass
119 - 115.5	Pole	TP16x16x0.375	Pole	40.8%	Pass
115.5 - 115	Pole	TP17.81x16x0.375	Pole	35.4%	Pass
115 - 110	Pole	TP18.96x17.81x0.2188	Pole	50.7%	Pass
110 - 105	Pole	TP20.111x18.96x0.2188	Pole	67.2%	Pass
105 - 100	Pole	TP21.261x20.111x0.2188	Pole	85.8%	Pass
100 - 99	Pole	TP21.491x21.261x0.2188	Pole	89.2%	Pass
99 - 98.75	Pole + Reinf.	TP21.548x21.491x0.45	Reinf. 15 Tension Rupture	72.9%	Pass
98.75 - 93.75	Pole + Reinf.	TP22.699x21.548x0.4375	Reinf. 15 Tension Rupture	87.2%	Pass
93.75 - 92	Pole + Reinf.	TP23.101x22.699x0.4313	Reinf. 15 Tension Rupture	92.8%	Pass
92 - 91.75	Pole + Reinf.	TP23.159x23.101x0.6563	Reinf. 10 Tension Rupture	63.4%	Pass
91.75 - 86.75	Pole + Reinf.	TP24.309x23.159x0.6313	Reinf. 10 Tension Rupture	74.0%	Pass
86.75 - 81.75	Pole + Reinf.	TP25.46x24.309x0.6063	Reinf. 10 Tension Rupture	83.6%	Pass
81.75 - 78	Pole + Reinf.	TP27.3x25.46x0.5938	Reinf. 10 Tension Rupture	90.1%	Pass
78 - 72.75	Pole + Reinf.	TP27.091x25.885x0.75	Reinf. 15 Tension Rupture	79.3%	Pass
72.75 - 70.5	Pole + Reinf.	TP27.608x27.091x0.7375	Reinf. 15 Tension Rupture	81.9%	Pass
70.5 - 70.25	Pole + Reinf.	TP27.665x27.608x0.9	Reinf. 9 Tension Rupture	62.4%	Pass
70.25 - 66.25	Pole + Reinf.	TP28.584x27.665x0.875	Reinf. 9 Tension Rupture	65.9%	Pass
66.25 - 66	Pole + Reinf.	TP28.641x28.584x1.0375	Reinf. 9 Tension Rupture	61.7%	Pass
66 - 61	Pole + Reinf.	TP29.79x28.641x0.9875	Reinf. 9 Tension Rupture	65.5%	Pass
61 - 56.5	Pole + Reinf.	TP30.823x29.79x0.9625	Reinf. 9 Tension Rupture	68.7%	Pass
56.5 - 56.25	Pole + Reinf.	TP30.881x30.823x0.9625	Reinf. 3 Tension Rupture	68.9%	Pass
56.25 - 51.25	Pole + Reinf.	TP32.029x30.881x0.9375	Reinf. 3 Tension Rupture	72.2%	Pass
51.25 - 46.25	Pole + Reinf.	TP33.178x32.029x0.9125	Reinf. 3 Tension Rupture	75.2%	Pass
46.25 - 42	Pole + Reinf.	TP35.36x33.178x0.8875	Reinf. 3 Tension Rupture	77.6%	Pass
42 - 35.75	Pole + Reinf.	TP34.968x33.529x0.8125	Reinf. 6 Tension Rupture	82.5%	Pass
35.75 - 35	Pole + Reinf.	TP35.141x34.968x0.8125	Reinf. 6 Tension Rupture	82.9%	Pass
35 - 34.75	Pole + Reinf.	TP35.198x35.141x0.8125	Reinf. 6 Tension Rupture	83.0%	Pass
34.75 - 31.25	Pole + Reinf.	TP36.004x35.198x0.8	Reinf. 6 Tension Rupture	84.4%	Pass
31.25 - 31	Pole + Reinf.	TP36.062x36.004x0.8625	Reinf. 6 Tension Rupture	79.4%	Pass
31 - 26	Pole + Reinf.	TP37.213x36.062x0.8375	Reinf. 6 Tension Rupture	81.4%	Pass
26 - 22	Pole + Reinf.	TP38.134x37.213x0.825	Reinf. 6 Tension Rupture	82.8%	Pass
22 - 21.75	Pole + Reinf.	TP38.192x38.134x0.9375	Reinf. 6 Tension Rupture	78.4%	Pass
21.75 - 20.5	Pole + Reinf.	TP38.48x38.192x0.925	Reinf. 6 Tension Rupture	78.9%	Pass
20.5 - 20.25	Pole + Reinf.	TP38.537x38.48x0.925	Reinf. 5 Tension Rupture	79.0%	Pass

20.25 - 19	Pole + Reinf.	TP38.825x38.537x0.925	Reinf. 5 Tension Rupture	79.4%	Pass
19 - 18.75	Pole + Reinf.	TP38.883x38.825x0.875	Reinf. 5 Tension Rupture	79.8%	Pass
18.75 - 18	Pole + Reinf.	TP39.055x38.883x0.875	Reinf. 5 Tension Rupture	80.1%	Pass
18 - 17.75	Pole + Reinf.	TP39.113x39.055x1	Reinf. 2 Tension Rupture	71.1%	Pass
17.75 - 12.75	Pole + Reinf.	TP40.264x39.113x0.975	Reinf. 2 Tension Rupture	72.6%	Pass
12.75 - 7.75	Pole + Reinf.	TP41.415x40.264x0.95	Reinf. 2 Tension Rupture	74.1%	Pass
7.75 - 5.5	Pole + Reinf.	TP41.934x41.415x0.95	Reinf. 2 Tension Rupture	74.7%	Pass
5.5 - 5.25	Pole + Reinf.	TP41.991x41.934x1.2	Reinf. 4 Weldment	68.5%	Pass
5.25 - 4	Pole + Reinf.	TP42.279x41.991x1.2	Reinf. 2 Tension Rupture	59.6%	Pass
4 - 3.75	Pole + Reinf.	TP42.337x42.279x1.225	Reinf. 1 Weldment	69.7%	Pass
3.75 - 3	Pole + Reinf.	TP42.509x42.337x1.2	Reinf. 2 Tension Rupture	59.2%	Pass
3 - 2.75	Pole + Reinf.	TP42.567x42.509x1.05	Reinf. 1 Tension Yield	62.9%	Pass
2.75 - 0	Pole + Reinf.	TP43.2x42.567x1.05	Reinf. 1 Tension Yield	63.5%	Pass
				Summary	
			Pole	89.2%	Pass
			Reinforcement	92.8%	Pass
			Overall	92.8%	Pass

Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	89.1	Pass
	Additional Anchor Bracket		80.1	Pass
	Base Plate		51.4	Pass
	Base Foundation		87.0	Pass
	Base Foundation Soil Interaction		28.5	Pass

Structure Rating (max from all components) =	92.8%
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Notes:

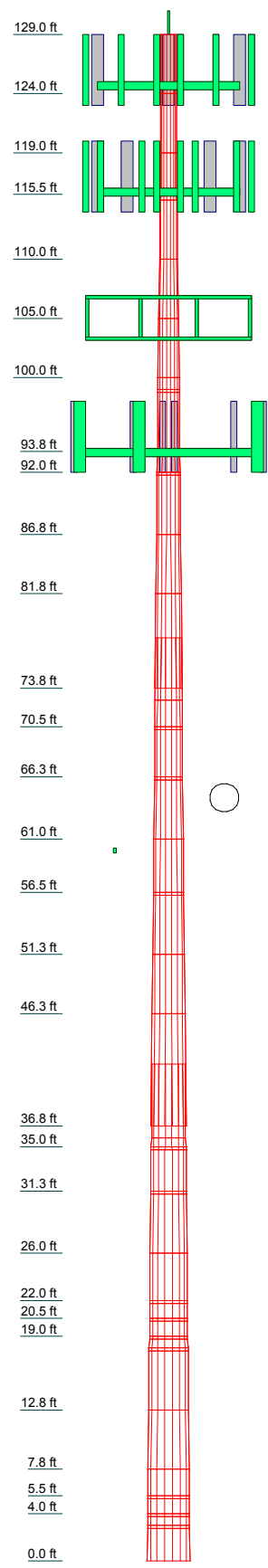
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed. Rating per TIA-222-H Section 15.5.

4.1) Recommendations

The tower and its base and anchor foundations have sufficient capacity to carry the proposed load configuration once the proposed modifications are installed.

APPENDIX A
TNXTOWER OUTPUT

Section	49-488-443	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1										
Length (ft)	2.7500	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000								
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12						
Thickness (in)	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500	1.0500							
Socket Length (ft)		4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500						
Top Dia (in)	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625	42.6625				
Bot Dia (in)	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	43.8000	
Grade																																																				
Weight (K)	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 124.00 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.00 mph basic wind with 1.70 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TIA-222-H Annex S

Black & Veatch Corp.
 6800 W. 115th Street, Suite 2292
 Overland Park, KS 66211
 Phone: (913) 458-8145
 FAX: (913) 458-8136

Job:	HRT 303 943203 (BU # 806365)		
Project:	400087 (806365.1664273)		
Client:	Crown Castle	Drawn by:	zan92313
Code:	TIA-222-H	Date:	11/30/18
Path:			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:

- 1) Tower is located in Tolland County, Connecticut.
- 2) Tower base elevation above sea level: 754.1500 ft.
- 3) Basic wind speed of 124.00 mph.
- 4) Risk Category II.
- 5) Exposure Category C.
- 6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 7) Topographic Category: 1.
- 8) Crest Height: 0.0000 ft.
- 9) Nominal ice thickness of 1.7000 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56.000 pcf.
- 12) A wind speed of 50.00 mph is used in combination with ice.
- 13) Temperature drop of 50.000 °F.
- 14) Deflections calculated using a wind speed of 60.00 mph.
- 15) A non-linear (P-delta) analysis was used.
- 16) Pressures are calculated at each section.
- 17) Stress ratio used in pole design is 1.05.
- 18) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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
 <li style="text-align: center;">Poles √ 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	129.0000-124.0000	5.0000	0.000	Round	16.0000	16.0000	0.3750		A53-B-35 (35 ksi)
L2	124.0000-119.0000	5.0000	0.000	Round	16.0000	16.0000	0.3750		A53-B-35 (35 ksi)
L3	119.0000-115.5000	3.5000	0.000	Round	16.0000	16.0000	0.3750		A53-B-35 (35 ksi)
L4	115.5000-115.0000	0.5000	0.000	Round	16.0000	17.8100	0.3750		A53-B-35 (35 ksi)
L5	115.0000-110.0000	5.0000	0.000	12	17.8100	18.9603	0.2188	0.8750	A572-65 (65 ksi)
L6	110.0000-105.0000	5.0000	0.000	12	18.9603	20.1106	0.2188	0.8750	A572-65 (65 ksi)
L7	105.0000-100.0000	5.0000	0.000	12	20.1106	21.2609	0.2188	0.8750	A572-65 (65 ksi)
L8	100.0000-99.0000	1.0000	0.000	12	21.2609	21.4910	0.2188	0.8750	A572-65 (65 ksi)
L9	99.0000-98.7500	0.2500	0.000	12	21.4910	21.5485	0.4500	1.8000	A572-65 (65 ksi)
L10	98.7500-93.7500	5.0000	0.000	12	21.5485	22.6988	0.4375	1.7500	A572-65 (65 ksi)
L11	93.7500-92.0000	1.7500	0.000	12	22.6988	23.1014	0.4313	1.7250	A572-65 (65 ksi)
L12	92.0000-91.7500	0.2500	0.000	12	23.1014	23.1589	0.6563	2.6250	A572-65 (65 ksi)
L13	91.7500-86.7500	5.0000	0.000	12	23.1589	24.3092	0.6312	2.5250	A572-65 (65 ksi)
L14	86.7500-81.7500	5.0000	0.000	12	24.3092	25.4595	0.6062	2.4250	A572-65 (65 ksi)
L15	81.7500-73.7500	8.0000	4.250	12	25.4595	27.3000	0.5938	2.3750	A572-65 (65 ksi)
L16	73.7500-72.7500	5.2500	0.000	12	25.8847	27.0907	0.7500	3.0000	A572-65 (65 ksi)
L17	72.7500-70.5000	2.2500	0.000	12	27.0907	27.6075	0.7375	2.9500	A572-65 (65 ksi)
L18	70.5000-70.2500	0.2500	0.000	12	27.6075	27.6649	0.9000	3.6000	A572-65 (65 ksi)
L19	70.2500-66.2500	4.0000	0.000	12	27.6649	28.5838	0.8750	3.5000	A572-65 (65 ksi)
L20	66.2500-66.0000	0.2500	0.000	12	28.5838	28.6412	1.0375	4.1500	A572-65 (65 ksi)
L21	66.0000-61.0000	5.0000	0.000	12	28.6412	29.7897	0.9875	3.9500	A572-65 (65 ksi)
L22	61.0000-56.5000	4.5000	0.000	12	29.7897	30.8234	0.9625	3.8500	A572-65 (65 ksi)
L23	56.5000-56.2500	0.2500	0.000	12	30.8234	30.8808	0.9625	3.8500	A572-65 (65 ksi)
L24	56.2500-51.2500	5.0000	0.000	12	30.8808	32.0293	0.9375	3.7500	A572-65 (65 ksi)
L25	51.2500-46.2500	5.0000	0.000	12	32.0293	33.1778	0.9125	3.6500	A572-65 (65 ksi)
L26	46.2500-36.7500	9.5000	5.250	12	33.1778	35.3600	0.8875	3.5500	A572-65 (65 ksi)
L27	36.7500-35.7500	6.2500	0.000	12	33.5291	34.9682	0.8125	3.2500	A572-65 (65 ksi)
L28	35.7500-35.0000	0.7500	0.000	12	34.9682	35.1409	0.8125	3.2500	A572-65 (65 ksi)
L29	35.0000-34.7500	0.2500	0.000	12	35.1409	35.1984	0.8125	3.2500	A572-65 (65 ksi)
L30	34.7500-31.2500	3.5000	0.000	12	35.1984	36.0044	0.8000	3.2000	A572-65 (65 ksi)
L31	31.2500-31.0000	0.2500	0.000	12	36.0044	36.0619	0.8625	3.4500	A572-65 (65 ksi)
L32	31.0000-26.0000	5.0000	0.000	12	36.0619	37.2132	0.8375	3.3500	A572-65 (65 ksi)
L33	26.0000-22.0000	4.0000	0.000	12	37.2132	38.1343	0.8250	3.3000	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	22.0000-21.7500	0.2500	0.000	12	38.1343	38.1918	0.9375	3.7500	A572-65 (65 ksi)
L35	21.7500-20.5000	1.2500	0.000	12	38.1918	38.4797	0.9250	3.7000	A572-65 (65 ksi)
L36	20.5000-20.2500	0.2500	0.000	12	38.4797	38.5372	0.9250	3.7000	A572-65 (65 ksi)
L37	20.2500-19.0000	1.2500	0.000	12	38.5372	38.8251	0.9250	3.7000	A572-65 (65 ksi)
L38	19.0000-18.7500	0.2500	0.000	12	38.8251	38.8826	0.8750	3.5000	A572-65 (65 ksi)
L39	18.7500-18.0000	0.7500	0.000	12	38.8826	39.0553	0.8750	3.5000	A572-65 (65 ksi)
L40	18.0000-17.7500	0.2500	0.000	12	39.0553	39.1129	1.0000	4.0000	A572-65 (65 ksi)
L41	17.7500-12.7500	5.0000	0.000	12	39.1129	40.2642	0.9750	3.9000	A572-65 (65 ksi)
L42	12.7500-7.7500	5.0000	0.000	12	40.2642	41.4155	0.9500	3.8000	A572-65 (65 ksi)
L43	7.7500-5.5000	2.2500	0.000	12	41.4155	41.9336	0.9500	3.8000	A572-65 (65 ksi)
L44	5.5000-5.2500	0.2500	0.000	12	41.9336	41.9911	1.2000	4.8000	A572-65 (65 ksi)
L45	5.2500-4.0000	1.2500	0.000	12	41.9911	42.2790	1.2000	4.8000	A572-65 (65 ksi)
L46	4.0000-3.7500	0.2500	0.000	12	42.2790	42.3365	1.2250	4.9000	A572-65 (65 ksi)
L47	3.7500-3.0000	0.7500	0.000	12	42.3365	42.5092	1.2000	4.8000	A572-65 (65 ksi)
L48	3.0000-2.7500	0.2500	0.000	12	42.5092	42.5668	1.0500	4.2000	A572-65 (65 ksi)
L49	2.7500-0.0000	2.7500		12	42.5668	43.2000	1.0500	4.2000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
L2	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
L3	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
L4	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
L5	17.8100	20.5401	780.8325	6.1656	8.9050	87.6847	1561.6650	10.2639	0.0000	0
L6	18.3611	12.3908	489.4181	6.2977	9.2256	53.0501	991.6937	6.0984	4.1868	19.14
L7	19.5520	13.2011	591.8431	6.7095	9.8214	60.2603	1199.2346	6.4972	4.4951	20.549
L8	20.7429	14.0113	707.6456	7.1213	10.4173	67.9299	1433.8818	6.8959	4.8034	21.958
L9	21.9337	14.8216	837.6465	7.5331	11.0132	76.0588	1697.2989	7.2947	5.1117	23.368
L10	22.1719	14.9836	865.4228	7.6155	11.1323	77.7396	1753.5811	7.3745	5.1733	23.65
L11	22.0903	30.4884	1722.8663	7.5327	11.1323	154.7625	3490.9943	15.0054	4.5536	10.119
L12	22.1499	30.5717	1737.0333	7.5533	11.1621	155.6186	3519.7004	15.0465	4.5690	10.153
L13	22.1543	29.7401	1691.7857	7.5577	11.1621	151.5650	3428.0166	14.6372	4.6025	10.52
L14	23.3452	31.3606	1983.6760	7.9695	11.7580	168.7090	4019.4654	15.4347	4.9108	11.225
L15	23.3474	30.9213	1956.9851	7.9718	11.7580	166.4390	3965.3825	15.2185	4.9275	11.426
L16	23.7642	31.4803	2065.0652	8.1159	11.9665	172.5702	4184.3819	15.4937	5.0354	11.676
L17	23.6848	47.4294	3049.8489	8.0354	11.9665	254.8651	6179.8207	23.3433	4.4324	6.754
L18	23.7444	47.5509	3073.3545	8.0560	11.9963	256.1916	6227.4495	23.4031	4.4478	6.778
L19	23.7532	45.7903	2966.1384	8.0649	11.9963	247.2541	6010.2005	22.5366	4.5148	7.152
L20	24.9441	48.1284	3444.1034	8.4767	12.5922	273.5115	6978.6872	23.6873	4.8231	7.641
L21	24.9529	46.2711	3318.1915	8.4857	12.5922	263.5122	6723.5555	22.7733	4.8901	8.066
L22	26.1438	48.5167	3825.1100	8.8975	13.1880	290.0441	7750.7100	23.8784	5.1984	8.575

<i>Tower Elevation</i>	<i>Gusset Area (per face)</i>	<i>Gusset Thickness</i>	<i>Gusset Grade</i>	<i>Adjust. Factor A_f</i>	<i>Adjust. Factor A_r</i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals in</i>	<i>Double Angle Stitch Bolt Spacing Horizontals in</i>	<i>Double Angle Stitch Bolt Spacing Redundants in</i>
<i>ft</i>	<i>ft²</i>	<i>in</i>							
L1 129.0000-124.0000				1	1	1			
L2 124.0000-119.0000				1	1	1			
L3 119.0000-115.5000				1	1	1			
L4 115.5000-115.0000				1	1	1			
L5 115.0000-110.0000				1	1	1			
L6 110.0000-105.0000				1	1	1			
L7 105.0000-100.0000				1	1	1			
L8 100.0000-99.0000				1	1	1			
L9 99.0000-98.7500				1	1	0.933657			
L10 98.7500-93.7500				1	1	0.936007			
L11 93.7500-92.0000				1	1	0.941455			
L12 92.0000-91.7500				1	1	0.90844			
L13 91.7500-86.7500				1	1	0.914375			
L14 86.7500-81.7500				1	1	0.923758			
L15 81.7500-73.7500				1	1	0.923474			
L16 73.7500-72.7500				1	1	0.919481			
L17 72.7500-70.5000				1	1	0.924795			
L18 70.5000-70.2500				1	1	0.901944			
L19 70.2500-66.2500				1	1	0.907957			
L20 66.2500-66.0000				1	1	1.00005			
L21 66.0000-61.0000				1	1	1.01959			
L22 61.0000-56.5000				1	1	1.02022			
L23 56.5000-56.2500				1	1	1.01889			
L24 56.2500-51.2500				1	1	1.01889			
L25 51.2500-46.2500				1	1	1.02092			
L26 46.2500-36.7500				1	1	1.02842			
L27 36.7500-35.7500				1	1	0.978759			
L28 35.7500-35.0000				1	1	0.976157			
L29 35.0000-34.7500				1	1	0.975295			
L30 34.7500-31.2500				1	1	0.978237			
L31 31.2500-31.0000				1	1	1.01703			
L32 31.0000-26.0000				1	1	1.02769			
L33 26.0000-22.0000				1	1	1.02838			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L34 22.0000-21.7500				1	1	0.979278			
L35 21.7500-20.5000				1	1	0.987682			
L36 20.5000-20.2500				1	1	0.98679			
L37 20.2500-19.0000				1	1	0.982375			
L38 19.0000-18.7500				1	1	0.960239			
L39 18.7500-18.0000				1	1	0.957834			
L40 18.0000-17.7500				1	1	0.987036			
L41 17.7500-12.7500				1	1	0.993306			
L42 12.7500-7.7500				1	1	1.00104			
L43 7.7500-5.5000				1	1	0.993377			
L44 5.5000-5.2500				1	1	0.93353			
L45 5.2500-4.0000				1	1	0.929179			
L46 4.0000-3.7500				1	1	0.898345			
L47 3.7500-3.0000				1	1	0.913978			
L48 3.0000-2.7500				1	1	0.911401			
L49 2.7500-0.0000				1	1	0.903075			

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 klf
Safety Line 3/8	C	No	Surface Af (CaAa)	129.0000 - 0.0000	1	1	-0.260 -0.250	0.0000	0.7500	0.000

HCS 6X12 4AWG(1-5/8)	C	No	Surface Af (CaAa)	125.0000 - 0.0000	4	4	-0.106 0.106	0.0000	3.3200	0.002

1stMod										
CCI-AFP-060100	A	No	Surface Af (CaAa)	20.5000 - 0.5000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	B	No	Surface Af (CaAa)	20.5000 - 0.5000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	C	No	Surface Af (CaAa)	20.5000 - 0.5000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	A	No	Surface Af (CaAa)	59.0000 - 39.0000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	B	No	Surface Af (CaAa)	59.0000 - 39.0000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	C	No	Surface Af (CaAa)	59.0000 - 39.0000	1	1	0.000 0.000	6.0000	14.0000	0.000
2ndMod										
CCI-AFP-065125	A	No	Surface Af (CaAa)	25.5000 - 0.5000	1	1	0.000 0.000	6.5000	15.5000	0.000
CCI-AFP-065125	A	No	Surface Af (CaAa)	40.5833 - 15.5833	1	1	0.000 0.000	6.5000	15.5000	0.000

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 klf
CCI-AFP-065125	B	No	Surface Af (CaAa)	40.5833 - 0.5000	1	1	0.000 0.000	6.5000	15.5000	0.000
CCI-AFP-065125	C	No	Surface Af (CaAa)	40.5833 - 0.5000	1	1	0.000 0.000	6.5000	15.5000	0.000
CCI-AFP-060100	A	No	Surface Af (CaAa)	74.0000 - 54.0000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	B	No	Surface Af (CaAa)	74.0000 - 54.0000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-060100	C	No	Surface Af (CaAa)	74.0000 - 54.0000	1	1	0.000 0.000	6.0000	14.0000	0.000
CCI-AFP-045100	A	No	Surface Af (CaAa)	94.0833 - 74.0833	1	1	0.000 0.000	4.5000	11.0000	0.000
CCI-AFP-045100	B	No	Surface Af (CaAa)	94.0833 - 74.0833	1	1	0.000 0.000	4.5000	11.0000	0.000
CCI-AFP-045100	C	No	Surface Af (CaAa)	94.0833 - 74.0833	1	1	0.000 0.000	4.5000	11.0000	0.000
3rdMod										
CCI-WSFP-085125	A	No	Surface Af (CaAa)	35.0000 - 0.0000	1	1	0.000 0.000	8.5000	19.5000	0.000
CCI-WSFP-085125	B	No	Surface Af (CaAa)	35.0000 - 0.0000	1	1	0.000 0.000	8.5000	19.5000	0.000
CCI-WSFP-085125	C	No	Surface Af (CaAa)	35.0000 - 0.0000	1	1	0.000 0.000	8.5000	19.5000	0.000
CCI-SFP-085125	A	No	Surface Af (CaAa)	70.0833 - 35.0833	1	1	0.000 0.000	8.5000	19.5000	0.000
CCI-SFP-085125	B	No	Surface Af (CaAa)	70.0833 - 35.0833	1	1	0.000 0.000	8.5000	19.5000	0.000
CCI-SFP-065125	A	No	Surface Af (CaAa)	70.6667 - 40.6667	1	1	0.000 0.000	6.5000	15.5000	0.000
CCI-SFP-065125	B	No	Surface Af (CaAa)	70.6667 - 40.6667	1	1	0.000 0.000	6.5000	15.5000	0.000
CCI-SFP-065125	C	No	Surface Af (CaAa)	70.6667 - 40.6667	1	1	0.000 0.000	6.5000	15.5000	0.000
CCI-SFP-045100	A	No	Surface Af (CaAa)	100.7500 - 70.7500	1	1	0.000 0.000	4.5000	11.0000	0.000
CCI-SFP-045100	B	No	Surface Af (CaAa)	100.7500 - 70.7500	1	1	0.000 0.000	4.5000	11.0000	0.000
CCI-SFP-045100	C	No	Surface Af (CaAa)	100.7500 - 70.7500	1	1	0.000 0.000	4.5000	11.0000	0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight klf

LDF5-50A(7/8)	C	No	No	Inside Pole	116.0000 - 0.0000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.000 0.000 0.000 0.000
HB114-1-05U3-S3J(1-1/4)	C	No	No	Inside Pole	116.0000 - 0.0000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.001 0.001 0.001 0.001

HB114-08U3M12-XXXF(7/8)	C	No	No	Inside Pole	105.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.001 0.001 0.001 0.001
HB114-1-08U4-M5F(1-1/4)	C	No	No	Inside Pole	105.0000 - 0.0000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.001 0.001 0.001 0.001

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight klf

LDF6-50A(1-1/4)	C	No	No	Inside Pole	94.0000 - 0.0000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.001 0.001 0.001 0.001
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	94.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.000 0.000 0.000 0.000
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	94.0000 - 0.0000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.001 0.001 0.001 0.001
2" innerduct conduit	C	No	No	Inside Pole	94.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.000 0.000 0.000 0.000

FLC 12-50J(1/2)	C	No	No	Inside Pole	60.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.000 0.000 0.000 0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	129.0000-124.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.011
L2	124.0000-119.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.049
L3	119.0000-115.5000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.037
L4	115.5000-115.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.008
L5	115.0000-110.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.078
L6	110.0000-105.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.078
L7	105.0000-100.0000	A	0.000	0.000	0.563	0.000	0.000
		B	0.000	0.000	0.563	0.000	0.000
		C	0.000	0.000	0.563	0.000	0.101
L8	100.0000-99.0000	A	0.000	0.000	0.750	0.000	0.000
		B	0.000	0.000	0.750	0.000	0.000
		C	0.000	0.000	0.750	0.000	0.020
L9	99.0000-98.7500	A	0.000	0.000	0.188	0.000	0.000
		B	0.000	0.000	0.188	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.005
L10	98.7500-93.7500	A	0.000	0.000	4.000	0.000	0.000
		B	0.000	0.000	4.000	0.000	0.000
		C	0.000	0.000	4.000	0.000	0.103
L11	93.7500-92.0000	A	0.000	0.000	2.625	0.000	0.000
		B	0.000	0.000	2.625	0.000	0.000

Tower Section	Tower Elevation ft	Face	A_R	A_F	C_{AA}	C_{AA}	Weight K
			ft ²	ft ²	In Face ft ²	Out Face ft ²	
L12	92.0000-91.7500	C	0.000	0.000	2.625	0.000	0.050
		A	0.000	0.000	0.375	0.000	0.000
		B	0.000	0.000	0.375	0.000	0.000
L13	91.7500-86.7500	C	0.000	0.000	0.375	0.000	0.007
		A	0.000	0.000	7.500	0.000	0.000
		B	0.000	0.000	7.500	0.000	0.000
L14	86.7500-81.7500	C	0.000	0.000	7.500	0.000	0.144
		A	0.000	0.000	7.500	0.000	0.000
		B	0.000	0.000	7.500	0.000	0.000
L15	81.7500-73.7500	C	0.000	0.000	7.500	0.000	0.144
		A	0.000	0.000	12.000	0.000	0.000
		B	0.000	0.000	12.000	0.000	0.000
L16	73.7500-72.7500	C	0.000	0.000	12.000	0.000	0.230
		A	0.000	0.000	1.750	0.000	0.000
		B	0.000	0.000	1.750	0.000	0.000
L17	72.7500-70.5000	C	0.000	0.000	1.750	0.000	0.029
		A	0.000	0.000	3.931	0.000	0.000
		B	0.000	0.000	3.931	0.000	0.000
L18	70.5000-70.2500	C	0.000	0.000	3.931	0.000	0.065
		A	0.000	0.000	0.521	0.000	0.000
		B	0.000	0.000	0.521	0.000	0.000
L19	70.2500-66.2500	C	0.000	0.000	0.521	0.000	0.007
		A	0.000	0.000	13.764	0.000	0.000
		B	0.000	0.000	13.764	0.000	0.000
L20	66.2500-66.0000	C	0.000	0.000	8.333	0.000	0.115
		A	0.000	0.000	0.875	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L21	66.0000-61.0000	C	0.000	0.000	0.521	0.000	0.007
		A	0.000	0.000	17.500	0.000	0.000
		B	0.000	0.000	17.500	0.000	0.000
L22	61.0000-56.5000	C	0.000	0.000	10.417	0.000	0.144
		A	0.000	0.000	18.250	0.000	0.000
		B	0.000	0.000	18.250	0.000	0.000
L23	56.5000-56.2500	C	0.000	0.000	11.875	0.000	0.130
		A	0.000	0.000	1.125	0.000	0.000
		B	0.000	0.000	1.125	0.000	0.000
L24	56.2500-51.2500	C	0.000	0.000	0.771	0.000	0.007
		A	0.000	0.000	19.750	0.000	0.000
		B	0.000	0.000	19.750	0.000	0.000
L25	51.2500-46.2500	C	0.000	0.000	12.667	0.000	0.145
		A	0.000	0.000	17.500	0.000	0.000
		B	0.000	0.000	17.500	0.000	0.000
L26	46.2500-36.7500	C	0.000	0.000	10.417	0.000	0.145
		A	0.000	0.000	30.910	0.000	0.000
		B	0.000	0.000	30.910	0.000	0.000
L27	36.7500-35.7500	C	0.000	0.000	17.451	0.000	0.275
		A	0.000	0.000	2.500	0.000	0.000
		B	0.000	0.000	2.500	0.000	0.000
L28	35.7500-35.0000	C	0.000	0.000	1.083	0.000	0.029
		A	0.000	0.000	1.757	0.000	0.000
		B	0.000	0.000	1.757	0.000	0.000
L29	35.0000-34.7500	C	0.000	0.000	0.813	0.000	0.022
		A	0.000	0.000	0.625	0.000	0.000
		B	0.000	0.000	0.625	0.000	0.000
L30	34.7500-31.2500	C	0.000	0.000	0.625	0.000	0.007
		A	0.000	0.000	8.750	0.000	0.000
		B	0.000	0.000	8.750	0.000	0.000
L31	31.2500-31.0000	C	0.000	0.000	8.750	0.000	0.101
		A	0.000	0.000	0.625	0.000	0.000
		B	0.000	0.000	0.625	0.000	0.000
L32	31.0000-26.0000	C	0.000	0.000	0.625	0.000	0.007
		A	0.000	0.000	12.500	0.000	0.000
		B	0.000	0.000	12.500	0.000	0.000
L33	26.0000-22.0000	C	0.000	0.000	12.500	0.000	0.145
		A	0.000	0.000	13.792	0.000	0.000
		B	0.000	0.000	10.000	0.000	0.000
L34	22.0000-21.7500	C	0.000	0.000	10.000	0.000	0.116
		A	0.000	0.000	0.896	0.000	0.000
		B	0.000	0.000	0.625	0.000	0.000

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L35	21.7500-20.5000	C	0.000	0.000	0.625	0.000	0.007
		A	0.000	0.000	4.479	0.000	0.000
		B	0.000	0.000	3.125	0.000	0.000
L36	20.5000-20.2500	C	0.000	0.000	3.125	0.000	0.036
		A	0.000	0.000	1.146	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L37	20.2500-19.0000	C	0.000	0.000	0.875	0.000	0.007
		A	0.000	0.000	5.729	0.000	0.000
		B	0.000	0.000	4.375	0.000	0.000
L38	19.0000-18.7500	C	0.000	0.000	4.375	0.000	0.036
		A	0.000	0.000	1.146	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L39	18.7500-18.0000	C	0.000	0.000	0.875	0.000	0.007
		A	0.000	0.000	3.438	0.000	0.000
		B	0.000	0.000	2.625	0.000	0.000
L40	18.0000-17.7500	C	0.000	0.000	2.625	0.000	0.022
		A	0.000	0.000	1.146	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L41	17.7500-12.7500	C	0.000	0.000	0.875	0.000	0.007
		A	0.000	0.000	19.847	0.000	0.000
		B	0.000	0.000	17.500	0.000	0.000
L42	12.7500-7.7500	C	0.000	0.000	17.500	0.000	0.145
		A	0.000	0.000	17.500	0.000	0.000
		B	0.000	0.000	17.500	0.000	0.000
L43	7.7500-5.5000	C	0.000	0.000	17.500	0.000	0.145
		A	0.000	0.000	7.875	0.000	0.000
		B	0.000	0.000	7.875	0.000	0.000
L44	5.5000-5.2500	C	0.000	0.000	7.875	0.000	0.065
		A	0.000	0.000	0.875	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L45	5.2500-4.0000	C	0.000	0.000	0.875	0.000	0.007
		A	0.000	0.000	4.375	0.000	0.000
		B	0.000	0.000	4.375	0.000	0.000
L46	4.0000-3.7500	C	0.000	0.000	4.375	0.000	0.036
		A	0.000	0.000	0.875	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L47	3.7500-3.0000	C	0.000	0.000	0.875	0.000	0.007
		A	0.000	0.000	2.625	0.000	0.000
		B	0.000	0.000	2.625	0.000	0.000
L48	3.0000-2.7500	C	0.000	0.000	2.625	0.000	0.022
		A	0.000	0.000	0.875	0.000	0.000
		B	0.000	0.000	0.875	0.000	0.000
L49	2.7500-0.0000	C	0.000	0.000	0.875	0.000	0.007
		A	0.000	0.000	8.583	0.000	0.000
		B	0.000	0.000	8.583	0.000	0.000
		C	0.000	0.000	8.583	0.000	0.080

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	129.0000- 124.0000	A	1.944	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.944	0.000	0.049
L2	124.0000- 119.0000	A	1.937	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.937	0.000	0.120
L3	119.0000- 115.5000	A	1.930	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.351	0.000	0.086
L4	115.5000- 115.0000	A	1.926	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.193	0.000	0.015
L5	115.0000- 110.0000	A	1.922	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
		C		0.000	0.000	1.922	0.000	0.147
L6	110.0000-105.0000	A	1.913	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.913	0.000	0.147
L7	105.0000-100.0000	A	1.904	0.000	0.000	0.848	0.000	0.010
		B		0.000	0.000	0.848	0.000	0.010
		C		0.000	0.000	2.752	0.000	0.179
L8	100.0000-99.0000	A	1.898	0.000	0.000	1.130	0.000	0.013
		B		0.000	0.000	1.130	0.000	0.013
		C		0.000	0.000	1.509	0.000	0.047
L9	99.0000-98.7500	A	1.897	0.000	0.000	0.282	0.000	0.003
		B		0.000	0.000	0.282	0.000	0.003
		C		0.000	0.000	0.377	0.000	0.012
L10	98.7500-93.7500	A	1.892	0.000	0.000	6.018	0.000	0.071
		B		0.000	0.000	6.018	0.000	0.071
		C		0.000	0.000	7.910	0.000	0.242
L11	93.7500-92.0000	A	1.885	0.000	0.000	3.945	0.000	0.047
		B		0.000	0.000	3.945	0.000	0.047
		C		0.000	0.000	4.605	0.000	0.120
L12	92.0000-91.7500	A	1.883	0.000	0.000	0.563	0.000	0.007
		B		0.000	0.000	0.563	0.000	0.007
		C		0.000	0.000	0.657	0.000	0.017
L13	91.7500-86.7500	A	1.878	0.000	0.000	11.256	0.000	0.132
		B		0.000	0.000	11.256	0.000	0.132
		C		0.000	0.000	13.133	0.000	0.343
L14	86.7500-81.7500	A	1.867	0.000	0.000	11.234	0.000	0.131
		B		0.000	0.000	11.234	0.000	0.131
		C		0.000	0.000	13.101	0.000	0.341
L15	81.7500-73.7500	A	1.852	0.000	0.000	17.895	0.000	0.207
		B		0.000	0.000	17.895	0.000	0.207
		C		0.000	0.000	20.859	0.000	0.542
L16	73.7500-72.7500	A	1.841	0.000	0.000	2.490	0.000	0.028
		B		0.000	0.000	2.490	0.000	0.028
		C		0.000	0.000	2.861	0.000	0.070
L17	72.7500-70.5000	A	1.837	0.000	0.000	5.553	0.000	0.062
		B		0.000	0.000	5.553	0.000	0.062
		C		0.000	0.000	6.380	0.000	0.156
L18	70.5000-70.2500	A	1.834	0.000	0.000	0.704	0.000	0.008
		B		0.000	0.000	0.704	0.000	0.008
		C		0.000	0.000	0.796	0.000	0.018
L19	70.2500-66.2500	A	1.828	0.000	0.000	18.090	0.000	0.195
		B		0.000	0.000	18.090	0.000	0.195
		C		0.000	0.000	12.721	0.000	0.289
L20	66.2500-66.0000	A	1.822	0.000	0.000	1.148	0.000	0.012
		B		0.000	0.000	1.148	0.000	0.012
		C		0.000	0.000	0.794	0.000	0.018
L21	66.0000-61.0000	A	1.815	0.000	0.000	22.945	0.000	0.246
		B		0.000	0.000	22.945	0.000	0.246
		C		0.000	0.000	15.862	0.000	0.359
L22	61.0000-56.5000	A	1.801	0.000	0.000	24.013	0.000	0.255
		B		0.000	0.000	24.013	0.000	0.255
		C		0.000	0.000	17.638	0.000	0.358
L23	56.5000-56.2500	A	1.794	0.000	0.000	1.484	0.000	0.016
		B		0.000	0.000	1.484	0.000	0.016
		C		0.000	0.000	1.130	0.000	0.021
L24	56.2500-51.2500	A	1.785	0.000	0.000	25.908	0.000	0.273
		B		0.000	0.000	25.908	0.000	0.273
		C		0.000	0.000	18.825	0.000	0.388
L25	51.2500-46.2500	A	1.768	0.000	0.000	22.803	0.000	0.237
		B		0.000	0.000	22.803	0.000	0.237
		C		0.000	0.000	15.719	0.000	0.352
L26	46.2500-36.7500	A	1.739	0.000	0.000	40.011	0.000	0.409
		B		0.000	0.000	40.011	0.000	0.409
		C		0.000	0.000	26.553	0.000	0.627
L27	36.7500-35.7500	A	1.716	0.000	0.000	3.196	0.000	0.033
		B		0.000	0.000	3.196	0.000	0.033
		C		0.000	0.000	1.779	0.000	0.056
L28	35.7500-35.0000	A	1.712	0.000	0.000	2.242	0.000	0.023
		B		0.000	0.000	2.242	0.000	0.023

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L29	35.0000-34.7500	C		0.000	0.000	1.326	0.000	0.041
		A	1.709	0.000	0.000	0.796	0.000	0.008
		B		0.000	0.000	0.796	0.000	0.008
L30	34.7500-31.2500	C		0.000	0.000	0.881	0.000	0.018
		A	1.700	0.000	0.000	11.130	0.000	0.111
		B		0.000	0.000	11.130	0.000	0.111
L31	31.2500-31.0000	C		0.000	0.000	12.320	0.000	0.251
		A	1.690	0.000	0.000	0.794	0.000	0.008
		B		0.000	0.000	0.794	0.000	0.008
L32	31.0000-26.0000	C		0.000	0.000	0.879	0.000	0.018
		A	1.675	0.000	0.000	15.850	0.000	0.155
		B		0.000	0.000	15.850	0.000	0.155
L33	26.0000-22.0000	C		0.000	0.000	17.526	0.000	0.355
		A	1.647	0.000	0.000	17.579	0.000	0.170
		B		0.000	0.000	12.635	0.000	0.122
L34	22.0000-21.7500	C		0.000	0.000	13.952	0.000	0.280
		A	1.632	0.000	0.000	1.141	0.000	0.011
		B		0.000	0.000	0.788	0.000	0.008
L35	21.7500-20.5000	C		0.000	0.000	0.870	0.000	0.017
		A	1.626	0.000	0.000	5.699	0.000	0.055
		B		0.000	0.000	3.938	0.000	0.037
L36	20.5000-20.2500	C		0.000	0.000	4.344	0.000	0.087
		A	1.620	0.000	0.000	1.470	0.000	0.014
		B		0.000	0.000	1.118	0.000	0.011
L37	20.2500-19.0000	C		0.000	0.000	1.199	0.000	0.020
		A	1.614	0.000	0.000	7.343	0.000	0.070
		B		0.000	0.000	5.585	0.000	0.053
L38	19.0000-18.7500	C		0.000	0.000	5.989	0.000	0.102
		A	1.608	0.000	0.000	1.467	0.000	0.014
		B		0.000	0.000	1.116	0.000	0.011
L39	18.7500-18.0000	C		0.000	0.000	1.197	0.000	0.020
		A	1.603	0.000	0.000	4.399	0.000	0.042
		B		0.000	0.000	3.346	0.000	0.031
L40	18.0000-17.7500	C		0.000	0.000	3.587	0.000	0.061
		A	1.599	0.000	0.000	1.466	0.000	0.014
		B		0.000	0.000	1.115	0.000	0.010
L41	17.7500-12.7500	C		0.000	0.000	1.195	0.000	0.020
		A	1.574	0.000	0.000	25.250	0.000	0.233
		B		0.000	0.000	22.221	0.000	0.205
L42	12.7500-7.7500	C		0.000	0.000	23.794	0.000	0.398
		A	1.512	0.000	0.000	22.037	0.000	0.195
		B		0.000	0.000	22.037	0.000	0.195
L43	7.7500-5.5000	C		0.000	0.000	23.549	0.000	0.385
		A	1.448	0.000	0.000	9.829	0.000	0.083
		B		0.000	0.000	9.829	0.000	0.083
L44	5.5000-5.2500	C		0.000	0.000	10.481	0.000	0.167
		A	1.418	0.000	0.000	1.088	0.000	0.009
		B		0.000	0.000	1.088	0.000	0.009
L45	5.2500-4.0000	C		0.000	0.000	1.159	0.000	0.018
		A	1.397	0.000	0.000	5.423	0.000	0.044
		B		0.000	0.000	5.423	0.000	0.044
L46	4.0000-3.7500	C		0.000	0.000	5.772	0.000	0.090
		A	1.372	0.000	0.000	1.081	0.000	0.009
		B		0.000	0.000	1.081	0.000	0.009
L47	3.7500-3.0000	C		0.000	0.000	1.149	0.000	0.018
		A	1.353	0.000	0.000	3.234	0.000	0.025
		B		0.000	0.000	3.234	0.000	0.025
L48	3.0000-2.7500	C		0.000	0.000	3.437	0.000	0.053
		A	1.332	0.000	0.000	1.075	0.000	0.008
		B		0.000	0.000	1.075	0.000	0.008
L49	2.7500-0.0000	C		0.000	0.000	1.141	0.000	0.017
		A	1.237	0.000	0.000	10.377	0.000	0.074
		B		0.000	0.000	10.377	0.000	0.074
		C		0.000	0.000	11.057	0.000	0.171

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	129.0000-124.0000	0.0000	0.0000	1.2067	0.7810
L2	124.0000-119.0000	0.0000	0.0000	1.0405	0.6734
L3	119.0000-115.5000	0.0000	0.0000	1.0384	0.6721
L4	115.5000-115.0000	0.0000	0.0000	1.0617	0.6864
L5	115.0000-110.0000	0.0000	0.0000	1.0768	0.6951
L6	110.0000-105.0000	0.0000	0.0000	1.0986	0.7085
L7	105.0000-100.0000	0.0000	0.0000	0.9716	0.6260
L8	100.0000-99.0000	0.0000	0.0000	0.5684	0.3660
L9	99.0000-98.7500	0.0000	0.0000	0.5715	0.3680
L10	98.7500-93.7500	0.0000	0.0000	0.5620	0.3617
L11	93.7500-92.0000	0.0000	0.0000	0.3933	0.2530
L12	92.0000-91.7500	0.0000	0.0000	0.3964	0.2549
L13	91.7500-86.7500	0.0000	0.0000	0.4036	0.2595
L14	86.7500-81.7500	0.0000	0.0000	0.4170	0.2679
L15	81.7500-73.7500	0.0000	0.0000	0.4341	0.2787
L16	73.7500-72.7500	0.0000	0.0000	0.4107	0.2637
L17	72.7500-70.5000	0.0000	0.0000	0.4145	0.2660
L18	70.5000-70.2500	0.0000	0.0000	0.3807	0.2443
L19	70.2500-66.2500	0.0000	-1.6549	0.3037	-1.3579
L20	66.2500-66.0000	0.0000	-1.7314	0.3046	-1.4319
L21	66.0000-61.0000	0.0000	-1.7578	0.3089	-1.4564
L22	61.0000-56.5000	0.0000	-1.5792	0.2764	-1.3107
L23	56.5000-56.2500	0.0000	-1.4554	0.2541	-1.2086
L24	56.2500-51.2500	0.0000	-1.6630	0.2902	-1.3853
L25	51.2500-46.2500	0.0000	-1.9019	0.3311	-1.5925
L26	46.2500-36.7500	0.0000	-2.0992	0.3631	-1.7693
L27	36.7500-35.7500	0.0000	-2.8678	0.4612	-2.2463
L28	35.7500-35.0000	0.0000	-2.6515	0.4722	-2.0395
L29	35.0000-34.7500	0.0000	0.0000	0.3942	0.2523
L30	34.7500-31.2500	0.0000	0.0000	0.3962	0.2536
L31	31.2500-31.0000	0.0000	0.0000	0.3980	0.2547
L32	31.0000-26.0000	0.0000	0.0000	0.4003	0.2561
L33	26.0000-22.0000	-1.2753	-0.7363	-0.9404	-0.5197
L34	22.0000-21.7500	-1.4529	-0.8388	-1.1265	-0.6274
L35	21.7500-20.5000	-1.4573	-0.8414	-1.1311	-0.6301
L36	20.5000-20.2500	-1.1696	-0.6753	-0.9019	-0.5024
L37	20.2500-19.0000	-1.1734	-0.6775	-0.9058	-0.5047
L38	19.0000-18.7500	-1.1771	-0.6796	-0.9097	-0.5070
L39	18.7500-18.0000	-1.1797	-0.6811	-0.9124	-0.5085
L40	18.0000-17.7500	-1.1825	-0.6827	-0.9152	-0.5101
L41	17.7500-12.7500	-0.5345	-0.3086	-0.2416	-0.1205
L42	12.7500-7.7500	0.0000	0.0000	0.3126	0.1998
L43	7.7500-5.5000	0.0000	0.0000	0.3067	0.1960
L44	5.5000-5.2500	0.0000	0.0000	0.3033	0.1938
L45	5.2500-4.0000	0.0000	0.0000	0.3005	0.1921
L46	4.0000-3.7500	0.0000	0.0000	0.2972	0.1899
L47	3.7500-3.0000	0.0000	0.0000	0.2944	0.1882
L48	3.0000-2.7500	0.0000	0.0000	0.2911	0.1860
L49	2.7500-0.0000	0.0000	0.0000	0.2997	0.1915

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	124.00 - 129.00	1.0000	1.0000
L1	3	HCS 6X12 4AWG(1-5/8)	124.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			125.00		
L2	1	Safety Line 3/8	119.00 - 124.00	1.0000	1.0000
L2	3	HCS 6X12 4AWG(1-5/8)	119.00 - 124.00	1.0000	1.0000
L3	1	Safety Line 3/8	115.50 - 119.00	1.0000	1.0000
L3	3	HCS 6X12 4AWG(1-5/8)	115.50 - 119.00	1.0000	1.0000
L4	1	Safety Line 3/8	115.00 - 115.50	1.0000	1.0000
L4	3	HCS 6X12 4AWG(1-5/8)	115.00 - 115.50	1.0000	1.0000
L5	1	Safety Line 3/8	110.00 - 115.00	1.0000	1.0000
L5	3	HCS 6X12 4AWG(1-5/8)	110.00 - 115.00	1.0000	1.0000
L6	1	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L6	3	HCS 6X12 4AWG(1-5/8)	105.00 - 110.00	1.0000	1.0000
L7	1	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000
L7	3	HCS 6X12 4AWG(1-5/8)	100.00 - 105.00	1.0000	1.0000
L7	48	CCI-SFP-045100	100.00 - 100.75	1.0000	1.0000
L7	49	CCI-SFP-045100	100.00 - 100.75	1.0000	1.0000
L7	50	CCI-SFP-045100	100.00 - 100.75	1.0000	1.0000
L8	1	Safety Line 3/8	99.00 - 100.00	1.0000	1.0000
L8	3	HCS 6X12 4AWG(1-5/8)	99.00 - 100.00	1.0000	1.0000
L8	48	CCI-SFP-045100	99.00 - 100.00	1.0000	1.0000
L8	49	CCI-SFP-045100	99.00 - 100.00	1.0000	1.0000
L8	50	CCI-SFP-045100	99.00 - 100.00	1.0000	1.0000
L9	1	Safety Line 3/8	98.75 - 99.00	1.0000	1.0000
L9	3	HCS 6X12 4AWG(1-5/8)	98.75 - 99.00	1.0000	1.0000
L9	48	CCI-SFP-045100	98.75 - 99.00	1.0000	1.0000
L9	49	CCI-SFP-045100	98.75 - 99.00	1.0000	1.0000
L9	50	CCI-SFP-045100	98.75 - 99.00	1.0000	1.0000
L10	1	Safety Line 3/8	93.75 - 98.75	1.0000	1.0000
L10	3	HCS 6X12 4AWG(1-5/8)	93.75 - 98.75	1.0000	1.0000
L10	36	CCI-AFP-045100	93.75 - 94.08	1.0000	1.0000
L10	37	CCI-AFP-045100	93.75 - 94.08	1.0000	1.0000
L10	38	CCI-AFP-045100	93.75 - 94.08	1.0000	1.0000
L10	48	CCI-SFP-045100	93.75 - 98.75	1.0000	1.0000
L10	49	CCI-SFP-045100	93.75 - 98.75	1.0000	1.0000
L10	50	CCI-SFP-045100	93.75 - 98.75	1.0000	1.0000
L11	1	Safety Line 3/8	92.00 - 93.75	1.0000	1.0000
L11	3	HCS 6X12 4AWG(1-5/8)	92.00 - 93.75	1.0000	1.0000
L11	36	CCI-AFP-045100	92.00 - 93.75	1.0000	1.0000
L11	37	CCI-AFP-045100	92.00 - 93.75	1.0000	1.0000
L11	38	CCI-AFP-045100	92.00 - 93.75	1.0000	1.0000
L11	48	CCI-SFP-045100	92.00 - 93.75	1.0000	1.0000
L11	49	CCI-SFP-045100	92.00 - 93.75	1.0000	1.0000
L11	50	CCI-SFP-045100	92.00 - 93.75	1.0000	1.0000
L12	1	Safety Line 3/8	91.75 - 92.00	1.0000	1.0000
L12	3	HCS 6X12 4AWG(1-5/8)	91.75 - 92.00	1.0000	1.0000
L12	36	CCI-AFP-045100	91.75 - 92.00	1.0000	1.0000
L12	37	CCI-AFP-045100	91.75 - 92.00	1.0000	1.0000
L12	38	CCI-AFP-045100	91.75 - 92.00	1.0000	1.0000
L12	48	CCI-SFP-045100	91.75 - 92.00	1.0000	1.0000
L12	49	CCI-SFP-045100	91.75 - 92.00	1.0000	1.0000
L12	50	CCI-SFP-045100	91.75 - 92.00	1.0000	1.0000
L13	1	Safety Line 3/8	86.75 - 91.75	1.0000	1.0000
L13	3	HCS 6X12 4AWG(1-5/8)	86.75 - 91.75	1.0000	1.0000
L13	36	CCI-AFP-045100	86.75 - 91.75	1.0000	1.0000
L13	37	CCI-AFP-045100	86.75 - 91.75	1.0000	1.0000
L13	38	CCI-AFP-045100	86.75 - 91.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L13	48	CCI-SFP-045100	86.75 - 91.75	1.0000	1.0000
L13	49	CCI-SFP-045100	86.75 - 91.75	1.0000	1.0000
L13	50	CCI-SFP-045100	86.75 - 91.75	1.0000	1.0000
L14	1	Safety Line 3/8	81.75 - 86.75	1.0000	1.0000
L14	3	HCS 6X12 4AWG(1-5/8)	81.75 - 86.75	1.0000	1.0000
L14	36	CCI-AFP-045100	81.75 - 86.75	1.0000	1.0000
L14	37	CCI-AFP-045100	81.75 - 86.75	1.0000	1.0000
L14	38	CCI-AFP-045100	81.75 - 86.75	1.0000	1.0000
L14	48	CCI-SFP-045100	81.75 - 86.75	1.0000	1.0000
L14	49	CCI-SFP-045100	81.75 - 86.75	1.0000	1.0000
L14	50	CCI-SFP-045100	81.75 - 86.75	1.0000	1.0000
L15	1	Safety Line 3/8	73.75 - 81.75	1.0000	1.0000
L15	3	HCS 6X12 4AWG(1-5/8)	73.75 - 81.75	1.0000	1.0000
L15	33	CCI-AFP-060100	73.75 - 74.00	1.0000	1.0000
L15	34	CCI-AFP-060100	73.75 - 74.00	1.0000	1.0000
L15	35	CCI-AFP-060100	73.75 - 74.00	1.0000	1.0000
L15	36	CCI-AFP-045100	74.08 - 81.75	1.0000	1.0000
L15	37	CCI-AFP-045100	74.08 - 81.75	1.0000	1.0000
L15	38	CCI-AFP-045100	74.08 - 81.75	1.0000	1.0000
L15	48	CCI-SFP-045100	73.75 - 81.75	1.0000	1.0000
L15	49	CCI-SFP-045100	73.75 - 81.75	1.0000	1.0000
L15	50	CCI-SFP-045100	73.75 - 81.75	1.0000	1.0000
L17	1	Safety Line 3/8	70.50 - 72.75	1.0000	1.0000
L17	3	HCS 6X12 4AWG(1-5/8)	70.50 - 72.75	1.0000	1.0000
L17	33	CCI-AFP-060100	70.50 - 72.75	1.0000	1.0000
L17	34	CCI-AFP-060100	70.50 - 72.75	1.0000	1.0000
L17	35	CCI-AFP-060100	70.50 - 72.75	1.0000	1.0000
L17	45	CCI-SFP-065125	70.50 - 70.67	1.0000	1.0000
L17	46	CCI-SFP-065125	70.50 - 70.67	1.0000	1.0000
L17	47	CCI-SFP-065125	70.50 - 70.67	1.0000	1.0000
L17	48	CCI-SFP-045100	70.75 - 72.75	1.0000	1.0000
L17	49	CCI-SFP-045100	70.75 - 72.75	1.0000	1.0000
L17	50	CCI-SFP-045100	70.75 - 72.75	1.0000	1.0000
L18	1	Safety Line 3/8	70.25 - 70.50	1.0000	1.0000
L18	3	HCS 6X12 4AWG(1-5/8)	70.25 - 70.50	1.0000	1.0000
L18	33	CCI-AFP-060100	70.25 - 70.50	1.0000	1.0000
L18	34	CCI-AFP-060100	70.25 - 70.50	1.0000	1.0000
L18	35	CCI-AFP-060100	70.25 - 70.50	1.0000	1.0000
L18	45	CCI-SFP-065125	70.25 - 70.50	1.0000	1.0000
L18	46	CCI-SFP-065125	70.25 - 70.50	1.0000	1.0000
L18	47	CCI-SFP-065125	70.25 - 70.50	1.0000	1.0000
L19	1	Safety Line 3/8	66.25 - 70.25	1.0000	1.0000
L19	3	HCS 6X12 4AWG(1-5/8)	66.25 - 70.25	1.0000	1.0000
L19	33	CCI-AFP-060100	66.25 - 70.25	1.0000	1.0000
L19	34	CCI-AFP-060100	66.25 - 70.25	1.0000	1.0000
L19	35	CCI-AFP-060100	66.25 - 70.25	1.0000	1.0000
L19	43	CCI-SFP-085125	66.25 - 70.08	1.0000	1.0000
L19	44	CCI-SFP-085125	66.25 - 70.08	1.0000	1.0000
L19	45	CCI-SFP-065125	66.25 - 70.25	1.0000	1.0000
L19	46	CCI-SFP-065125	66.25 - 70.25	1.0000	1.0000
L19	47	CCI-SFP-065125	66.25 - 70.25	1.0000	1.0000
L20	1	Safety Line 3/8	66.00 - 66.25	1.0000	1.0000
L20	3	HCS 6X12 4AWG(1-5/8)	66.00 - 66.25	1.0000	1.0000
L20	33	CCI-AFP-060100	66.00 - 66.25	1.0000	1.0000
L20	34	CCI-AFP-060100	66.00 - 66.25	1.0000	1.0000
L20	35	CCI-AFP-060100	66.00 - 66.25	1.0000	1.0000
L20	43	CCI-SFP-085125	66.00 - 66.25	1.0000	1.0000
L20	44	CCI-SFP-085125	66.00 - 66.25	1.0000	1.0000
L20	45	CCI-SFP-065125	66.00 - 66.25	1.0000	1.0000
L20	46	CCI-SFP-065125	66.00 - 66.25	1.0000	1.0000
L20	47	CCI-SFP-065125	66.00 - 66.25	1.0000	1.0000
L21	1	Safety Line 3/8	61.00 - 66.00	1.0000	1.0000
L21	3	HCS 6X12 4AWG(1-5/8)	61.00 - 66.00	1.0000	1.0000
L21	33	CCI-AFP-060100	61.00 - 66.00	1.0000	1.0000
L21	34	CCI-AFP-060100	61.00 - 66.00	1.0000	1.0000
L21	35	CCI-AFP-060100	61.00 - 66.00	1.0000	1.0000
L21	43	CCI-SFP-085125	61.00 - 66.00	1.0000	1.0000
L21	44	CCI-SFP-085125	61.00 - 66.00	1.0000	1.0000
L21	45	CCI-SFP-065125	61.00 - 66.00	1.0000	1.0000
L21	46	CCI-SFP-065125	61.00 - 66.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L21	47	CCI-SFP-065125	61.00 - 66.00	1.0000	1.0000
L22	1	Safety Line 3/8	56.50 - 61.00	1.0000	1.0000
L22	3	HCS 6X12 4AWG(1-5/8)	56.50 - 61.00	1.0000	1.0000
L22	25	CCI-AFP-060100	56.50 - 59.00	1.0000	1.0000
L22	26	CCI-AFP-060100	56.50 - 59.00	1.0000	1.0000
L22	27	CCI-AFP-060100	56.50 - 59.00	1.0000	1.0000
L22	33	CCI-AFP-060100	56.50 - 61.00	1.0000	1.0000
L22	34	CCI-AFP-060100	56.50 - 61.00	1.0000	1.0000
L22	35	CCI-AFP-060100	56.50 - 61.00	1.0000	1.0000
L22	43	CCI-SFP-085125	56.50 - 61.00	1.0000	1.0000
L22	44	CCI-SFP-085125	56.50 - 61.00	1.0000	1.0000
L22	45	CCI-SFP-065125	56.50 - 61.00	1.0000	1.0000
L22	46	CCI-SFP-065125	56.50 - 61.00	1.0000	1.0000
L22	47	CCI-SFP-065125	56.50 - 61.00	1.0000	1.0000
L23	1	Safety Line 3/8	56.25 - 56.50	1.0000	1.0000
L23	3	HCS 6X12 4AWG(1-5/8)	56.25 - 56.50	1.0000	1.0000
L23	25	CCI-AFP-060100	56.25 - 56.50	1.0000	1.0000
L23	26	CCI-AFP-060100	56.25 - 56.50	1.0000	1.0000
L23	27	CCI-AFP-060100	56.25 - 56.50	1.0000	1.0000
L23	33	CCI-AFP-060100	56.25 - 56.50	1.0000	1.0000
L23	34	CCI-AFP-060100	56.25 - 56.50	1.0000	1.0000
L23	35	CCI-AFP-060100	56.25 - 56.50	1.0000	1.0000
L23	43	CCI-SFP-085125	56.25 - 56.50	1.0000	1.0000
L23	44	CCI-SFP-085125	56.25 - 56.50	1.0000	1.0000
L23	45	CCI-SFP-065125	56.25 - 56.50	1.0000	1.0000
L23	46	CCI-SFP-065125	56.25 - 56.50	1.0000	1.0000
L23	47	CCI-SFP-065125	56.25 - 56.50	1.0000	1.0000
L24	1	Safety Line 3/8	51.25 - 56.25	1.0000	1.0000
L24	3	HCS 6X12 4AWG(1-5/8)	51.25 - 56.25	1.0000	1.0000
L24	25	CCI-AFP-060100	51.25 - 56.25	1.0000	1.0000
L24	26	CCI-AFP-060100	51.25 - 56.25	1.0000	1.0000
L24	27	CCI-AFP-060100	51.25 - 56.25	1.0000	1.0000
L24	33	CCI-AFP-060100	54.00 - 56.25	1.0000	1.0000
L24	34	CCI-AFP-060100	54.00 - 56.25	1.0000	1.0000
L24	35	CCI-AFP-060100	54.00 - 56.25	1.0000	1.0000
L24	43	CCI-SFP-085125	51.25 - 56.25	1.0000	1.0000
L24	44	CCI-SFP-085125	51.25 - 56.25	1.0000	1.0000
L24	45	CCI-SFP-065125	51.25 - 56.25	1.0000	1.0000
L24	46	CCI-SFP-065125	51.25 - 56.25	1.0000	1.0000
L24	47	CCI-SFP-065125	51.25 - 56.25	1.0000	1.0000
L25	1	Safety Line 3/8	46.25 - 51.25	1.0000	1.0000
L25	3	HCS 6X12 4AWG(1-5/8)	46.25 - 51.25	1.0000	1.0000
L25	25	CCI-AFP-060100	46.25 - 51.25	1.0000	1.0000
L25	26	CCI-AFP-060100	46.25 - 51.25	1.0000	1.0000
L25	27	CCI-AFP-060100	46.25 - 51.25	1.0000	1.0000
L25	43	CCI-SFP-085125	46.25 - 51.25	1.0000	1.0000
L25	44	CCI-SFP-085125	46.25 - 51.25	1.0000	1.0000
L25	45	CCI-SFP-065125	46.25 - 51.25	1.0000	1.0000
L25	46	CCI-SFP-065125	46.25 - 51.25	1.0000	1.0000
L25	47	CCI-SFP-065125	46.25 - 51.25	1.0000	1.0000
L26	1	Safety Line 3/8	36.75 - 46.25	1.0000	1.0000
L26	3	HCS 6X12 4AWG(1-5/8)	36.75 - 46.25	1.0000	1.0000
L26	25	CCI-AFP-060100	39.00 - 46.25	1.0000	1.0000
L26	26	CCI-AFP-060100	39.00 - 46.25	1.0000	1.0000
L26	27	CCI-AFP-060100	39.00 - 46.25	1.0000	1.0000
L26	30	CCI-AFP-065125	36.75 - 40.58	1.0000	1.0000
L26	31	CCI-AFP-065125	36.75 - 40.58	1.0000	1.0000
L26	32	CCI-AFP-065125	36.75 - 40.58	1.0000	1.0000
L26	43	CCI-SFP-085125	36.75 - 46.25	1.0000	1.0000
L26	44	CCI-SFP-085125	36.75 - 46.25	1.0000	1.0000
L26	45	CCI-SFP-065125	40.67 - 46.25	1.0000	1.0000
L26	46	CCI-SFP-065125	40.67 - 46.25	1.0000	1.0000
L26	47	CCI-SFP-065125	40.67 - 46.25	1.0000	1.0000
L28	1	Safety Line 3/8	35.00 - 35.75	1.0000	1.0000
L28	3	HCS 6X12 4AWG(1-5/8)	35.00 - 35.75	1.0000	1.0000
L28	30	CCI-AFP-065125	35.00 - 35.75	1.0000	1.0000
L28	31	CCI-AFP-065125	35.00 - 35.75	1.0000	1.0000
L28	32	CCI-AFP-065125	35.00 - 35.75	1.0000	1.0000
L28	43	CCI-SFP-085125	35.08 - 35.75	1.0000	1.0000
L28	44	CCI-SFP-085125	35.08 - 35.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L29	1	Safety Line 3/8	34.75 - 35.00	1.0000	1.0000
L29	3	HCS 6X12 4AWG(1-5/8)	34.75 - 35.00	1.0000	1.0000
L29	30	CCI-AFP-065125	34.75 - 35.00	1.0000	1.0000
L29	31	CCI-AFP-065125	34.75 - 35.00	1.0000	1.0000
L29	32	CCI-AFP-065125	34.75 - 35.00	1.0000	1.0000
L29	40	CCI-WSFP-085125	34.75 - 35.00	1.0000	1.0000
L29	41	CCI-WSFP-085125	34.75 - 35.00	1.0000	1.0000
L29	42	CCI-WSFP-085125	34.75 - 35.00	1.0000	1.0000
L30	1	Safety Line 3/8	31.25 - 34.75	1.0000	1.0000
L30	3	HCS 6X12 4AWG(1-5/8)	31.25 - 34.75	1.0000	1.0000
L30	30	CCI-AFP-065125	31.25 - 34.75	1.0000	1.0000
L30	31	CCI-AFP-065125	31.25 - 34.75	1.0000	1.0000
L30	32	CCI-AFP-065125	31.25 - 34.75	1.0000	1.0000
L30	40	CCI-WSFP-085125	31.25 - 34.75	1.0000	1.0000
L30	41	CCI-WSFP-085125	31.25 - 34.75	1.0000	1.0000
L30	42	CCI-WSFP-085125	31.25 - 34.75	1.0000	1.0000
L31	1	Safety Line 3/8	31.00 - 31.25	1.0000	1.0000
L31	3	HCS 6X12 4AWG(1-5/8)	31.00 - 31.25	1.0000	1.0000
L31	30	CCI-AFP-065125	31.00 - 31.25	1.0000	1.0000
L31	31	CCI-AFP-065125	31.00 - 31.25	1.0000	1.0000
L31	32	CCI-AFP-065125	31.00 - 31.25	1.0000	1.0000
L31	40	CCI-WSFP-085125	31.00 - 31.25	1.0000	1.0000
L31	41	CCI-WSFP-085125	31.00 - 31.25	1.0000	1.0000
L31	42	CCI-WSFP-085125	31.00 - 31.25	1.0000	1.0000
L32	1	Safety Line 3/8	26.00 - 31.00	1.0000	1.0000
L32	3	HCS 6X12 4AWG(1-5/8)	26.00 - 31.00	1.0000	1.0000
L32	30	CCI-AFP-065125	26.00 - 31.00	1.0000	1.0000
L32	31	CCI-AFP-065125	26.00 - 31.00	1.0000	1.0000
L32	32	CCI-AFP-065125	26.00 - 31.00	1.0000	1.0000
L32	40	CCI-WSFP-085125	26.00 - 31.00	1.0000	1.0000
L32	41	CCI-WSFP-085125	26.00 - 31.00	1.0000	1.0000
L32	42	CCI-WSFP-085125	26.00 - 31.00	1.0000	1.0000
L33	1	Safety Line 3/8	22.00 - 26.00	1.0000	1.0000
L33	3	HCS 6X12 4AWG(1-5/8)	22.00 - 26.00	1.0000	1.0000
L33	29	CCI-AFP-065125	22.00 - 25.50	1.0000	1.0000
L33	30	CCI-AFP-065125	22.00 - 26.00	1.0000	1.0000
L33	31	CCI-AFP-065125	22.00 - 26.00	1.0000	1.0000
L33	32	CCI-AFP-065125	22.00 - 26.00	1.0000	1.0000
L33	40	CCI-WSFP-085125	22.00 - 26.00	1.0000	1.0000
L33	41	CCI-WSFP-085125	22.00 - 26.00	1.0000	1.0000
L33	42	CCI-WSFP-085125	22.00 - 26.00	1.0000	1.0000
L34	1	Safety Line 3/8	21.75 - 22.00	1.0000	1.0000
L34	3	HCS 6X12 4AWG(1-5/8)	21.75 - 22.00	1.0000	1.0000
L34	29	CCI-AFP-065125	21.75 - 22.00	1.0000	1.0000
L34	30	CCI-AFP-065125	21.75 - 22.00	1.0000	1.0000
L34	31	CCI-AFP-065125	21.75 - 22.00	1.0000	1.0000
L34	32	CCI-AFP-065125	21.75 - 22.00	1.0000	1.0000
L34	40	CCI-WSFP-085125	21.75 - 22.00	1.0000	1.0000
L34	41	CCI-WSFP-085125	21.75 - 22.00	1.0000	1.0000
L34	42	CCI-WSFP-085125	21.75 - 22.00	1.0000	1.0000
L35	1	Safety Line 3/8	20.50 - 21.75	1.0000	1.0000
L35	3	HCS 6X12 4AWG(1-5/8)	20.50 - 21.75	1.0000	1.0000
L35	29	CCI-AFP-065125	20.50 - 21.75	1.0000	1.0000
L35	30	CCI-AFP-065125	20.50 - 21.75	1.0000	1.0000
L35	31	CCI-AFP-065125	20.50 - 21.75	1.0000	1.0000
L35	32	CCI-AFP-065125	20.50 - 21.75	1.0000	1.0000
L35	40	CCI-WSFP-085125	20.50 - 21.75	1.0000	1.0000
L35	41	CCI-WSFP-085125	20.50 - 21.75	1.0000	1.0000
L35	42	CCI-WSFP-085125	20.50 - 21.75	1.0000	1.0000
L36	1	Safety Line 3/8	20.25 - 20.50	1.0000	1.0000
L36	3	HCS 6X12 4AWG(1-5/8)	20.25 - 20.50	1.0000	1.0000
L36	22	CCI-AFP-060100	20.25 - 20.50	1.0000	1.0000
L36	23	CCI-AFP-060100	20.25 - 20.50	1.0000	1.0000
L36	24	CCI-AFP-060100	20.25 - 20.50	1.0000	1.0000
L36	29	CCI-AFP-065125	20.25 - 20.50	1.0000	1.0000
L36	30	CCI-AFP-065125	20.25 - 20.50	1.0000	1.0000
L36	31	CCI-AFP-065125	20.25 - 20.50	1.0000	1.0000
L36	32	CCI-AFP-065125	20.25 - 20.50	1.0000	1.0000
L36	40	CCI-WSFP-085125	20.25 - 20.50	1.0000	1.0000
L36	41	CCI-WSFP-085125	20.25 - 20.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L36	42	CCI-WSFP-085125	20.25 - 20.50	1.0000	1.0000
L37	1	Safety Line 3/8	19.00 - 20.25	1.0000	1.0000
L37	3	HCS 6X12 4AWG(1-5/8)	19.00 - 20.25	1.0000	1.0000
L37	22	CCI-AFP-060100	19.00 - 20.25	1.0000	1.0000
L37	23	CCI-AFP-060100	19.00 - 20.25	1.0000	1.0000
L37	24	CCI-AFP-060100	19.00 - 20.25	1.0000	1.0000
L37	29	CCI-AFP-065125	19.00 - 20.25	1.0000	1.0000
L37	30	CCI-AFP-065125	19.00 - 20.25	1.0000	1.0000
L37	31	CCI-AFP-065125	19.00 - 20.25	1.0000	1.0000
L37	32	CCI-AFP-065125	19.00 - 20.25	1.0000	1.0000
L37	40	CCI-WSFP-085125	19.00 - 20.25	1.0000	1.0000
L37	41	CCI-WSFP-085125	19.00 - 20.25	1.0000	1.0000
L37	42	CCI-WSFP-085125	19.00 - 20.25	1.0000	1.0000
L38	1	Safety Line 3/8	18.75 - 19.00	1.0000	1.0000
L38	3	HCS 6X12 4AWG(1-5/8)	18.75 - 19.00	1.0000	1.0000
L38	22	CCI-AFP-060100	18.75 - 19.00	1.0000	1.0000
L38	23	CCI-AFP-060100	18.75 - 19.00	1.0000	1.0000
L38	24	CCI-AFP-060100	18.75 - 19.00	1.0000	1.0000
L38	29	CCI-AFP-065125	18.75 - 19.00	1.0000	1.0000
L38	30	CCI-AFP-065125	18.75 - 19.00	1.0000	1.0000
L38	31	CCI-AFP-065125	18.75 - 19.00	1.0000	1.0000
L38	32	CCI-AFP-065125	18.75 - 19.00	1.0000	1.0000
L38	40	CCI-WSFP-085125	18.75 - 19.00	1.0000	1.0000
L38	41	CCI-WSFP-085125	18.75 - 19.00	1.0000	1.0000
L38	42	CCI-WSFP-085125	18.75 - 19.00	1.0000	1.0000
L39	1	Safety Line 3/8	18.00 - 18.75	1.0000	1.0000
L39	3	HCS 6X12 4AWG(1-5/8)	18.00 - 18.75	1.0000	1.0000
L39	22	CCI-AFP-060100	18.00 - 18.75	1.0000	1.0000
L39	23	CCI-AFP-060100	18.00 - 18.75	1.0000	1.0000
L39	24	CCI-AFP-060100	18.00 - 18.75	1.0000	1.0000
L39	29	CCI-AFP-065125	18.00 - 18.75	1.0000	1.0000
L39	30	CCI-AFP-065125	18.00 - 18.75	1.0000	1.0000
L39	31	CCI-AFP-065125	18.00 - 18.75	1.0000	1.0000
L39	32	CCI-AFP-065125	18.00 - 18.75	1.0000	1.0000
L39	40	CCI-WSFP-085125	18.00 - 18.75	1.0000	1.0000
L39	41	CCI-WSFP-085125	18.00 - 18.75	1.0000	1.0000
L39	42	CCI-WSFP-085125	18.00 - 18.75	1.0000	1.0000
L40	1	Safety Line 3/8	17.75 - 18.00	1.0000	1.0000
L40	3	HCS 6X12 4AWG(1-5/8)	17.75 - 18.00	1.0000	1.0000
L40	22	CCI-AFP-060100	17.75 - 18.00	1.0000	1.0000
L40	23	CCI-AFP-060100	17.75 - 18.00	1.0000	1.0000
L40	24	CCI-AFP-060100	17.75 - 18.00	1.0000	1.0000
L40	29	CCI-AFP-065125	17.75 - 18.00	1.0000	1.0000
L40	30	CCI-AFP-065125	17.75 - 18.00	1.0000	1.0000
L40	31	CCI-AFP-065125	17.75 - 18.00	1.0000	1.0000
L40	32	CCI-AFP-065125	17.75 - 18.00	1.0000	1.0000
L40	40	CCI-WSFP-085125	17.75 - 18.00	1.0000	1.0000
L40	41	CCI-WSFP-085125	17.75 - 18.00	1.0000	1.0000
L40	42	CCI-WSFP-085125	17.75 - 18.00	1.0000	1.0000
L41	1	Safety Line 3/8	12.75 - 17.75	1.0000	1.0000
L41	3	HCS 6X12 4AWG(1-5/8)	12.75 - 17.75	1.0000	1.0000
L41	22	CCI-AFP-060100	12.75 - 17.75	1.0000	1.0000
L41	23	CCI-AFP-060100	12.75 - 17.75	1.0000	1.0000
L41	24	CCI-AFP-060100	12.75 - 17.75	1.0000	1.0000
L41	29	CCI-AFP-065125	12.75 - 17.75	1.0000	1.0000
L41	30	CCI-AFP-065125	15.58 - 17.75	1.0000	1.0000
L41	31	CCI-AFP-065125	12.75 - 17.75	1.0000	1.0000
L41	32	CCI-AFP-065125	12.75 - 17.75	1.0000	1.0000
L41	40	CCI-WSFP-085125	12.75 - 17.75	1.0000	1.0000
L41	41	CCI-WSFP-085125	12.75 - 17.75	1.0000	1.0000
L41	42	CCI-WSFP-085125	12.75 - 17.75	1.0000	1.0000
L42	1	Safety Line 3/8	7.75 - 12.75	1.0000	1.0000
L42	3	HCS 6X12 4AWG(1-5/8)	7.75 - 12.75	1.0000	1.0000
L42	22	CCI-AFP-060100	7.75 - 12.75	1.0000	1.0000
L42	23	CCI-AFP-060100	7.75 - 12.75	1.0000	1.0000
L42	24	CCI-AFP-060100	7.75 - 12.75	1.0000	1.0000
L42	29	CCI-AFP-065125	7.75 - 12.75	1.0000	1.0000
L42	31	CCI-AFP-065125	7.75 - 12.75	1.0000	1.0000
L42	32	CCI-AFP-065125	7.75 - 12.75	1.0000	1.0000
L42	40	CCI-WSFP-085125	7.75 - 12.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L42	41	CCI-WSFP-085125	7.75 - 12.75	1.0000	1.0000
L42	42	CCI-WSFP-085125	7.75 - 12.75	1.0000	1.0000
L43	1	Safety Line 3/8	5.50 - 7.75	1.0000	1.0000
L43	3	HCS 6X12 4AWG(1-5/8)	5.50 - 7.75	1.0000	1.0000
L43	22	CCI-AFP-060100	5.50 - 7.75	1.0000	1.0000
L43	23	CCI-AFP-060100	5.50 - 7.75	1.0000	1.0000
L43	24	CCI-AFP-060100	5.50 - 7.75	1.0000	1.0000
L43	29	CCI-AFP-065125	5.50 - 7.75	1.0000	1.0000
L43	31	CCI-AFP-065125	5.50 - 7.75	1.0000	1.0000
L43	32	CCI-AFP-065125	5.50 - 7.75	1.0000	1.0000
L43	40	CCI-WSFP-085125	5.50 - 7.75	1.0000	1.0000
L43	41	CCI-WSFP-085125	5.50 - 7.75	1.0000	1.0000
L43	42	CCI-WSFP-085125	5.50 - 7.75	1.0000	1.0000
L44	1	Safety Line 3/8	5.25 - 5.50	1.0000	1.0000
L44	3	HCS 6X12 4AWG(1-5/8)	5.25 - 5.50	1.0000	1.0000
L44	22	CCI-AFP-060100	5.25 - 5.50	1.0000	1.0000
L44	23	CCI-AFP-060100	5.25 - 5.50	1.0000	1.0000
L44	24	CCI-AFP-060100	5.25 - 5.50	1.0000	1.0000
L44	29	CCI-AFP-065125	5.25 - 5.50	1.0000	1.0000
L44	31	CCI-AFP-065125	5.25 - 5.50	1.0000	1.0000
L44	32	CCI-AFP-065125	5.25 - 5.50	1.0000	1.0000
L44	40	CCI-WSFP-085125	5.25 - 5.50	1.0000	1.0000
L44	41	CCI-WSFP-085125	5.25 - 5.50	1.0000	1.0000
L44	42	CCI-WSFP-085125	5.25 - 5.50	1.0000	1.0000
L45	1	Safety Line 3/8	4.00 - 5.25	1.0000	1.0000
L45	3	HCS 6X12 4AWG(1-5/8)	4.00 - 5.25	1.0000	1.0000
L45	22	CCI-AFP-060100	4.00 - 5.25	1.0000	1.0000
L45	23	CCI-AFP-060100	4.00 - 5.25	1.0000	1.0000
L45	24	CCI-AFP-060100	4.00 - 5.25	1.0000	1.0000
L45	29	CCI-AFP-065125	4.00 - 5.25	1.0000	1.0000
L45	31	CCI-AFP-065125	4.00 - 5.25	1.0000	1.0000
L45	32	CCI-AFP-065125	4.00 - 5.25	1.0000	1.0000
L45	40	CCI-WSFP-085125	4.00 - 5.25	1.0000	1.0000
L45	41	CCI-WSFP-085125	4.00 - 5.25	1.0000	1.0000
L45	42	CCI-WSFP-085125	4.00 - 5.25	1.0000	1.0000
L46	1	Safety Line 3/8	3.75 - 4.00	1.0000	1.0000
L46	3	HCS 6X12 4AWG(1-5/8)	3.75 - 4.00	1.0000	1.0000
L46	22	CCI-AFP-060100	3.75 - 4.00	1.0000	1.0000
L46	23	CCI-AFP-060100	3.75 - 4.00	1.0000	1.0000
L46	24	CCI-AFP-060100	3.75 - 4.00	1.0000	1.0000
L46	29	CCI-AFP-065125	3.75 - 4.00	1.0000	1.0000
L46	31	CCI-AFP-065125	3.75 - 4.00	1.0000	1.0000
L46	32	CCI-AFP-065125	3.75 - 4.00	1.0000	1.0000
L46	40	CCI-WSFP-085125	3.75 - 4.00	1.0000	1.0000
L46	41	CCI-WSFP-085125	3.75 - 4.00	1.0000	1.0000
L46	42	CCI-WSFP-085125	3.75 - 4.00	1.0000	1.0000
L47	1	Safety Line 3/8	3.00 - 3.75	1.0000	1.0000
L47	3	HCS 6X12 4AWG(1-5/8)	3.00 - 3.75	1.0000	1.0000
L47	22	CCI-AFP-060100	3.00 - 3.75	1.0000	1.0000
L47	23	CCI-AFP-060100	3.00 - 3.75	1.0000	1.0000
L47	24	CCI-AFP-060100	3.00 - 3.75	1.0000	1.0000
L47	29	CCI-AFP-065125	3.00 - 3.75	1.0000	1.0000
L47	31	CCI-AFP-065125	3.00 - 3.75	1.0000	1.0000
L47	32	CCI-AFP-065125	3.00 - 3.75	1.0000	1.0000
L47	40	CCI-WSFP-085125	3.00 - 3.75	1.0000	1.0000
L47	41	CCI-WSFP-085125	3.00 - 3.75	1.0000	1.0000
L47	42	CCI-WSFP-085125	3.00 - 3.75	1.0000	1.0000
L48	1	Safety Line 3/8	2.75 - 3.00	1.0000	1.0000
L48	3	HCS 6X12 4AWG(1-5/8)	2.75 - 3.00	1.0000	1.0000
L48	22	CCI-AFP-060100	2.75 - 3.00	1.0000	1.0000
L48	23	CCI-AFP-060100	2.75 - 3.00	1.0000	1.0000
L48	24	CCI-AFP-060100	2.75 - 3.00	1.0000	1.0000
L48	29	CCI-AFP-065125	2.75 - 3.00	1.0000	1.0000
L48	31	CCI-AFP-065125	2.75 - 3.00	1.0000	1.0000
L48	32	CCI-AFP-065125	2.75 - 3.00	1.0000	1.0000
L48	40	CCI-WSFP-085125	2.75 - 3.00	1.0000	1.0000
L48	41	CCI-WSFP-085125	2.75 - 3.00	1.0000	1.0000
L48	42	CCI-WSFP-085125	2.75 - 3.00	1.0000	1.0000
L49	1	Safety Line 3/8	0.00 - 2.75	1.0000	1.0000
L49	3	HCS 6X12 4AWG(1-5/8)	0.00 - 2.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L49	22	CCI-AFP-060100	0.50 - 2.75	1.0000	1.0000
L49	23	CCI-AFP-060100	0.50 - 2.75	1.0000	1.0000
L49	24	CCI-AFP-060100	0.50 - 2.75	1.0000	1.0000
L49	29	CCI-AFP-065125	0.50 - 2.75	1.0000	1.0000
L49	31	CCI-AFP-065125	0.50 - 2.75	1.0000	1.0000
L49	32	CCI-AFP-065125	0.50 - 2.75	1.0000	1.0000
L49	40	CCI-WSFP-085125	0.00 - 2.75	1.0000	1.0000
L49	41	CCI-WSFP-085125	0.00 - 2.75	1.0000	1.0000
L49	42	CCI-WSFP-085125	0.00 - 2.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Lighting Rod 5/8" x 4'	A	None		0.000	129.0000	No Ice	0.2500	0.031
						1/2" Ice	0.6635	0.034
						1" Ice	0.9732	0.039
						2" Ice	1.4936	0.059
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Leg	4.0000 -6.000 1.000	0.000	125.0000	No Ice	6.7474	0.153
						1/2" Ice	7.2017	0.214
						1" Ice	7.6475	0.282
						2" Ice	8.5651	0.441
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Face	4.0000 -6.000 1.000	0.000	125.0000	No Ice	6.7474	0.153
						1/2" Ice	7.2017	0.214
						1" Ice	7.6475	0.282
						2" Ice	8.5651	0.441
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Leg	4.0000 -6.000 1.000	0.000	125.0000	No Ice	6.7474	0.153
						1/2" Ice	7.2017	0.214
						1" Ice	7.6475	0.282
						2" Ice	8.5651	0.441
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Leg	4.0000 -6.000 1.000	0.000	125.0000	No Ice	6.7474	0.153
						1/2" Ice	7.2017	0.214
						1" Ice	7.6475	0.282
						2" Ice	8.5651	0.441
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000 0.000 1.000	0.000	125.0000	No Ice	6.3292	0.112
						1/2" Ice	6.7751	0.169
						1" Ice	7.2137	0.233
						2" Ice	8.1168	0.383
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.0000 0.000 1.000	0.000	125.0000	No Ice	6.3292	0.112
						1/2" Ice	6.7751	0.169
						1" Ice	7.2137	0.233
						2" Ice	8.1168	0.383
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000 0.000 1.000	0.000	125.0000	No Ice	6.3292	0.112
						1/2" Ice	6.7751	0.169
						1" Ice	7.2137	0.233
						2" Ice	8.1168	0.383
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000 0.000 1.000	0.000	125.0000	No Ice	6.3292	0.112
						1/2" Ice	6.7751	0.169
						1" Ice	7.2137	0.233
						2" Ice	8.1168	0.383
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000 6.000 1.000	0.000	125.0000	No Ice	20.4801	0.161
						1/2" Ice	21.2306	0.297
						1" Ice	21.9900	0.444
						2" Ice	23.4441	0.775
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Face	4.0000 6.000 1.000	0.000	125.0000	No Ice	20.4801	0.161
						1/2" Ice	21.2306	0.297
						1" Ice	21.9900	0.444
						2" Ice	23.4441	0.775

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz Lateral ft	Vert ft					
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000	0.000	125.0000	No Ice	20.4801	11.0240	0.161
			6.000	1/2" Ice		21.2306	12.5496	0.297	
			1.000	1" Ice		21.9900	14.0992	0.444	
				2" Ice		23.4441	16.4509	0.775	
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000	0.000	125.0000	No Ice	20.4801	11.0240	0.161
			6.000	1/2" Ice		21.2306	12.5496	0.297	
			1.000	1" Ice		21.9900	14.0992	0.444	
				2" Ice		23.4441	16.4509	0.775	
RADIO 4449 B12/B71	A	From Leg	4.0000	0.000	125.0000	No Ice	1.6500	1.3000	0.075
			0.000	1/2" Ice		1.8104	1.4448	0.092	
			1.000	1" Ice		1.9781	1.5970	0.112	
				2" Ice		2.3359	1.9237	0.161	
RADIO 4449 B12/B71	B	From Face	4.0000	0.000	125.0000	No Ice	1.6500	1.3000	0.075
			0.000	1/2" Ice		1.8104	1.4448	0.092	
			1.000	1" Ice		1.9781	1.5970	0.112	
				2" Ice		2.3359	1.9237	0.161	
RADIO 4449 B12/B71	B	From Leg	4.0000	0.000	125.0000	No Ice	1.6500	1.3000	0.075
			0.000	1/2" Ice		1.8104	1.4448	0.092	
			1.000	1" Ice		1.9781	1.5970	0.112	
				2" Ice		2.3359	1.9237	0.161	
RADIO 4449 B12/B71	C	From Leg	4.0000	0.000	125.0000	No Ice	1.6500	1.3000	0.075
			0.000	1/2" Ice		1.8104	1.4448	0.092	
			1.000	1" Ice		1.9781	1.5970	0.112	
				2" Ice		2.3359	1.9237	0.161	
Site Pro 1 F4P-HRK12 12'Hand Rail Kit	C	None		0.000	125.0000	No Ice	5.6800	5.4400	0.507
				1/2" Ice		7.9100	7.3900	0.618	
				1" Ice		10.2200	8.8200	0.772	
				2" Ice		14.6000	13.2400	0.951	
Site Pro 1 F4P-12W 12' Fortress Quad Platform	C	None		0.000	125.0000	No Ice	34.6575	34.6575	2.636
				1/2" Ice		44.0625	44.0625	3.477	
				1" Ice		56.6550	53.4675	4.638	
				2" Ice		72.2775	72.2775	6.000	

LNX-8513DS-VTM w/ Mount Pipe	A	From Leg	4.0000	0.000	116.0000	No Ice	8.4106	7.0817	0.065
			6.000	1/2" Ice		8.9745	8.2729	0.134	
			1.000	1" Ice		9.5048	9.1847	0.211	
				2" Ice		10.5853	11.0232	0.393	
LNX-8513DS-VTM w/ Mount Pipe	B	From Leg	4.0000	0.000	116.0000	No Ice	8.4106	7.0817	0.065
			6.000	1/2" Ice		8.9745	8.2729	0.134	
			1.000	1" Ice		9.5048	9.1847	0.211	
				2" Ice		10.5853	11.0232	0.393	
LNX-8513DS-VTM w/ Mount Pipe	C	From Leg	4.0000	0.000	116.0000	No Ice	8.4106	7.0817	0.065
			6.000	1/2" Ice		8.9745	8.2729	0.134	
			1.000	1" Ice		9.5048	9.1847	0.211	
				2" Ice		10.5853	11.0232	0.393	
LNX-8513DS-VTM w/ Mount Pipe	A	From Leg	4.0000	0.000	116.0000	No Ice	8.4106	7.0817	0.065
			3.500	1/2" Ice		8.9745	8.2729	0.134	
			1.000	1" Ice		9.5048	9.1847	0.211	
				2" Ice		10.5853	11.0232	0.393	
LNX-8513DS-VTM w/ Mount Pipe	B	From Leg	4.0000	0.000	116.0000	No Ice	8.4106	7.0817	0.065
			3.500	1/2" Ice		8.9745	8.2729	0.134	
			1.000	1" Ice		9.5048	9.1847	0.211	
				2" Ice		10.5853	11.0232	0.393	
LNX-8513DS-VTM w/ Mount Pipe	C	From Leg	4.0000	0.000	116.0000	No Ice	8.4106	7.0817	0.065
			3.500	1/2" Ice		8.9745	8.2729	0.134	
			1.000	1" Ice		9.5048	9.1847	0.211	
				2" Ice		10.5853	11.0232	0.393	
SBNH-1D8585C w/ Mount Pipe	A	From Leg	4.0000	0.000	116.0000	No Ice	11.6828	9.8418	0.090
			-3.500	1/2" Ice		12.4043	11.3657	0.180	
			1.000	1" Ice		13.1351	12.9138	0.280	
				2" Ice		14.5120	15.2672	0.513	
SBNH-1D8585C w/ Mount Pipe	B	From Leg	4.0000	0.000	116.0000	No Ice	11.6828	9.8418	0.090
			-3.500	1/2" Ice		12.4043	11.3657	0.180	
			1.000	1" Ice		13.1351	12.9138	0.280	
				2" Ice		14.5120	15.2672	0.513	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A		Weight
			Horz Lateral	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
SBNH-1D8585C w/ Mount Pipe	C	From Leg	4.0000	0.000	116.0000	No Ice	11.6828	9.8418	0.090
			-3.500			1/2" Ice	12.4043	11.3657	0.180
			1.000			1" Ice	13.1351	12.9138	0.280
						2" Ice	14.5120	15.2672	0.513
SBNH-1D8585C w/ Mount Pipe	A	From Leg	4.0000	0.000	116.0000	No Ice	11.6828	9.8418	0.090
			-6.000			1/2" Ice	12.4043	11.3657	0.180
			1.000			1" Ice	13.1351	12.9138	0.280
						2" Ice	14.5120	15.2672	0.513
SBNH-1D8585C w/ Mount Pipe	B	From Leg	4.0000	0.000	116.0000	No Ice	11.6828	9.8418	0.090
			-6.000			1/2" Ice	12.4043	11.3657	0.180
			1.000			1" Ice	13.1351	12.9138	0.280
						2" Ice	14.5120	15.2672	0.513
SBNH-1D8585C w/ Mount Pipe	C	From Leg	4.0000	0.000	116.0000	No Ice	11.6828	9.8418	0.090
			-6.000			1/2" Ice	12.4043	11.3657	0.180
			1.000			1" Ice	13.1351	12.9138	0.280
						2" Ice	14.5120	15.2672	0.513
AWS4 (B66) 4X45 RRH	A	From Leg	4.0000	0.000	116.0000	No Ice	2.5800	1.6296	0.067
			0.000			1/2" Ice	2.7937	1.8106	0.087
			1.000			1" Ice	3.0148	1.9986	0.111
						2" Ice	3.4793	2.3955	0.168
AWS4 (B66) 4X45 RRH	B	From Leg	4.0000	0.000	116.0000	No Ice	2.5800	1.6296	0.067
			0.000			1/2" Ice	2.7937	1.8106	0.087
			1.000			1" Ice	3.0148	1.9986	0.111
						2" Ice	3.4793	2.3955	0.168
AWS4 (B66) 4X45 RRH	C	From Leg	4.0000	0.000	116.0000	No Ice	2.5800	1.6296	0.067
			0.000			1/2" Ice	2.7937	1.8106	0.087
			1.000			1" Ice	3.0148	1.9986	0.111
						2" Ice	3.4793	2.3955	0.168
B13 RRH 4X30	A	From Leg	4.0000	0.000	116.0000	No Ice	2.0552	1.3201	0.056
			0.000			1/2" Ice	2.2405	1.4754	0.073
			1.000			1" Ice	2.4333	1.6376	0.093
						2" Ice	2.8411	1.9966	0.142
B13 RRH 4X30	B	From Leg	4.0000	0.000	116.0000	No Ice	2.0552	1.3201	0.056
			0.000			1/2" Ice	2.2405	1.4754	0.073
			1.000			1" Ice	2.4333	1.6376	0.093
						2" Ice	2.8411	1.9966	0.142
B13 RRH 4X30	C	From Leg	4.0000	0.000	116.0000	No Ice	2.0552	1.3201	0.056
			0.000			1/2" Ice	2.2405	1.4754	0.073
			1.000			1" Ice	2.4333	1.6376	0.093
						2" Ice	2.8411	1.9966	0.142
PCS B25 RRH4X30	A	From Leg	4.0000	0.000	116.0000	No Ice	2.2000	1.7417	0.055
			0.000			1/2" Ice	2.3926	1.9204	0.075
			1.000			1" Ice	2.5926	2.1065	0.099
						2" Ice	3.0148	2.5009	0.156
PCS B25 RRH4X30	B	From Leg	4.0000	0.000	116.0000	No Ice	2.2000	1.7417	0.055
			0.000			1/2" Ice	2.3926	1.9204	0.075
			1.000			1" Ice	2.5926	2.1065	0.099
						2" Ice	3.0148	2.5009	0.156
PCS B25 RRH4X30	C	From Leg	4.0000	0.000	116.0000	No Ice	2.2000	1.7417	0.055
			0.000			1/2" Ice	2.3926	1.9204	0.075
			1.000			1" Ice	2.5926	2.1065	0.099
						2" Ice	3.0148	2.5009	0.156
(2) DB-B1-6C-12AB-0Z	A	From Leg	4.0000	0.000	116.0000	No Ice	3.3636	2.1921	0.021
			0.000			1/2" Ice	3.5972	2.3950	0.050
			1.000			1" Ice	3.8383	2.6056	0.082
						2" Ice	4.3426	3.0491	0.158
Platform Mount [LP 602-1]	C	None		0.000	116.0000	No Ice	32.0300	32.0300	1.343
						1/2" Ice	38.7100	38.7100	1.800
						1" Ice	45.3900	45.3900	2.257
						2" Ice	58.7500	58.7500	3.170

APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.0000	0.000	105.0000	No Ice	6.5799	4.9591	0.077
			7.000			1/2" Ice	7.0306	5.7544	0.132
			-1.000			1" Ice	7.4733	6.4723	0.193
						2" Ice	8.3846	7.9407	0.339

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A		Weight
			Horz Lateral	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.0000	0.000	105.0000	No Ice	6.5799	4.9591	0.077
			7.000			1/2" Ice	7.0306	5.7544	0.132
			-1.000			1" Ice	7.4733	6.4723	0.193
						2" Ice	8.3846	7.9407	0.339
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.0000	0.000	105.0000	No Ice	6.5799	4.9591	0.077
			7.000			1/2" Ice	7.0306	5.7544	0.132
			-1.000			1" Ice	7.4733	6.4723	0.193
						2" Ice	8.3846	7.9407	0.339
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.0000	0.000	105.0000	No Ice	12.5086	7.4125	0.103
			-7.000			1/2" Ice	13.1075	8.5976	0.194
			-1.000			1" Ice	13.6715	9.4965	0.293
						2" Ice	14.8221	11.3279	0.520
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.0000	0.000	105.0000	No Ice	12.5086	7.4125	0.103
			-7.000			1/2" Ice	13.1075	8.5976	0.194
			-1.000			1" Ice	13.6715	9.4965	0.293
						2" Ice	14.8221	11.3279	0.520
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.0000	0.000	105.0000	No Ice	12.5086	7.4125	0.103
			-7.000			1/2" Ice	13.1075	8.5976	0.194
			-1.000			1" Ice	13.6715	9.4965	0.293
						2" Ice	14.8221	11.3279	0.520
PCS 1900MHZ 4X45W- 65MHZ	A	From Leg	4.0000	0.000	105.0000	No Ice	2.3218	2.2381	0.060
			0.000			1/2" Ice	2.5266	2.4407	0.083
			-1.000			1" Ice	2.7388	2.6507	0.110
						2" Ice	3.1855	3.0929	0.173
PCS 1900MHZ 4X45W- 65MHZ	B	From Leg	4.0000	0.000	105.0000	No Ice	2.3218	2.2381	0.060
			0.000			1/2" Ice	2.5266	2.4407	0.083
			-1.000			1" Ice	2.7388	2.6507	0.110
						2" Ice	3.1855	3.0929	0.173
PCS 1900MHZ 4X45W- 65MHZ	C	From Leg	4.0000	0.000	105.0000	No Ice	2.3218	2.2381	0.060
			0.000			1/2" Ice	2.5266	2.4407	0.083
			-1.000			1" Ice	2.7388	2.6507	0.110
						2" Ice	3.1855	3.0929	0.173
(2) RRH2X50-800	A	From Leg	4.0000	0.000	105.0000	No Ice	1.7008	1.2822	0.053
			0.000			1/2" Ice	1.8640	1.4275	0.070
			-1.000			1" Ice	2.0345	1.5803	0.090
						2" Ice	2.3979	1.9081	0.138
(2) RRH2X50-800	B	From Leg	4.0000	0.000	105.0000	No Ice	1.7008	1.2822	0.053
			0.000			1/2" Ice	1.8640	1.4275	0.070
			-1.000			1" Ice	2.0345	1.5803	0.090
						2" Ice	2.3979	1.9081	0.138
(2) RRH2X50-800	C	From Leg	4.0000	0.000	105.0000	No Ice	1.7008	1.2822	0.053
			0.000			1/2" Ice	1.8640	1.4275	0.070
			-1.000			1" Ice	2.0345	1.5803	0.090
						2" Ice	2.3979	1.9081	0.138
TD-RRH8X20-25	A	From Leg	4.0000	0.000	105.0000	No Ice	4.0455	1.5345	0.070
			0.000			1/2" Ice	4.2975	1.7142	0.097
			-1.000			1" Ice	4.5570	1.9008	0.128
						2" Ice	5.0981	2.2951	0.201
TD-RRH8X20-25	B	From Leg	4.0000	0.000	105.0000	No Ice	4.0455	1.5345	0.070
			0.000			1/2" Ice	4.2975	1.7142	0.097
			-1.000			1" Ice	4.5570	1.9008	0.128
						2" Ice	5.0981	2.2951	0.201
TD-RRH8X20-25	C	From Leg	4.0000	0.000	105.0000	No Ice	4.0455	1.5345	0.070
			0.000			1/2" Ice	4.2975	1.7142	0.097
			-1.000			1" Ice	4.5570	1.9008	0.128
						2" Ice	5.0981	2.2951	0.201
Platform Mount [LP 1201-1]	C	None		0.000	105.0000	No Ice	23.1000	23.1000	2.100
						1/2" Ice	26.8000	26.8000	2.500
						1" Ice	30.5000	30.5000	2.900
						2" Ice	37.9000	37.9000	3.700
Miscellaneous [NA 510-1]	C	From Leg	0.0000	0.000	105.0000	No Ice	6.0000	6.0000	0.256
			0.000			1/2" Ice	8.5000	8.5000	0.340
			2.500			1" Ice	11.0000	11.0000	0.423
						2" Ice	16.0000	16.0000	0.591

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
7770.00 w/ Mount Pipe	A	From Face	4.0000	0.0000	94.0000	No Ice	5.7460	4.2543	0.055
			-7.500			1/2" Ice	6.1791	5.0137	0.103
			1.000			1" Ice	6.6067	5.7109	0.157
						2" Ice	7.4880	7.1553	0.287
7770.00 w/ Mount Pipe	B	From Face	4.0000	0.0000	94.0000	No Ice	5.7460	4.2543	0.055
			-7.500			1/2" Ice	6.1791	5.0137	0.103
			1.000			1" Ice	6.6067	5.7109	0.157
						2" Ice	7.4880	7.1553	0.287
7770.00 w/ Mount Pipe	C	From Face	4.0000	0.0000	94.0000	No Ice	5.7460	4.2543	0.055
			-7.500			1/2" Ice	6.1791	5.0137	0.103
			1.000			1" Ice	6.6067	5.7109	0.157
						2" Ice	7.4880	7.1553	0.287
P65-17-XLH-RR w/ Mount Pipe	A	From Face	4.0000	0.0000	94.0000	No Ice	11.7042	8.9375	0.092
			2.500			1/2" Ice	12.4240	10.4499	0.178
			1.000			1" Ice	13.1530	11.9863	0.273
						2" Ice	14.5175	14.3127	0.498
P65-17-XLH-RR w/ Mount Pipe	B	From Face	4.0000	0.0000	94.0000	No Ice	11.7042	8.9375	0.092
			2.500			1/2" Ice	12.4240	10.4499	0.178
			1.000			1" Ice	13.1530	11.9863	0.273
						2" Ice	14.5175	14.3127	0.498
P65-17-XLH-RR w/ Mount Pipe	C	From Face	4.0000	0.0000	94.0000	No Ice	11.7042	8.9375	0.092
			2.500			1/2" Ice	12.4240	10.4499	0.178
			1.000			1" Ice	13.1530	11.9863	0.273
						2" Ice	14.5175	14.3127	0.498
P65-17-XLH-RR w/ Mount Pipe	A	From Face	4.0000	0.0000	94.0000	No Ice	11.7042	8.9375	0.092
			7.500			1/2" Ice	12.4240	10.4499	0.178
			1.000			1" Ice	13.1530	11.9863	0.273
						2" Ice	14.5175	14.3127	0.498
P65-17-XLH-RR w/ Mount Pipe	B	From Face	4.0000	0.0000	94.0000	No Ice	11.7042	8.9375	0.092
			7.500			1/2" Ice	12.4240	10.4499	0.178
			1.000			1" Ice	13.1530	11.9863	0.273
						2" Ice	14.5175	14.3127	0.498
P65-17-XLH-RR w/ Mount Pipe	C	From Face	4.0000	0.0000	94.0000	No Ice	11.7042	8.9375	0.092
			7.500			1/2" Ice	12.4240	10.4499	0.178
			1.000			1" Ice	13.1530	11.9863	0.273
						2" Ice	14.5175	14.3127	0.498
TT08-19DB111-001	A	From Face	4.0000	0.0000	94.0000	No Ice	0.7928	0.6421	0.022
			0.000			1/2" Ice	0.9126	0.7516	0.030
			1.000			1" Ice	1.0399	0.8716	0.039
						2" Ice	1.3165	1.1338	0.065
TT08-19DB111-001	B	From Face	4.0000	0.0000	94.0000	No Ice	0.7928	0.6421	0.022
			0.000			1/2" Ice	0.9126	0.7516	0.030
			1.000			1" Ice	1.0399	0.8716	0.039
						2" Ice	1.3165	1.1338	0.065
TT08-19DB111-001	C	From Face	4.0000	0.0000	94.0000	No Ice	0.7928	0.6421	0.022
			0.000			1/2" Ice	0.9126	0.7516	0.030
			1.000			1" Ice	1.0399	0.8716	0.039
						2" Ice	1.3165	1.1338	0.065
RRUS 11	A	From Face	1.0000	0.0000	94.0000	No Ice	2.7845	1.1872	0.051
			0.000			1/2" Ice	2.9919	1.3342	0.071
			3.000			1" Ice	3.2066	1.4897	0.095
						2" Ice	3.6584	1.8326	0.153
RRUS 11	B	From Face	1.0000	0.0000	94.0000	No Ice	2.7845	1.1872	0.051
			0.000			1/2" Ice	2.9919	1.3342	0.071
			3.000			1" Ice	3.2066	1.4897	0.095
						2" Ice	3.6584	1.8326	0.153
RRUS 11	C	From Face	1.0000	0.0000	94.0000	No Ice	2.7845	1.1872	0.051
			0.000			1/2" Ice	2.9919	1.3342	0.071
			3.000			1" Ice	3.2066	1.4897	0.095
						2" Ice	3.6584	1.8326	0.153
DTMABP7819VG12A	A	From Face	4.0000	0.0000	94.0000	No Ice	0.9762	0.3387	0.019
			0.000			1/2" Ice	1.1002	0.4192	0.026
			1.000			1" Ice	1.2316	0.5098	0.036
						2" Ice	1.5166	0.7143	0.060
DTMABP7819VG12A	B	From Face	4.0000	0.0000	94.0000	No Ice	0.9762	0.3387	0.019

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₂ Side ft ²	Weight K	
			0.000			1/2" Ice	1.1002	0.4192	0.026
			1.000			1" Ice	1.2316	0.5098	0.036
						2" Ice	1.5166	0.7143	0.060
DTMABP7819VG12A	C	From Face	4.0000	0.000	94.0000	No Ice	0.9762	0.3387	0.019
			0.000			1/2" Ice	1.1002	0.4192	0.026
			1.000			1" Ice	1.2316	0.5098	0.036
						2" Ice	1.5166	0.7143	0.060
(2) DC6-48-60-18-8F	A	From Face	1.0000	0.000	94.0000	No Ice	0.9167	0.9167	0.019
			0.000			1/2" Ice	1.4583	1.4583	0.037
			1.000			1" Ice	1.6431	1.6431	0.057
						2" Ice	2.0417	2.0417	0.105
(2) LGP13519	A	From Face	4.0000	0.000	94.0000	No Ice	0.2897	0.1806	0.005
			0.000			1/2" Ice	0.3617	0.2407	0.008
			1.000			1" Ice	0.4411	0.3103	0.012
						2" Ice	0.6223	0.4726	0.024
(2) LGP13519	B	From Face	4.0000	0.000	94.0000	No Ice	0.2897	0.1806	0.005
			0.000			1/2" Ice	0.3617	0.2407	0.008
			1.000			1" Ice	0.4411	0.3103	0.012
						2" Ice	0.6223	0.4726	0.024
(2) LGP13519	C	From Face	4.0000	0.000	94.0000	No Ice	0.2897	0.1806	0.005
			0.000			1/2" Ice	0.3617	0.2407	0.008
			1.000			1" Ice	0.4411	0.3103	0.012
						2" Ice	0.6223	0.4726	0.024
Platform Mount [LP 714-1]	C	None		0.000	94.0000	No Ice	37.4700	37.4700	1.600
						1/2" Ice	44.2300	44.2300	2.040
						1" Ice	50.9900	50.9900	2.480
						2" Ice	64.5100	64.5100	3.360
5'x2 1/2" Pipe Mount	A	From Face	1.0000	0.000	95.0000	No Ice	1.3275	1.3275	0.029
			0.000			1/2" Ice	1.6321	1.6321	0.040
			3.000			1" Ice	1.9459	1.9459	0.054
						2" Ice	2.6012	2.6012	0.093
5'x2 1/2" Pipe Mount	B	From Face	1.0000	0.000	95.0000	No Ice	1.3275	1.3275	0.029
			0.000			1/2" Ice	1.6321	1.6321	0.040
			3.000			1" Ice	1.9459	1.9459	0.054
						2" Ice	2.6012	2.6012	0.093
5'x2 1/2" Pipe Mount	C	From Face	1.0000	0.000	95.0000	No Ice	1.3275	1.3275	0.029
			0.000			1/2" Ice	1.6321	1.6321	0.040
			3.000			1" Ice	1.9459	1.9459	0.054
						2" Ice	2.6012	2.6012	0.093
Side Arm Mount [SO 102-3]	C	None		0.000	95.0000	No Ice	3.0000	3.0000	0.081
						1/2" Ice	3.4800	3.4800	0.111
						1" Ice	3.9600	3.9600	0.141
						2" Ice	4.9200	4.9200	0.201

GPS_A	C	From Leg	4.0000	0.000	60.0000	No Ice	0.2550	0.2550	0.001
			0.000			1/2" Ice	0.3205	0.3205	0.005
			0.000			1" Ice	0.3934	0.3934	0.010
						2" Ice	0.5614	0.5614	0.025
Side Arm Mount [SO 701-1]	C	None		0.000	60.0000	No Ice	0.8500	1.6700	0.065
						1/2" Ice	1.1400	2.3400	0.079
						1" Ice	1.4300	3.0100	0.093
						2" Ice	2.0100	4.3500	0.121

HSS Jump Plate 132" x 6" x 5/8"	A	From Face	0.0000	0.000	111.5000	No Ice	10.4500	6.2516	0.915
			0.000			1/2" Ice	12.2840	7.2915	1.012
			0.000			1" Ice	14.1444	8.3453	1.066
						2" Ice	17.9444	10.4946	1.196
HSS Jump Plate 132" x 6" x 5/8"	B	From Face	0.0000	0.000	111.5000	No Ice	10.4500	6.2516	0.915
			0.000			1/2" Ice	12.2840	7.2915	1.012
			0.000			1" Ice	14.1444	8.3453	1.066
						2" Ice	17.9444	10.4946	1.196
HSS Jump Plate 132" x 6" x 5/8"	C	From Face	0.0000	0.000	111.5000	No Ice	10.4500	6.2516	0.915
			0.000			1/2" Ice	12.2840	7.2915	1.012
			0.000			1" Ice	14.1444	8.3453	1.066
						2" Ice	17.9444	10.4946	1.196

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

Load Combinations

<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
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	129 - 124	Pole	Max Tension	42	0.000	0.000	0.000
			Max. Compression	26	-15.482	-8.391	2.538
			Max. Mx	8	-5.686	-16.327	1.895
			Max. My	2	-5.729	-2.215	14.711
			Max. Vy	8	8.200	-16.327	1.895
			Max. Vx	14	7.943	-1.327	-12.007
			Max. Torque	2			-6.382
L2	124 - 119	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-16.200	-8.575	2.511
			Max. Mx	8	-6.106	-57.935	2.984
			Max. My	2	-6.149	-3.426	54.978
			Max. Vy	8	8.443	-57.935	2.984
			Max. Vx	14	8.184	-0.286	-52.369
			Max. Torque	2			-6.382
L3	119 - 115.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.310	-8.700	3.952
			Max. Mx	8	-9.035	-96.606	3.892
			Max. My	2	-9.077	-4.280	93.074
			Max. Vy	8	15.819	-96.606	3.892
			Max. Vx	14	15.649	0.440	-90.068
			Max. Torque	2			-6.384
L4	115.5 - 115	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.389	-8.724	3.952
			Max. Mx	8	-9.091	-104.520	4.004
			Max. My	2	-9.133	-4.407	100.896
			Max. Vy	8	15.840	-104.520	4.004
			Max. Vx	14	15.670	0.543	-97.900
			Max. Torque	2			-6.384
L5	115 - 110	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-32.163	-8.952	3.932
			Max. Mx	8	-12.644	-186.946	5.113
			Max. My	2	-12.685	-5.665	182.402
			Max. Vy	8	17.768	-186.946	5.113
			Max. Vx	14	17.597	1.586	-179.526
			Max. Torque	2			-6.383
L6	110 - 105	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-32.860	-9.147	3.891
			Max. Mx	8	-13.129	-276.519	6.227
			Max. My	2	-13.165	-6.905	271.045
			Max. Vy	8	18.082	-276.519	6.227
			Max. Vx	14	17.915	2.661	-268.306
			Max. Torque	2			-6.379
L7	105 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-42.922	-8.877	3.574
			Max. Mx	8	-17.637	-388.192	7.232
			Max. My	2	-17.673	-7.942	381.867
			Max. Vy	8	22.935	-388.192	7.232
			Max. Vx	14	22.769	3.961	-379.548
			Max. Torque	2			-6.372
L8	100 - 99	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.116	-8.907	3.560
			Max. Mx	8	-17.765	-411.143	7.454
			Max. My	2	-17.800	-8.185	404.631
			Max. Vy	8	23.008	-411.143	7.454
			Max. Vx	14	22.850	4.182	-402.349
			Max. Torque	2			-6.135
L9	99 - 98.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.178	-8.915	3.557
			Max. Mx	8	-17.828	-416.893	7.509
			Max. My	2	-17.862	-8.244	410.334
			Max. Vy	8	23.015	-416.893	7.509
			Max. Vx	14	22.858	4.239	-408.062
			Max. Torque	2			-6.134
L10	98.75 - 93.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.533	-8.701	3.678
			Max. Mx	8	-21.581	-539.167	8.651

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L11	93.75 - 92	Pole	Max. My	2	-21.618	-9.388	531.791
			Max. Vy	8	29.268	-539.167	8.651
			Max. Vx	14	29.149	5.409	-529.739
			Max. Torque	2			-6.134
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-54.069	-8.750	3.648
			Max. Mx	8	-21.889	-590.515	9.038
			Max. My	2	-21.925	-9.815	582.807
			Max. Vy	8	29.455	-590.515	9.038
			Max. Vx	14	29.360	5.795	-580.920
L12	92 - 91.75	Pole	Max. Torque	2			-6.013
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-54.159	-8.758	3.644
			Max. Mx	8	-21.978	-597.876	9.094
			Max. My	2	-22.013	-9.875	590.120
			Max. Vy	8	29.461	-597.876	9.094
			Max. Vx	14	29.368	5.853	-588.261
			Max. Torque	2			-6.013
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-55.973	-8.886	3.551
L13	91.75 - 86.75	Pole	Max. Mx	8	-23.124	-746.552	10.194
			Max. My	2	-23.157	-11.086	737.849
			Max. Vy	8	30.028	-746.552	10.194
			Max. Vx	14	30.004	6.961	-736.709
			Max. Torque	2			-6.012
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-57.812	-9.001	3.447
			Max. Mx	8	-24.318	-898.013	11.288
			Max. My	2	-24.349	-12.284	888.363
			Max. Vy	8	30.585	-898.013	11.288
L14	86.75 - 81.75	Pole	Max. Vx	14	30.628	8.075	-888.281
			Max. Torque	2			-6.009
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-59.211	-9.078	3.359
			Max. Mx	8	-25.234	-1013.424	12.101
			Max. My	14	-25.226	8.912	-1003.993
			Max. Vy	8	31.001	-1013.424	12.101
			Max. Vx	14	31.092	8.912	-1003.993
			Max. Torque	2			-6.006
			Max Tension	1	0.000	0.000	0.000
L15	81.75 - 73.75	Pole	Max. Compression	26	-62.531	-9.180	3.234
			Max. Mx	8	-27.514	-1178.031	13.238
			Max. My	14	-27.502	10.083	-1169.333
			Max. Vy	8	31.720	-1178.031	13.238
			Max. Vx	14	31.883	10.083	-1169.333
			Max. Torque	2			-6.002
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-63.511	-9.221	3.178
			Max. Mx	8	-28.185	-1249.668	13.723
			Max. My	14	-28.171	10.587	-1241.404
L16	73.75 - 72.75	Pole	Max. Vy	8	31.988	-1249.668	13.723
			Max. Vx	14	32.184	10.587	-1241.404
			Max. Torque	2			-6.002
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-63.635	-9.226	3.172
			Max. Mx	8	-28.286	-1257.665	13.777
			Max. My	14	-28.271	10.643	-1249.454
			Max. Vy	8	32.008	-1257.665	13.777
			Max. Vx	14	32.207	10.643	-1249.454
			Max. Torque	2			-6.001
L17	72.75 - 70.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.750	-9.295	3.156
			Max. Mx	8	-29.635	-1386.785	14.637
			Max. My	14	-29.618	11.538	-1379.525
			Max. Vy	8	32.572	-1386.785	14.637
			Max. Vx	14	32.818	11.538	-1379.525
			Max. Torque	2			-6.000
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.906	-9.300	3.156
			L18	70.5 - 70.25	Pole	Max. Compression	26
Max. Mx	8	-29.635				-1386.785	14.637
Max. My	14	-29.618				11.538	-1379.525
Max. Vy	8	32.572				-1386.785	14.637
L19	70.25 - 66.25	Pole	Max. Vx	14	32.818	11.538	-1379.525
			Max. Torque	2			-6.000
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.750	-9.295	3.156
			Max. Mx	8	-29.635	-1386.785	14.637
			Max. My	14	-29.618	11.538	-1379.525
			Max. Vy	8	32.572	-1386.785	14.637
			Max. Vx	14	32.818	11.538	-1379.525
			Max. Torque	2			-6.000
			Max Tension	1	0.000	0.000	0.000
L20	66.25 - 66	Pole	Max. Compression	26	-65.906	-9.300	3.156
			Max. Mx	8	-29.635	-1386.785	14.637
			Max. My	14	-29.618	11.538	-1379.525

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft			
L21	66 - 61	Pole	Max. Mx	8	-29.754	-1394.930	14.691			
			Max. My	14	-29.737	11.594	-1387.735			
			Max. Vy	8	32.599	-1394.930	14.691			
			Max. Vx	14	32.847	11.594	-1387.735			
			Max. Torque	2			-5.999			
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-69.007	-9.380	3.137			
			Max. Mx	8	-31.879	-1559.720	15.760			
			Max. My	14	-31.859	12.713	-1553.999			
			Max. Vy	8	33.337	-1559.720	15.760			
L22	61 - 56.5	Pole	Max. Vx	14	33.647	12.713	-1553.999			
			Max. Torque	2			-5.998			
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-72.083	-9.348	3.060			
			Max. Mx	8	-33.904	-1711.451	16.716			
			Max. My	14	-33.883	13.724	-1707.299			
			Max. Vy	8	34.088	-1711.451	16.716			
			Max. Vx	14	34.440	13.724	-1707.299			
			Max. Torque	2			-5.996			
			L23	56.5 - 56.25	Pole	Max Tension	1	0.000	0.000	0.000
Max. Compression	26	-72.252				-9.353	3.059			
Max. Mx	8	-34.026				-1719.974	16.769			
Max. My	14	-34.006				13.781	-1715.914			
Max. Vy	8	34.116				-1719.974	16.769			
Max. Vx	14	34.468				13.781	-1715.914			
Max. Torque	2						-5.950			
Max Tension	1	0.000				0.000	0.000			
Max. Compression	26	-75.502				-9.423	3.034			
L24	56.25 - 51.25	Pole				Max. Mx	8	-36.214	-1892.353	17.828
			Max. My	14	-36.192	14.900	-1890.285			
			Max. Vy	8	34.858	-1892.353	17.828			
			Max. Vx	14	35.269	14.900	-1890.285			
			Max. Torque	2			-5.949			
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-78.679	-9.489	3.005			
			Max. Mx	8	-38.444	-2068.327	18.880			
			Max. My	14	-38.421	16.020	-2068.596			
			L25	51.25 - 46.25	Pole	Max. Vy	8	35.564	-2068.327	18.880
Max. Vx	14	36.055				16.020	-2068.596			
Max. Torque	2						-5.948			
Max Tension	1	0.000				0.000	0.000			
Max. Compression	26	-81.356				-9.540	2.978			
Max. Mx	8	-40.367				-2220.617	19.767			
Max. My	14	-40.343				16.970	-2223.222			
Max. Vy	8	36.136				-2220.617	19.767			
Max. Vx	14	36.710				16.970	-2223.222			
L26	46.25 - 36.75	Pole				Max. Torque	2			-5.946
			Max Tension	1	0.000	0.000	0.000			
			Max. Compression	26	-87.533	-9.564	2.923			
			Max. Mx	8	-44.989	-2449.515	21.070			
			Max. My	14	-44.964	18.365	-2456.200			
			Max. Vy	8	37.111	-2449.515	21.070			
			Max. Vx	14	37.808	18.365	-2456.200			
			Max. Torque	2			-5.944			
			Max Tension	1	0.000	0.000	0.000			
			L27	36.75 - 35.75	Pole	Max. Compression	26	-87.951	-9.567	2.914
Max. Mx	8	-45.310				-2477.366	21.225			
Max. My	14	-45.284				18.533	-2484.591			
Max. Vy	8	37.194				-2477.366	21.225			
Max. Vx	14	37.903				18.533	-2484.591			
Max. Torque	2						-5.944			
Max Tension	1	0.000				0.000	0.000			
Max. Compression	26	-88.096				-9.569	2.906			
Max. Mx	8	-45.424				-2486.664	21.277			
L28	35.75 - 35	Pole				Max. My	14	-45.399	18.589	-2494.072
			Max. Vy	8	37.214	-2486.664	21.277			
			Max. Vx	14	37.926	18.589	-2494.072			
			Max. Torque	2			-5.943			
			Max Tension	1	0.000	0.000	0.000			
			L29	35 - 34.75	Pole	Max. Compression	26	-88.096	-9.569	2.906
						Max. Mx	8	-45.424	-2486.664	21.277
						Max. My	14	-45.399	18.589	-2494.072
						Max. Vy	8	37.214	-2486.664	21.277
						Max. Vx	14	37.926	18.589	-2494.072
Max. Torque	2						-5.943			
Max Tension	1	0.000				0.000	0.000			
L30	34.75 - 31.25	Pole				Max. Compression	26	-88.096	-9.569	2.906
						Max. Mx	8	-45.424	-2486.664	21.277
						Max. My	14	-45.399	18.589	-2494.072
			Max. Vy	8	37.214	-2486.664	21.277			
			Max. Vx	14	37.926	18.589	-2494.072			
			Max. Torque	2			-5.943			
			Max Tension	1	0.000	0.000	0.000			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-90.120	-9.581	2.781
			Max. Mx	8	-46.890	-2617.599	22.001
			Max. My	14	-46.865	19.370	-2627.676
			Max. Vy	8	37.638	-2617.599	22.001
			Max. Vx	14	38.414	19.370	-2627.676
			Max. Torque	2			-5.943
			Max Tension	1	0.000	0.000	0.000
L31	31.25 - 31	Pole	Max. Compression	26	-90.276	-9.583	2.773
			Max. Mx	8	-47.023	-2627.006	22.053
			Max. My	14	-46.999	19.427	-2637.282
			Max. Vy	8	37.649	-2627.006	22.053
			Max. Vx	14	38.428	19.427	-2637.282
			Max. Torque	2			-5.942
			Max Tension	1	0.000	0.000	0.000
L32	31 - 26	Pole	Max. Compression	26	-93.398	-9.601	2.593
			Max. Mx	8	-49.357	-2816.656	23.078
			Max. My	14	-49.335	20.539	-2831.141
			Max. Vy	8	38.240	-2816.656	23.078
			Max. Vx	14	39.106	20.539	-2831.141
			Max. Torque	2			-5.942
			Max Tension	1	0.000	0.000	0.000
L33	26 - 22	Pole	Max. Compression	26	-95.961	-9.548	2.487
			Max. Mx	8	-51.260	-2970.466	23.891
			Max. My	14	-51.241	21.426	-2988.624
			Max. Vy	8	38.709	-2970.466	23.891
			Max. Vx	14	39.641	21.426	-2988.624
			Max. Torque	2			-5.941
			Max Tension	1	0.000	0.000	0.000
L34	22 - 21.75	Pole	Max. Compression	26	-96.131	-9.544	2.480
			Max. Mx	8	-51.400	-2980.142	23.942
			Max. My	14	-51.382	21.482	-2998.538
			Max. Vy	8	38.723	-2980.142	23.942
			Max. Vx	14	39.658	21.482	-2998.538
			Max. Torque	2			-5.940
			Max Tension	1	0.000	0.000	0.000
L35	21.75 - 20.5	Pole	Max. Compression	26	-96.981	-9.524	2.449
			Max. Mx	8	-52.024	-3028.632	24.195
			Max. My	14	-52.006	21.758	-3048.236
			Max. Vy	8	38.891	-3028.632	24.195
			Max. Vx	14	39.848	21.758	-3048.236
			Max. Torque	2			-5.940
			Max Tension	1	0.000	0.000	0.000
L36	20.5 - 20.25	Pole	Max. Compression	26	-97.160	-9.521	2.442
			Max. Mx	8	-52.167	-3038.353	24.245
			Max. My	14	-52.149	21.814	-3058.201
			Max. Vy	8	38.904	-3038.353	24.245
			Max. Vx	14	39.863	21.814	-3058.201
			Max. Torque	2			-5.940
			Max Tension	1	0.000	0.000	0.000
L37	20.25 - 19	Pole	Max. Compression	26	-98.057	-9.500	2.410
			Max. Mx	8	-52.793	-3087.073	24.497
			Max. My	14	-52.776	22.089	-3108.156
			Max. Vy	8	39.078	-3087.073	24.497
			Max. Vx	14	40.054	22.089	-3108.156
			Max. Torque	2			-5.940
			Max Tension	1	0.000	0.000	0.000
L38	19 - 18.75	Pole	Max. Compression	26	-98.229	-9.497	2.404
			Max. Mx	8	-52.928	-3096.840	24.547
			Max. My	14	-52.912	22.145	-3118.172
			Max. Vy	8	39.090	-3096.840	24.547
			Max. Vx	14	40.068	22.145	-3118.172
			Max. Torque	2			-5.940
			Max Tension	1	0.000	0.000	0.000
L39	18.75 - 18	Pole	Max. Compression	26	-98.743	-9.485	2.385
			Max. Mx	8	-53.283	-3126.187	24.698
			Max. My	14	-53.266	22.310	-3148.271
			Max. Vy	8	39.189	-3126.187	24.698
			Max. Vx	14	40.178	22.310	-3148.271
			Max. Torque	2			-5.940

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L40	18 - 17.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-98.933	-9.481	2.379
			Max. Mx	8	-53.429	-3135.984	24.749
			Max. My	14	-53.413	22.366	-3158.321
			Max. Vy	8	39.210	-3135.984	24.749
			Max. Vx	14	40.201	22.366	-3158.321
			Max. Torque	2			-5.940
L41	17.75 - 12.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-102.669	-9.457	2.218
			Max. Mx	8	-56.186	-3333.443	25.748
			Max. My	14	-56.174	23.465	-3361.051
			Max. Vy	8	39.799	-3333.443	25.748
			Max. Vx	14	40.876	23.465	-3361.051
			Max. Torque	2			-5.940
L42	12.75 - 7.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-106.367	-9.475	2.034
			Max. Mx	8	-58.987	-3533.743	26.739
			Max. My	14	-58.979	24.561	-3567.096
			Max. Vy	8	40.361	-3533.743	26.739
			Max. Vx	14	41.541	24.561	-3567.096
			Max. Torque	2			-5.939
L43	7.75 - 5.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-108.026	-9.483	1.952
			Max. Mx	8	-60.261	-3624.794	27.181
			Max. My	14	-60.255	25.052	-3660.905
			Max. Vy	8	40.617	-3624.794	27.181
			Max. Vx	14	41.845	25.052	-3660.905
			Max. Torque	2			-5.939
L44	5.5 - 5.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-108.233	-9.484	1.943
			Max. Mx	8	-60.437	-3634.947	27.230
			Max. My	14	-60.432	25.107	-3671.370
			Max. Vy	8	40.629	-3634.947	27.230
			Max. Vx	14	41.862	25.107	-3671.370
			Max. Torque	2			-5.939
L45	5.25 - 4	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-109.264	-9.487	1.898
			Max. Mx	8	-61.247	-3685.823	27.475
			Max. My	14	-61.242	25.379	-3723.830
			Max. Vy	8	40.797	-3685.823	27.475
			Max. Vx	14	42.056	25.379	-3723.830
			Max. Torque	2			-5.939
L46	4 - 3.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-109.467	-9.488	1.889
			Max. Mx	8	-61.420	-3696.021	27.524
			Max. My	14	-61.416	25.434	-3734.349
			Max. Vy	8	40.811	-3696.021	27.524
			Max. Vx	14	42.075	25.434	-3734.349
			Max. Torque	2			-5.939
L47	3.75 - 3	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-110.077	-9.490	1.863
			Max. Mx	8	-61.903	-3726.660	27.671
			Max. My	14	-61.899	25.597	-3765.958
			Max. Vy	8	40.910	-3726.660	27.671
			Max. Vx	14	42.190	25.597	-3765.958
			Max. Torque	2			-5.939
L48	3 - 2.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-110.261	-9.491	1.854
			Max. Mx	8	-62.053	-3736.889	27.720
			Max. My	14	-62.050	25.651	-3776.513
			Max. Vy	8	40.932	-3736.889	27.720
			Max. Vx	14	42.217	25.651	-3776.513
			Max. Torque	2			-5.939
L49	2.75 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-112.219	-9.498	1.761
			Max. Mx	8	-63.636	-3849.875	28.255
			Max. My	14	-63.635	26.248	-3893.163
			Max. Vy	8	41.270	-3849.875	28.255
			Max. Vx	14	42.607	26.248	-3893.163

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	2			-5.939

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	29	112.219	-8.306	4.804
	Max. H _x	20	63.653	41.175	-0.216
	Max. H _z	3	47.740	-0.216	40.576
	Max. M _x	2	3800.913	-0.216	40.576
	Max. M _z	8	3849.875	-41.244	0.216
	Max. Torsion	14	5.892	0.216	-42.580
	Min. Vert	5	47.740	-20.554	35.248
	Min. H _x	8	63.653	-41.244	0.216
	Min. H _z	15	47.740	0.216	-42.580
	Min. M _x	14	-3893.163	0.216	-42.580
	Min. M _z	20	-3843.672	41.175	-0.216
	Min. Torsion	2	-5.939	-0.216	40.576

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	53.044	0.000	0.000	0.294	-1.902	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	63.653	0.216	-40.576	-3800.913	-30.905	5.939
0.9 Dead+1.0 Wind 0 deg - No Ice	47.740	0.216	-40.576	-3761.905	-29.918	5.874
1.2 Dead+1.0 Wind 30 deg - No Ice	63.653	20.554	-35.248	-3305.864	-1938.449	5.227
0.9 Dead+1.0 Wind 30 deg - No Ice	47.740	20.554	-35.248	-3271.908	-1917.831	5.187
1.2 Dead+1.0 Wind 60 deg - No Ice	63.653	37.057	-21.441	-1969.322	-3403.973	3.097
0.9 Dead+1.0 Wind 60 deg - No Ice	47.740	37.057	-21.441	-1949.281	-3368.639	3.094
1.2 Dead+1.0 Wind 90 deg - No Ice	63.653	41.244	-0.216	-28.255	-3849.875	0.137
0.9 Dead+1.0 Wind 90 deg - No Ice	47.740	41.244	-0.216	-27.959	-3809.753	0.171
1.2 Dead+1.0 Wind 120 deg - No Ice	63.653	35.607	20.355	1888.364	-3319.797	-2.844
0.9 Dead+1.0 Wind 120 deg - No Ice	47.740	35.607	20.355	1869.007	-3285.146	-2.783
1.2 Dead+1.0 Wind 150 deg - No Ice	63.653	20.433	35.472	3299.106	-1901.183	-5.046
0.9 Dead+1.0 Wind 150 deg - No Ice	47.740	20.433	35.472	3265.265	-1881.122	-4.974
1.2 Dead+1.0 Wind 180 deg - No Ice	63.653	-0.216	42.580	3893.163	26.249	-5.892
0.9 Dead+1.0 Wind 180 deg - No Ice	47.740	-0.216	42.580	3853.504	26.514	-5.828
1.2 Dead+1.0 Wind 210 deg - No Ice	63.653	-20.773	35.628	3326.239	1945.189	-5.176
0.9 Dead+1.0 Wind 210 deg - No Ice	47.740	-20.773	35.628	3292.064	1925.770	-5.137
1.2 Dead+1.0 Wind 240 deg - No Ice	63.653	-35.764	20.695	1937.003	3342.233	-3.093
0.9 Dead+1.0 Wind 240 deg - No Ice	47.740	-35.764	20.695	1917.042	3308.511	-3.090

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
No Ice						
1.2 Dead+1.0 Wind 270 deg - No Ice	63.653	-41.175	0.216	28.897	3843.672	-0.184
0.9 Dead+1.0 Wind 270 deg - No Ice	47.740	-41.175	0.216	28.471	3804.840	-0.217
1.2 Dead+1.0 Wind 300 deg - No Ice	63.653	-36.810	-21.049	-1919.445	3370.083	2.794
0.9 Dead+1.0 Wind 300 deg - No Ice	47.740	-36.810	-21.049	-1900.041	3336.381	2.733
1.2 Dead+1.0 Wind 330 deg - No Ice	63.653	-20.179	-35.032	-3277.389	1884.357	5.042
0.9 Dead+1.0 Wind 330 deg - No Ice	47.740	-20.179	-35.032	-3243.800	1865.620	4.970
1.2 Dead+1.0 Ice+1.0 Temp	112.219	0.000	-0.000	-1.761	-9.498	0.003
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	112.219	0.021	-9.233	-961.555	-12.635	1.457
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	112.219	4.639	-8.007	-834.462	-492.752	1.178
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	112.219	8.306	-4.804	-492.392	-857.516	0.585
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	112.219	9.323	-0.021	-4.777	-974.840	-0.166
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	112.219	8.064	4.639	477.575	-844.044	-0.870
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	112.219	4.643	8.057	831.476	-489.673	-1.341
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	112.219	-0.021	9.584	974.756	-6.685	-1.452
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	112.219	-4.674	8.068	834.225	475.375	-1.172
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	112.219	-8.074	4.670	482.595	827.468	-0.579
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	112.219	-9.311	0.021	1.173	955.253	0.170
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	112.219	-8.280	-4.764	-487.159	835.082	0.875
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	112.219	-4.602	-7.986	-831.483	468.276	1.346
Dead+Wind 0 deg - Service	53.044	0.045	-8.500	-791.528	-7.919	1.250
Dead+Wind 30 deg - Service	53.044	4.306	-7.384	-688.419	-405.274	1.102
Dead+Wind 60 deg - Service	53.044	7.763	-4.492	-410.038	-710.611	0.658
Dead+Wind 90 deg - Service	53.044	8.640	-0.045	-5.665	-803.444	0.038
Dead+Wind 120 deg - Service	53.044	7.459	4.264	393.573	-693.011	-0.592
Dead+Wind 150 deg - Service	53.044	4.280	7.431	687.428	-397.510	-1.062
Dead+Wind 180 deg - Service	53.044	-0.045	8.920	811.233	3.974	-1.248
Dead+Wind 210 deg - Service	53.044	-4.352	7.464	693.113	403.713	-1.100
Dead+Wind 240 deg - Service	53.044	-7.492	4.335	403.721	694.749	-0.658
Dead+Wind 270 deg - Service	53.044	-8.626	0.045	6.228	799.196	-0.040
Dead+Wind 300 deg - Service	53.044	-7.711	-4.409	-399.649	700.565	0.590
Dead+Wind 330 deg - Service	53.044	-4.227	-7.339	-682.472	391.028	1.062

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	0.000	-53.044	0.000	0.000	53.044	0.000	0.000%
2	0.216	-63.653	-40.576	-0.216	63.653	40.576	0.000%
3	0.216	-47.740	-40.576	-0.216	47.740	40.576	0.000%
4	20.554	-63.653	-35.248	-20.554	63.653	35.248	0.000%
5	20.554	-47.740	-35.248	-20.554	47.740	35.248	0.000%
6	37.057	-63.653	-21.441	-37.057	63.653	21.441	0.000%
7	37.057	-47.740	-21.441	-37.057	47.740	21.441	0.000%
8	41.244	-63.653	-0.216	-41.244	63.653	0.216	0.000%
9	41.244	-47.740	-0.216	-41.244	47.740	0.216	0.000%
10	35.607	-63.653	20.355	-35.607	63.653	-20.355	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
11	35.607	-47.740	20.355	-35.607	47.740	-20.355	0.000%
12	20.433	-63.653	35.472	-20.433	63.653	-35.472	0.000%
13	20.433	-47.740	35.472	-20.433	47.740	-35.472	0.000%
14	-0.216	-63.653	42.580	0.216	63.653	-42.580	0.000%
15	-0.216	-47.740	42.580	0.216	47.740	-42.580	0.000%
16	-20.773	-63.653	35.628	20.773	63.653	-35.628	0.000%
17	-20.773	-47.740	35.628	20.773	47.740	-35.628	0.000%
18	-35.764	-63.653	20.695	35.764	63.653	-20.695	0.000%
19	-35.764	-47.740	20.695	35.764	47.740	-20.695	0.000%
20	-41.175	-63.653	0.216	41.175	63.653	-0.216	0.000%
21	-41.175	-47.740	0.216	41.175	47.740	-0.216	0.000%
22	-36.810	-63.653	-21.049	36.810	63.653	21.049	0.000%
23	-36.810	-47.740	-21.049	36.810	47.740	21.049	0.000%
24	-20.179	-63.653	-35.032	20.179	63.653	35.032	0.000%
25	-20.179	-47.740	-35.032	20.179	47.740	35.032	0.000%
26	0.000	-112.219	0.000	-0.000	112.219	0.000	0.000%
27	0.021	-112.219	-9.233	-0.021	112.219	9.233	0.000%
28	4.639	-112.219	-8.007	-4.639	112.219	8.007	0.000%
29	8.306	-112.219	-4.804	-8.306	112.219	4.804	0.000%
30	9.323	-112.219	-0.021	-9.323	112.219	0.021	0.000%
31	8.064	-112.219	4.639	-8.064	112.219	-4.639	0.000%
32	4.643	-112.219	8.057	-4.643	112.219	-8.057	0.000%
33	-0.021	-112.219	9.584	0.021	112.219	-9.584	0.000%
34	-4.674	-112.219	8.068	4.674	112.219	-8.068	0.000%
35	-8.074	-112.219	4.670	8.074	112.219	-4.670	0.000%
36	-9.311	-112.219	0.021	9.311	112.219	-0.021	0.000%
37	-8.280	-112.219	-4.764	8.280	112.219	4.764	0.000%
38	-4.602	-112.219	-7.986	4.602	112.219	7.986	0.000%
39	0.045	-53.044	-8.500	-0.045	53.044	8.500	0.000%
40	4.306	-53.044	-7.384	-4.306	53.044	7.384	0.000%
41	7.763	-53.044	-4.492	-7.763	53.044	4.492	0.000%
42	8.640	-53.044	-0.045	-8.640	53.044	0.045	0.000%
43	7.459	-53.044	4.264	-7.459	53.044	-4.264	0.000%
44	4.280	-53.044	7.431	-4.280	53.044	-7.431	0.000%
45	-0.045	-53.044	8.920	0.045	53.044	-8.920	0.000%
46	-4.352	-53.044	7.464	4.352	53.044	-7.464	0.000%
47	-7.492	-53.044	4.335	7.492	53.044	-4.335	0.000%
48	-8.626	-53.044	0.045	8.626	53.044	-0.045	0.000%
49	-7.711	-53.044	-4.409	7.711	53.044	4.409	0.000%
50	-4.227	-53.044	-7.339	4.227	53.044	7.339	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000397
2	Yes	6	0.00000001	0.00010095
3	Yes	5	0.00000001	0.00087896
4	Yes	6	0.00000001	0.00053498
5	Yes	6	0.00000001	0.00017127
6	Yes	6	0.00000001	0.00047061
7	Yes	6	0.00000001	0.00014669
8	Yes	5	0.00000001	0.00021461
9	Yes	5	0.00000001	0.00008480
10	Yes	6	0.00000001	0.00044866
11	Yes	6	0.00000001	0.00014200
12	Yes	6	0.00000001	0.00051829
13	Yes	6	0.00000001	0.00016705
14	Yes	6	0.00000001	0.00007927
15	Yes	5	0.00000001	0.00068977
16	Yes	6	0.00000001	0.00044884
17	Yes	6	0.00000001	0.00014063
18	Yes	6	0.00000001	0.00051309
19	Yes	6	0.00000001	0.00016349
20	Yes	5	0.00000001	0.00027629

21	Yes	5	0.00000001	0.00012480
22	Yes	6	0.00000001	0.00050144
23	Yes	6	0.00000001	0.00016007
24	Yes	6	0.00000001	0.00043149
25	Yes	6	0.00000001	0.00013657
26	Yes	5	0.00000001	0.00023392
27	Yes	6	0.00000001	0.00079348
28	Yes	6	0.00000001	0.00094608
29	Yes	6	0.00000001	0.00094301
30	Yes	6	0.00000001	0.00080348
31	Yes	6	0.00000001	0.00090975
32	Yes	6	0.00000001	0.00092121
33	Yes	6	0.00000001	0.00077984
34	Yes	6	0.00000001	0.00086749
35	Yes	6	0.00000001	0.00087411
36	Yes	6	0.00000001	0.00075267
37	Yes	6	0.00000001	0.00089133
38	Yes	6	0.00000001	0.00087569
39	Yes	5	0.00000001	0.00008505
40	Yes	5	0.00000001	0.00016007
41	Yes	5	0.00000001	0.00011114
42	Yes	4	0.00000001	0.00052112
43	Yes	5	0.00000001	0.00010140
44	Yes	5	0.00000001	0.00015150
45	Yes	5	0.00000001	0.00008151
46	Yes	5	0.00000001	0.00010700
47	Yes	5	0.00000001	0.00013775
48	Yes	4	0.00000001	0.00051906
49	Yes	5	0.00000001	0.00013266
50	Yes	5	0.00000001	0.00010041

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	129 - 124	17.720	41	1.437	0.026
L2	124 - 119	16.216	41	1.434	0.025
L3	119 - 115.5	14.725	41	1.410	0.021
L4	115.5 - 115	13.702	41	1.379	0.018
L5	115 - 110	13.558	41	1.375	0.018
L6	110 - 105	12.160	41	1.290	0.013
L7	105 - 100	10.866	41	1.180	0.010
L8	100 - 99	9.697	41	1.049	0.007
L9	99 - 98.75	9.480	41	1.020	0.006
L10	98.75 - 93.75	9.427	41	1.017	0.006
L11	93.75 - 92	8.403	41	0.938	0.005
L12	92 - 91.75	8.064	41	0.909	0.004
L13	91.75 - 86.75	8.017	41	0.907	0.004
L14	86.75 - 81.75	7.100	41	0.843	0.004
L15	81.75 - 73.75	6.253	41	0.774	0.003
L16	78 - 72.75	5.667	41	0.719	0.003
L17	72.75 - 70.5	4.896	41	0.678	0.002
L18	70.5 - 70.25	4.583	41	0.649	0.002
L19	70.25 - 66.25	4.549	41	0.647	0.002
L20	66.25 - 66	4.025	41	0.603	0.002
L21	66 - 61	3.994	41	0.601	0.002
L22	61 - 56.5	3.390	41	0.552	0.002
L23	56.5 - 56.25	2.891	41	0.508	0.001
L24	56.25 - 51.25	2.864	41	0.505	0.001
L25	51.25 - 46.25	2.361	41	0.456	0.001
L26	46.25 - 36.75	1.910	41	0.406	0.001
L27	42 - 35.75	1.568	41	0.363	0.001
L28	35.75 - 35	1.114	41	0.324	0.001
L29	35 - 34.75	1.064	41	0.316	0.001
L30	34.75 - 31.25	1.048	41	0.313	0.001
L31	31.25 - 31	0.832	41	0.275	0.001
L32	31 - 26	0.818	41	0.272	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L33	26 - 22	0.560	41	0.220	0.001
L34	22 - 21.75	0.393	41	0.179	0.000
L35	21.75 - 20.5	0.384	41	0.177	0.000
L36	20.5 - 20.25	0.339	41	0.165	0.000
L37	20.25 - 19	0.330	41	0.163	0.000
L38	19 - 18.75	0.289	41	0.152	0.000
L39	18.75 - 18	0.281	41	0.150	0.000
L40	18 - 17.75	0.258	41	0.143	0.000
L41	17.75 - 12.75	0.251	41	0.140	0.000
L42	12.75 - 7.75	0.126	41	0.098	0.000
L43	7.75 - 5.5	0.045	41	0.057	0.000
L44	5.5 - 5.25	0.023	41	0.038	0.000
L45	5.25 - 4	0.021	41	0.036	0.000
L46	4 - 3.75	0.012	41	0.028	0.000
L47	3.75 - 3	0.011	41	0.027	0.000
L48	3 - 2.75	0.007	41	0.022	0.000
L49	2.75 - 0	0.006	41	0.020	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
129.0000	Lighting Rod 5/8" x 4'	41	17.720	1.437	0.026	23097
125.0000	AIR 32 B2a/B66Aa w/ Mount Pipe	41	16.517	1.436	0.026	23097
116.0000	LNx-8513DS-VTM w/ Mount Pipe	41	13.847	1.383	0.018	5257
111.5000	HSS Jump Plate 132" x 6" x 5/8"	41	12.570	1.321	0.015	3210
105.0000	APXVTM14-ALU-I20 w/ Mount Pipe	41	10.866	1.180	0.010	2375
95.0000	5'x2 1/2" Pipe Mount	41	8.651	0.960	0.005	3611
94.0000	7770.00 w/ Mount Pipe	41	8.452	0.943	0.005	3721
60.0000	GPS_A	41	3.276	0.542	0.002	5847

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	129 - 124	84.381	6	6.783	0.123
L2	124 - 119	77.308	6	6.776	0.119
L3	119 - 115.5	70.282	6	6.680	0.099
L4	115.5 - 115	65.449	6	6.547	0.085
L5	115 - 110	64.767	6	6.528	0.083
L6	110 - 105	58.144	6	6.142	0.063
L7	105 - 100	51.990	6	5.629	0.045
L8	100 - 99	46.422	6	5.013	0.032
L9	99 - 98.75	45.388	6	4.880	0.029
L10	98.75 - 93.75	45.134	6	4.863	0.029
L11	93.75 - 92	40.242	6	4.491	0.023
L12	92 - 91.75	38.624	6	4.354	0.021
L13	91.75 - 86.75	38.396	6	4.340	0.021
L14	86.75 - 81.75	34.014	6	4.039	0.018
L15	81.75 - 73.75	29.962	6	3.708	0.015
L16	78 - 72.75	27.154	6	3.448	0.013
L17	72.75 - 70.5	23.462	6	3.250	0.011
L18	70.5 - 70.25	21.965	6	3.113	0.010
L19	70.25 - 66.25	21.802	6	3.100	0.010
L20	66.25 - 66	19.295	6	2.891	0.009
L21	66 - 61	19.144	6	2.880	0.009
L22	61 - 56.5	16.252	6	2.647	0.008
L23	56.5 - 56.25	13.859	6	2.435	0.007

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	56.25 - 51.25	13.732	6	2.423	0.007
L25	51.25 - 46.25	11.320	6	2.186	0.006
L26	46.25 - 36.75	9.158	6	1.946	0.005
L27	42 - 35.75	7.517	6	1.742	0.004
L28	35.75 - 35	5.343	6	1.556	0.004
L29	35 - 34.75	5.102	6	1.516	0.004
L30	34.75 - 31.25	5.023	6	1.503	0.004
L31	31.25 - 31	3.989	6	1.317	0.003
L32	31 - 26	3.921	6	1.305	0.003
L33	26 - 22	2.686	6	1.055	0.002
L34	22 - 21.75	1.884	6	0.858	0.002
L35	21.75 - 20.5	1.840	6	0.847	0.002
L36	20.5 - 20.25	1.625	6	0.793	0.002
L37	20.25 - 19	1.584	6	0.782	0.002
L38	19 - 18.75	1.386	6	0.729	0.002
L39	18.75 - 18	1.348	6	0.717	0.002
L40	18 - 17.75	1.238	6	0.684	0.001
L41	17.75 - 12.75	1.203	6	0.674	0.001
L42	12.75 - 7.75	0.603	6	0.472	0.001
L43	7.75 - 5.5	0.215	6	0.271	0.001
L44	5.5 - 5.25	0.108	6	0.182	0.000
L45	5.25 - 4	0.099	6	0.174	0.000
L46	4 - 3.75	0.058	6	0.136	0.000
L47	3.75 - 3	0.051	6	0.128	0.000
L48	3 - 2.75	0.033	6	0.105	0.000
L49	2.75 - 0	0.028	6	0.096	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
129.0000	Lighting Rod 5/8" x 4'	6	84.381	6.783	0.126	6541
125.0000	AIR 32 B2a/B66Aa w/ Mount Pipe	6	78.721	6.782	0.124	6541
116.0000	LNx-8513DS-VTM w/ Mount Pipe	6	66.133	6.565	0.089	1227
111.5000	HSS Jump Plate 132" x 6" x 5/8"	6	60.088	6.285	0.071	722
105.0000	APXVTM14-ALU-I20 w/ Mount Pipe	6	51.990	5.629	0.047	519
95.0000	5'x2 1/2" Pipe Mount	6	41.429	4.596	0.025	772
94.0000	7770.00 w/ Mount Pipe	6	40.477	4.513	0.024	795
60.0000	GPS_A	6	15.703	2.599	0.008	1226

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	129 - 124 (1)	TP16x16x0.375	5.0000	0.0000	0.0	18.4078	-5.658	579.845	0.010
L2	124 - 119 (2)	TP16x16x0.375	5.0000	0.0000	0.0	18.4078	-6.079	579.845	0.010
L3	119 - 115.5 (3)	TP16x16x0.375	3.5000	0.0000	0.0	18.4078	-8.994	579.845	0.016
L4	115.5 - 115 (4)	TP17.81x16x0.375	0.5000	0.0000	0.0	18.4078	-9.004	579.845	0.016
L5	115 - 110 (5)	TP18.9603x17.81x0.2188	5.0000	0.0000	0.0	13.2011	-12.603	772.263	0.016
L6	110 - 105 (6)	TP20.1106x18.9603x0.2188	5.0000	0.0000	0.0	14.0113	-13.091	819.663	0.016
L7	105 - 100 (7)	TP21.2609x20.1106x0.2188	5.0000	0.0000	0.0	14.8216	-17.597	867.062	0.020
L8	100 - 99 (8)	TP21.491x21.2609x0.2188	1.0000	0.0000	0.0	14.9836	-17.726	876.542	0.020
L9	99 - 98.75 (9)	TP21.5485x21.491x0.45	0.2500	0.0000	0.0	30.5717	-17.789	1788.440	0.010

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L10	98.75 - 93.75 (10)	TP22.6988x21.5485x0.4375	5.0000	0.0000	0.0	31.3606	-21.535	1834.590	0.012
L11	93.75 - 92 (11)	TP23.1014x22.6988x0.4313	1.7500	0.0000	0.0	31.4803	-21.841	1841.600	0.012
L12	92 - 91.75 (12)	TP23.1589x23.1014x0.6563	0.2500	0.0000	0.0	47.5509	-21.931	2781.730	0.008
L13	91.75 - 86.75 (13)	TP24.3092x23.1589x0.6313	5.0000	0.0000	0.0	48.1284	-23.074	2815.510	0.008
L14	86.75 - 81.75 (14)	TP25.4595x24.3092x0.6063	5.0000	0.0000	0.0	48.5167	-24.267	2838.230	0.009
L15	81.75 - 73.75 (15)	TP27.3x25.4595x0.5938	8.0000	0.0000	0.0	49.1897	-25.182	2877.600	0.009
L16	73.75 - 72.75 (16)	TP27.0907x25.8847x0.75	5.2500	0.0000	0.0	63.6128	-27.460	3721.350	0.007
L17	72.75 - 70.5 (17)	TP27.6075x27.0907x0.7375	2.2500	0.0000	0.0	63.8096	-28.131	3732.860	0.008
L18	70.5 - 70.25 (18)	TP27.6649x27.6075x0.9	0.2500	0.0000	0.0	77.5648	-28.232	4537.540	0.006
L19	70.25 - 66.25 (19)	TP28.5838x27.6649x0.875	4.0000	0.0000	0.0	78.0694	-29.581	4567.060	0.006
L20	66.25 - 66 (20)	TP28.6412x28.5838x1.0375	0.2500	0.0000	0.0	92.2170	-29.700	5394.690	0.006
L21	66 - 61 (21)	TP29.7897x28.6412x0.9875	5.0000	0.0000	0.0	91.5838	-31.826	5357.650	0.006
L22	61 - 56.5 (22)	TP30.8234x29.7897x0.9625	4.5000	0.0000	0.0	92.5463	-33.852	5413.960	0.006
L23	56.5 - 56.25 (23)	TP30.8808x30.8234x0.9625	0.2500	0.0000	0.0	92.7243	-33.975	5424.370	0.006
L24	56.25 - 51.25 (24)	TP32.0293x30.8808x0.9375	5.0000	0.0000	0.0	93.8584	-36.164	5490.720	0.007
L25	51.25 - 46.25 (25)	TP33.1778x32.0293x0.9125	5.0000	0.0000	0.0	94.8036	-38.396	5546.010	0.007
L26	46.25 - 36.75 (26)	TP35.36x33.1778x0.8875	9.5000	0.0000	0.0	95.0675	-40.321	5561.450	0.007
L27	36.75 - 35.75 (27)	TP34.9682x33.5291x0.8125	6.2500	0.0000	0.0	89.3598	-44.945	5227.550	0.009
L28	35.75 - 35 (28)	TP35.1409x34.9682x0.8125	0.7500	0.0000	0.0	89.8116	-45.267	5253.980	0.009
L29	35 - 34.75 (29)	TP35.1984x35.1409x0.8125	0.2500	0.0000	0.0	89.9622	-45.381	5262.790	0.009
L30	34.75 - 31.25 (30)	TP36.0044x35.1984x0.8	3.5000	0.0000	0.0	90.6864	-46.850	5305.160	0.009
L31	31.25 - 31 (31)	TP36.0619x36.0044x0.8625	0.2500	0.0000	0.0	97.7576	-46.984	5718.820	0.008
L32	31 - 26 (32)	TP37.2132x36.0619x0.8375	5.0000	0.0000	0.0	98.0962	-49.323	5738.630	0.009
L33	26 - 22 (33)	TP38.1343x37.2132x0.825	4.0000	0.0000	0.0	99.1121	-51.231	5798.060	0.009
L34	22 - 21.75 (34)	TP38.1918x38.1343x0.9375	0.2500	0.0000	0.0	112.462	-51.372	6579.000	0.008
L35	21.75 - 20.5 (35)	TP38.4797x38.1918x0.925	1.2500	0.0000	0.0	111.857	-51.997	6543.610	0.008
L36	20.5 - 20.25 (36)	TP38.5372x38.4797x0.925	0.2500	0.0000	0.0	112.028	-52.140	6553.640	0.008
L37	20.25 - 19 (37)	TP38.8251x38.5372x0.925	1.2500	0.0000	0.0	112.885	-52.767	6603.790	0.008
L38	19 - 18.75 (38)	TP38.8826x38.8251x0.875	0.2500	0.0000	0.0	107.086	-52.903	6264.560	0.008
L39	18.75 - 18 (39)	TP39.0553x38.8826x0.875	0.7500	0.0000	0.0	107.573	-53.258	6293.020	0.008
L40	18 - 17.75 (40)	TP39.1129x39.0553x1	0.2500	0.0000	0.0	122.723	-53.406	7179.320	0.007
L41	17.75 - 12.75 (41)	TP40.2642x39.1129x0.975	5.0000	0.0000	0.0	123.348	-56.169	7215.880	0.008
L42	12.75 - 7.75 (42)	TP41.4155x40.2642x0.95	5.0000	0.0000	0.0	123.784	-58.976	7241.360	0.008
L43	7.75 - 5.5 (43)	TP41.9336x41.4155x0.95	2.2500	0.0000	0.0	125.369	-60.252	7334.070	0.008
L44	5.5 - 5.25 (44)	TP41.9911x41.9336x1.2	0.2500	0.0000	0.0	157.395	-60.272	9207.580	0.007
L45	5.25 - 4 (45)	TP42.279x41.9911x1.2	1.2500	0.0000	0.0	157.617	-60.447	9220.590	0.007
L46	4 - 3.75 (46)	TP42.3365x42.279x1.225	0.2500	0.0000	0.0	161.937	-61.258	9473.330	0.006
L47	3.75 - 3 (47)	TP42.5092x42.3365x1.2	0.7500	0.0000	0.0	158.952	-61.426	9298.660	0.007
L48	3 - 2.75 (48)	TP42.5668x42.5092x1.05	0.2500	0.0000	0.0	140.174	-61.910	8200.160	0.008
L49	2.75 - 0 (49)	TP43.2x42.5668x1.05	2.7500	0.0000	0.0	140.368	-62.070	8211.540	0.008

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
0									

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	129 - 124 (1)	TP16x16x0.375	16.933	240.372	0.070	0.000	240.372	0.000
L2	124 - 119 (2)	TP16x16x0.375	59.177	240.372	0.246	0.000	240.372	0.000
L3	119 - 115.5 (3)	TP16x16x0.375	98.442	240.372	0.410	0.000	240.372	0.000
L4	115.5 - 115 (4)	TP17.81x16x0.375	98.442	240.372	0.410	0.000	240.372	0.000
L5	115 - 110 (5)	TP18.9603x17.81x0.2188	189.625	365.365	0.519	0.000	365.365	0.000
L6	110 - 105 (6)	TP20.1106x18.9603x0.2188	279.978	404.036	0.693	0.000	404.036	0.000
L7	105 - 100 (7)	TP21.2609x20.1106x0.2188	392.414	443.617	0.885	0.000	443.617	0.000
L8	100 - 99 (8)	TP21.491x21.2609x0.2188	415.527	451.628	0.920	0.000	451.628	0.000
L9	99 - 98.75 (9)	TP21.5485x21.491x0.45	421.320	955.892	0.441	0.000	955.892	0.000
L10	98.75 - 93.75 (10)	TP22.6988x21.5485x0.4375	544.548	1036.292	0.525	0.000	1036.292	0.000
L11	93.75 - 92 (11)	TP23.1014x22.6988x0.4313	596.275	1060.017	0.563	0.000	1060.017	0.000
L12	92 - 91.75 (12)	TP23.1589x23.1014x0.6563	603.694	1573.658	0.384	0.000	1573.658	0.000
L13	91.75 - 86.75 (13)	TP24.3092x23.1589x0.6313	753.692	1680.042	0.449	0.000	1680.042	0.000
L14	86.75 - 81.75 (14)	TP25.4595x24.3092x0.6063	906.800	1781.600	0.509	0.000	1781.600	0.000
L15	81.75 - 73.75 (15)	TP27.3x25.4595x0.5938	1023.658	1872.325	0.547	0.000	1872.325	0.000
L16	73.75 - 72.75 (16)	TP27.0907x25.8847x0.75	1190.592	2465.925	0.483	0.000	2465.925	0.000
L17	72.75 - 70.5 (17)	TP27.6075x27.0907x0.7375	1263.350	2525.783	0.500	0.000	2525.783	0.000
L18	70.5 - 70.25 (18)	TP27.6649x27.6075x0.9	1271.475	3039.967	0.418	0.000	3039.967	0.000
L19	70.25 - 66.25 (19)	TP28.5838x27.6649x0.875	1402.750	3173.925	0.442	0.000	3173.925	0.000
L20	66.25 - 66 (20)	TP28.6412x28.5838x1.0375	1411.042	3713.258	0.380	0.000	3713.258	0.000
L21	66 - 61 (21)	TP29.7897x28.6412x0.9875	1578.808	3860.158	0.409	0.000	3860.158	0.000
L22	61 - 56.5 (22)	TP30.8234x29.7897x0.9625	1733.442	4052.142	0.428	0.000	4052.142	0.000
L23	56.5 - 56.25 (23)	TP30.8808x30.8234x0.9625	1742.133	4067.992	0.428	0.000	4067.992	0.000
L24	56.25 - 51.25 (24)	TP32.0293x30.8808x0.9375	1917.992	4287.642	0.447	0.000	4287.642	0.000
L25	51.25 - 46.25 (25)	TP33.1778x32.0293x0.9125	2097.775	4502.467	0.466	0.000	4502.467	0.000
L26	46.25 - 36.75 (26)	TP35.36x33.1778x0.8875	2253.592	4662.375	0.483	0.000	4662.375	0.000
L27	36.75 - 35.75 (27)	TP34.9682x33.5291x0.8125	2488.133	4512.283	0.551	0.000	4512.283	0.000
L28	35.75 - 35 (28)	TP35.1409x34.9682x0.8125	2516.692	4558.567	0.552	0.000	4558.567	0.000
L29	35 - 34.75 (29)	TP35.1984x35.1409x0.8125	2526.225	4574.042	0.552	0.000	4574.042	0.000
L30	34.75 - 31.25 (30)	TP36.0044x35.1984x0.8	2660.592	4724.775	0.563	0.000	4724.775	0.000
L31	31.25 - 31 (31)	TP36.0619x36.0044x0.8625	2670.258	5083.633	0.525	0.000	5083.633	0.000
L32	31 - 26 (32)	TP37.2132x36.0619x0.8375	2865.192	5279.342	0.543	0.000	5279.342	0.000
L33	26 - 22 (33)	TP38.1343x37.2132x0.825	3023.525	5475.783	0.552	0.000	5475.783	0.000
L34	22 - 21.75 (34)	TP38.1918x38.1343x0.9375	3033.492	6185.691	0.490	0.000	6185.691	0.000
L35	21.75 - 20.5 (35)	TP38.4797x38.1918x0.925	3083.458	6205.250	0.497	0.000	6205.250	0.000
L36	20.5 - 20.25 (36)	TP38.5372x38.4797x0.925	3093.475	6224.517	0.497	0.000	6224.517	0.000
L37	20.25 - 19 (37)	TP38.8251x38.5372x0.925	3143.692	6321.300	0.497	0.000	6321.300	0.000
L38	19 - 18.75 (38)	TP38.8826x38.8251x0.875	3153.758	6021.733	0.524	0.000	6021.733	0.000
L39	18.75 - 18 (39)	TP39.0553x38.8826x0.875	3184.017	6077.200	0.524	0.000	6077.200	0.000
L40	18 - 17.75 (40)	TP39.1129x39.0553x1	3194.117	6898.467	0.463	0.000	6898.467	0.000
L41	17.75 - 12.75 (41)	TP40.2642x39.1129x0.975	3397.892	7157.508	0.475	0.000	7157.508	0.000

Section No.	Elevation ft	Size	M_{ux}	ϕM_{ux}	Ratio	M_{uy}	ϕM_{uy}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{ux}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{uy}}$
L42	12.75 - 7.75 (42)	TP41.4155x40.2642x0.95	3604.958	7407.508	0.487	0.000	7407.508	0.000
L43	7.75 - 5.5 (43)	TP41.9336x41.4155x0.95	3699.225	7600.608	0.487	0.000	7600.608	0.000
L44	5.5 - 5.25 (44)	TP41.9911x41.9336x1.2	3699.225	9426.167	0.392	0.000	9426.167	0.000
L45	5.25 - 4 (45)	TP42.279x41.9911x1.2	3709.742	9453.167	0.392	0.000	9453.167	0.000
L46	4 - 3.75 (46)	TP42.3365x42.279x1.225	3762.450	9770.917	0.385	0.000	9770.917	0.000
L47	3.75 - 3 (47)	TP42.5092x42.3365x1.2	3773.025	9616.250	0.392	0.000	9616.250	0.000
L48	3 - 2.75 (48)	TP42.5668x42.5092x1.05	3804.783	8578.833	0.444	0.000	8578.833	0.000
L49	2.75 - 0 (49)	TP43.2x42.5668x1.05	3815.392	8602.917	0.443	0.000	8602.917	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	V_u	ϕV_n	Ratio	T_u	ϕT_n	Ratio
			K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	129 - 124 (1)	TP16x16x0.375	8.333	173.953	0.048	3.933	238.964	0.016
L2	124 - 119 (2)	TP16x16x0.375	8.575	173.953	0.049	3.933	238.964	0.016
L3	119 - 115.5 (3)	TP16x16x0.375	15.977	173.953	0.092	3.932	238.964	0.016
L4	115.5 - 115 (4)	TP17.81x16x0.375	15.999	194.104	0.082	3.243	238.964	0.014
L5	115 - 110 (5)	TP18.9603x17.81x0.2188	17.930	231.679	0.077	3.241	381.938	0.008
L6	110 - 105 (6)	TP20.1106x18.9603x0.2188	18.243	245.899	0.074	3.238	430.261	0.008
L7	105 - 100 (7)	TP21.2609x20.1106x0.2188	23.100	260.119	0.089	3.233	481.462	0.007
L8	100 - 99 (8)	TP21.491x21.2609x0.2188	23.179	262.963	0.088	3.233	492.047	0.007
L9	99 - 98.75 (9)	TP21.5485x21.491x0.45	23.192	536.533	0.043	3.232	995.742	0.003
L10	98.75 - 93.75 (10)	TP22.6988x21.5485x0.4375	29.480	550.378	0.054	3.230	1077.733	0.003
L11	93.75 - 92 (11)	TP23.1014x22.6988x0.4313	29.690	552.480	0.054	3.113	1101.717	0.003
L12	92 - 91.75 (12)	TP23.1589x23.1014x0.6563	29.703	834.519	0.036	3.113	1651.850	0.002
L13	91.75 - 86.75 (13)	TP24.3092x23.1589x0.6313	30.332	844.654	0.036	3.111	1759.233	0.002
L14	86.75 - 81.75 (14)	TP25.4595x24.3092x0.6063	30.954	851.468	0.036	3.109	1861.450	0.002
L15	81.75 - 73.75 (15)	TP27.3x25.4595x0.5938	31.418	863.279	0.036	3.108	1953.733	0.002
L16	73.75 - 72.75 (16)	TP27.0907x25.8847x0.75	32.208	1116.400	0.029	3.107	2586.717	0.001
L17	72.75 - 70.5 (17)	TP27.6075x27.0907x0.7375	32.509	1119.860	0.029	3.106	2646.858	0.001
L18	70.5 - 70.25 (18)	TP27.6649x27.6075x0.9	32.536	1361.260	0.024	3.106	3204.850	0.001
L19	70.25 - 66.25 (19)	TP28.5838x27.6649x0.875	33.142	1370.120	0.024	3.105	3339.450	0.001
L20	66.25 - 66 (20)	TP28.6412x28.5838x1.0375	33.176	1618.410	0.020	3.105	3929.658	0.001
L21	66 - 61 (21)	TP29.7897x28.6412x0.9875	33.971	1607.300	0.021	3.104	4072.125	0.001
L22	61 - 56.5 (22)	TP30.8234x29.7897x0.9625	34.763	1624.190	0.021	3.103	4266.175	0.001
L23	56.5 - 56.25 (23)	TP30.8808x30.8234x0.9625	34.794	1627.310	0.021	3.103	4282.592	0.001
L24	56.25 - 51.25 (24)	TP32.0293x30.8808x0.9375	35.590	1647.210	0.022	3.102	4505.008	0.001
L25	51.25 - 46.25 (25)	TP33.1778x32.0293x0.9125	36.376	1663.800	0.022	3.101	4722.125	0.001
L26	46.25 - 36.75 (26)	TP35.36x33.1778x0.8875	37.005	1668.430	0.022	3.100	4882.217	0.001
L27	36.75 - 35.75 (27)	TP34.9682x33.5291x0.8125	38.061	1568.260	0.024	3.099	4711.750	0.001
L28	35.75 - 35 (28)	TP35.1409x34.9682x0.8125	38.149	1576.190	0.024	3.099	4759.517	0.001
L29	35 - 34.75 (29)	TP35.1984x35.1409x0.8125	38.173	1578.840	0.024	3.099	4775.492	0.001
L30	34.75 - 31.25 (30)	TP36.0044x35.1984x0.8	38.658	1591.550	0.024	3.099	4928.508	0.001
L31	31.25 - 31 (31)	TP36.0619x36.0044x0.8625	38.673	1715.650	0.023	3.098	5312.058	0.001
L32	31 - 26 (32)	TP37.2132x36.0619x0.8375	39.349	1721.590	0.023	3.098	5508.600	0.001
L33	26 - 22 (33)	TP38.1343x37.2132x0.825	39.882	1739.420	0.023	3.097	5708.475	0.001
L34	22 - 21.75 (34)	TP38.1918x38.1343x0.9375	39.900	1973.700	0.020	3.097	6467.817	0.000
L35	21.75 - 20.5 (35)	TP38.4797x38.1918x0.925	40.088	1963.080	0.020	3.097	6484.883	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L36	20.5 - 20.25 (36)	TP38.5372x38.4797x0.925	40.103	1966.090	0.020	3.097	6504.783	0.000
L37	20.25 - 19 (37)	TP38.8251x38.5372x0.925	40.294	1981.140	0.020	3.097	6604.717	0.000
L38	19 - 18.75 (38)	TP38.8826x38.8251x0.875	40.308	1879.370	0.021	3.097	6283.217	0.000
L39	18.75 - 18 (39)	TP39.0553x38.8826x0.875	40.417	1887.910	0.021	3.097	6340.450	0.000
L40	18 - 17.75 (40)	TP39.1129x39.0553x1	40.441	2153.800	0.019	3.097	7220.650	0.000
L41	17.75 - 12.75 (41)	TP40.2642x39.1129x0.975	41.114	2164.760	0.019	3.097	7481.408	0.000
L42	12.75 - 7.75 (42)	TP41.4155x40.2642x0.95	41.777	2172.410	0.019	3.097	7732.608	0.000
L43	7.75 - 5.5 (43)	TP41.9336x41.4155x0.95	42.080	2200.220	0.019	3.097	7931.875	0.000
L44	5.5 - 5.25 (44)	TP41.9911x41.9336x1.2	42.096	2766.180	0.015	3.097	9897.333	0.000
L45	5.25 - 4 (45)	TP42.279x41.9911x1.2	42.290	2785.700	0.015	3.097	9925.333	0.000
L46	4 - 3.75 (46)	TP42.3365x42.279x1.225	42.309	2845.990	0.015	3.097	10263.083	0.000
L47	3.75 - 3 (47)	TP42.5092x42.3365x1.2	42.424	2801.310	0.015	3.097	10094.167	0.000
L48	3 - 2.75 (48)	TP42.5668x42.5092x1.05	42.451	2463.460	0.017	3.097	8971.500	0.000
L49	2.75 - 0 (49)	TP43.2x42.5668x1.05	42.656	2482.250	0.017	3.097	8996.417	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{ux}	Ratio M_{uy} ϕM_{uy}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	129 - 124 (1)	0.010	0.070	0.000	0.048	0.016	0.084	1.050	4.8.2
L2	124 - 119 (2)	0.010	0.246	0.000	0.049	0.016	0.261	1.050	4.8.2
L3	119 - 115.5 (3)	0.016	0.410	0.000	0.092	0.016	0.437	1.050	4.8.2
L4	115.5 - 115 (4)	0.016	0.410	0.000	0.082	0.014	0.434	1.050	4.8.2
L5	115 - 110 (5)	0.016	0.519	0.000	0.077	0.008	0.543	1.050	4.8.2
L6	110 - 105 (6)	0.016	0.693	0.000	0.074	0.008	0.716	1.050	4.8.2
L7	105 - 100 (7)	0.020	0.885	0.000	0.089	0.007	0.914	1.050	4.8.2
L8	100 - 99 (8)	0.020	0.920	0.000	0.088	0.007	0.949	1.050	4.8.2
L9	99 - 98.75 (9)	0.010	0.441	0.000	0.043	0.003	0.453	1.050	4.8.2
L10	98.75 - 93.75 (10)	0.012	0.525	0.000	0.054	0.003	0.540	1.050	4.8.2
L11	93.75 - 92 (11)	0.012	0.563	0.000	0.054	0.003	0.578	1.050	4.8.2
L12	92 - 91.75 (12)	0.008	0.384	0.000	0.036	0.002	0.393	1.050	4.8.2
L13	91.75 - 86.75 (13)	0.008	0.449	0.000	0.036	0.002	0.458	1.050	4.8.2
L14	86.75 - 81.75 (14)	0.009	0.509	0.000	0.036	0.002	0.519	1.050	4.8.2
L15	81.75 - 73.75 (15)	0.009	0.547	0.000	0.036	0.002	0.557	1.050	4.8.2
L16	73.75 - 72.75 (16)	0.007	0.483	0.000	0.029	0.001	0.491	1.050	4.8.2
L17	72.75 - 70.5 (17)	0.008	0.500	0.000	0.029	0.001	0.509	1.050	4.8.2
L18	70.5 - 70.25 (18)	0.006	0.418	0.000	0.024	0.001	0.425	1.050	4.8.2
L19	70.25 - 66.25 (19)	0.006	0.442	0.000	0.024	0.001	0.449	1.050	4.8.2
L20	66.25 - 66 (20)	0.006	0.380	0.000	0.020	0.001	0.386	1.050	4.8.2
L21	66 - 61 (21)	0.006	0.409	0.000	0.021	0.001	0.415	1.050	4.8.2
L22	61 - 56.5 (22)	0.006	0.428	0.000	0.021	0.001	0.435	1.050	4.8.2
L23	56.5 - 56.25 (23)	0.006	0.428	0.000	0.021	0.001	0.435	1.050	4.8.2
L24	56.25 - 51.25 (24)	0.007	0.447	0.000	0.022	0.001	0.454	1.050	4.8.2
L25	51.25 - 46.25 (25)	0.007	0.466	0.000	0.022	0.001	0.473	1.050	4.8.2
L26	46.25 - 36.75 (26)	0.007	0.483	0.000	0.022	0.001	0.491	1.050	4.8.2
L27	36.75 - 35.75 (27)	0.009	0.551	0.000	0.024	0.001	0.561	1.050	4.8.2

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
L28	35.75 - 35 (28)	0.009	0.552	0.000	0.024	0.001	0.561	1.050	4.8.2
L29	35 - 34.75 (29)	0.009	0.552	0.000	0.024	0.001	0.562	1.050	4.8.2
L30	34.75 - 31.25 (30)	0.009	0.563	0.000	0.024	0.001	0.573	1.050	4.8.2
L31	31.25 - 31 (31)	0.008	0.525	0.000	0.023	0.001	0.534	1.050	4.8.2
L32	31 - 26 (32)	0.009	0.543	0.000	0.023	0.001	0.552	1.050	4.8.2
L33	26 - 22 (33)	0.009	0.552	0.000	0.023	0.001	0.562	1.050	4.8.2
L34	22 - 21.75 (34)	0.008	0.490	0.000	0.020	0.000	0.499	1.050	4.8.2
L35	21.75 - 20.5 (35)	0.008	0.497	0.000	0.020	0.000	0.505	1.050	4.8.2
L36	20.5 - 20.25 (36)	0.008	0.497	0.000	0.020	0.000	0.505	1.050	4.8.2
L37	20.25 - 19 (37)	0.008	0.497	0.000	0.020	0.000	0.506	1.050	4.8.2
L38	19 - 18.75 (38)	0.008	0.524	0.000	0.021	0.000	0.533	1.050	4.8.2
L39	18.75 - 18 (39)	0.008	0.524	0.000	0.021	0.000	0.533	1.050	4.8.2
L40	18 - 17.75 (40)	0.007	0.463	0.000	0.019	0.000	0.471	1.050	4.8.2
L41	17.75 - 12.75 (41)	0.008	0.475	0.000	0.019	0.000	0.483	1.050	4.8.2
L42	12.75 - 7.75 (42)	0.008	0.487	0.000	0.019	0.000	0.495	1.050	4.8.2
L43	7.75 - 5.5 (43)	0.008	0.487	0.000	0.019	0.000	0.495	1.050	4.8.2
L44	5.5 - 5.25 (44)	0.007	0.392	0.000	0.015	0.000	0.399	1.050	4.8.2
L45	5.25 - 4 (45)	0.007	0.392	0.000	0.015	0.000	0.399	1.050	4.8.2
L46	4 - 3.75 (46)	0.006	0.385	0.000	0.015	0.000	0.392	1.050	4.8.2
L47	3.75 - 3 (47)	0.007	0.392	0.000	0.015	0.000	0.399	1.050	4.8.2
L48	3 - 2.75 (48)	0.008	0.444	0.000	0.017	0.000	0.451	1.050	4.8.2
L49	2.75 - 0 (49)	0.008	0.443	0.000	0.017	0.000	0.451	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	129 - 124	Pole	TP16x16x0.375	1	-5.658	608.837	8.0	Pass
L2	124 - 119	Pole	TP16x16x0.375	2	-6.079	608.837	24.9	Pass
L3	119 - 115.5	Pole	TP16x16x0.375	3	-8.994	608.837	41.6	Pass
L4	115.5 - 115	Pole	TP17.81x16x0.375	4	-9.004	608.837	41.4	Pass
L5	115 - 110	Pole	TP18.9603x17.81x0.2188	5	-12.603	810.876	51.7	Pass
L6	110 - 105	Pole	TP20.1106x18.9603x0.2188	6	-13.091	860.646	68.2	Pass
L7	105 - 100	Pole	TP21.2609x20.1106x0.2188	7	-17.597	910.415	87.0	Pass
L8	100 - 99	Pole	TP21.491x21.2609x0.2188	8	-17.726	920.369	90.4	Pass
L9	99 - 98.75	Pole	TP21.5485x21.491x0.45	9	-17.789	1877.862	43.1	Pass
L10	98.75 - 93.75	Pole	TP22.6988x21.5485x0.4375	10	-21.535	1926.319	51.5	Pass
L11	93.75 - 92	Pole	TP23.1014x22.6988x0.4313	11	-21.841	1933.680	55.0	Pass
L12	92 - 91.75	Pole	TP23.1589x23.1014x0.6563	12	-21.931	2920.816	37.4	Pass
L13	91.75 - 86.75	Pole	TP24.3092x23.1589x0.6313	13	-23.074	2956.285	43.6	Pass
L14	86.75 - 81.75	Pole	TP25.4595x24.3092x0.6063	14	-24.267	2980.141	49.4	Pass
L15	81.75 - 73.75	Pole	TP27.3x25.4595x0.5938	15	-25.182	3021.480	53.0	Pass
L16	73.75 - 72.75	Pole	TP27.0907x25.8847x0.75	16	-27.460	3907.417	46.8	Pass
L17	72.75 - 70.5	Pole	TP27.6075x27.0907x0.7375	17	-28.131	3919.503	48.4	Pass
L18	70.5 - 70.25	Pole	TP27.6649x27.6075x0.9	18	-28.232	4764.417	40.5	Pass
L19	70.25 - 66.25	Pole	TP28.5838x27.6649x0.875	19	-29.581	4795.413	42.8	Pass
L20	66.25 - 66	Pole	TP28.6412x28.5838x1.0375	20	-29.700	5664.424	36.8	Pass
L21	66 - 61	Pole	TP29.7897x28.6412x0.9875	21	-31.826	5625.532	39.6	Pass
L22	61 - 56.5	Pole	TP30.8234x29.7897x0.9625	22	-33.852	5684.658	41.4	Pass
L23	56.5 - 56.25	Pole	TP30.8808x30.8234x0.9625	23	-33.975	5695.588	41.4	Pass
L24	56.25 - 51.25	Pole	TP32.0293x30.8808x0.9375	24	-36.164	5765.256	43.3	Pass
L25	51.25 - 46.25	Pole	TP33.1778x32.0293x0.9125	25	-38.396	5823.310	45.1	Pass
L26	46.25 - 36.75	Pole	TP35.36x33.1778x0.8875	26	-40.321	5839.522	46.8	Pass
L27	36.75 - 35.75	Pole	TP34.9682x33.5291x0.8125	27	-44.945	5488.927	53.4	Pass
L28	35.75 - 35	Pole	TP35.1409x34.9682x0.8125	28	-45.267	5516.679	53.5	Pass
L29	35 - 34.75	Pole	TP35.1984x35.1409x0.8125	29	-45.381	5525.929	53.5	Pass
L30	34.75 - 31.25	Pole	TP36.0044x35.1984x0.8	30	-46.850	5570.418	54.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L31	31.25 - 31	Pole	TP36.0619x36.0044x0.8625	31	-46.984	6004.761	50.9	Pass	
L32	31 - 26	Pole	TP37.2132x36.0619x0.8375	32	-49.323	6025.561	52.6	Pass	
L33	26 - 22	Pole	TP38.1343x37.2132x0.825	33	-51.231	6087.963	53.5	Pass	
L34	22 - 21.75	Pole	TP38.1918x38.1343x0.9375	34	-51.372	6907.950	47.5	Pass	
L35	21.75 - 20.5	Pole	TP38.4797x38.1918x0.925	35	-51.997	6870.790	48.1	Pass	
L36	20.5 - 20.25	Pole	TP38.5372x38.4797x0.925	36	-52.140	6881.322	48.1	Pass	
L37	20.25 - 19	Pole	TP38.8251x38.5372x0.925	37	-52.767	6933.979	48.2	Pass	
L38	19 - 18.75	Pole	TP38.8826x38.8251x0.875	38	-52.903	6577.788	50.7	Pass	
L39	18.75 - 18	Pole	TP39.0553x38.8826x0.875	39	-53.258	6607.671	50.7	Pass	
L40	18 - 17.75	Pole	TP39.1129x39.0553x1	40	-53.406	7538.286	44.8	Pass	
L41	17.75 - 12.75	Pole	TP40.2642x39.1129x0.975	41	-56.169	7576.674	46.0	Pass	
L42	12.75 - 7.75	Pole	TP41.4155x40.2642x0.95	42	-58.976	7603.428	47.2	Pass	
L43	7.75 - 5.5	Pole	TP41.9336x41.4155x0.95	43	-60.252	7700.773	47.2	Pass	
L44	5.5 - 5.25	Pole	TP41.9911x41.9336x1.2	44	-60.272	9667.959	38.0	Pass	
L45	5.25 - 4	Pole	TP42.279x41.9911x1.2	45	-60.447	9681.619	38.0	Pass	
L46	4 - 3.75	Pole	TP42.3365x42.279x1.225	46	-61.258	9946.996	37.3	Pass	
L47	3.75 - 3	Pole	TP42.5092x42.3365x1.2	47	-61.426	9763.593	38.0	Pass	
L48	3 - 2.75	Pole	TP42.5668x42.5092x1.05	48	-61.910	8610.168	43.0	Pass	
L49	2.75 - 0	Pole	TP43.2x42.5668x1.05	49	-62.070	8622.117	43.0	Pass	
							Summary		
							Pole (L8)	90.4	Pass
							RATING =	90.4	Pass

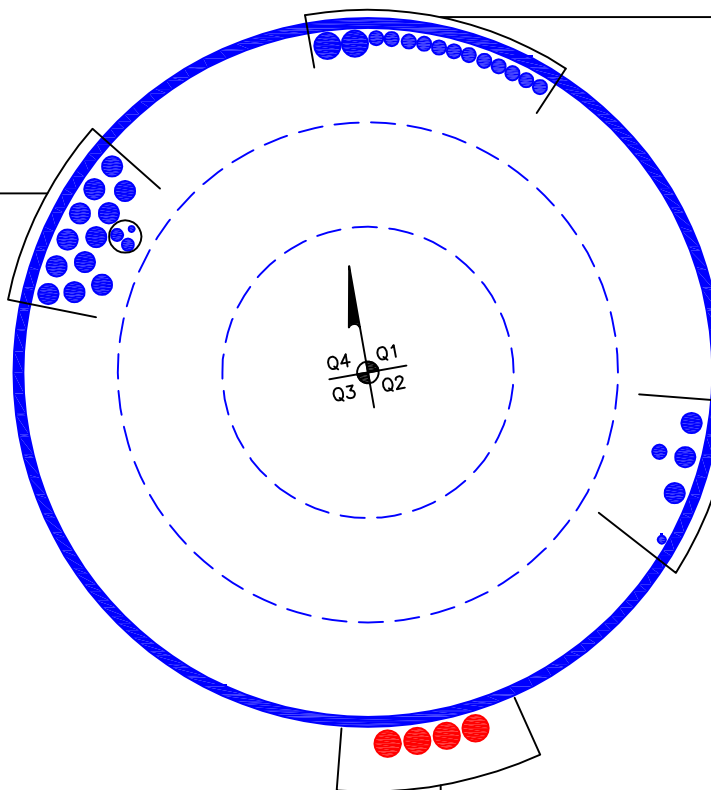
*NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT—IN 2" CONDUIT)
(1) 3/8" TO 94 FT LEVEL
(2) 3/4" TO 94 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-1/4" TO 94 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(12) 7/8" TO 116 FT LEVEL
(2) 1-1/4" TO 116 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 60 FT LEVEL
(1) 7/8" TO 105 FT LEVEL
(3) 1-1/4" TO 105 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(4) 1-5/8" TO 125 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Site BU: 806365
Work Order: 1664273

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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	129	13.5	0	0	16	16	0.375		A53-B-35
2	115.5	0.5	0	0	16.00	17.81	0.375		A53-B-35
3	115	41.25	4.25	12	17.81	27.3	0.21875	Auto	A572-65
4	78	41.25	5.25	12	25.88	35.36	0.3125	Auto	A572-65
5	42	42	0	12	33.53	43.2	0.375	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
1	0	4	plate	TS1 1.25" x 6"	3	C					C				C		
2	3	18	plate	CCI-AFP-060100	3	E					E				E		
3	41.5	56.5	plate	CCI-AFP-060100	3	E					E				E		
4	0	5.5	plate	TS2 1.25" x 6"	3		C					C				C	
5	4	20.5	plate	CCI-AFP-065125	2		E									E	
6	20.5	40.5	plate	CCI-AFP-065125	2		E									E	
7	4	22	plate	CCI-AFP-065125	1							E					
8	19	40.5	plate	CCI-AFP-065125	1							E					
9	56.5	74	plate	CCI-AFP-060100	3			E					E				E
10	74	92	plate	CCI-AFP-045100	3			E					E				E
11	0	35	plate	CCI-WSFP-085125	2					P				P			
12	35	66.25	plate	CCI-SFP-085125	2					P				P			
13	0	31.25	plate	CCI-WSFP-085125	1												P
14	40.5	70.5	plate	CCI-SFP-065125	3			P				P				P	
15	70.5	99	plate	CCI-SFP-045100	3			P				P				P	
16																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _y (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	1.25	6	7.5	3	n/a	n/a	0.000	7.500	0.0000	A572-65
2	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
3	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
4	1.25	6	7.5	3	n/a	n/a	0.000	7.500	0.0000	A572-65
5	6.5	1.25	8.125	0.625	42.000	42.000	19.000	6.563	1.1875	A572-65
6	6.5	1.25	8.125	0.625	42.000	42.000	19.000	6.563	1.1875	A572-65
7	6.5	1.25	8.125	0.625	42.000	42.000	19.000	6.563	1.1875	A572-65
8	6.5	1.25	8.125	0.625	42.000	42.000	19.000	6.563	1.1875	A572-65
9	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
10	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
11	8.5	1.25	10.625	0.625	n/a	45.000	17.000	9.063	1.1875	A572-65
12	8.5	1.25	10.625	0.625	45.000	45.000	17.000	9.063	1.1875	A572-65
13	8.5	1.25	10.625	0.625	n/a	45.000	17.000	9.063	1.1875	A572-65
14	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
15	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	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	129 - 124	5		0	16.000	16.000	0.375	A53-B-35	1.000
2	124 - 119	5		0	16.000	16.000	0.375	A53-B-35	1.000
3	119 - 115.5	3.5	0	0	16.000	16.000	0.375	A53-B-35	1.000
4	115.5 - 115	0.5	0	0	16.000	17.810	0.375	A53-B-35	1.000
5	115 - 110	5		12	17.810	18.960	0.21875	A572-65	1.000
6	110 - 105	5		12	18.960	20.111	0.21875	A572-65	1.000
7	105 - 100	5		12	20.111	21.261	0.21875	A572-65	1.000
8	100 - 99	1		12	21.261	21.491	0.21875	A572-65	1.000
9	99 - 98.75	0.25		12	21.491	21.548	0.45	A572-65	0.934
10	98.75 - 93.75	5		12	21.548	22.699	0.4375	A572-65	0.936
11	93.75 - 92	1.75		12	22.699	23.101	0.43125	A572-65	0.941
12	92 - 91.75	0.25		12	23.101	23.159	0.65625	A572-65	0.908
13	91.75 - 86.75	5		12	23.159	24.309	0.63125	A572-65	0.914
14	86.75 - 81.75	5		12	24.309	25.460	0.60625	A572-65	0.924
15	81.75 - 78	8	4.25	12	25.460	27.300	0.59375	A572-65	0.923
16	78 - 72.75	5.25		12	25.885	27.091	0.75	A572-65	0.919
17	72.75 - 70.5	2.25		12	27.091	27.608	0.7375	A572-65	0.925
18	70.5 - 70.25	0.25		12	27.608	27.665	0.9	A572-65	0.902
19	70.25 - 66.25	4		12	27.665	28.584	0.875	A572-65	0.908
20	66.25 - 66	0.25		12	28.584	28.641	1.0375	A572-65	1.000
21	66 - 61	5		12	28.641	29.790	0.9875	A572-65	1.020
22	61 - 56.5	4.5		12	29.790	30.823	0.9625	A572-65	1.020
23	56.5 - 56.25	0.25		12	30.823	30.881	0.9625	A572-65	1.019
24	56.25 - 51.25	5		12	30.881	32.029	0.9375	A572-65	1.019
25	51.25 - 46.25	5		12	32.029	33.178	0.9125	A572-65	1.021
26	46.25 - 42	9.5	5.25	12	33.178	35.360	0.8875	A572-65	1.028
27	42 - 35.75	6.25		12	33.529	34.968	0.8125	A572-65	0.979
28	35.75 - 35	0.75		12	34.968	35.141	0.8125	A572-65	0.976
29	35 - 34.75	0.25		12	35.141	35.198	0.8125	A572-65	0.975
30	34.75 - 31.25	3.5		12	35.198	36.004	0.8	A572-65	0.978
31	31.25 - 31	0.25		12	36.004	36.062	0.8625	A572-65	1.017
32	31 - 26	5		12	36.062	37.213	0.8375	A572-65	1.028
33	26 - 22	4		12	37.213	38.134	0.825	A572-65	1.028
34	22 - 21.75	0.25		12	38.134	38.192	0.9375	A572-65	0.979
35	21.75 - 20.5	1.25		12	38.192	38.480	0.925	A572-65	0.988
36	20.5 - 20.25	0.25		12	38.480	38.537	0.925	A572-65	0.987
37	20.25 - 19	1.25		12	38.537	38.825	0.925	A572-65	0.982
38	19 - 18.75	0.25		12	38.825	38.883	0.875	A572-65	0.960
39	18.75 - 18	0.75		12	38.883	39.055	0.875	A572-65	0.958
40	18 - 17.75	0.25		12	39.055	39.113	1	A572-65	0.987
41	17.75 - 12.75	5		12	39.113	40.264	0.975	A572-65	0.993
42	12.75 - 7.75	5		12	40.264	41.415	0.95	A572-65	1.001
43	7.75 - 5.5	2.25		12	41.415	41.934	0.95	A572-65	0.993
44	5.5 - 5.25	0.25		12	41.934	41.991	1.2	A572-65	0.934
45	5.25 - 4	1.25		12	41.991	42.279	1.2	A572-65	0.929
46	4 - 3.75	0.25		12	42.279	42.337	1.225	A572-65	0.898
47	3.75 - 3	0.75		12	42.337	42.509	1.2	A572-65	0.914
48	3 - 2.75	0.25		12	42.509	42.567	1.05	A572-65	0.911
49	2.75 - 0	2.75		12	42.567	43.200	1.05	A572-65	0.903

TNX Section Forces

Increment (ft):		TNX Output		
5		P_u (K)	M_{ux} (kip-ft)	V_u (K)
	Section Height (ft)			
1	129 - 124	5.66	16.93	8.33
2	124 - 119	6.08	59.18	8.57
3	119 - 115.5	8.99	98.44	15.98
4	115.5 - 115	9.05	106.43	16.00
5	115 - 110	12.60	189.63	17.93
6	110 - 105	13.09	279.98	18.24
7	105 - 100	17.60	392.41	23.10
8	100 - 99	17.73	415.53	23.18
9	99 - 98.75	17.79	421.32	23.19
10	98.75 - 93.75	21.53	544.55	29.48
11	93.75 - 92	21.84	596.28	29.69
12	92 - 91.75	21.93	603.69	29.70
13	91.75 - 86.75	23.07	753.69	30.33
14	86.75 - 81.75	24.27	906.80	30.95
15	81.75 - 78	25.18	1023.66	31.42
16	78 - 72.75	27.46	1190.59	32.21
17	72.75 - 70.5	28.13	1263.35	32.51
18	70.5 - 70.25	28.23	1271.47	32.54
19	70.25 - 66.25	29.58	1402.75	33.14
20	66.25 - 66	29.70	1411.04	33.18
21	66 - 61	31.83	1578.80	33.97
22	61 - 56.5	33.85	1733.44	34.76
23	56.5 - 56.25	33.97	1742.13	34.79
24	56.25 - 51.25	36.16	1917.99	35.59
25	51.25 - 46.25	38.40	2097.78	36.38
26	46.25 - 42	40.32	2253.60	37.00
27	42 - 35.75	44.95	2488.13	38.06
28	35.75 - 35	45.27	2516.69	38.15
29	35 - 34.75	45.38	2526.23	38.17
30	34.75 - 31.25	46.85	2660.60	38.66
31	31.25 - 31	46.98	2670.26	38.67
32	31 - 26	49.32	2865.19	39.35
33	26 - 22	51.23	3023.53	39.88
34	22 - 21.75	51.37	3033.49	39.90
35	21.75 - 20.5	52.00	3083.45	40.09
36	20.5 - 20.25	52.14	3093.47	40.10
37	20.25 - 19	52.77	3143.69	40.29
38	19 - 18.75	52.90	3153.76	40.31
39	18.75 - 18	53.26	3184.02	40.42
40	18 - 17.75	53.41	3194.12	40.44
41	17.75 - 12.75	56.17	3397.89	41.11
42	12.75 - 7.75	58.98	3604.96	41.78
43	7.75 - 5.5	60.25	3699.23	42.08
44	5.5 - 5.25	60.43	3709.74	42.10
45	5.25 - 4	61.24	3762.45	42.29
46	4 - 3.75	61.41	3773.02	42.31
47	3.75 - 3	61.90	3804.78	42.42
48	3 - 2.75	62.05	3815.39	42.45
49	2.75 - 0	63.64	3932.59	42.84

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
129 - 124	Pole	TP16x16x0.375	Pole	7.7%	Pass
124 - 119	Pole	TP16x16x0.375	Pole	24.5%	Pass
119 - 115.5	Pole	TP16x16x0.375	Pole	40.8%	Pass
115.5 - 115	Pole	TP17.81x16x0.375	Pole	35.4%	Pass
115 - 110	Pole	TP18.96x17.81x0.2188	Pole	50.7%	Pass
110 - 105	Pole	TP20.111x18.96x0.2188	Pole	67.2%	Pass
105 - 100	Pole	TP21.261x20.111x0.2188	Pole	85.8%	Pass
100 - 99	Pole	TP21.491x21.261x0.2188	Pole	89.2%	Pass
99 - 98.75	Pole + Reinf.	TP21.548x21.491x0.45	Reinf. 15 Tension Rupture	72.9%	Pass
98.75 - 93.75	Pole + Reinf.	TP22.699x21.548x0.4375	Reinf. 15 Tension Rupture	87.2%	Pass
93.75 - 92	Pole + Reinf.	TP23.101x22.699x0.4313	Reinf. 15 Tension Rupture	92.8%	Pass
92 - 91.75	Pole + Reinf.	TP23.159x23.101x0.6563	Reinf. 10 Tension Rupture	63.4%	Pass
91.75 - 86.75	Pole + Reinf.	TP24.309x23.159x0.6313	Reinf. 10 Tension Rupture	74.0%	Pass
86.75 - 81.75	Pole + Reinf.	TP25.46x24.309x0.6063	Reinf. 10 Tension Rupture	83.6%	Pass
81.75 - 78	Pole + Reinf.	TP27.3x25.46x0.5938	Reinf. 10 Tension Rupture	90.1%	Pass
78 - 72.75	Pole + Reinf.	TP27.091x25.885x0.75	Reinf. 15 Tension Rupture	79.3%	Pass
72.75 - 70.5	Pole + Reinf.	TP27.608x27.091x0.7375	Reinf. 15 Tension Rupture	81.9%	Pass
70.5 - 70.25	Pole + Reinf.	TP27.665x27.608x0.9	Reinf. 9 Tension Rupture	62.4%	Pass
70.25 - 66.25	Pole + Reinf.	TP28.584x27.665x0.875	Reinf. 9 Tension Rupture	65.9%	Pass
66.25 - 66	Pole + Reinf.	TP28.641x28.584x1.0375	Reinf. 9 Tension Rupture	61.7%	Pass
66 - 61	Pole + Reinf.	TP29.79x28.641x0.9875	Reinf. 9 Tension Rupture	65.5%	Pass
61 - 56.5	Pole + Reinf.	TP30.823x29.79x0.9625	Reinf. 9 Tension Rupture	68.7%	Pass
56.5 - 56.25	Pole + Reinf.	TP30.881x30.823x0.9625	Reinf. 3 Tension Rupture	68.9%	Pass
56.25 - 51.25	Pole + Reinf.	TP32.029x30.881x0.9375	Reinf. 3 Tension Rupture	72.2%	Pass
51.25 - 46.25	Pole + Reinf.	TP33.178x32.029x0.9125	Reinf. 3 Tension Rupture	75.2%	Pass
46.25 - 42	Pole + Reinf.	TP35.36x33.178x0.8875	Reinf. 3 Tension Rupture	77.6%	Pass
42 - 35.75	Pole + Reinf.	TP34.968x33.529x0.8125	Reinf. 6 Tension Rupture	82.5%	Pass
35.75 - 35	Pole + Reinf.	TP35.141x34.968x0.8125	Reinf. 6 Tension Rupture	82.9%	Pass
35 - 34.75	Pole + Reinf.	TP35.198x35.141x0.8125	Reinf. 6 Tension Rupture	83.0%	Pass
34.75 - 31.25	Pole + Reinf.	TP36.004x35.198x0.8	Reinf. 6 Tension Rupture	84.4%	Pass
31.25 - 31	Pole + Reinf.	TP36.062x36.004x0.8625	Reinf. 6 Tension Rupture	79.4%	Pass
31 - 26	Pole + Reinf.	TP37.213x36.062x0.8375	Reinf. 6 Tension Rupture	81.4%	Pass
26 - 22	Pole + Reinf.	TP38.134x37.213x0.825	Reinf. 6 Tension Rupture	82.8%	Pass
22 - 21.75	Pole + Reinf.	TP38.192x38.134x0.9375	Reinf. 6 Tension Rupture	78.4%	Pass
21.75 - 20.5	Pole + Reinf.	TP38.48x38.192x0.925	Reinf. 6 Tension Rupture	78.9%	Pass
20.5 - 20.25	Pole + Reinf.	TP38.537x38.48x0.925	Reinf. 5 Tension Rupture	79.0%	Pass
20.25 - 19	Pole + Reinf.	TP38.825x38.537x0.925	Reinf. 5 Tension Rupture	79.4%	Pass
19 - 18.75	Pole + Reinf.	TP38.883x38.825x0.875	Reinf. 5 Tension Rupture	79.8%	Pass
18.75 - 18	Pole + Reinf.	TP39.055x38.883x0.875	Reinf. 5 Tension Rupture	80.1%	Pass
18 - 17.75	Pole + Reinf.	TP39.113x39.055x1	Reinf. 2 Tension Rupture	71.1%	Pass
17.75 - 12.75	Pole + Reinf.	TP40.264x39.113x0.975	Reinf. 2 Tension Rupture	72.6%	Pass
12.75 - 7.75	Pole + Reinf.	TP41.415x40.264x0.95	Reinf. 2 Tension Rupture	74.1%	Pass
7.75 - 5.5	Pole + Reinf.	TP41.934x41.415x0.95	Reinf. 2 Tension Rupture	74.7%	Pass
5.5 - 5.25	Pole + Reinf.	TP41.991x41.934x1.2	Reinf. 4 Weldment	68.5%	Pass
5.25 - 4	Pole + Reinf.	TP42.279x41.991x1.2	Reinf. 2 Tension Rupture	59.6%	Pass
4 - 3.75	Pole + Reinf.	TP42.337x42.279x1.225	Reinf. 1 Weldment	69.7%	Pass
3.75 - 3	Pole + Reinf.	TP42.509x42.337x1.2	Reinf. 2 Tension Rupture	59.2%	Pass
3 - 2.75	Pole + Reinf.	TP42.567x42.509x1.05	Reinf. 1 Tension Yield	62.9%	Pass
2.75 - 0	Pole + Reinf.	TP43.2x42.567x1.05	Reinf. 1 Tension Yield	63.5%	Pass
				Summary	
			Pole	89.2%	Pass
			Reinforcement	92.8%	Pass
			Overall	92.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity*																
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	
129 - 124	562	n/a	562	18.41	n/a	18.41	7.7%																
124 - 119	562	n/a	562	18.41	n/a	18.41	24.5%																
119 - 115.5	562	n/a	562	18.41	n/a	18.41	40.8%																
115.5 - 115	781	n/a	781	20.54	n/a	20.54	35.4%																
115 - 110	593	n/a	593	13.18	n/a	13.18	50.7%																
110 - 105	709	n/a	709	13.99	n/a	13.99	67.2%																
105 - 100	839	n/a	839	14.80	n/a	14.80	85.8%																
100 - 99	867	n/a	867	14.96	n/a	14.96	89.2%																
99 - 98.75	874	870	1744	15.00	13.50	28.50	43.8%																72.9%
98.75 - 93.75	1023	960	1982	15.81	13.50	29.31	53.5%																87.2%
93.75 - 92	1079	992	2071	16.09	13.50	29.59	57.4%																92.8%
92 - 91.75	1087	1994	3081	16.14	27.00	43.14	39.3%										63.4%						63.4%
91.75 - 86.75	1259	2186	3444	16.94	27.00	43.94	46.8%										74.0%						74.0%
86.75 - 81.75	1448	2387	3834	17.75	27.00	44.75	54.0%										83.6%						83.6%
81.75 - 78	1601	2543	4145	18.36	27.00	45.36	59.2%										90.1%						90.1%
78 - 72.75	2470	3147	5616	26.91	31.50	58.41	45.9%										72.4%						79.3%
72.75 - 70.5	2615	3262	5877	27.43	31.50	58.93	47.7%										74.8%						81.9%
70.5 - 70.25	2632	4468	7100	27.48	42.38	69.86	39.9%										62.4%						61.7%
70.25 - 66.25	2906	4753	7659	28.41	42.38	70.78	42.5%										65.9%						65.1%
66.25 - 66	2999	6009	9007	28.46	63.63	92.09	41.6%										61.7%			42.6%			52.9%
66 - 61	3376	6470	9846	29.62	63.63	93.24	44.8%										65.5%			45.4%			56.2%
61 - 56.5	3741	6900	10641	30.66	63.63	94.28	47.6%										68.7%			47.7%			59.0%
56.5 - 56.25	3762	6924	10687	30.72	63.63	94.34	47.8%				68.9%									47.9%			59.1%
56.25 - 51.25	4200	7420	11620	31.87	63.63	95.49	50.8%				72.2%									50.3%			62.0%
51.25 - 46.25	4670	7934	12604	33.02	63.63	96.65	53.8%				75.2%									52.6%			64.7%
46.25 - 42	5096	8384	13480	34.00	63.63	97.63	56.2%				77.6%									54.5%			66.8%
42 - 35.75	6508	6926	13434	41.71	45.63	87.34	59.6%						82.5%		79.6%					65.6%			
35.75 - 35	6605	6992	13597	41.92	45.63	87.54	59.9%						82.9%		80.0%					65.9%			
35 - 34.75	6638	7014	13652	41.99	45.63	87.61	60.0%						83.0%		80.1%					66.0%			
34.75 - 31.25	7106	7325	14432	42.96	45.63	88.59	61.6%						84.4%		81.5%					67.3%			
31.25 - 31	7052	8414	15466	43.03	56.25	99.28	55.6%						79.4%		73.6%					68.1%		64.3%	
31 - 26	7756	8932	16688	44.42	56.25	100.67	57.7%						81.4%		75.5%					69.9%		66.0%	
26 - 22	8351	9358	17709	45.53	56.25	101.78	59.3%						82.8%		76.9%					71.2%		67.3%	
22 - 21.75	8577	11589	20166	45.60	64.38	109.97	55.1%						78.4%		63.5%	64.2%				65.9%		66.2%	
21.75 - 20.5	8773	11757	20530	45.95	64.38	110.32	55.5%						78.9%		63.9%	64.6%				66.3%		66.6%	
20.5 - 20.25	8812	11791	20603	46.01	64.38	110.39	55.6%						79.0%		63.9%	64.7%				66.3%		66.6%	
20.25 - 19	9011	11962	20973	46.36	64.38	110.74	56.1%						79.4%		64.3%	65.1%				66.7%		67.0%	
19 - 18.75	8910	11065	19975	46.43	56.25	102.68	57.6%						79.8%		77.4%					72.6%		71.8%	
18.75 - 18	9030	11160	20189	46.64	56.25	102.89	57.9%						80.1%		77.6%					72.8%		72.0%	
18 - 17.75	9004	13818	22822	46.71	74.25	120.96	48.6%		71.1%				67.3%		65.4%					61.6%		60.9%	
17.75 - 12.75	9830	14608	24438	48.10	74.25	122.35	50.3%			72.6%			68.7%		66.9%					62.9%		62.3%	
12.75 - 7.75	10705	15421	26126	49.49	74.25	123.74	51.9%			74.1%			70.1%		68.3%					64.2%		63.6%	
7.75 - 5.5	11115	15794	26909	50.11	74.25	124.36	52.7%			74.7%			70.7%		68.8%					64.8%		64.1%	
5.5 - 5.25	11128	22173	33300	50.18	96.75	146.93	43.1%			59.3%		66.5%	56.6%		55.1%					52.2%		51.5%	
5.25 - 4	11383	23072	34456	50.53	96.75	147.28	42.3%			59.6%		54.1%	56.9%		55.4%					52.5%		51.8%	
4 - 3.75	11426	23527	34953	50.60	94.88	145.47	43.1%	69.7%	59.0%		52.4%									50.5%		48.8%	
3.75 - 3	11561	23574	35135	50.80	94.88	145.68	42.1%	55.0%	59.2%		52.5%									50.7%		48.9%	
3 - 2.75	11622	19446	31068	50.87	76.88	127.75	49.7%	62.9%			59.8%									57.4%		55.2%	
2.75 - 0	12153	19968	32120	51.64	76.88	128.51	50.6%	63.5%			60.4%									58.1%		55.9%	

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

Bolted Bridge Stiffeners Reinforcement Check

TIA Rev. H



Description:

This sheet is for the analysis of a reinforced flange connection using existing bolted bridge stiffeners.

Assumptions / Notes:

- 1. For analysis purposes, load is distributed between flange bolts and existing bridge stiffeners.*
- 2. The plastification of the pole is not considered.*
- 3. All shear and axial loads are taken by the flange bolts.*

1. PARAMETERS

Flange Elevation: 111'-6"

1.1 tnxTower Reactions

Apply TIA-222-H Section 15.5?

No
Yes

Moment: $M := 164.63 \text{kip}\cdot\text{ft}$

Axial Load: $P := 9.03 \text{kip}$

Shear Load: $V_w := 16.0 \text{kip}$

1.2 Shaft Properties at the Flange

Upper Shaft Diameter: $D_{\text{shaft1}} := 16 \text{in}$

Upper Shaft Thickness: $t_1 := 0.375 \text{in}$

Lower Shaft Diameter: $D_{\text{shaft2}} := 17.81 \text{in}$

Lower Shaft Thickness: $t_2 := 0.375 \text{in}$

Shaft Grade: $F_{y\text{shaft}} := 35 \text{ksi}$ $F_{u\text{shaft}} := 60 \text{ksi}$

1.3 Existing Bridge Stiffener Properties

(Verify existing bolted connection for reduced moment.)

Number of Existing Bridge Stiffeners: $N_{\text{exist}} := 3$

Existing Bridge Stiffener Grade: $F_{y\text{Ex}} := 46 \text{ksi}$ $F_{u\text{Ex}} := 62 \text{ksi}$

Diameter to the centroid of Existing Bridge Stiffeners: $BC_{\text{exist}} := 35 \text{in}$

Thickness of Existing Bridge Stiffeners: $t_{\text{exist}} := 0 \text{in}$

Width of Existing Bridge Stiffeners: $w_{\text{exist}} := 0 \text{in}$

Gross Area of One Existing Bridge Stiffener: $A_{g_exist} := 11.7 \text{in}^2$

Moment of Inertia of Existing Bridge Stiffeners: $I_{\text{exist}} := 6369.22 \text{in}^4$

Radius of Gyration about x-axis: $r_{x2} := 2.17 \text{in}$

1.5 Division of Forces

Total Gross Area: $A_{g_total} := N_{exist} \cdot A_{g_exist} + N_{bolts} \cdot A_{g_bolts} = 35.1 \cdot \text{in}^2$

Total Moment of Inertia: $I_{total} := I_{exist} + I_{bolts} = 6369.22 \cdot \text{in}^4$

1.6 Reactions to Existing Bridge Stiffeners

Moment Reaction to Existing Bridge Stiffeners: $M_{exist} := M = 164.63 \cdot \text{kip} \cdot \text{ft}$

Axial Reaction to Existing Bridge Stiffeners: $P_{exist} := P = 9.03 \cdot \text{kip}$

Shear Reaction to Existing Bridge Stiffeners: $V_{exist} := V = 16 \cdot \text{kip}$

2. Existing Bridge Stiffener Checks

2.1 Maximum Axial Forces in Single Existing Bridge Stiffener

Outer Radius of Bolt Circle: $C_{\text{max}} := \frac{BC_{\text{exist}}}{2} = 17.5 \cdot \text{in}$

Critical Compression Bending Stress: $P_{\text{comp}} := \frac{(M_{\text{exist}} + V_{\text{exist}} \cdot 5\text{ft}) \cdot C}{I_{\text{exist}}} \cdot A_{g_exist} + \frac{P_{\text{exist}}}{N_{\text{exist}}} = 97.38 \cdot \text{kip}$

Critical Tension Bending Stress: $P_{\text{tens}} := \frac{(M_{\text{exist}} + V_{\text{exist}} \cdot 5\text{ft}) \cdot C}{I_{\text{exist}}} \cdot A_{g_exist} - \frac{P_{\text{exist}}}{N_{\text{exist}}} = 91.36 \cdot \text{kip}$

2.2 Available Compression Strength

[AISC 15th Edition E3-1]

Resistance Factor: $\phi_c := 0.9$

Unbraced Length: $L_u := 48\text{in}$

Effective Length Factor: $K_{\text{max}} := 1.0$

Effective Length of Member: $L_c := K \cdot L_u = 48 \cdot \text{in}$

[AISC 15th Edition E3-2]

Strength of Bridge Stiffener: $F_{yEX} = 46 \cdot \text{ksi}$ $F_{uEX} = 62 \cdot \text{ksi}$

Elastic Buckling Stress:
 [AISC 15th Ed., Eq. E3-4] $F_e := \frac{\pi^2 \cdot 29000\text{ksi}}{\left(\frac{L_c}{r_{x2}}\right)^2} = 584.97 \cdot \text{ksi}$

Determination of Critical Stress:
 [AISC 15th Ed., Eqs. E3-2 and E3-3] $F_{cr} := \begin{cases} \left(0.658 \frac{F_{yEX}}{F_e}\right) \cdot F_{yEX} & \text{if } 4.71 \cdot \sqrt{\frac{E}{F_{yEX}}} \geq \frac{L_c}{r_{x2}} \\ (0.877 \cdot F_e) & \text{otherwise} \end{cases}$

$F_{cr} = 44.51 \cdot \text{ksi}$

Allowable Compressive Strength:
 [AISC 15th Ed., Eqs. J4-6 and E3-1] $\phi P_n := \begin{cases} (\phi_c \cdot F_{yEX} \cdot A_{g_exist}) & \text{if } \frac{L_c}{r_{x2}} \leq 25 \\ (\phi_c \cdot F_{cr} \cdot A_{g_exist}) & \text{otherwise} \end{cases}$

$\phi P_n = 484.38 \cdot \text{kip}$

Check Compressive Strength: $Check_{comp} := \begin{cases} \text{"OK"} & \text{if } \frac{P_{comp}}{\phi P_n} \leq 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$

$Check_{comp} = \text{"OK"}$

$Capacity_{comp} = 19.15\%$

2.3 Available Tension Strength

Gross Section Yield

[AISC 15th Edition Ch. D2]

Available Tension Yield Strength: $\phi P_{ty} := 0.9 \cdot F_{yEX} \cdot A_{g_exist} = 484.38 \cdot \text{kip}$

Net Section Fracture

Bolt Hole Diameter: $BH := 1.125 \text{in}$

Thickness: $T := 0.465 \text{in}$

Net Area: $A_{net} := A_{g_exist} - \left(BH + \frac{1}{16} \right) \cdot 2 \cdot T = 10.6 \cdot \text{in}^2$

Net Area Limitation: $A_e := A_{net} = 10.6 \cdot \text{in}^2$

Available Fractile Strength: $\phi P_{tr} := 0.75 \cdot F_{uEX} \cdot A_e = 492.7 \cdot \text{kip}$

Tension Check

Controlling Mode of Failure: $Check_{mode} := \begin{cases} \text{"Fracture Controls"} & \text{if } \frac{P_{tens}}{\phi P_{tr}} > \frac{P_{tens}}{\phi P_{ty}} \\ \text{"Yield Controls"} & \text{otherwise} \end{cases}$

$Check_{mode} = \text{"Yield Controls"}$

$\phi P_{nt} := \begin{cases} \phi P_{tr} & \text{if } Check_{mode} = \text{"Fracture Controls"} \\ \phi P_{ty} & \text{otherwise} \end{cases}$

Controlling Tension Mode Check: $Check_{tension} := \begin{cases} \text{"OK"} & \text{if } \frac{P_{tens}}{\phi P_{nt}} \leq 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$

$Check_{tension} = \text{"OK"}$

$Capacity_{tension} = 17.96\%$

SUMMARY

tnxTower Reactions:

$$M = 164.63 \cdot \text{kip} \cdot \text{ft}$$

$$P = 9.03 \cdot \text{kip}$$

$$V = 16 \cdot \text{kip}$$

Existing Jump Plates:

Moment to Proposed Bridge
Stiffeners:

$$M_{\text{exist}} = 164.63 \text{ ft} \cdot \text{kip}$$

Number of Existing Bridge
Stiffeners:

$$N_{\text{exist}} = 3$$

Thickness:

$$t_{\text{exist}} = 0 \cdot \text{in}$$

Width:

$$w_{\text{exist}} = 0 \cdot \text{in}$$

Controlling Capacity of Existing
Bridge Stiffeners:

$$\text{Capacity}_{\text{exist}} = 19.1\%$$

Bolt Shear Check:

1. Bolt @ backer plate: $9.04/9 = 1.0$ kips
2. Bolt @ Tube: $9.04/(2 \cdot 4) = 1.13$ kips < 31.8 kips (1" Dia. Shear Capacity)

Section Properties: Section1

Section Information:

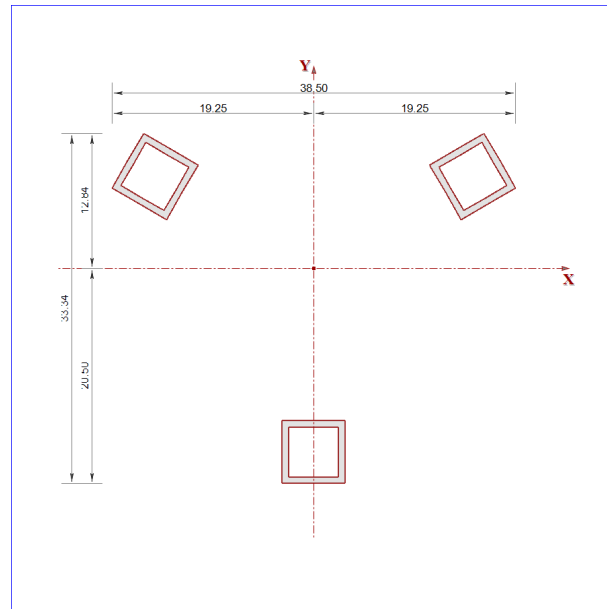
Material Type	=	General
Shape Type	=	Arbitrary
Number of Shapes	=	3

Basic Properties:

Total Width	=	38.506	in
Total Height	=	33.348	in
Centroid, Xo	=	-0.000	in
Centroid, Yo	=	-0.000	in
X-Bar (Right)	=	19.253	in
X-Bar (Left)	=	19.253	in
Y-Bar (Top)	=	12.848	in
Y-Bar (Bot)	=	20.500	in
Max Thick	=	5.375	in

Equivalent Properties:

Area, Ax	=	40.313	in ²
Inertia, Ixx	=	6369.58	in ⁴
Inertia, Iyy	=	6369.22	in ⁴
Inertia, Ixy	=	-0.000	in ⁴
Sx (Top)	=	495.76	in ³
Sx (Bot)	=	310.71	in ³
Sy (Left)	=	330.82	in ³
Sy (Right)	=	330.82	in ³
rx	=	12.570	in
ry	=	12.570	in
Plastic Zx	=	390.86	in ³
Plastic Zy	=	434.50	in ³
Torsional J	=	309.73	in ⁴
As-xx Def	=	1.000	
As-yy Def	=	1.000	
As-xx Stress	=	1.000	
As-yy Stress	=	1.000	



Section Diagram

Monopole Base Plate Connection

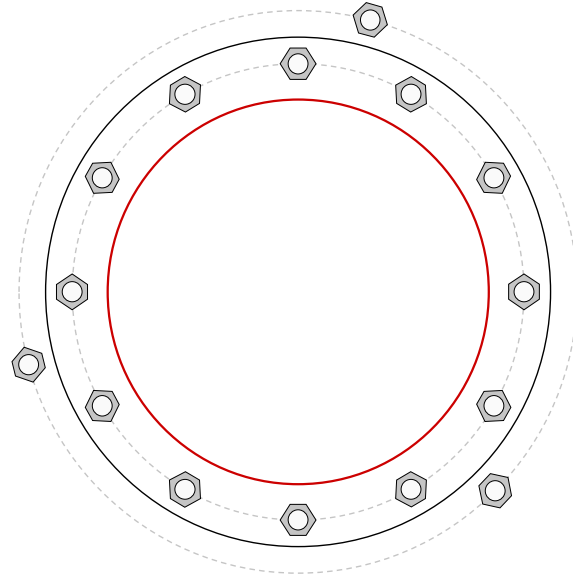


Site Info	
BU #	806365
Site Name	HRT 303 943203
Order #	460512 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	0.25

Applied Loads	
Moment (kip-ft)	3932.59
Axial Force (kips)	63.64
Shear Force (kips)	42.84

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
GROUP 1: (12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 51.23" BC
GROUP 2: (3) 2-1/4" ϕ bolts (A193 Gr. B7 N; $F_y=105$ ksi, $F_u=125$ ksi) on 63.22" BC
Base Plate Data
57.23" OD x 2.625" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
43.2" x 0.375" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
GROUP 1:		
$P_u_c = 227.53$	$\phi P_n_c = 243.75$	Stress Rating
$V_u = 3.57$	$\phi V_n = 73.13$	89.1%
$M_u = n/a$	$\phi M_n = n/a$	Pass
GROUP 2:		
$P_u_c = 274.24$	$\phi P_n_c = 297.78$	Stress Rating
$V_u = 0$	$\phi V_n = 102.38$	87.7%
$M_u = 0$	$\phi M_n = 132.58$	Pass
Base Plate Summary		
Max Stress (ksi):	29.14	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	51.4%	Pass

Additional Anchor Rods: Division of Forces

Base Reactions from tnxTower:

$$\text{Moment} := 3932.59 \cdot \text{kip} \cdot \text{ft}$$

$$\text{Axial} := 63.64 \text{ kip}$$

$$\text{Shear} := 42.84 \cdot \text{kip}$$

Apply TIA-222-H Section 15.5?

No
Yes

Existing Anchor Rod Group Moment of Inertia:

$$N_{\text{existing}} := 12$$

$$D_{\text{existing}} := 2.25 \cdot \text{in}$$

$$BC_{\text{existing}} := 51.23 \cdot \text{in}$$

$$A_{\text{existing}} := 3.25 \text{ in}^2$$

$$I_{\text{existing}} := \left(\frac{N_{\text{existing}}}{8} \right) \cdot (BC_{\text{existing}})^2 \cdot (A_{\text{existing}}) = 12794.5 \cdot \text{in}^4$$

Additional (New) Anchor Rod Group Moment of Inertia:

$$N_{\text{new}} := 3$$

$$D_{\text{new}} := 2.25 \cdot \text{in}$$

$$F_{u_{\text{rod}}} := 125 \text{ ksi}$$

$$BC_{\text{new}} := 63.22 \cdot \text{in}$$

$$A_{\text{new}} := 3.25 \text{ in}^2$$

$$F_{y_{\text{rod}}} := 105 \text{ ksi}$$

$$I_{\text{new}} := \left(\frac{N_{\text{new}}}{8} \right) \cdot (BC_{\text{new}})^2 \cdot (A_{\text{new}}) = 4871.06 \cdot \text{in}^4$$

Division of Forces:

$$I_{\text{total}} := (I_{\text{existing}}) + (I_{\text{new}}) = 17665.56 \cdot \text{in}^4$$

$$\text{Percentage}_{\text{existing}} := \left(\frac{I_{\text{existing}}}{I_{\text{total}}} \right) = 72.43\%$$

$$\text{Percentage}_{\text{new}} := \left(\frac{I_{\text{new}}}{I_{\text{total}}} \right) = 27.57\%$$

Forces Remaining in Existing Anchor Rods:

$$M_{\text{existing}} := \text{Moment} \cdot (\text{Percentage}_{\text{existing}}) = 2848.23 \cdot \text{kip} \cdot \text{ft}$$

$$A_{x_{\text{existing}}} := \text{Axial} = 63.64 \cdot \text{kip}$$

$$S_{\text{existing}} := \text{Shear} = 42.84 \cdot \text{kip}$$

Forces to New Anchor Rods:

$$M_{\text{new}} := \text{Moment} \cdot (\text{Percentage}_{\text{new}}) = 1084.36 \cdot \text{kip} \cdot \text{ft}$$

$$A_{x_{\text{new}}} := 0 \cdot \text{kip}$$

$$S_{\text{new}} := 0 \cdot \text{kip}$$

(It is assumed that all of the Axial and Shear loads will go to the existing anchor rods)

--See attached CCIplate output for additional anchor rod group capacity and structural rating values--



Anchor Rod Bracket Calculations

Analyze the anchor rod bracket and all components to resist the demand load of the additional anchors.

Bracket Demand Load:

$$\phi P_n := 274.24 \cdot \text{kip}$$

Tube Design (Square HSS)

Member Size: HSS 5" x 5" x 1/2"

Member Properties

(AISC 15th Ed., Table 1-12):

Outside Diameter: $OD_{HSS} := 5 \cdot \text{in}$

Area: $A_{HSS} := 7.88 \cdot \text{in}^2$

$$A_{e_{HSS}} := 0.75 \cdot A_{HSS} = 5.91 \cdot \text{in}^2$$

Thickness: $t_{HSS} := 0.5 \cdot \text{in}$

Yield Strength: $F_{y_{HSS}} := 46 \cdot \text{ksi}$

$$F_{u_{HSS}} := 58 \cdot \text{ksi}$$

Length: $L_{HSS} := 24 \cdot \text{in}$

Moment of Inertia: $I_{HSS} := 26 \cdot \text{in}^4$

Radius of Gyration: $r_{HSS} := 1.82 \cdot \text{in}$

Inside Dimension: $ID_{HSS} := OD_{HSS} - 2 \cdot t_{HSS} = 4 \cdot \text{in}$

Bearing Check

(AISC 15th Ed., Equation J7-1):

$$\phi_b := 0.75$$

$$\phi P_n = \phi_b \cdot R_n = \phi_b \cdot 1.8 \cdot F_{y_{HSS}} \cdot A_{pb}$$

$$A_{pb} := \frac{\phi P_n}{\phi_b \cdot 1.8 \cdot F_{y_{HSS}}} = 4.42 \cdot \text{in}^2$$

$$\text{Check}_{\text{bear}} := \begin{cases} \text{"OK"} & \text{if } A_{HSS} \geq A_{pb} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$$\text{Check}_{\text{bear}} = \text{"OK"}$$

**Compression Check
 (AISC 15th Ed., Eqs. E3-1 to E3-4):**

$$\phi_c := 0.9$$

$$K_{xx} := 1$$

$$\phi P_{n_comp} = \phi_c \cdot F_{cr} \cdot A_g$$

$$L_c := K \cdot L_{HSS} = 24 \cdot \text{in}$$

$$F_e := \frac{\pi^2 \cdot 29000 \text{ksi}}{\left(\frac{L_c}{r_{HSS}}\right)^2} = 1645.96 \cdot \text{ksi}$$

$$\frac{L_c}{r_{HSS}} = 13.19 < 4.71 \cdot \sqrt{\frac{29000 \cdot \text{ksi}}{F_{y_HSS}}} = 118.26$$

$$\therefore F_{cr} := 0.658 \cdot \frac{F_{y_HSS}}{F_e} \cdot F_{y_HSS} = 45.47 \cdot \text{ksi}$$

(AISC 15th Ed., Equation J4-6):

$$\phi P_{n_comp} := \begin{cases} \phi_c \cdot F_{y_HSS} \cdot A_{HSS} & \text{if } \frac{L_c}{r_{HSS}} \leq 25 \\ \phi_c \cdot F_{cr} \cdot A_{HSS} & \text{otherwise} \end{cases}$$

$$\phi P_{n_comp} = 326.23 \cdot \text{kip}$$

$$\text{Check}_{comp} := \begin{cases} \text{"OK"} & \text{if } \phi P_{n_comp} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check_{comp} = "OK"

Gusset Plate Design

Gusset Plate width: $w_{plate} := 6 \cdot \text{in}$

Gusset Plate thickness: $t_{plate} := 1.25 \text{in}$

$L_{plate1} := 84 \text{in}$

$L_{plate2} := 24 \text{in}$

Gusset Plate Strength: $F_{yplate} := 65 \text{ksi}$

$F_{uplate} := 80 \text{ksi}$

Pole thickness: $t_{pole} := 0.375 \text{in}$

Shear Check
(AISC 15th Ed., Eqs. J4-3 and J4-4):

$$A_g := t_{plate} \cdot L_{plate2} = 30 \cdot \text{in}^2$$

$$A_{nv} := A_g = 30 \cdot \text{in}^2$$

Shear Yielding

$$\phi_v := 1$$

$$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_g \cdot F_{yplate} = 1170 \cdot \text{kip}$$

$$\text{Check}_{shear} := \begin{cases} \text{"OK"} & \text{if } \phi V_{plate} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check_{shear} = "OK"

Shear Rupture

$$\phi_{rn} := 0.75$$

$$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_{nv} \cdot F_{uplate} = 1080 \cdot \text{kip}$$

$$\text{Check}_{shear} := \begin{cases} \text{"OK"} & \text{if } \phi V_{plate} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check_{shear} = "OK"

Gusset Plate to Pole and Base Plate
Weld Design (Horizontal and Vertical
Weld):
(AISC 15th Ed., Part 8)

Gusset plate thickness:

$$t_{plate} = 1.25 \cdot \text{in}$$

Pole Grade:

$$F_{ypole} := 65 \text{ksi} \quad F_{upole} := 80 \text{ksi}$$

Base Plate Grade:

$$F_{ybase} := 60 \text{ksi} \quad F_{ubase} := 75 \text{ksi}$$

Gusset Plate Grade:

$$F_{yplate} = 65 \cdot \text{ksi} \quad F_{uplate} = 80 \cdot \text{ksi}$$

Height of vertical weld from base plate:

$$H_{vw} := L_{plate1} = 84 \cdot \text{in}$$

Notch := 0.75 in

Gap between Base Plate and HSS:

Gap := 12 in

Vertical fillet weld size to pole:
(in sixteenths of an inch)

$$D_{vpole} := 6$$

$$\text{weldsize}_{pole} := \frac{D_{vpole}}{16} = \frac{3}{8}$$

Weld Material Grade:

$$F_{EXX} := 80 \text{ksi}$$



Check := "OK" if Capacity < 100%
"INSUFFICIENT" otherwise

Check = "OK"

Gusset Plate to HSS Weld Design (AISC 15th Ed., Table 8-4)

Electrode Strength:

$$F_{EXX} := 80 \text{ksi}$$

Weld Size (in sixteenths
of an inch):

$$D_1 := 8$$

$$\text{weldsize}_1 := \frac{D_1}{16} = \frac{1}{2}$$

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$\text{ecc}_2 := \text{OD}_{\text{HSS}} - t_{\text{HSS}} - \frac{D_{\text{new}}}{2} = 3.38 \text{ in}$$

Load not in plane with weld
group:

$$k := 0$$

$$a := \frac{\text{ecc}_2}{L_{\text{plate2}}} = 0.14$$

$$C_1 := 1.03$$

$$\text{Coeff}_1 := 3.72$$

$$\phi_w := 0.75$$

$$D_{\min 1} := \text{ceil} \left(\frac{\phi P_n \cdot \text{in}}{\phi_w \cdot \text{Coeff}_1 \cdot C_1 \cdot L_{\text{plate}2} \cdot \text{kip}} \right) = 4$$

$$\text{minweldsize} := \frac{D_{\min 1}}{16} = \frac{1}{4}$$

$$\text{Check}_{\text{weld}} := \begin{cases} \text{"OK"} & \text{if } D_1 \geq D_{\min 1} \wedge D_1 \geq \text{Min}_{\text{weldsize}} \wedge D_1 \leq \text{Max}_{\text{weldsize}} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$$\text{Check}_{\text{weld}} = \text{"OK"}$$

$$\phi R_{n_{\text{weld}1}} := \phi_w \cdot \text{Coeff}_1 \cdot \text{ksi} \cdot \text{in} \cdot C_1 \cdot D_1 \cdot L_{\text{plate}2} = 551.75 \cdot \text{kip}$$

$$\text{Check}_{\text{weld}1} := \begin{cases} \text{"OK"} & \text{if } \phi R_{n_{\text{weld}1}} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$$\text{Check}_{\text{weld}1} = \text{"OK"}$$

Gusset Plate to Pole Punching Shear Check
 (max per unit length):
 (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$\phi_{\text{sy}} := 1.0$$

$$\phi_{\text{sr}} := 0.75$$

$$\text{ecc}_1 := w_{\text{plate}} + \text{OD}_{\text{HSS}} - t_{\text{HSS}} - \frac{D_{\text{new}}}{2} = 9.38 \cdot \text{in}$$

$$M_1 := \phi P_n \cdot \text{ecc}_1 = 2571 \cdot \text{kip} \cdot \text{in}$$

$$S_1 := \frac{t_{\text{plate}} \cdot L_{\text{plate}1}^2}{6} = 1470 \cdot \text{in}^3$$

$$f_{\text{ww}} := \frac{M_1}{S_1} \cdot t_{\text{plate}} \cdot \text{in} = 2.19 \cdot \text{kip}$$

AISC 15th Ed., Equation J4-3:

$$\phi F_{\text{sy}} := \phi_{\text{sy}} \cdot 0.6 \cdot F_{\text{ypole}} \cdot 2 \cdot t_{\text{pole}} \cdot \text{in} = 29.25 \cdot \text{kip}$$

AISC 15th Ed., Equation J4-4:

$$\phi F_{\text{sr}} := \phi_{\text{sr}} \cdot 0.6 \cdot F_{\text{upole}} \cdot 2 \cdot t_{\text{pole}} \cdot \text{in} = 27 \cdot \text{kip}$$

$$\phi F_{vw} := \min(\phi F_{sy}, \phi F_{sr}) = 27 \cdot \text{kip}$$

$$\text{Check}_{PS1} := \begin{cases} \text{"OK"} & \text{if } \phi F_v \geq f_v \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$$\text{Check}_{PS1} = \text{"OK"}$$

**Gusset Plate to HSS Punching
Shear Check
(max per unit length):
(AISC 15th Ed., Section J4.2)**

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 3.38 \cdot \text{in}$$

$$M_2 := \phi P_n \cdot ecc_2 = 925.56 \cdot \text{kip} \cdot \text{in}$$

$$S_2 := \frac{t_{plate} \cdot L_{plate}^2}{6} = 120 \cdot \text{in}^3$$

$$f_w := \frac{M_2}{S_2} \cdot t_{plate} \cdot 1 \text{in} = 9.64 \cdot \text{kip}$$

AISC 15th Ed., Equation J4-3:

$$\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot F_{y_HSS} \cdot 2 \cdot t_{HSS} \cdot 1 \text{in} = 27.6 \cdot \text{kip}$$

AISC 15th Ed., Equation J4-4:

$$\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot F_{u_HSS} \cdot 2 \cdot t_{HSS} \cdot 1 \text{in} = 26.1 \cdot \text{kip}$$

$$\phi F_{vw} := \min(\phi F_{sy}, \phi F_{sr}) = 26.1 \cdot \text{kip}$$

$$\text{Check}_{PS2} := \begin{cases} \text{"OK"} & \text{if } \phi F_v \geq f_v \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$$\text{Check}_{PS2} = \text{"OK"}$$

Embedment Depth Calculations

Projected Embedment Depth:	$L_{em} := 8 \cdot ft$	
Yield Strength of Rebar:	$f_y := 60ksi$	
Concrete Strength:	$f_c := 3000psi$	
Transverse Reinforcement Index:	$k_{tr} := 0$	Can be taken as 0 for design per ACI 318-14
Epoxy Factor:	$\psi_e := 1$	
Rebar Size Factor:	$\psi_s := 1$	
Casting Position Factor:	$\psi_t := 1$	
Concrete Weight Factor:	$\lambda := 1 \cdot \sqrt{psi}$	
Pier Diameter:	$D_{pier} := 7ft$	
Cover	$c_c := 3in$	
Rebar Size:	$d_s := 10$	$d_b := vlookup(d_s, Rebar, 2) \cdot in = 1.27 \cdot in$
Tie Size:	$Tie := 3$	
Number of Vertical Rebar:	$n := 22$	

Development Length (ACI 318-14 Chapter 25):

$$BC_{rebar} := D_{pier} - 2 \cdot c_c - \frac{Tie \cdot in}{4} - d_b = 75.98 \cdot in$$

$$S_{rebar} := \frac{\pi \cdot BC_{rebar}}{n} = 10.85 \cdot in$$

$$c_b := \min\left(c_c + \frac{Tie}{8} \cdot in + \frac{d_b}{2}, S_{rebar} \cdot 0.5\right) = 4.01 \cdot in$$

ACI 318-14, Equation 25.4.2.3a:

$$l_d := \left[\frac{3}{40} \cdot \frac{f_y}{\lambda \cdot \sqrt{f_c}} \cdot \frac{\psi_t \cdot \psi_e \cdot \psi_s}{\min\left[\left(\frac{c_b + k_{tr}}{d_b}\right), 2.5\right]} \right] \cdot d_b = 41.74 \cdot in$$

Calculate Max Distance Between Rebar and New Anchor Rods:

$$A := \frac{1}{2} \cdot S_{\text{rebar}} = 5.425 \cdot \text{in}$$

$$B := \frac{BC_{\text{rebar}}}{2} - \frac{BC_{\text{new}}}{2} = 6.38 \cdot \text{in}$$

$$G := \sqrt{A^2 + B^2} = 8.375 \cdot \text{in}$$

$$l'_d := l_d + \frac{G}{1.5} + 3 \text{in} = 4.19 \text{ft}$$

Epoxy Development Length:

Bond Strength:

Epoxy :=

$$\phi_{\text{bond}} := 0.65$$

$$S_b := \begin{cases} S_{bh} & \text{if Epoxy} = 0 \\ S_{bA} & \text{otherwise} \end{cases}$$

$$S_b = 1037 \text{psi}$$

$$L_{be} := \frac{\phi P_n}{\pi \cdot D_{\text{new}} \cdot S_b \cdot \phi_{\text{bond}}} = 57.56 \cdot \text{in}$$

Required Embedment Length:

$$L_{\text{min}} := \max(L_{be} + 12 \text{in}, l'_d + 0.25 \cdot L_{be}) = 5.8 \text{ft}$$

$$L_{\text{min}} := \text{ceil}\left(\frac{L_{\text{min}}}{0.5 \text{ft}}\right) \cdot 0.5 \text{ft}$$

$$L_{\text{min}} = 6 \text{ft}$$

$$\text{Check} := \begin{cases} \text{"OK"} & \text{if } L_{\text{min}} \leq L_{\text{em}} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check = "OK"

Anchor Rod Pullout Test:

$$\phi_p := 0.75$$

Is this a CA DSA site?

Yes
 No

$$\text{Pullout} := \begin{cases} \frac{\phi_p \cdot F_{u\text{rod}} \cdot A_{\text{new}}}{1.6} & \text{if } CA = 0 \\ (0.8 \cdot F_{y\text{rod}} \cdot A_{\text{new}}) & \text{otherwise} \end{cases} = 190 \cdot \text{kip}$$

Pier and Pad Foundation



BU #: 806365
 Site Name: HRT 303 943203
 App. Number: 460512 Rev.0

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	63.6	kips
Base Shear, V_{u_comp} :	42.8	kips
Moment, M_u :	3932.6	ft-kips
Tower Height, H :	129	ft
BP Dist. Above Fdn, bp_{dist} :	5.125	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	737.66	42.80	5.5%	Pass
<i>Bearing Pressure (ksf)</i>	15.00	2.68	17.0%	Pass
<i>Overtuning (kip*ft)</i>	15490.91	4420.40	28.5%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	4577.46	4183.84	87.0%	Pass
<i>Pier Compression (kip)</i>	18370.97	104.26	0.5%	Pass
<i>Pad Flexure (kip*ft)</i>	9228.34	1540.08	15.9%	Pass
<i>Pad Shear - 1-way (kips)</i>	1548.24	171.04	10.5%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.017	9.9%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	14411.53	2510.30	16.6%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	7	ft
Ext. Above Grade, E :	0.67	ft
Pier Rebar Size, S_c :	10	
Pier Rebar Quantity, mc :	22	
Pier Tie/Spiral Size, St :	3	
Pier Tie/Spiral Quantity, mt :	6	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	28.5%
Structural Rating*:	87.0%

Pad Properties		
Depth, D :	10.3	ft
Pad Width, W :	28	ft
Pad Thickness, T :	5.1	ft
Pad Rebar Size (Bottom), Sp :	11	
Pad Rebar Quantity (Bottom), mp :	24	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60000	psi
Concrete Compressive Strength, F'_c :	3000	psi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	135	pcf
Ultimate Gross Bearing, Q_{ult} :	20.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	36	degrees
SPT Blow Count, N_{blows} :	60	
Base Friction, μ :	0.35	
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

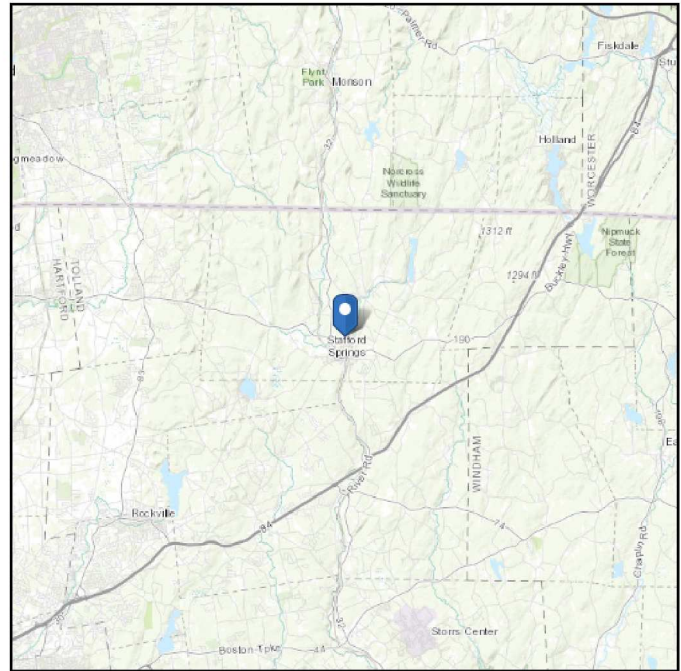
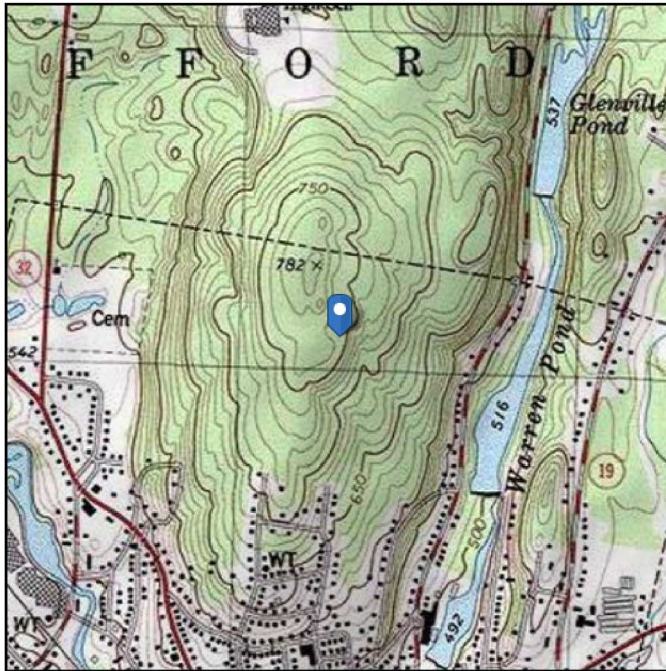
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ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 754.15 ft (NAVD 88)
Latitude: 41.964222
Longitude: -72.304944



Wind

Results:	77 Vmph
Wind Speed:	124 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	101 Vmph

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

Date Accessed: Thu Nov 29 2018

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.

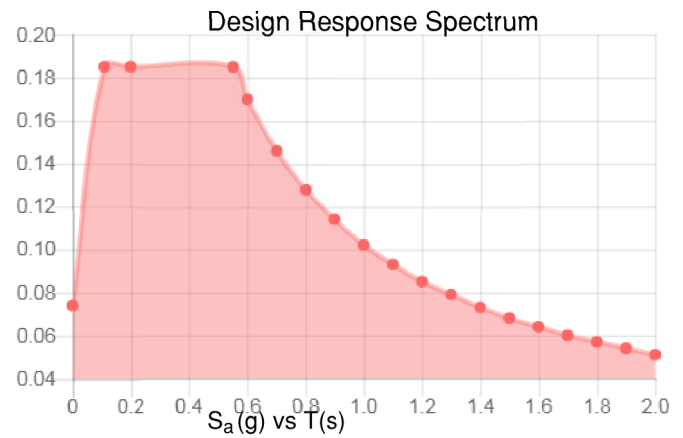
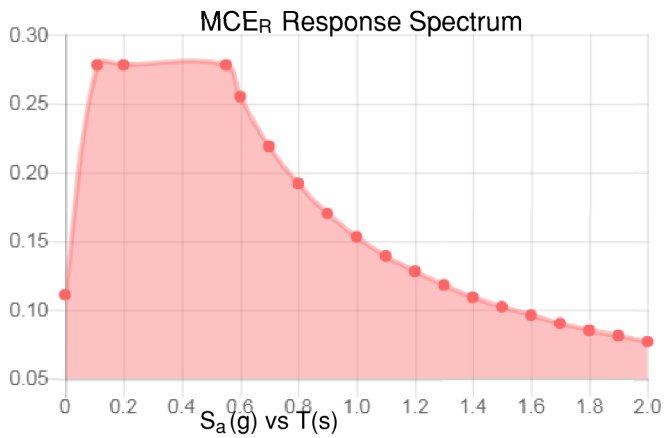
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.174	S_{DS} :	0.185
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.085
S_{MS} :	0.278	PGA _M :	0.137
S_{M1} :	0.153	F_{PGA} :	1.600
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu Nov 29 2018

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: Thu Nov 29 2018

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

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

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WIRELESS COMMUNICATIONS FACILITY

CROWN CASTLE MP

SITE ID: CT11528C

BRENDAN STREET

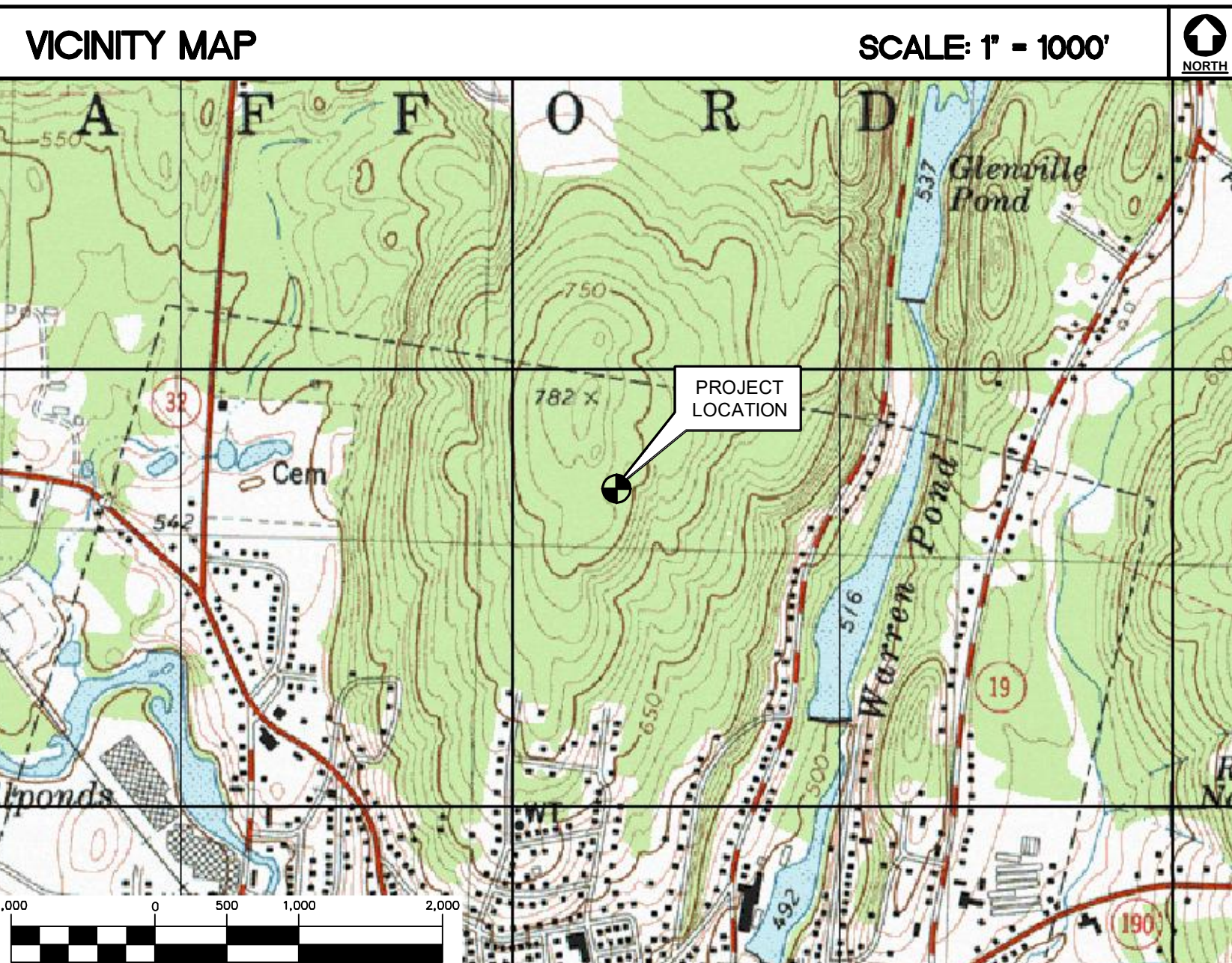
STAFFORD SPRINGS, CT 06076

GENERAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
- CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
- CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
- CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
- CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
- CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
- LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
- THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
- DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
- ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
- ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
- ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
- CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
- THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
- COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
- CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM:	TO:
35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	BRENDAN STREET STAFFORD SPRINGS, CT
1. HEAD SOUTHEAST ON W NEWBERRY RD TOWARD GRIFFIN RD S.	0.05 MI.
2. TURN LEFT ONTO GRIFFIN RD S.	0.60 MI.
3. TURN RIGHT ONTO DAY HILL RD.	3.60 MI.
4. USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD.	0.40 MI.
5. MERGE ONTO I-91 S.	3.60 MI.
6. TAKE EXIT 35A FOR I-291 TOWARD MANCHESTER.	0.60 MI.
7. CONTINUE ONTO I-291 E.	5.60 MI.
8. USE THE LEFT LANE TO MERGE ONTO I-84 E TOWARD BOSTON.	16.90 MI.
9. TAKE EXIT 70 FOR CT-32 TOWARD STAFFORD SPRINGS.	0.20 MI.
10. TURN LEFT ONTO CT-32 N/RIVER RD.	4.30 MI.
11. AT THE TRAFFIC CIRCLE TAKE THE FIRST EXIT ONTO MAIN ST.	0.10 MI.
12. CONTINUE STRAIGHT ONTO FURNACE AVE.	0.10 MI.
13. TURN RIGHT ONTO PROSPECT ST.	0.10 MI.
14. TURN RIGHT ONTO BRENDAN ST.	0.10 MI.



T-MOBILE RF CONFIGURATION

4Sec-67D92DB_2xAIR+1OP

PROJECT SUMMARY

- THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
 - REMOVE (6) EXISTING PANEL ANTENNAS.
 - REMOVE (3) EXISTING TMAs.
 - REMOVE (3) EXISTING T-ARMS.
 - INSTALL (1) PROPOSED LOW PROFILE PLATFORM.
 - INSTALL (12) PANEL ANTENNAS.
 - INSTALL (4) REMOTE RADIO HEADS.
 - REMOVE (12) COAX CABLES.
 - INSTALL (4) 6X12 HYBRID CABLES.
 - REPLACE EXISTING 6201 EQUIPMENT CABINET WITH 6102 EQUIPMENT CABINET.

PROJECT INFORMATION

SITE NAME:	CROWN CASTLE MP
SITE ID:	CT11528C
SITE ADDRESS:	BRENDAN STREET STAFFORD SPRINGS, CT 06076
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-57'-51.2" N LONGITUDE: 72°-18'-17.8" W GROUND ELEVATION: 811'± AMSL
	SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
N-1	DESIGN BASIS AND SITE NOTES	1
C-1	SITE LOCATION PLAN	1
C-2	COMPOUND PLAN	1
C-3	ANTENNA CONFIGURATION AND ELEVATION	1
E-1	TYPICAL ELECTRICAL DETAILS	1

PROFESSIONAL ENGINEER SEAL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
T-Mobile Transcend Wireless	REV. 1 01/23/19 KAW/R TLL 0 01/17/19 KAW/R TLL DATE DRAWN BY CHK'D BY DESCRIPTION
CENTEK engineering Centered on Solutions (203) 498-0380 (203) 498-3887 Fax 632 North Branford Road Branford, CT 06405 www.CentekEng.com	
T-MOBILE NORTHEAST LLC WIRELESS COMMUNICATIONS FACILITY CROWN CASTLE MP SITE ID: CT11528C BRENDAN STREET STAFFORD SPRINGS, CT 06076	
DATE: 10/28/18	
SCALE: AS NOTED	
JOB NO. 18127.13	
TITLE SHEET	
T-1	
Sheet No. 1 of 6	

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

- 1. DESIGN CRITERIA:
 - WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 95-105 MPH (3 SECOND GUST)
 - RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
 - NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (V_{wd}) (EXPOSURE C)/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10 PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
 - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

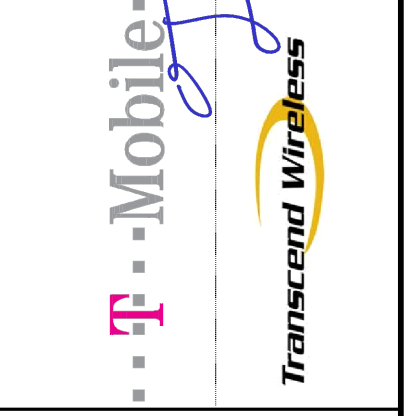
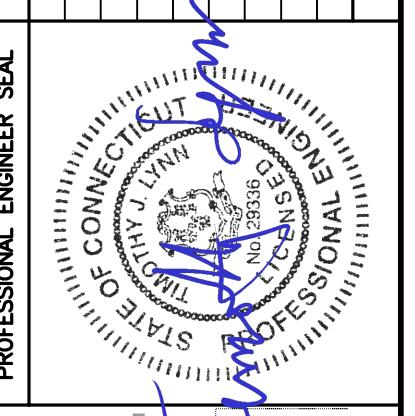
GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
 - A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
 - B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
 - C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 - D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 - E. PIPE---ASTM A53 (FY = 35 KSI)
 - F. CONNECTION BOLTS---ASTM A325-N
 - G. U-BOLTS---ASTM A36
 - H. ANCHOR RODS---ASTM F 1554
 - I. WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	BY	DESCRIPTION
1	01/03/18	KANUR	TUL CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	01/17/18	KANUR	TUL CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

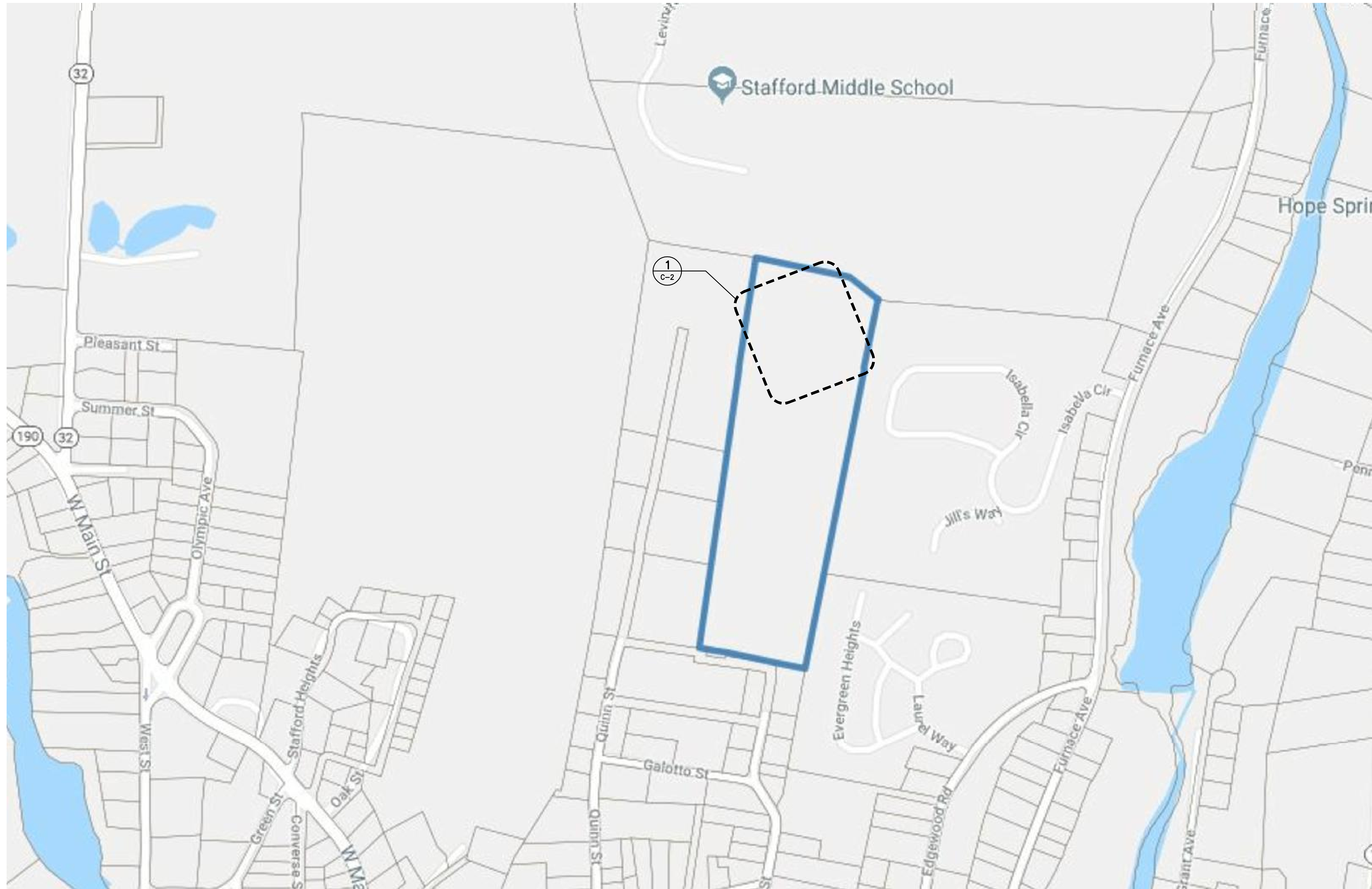


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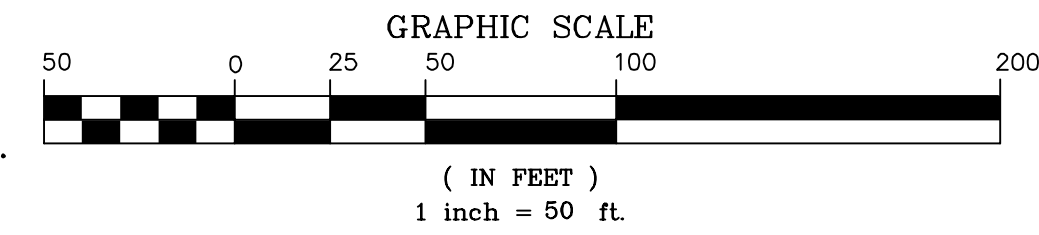
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CROWN CASTLE MP
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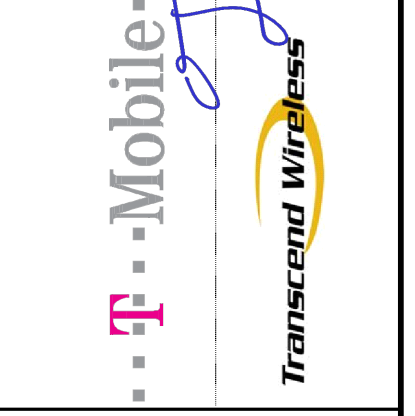
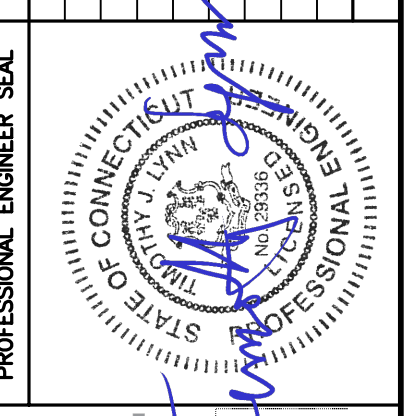
DESIGN BASIS
 AND SITE NOTES



1
C-1 **SITE LOCATION PLAN**
SCALE: 1" = 50'



REV.	DATE	BY	CHK'D BY	DESCRIPTION
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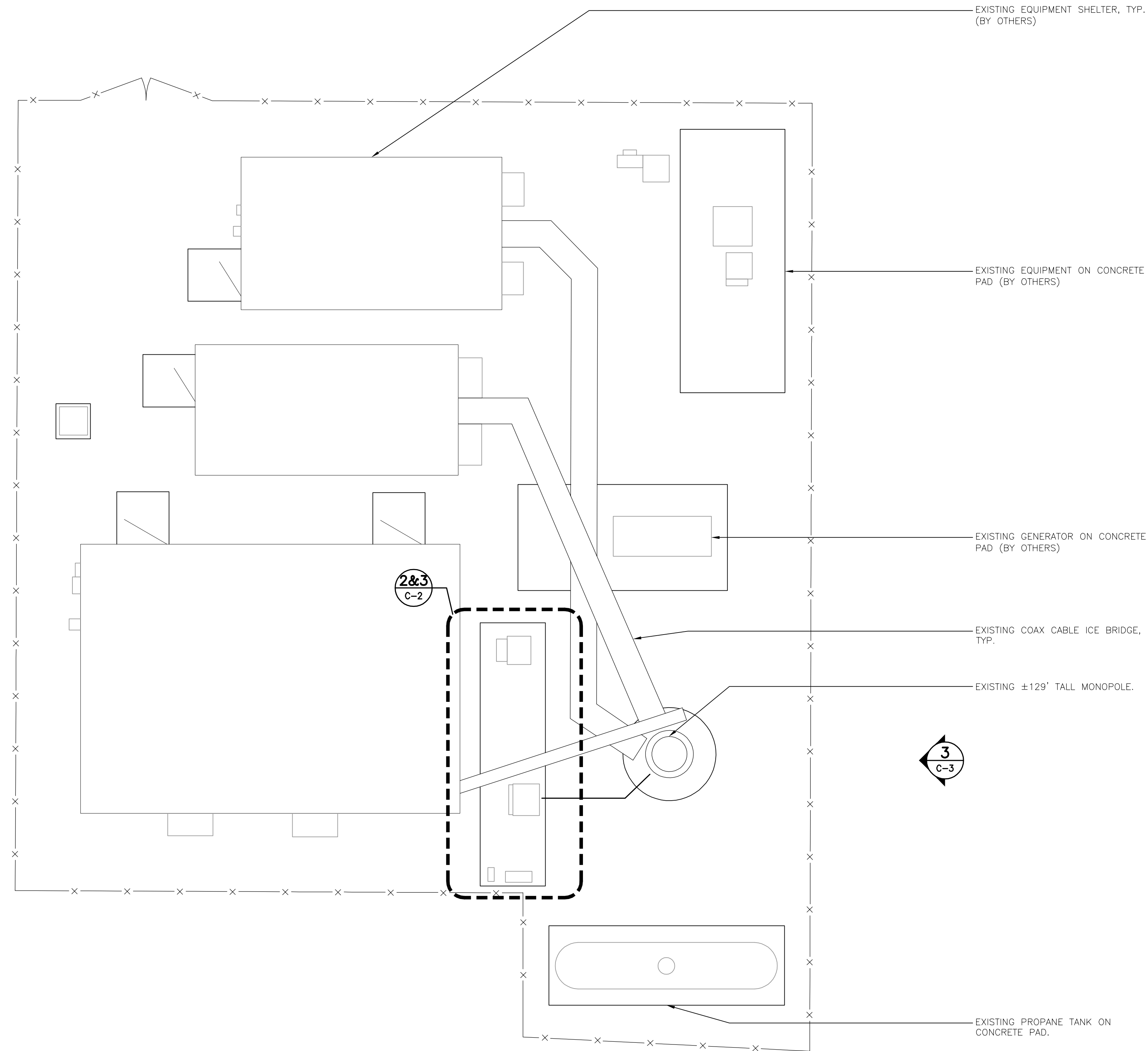
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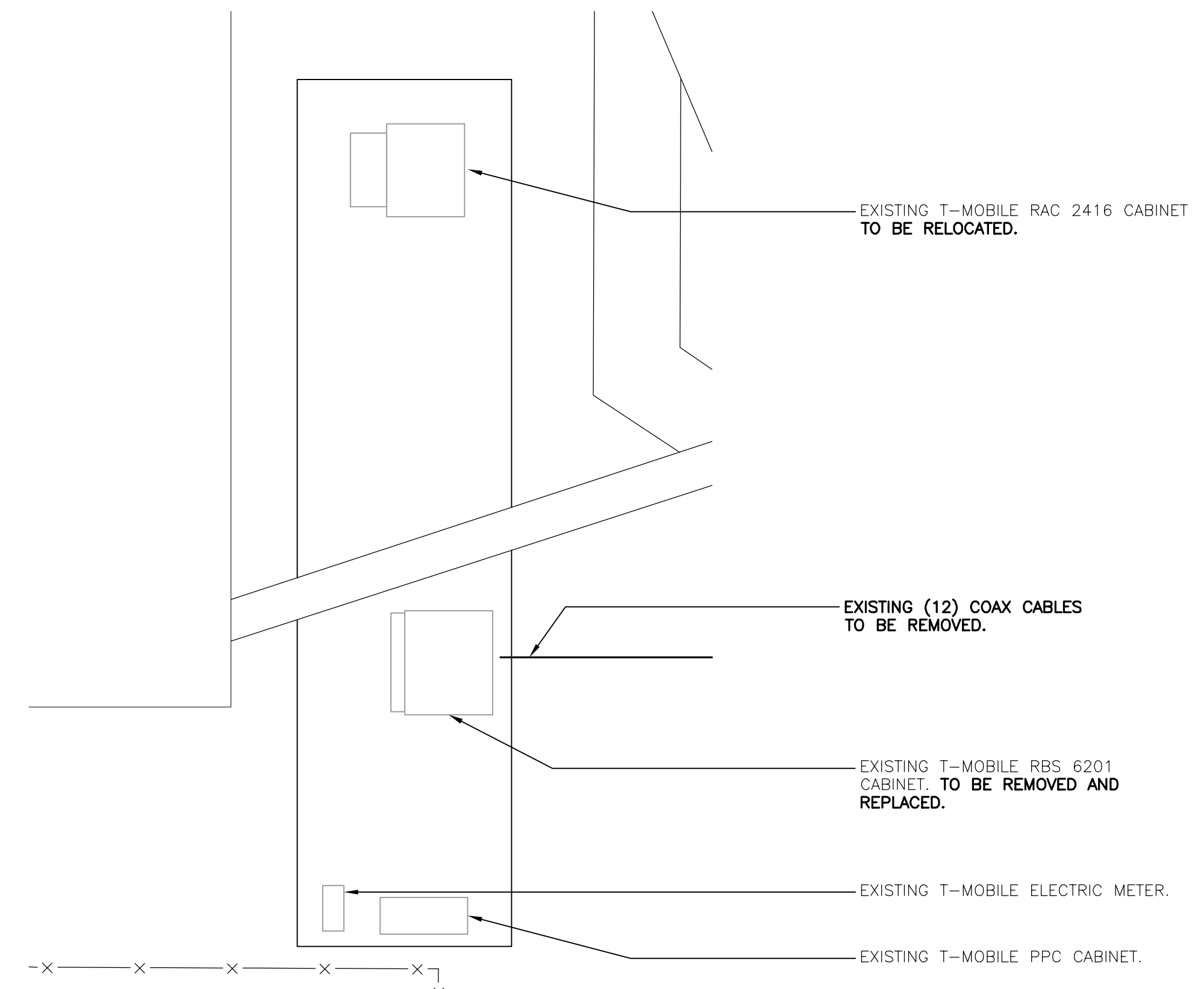
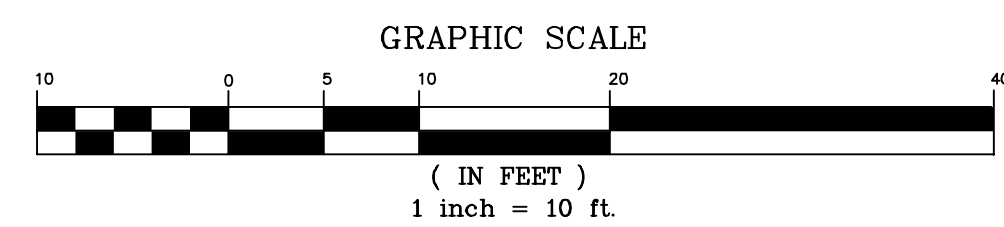
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SITE LOCATION PLAN

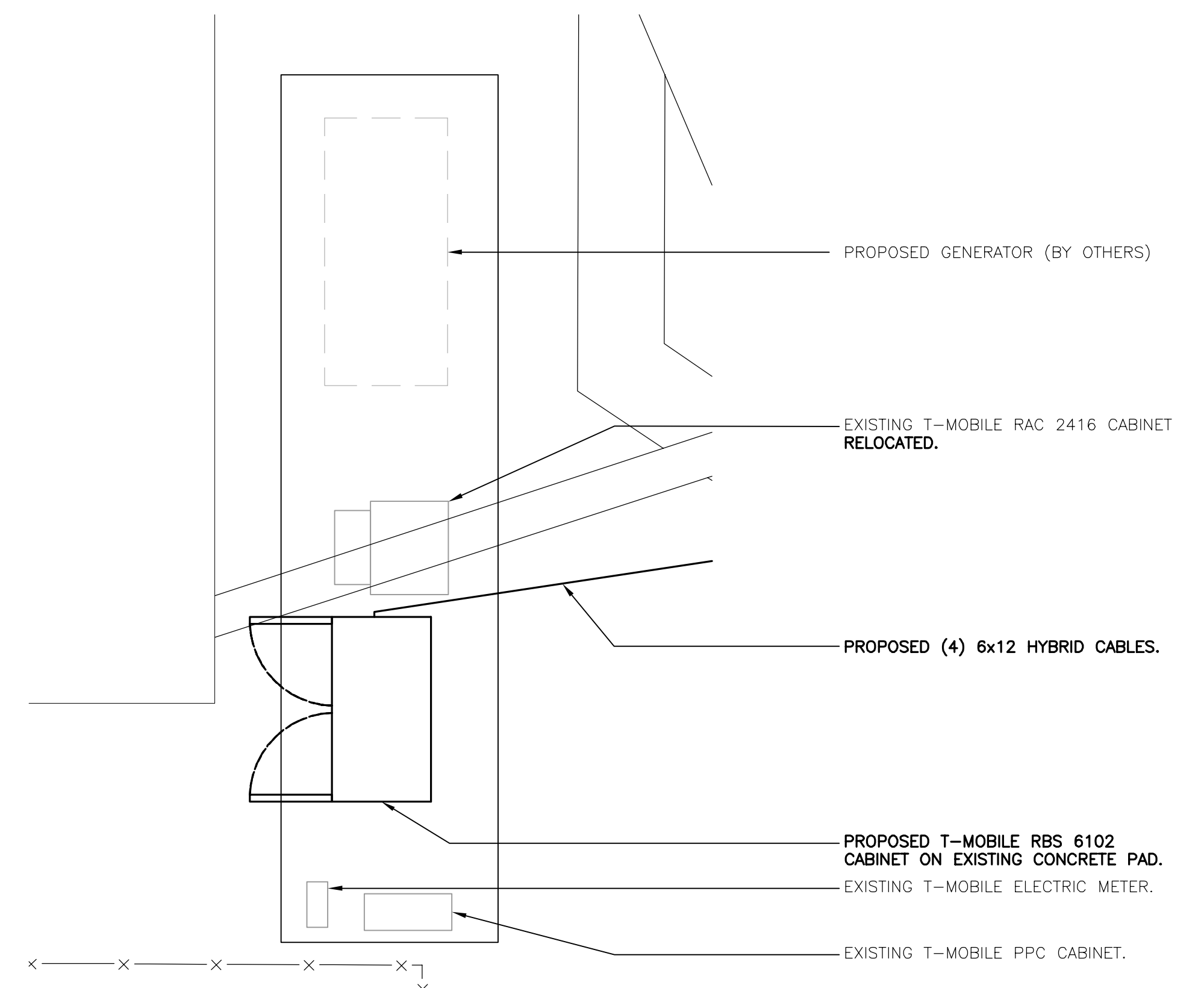
C-1
 Sheet No. 3 of 6



1
C-2
COMPOUND PLAN
SCALE: 1" = 5'



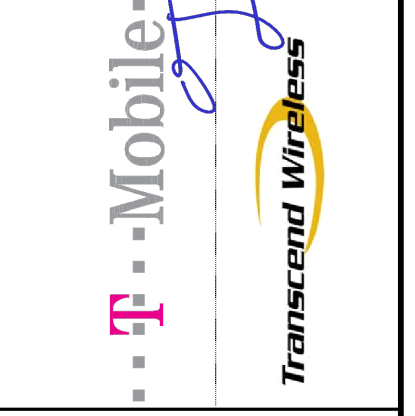
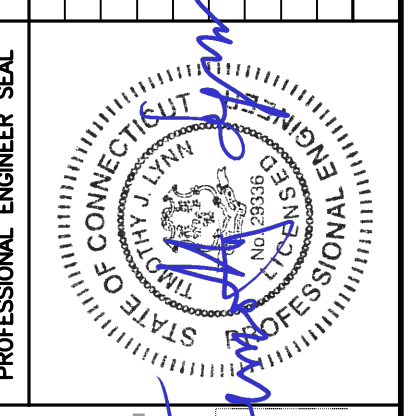
2
C-2
EXISTING EQUIPMENT PLAN
SCALE: 3/8" = 1'



3
C-2
PROPOSED EQUIPMENT PLAN
SCALE: 3/8" = 1'



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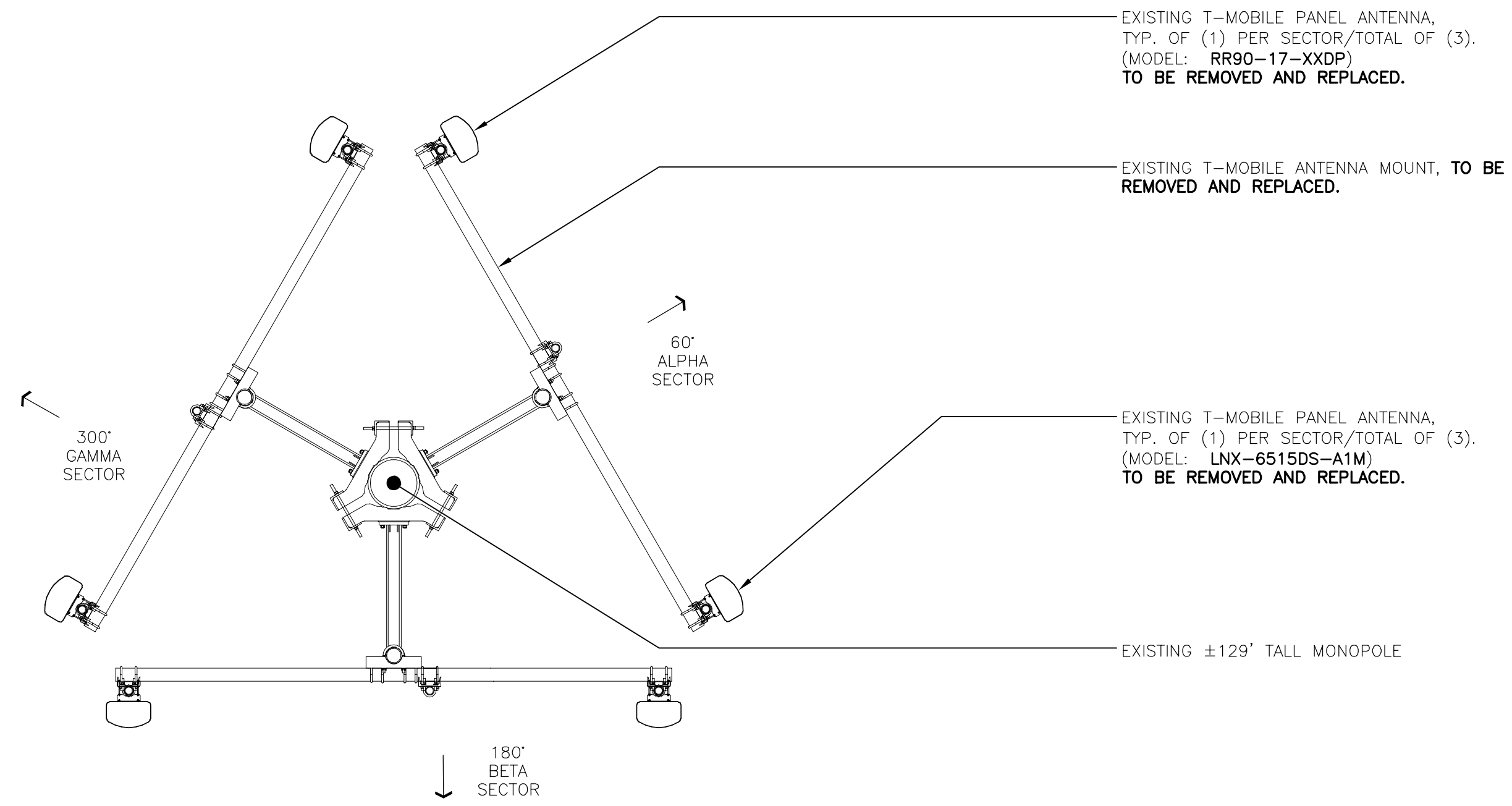
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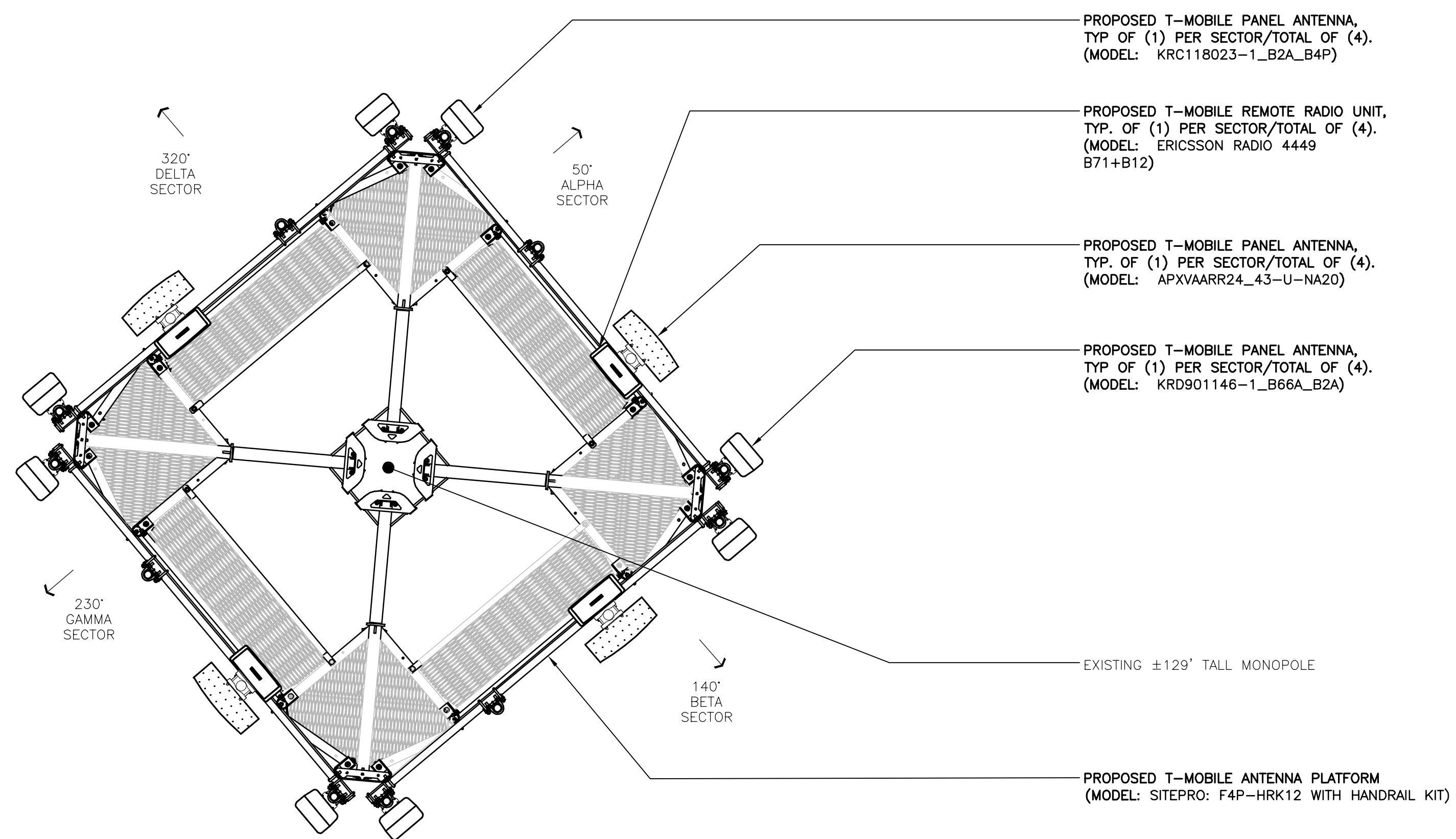
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COMPOUND PLAN

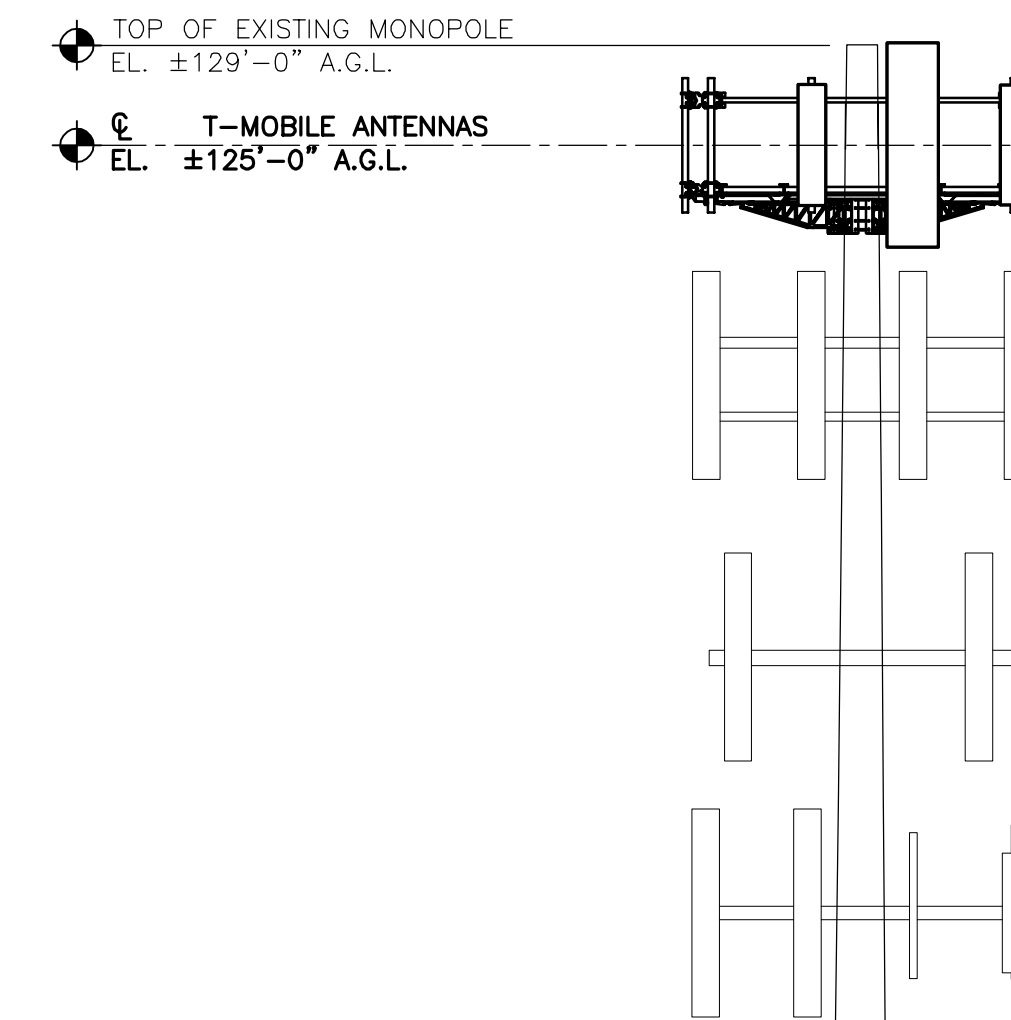
C-2



1 EXISTING ANTENNA MOUNTING CONFIGURATION
 C-3 SCALE: 3/8" = 1'
 TRUE NORTH



2 PROPOSED ANTENNA MOUNTING CONFIGURATION
 C-3 SCALE: 3/8" = 1'
 TRUE NORTH



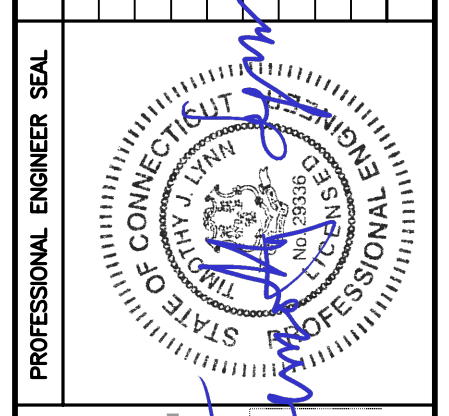
TOWER STRUCTURAL NOTES:

- REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY BLACK & VEATCH CORP. PROJ. NO. 400087, DATED NOVEMBER 30, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY BLACK & VEATCH CORP. AND FINAL T-MOBILE RF DATA SHEET.

NOTE:
 GROUND EQUIPMENT NOT SHOWN FOR CLARITY

3 SOUTH TOWER ELEVATION
 C-3 SCALE: 1" = 7.5'
 GRAPHIC SCALE
 (IN FEET)
 1 inch = 7.5 ft.

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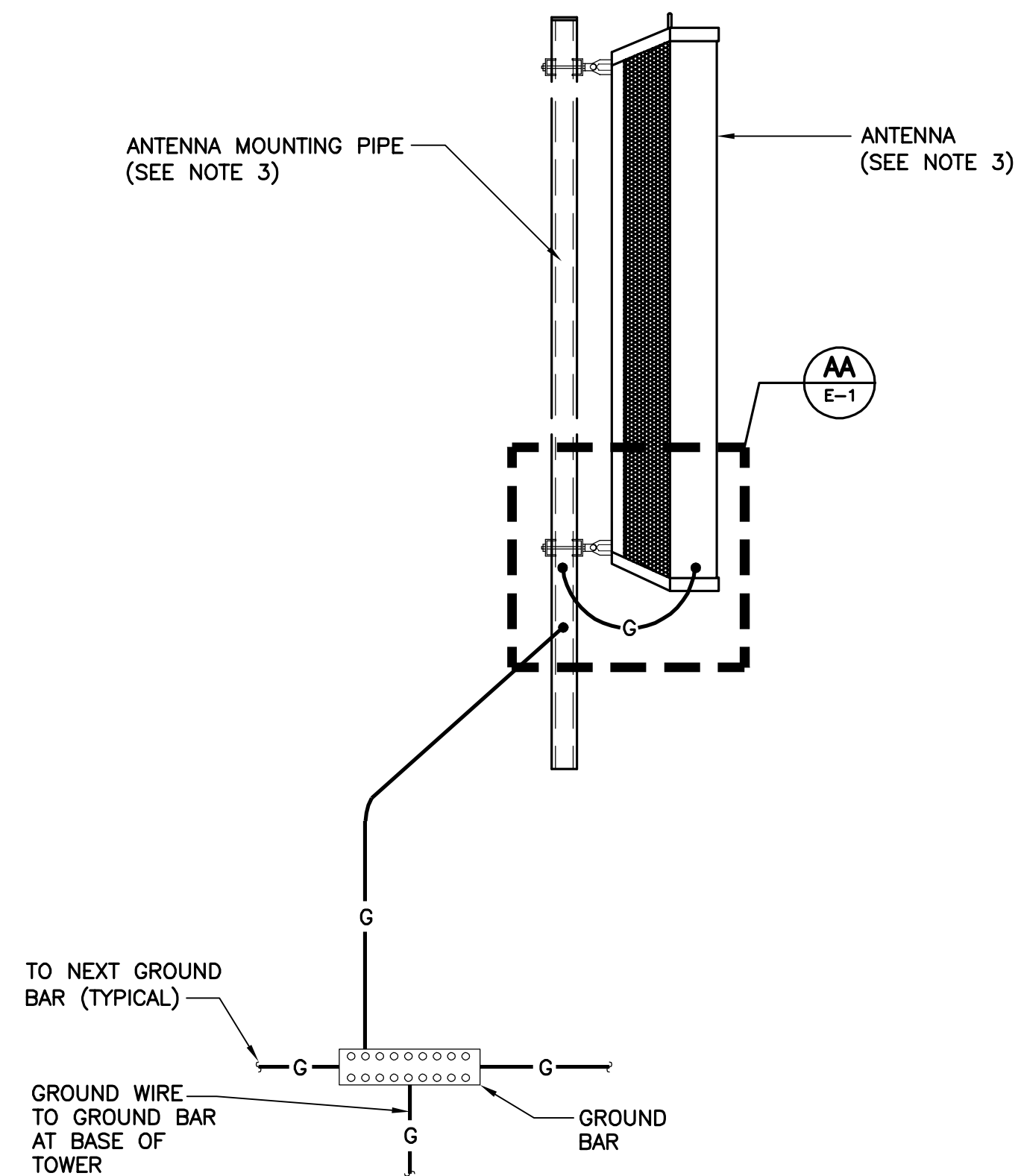


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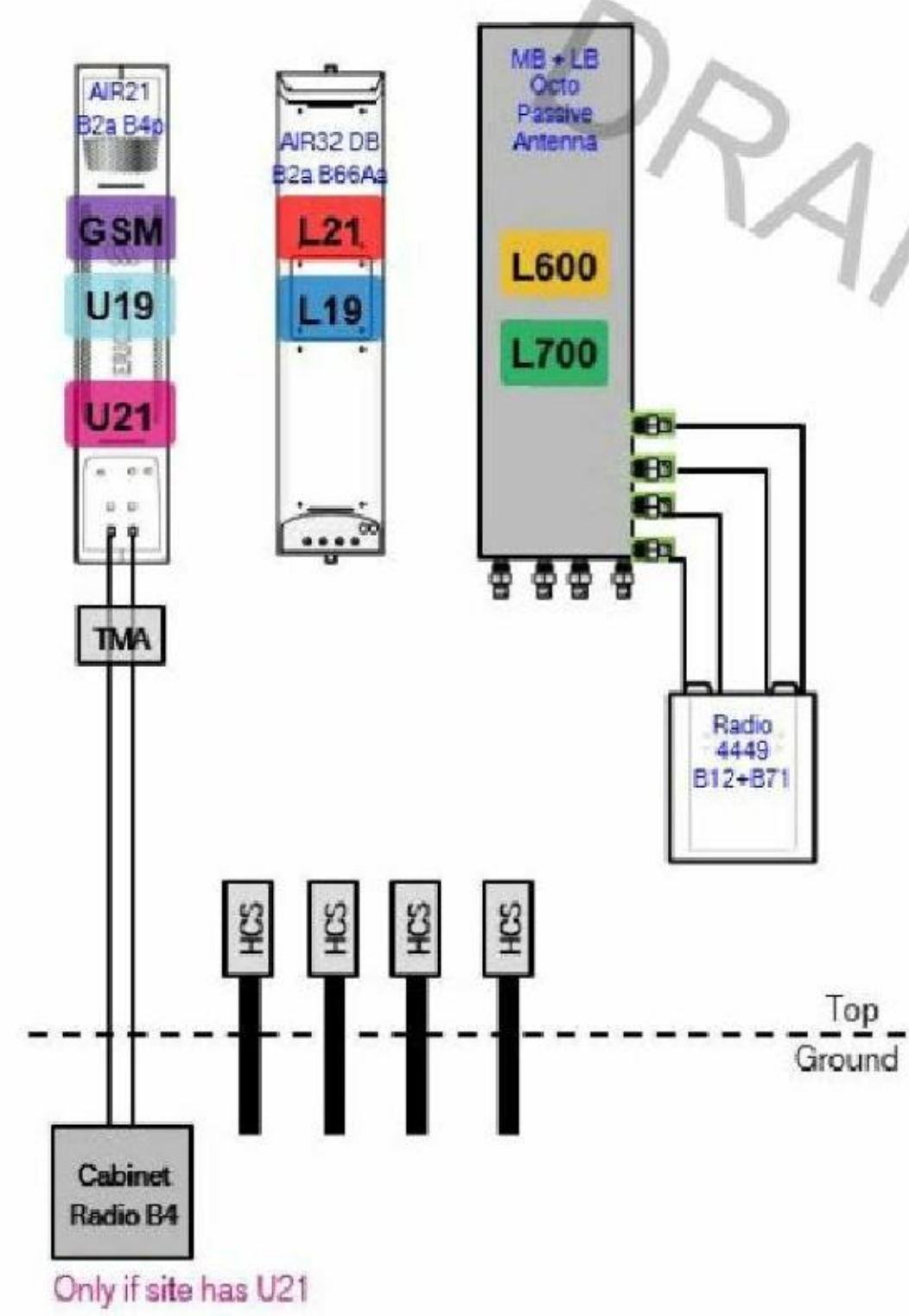
ANTENNA CONFIGURATION AND ELEVATION



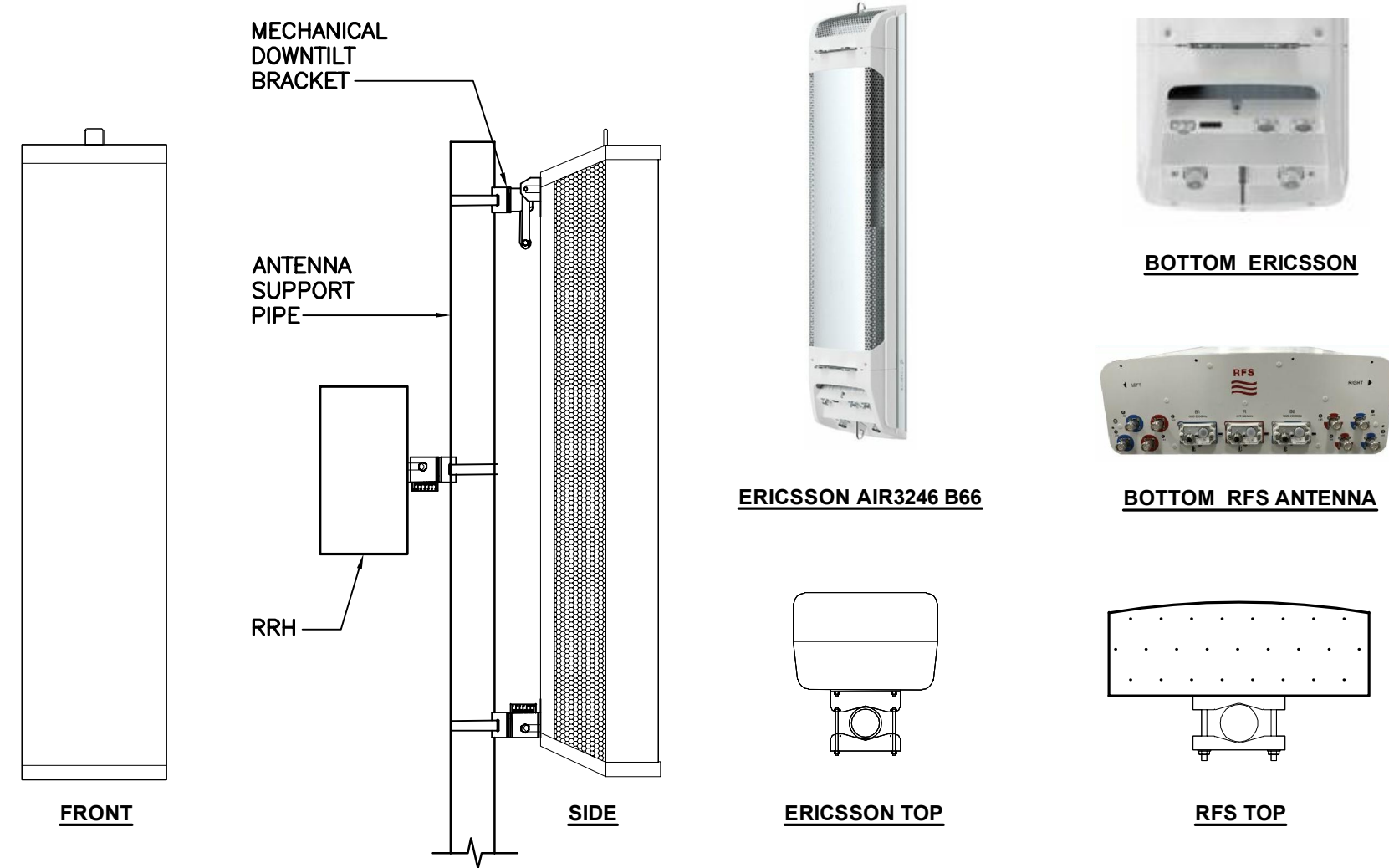
NOTES:

- BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
- BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
- DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 TYPICAL ANTENNA GROUNDING DETAIL
E-1 SCALE: NONE



2 PROPOSED PLUMBING DIAGRAM
E-1 SCALE: NONE



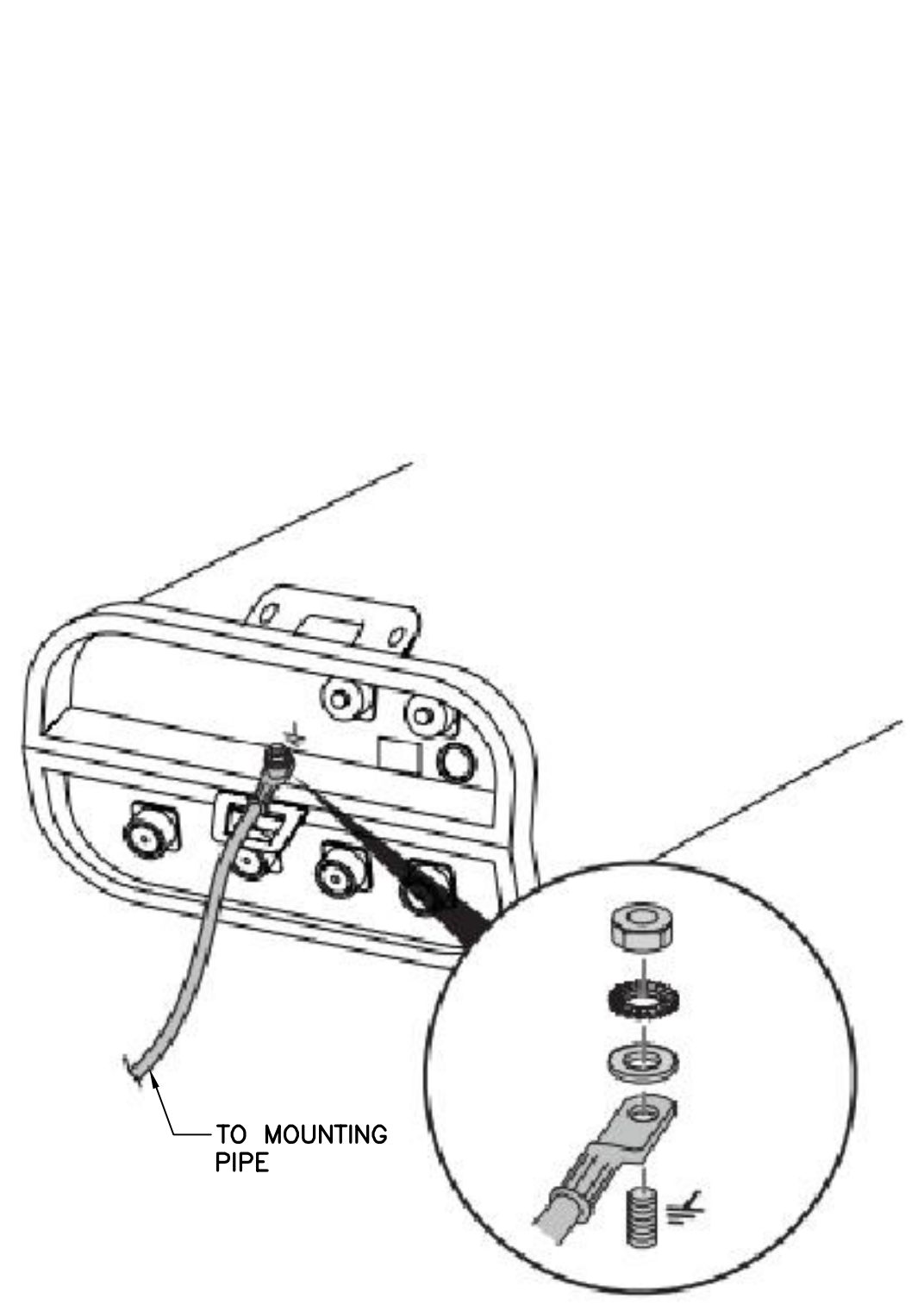
ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAARR24_43-U-NA20	95.9"L x 24"W x 8.7"D	153 LBS.
MAKE: ERICSSON MODEL: KR901146-1_B66A_B2A	56.65"L x 12.87"W x 8.66"D	132.2 LBS.
MAKE: ERICSSON MODEL: KRC118023-1_B2A_B4P	56"L x 12.1"W x 7.9"D	90 LBS.

3 PROPOSED ANTENNA DETAIL
E-1 SCALE: NONE

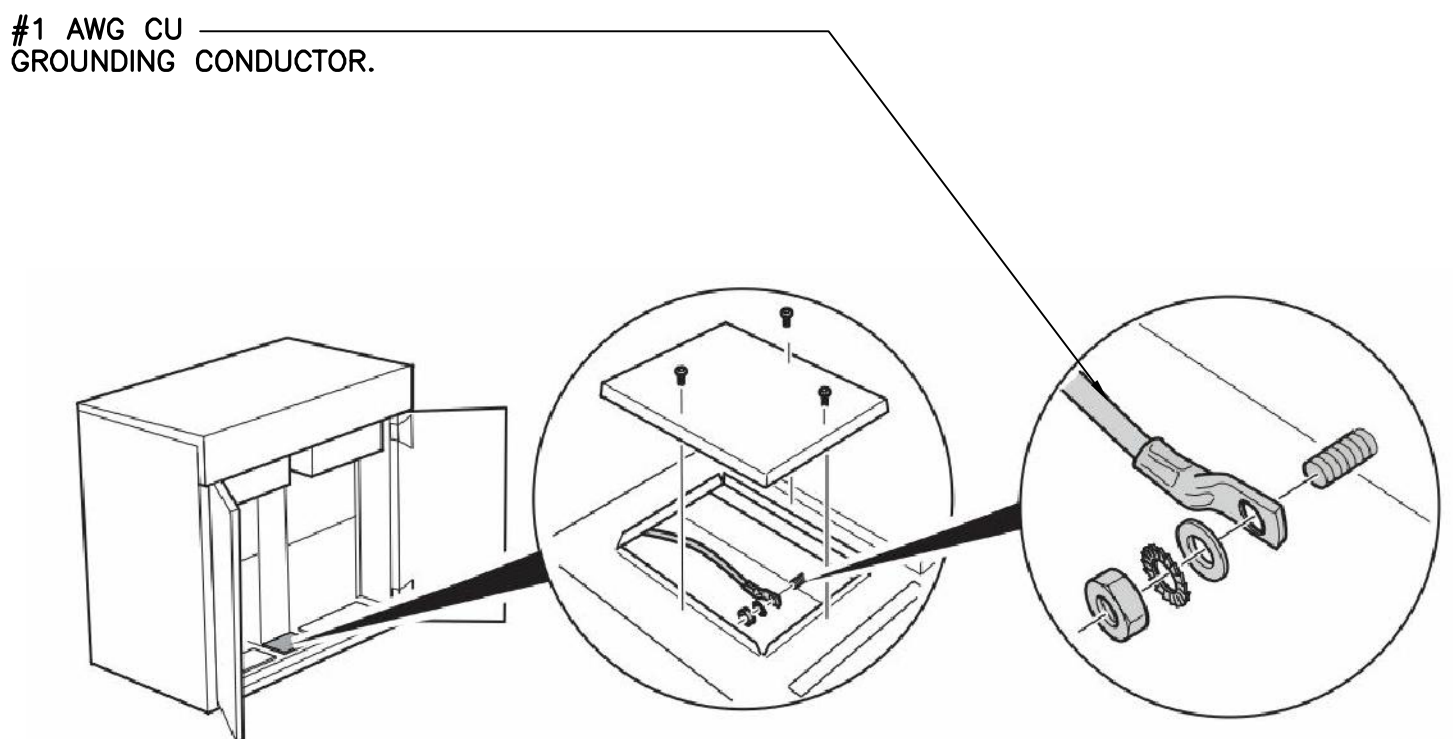


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71B12	14.9"L x 13.2"W x 10.4"D	74 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

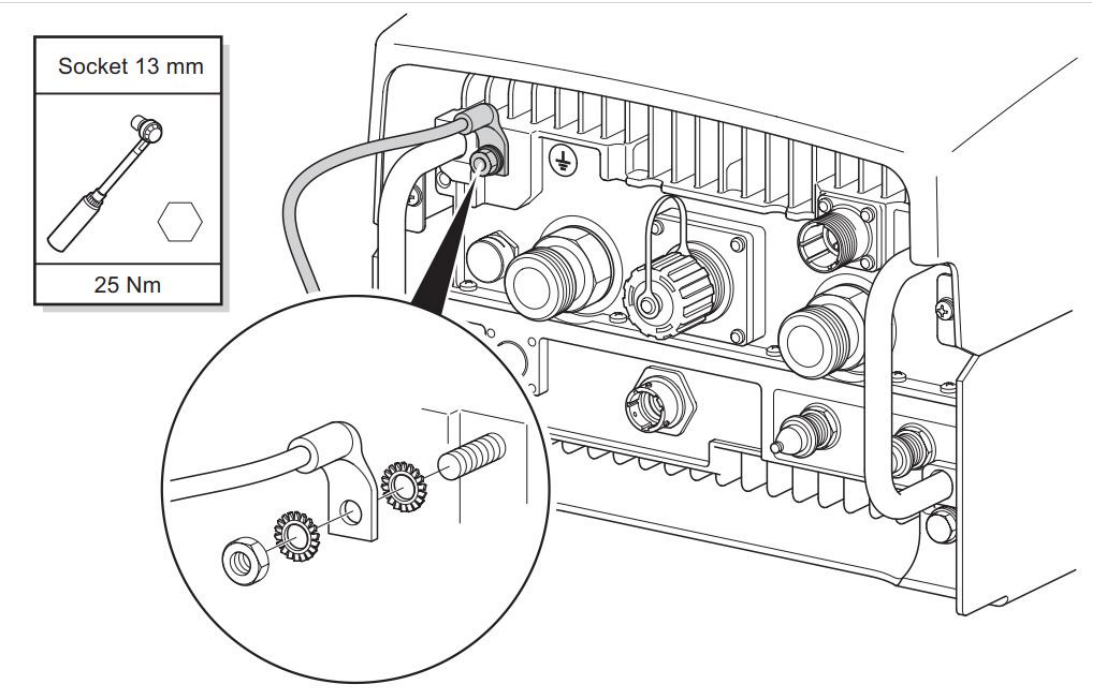
4 PROPOSED RRU DETAIL
E-1 SCALE: NONE



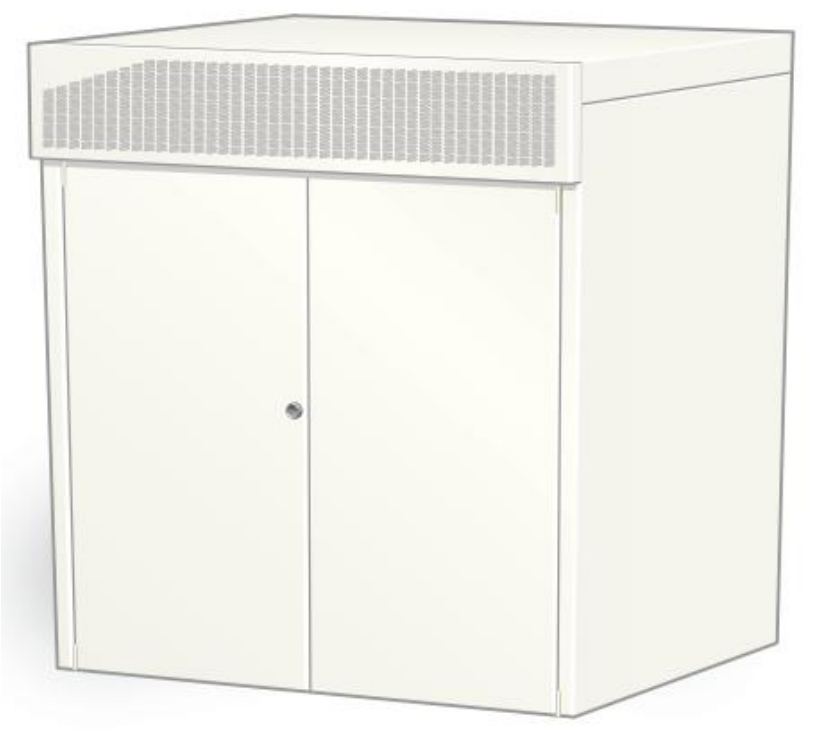
AA TYPICAL ANTENNA GROUNDING DETAIL
E-1 SCALE: NONE



6 ERICSSON CABINET GROUNDING DETAIL
E-1 SCALE: NTS



5 RRU GROUNDING DETAIL
E-1 NOT TO SCALE

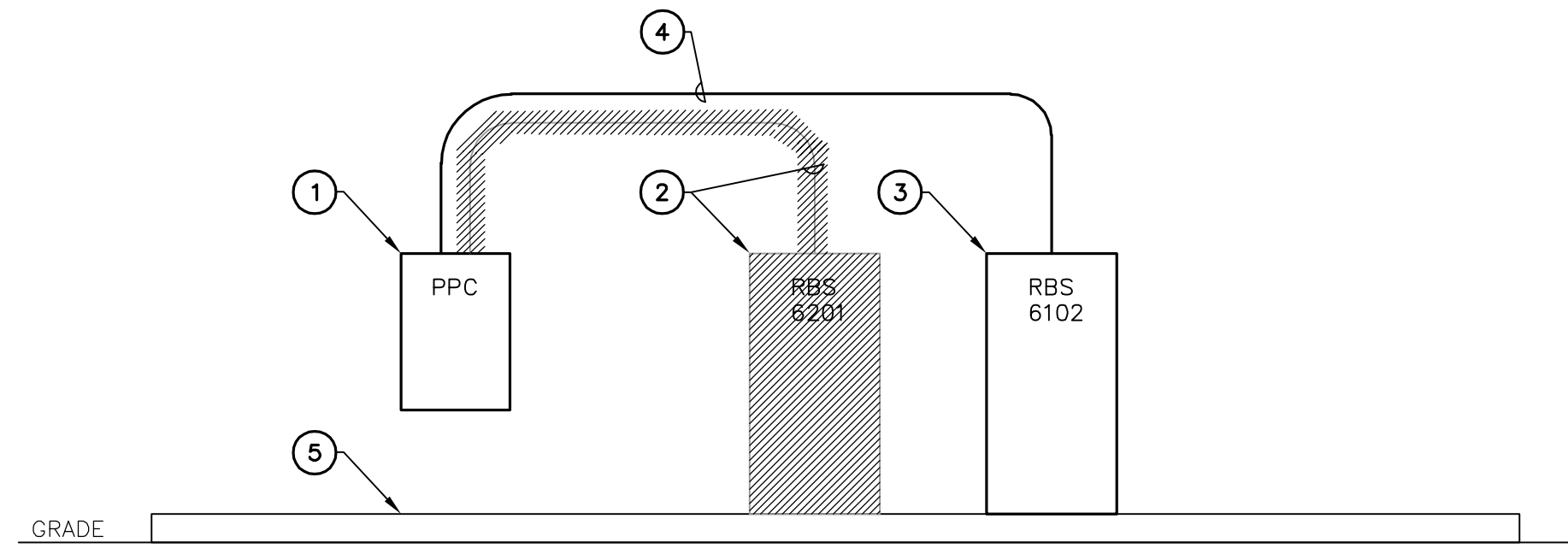


EQUIPMENT CABINET			
EQUIPMENT	DIMENSIONS	WEIGHT	VOLTS/PH/AMPS
MAKE: ERICSSON MODEL: 6102	57.09"H x 51.18"W x 27.56"D	727.53-LBS	240/1/100

7 ERICSSON RADIO CABINET DETAIL
E-1 SCALE: NTS

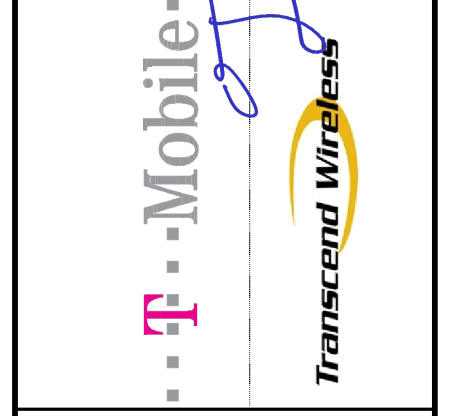
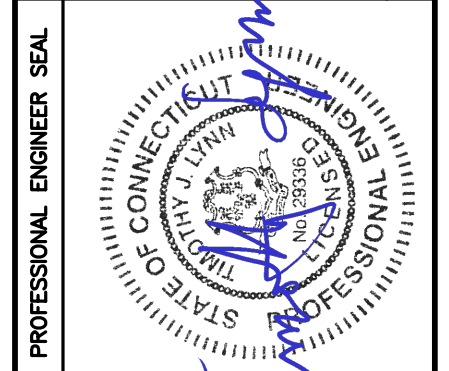
RISER DIAGRAM NOTES

- EXISTING T-MOBILE PPC CABINET TO REMAIN.
- EXISTING T-MOBILE RBS 6201 CABINET AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.
- NEW T-MOBILE RBS 6102 TO BE INSTALLED. BOND TO EXISTING GROUND RING PER MANUFACTURERS SPECIFICATIONS (MINIMUM OF #2 AWG GROUND).
- (3) #1/0 AWG, (1) #6 AWG GROUND, 2" CONDUIT CONNECTED TO NEW 150A, 2P CIRCUIT BREAKER IN PPC CABINET.
- T-MOBILE EQUIPMENT PAD.



8 ELECTRICAL POWER RISER DIAGRAM
E-1 NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS